

# Electromagnetic Compatibility Test Report

*Prepared in accordance with*

**FCC Part 15, RSS-210**

On

## Portable Biometric Identification Terminal

**DSV3-EP**

Datastrip Products, Inc.  
1 Waterview Drive  
Shelton, CT 06484

Prepared by:

**TUV Rheinland of North America, Inc.**

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|  |  |  |                       |
|--|--|--|-----------------------|
| <b>Client:</b>   |  | Datastrip Products, Inc.<br>1 Waterview Drive<br>Shelton, CT 06484                           |                       |
|  |  | Scott Robinson<br>(203) 225-9184 Fax: (203)<br>225-9260<br>Email:<br>srobinson@datastrip.net |                       |
| <b>Identification:</b>   | Portable Biometric Identification Terminal   | <b>Serial No.:</b>   | DSV3EPAK083900052     |
| <b>Test item:</b>  | DSV3-EP  | <b>Date tested:</b>  | 30 June - 3 July 2009 |
| <b>Testing location:</b>   | TUV Rheinland of North America<br>762 Park Avenue<br>Youngsville, NC 27596-9470<br>U.S.A.  | Tel: (919) 554-3668<br>Fax: (919) 554-3542   |                       |
| <b>Test specification:</b>   | <b>Emissions:</b> FCC Part 15, Subpart C, RSS-210 Issue 7:<br>FCC Parts 15.205, 15.209, 15.215(b),<br>FCC Part 15.225 and RSS-210 A2.6,<br>FCC Part 15.225(a) and RSS-210 A2.6(a),<br>FCC Part 15.225(b) and RSS-210 A2.6(b),<br>FCC Part 15.225(c) and RSS-210 A2.6(c),<br>FCC Part 15.225(d) and RSS-210 A2.6(d),<br>FCC Part 15.225(e) and RSS-210 A2.6,<br>FCC Part 15.225(f) and RSS-210 Part 2.5,<br>FCC Part 15.215 (c) and RSS-210 |  |                       |
| <b>Test Result</b>   | <b>The above product was found to be Compliant to the above test standard(s)</b>   |  |                       |
| <b>tested by:</b> Mark Ryan  | <b>reviewed by:</b> Robert Richards  |  |                       |
| 9 September 2009<br><i>Date</i>  | <i>Signature</i>   | 9 September 2009<br><i>Date</i>  | <i>Signature</i>      |
| <b>Other Aspects:</b>  | <b>None</b>  |  |                       |
| Abbreviations: OK, Pass, Compliant, Complies = passed<br>Fail, Not Compliant, Does Not Comply = failed<br>N/A = not applicable |  |  |                       |
| <b>FC</b>  | <b>NVLAP</b><br>NVLAP Lab Code (200094-0)  | <b>Industry Canada</b>   |                       |
| <b>90552 and 100881</b>  |  | <b>IC-2932H</b>  |                       |

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## 1 General Information

### 1.1 Scope

This report is intended to document the status of conformance with the requirements of the FCC Part 15, RSS-210 based on the results of testing performed on 30 June - 3 July 2009 on the Portable Biometric Identification Terminal, Model No. DSV3-EP, manufactured by Datastrip Products, Inc.. This report only applies to the specific samples tested under the stated test conditions. It is the responsibility of the manufacturer to assure that additional production units of this model are manufactured with identical or EMI equivalent electrical and mechanical components. This report is further intended to document changes and modifications to the EUT throughout its life cycle. All documentation will be included as a supplement.

### 1.2 Purpose

Testing was performed to evaluate the EMC performance of the EUT (Equipment Under Test) in accordance with the applicable requirements, procedures, and criteria defined in the application of regulations and application of standards listed in this report.

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### 1.3 Summary of Test Results

| <b>Applicant</b>                        | Datastrip Products, Inc.<br>1 Waterview Drive<br>Shelton, CT 06484 | <b>Tel</b>   | (203) 225-9184 | <b>Contact</b>  | Scott Robinson          |  |
|---|--|--|----------------|---|-------------------------|--|
|   |  | <b>Fax</b>   | (203) 225-9260 | <b>e-mail</b>   | srobinson@datastrip.net |  |
| <b>Description</b>                      |  | <b>Model Number</b>  |                | DSV3-EP   |                         |  |
| <b>Serial Number</b>                    |  | <b>Test Voltage/Freq.</b>  |                | 120VAC / 60Hz   |                         |  |
| <b>Test Date Completed:</b>             |  | <b>Test Engineer</b>   |                | Mark Ryan   |                         |  |
| <b>Standards</b>                        |  | <b>Description</b>   |                | <b>Severity Level or Limit</b>                                    | <b>Criteria</b>         |  |
| FCC Part 15, Subpart C Standard         |  | Radio Frequency Devices-Subpart C: Intentional Radiators   |                | See called out basic standards below                              | See Below               |  |
| RSS-210 Issue 7 Standard                |  | Low-Power Licence-exempt Radiocommunication Devices Category I Equipment                                     |                | See called out basic standards below                              | See Below               |  |
| FCC Parts 15.205, 15.209, 15.215(b)     |  | Radiated Emissions   |                | Below limit of sections 15.205, 15.209(a) and 15.109(g) - Class B | Below Limit             |  |
| FCC Part 15.207                         |  | Conducted Emissions  |                | Below limit of section 15.207(a) and 15.107(a) - Class B          | Below Limit             |  |
| FCC Part 15.215 (c) RSS-210             |  | 20 dB Bandwidth 99% Power Bandwidth  |                | Contained within the Frequency Band                               | Within Limit            |  |
| FCC Part 15.225 and RSS-210 A2.6        |  | Operation within the band 13.110 – 14.01 MHz   |                | See called out basic standards below                              | Below Limit             |  |
| FCC Part 15.225(a) and RSS-210 A2.6(a)  |  | Field strength Emissions within 13.553 – 13.567 MHz  |                | 15.848 $\mu$ V/m at 30m<br>84 dB $\mu$ V/m at 30m                 | Below Limit             |  |
| FCC Part 15.225(b) and RSS-210 A2.6(b)  |  | Field strength Emissions within 13.410 – 13.553 MHz and 13.567 - 13.710                                      |                | 334 $\mu$ V/m at 30m<br>50.5 dB $\mu$ V/m at 30m                  | Below Limit             |  |
| FCC Part 15.225(c) and RSS-210 A2.6(c)  |  | Field strength Emissions within 13.110 – 13.410 MHz and 13.710 - 14.010                                      |                | 106 $\mu$ V/m at 30m<br>40.5 dB $\mu$ V/m at 30m                  | Below Limit             |  |
| FCC Part 15.225(d) and RSS-210 A2.6(d)  |  | Field strength outside the 13.110 - 14.010 MHz band  |                | Shall not exceed the limits of FCC Part 15.209                    | Below Limit             |  |
| FCC Part 15.225(e) and RSS-210 A2.6     |  | Frequency tolerance over -20°C to +50°C at normal power supply and for 85% and 115% of rated supply voltage. |                | 0.01% of operating frequency                                      | Within Limit            |  |
| FCC Part 15.225(f) and RSS-210 Part 2.5 |  | Frequency Powered Tags   |                | Not Applicable: Tags are not powered.                             | NA                      |  |
|   |  |  |                |   | Complies                |  |

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## 2 Laboratory Information

### 2.1.1 US Federal Communications Commission

TUV Rheinland of North America located at 762 Park Avenue, Youngsville, NC 27596-9470 is accredited by the commission for performing testing services for the general public on a fee basis. This laboratory test facilities have been fully described in reports submitted to and accepted by the FCC (Registration No 90552 and 100881). The laboratory scope of accreditation includes: Title 47 CFR Part 15, and 18. The accreditation is updated every 3 years.

### 2.1.2 NIST / NVLAP

Program, which is administered under the auspices of the National Institute of Standards and Technology. The laboratory has been assessed and accredited in accordance with ISO Standard 17025:2005 (Lab code: 200094-0). The scope of laboratory accreditation includes emission and immunity testing. The accreditation is updated annually.

### 2.1.3 Industry Canada

Registration No.: IC-2932H The OATS has been accepted by Industry Canada to perform testing to 3 and to 10m, based on the test procedures described in ANSI C63.4-2003.

### 2.1.4 Japan – VCCI

The Voluntary Control Council for Interference by Information Technology Equipment (VCCI) is a group that consists of Information Technology Equipment (ITE) manufacturers and EMC test laboratories. The purpose of the Council is to take voluntary control measures against electromagnetic interference from Information Technology Equipment, and thereby contribute to the development of a socially beneficial and responsible state of affairs in the realm of Information Technology Equipment in Japan. TUV Rheinland at the 762 Park Ave. Youngsville, N.C 27596 address has been assessed and approved in accordance with the Regulations for Voluntary Control Measures. (Registration No. R-1174, R-1679, C-1790 and C-1791).

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### **2.1.5 Sample Calculation – radiated & conducted emissions**

The field strength is calculated by subtracting the Amplifier Gain and adding the Cable Loss and Antenna Correction Factor to the measured reading. The basic equation is as follows:

$$\text{Field Strength (dB}\mu\text{V/m)} = \text{RAW} - \text{AMP} + \text{CBL} + \text{ACF}$$

Where: RAW = Measured level before correction (dB $\mu$ V)

AMP = Amplifier Gain (dB)

CBL = Cable Loss (dB)

ACF = Antenna Correction Factor (dB/m)

$$\mu\text{V/m} = 10^{\frac{\text{dB}\mu\text{V/m}}{20}}$$

### **2.1.6 Sample radiated emissions calculation @ 30 MHz**

**Measurement +Antenna Factor–Amplifier Gain+Cable loss=Radiated Emissions (dBuV/m)**

$$25 \text{ dBuV/m} + 17.5 \text{ dB} - 20 \text{ dB} + 1.0 \text{ dB} = 23.5 \text{ dBuV/m}$$

## **2.2 Measurement Uncertainty Emissions**

|  | $U_{\text{lab}}$ | $U_{\text{cispr}}$ |
|--|------------------|--------------------|
| <b>Radiated Disturbance @ 10m</b>              |                  |                    |
| 30 MHz – 1,000 MHz                             | 3.3 dB           | 5.2 dB             |
| <b>Conducted Disturbance @ Mains Terminals</b> |                  |                    |
| 150 kHz – 30 MHz                               | 1.18 dB          | 3.6 dB             |
| <b>Disturbance Power</b>                       |                  |                    |
| 30 MHz – 300 MHz                               | 3.88 dB          | 4.5 dB             |

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### Measurement Uncertainty Immunity

The estimated combined standard uncertainty for harmonic current and flicker measurements is  $\pm 2.5\%$

The estimated combined standard uncertainty for ESD immunity measurements is  $4.10\%$

The estimated combined standard uncertainty for radiated immunity measurements is  $\pm 2.05\text{ dB}$

The estimated combined standard uncertainty for EFT fast transient immunity measurements is  $\pm 2.92\%$

The estimated combined standard uncertainty for surge immunity measurements is  $\pm 2.92\%$

The estimated combined standard uncertainty for conducted immunity measurements is  $\pm 1.83$

The estimated combined standard uncertainty for power frequency magnetic field immunity measurements is  $\pm 5.8\%$

The estimated combined standard uncertainty for voltage variation and interruption measurements is  $\pm 1.74\%$

The expanded uncertainty at a level of 95% confidence is obtained by multiplying the combined standard uncertainty by a coverage factor of 2. Compliance criteria are not based on measurement uncertainty.

