



**Test Report:** 6W58614.4, issue 2

**Applicant:** Exavera Technologies, Inc.  
195 New Hampshire Avenue  
Suite 155  
Portsmouth, NH 03801

**Equipment Under Test:** Verafi Access Reading Point VF-2200

**FCC ID:** T2R VF2200

**In Accordance With:** **FCC Part 15, Subpart C, 15.249**

**Tested By:** Nemko Canada Inc.  
303 River Road, R.R. 5  
Ottawa, Ontario K1V 1H2

**Authorized By:**

Jason Nixon, Telecom Specialist

**Date:** September 10, 2007

**Total Number of Pages:** 20

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*EQUIPMENT: Verafi Access Reading Point VF-2200**FCC ID: T2RVF2200*

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## **Section 1. Summary Of Test Results**

### **General**

All measurements are traceable to national standards.

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 15.249. All tests were conducted using measurement procedure ANSI C63.4-2003. Radiated Emissions were made on an open area test site. A description of the test facility is on file with the FCC.

**THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.**

**THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE.**

See "Summary of Test Data".

TESTED BY:   
Xu Jin, Wireless Specialist

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This report applies only to the items tested.

*EQUIPMENT: Verafi Access Reading Point VF-2200**FCC ID: T2RVF2200*

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## **Section 2. Summary Of Test Data**

### **Summary Of Test Data**

| <b>Name Of Test</b>            | <b>Para. No.</b> | <b>Result</b> |
|--------------------------------|------------------|---------------|
| Power line Conducted Emissions | 15.207(a)        | Complies      |
| Radiated Emissions             | 15.249           | Complies      |

### **Test Conditions:**

**Indoor**                    Temperature: 22°C  
                                  Humidity: 52%

**Outdoor**                    Temperature: 25°C  
                                  Humidity: 50%

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**Section 3. General Equipment Specification**

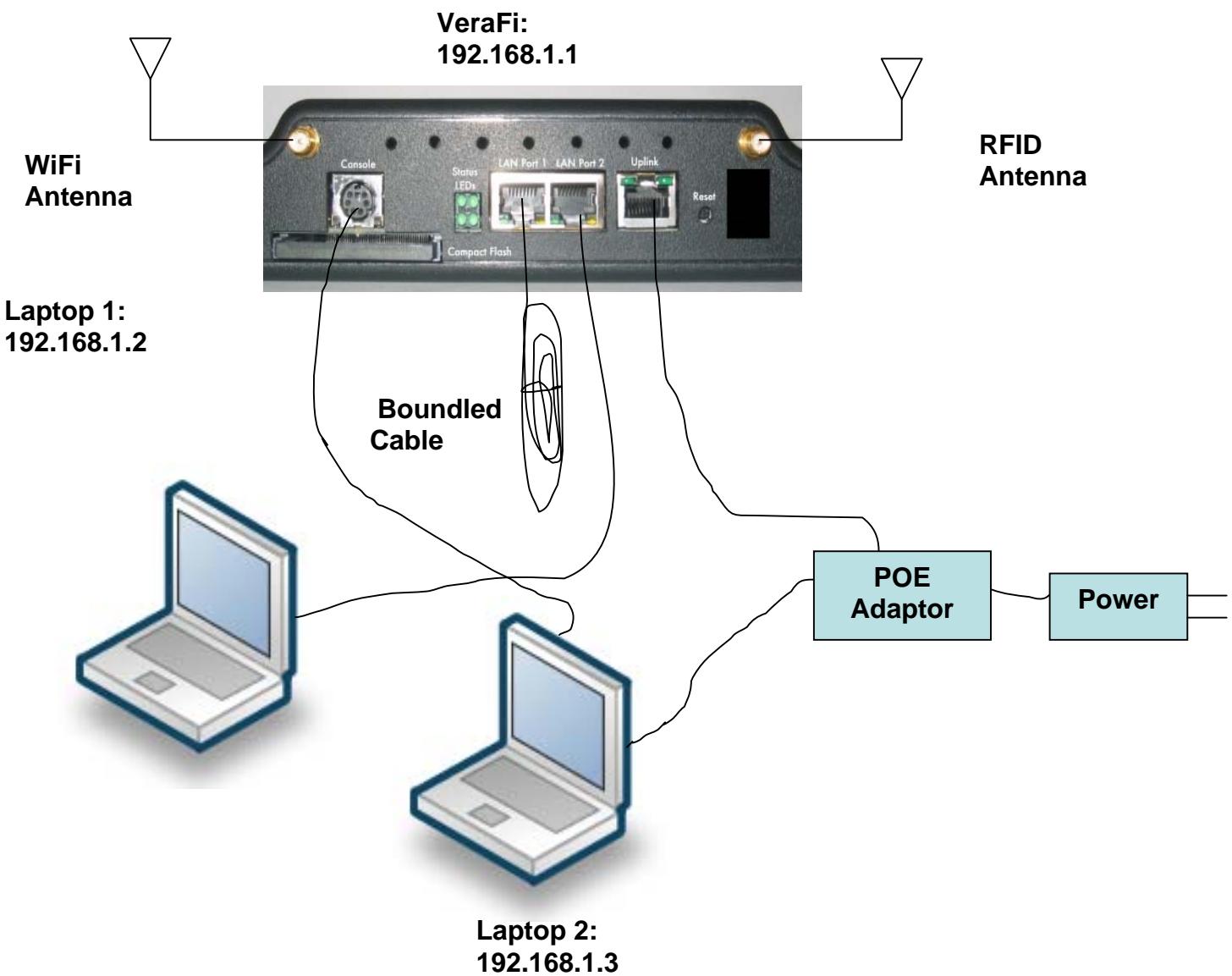
|                                     |  |
|-------------------------------------|--|
| <b>Manufacturer:</b>                | Exavera Technologies                         |
| <b>Model No.:</b>                   | Verafi Access Reading Point VF-2200          |
| <b>Date Received In Laboratory:</b> | July 9, 2007                                 |
| <b>Frequency Range:</b>             | Tx: 905.3---925.3MHz<br>Rx: 907.8---927.8MHz |
| <b>Modulation:</b>                  | FSK  |
| <b>Power Source:</b>                | 120VAC                                       |
| <b>Antenna Information</b>          | ANT-916-CW-HW Dipole Antenna : -2.96 dBi     |

