

# REGULATORY TEST REPORT

**TITLE:** G5R 960MHz Data**AUTHOR:** Drew Rosenberg

| REV | CCO | DESCRIPTION OF CHANGE | DATE | APPROVALS   |  |
|-----|-----|-----------------------|------|-------------|--|
|     |     | INITIAL RELEASE       |      | Engineering |  |
|     |     |                       |      | Engineering |  |

## REVISION HISTORY

|  |  |  |  |             |  |
|--|--|--|--|-------------|--|
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**Summary***Test Data Summary*

**FCC Part 101 / RSS-119 Transceiver**  
**952-960 MHz**  
**FCC ID: EO9-G5R**

**Device Model:**  
*G5R*

**Model Numbers:**  
*G5R*

**Serial Numbers:**  
*495907*

| Rule            | Description                   | Max. Reading | Pass/Fail |
|-----------------|-------------------------------|--------------|-----------|
| FCC 101.113     | EIRP of Fundamental Emissions |              |           |
| FCC 101.111a(5) | Transmit Mask - FCC           |              |           |
| FCC 101.109     | Occupied Bandwidth            |              |           |

| Cognizant Personnel           |                                     |
|-------------------------------|-------------------------------------|
| <u>Drew Rosenberg</u><br>Name | <u>Regulatory Engineer</u><br>Title |
| <u>Mark Kvamme</u><br>Name    | <u>Senior Technician</u><br>Title   |

## Test 1: FCC Part 101.113

### *EIRP of Fundamental Emissions*

Measure the EIRP of the transmitter fundamental using the antenna substitution procedure (appendix A). The EIRP of the transmitter may not exceed:

| Frequency (MHz) | Fixed (dBW) | Mobile (dBW) |
|-----------------|-------------|--------------|
| 952-860         | 40          | 14           |

| Equipment Used                        | Serial Number | Cal Date       | Cal Due    |
|---------------------------------------|---------------|----------------|------------|
| Substitution Antenna (Roberts Dipole) | 4106          | 09/13/04       | 09/13/06   |
| Receive Antenna (Roberts Dipole)      | AN 19570      | Reference Only |            |
| Frequency Generator HP8673D           | 3123A01161    | 11/8/2004      | 11/8/2006  |
| Spectrum Analyzer Agilent E4408B      | US40240538    | 4/21/2005      | 4/21/2006  |
| Power Meter HP437B                    | 3125U11553    | 11/10/2004     | 11/10/2005 |
| Power Sensor HP8481D                  | 3318A08626    | 12/1/2004      | 11/30/2005 |

| Date    | Temp/Humidity °F / % | Tested by   |
|---------|----------------------|-------------|
| 6/24/05 | 74 / 74              | Mark Kvamme |

Fill in the white spaces in the table below for each frequency measured:

| Frequency (MHz) | Polarity | Analyzer Reading of Device Emissions (dBm) | Analyzer Reading of Generator Emissions (dBm) | Difference (add to ERP reading) | Substitution Antenna Gain (dBi) | Generator Output (dBm) | EIRP (dBm) |
|-----------------|----------|--------------------------------------------|-----------------------------------------------|---------------------------------|---------------------------------|------------------------|------------|
| 960             | V        | -15.805                                    | -37.34                                        | 21.535                          | 0.8                             | -0.044                 | 22.291     |

