

**FCC CFR47 PART 15 CERTIFICATION**



**TEST REPORT**

***FOR***

**11 Mbps RF MODULE**

**MODEL: GINA-2011**

**FCC ID: DE8-2011**

**REPORT NUMBER: 01U0988-1**

**ISSUE DATE: OCTOBER 2, 2001**

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**NVLAP<sup>®</sup>**  
**LAB CODE:200065-0**

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- PART LIST
- PRODUCT SPECIFICATION
- PROCESSING GAIN
- THEORY OF OPERATION
- RF BLOCK DIAGRAM & SCHEMATIC DIAGRAM

## 1. TEST RESULT CERTIFICATION

**COMPANY NAME:** GRE AMERICA, INC.  
425 HARBOR BLVD.  
BELMONT, CA 94002 USA

**CONTACT PERSON:** TERU TAKAHASHI / PRESIDENT

**TELEPHONE NO:** 650-591-1400

**EUT DESCRIPTION:** 11 MBPS RF MODULE

**MODEM NAME:** GINA-2011

**DATE TESTED:** OCTOBER 02, 2001

|                       |                               |
|-----------------------|-------------------------------|
| TYPE OF EQUIPMENT     | INTENTIONAL RADIATOR          |
| EQUIPMENT TYPE        | 2.4GHz TRANSCEIVER            |
| MEASUREMENT PROCEDURE | ANSI 63.4 / 1992, TIA/EIA 603 |
| PROCEDURE             | CERTIFICATION                 |
| FCC RULE              | CFR 47 PART 15.247            |

Compliance Certification Services, Inc. tested the above equipment for compliance with the requirement set forth in CFR 47, PART 15.247. The equipment in the configuration described in this report, shows the measured emission levels emanating from the equipment do not exceed the specified limit.

**Note:** This document reports conditions under which testing was conducted and results of tests performed. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services will constitute fraud and shall nullify the document.

Approved & Released For CCS By:

Tested By:

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STEVE CHENG  
EMC ENGINEERING MANAGER  
COMPLIANCE CERTIFICATION SERVICES

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HUE LY VANG  
ASSOCIATE EMC ENGINEER  
COMPLIANCE CERTIFICATION SERVICES

## 2. EUT DESCRIPTION

The GINA-2011 is a small, versatile high performance RF Module that delivers data up to speeds of 11Mbps/s. The Module is designed to provide up to 0.5 watt (27dBm) output power. The GINA-2011 RF Module is available as a plug-in module for those Research who wish to interface it with there own designed controllers.

GINA-2011 operates at 2.4 GHz Direct Sequence Spread Spectrum (DSSS) Module physical layer can be compliant with IEEE 802.11b standard insures interoperability with other Wireless LAN products.

GINA-2011's highly integrated digital modulation transceiver module can also be used for factory automation equipment and barcode readers, embedded systems, and other applications.

## 3. TEST METHODOLOGY

Both conducted and radiated testing were performed according to the procedures documented on chapter 13 of ANSI C63.4 and FCC CFR 47 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055 and 2.1057.

## 4. TEST FACILITY

The open area test sites and conducted measurement facilities used to collect the radiated data are located at 561F Monterey Road, Morgan Hill, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

## 5. ACCREDITATION AND LISTING

The test facilities used to perform radiated and conducted emissions tests are accredited by National Voluntary Laboratory Accreditation Program for the specific scope of accreditation under Lab Code: 200065-0 to perform Electromagnetic Interference tests according to FCC PART 15 AND CISPR 22 requirements. No part of this report may be used to claim or imply product endorsement by NVLAP or any agency of the US Government. In addition, the test facilities are listed with Federal Communications Commission (reference no: 31040/SIT (1300B3) and 31040/SIT (1300F2))

## 5.1. Laboratory Accreditations and Listings

| Country | Agency          | Scope of Accreditation                                                                                                                                                                                                          | Logo                                                                                                         |
|---------|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| USA     | NVLAP*          | FCC Part 15, CISPR 22, AS/NZS 3548, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11, CNS 13438                                                                         | <br>200065-0              |
| USA     | FCC             | 3/10 meter Open Area Test Sites to perform FCC Part 15/18 measurements                                                                                                                                                          | <br>1300                  |
| Japan   | VCCI            | CISPR 22 Two OATS and one conducted Site                                                                                                                                                                                        | <br>R-1014, R-619, C-640  |
| Norway  | NEMKO           | EN50081-1, EN50081-2, EN50082-1, EN50082-2, IEC61000-6-1, IEC61000-6-2, EN50083-2, EN50091-2, EN50130-4, EN55011, EN55013, EN55014-1, EN55104, EN55015, EN61547, EN55022, EN55024, EN61000-3-2, EN61000-3-3, EN60945, EN61326-1 | <br>ELA 117               |
| Norway  | NEMKO           | EN60601-1-2 and IEC 60601-1-2, the Collateral Standards for Electro-Medical Products. MDD, 93/42/EEC, AIMD 90/385/EEC                                                                                                           | <br>ELA-171              |
| Taiwan  | BSMI            | CNS 13438                                                                                                                                                                                                                       | <br>SL2-IN-E-1012       |
| Canada  | Industry Canada | RSS210 Low Power Transmitter and Receiver                                                                                                                                                                                       | <br>IC2324 A,B,C, and F |

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

## 6. MEASURING INSTRUMENT CALIBRATION

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

| TEST EQUIPMENTS LIST      |                            |                  |            |          |
|---------------------------|----------------------------|------------------|------------|----------|
| Name of Equipment         | Manufacturer               | Model No.        | Serial No. | Due Date |
| Spectrum Analyzer         | HP100Hz - 22GHz            | 8566B            | 2140A01296 | 5/4/02   |
| Spectrum Display          | HP                         | 85662A           | 2152A03066 | 4/10/02  |
| Quasi-Peak Detector       | HP9K - 1GHz                | 85650A           | 2811A01155 | 5/4/02   |
| Pre-Amplifier, 25 dB      | HP 0.1 - 1300MHz           | 8447D (P_1M)     | 2944A06833 | 11/21/01 |
| Antenna, BiLog            | Chase 30 - 2000MHz         | CBL6112          | 2049       | 12/11/01 |
| LISN                      | Fisher Cus. Comm.          | LISN-50/250-25-2 | 2023       | 8/5/02   |
| EMI Test Receiver         | Rohde & Schwarz            | ESHS 20          | 827129/006 | 2/28/02  |
| EMC Receiver (9K-26.5GHz) | HP                         | 8593EM           | 3710A00205 | 6/20/02  |
| Horn Antenna(1 - 18GHz)   | EMCO                       | 3115             | 2238       | 6/20/02  |
| Horn Antenna,(18 - 26GHz) | Antenna Research Associate | MWH 1826/B       | 1013       | 7/26/02  |
| Power Meter               | HP                         | 436A             | 2709A29209 | 2/8/02   |
| High pass filter          | ESM Microwave              | HM 4570-9SS      | 3          | N.C.R.   |

### 6.1. Measurement Uncertainty

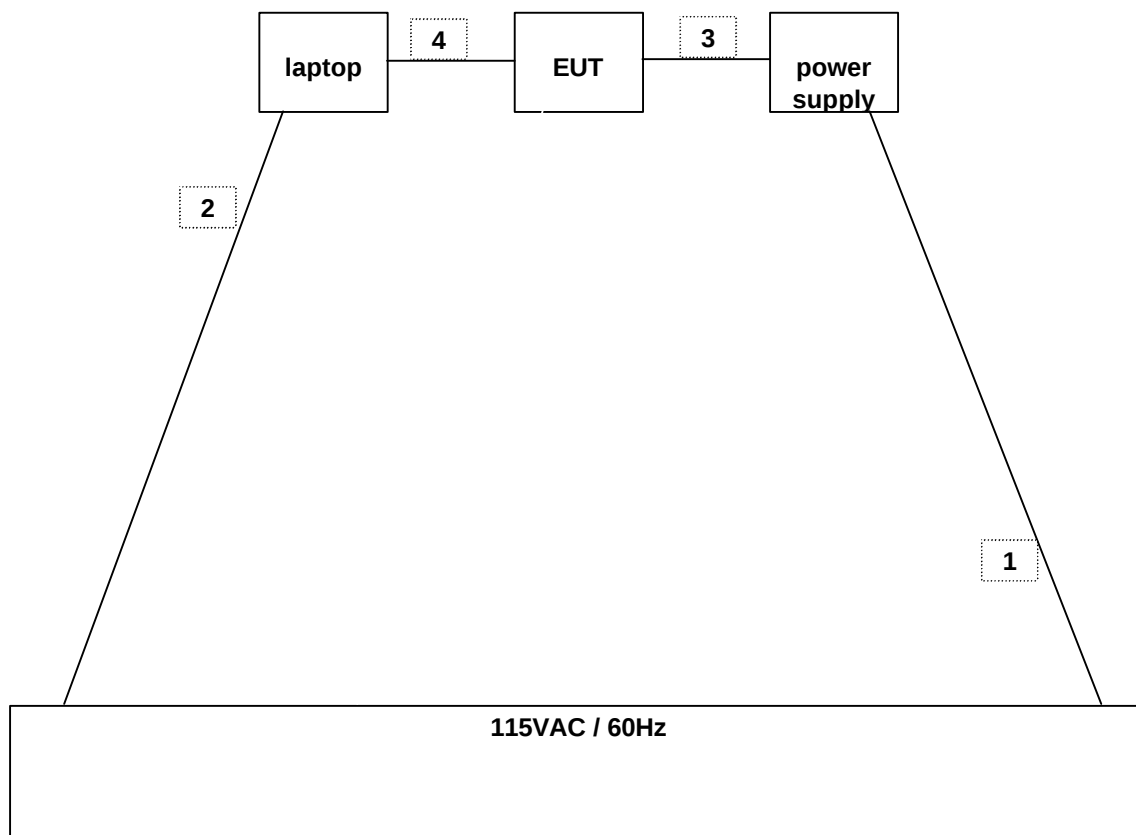
Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

| Radiated Emission             |             |
|-------------------------------|-------------|
| 30MHz – 200 MHz               | +/- 3.3dB   |
| 200MHz – 1000MHz              | +4.5/-2.9dB |
| 1000MHz – 2000MHz             | +4.6/-2.2dB |
| Power Line Conducted Emission |             |
| 150kHz – 30MHz                | +/-2.9      |

Any results falling within the above values are deemed to be marginal.

## 7. SUPPORT EQUIPMENT / TEST DIAGRAM

| TEST PERIPHERALS |               |              |               |        |
|------------------|---------------|--------------|---------------|--------|
| Device Type      | Manufacturer  | Model Number | Serial Number | FCC ID |
| Power Supply     | Kikusui Corp. | PAB          | A9288132      | DoC    |
| Laptop           | Hitachi       | 7360         | TD045700087   | DoC    |
| AC/DC Adaptor    | Phihong       | PSA10R-075CB | C11201385A1   | DoC    |



## 8. APPLICABLE RULES AND BRIEF TEST RESULT

### §15.247- POWER LIMIT

(b) The maximum peak output power of the intentional radiator shall not exceed the following:

(1) For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 hopping channels, all frequency hopping systems in the 5725-5850 MHz band, and all direct sequence systems: 1 watt.

**Spec limit:** As specified above, 1W maximum.

**Test result:** No non-compliance noted.

| Channel | Frequency (MHz) | Output Power(watts) |
|---------|-----------------|---------------------|
| 1       | 2412            | 543mW (27.35 dBm)   |
| 6       | 2436            | 568.9mW (27.55 dBm) |
| 11      | 2462            | 562mW (27.5 dBm)    |

### §14.407- BANDWIDTH LIMITATION

(2) For direct sequence systems, the minimum 6 dB bandwidth shall be at least 500 kHz.

**Spec limit:** > 500 kHz.

**Test result:** No non-compliance noted.

| Channel | Frequency (MHz) | Bandwidth(MHz) |
|---------|-----------------|----------------|
| 1       | 2412            | 10.02          |
| 6       | 2436            | 10.08          |
| 11      | 2462            | 10.11          |

### §15.247- PEAK POWER SPECTRAL DENSITY

(d) For direct sequence systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

**Spec limit:** < 8dBm.

**Test result:** No non-compliance noted.

| Channel | Frequency (MHz) | Results (dBm) |
|---------|-----------------|---------------|
| 1       | 2412            | 2.4           |
| 6       | 2436            | .8            |
| 11      | 2462            | 3.9           |

### **§15.247- PROCESS GAIN**

(e) The processing gain of a direct sequence system shall be at least 10 dB. The processing gain represents the improvement to the received signal-to-noise ratio, after filtering to the information bandwidth, from the spreading/despreading function.