*EQUIPMENT: Verafi Access Reading Point VF-2200*

*FCC ID: T2RVF2200*

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**Test Setup Information:**



*EQUIPMENT: Verafi Access Reading Point VF-2200**FCC ID: T2RVF2200***Section 4. Powerline Conducted Emissions****Para. No.: 15.207 (a)****Test Performed By: Xu Jin****Date of Test: Aug 17, 2007**

§15.207 Conducted limits.

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

| Frequency of Emission (MHz) | Conducted limit (dB $\mu$ V) |
|-----------------------------|------------------------------|
|                             | Quasi-peak                   |
|                             | Average                      |
| 0.15-0.5                    | 66 to 56*                    |
| 0.5-5                       | 56                           |
| 5-30                        | 60                           |

- Decreases with the logarithm of the frequency.

**Test Results:** Complies.**Measurement Data:** See attached graph(s).

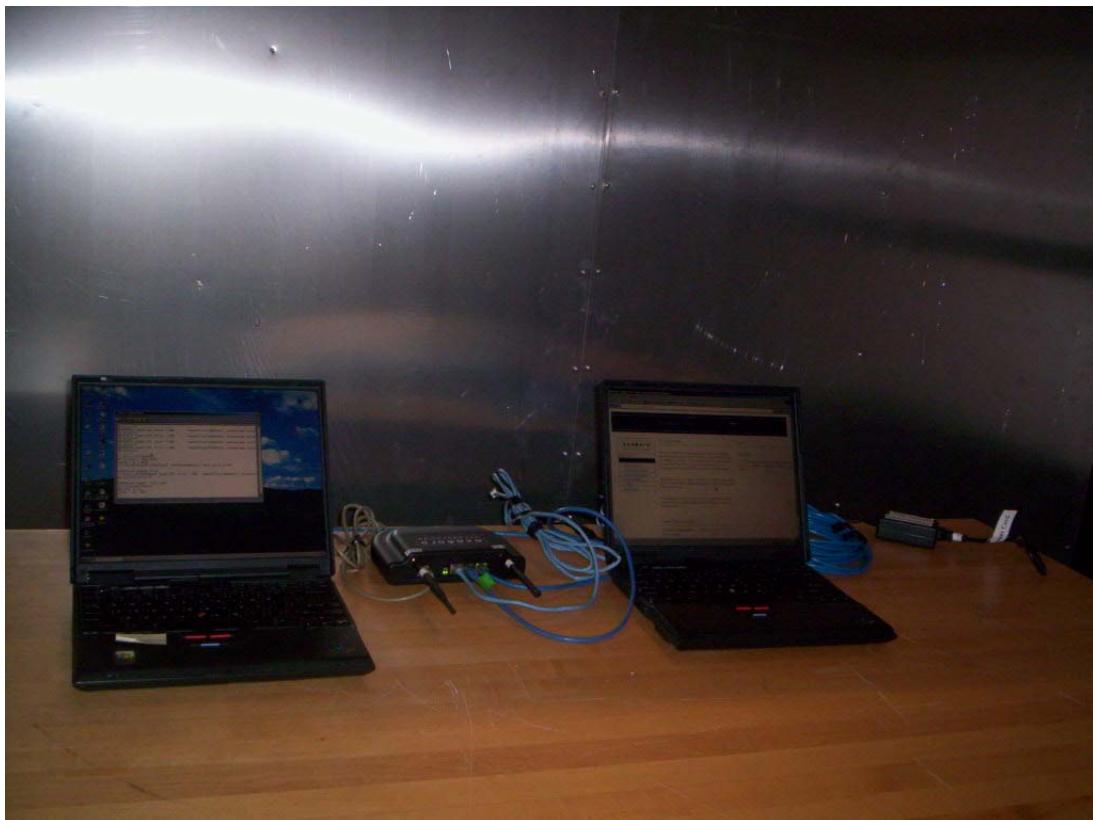
Note: Spectral plots have been corrected with cable, LISN, and attenuator losses to show compliance with limits

