

## TEST REPORT – EMC Emissions

**Report Number: 100211930DEN-001**

**Project Number: 100211930**

**Report Issue Date: 12/9/2010**

**Product Designation: Model: E-Reg-R (Electronic Register with Embedded M2 Radio)**

**Standards:** FCC 47 CFR Part 15.247  
IC RSS 210: Issue 7  
IC RSS-GEN Issue 2: 2007

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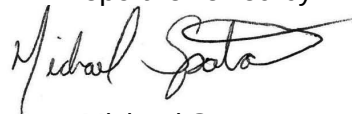
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**Product Under Test**

E-Reg-R  
(Electronic Register with Embedded M2 Radio)



## 1 Introduction and Conclusion

The tests indicated in section 2.0 were performed on the product constructed as described in section 3.0. The remaining test sections are the verbatim text from the actual data sheets used during the investigation. These test sections include the test name, the specified test Method, a list of the actual Test Equipment Used, documentation Photos, Results and raw Data. No additions, deviations, or exclusions have been made from the standard(s) unless specifically noted.

Based on the results of our investigation, we have concluded **the product tested complies with the requirements of the standard(s) indicated.** The results obtained in this test report pertain only to the item(s) tested.

## 2 Test Summary

| Section | Test full name                                                                                                                                   | Test date  | Result |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------|
| 5       | Radiated Emissions – Field Strength of the Fundamental & Harmonics of the Fundamental - FCC 247(b)(3) (d)/15.205 (Covers RSS-210 A8.4(4) & A8.5) | 10/14/2010 | Pass   |
| 6       | Radiated Emissions – Unintentional & Spurious - FCC 15.209/ 15.247(d) (Covers RSS-210, Section 2.7, Tables 2 & 3)                                | 10/15/2010 | Pass   |
| 7       | 6dB Bandwidth – FCC 15.247 (a)(2) (Covers RSS-210 A8.2(a))                                                                                       | 10/21/2010 | Pass   |
| 8       | Power Spectral Density (PSD) – FCC 15.247(e) (Covers RSS-210 A8.2(b))                                                                            | 10/21/2010 | Pass   |
| 9       | Occupied Bandwidth - RSS-GEN, Section 4.6.1                                                                                                      | 10/21/2010 | Pass   |
| 10      | Band Edge Measurements – FCC 15.247(d) / 15.209 (Covers RSS-210, A8.5 & Section 2.7, Table 2)                                                    | 10/14/2010 | Pass   |
| 11      | AC Conducted Emissions – FCC 15.207 – Not Applicable                                                                                             | -----      | N/A    |

### Notes:

- 1) Product is battery-powered – therefore, Conducted Emissions does not apply.
- 2)

**General Remarks:**

The following remarks are to be considered as “where applicable” and are taken into account while completing any FCC/IC/ETSI Radio tests at Intertek-Louisville.

Testing was performed in 3 different orthogonal axes to determine the worst-case emissions from the device. The worst-case axis and emissions are shown in this report.

FCC CFR47 Part 15.31: Measurement Standards: In any case where the device is powered off a battery, a fresh battery was used during testing. In cases where the device is powered of an AC Supply, voltage was varied per Part 15.31 to find worst-case emissions.

FCC CFR Part 15.35: Measurement Detector Functions and Bandwidths: FCC Part 15.35 was utilized when performing measurements within this report.

Whenever possible the approved test procedures specified in FCC KDB 558074 for DTS devices was used for testing.

**Limit Calculation:**

At the time of testing, Intertek was unable to obtain the gain of the antenna for the EUT from the manufacturer of the EUT or from the manufacture of the antenna. Therefore, the following calculation was used to determine the field strength limit for a test distance of 3m. This calculation assumes ideal isotropic radiation from the source.

$$P = 20 \cdot \log(E) - 95.2289$$

P is power in dBm

E is uV/m

**3 Description of Equipment Under Test**

| Equipment Under Test                       |                          |              |               |
|--------------------------------------------|--------------------------|--------------|---------------|
| Description                                | Manufacturer             | Model Number | Serial Number |
| Electronic Register with Embedded M2 Radio | Transparent Technologies | E-Reg-R      | FCCONE        |
|                                            |                          |              |               |
|                                            |                          |              |               |

|                     |                   |
|---------------------|-------------------|
| Receive Date:       | 10/14/2010        |
| Received Condition: | Good              |
| Type:               | Production Sample |

**Description of Equipment Under Test (provided by client)**

The E-Reg-R Electronic Register with Embedded M2 Radio is a low-power, battery-operated index register designed for water meters. The radio operates at a nominal frequency range of 903-927MHz. The transceiver, constructed on an etched printed circuit card, is powered from a 3.6V lithium battery. The product can operate in the following modes:

- transmit only (one-way) mode
- transmit/receive (two-way) mode

In the one-way mode, the product transmits data packets over the RF channel. In the two-way mode, the product has the ability to receive data for remote re-configuration and datalogging.

The transmission duration (duty cycle) is approximately 3 ms and a data frame is 128 bits.

The product utilizes FM Digital Modulation (FSK) for its radio function.

The antenna is an inverted-F constructed on an etched PCB which is soldered to the PCA and is permanently sealed inside the E-Reg-R.

Intended use of the product is commercial and industrial applications in dry, damp and wet locations.

The product is marketed in the US & Canada.

| Equipment Under Test Power Configuration |               |                 |                  |
|------------------------------------------|---------------|-----------------|------------------|
| Rated Voltage                            | Rated Current | Rated Frequency | Number of Phases |
| 3.6 VDC Battery                          | -----         | -----           | -----            |

**Operating modes of the EUT:**

| No. | Descriptions of EUT Exercising                                                 |
|-----|--------------------------------------------------------------------------------|
| 1   | Tx - Product set up in transmit mode at full power, CW mode (for testing only) |
| 2   | Rx – Product set up in “standby” receive mode                                  |

**Clock Frequencies of the EUT:**

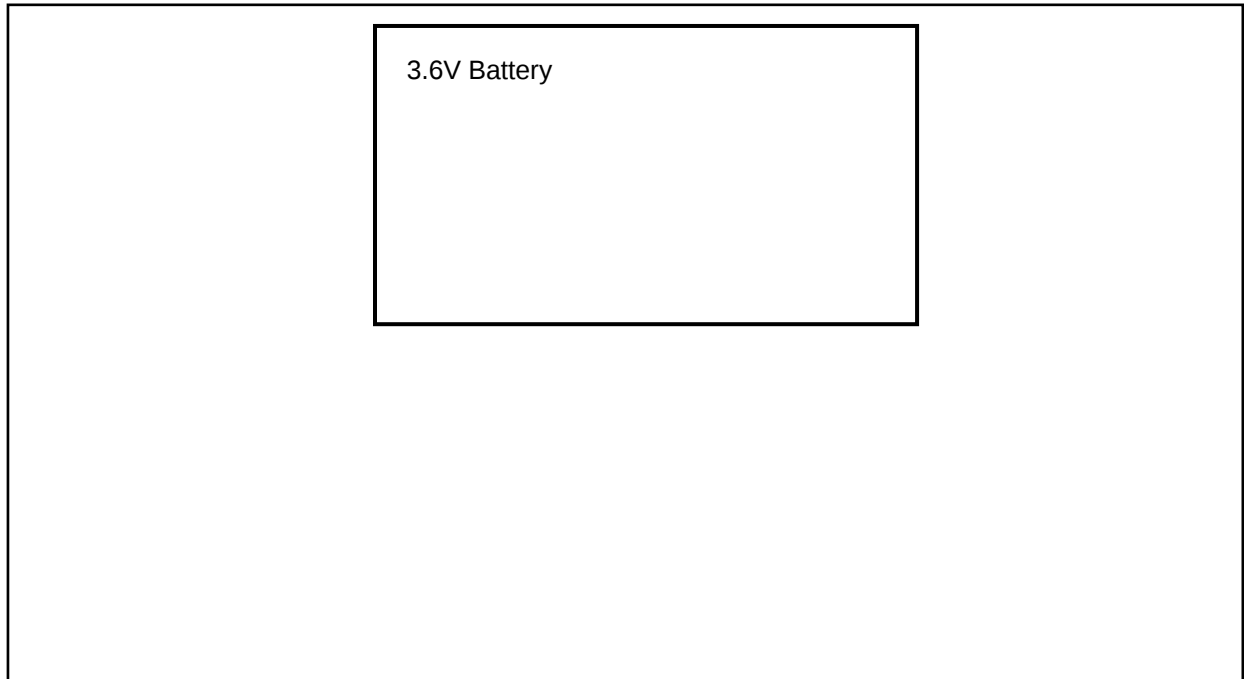
| No. | Descriptions of Product Clocks         |
|-----|----------------------------------------|
| 1   | Transmit Frequency: 903 MHz to 927 MHz |
| 2   | Lowest Frequency Utilized: 32.768 kHz  |

#### **4 System setup including cable interconnection details, support equipment and simplified block diagram**

##### **4.1 Method:**

Record the details of EUT cabling, document the support equipment, and show the interconnections in a block diagram.

##### **4.2 EUT Block Diagram:**



|                                 |                   |
|---------------------------------|-------------------|
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**4.3 Data:**

| ID | Cable Description | Length | Shielding | Ferrites |
|----|-------------------|--------|-----------|----------|
| 1  | None              | ----   | ----      | ----     |
|    |                   |        |           |          |
|    |                   |        |           |          |
|    |                   |        |           |          |
|    |                   |        |           |          |
|    |                   |        |           |          |
|    |                   |        |           |          |

| Support Equipment |              |              |               |
|-------------------|--------------|--------------|---------------|
| Description       | Manufacturer | Model Number | Serial Number |
| ---               | ---          | ---          | ---           |
|                   |              |              |               |
|                   |              |              |               |
|                   |              |              |               |
|                   |              |              |               |
|                   |              |              |               |

General notes:

1. Product did not require any support equipment other than laptop/software utility to change Tx channels and operating modes.

## 5 Radiated Emissions – Field Strength of the Fundamental & Harmonics of the Fundamental

The test methods used comply with ANSI C63.4 and CISPR 16. Unless otherwise stated no deviations were made from **FCC CFR47 15.247 & IC RSS-210**.

Intertek Louisville's emissions testing facility is located at 40 Meadow Rd. in Pinewood Springs CO 80540. The emissions testing facility is ISO17025:2005 accredited by NVLAP, our lab code is 200624-0, BSMI lab number is SL2-IN-E-029R, our VCCI registration no. R-1643, our FCC designation no. US5170 and our IC lab no. 2042N.

### 5.1 Test Equipment Used:

| <u>Asset ID:</u> | <u>Description:</u>                       | <u>Manufacturer:</u> | <u>Model:</u>  | <u>Serial:</u> | <u>Cal Date</u> | <u>Cal Due</u> |
|------------------|-------------------------------------------|----------------------|----------------|----------------|-----------------|----------------|
| 18882            | Spectrum Analyzer (dc-22 GHz)             | Hewlett-Packard      | 8566B          | 2410A00154     | 11/12/2009      | 11/12/2010     |
| 18660            | Spectrum Analyzer Display Section (set 1) | Hewlett-Packard      | 85662A         | 2318A04983     | 11/12/2009      | 11/12/2010     |
| 18880            | Q.P Adapter                               | Hewlett-Packard      | 85650A         | 2811A01300     | 11/12/2009      | 11/12/2010     |
| 18912            | 9 kHz- 1.3GHz Pre Amp                     | Hewlett-Packard      | 8447F          | 3113A05545     | 06/04/2010      | 06/04/2011     |
| 18906            | Pre-Amplifier (1-4 GHz)                   | Mini-Circuits Lab    | ZHL-42         | N052792-2      | 06/11/2010      | 06/11/2011     |
| 18900            | RF Pre-Amplifier (4-8 GHz)                | Avantek              | AFT97-8434-10F | 1007           | 06/07/2010      | 06/07/2011     |
| 18901            | RF Pre-Amplifier (8-18 GHz)               | Avantek              | AWT-18037      | 1002           | 06/07/2010      | 06/07/2011     |
| 18798            | Bicon Antenna 30 - 300 MHz                | EMCO                 | 3109           | 9801-3142      | 02/03/2010      | 02/03/2011     |
| 18808            | Log Periodic Antenna                      | EMCO                 | 3146           | 9203-3376      | 12/05/2009      | 12/05/2010     |
| 18886            | Ridged Guide Antenna 1-18GHz              | TENSOR               | 4105           | 2020           | 10/08/2010      | 10/08/2011     |

### 5.2 Results:

The sample tested was found to Comply.