***Spec limit: >10dBm.***

***Test result: No non-compliance noted.***

### **§15.205- RESTRICTED BANDS OF OPERATIONS**

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

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

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

<sup>2</sup> Above 38.6

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

***Spec limit: As specified above.***

***Test result: No non-compliance noted. See section 9.7 Radiated Emission.***

## **§90.209- RADIATED EMISSION LIMITS; GENERAL REQUIREMENTS**

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

| Frequency<br>(MHz) | Field Strength<br>(microvolts/meter) | Measurement Distance<br>(meters) |
|--------------------|--------------------------------------|----------------------------------|
| 0.009 - 0.490      | 2400/F(kHz)                          | 300                              |
| 0.490 - 1.705      | 24000/F(kHz)                         | 30                               |
| 1.705 - 30.0       | 30                                   | 30                               |
| 30 - 88            | 100 **                               | 3                                |
| 88 - 216           | 150 **                               | 3                                |
| 216 - 960          | 200 **                               | 3                                |
| Above 960          | 500                                  | 3                                |

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

(b) In the emission table above, the tighter limit applies at the band edges.

FCC PART 15 CLASS A

| MEASURING DISTANCE OF 10 METER |                                  |                            |
|--------------------------------|----------------------------------|----------------------------|
| FREQUENCY RANGE<br>(MHz)       | FIELD STRENGTH<br>(Microvolts/m) | FIELD STRENGTH<br>(dBuV/m) |
| 30-88                          | 90                               | 39.1                       |
| 88-216                         | 150                              | 43.5                       |
| 216-960                        | 210                              | 46.4                       |
| Above 960                      | 300                              | 49.5                       |

FCC PART 15 CLASS B

| MEASURING DISTANCE OF 3 METER |                                  |                            |
|-------------------------------|----------------------------------|----------------------------|
| FREQUENCY RANGE<br>(MHz)      | FIELD STRENGTH<br>(Microvolts/m) | FIELD STRENGTH<br>(dBuV/m) |
| 30-88                         | 100                              | 40                         |
| 88-216                        | 150                              | 43.5                       |
| 216-960                       | 200                              | 46                         |
| Above 960                     | 500                              | 54                         |

***Spec limit: As specified above.***

***Test result: No non-compliance noted.***

### **§15.207- CONDUCTED LIMITS**

(a) For an intentional radiator which 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 450 kHz to 30 MHz shall not exceed 250 microvolts. Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminals.

#### **FCC CLASS A**

| <b>FREQUENCY RANGE</b> | <b>FIELD STRENGTH<br/>(Microvolts)</b> | <b>FIELD STRENGTH<br/>(dBuV)/QP</b> |
|------------------------|----------------------------------------|-------------------------------------|
| 450kHz-1.705MHz        | 1000                                   | 60                                  |
| 1.705MHz - 30MHz       | 3000                                   | 69.54                               |

#### **FCC CLASS B**

| <b>FREQUENCY RANGE</b> | <b>FIELD STRENGTH<br/>(Microvolts)</b> | <b>FIELD STRENGTH<br/>(dBuV)/QP</b> |
|------------------------|----------------------------------------|-------------------------------------|
| 450kHz-30MHz           | 250                                    | 48                                  |

***Spec limit: As specified above.***

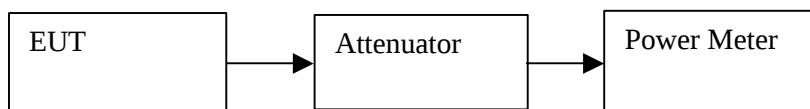
***Test result: No non-compliance noted. No radiated emissions were detected other than the fundamental frequency and harmonics. Line conducted emissions comply.***

## 9. TEST SETUP, PROCEDURE AND RESULT

### 9.1. CONDUCTED POWER

#### 9.1.1. Power Meter Measurement

##### TEST SETUP



##### TEST PROCEDURE

The EUT is configured on a test bench as shown above in a continuously transmitting / receiving mode.

##### RESULT

*No non-compliance noted.*

| <i>Channel</i> | <i>Frequency (MHz)</i> | <i>Output Power(watts)</i> |
|----------------|------------------------|----------------------------|
| <b>1</b>       | <b>2412</b>            | <b>543mW (27.35 dBm)</b>   |
| <b>6</b>       | <b>2436</b>            | <b>568.9mW (27.55 dBm)</b> |
| <b>11</b>      | <b>2462</b>            | <b>562mW (27.5 dBm)</b>    |

#### 9.1.2. Spectrum Analyzer Measurement

##### TEST SETUP



Detector Function Setting of Test Receiver

| Frequency Range (MHz) | Detector Function                                                            | Resolution Bandwidth                                                        | Video Bandwidth                                                             |
|-----------------------|------------------------------------------------------------------------------|-----------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| Above 1000            | <input checked="" type="checkbox"/> Peak<br><input type="checkbox"/> Average | <input checked="" type="checkbox"/> 3 MHz<br><input type="checkbox"/> 1 MHz | <input checked="" type="checkbox"/> 3 MHz<br><input type="checkbox"/> 10 Hz |

##### TEST PROCEDURE

The EUT is configured on a test bench as shown above in a continuously transmitting / receiving mode. While the transceiver started, the analyzer MAX HOLD function is used to capture the emissions.

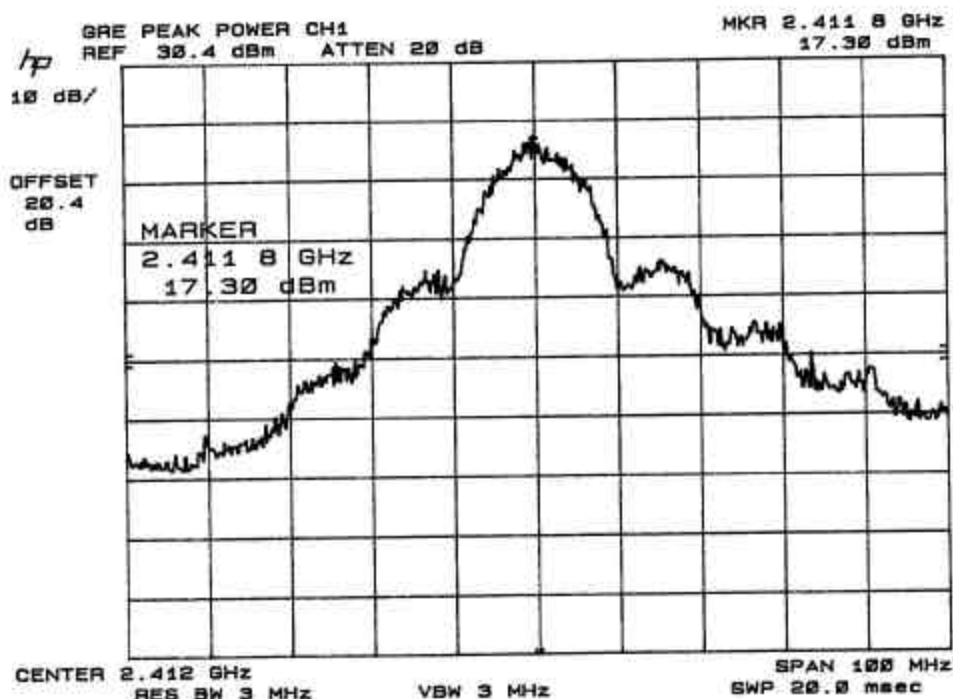
Then that number is added to the 6 dB correction factor.

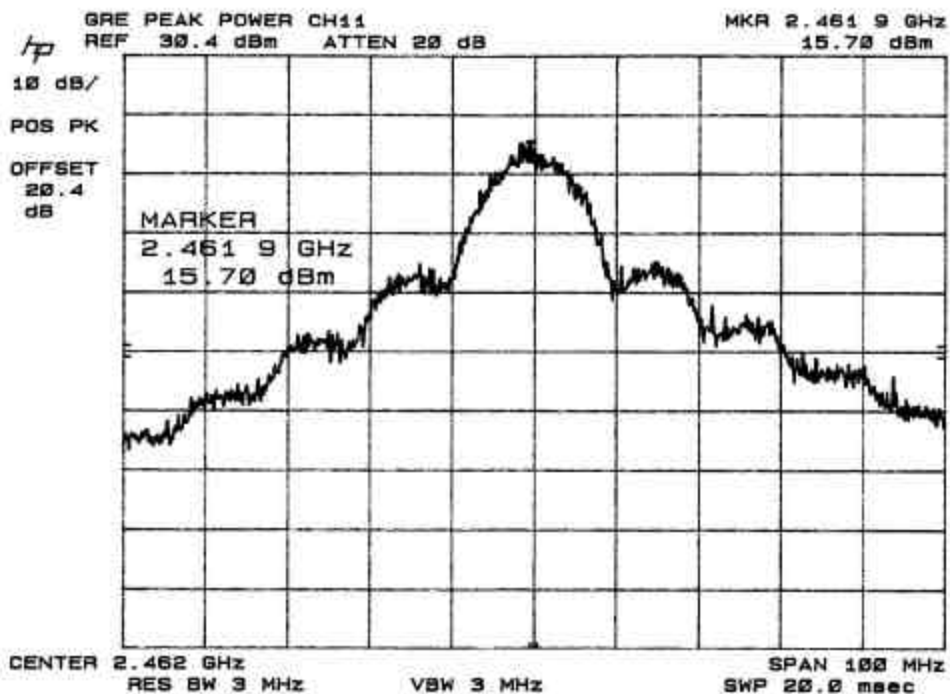
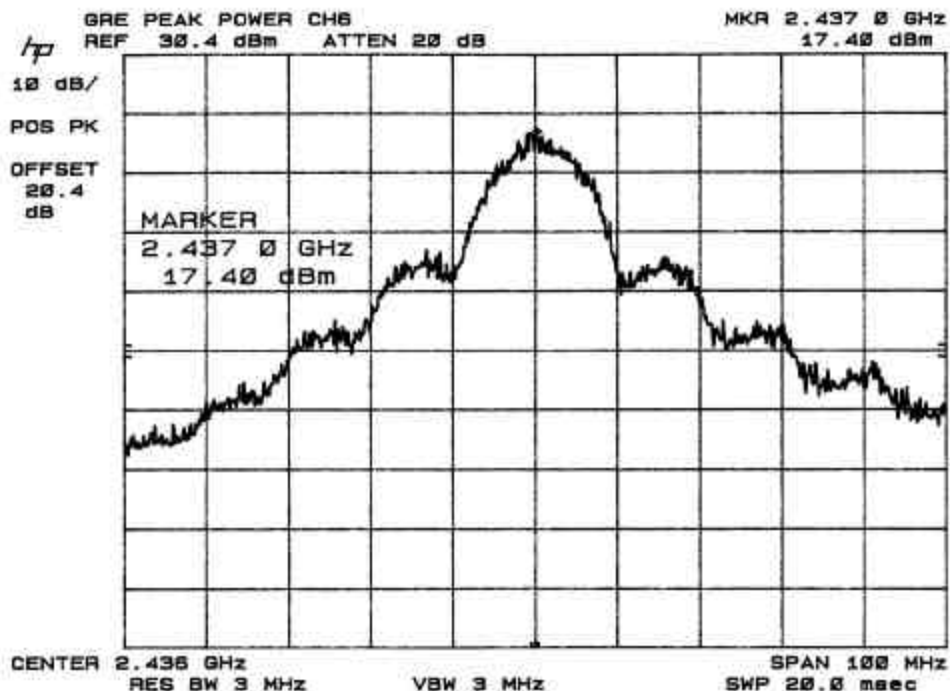
Formula = reading + 10 log (6dB bandwidth / resolution bandwidth)

| Channel | Frequency (MHz) | EUT reading (dBm) | 6 dB Bandwidth (MHz) | True Power (dBm) |
|---------|-----------------|-------------------|----------------------|------------------|
| 1       | 2412            | 17.3              | 10.6                 | 27.55            |
| 6       | 2436            | 17.4              | 10.02                | 27.41            |
| 11      | 2462            | 15.7              | 10.11                | 25.75            |