*EQUIPMENT: Verafi Access Reading Point VF-2200*

*FCC ID: T2RVF2200*

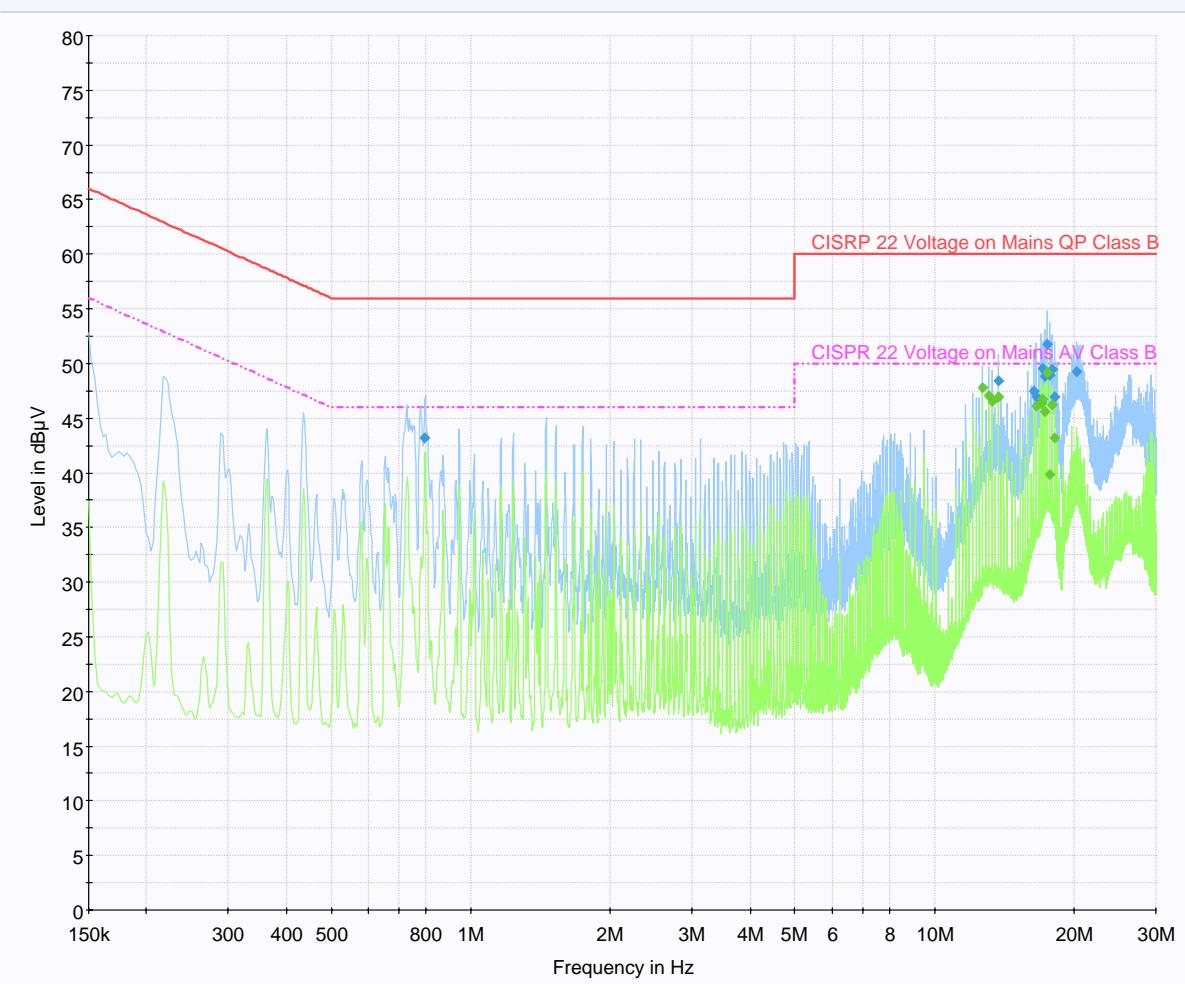
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Conducted Disturbance at Mains Detailed Setup Photos



*EQUIPMENT: Verifi Access Reading Point VF-2200**FCC ID: T2RVF2200*

## AC Power line conducted emission\_ N



— CISRP 22 Voltage on Mains QP Class B    - - - CISPR 22 Voltage on Mains AV Class B    — AC Power Line \_Neutral  
— CISRP 22 Voltage on Mains AV Class B    — CISPR 22 Voltage on Mains AV Class B Final Quasi\_Peak Detector    — Peak detector  
— CISRP 22 Voltage on Mains AV Class B Final Quasi\_Peak Detector    — Final Average Detector

