



*Product Integrity Laboratory*

5151-47<sup>th</sup> Street, NE  
Calgary, Alberta T3J 3R2  
Tel: (403) 568-6605  
Fax : (403) 568-6970

**Certification Test Report**

**CFR 47 FCC Part 15, Subpart C Section 15.225  
Industry Canada RSS 210, Issue 7**

**Applicant: OCE Display Graphics Inc  
FCC ID # U2P-3010105668  
IC ID # 6947A-3010105668**

**Project Code CG-654  
(Report CG-654-EM-1-2)  
Supersedes CG-654-EM-1-1  
Revision: 1**

**December 13, 2007**

**Prepared for:** OCE Display Graphics Inc

**Author:** Spencer Watson

---

**Approved by:** Nick Kobrosly  
Director of Operations

---

---

**Confidentiality Statement:** This report and the information contained herein represent the results of testing articles/products identified and selected by the client. The tests were performed to specifications and/or procedures approved by the client. National Technical Systems ("NTS") makes no representations expressed or implied that such testing fully demonstrates efficiency, performance, reliability, or any other characteristic of the articles being tested, or similar products. This report should not be relied upon as an endorsement or certification by NTS of the equipment tested, nor does it represent any statement whatsoever as to its merchantability or fitness of the test article or similar products for a particular purpose. This document shall not be reproduced except in full without written approval from National Technical Systems ("NTS") and the customer.

## Report Summary

|                                |   |
|--------------------------------|---|
| <b>Test Facility</b>           | <b>NTS Canada</b><br>Product Integrity Laboratory<br>5151-47 <sup>th</sup> Street, N.E. Calgary Alberta T3J 3R2   |
| <b>Accreditation Numbers</b>   | FCC 101386<br>IC 46405-3978 - File # IC3978-2<br>Standards Council of Canada Accredited Laboratory No. 440  |
| <b>Performed For</b>           | Oce Display Graphics Systems<br>13231 Delf Place<br>Building #501<br>Richmond, British Columbia V6V 2C3<br>Phone #: (604)232 2345 Direct Dial<br>Fax #: (604)273 2775 Fax |
| <b>Customer Representative</b> | Name: Colin Souter<br>Phone #: (604) 232-2345<br>Email Address: colin.souter@oce.com  |
| <b>Responsible Manager</b>     | Name:<br>Phone #:<br>Email Address:   |

The test results contained in this report refer exclusively to the product(s) presented for testing. The test results do not cover models or products not referred herein. This test report should not be published or duplicated in whole or part without permission from the testing body and the customer.

NTS Product Integrity Laboratory, 5151-47<sup>th</sup> Street N.E. Tel: 403-568-6605, Fax: 403-568-6970

## Test Summary

| Appendix | Test/Requirement Description                 | Deviations* from: |            |               | Pass / Fail | Applicable Rule Parts  |
|----------|--|-------------------|------------|---------------|-------------|--|
|          |  | Base Standard     | Test Basis | NTS Procedure |             |  |
| A        | Radiated E-Field Emissions<br>30 MHz – 1 GHz | No                | No         | No            | PASS        | FCC 15.209, RSS 210 Issue 7 Section 2.7                          |
| B        | Radiated H-Field Emissions<br>9 kHz – 30 MHz | No                | No         | No            | PASS        | FCC 15.209, 15.225, RSS 210 Issue 7 Section 2.7 and Appendix 2.6 |
| C        | Frequency Stability                          | No                | No         | No            | PASS        | FCC 15.225, RSS 210 Issue 7 Appendix 2.6                         |
| D        | Occupied BW                                  | No                | No         | No            | 3.407 kHz   | RSS Gen Issue 2 Section 4.6.1                                    |

The compliance test cases and respective test standards, as defined by the customer, may not be inclusive of all testing required by the Base Standards or fulfill the applicable regulatory requirements in their entirety. They do not reflect the opinions or recommendations of NTS

**Test Result:** The product presented for testing complied with test requirements as shown above.

The test results contained in this report refer exclusively to the product(s) presented for testing. The test results do not cover models or products not referred herein. This test report should not be published or duplicated in whole or part without permission from the testing body and the customer.

NTS Product Integrity Laboratory, 5151-47<sup>th</sup> Street N.E. Tel: 403-568-6605, Fax: 403-568-6970

### Test Log & Signatures:

| APPENDIX | Test Case                                    | Start            | End              | Tester                             |
|----------|--|------------------|------------------|------------------------------------|
| A        | Radiated E-Field Emissions<br>30 MHz – 1 GHz | Sept 20,<br>2007 | Sept 21,<br>2007 | Spencer Watson<br>EMC Technologist |
| B        | Radiated H-Field Emissions<br>9 kHz – 30 MHz | Sept 21,<br>2007 | Sept 21,<br>2007 | Spencer Watson<br>EMC Technologist |
| C        | Frequency Stability                          | Dec 11,<br>2007  | Dec 11,<br>2007  | James MacKay<br>EMC Technologist   |
| D        | Occupied BW                                  | Dec 11,<br>2007  | Dec 11,<br>2007  | Spencer Watson<br>EMC Technologist |

Prepared By: \_\_\_\_\_  
Spencer Watson  
EMC Technologist

Reviewed By: \_\_\_\_\_  
Glen Moore  
EMC Manager

Checked By: \_\_\_\_\_  
Robyn Zuelkhe  
Quality Manager

The test results contained in this report refer exclusively to the product(s) presented for testing. The test results do not cover models or products not referred herein. This test report should not be published or duplicated in whole or part without permission from the testing body and the customer.

NTS Product Integrity Laboratory, 5151-47<sup>th</sup> Street N.E. Tel: 403-568-6605, Fax: 403-568-6970

## Table of Contents

|   |    |
|---|----|
| REPORT SUMMARY .....  | 2  |
| TEST SUMMARY .....  | 3  |
| TEST LOG & SIGNATURES: .....                                | 4  |
| REGISTER OF REVISIONS .....                                 | 6  |
| 1.0 INTRODUCTION .....                                      | 7  |
| 1.1 PURPOSE .....   | 7  |
| 1.2 ABBREVIATIONS AND DEFINITIONS .....                     | 7  |
| 1.3 REFERENCES .....  | 8  |
| 2.0 EUT DESCRIPTION .....                                   | 9  |
| 2.1 MODE OF OPERATION .....                                 | 9  |
| 2.2 MODIFICATIONS REQUIRED FOR COMPLIANCE .....             | 9  |
| 3.0 SUPPORT EQUIPMENT .....                                 | 10 |
| 3.1 CONFIGURATION .....                                     | 10 |
| 3.2 CABLES .....  | 10 |
| APPENDICES .....  | 11 |
| APPENDIX A: RADIATED EMISSIONS 30 MHZ – 1 GHZ .....         | 12 |
| APPENDIX B: RADIATED H-FIELD EMISSIONS 9 KHZ - 30 MHZ ..... | 16 |
| APPENDIX C: FREQUENCY STABILITY .....                       | 23 |
| APPENDIX D: OCCUPIED BANDWIDTH .....                        | 27 |
| APPENDIX E: TEST EQUIPMENTS .....                           | 29 |
| END OF DOCUMENT .....                                       | 31 |

The test results contained in this report refer exclusively to the product(s) presented for testing. The test results do not cover models or products not referred herein. This test report should not be published or duplicated in whole or part without permission from the testing body and the customer.

NTS Product Integrity Laboratory, 5151-47<sup>th</sup> Street N.E. Tel: 403-568-6605, Fax: 403-568-6970

## REGISTER OF REVISIONS

| Revision | Date              | Description of Revisions           |
|----------|-------------------|------------------------------------|
| 0        | December 11, 2007 | First Draft                        |
| 1        | December 12, 2007 | Revised for technical review notes |
| 2        | December 13, 2007 | Corrected notes on H-Field plots   |

The test results contained in this report refer exclusively to the product(s) presented for testing. The test results do not cover models or products not referred herein. This test report should not be published or duplicated in whole or part without permission from the testing body and the customer.

NTS Product Integrity Laboratory, 5151-47<sup>th</sup> Street N.E. Tel: 403-568-6605, Fax: 403-568-6970

## 1.0 INTRODUCTION

### 1.1 PURPOSE

The purpose of this document is to describe the tests applied by NTS Canada to demonstrate compliance of the OCE Display Graphic Model 3010105668 RFID transceiver to FCC Part 15 Subpart C section 15.225 for Intentional Radiator and the equivalent sections of Industry Canada's RSS 210 Issue 7.

The tests outlined may not be inclusive of all testing required by the Base Standards and may not fulfill the applicable regulatory requirements in their entirety.

### 1.2 ABBREVIATIONS AND DEFINITIONS

| <u>Abbreviation</u> | <u>Explanation</u>                        |
|---------------------|---|
| dB                  | Decibel                                   |
| EMC                 | Electromagnetic Compatibility             |
| Hz                  | Hertz                                     |
| IEC                 | International Electrotechnical Commission |
| ITE                 | Information Technology Equipment          |
| MHz                 | Megahertz                                 |
| N/A                 | Not Applicable                            |
| NA                  | Not Available                             |
| $\mu$ V             | Microvolts                                |
| dBm                 | decibel relative to 1 mW                  |
| GHz                 | Giga Hertz                                |
| QA                  | Quality Assurance                         |
| EUT                 | Equipment Under Test                      |
| NDP                 | No Degradation in Performance             |
| PI                  | Product Integrity                         |
| RF                  | Radio Frequency                           |

#### Definitions:

*Equipment Under Test (EUT):* A representative ITE or functionally interactive group of ITE (that is a system), which includes one or more host units and is used for evaluation purposes.

*Electromagnetic compatibility:* EMC (abbreviation): The ability of an equipment or system to function satisfactorily in its electromagnetic environment without introducing intolerable electromagnetic disturbances to anything in that environment.

---

The test results contained in this report refer exclusively to the product(s) presented for testing. The test results do not cover models or products not referred herein. This test report should not be published or duplicated in whole or part without permission from the testing body and the customer.

NTS Product Integrity Laboratory, 5151-47<sup>th</sup> Street N.E. Tel: 403-568-6605, Fax: 403-568-6970

### 1.3 REFERENCES

- FCC CFR 47 Part 15      CFR Title 47 – Telecommunications, Chapter I – Subpart C  
Intentional Radiators § 15.225    Operation within the band 13.110–  
14.010 MHz
- RSS 210 Issue 7      Radio Standards Specification 210 Issue 7 June 2007 – Low-power  
License-Exempt Radiocommunication Devices (All Frequency Bands):  
Category I Equipment
- RSS Gen Issue 2      Radio Standards Specification Gen Issue 2 June 2007 – General  
Requirements and Information for the Certification of  
Radiocommunication Equipment

#### International Standards

- CISPR 22      Information technology equipment – Radio disturbance characteristics –  
Limits and methods of measurement, 2005

#### American National Standards Institute

- ANSI C63.4-2003      American National Standards for Methods of Measurements of Radio-  
Noise Emissions from Low Voltage Electrical and Electronic Equipments  
in the range of 9 kHz to 40 GHz, December 11, 2003

#### NTS Documentation

- NTS Radiated Emissions 30 MHz – 1 GHz Automated Test Method SOP CAG EMC 01
- NTS Radiated Emissions 9 kHz – 30 MHz Manual Test Method – Method 28.2 Rev 1.0

---

The test results contained in this report refer exclusively to the product(s) presented for testing. The test results do not cover models or products not referred herein. This test report should not be published or duplicated in whole or part without permission from the testing body and the customer.