### 2.3 Calibration Traceability

All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST). Measurement method complies with ANSI/NCSL Z540-1-1994 and ISO Standard 17025:2005. Equipment calibration records are kept on file at the test facility.

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## 2.4 Measurement Equipment Used

| Equipment              | Manufacturer                | Model #   | Serial/Inst # | Last Cal dd/mm/yy | Next Cal dd/mm/yy | Test |
|------------------------|-----------------------------|-----------|---------------|-------------------|-------------------|------|
| Ant. BiconiLog         | Chase                       | CBL6140A  | 1108          | 13-Jun-08         | 13-Jun-10         | RE   |
| Antenna Loop           | EMCO                        | 6502      | 3336          | 17-Jun-08         | 17-Jun-10         | RE   |
| Receiver, EMI          | Rohde & Schwarz             | ESIB40    | 100043        | 29-Jun-09         | 29-Jun-10         | RE   |
| Cable, Coax            | Andrew                      | FSJ1-50A  | 003           | 22-Jan-09         | 22-Jan-10         | RE   |
| Cable, Coax            | Andrew                      | FSJ1-50A  | 030           | 22-Jan-09         | 22-Jan-10         | RE   |
| Cable, Coax            | Andrew                      | FSJ1-50A  | 045           | 22-Jan-09         | 22-Jan-10         | RE   |
| Spectrum Analyzer      | Agilent Tec.                | E7405A    | US39440157    | 02-Dec-08         | 02-Dec-09         | CE   |
| LISN 15-18 (NSLK 8126) | Schwarzbeck Mess-Electronik | NSLK 8126 | 003885        | 02-Feb-09         | 02-Feb-10         | CE   |
| Transient Limiter      | Schaffner                   | CFL-9206  | 1649          | 23-Jan-09         | 23-Jan-10         | CE   |
| Cable, Coax            | Pasternack                  | RG-223    | 051           | 22-Jan-09         | 22-Jan-10         | CE   |
| Meter, Multi           | Fluke                       | 179       | 90580752      | 02-Dec-08         | 02-Dec-09         | ALL  |
| AC Source              | Elgar                       | SW1750A   | 0114A1040     | 03-Dec-08         | 03-Dec-09         | PLIH |
| Isolation Transformer  | Solar Electronics           | 6220-1A   | None          | CNR II            | CNR II            | PLIH |

Note: CE = Conducted Emissions, CI= Conducted Immunity, DP=Disturbance Power, EFT=Electrical Fast Transients, ESD = Electrostatic Discharge, FLI=Flicker, HAR=Harmonics, MF=Magnetic Field Immunity, RE=Radiated Emissions, RI=Radiated Immunity, SI=Surge Immunity, VDSI=Voltage Dips and Short Interruptions, PLIH=Power Line Inter-Harmonics

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## 3 Product Information

### 3.1 Product Description

The DSV3® Series of products are portable, handheld computers specifically designed for security, law enforcement, border control and positive I.D. verification applications. They feature the ability to interface with Contact-less Smart Cards. An integrated fingerprint sensor enables biometric verification of identity.

The apparatus has two antennas that alternate at a rate of 2 times a second looking for a tag. Both antennas will be active (not transmitting at the same time) for these tests. The antenna that gets the strongest return from the tag will take precedence. The scans will be made without a RFID tag. Therefore, both antennas will alternate and therefore the worst case emissions will be measured automatically, by default. Refer to the Operational Description document for more details of this process.

### 3.2 Equipment Modifications

No modifications were needed to bring product into compliance.

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## 4 Emissions

### 4.1 Radiated Emissions

This test measures the electromagnetic levels of spurious signals generated by the EUT that radiated from the EUT and may affect the performance of other nearby electronic equipment.

Except for a fraction of a second pause, The EUT is transmitting at all times.

#### 4.1.1 Over View of Test

|                        |   |             |                           |                      |                   |                 |          |  |
|------------------------|---|-------------|---------------------------|----------------------|-------------------|-----------------|----------|--|
| <b>Results</b>         | <b>Complies</b> (as tested per this report)                             |             |                           | <b>Date</b>          | 03/06/09          |                 |          |  |
| <b>Standard</b>        | FCC Parts 15.205, 15.209, 15.215(b)                                     |             |                           |                      |                   |                 |          |  |
| <b>Product Model</b>   | DSV3-EP   |             |                           | <b>Serial#</b>       | DSV3EPAK083900052 |                 |          |  |
| <b>Configuration</b>   | See test plan for details   |             |                           |                      |                   |                 |          |  |
| <b>Test Set-up</b>     | Tested on 10m O.A.T.S. placed on turn-table, see test plans for details |             |                           |                      |                   |                 |          |  |
| <b>EUT Powered By</b>  | 120 VAC 60Hz  | <b>Temp</b> | 21°C                      | <b>Humidity</b>      | 31%               | <b>Pressure</b> | 1004mbar |  |
| <b>Frequency Range</b> | 30 MHz to 2 GHz   |             |                           |                      |                   |                 |          |  |
| <b>Perf. Criteria</b>  | . (Below Limit)   |             | <b>Perf. Verification</b> | Readings Under Limit |                   |                 |          |  |
| <b>Mod. to EUT</b>     | None  |             | <b>Test Performed By</b>  | Dave Hollis          |                   |                 |          |  |

#### 4.1.2 Test Procedure

Radiated and FCC emissions tests were performed using the procedures of ANSI C63.4 including methods for signal maximizations and EUT configuration. The photos included with the report show the EUT in its maximized configuration.

The frequency range from 30 MHz to 2GHz was investigated for radiated emissions.

Radiated emission testing was first performed at a distance of 3 meters in the semi-anechoic chamber in order to identify the specific frequencies for which these measurements will be made on the 10 m OATS. The EUT employs two antenna systems that are constantly alternating, the values in this report will be worst case emissions (refer to section 3.1 of this report).

#### 4.1.3 Deviations

There were no deviations from the test methodology listed in the test plan for the radiated emission test.

#### 4.1.4 Final Test

All final radiated emissions measurements were below (in compliance) the limits.

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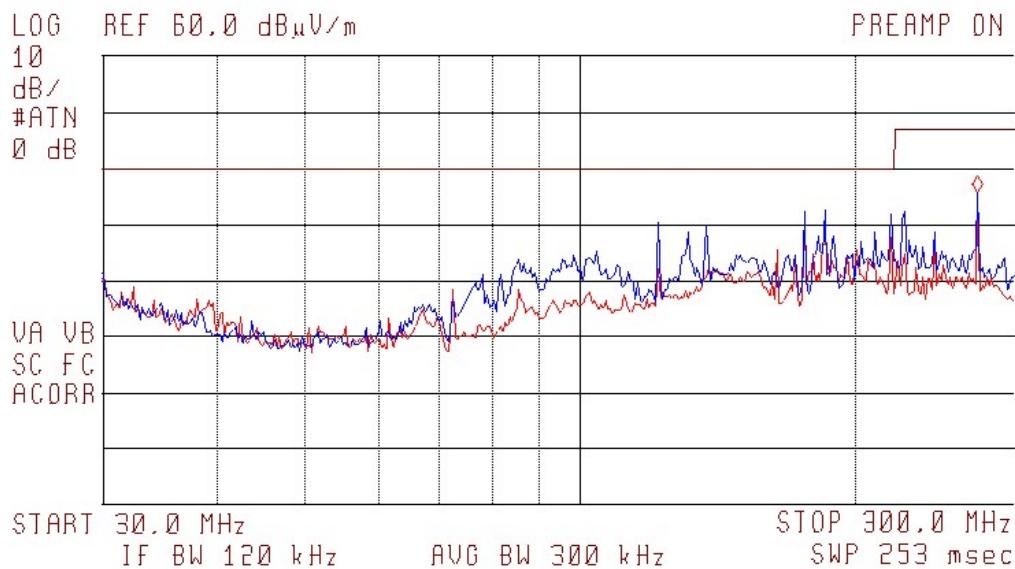
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#### 4.1.5 Final Graphs

NOTES:

**Radiated Emissions Prescan at 30 MHz to 300 MHz**  
**Vertical / Horizontal** 12:30:01 MAR 27, 2009  
DATASTRIP MODEL DSV3-EPACTV DET: PEAK  
MEAS DET: PEAK QP AVG  
MKR 277.5 MHz  
35.61 dB $\mu$ V/m

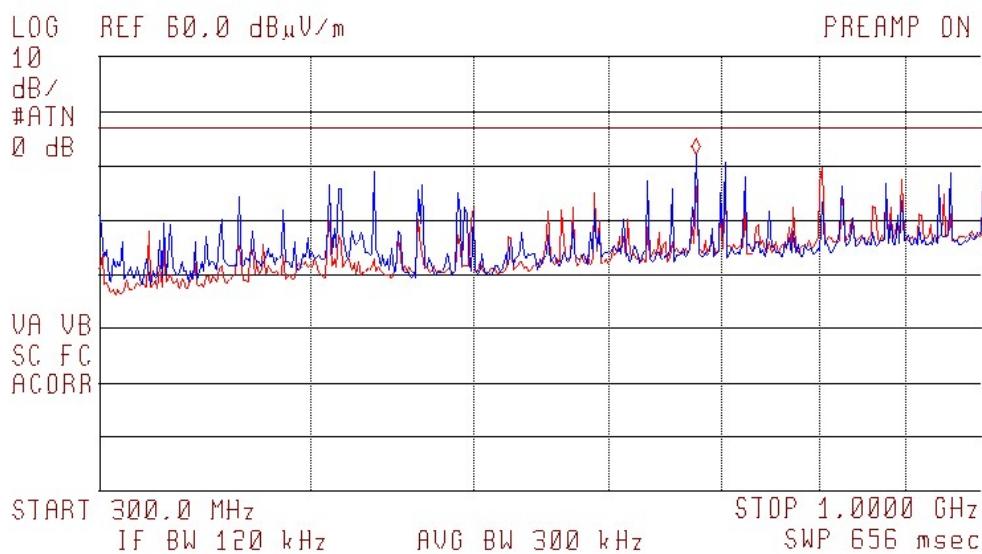
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## NOTES:

**Radiated Emissions Prescan at 300 MHz to 1 GHz**  
**Vertical / Horizontal**[60] 12:31:54 MAR 27, 2009  
DATASTRIP MODEL DSV3-EPACTV DET: PEAK  
MEAS DET: PEAK QP AVG  
MKR 704.5 MHz  
41.96 dB $\mu$ V/m

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#### 4.1.6 Pre Scan Data

| Meas #  | Freq (MHz) | Peak  | Antenna Polarization | Angle (degrees) | Antenna Height (meters) | Comment |
|---|------------|-------|----------------------|-----------------|-------------------------|---------|
| 1   | 125.6875   | 31.20 | Vertical             | 180             | 1.50                    | Prescan |
| 2   | 192.0500   | 32.35 | Vertical             | 180             | 1.50                    | Prescan |
| 3   | 276.5250   | 36.77 | Vertical             | 180             | 1.50                    | Prescan |
| 4   | 452.5125   | 39.81 | Vertical             | 180             | 1.50                    | Prescan |
| 5   | 703.9000   | 43.51 | Vertical             | 180             | 1.50                    | Prescan |
| 6   | 733.1750   | 41.18 | Vertical             | 180             | 1.50                    | Prescan |
| 7   | 1106.1825  | 42.23 | Vertical             | 180             | 1.50                    | Prescan |
| 8   | 1233.1250  | 39.72 | Vertical             | 180             | 1.50                    | Prescan |
| 9   | 1466.4250  | 44.73 | Vertical             | 180             | 1.50                    | Prescan |
| 10  | 1532.8000  | 43.95 | Horizontal           | 180             | 1.50                    | Prescan |
| 11  | 1833.0000  | 46.82 | Vertical             | 180             | 1.50                    | Prescan |
| Tested by: David Hollis   |            |       |                      |                 |                         |         |
| TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 |            |       |                      |                 |                         |         |
| RE22_B.xls Revised 21OCT05  |            |       |                      |                 |                         |         |