- FCC 247(b)(3) (d)/15.205
- RSS-210 A8.4(4) & A8.5

### 5.3 Setup Photographs:

Test setup – Front View



**Photo:**

Test setup – Rear View



**Photo:**

Worst-Case Axis 1 (EUT Flat on Table)



## 5.4 Test Data:

## Fundamental and Spurious of the Transmitter

|                |                         |            |                      |                    |      |     |
|----------------|-------------------------|------------|----------------------|--------------------|------|-----|
| Test Report #: | <b>500255363 Run 01</b> | Test Area: | Pinewood Site 1 (3m) | Temperature:       | 22.3 | °C  |
| Test Method:   | FCC 15.247/ IC RSS-210  | Test Date: | 14-Oct-2010          | Relative Humidity: | 35.1 | %   |
| EUT Model #:   | E-REG-R                 | EUT Power: | 3.6 VDC Battery      | Air Pressure:      | 79.9 | kPa |
| EUT Serial #:  | FCCONE                  |            |                      |                    |      |     |

|                  |                                                   |                |                  |
|------------------|---------------------------------------------------|----------------|------------------|
| Manufacturer:    | Transparent Technologies                          | Level Key      |                  |
| EUT Description: | Water Register-Radio                              | Pk – Peak      | Nb – Narrow Band |
| Notes:           | Tx transmitting CW for test purposes only.        | Qp – QuasiPeak | Bb – Broad Band  |
|                  | Worst-Case Axis determined from previous testing. | Av - Average   |                  |

| FREQ                                                                                                                                                           | LEVEL   | CABLE / ANT /<br>PREAMP | FINAL  | POL / HGT / AZ  | Duty Cycle<br>Correction | Final Corrected | Limit<br>FCC<br>15.247 | DELTA |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-------------------------|--------|-----------------|--------------------------|-----------------|------------------------|-------|
| (MHz)                                                                                                                                                          | (dBuV)  | (dB) (dBm) (dB)         | (dBuV) | (m) (DEG)       | (dB)                     | (dBuV/m)        | (dBuV/m)               | (dB)  |
| The following Duty Cycle was declared by the manufacturer:                                                                                                     |         |                         |        |                 |                          |                 |                        |       |
| <b>3.0%</b>                                                                                                                                                    |         |                         |        |                 |                          |                 |                        |       |
| <b>Averaging method for pulsed signals and calculation in accordance to FCC CFR47 Part 15.35 utilized to calculate field strength emissions.</b>               |         |                         |        |                 |                          |                 |                        |       |
| The testing performed in accordance to FCC CFR47 Part 15.205 (restricted bands of operation) and 15.247 emissions and delta limits were calculated as follows: |         |                         |        |                 |                          |                 |                        |       |
| Final Corrected Peak Measurement – Duty Cycle Correction Factor* = Final Calculated Emission                                                                   |         |                         |        |                 |                          |                 |                        |       |
| The Final Calculated Emission was then compared to the Limits in CFR47 Part 15.209 and 15.247 and the emission/limit delta was calculated.                     |         |                         |        |                 |                          |                 |                        |       |
| the DTCF is calculated as follows $20 \cdot \log_{10}(\text{duty cycle in 100ms})$ <b>“not to exceed 20dB”</b>                                                 |         |                         |        |                 |                          |                 |                        |       |
| <b>Part 15.247 and 15.205 Respectively</b>                                                                                                                     |         |                         |        |                 |                          |                 |                        |       |
| <b>Fundamental Measurements</b>                                                                                                                                |         |                         |        |                 |                          |                 |                        |       |
| <b>Fundamental - Low Channel</b>                                                                                                                               |         |                         |        |                 |                          |                 |                        |       |
| 902.81                                                                                                                                                         | 88.4 Pk | 3.6 / 22.5 / 0.0        | 114.5  | V / 1.0 / 242.0 | 0.0                      | 114.5           | 125.0                  | -10.5 |
| 902.81                                                                                                                                                         | 81.7 Pk | 3.6 / 22.5 / 0.0        | 107.7  | H / 1.5 / 187.0 | 0.0                      | 107.7           | 125.0                  | -17.3 |
| <b>Fundamental - Mid Channel</b>                                                                                                                               |         |                         |        |                 |                          |                 |                        |       |
| 919.81                                                                                                                                                         | 80.7 Pk | 3.6 / 22.5 / 0.0        | 106.9  | H / 1.5 / 44.0  | 0.0                      | 106.9           | 125.0                  | -18.1 |
| 919.81                                                                                                                                                         | 87.5 Pk | 3.6 / 22.5 / 0.0        | 113.7  | V / 1.1 / 272.0 | 0.0                      | 113.7           | 125.0                  | -11.3 |
| <b>Fundamental - High Channel</b>                                                                                                                              |         |                         |        |                 |                          |                 |                        |       |
| 926.81                                                                                                                                                         | 87.0 Pk | 3.6 / 22.6 / 0.0        | 113.2  | V / 1.1 / 345.0 | 0.0                      | 113.2           | 125.0                  | -11.8 |
| 926.81                                                                                                                                                         | 82.8 Pk | 3.6 / 22.6 / 0.0        | 109    | H / 1.6 / 193.0 | 0.0                      | 109.0           | 125.0                  | -16.0 |

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| FREQ                                                                                 | LEVEL          | CABLE / ANT /<br>PREAMP  | FINAL       | POL / HGT / AZ         | Duty Cycle<br>Correction | Final Corrected | Limit<br>FCC<br>15.247 | DELTA       |
|--------------------------------------------------------------------------------------|----------------|--------------------------|-------------|------------------------|--------------------------|-----------------|------------------------|-------------|
| (MHz)                                                                                | (dBuV)         | (dB) (dBm) (dB)          | (dBuV)      | (m) (DEG)              | (dB)                     | (dBuV/m)        | (dBuV/m)               | (dB)        |
| <b>Harmonics of the Fundamental – FCC Restricted Bands are Highlighted in Yellow</b> |                |                          |             |                        |                          |                 |                        |             |
| <b>Harmonics - Low Channel</b>                                                       |                |                          |             |                        |                          |                 |                        |             |
| 1805.65                                                                              | 76.5 Pk        | 2.8 / 26.3 / 37.0        | 68.6        | H / 1.5 / 186.0        | 20.0                     | 48.6            | 94.5                   | -45.9       |
| 1805.65                                                                              | 76.0 Pk        | 2.8 / 26.3 / 37.0        | 68.1        | V / 1.4 / 212.0        | 20.0                     | 48.1            | 94.5                   | -46.4       |
| <b>2708.5</b>                                                                        | <b>75.5 Pk</b> | <b>3.5 / 29.7 / 37.5</b> | <b>71.2</b> | <b>H / 1.2 / 192.0</b> | <b>20.0</b>              | <b>51.2</b>     | <b>54.0</b>            | <b>-2.8</b> |
| 2708.5                                                                               | 59.7 Pk        | 3.5 / 29.7 / 37.5        | 55.3        | V / 1.1 / 210.0        | 20.0                     | 35.3            | 54.0                   | -18.7       |
| 3611.34                                                                              | 54.2 Pk        | 4.5 / 31.7 / 37.7        | 52.7        | H / 1.1 / 222.0        | 20.0                     | 32.7            | 54.0                   | -21.3       |
| 3611.34                                                                              | 53.4 Pk        | 4.5 / 31.7 / 37.7        | 51.9        | V / 1.7 / 58.0         | 20.0                     | 31.9            | 54.0                   | -22.1       |
| 4514.17                                                                              | 55.9 Pk        | 5.3 / 32.3 / 39.0        | 54.4        | V / 1.6 / 208.0        | 20.0                     | 34.4            | 54.0                   | -19.6       |
| 4514.18                                                                              | 53.1 Pk        | 5.3 / 32.3 / 39.0        | 51.6        | H / 1.6 / 88.0         | 20.0                     | 31.6            | 54.0                   | -22.4       |
| 5417.02                                                                              | 38.6 Pk        | 6.0 / 34.3 / 39.1        | 40          | H / 1.3 / 12.0         | 20.0                     | 20.0            | 54.0                   | -34.0       |
| 5417.03                                                                              | 41.9 Pk        | 6.0 / 34.3 / 39.1        | 43.2        | V / 1.6 / 292.0        | 20.0                     | 23.2            | 54.0                   | -30.8       |
| 6319.95                                                                              | 44.3 Pk        | 6.6 / 35.2 / 39.6        | 46.6        | V / 1.3 / 292.0        | 20.0                     | 26.6            | 94.5                   | -67.9       |
| 6319.95                                                                              | 43.0 Pk        | 6.6 / 35.2 / 39.6        | 45.2        | H / 1.3 / 142.0        | 20.0                     | 25.2            | 94.5                   | -69.3       |
| 7222.8                                                                               | 44.0 Pk        | 7.3 / 36.3 / 39.7        | 47.8        | V / 1.2 / 154.0        | 20.0                     | 27.8            | 94.5                   | -66.7       |
| 7222.8                                                                               | 39.1 Pk        | 7.3 / 36.3 / 39.7        | 42.9        | H / 1.4 / 142.0        | 20.0                     | 22.9            | 94.5                   | -71.6       |
| 8125.63                                                                              | 49.5 Pk        | 7.8 / 37.1 / 45.7        | 48.8        | H / 1.4 / 226.0        | 20.0                     | 28.8            | 54.0                   | -25.2       |
| 8125.63                                                                              | 48.4 Pk        | 7.8 / 37.1 / 45.7        | 47.6        | V / 1.3 / 142.0        | 20.0                     | 27.6            | 54.0                   | -26.4       |
| 9028.43                                                                              | 41.0 Pk        | 8.4 / 37.9 / 47.3        | 40.1        | H / 1.4 / 226.0        | 20.0                     | 20.1            | 54.0                   | -33.9       |
| 9028.43                                                                              | 44.3 Pk        | 8.4 / 37.9 / 47.3        | 43.3        | V / 1.4 / 226.0        | 20.0                     | 23.3            | 54.0                   | -30.7       |
| <b>Harmonics - Mid Channel</b>                                                       |                |                          |             |                        |                          |                 |                        |             |
| 1839.65                                                                              | 74.8 Pk        | 2.8 / 26.5 / 37.1        | 67          | V / 1.4 / 162.0        | 20.0                     | 47.0            | 93.7                   | -46.7       |
| 1839.65                                                                              | 75.2 Pk        | 2.8 / 26.5 / 37.1        | 67.4        | H / 1.4 / 188.0        | 20.0                     | 47.4            | 93.7                   | -46.3       |
| 2759.48                                                                              | 71.5 Pk        | 3.5 / 29.9 / 37.5        | 67.5        | H / 1.2 / 188.0        | 20.0                     | 47.5            | 54.0                   | -6.5        |
| 2759.5                                                                               | 61.3 Pk        | 3.5 / 29.9 / 37.5        | 57.2        | V / 1.7 / 264.0        | 20.0                     | 37.2            | 54.0                   | -16.8       |
| 3679.34                                                                              | 55.0 Pk        | 4.5 / 31.8 / 37.7        | 53.6        | V / 1.6 / 275.0        | 20.0                     | 33.6            | 54.0                   | -20.4       |
| 3679.34                                                                              | 54.8 Pk        | 4.5 / 31.8 / 37.7        | 53.4        | H / 1.3 / 193.0        | 20.0                     | 33.4            | 54.0                   | -20.6       |
| 4599.17                                                                              | 49.9 Pk        | 5.3 / 32.5 / 39.1        | 48.6        | H / 1.6 / 208.0        | 20.0                     | 28.6            | 54.0                   | -25.4       |
| 4599.17                                                                              | 55.9 Pk        | 5.3 / 32.5 / 39.1        | 54.6        | V / 1.5 / 210.0        | 20.0                     | 34.6            | 54.0                   | -19.4       |
| 5519.03                                                                              | 38.1 Pk        | 6.1 / 34.5 / 39.1        | 39.7        | H / 1.4 / 320.0        | 20.0                     | 19.7            | 93.7                   | -74.0       |
| 5519.03                                                                              | 40.5 Pk        | 6.1 / 34.5 / 39.1        | 42.1        | V / 1.4 / 154.0        | 20.0                     | 22.1            | 93.7                   | -71.6       |
| 6438.94                                                                              | 43.4 Pk        | 6.7 / 35.3 / 39.5        | 45.9        | V / 1.2 / 204.0        | 20.0                     | 25.9            | 93.7                   | -67.8       |
| 6438.95                                                                              | 40.2 Pk        | 6.7 / 35.3 / 39.5        | 42.7        | H / 1.6 / 198.0        | 20.0                     | 22.7            | 93.7                   | -71.0       |
| 7358.79                                                                              | 38.6 Pk        | 7.4 / 36.4 / 39.4        | 43          | H / 1.5 / 198.0        | 20.0                     | 23.0            | 54.0                   | -31.0       |
| 7358.8                                                                               | 42.4 Pk        | 7.4 / 36.4 / 39.4        | 46.8        | V / 1.3 / 164.0        | 20.0                     | 26.8            | 54.0                   | -27.2       |
| 8278.63                                                                              | 48.4 Pk        | 7.9 / 37.1 / 45.9        | 47.4        | V / 1.3 / 146.0        | 20.0                     | 27.4            | 54.0                   | -26.6       |
| 8278.63                                                                              | 48.8 Pk        | 7.9 / 37.1 / 45.9        | 47.9        | H / 1.3 / 224.0        | 20.0                     | 27.9            | 54.0                   | -26.1       |
| 9198.43                                                                              | 42.9 Pk        | 8.5 / 38.1 / 47.5        | 42          | V / 1.3 / 146.0        | 20.0                     | 22.0            | 54.0                   | -32.0       |
| 9198.43                                                                              | 44.4 Pk        | 8.5 / 38.1 / 47.5        | 43.6        | H / 1.3 / 146.0        | 20.0                     | 23.6            | 54.0                   | -30.4       |

