

#### **4.2 Radiated Emissions Measurements, §15.205, §15.209a, §15.247d**

Radiated Emissions measurements were recorded for the test sample at a distance of 3 meters. Radiated Emissions were measured with the antenna in both the horizontal and vertical polarizations. The antenna was raised 1 to 4 meters in height and the Equipment Under Test (EUT) was rotated 360° to maximize the emission. No significant emission level changes occurred while positioning the EUT power cable.

For intentional radiators the field strength of emissions of the EUT was measured out to the tenth harmonic of the carrier frequency. The carrier frequency was set to 2.412 and 2.462GHz.

Figure 7 is a test setup diagram for Radiated Emissions and Figure 8 are the photographs of the test setup.

The test results for Radiated Emissions testing are shown in the following figures:

Figure 9 Unintentional Radiated Emissions Test Results Data, 2.412GHz, CH 1, Vertical

Figure 10 Unintentional Radiated Emissions Test Results Data, 2.412GHz, CH 1, Horizontal

Figure 11 Unintentional Radiated Emissions Test Results Data, 2.462GHz, CH 11, Vertical

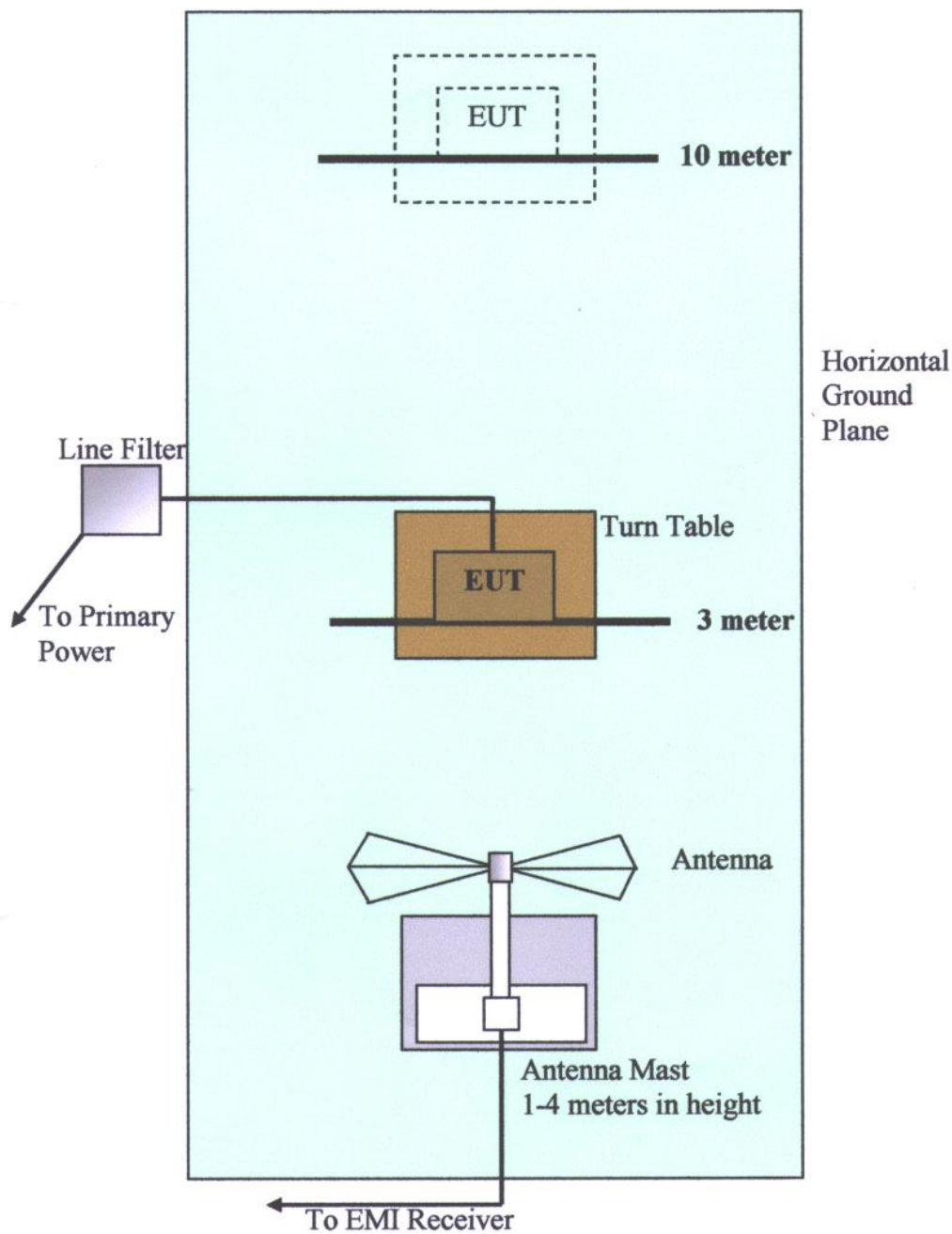
Figure 12 Unintentional Radiated Emissions Test Results Data, 2.462GHz, CH 11, Horizontal