NTS Product Integrity Laboratory, 5151-47<sup>th</sup> Street N.E. Tel: 403-568-6605, Fax: 403-568-6970



## 2.0 EUT DESCRIPTION

### Description of EUT

|                | Name  | Model      | Revision | Serial Number |
|----------------|---|------------|----------|---------------|
| EUT            | OCE RFID  | 3010105668 | 5        | EMC01         |
| Classification | Tabletop  |            |          |               |
| Size (m)       | 0.37m x 0.10m x 0.09m                                 |            |          |               |
| Weight         | 1 kg  |            |          |               |
| Power          | 24 VDC  |            |          |               |
| Description    | RFID transceiver                                      |            |          |               |
| Cables         | Cable connections to support equipment detailed below |            |          |               |

### 2.1 MODE OF OPERATION

The EUT was tested while in a Reader/Writer mode with worst case results reported. For Radiated emissions the EUT was checked in three orthogonal planes with worst case results reported.

### 2.2 MODIFICATIONS REQUIRED FOR COMPLIANCE

None

The test results contained in this report refer exclusively to the product(s) presented for testing. The test results do not cover models or products not referred herein. This test report should not be published or duplicated in whole or part without permission from the testing body and the customer.

NTS Product Integrity Laboratory, 5151-47<sup>th</sup> Street N.E. Tel: 403-568-6605, Fax: 403-568-6970

### 3.0 SUPPORT EQUIPMENT

#### 3.1 CONFIGURATION

All support equipment information was supplied by the client and was verified by NTS.

| Type            | Position         | Qty | Model #           | P/N          | Serial Number     |
|-----------------|------------------|-----|-------------------|--------------|-------------------|
| PC              | 10m Support Room | 1   | Vento M9          | 71X350011301 | 90-PL982MC004-530 |
| Monitor         | 10m Support Room | 1   | Viewsonic VS10040 | VE510b       | P1H045050016      |
| Keyboard        | 10m Support Room | 1   | NEC KB-8963       | 229-00012    | CHKB90842680      |
| Mouse           | 10m Support Room | 1   | Microsoft 2.1A    | 90516        | 00620054          |
| DC Power supply | 10m Support Room | 1   | Cosel             | ADA600F-24   | 6140530TR         |

#### 3.2 CABLES

**Support Cable List (These cables are not part of the EUT, but were required to exercise the EUT) and were located in the support shielded room underneath the turntable**

| Quantity | Routing                                   |                    | Description                           | Cable Length (m) |
|----------|---|--------------------|---------------------------------------|------------------|
|          | From                                      | To                 |                                       |                  |
| 1        | 24 VDC Cosel Power Supply in support room | EUT in 10m chamber | 2-conductor shielded ungrounded cable | ~ 4m             |
| 1        | PC in support room                        | EUT in 10m chamber | Ethernet Cat5                         | ~ 4m             |

The test results contained in this report refer exclusively to the product(s) presented for testing. The test results do not cover models or products not referred herein. This test report should not be published or duplicated in whole or part without permission from the testing body and the customer.

NTS Product Integrity Laboratory, 5151-47<sup>th</sup> Street N.E. Tel: 403-568-6605, Fax: 403-568-6970

## APPENDICES

---

The test results contained in this report refer exclusively to the product(s) presented for testing. The test results do not cover models or products not referred herein. This test report should not be published or duplicated in whole or part without permission from the testing body and the customer.

NTS Product Integrity Laboratory, 5151-47<sup>th</sup> Street N.E. Tel: 403-568-6605, Fax: 403-568-6970

## APPENDIX A: RADIATED EMISSIONS 30 MHZ – 1 GHZ

### A.1. Base Standard & Test Basis

|                      |   |
|----------------------|---|
| <b>Base Standard</b> | CFR Title 47 – Telecommunications, Chapter I - FCC<br>Part 15.209 – Radio Frequency Devices RSS 210 Issue 7 Section 2.7                                   |
| <b>Test Basis</b>    | ANSI C63.4 - 2003<br>Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz |
| <b>Test Method</b>   | NTS Radiated Emissions 30 MHz – 1GHz Automated Test Method SOP CAG<br>EMC 01  |

### A.2. Specifications

| Frequency  | FCC Part 15<br>10-m Limit<br>(Quasi-Peak) |
|------------|---|
| MHz        | dBμV/m                                    |
| 30 - 88    | 29.54                                     |
| 88 - 216   | 33.06                                     |
| 216 - 960  | 35.56                                     |
| 960 - 1000 | 43.52                                     |

**Notes:** Limit extrapolated from 3m using 10m Limit = 3m Limit – 20 \* log<sub>10</sub>(10/3)

### § 15.205 Restricted bands of operation.

| 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         | 2690–2900     | 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     | N/A         |
| 13.36–13.41              | N/A                 | N/A           | N/A         |

At frequencies equal to or less than 1000 MHz, compliance with the limits in §15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in §15.209 shall be demonstrated based on the average value of the measured emissions.

The test results contained in this report refer exclusively to the product(s) presented for testing. The test results do not cover models or products not referred herein. This test report should not be published or duplicated in whole or part without permission from the testing body and the customer.

NTS Product Integrity Laboratory, 5151-47<sup>th</sup> Street N.E. Tel: 403-568-6605, Fax: 403-568-6970

### A.3. Measurement Uncertainty

| Radiated Emissions<br>30 MHz – 1 GHz | Measurement Uncertainty | Expanded Uncertainty (K=2) |
|--------------------------------------|-------------------------|----------------------------|
| (dB)                                 | +2.32/-2.36             | +4.65/-4.72                |

### A.4. Deviations

| Deviation<br>Number | Time &<br>Date | Description and<br>Justification of<br>Deviation | Deviation Reference |            |                  | Approval |
|---------------------|----------------|--|---------------------|------------|------------------|----------|
|                     |                |  | Base<br>Standard    | Test Basis | NTS<br>Procedure |          |
| None                |                |  |                     |            |                  |          |

### A.5. Test Method


The EUT was placed on a non-conductive table 0.8 meters above the ground plane. The table was centered on a motorized turntable. The emission levels were maximized by rotating the turntable through 360 degrees, a measurement antenna was positioned at a distance of 10meters as measured from the closest point of the EUT, and scanned from 1-4 meters.

A spectrum analyzer with peak detection was used to find the maximum field strength during the scans. The EUT was tested in 3 orthogonal planes and checked for worst case emissions configuration, with the worst case results being reported.

The test results contained in this report refer exclusively to the product(s) presented for testing. The test results do not cover models or products not referred herein. This test report should not be published or duplicated in whole or part without permission from the testing body and the customer.

NTS Product Integrity Laboratory, 5151-47<sup>th</sup> Street N.E. Tel: 403-568-6605, Fax: 403-568-6970

## A.6. Test Results

|  |                 |  |                      |  |                         |  |                |             |                  |                           |
|--|-----------------|--|----------------------|--|-------------------------|--|----------------|-------------|------------------|---------------------------|
| <br>Product Integrity Laboratory V2.5 |                 | <b>Project Number:</b> CG-654<br><b>Model:</b> OCE RFID<br><b>Comments:</b> Conf20: EUT powered on, running at max dutycycle, without mounting plate. HP Power supply. EUT Vertical orientation. 2 ferrites in control room on data line near PC |                      |  |                         | <b>Tester:</b> Spencer Watson<br><b>Test ID:</b> RE02c-10m-654 |                |             |                  |                           |
|  |                 | <b>Standard:</b> FCC15.209   |                      | <b>Measurement Distance:</b> <1GHz 10 meters<br>>1GHz 3 meters |                         |  |                |             |                  |                           |
| Antenna Polarization   | Frequency (MHz) | Measured Level (dBμV)  | Measurement Detector | Correction Factors (dB/m)                                      | Emission Level (dBμV/m) | Limit Line   | Limit (dBμV/m) | Margin (dB) | Mast Height (cm) | Turntable Angle (degrees) |
| Horizontal   | 279.17          | 39.3   | Q.Peak               | -10.57   | 28.73                   | Q.Peak   | 35.56          | 6.83        | 282              | 317                       |
| Horizontal   | 284.74          | 41.16  | Q.Peak               | -10.41   | 30.75                   | Q.Peak   | 35.56          | 4.81        | 279              | 316                       |
| Horizontal   | 732.18          | 31.53  | Q.Peak               | -3.99  | 27.54                   | Q.Peak   | 35.56          | 8.02        | 94               | 357                       |
| Vertical   | 100.00          | 44.23  | Q.Peak               | -15.12   | 29.11                   | Q.Peak   | 33.06          | 3.95        | 110              | 319                       |
| Vertical   | 279.17          | 36.03  | Q.Peak               | -10.04   | 25.99                   | Q.Peak   | 35.56          | 9.57        | 100              | 162                       |
| Vertical   | 284.74          | 38.9   | Q.Peak               | -9.91  | 28.99                   | Q.Peak   | 35.56          | 6.57        | 100              | 155                       |

**Table 1: Radiated Emissions Data, 30 MHz – 1000 MHz**

The highest emission measured was 30.75 dBμV/m at 284.74 MHz, when antenna is Horizontally polarized. It has 4.81 dB margin to the FCC 15.209 limit.

The emission with the least margin to the limit measured was 29.11 dBμV/m at 100.00 MHz, when antenna is Vertically polarized. It has 3.95 dB margin to the FCC 15.209 limit.

The EUT is in compliance with FCC Part 15 Subpart C 15.209, FCC Part 15 Subpart C 15.205 and Industry Canada RSS-210 Issue 7 Section 2.7 requirements.