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| Harmonics - High Channel |         |                   |      |                 |      |      |      |       |
|--------------------------|---------|-------------------|------|-----------------|------|------|------|-------|
| 1853.65                  | 74.5 Qp | 2.9 / 26.5 / 37.1 | 66.8 | H / 1.5 / 154.0 | 20.0 | 46.8 | 93.2 | -46.4 |
| 1853.64                  | 74.3 Pk | 2.9 / 26.5 / 37.1 | 66.6 | V / 1.8 / 162.0 | 20.0 | 46.6 | 93.2 | -46.6 |
| 2780.5                   | 67.0 Pk | 3.5 / 30.0 / 37.5 | 63   | H / 1.7 / 282.0 | 20.0 | 43.0 | 54.0 | -11.0 |
| 2780.5                   | 62.1 Pk | 3.5 / 30.0 / 37.5 | 58.1 | V / 1.5 / 162.0 | 20.0 | 38.1 | 54.0 | -15.9 |
| 3707.34                  | 55.0 Pk | 4.5 / 31.9 / 37.7 | 53.8 | H / 1.2 / 318.0 | 20.0 | 33.8 | 54.0 | -20.2 |
| 3707.34                  | 54.5 Pk | 4.5 / 31.9 / 37.7 | 53.3 | V / 1.5 / 288.0 | 20.0 | 33.3 | 54.0 | -20.7 |
| 4634.18                  | 55.0 Pk | 5.4 / 32.6 / 39.1 | 53.8 | V / 1.6 / 224.0 | 20.0 | 33.8 | 54.0 | -20.2 |
| 4634.19                  | 51.6 Pk | 5.4 / 32.6 / 39.1 | 50.5 | H / 1.5 / 204.0 | 20.0 | 30.5 | 54.0 | -23.5 |
| 5561.02                  | 43.2 Pk | 6.1 / 34.6 / 39.1 | 44.8 | V / 1.4 / 184.0 | 20.0 | 24.8 | 93.2 | -68.4 |
| 5561.03                  | 38.5 Pk | 6.1 / 34.6 / 39.1 | 40.1 | H / 1.6 / 224.0 | 20.0 | 20.1 | 93.2 | -73.1 |
| 6487.95                  | 47.5 Pk | 6.8 / 35.3 / 39.5 | 50.1 | V / 1.3 / 184.0 | 20.0 | 30.1 | 93.2 | -63.1 |
| 6487.96                  | 40.5 Pk | 6.8 / 35.3 / 39.5 | 43.1 | H / 1.5 / 224.0 | 20.0 | 23.1 | 93.2 | -70.1 |
| 7414.8                   | 42.9 Pk | 7.4 / 36.5 / 39.4 | 47.4 | V / 1.4 / 142.0 | 20.0 | 27.4 | 54.0 | -26.6 |
| 7414.8                   | 39.8 Pk | 7.4 / 36.5 / 39.4 | 44.3 | H / 1.4 / 191.0 | 20.0 | 24.3 | 54.0 | -29.7 |
| 8341.64                  | 51.1 Pk | 8.0 / 37.1 / 46.1 | 50.1 | H / 1.3 / 154.0 | 20.0 | 30.1 | 54.0 | -23.9 |
| 8341.64                  | 47.8 Pk | 8.0 / 37.1 / 46.1 | 46.8 | V / 1.3 / 142.0 | 20.0 | 26.8 | 54.0 | -27.2 |
| 9268.44                  | 42.5 Pk | 8.5 / 38.2 / 47.5 | 41.7 | H / 1.3 / 154.0 | 20.0 | 21.7 | 93.2 | -71.5 |
| 9268.44                  | 43.4 Pk | 8.5 / 38.2 / 47.5 | 42.6 | V / 1.3 / 212.0 | 20.0 | 22.6 | 93.2 | -70.6 |
|                          |         |                   |      |                 |      |      |      |       |

Example calculation:

| Measured Level | + | Transducer, Cable Loss & Amplifier corrections | = | Corrected Reading | Specification Limit | - | Corrected Reading | = | Delta Specification |
|----------------|---|------------------------------------------------|---|-------------------|---------------------|---|-------------------|---|---------------------|
| (dBμV)         |   | (dB)                                           |   | (dBμV/m)          | (dBμV/m)            |   | (dBμV/m)          |   |                     |
| 14.0           |   | 14.9                                           |   | 28.9              | 40.0                |   | 28.9              |   | -11.1               |

Deviations, Additions, or Exclusions: None

Notes:

When antenna conducted port tests cannot be performed, radiated tests to demonstrate compliance are acceptable per FCC 15.247 and IC RSS-210.

The following equation was used to convert power (watts) limits into field strength (V/m) limits:

$$P = (E \times D)^2 / (30 \times G), \text{ Therefore } E = \text{SQRT } (P (30 \times G)) / D$$

**Power Limit Fundamental Frequency = 1 W = 1.82574 V/m = 125.23 dBuV/m**

Where:

E = Measured Field Strength in V/m (converted to dBuV/m in test data)

P = 1 Watt Fundamental Limit

G = Numeric Gain of transmitting antenna over an ideal isotropic radiator = 1

D = EUT-to-Antenna Test Distance = 3-meters

## 6 Radiated Emissions – Unintentional and Spurious

### 6.1 Method

The test methods used comply with ANSI C63.4 and CISPR 16. Unless otherwise stated no deviations were made from **FCC 15.247 & IC RSS-210**.

Intertek Louisville's emissions testing facility is located at 40 Meadow Rd. in Pinewood Springs CO 80540. The emissions testing facility is ISO17025:2005 accredited by NVLAP, our lab code is 200624-0, BSMI lab number is SL2-IN-E-029R, our VCCI registration no. R-1643, our FCC designation no. US5170 and our IC lab no. 2042N.

### 6.2 Test Equipment Used:

| <u>Asset ID:</u> | <u>Description:</u>                       | <u>Manufacturer:</u> | <u>Model:</u>  | <u>Serial:</u> | <u>Cal Date</u> | <u>Cal Due</u> |
|------------------|-------------------------------------------|----------------------|----------------|----------------|-----------------|----------------|
| 18882            | Spectrum Analyzer (dc-22 GHz)             | Hewlett-Packard      | 8566B          | 2410A00154     | 11/12/2009      | 11/12/2010     |
| 18660            | Spectrum Analyzer Display Section (set 1) | Hewlett-Packard      | 85662A         | 2318A04983     | 11/12/2009      | 11/12/2010     |
| 18880            | Q.P Adapter                               | Hewlett-Packard      | 85650A         | 2811A01300     | 11/12/2009      | 11/12/2010     |
| 18912            | 9 kHz- 1.3GHz Pre Amp                     | Hewlett-Packard      | 8447F          | 3113A05545     | 06/04/2010      | 06/04/2011     |
| 18906            | Pre-Amplifier (1-4 GHz)                   | Mini-Circuits Lab    | ZHL-42         | N052792-2      | 06/11/2010      | 06/11/2011     |
| 18900            | RF Pre-Amplifier (4-8 GHz)                | Avantek              | AFT97-8434-10F | 1007           | 06/07/2010      | 06/07/2011     |
| 18897            | Magnetic loop                             | EMCO                 | 6502           | 9205-2738      | 11/18/2010      | 11/18/2011     |
| 18798            | Bicon Antenna 30 - 300 MHz                | EMCO                 | 3109           | 9801-3142      | 02/03/2010      | 02/03/2011     |
| 18808            | Log Periodic Antenna                      | EMCO                 | 3146           | 9203-3376      | 12/05/2009      | 12/05/2010     |
| 18886            | Ridged Guide Antenna 1-18GHz              | TENSOR               | 4105           | 2020           | 10/08/2010      | 10/08/2011     |

### 6.3 Results:

The sample tested was found to Comply.

- FCC 15.209/ 15.247(d)
- IC RSS-210, Section 2.7, Tables 2 & 3

#### 6.4 Setup Photographs:

Test setup – Front View

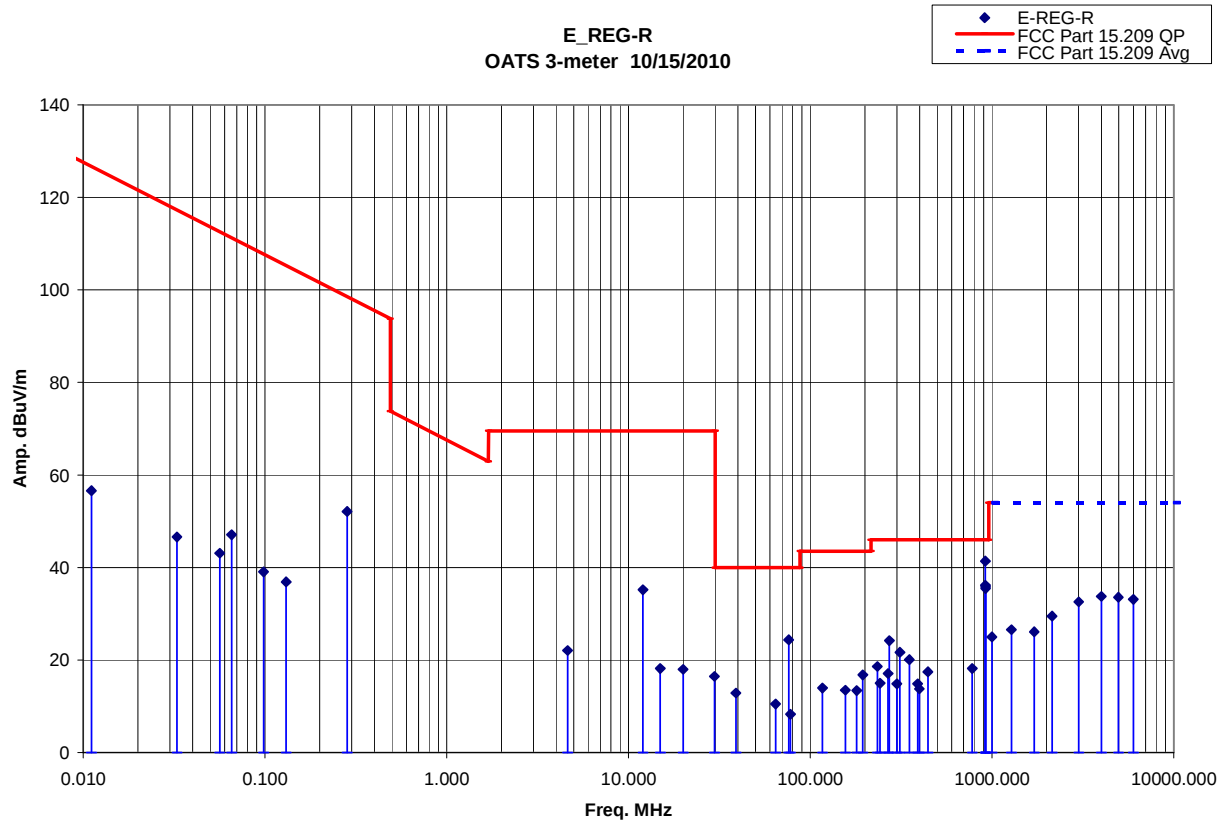


**Photo:**

Test setup – Rear View



## 6.5 Plot Summary:



## 6.6 Test Data

## Radiated Electromagnetic Emissions (Unintentional & Spurious)

Test Report #: **500255363 Run 01**

Test Area: Pinewood Site 1 (3m)