Figure 13 Intentional Radiated Emissions Test Results Data, 2.461GHz, CH 1 Vert/Horizontal

Figure 14 Intentional Radiated Emissions Test Results Data, 2.462GHz, CH 11 Vert/Horizontal

**ALL LEVELS COMPLY WITH THE APPLICABLE FCC LIMITS FOR RADIATED EMISSIONS PER THE APPLICABLE PARAGRAPHS.**





**Radiated Emissions Test Setup Diagram**  
**Figure 7**



**Radiated Emissions Test Setup Photographs**  
**Figure 8**

Test Personnel: J. Kavalusky  
Date: 7/31/2006

## Radiated Emissions for Unintentional Radiators

[illegible]

### Figure 9

Test Personnel: J. Kavalusky  
Date: 7/24/06

## Radiated Emissions for Unintentional Radiators

[illegible]

### Figure 10

Test Personnel: J. Kavalusky  
Date: 7/31/2006

## Radiated Emissions for Unintentional Radiators

[illegible]

### Figure 11

Test Personnel: J. Kavalusky  
Date: 7/31/06

## Radiated Emissions for Unintentional Radiators

[illegible]

### Figure 12

Company: hField T Technologies  
 Model #: HFWFG10  
 S/N: NSN  
 Channel 1 2.412GHz.