See plots:

6 dB plots is in the 6 dB bandwidth measurement sections



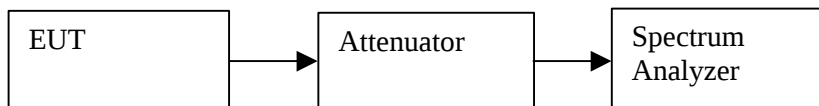


## 9.2. 6 dB BANDWIDTH MEASUREMENT

Detector Function Setting of Test Receiver

| Frequency Range (MHz) | Detector Function                                                            | Resolution Bandwidth                                                          | Video Bandwidth                                                               |
|-----------------------|------------------------------------------------------------------------------|-------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| Above 1000            | <input checked="" type="checkbox"/> Peak<br><input type="checkbox"/> Average | <input checked="" type="checkbox"/> 100 kHz<br><input type="checkbox"/> 1 MHz | <input checked="" type="checkbox"/> 100 kHz<br><input type="checkbox"/> 1 MHz |

### TEST SETUP

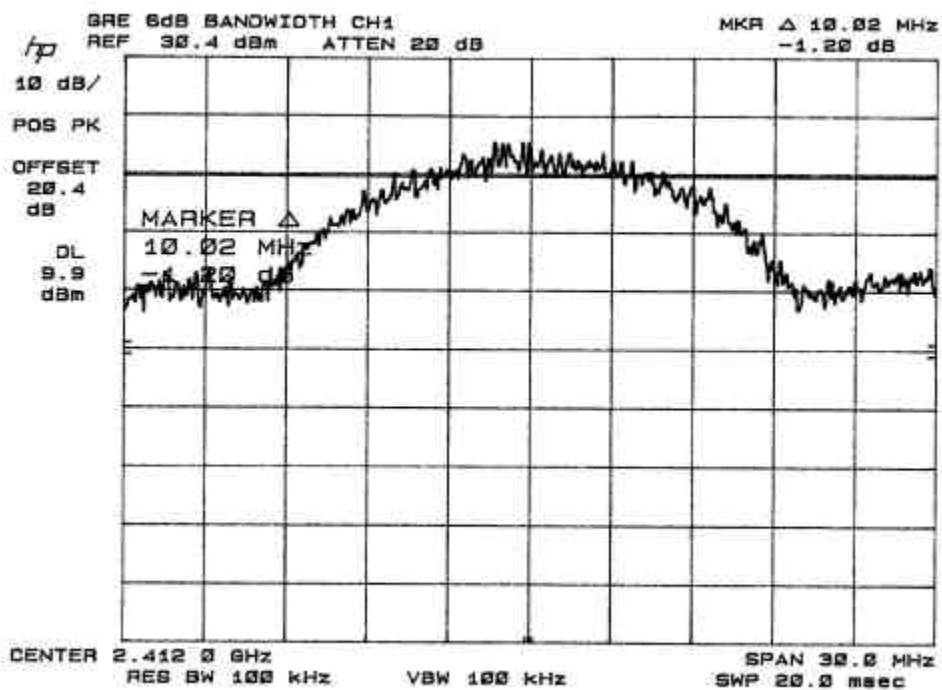
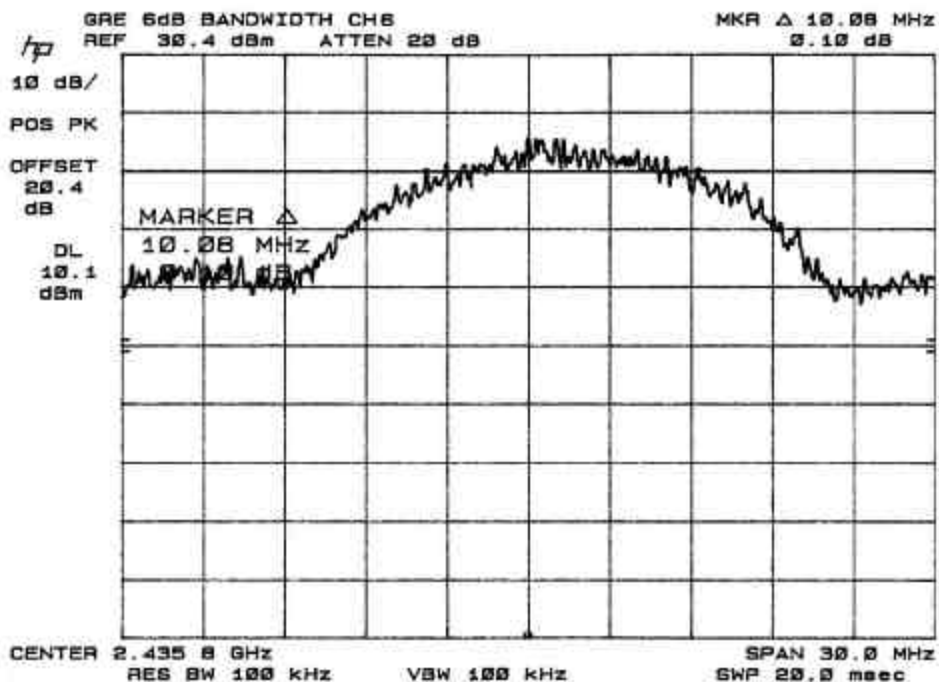


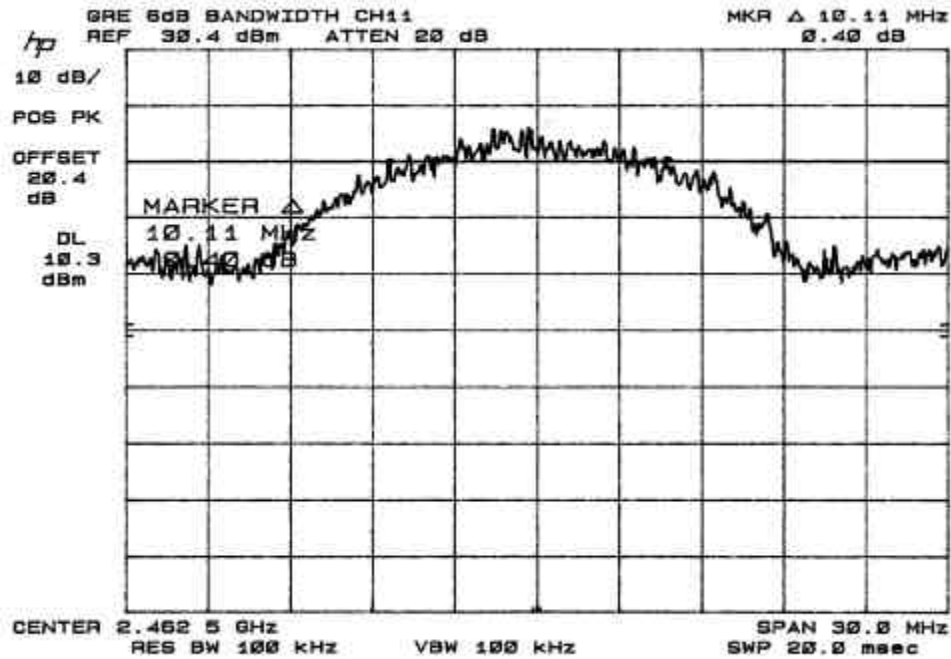
### TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100 kHz RBW and 100 kHz VBW. The 6 dB bandwidth is defined as the total spectrum the poweroff which is higher than peak power minus 6 dB.

### RESULT

*No non-compliance noted.*



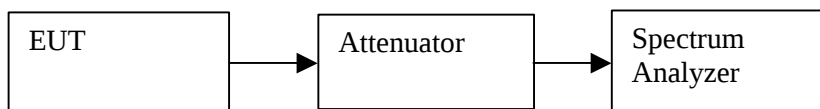


### 9.3. CONDUCTED SPURIOUS EMISSION

Detector Function Setting of Test Receiver

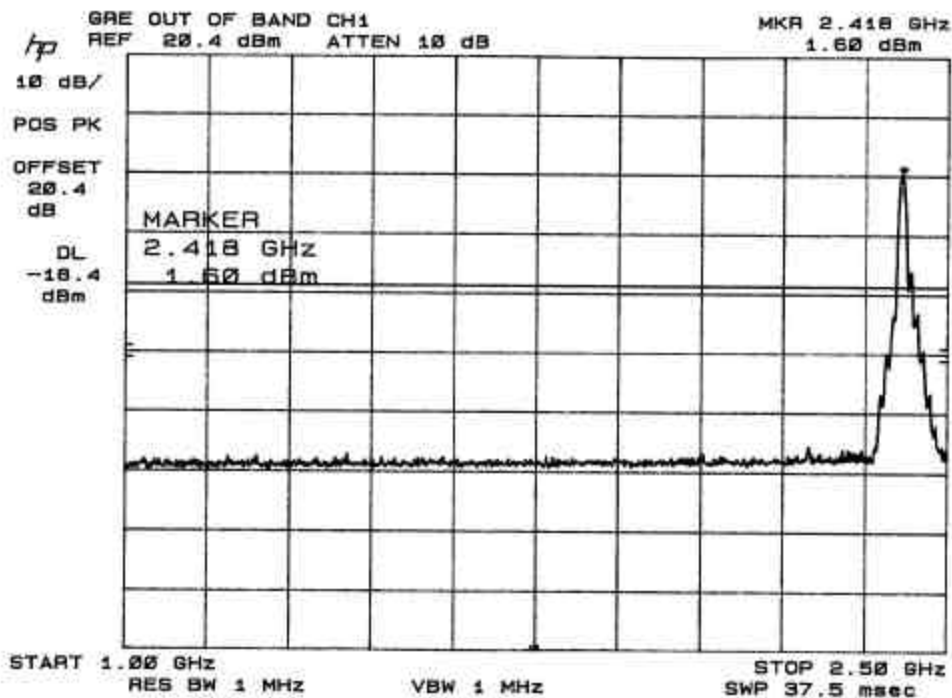
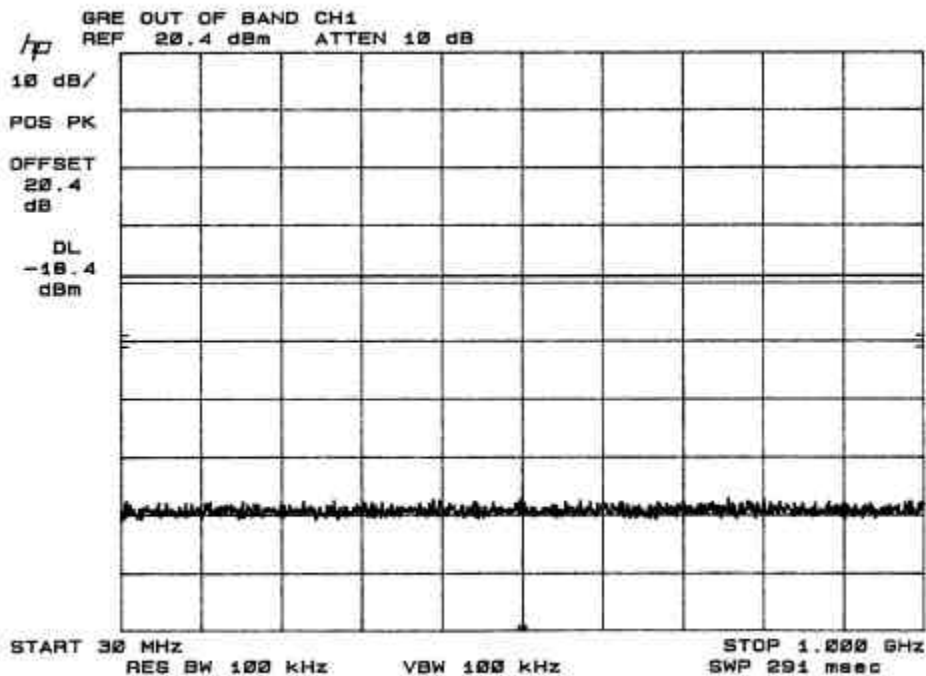
| Frequency Range (MHz) | Detector Function                        | Resolution Bandwidth                        | Video Bandwidth                             |
|-----------------------|------------------------------------------|---------------------------------------------|---------------------------------------------|
| Below 1000            | <input checked="" type="checkbox"/> Peak | <input checked="" type="checkbox"/> 100 kHz | <input checked="" type="checkbox"/> 100 kHz |
|                       | <input type="checkbox"/> Average         | <input type="checkbox"/> 1 MHz              | <input type="checkbox"/> 10 Hz              |
| Above 1000            | <input checked="" type="checkbox"/> Peak | <input checked="" type="checkbox"/> 1 MHz   | <input checked="" type="checkbox"/> 1 MHz   |
|                       | <input type="checkbox"/> Average         | <input type="checkbox"/> 1 MHz              | <input type="checkbox"/> 10 Hz              |