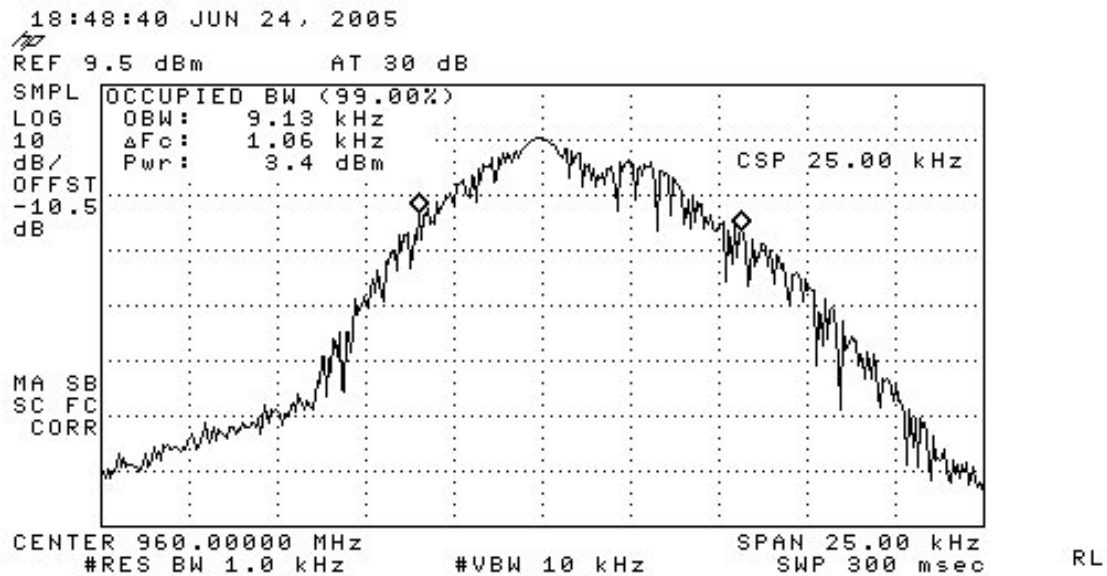
**Test 2: FCC 101.109***Occupied Bandwidth*

Measure the occupied bandwidth (99% bandwidth). The Occupied bandwidth may not exceed 12.5kHz (US) or 11.25kHz (Canada).

| Equipment Used | Serial Number | Cal Date  | Cal Due   |
|----------------|---------------|-----------|-----------|
| HP8593E        | 3543A02032    | 6/22/2005 | 9/15/2006 |

| Date    | Temp/Humidity<br>°F / % | Tested by   |
|---------|-------------------------|-------------|
| 6/24/05 | 74 / 74                 | Mark Kvamme |

Place a screen capture of the measurement below:



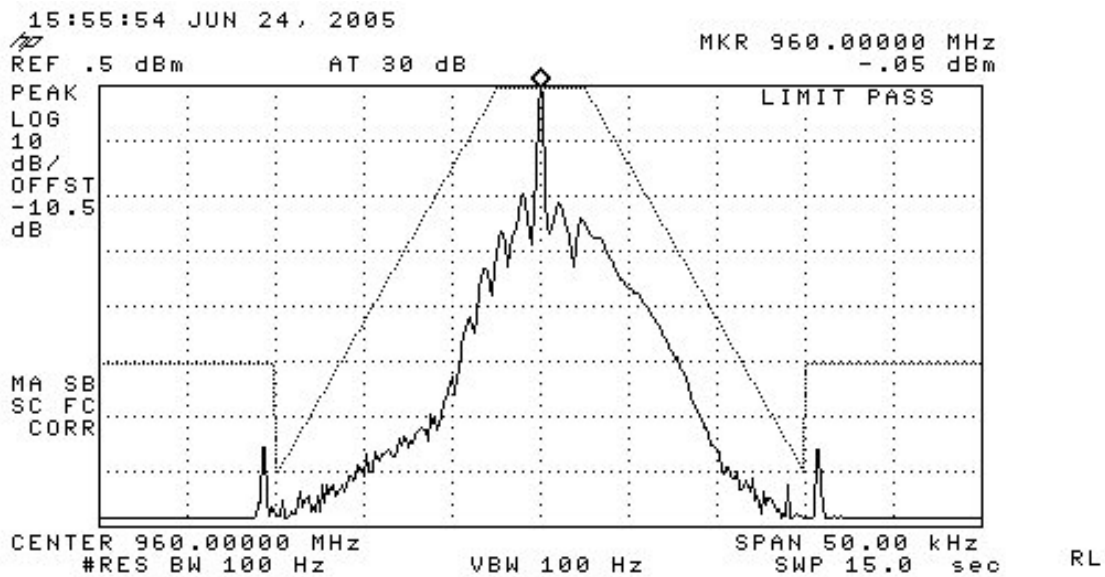
**Test 3: FCC Part 101.111a(5)***Transmitter Mask (US)*