Temperature: 22.3 °C

Test Method: FCC Part 15.209

Test Date: 15-Oct-2010

Relative Humidity: 31.4 %

EUT Model #: E-REG-R

EUT Power: 3.3 VDC Battery

Air Pressure: 80.1 kPa

EUT Serial #: FCCONE

Manufacturer: Transparent Technologies

EUT Description: Water Register-Radio

Notes: Product in standby mode

Lowest signal utilized in product: 32.768 kHz

Highest signal utilized in product: 927 MHz

## Level Key

Pk – Peak Nb – Narrow Band

Qp – QuasiPeak Bb – Broad Band

Av - Average

| FREQ                                   | LEVEL   | CABLE / ANT / PREAMP | FINAL  | POL / HGT / AZ  | DELTA1 (dB)  | DELTA2 (dB)  |
|----------------------------------------|---------|----------------------|--------|-----------------|--------------|--------------|
| (MHz)                                  | (dBuV)  | (dB) (dBm) (dB)      | (dBuV) | (m) (DEG)       | 15.209 <1GHz | 15.209 >1GHz |
| <b>***** Measurement Summary *****</b> |         |                      |        |                 |              |              |
| 921.49                                 | 42.7 Qp | 3.6 / 22.5 / 27.4    | 41.4   | V / 1.0 / 228.0 | -4.6         | N/A          |
| 921.13                                 | 37.5 Qp | 3.6 / 22.5 / 27.5    | 36.2   | V / 1.0 / 228.0 | -9.8         | N/A          |
| 922.16                                 | 37.1 Qp | 3.6 / 22.5 / 27.4    | 35.8   | V / 1.0 / 228.0 | -10.2        | N/A          |
| 921.89                                 | 36.8 Qp | 3.6 / 22.5 / 27.4    | 35.5   | V / 1.0 / 0.0   | -10.5        | N/A          |
| 76.34                                  | 43.0 Qp | 0.9 / 8.4 / 27.9     | 24.4   | V / 1.0 / 0.0   | -15.6        | N/A          |
| 3999.25                                | 33.6 Av | 4.7 / 32.3 / 36.9    | 33.8   | V / 1.0 / 0.0   | N/A          | -20.2        |
| 4968.17                                | 33.7 Av | 5.7 / 33.3 / 39.1    | 33.6   | H / 1.5 / 0.0   | N/A          | -20.4        |
| 6000.20                                | 30.9 Av | 6.3 / 35.1 / 39.1    | 33.1   | H / 1.5 / 0.0   | N/A          | -20.9        |
| 3000.61                                | 35.4 Av | 3.8 / 30.9 / 37.5    | 32.6   | H / 1.5 / 0.0   | N/A          | -21.4        |
| 273.00                                 | 36.1 Qp | 1.8 / 13.3 / 27.0    | 24.2   | V / 1.0 / 0.0   | -21.8        | N/A          |
| 312.00                                 | 32.0 Qp | 1.9 / 14.7 / 27.1    | 21.7   | V / 1.0 / 0.0   | -24.3        | N/A          |
| 2141.15                                | 36.1 Av | 3.1 / 27.6 / 37.4    | 29.5   | V / 1.0 / 0.0   | N/A          | -24.5        |
| 351.00                                 | 30.8 Qp | 2.1 / 14.5 / 27.3    | 20.1   | V / 1.0 / 0.0   | -25.9        | N/A          |
| 195.00                                 | 28.8 Qp | 1.5 / 13.8 / 27.3    | 16.8   | V / 1.0 / 0.0   | -26.7        | N/A          |
| 39.00                                  | 28.2 Qp | 0.6 / 12.2 / 28.1    | 12.9   | V / 1.0 / 0.0   | -27.1        | N/A          |
| 234.00                                 | 32.9 Qp | 1.7 / 11.3 / 27.1    | 18.6   | V / 1.0 / 0.0   | -27.4        | N/A          |
| 1280.00                                | 36.9 Av | 2.3 / 24.6 / 37.1    | 26.6   | H / 1.5 / 0.0   | N/A          | -27.4        |
| 778.79                                 | 21.8 Qp | 3.3 / 21.0 / 27.9    | 18.2   | H / 1.6 / 0.0   | -27.8        | N/A          |
| 1709.49                                | 34.4 Av | 2.7 / 25.9 / 36.9    | 26.1   | V / 1.0 / 0.0   | N/A          | -27.9        |
| 444.37                                 | 26.5 Qp | 2.4 / 16.5 / 27.9    | 17.5   | H / 1.6 / 0.0   | -28.5        | N/A          |
| 268.17                                 | 29.2 Qp | 1.8 / 13.0 / 27.0    | 17.1   | H / 1.6 / 0.0   | -28.9        | N/A          |
| 1000.00                                | 34.5 Av | 3.7 / 24.1 / 37.3    | 25.0   | H / 1.5 / 0.0   | N/A          | -29.0        |
| 64.55                                  | 29.5 Qp | 0.8 / 8.2 / 27.9     | 10.5   | H / 1.6 / 0.0   | -29.5        | N/A          |
| 117.00                                 | 28.9 Qp | 1.2 / 11.6 / 27.7    | 14.0   | V / 1.0 / 0.0   | -29.5        | N/A          |
| 156.00                                 | 27.2 Qp | 1.4 / 12.5 / 27.5    | 13.5   | V / 1.0 / 0.0   | -30.0        | N/A          |
| 180.33                                 | 26.6 Qp | 1.4 / 12.7 / 27.4    | 13.4   | V / 1.0 / 0.0   | -30.1        | N/A          |
| 243.01                                 | 28.9 Qp | 1.7 / 11.5 / 27.1    | 15.0   | H / 1.6 / 0.0   | -31.0        | N/A          |
| 300.00                                 | 25.2 Qp | 1.9 / 14.7 / 27.0    | 14.9   | V / 1.0 / 0.0   | -31.1        | N/A          |
| 390.00                                 | 25.1 Qp | 2.2 / 15.1 / 27.6    | 14.9   | V / 1.0 / 0.0   | -31.1        | N/A          |

# Intertek

Report Number: 100211930DEN-001

Issued: 12/9/2010

| FREQ   | LEVEL   | CABLE / ANT / PREAMP | FINAL  | POL / HGT / AZ  | DELTA1 (dB)  | DELTA2 (dB)  |
|--------|---------|----------------------|--------|-----------------|--------------|--------------|
| (MHz)  | (dBuV)  | (dB) (dBm) (dB)      | (dBuV) | (m) (DEG)       | 15.209 <1GHz | 15.209 >1GHz |
| 78.00  | 27.9 Qp | 0.9 / 7.4 / 27.9     | 8.3    | V / 1.0 / 0.0   | -31.7        | N/A          |
| 399.43 | 23.9 Qp | 2.2 / 15.4 / 27.6    | 13.8   | H / 1.6 / 0.0   | -32.2        | N/A          |
| 12.02  | 24.2 Qp | 0.3 / 10.7 / 0.0     | 35.2   | V / 1.0 / 258.0 | -34.3        | N/A          |
| 0.283  | 41.6 Qp | 0.1 / 10.4 / 0.0     | 52.1   | V / 1.0 / 258.0 | -46.5        | N/A          |
| 4.63   | 11.3 Qp | 0.2 / 10.6 / 0.0     | 22.1   | V / 1.0 / 258.0 | -47.4        | N/A          |
| 14.98  | 7.3 Qp  | 0.3 / 10.6 / 0.0     | 18.2   | V / 1.0 / 258.0 | -51.3        | N/A          |
| 20.01  | 7.0 Qp  | 0.4 / 10.6 / 0.0     | 18.0   | V / 1.0 / 0.0   | -51.5        | N/A          |
| 29.78  | 7.8 Qp  | 0.5 / 8.2 / 0.0      | 16.5   | V / 1.0 / 0.0   | -53.0        | N/A          |
| 0.0655 | 36.3 Qp | 0.1 / 10.7 / 0.0     | 47.1   | V / 1.0 / 0.0   | -64.2        | N/A          |
| 0.131  | 26.2 Qp | 0.1 / 10.6 / 0.0     | 36.9   | V / 1.0 / 216.0 | -68.3        | N/A          |
| 0.0983 | 28.5 Qp | 0.1 / 10.5 / 0.0     | 39.1   | V / 1.0 / 216.0 | -68.6        | N/A          |
| 0.0564 | 32.2 Qp | 0.1 / 10.9 / 0.0     | 43.1   | V / 1.0 / 148.0 | -69.5        | N/A          |
| 0.0111 | 38.1 Qp | 0.0 / 18.5 / 0.0     | 56.6   | V / 1.0 / 216.0 | -70.1        | N/A          |
| 0.0328 | 33.8 Qp | 0.0 / 12.8 / 0.0     | 46.6   | V / 1.0 / 148.0 | -70.7        | N/A          |

Example calculation:

| Measured Level |   | Transducer, Cable Loss & Amplifier corrections |   | Corrected Reading | Specification Limit |   | Corrected Reading |   | Delta Specification |
|----------------|---|------------------------------------------------|---|-------------------|---------------------|---|-------------------|---|---------------------|
| (dBμV)         | + | (dB)                                           | = | (dBμV/m)          | (dBμV/m)            | - | (dBμV/m)          | = |                     |
| 14.0           |   | 14.9                                           |   | 28.9              | 40.0                |   | 28.9              |   | -11.1               |

Deviations, Additions, or Exclusions: None

## 7 6dB Bandwidth

### 7.1 Method

The test methods used comply with ANSI C63.4 and CISPR 16. Unless otherwise stated no deviations were made from **FCC 15.247 & IC RSS-210**.

Intertek Louisville's emissions testing facility is located at 40 Meadow Rd. in Pinewood Springs CO 80540. The emissions testing facility is ISO17025:2005 accredited by NVLAP, our lab code is 200624-0, BSMI lab number is SL2-IN-E-029R, our VCCI registration no. R-1643, our FCC designation no. US5170 and our IC lab no. 2042N.

### 7.2 Test Equipment Used:

| <u>Asset ID:</u> | <u>Description:</u>            | <u>Manufacturer:</u> | <u>Model:</u> | <u>Serial:</u> | <u>Cal Date</u> | <u>Cal Due</u> |
|------------------|--------------------------------|----------------------|---------------|----------------|-----------------|----------------|
| 18913            | Spectrum Analyzer with Pre-Amp | Hewlett-Packard      | E7405A        | My44211889     | 05/11/2010      | 05/11/2011     |
| 18808            | Log Periodic Antenna           | EMCO                 | 3146          | 9203-3376      | 12/05/2009      | 12/05/2010     |

### 7.3 Results:

The sample tested was found to Comply.

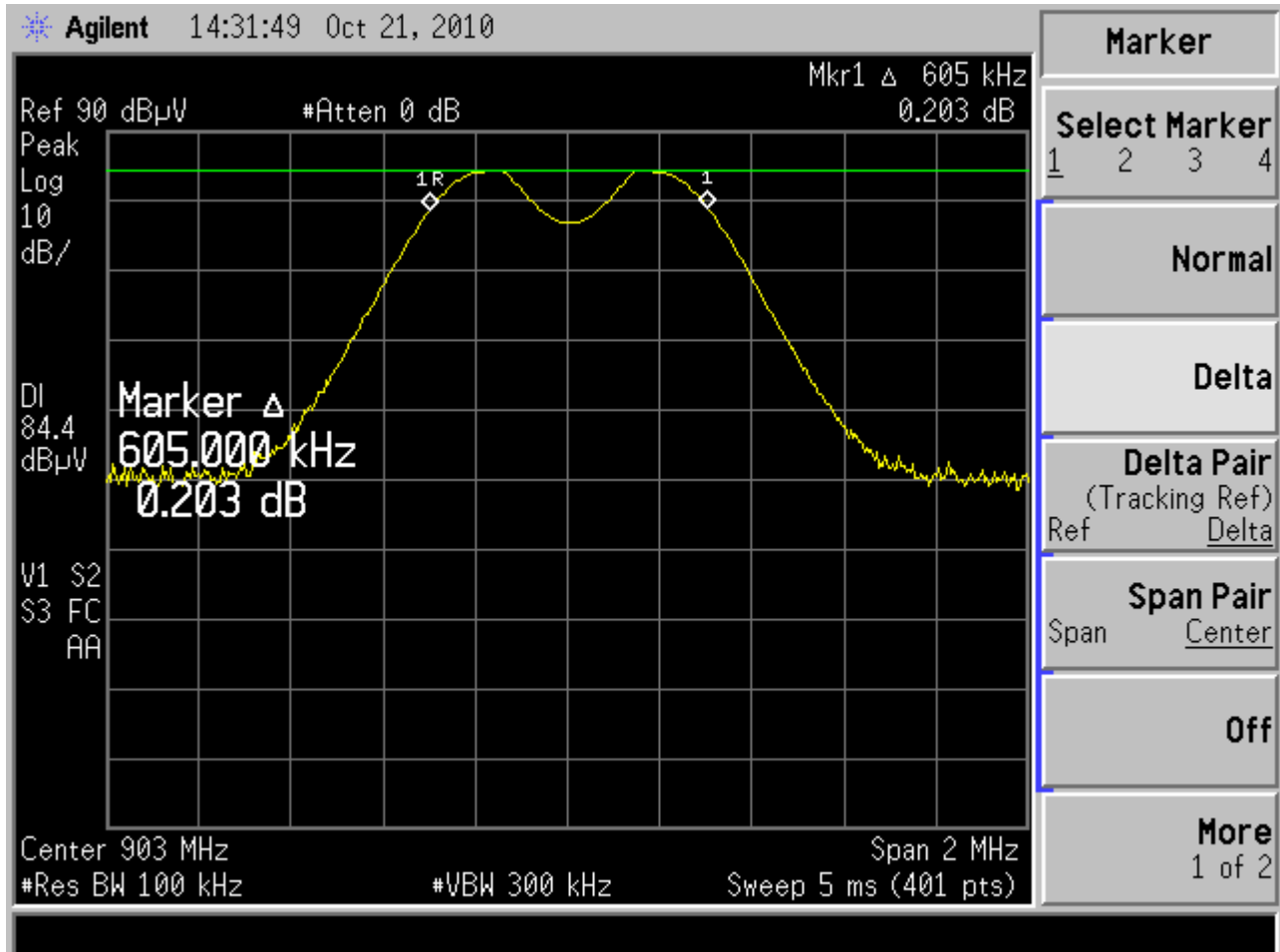
- FCC 15.247 (a)(2)
- IC RSS-210 A8.2(a)

