



Project: 04CA52274  
File: E133631  
Date: 11/20/04  
Model: CL4XXE  
FCC ID: MMFCL4XXEAW

# **Test Report**

## **On**

### **Electromagnetic Compatibility Testing**

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to public safety and committed to  
quality service for over 100 years**

File Number: E133631  
Project Number: O4CA52274  
Model Number: CL4XXE  
FCC ID: MMFCL4XXEAW

Issued: 3/4/2005

## Test Report Details

|                        |                                                                                                                                                                             |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tests Performed By:    | <b>Underwriters Laboratories Inc.</b><br><b>1285 Walt Whitman Rd.</b><br><b>Melville, NY 11747</b>                                                                          |
| Tests Performed For:   | <b>SATO Corporation</b><br><b>TECHNO Center</b><br><b>1-207 OHNARI-CHO</b><br><b>SHITAMA-SHI, SAI-TAMA-KEN 330-0852</b><br><b>1-207, Onari-chom, Omiya-ku, Saitama-shi,</b> |
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| Test Report Date:      | <b>3/2/2005</b>                                                                                                                                                             |
| Product Type:          | <b>RFID Printer</b>                                                                                                                                                         |
| Model Number:          | <b>CL4XXE</b>                                                                                                                                                               |
| Sample Serial Number:  | <b>45590308</b>                                                                                                                                                             |
| Sample Tag Number:     | <b>0630745001</b>                                                                                                                                                           |
| Sample Receive Date:   | <b>11/19/2004</b>                                                                                                                                                           |
| EUT Category:          | <b>Radio Transmitter</b>                                                                                                                                                    |
| Testing Start Date:    | <b>11/22/2004</b>                                                                                                                                                           |
| Date Testing Complete: | <b>1/19/2005</b>                                                                                                                                                            |

Underwriters Laboratories Inc. reports apply only to the specific samples tested under stated test conditions. All samples tested were in good operating condition throughout the entire test program. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. Underwriters Laboratories Inc. shall have no liability for any deductions, inferences or generalizations drawn by the client or others from Underwriters Laboratories Inc. issued reports. This report shall not be used to claim, constitute or imply product certification, approval, or endorsement by NVLAP, A2LA, or any agency of the US government.

This report may contain test results that are not covered by the NVLAP or A2LA accreditation. The scope of accreditation is limited to the specific tests that are listed on the NVLAP and/or A2LA certificates provided at the end of this report.

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## Report Revision History

| Revision Date | Description | Revised By | Revision Reviewed By |
|---------------|-------------|------------|----------------------|
| -             | Original    | -          | -                    |

## 1.0 G E N E R A L - Product Description

### Printer Description

CL408e is a thermal printer which uses an thermal ink ribbon or a heat transfer system. It is suitable for the printing of a text, bar codes, and graphics with the high resolution (203 dpi). It can respond to many kinds of papers, such as a labels with adhesive applied to the back of a paper, and ticket paper without adhesive. CL412e has a higher resolution of 305 dpi.

#### Difference between CL408e and CL412e

The difference between the CL408e and CL412e is the thermal head. The different heads provide different resolutions, CL408e – 203 dpi and CL412e – 305dpi. The printer control board recognizes the different thermal heads. The printout data sent from the host computer is changed into each resolution by the processor inside the printer. The processor performs all of these controls and the structure is identical except for the thermal head.

#### Part List

| Product | Description  | Part Number        | Manufacturer        |
|---------|--------------|--------------------|---------------------|
| CL408e  | Thermal Head | KPA-112-8MTA2-SKB  | Kyocera Corporation |
| CL412e  | Thermal Head | KHT-112-12TAJ2-SKB | Kyocera Corporation |

### RFID Description

The RFID Reader/Writer and the antenna for performing communication with a RFID tag are built in Sato's RFID printer. The inlet (the RFID tag) has an IC chip and antenna incorporated into the printer label. The printout data entered from the host interface is analyzed inside the printer, modified and sent to RFID Reader/Writer module. The RFID Reader/Writer module communicates with the inlet through the antenna. Reading of data, writing, etc. are performed between the IC chips. When writing into the IC chip ends, a label is conveyed and printing is done on the label surface by the thermal head. The label with the RFID data will be used for physical distribution, product management, and so on.

In order to avoid simultaneous occupancy of transmitting channels in a multi-transmitter environment, each frequency table is pseudo random and is in no way synchronous with any other (see Table 1). And, although there is always a possibility that 2 or more transmitters can transmit simultaneously in any instant, the probability of any substantial energy buildup is, practically zero.

**Table 1.**



## APPLICATION NOTE

### US Frequency Table

| Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---------|-----------------|---------|-----------------|
| 1       | 903.138         | 26      | 915.446         |
| 2       | 903.631         | 27      | 915.938         |
| 3       | 904.123         | 28      | 916.431         |
| 4       | 904.615         | 29      | 916.923         |
| 5       | 905.108         | 30      | 917.415         |
| 6       | 905.600         | 31      | 917.908         |
| 7       | 906.092         | 32      | 918.400         |
| 8       | 906.585         | 33      | 918.892         |
| 9       | 907.077         | 34      | 919.385         |
| 10      | 907.569         | 35      | 919.877         |
| 11      | 908.062         | 36      | 920.369         |
| 12      | 908.554         | 37      | 920.862         |
| 13      | 909.046         | 38      | 921.354         |
| 14      | 909.538         | 39      | 921.846         |
| 15      | 910.031         | 40      | 922.338         |
| 16      | 910.523         | 41      | 922.831         |
| 17      | 911.015         | 42      | 923.323         |
| 18      | 911.508         | 43      | 923.815         |
| 19      | 912.00          | 44      | 924.308         |
| 20      | 912.492         | 45      | 924.800         |
| 21      | 912.985         | 46      | 925.292         |
| 22      | 913.477         | 47      | 925.785         |
| 23      | 913.969         | 48      | 926.277         |
| 24      | 914.462         | 49      | 926.769         |
| 25      | 914.954         | 50      | 927.262         |

## 1.1 Device Configuration During Test

### 1.1.1 Equipment Used During Test:

| Use* | Product Type | Manufacturer     | Model  | Comments         |
|------|--------------|------------------|--------|------------------|
| EUT  | RFID Printer | SATO Corporation | CL408E | All Ports Loaded |

\* Use = EUT - Equipment Under Test, ACC - Accessory (Not Subjected to Test), or SIM - Simulator (Not Subjected to Test)

### 1.1.2 Input/Output Ports:

| Port # | Name          | Type* | Cable Max. >3m | Cable Shielded | Comments  |
|--------|---------------|-------|----------------|----------------|-----------|
| 0      | Enclosure     | N/E   | -              | -              | None      |
| 1      | Mains         | AC    | No             | No             | 120V/60Hz |
| 2      | Parallel Port | I/O   | Yes            | No             |           |
| 3      | EXT I/F       | I/O   | Yes            | No             |           |

\*AC = AC Power Port      DC = DC Power Port      N/E = Non-Electrical  
I/O = Signal Input or Output Port (Not Involved in Process Control)  
PMC = Process Measurement and Control Port

### 1.1.3 EUT Internal Operating Frequencies:

| Frequency (MHz) | Description              | Frequency (MHz) | Description |
|-----------------|--------------------------|-----------------|-------------|
| 902.4 – 926.5   | FHSS Range of Operation  | ---             | ---         |
| 902.4           | Low Channel Frequency    |                 |             |
| 915.2           | Middle Channel Frequency |                 |             |
| 926.5           | High Channel Frequency   |                 |             |

### 1.1.4 Power Interface:

| Mode # | Voltage (V) | Current (A) | Power (W) | Frequency (DC/AC-Hz) | Phases (#) | Comments |
|--------|-------------|-------------|-----------|----------------------|------------|----------|
| 1      | 120         | 3.15        | -         | 60                   | 1          | --       |

### 1.2 EUT Operation Modes:

| Mode # | Description                                      |
|--------|--------------------------------------------------|
| 1      | Transmit Mode – Low Channel, Hopping Disabled    |
| 2      | Transmit Mode – Middle Channel, Hopping Disabled |
| 3      | Transmit Mode – High Channel, Hopping Disabled   |
| 4      | Transmit Mode –Hopping Enabled                   |
| 5      | Receive Mode – RF Off and Printing               |

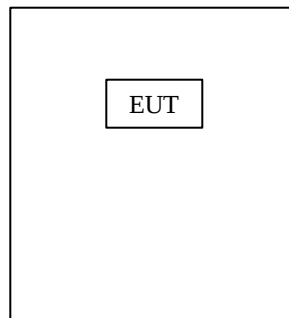
### 1.3 EUT Configuration Modes:

| Mode # | Description                                                    |
|--------|----------------------------------------------------------------|
| 1      | Printer utilizing RFID technology. Model: CL408E S/N: 45590308 |

"The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report"

## 1.4 Block Diagram:

The diagram below illustrates the configuration of the equipment above.



## 1.5 Deviations from standard test methods.

Not Applicable

## 1.6 Device Modifications Necessary for Compliance

As described below:

Modifications to the CL408E were necessary in order to reduce harmonic emissions in the restricted bands. The following modifications were made:

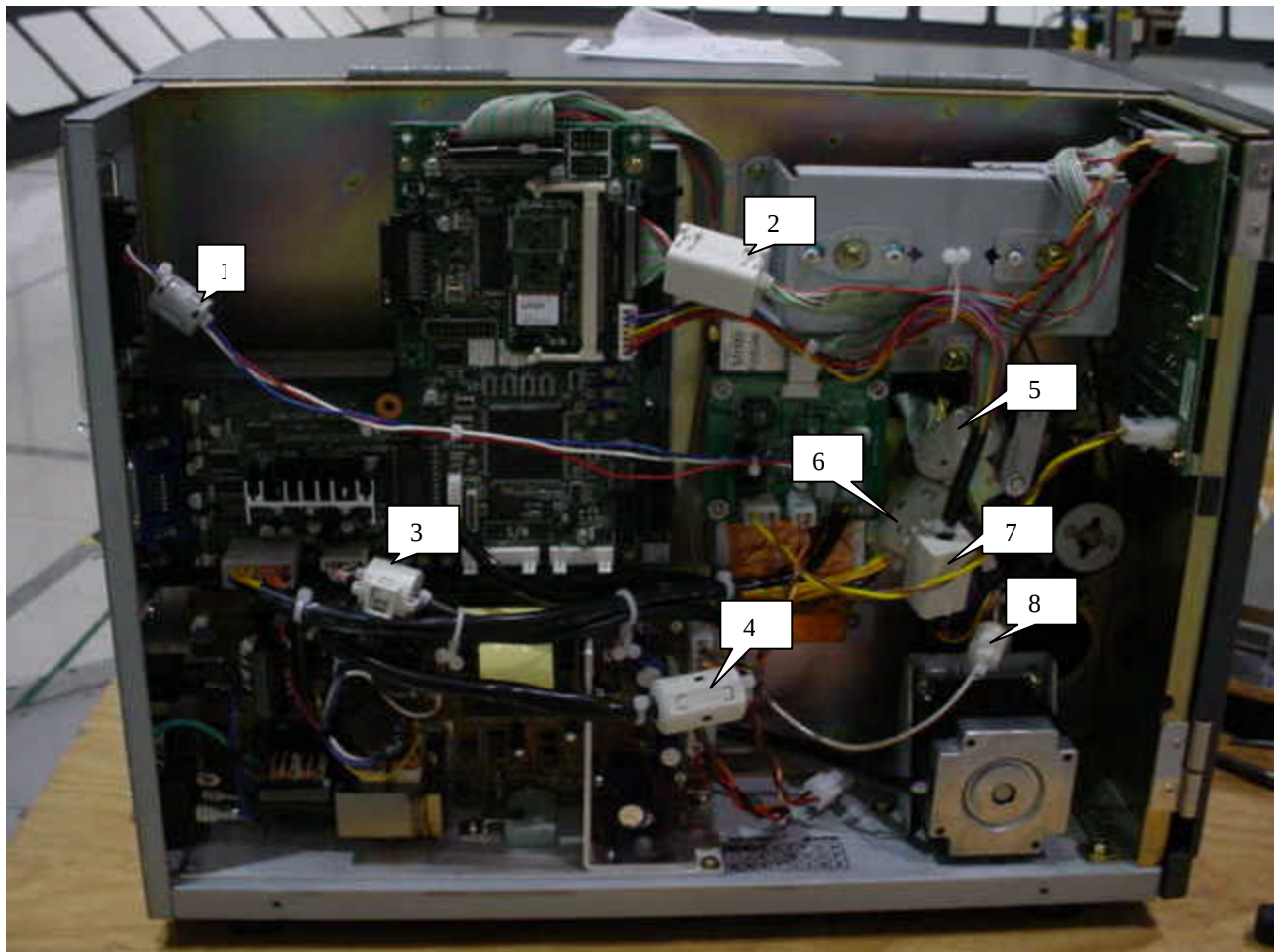
- A. Copper shielding was placed on the bottom portion of the transmitter covering the ribbon cable. **Figure 1.6a**
- B. A Kitagawa SFC-3 ferrite ring was placed on the antenna cable. **Figure 1.6b**
- C. A TDK ZCAT 1518-0730 ferrite ring was placed on the communication cable, internally between the connector and the transmitter interface board. **Figure 1.6b**
- D. A Kitagawa SFC-8 ferrite ring was placed on a cable harness commonly routed with the antenna cable. **Figure 1.6b**
- E. The antenna cable was replaced with a higher quality cable with additional shielding near the antenna and near the connector. **Figure 1.6c**
- F. An additional L- shaped metal plate was placed under the antenna. **Figure 1.6d**

### Note:

Additional ferrite rings shown but not discussed are part of the original product configuration. A detailed list of all ferrites employed in the design is included below. **Figure 1.6b**

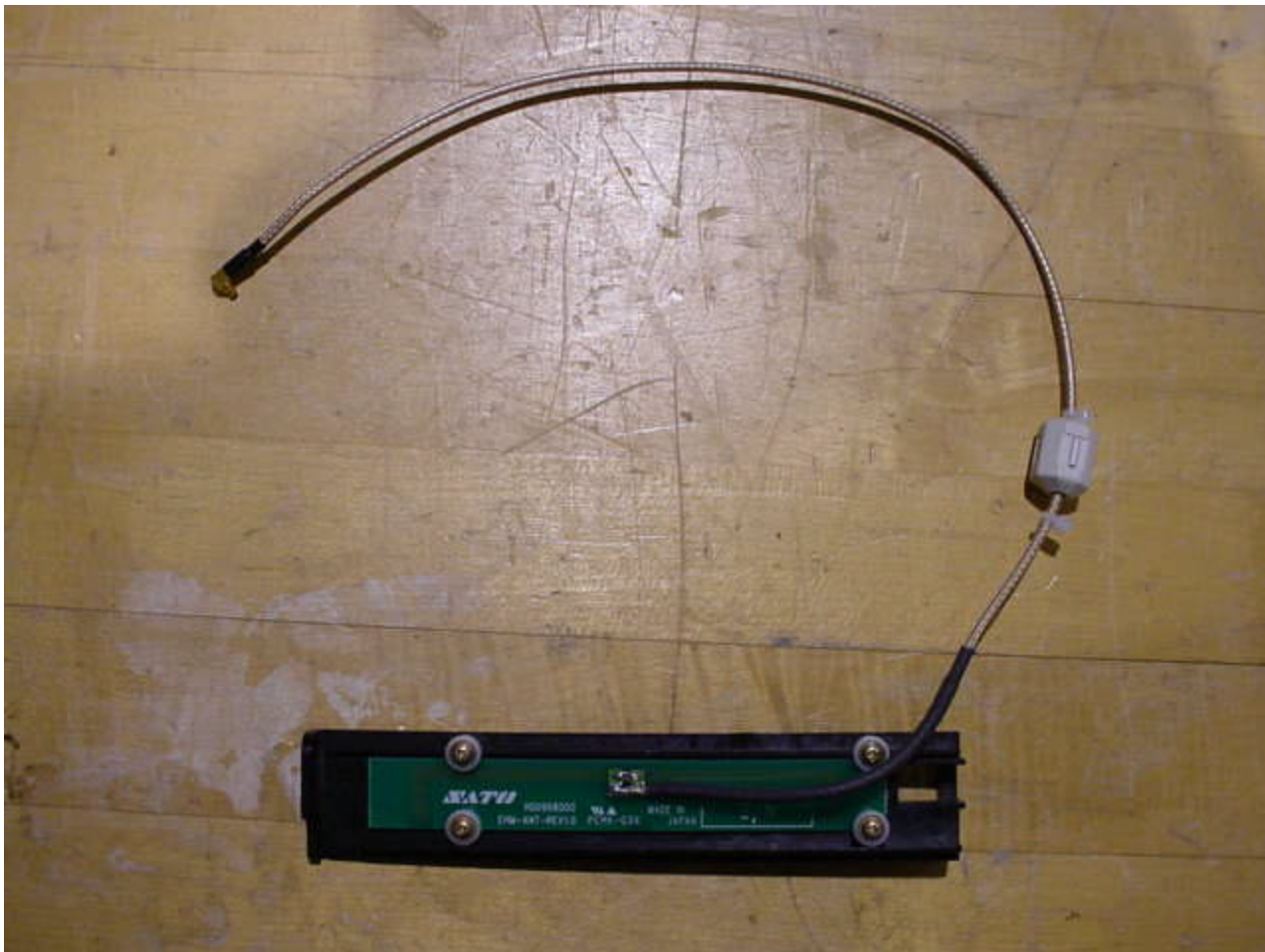


**Figure 1.6a** Transmitter Shielding

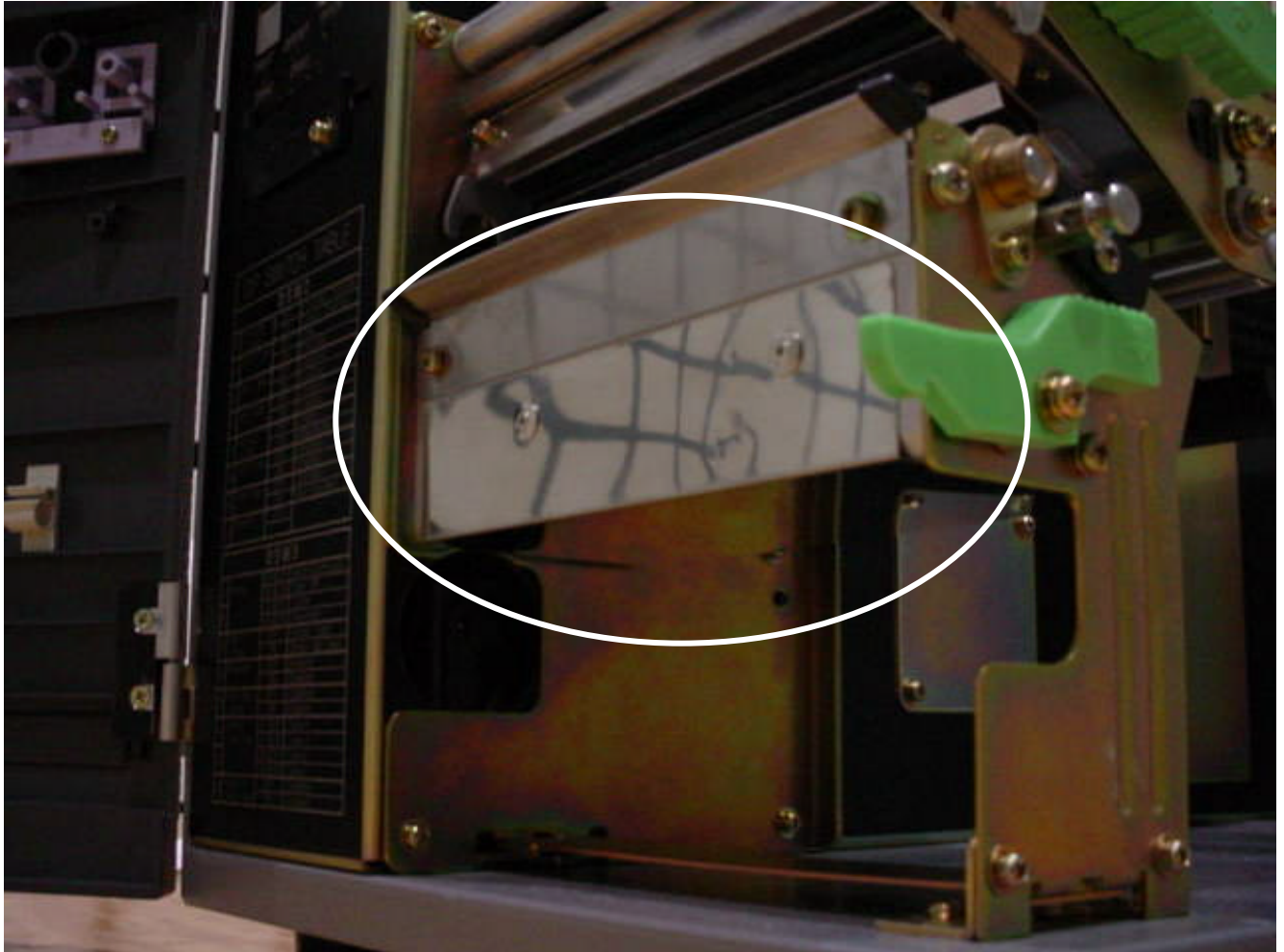


| No. | Part Number    | Manufacturer        | Remarks                                  |
|-----|----------------|---------------------|------------------------------------------|
| 1   | ZCAT 1518-0730 | TDK Corporation     | Added for compliance                     |
| 2   | SFC-8          | Kitagawa Industries | Previously added                         |
| 3   | TFC-16-8-16    | Kitagawa Industries | Previously added                         |
| 4   | RFC-8          | Kitagawa Industries | Previously added                         |
| 5   | RFC-8          | Kitagawa Industries | Previously added                         |
| 6   | RFC-8          | Kitagawa Industries | Previously added                         |
| 7   | SFC-8          | Kitagawa Industries | Added for compliance                     |
| 8   | SFC-3          | Kitagawa Industries | Added for compliance                     |
|     | ZCAT 2035-0930 | TDK Corporation     | Previously added<br>Not Shown – AC Cable |