*EQUIPMENT: Verafi Access Reading Point VF-2200**FCC ID: T2RVF2200*

## Final Quasi-Peak Detector\_N

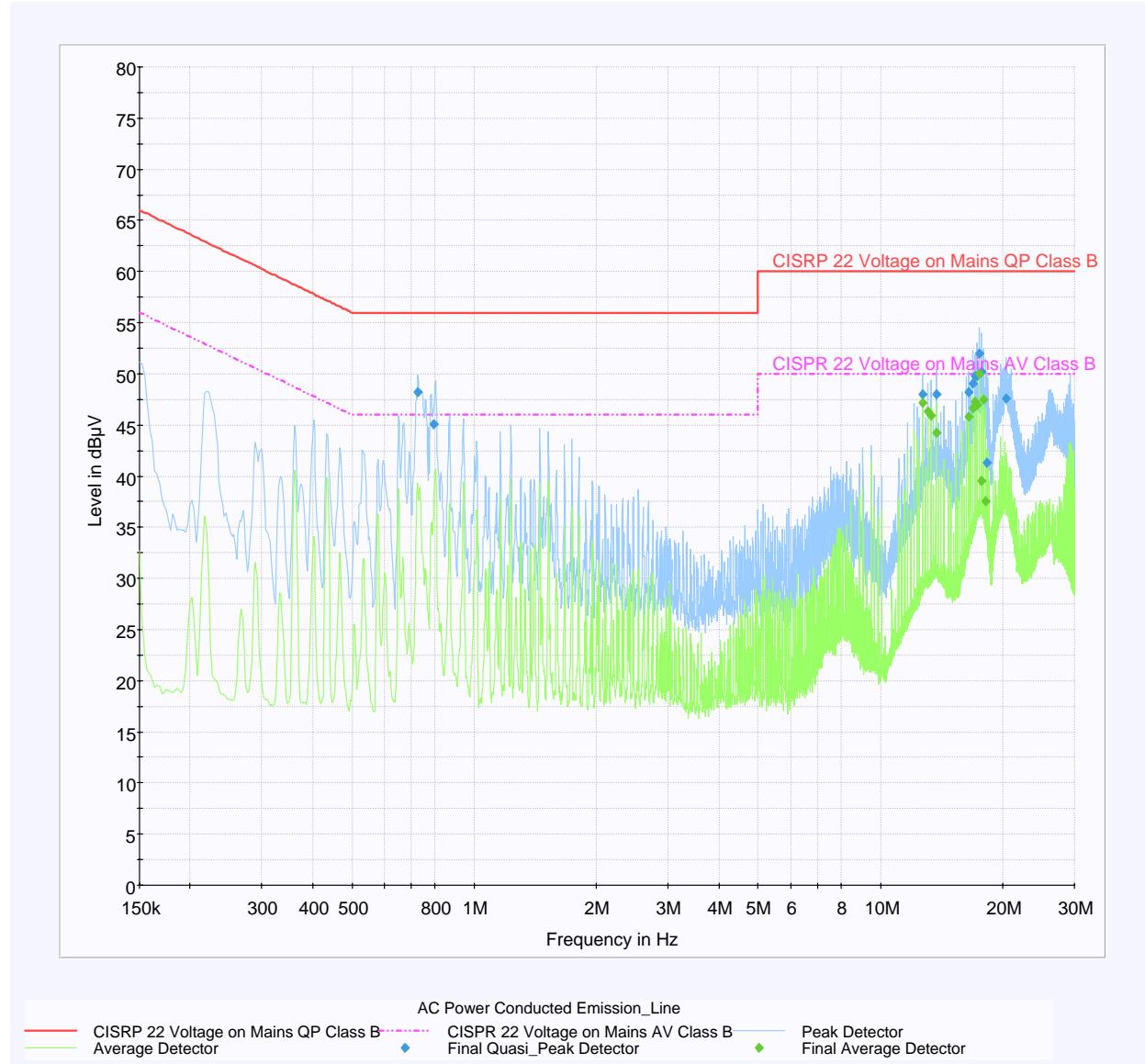
| Frequency (MHz) | Quasi_Peak (dBuv) | Measure time (ms) | Bandwidth (KHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBuv) |
|-----------------|-------------------|-------------------|-----------------|--------|------|------------|-------------|--------------|
| 0.796           | 43.2              | 100               | 9               | On     | N    | 10.1       | 12.8        | 56           |
| 13.697          | 48.5              | 100               | 9               | On     | N    | 10.5       | 11.5        | 60           |
| 16.316          | 47.5              | 100               | 9               | On     | N    | 10.6       | 12.5        | 60           |
| 16.5185         | 47                | 100               | 9               | On     | N    | 10.6       | 13          | 60           |
| 16.923          | 46.5              | 100               | 9               | On     | N    | 10.6       | 13.5        | 60           |
| 17.1215         | 49.6              | 100               | 9               | On     | N    | 10.6       | 10.4        | 60           |
| 17.324          | 48.8              | 100               | 9               | On     | N    | 10.6       | 11.2        | 60           |
| 17.52425        | 51.7              | 100               | 9               | On     | N    | 10.6       | 8.3         | 60           |
| 17.72675        | 48.9              | 100               | 9               | On     | N    | 10.6       | 11.1        | 60           |
| 17.927          | 49.5              | 100               | 9               | On     | N    | 10.6       | 10.5        | 60           |
| 18.1295         | 46.9              | 100               | 9               | On     | N    | 10.6       | 13.1        | 60           |
| 20.25975        | 49.2              | 100               | 9               | On     | N    | 10.8       | 10.8        | 60           |