## A.7. Sample Calculation

Emission Level = Measured Level + Correction Factors

Margin = Limit – Emission Level

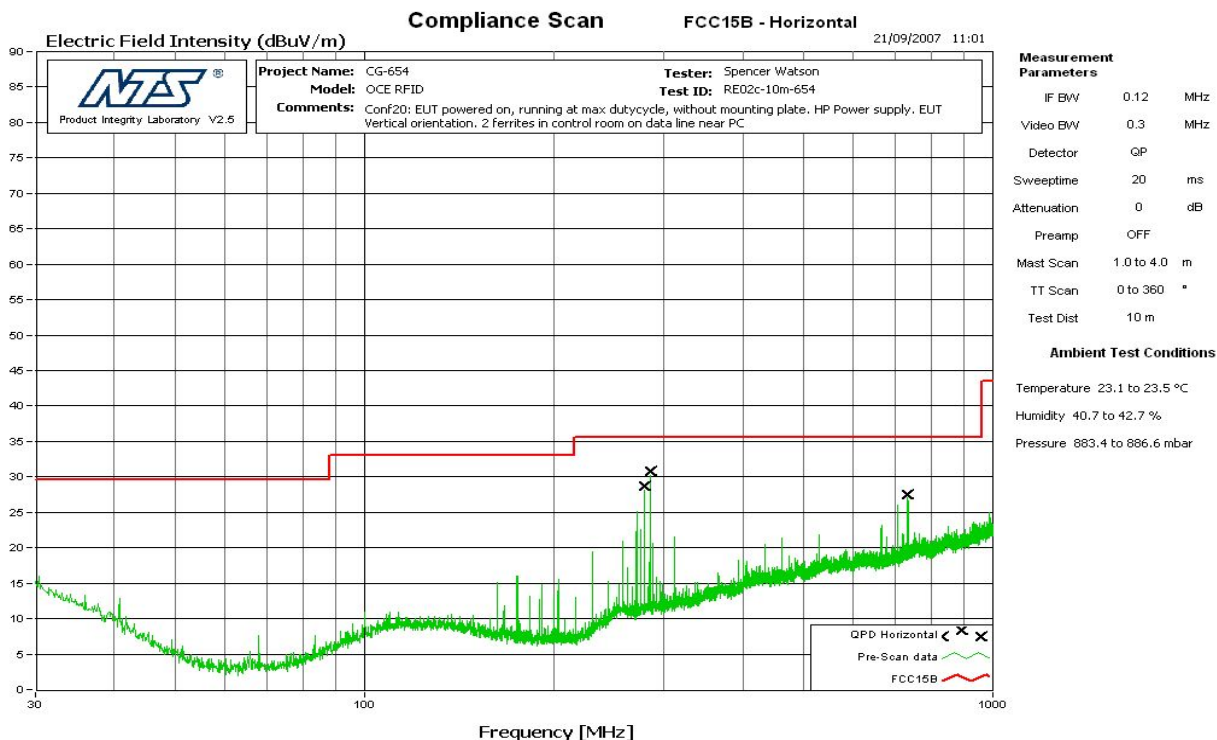
## A.8. Tested By

This testing was conducted in accordance with the ISO 17025:2005 scope of accreditation, table 1; Quality Manual.

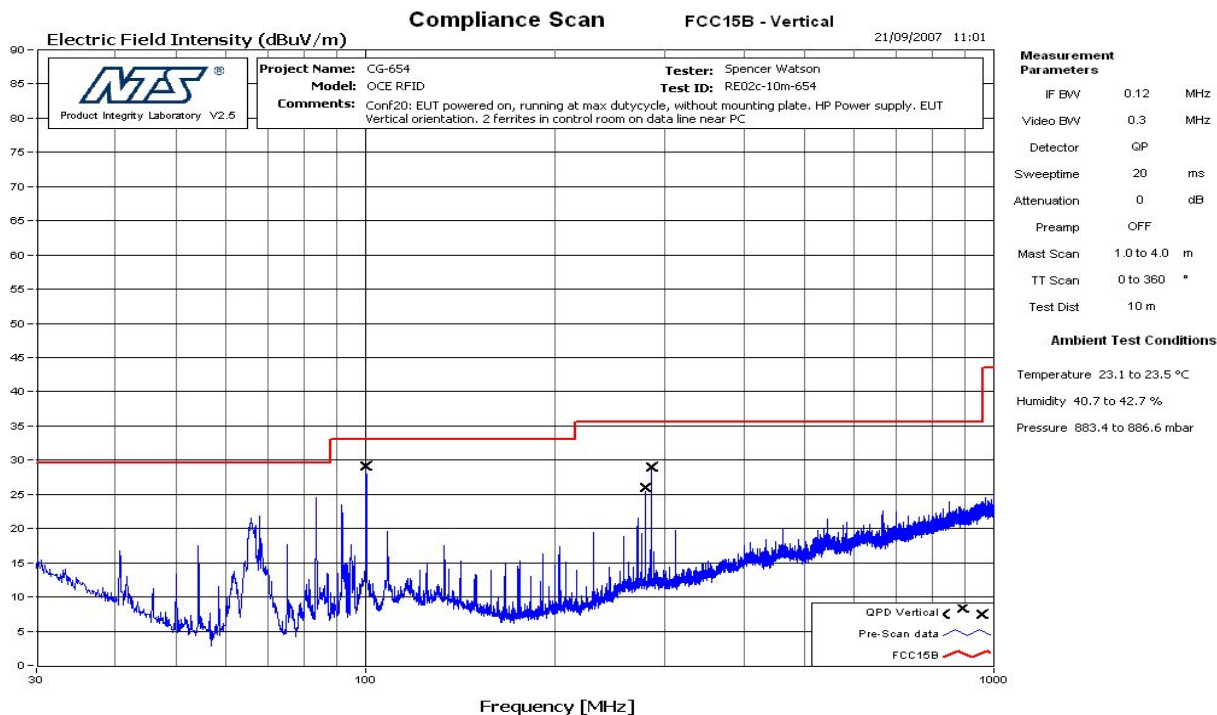
Name: Spencer Watson  
Function: EMC Technologist

The test results contained in this report refer exclusively to the product(s) presented for testing. The test results do not cover models or products not referred herein. This test report should not be published or duplicated in whole or part without permission from the testing body and the customer.

NTS Product Integrity Laboratory, 5151-47<sup>th</sup> Street N.E. Tel: 403-568-6605, Fax: 403-568-6970



**Figure 1 Radiated Emission – Horizontal, 30 MHz – 1 GHz**



**Figure 2 Radiated Emission – Vertical, 30 MHz – 1 GHz**

The test results contained in this report refer exclusively to the product(s) presented for testing. The test results do not cover models or products not referred herein. This test report should not be published or duplicated in whole or part without permission from the testing body and the customer.

NTS Product Integrity Laboratory, 5151-47<sup>th</sup> Street N.E. Tel: 403-568-6605, Fax: 403-568-6970

## APPENDIX B: RADIATED H-FIELD EMISSIONS 9 KHZ - 30 MHZ

### B.1. Base Standard & Test Basis

|               |                                     |   |
|---------------|-------------------------------------|---|
| Base Standard | <input checked="" type="checkbox"/> | CFR Title 47 – Telecommunications, Chapter I - FCC Part 15.209 and Part 15.225 – Radio Frequency Devices, RSS 210 Issue 7 Section 2.7 and Appendix 2.6  |
| Test Basis    | <input checked="" type="checkbox"/> | ANSI C63.4-2001<br>Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz |

### B.2. Specifications

| Frequency<br>(F) | Limit          |          | Limit at 3m                |
|------------------|----------------|----------|----------------------------|
|                  | Field Strength | Distance |                            |
| MHz              | μV/m           | m        | dBμV/m                     |
| 0.009 – 0.49     | 2400/ F(kHz)   | 300      | 128.5 to 93.8 <sup>1</sup> |
| 0.49 – 1.705     | 24000/ F(kHz)  | 30       | 73.8 to 63.0 <sup>1</sup>  |
| 1.705 – 13.11    | 30             | 30       | 69.5                       |
| 13.11 – 13.41    | 106            | 30       | 80.5                       |
| 13.41 – 13.553   | 334            | 30       | 90.5                       |
| 13.553 – 13.567  | 15848          | 30       | 124.0                      |
| 13.567 – 13.71   | 334            | 30       | 90.5                       |
| 13.71 – 14.01    | 106            | 30       | 80.5                       |
| 14.01 – 30       | 30             | 30       | 69.5                       |

#### Notes:

- <sup>1</sup> decrease with the logarithm of the frequency.
- Limit is extrapolated from 300m and 30 to 3m by adding 80dB and 40dB respectively as per 15.31(f)(2).

### B.3. Measurement Uncertainty

| Radiated H-Field Emissions<br>9kHz – 30MHz | Measurement Uncertainty | Expanded Uncertainty (K=2) |
|--|-------------------------|----------------------------|
| (DB)                                       | +2.15/-2.19             | +4.30/-4.38                |

### B.4. Deviations

| Deviation<br>Number | Time &<br>Date | Description and<br>Justification of<br>Deviation | Deviation Reference |            |                  | Approval |
|---------------------|----------------|--|---------------------|------------|------------------|----------|
|                     |                |  | Base<br>Standard    | Test Basis | NTS<br>Procedure |          |
| none                |                |  |                     |            |                  |          |

The test results contained in this report refer exclusively to the product(s) presented for testing. The test results do not cover models or products not referred herein. This test report should not be published or duplicated in whole or part without permission from the testing body and the customer.


NTS Product Integrity Laboratory, 5151-47<sup>th</sup> Street N.E. Tel: 403-568-6605, Fax: 403-568-6970



## B.5. Test Method

The EUT was placed on a non-conductive table 0.8 meters above the ground plane. The table was centered on a motorized turntable. The fundamental field strength was maximized by rotating the turntable through 360 degrees. The receive Loop antenna was positioned at a distance of 3 meters as measured from the closest point of the EUT and 1 meter above the ground plane. A spectrum analyzer with peak detection was used to find the maximum field strength during the scans. The EUT was tested in 3 orthogonal planes at a worst case data rate and duty cycle (continuous tx) as reported by the applicant with the worst case results being reported.