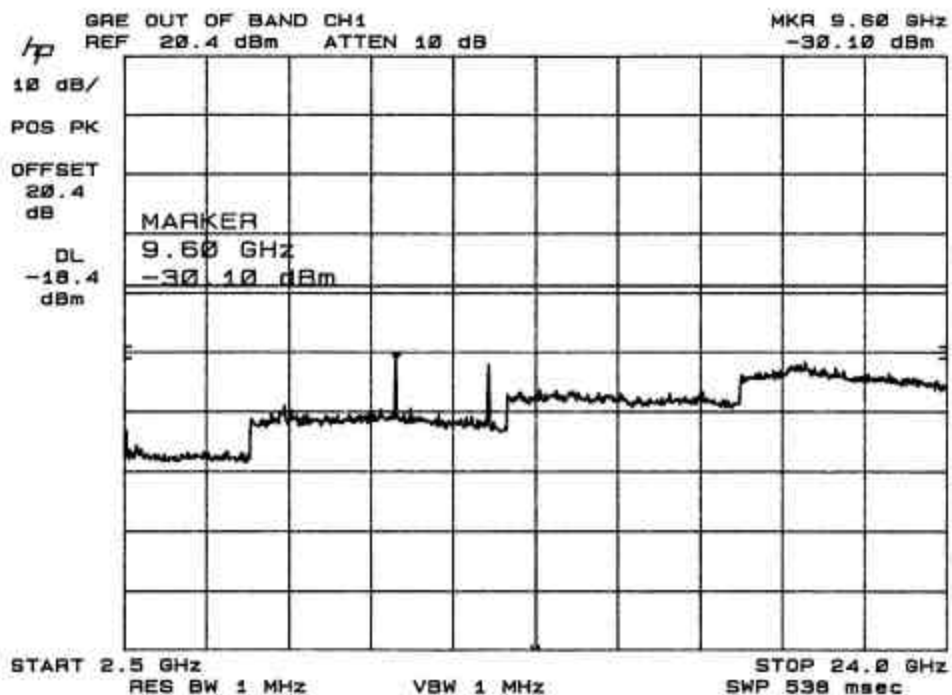
#### TEST SETUP

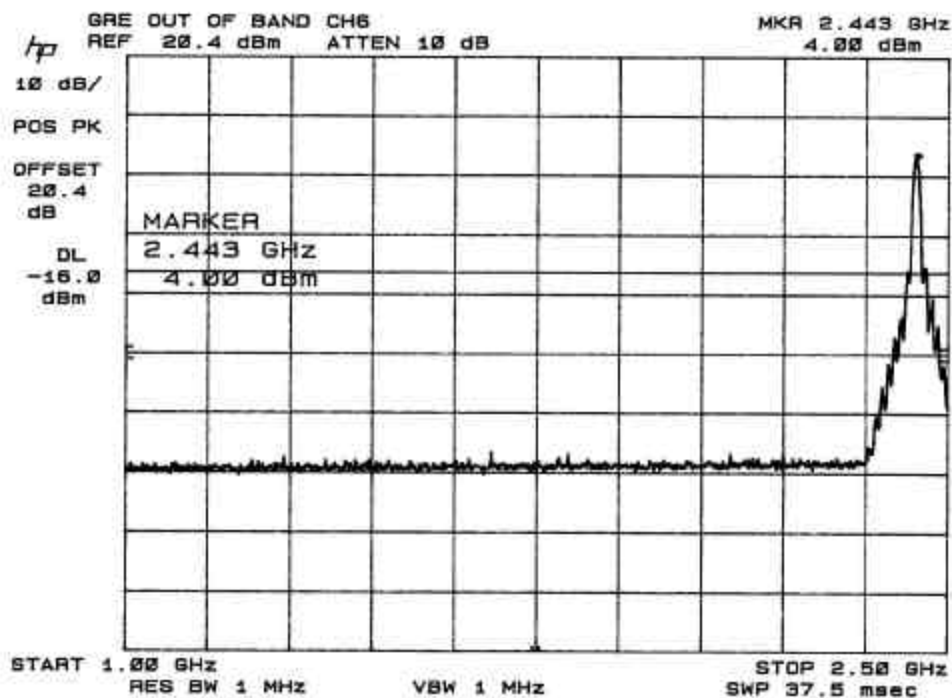
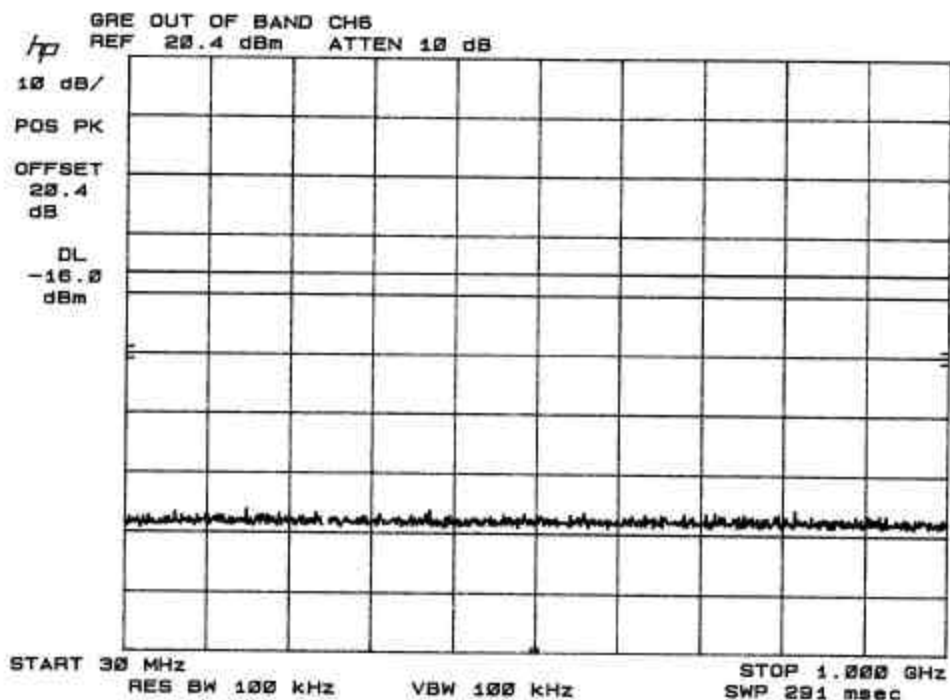


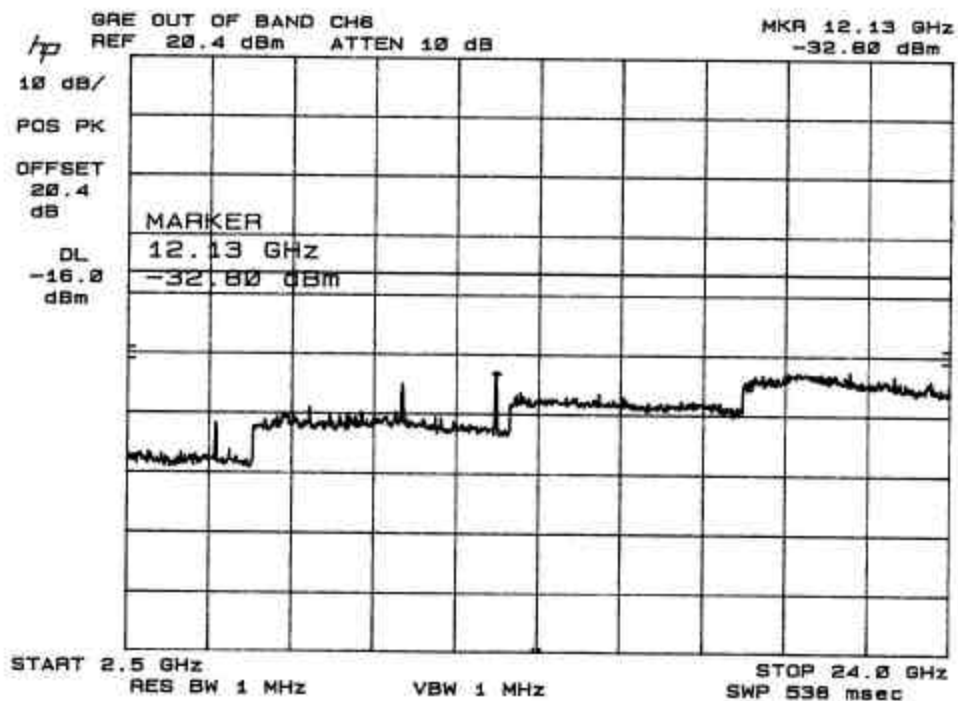
#### TEST PROCEDURE

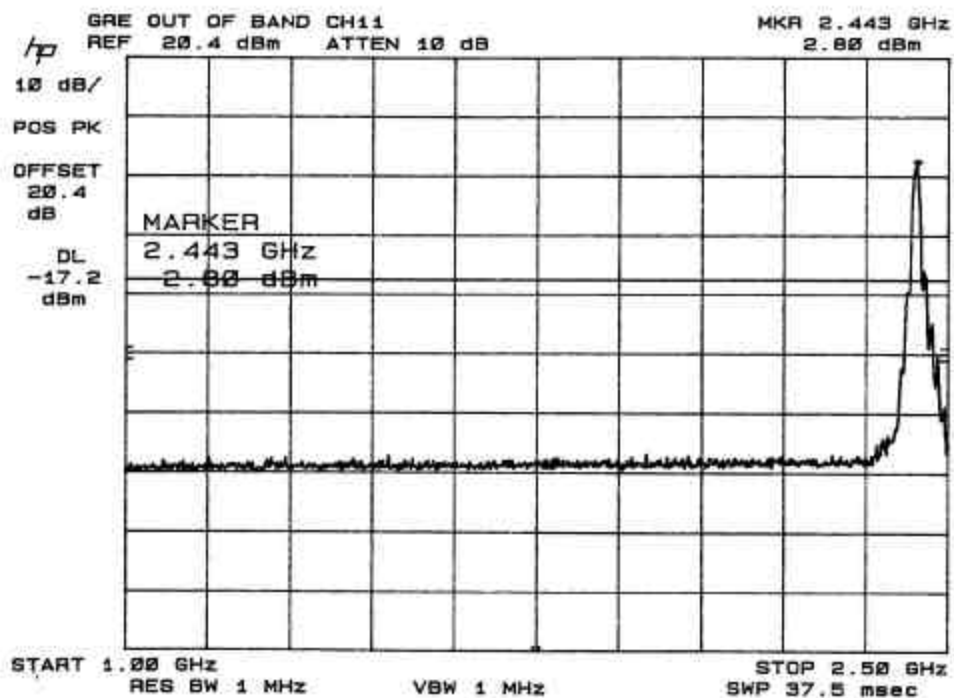
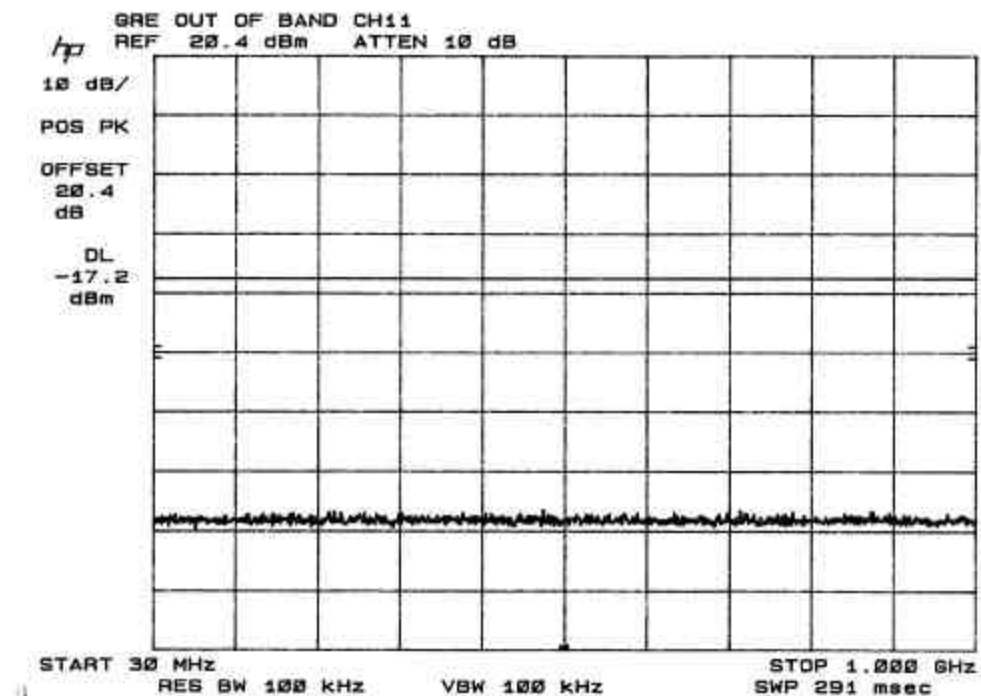
Connect the Eut's antenna port to the Spectrum Analyzer's input put.  
Investigate the entire frequency of the carrier frequency band.

