



**FCC CFR47 PART 15 SUBPART C  
INDUSTRY CANADA RSS-210 ISSUE 8**

**CERTIFICATION TEST REPORT**

**FOR**

**EV REMOTE ANTENNA MODULE**

**MODEL NUMBER: CGF-M002**

**FCC ID: OUCCGF-M002**

**IC: 850G-CGFM002**

**REPORT NUMBER: 11J13652-1**

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## TABLE OF CONTENTS

<b>1. ATTESTATION OF TEST RESULTS</b> .....	<b>4</b>
<b>2. TEST METHODOLOGY</b> .....	<b>5</b>
<b>3. FACILITIES AND ACCREDITATION</b> .....	<b>5</b>
<b>4. CALIBRATION AND UNCERTAINTY</b> .....	<b>5</b>
4.1. <i>MEASURING INSTRUMENT CALIBRATION</i> .....	5
4.2. <i>SAMPLE CALCULATION</i> .....	5
4.3. <i>MEASUREMENT UNCERTAINTY</i> .....	5
<b>5. EQUIPMENT UNDER TEST</b> .....	<b>6</b>
5.1. <i>DESCRIPTION OF EUT</i> .....	6
5.2. <i>DESCRIPTION OF AVAILABLE ANTENNAS</i> .....	6
5.3. <i>SOFTWARE AND FIRMWARE</i> .....	6
5.4. <i>WORST-CASE CONFIGURATION AND MODE</i> .....	6
5.5. <i>DESCRIPTION OF TEST SETUP</i> .....	7
<b>6. TEST AND MEASUREMENT EQUIPMENT</b> .....	<b>9</b>
<b>7. ANTENNA PORT TEST RESULTS</b> .....	<b>10</b>
7.1.1. <i>99% BANDWIDTH</i> .....	10
<b>8. RADIATED TEST RESULTS</b> .....	<b>11</b>
8.1. <i>LIMITS AND PROCEDURE</i> .....	11
8.2. <i>TRANSMITTER BELOW 1 GHz</i> .....	12
8.3. <i>TRANSMITTER ABOVE 1 GHz</i> .....	15
8.4. <i>RECEIVER BELOW 1 GHz</i> .....	16
8.5. <i>RECEIVER ABOVE 1 GHz</i> .....	17
<b>9. SETUP PHOTOS</b> .....	<b>18</b>

# 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** OMRON CORPORATION  
6368 NENJOZAKA, OKUSA  
KOMAKI, AICHI, 485-0802, JAPAN

**EUT DESCRIPTION:** EV REMOTE ANTENNA MODULE

**MODEL:** CGF-M002

**SERIAL NUMBER:** 15

**DATE TESTED:** FEBRUARY 25, 2011 – MARCH 2, 2011

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Pass
INDUSTRY CANADA RSS-210 Issue 8 Annex 2.9	Pass
INDUSTRY CANADA RSS-GEN Issue 3	Pass

Underwriters Laboratories tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

**Note:** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For UL CCS By:

Tested By:



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ENGINEERING MANAGER  
UL CCS

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UNDERWRITERS LABORATORIES

## 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2003, FCC CFR 47 Part 2, FCC CFR 47 Part 15, RSS-GEN Issue 3, and RSS-210 Issue 8.

## 3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 333 Pflingsten Road, Northbrook, IL 60193, USA.

UL NBK is accredited by NVLAP, Laboratory Code 100414-0

## 4. CALIBRATION AND UNCERTAINTY

### 4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

### 4.2. SAMPLE CALCULATION

#### Sample Calculations

Radiated Field Strength and Conducted Emissions data contained within this report is calculated on the following basis:

Field Strength (dBuV/m) = Meter Reading (dBuV) + AF (dB/m) - Gain (dB) + Cable Loss (dB)  
Conducted Voltage (dBuV) = Meter Reading (dBuV) + Cable Loss (dB) + LISN IL (dB)  
Conducted Current (dBuA) = Meter Reading (dBuV) + Cable Loss (dB) - Transducer Factor (dBohms)

### 4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	+/- 0.3 dB (k=2)
Radiated Disturbance, 30 to 1000 MHz	+/- 3.17 dB (k=2)

Uncertainty figures are valid to a confidence level of 95%.