#### 4.1.7 Final Tabulated Data

| Radiated Emissions Measurements |   |       |            |         |                  |              | PRESCAN or FINAL:   |          | Date: 3/27/09        |                 |                         |                   |
|---------------------------------|---|-------|------------|---------|------------------|--------------|---|----------|----------------------|-----------------|-------------------------|-------------------|
| Standard:                       | EN 55022: 2006 Class B/FCC Part 15.109(g) |       |            |         |                  |              | PRESCAN or FINAL:   | Final    | Date: 3/27/09        |                 |                         |                   |
| Device Tested:                  | Datastrip Model DSV3_EP                   |       |            |         |                  |              | Distance:   | 10m      |                      |                 |                         |                   |
| Measured Level                  |   |       |            |         |                  |              |   |          |                      |                 |                         |                   |
| Meas #                          | Freq (MHz)                                | Peak  | Quasi-Peak | Average | Quasi-Peak Limit | Quasi-Peak Δ | Antenna + Cable Correction Factor (included in measured levels) | Result   | Antenna Polarization | Angle (degrees) | Antenna Height (meters) | Comment           |
| 1                               | 125.6875                                  | 33.69 | 26.07      | 23.68   | 30.00            | -3.93        | 13.08   | Complied | Vertical             | 360             | 1.00                    | Maximum Emissions |
| 2                               | 192.0250                                  | 29.19 | 24.20      | 17.69   | 30.00            | -5.80        | 11.62   | Complied | Vertical             | 360             | 1.00                    |                   |
| 3                               | 276.5400                                  | 31.60 | 29.76      | 29.04   | 37.00            | -7.24        | 15.56   | Complied | Vertical             | 360             | 1.50                    |                   |
| 4                               | 452.5120                                  | 35.16 | 32.95      | 31.31   | 37.00            | -4.05        | 19.42   | Complied | Vertical             | 360             | 1.50                    |                   |
| 5                               | 703.9000                                  | 35.41 | 32.79      | 31.14   | 37.00            | -4.21        | 22.71   | Complied | Vertical             | 360             | 2.20                    |                   |
| 6                               | 733.1625                                  | 35.00 | 32.68      | 30.04   | 37.00            | -4.32        | 22.70   | Complied | Vertical             | 360             | 2.20                    |                   |
| Avg Limit                       |   |       |            |         |                  |              |   |          |                      |                 |                         |                   |
| 7                               | 1106.0000                                 | 48.38 | 29.66      | 24.41   | 43.51            | -19.10       | 27.10   | Complied | Vertical             | 360             | 2.20                    |                   |
| 8                               | 1233.1250                                 | 40.11 | 30.29      | 26.73   | 43.51            | -16.78       | 28.22   | Complied | Vertical             | 360             | 2.00                    |                   |
| 9                               | 1491.5513                                 | 43.34 | 33.45      | 29.91   | 43.51            | -13.60       | 30.78   | Complied | Vertical             | 360             | 2.00                    |                   |
| 10                              | 1534.3338                                 | 43.47 | 33.99      | 30.36   | 43.51            | -13.15       | 31.13   | Complied | Vertical             | 360             | 1.80                    |                   |
| 11                              | 1833.0000                                 | 47.30 | 37.81      | 34.24   | 43.51            | -9.27        | 33.14   | Complied | Vertical             | 360             | 1.80                    |                   |

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## 4.2 Conducted Emissions

This test measures the electromagnetic levels of spurious signals generated by the EUT on the AC power line that may affect the performance of other nearby electronic equipment.

Except for a fraction of a second pause, The EUT is transmitting at all times.

### 4.2.1 Over View of Test

|                        |   |             |                           |                                     |                   |                 |  |  |
|------------------------|---|-------------|---------------------------|-------------------------------------|-------------------|-----------------|--|--|
| <b>Results</b>         | <b>Complies</b> (as tested per this report) |             |                           | <b>Date</b>                         | 03/06/09          |                 |  |  |
| <b>Standard</b>        | FCC Part 15.207(a)                          |             |                           |                                     |                   |                 |  |  |
| <b>Product Model</b>   | DSV3-EP                                     |             |                           | <b>Serial#</b>                      | DSV3EPAK083900052 |                 |  |  |
| <b>Configuration</b>   | See test plan for details                   |             |                           |                                     |                   |                 |  |  |
| <b>Test Set-up</b>     | Tested in shielded room                     |             | EUT placed on table       | see test plans for details          |                   |                 |  |  |
| <b>EUT Powered By</b>  | 120/60 230/50                               | <b>Temp</b> | 22° C                     | <b>Humidity</b>                     | 34%               | <b>Pressure</b> |  |  |
| <b>Frequency Range</b> | 150 kHz – 30 MHz                            |             |                           |                                     |                   |                 |  |  |
| <b>Perf. Criteria</b>  | Below Limits                                |             | <b>Perf. Verification</b> | Readings Under Limits for L1 and L2 |                   |                 |  |  |
| <b>Mod. to EUT</b>     | See section 4.2.3                           |             | <b>Test Performed By</b>  | Mark Ryan                           |                   |                 |  |  |

### 4.2.2 Test Procedure

Conducted and FCC emissions tests were performed using the procedures of ANSI C63.4 including methods for signal maximizations and EUT configuration. The photos included with the report show the EUT in its maximized configuration.

The frequency range from 150 kHz to 30 MHz was investigated for conducted emissions.

Conducted Emissions measurements were performed in the shielded room using procedures specified in the test plan and standard.

### 4.2.3 Deviations

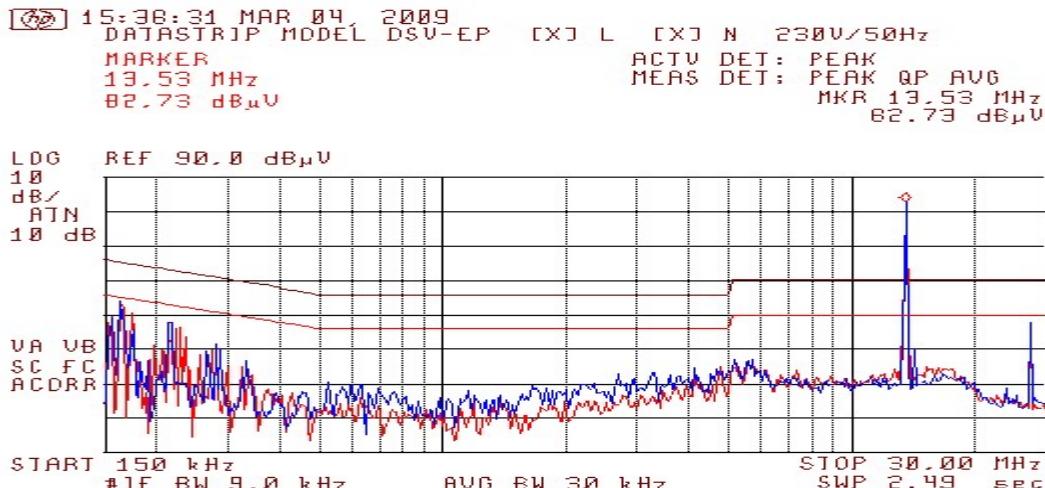
Since the RFID operated at 13.5MHz, and the conducted emission at that frequency is well above the limit, the procedures of FCC Publication 174176 (the use of a dummy load in place of the RFID antenna) were used.

### 4.2.4 Final Test

All final conducted emissions measurements were below (in compliance) the limits.

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#### 4.2.5 Final Graphs and Tabulated Data

**NOTES:**
**Conducted Emissions @ 230V/50Hz (with internal antennas active)**  
**Line / Neutral**


#### 4.2.6 Final Tabulated Data at of EUT with internal antennas connected (no dummy loads)

| Conducted Emissions Measurements     |   |                     |                    |                     |                     |                      |           |                |                |                 |                            |      |
|--------------------------------------|---|---------------------|--------------------|---------------------|---------------------|----------------------|-----------|----------------|----------------|-----------------|----------------------------|------|
| Standard:                            | EN55022:1998, Class B/FCC Part 15.107 (a)                         |                     |                    |                     |                     |                      |           | Date:          | 4-Mar-09       |                 |                            |      |
| Device Tested:                       | Datastrip Model DSV3-EP at 230VAC/50Hz without Dummy Load on RFID |                     |                    |                     |                     |                      |           | File:          | .xls 9030401   |                 |                            |      |
| Signal Num                           | Freq MHz  | Peak Amp dB $\mu$ V | QP Amp dB $\mu$ V  | Avg Amp dB $\mu$ V  | QP Limit dB $\mu$ V | Avg Limit dB $\mu$ V | Conductor | QP $\Delta$ dB | QP Result      | Avg $\Delta$ dB | Average Result             | Mode |
| 1                                    | 0.176   | 54.22               | 53.04              | 22.80               | 64.65               | 54.65                | Line      | -11.61         | Complied       | -31.85          | Complied                   |      |
| 2                                    | 0.235   | 41.14               | 29.84              | 27.43               | 62.27               | 52.27                | Line      | -32.43         | Complied       | -24.84          | Complied                   |      |
| 3                                    | 1.280   | 25.25               | 20.22              | 10.67               | 56.00               | 46.00                | Line      | -35.78         | Complied       | -35.33          | Complied                   |      |
| 4                                    | 5.268   | 37.41               | 29.90              | 18.80               | 60.00               | 50.00                | Line      | -30.10         | Complied       | -31.20          | Complied                   |      |
| 5                                    | 13.559  | 82.64               | 79.35              | 81.14               | 60.00               | 50.00                | Line      | 19.35          | Did Not Comply | 31.14           | Did Not Comply             |      |
| 6                                    | 27.119  | 47.88               | 46.73              | 46.71               | 60.00               | 50.00                | Line      | -13.27         | Complied       | -3.29           | Complied                   |      |
| 7                                    | 0.177   | 55.01               | 41.73              | 29.14               | 64.62               | 54.62                | Neutral   | -22.89         | Complied       | -25.48          | Complied                   |      |
| 8                                    | 0.220   | 37.59               | 31.31              | 26.79               | 62.82               | 52.82                | Neutral   | -31.51         | Complied       | -26.03          | Complied                   |      |
| 9                                    | 0.637   | 31.14               | 27.98              | 16.86               | 56.00               | 46.00                | Neutral   | -28.02         | Complied       | -29.14          | Complied                   |      |
| 10                                   | 5.578   | 35.66               | 30.71              | 19.32               | 60.00               | 50.00                | Neutral   | -29.29         | Complied       | -30.68          | Complied                   |      |
| 11                                   | 13.559  | 82.46               | 79.97              | 81.37               | 60.00               | 50.00                | Neutral   | 19.97          | Did Not Comply | 31.37           | Did Not Comply             |      |
| 12                                   | 27.119  | 49.23               | 47.56              | 47.04               | 60.00               | 50.00                | Neutral   | -12.44         | Complied       | -2.96           | Complied                   |      |
| Tested by:                           | Mark Ryan   |                     |                    |                     |                     |                      |           |                |                |                 |                            |      |
| TUV Rheinland of North America, Inc. | 12 Commerce Road  | Newtown, CT 06470   | Tel:(203) 426-0888 | Fax: (203) 426-4009 |                     |                      |           |                |                |                 | CE22_B.xls Revised 13APR05 |      |

**NOTE:** Per the procedures of FCC Publication 174176; if the RFID fails conducted emissions at the operating frequency (13.56MHz) then the antenna will be replaced with a dummy load. The data above is with internal Antennas.