**Figure 1.6b** Ferrite Details



**Figure 1.6c** Modified Antenna Assembly



**Figure 1.6d** Antenna Shielding

## 1.7 Test Summary

| Test Name<br>Test Requirement/Specification                                       | Comply | Does Not<br>Comply | See<br>Remark |
|-----------------------------------------------------------------------------------|--------|--------------------|---------------|
| Radiated Disturbance Emissions - 30 to 10000 MHz Electric Field                   | Y      |                    | 2             |
| FCC Part 15, Subpart C, Section 15.247                                            |        | -                  |               |
| Conducted Disturbance Spurious Emissions - FCC Part 15, Subpart C, Section 15.247 | Y      |                    | 1             |
| Carrier Frequency Section 15.247                                                  | Y      | -                  | 1             |
| Number of Hopping Frequencies Section 15.247 A (i)                                | Y      | -                  | 1             |
| Time of Occupancy (Dwell Time)                                                    | Y      |                    | 1             |
| Occupied Bandwidth                                                                | Y      | -                  | 1             |
| Peak Output Power Section 15.247(B)                                               | Y      |                    | 1             |
| RF Exposure Compliance Requirements                                               | Y      | -                  | 1             |
| Band-edge Compliance of RF Conducted Emissions: Section 15.247 (C)                | Y      |                    | 1             |

### Remarks:

- 1) No Modifications required for compliance.
- 2) Modifications required to comply as described in Section 1.6

## 2.0 Conclusion:

The tests listed in the Summary of Testing section of this report have been performed and the results recorded by Underwriters Laboratories Inc. in accordance with the procedures stated in each test requirement and specification. The test list was determined by the Applicant as being applicable to the Equipment Under Test. As a result, the subject product has been verified to comply or not comply as noted in the Summary of Testing with each test specification. The test results relate only to the items tested.

**The equipment under test has met the technical requirements as defined under section 5.0.**

Test Start Date: 22 November 2004  
Test Completion Date: 19 January 2005



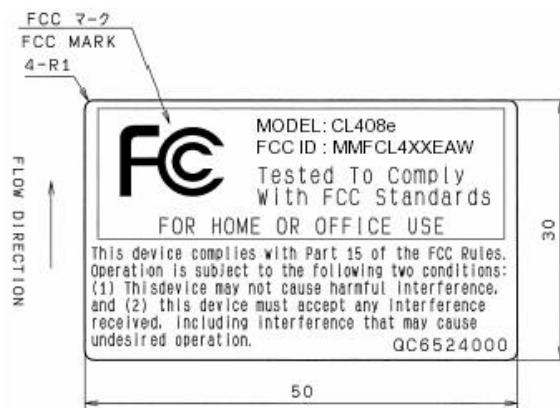
Joshua Thompson (Ext.22218)  
Engineer  
International EMC Services  
Conformity Assessment Services-3027EMEL



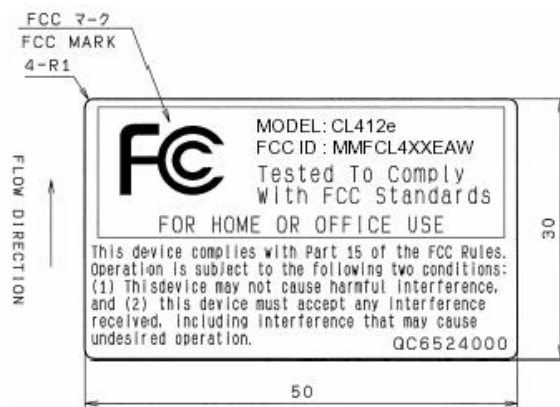
Robert DeLisi (Ext.22452)  
Senior Staff Engineer  
International EMC Services  
Conformity Assessment Services-3027EMEL

### 3.0 FCC Labeling Information

#### Label



FCC Label for CL408e



FCC Label for CL412e

Measurements (unit: mm)

Material: Matt Silver Polyester (Thickness: 0.05mm), on Laminate  
Adhesive: Hot melt pressure sensitive adhesives, or Synthetic resin emulsion



Label Position (Printer Back View)

## **4.0 Calibration of Equipment Used for Measurement**

All test equipment and test accessories are calibrated on a regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less.

All test equipment calibrations are traceable to the National Institute of Standards and Technology (NIST); therefore, all test data recorded in this report is traceable to NIST.

## 5.0 EMISSIONS TEST REGULATIONS

The emissions tests were performed according to following regulations:

----- United States -----

FCC Part 15, Subpart B, 15.107,  
15.109 and Subpart C, 15.207,  
15.209 and Section 15.247

Code of Federal Regulations, Part 15, Subpart B and C, Radio  
Frequency Devices

| <b>Measurement summary:</b>                                     |                          |
|-----------------------------------------------------------------|--------------------------|
| <b>Measure ments</b>                                            | <b>Results</b>           |
| Spurious RF Antenna Port Conducted Emissions                    | >20 dB below Fundamental |
| Occupied Bandwidth (20 dB BW)                                   | 0.324 MHz                |
| Peak Output Power                                               | 314.05 mW                |
| Number of Hopping Frequencies                                   | 50                       |
| Carrier Frequency Separation                                    | 0.492 MHz                |
| Band Edge Compliance (lower and Upper Band 902 MHz and 928 MHz) | >20 dB below Fundamental |
| Time of Occupancy                                               | 300 ms                   |
| Spurious Radiated Emissions                                     | Meets FCC 15.209 Limit   |
| Harmonic Radiated Emissions (Outside Restricted Bands)          | >20 dB below Fundamental |
| Harmonic Radiated Emissions (Inside Restricted Bands)           | Meets FCC 15.209 Limit   |

## 5.1.1 AC Mains Conducted Emissions Tests

Measurements were made on a ground plane that extends 1-meter minimum beyond three sides of the system under test with the fourth side positioned 40 cm from a vertical ground plane. The system under test was positioned on a non-conductive table 80 cm above the horizontal ground plane. All power was connected to the system through Line Impedance Stabilization Networks (LISN). Conducted voltage measurements on mains lines were made at the output of the LISN.

### Results

The system met the requirements for AC Mains Conducted Emissions. Data Pages follow.

|                      |                 |
|----------------------|-----------------|
| Temperature:         | 21.0°C          |
| Humidity:            | 47 %RH          |
| Pressure:            | 1014 mbar       |
| Date test performed: | 14 January 2005 |

1 fully configured sample was scanned over the following frequency range

| Frequency Range | Measurement Point | Mode*    |           |
|-----------------|-------------------|----------|-----------|
|                 |                   | Power    | Operation |
| 150kHz to 30MHz | AC Mains          | <u>1</u> | <u>5</u>  |

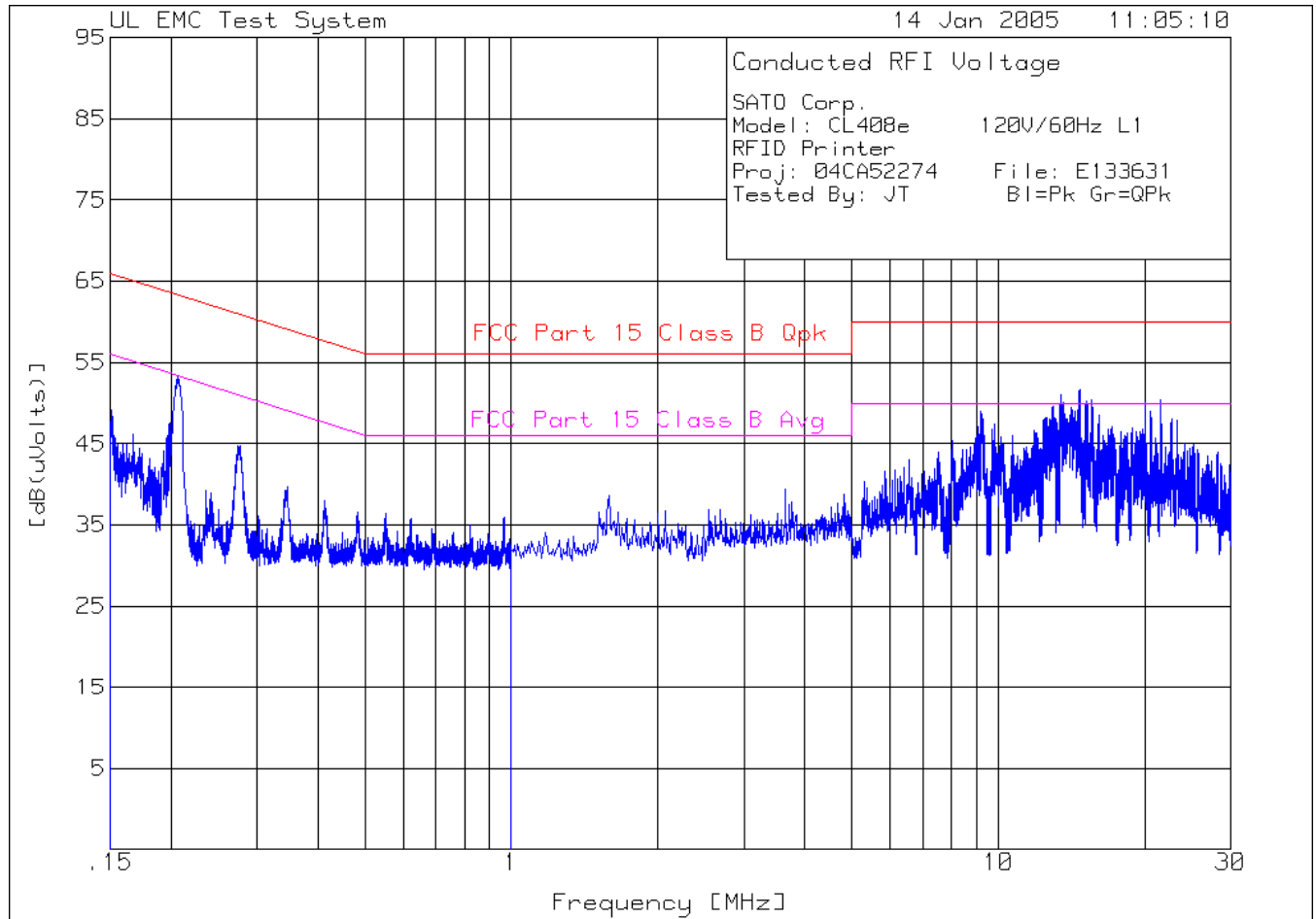
\*See Power Interface and EUT Operating Modes for details

#### Test equipment used for Conducted Emissions

|                             |                                       |                                      |                                |
|-----------------------------|---------------------------------------|--------------------------------------|--------------------------------|
| <b>E7402A</b>               | <b>Agilent Technologies</b>           | <b>EMI Spectrum Analyzer</b>         | <b>Equipment No.: ME5B-123</b> |
|                             |                                       | <b>Quasi Peak BW: 9kHz</b>           | <b>150kHz to 30MHz</b>         |
|                             |                                       | <b>RBW 100 KHz</b>                   |                                |
|                             |                                       | <b>Quasi Peak BW: 120 kHz</b>        | <b>30 to 1000MHz</b>           |
|                             |                                       | <b>RBW 1.0 MHz</b>                   |                                |
| Range: 0.15 – 30 MHz        | Last Calibration Date: 17 August 2004 | Calibration Due Date: 17 August 2005 |                                |
| <b>EMI Software Version</b> | 9.1                                   |                                      |                                |