## B.6. Test Results

|   |   |                       |                                       |                              |                         |            |                |             |
|---|---|-----------------------|---------------------------------------|------------------------------|-------------------------|------------|----------------|-------------|
| <br>Product Integrity<br>Laboratory V2.5 | <b>Project Number:</b> CG-654   |                       |                                       | <b>Tester:</b> Spencer       |                         |            |                |             |
|   | <b>Model:</b> OCE RFID  |                       |                                       | <b>Test ID:</b> RE01-10m-654 |                         |            |                |             |
|   | <b>Comments:</b> Conf22: EUT powered on, running at max dutycycle, no mounting plate. HP Power supply. EUT Side up orientation. 2 ferrites in control room on data line near PC |                       |                                       |                              |                         |            |                |             |
|   |   |                       |                                       |                              |                         |            |                |             |
| <b>Standard:</b> FCC15.225  |   |                       | <b>Measurement Distance:</b> 3 meters |                              |                         |            |                |             |
|   |   |                       |                                       |                              |                         |            |                |             |
| Antenna Polarization  | Frequency (MHz)   | Measured Level (dBμV) | Measurement Detector                  | Correction Factors (dB/m)    | Emission Level (dBμV/m) | Limit Line | Limit (dBμV/m) | Margin (dB) |
| Parallel  | 0.0090  | 23.92                 | Peak                                  | 19.84                        | 43.76                   | Q.Peak     | 128.52         | 84.76       |
| Parallel  | 0.0961  | 31.51                 | Peak                                  | 19.61                        | 51.12                   | Q.Peak     | 107.95         | 56.83       |
| Parallel  | 13.561*   | 35.67                 | Peak                                  | 20.47                        | 56.14                   | Q.Peak     | 124.00         | 67.86       |
| Perpendicular   | 0.0092  | 27.81                 | Peak                                  | 19.81                        | 47.62                   | Q.Peak     | 128.37         | 80.75       |
| Perpendicular   | 0.0961  | 31.72                 | Peak                                  | 19.61                        | 51.33                   | Q.Peak     | 107.95         | 56.62       |
| Perpendicular   | 13.563*   | 24.59                 | Peak                                  | 20.47                        | 45.06                   | Q.Peak     | 124.00         | 78.94       |

**Table 2: Radiated Emissions Data – 9 kHz – 30 MHz**

The highest emission measured was 56.14 dBμV/m at 13.561 MHz, when antenna is Parallel polarized. It has 67.86 dB margin to the FCC 15.225 limit.

The EUT is in compliance with FCC Part 15 Subpart C 15.225, FCC Part 15 Subpart C 15.209, Industry Canada RSS-210 Issue 7 Section 2.7 and Industry Canada RSS-210 Issue 7 Appendix 2.6 requirements.

## B.7. Sample Calculations

Corrected Value= Measured value + AF (antenna factor) + CL (Cable Losses)  
Margin = Limit – Corrected value

## B.8. Test Data

See plots on following pages

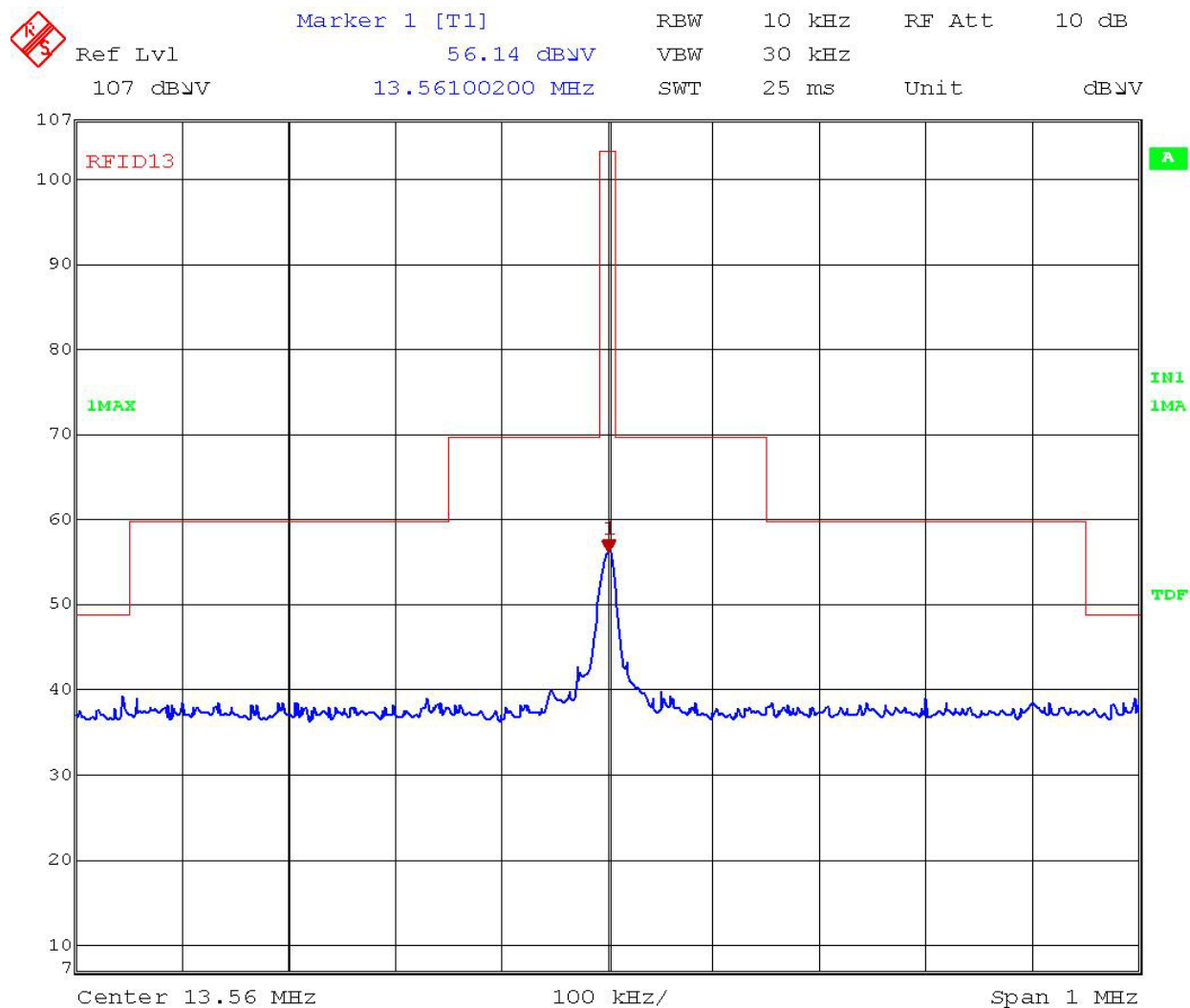
## B.9. Tested By

This testing was conducted in accordance with the ISO 17025:2005 scope of accreditation, table 1; Quality Manual.

Name: Spencer Watson  
Function: EMC Technologist

The test results contained in this report refer exclusively to the product(s) presented for testing. The test results do not cover models or products not referred herein. This test report should not be published or duplicated in whole or part without permission from the testing body and the customer.

NTS Product Integrity Laboratory, 5151-47<sup>th</sup> Street N.E. Tel: 403-568-6605, Fax: 403-568-6970

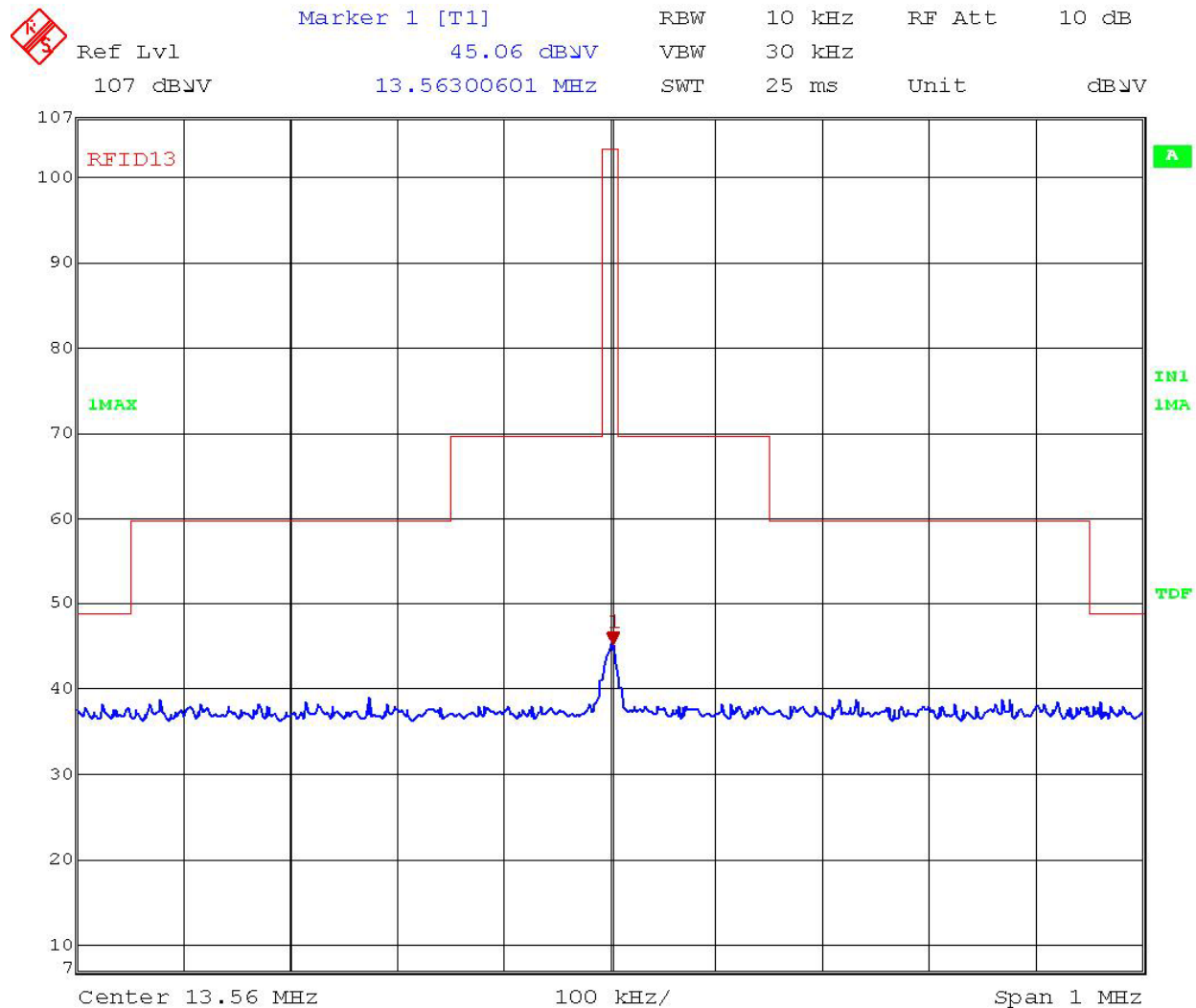


Title: CG-654 OCE RFID Parallel 3m H-Field  
Comment A: Conf22:Max duty cycle, Side Up orientation, no mounting plate, 2 ferrites in support room  
Date: 21.SEP.2007 16:28:14

**Figure 3 RE - Parallel – 13.06 MHz – 14.06 MHz**

The test results contained in this report refer exclusively to the product(s) presented for testing. The test results do not cover models or products not referred herein. This test report should not be published or duplicated in whole or part without permission from the testing body and the customer.