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Report No.:

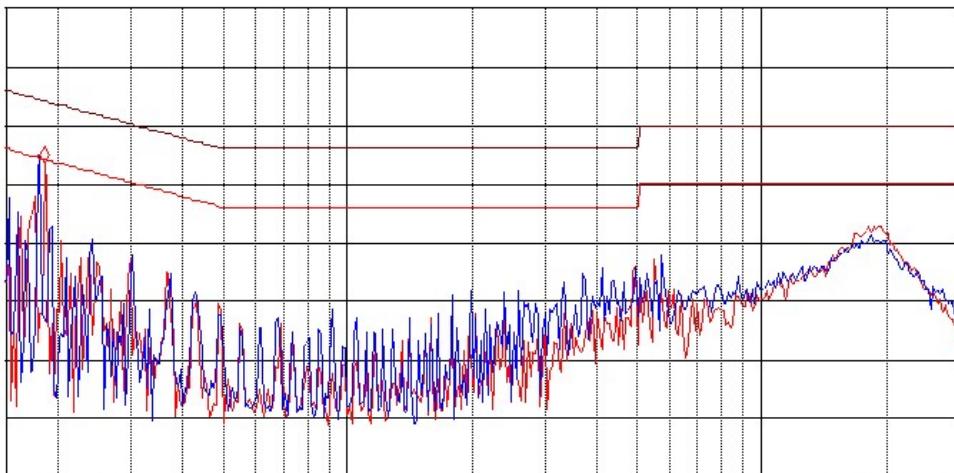
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## NOTES:

**Conducted Emissions @ 120V/60Hz (w/ dummy load)**  
**Line / Neutral**

13:32:20 MAR 06, 2009  
DATASTRIP MODEL DSV3-EP [X] L [X] N 120V/60Hz  
MARKER ACTV DET: PEAK  
190 kHz MEAS DET: PEAK QP AVG  
53.48 dB $\mu$ V MKR 190 kHz  
53.48 dB $\mu$ V

LOG REF B0.0 dB $\mu$ V10  
dB/  
ATN  
10 dBVA VB  
SC FC  
ACORR

START 150 kHz

#IF BW 9.0 kHz

STOP 30.00 MHz

AUG BW 30 kHz SWP 2.49 sec

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#### 4.2.7 Final Tabulated Data at 120V/60Hz

| Conducted Emissions Measurements |  |                  |                |                 |                  |                   |           |            |           | Date:       | 6-Mar-09       |      |
|----------------------------------|--|------------------|----------------|-----------------|------------------|-------------------|-----------|------------|-----------|-------------|----------------|------|
| Standard:                        | EN55022:1998, Class B/FCC Part 15.107(a)                       |                  |                |                 |                  |                   |           |            |           | File:       | .xls           |      |
| Device Tested:                   | Datastrip Model DSV3-EP at 120VAC/60Hz with Dummy Load on RFID |                  |                |                 |                  |                   |           |            |           |             | 9030602        |      |
| Signal Num                       | Freq<br>MHz  | Peak Amp<br>dBuV | QP Amp<br>dBuV | Avg Amp<br>dBuV | QP Limit<br>dBuV | Avg Limit<br>dBuV | Conductor | QP Δ<br>dB | QP Result | Avg Δ<br>dB | Average Result | Mode |
| 1                                | 0.185  | 55.84            | 54.65          | 42.27           | 64.24            | 54.24             | Line      | -9.59      | Complied  | -11.97      | Complied       |      |
| 2                                | 0.371  | 36.70            | 35.09          | 25.53           | 58.48            | 48.48             | Line      | -23.39     | Complied  | -22.95      | Complied       |      |
| 3                                | 0.496  | 29.34            | 27.44          | 19.49           | 56.06            | 46.06             | Line      | -28.62     | Complied  | -26.57      | Complied       |      |
| 4                                | 2.046  | 27.99            | 26.21          | 20.50           | 56.00            | 46.00             | Line      | -29.79     | Complied  | -25.50      | Complied       |      |
| 5                                | 4.708  | 36.72            | 34.13          | 23.25           | 56.00            | 46.00             | Line      | -21.87     | Complied  | -22.75      | Complied       |      |
| 6                                | 18.652   | 43.69            | 41.83          | 36.75           | 60.00            | 50.00             | Line      | -18.17     | Complied  | -13.25      | Complied       |      |
| 7                                | 0.185  | 55.27            | 54.21          | 42.11           | 64.24            | 54.24             | Neutral   | -10.03     | Complied  | -12.13      | Complied       |      |
| 8                                | 0.248  | 47.29            | 45.65          | 34.82           | 61.82            | 51.82             | Neutral   | -16.17     | Complied  | -17.00      | Complied       |      |
| 9                                | 0.930  | 28.75            | 25.02          | 20.69           | 56.00            | 46.00             | Neutral   | -30.98     | Complied  | -25.31      | Complied       |      |
| 10                               | 2.664  | 33.31            | 31.26          | 26.07           | 56.00            | 46.00             | Neutral   | -24.74     | Complied  | -19.93      | Complied       |      |
| 11                               | 5.577  | 38.82            | 36.85          | 28.40           | 60.00            | 50.00             | Neutral   | -23.15     | Complied  | -21.60      | Complied       |      |
| 12                               | 18.094   | 41.24            | 39.32          | 34.13           | 60.00            | 50.00             | Neutral   | -20.68     | Complied  | -15.87      | Complied       |      |

Tested by:

NOTE: Per the procedures of FCC Publication 174176 the RFID antennas were replaced with a dummy loads.

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### 4.3 Band Width Measurement - FCC Part 15.215(c) and RSS-210

Intentional radiators must be designed to ensure that the 20 dB bandwidth of the emission is contained within the frequency band designated in the rule section under which the equipment is operated.

#### 4.3.1 Test Over View

|                       |   |             |                           |                       |                   |                 |          |  |  |  |
|-----------------------|---|-------------|---------------------------|-----------------------|-------------------|-----------------|----------|--|--|--|
| <b>Results</b>        | <b>Complies</b> (as tested per this report)               |             |                           | <b>Date</b>           | 01 July 2009      |                 |          |  |  |  |
| <b>Standard</b>       | FCC Part 15.215 (c) and RSS-210                           |             |                           |                       |                   |                 |          |  |  |  |
| <b>Product Model</b>  | DSV3-EP   |             |                           | <b>Serial#</b>        | DSV3EPAK083900052 |                 |          |  |  |  |
| <b>Configuration</b>  | See test plan for details                                 |             |                           |                       |                   |                 |          |  |  |  |
| <b>Test Set-up</b>    | Tested in temperature chamber. See test plans for details |             |                           |                       |                   |                 |          |  |  |  |
| <b>EUT Powered By</b> | 120VAC / 60Hz   | <b>Temp</b> | 78 °F                     | <b>Humidity</b>       | 35%               | <b>Pressure</b> | 997 mbar |  |  |  |
| <b>Perf. Criteria</b> | 0.01% of the operating frequency                          |             | <b>Perf. Verification</b> | Readings within Limit |                   |                 |          |  |  |  |
| <b>Mod to EUT</b>     | None  |             | <b>Test Performed By</b>  | Mark Ryan             |                   |                 |          |  |  |  |

#### 4.3.2 Test Procedure

Radiated field strength emissions tests were performed using the procedures of ANSI C63.4 including methods for signal maximizations and EUT Configuration. Testing was performed, using the worst-case orientation, at a distance of 3 meters in the compliant 5m chamber. Measurements made were the 20dB and 99% Power Bandwidths.

#### 4.3.3 Deviations

There were no deviations from the test methodology listed for this test.

#### 4.3.4 Final Test

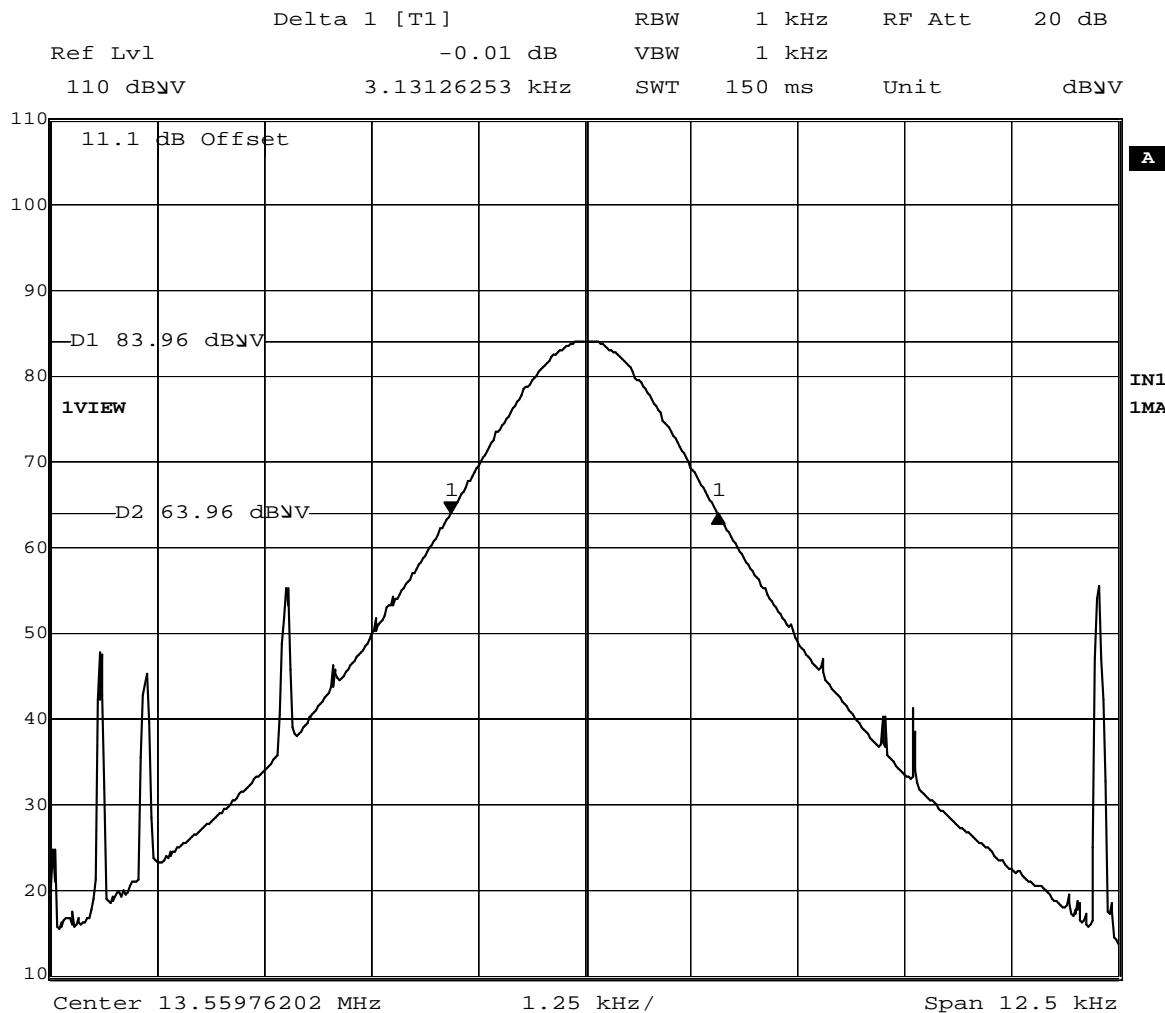
The Frequency Tolerance was within the limits (in compliance) as specified in FCC Part 15.215(c).