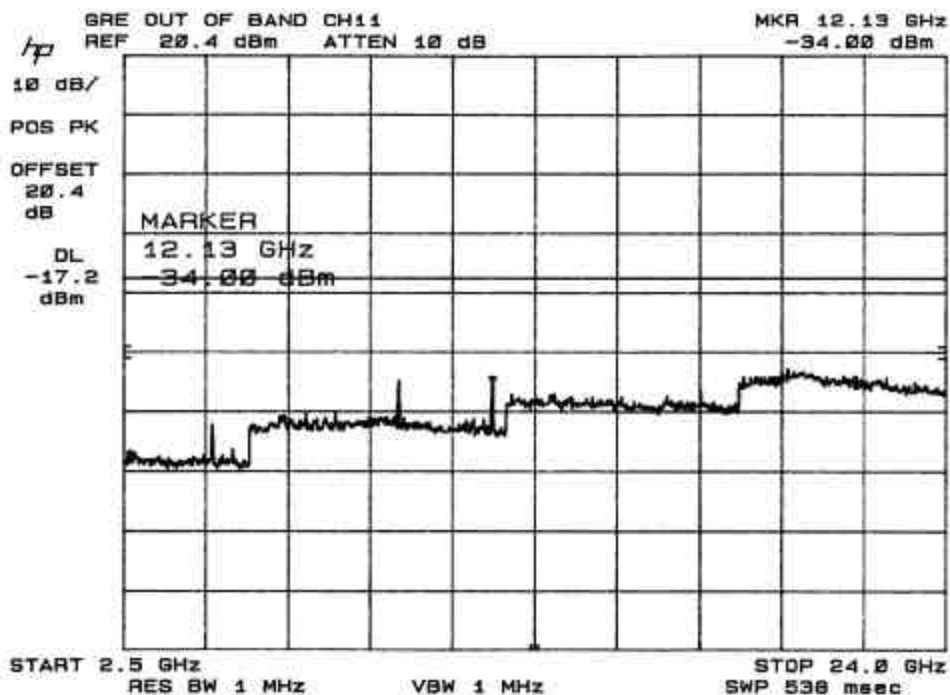










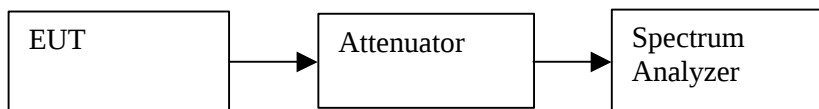


#### 9.4. PEAK POWER SPECTRAL DENSITY

Detector Function Setting of Test Receiver

| Frequency Range (MHz) | Detector Function                                                            | Resolution Bandwidth                                                        | Video Bandwidth                                                             |
|-----------------------|------------------------------------------------------------------------------|-----------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| Above 1000            | <input checked="" type="checkbox"/> Peak<br><input type="checkbox"/> Average | <input checked="" type="checkbox"/> 3 kHz<br><input type="checkbox"/> 1 MHz | <input checked="" type="checkbox"/> 3 kHz<br><input type="checkbox"/> 10 Hz |

#### TEST SETUP



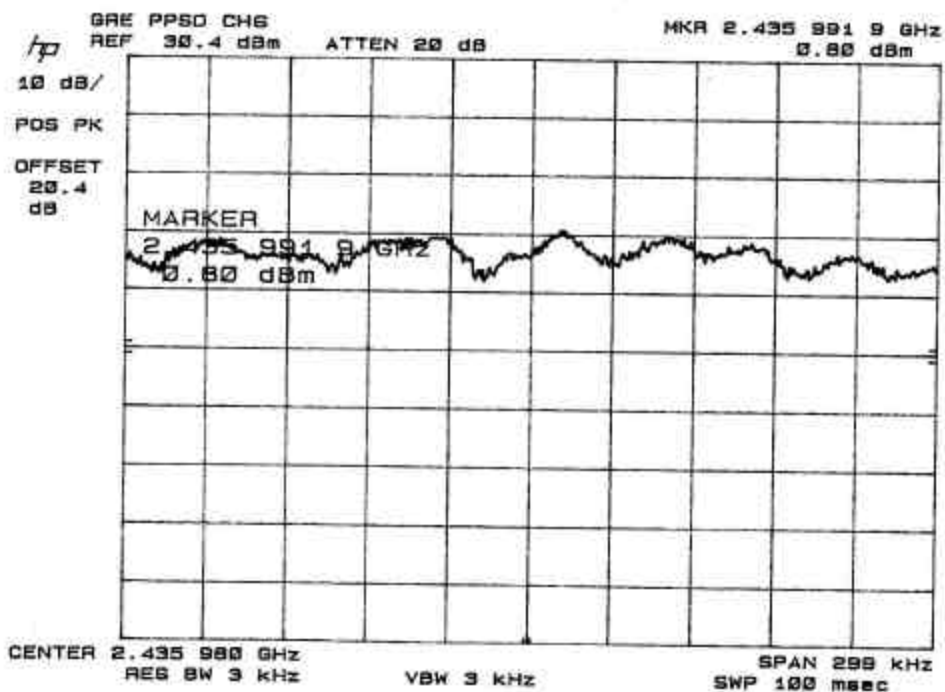
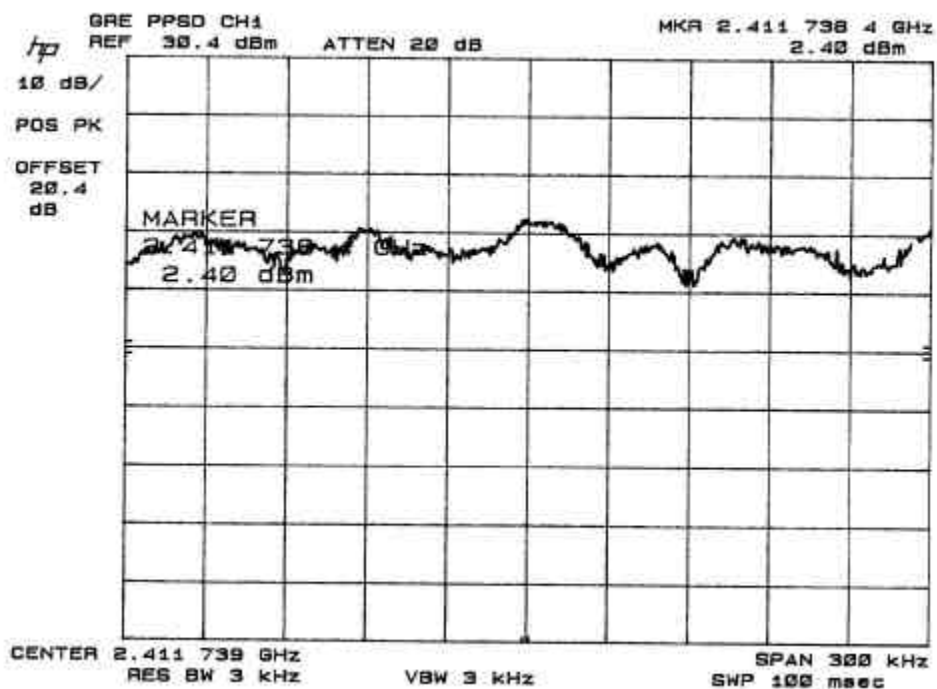
#### TEST PROCEDURE

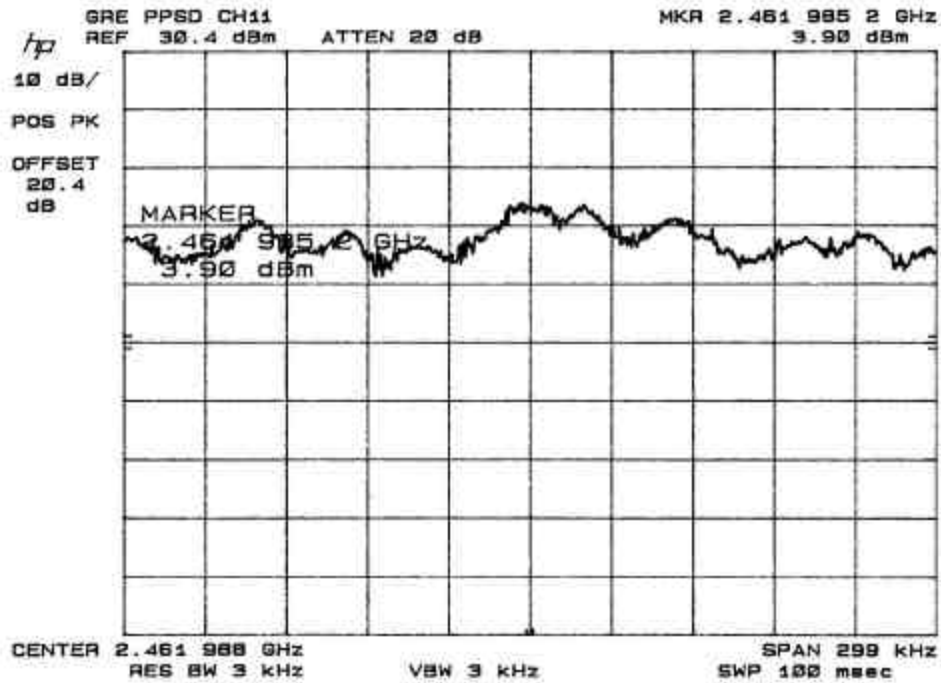
The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3 kHz RBW and 30 kHz VBW, set sweep time=span/3kHz. The power spectral density was measured and recorded.

The sweep time is allowed to be longer than span/3KHz for a full response of the mixer in the spectrum analyzer.

#### Result:

*No non-compliance noted. See plots:*





## 9.5. PROCESSING GAIN

CUSTOMER PROVIDED PROCESSING GAIN.

| Channel | Processing gain (dBm) | Limit (dBm) | Margin (dBm) |
|---------|-----------------------|-------------|--------------|
| 1       | 11.4                  | >10         | 1.4          |
| 6       | 11.4                  | >10         | 1.4          |
| 11      | 11.4                  | >10         | 1.4          |

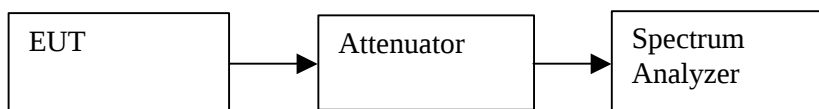
Refer to attachment “jamming margin.PDF” for detail measurement procedures and results.

## 9.6. BAND EDGE MEASUREMENT

Detector Function Setting of Test Receiver

| Frequency Range (MHz) | Detector Function                                                            | Resolution Bandwidth                                                          | Video Bandwidth                                                               |
|-----------------------|------------------------------------------------------------------------------|-------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| Above 1000            | <input checked="" type="checkbox"/> Peak<br><input type="checkbox"/> Average | <input checked="" type="checkbox"/> 100 kHz<br><input type="checkbox"/> 1 MHz | <input checked="" type="checkbox"/> 100 kHz<br><input type="checkbox"/> 10 Hz |

### TEST SETUP



### TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator; the lower and upper band edge of the EUT is investigated.