NTS Product Integrity Laboratory, 5151-47<sup>th</sup> Street N.E. Tel: 403-568-6605, Fax: 403-568-6970

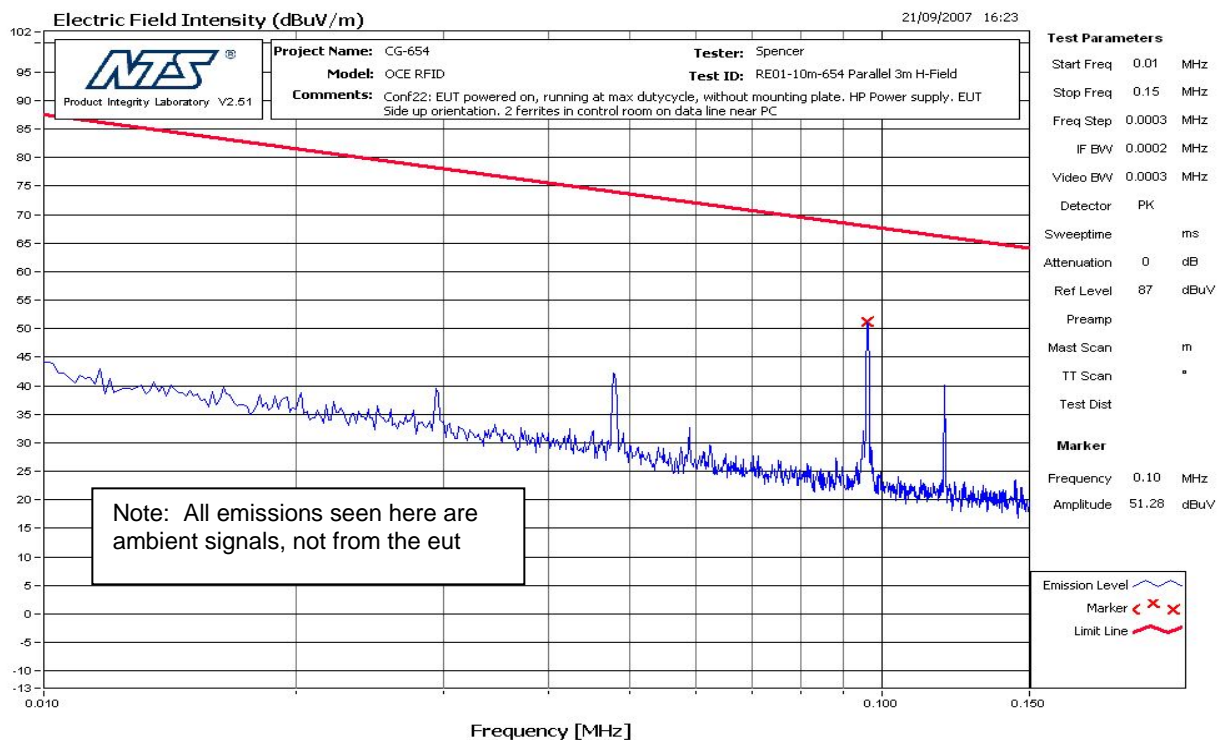


Title: CG-654 OCE RFID Perpendicular 3m H-Field  
Comment A: Conf22:Max duty cycle, Side Up orientation, no mounting plat  
e, 2 ferrites in support room  
Date: 21.SEP.2007 16:37:57

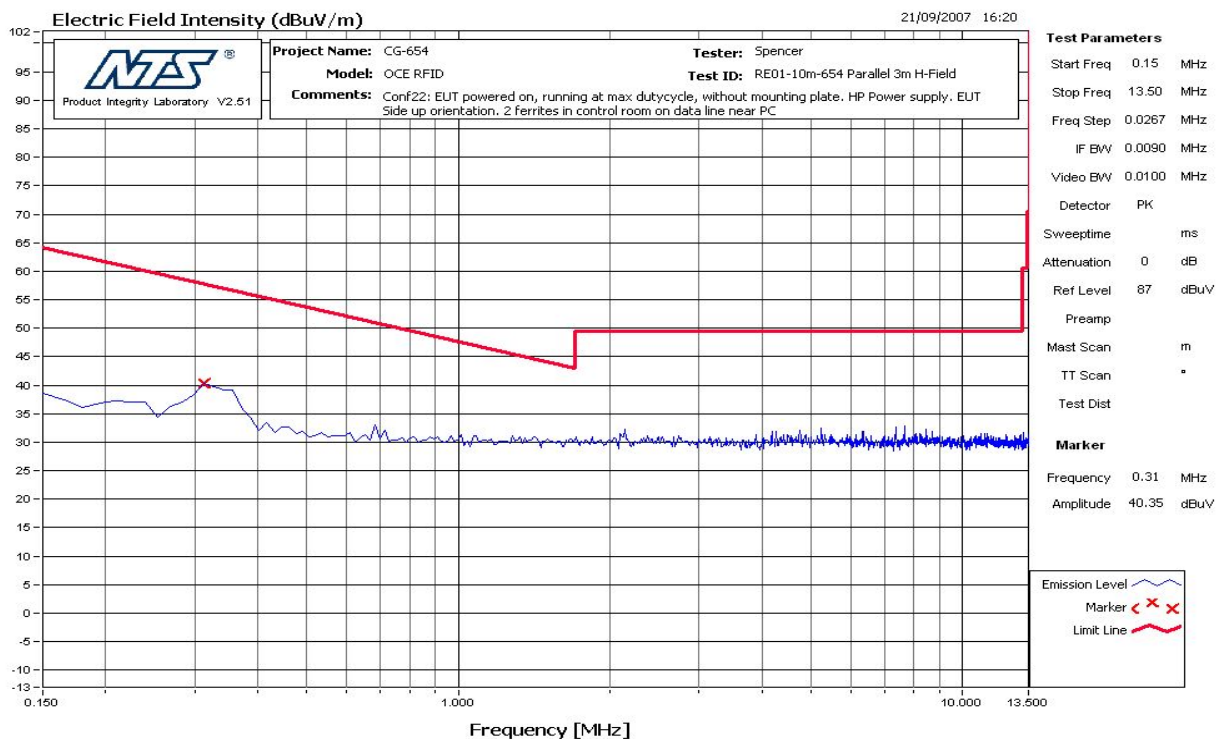
**Figure 4 RE - Perpendicular – 13.06 MHz – 14.06 MHz**

The test results contained in this report refer exclusively to the product(s) presented for testing. The test results do not cover models or products not referred herein. This test report should not be published or duplicated in whole or part without permission from the testing body and the customer.

NTS Product Integrity Laboratory, 5151-47<sup>th</sup> Street N.E. Tel: 403-568-6605, Fax: 403-568-6970



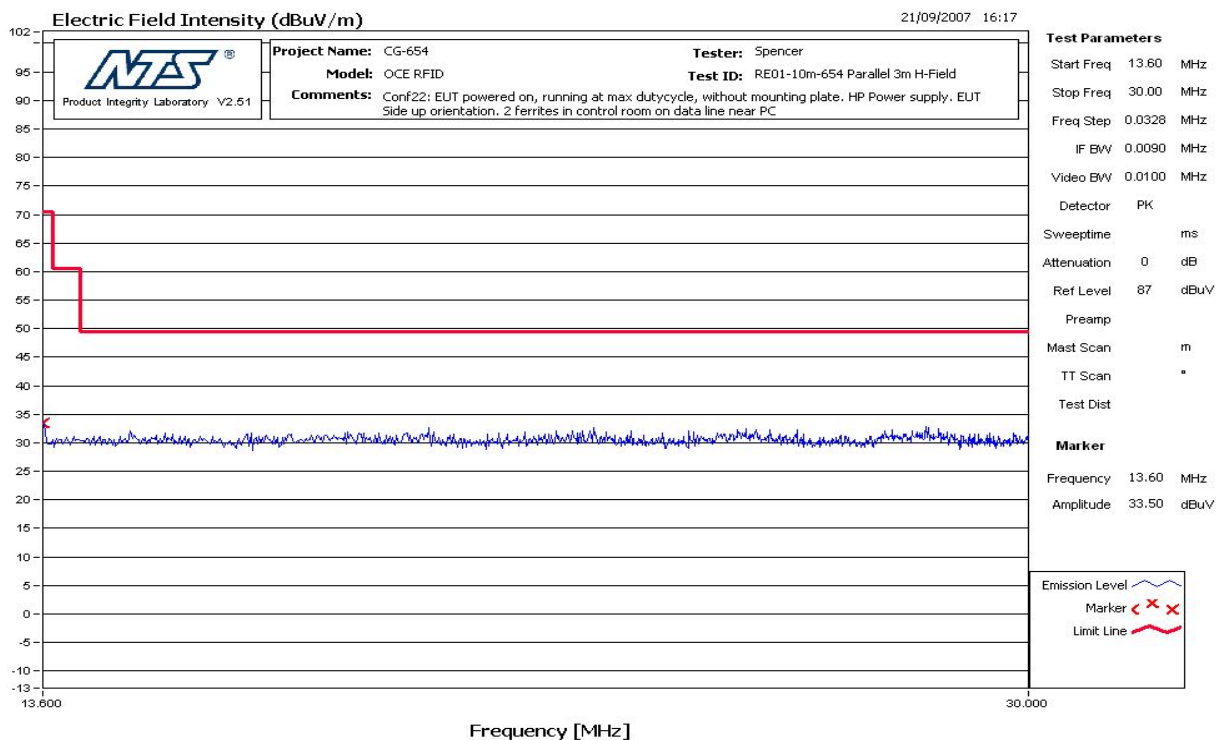
**Figure 5 RE - Parallel - 9kHz - 150kHz - Limit shown is not the limit applied**