#### 4.3.5 Final Test Data

| <b>Band width</b> | <b>Frequency (in kHz)</b> | <b>Results</b> |
|-------------------|---------------------------|----------------|
| 20dB              | 3.13                      | Complies       |
| 99% PBW           | 2.76                      | Complies       |

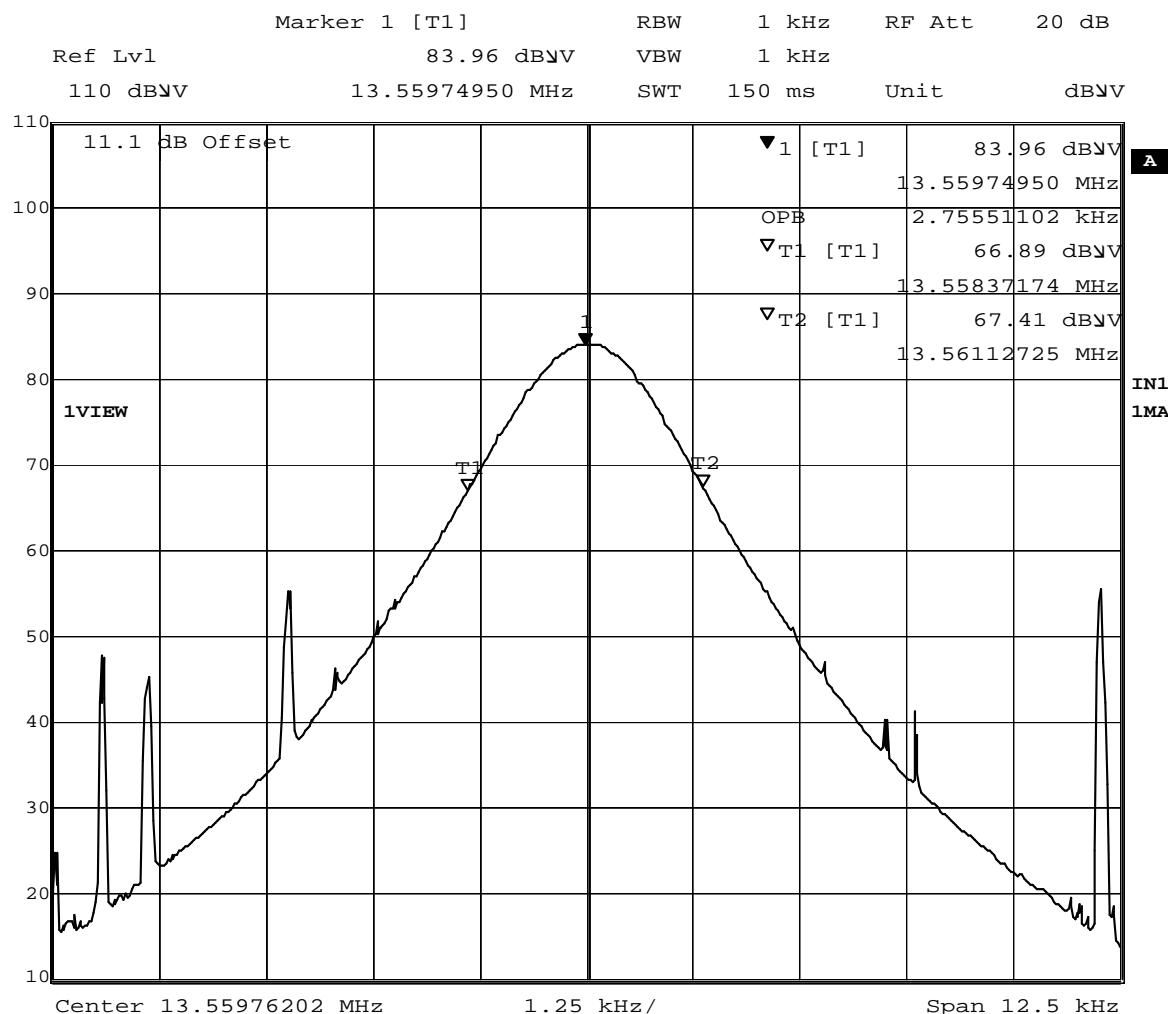
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### 4.3.6 Final graphs



20 dB Bandwidth = 3.13 kHz

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99% Power Bandwidth = 2.76 kHz

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#### 4.4 Radiated Field Strength Emissions FCC Parts 15.225 (a), (b) and (c)

- (a) The field strength of any emissions within the band 13.553 to 13567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.
- (b) Within the bands 13.410 to 13.553 MHz and 13.567 to 13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.
- (c) Within the bands 13.110 to 13.410 MHz and 13.710 to 14.010 MHz, the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.

##### 4.4.1 Test Over View

|                       |   |             |                           |                           |                   |                 |           |
|-----------------------|---|-------------|---------------------------|---------------------------|-------------------|-----------------|-----------|
| <b>Results</b>        | <b>Complies</b> (as tested per this report)                 |             |                           |                           | <b>Date</b>       | 27 July 2009    |           |
| <b>Standard</b>       | FCC Parts 15.225(a), (b), (c) and RSS-210 A2.6(a), (b), (c) |             |                           |                           |                   |                 |           |
| <b>Product Model</b>  | DSV3-EP   |             |                           | <b>Serial#</b>            | DSV3EPAK083900052 |                 |           |
| <b>Configuration</b>  | See test plan for details                                   |             |                           |                           |                   |                 |           |
| <b>Test Set-up</b>    | Tested in compliant 5m chamber, EUT placed on table         |             |                           | See test plan for details |                   |                 |           |
| <b>EUT Powered By</b> | 120VAC / 60Hz   | <b>Temp</b> | 78 °F                     | <b>Humidity</b>           | 40%               | <b>Pressure</b> | 1005 mbar |
| <b>Perf. Criteria</b> | Below Limit   |             | <b>Perf. Verification</b> | Readings under Limit      |                   |                 |           |
| <b>Mod to EUT</b>     | None  |             | <b>Test Performed By</b>  | Mark Ryan                 |                   |                 |           |

##### 4.4.2 Test Procedure

The frequency range from 13.110 MHz to 14.010 MHz was investigated in three orientations for worst-case radiated field strength emissions. Radiated field strength emissions were performed using the procedures of ANSI C63.4 including methods for signal maximizations and EUT configuration. Testing was performed in a compliant 5m chamber.

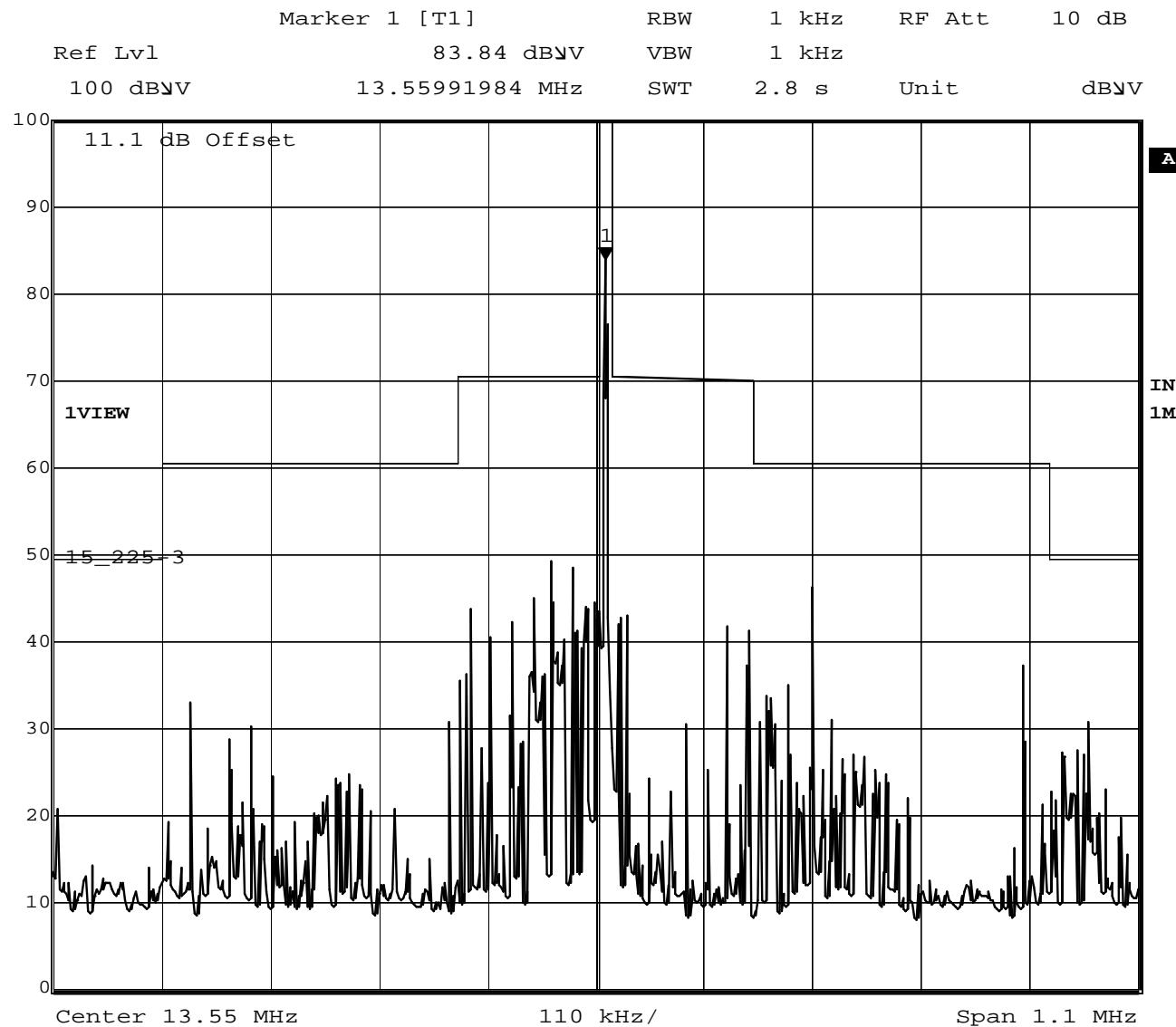
##### 4.4.3 Deviations

The measurement distance was 3m for all frequencies. The limits below 30 MHz were adjusted for this shorter measurement distance. See section 4.4.6 of this test report for details.

##### 4.4.4 Final Test

All radiated emissions measurements were below (in compliance with) the limits.