## **5. EQUIPMENT UNDER TEST**

### **5.1. DESCRIPTION OF EUT**

The EUT is an EV Remote Antenna module operating at 927MHz.

### **5.2. DESCRIPTION OF AVAILABLE ANTENNAS**

The radio utilizes Printed antenna installed in the glass of a car with maximum peak gains of -2.19dBi gain.

### **5.3. SOFTWARE AND FIRMWARE**

The test utility software used during testing was EVRemote-ANT Ver. 1.21.

### **5.4. WORST-CASE CONFIGURATION AND MODE**

The worst case was found to be at X orientation.

## 5.5. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
DC Power supply	Leader	LPS-614	NA	DoC

### I/O CABLES

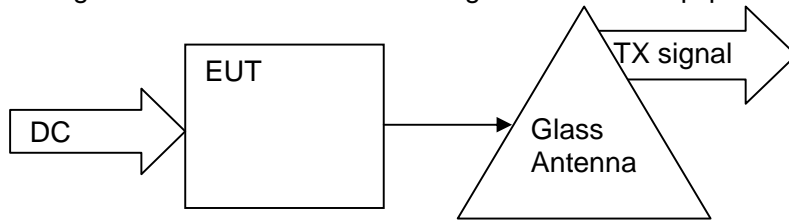
I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	DC	1	EUT	Un-shielded	1m	None
2	Antenna	1	Antenna	shielded	19cm	None

### TEST SETUP

The EUT contained an antenna built into a glass window of an automobile connected to pcb module. The module was powered by DC power supply and wired to either transmit or receive continuously.

**SETUP DIAGRAM FOR TESTS**

The diagram below illustrates the configuration of the equipment above.





## 6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

### Radiated Emissions

Description	Manufacturer	Model	Identifier	Cal Date	Cal Due
EMI Test Receiver	Rohde & Schwarz	ESU	EMC4323	12/30/10	12/31/11
Bicon Antenna	Chase	VBA6106A	EMC4078	12/2/10	12/31/11
Log-P Antenna	Chase	UPA6109	EMC4313	6/1/10	6/30/11
Spectrum Analyzer	Rhode & Schwarz	FSEK	EMC4182	12/28/10	12/31/11
Antenna Array	UL	BOMS	EMC4276	N/A	N/A

### Occupied Bandwidth

Description	Manufacturer	Model	Identifier	Cal Date	Cal Due
EMI Test Receiver	Rohde & Schwarz	ESU	EMC4323	12/30/10	12/31/11
Antenna	EMCO	7405-901	-	NA	NA