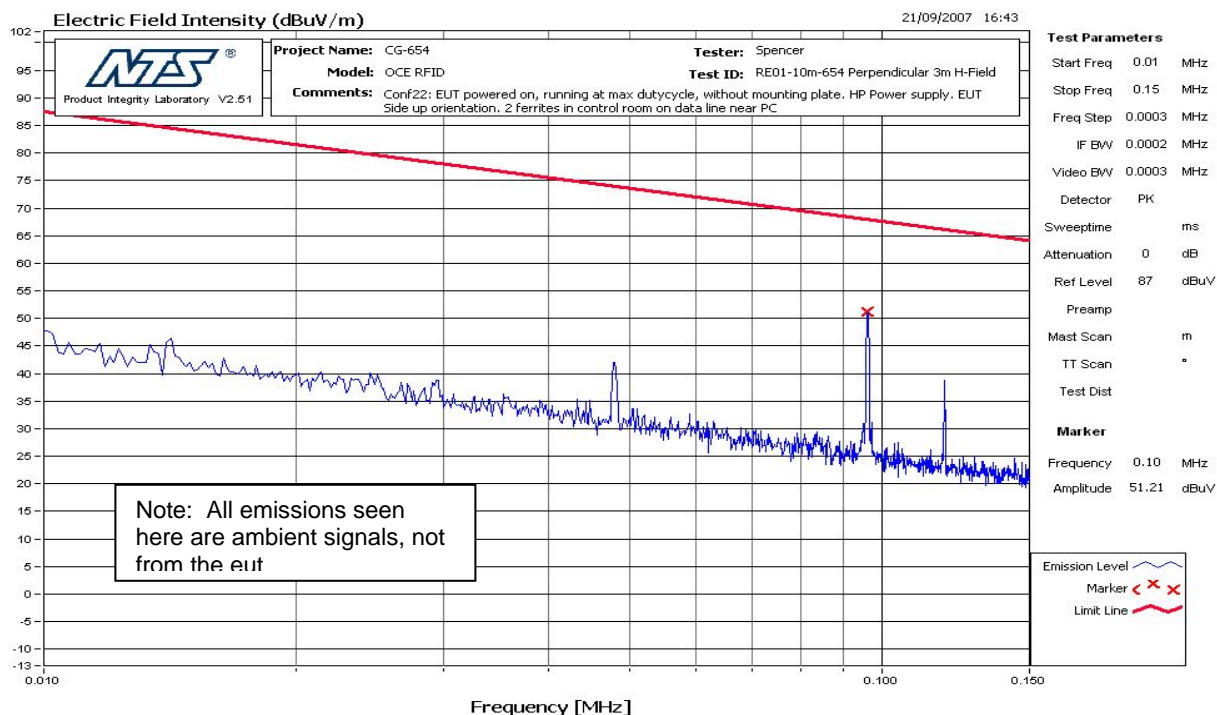
**Figure 6 RE - Parallel - 150kHz - 13.5MHz - Limit shown is not the limit applied**

The test results contained in this report refer exclusively to the product(s) presented for testing. The test results do not cover models or products not referred herein. This test report should not be published or duplicated in whole or part without permission from the testing body and the customer.

NTS Product Integrity Laboratory, 5151-47<sup>th</sup> Street N.E. Tel: 403-568-6605, Fax: 403-568-6970



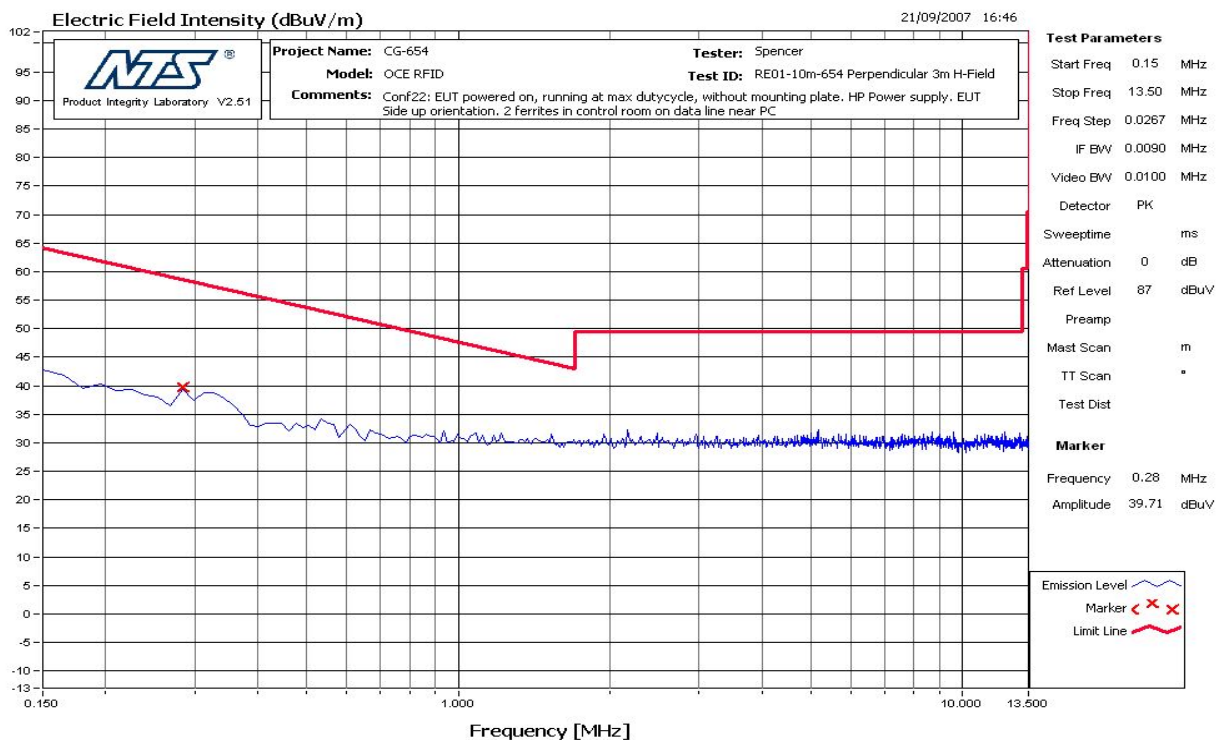
**Figure 7 RE - Parallel – 13.60 MHz – 30.0 MHz – Limit shown is not the limit applied**



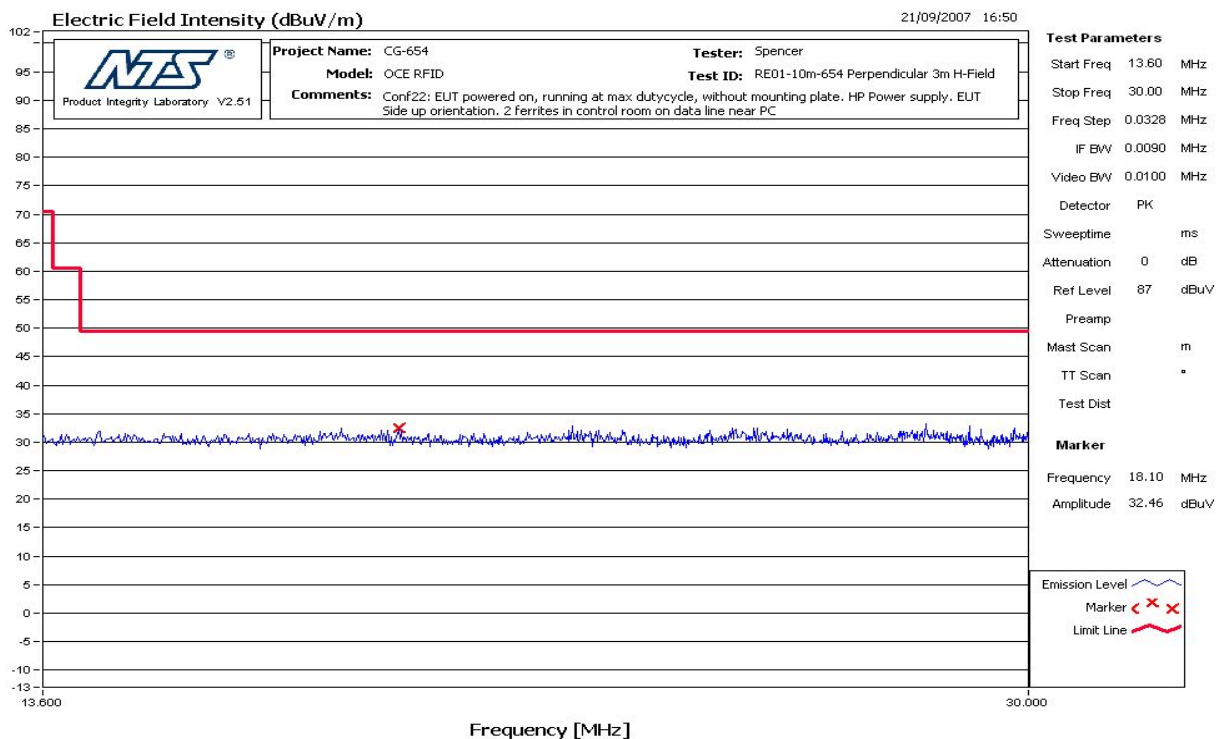
**Figure 8 RE – Perpendicular – 9kHz – 150kHz – Limit shown is not the limit applied**

The test results contained in this report refer exclusively to the product(s) presented for testing. The test results do not cover models or products not referred herein. This test report should not be published or duplicated in whole or part without permission from the testing body and the customer.

NTS Product Integrity Laboratory, 5151-47<sup>th</sup> Street N.E. Tel: 403-568-6605, Fax: 403-568-6970



**Figure 9 RE - Perpendicular – 150kHz – 13.5MHz – Limit shown is not the limit applied**



**Figure 10 RE - Perpendicular – 13.60 MHz – 30.0 MHz – Limit shown is not the limit applied**

The test results contained in this report refer exclusively to the product(s) presented for testing. The test results do not cover models or products not referred herein. This test report should not be published or duplicated in whole or part without permission from the testing body and the customer.

NTS Product Integrity Laboratory, 5151-47<sup>th</sup> Street N.E. Tel: 403-568-6605, Fax: 403-568-6970



## APPENDIX C: FREQUENCY STABILITY

### C.1. Base Standard & Test Basis

|               |   |
|---------------|---|
| Base Standard | CFR Title 47 – Telecommunications, Chapter I - FCC<br>Part 15.225 – Radio Frequency Devices, RSS 210 Issue 2 Appendix 2.6                                 |
| Test Basis    | ANSI C63.4 – 2003<br>Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz |
| Test Method   | ANSI C63.4 - 2003 , 13.1.6 – Frequency Stability Measurements   |

### C.2. Specifications

| Supply Voltage | Temperature | Maximum Tolerance |
|----------------|-------------|-------------------|
| VDC            | °C          | kHz               |
| 24.0           | 20          | 1.356             |
| 27.6 (115%)    | 20          | 1.356             |
| 20.4 (85%)     | 20          | 1.356             |
| 24.0           | -20         | 1.356             |
| 24.0           | -10         | 1.356             |
| 24.0           | 0           | 1.356             |
| 24.0           | 10          | 1.356             |
| 24.0           | 30          | 1.356             |
| 24.0           | 40          | 1.356             |
| 24.0           | 50          | 1.356             |

FCC Part 15.225 limit = 0.01% of fundamental frequency

RSS 210 Appendix 2.6 limit = 100 ppm = 0.01% of fundamental frequency

13.56 MHz \* 0.0001 = 1.356 kHz

### C.3. Deviations

| Deviation Number | Time & Date | Description and Justification of Deviation | Deviation Reference |            |               | Approval |
|------------------|-------------|--|---------------------|------------|---------------|----------|
|                  |             |  | Base Standard       | Test Basis | NTS Procedure |          |
| none             |             |  |                     |            |               |          |

### C.4. Test Procedure for Temperature Variation

The EUT was allowed to stabilize at each temperature for a period of 20 minutes. The transmitter was keyed on and frequency readings were taken via radiated signal to a loop antenna on one minute intervals for ten minutes. The frequency was recorded and the frequency drift calculated from these measurements.