## Final Average Detector\_N

| Frequency (MHz) | Average (dBuv) | Measure time (ms) | Bandwidth (KHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBuv) |
|-----------------|----------------|-------------------|-----------------|--------|------|------------|-------------|--------------|
| 12.689          | 47.7           | 100               | 9               | On     | N    | 10.4       | 2.3         | 50           |
| 13.09175        | 47.1           | 100               | 9               | On     | N    | 10.4       | 2.9         | 50           |
| 13.29425        | 46.5           | 100               | 9               | On     | N    | 10.4       | 3.5         | 50           |
| 13.697          | 47             | 100               | 9               | On     | N    | 10.5       | 3           | 50           |
| 16.51625        | 46.1           | 100               | 9               | On     | N    | 10.6       | 3.9         | 50           |
| 16.92125        | 46.3           | 100               | 9               | On     | N    | 10.6       | 3.7         | 50           |
| 17.1215         | 46.7           | 100               | 9               | On     | N    | 10.6       | 3.3         | 50           |
| 17.324          | 45.6           | 100               | 9               | On     | N    | 10.6       | 4.4         | 50           |
| 17.52425        | 49.2           | 100               | 9               | On     | N    | 10.6       | 0.8         | 50           |
| 17.69475        | 39.8           | 100               | 9               | On     | N    | 10.6       | 10.2        | 50           |
| 17.927          | 46.2           | 100               | 9               | On     | N    | 10.6       | 3.8         | 50           |
| 18.1295         | 43.2           | 100               | 9               | On     | N    | 10.6       | 6.8         | 50           |

*EQUIPMENT: Verafi Access Reading Point VF-2200*  
*FCC ID: T2RVF2200*

## AC Power line conducted emission\_ L



*EQUIPMENT: Verafi Access Reading Point VF-2200**FCC ID: T2RVF2200***Final Quasi-Peak Detector \_ L**

| Frequency (MHz) | Quasi_Peak (dBuv) | Measure time (ms) | Bandwidth (KHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBuv) |
|-----------------|-------------------|-------------------|-----------------|--------|------|------------|-------------|--------------|
| 0.724           | 48.2              | 100               | 9               | On     | L1   | 10.1       | 7.8         | 56           |
| 0.7965          | 45.1              | 100               | 9               | On     | L1   | 10.1       | 10.9        | 56           |
| 12.68           | 48                | 100               | 9               | On     | L1   | 10.4       | 12          | 60           |
| 13.68575        | 48                | 100               | 9               | On     | L1   | 10.4       | 12          | 60           |
| 16.505          | 48.2              | 100               | 9               | On     | L1   | 10.5       | 11.8        | 60           |
| 16.9095         | 49                | 100               | 9               | On     | L1   | 10.5       | 11          | 60           |
| 17.108          | 49.8              | 100               | 9               | On     | L1   | 10.6       | 10.2        | 60           |
| 17.3105         | 49.8              | 100               | 9               | On     | L1   | 10.6       | 10.2        | 60           |
| 17.51075        | 52                | 100               | 9               | On     | L1   | 10.6       | 8           | 60           |
| 17.71325        | 50.2              | 100               | 9               | On     | L1   | 10.6       | 9.8         | 60           |
| 18.214          | 41.3              | 100               | 9               | On     | L1   | 10.6       | 18.7        | 60           |
| 20.3205         | 47.5              | 100               | 9               | On     | L1   | 10.7       | 12.5        | 60           |

**Final Average Detector \_ L**

| Frequency (MHz) | Average (dBuv) | Measure time (ms) | Bandwidth (KHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBuv) |
|-----------------|----------------|-------------------|-----------------|--------|------|------------|-------------|--------------|
| 12.68           | 47.2           | 100               | 9               | On     | L1   | 10.4       | 2.8         | 50           |
| 13.08275        | 46.3           | 100               | 9               | On     | L1   | 10.4       | 3.7         | 50           |
| 13.283          | 45.9           | 100               | 9               | On     | L1   | 10.4       | 4.1         | 50           |
| 13.68975        | 44.2           | 100               | 9               | On     | L1   | 10.4       | 5.8         | 50           |
| 16.505          | 45.8           | 100               | 9               | On     | L1   | 10.5       | 4.2         | 50           |
| 16.9095         | 46.6           | 100               | 9               | On     | L1   | 10.5       | 3.4         | 50           |
| 17.108          | 47.3           | 100               | 9               | On     | L1   | 10.6       | 2.7         | 50           |
| 17.30825        | 47             | 100               | 9               | On     | L1   | 10.6       | 3           | 50           |
| 17.51075        | 50             | 100               | 9               | On     | L1   | 10.6       | 0           | 50           |
| 17.695          | 39.5           | 100               | 9               | On     | L1   | 10.6       | 10.5        | 50           |
| 17.9135         | 47.5           | 100               | 9               | On     | L1   | 10.6       | 2.5         | 50           |
| 18.12175        | 37.6           | 100               | 9               | On     | L1   | 10.6       | 12.4        | 50           |

*EQUIPMENT: Verafi Access Reading Point VF-2200**FCC ID: T2RVF2200***Section 5. Radiated Emissions****Para. No.: 15.249****Test Performed By: Xu Jin****Date of Test: Aug 20, 2007**

**Minimum Standard:** 15.209&15.249  
Band edge check must comply with 50dBc requirement.  
Radiated Emission must comply with 15.209 general requirement