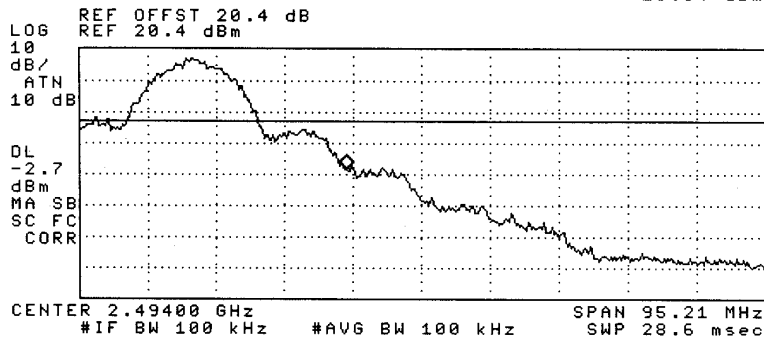
The resolutions and video bandwidth were set to 100kHz.

### RESULT

*No non-compliance noted. See plots:*

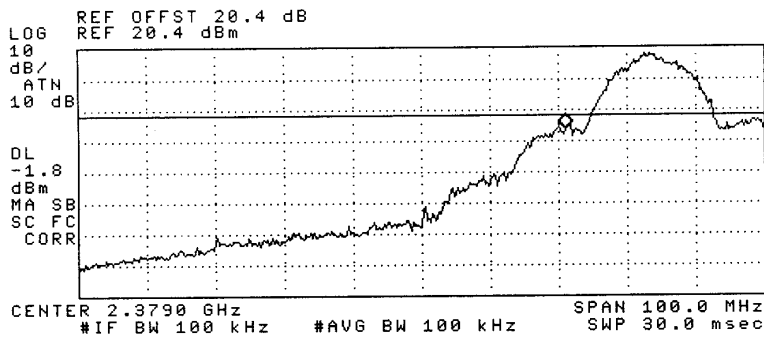
08:54:43 OCT 09, 2001  
GRE BANDEDGE HI CH:11

ACTV DET: PEAK  
MEAS DET: PEAK QP AVG  
MKR 2.48353 GHz  
-18.04 dBm



08:49:10 OCT 09, 2001  
GRE BANDEDGE LOW CH:1

ACTV DET: PEAK  
MEAS DET: PEAK QP AVG  
MKR 2.4000 GHz  
-5.96 dBm



## 9.7. RADIATED EMISSION

Detector Function Setting of Test Receiver

| Frequency Range (MHz) | Detector Function                        | Resolution Bandwidth                        | Video Bandwidth                             |
|-----------------------|------------------------------------------|---------------------------------------------|---------------------------------------------|
| 30 to 1000            | <input checked="" type="checkbox"/> Peak | <input checked="" type="checkbox"/> 100 KHz | <input checked="" type="checkbox"/> 100 KHz |
|                       | <input type="checkbox"/> Quasi Peak      | <input type="checkbox"/> 120 KHz            | <input type="checkbox"/> 120 KHz            |
| Above 1000            | <input checked="" type="checkbox"/> Peak | <input checked="" type="checkbox"/> 1 MHz   | <input checked="" type="checkbox"/> 1 MHz   |
|                       | <input type="checkbox"/> Average         | <input type="checkbox"/> 1 MHz              | <input type="checkbox"/> 10 Hz              |

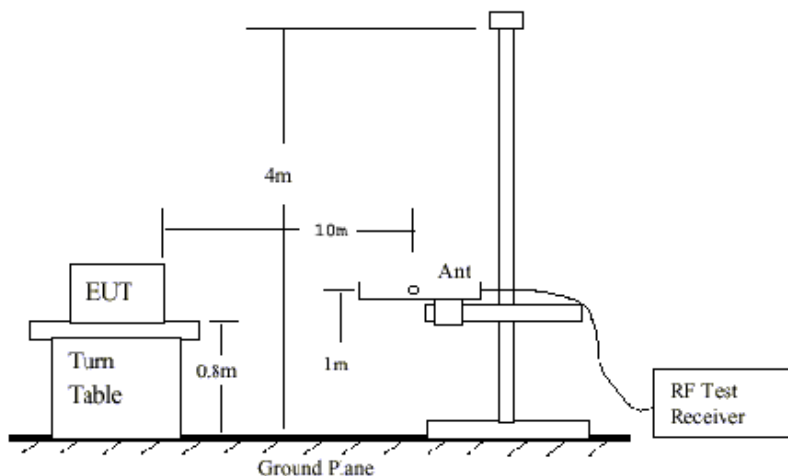


Fig 1: Radiated Emission Measurement 30 to 1000 MHz

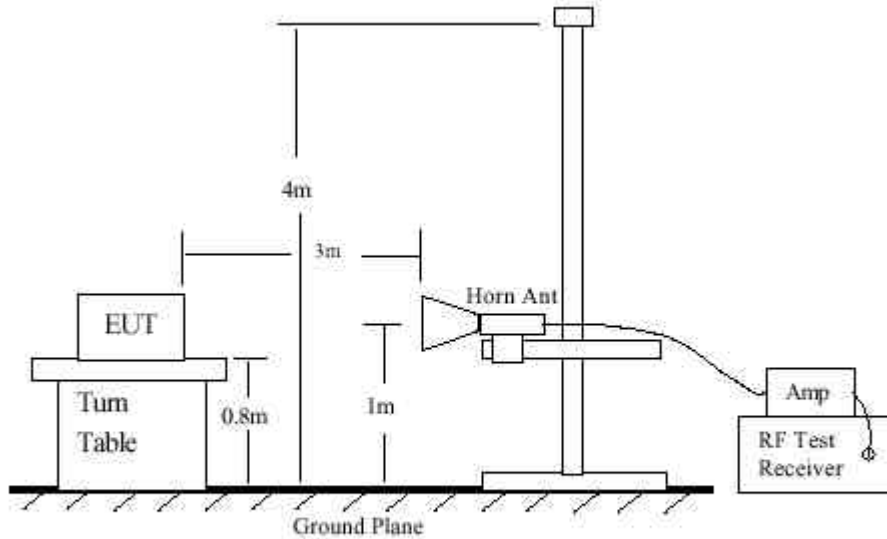


Fig 2: Radiated Emission Above 1000 MHz

#### **TEST SETUP & PROCEDURE**

1. The EUT was placed on the turn table 0.8 meter above ground in 3 meter open area test site.
2. Set the resolution bandwidth to 120KHz in the test receiver and select Peak function to scan the frequency below 1 GHz.
3. Shift the interference-receiving antenna located in antenna tower upwards and downwards between 1 and 4 meters above ground and find out the local peak emission on frequency domain.
4. Locate the interference-receiving antenna at the position where the local peak reach the maximum emission.
5. Rotate the turn table and stop at the angle where the measurement device has maximum reading
6. Shift the interference-receiving antenna again to detect the maximum emission of the local peak
7. If the reading of the local peak under Peak function is lower than limit by 6dB, then Quasi Peak detection is not needed and this reading should be recorded. And if it is higher than Peak limit, then the test is fail. Others, switch the receiver to Quasi Peak function, set the resolution bandwidth to 100kHz and repeat the procedures C ~ F. If the reading is lower than limit, this reading should be recorded, otherwise, the test is fail.
8. Set the resolution and video bandwidth of the spectrum analyzer to 1MHz and repeat procedures C ~ F for frequency band from 1 GHz to 10 times carrier frequency.

9. If the reading for the local peak is lower than the Average limit, no further testing is needed in this local peak and this reading should be recorded. If it is higher than Average limit but lower than Peak limit, then set the resolution bandwidth to 1MHz and video bandwidth to 300Hz. Repeat procedures C ~ F. If the maximum reading is lower than Average limit, then this reading should be recorded. If it is higher, then the test is fail.

# **RESULT**

No non-compliance noted, as shown below.

|                                                                                                                                                                                                                                                                |  |  |  |  |  |                                                                                                                                                         |  |  |  |  |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|---------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|
|  <p>FCC, VCCI, CISPR, CE, AUSTEL, NZ<br/>UL, CSA, TUV, BSMI, DHHS, NVLAP</p> <p>561F MONTEREY ROAD, SAN JOSE, CA 95037-9001<br/>PHONE: (408) 463-0885 FAX: (408) 463-0888</p> |  |  |  |  |  | <p><b>Project #:</b> 01U0988-1</p> <p><b>Report #:</b> 011002b</p> <p><b>Date&amp; Time:</b> 10/02/01 11:56 AM</p> <p><b>Test Engr:</b> Hue Ly Vang</p> |  |  |  |  |  |
| <p><b>Company:</b> GRE America, INC.</p> <p><b>EUT Description:</b> 11MPs RF Module</p> <p><b>Test Configuration :</b> EUT/Laptop/ Powersupply</p> <p><b>Type of Test:</b> FCC Class B</p> <p><b>Mode of Operation:</b> Continous packet RX mode</p>           |  |  |  |  |  | <p>&lt;&lt; Main Sheet</p>                                                                                                                              |  |  |  |  |  |

| Freq.<br>(MHz) | Reading<br>(dBuV) | AF<br>(dB) | Closs<br>(dB) | Pre-amp<br>(dB) | Level<br>(dBuV/m) | Limit<br>FCC B | Margin<br>(dB) | Pol<br>(H/V) | Az<br>(Deg) | Height<br>(Meter) | Mark<br>(P/Q/A) |
|----------------|-------------------|------------|---------------|-----------------|-------------------|----------------|----------------|--------------|-------------|-------------------|-----------------|
| 748.00         | 47.30             | 20.30      | 6.78          | 29.40           | 44.97             | 46.00          | -1.03          | 3mH          | 90.00       | 1.00              | QP              |
| 748.00         | 47.00             | 19.71      | 6.78          | 29.40           | 44.09             | 46.00          | -1.91          | 3mV          | 180.00      | 1.00              | QP              |
| 280.00         | 47.00             | 13.26      | 3.62          | 28.86           | 35.02             | 46.00          | -10.98         | 3mH          | 90.00       | 1.00              | P               |
| 114.00         | 46.40             | 11.55      | 2.32          | 29.52           | 30.75             | 43.50          | -12.75         | 3mV          | 180.00      | 1.00              | P               |
| 44.00          | 39.10             | 7.68       | 1.66          | 29.68           | 18.76             | 40.00          | -21.24         | 3mV          | 180.00      | 1.00              | P               |
| 44.00          | 35.90             | 10.66      | 1.66          | 29.68           | 18.54             | 40.00          | -21.46         | 3mH          | 180.00      | 1.00              | P               |
| 6 Worst Data   |                   |            |               |                 |                   |                |                |              |             |                   |                 |