Test Personnel: J. Kavalusky  
 Date: 7/28/2006

### Radiated Emission for Intentional Radiators

| Frequency<br>(MHz) | Polarity | Antenna<br>Height<br>(Meters) | Antenna<br>Azimuth<br>(Degrees) | Indicated<br>Level<br>(dBuV) | Antenna<br>Factor<br>(dB) | Pre-Amp<br>Gain<br>Factor<br>(dB) | Cable<br>Loss<br>(dB) | Averaging<br>Factor<br>(dB) | Field<br>Strength<br>@ 3m<br>(dBuV/m) | Limits<br>@ 3m<br>(dBuV/m) | Margin<br>(dB) |
|--------------------|----------|-------------------------------|---------------------------------|------------------------------|---------------------------|-----------------------------------|-----------------------|-----------------------------|---------------------------------------|----------------------------|----------------|
| 2412.0             | Vert     | 1.00                          | 0.0                             | 59.5                         | 28.1                      | -28.0                             | 1.0                   | -20.0                       | 40.6                                  | 94.00                      | -53.4          |
| 4824.0             | Vert     | 1.00                          | 0.0                             | 32.0                         | 32.7                      | -20.8                             | 1.2                   | -20.0                       | 25.1                                  | 54.00                      | -28.9          |
| 7236.0             | Vert     | 1.00                          | 0.0                             | 34.00                        | 35.8                      | -22.8                             | 2.3                   | -20.0                       | 29.30                                 | 54.00                      | -24.7          |
| 9648.0             | Vert     | 1.00                          | 0.0                             | 34.70                        | 38.2                      | -21.0                             | 2.5                   | -20.0                       | 34.40                                 | 54.00                      | -19.6          |
| 12060.0            | Vert     | 1.00                          | 0.0                             | 35.0                         | 38.6                      | -21.0                             | 4.7                   | -20.0                       | 37.3                                  | 54.00                      | -16.7          |
| 14470.0            | Vert     | 1.00                          | 0.0                             | 35.50                        | 41.5                      | -19.2                             | 5.2                   | -20.0                       | 43.00                                 | 54.00                      | -11.0          |
| 16884.0            | Vert     | 1.00                          | 0.0                             | 37.70                        | 40.3                      | -16.8                             | 3.6                   | -20.0                       | 44.80                                 | 54.00                      | -9.2           |
| 19296.0            | Vert     | 1.00                          | 0.0                             | 37.8                         | 40.4                      | -11.5                             | 3.4                   | -20.0                       | 50.1                                  | 54.00                      | -3.9           |
| 21708.0            | Vert     | 1.00                          | 0.0                             | 36.2                         | 40.5                      | -11.5                             | 3.4                   | -20.0                       | 48.60                                 | 54.0                       | -5.4           |
| 24120.0            | Vert     | 1.00                          | 0.0                             | 37.8                         | 40.7                      | -11.5                             | 3.4                   | -20.0                       | 50.4                                  | 54.0                       | -3.6           |
| 2412.0             | Horiz    | 1.00                          | 0.0                             | 61.7                         | 28.1                      | -28.0                             | 1.0                   | -20.0                       | 42.8                                  | 94.00                      | -51.2          |
| 4824.0             | Horiz    | 1.00                          | 0.0                             | 33.2                         | 32.7                      | -20.8                             | 1.2                   | -20.0                       | 26.3                                  | 54.00                      | -27.7          |
| 7236.0             | Horiz    | 1.00                          | 0.0                             | 33.7                         | 35.9                      | -22.8                             | 2.3                   | -20.0                       | 29.1                                  | 54.00                      | -24.9          |
| 9648.0             | Horiz    | 1.00                          | 0.0                             | 33.0                         | 38.0                      | -21.0                             | 2.5                   | -20.0                       | 32.5                                  | 54.00                      | -21.5          |
| 12060.0            | Horiz    | 1.00                          | 0.0                             | 33.70                        | 38.5                      | -21.0                             | 4.7                   | -20.0                       | 35.90                                 | 54.00                      | -18.1          |
| 14472.0            | Horiz    | 1.00                          | 0.0                             | 35.50                        | 41.9                      | -19.2                             | 5.2                   | -20.0                       | 43.4                                  | 54.00                      | -10.6          |
| 16884.0            | Horiz    | 1.00                          | 0.0                             | 35.50                        | 40.3                      | -16.8                             | 3.6                   | -20.0                       | 42.60                                 | 54.00                      | -11.4          |
| 19296.0            | Horiz    | 1.00                          | 0.0                             | 35.00                        | 40.4                      | -11.5                             | 3.4                   | -20.0                       | 47.30                                 | 54.00                      | -6.7           |
| 21708.0            | Horiz    | 1.00                          | 0.0                             | 36.50                        | 40.5                      | -11.5                             | 3.4                   | -20.0                       | 48.90                                 | 54.0                       | -5.1           |
| 24120.0            | Horiz    | 1.00                          | 0.0                             | 39.20                        | 40.7                      | -11.5                             | 3.4                   | -20.0                       | 51.80                                 | 54.0                       | -2.2           |

Figure 13

Company: hField Technologies  
 Model #: HFWFG10  
 S/N: NSN  
 Channel 11 2.462GHz.