#### Test Accessories for Conducted Emissions

|                         |                                      |                                     |                                |
|-------------------------|--------------------------------------|-------------------------------------|--------------------------------|
| <b>11947A</b>           | <b>Hewlett Packard</b>               | <b>Transient Limiter</b>            | <b>Equipment No.: ME5A-443</b> |
| Range: 0.15 – 30 MHz    | Last Calibration Date: 24 March 2004 | Calibration Due Date: 24 March 2005 |                                |
| <b>9252-50-R-24-BNC</b> | <b>Solar Electronics</b>             | <b>50W LISN</b>                     | <b>Equipment No.: ME5A-637</b> |
| Range: 0.15 – 30 MHz    | Last Calibration Date: 7 July 2004   | Calibration Due Date: 7 July 2005   |                                |
| <b>99760-00</b>         | <b>Cole –Parmer</b>                  | <b>Hygrometer/Temp/Baro meter</b>   | <b>Equipment No.: ME4-268</b>  |
|                         |                                      | Ranges                              | Temp: 0°C-55°C                 |
|                         |                                      |                                     | Humidity: 25% to 95 %RH        |
|                         |                                      |                                     | Pressure: 795 to 1050 mbar     |
|                         | Last Calibration Date: 18 June 2004  | Calibration Due Date: 18 June 2005  |                                |



File Number: E133631  
 Project Number: O4CA52274  
 Model Number: CL4XXE  
 FCC ID: MMFCL4XXEAW

Issued: 3/4/2005

SATO Corp.  
 Model: CL408e 120V/60Hz L1  
 RFID Printer  
 Proj: 04CA52274 File: E133631  
 Tested By: JT Bl=Pk Gr=QPk

| No.                       | Test<br>Frequency<br>[MHz] | Meter<br>Reading<br>[dB(uV)] | Gain/Loss<br>Factor<br>[dB] | Transducer<br>Factor<br>[dB] | Level<br>[dB(uVolts)] | Limit:1 | 2     |
|---------------------------|----------------------------|------------------------------|-----------------------------|------------------------------|-----------------------|---------|-------|
| =====                     |                            |                              |                             |                              |                       |         |       |
| Range: 1 .15 - 1MHz ----- |                            |                              |                             |                              |                       |         |       |
| 1                         | .2066                      | 43.33 pk                     | 10.1                        | 0                            | 53.43                 | 63.3    | 53.3  |
|                           |                            |                              |                             | Margin [dB]                  |                       | -9.87   | .13   |
| 2                         | .27656                     | 34.7 pk                      | 10.1                        | 0                            | 44.8                  | 60.9    | 50.9  |
|                           |                            |                              |                             | Margin [dB]                  |                       | -16.1   | -6.1  |
| Range: 1 1 - 30MHz -----  |                            |                              |                             |                              |                       |         |       |
| 3                         | 3.64753                    | 29.03 pk                     | 10.3                        | 0                            | 39.33                 | 56      | 46    |
|                           |                            |                              |                             | Margin [dB]                  |                       | -16.67  | -6.67 |
| 4                         | 8.06733                    | 34.94 pk                     | 10.4                        | 0                            | 45.34                 | 60      | 50    |
|                           |                            |                              |                             | Margin [dB]                  |                       | -14.66  | -4.66 |
| 5                         | 9.19578                    | 38.51 pk                     | 10.4                        | 0                            | 48.91                 | 60      | 50    |
|                           |                            |                              |                             | Margin [dB]                  |                       | -11.09  | -1.09 |
| 6                         | 9.78895                    | 36.95 pk                     | 10.4                        | 0                            | 47.35                 | 60      | 50    |
|                           |                            |                              |                             | Margin [dB]                  |                       | -12.65  | -2.65 |
| 7                         | 10.68592                   | 35.61 pk                     | 10.4                        | 0                            | 46.01                 | 60      | 50    |
|                           |                            |                              |                             | Margin [dB]                  |                       | -13.99  | -3.99 |
| 8                         | 11.85778                   | 36.22 pk                     | 10.4                        | 0                            | 46.62                 | 60      | 50    |
|                           |                            |                              |                             | Margin [dB]                  |                       | -13.38  | -3.38 |
| 9                         | 12.47265                   | 37.86 pk                     | 10.4                        | 0                            | 48.26                 | 60      | 50    |
|                           |                            |                              |                             | Margin [dB]                  |                       | -11.74  | -1.74 |
| 10                        | 12.92837                   | 39.24 pk                     | 10.4                        | 0                            | 49.64                 | 60      | 50    |
|                           |                            |                              |                             | Margin [dB]                  |                       | -10.36  | -.36  |
| 11                        | 13.4492                    | 40.7 pk                      | 10.4                        | 0                            | 51.1                  | 60      | 50    |
|                           |                            |                              |                             | Margin [dB]                  |                       | -8.9    | 1.1   |
| 12                        | 14.14363                   | 38.9 pk                      | 10.5                        | 0                            | 49.4                  | 60      | 50    |
|                           |                            |                              |                             | Margin [dB]                  |                       | -10.6   | -.6   |
| 13                        | 14.67893                   | 41.08 pk                     | 10.5                        | 0                            | 51.58                 | 60      | 50    |
|                           |                            |                              |                             | Margin [dB]                  |                       | -8.42   | 1.58  |
| 14                        | 15.17082                   | 39.74 pk                     | 10.5                        | 0                            | 50.24                 | 60      | 50    |
|                           |                            |                              |                             | Margin [dB]                  |                       | -9.76   | .24   |
| 15                        | 15.57591                   | 39.93 pk                     | 10.5                        | 0                            | 50.43                 | 60      | 50    |
|                           |                            |                              |                             | Margin [dB]                  |                       | -9.57   | .43   |
| 16                        | 16.06056                   | 38.01 pk                     | 10.5                        | 0                            | 48.51                 | 60      | 50    |
|                           |                            |                              |                             | Margin [dB]                  |                       | -11.49  | -1.49 |
| 17                        | 17.08775                   | 36.6 pk                      | 10.5                        | 0                            | 47.1                  | 60      | 50    |
|                           |                            |                              |                             | Margin [dB]                  |                       | -12.9   | -2.9  |
| 18                        | 18.82384                   | 36.37 pk                     | 10.5                        | 0                            | 46.87                 | 60      | 50    |
|                           |                            |                              |                             | Margin [dB]                  |                       | -13.13  | -3.13 |
| 19                        | 19.9957                    | 39.62 pk                     | 10.5                        | 0                            | 50.12                 | 60      | 50    |
|                           |                            |                              |                             | Margin [dB]                  |                       | -9.88   | .12   |
| 20                        | 20.54546                   | 38.45 pk                     | 10.5                        | 0                            | 48.95                 | 60      | 50    |
|                           |                            |                              |                             | Margin [dB]                  |                       | -11.05  | -1.05 |

File Number: E133631  
Project Number: O4CA52274  
Model Number: CL4XXE  
FCC ID: MMFCL4XXEAW

Issued: 3/4/2005

|    |          |          |      |             |       |        |       |
|----|----------|----------|------|-------------|-------|--------|-------|
| 21 | 21.51477 | 39.88 pk | 10.5 | 0           | 50.38 | 60     | 50    |
|    |          |          |      | Margin [dB] |       | -9.62  | .38   |
| 22 | 22.75174 | 37.49 pk | 10.5 | 0           | 47.99 | 60     | 50    |
|    |          |          |      | Margin [dB] |       | -12.01 | -2.01 |
| 23 | 23.3015  | 35.74 pk | 10.5 | 0           | 46.24 | 60     | 50    |
|    |          |          |      | Margin [dB] |       | -13.76 | -3.76 |

LIMIT 1: FCC Part 15 Class B Qpk  
LIMIT 2: FCC Part 15 Class B Avg

pk - Peak detector

File Number: E133631  
 Project Number: O4CA52274  
 Model Number: CL4XXE  
 FCC ID: MMFCL4XXEAW

Issued: 3/4/2005

SATO Corp.  
 Model: CL408e      120V/60Hz L1  
 RFID Printer  
 Proj: 04CA52274      File: E133631  
 Tested By: JT      Bl=Pk Gr=QPk

| Test                | Meter     | Gain/Loss | Transducer   | Level        | Limit:1 | 2      |
|---------------------|-----------|-----------|--------------|--------------|---------|--------|
| Frequency           | Reading   | Factor    | Factor       | [dB(uVolts)] |         |        |
| [MHz]               | [dB(uV)]  | [dB]      | [dB]         |              |         |        |
| =====               |           |           |              |              |         |        |
| Range: 1 .15 - 1MHz |           |           |              |              |         |        |
| .2066               | 40.12 ave | 10.1      | 0            | 50.22        | 63.3    | 53.3   |
|                     |           |           | Margin [dB]: |              | -13.08  | -3.08  |
| Range: 1 1 - 30MHz  |           |           |              |              |         |        |
| 8.06733             | 25.67 ave | 10.4      | 0            | 36.07        | 60      | 50     |
|                     |           |           | Margin [dB]: |              | -23.93  | -13.93 |
| 9.19578             | 25.37 ave | 10.4      | 0            | 35.77        | 60      | 50     |
|                     |           |           | Margin [dB]: |              | -24.23  | -14.23 |
| 9.78895             | 19.56 ave | 10.4      | 0            | 29.96        | 60      | 50     |
|                     |           |           | Margin [dB]: |              | -30.04  | -20.04 |
| 10.68592            | 25.5 ave  | 10.4      | 0            | 35.9         | 60      | 50     |
|                     |           |           | Margin [dB]: |              | -24.1   | -14.1  |
| 11.85778            | 31.2 ave  | 10.4      | 0            | 41.6         | 60      | 50     |
|                     |           |           | Margin [dB]: |              | -18.4   | -8.4   |
| 12.47265            | 32.61 ave | 10.4      | 0            | 43.01        | 60      | 50     |
|                     |           |           | Margin [dB]: |              | -16.99  | -6.99  |
| 12.92837            | 32.44 ave | 10.4      | 0            | 42.84        | 60      | 50     |
|                     |           |           | Margin [dB]: |              | -17.16  | -7.16  |
| 13.4492             | 31.85 ave | 10.4      | 0            | 42.25        | 60      | 50     |
|                     |           |           | Margin [dB]: |              | -17.75  | -7.75  |
| 14.14363            | 32.24 ave | 10.5      | 0            | 42.74        | 60      | 50     |
|                     |           |           | Margin [dB]: |              | -17.26  | -7.26  |
| 14.67893            | 29.81 ave | 10.5      | 0            | 40.31        | 60      | 50     |
|                     |           |           | Margin [dB]: |              | -19.69  | -9.69  |
| 15.17082            | 29.84 ave | 10.5      | 0            | 40.34        | 60      | 50     |
|                     |           |           | Margin [dB]: |              | -19.66  | -9.66  |
| 15.57591            | 27.06 ave | 10.5      | 0            | 37.56        | 60      | 50     |
|                     |           |           | Margin [dB]: |              | -22.44  | -12.44 |
| 16.06056            | 28.55 ave | 10.5      | 0            | 39.05        | 60      | 50     |
|                     |           |           | Margin [dB]: |              | -20.95  | -10.95 |
| 17.08775            | 27.69 ave | 10.5      | 0            | 38.19        | 60      | 50     |
|                     |           |           | Margin [dB]: |              | -21.81  | -11.81 |
| 18.82384            | 27.46 ave | 10.5      | 0            | 37.96        | 60      | 50     |
|                     |           |           | Margin [dB]: |              | -22.04  | -12.04 |
| 19.9957             | 27.32 ave | 10.5      | 0            | 37.82        | 60      | 50     |
|                     |           |           | Margin [dB]: |              | -22.18  | -12.18 |
| 20.54546            | 27.29 ave | 10.5      | 0            | 37.79        | 60      | 50     |
|                     |           |           | Margin [dB]: |              | -22.21  | -12.21 |
| 21.51477            | 26.16 ave | 10.5      | 0            | 36.66        | 60      | 50     |
|                     |           |           | Margin [dB]: |              | -23.34  | -13.34 |
| 22.75174            | 24.47 ave | 10.5      | 0            | 34.97        | 60      | 50     |
|                     |           |           | Margin [dB]: |              | -25.03  | -15.03 |
| 23.3015             | 23.17 ave | 10.5      | 0            | 33.67        | 60      | 50     |