| COMPLIANCE ENGINEERING SERVICES, INC.                                |         |      |      |       |      |      |      |          |                    |           |     |                   |       |         |
|----------------------------------------------------------------------|---------|------|------|-------|------|------|------|----------|--------------------|-----------|-----|-------------------|-------|---------|
| Harmonic Emissions                                                   |         |      |      |       |      |      |      |          |                    |           |     |                   |       |         |
| GRE American Inc.                                                    |         |      |      |       |      |      |      |          | 9/27/01            |           |     |                   |       |         |
| Channel 1 : 2412MHz                                                  |         |      |      |       |      |      |      |          | Hue Vang           |           |     |                   |       |         |
|                                                                      |         |      |      |       |      |      |      |          | A site (1.0 Meter) |           |     |                   |       |         |
|                                                                      |         |      |      |       |      |      |      |          |                    |           |     |                   |       |         |
| F(MHz)                                                               | READING |      | AF   | CL    | AMP  | DIST | HPF  | TOTAL    |                    | LIMIT     |     | MARGIN            |       | POL     |
|                                                                      | (dBuV)  |      | (dB) | (dB)  | (dB) | (dB) | (dB) | (dBuV/m) |                    | (dBuV/m)  |     | (dB)              |       | (H/V)   |
|                                                                      | Pk      | Avg  |      |       |      |      |      | Pk       | Avg                | Pk        | Avg | Pk                | Avg   |         |
|                                                                      |         |      |      |       |      |      |      |          |                    |           |     |                   |       |         |
| 2388*                                                                | 42      | 30   | 29   | 3     | 0    | 9.5  | 0    | 64.5     | 52.5               | 74        | 54  | -9.5              | -1.5  | H       |
| 4824                                                                 | 73.3    | 62.9 | 33   | 4.93  | 41   | 9.5  | 1    | 61.73    | 51.33              | 74        | 54  | -12.3             | -2.67 | H       |
| 7235.9                                                               | 69.9    | 58.5 | 37.2 | 6.29  | 41   | 9.5  | 1    | 63.89    | 52.49              | 74        | 54  | -10.1             | -1.51 | H       |
| 9642.8                                                               | 58.9    | 54   | 38.1 | 7.48  | 39.4 | 9.5  | 1    | 56.58    | 51.68              | 74        | 54  | -17.4             | -2.32 | H       |
| 12061.5                                                              | 56.7    | 45.9 | 39   | 8.67  | 40   | 9.5  | 1    | 55.87    | 45.07              | 74        | 54  | -18.1             | -8.93 | H       |
| 14472                                                                | 48.6    | 38.2 | 41.3 | 9.69  | 42.5 | 9.5  | 1    | 48.59    | 38.19              | 74        | 54  | -25.4             | -15.8 | H       |
| 16884                                                                | 49.5    | 38.9 | 43.2 | 11.05 | 44   | 9.5  | 1    | 51.25    | 40.65              | 74        | 54  | -22.8             | -13.4 | H       |
| 19296                                                                | 44.5    | 38.8 | 45   | 11.9  | 44   | 9.5  | 1    | 48.9     | 43.2               | 74        | 54  | -25.1             | -10.8 | H       |
| 21708                                                                | 46.2    | 39.2 | 47   | 13.09 | 42.5 | 9.5  | 1    | 55.29    | 48.29              | 74        | 54  | -18.7             | -5.71 | H       |
| 24120                                                                | 44.3    | 39.1 | 45   | 13.43 | 42   | 9.5  | 1    | 52.23    | 47.03              | 74        | 54  | -21.8             | -6.97 | H       |
| 2388*                                                                | 41      | 29   | 29   | 3     | 0    | 9.5  | 0    | 63.5     | 51.5               | 74        | 54  | -10.5             | -2.5  | V       |
| 4824                                                                 | 73.6    | 63.8 | 33   | 4.93  | 41   | 9.5  | 1    | 62.03    | 52.23              | 74        | 54  | -12               | -1.77 | V       |
| 7235.9                                                               | 70.9    | 59.5 | 37.2 | 6.29  | 41   | 9.5  | 1    | 64.89    | 53.49              | 74        | 54  | -9.11             | -0.51 | V       |
| 9642.8                                                               | 63.5    | 56.8 | 38.1 | 7.48  | 39.4 | 9.5  | 1    | 61.18    | 54.48              | 74        | 54  | -12.8             | 0.48  | V       |
| 12061.5                                                              | 54.5    | 42.4 | 39   | 8.67  | 40   | 9.5  | 1    | 53.67    | 41.57              | 74        | 54  | -20.3             | -12.4 | V       |
| 14472                                                                | 49.9    | 38.5 | 41.3 | 9.69  | 42.5 | 9.5  | 1    | 49.89    | 38.49              | 74        | 54  | -24.1             | -15.5 | V       |
| 16884                                                                | 49.7    | 38.4 | 43.2 | 11.05 | 44   | 9.5  | 1    | 51.45    | 40.15              | 74        | 54  | -22.6             | -13.9 | V       |
| 19296                                                                | 44.5    | 38.9 | 45   | 11.9  | 44   | 9.5  | 1    | 48.9     | 43.3               | 74        | 54  | -25.1             | -10.7 | V       |
| 21708                                                                | 43.6    | 38.1 | 47   | 13.09 | 42.5 | 9.5  | 1    | 52.69    | 47.19              | 74        | 54  | -21.3             | -6.81 | V       |
| 24120                                                                | 46.1    | 39.2 | 45   | 13.43 | 42   | 9.5  | 1    | 54.03    | 47.13              | 74        | 54  | -20               | -6.87 | V       |
|                                                                      |         |      |      |       |      |      |      |          |                    |           |     |                   |       |         |
| NOTE: ALL READINGS MEASURED AT 1 METER.                              |         |      |      |       |      |      |      |          |                    |           |     |                   |       |         |
| DIST: Correction to extrapolate reading to 3m specification distance |         |      |      |       |      |      |      |          |                    |           |     |                   |       |         |
|                                                                      |         |      |      |       |      |      |      |          |                    |           |     | ANALYZER SETTINGS |       |         |
| AF: Antenna Factor                                                   |         |      |      |       |      |      |      |          |                    | PEAK(Pk): |     | Res bw            |       | Avg. bw |
| AMP: Pre-amp gain                                                    |         |      |      |       |      |      |      |          |                    |           |     | 1MHz              |       | 1MHz    |
| CL: Cable loss                                                       |         |      |      |       |      |      |      |          |                    | AVG(Pk):  |     | Res bw            |       | Avg. bw |
| HPF: High pass filter insertion loss                                 |         |      |      |       |      |      |      |          |                    |           |     | 1MHz              |       | 10Hz    |
| * : Restrict band                                                    |         |      |      |       |      |      |      |          |                    |           |     |                   |       |         |

| COMPLIANCE ENGINEERING SERVICES, INC.                                |         |      |      |       |      |      |      |          |       |                    |     |        |       |                   |  |        |  |         |  |  |  |
|----------------------------------------------------------------------|---------|------|------|-------|------|------|------|----------|-------|--------------------|-----|--------|-------|-------------------|--|--------|--|---------|--|--|--|
| Harmonic Emissions                                                   |         |      |      |       |      |      |      |          |       |                    |     |        |       |                   |  |        |  |         |  |  |  |
| GRE American Inc.                                                    |         |      |      |       |      |      |      |          |       | 6/27/01            |     |        |       |                   |  |        |  |         |  |  |  |
| Channel 6 : 2437 MHz                                                 |         |      |      |       |      |      |      |          |       | Hue Vang           |     |        |       |                   |  |        |  |         |  |  |  |
|                                                                      |         |      |      |       |      |      |      |          |       | A site (1.0 Meter) |     |        |       |                   |  |        |  |         |  |  |  |
|                                                                      |         |      |      |       |      |      |      |          |       |                    |     |        |       |                   |  |        |  |         |  |  |  |
| F(MHz)                                                               | READING |      | AF   | CL    | AMP  | DIST | HPF  | TOTAL    |       | LIMIT              |     | MARGIN |       | POL               |  |        |  |         |  |  |  |
|                                                                      | (dBuV)  |      | (dB) | (dB)  | (dB) | (dB) | (dB) | (dBuV/m) |       | (dBuV/m)           |     | (dB)   |       | (H/V)             |  |        |  |         |  |  |  |
|                                                                      | Pk      | Avg  |      |       |      |      |      | Pk       | Avg   | Pk                 | Avg | Pk     | Avg   |                   |  |        |  |         |  |  |  |
|                                                                      |         |      |      |       |      |      |      |          |       |                    |     |        |       |                   |  |        |  |         |  |  |  |
| 4873.5                                                               | 71.8    | 60.4 | 33   | 4.93  | 41   | 9.5  | 1    | 60.23    | 48.83 | 74                 | 54  | -13.8  | -5.17 | H                 |  |        |  |         |  |  |  |
| 7312.3                                                               | 69.7    | 56.9 | 37.2 | 6.29  | 41   | 9.5  | 1    | 63.69    | 50.89 | 74                 | 54  | -10.3  | -3.11 | H                 |  |        |  |         |  |  |  |
| 9749.3                                                               | 55.5    | 49.6 | 38.1 | 7.48  | 39.4 | 9.5  | 1    | 53.18    | 47.28 | 74                 | 54  | -20.8  | -6.72 | H                 |  |        |  |         |  |  |  |
| 12185                                                                | 56.9    | 46.6 | 39   | 8.67  | 40   | 9.5  | 1    | 56.07    | 45.77 | 74                 | 54  | -17.9  | -8.23 | H                 |  |        |  |         |  |  |  |
| 14622                                                                | 48.7    | 38.1 | 41.3 | 9.69  | 42.5 | 9.5  | 1    | 48.69    | 38.09 | 74                 | 54  | -25.3  | -15.9 | H                 |  |        |  |         |  |  |  |
| 17059                                                                | 50      | 38.4 | 43.2 | 11.05 | 44   | 9.5  | 1    | 51.75    | 40.15 | 74                 | 54  | -22.3  | -13.9 | H                 |  |        |  |         |  |  |  |
| 19496                                                                | 50      | 38.9 | 45   | 11.9  | 44   | 9.5  | 1    | 54.4     | 43.3  | 74                 | 54  | -19.6  | -10.7 | H                 |  |        |  |         |  |  |  |
| 21933                                                                | 46      | 39   | 47   | 13.09 | 42.5 | 9.5  | 1    | 55.09    | 48.09 | 74                 | 54  | -18.9  | -5.91 | H                 |  |        |  |         |  |  |  |
| 24370                                                                | 47      | 35.1 | 45   | 13.43 | 42   | 9.5  | 1    | 54.93    | 43.03 | 74                 | 54  | -19.1  | -11   | H                 |  |        |  |         |  |  |  |
| 4873.5                                                               | 75.7    | 57.4 | 33   | 4.93  | 41   | 9.5  | 1    | 64.13    | 45.83 | 74                 | 54  | -9.87  | -8.17 | V                 |  |        |  |         |  |  |  |
| 7312.3                                                               | 68.2    | 54.3 | 37.2 | 6.29  | 41   | 9.5  | 1    | 62.19    | 48.29 | 74                 | 54  | -11.8  | -5.71 | V                 |  |        |  |         |  |  |  |
| 9749.3                                                               | 59.8    | 48.8 | 38.1 | 7.48  | 39.4 | 9.5  | 1    | 57.48    | 46.48 | 74                 | 54  | -16.5  | -7.52 | V                 |  |        |  |         |  |  |  |
| 12185                                                                | 58.4    | 38   | 39   | 8.67  | 40   | 9.5  | 1    | 57.57    | 37.17 | 74                 | 54  | -16.4  | -16.8 | V                 |  |        |  |         |  |  |  |
| 14622                                                                | 48.4    | 38   | 41.3 | 9.69  | 42.5 | 9.5  | 1    | 48.39    | 37.99 | 74                 | 54  | -25.6  | -16   | V                 |  |        |  |         |  |  |  |
| 17059                                                                | 48.5    | 39   | 43.2 | 11.05 | 44   | 9.5  | 1    | 50.25    | 40.75 | 74                 | 54  | -23.8  | -13.3 | V                 |  |        |  |         |  |  |  |
| 19496                                                                | 49      | 39.5 | 45   | 11.9  | 44   | 9.5  | 1    | 53.4     | 43.9  | 74                 | 54  | -20.6  | -10.1 | V                 |  |        |  |         |  |  |  |
| 21933                                                                | 48.6    | 38.1 | 47   | 13.09 | 42.5 | 9.5  | 1    | 57.69    | 47.19 | 74                 | 54  | -16.3  | -6.81 | V                 |  |        |  |         |  |  |  |
| 24370                                                                | 49.5    | 38.5 | 45   | 13.43 | 42   | 9.5  | 1    | 57.43    | 46.43 | 74                 | 54  | -16.6  | -7.57 | V                 |  |        |  |         |  |  |  |
|                                                                      |         |      |      |       |      |      |      |          |       |                    |     |        |       |                   |  |        |  |         |  |  |  |
| NOTE: ALL READINGS MEASURED AT 1 METER.                              |         |      |      |       |      |      |      |          |       |                    |     |        |       |                   |  |        |  |         |  |  |  |
| DIST: Correction to extrapolate reading to 3m specification distance |         |      |      |       |      |      |      |          |       |                    |     |        |       |                   |  |        |  |         |  |  |  |
|                                                                      |         |      |      |       |      |      |      |          |       |                    |     |        |       |                   |  |        |  |         |  |  |  |
| AF: Antenna Factor                                                   |         |      |      |       |      |      |      |          |       |                    |     |        |       | ANALYZER SETTINGS |  |        |  |         |  |  |  |
| AMP: Pre-amp gain                                                    |         |      |      |       |      |      |      |          |       |                    |     |        |       | PEAK(Pk):         |  | Res bw |  | Avg. bw |  |  |  |
| CL: Cable loss                                                       |         |      |      |       |      |      |      |          |       |                    |     |        |       |                   |  | 1MHz   |  | 1MHz    |  |  |  |
| HPF: High pass filter insertion loss                                 |         |      |      |       |      |      |      |          |       |                    |     |        |       | AVG(Pk):          |  | Res bw |  | Avg. bw |  |  |  |
|                                                                      |         |      |      |       |      |      |      |          |       |                    |     |        |       |                   |  | 1MHz   |  | 10Hz    |  |  |  |