### C.5. Test Procedure for Voltage Variation

The EUT was kept at 20 degrees Celsius for all voltage variation measurements. DC supply voltage was varied by 15% both above and below the rated input level of 24 VDC. The transmitter was keyed on and frequency readings were taken via radiated signal to a loop antenna. The frequency was recorded and the frequency drift calculated from these measurements.

The test results contained in this report refer exclusively to the product(s) presented for testing. The test results do not cover models or products not referred herein. This test report should not be published or duplicated in whole or part without permission from the testing body and the customer.

NTS Product Integrity Laboratory, 5151-47<sup>th</sup> Street N.E. Tel: 403-568-6605, Fax: 403-568-6970

### C.6. Temperature Drift Test Data

| Temperature (° C) | Time       | Frequency Reading (MHz) | Delta (kHz) | Percent  |
|-------------------|------------|-------------------------|-------------|----------|
| 30.2 °            | Initial    | 13.55885972             | -1.1403     | -0.00841 |
| 30.1 °            | 1 minute   | 13.55887132             | -1.1287     | -0.00832 |
| 30.1 °            | 2 minutes  | 13.55886853             | -1.1315     | -0.00834 |
| 30.2 °            | 3 minutes  | 13.55887976             | -1.1202     | -0.00826 |
| 30.1 °            | 4 minutes  | 13.55875952             | -1.2405     | -0.00915 |
| 30.2 °            | 5 minutes  | 13.55883968             | -1.1603     | -0.00856 |
| 30.2 °            | 6 minutes  | 13.55889980             | -1.1002     | -0.00811 |
| 30 °              | 7 minutes  | 13.55887976             | -1.1202     | -0.00826 |
| 30.2 °            | 8 minutes  | 13.55879960             | -1.2004     | -0.00885 |
| 30.2 °            | 9 minutes  | 13.55883968             | -1.1603     | -0.00856 |
| 30.2 °            | 10 minutes | 13.55879960             | -1.2004     | -0.00885 |
| 40.2 °            | Initial    | 13.55879960             | -1.2004     | -0.00885 |
| 40.4 °            | 1 minute   | 13.55879960             | -1.2004     | -0.00885 |
| 40.3 °            | 2 minutes  | 13.55879960             | -1.2004     | -0.00885 |
| 40.1 °            | 3 minutes  | 13.55902004             | -0.9800     | -0.00723 |
| 40.2 °            | 4 minutes  | 13.55881964             | -1.1804     | -0.00870 |
| 40.2 °            | 5 minutes  | 13.55883968             | -1.1603     | -0.00856 |
| 40.2 °            | 6 minutes  | 13.55883968             | -1.1603     | -0.00856 |
| 40.1 °            | 7 minutes  | 13.55879960             | -1.2004     | -0.00885 |
| 40.1 °            | 8 minutes  | 13.55883968             | -1.1603     | -0.00856 |
| 40.3 °            | 9 minutes  | 13.55883968             | -1.1603     | -0.00856 |
| 40.2 °            | 10 minutes | 13.55879960             | -1.2004     | -0.00885 |
| 50.2 °            | Initial    | 13.55871944             | -1.2806     | -0.00944 |
| 50.1 °            | 1 minute   | 13.55871944             | -1.2806     | -0.00944 |
| 50.3 °            | 2 minutes  | 13.55871944             | -1.2806     | -0.00944 |
| 50.2 °            | 3 minutes  | 13.55873948             | -1.2605     | -0.00930 |
| 50.1 °            | 4 minutes  | 13.55873948             | -1.2605     | -0.00930 |
| 50.2 °            | 5 minutes  | 13.55873948             | -1.2605     | -0.00930 |
| 50.3 °            | 6 minutes  | 13.55873948             | -1.2605     | -0.00930 |
| 50.1 °            | 7 minutes  | 13.55873948             | -1.2605     | -0.00930 |
| 50.3 °            | 8 minutes  | 13.55887976             | -1.1202     | -0.00826 |
| 50.2 °            | 9 minutes  | 13.55877956             | -1.2204     | -0.00900 |
| 50.4 °            | 10 minutes | 13.55873948             | -1.2605     | -0.00930 |
| -20.3             | Initial    | 13.55885972             | -1.1403     | -0.00841 |
| -20.4             | 1 minute   | 13.55889980             | -1.1002     | -0.00811 |
| -20.1             | 2 minutes  | 13.55885972             | -1.1403     | -0.00841 |
| -20.2             | 3 minutes  | 13.55885972             | -1.1403     | -0.00841 |
| -20.3             | 4 minutes  | 13.55889980             | -1.1002     | -0.00811 |
| -20.2             | 5 minutes  | 13.55885972             | -1.1403     | -0.00841 |
| -20.4             | 6 minutes  | 13.55897996             | -1.0200     | -0.00752 |
| -20.2             | 7 minutes  | 13.55889980             | -1.1002     | -0.00811 |
| -20.3             | 8 minutes  | 13.55886971             | -1.1303     | -0.00834 |
| -20.1             | 9 minutes  | 13.55885972             | -1.1403     | -0.00841 |
| -20               | 10 minutes | 13.55889980             | -1.1002     | -0.00811 |

The test results contained in this report refer exclusively to the product(s) presented for testing. The test results do not cover models or products not referred herein. This test report should not be published or duplicated in whole or part without permission from the testing body and the customer.

NTS Product Integrity Laboratory, 5151-47<sup>th</sup> Street N.E. Tel: 403-568-6605, Fax: 403-568-6970



| Temperature (° C) | Time       | Frequency Reading (MHz) | Delta (kHz) | Percent  |
|-------------------|------------|-------------------------|-------------|----------|
| -10.1             | Initial    | 13.55893988             | -1.0601     | -0.00782 |
| -10.2             | 1 minute   | 13.55893988             | -1.0601     | -0.00782 |
| -10               | 2 minutes  | 13.55889980             | -1.1002     | -0.00811 |
| -10.3             | 3 minutes  | 13.55893988             | -1.0601     | -0.00782 |
| -10.1             | 4 minutes  | 13.55893988             | -1.0601     | -0.00782 |
| -10.1             | 5 minutes  | 13.55889980             | -1.1002     | -0.00811 |
| -10.2             | 6 minutes  | 13.55893988             | -1.0601     | -0.00782 |
| -10.2             | 7 minutes  | 13.55889980             | -1.1002     | -0.00811 |
| -10.1             | 8 minutes  | 13.55893988             | -1.0601     | -0.00782 |
| -10.3             | 9 minutes  | 13.55889980             | -1.1002     | -0.00811 |
| -10.1             | 10 minutes | 13.55893988             | -1.0601     | -0.00782 |
| -0.4              | Initial    | 13.55893988             | -1.0601     | -0.00782 |
| -0.3              | 1 minute   | 13.55881964             | -1.1804     | -0.00870 |
| -0.2              | 2 minutes  | 13.55891984             | -1.0802     | -0.00797 |
| -0.3              | 3 minutes  | 13.55891984             | -1.0802     | -0.00797 |
| -0.4              | 4 minutes  | 13.55891984             | -1.0802     | -0.00797 |
| -0.3              | 5 minutes  | 13.55891984             | -1.0802     | -0.00797 |
| -0.3              | 6 minutes  | 13.55891984             | -1.0802     | -0.00797 |
| -0.5              | 7 minutes  | 13.55890206             | -1.0979     | -0.00810 |
| -0.4              | 8 minutes  | 13.55891984             | -1.0802     | -0.00797 |
| -0.5              | 9 minutes  | 13.55892017             | -1.0798     | -0.00796 |
| -0.6              | 10 minutes | 13.55895992             | -1.0401     | -0.00767 |
| 10.2 °            | Initial    | 13.55891984             | -1.0802     | -0.00797 |
| 10.1 °            | 1 minute   | 13.55895992             | -1.0401     | -0.00767 |
| 10.1 °            | 2 minutes  | 13.55889980             | -1.1002     | -0.00811 |
| 10.2 °            | 3 minutes  | 13.55885972             | -1.1403     | -0.00841 |
| 10.3 °            | 4 minutes  | 13.55889980             | -1.1002     | -0.00811 |
| 10.2 °            | 5 minutes  | 13.55887976             | -1.1202     | -0.00826 |
| 10.2 °            | 6 minutes  | 13.55914028             | -0.8597     | -0.00634 |
| 10.2 °            | 7 minutes  | 13.55889980             | -1.1002     | -0.00811 |
| 10.2 °            | 8 minutes  | 13.55893988             | -1.0601     | -0.00782 |
| 10.2 °            | 9 minutes  | 13.55893546             | -1.0645     | -0.00785 |
| 10.2 °            | 10 minutes | 13.55889980             | -1.1002     | -0.00811 |
| 20.2 °            | Initial    | 13.55893988             | -1.0601     | -0.00782 |
| 20.1 °            | 1 minute   | 13.55889980             | -1.1002     | -0.00811 |
| 20.1 °            | 2 minutes  | 13.55893988             | -1.0601     | -0.00782 |
| 20.2 °            | 3 minutes  | 13.55897996             | -1.0200     | -0.00752 |
| 20.2 °            | 4 minutes  | 13.55889980             | -1.1002     | -0.00811 |
| 20.2 °            | 5 minutes  | 13.55885972             | -1.1403     | -0.00841 |
| 20.1 °            | 6 minutes  | 13.55885972             | -1.1403     | -0.00841 |
| 20.2 °            | 7 minutes  | 13.55889980             | -1.1002     | -0.00811 |
| 20 °              | 8 minutes  | 13.55885972             | -1.1403     | -0.00841 |
| 20.2 °            | 9 minutes  | 13.55889980             | -1.1002     | -0.00811 |
| 20 °              | 10 minutes | 13.55885972             | -1.1403     | -0.00841 |

The test results contained in this report refer exclusively to the product(s) presented for testing. The test results do not cover models or products not referred herein. This test report should not be published or duplicated in whole or part without permission from the testing body and the customer.

NTS Product Integrity Laboratory, 5151-47<sup>th</sup> Street N.E. Tel: 403-568-6605, Fax: 403-568-6970

#### C.7. Voltage Drift Test Data

| Voltage Variations        | Frequency Reading (MHz) | Delta (kHz) | Percent   |
|---------------------------|-------------------------|-------------|-----------|
| 85 % of 24 VDC = 20.4 VDC | 13.5588998              | -1.1002     | -0.008114 |
| 115 % of VDC = 27.6 VDC   | 13.55906012             | -0.93988    | -0.006931 |

#### C.8. Test Results

The maximum frequency drift from both temperature and voltage variation was found to be 1281 Hz at 50 degrees C (-0.009444% of fundamental frequency, 94.44 ppm).

The EUT is in compliance with FCC Part 15 Subpart C 15.225 and Industry Canada RSS 210 Issue 7 Appendix 2.6 requirements.