File Number: E133631  
Project Number: O4CA52274  
Model Number: CL4XXE  
FCC ID: MMFCL4XXEAW

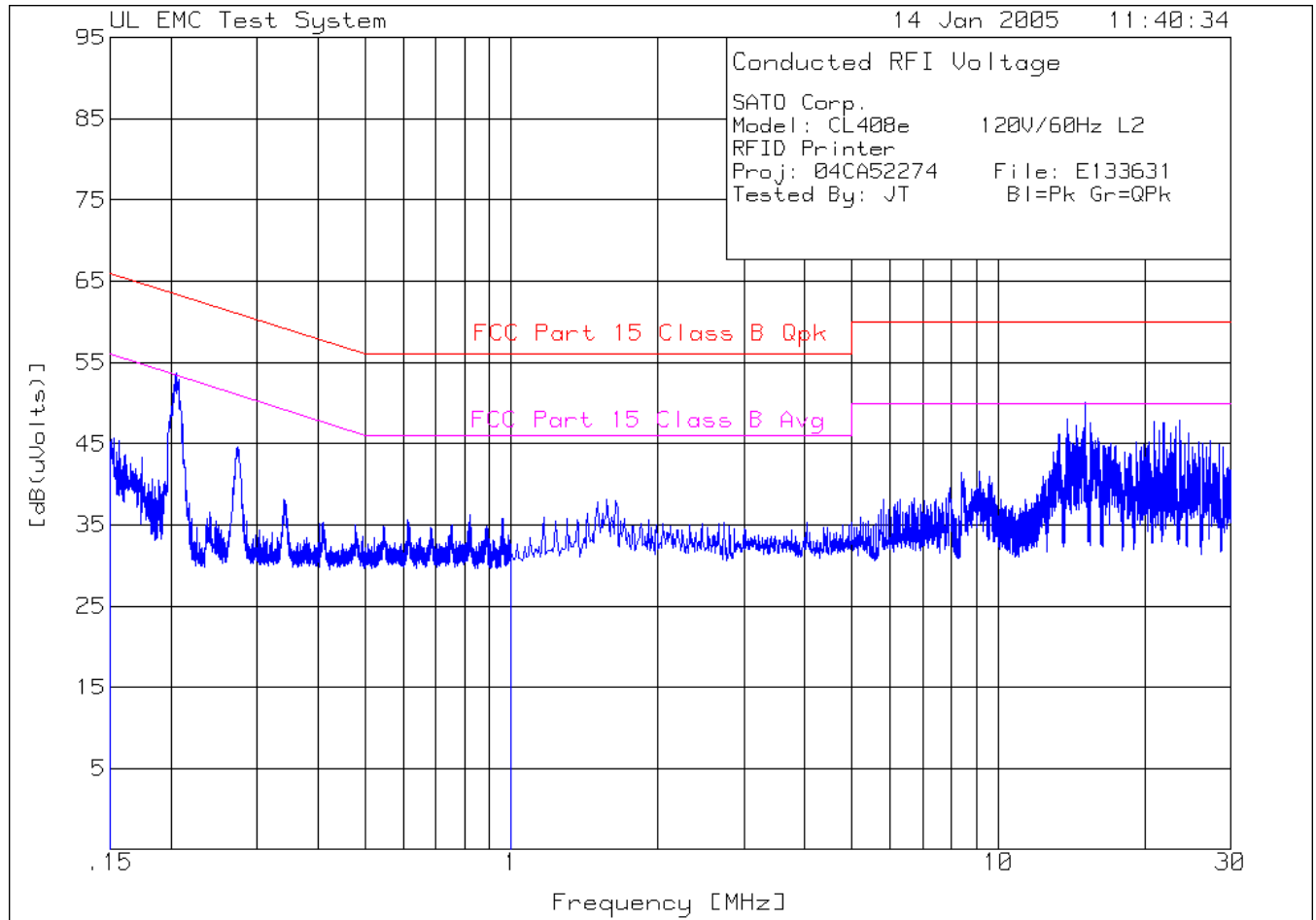
Issued: 3/4/2005

Margin [dB]:                    -26.33    -16.33

NOTE: "+" - Indicates an emission level in excess of the  
             applicable limit (s).

pk - Peak detector  
qp - Quasi-Peak detector  
ave - denotes average detection

LIMIT 1: FCC Part 15 Class B Qpk  
LIMIT 2: FCC Part 15 Class B Avg



File Number: E133631  
 Project Number: O4CA52274  
 Model Number: CL4XXE  
 FCC ID: MMFCL4XXEAW

Issued: 3/4/2005

SATO Corp.  
 Model: CL408e 120V/60Hz L2  
 RFID Printer  
 Proj: O4CA52274 File: E133631  
 Tested By: JT Bl=Pk Gr=QPk

| No.                       | Test<br>Frequency<br>[MHz] | Meter<br>Reading<br>[dB(uV)] | Gain/Loss<br>Factor<br>[dB] | Transducer<br>Factor<br>[dB] | Level<br>[dB(uVolts)] | Limit:1 | 2     |
|---------------------------|----------------------------|------------------------------|-----------------------------|------------------------------|-----------------------|---------|-------|
| =====                     |                            |                              |                             |                              |                       |         |       |
| Range: 1 .15 - 1MHz ----- |                            |                              |                             |                              |                       |         |       |
| 1                         | .2047                      | 43.57 pk                     | 10.1                        | 0                            | 53.67                 | 63.4    | 53.4  |
|                           |                            |                              |                             | Margin [dB]                  |                       | -9.73   | .27   |
| 2                         | .27444                     | 34.53 pk                     | 10.1                        | 0                            | 44.63                 | 61      | 51    |
|                           |                            |                              |                             | Margin [dB]                  |                       | -16.37  | -6.37 |
| Range: 1 1 - 30MHz -----  |                            |                              |                             |                              |                       |         |       |
| 3                         | 13.27559                   | 35.78 pk                     | 10.4                        | 0                            | 46.18                 | 60      | 50    |
|                           |                            |                              |                             | Margin [dB]                  |                       | -13.82  | -3.82 |
| 4                         | 13.82535                   | 37.6 pk                      | 10.5                        | 0                            | 48.1                  | 60      | 50    |
|                           |                            |                              |                             | Margin [dB]                  |                       | -11.9   | -1.9  |
| 5                         | 14.43298                   | 36.81 pk                     | 10.5                        | 0                            | 47.31                 | 60      | 50    |
|                           |                            |                              |                             | Margin [dB]                  |                       | -12.69  | -2.69 |
| 6                         | 15.04785                   | 39.63 pk                     | 10.5                        | 0                            | 50.13                 | 60      | 50    |
|                           |                            |                              |                             | Margin [dB]                  |                       | -9.87   | .13   |
| 7                         | 15.48187                   | 37.11 pk                     | 10.5                        | 0                            | 47.61                 | 60      | 50    |
|                           |                            |                              |                             | Margin [dB]                  |                       | -12.39  | -2.39 |
| 8                         | 15.96653                   | 35.15 pk                     | 10.5                        | 0                            | 45.65                 | 60      | 50    |
|                           |                            |                              |                             | Margin [dB]                  |                       | -14.35  | -4.35 |
| 9                         | 17.02265                   | 34.49 pk                     | 10.5                        | 0                            | 44.99                 | 60      | 50    |
|                           |                            |                              |                             | Margin [dB]                  |                       | -15.01  | -5.01 |
| 10                        | 19.17105                   | 34.65 pk                     | 10.5                        | 0                            | 45.15                 | 60      | 50    |
|                           |                            |                              |                             | Margin [dB]                  |                       | -14.85  | -4.85 |
| 11                        | 19.90889                   | 34.42 pk                     | 10.5                        | 0                            | 44.92                 | 60      | 50    |
|                           |                            |                              |                             | Margin [dB]                  |                       | -15.08  | -5.08 |
| 12                        | 20.38632                   | 34.77 pk                     | 10.5                        | 0                            | 45.27                 | 60      | 50    |
|                           |                            |                              |                             | Margin [dB]                  |                       | -14.73  | -4.73 |
| 13                        | 20.87097                   | 37.29 pk                     | 10.5                        | 0                            | 47.79                 | 60      | 50    |
|                           |                            |                              |                             | Margin [dB]                  |                       | -12.21  | -2.21 |
| 14                        | 21.3484                    | 36.14 pk                     | 10.5                        | 0                            | 46.64                 | 60      | 50    |
|                           |                            |                              |                             | Margin [dB]                  |                       | -13.36  | -3.36 |
| 15                        | 21.82582                   | 37.09 pk                     | 10.5                        | 0                            | 47.59                 | 60      | 50    |
|                           |                            |                              |                             | Margin [dB]                  |                       | -12.41  | -2.41 |
| 16                        | 22.57089                   | 35.8 pk                      | 10.5                        | 0                            | 46.3                  | 60      | 50    |
|                           |                            |                              |                             | Margin [dB]                  |                       | -13.7   | -3.7  |
| 17                        | 23.12789                   | 36.56 pk                     | 10.5                        | 0                            | 47.06                 | 60      | 50    |
|                           |                            |                              |                             | Margin [dB]                  |                       | -12.94  | -2.94 |
| 18                        | 23.53298                   | 35.54 pk                     | 10.5                        | 0                            | 46.04                 | 60      | 50    |
|                           |                            |                              |                             | Margin [dB]                  |                       | -13.96  | -3.96 |
| 19                        | 23.60531                   | 37.32 pk                     | 10.5                        | 0                            | 47.82                 | 60      | 50    |
|                           |                            |                              |                             | Margin [dB]                  |                       | -12.18  | -2.18 |
| 20                        | 24.5674                    | 35.85 pk                     | 10.5                        | 0                            | 46.35                 | 60      | 50    |
|                           |                            |                              |                             | Margin [dB]                  |                       | -13.65  | -3.65 |