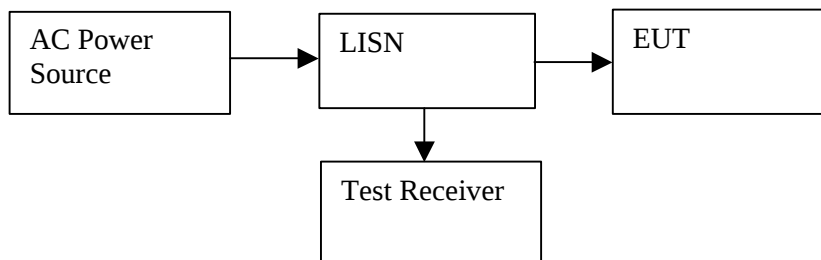
| COMPLIANCE ENGINEERING SERVICES, INC.                                |         |      |      |       |      |      |      |          |                    |                   |        |        |         |       |
|----------------------------------------------------------------------|---------|------|------|-------|------|------|------|----------|--------------------|-------------------|--------|--------|---------|-------|
| Harmonic Emissions                                                   |         |      |      |       |      |      |      |          |                    |                   |        |        |         |       |
| GRE American Inc.                                                    |         |      |      |       |      |      |      |          | 6/27/01            |                   |        |        |         |       |
| Channel 11 : 2462 MHz                                                |         |      |      |       |      |      |      |          | Hue Vang           |                   |        |        |         |       |
|                                                                      |         |      |      |       |      |      |      |          | A site (1.0 Meter) |                   |        |        |         |       |
| F(MHz)                                                               | READING |      | AF   | CL    | AMP  | DIST | HPF  | TOTAL    |                    | LIMIT             |        | MARGIN |         | POL   |
|                                                                      | (dBuV)  |      | (dB) | (dB)  | (dB) | (dB) | (dB) | (dBuV/m) |                    | (dBuV/m)          |        | (dB)   |         | (H/V) |
|                                                                      | Pk      | Avg  |      |       |      |      |      | Pk       | Avg                | Pk                | Avg    | Pk     | Avg     |       |
| 2491*                                                                | 42.9    | 29.6 | 29   | 3     | 0    | 9.5  | 0    | 65.4     | 52.1               | 74                | 54     | -8.6   | -1.9    | H     |
| 4924                                                                 | 70      | 62.8 | 33   | 4.93  | 41   | 9.5  | 1    | 58.43    | 51.23              | 74                | 54     | -15.6  | -2.77   | H     |
| 7388                                                                 | 68.1    | 56.9 | 37.2 | 6.29  | 41   | 9.5  | 1    | 62.09    | 50.89              | 74                | 54     | -11.9  | -3.11   | H     |
| 9848                                                                 | 58      | 51.6 | 38.1 | 7.48  | 39.4 | 9.5  | 1    | 55.68    | 49.28              | 74                | 54     | -18.3  | -4.72   | H     |
| 12310                                                                | 58.6    | 47.4 | 39   | 8.67  | 40   | 9.5  | 1    | 57.77    | 46.57              | 74                | 54     | -16.2  | -7.43   | H     |
| 14772                                                                | 50      | 38.1 | 41.3 | 9.69  | 42.5 | 9.5  | 1    | 49.99    | 38.09              | 74                | 54     | -24    | -15.9   | H     |
| 17234                                                                | 49.4    | 38.4 | 43.2 | 11.05 | 44   | 9.5  | 1    | 51.15    | 40.15              | 74                | 54     | -22.9  | -13.9   | H     |
| 19696                                                                | 45      | 38.6 | 45   | 11.9  | 44   | 9.5  | 1    | 49.4     | 43                 | 74                | 54     | -24.6  | -11     | H     |
| 22158                                                                | 45.6    | 38.9 | 47   | 13.09 | 42.5 | 9.5  | 1    | 54.69    | 47.99              | 74                | 54     | -19.3  | -6.01   | H     |
| 24620                                                                | 46.5    | 39.2 | 45   | 13.43 | 42   | 9.5  | 1    | 54.43    | 47.13              | 74                | 54     | -19.6  | -6.87   | H     |
| 2491*                                                                | 73      | 62.6 | 33   | 4.93  | 41   | 9.5  | 1    | 61.43    | 51.03              | 74                | 54     | -12.6  | -2.97   | V     |
| 4924                                                                 | 41      | 29   | 29   | 3     | 0    | 9.5  | 0    | 63.5     | 51.5               | 74                | 54     | -10.5  | -2.5    | V     |
| 7388                                                                 | 68.3    | 58   | 37.2 | 6.29  | 41   | 9.5  | 1    | 62.29    | 51.99              | 74                | 54     | -11.7  | -2.01   | V     |
| 9848                                                                 | 58.3    | 53.7 | 38.1 | 7.48  | 39.4 | 9.5  | 1    | 55.98    | 51.38              | 74                | 54     | -18    | -2.62   | V     |
| 12310                                                                | 55.1    | 41.9 | 39   | 8.67  | 40   | 9.5  | 1    | 54.27    | 41.07              | 74                | 54     | -19.7  | -12.9   | V     |
| 14772                                                                | 48.1    | 38   | 41.3 | 9.69  | 42.5 | 9.5  | 1    | 48.09    | 37.99              | 74                | 54     | -25.9  | -16     | V     |
| 17234                                                                | 48.3    | 38.3 | 43.2 | 11.05 | 44   | 9.5  | 1    | 50.05    | 40.05              | 74                | 54     | -24    | -14     | V     |
| 19696                                                                | 45.3    | 38.5 | 45   | 11.9  | 44   | 9.5  | 1    | 49.7     | 42.9               | 74                | 54     | -24.3  | -11.1   | V     |
| 22158                                                                | 45.8    | 38.9 | 47   | 13.09 | 42.5 | 9.5  | 1    | 54.89    | 47.99              | 74                | 54     | -19.1  | -6.01   | V     |
| 24620                                                                | 46.1    | 39.2 | 45   | 13.43 | 42   | 9.5  | 1    | 54.03    | 47.13              | 74                | 54     | -20    | -6.87   | V     |
|                                                                      |         |      |      |       |      |      |      |          |                    |                   |        |        |         |       |
|                                                                      |         |      |      |       |      |      |      |          |                    |                   |        |        |         |       |
| NOTE: ALL READINGS MEASURED AT 1 METER.                              |         |      |      |       |      |      |      |          |                    |                   |        |        |         |       |
| DIST: Correction to extrapolate reading to 3m specification distance |         |      |      |       |      |      |      |          |                    |                   |        |        |         |       |
|                                                                      |         |      |      |       |      |      |      |          |                    | ANALYZER SETTINGS |        |        |         |       |
| AF: Antenna Factor                                                   |         |      |      |       |      |      |      |          | PEAK(Pk):          |                   | Res bw |        | Avg. bw |       |
| AMP: Pre-amp gain                                                    |         |      |      |       |      |      |      |          |                    | 1MHz              |        | 1MHz   |         |       |
| CL: Cable loss                                                       |         |      |      |       |      |      |      |          | AVG(Pk):           |                   | Res bw |        | Avg. bw |       |
| HPF: High pass filter insertion loss                                 |         |      |      |       |      |      |      |          |                    | 1MHz              |        | 10Hz   |         |       |
| * : Restricted band                                                  |         |      |      |       |      |      |      |          |                    |                   |        |        |         |       |

## 9.8. POWER LINE CONDUCTED EMISSION

Detector Function Setting of Test Receiver

| Frequency Range (MHz) | Detector Function                                                                     | Resolution Bandwidth                      | Video Bandwidth                           |
|-----------------------|---------------------------------------------------------------------------------------|-------------------------------------------|-------------------------------------------|
| 450 K to 30 MHz       | <input checked="" type="checkbox"/> Peak<br><input type="checkbox"/> CISPR Quasi Peak | <input checked="" type="checkbox"/> 9 KHz | <input checked="" type="checkbox"/> 9 KHz |

### TEST SETUP



### TEST PROCEDURE

1. The EUT was placed on a wooden table 40 cm from a vertical ground plane and approximately 80 cm above the horizontal ground plane on the floor. The EUT was set to transmit in a continuous mode.
2. Line conducted data was recorded for both NEUTRAL and HOT lines.

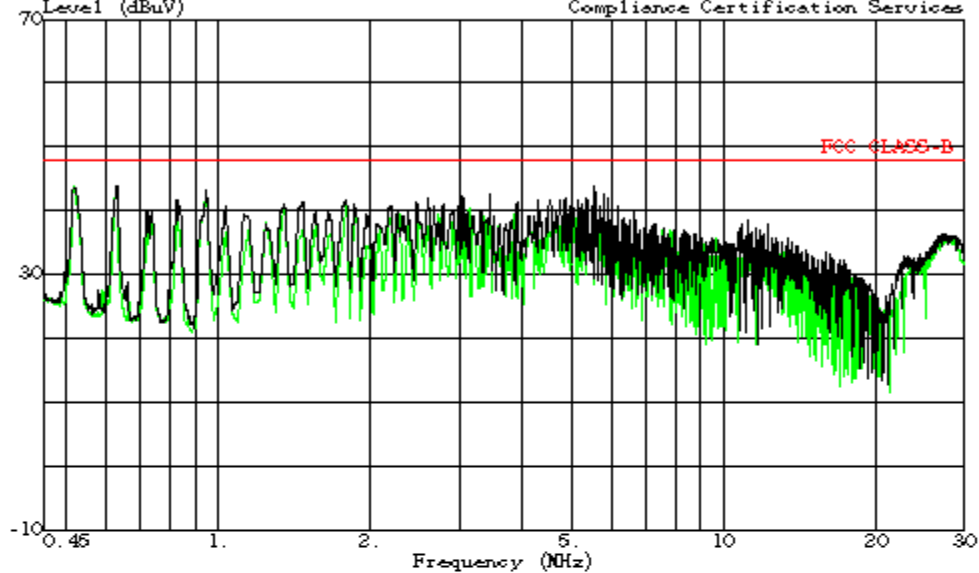
### RESULT

*No non-compliance noted. See plot Line Conduction.*



561 F Monterey Road, Route 2  
Morgan Hill, CA 95037-9001 USA  
Tel: (408) 463-0885  
Fax: (408) 463-0888

Data#: 7 File#: 01U0988.ENI Date: 10-02-2001 Time: 15:42:18  
Level (dBuV) Compliance Certification Services



Trace: 3  
Project No. : 01U0988-1  
Report No. : 0110021c  
Test Engr : Hue Ly Vang  
Company : GRE America, Inc.  
EUT Description : 11Mbps RF Module  
Model : GINA-2011  
EUT Config. : EUT/PC/powersupply  
Type of Test : FCC Class B  
Mode of Operation: Continuous Packet receive  
: Peak: L1 (Green), L2 (Black)  
: 115Vac, 60Hz

Ref Trace:

| CONDUCTED EMISSIONS DATA (115VAC 60Hz) |           |           |           |       |       |    |         |         |         |
|----------------------------------------|-----------|-----------|-----------|-------|-------|----|---------|---------|---------|
| Freq.                                  | Reading   |           |           | Closs | Limit |    | Margin  |         | Remark  |
| (MHz)                                  | PK (dBuV) | OP (dBuV) | AV (dBuV) | (dB)  | OP    | AV | OP (dB) | AV (dB) | L1 / L2 |
| 0.52                                   | 42.98     | --        | --        | 0.00  | 48.00 | -- | -5.02   | --      | L1      |
| 1.79                                   | 42.09     | --        | --        | 0.00  | 48.00 | -- | -5.91   | --      | L1      |
| 27.35                                  | 36.99     | --        | --        | 0.00  | 48.00 | -- | -11.01  | --      | L1      |
| 0.62                                   | 45.05     | --        | --        | 0.00  | 48.00 | -- | -2.95   | --      | L2      |
| 5.57                                   | 45.20     | --        | --        | 0.00  | 48.00 | -- | -2.80   | --      | L2      |
| 12.26                                  | 38.32     | --        | --        | 0.00  | 48.00 | -- | -9.68   | --      | L2      |
| 6 Worst Data                           |           |           |           |       |       |    |         |         |         |