Test Personnel: J. Kavalusky  
 Date: 7/28/2006

### Radiated Emission for Intentional Radiators

| Frequency (MHz) | Polarity | Antenna Height (Meters) | Antenna Azimuth (Degrees) | Indicated Level (dBuV) | Antenna Factor (dB) | Pre-Amp Gain Factor (dB) | Cable Loss (dB) | Averaging Factor (dB) | Field Strength @ 3m (dBuV/m) | Limits @ 3m (dBuV/m) | Margin (dB) |
|-----------------|----------|-------------------------|---------------------------|------------------------|---------------------|--------------------------|-----------------|-----------------------|------------------------------|----------------------|-------------|
| 2462.0          | Vert     | 1.00                    | 0.0                       | 60.1                   | 28.1                | -28.0                    | 1.0             | -20.0                 | 41.2                         | 94.00                | -52.8       |
| 4924.0          | Vert     | 1.00                    | 0.0                       | 33.8                   | 32.7                | -20.8                    | 1.2             | -20.0                 | 26.9                         | 54.00                | -27.1       |
| 7386.0          | Vert     | 1.00                    | 0.0                       | 34.20                  | 35.8                | -22.8                    | 2.3             | -20.0                 | 29.5                         | 54.00                | -24.5       |
| 9848.0          | Vert     | 1.00                    | 0.0                       | 35.00                  | 38.2                | -21.0                    | 2.3             | -20.0                 | 34.5                         | 54.00                | -19.5       |
| 12310.0         | Vert     | 1.00                    | 0.0                       | 33.8                   | 33.8                | -21.0                    | 4.7             | -20.0                 | 31.3                         | 54.00                | -22.7       |
| 14770.0         | Vert     | 1.00                    | 0.0                       | 35.00                  | 41.5                | -19.2                    | 5.2             | -20.0                 | 42.50                        | 54.00                | -11.5       |
| 17234.0         | Vert     | 1.00                    | 0.0                       | 35.80                  | 40.3                | -16.8                    | 4.5             | -20.0                 | 43.80                        | 54.00                | -10.2       |
| 19696.0         | Vert     | 1.00                    | 0.0                       | 34.5                   | 40.4                | -11.5                    | 3.4             | -20.0                 | 46.8                         | 54.00                | -7.2        |
| 22158.0         | Vert     | 1.00                    | 0.0                       | 32.8                   | 40.5                | -11.5                    | 3.4             | -20.0                 | 45.20                        | 54.0                 | -8.8        |
| 24620.0         | Vert     | 1.00                    | 0.0                       | 35.8                   | 40.7                | -11.5                    | 3.4             | -20.0                 | 48.4                         | 54.0                 | -5.6        |
|                 |          |                         |                           |                        |                     |                          |                 |                       |                              |                      |             |
| 2462.0          | Horiz    | 1.00                    | 0.0                       | 61.2                   | 28.1                | -28.0                    | 1.0             | -20.0                 | 42.3                         | 94.00                | -51.7       |
| 4924.0          | Horiz    | 1.00                    | 0.0                       | 29.3                   | 32.7                | -20.8                    | 1.2             | -20.0                 | 22.4                         | 54.00                | -31.6       |
| 7386.0          | Horiz    | 1.00                    | 0.0                       | 30.5                   | 35.9                | -22.8                    | 2.3             | -20.0                 | 25.9                         | 54.00                | -28.1       |
| 9848.0          | Horiz    | 1.00                    | 0.0                       | 30.5                   | 38.0                | -21.0                    | 2.3             | -20.0                 | 29.8                         | 54.00                | -24.2       |
| 12310.0         | Horiz    | 1.00                    | 0.0                       | 31.50                  | 38.5                | -21.0                    | 4.7             | -20.0                 | 33.70                        | 54.00                | -20.3       |
| 14770.0         | Horiz    | 1.00                    | 0.0                       | 33.80                  | 41.9                | -19.2                    | 5.2             | -20.0                 | 41.7                         | 54.00                | -12.3       |
| 17930.0         | Horiz    | 1.00                    | 0.0                       | 33.20                  | 40.3                | -16.8                    | 4.5             | -20.0                 | 41.20                        | 54.00                | -12.8       |
| 19700.0         | Horiz    | 1.00                    | 0.0                       | 33.80                  | 40.4                | -11.5                    | 3.4             | -20.0                 | 46.10                        | 54.00                | -7.9        |
| 22158.0         | Horiz    | 1.00                    | 0.0                       | 32.00                  | 40.5                | -11.5                    | 3.4             | -20.0                 | 44.40                        | 54.0                 | -9.6        |
| 24620.0         | Horiz    | 1.00                    | 0.0                       | 37.30                  | 40.7                | -11.5                    | 3.4             | -20.0                 | 49.90                        | 54.0                 | -4.1        |