Measure the transmitter mask, referenced to an unmodulated carrier, according to the following schedule:

| Minimum Displacement Frequency (kHz) | Maximum Displacement Frequency (kHz) | Attenuation below unmodulated carrier (dB) |
|--------------------------------------|--------------------------------------|--------------------------------------------|
| 2.5                                  | 6.25                                 | $53 \cdot \log(f_d/2.5)$                   |
| 6.25                                 | 9.5                                  | $103 \cdot \log(f_d/3.9)$                  |
| 9.5                                  | 15                                   | $157 \cdot \log(f_d/5.3)$                  |
| 15                                   | >15                                  | $50 + \log(P)$ or 70                       |

| Equipment Used | Serial Number | Cal Date | Cal Due  |
|----------------|---------------|----------|----------|
| HP8594         | 3710A04999    | 02/24/05 | 02/24/07 |

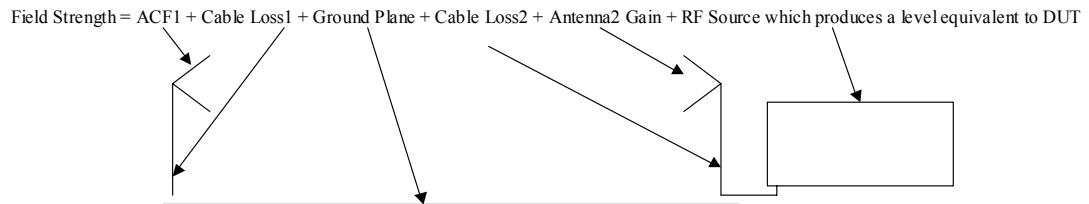
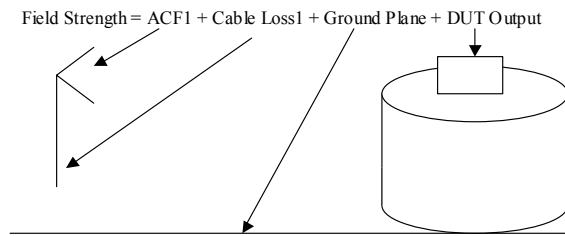
| Date    | Temp/Humidity °F / % | Tested by   |
|---------|----------------------|-------------|
| 6/24/05 | 74 / 74              | Mark Kvamme |



## Appendix A

### *Antenna Substitution Method of EIRP Measurement*

First, measure the field strength of the device in accordance with the procedure in Appendix B. Second, replace the device with an antenna and connect the antenna to the output of a signal generator. Set the signal generator to the same frequency as the device emission that is being measured. Adjust the height of receiving antenna to give the highest reading. Repeat with the substitution antenna in the vertical position. Bring the position back to the polarity and height that results in the highest field strength reading. Set the signal generator to a power that results in the same field strength reading as that of the device emission. The gain of the transmitting antenna, output power of the generator, and loss of the cable can then be used to determine the EIRP of the device.



## Appendix B

### Field Strength Measurement Procedure

This test measures the field strength of radiated emissions using a spectrum analyzer and a receiving antenna in accordance with ANSI C63.4-2003. During the test, the EUT is to be placed on a non-conducting support at 80 cm above the horizontal ground plane of the OATS. The horizontal distance between the antenna and the DUT is to be exactly 3 meters. Levels below 1 GHz are to be measured with the spectrum analyzer resolution bandwidth at 120 kHz and levels at or above 1 GHz are to be measured with the spectrum analyzer resolution bandwidth at 1 MHz.

- 1) Monitor the frequency range of interest at a fixed antenna height and EUT azimuth.
- 2) If appropriate, manipulate the system cables to produce the highest amplitude signal relative to the limit. Note the amplitude and frequency of the suspect signal.
- 3) Rotate the EUT 360° to maximize the suspected highest amplitude signal. If the signal or another at a different frequency is observed to exceed the previously noted highest amplitude signal by 1 dB or more, go back to the azimuth and repeat step b). Otherwise, orient the EUT azimuth to repeat the highest amplitude observation and proceed.
- 4) Move the antenna over its fully allowed range of travel to maximize the suspected highest amplitude signal. If the signal or another at a different frequency is observed to exceed the previously noted highest amplitude signal by 1 dB or more, return to step b) with the antenna fixed at this height. Otherwise, move the antenna to the height that repeats the highest amplitude observation and proceed.
- 5) Change the polarity of the antenna and repeat step b), step c), and step d). Compare the resulting suspected highest amplitude signal with that found for the other polarity. Select and note the higher of the two signals. This signal is termed the highest observed signal with respect to the limit for this EUT operational mode.