## 7.4 Test Data:

## 6 dB Bandwidth

FCC 15.247(a)(2) / RSS-210 A8.2(a)

Low Channel – 903 MHz

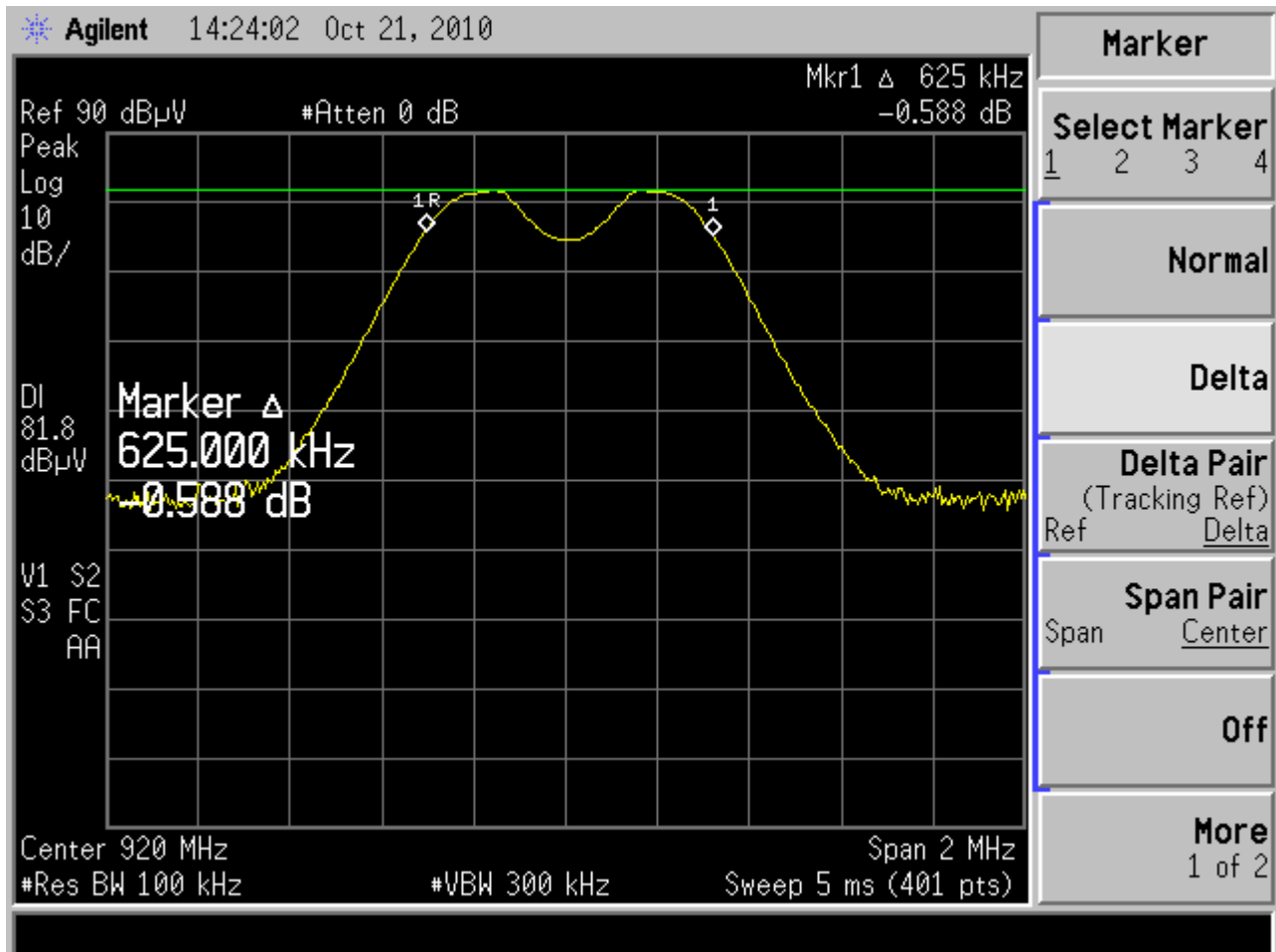


Specification: 6dB Bandwidth &gt; 500 kHz

## 6 dB Bandwidth

FCC 15.247(a)(2) / RSS-210 A8.2(a)

Mid Channel – 920 MHz

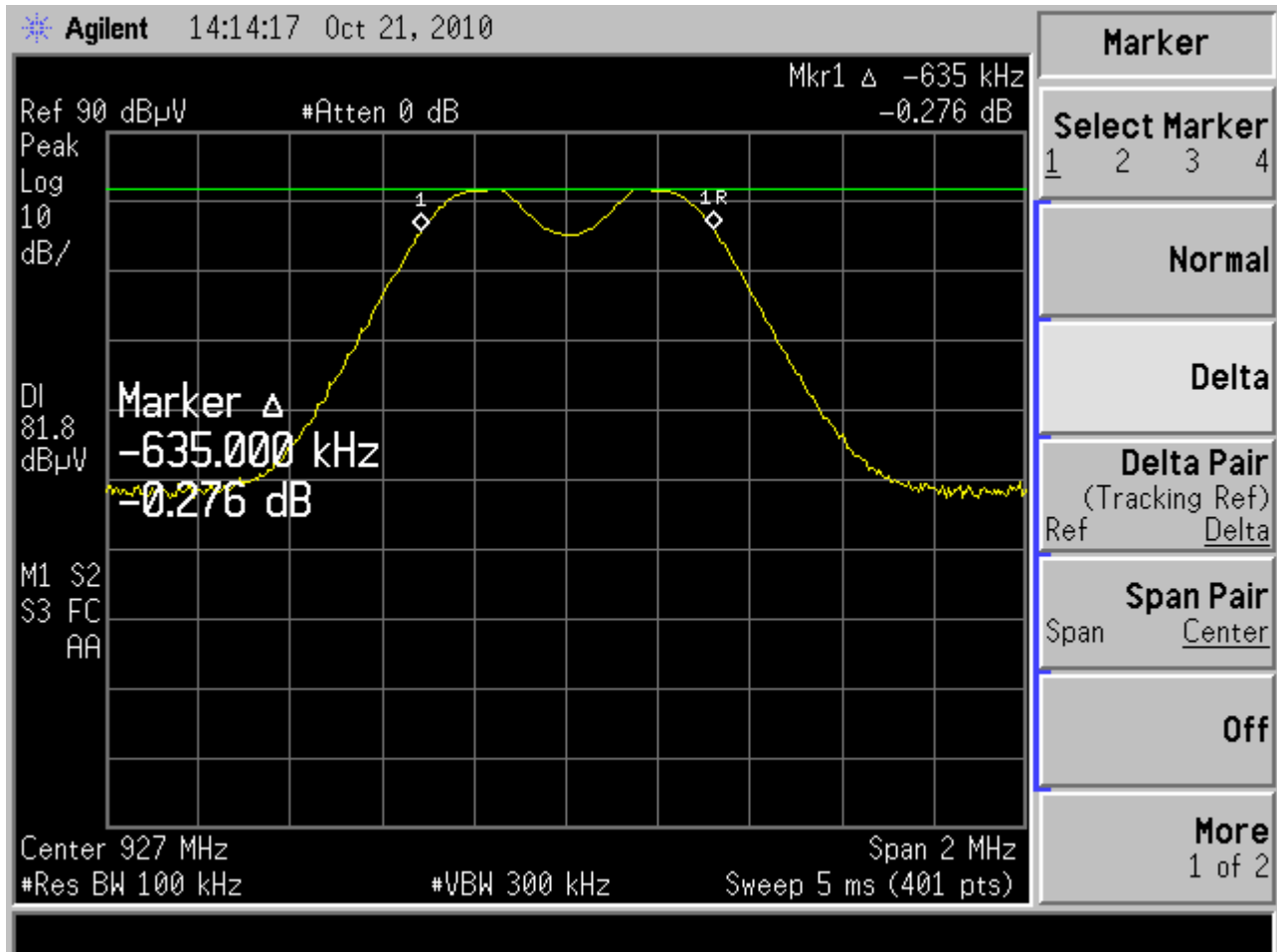


Specification: 6dB Bandwidth &gt; 500 kHz

## 6 dB Bandwidth

FCC 15.247(a)(2) / RSS-210 A8.2(a)

High Channel – 927 MHz



Specification: 6dB Bandwidth &gt; 500 kHz

Deviations, Additions, or Exclusions: None

## 8 Power Spectral Density (PSD)

### 8.1 Method

The test methods used comply with ANSI C63.4 and CISPR 16. Unless otherwise stated no deviations were made from **FCC 15.247 & IC RSS-210**.

Intertek Louisville's emissions testing facility is located at 40 Meadow Rd. in Pinewood Springs CO 80540. The emissions testing facility is ISO17025:2005 accredited by NVLAP, our lab code is 200624-0, BSMI lab number is SL2-IN-E-029R, our VCCI registration no. R-1643, our FCC designation no. US5170 and our IC lab no. 2042N.

### 8.2 Test Equipment Used:

| <u>Asset ID:</u> | <u>Description:</u>            | <u>Manufacturer:</u> | <u>Model:</u> | <u>Serial:</u> | <u>Cal Date</u> | <u>Cal Due</u> |
|------------------|--------------------------------|----------------------|---------------|----------------|-----------------|----------------|
| 18913            | Spectrum Analyzer with Pre-Amp | Hewlett-Packard      | E7405A        | My44211889     | 05/11/2010      | 05/11/2011     |
| 18808            | Log Periodic Antenna           | EMCO                 | 3146          | 9203-3376      | 12/05/2009      | 12/05/2010     |

### 8.3 Results:

The sample tested was found to Comply.