File Number: E133631  
Project Number: O4CA52274  
Model Number: CL4XXE  
FCC ID: MMFCL4XXEAW

Issued: 3/4/2005

|    |          |          |      |             |       |        |       |
|----|----------|----------|------|-------------|-------|--------|-------|
| 21 | 25.72479 | 34.77 pk | 10.5 | 0           | 45.27 | 60     | 50    |
|    |          |          |      | Margin [dB] |       | -14.73 | -4.73 |
| 22 | 26.26008 | 34.61 pk | 10.5 | 0           | 45.11 | 60     | 50    |
|    |          |          |      | Margin [dB] |       | -14.89 | -4.89 |
| 23 | 27.16429 | 34.89 pk | 10.5 | 0           | 45.39 | 60     | 50    |
|    |          |          |      | Margin [dB] |       | -14.61 | -4.61 |
| 24 | 28.37956 | 34.44 pk | 10.5 | 0           | 44.94 | 60     | 50    |
|    |          |          |      | Margin [dB] |       | -15.06 | -5.06 |
| 25 | 28.93655 | 33.56 pk | 10.6 | 0           | 44.16 | 60     | 50    |
|    |          |          |      | Margin [dB] |       | -15.84 | -5.84 |

LIMIT 1: FCC Part 15 Class B Qpk

LIMIT 2: FCC Part 15 Class B Avg

pk - Peak detector

File Number: E133631  
 Project Number: O4CA52274  
 Model Number: CL4XXE  
 FCC ID: MMFCL4XXEAW

Issued: 3/4/2005

|                     |           |               |              |              |         |        |
|---------------------|-----------|---------------|--------------|--------------|---------|--------|
| SATO Corp.          |           |               |              |              |         |        |
| Model: CL408e       |           | 120V/60Hz L2  |              |              |         |        |
| RFID Printer        |           |               |              |              |         |        |
| Proj: 04CA52274     |           | File: E133631 |              |              |         |        |
| Tested By: JT       |           | Bl=Pk Gr=QPk  |              |              |         |        |
| Test                | Meter     | Gain/Loss     | Transducer   | Level        | Limit:1 | 2      |
| Frequency           | Reading   | Factor        | Factor       | [dB(uVolts)] |         |        |
| [MHz]               | [dB(uV)]  | [dB]          | [dB]         |              |         |        |
| =====               |           |               |              |              |         |        |
| Range: 1 .15 - 1MHz |           |               |              |              |         |        |
| .2047               | 39.34 ave | 10.1          | 0            | 49.44        | 63.4    | 53.4   |
|                     |           |               | Margin [dB]: |              | -13.96  | -3.96  |
| Range: 1 1 - 30MHz  |           |               |              |              |         |        |
| 13.27559            | 26.11 ave | 10.4          | 0            | 36.51        | 60      | 50     |
|                     |           |               | Margin [dB]: |              | -23.49  | -13.49 |
| 13.82535            | 28.01 ave | 10.5          | 0            | 38.51        | 60      | 50     |
|                     |           |               | Margin [dB]: |              | -21.49  | -11.49 |
| 14.43298            | 26.67 ave | 10.5          | 0            | 37.17        | 60      | 50     |
|                     |           |               | Margin [dB]: |              | -22.83  | -12.83 |
| 15.04785            | 28.17 ave | 10.5          | 0            | 38.67        | 60      | 50     |
|                     |           |               | Margin [dB]: |              | -21.33  | -11.33 |
| 15.48187            | 26.38 ave | 10.5          | 0            | 36.88        | 60      | 50     |
|                     |           |               | Margin [dB]: |              | -23.12  | -13.12 |
| 15.96653            | 25.7 ave  | 10.5          | 0            | 36.2         | 60      | 50     |
|                     |           |               | Margin [dB]: |              | -23.8   | -13.8  |
| 17.02265            | 25.67 ave | 10.5          | 0            | 36.17        | 60      | 50     |
|                     |           |               | Margin [dB]: |              | -23.83  | -13.83 |
| 19.17105            | 24.24 ave | 10.5          | 0            | 34.74        | 60      | 50     |
|                     |           |               | Margin [dB]: |              | -25.26  | -15.26 |
| 19.90889            | 24.65 ave | 10.5          | 0            | 35.15        | 60      | 50     |
|                     |           |               | Margin [dB]: |              | -24.85  | -14.85 |
| 20.38632            | 25.17 ave | 10.5          | 0            | 35.67        | 60      | 50     |
|                     |           |               | Margin [dB]: |              | -24.33  | -14.33 |
| 20.87097            | 25.2 ave  | 10.5          | 0            | 35.7         | 60      | 50     |
|                     |           |               | Margin [dB]: |              | -24.3   | -14.3  |
| 21.3484             | 24.48 ave | 10.5          | 0            | 34.98        | 60      | 50     |
|                     |           |               | Margin [dB]: |              | -25.02  | -15.02 |
| 21.82582            | 24.13 ave | 10.5          | 0            | 34.63        | 60      | 50     |
|                     |           |               | Margin [dB]: |              | -25.37  | -15.37 |
| 22.57089            | 22.7 ave  | 10.5          | 0            | 33.2         | 60      | 50     |
|                     |           |               | Margin [dB]: |              | -26.8   | -16.8  |
| 23.12789            | 22.82 ave | 10.5          | 0            | 33.32        | 60      | 50     |
|                     |           |               | Margin [dB]: |              | -26.68  | -16.68 |
| 23.53298            | 22.04 ave | 10.5          | 0            | 32.54        | 60      | 50     |
|                     |           |               | Margin [dB]: |              | -27.46  | -17.46 |
| 23.60531            | 21.4 ave  | 10.5          | 0            | 31.9         | 60      | 50     |
|                     |           |               | Margin [dB]: |              | -28.1   | -18.1  |
| 24.5674             | 20.9 ave  | 10.5          | 0            | 31.4         | 60      | 50     |
|                     |           |               | Margin [dB]: |              | -28.6   | -18.6  |
| 25.72479            | 18.44 ave | 10.5          | 0            | 28.94        | 60      | 50     |
|                     |           |               | Margin [dB]: |              | -31.06  | -21.06 |
| 26.26008            | 18.82 ave | 10.5          | 0            | 29.32        | 60      | 50     |

File Number: E133631  
Project Number: O4CA52274  
Model Number: CL4XXE  
FCC ID: MMFCL4XXEAW

Issued: 3/4/2005

|          |           |      |              |        |        |
|----------|-----------|------|--------------|--------|--------|
| 27.16429 | 17.69 ave | 10.5 | Margin [dB]: | -30.68 | -20.68 |
|          |           |      | 0            | 28.19  | 60 50  |
| 28.37956 | 13.8 ave  | 10.5 | Margin [dB]: | -31.81 | -21.81 |
|          |           |      | 0            | 24.3   | 60 50  |
| 28.93655 | 16.39 ave | 10.6 | Margin [dB]: | -35.7  | -25.7  |
|          |           |      | 0            | 26.99  | 60 50  |
|          |           |      | Margin [dB]: | -33.01 | -23.01 |

NOTE: "+" - Indicates an emission level in excess of the applicable limit (s).

pk - Peak detector  
qp - Quasi-Peak detector  
ave - denotes average detection

LIMIT 1: FCC Part 15 Class B Qpk  
LIMIT 2: FCC Part 15 Class B Avg



**Conducted Emissions Test Setup**

## 5.1.2 Spurious RF Conducted Emissions Tests

All harmonics/spurs must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz bandwidth. Spurious RF conducted emissions are measured with a direct connection between the antenna port of the transmitter and the spectrum analyzer. The spectrum analyzer scans up to the 10<sup>th</sup> harmonic.

Use the following spectrum analyzer settings:

Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10<sup>th</sup> harmonic. Typically, several plots are required to cover this entire span.

RBW = 100 kHz

VBW ≥ RBW

Sweep = auto

Detector function = peak

Trace = max hold

Allow the trace to stabilize. Set the marker on the peak of any spurious emission recorded. The level displayed must comply with the limit specified in this Section. Submit these plots.

### Results

The system met the requirements for conducted emissions. Data Pages follow.

|                      |                  |
|----------------------|------------------|
| Temperature:         | 20.0°C           |
| Humidity:            | 42 %RH           |
| Pressure:            | 1011 mbar        |
| Date test performed: | 30 November 2004 |

1 fully configured sample was scanned over the following frequency range

#### Frequency Range

#### Measurement Point

#### Mode\*

|                |                                | Power    | Operation      |
|----------------|--------------------------------|----------|----------------|
| 30MHz to 10GHz | Antenna Port Spurious Emission | <u>1</u> | <u>1,2,3,4</u> |

\*See Power Interface and EUT Operating Modes for details

File Number: E133631  
Project Number: O4CA52274  
Model Number: CL4XXE  
FCC ID: MMFCL4XXEAW