Figure 14



#### **4.3 Bandwidth Measurements, Paragraph 15.247(a)(2)**

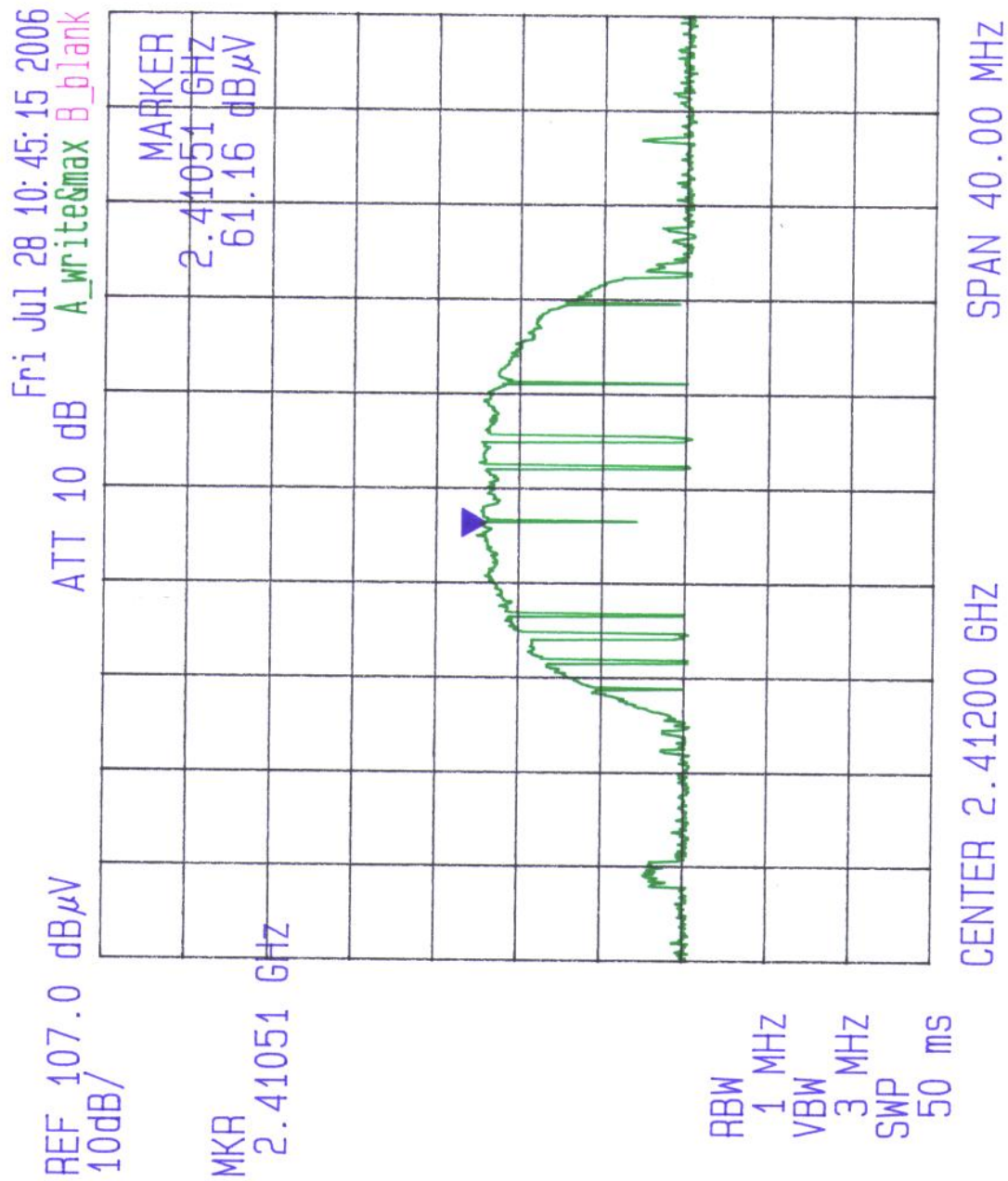
Bandwidth measurements were made at the transmit frequencies of 2.412 and 2.462GHz.

**Retlif** used an Advantest R3271 Spectrum Analyzer to perform bandwidth measurements. Bandwidth plots are shown on data sheets.