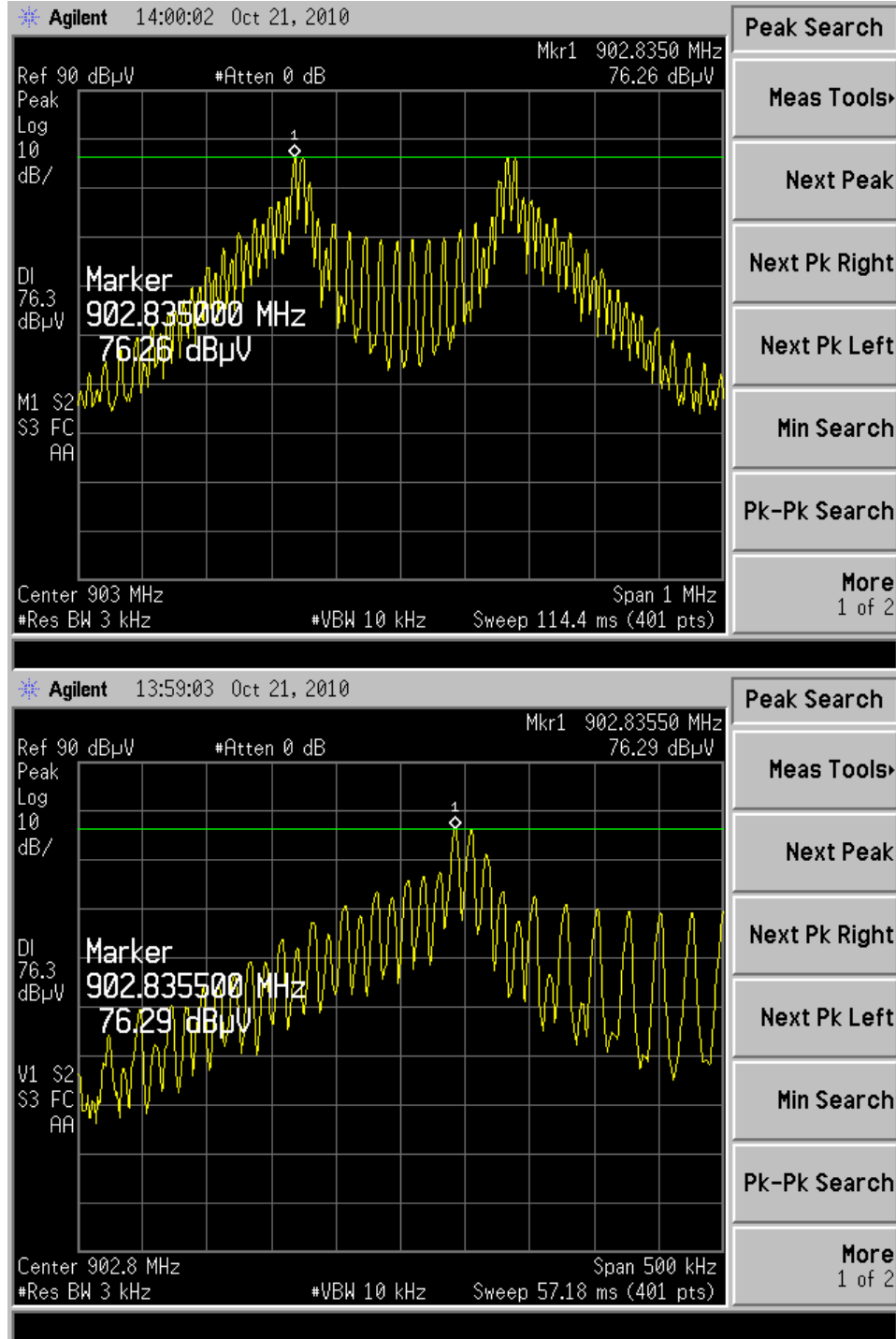
- FCC 15.247(e)
- IC RSS-210 A8.2(b)

## 8.4 Test Data:

### Power Spectral Density (PSD)

FCC 15.247(e) / RSS-210 A8.2(b)

#### Low Channel – 903 MHz



**Specification: PSD < 8 dBm**

Measured field strength + antenna factor + cable loss = Final corrected field strength (dBuV/m)

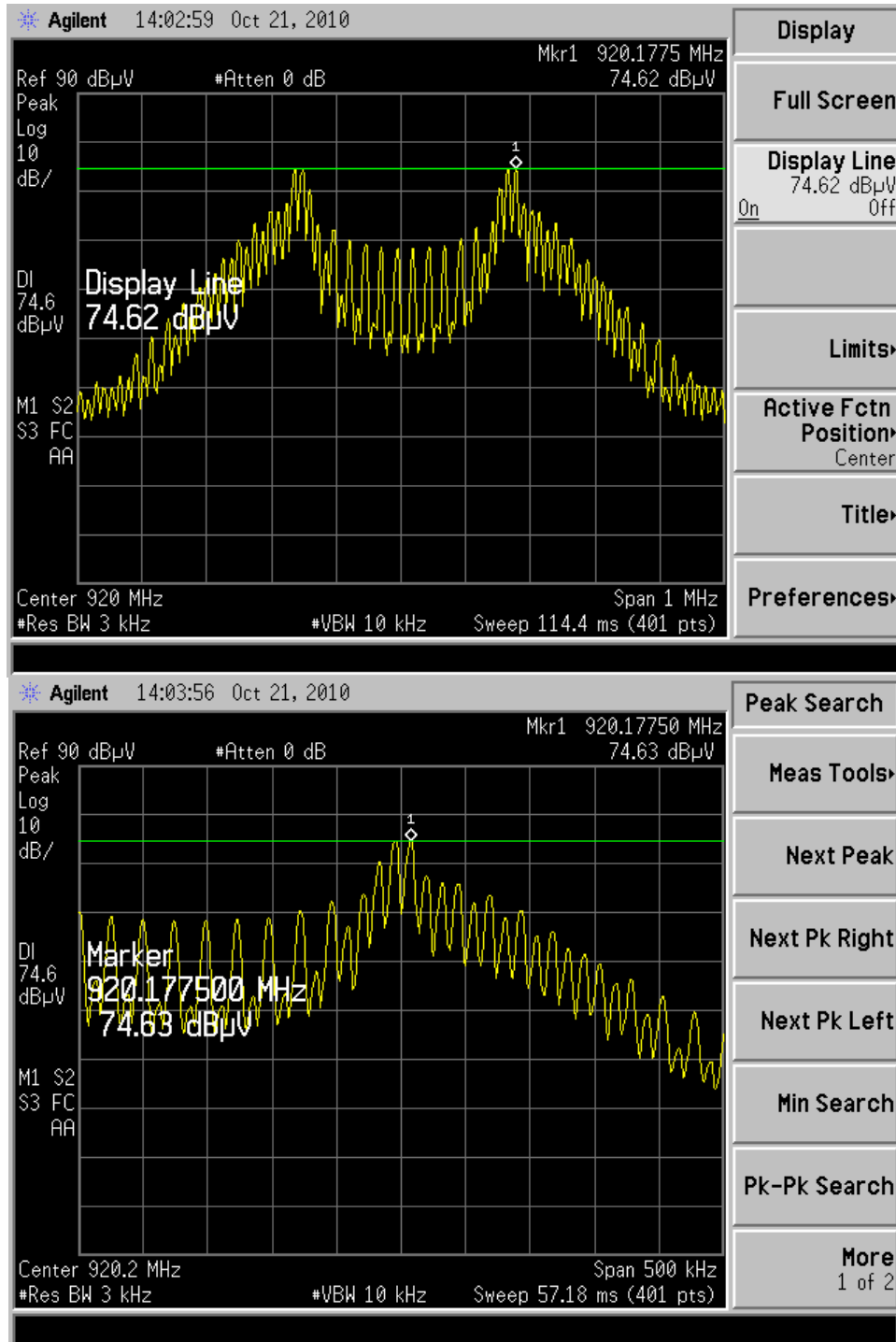
$$76.29 + 22.5 + 3.1 = 101.89 \text{ dBuV}$$

$$\text{Pd} = 101.89 - 95.2289 = 6.66 \text{ dBm}$$

Power Spectral Density (PSD)

FCC 15.247(e) / RSS-210 A8.2(b)

Mid Channel – 920 MHz



Specification: PSD < 8 dBm

Measured field strength + antenna factor + cable loss = Final corrected field strength (dBuV/m)

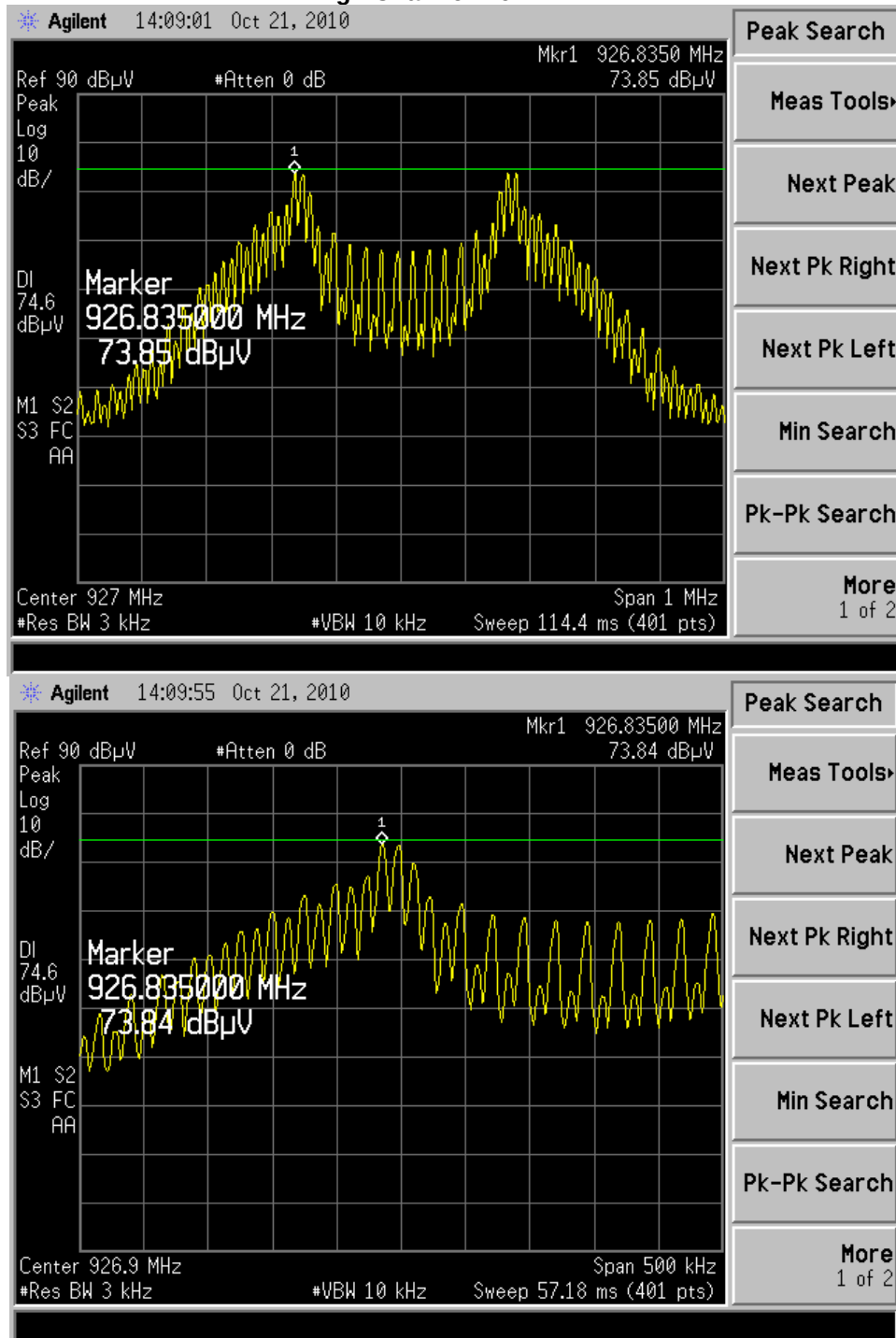
$$74.63 + 22.5 + 3.1 = 100.23 \text{ dBuV/m}$$

$$P \text{ dBm} = 100.23 - 95.2289 = 5.00 \text{ dBm}$$

## Power Spectral Density (PSD)

FCC 15.247(e) / RSS-210 A8.2(b)

## High Channel – 927 MHz



Specification: PSD &lt; 8 dBm

Measured field strength + antenna factor + cable loss = Final corrected field strength (dBuV/m)  
 $73.84 + 22.5 + 3.1 = 99.44$  dBuV/m  
 $P \text{ dBm} = 99.44 - 95.2289 = 4.21 \text{ dBm}$

**PSD Example calculation: Worst-Case Channel (903 MHz - Low Channel)**

Measured field strength + antenna factor + cable loss = Final corrected measured field strength (dBuV/m)

$$76.29 + 22.5 + 3.1 = \underline{101.89 \text{ dBuV}}$$

The following equation was used to convert field strength (dBuV/m) into power (dBm):  
(This calculation assumes ideal isotropic radiation from the source and a test distance of 3-meters)

$$P = 20 \cdot \log(E) - 95.2289$$

P is power in dBm

E is uV/m

PSD Limit: +8 dBm

$$P \text{ dBm} = 101.89 - 95.2289 = 6.66 \text{ dBm}$$

$$\text{Delta from Limit: } 8.0 \text{ dBm} - 6.66 \text{ dBm} = \mathbf{1.34 \text{ dB below limit}}$$

Deviations, Additions, or Exclusions: None

## 9 Occupied Bandwidth (OBW)

### 9.1 Method

The test methods used comply with ANSI C63.4 and CISPR 16. Unless otherwise stated no deviations were made from **IC RSS-GEN**.

Intertek Louisville's emissions testing facility is located at 40 Meadow Rd. in Pinewood Springs CO 80540. The emissions testing facility is ISO17025:2005 accredited by NVLAP, our lab code is 200624-0, BSMI lab number is SL2-IN-E-029R, our VCCI registration no. R-1643, our FCC designation no. US5170 and our IC lab no. 2042N.