#### C.9. Tested By

This testing was conducted in accordance with the ISO 17025:2005 scope of accreditation, table 1; Quality Manual.

Name: James MacKay  
Function: EMC Technologist

The test results contained in this report refer exclusively to the product(s) presented for testing. The test results do not cover models or products not referred herein. This test report should not be published or duplicated in whole or part without permission from the testing body and the customer.

NTS Product Integrity Laboratory, 5151-47<sup>th</sup> Street N.E. Tel: 403-568-6605, Fax: 403-568-6970

## APPENDIX D: OCCUPIED BANDWIDTH

### D.1. Base Standard & Test Basis

|               |                               |
|---------------|-------------------------------|
| Base Standard | RSS Gen Issue 2 June 2007     |
| Test Basis    | RSS Gen Issue 2 section 4.6.1 |
| Test Method   | RSS Gen Issue 2 section 4.6.1 |

### D.2. Specifications

The 99% occupied BW is measured and used to determine the emission designator

### D.3. Deviations

| Deviation Number | Time & Date | Description and Justification of Deviation | Deviation Reference |            |               | Approval |
|------------------|-------------|--|---------------------|------------|---------------|----------|
|                  |             |  | Base Standard       | Test Basis | NTS Procedure |          |
| None             |             |  |                     |            |               |          |

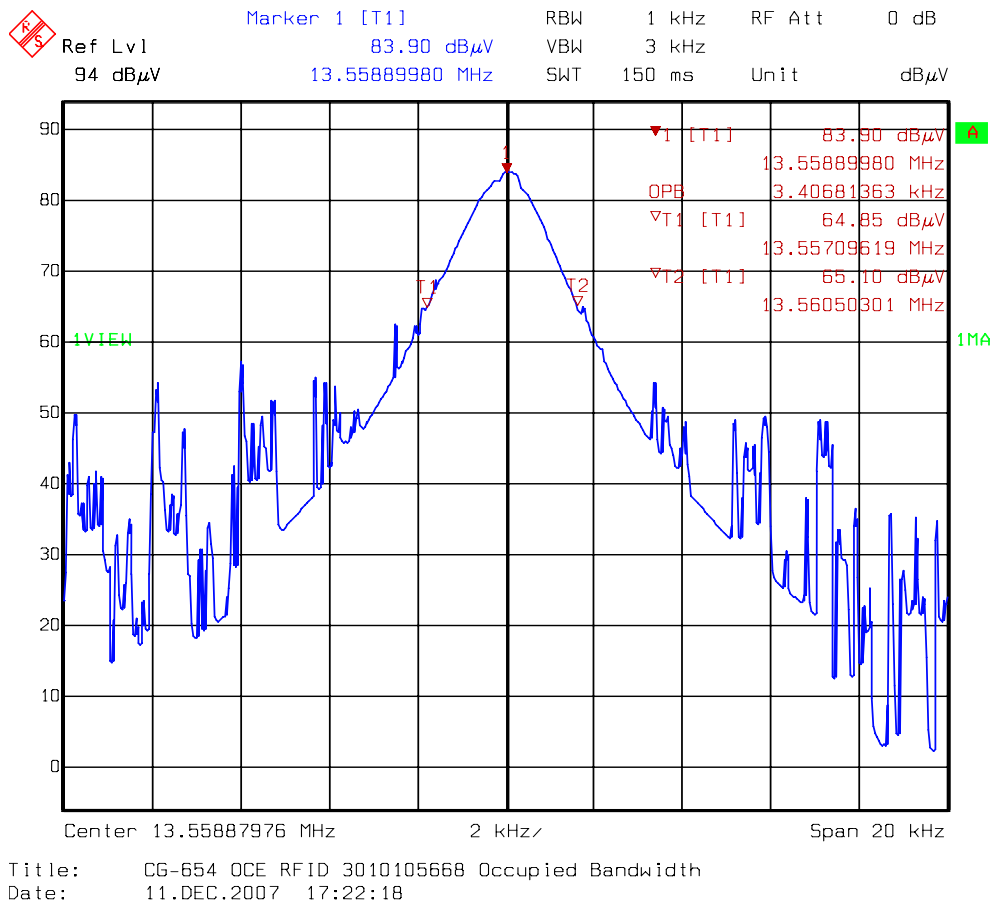
### D.4. Test Results

Compliant. The 99% occupied bandwidth is 3.407 KHz

The test results contained in this report refer exclusively to the product(s) presented for testing. The test results do not cover models or products not referred herein. This test report should not be published or duplicated in whole or part without permission from the testing body and the customer.

NTS Product Integrity Laboratory, 5151-47<sup>th</sup> Street N.E. Tel: 403-568-6605, Fax: 403-568-6970

## D.5. Test Data



## D.6. Tested By

This testing was conducted in accordance with the ISO 17025:2005 scope of accreditation, table 1; Quality Manual.

Name: Spencer Watson  
Function: EMC Technologist

The test results contained in this report refer exclusively to the product(s) presented for testing. The test results do not cover models or products not referred herein. This test report should not be published or duplicated in whole or part without permission from the testing body and the customer.

NTS Product Integrity Laboratory, 5151-47<sup>th</sup> Street N.E. Tel: 403-568-6605, Fax: 403-568-6970

## APPENDIX E: TEST EQUIPMENTS

### E.1. Radiated Emissions 30 MHz – 1 GHz Measurement Equipment

| Description                             | Manufacturer                              | Type/Model                | Asset #           | Cal Due | Cal Date |
|---|---|---------------------------|-------------------|---------|----------|
| <b>10m ANECHOIC CHAMBER</b>             |   |                           |                   |         |          |
| Bilog Antenna                           | <input checked="" type="checkbox"/> Chase | CBL 6112B                 | CG0314            | 24SEP07 | 24AUG06  |
| RF Cable                                | Suhner Sucoflex                           | Ferrite bead loaded cable | CG0398            | 13APR08 | 13APR06  |
| Digital Barometer / Thermometer         | Cole-Parmer                               | 1870                      | CG0728            | 19JUN08 | 19JUN07  |
| <b>CONTROL ROOM</b>                     |   |                           |                   |         |          |
| Test Receiver                           | Rohde & Schwarz                           | ESMI                      | CG0433/<br>CG0434 | 27FEB08 | 27FEB07  |
| Mast Controller                         | EMCO                                      | 2090                      | CG0179            | N/A     | N/A      |
| Multi Device Controller TT1 (Turntable) | EMCO                                      | 2090                      | CG0178            | N/A     | N/A      |
| RF 10m East site Link                   |   |                           |                   | 13APR08 | 13APR06  |
| - Cable 1                               | Suhner Sucoflex                           | NA                        | CG0690            |         |          |
| - Cable 2                               | Suhner Sucoflex                           | NA                        | CG0634            |         |          |
| - Cable 3                               | Suhner Sucoflex                           | NA                        | CG0660            |         |          |
| - Cable 4                               | Suhner Sucoflex                           | NA                        | CG0661            |         |          |
| - Amplifier                             | Hewlett Packard                           | 8447F                     | CG0177            |         |          |

The test results contained in this report refer exclusively to the product(s) presented for testing. The test results do not cover models or products not referred herein. This test report should not be published or duplicated in whole or part without permission from the testing body and the customer.

NTS Product Integrity Laboratory, 5151-47<sup>th</sup> Street N.E. Tel: 403-568-6605, Fax: 403-568-6970

## E.2. Radiated H-Field Emissions 10kHz – 30MHz Measurement Equipment

| Descriptions                          | Manufacturer    | Type/Model | Asset #           | Cal Due | Cal Date |
|---------------------------------------|-----------------|------------|-------------------|---------|----------|
| <b>10m ANECHOIC CHAMBER</b>           |                 |            |                   |         |          |
| Loop Antenna (Rx)<br>10 KHz – 30 MHz  | Rohde & Schwarz | HFH2-Z2    | CG0701            | 02JUL08 | 02JUL07  |
| E-field link Cable<br>10 KHz – 35 MHz | Sucoflex        | N/A        | CG0667            | 8JAN08  | 8JAN06   |
| Digital Barometer /<br>Thermometer    | Cole-Parmer     | 1870       | CG0728            | 19JUN08 | 19JUN07  |
| <b>CONTROL ROOM</b>                   |                 |            |                   |         |          |
| Test Receiver                         | Rohde & Schwarz | ESMI       | CG0433/<br>CG0434 | 27FEB08 | 27FEB07  |
| Cable to Receiver                     | NA              | NA         | CG0685            | 18JAN08 | 18JAN06  |

## E.3. Frequency Stability Measurement Equipment

| Descriptions                                   | Manufacturer          | Type/Model | Asset #    | Cal Due | Cal Date |
|--|-----------------------|------------|------------|---------|----------|
| Temperature Chamber                            | Thermotron Industries | S-16C      | CG0001     | NA      | NA       |
| Data Acquisition/<br>Switch unit               | Hewlett Packard       | 34970A     | CG0016     | 27NOV07 | 27NOV06  |
| Test receiver Spectrum<br>Analyzer 9k-40GHz    | Rohde & Schwarz       | FSEK-20    | CG0118     | 19JUN08 | 19JUN07  |
| DC Power Supply                                | Harrison              | 6206B      | S/N:6E6028 | NA      | NA       |
| RMS Multimeter                                 | Fluke                 | 87         | CG0383     | 29JAN08 | 29JAN07  |
| EMI Passive Loop<br>Antenna 1 kHz to 30<br>MHz | EMCO                  | 6509       | CG0095     | NA      | NA       |

## E.4. Occupied Bandwidth Measurement Equipment

| Descriptions                                   | Manufacturer    | Type/Model | Asset # | Cal Due | Cal Date |
|--|-----------------|------------|---------|---------|----------|
| Test receiver Spectrum<br>Analyzer 9k-40GHz    | Rohde & Schwarz | FSEK-20    | CG0118  | 19JUN08 | 19JUN07  |
| EMI Passive Loop<br>Antenna 1 kHz to 30<br>MHz | EMCO            | 6509       | CG0095  | NA      | NA       |

The test results contained in this report refer exclusively to the product(s) presented for testing. The test results do not cover models or products not referred herein. This test report should not be published or duplicated in whole or part without permission from the testing body and the customer.

NTS Product Integrity Laboratory, 5151-47<sup>th</sup> Street N.E. Tel: 403-568-6605, Fax: 403-568-6970

**END OF DOCUMENT**

---

The test results contained in this report refer exclusively to the product(s) presented for testing. The test results do not cover models or products not referred herein. This test report should not be published or duplicated in whole or part without permission from the testing body and the customer.

NTS Product Integrity Laboratory, 5151-47<sup>th</sup> Street N.E. Tel: 403-568-6605, Fax: 403-568-6970