The requirement states that the bandwidth shall be a minimum of 500kHz at the 6dB down points. Results of testing are shown in Figures 15 and 16.

**THE BANDWIDTH MEASUREMENTS COMPLIED WITH THE FCC REQUIREMENTS SET FORTH IN PARAGRAPH 15.247(A)(2).**





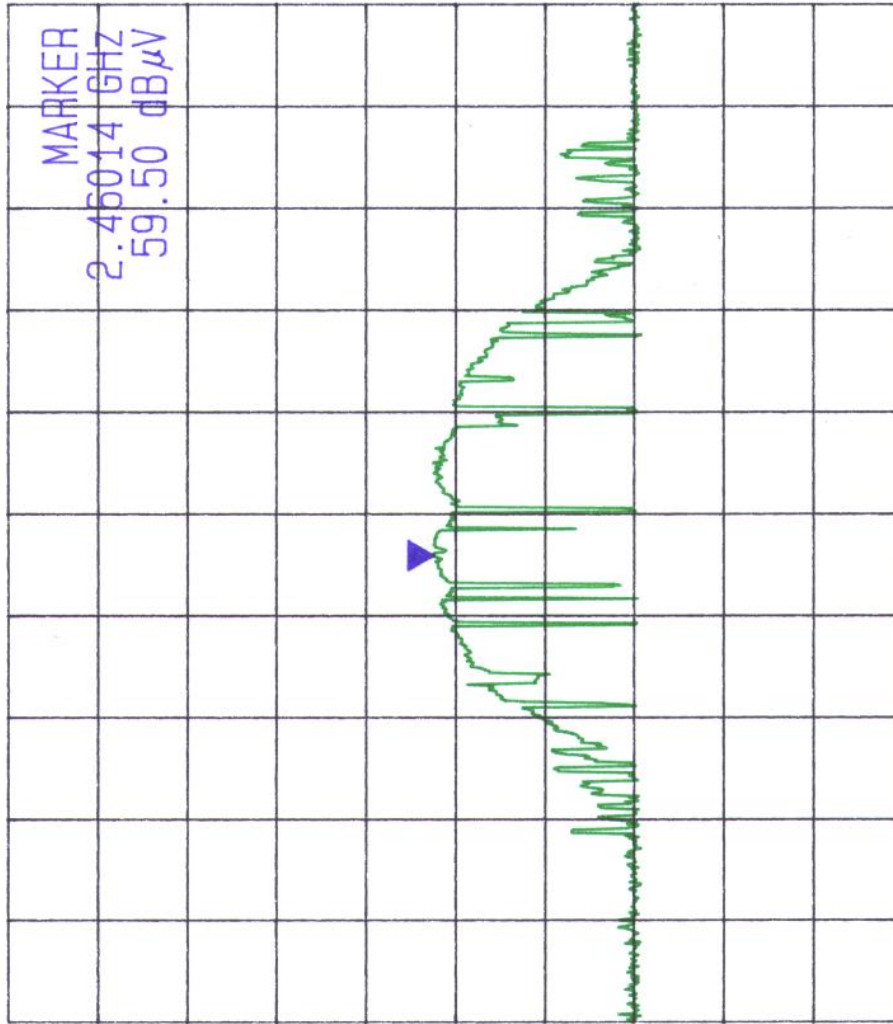
CHANNEL 1  
 FIGURE 15

Fri Jul 28 09:56:53 2006

ATT 10 dB

REF 107.0 dB $\mu$ V  
10dB/

A\_write&max B\_blank



RECALL No.  
IP

RBW 1 MHz  
VBW 3 MHz  
SWP 50 ms

SPAN 40.00 MHz

CENTER 2.46180 GHz

CHANNEL 11  
FIGURE 16

#### **4.4 Power Density Measurements 15.247e**

Power Density measurements were made at the two transmit frequencies of 2.412 and 2.462GHz.

**Retlif** used an Advantest R3271 Spectrum Analyzer to perform power density measurements. Power density plots are shown on data sheets. The power density measurements were taken across the input of the yogi antenna. Final measurements will be increased by 10dBs because of an external attenuator.

The requirement states that the power density shall be no greater than +8dBm on any 3kHz bend during any time interval of continuous transmission.