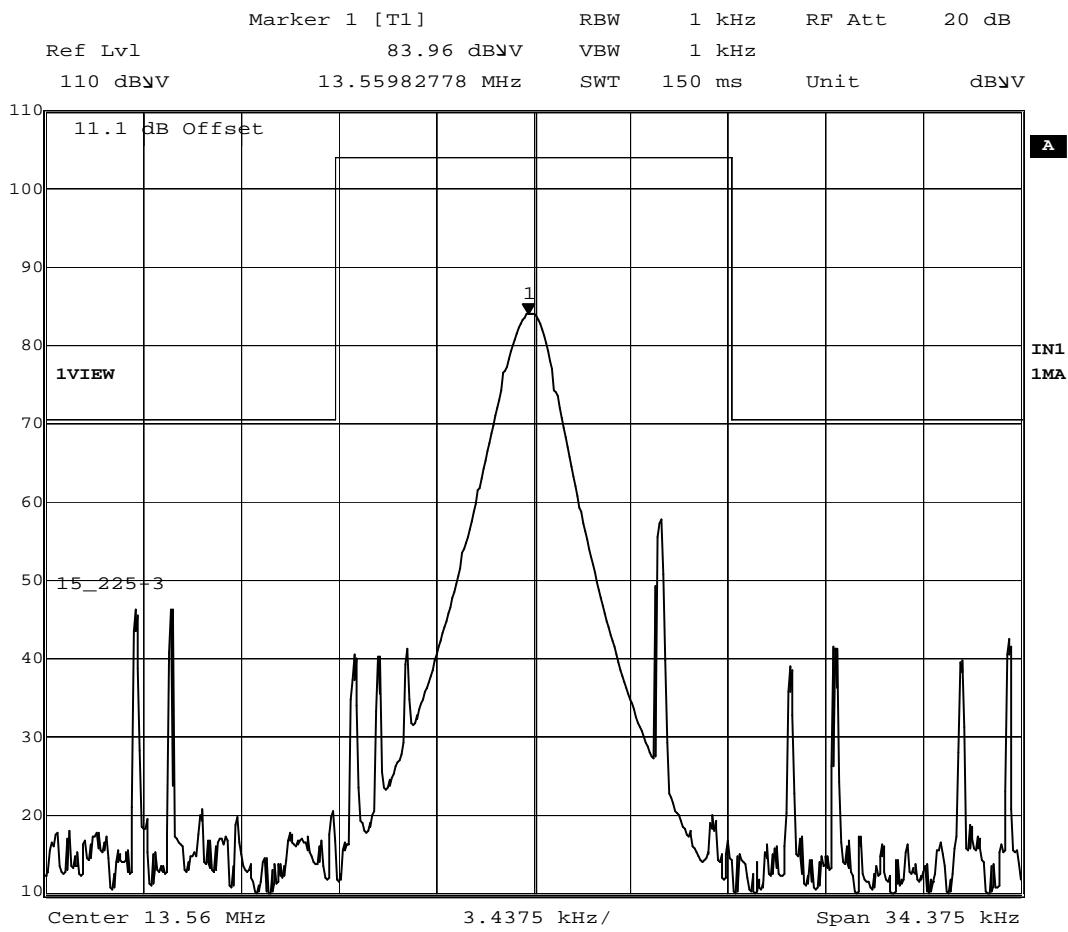
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**4.4.5 Final Field Strength Data**


Date: 27.JUL.2009 15:00:07

**Frequency Mask to include FCC Parts 15.225(a), (b), (c), and (d)**

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Date: 27.JUL.2009 15:03:03

### Frequency Mask to include FCC Part 15.225(a)

Note: Limits shown were converted from  $\mu$ V/m at 30m to dB $\mu$ V /m at 3 m measurement distance. The plot also includes 11.1 dB of correction factors for at 3m, for this band.

#### 4.4.6 Final Data

All peak emissions are more than 20 dB below the limit. The limit was adjusted for dB $\mu$ V at 3m measurements by using the following formula: 3m Limit = (10m limit in  $\mu$ V) + 20log(30m / 3m)

For example the limit between 13.110 MHz and 14.010 MHz is 15,848 $\mu$ V at 30m, therefore:

$$\text{The 3 m Limit} = 20 * \log(15,848) + 20 * \log(30/3) = 84 + 20 = 104 \text{ dB}\mu\text{V}$$

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#### 4.5 Radiated Field Strength Emissions FCC Part 15.225(d)

(d) The field strength of any emissions appearing outside of the 13.110 to 14.010 band shall not exceed the general radiated emissions in section 15.209.

##### 4.5.1 Test Over View

|                        |   |             |                           |                 |                      |                 |           |  |  |  |  |  |
|------------------------|---|-------------|---------------------------|-----------------|----------------------|-----------------|-----------|--|--|--|--|--|
| <b>Results</b>         | <b>Complies</b> (as tested per this report)                           |             |                           |                 | <b>Date</b>          | 27 July 2001    |           |  |  |  |  |  |
| <b>Standard</b>        | FCC Part 15.225(d) and RSS-210 A2.6(d)                                |             |                           |                 |                      |                 |           |  |  |  |  |  |
| <b>Product Model</b>   | DSV3-EP   |             |                           | <b>Serial#</b>  | DSV3EPAK083900052    |                 |           |  |  |  |  |  |
| <b>Configuration</b>   | See test plan for details   |             |                           |                 |                      |                 |           |  |  |  |  |  |
| <b>Test Set-up</b>     | Tested in shielded room EUT placed on table See test plan for details |             |                           |                 |                      |                 |           |  |  |  |  |  |
| <b>EUT Powered By</b>  | 120VAC / 60Hz   | <b>Temp</b> | 78 °F                     | <b>Humidity</b> | 40%                  | <b>Pressure</b> | 2005 mbar |  |  |  |  |  |
| <b>Frequency Range</b> |   |             |                           |                 |                      |                 |           |  |  |  |  |  |
| <b>Perf. Criteria</b>  | Below Limit   |             | <b>Perf. Verification</b> |                 | Readings Under Limit |                 |           |  |  |  |  |  |
| <b>Mod to EUT</b>      | None  |             | <b>Test Performed By</b>  |                 | Mark Ryan            |                 |           |  |  |  |  |  |

##### 4.5.2 Test Procedure

Radiated field strength emissions test were performed using the procedures of ANSI C63.4 including methods for signal maximizations and EUT configuration.

The frequency range from 150 kHz to 30 MHz was investigated with a loop antenna and then from 30 MHz to 1000 MHz was investigated using a Bilog antenna.

A preliminary emission scan was performed in order to identify the specific frequencies for which these measurements were made at 3 meters in the 5 meter compliant chamber. Limits were adjusted for 3 meter measurement distance where needed.

All spurious emission between these frequency ranges were investigated and compared to the limits stated in section 12.209. Restricted bands of operation were also investigated as stated in section 15.205. The additional provisions stated in section 15.215(b) were also considered during this test.

##### 4.5.3 Deviations

There were no deviations from the test methodology listed in the test plan for this test.

##### 4.5.4 Final Test

All radiated field strength emissions measurements were below (in compliance with) the 15.209 limits, including those not in the restricted bands as stated in part 15.205.

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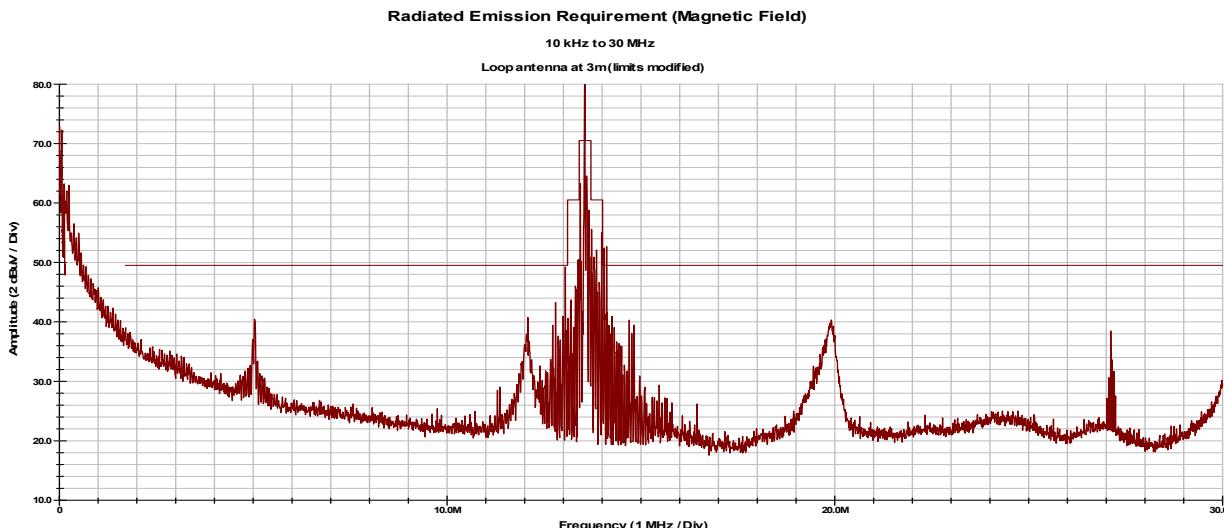
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#### 4.5.5 Final Graphs and Tabulated Data

##### Radiated Emissions – Worst Case 3 Orientations investigated.



| Emission Freq (MHz) | ANT Polar (P/p) | ANT Pos (m) | Table Pos (deg) | FIM Value (dB $\mu$ V) | Amp Gain (dB) | Cable Loss (dB) | ANT Factor (dB/m) | E-Field Value (dB $\mu$ V/m) | Spec Limit (dB $\mu$ V/m) | Spec Margin (dB) |
|---------------------|-----------------|-------------|-----------------|------------------------|---------------|-----------------|-------------------|------------------------------|---------------------------|------------------|
| 13.56               |                 | 1           | 257             | 61.96                  | 0.00          | 0.39            | 10.57             | 72.92                        | 104.00                    | -31.08           |
| 13.56               | +               | 1           | 120             | 41.48                  | 0.00          | 0.39            | 10.57             | 52.44                        | 104.00                    | -51.56           |
| 13.56               |                 | 1           | 197             | 72.90                  | 0.00          | 0.39            | 10.57             | 83.86                        | 104.00                    | -20.14           |
| 13.56               | +               | 1           | 258             | 71.18                  | 0.00          | 0.39            | 10.57             | 82.14                        | 104.00                    | -21.86           |
| 13.56               |                 | 1           | 248             | 72.80                  | 0.00          | 0.39            | 10.57             | 83.76                        | 104.00                    | -20.24           |
| 13.56               | +               | 1           | 245             | 69.85                  | 0.00          | 0.39            | 10.57             | 80.81                        | 104.00                    | -23.19           |

Spec Margin = E-Field Value - Limit, E-Field Value = FIM Value - Amp Gain + Cable Loss + ANT Factor  $\pm$  Uncertainty

Combined Standard Uncertainty  $u_c(y) = \pm 1.6\text{dB}$  Expanded Uncertainty  $U = ku_c(y)$   $k = 2$  for 95% confidence

Notes: Antenna Orientation: || = Parallel, + = Perpendicular

Signal shown in **RED** is Orientation 1

Signal shown in **GREEN** is Orientation 2 (worst case)

Signal shown in **BLUE** is Orientation 3

Limits shown were adjusted from  $\mu\text{V/m}$  at 30m to  $\text{dB}\mu\text{V/m}$  at 1 m measurement distance.