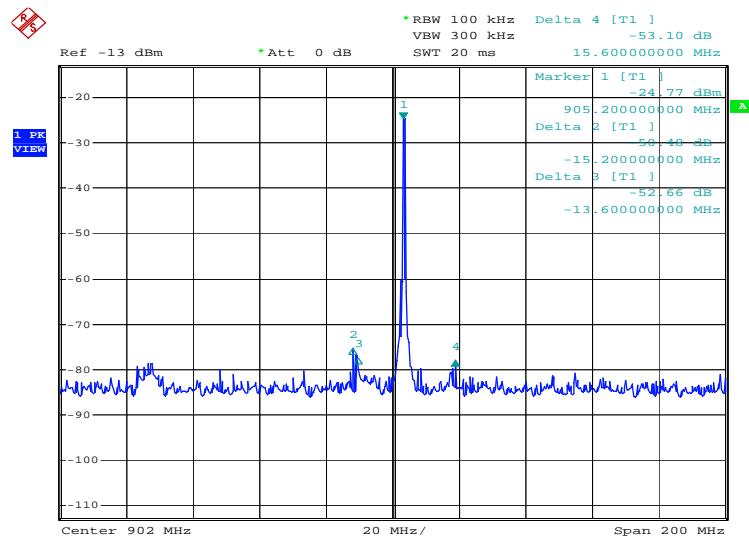
| Frequency<br>(MHz)                          | Field<br>Strength<br>(mV/m) | Field Strength<br>(dB $\mu$ V/m) |
|---|-----------------------------|----------------------------------|
| <b>Fundamental</b>                          |                             |                                  |
| 902-928                                     | 50                          | 94                               |
| <b>Spurious out side the frequency band</b> |                             |                                  |
| 33-88                                       | 0.1                         | 40.0                             |
| 88-216                                      | 0.15                        | 43.5                             |
| 216-960                                     | 0.2                         | 46.0                             |
| 960 above                                   | 0.5                         | 54.0                             |

**Test Results:** See graphic and data of this section.

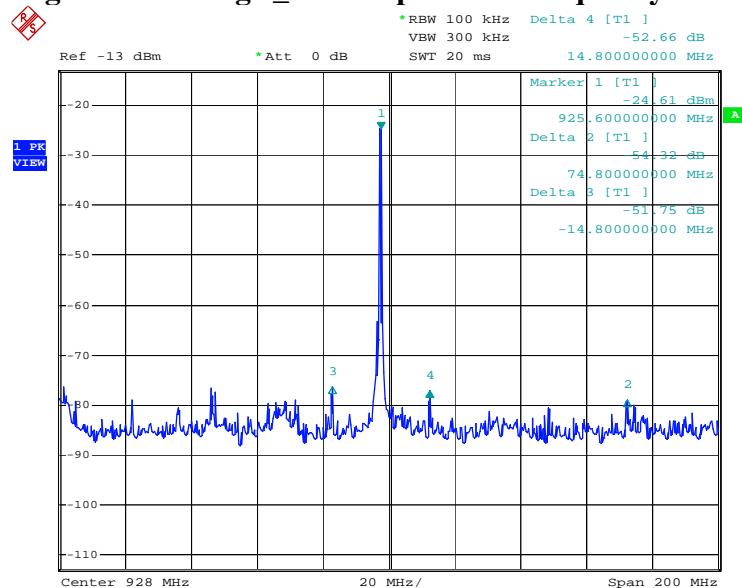
Radiated emission test was conducted at 3 meter at open area test site. The EUT was searched from 30MHz to the 10<sup>th</sup> harmonics, and for low, medium and high frequencies at the frequency band.

The spectrum analyzer was set to peak detector with 100KHz RBW/VBW for measurement below 1GHz and 1 MHz RBW / VBW above 1 GHz.

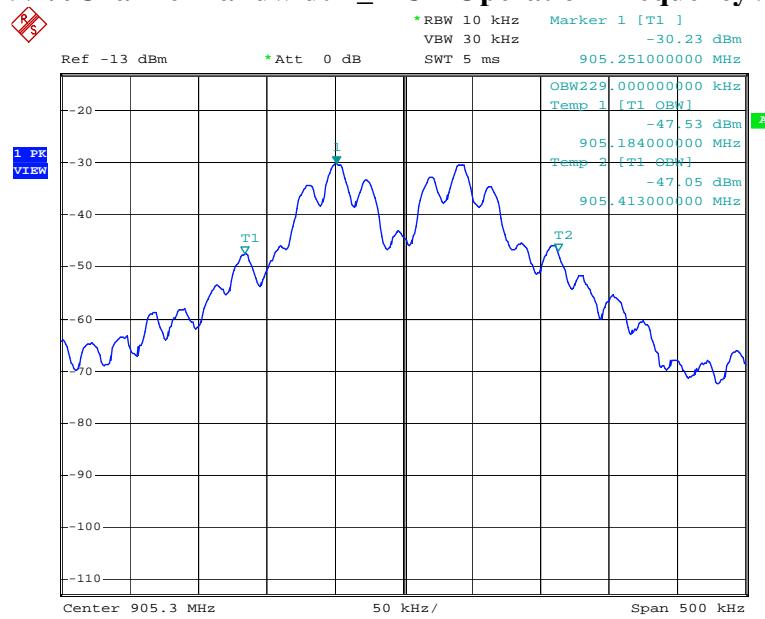
Only worst cases have been reported.