## 7. ANTENNA PORT TEST RESULTS

### 7.1.1. 99% BANDWIDTH

#### LIMITS

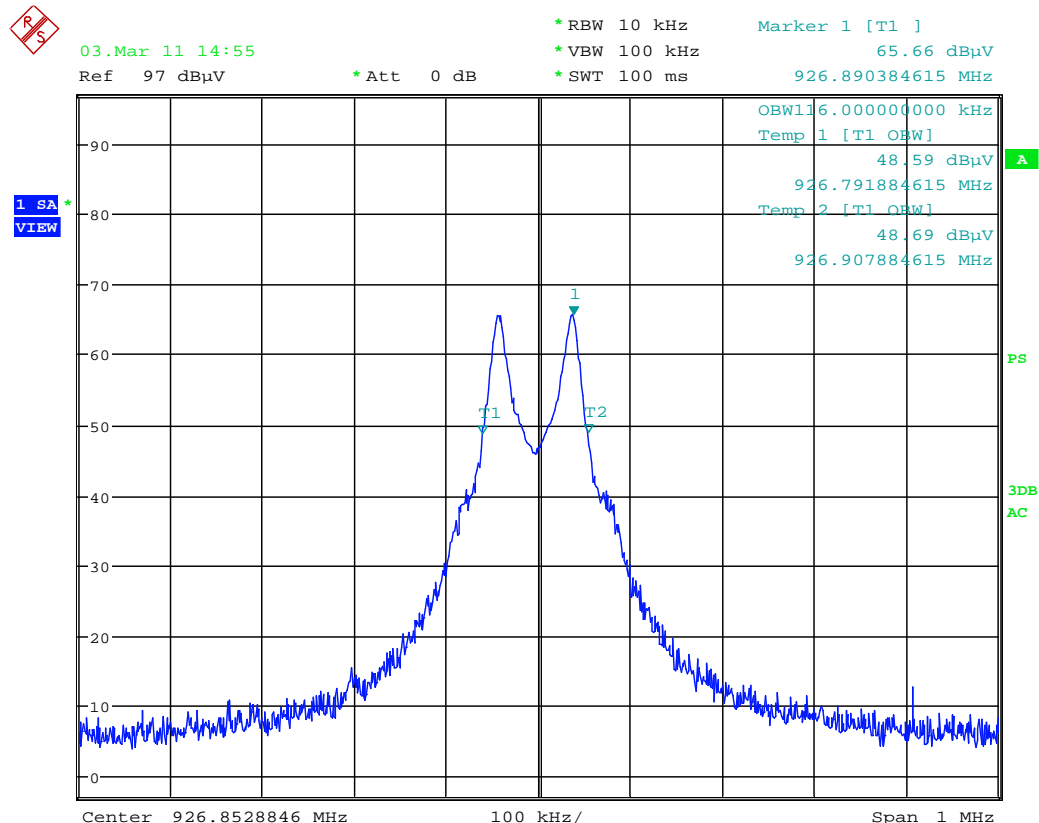
None; for reporting purposes only.

#### TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

#### RESULTS

BW=116kHz



Date: 3.MAR.2011 14:55:50

## 8. RADIATED TEST RESULTS

### 8.1. LIMITS AND PROCEDURE

#### LIMITS

The field strengths measured at 3 meters shall not exceed the following:

Frequency Range (MHz)	Field Strength (mV/m)	
	Fundamental	Harmonic
902 - 928	50	0.5
216 - 960	50	0.5
Above 960	50	0.5

FCC §15.209

IC RSS-210 Clause 2.6 (Transmitter) & IC RSS-GEN Clause 6 (Receiver)