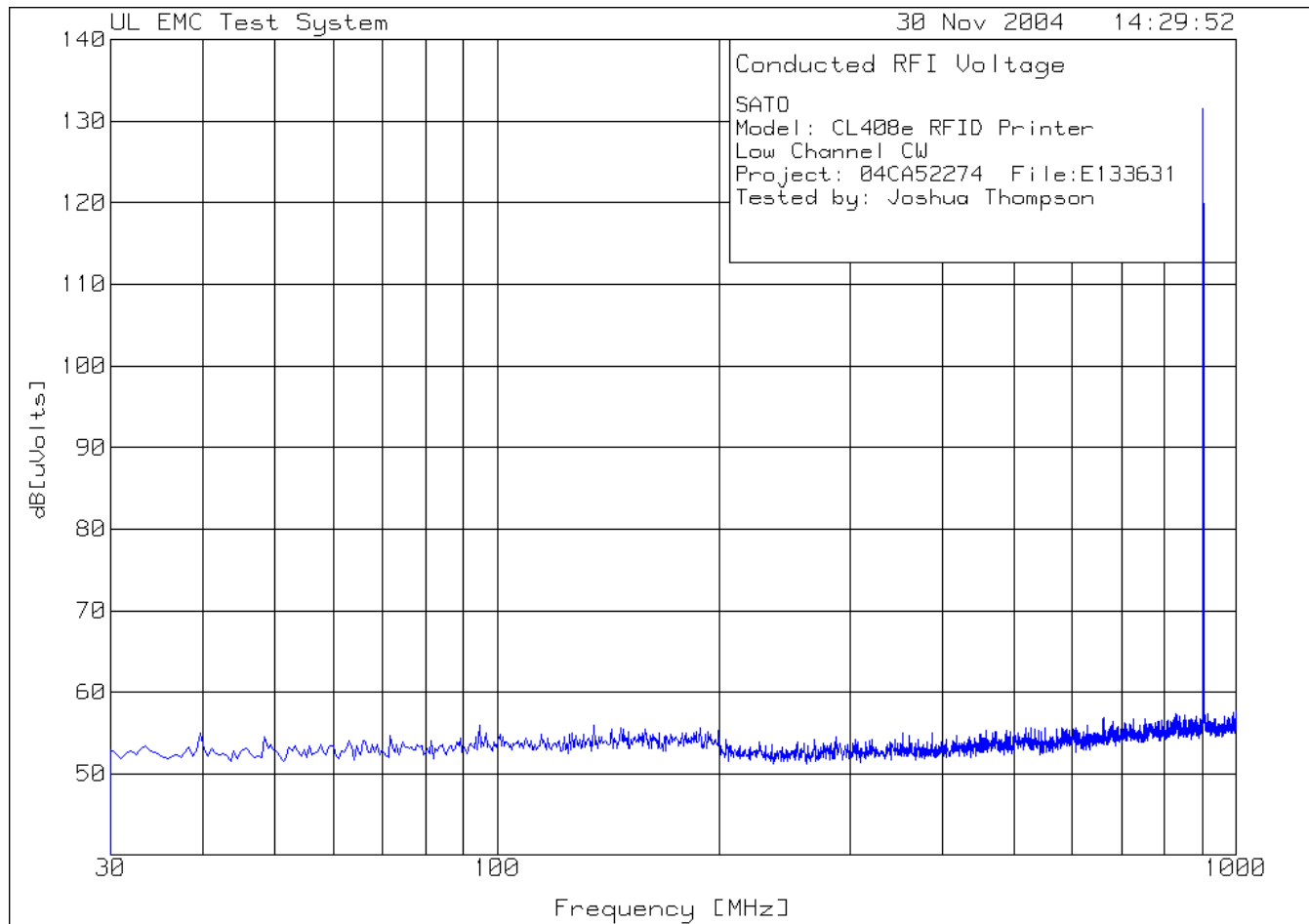
Issued: 3/4/2005

**Test equipment used for Conducted Emissions**

|                             |                                         |                     |                                        |
|-----------------------------|-----------------------------------------|---------------------|----------------------------------------|
| <b>ESI 26</b>               | <b>Rhode &amp; Schwartz</b>             | <b>EMI Receiver</b> | <b>Equipment No.: ME5B-081</b>         |
|                             |                                         |                     | <b>RBW 100 kHz</b>                     |
|                             |                                         |                     | <b>VBW 300 kHz</b>                     |
| Range: 0.03 -10 GHz         | Last Calibration Date: 7 September 2004 |                     | Calibration Due Date: 7 September 2005 |
| <b>EMI Software Version</b> | 9.2                                     |                     |                                        |

**Test Accessories for Conducted Emissions**

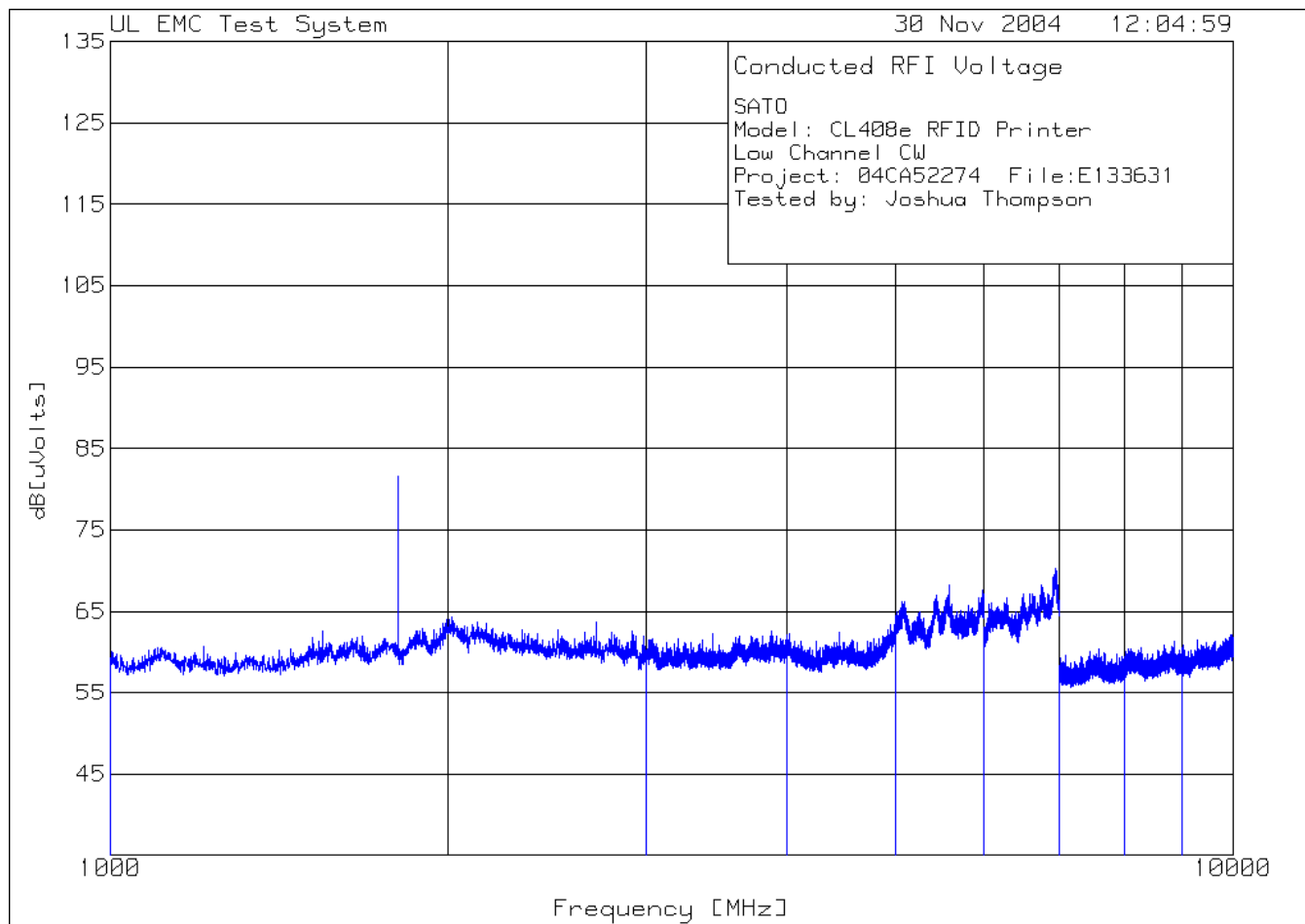
|                      |                                         |                             |                                        |
|----------------------|-----------------------------------------|-----------------------------|----------------------------------------|
| <b>BW-N20W5</b>      | <b>Mini-Circuits</b>                    | <b>20 dB Attenuator</b>     | <b>Equipment No.: A01</b>              |
| Range: 0.03 – 10 GHz | Last Calibration Date: 22 November 2004 |                             | Calibration Due Date: 22 November 2005 |
| <b>99760-00</b>      | <b>Cole –Parmer</b>                     | <b>Hygrometer/Temp/Baro</b> | <b>Equipment No.: ME4-268</b>          |
|                      |                                         | <b>meter</b>                |                                        |
|                      |                                         | Ranges                      | Temp: 0°C-55°C                         |
|                      |                                         |                             | Humidity: 25% to 95 %RH                |
|                      |                                         |                             | Pressure: 795 to 1050 mbar             |
|                      | Last Calibration Date: 18 June 2004     |                             | Calibration Due Date: 18 June 2005     |



SATO  
 Model: CL408e RFID Printer  
 Low Channel CW  
 Project: 04CA52274 File:E133631  
 Tested by: Joshua Thompson

| Test No.    | Frequency [MHz] | Meter Reading [dB(uV)] | Gain/Loss Factor [dB] | Transducer Factor [dB] | Level dB[uVolts] | Limit:1 | 2 | 3 |
|-------------|-----------------|------------------------|-----------------------|------------------------|------------------|---------|---|---|
| 1           | 902.4662        | 110.76 pk              | 20.8                  | 0                      | 131.56           | -       | - | - |
| Margin [dB] |                 |                        |                       |                        |                  | -       | - | - |

pk - Peak detector



File Number: E133631  
Project Number: O4CA52274  
Model Number: CL4XXE  
FCC ID: MMFCL4XXEAW

Issued: 3/4/2005

SATO

Model: CL408e RFID Printer

Low Channel CW

Project: 04CA52274 File:E133631

Tested by: Joshua Thompson

| No. | Test<br>Frequency<br>[MHz] | Meter<br>Reading<br>[dB(uV)] | Gain/Loss<br>Factor<br>[dB] | Transducer<br>Factor<br>[dB] | Level<br>dB[uVolts] | Limit:1 | 2 | 3 |
|-----|----------------------------|------------------------------|-----------------------------|------------------------------|---------------------|---------|---|---|
|-----|----------------------------|------------------------------|-----------------------------|------------------------------|---------------------|---------|---|---|

=====

|          |                |          |      |   |       |   |   |   |
|----------|----------------|----------|------|---|-------|---|---|---|
| Range: 2 | 1000 - 3000MHz | -----    |      |   |       |   |   |   |
| 1        | 1804.402       | 61 pk    | 20.6 | 0 | 81.6  | - | - | - |
| 2        | 2707.854       | 42.27 pk | 21.4 | 0 | 63.67 | - | - | - |

|         |                |          |      |   |       |   |   |   |
|---------|----------------|----------|------|---|-------|---|---|---|
| Range:2 | 3000 - 4000MHz | -----    |      |   |       |   |   |   |
| 3       | 3606.303       | 39.66 pk | 22.2 | 0 | 61.86 | - | - | - |

|         |                |          |      |   |       |   |   |   |
|---------|----------------|----------|------|---|-------|---|---|---|
| Range:3 | 4000 - 5000MHz | -----    |      |   |       |   |   |   |
| 4       | 4509.755       | 38.92 pk | 22.2 | 0 | 61.12 | - | - | - |

|         |                |         |      |   |      |   |   |   |
|---------|----------------|---------|------|---|------|---|---|---|
| Range:4 | 5000 - 6000MHz | -----   |      |   |      |   |   |   |
| 5       | 5440.72        | 44.8 pk | 22.1 | 0 | 66.9 | - | - | - |