*EQUIPMENT: Verafi Access Reading Point VF-2200**FCC ID: T2RVF2200***50dBc Band Edge Check****Lower Band Edge\_ EUT Operation Frequency 905.3MHz**

Date: 20.AUG.2007 12:41:14

**Higher Band Edge \_ EUT Operation Frequency 925.3MHz**

Date: 20.AUG.2007 12:37:38

*EQUIPMENT: Verafi Access Reading Point VF-2200**FCC ID: T2RVF2200***99% Channel Bandwidth \_ EUT Operation Frequency 905.3MHz**

Date: 20.AUG.2007 12:43:01

*EQUIPMENT: Verafi Access Reading Point VF-2200**FCC ID: T2RVF2200***Radiated Emission Test Data**

| Freq.<br>(MHz) | Ant.  | Pol.<br>V/H | RCVD<br>Signal<br>(dB $\mu$ V) | Ant.<br>Factor<br>(dB/m) | Amp.<br>Gain<br>(dB) | Cable<br>Loss<br>(dB) | Field<br>Strength<br>(dB $\mu$ V/m) | Limit<br>(dB $\mu$ V/m) | Margin<br>(dB) | Detector |
|----------------|-------|-------------|--------------------------------|--------------------------|----------------------|-----------------------|-------------------------------------|-------------------------|----------------|----------|
| 925.3000       | LP1   | H           | 65.5                           | 24.2                     | N/A                  | 3.2                   | 92.9                                | 94.0                    | 1.1            | Peak     |
| 925.3000       | LP1   | V           | 63.6                           | 23.0                     | N/A                  | 3.2                   | 89.8                                | 94.0                    | 4.2            | Peak     |
| 1850.6000      | Horn2 | H           | 68.1                           | 27.4                     | 49.1                 | 4.7                   | 51.2                                | 54.0                    | 2.8            | Peak     |
| 1850.6000      | Horn2 | V           | 65.4                           | 27.5                     | 49.1                 | 4.7                   | 48.6                                | 54.0                    | 5.4            | Peak     |
| 2775.0000      | Horn2 | H           | 76.3                           | 30.0                     | 59.7                 | 6.0                   | 52.6                                | 54.0                    | 1.4            | Peak     |
| 2775.0000      | Horn2 | V           | 73.3                           | 30.1                     | 59.7                 | 6.0                   | 49.6                                | 54.0                    | 4.4            | Peak     |
| 915.3000       | LP1   | H           | 63.3                           | 23.9                     | N/A                  | 3.2                   | 90.4                                | 94.0                    | 3.6            | Peak     |
| 915.3000       | LP1   | V           | 61.4                           | 22.9                     | N/A                  | 3.2                   | 87.5                                | 94.0                    | 6.5            | Peak     |
| 1830.6000      | Horn2 | H           | 60.7                           | 27.4                     | 49.1                 | 4.6                   | 43.6                                | 54.0                    | 10.4           | Peak     |
| 1830.6000      | Horn2 | V           | 59.2                           | 27.5                     | 49.1                 | 4.6                   | 42.3                                | 54.0                    | 11.7           | Peak     |
| 2745.9000      | Horn2 | H           | 71.3                           | 30.0                     | 59.7                 | 5.8                   | 47.3                                | 54.0                    | 6.7            | Peak     |
| 2745.9000      | Horn2 | V           | 69.4                           | 30.0                     | 59.7                 | 5.8                   | 45.5                                | 54.0                    | 8.5            | Peak     |
| 905.3000       | LP1   | H           | 65.8                           | 23.7                     | N/A                  | 3.1                   | 92.6                                | 94.0                    | 1.4            | Peak     |
| 905.3000       | LP1   | V           | 63.2                           | 22.9                     | N/A                  | 3.1                   | 89.2                                | 94.0                    | 4.8            | Peak     |
| 1810.6000      | Horn2 | H           | 59.4                           | 27.4                     | 49.1                 | 4.5                   | 42.3                                | 54.0                    | 11.7           | Peak     |
| 1810.6000      | Horn2 | V           | 57.5                           | 27.5                     | 49.1                 | 4.5                   | 40.4                                | 54.0                    | 13.6           | Peak     |
| 2715.9000      | Horn2 | H           | 75.5                           | 29.9                     | 59.8                 | 5.9                   | 51.6                                | 54.0                    | 2.4            | Peak     |
| 2715.9000      | Horn2 | V           | 73.2                           | 30.0                     | 59.8                 | 5.9                   | 49.4                                | 54.0                    | 4.6            | Peak     |

Note 1: Antenna Legend: BC = Biconical, BL = Bilog, LP = Log-Periodic, Horn = Horn, ED = EMCO Dipole