### 9.2 Test Equipment Used:

| <u>Asset ID:</u> | <u>Description:</u>            | <u>Manufacturer:</u> | <u>Model:</u> | <u>Serial:</u> | <u>Cal Date</u> | <u>Cal Due</u> |
|------------------|--------------------------------|----------------------|---------------|----------------|-----------------|----------------|
| 18913            | Spectrum Analyzer with Pre-Amp | Hewlett-Packard      | E7405A        | My44211889     | 05/11/2010      | 05/11/2011     |
| 18808            | Log Periodic Antenna           | EMCO                 | 3146          | 9203-3376      | 12/05/2009      | 12/05/2010     |

### 9.3 Results:

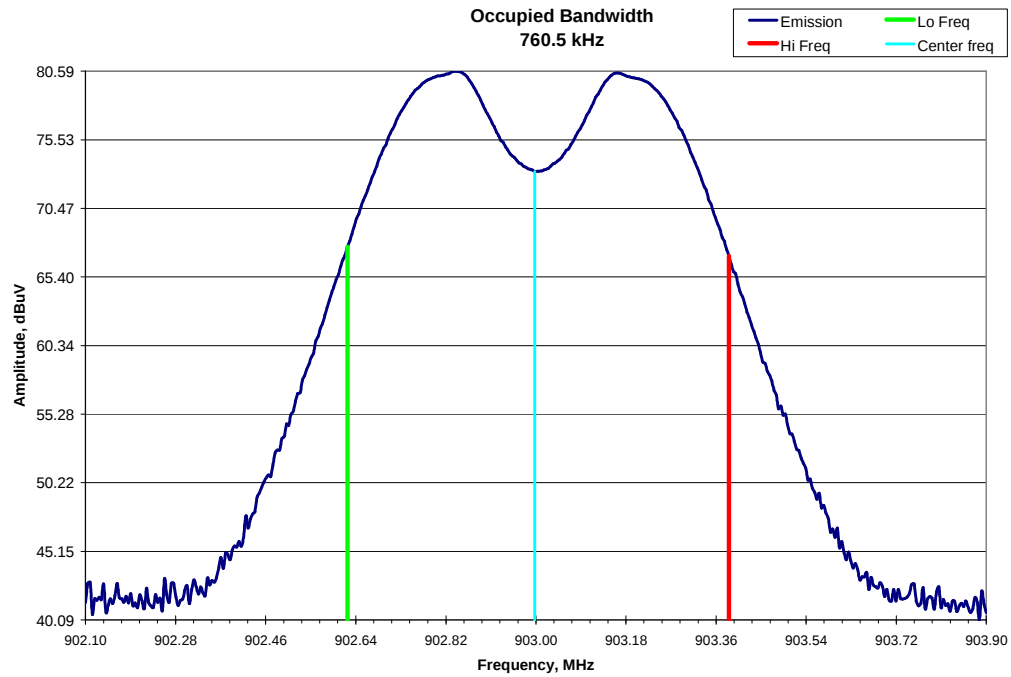
The sample tested was found to Comply.

- RSS-GEN, Section 4.6.1

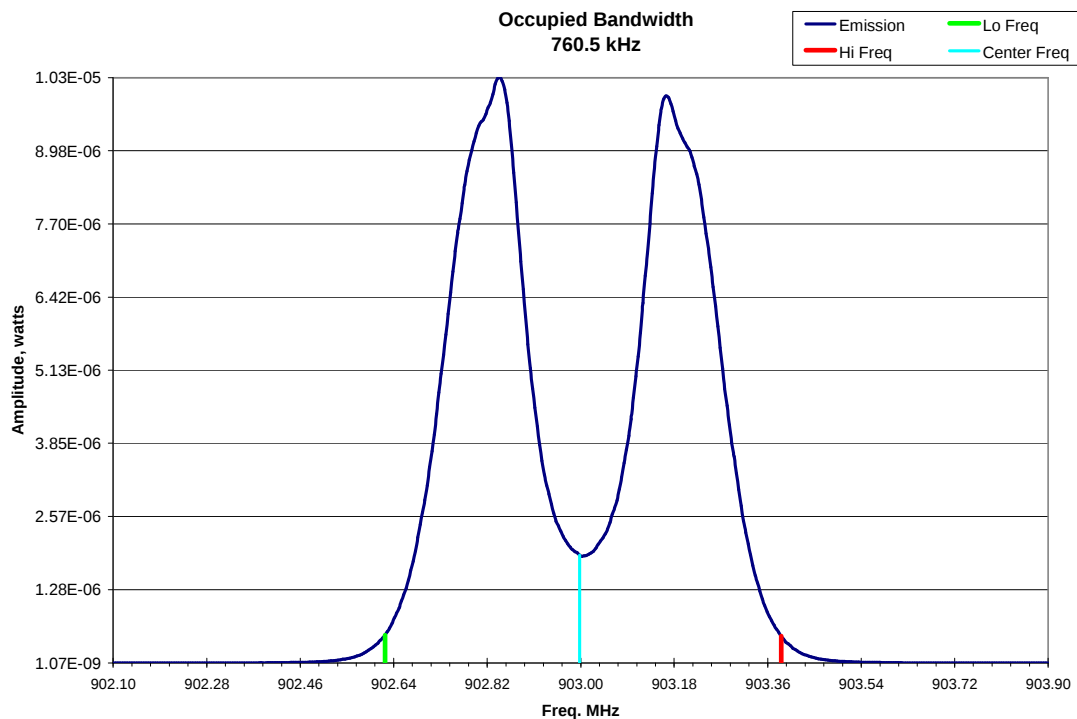
## 9.4 Test Data:

### Occupied Bandwidth Occupied Bandwidth - (RSS-GEN, Section 4.6.1)

#### Low Channel – 902.8 MHz Field Strength Graph

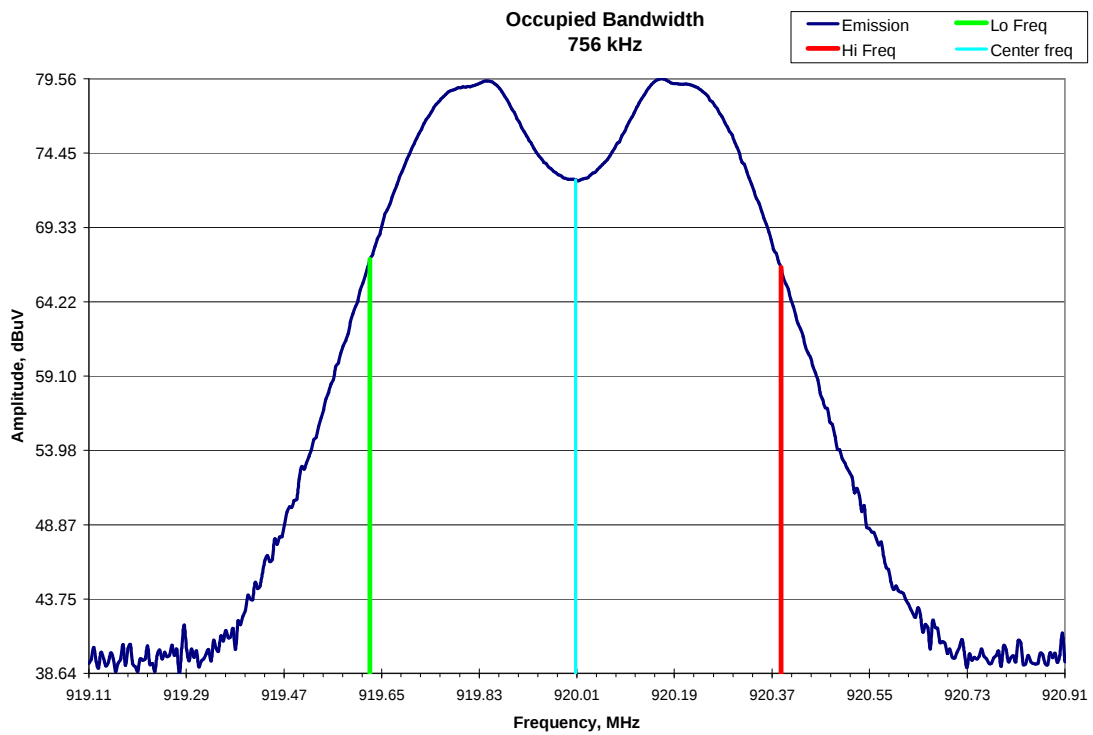


#### Power Graph

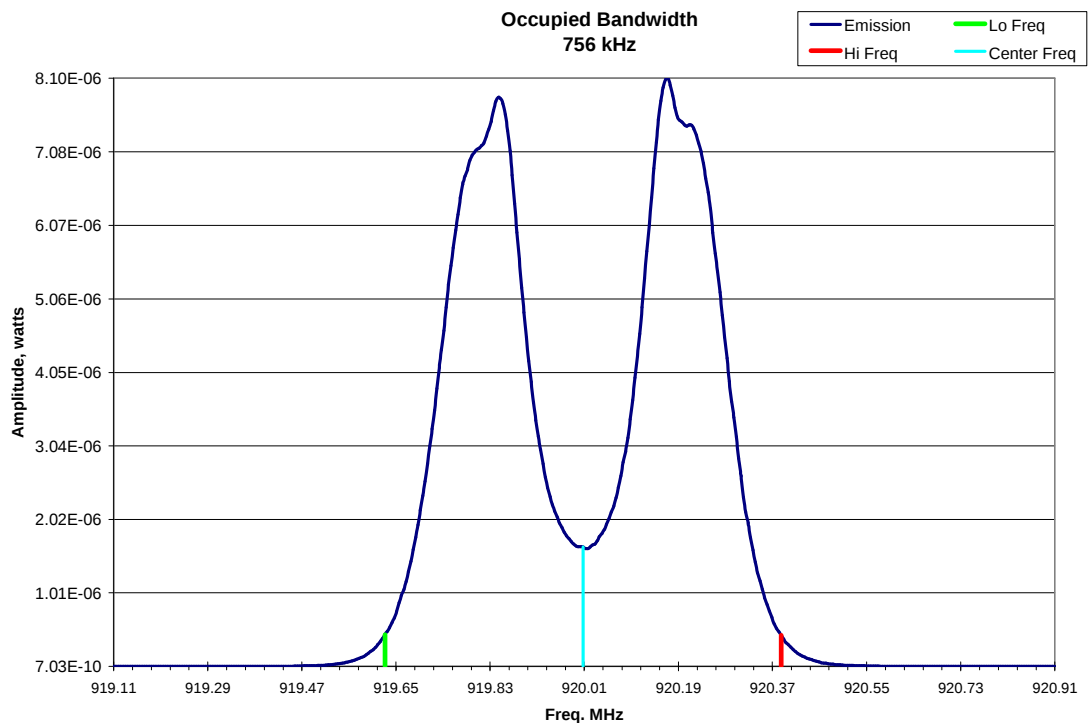


Occupied Bandwidth - (RSS-GEN, Section 4.6.1)