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

#### TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

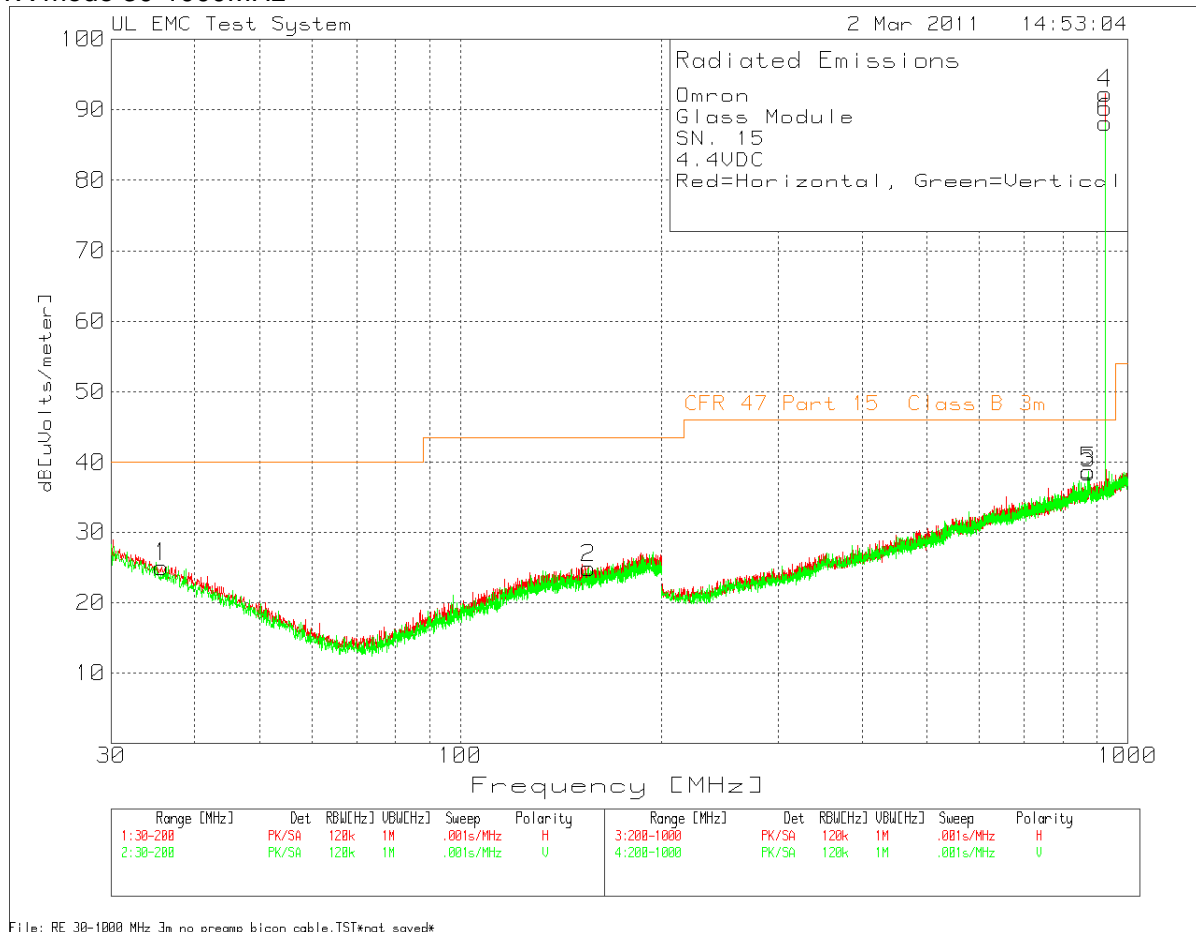
For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

The spectrum from 30 MHz to 10 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 900 MHz band.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

## 8.2. TRANSMITTER BELOW 1 GHz

TX mode 30-1000MHz



Omron  
 Glass Module  
 SN. 15  
 4.4VDC  
 Red=Horizontal, Green=Vertical

No.	Frequency [MHz]	Test	Meter	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB]	Limit:1	2	3	4	5	6
=====												
Bicon Horizontal 30 - 200MHz -----												
1	35.6922		8.25 PK	.7	16.1	25.05	-	40	-	-	-	-
			Height:300	Horz	Margin [dB]		-	-14.95	-	-	-	-
Bicon Vertical 30 - 200MHz -----												
2	155.8221		8.74 PK	1.5	14.6	24.84	-	43.5	-	-	-	-
			Height:100	Vert	Margin [dB]		-	-18.66	-	-	-	-
LogP Horizontal 200 - 1000MHz -----												
3	873.1512		11.6 PK	3.8	23	38.4	-	46	-	-	-	-
			Height:300	Horz	Margin [dB]		-	-7.6	-	-	-	-
4	926.982		64.97 PK	3.8	23.5	92.27	-	46	-	-	-	-
			Height:100	Horz	Margin [dB]		-	46.27	-	-	-	-
LogP Vertical 200 - 1000MHz -----												
5	873.1512		12.03 PK	3.8	22.9	38.73	-	46	-	-	-	-
			Height:200	Vert	Margin [dB]		-	-7.27	-	-	-	-
6	926.982		61.03 PK	3.8	23.3	88.13	-	46	-	-	-	-
			Height:100	Vert	Margin [dB]		-	42.13	-	-	-	-
LIMIT 1: NONE												
LIMIT 2: CFR 47 Part 15 Class B 3m												
PK - Peak detector												
926.8908	61.92	QP		3.9	23.5	89.32	94	-	-	-	-	-
	Azimuth: 204		Height:157	Horz	Margin [dB]:		-4.68	-	-	-	-	-
926.8906	57.61	QP		3.9	23.5	85.01	94	-	-	-	-	-
	Azimuth: 118		Height:106	Vert	Margin [dB]:		-8.99	-	-	-	-	-
LIMIT 1: FCC 15.249												
QP - Quasi-Peak detector												