Results of testing are shown in Figures 17 and 18.

**THE BANDWIDTH MEASUREMENTS COMPLIED WITH THE FCC REQUIREMENTS SET FORTH IN PARAGRAPH 15.247e.**

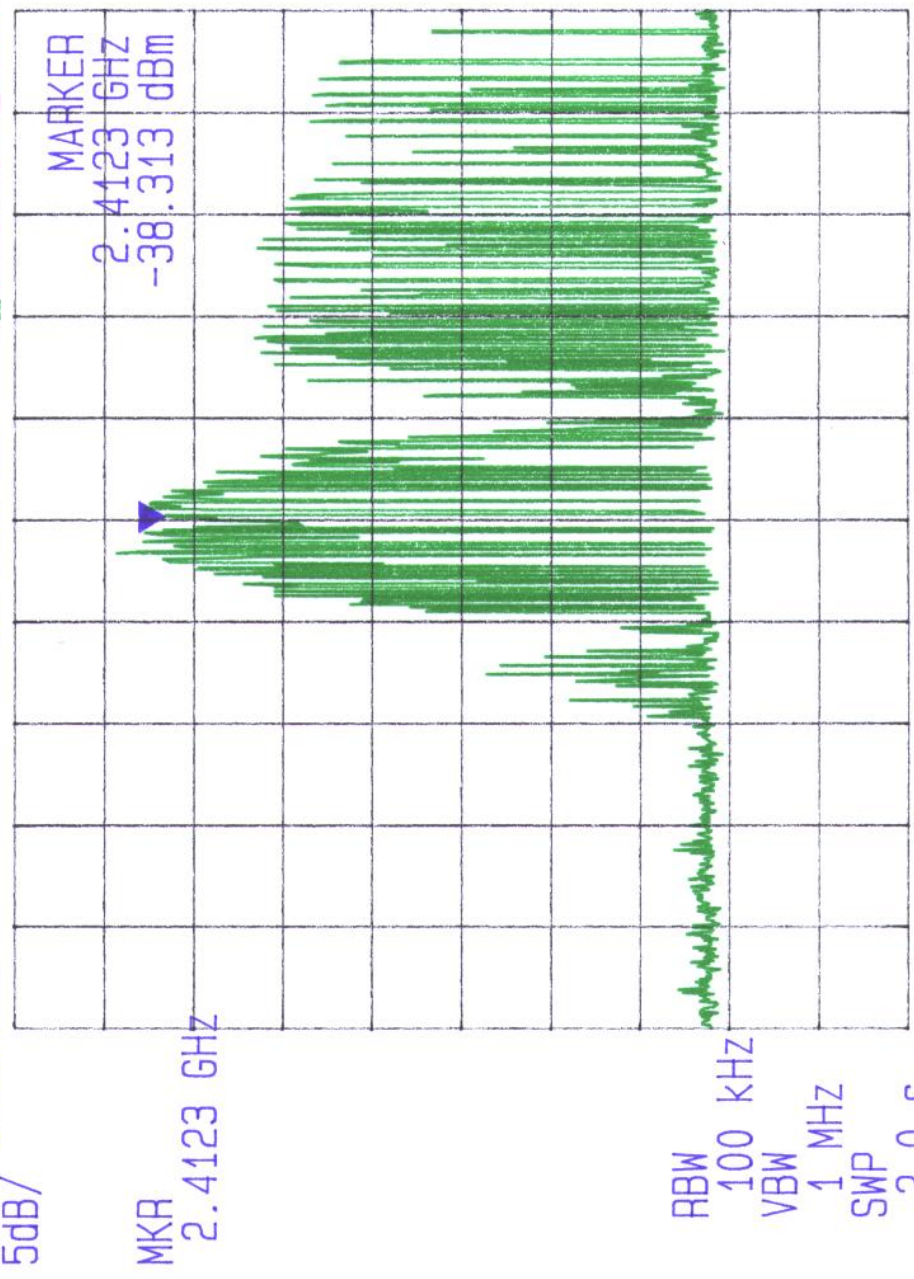


Mon Aug 7 10:10:21 2006

ATT 20 dB

REF -30.0 dBm  
5dB/

A\_write&max B\_blank



CENTER 2.4120 GHz SPAN 100.0 MHz

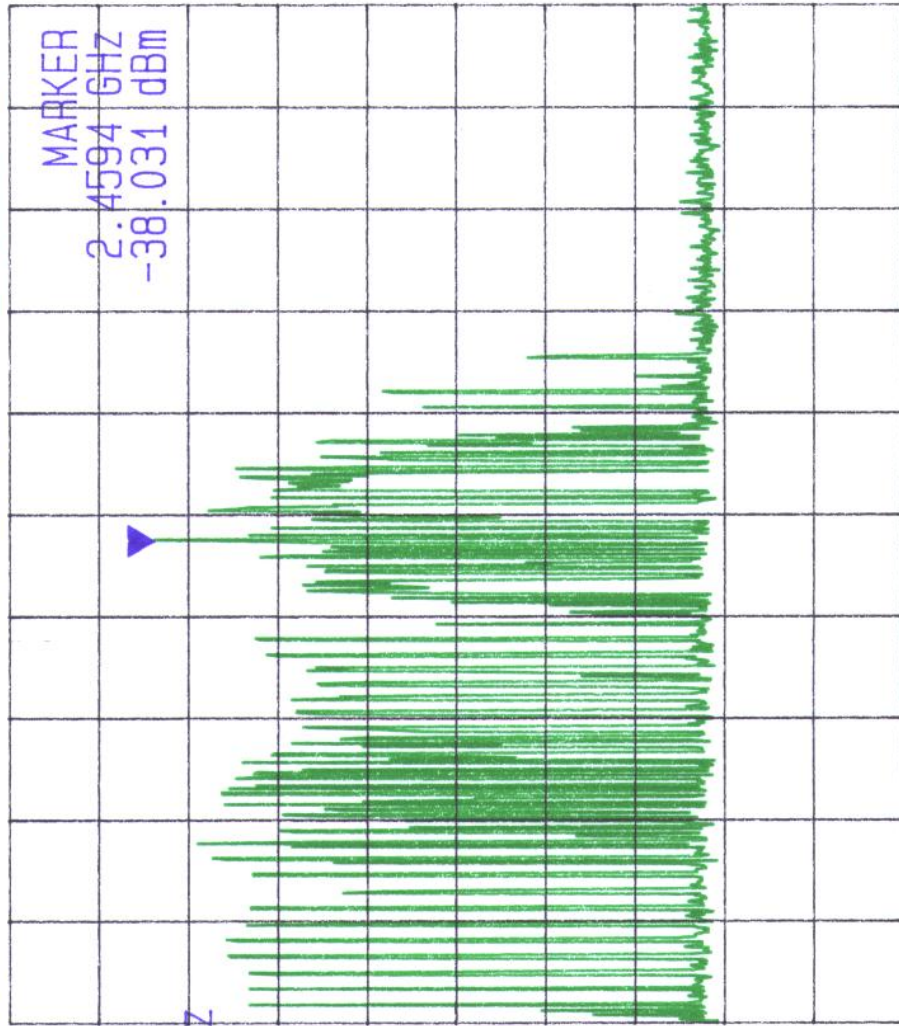
CHANNEL 1  
FIGURE 17

Mon Aug 7 10:26:19 2006

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ATT 20 dB

REF -30.0 dBm  
5dB/



SPAN 100.0 MHz

CENTER 2.4620 GHz

CHANNEL 11

FIGURE 18

## 5.0 CONCLUSIONS

The evaluation of the **hField Technologies, Inc. Model #: HFWFG10**, configured as described herein, indicated that the unit complies with the requirements set forth in Subpart B and C of Part 15 of the **FCC Rules** for unintentional and intentional radiators.

- 1, The **EUT** meets the Conducted Emissions limits set forth in §15.207
2. The **EUT** meets the Radiated Emissions limits for unintentional radiators  
Set forth in §15.247(d)
3. The **EUT** meets the Radiated Emissions limits set for intentional radiators set  
forth in §15.205, §15.209a, and §15.247(d)
- 4 The **EUT** meet the Power Density limits set forth in §15.247(e)