Peak is approx QP +1, Ave is approx QP-1

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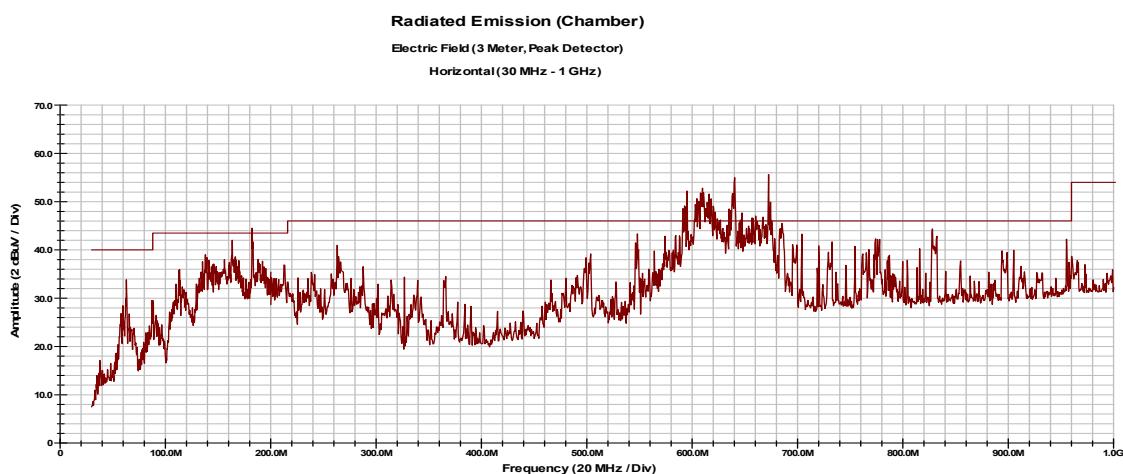
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**Radiated Emissions**

Horizontal



| Emission Freq (MHz) | ANT Polar | ANT Pos (m) | Table Pos (deg) | FIM Value (dB $\mu$ V) | Amp Gain (dB) | Cable Loss (dB) | ANT Factor (dB/m) | E-Field Value (dB $\mu$ V / m) | Spec Limit (dB $\mu$ V / m) | Spec Margin (dB) |
|---------------------|-----------|-------------|-----------------|------------------------|---------------|-----------------|-------------------|--------------------------------|-----------------------------|------------------|
| 63.56               | H         | 2.4         | 146             | 13.06                  | 0.00          | 0.85            | 9.89              | 23.79                          | 40.00                       | -16.21           |
| 182.20              | H         | 1.2         | 99              | 22.85                  | 0.00          | 1.45            | 9.66              | 33.96                          | 43.50                       | -9.54            |
| 609.20              | H         | 2.3         | 82              | 18.00                  | 0.00          | 2.72            | 19.00             | 39.72                          | 46.00                       | -6.28            |
| 639.96              | H         | 1           | 79              | 19.05                  | 0.00          | 2.79            | 20.10             | 41.94                          | 46.00                       | -4.06            |
| 668.80              | H         | 1           | 80              | 12.03                  | 0.00          | 2.85            | 20.20             | 35.08                          | 46.00                       | -10.92           |
| 827.76              | H         | 1.2         | 5               | 15.34                  | 0.00          | 3.17            | 21.86             | 40.37                          | 46.00                       | -5.63            |
|                     |           |             |                 |                        |               |                 |                   |                                |                             |                  |
|                     |           |             |                 |                        |               |                 |                   |                                |                             |                  |
|                     |           |             |                 |                        |               |                 |                   |                                |                             |                  |
|                     |           |             |                 |                        |               |                 |                   |                                |                             |                  |
|                     |           |             |                 |                        |               |                 |                   |                                |                             |                  |

 Spec Margin = E-Field Value - Limit, E-Field Value = FIM Value - Amp Gain + Cable Loss + ANT Factor  $\pm$  Uncertainty

 Combined Standard Uncertainty  $u_c(y) = \pm 1.6\text{dB}$  Expanded Uncertainty  $U = ku_c(y)$   $k = 2$  for 95% confidence

Notes:

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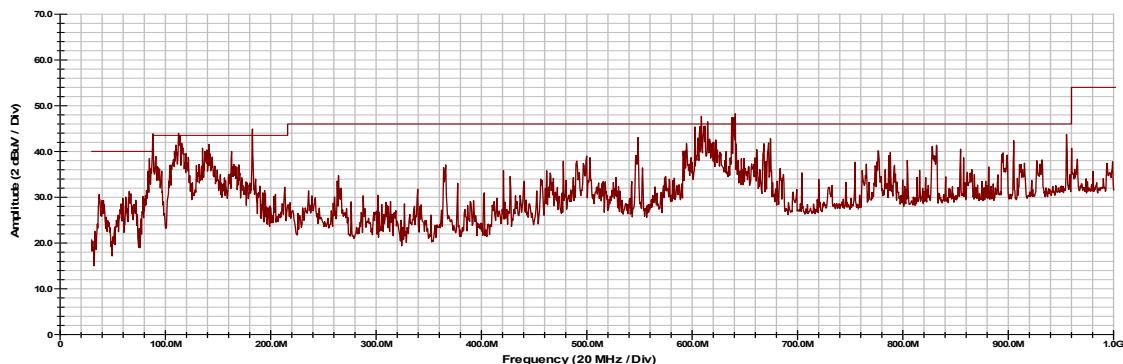
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## Radiated Emissions

Vertical

## Radiated Emission (Chamber)

Electric Field (3 Meter, Peak Detector)  
Vertical (30 MHz - 1 GHz)

11:34:07 AM, Wednesday, July 01, 2009

| Emission Freq (MHz) | ANT Polar | ANT Pos (m) | Table Pos (deg) | FIM Value (dB $\mu$ V) | Amp Gain (dB) | Cable Loss (dB) | ANT Factor (dB/m) | E-Field Value (dB $\mu$ V/m) | Spec Limit (dB $\mu$ V/m) | Spec Margin (dB) |
|---------------------|-----------|-------------|-----------------|------------------------|---------------|-----------------|-------------------|------------------------------|---------------------------|------------------|
| 90.56               | V         | 1           | 251             | 25.52                  | 0.00          | 1.01            | 6.61              | 33.14                        | 43.50                     | -10.36           |
| 113.44              | V         | 1           | 156             | 26.85                  | 0.00          | 1.14            | 7.53              | 35.52                        | 43.50                     | -7.98            |
| 182.96              | V         | 1           | 127             | 21.54                  | 0.00          | 1.45            | 9.22              | 32.21                        | 43.50                     | -11.29           |
| 609.72              | V         | 1           | 336             | 11.85                  | 0.00          | 2.72            | 19.59             | 34.16                        | 46.00                     | -11.84           |
| 639.16              | V         | 1           | 332             | 13.51                  | 0.00          | 2.79            | 20.48             | 36.78                        | 46.00                     | -9.22            |
| 955.32              | V         | 1           | 216             | 17.01                  | 0.00          | 3.49            | 23.31             | 43.81                        | 46.00                     | -2.19            |
|                     |           |             |                 |                        |               |                 |                   |                              |                           |                  |
|                     |           |             |                 |                        |               |                 |                   |                              |                           |                  |
|                     |           |             |                 |                        |               |                 |                   |                              |                           |                  |
|                     |           |             |                 |                        |               |                 |                   |                              |                           |                  |
|                     |           |             |                 |                        |               |                 |                   |                              |                           |                  |

Spec Margin = E-Field Value - Limit, E-Field Value = FIM Value - Amp Gain + Cable Loss + ANT Factor  $\pm$  UncertaintyCombined Standard Uncertainty  $u_c(y) = \pm 1.6\text{dB}$  Expanded Uncertainty  $U = ku_c(y)$   $k = 2$  for 95% confidence

Notes:

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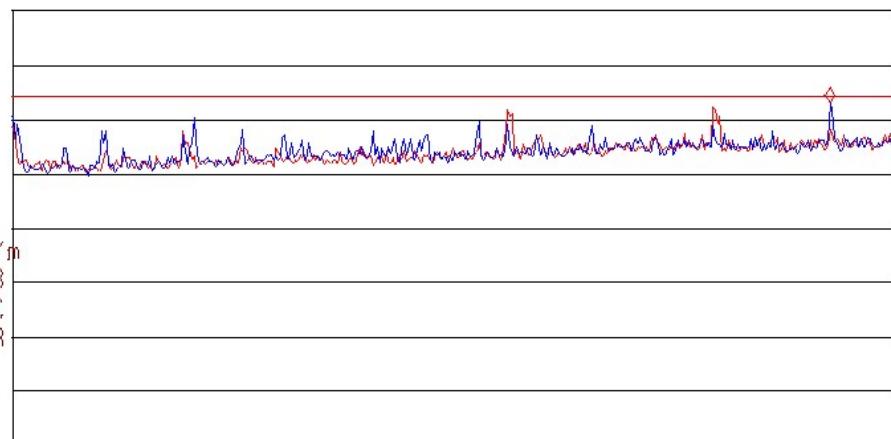
**Report No.:**
**30967181.003 Rev. E**
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**NOTES:**
**Radiated Emissions Prescan at 1 GHz to 1.5 GHz**  
**Vertical / Horizontal**
 12:39:16 MAR 27, 2009  
 DATASTRIP MODEL DSV3-EP

 ACTV DET: PEAK  
 MEAS DET: PEAK QP AVG  
 MKR 1.4625 GHz  
 43.05 dB $\mu$ V/m

 LOG REF 60.0 dB $\mu$ V/m

PREAMP ON

 10  
 dB/  
 #ATN  
 0 dB

 DL  
 44.0  
 dB $\mu$ V/m  
 VA VB  
 SC FC  
 ACORR

 START 1.0000 GHz  
 #IF BW 1.0 MHz

AVG BW 300 kHz

 STOP 1.5000 GHz  
 SWP 20.0 msec

|        |            | Measured Level |            |         |                  |              |   |          |                      |                 |                         |         |
|--------|------------|----------------|------------|---------|------------------|--------------|---|----------|----------------------|-----------------|-------------------------|---------|
| Meas # | Freq (MHz) | Peak           | Quasi-Peak | Average | Quasi-Peak Limit | Quasi-Peak Δ | Antenna + Cable Correction Factor (included in measured levels) | Result   | Antenna Polarization | Angle (degrees) | Antenna Height (meters) | Comment |
| 1      | 1106.0000  | 48.38          | 29.66      | 24.41   | 43.51            | -13.85       | 27.10   | Complied | Vertical             | 0               | 2.20                    |         |
| 2      | 1233.1250  | 40.11          | 30.29      | 26.73   | 43.51            | -13.22       | 28.22   | Complied | Vertical             | 0               | 2.00                    |         |
| 3      | 1491.5513  | 43.34          | 33.45      | 29.91   | 43.51            | -10.06       | 30.78   | Complied | Vertical             | 0               | 2.00                    |         |
| 4      | 1534.3338  | 43.47          | 33.99      | 30.36   | 43.51            | -9.52        | 31.13   | Complied | Vertical             | 0               | 1.80                    |         |
| 5      | 1833.0000  | 47.30          | 37.81      | 34.24   | 43.51            | -5.70        | 33.14   | Complied | Vertical             | 0               | 1.80                    |         |

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## NOTES:

## Radiated Emissions Prescan at 1.5 GHz to 2.0 GHz

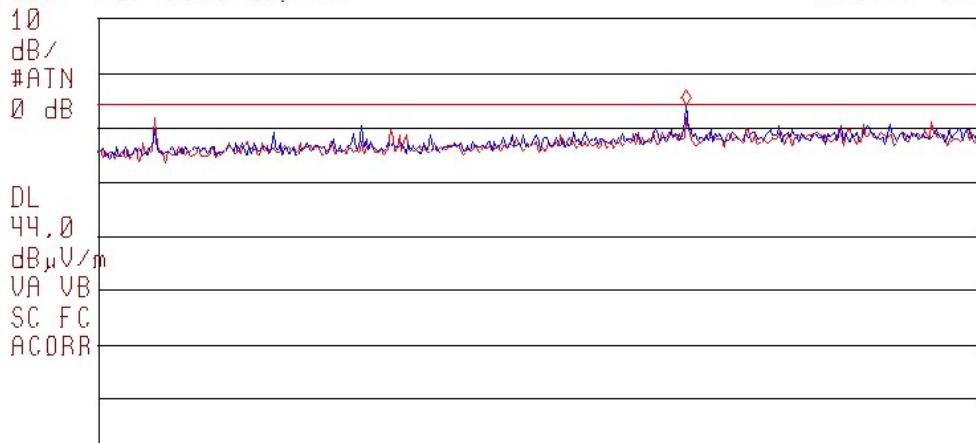
### Vertical / Horizontal

12:40:58 MAR 27, 2009  
DATASTRIP MODEL DSV3-EP

ACTV DET: PEAK  
MEAS DET: PEAK QP AVG  
MKR 1.8325 GHz  
43.99 dB $\mu$ V/m

LOG REF 60,0 dB $\mu$ V/m

PREAMP ON



START 1,5000 GHz

#IF BW 1.0 MHz

AVG BW 300 kHz

STOP 2,000 GHz

SWP 20.0 msec

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## 4.6 Frequency Tolerance FCC Part 15.225(e) and RSS-210, A2.6

The frequency tolerance of the carrier signal shall be maintained within  $\pm 0.01\%$  of the operating frequency over a temperature variation of  $-20^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$  at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of  $+20^{\circ}\text{C}$ . For battery operated equipment, the equipment tests shall be performed using a new battery.