Bandedge 902-928MHz



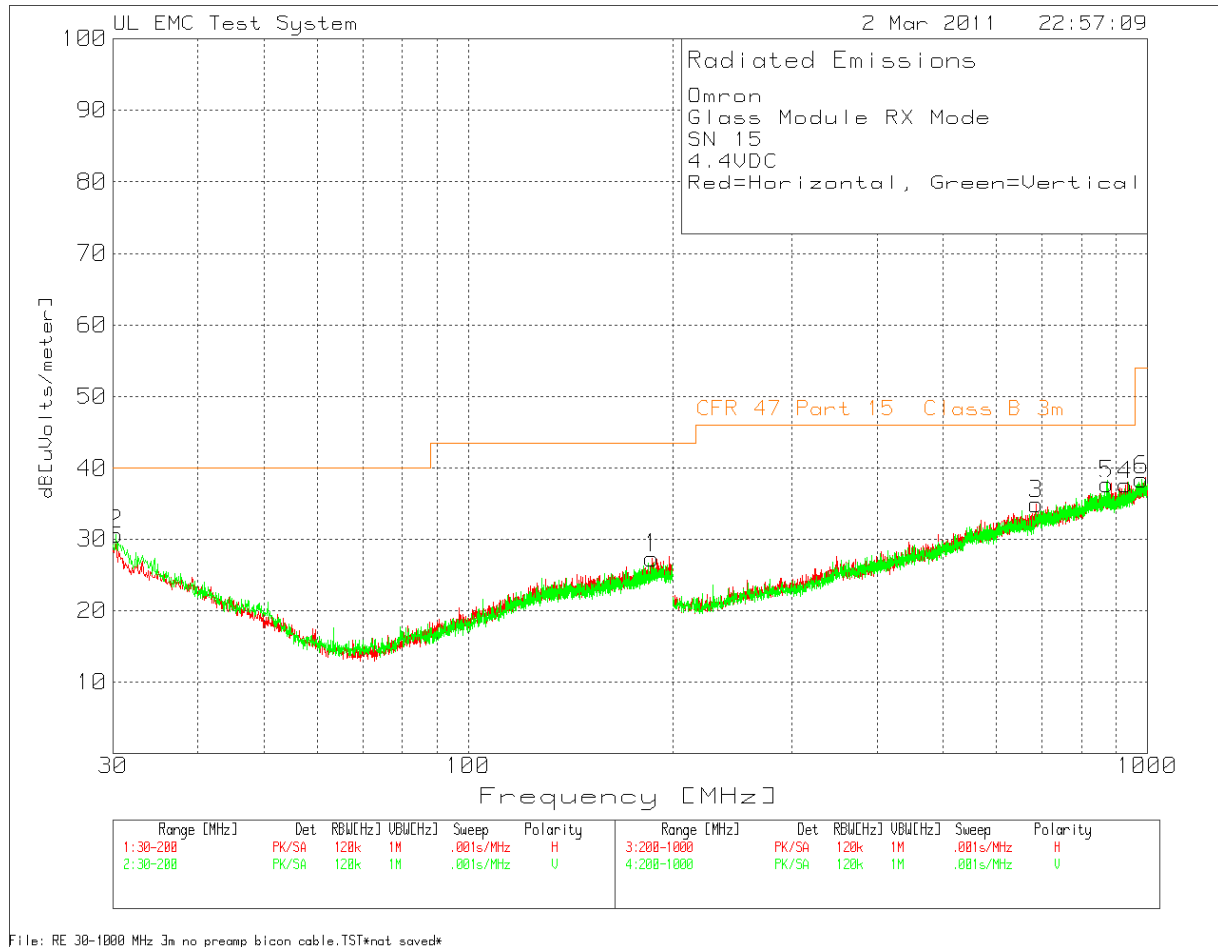
### 8.3. TRANSMITTER ABOVE 1 GHz

TX mode 1-10GHz



No Emissions found above the noise floor.