Mid Channel – 919.8 MHz  
Field Strength Graph

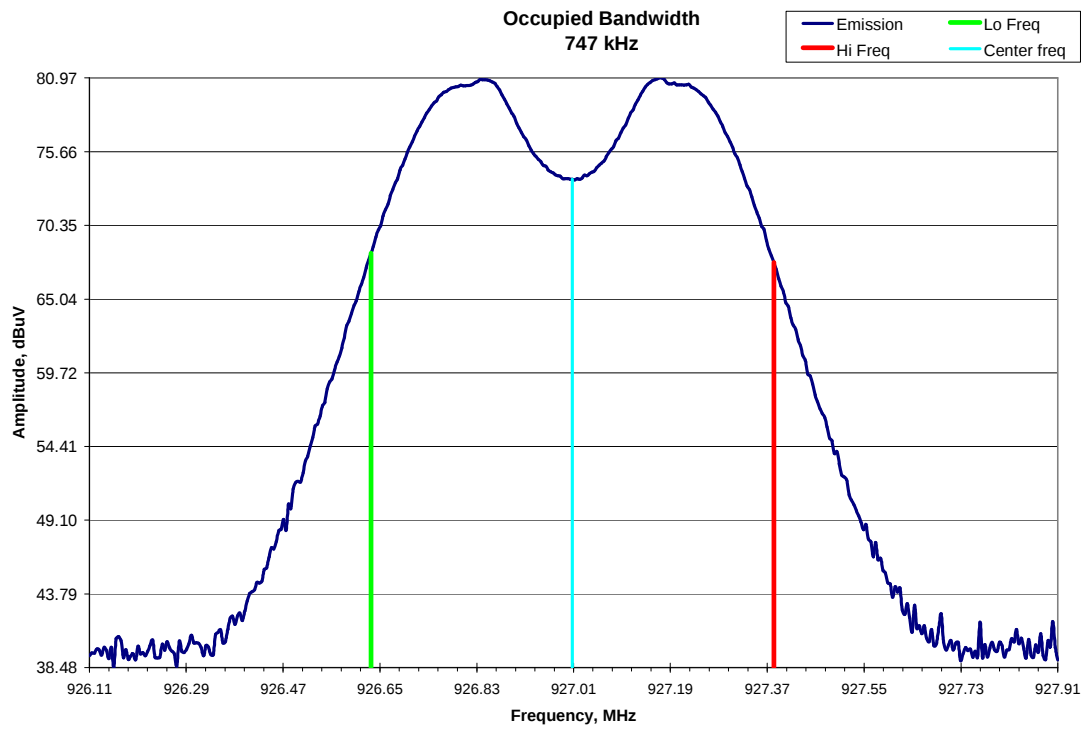


Power Graph

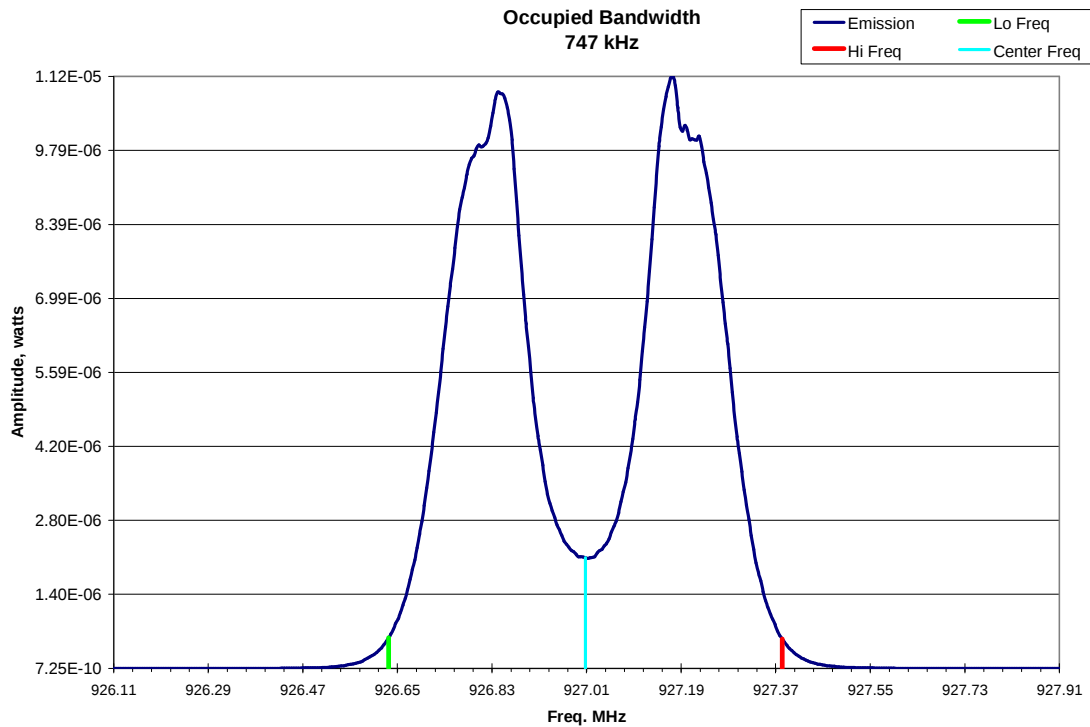


Occupied Bandwidth - (RSS-GEN, Section 4.6.1)

High Channel – 926.8 MHz  
Field Strength Graph



Power Graph



## 10 Band Edge Measurements

### 10.1 Method

The test methods used comply with ANSI C63.4 and CISPR 16. Unless otherwise stated no deviations were made from **FCC 15.247 & IC RSS-210**.

Intertek Louisville's emissions testing facility is located at 40 Meadow Rd. in Pinewood Springs CO 80540. The emissions testing facility is ISO17025:2005 accredited by NVLAP, our lab code is 200624-0, BSMI lab number is SL2-IN-E-029R, our VCCI registration no. R-1643, our FCC designation no. US5170 and our IC lab no. 2042N.

### 10.2 Test Equipment Used:

| <u>Asset ID:</u> | <u>Description:</u>                       | <u>Manufacturer:</u> | <u>Model:</u> | <u>Serial:</u> | <u>Cal Date</u> | <u>Cal Due</u> |
|------------------|-------------------------------------------|----------------------|---------------|----------------|-----------------|----------------|
| 18882            | Spectrum Analyzer (dc-22 GHz)             | Hewlett-Packard      | 8566B         | 2410A00154     | 11/12/2009      | 11/12/2010     |
| 18660            | Spectrum Analyzer Display Section (set 1) | Hewlett-Packard      | 85662A        | 2318A04983     | 11/12/2009      | 11/12/2010     |
| 18880            | Q.P Adapter                               | Hewlett-Packard      | 85650A        | 2811A01300     | 11/12/2009      | 11/12/2010     |
| 18912            | 9 kHz- 1.3GHz Pre Amp                     | Hewlett-Packard      | 8447F         | 3113A05545     | 06/04/2010      | 06/04/2011     |
| 18808            | Log Periodic Antenna                      | EMCO                 | 3146          | 9203-3376      | 12/05/2009      | 12/05/2010     |

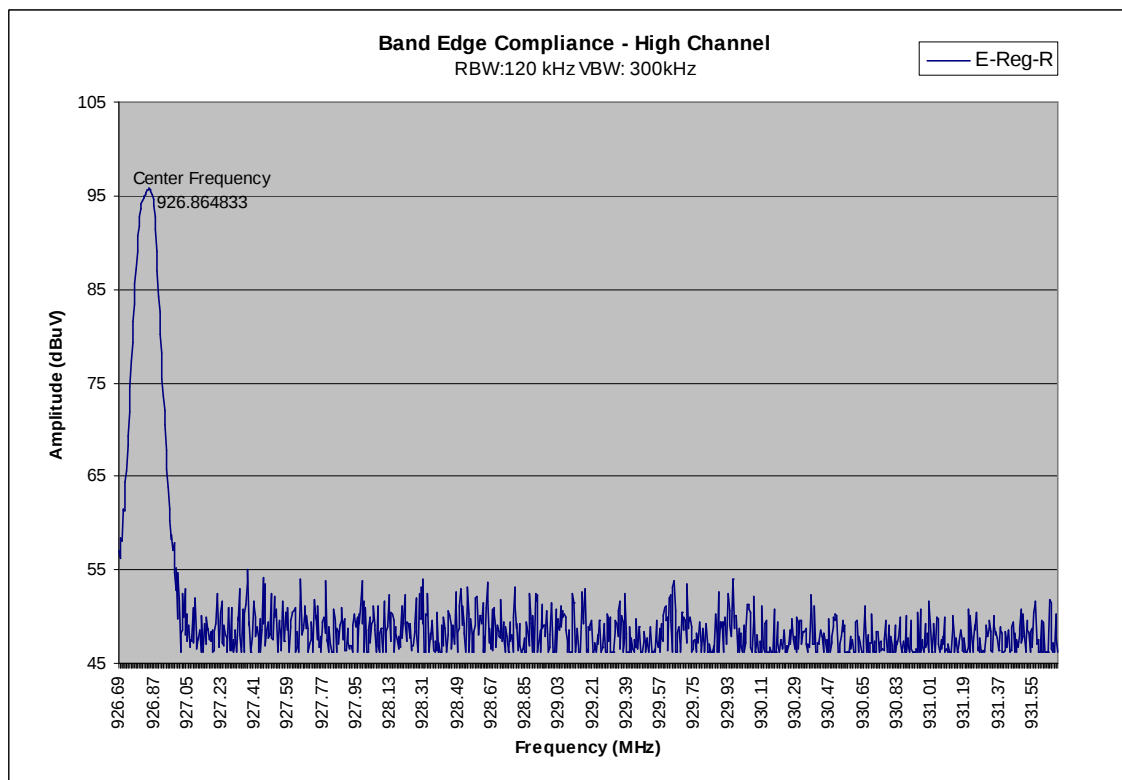
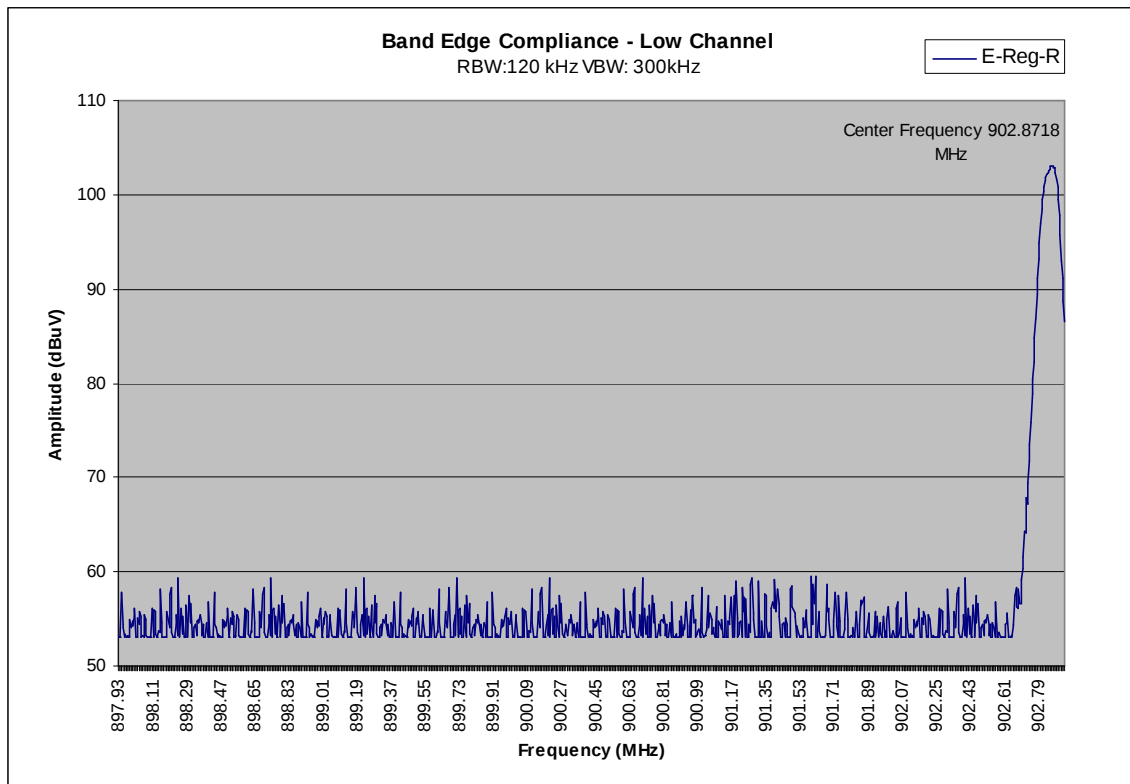
### 10.3 Results:

The sample tested was found to Comply.

- FCC 15.247(d) / 15.209

IC RSS-210, A8.5 & Section 2.7, Table 2

## 10.4 Test Data:



## 11 AC Conducted Emissions – Not Applicable (Product Battery-Powered)

### 11.1 Method

The test methods used comply with ANSI C63.4 and CISPR 16. Unless otherwise stated no deviations were made from **FCC 15.207**.

Intertek Louisville's emissions testing facility is located at 40 Meadow Rd. in Pinewood Springs CO 80540. The emissions testing facility is ISO17025:2005 accredited by NVLAP, our lab code is 200624-0, BSMI lab number is SL2-IN-E-029R, our VCCI registration no. R-1643, our FCC designation no. US5170 and our IC lab no. 2042N.

### 11.2 Test Equipment Used:

| <u>Asset ID:</u> | <u>Description:</u> | <u>Manufacturer:</u> | <u>Model:</u> | <u>Serial:</u> | <u>Cal Date</u> | <u>Cal Due</u> |
|------------------|---------------------|----------------------|---------------|----------------|-----------------|----------------|
|------------------|---------------------|----------------------|---------------|----------------|-----------------|----------------|

### 11.3 Results: Not Applicable

- FCC 15.207

### 11.4 Setup Photographs:

### 11.5 Test Data:

## 12 Measurement Uncertainty

The measured value related to the corresponding limit will be used to decide whether the equipment meets the requirements.

The measurement uncertainty figures were calculated and correspond to a coverage factor of  $k = 2$ , providing a confidence level of respectively 95.45 % in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian).

Measurement uncertainty Table

| Parameter                                      | Uncertainty $\pm$ | Notes |
|------------------------------------------------|-------------------|-------|
| Radiated emissions, 10kHz to 1000 MHz          | 4.8 dB            |       |
| Radiated emissions, 1 to 18 GHz                | 4.9 dB            |       |
| AC mains Conducted emissions, 150kHz to 30 MHz | 3.14 dB           |       |

**13 Revision History**

| Revision Level | Date       | Report Number    | Notes          |
|----------------|------------|------------------|----------------|
| 0              | 12/09/2010 | 100211930DEN-001 | Original Issue |
|                |            |                  |                |
|                |            |                  |                |
|                |            |                  |                |
|                |            |                  |                |
|                |            |                  |                |