### 4.6.1 Test Over View

|                       |   |             |                           |                 |                       |                 |        |  |  |  |
|-----------------------|---|-------------|---------------------------|-----------------|-----------------------|-----------------|--------|--|--|--|
| <b>Results</b>        | <b>Complies</b> (as tested per this report)               |             |                           | <b>Date</b>     | 02 July 2009          |                 |        |  |  |  |
| <b>Standard</b>       | FCC Part 15.225(e) and RSS-210 A2.6                       |             |                           |                 |                       |                 |        |  |  |  |
| <b>Product Model</b>  | DSV3-EP   |             |                           | <b>Serial#</b>  | DSV3EPAK083900052     |                 |        |  |  |  |
| <b>Configuration</b>  | See test plan for details                                 |             |                           |                 |                       |                 |        |  |  |  |
| <b>Test Set-up</b>    | Tested in temperature chamber. See test plans for details |             |                           |                 |                       |                 |        |  |  |  |
| <b>EUT Powered By</b> | 120VAC / 60Hz   | <b>Temp</b> | 75° F                     | <b>Humidity</b> | 39%                   | <b>Pressure</b> | 1005mb |  |  |  |
| <b>Perf. Criteria</b> | 0.01% of the operating frequency                          |             | <b>Perf. Verification</b> |                 | Readings within Limit |                 |        |  |  |  |
| <b>Mod to EUT</b>     | None  |             | <b>Test Performed By</b>  |                 | Mark Ryan             |                 |        |  |  |  |

### 4.6.2 Test Procedure

The EUT was placed in a temperature chamber for the temperature variation test. Readings were made as per ANSI C63.4:2003 section H.5.2.

Voltage variations tests were performed by connecting the AC/DC adapter to a variable power supply. The EUT also used a chargeable battery, so the test set up included a freshly charged battery, per ANSI C63.4:2003, section H.5.3.

### 4.6.3 Deviations

There were no deviations from the test methodology listed in the test plan for this test.

### 4.6.4 Final Test

The Frequency Tolerance was within the limits (in compliance) as specified in FCC Part 15.225(e).

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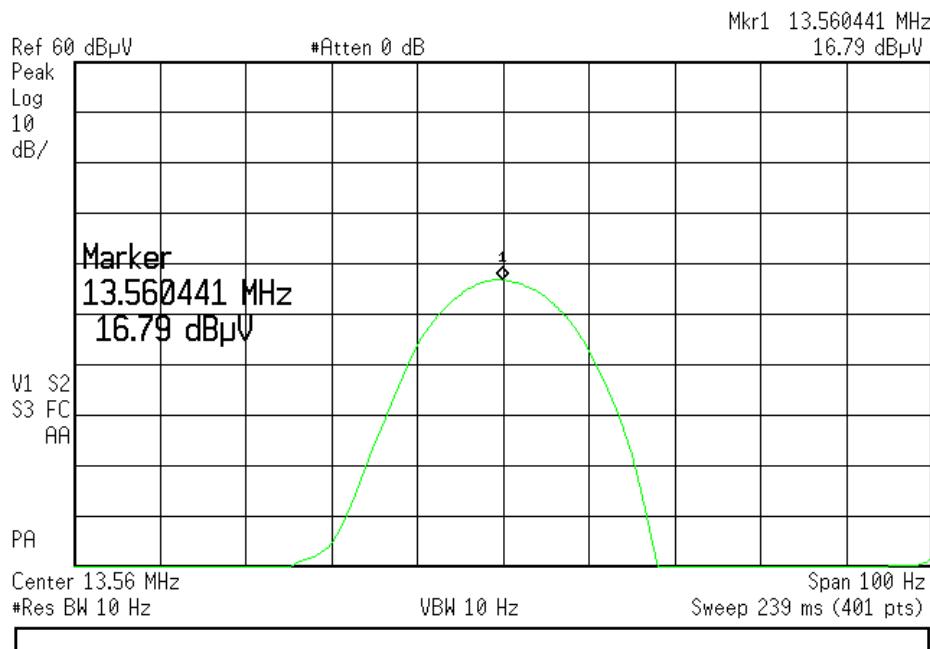
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#### 4.6.5 Final Data for Temperature Variations

Agilent 08:53:31 Jul 2, 2009



Reference frequency at +20°C, nominal 120 VAC/60Hz Voltage

0.01% of 13.56MHz = 1.356 KHz

| Temp °C | Measured frequency (in MHz) | Δ Reference (in Hz) | Permitted Band Edge in MHz ( $\pm 0.01\%$ ) | Results  |
|---------|-----------------------------|---------------------|---|----------|
| -20     | 13.560570                   | +129                | 13.5586 to 13.5614                          | Complied |
| 20      | 13.560441                   | 0                   |   | Complied |
| +50     | 13.560437                   | -4                  |   | Complied |

Variations from low to high temperature, measurements made after a minimum 30 minutes soak at temperature.

#### 4.6.6 Final Data for Voltage Variations

The Power module is rated from 100V to 240VAC, Reference Voltage is 120VAC

 $\pm 0.01\%$  of 13.56MHz =  $\pm 1.356$  KHz

| Voltage | Measured frequency (in MHz) | Δ Reference (in Hz) | Permitted Band Edge in MHz ( $\pm 0.01\%$ ) | Results  |
|---------|-----------------------------|---------------------|---|----------|
| -85     | 13.560441                   | 0                   | 13.5586 to 13.5614                          | Complied |
| 120     | 13.560441                   | 0                   |   | Complied |
| +276    | 13.560441                   | 0                   |   | Complied |

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## 4.7 Powered Tags FCC Part 15.225(f)

In the case of radio frequency powered tags designed to operate with a device authorized under this section, the tag may be approved with the device or be considered as a separate device subject to its own authorization. Powered tags approved with a device under a single application shall be labeled with the same identification number as the device.

### 4.7.1 Deviations

There were no deviations from the test methodology listed in the test plan for the Conducted Immunity test.

### 4.7.2 Final Test

The EUT does not use Powered Tags

### 4.7.3 Final Data

The EUT uses passive tags; therefore this section is compliant without testing.

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## Appendix A

### 5 Test Plan

This test report is intended to follow this test plan outlined here in unless other wise stated in this here report. The following test plan will give details on product information, standards to be used, test set ups and refer to TUV test procedures. The test procedures will give the steps to be taken when performing the stated test. The product information below came via client, product manual, product itself and or the internet.

#### 5.1 General Information

|                       |                          |
|-----------------------|--------------------------|
| <b>Client</b>         | Datastrip Products, Inc. |
| <b>Address 1</b>      | 1 Waterview Drive        |
| <b>Address 2</b>      | Shelton, CT 06484        |
| <b>Contact Person</b> | Scott Robinson           |
| <b>Telephone</b>      | (203) 225-9184           |
| <b>Fax</b>            | (203) 225-9260           |
| <b>e-mail</b>         | srobinson@datastrip.net  |

#### 5.2 Model(s) Name

DSV3-EP

#### 5.3 Type of Product

Portable Biometric Identification Terminal

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### 5.4 Equipment Under Test (EUT) Description

The DSV3® Series of products are portable, handheld computers specifically designed for security, law enforcement, border control and positive I.D. verification applications. They feature the ability to interface with Contact-less Smart Cards. An integrated fingerprint sensor enables biometric verification of identity.

### 5.5 Applicable Documents

| Standards  | Description  |
|--|--|
| FCC Part 15, Subpart C   | Radio Frequency Devices- Subpart C: Intentional Radiators  |
| RSS-210 Issue 7  | Low-Power Licence-exempt Radiocommunication Devices<br>Category I Equipment                                  |
| FCC Parts 15.205, 15.209, 15.215(b)                            | Radiated Emissions   |
| FCC Part 15.207  | Conducted Emissions  |
| FCC Part 15.225 and RSS-210 A2.6                               | Operation within the band 13.110 – 14.01 MHz   |
| FCC Part 15.225(a) and RSS-210 A2.6(a)                         | Field strength Emissions within 13.553 – 13.567 MHz  |
| FCC Part 15.225(b) and RSS-210 A2.6(b)<br>Basic test standard  | Field strength Emissions within 13.410 – 13.553 MHz and 13.567 - 13.710                                      |
| FCC Part 15.225(c) and RSS-210 A2.6(c)<br>Basic test standard  | Field strength Emissions within 13.110 – 13.410 MHz and 13.710 - 14.010                                      |
| FCC Part 15.225(d) and RSS-210 A2.6(d)<br>Basic test standard  | Field strength outside the 13.110 - 14.010 MHz band  |
| FCC Part 15.225(e) and RSS-210 A2.6<br>Basic test standard     | Frequency tolerance over -20°C to +50°C at normal power supply and for 85% and 115% of rated supply voltage. |
| FCC Part 15.225(f) and RSS-210 Part 2.5<br>Basic test standard | Frequency Powered Tags   |
| FCC Part 15.215 (c)<br>Basic test standard                     | 20 dB Bandwidth  |
| RSS-210<br>Basic test standard                                 | 99% Power Bandwidth  |

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## 5.6 General Product Information

|               |  |       |                         |        |          |         |
|---------------|--|-------|-------------------------|--------|----------|---------|
| <b>Size</b>   | <b>H</b>                                   | 18 cm | <b>W</b>                | 5.5 cm | <b>L</b> | 15.5 cm |
| <b>Weight</b> | 1 kg                                       |       | <b>Fork-Lift Needed</b> | No     |          |         |
| <b>Notes</b>  | Not including the external DC power module |       |                         |        |          |         |

## 5.7 EUT Clock/Oscillator Frequencies

|                                     |                             |  |
|-------------------------------------|-----------------------------|--|
| <input type="checkbox"/>            | <b>Less than 108MHz</b>     | <b>FCC – scan up to 1GHz</b>                             |
| <input checked="" type="checkbox"/> | <b>Less than 500MHz</b>     | <b>FCC – scan up to 2GHz</b>                             |
| <input type="checkbox"/>            | <b>Less than 1000MHz</b>    | <b>FCC – scan up to 5GHz</b>                             |
| <input type="checkbox"/>            | <b>Greater then 1000MHz</b> | <b>FCC – scan up to 5<sup>th</sup> Harmonic or 40GHz</b> |

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