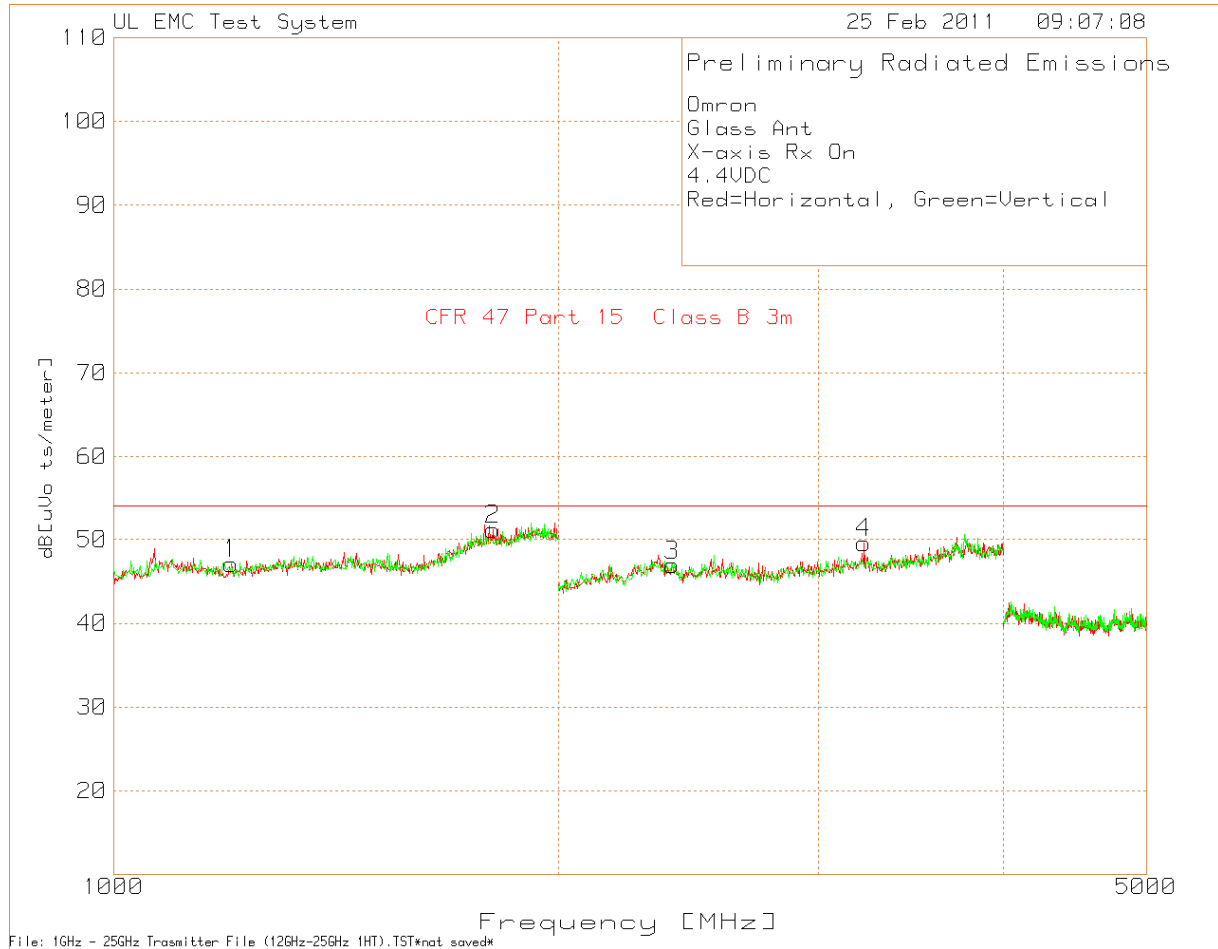
### 8.4. RECEIVER BELOW 1 GHz



No Emissions found above the noise floor.



### 8.5. RECEIVER ABOVE 1 GHz



No Emissions detected above the noise floor.