Note 2: Detector Legend: Below 1GHz, Peak detector with 100 kHz RBW, 100KHz VBW

Above 1GHz, Peak detector with 1.0MHz RBW, 1.0MHz VBW

*EQUIPMENT: Verafi Access Reading Point VF-2200*

*FCC ID: T2RVF2200*

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Radiated Emissions Photos



**Output Power Measurement Under Extreme Voltage Conditions**

**Test Method:** Radiated power was verified under voltage extreme conditions at the operation frequency of 905.3MHz.

**Extreme Voltage:**  $\pm 15\%$  of AC Mains.

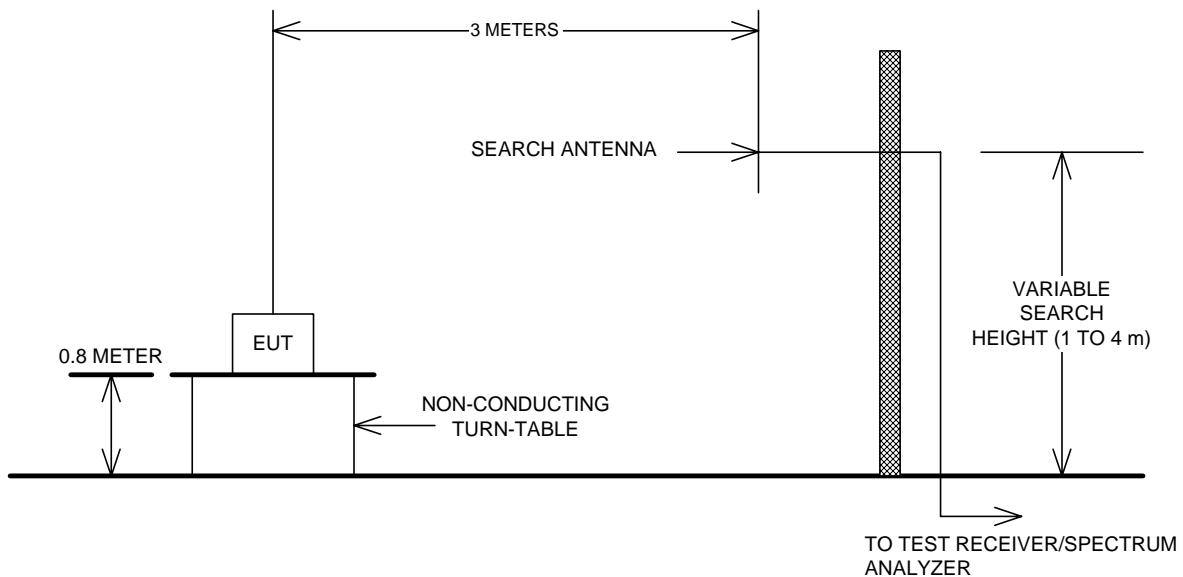
**Test Result:** No change in fundamental power level was observed during the test.

*EQUIPMENT: Verifi Access Reading Point VF-2200*  
*FCC ID: T2RVF2200*

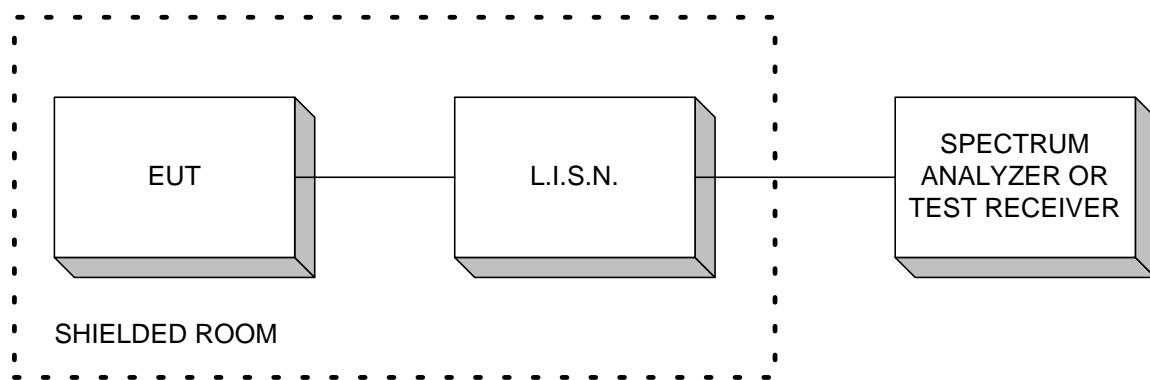
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## Section 6. Block Diagrams

### Test Site For Radiated Emissions



### Conducted Emissions



*EQUIPMENT: Verafi Access Reading Point VF-2200**FCC ID: T2RVF2200*

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## Section 7. Test Equipment List

| Equipment                      | Manufacturer    | Model No.  | Asset/Serial No. | Next Cal.  |
|--------------------------------|-----------------|------------|------------------|------------|
| Spectrum Analyzer              | Rhode & Schwarz | FSP        | FA001920         | Mar. 19/08 |
| Spectrum Analyzer              | Rhode & Schwarz | FSU        | FA001877         | Jan. 16/08 |
| Spectrum Analyzer/EMI Receiver | Rhode & Schwarz | ESU        | FA002043         | Oct. 24/07 |
| Signal Generator               | Rohde & Schwarz | SMR40      | FA001879         | Aug. 8/08  |
| RF AMP                         | JCA             | 1 – 2 GHz  | FA001498         | COU        |
| RF AMP                         | JCA             | 2 – 4 GHz  | FA001496         | COU        |
| RF AMP                         | JCA             | 4 – 8 GHz  | FA001497         | COU        |
| RF AMP                         | Narda           | 5 – 18 GHz | FA001409         | COU        |
| Bi-Conical Antenna #2          | EMCO            | 3109       | FA000904         | Sep. 12/07 |
| Log Periodic Antenna #1        | EMCO            | 3148       | FA001355         | Sep. 12/07 |
| Horn Antenna #2                | EMCO            | 3115       | FA000825         | Jan. 30/08 |
| LISN                           | Rohde & Schwarz | ENV216     | FA002023         | Aug. 28/07 |
| Spectrum Analyzer              | Rohde & Schwarz | FSU        | FA001877         | Jan. 16/08 |
| Receiver                       | Rohde & Schwarz | ESVS-30    | FA001437         | July 12/08 |

\* COU (Calibrate on Use)