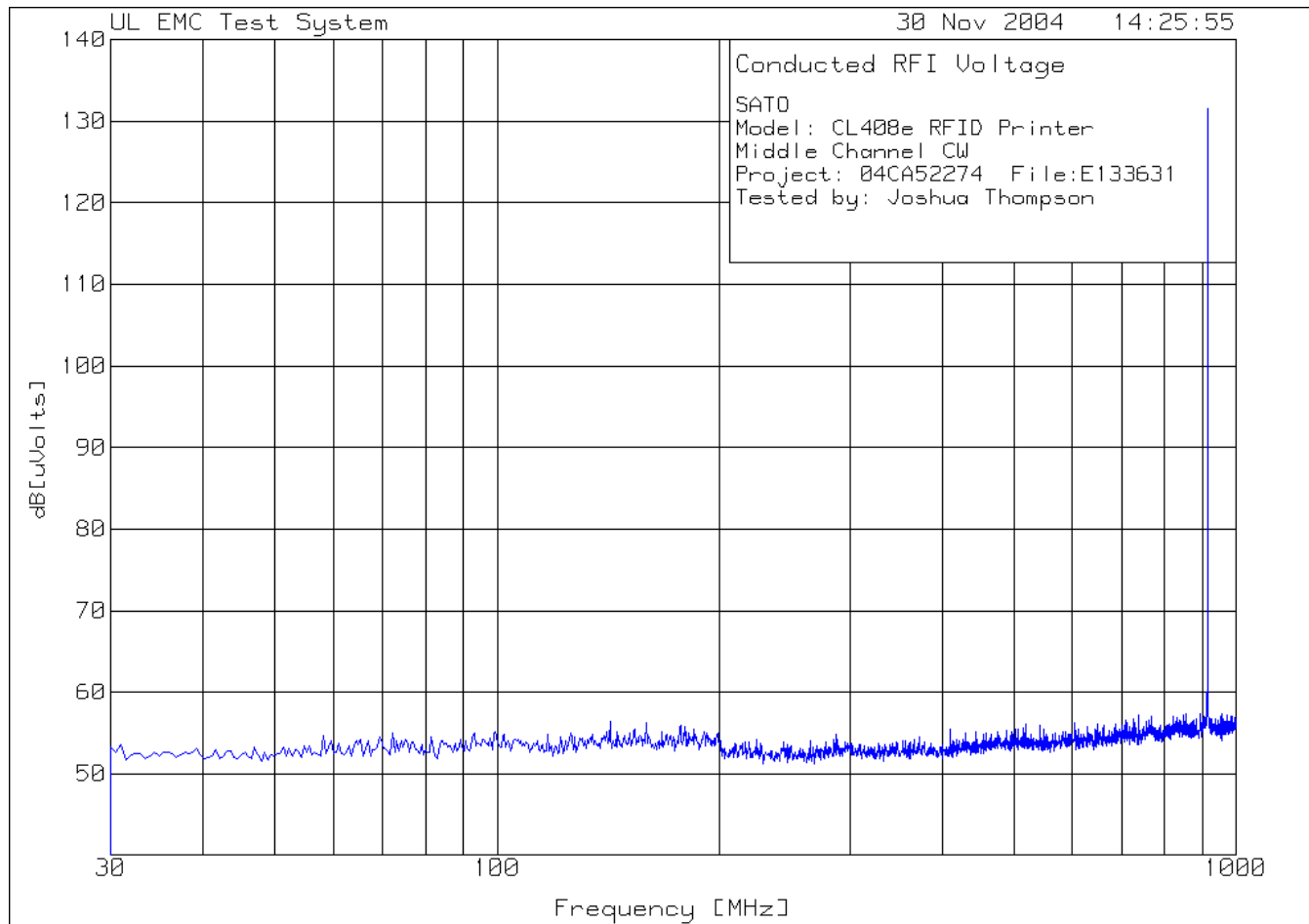
|         |                |          |      |   |       |   |   |   |
|---------|----------------|----------|------|---|-------|---|---|---|
| Range:5 | 6000 - 7000MHz | -----    |      |   |       |   |   |   |
| 6       | 6305.653       | 43.83 pk | 21.6 | 0 | 65.43 | - | - | - |

|         |                |         |      |   |      |   |   |   |
|---------|----------------|---------|------|---|------|---|---|---|
| Range:6 | 7000 - 8000MHz | -----   |      |   |      |   |   |   |
| 7       | 7217.109       | 38.1 pk | 20.7 | 0 | 58.8 | - | - | - |

|         |                |          |      |   |       |   |   |   |
|---------|----------------|----------|------|---|-------|---|---|---|
| Range:7 | 8000 - 9000MHz | -----    |      |   |       |   |   |   |
| 8       | 8098.549       | 39.09 pk | 21.3 | 0 | 60.39 | - | - | - |

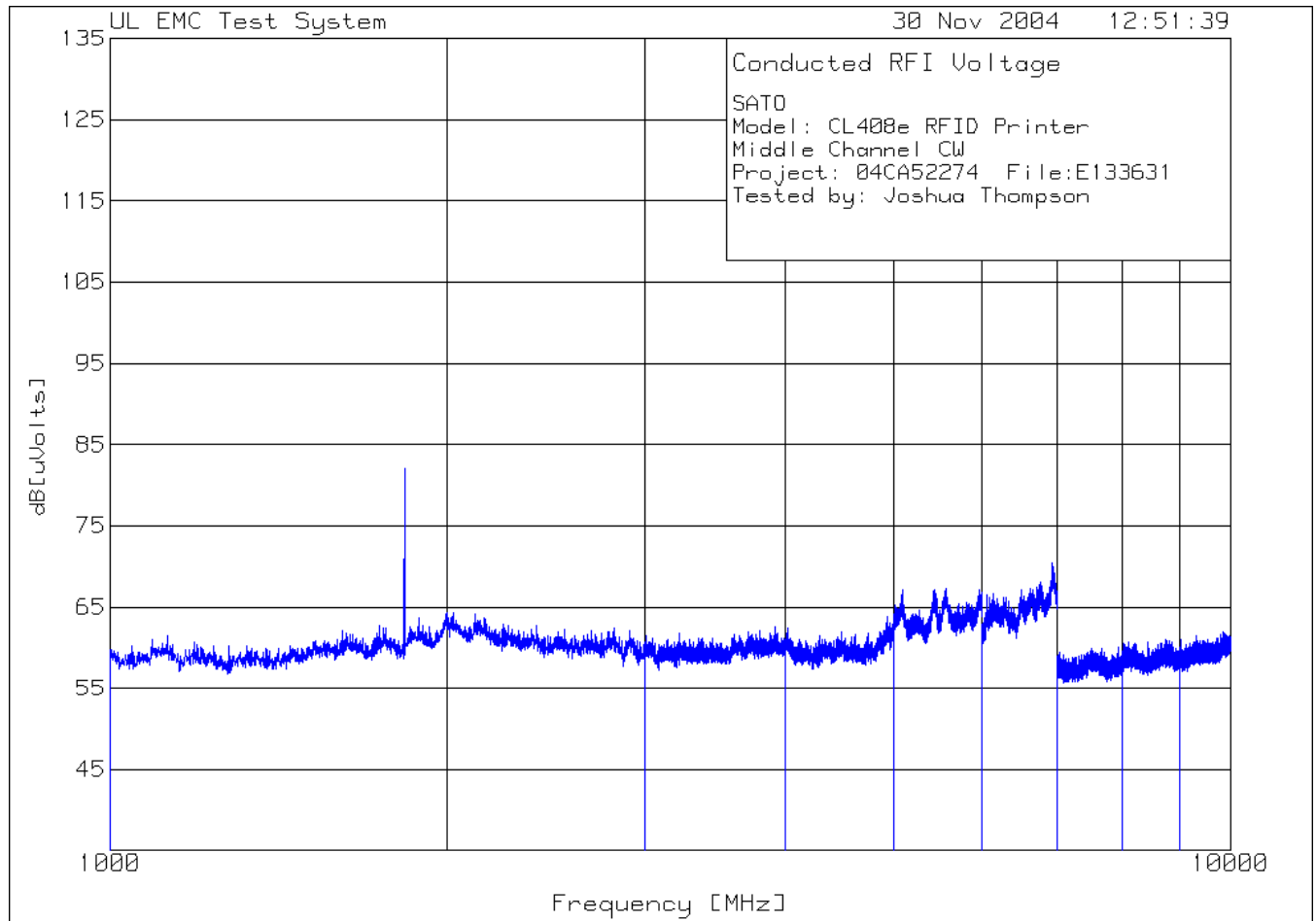
|         |                 |          |    |   |       |   |   |   |
|---------|-----------------|----------|----|---|-------|---|---|---|
| Range:8 | 9000 - 10000MHz | -----    |    |   |       |   |   |   |
| 9       | 9031.516        | 38.83 pk | 22 | 0 | 60.83 | - | - | - |

pk - Peak detector



SATO  
 Model: CL408e RFID Printer  
 Middle Channel CW  
 Project: 04CA52274 File:E133631  
 Tested by: Joshua Thompson

| Test                        | Meter     | Gain/Loss | Transducer | Level  | Limit:1    | 2 | 3 |
|-----------------------------|-----------|-----------|------------|--------|------------|---|---|
| No.                         | Frequency | Reading   | Factor     | Factor | dB[uVolts] |   |   |
|                             | [MHz]     | [dB(uV)]  | [dB]       | [dB]   |            |   |   |
| =====                       |           |           |            |        |            |   |   |
| Range: 2 30 - 1000MHz ----- |           |           |            |        |            |   |   |
| 1                           | 915.5677  | 110.82 pk | 20.7       | 0      | 131.52     | - | - |
| pk - Peak detector          |           |           |            |        |            |   |   |



File Number: E133631  
Project Number: O4CA52274  
Model Number: CL4XXE  
FCC ID: MMFCL4XXEAW

Issued: 3/4/2005

SATO

Model: CL408e RFID Printer

Middle Channel CW

Project: 04CA52274 File:E133631

Tested by: Joshua Thompson

| No. | Test<br>Frequency<br>[MHz] | Meter<br>Reading<br>[dB(uV)] | Gain/Loss<br>Factor<br>[dB] | Transducer<br>Factor<br>[dB] | Level<br>dB[uVolts] | Limit:1 | 2 | 3 |
|-----|----------------------------|------------------------------|-----------------------------|------------------------------|---------------------|---------|---|---|
|-----|----------------------------|------------------------------|-----------------------------|------------------------------|---------------------|---------|---|---|

=====

Range: 2 1000 - 3000MHz -----

|   |          |          |      |   |       |   |   |   |
|---|----------|----------|------|---|-------|---|---|---|
| 1 | 1830.415 | 61 pk    | 21.1 | 0 | 82.1  | - | - | - |
| 2 | 2745.873 | 40.43 pk | 21.3 | 0 | 61.73 | - | - | - |

Range:2 3000 - 4000MHz -----

|   |          |       |      |   |      |   |   |   |
|---|----------|-------|------|---|------|---|---|---|
| 3 | 3653.827 | 39 pk | 22.2 | 0 | 61.2 | - | - | - |
|---|----------|-------|------|---|------|---|---|---|

Range:3 4000 - 5000MHz -----

|   |          |         |    |   |      |   |   |   |
|---|----------|---------|----|---|------|---|---|---|
| 4 | 4582.791 | 39.3 pk | 22 | 0 | 61.3 | - | - | - |
|---|----------|---------|----|---|------|---|---|---|

Range:4 5000 - 6000MHz -----

|   |          |          |      |   |       |   |   |   |
|---|----------|----------|------|---|-------|---|---|---|
| 5 | 5491.246 | 42.68 pk | 21.9 | 0 | 64.58 | - | - | - |
|---|----------|----------|------|---|-------|---|---|---|

Range:5 6000 - 7000MHz -----

|   |          |         |    |   |      |   |   |   |
|---|----------|---------|----|---|------|---|---|---|
| 6 | 6401.201 | 42.7 pk | 22 | 0 | 64.7 | - | - | - |
|---|----------|---------|----|---|------|---|---|---|

Range:6 7000 - 8000MHz -----

|   |          |          |      |   |       |   |   |   |
|---|----------|----------|------|---|-------|---|---|---|
| 7 | 7324.162 | 38.13 pk | 20.8 | 0 | 58.93 | - | - | - |
|---|----------|----------|------|---|-------|---|---|---|

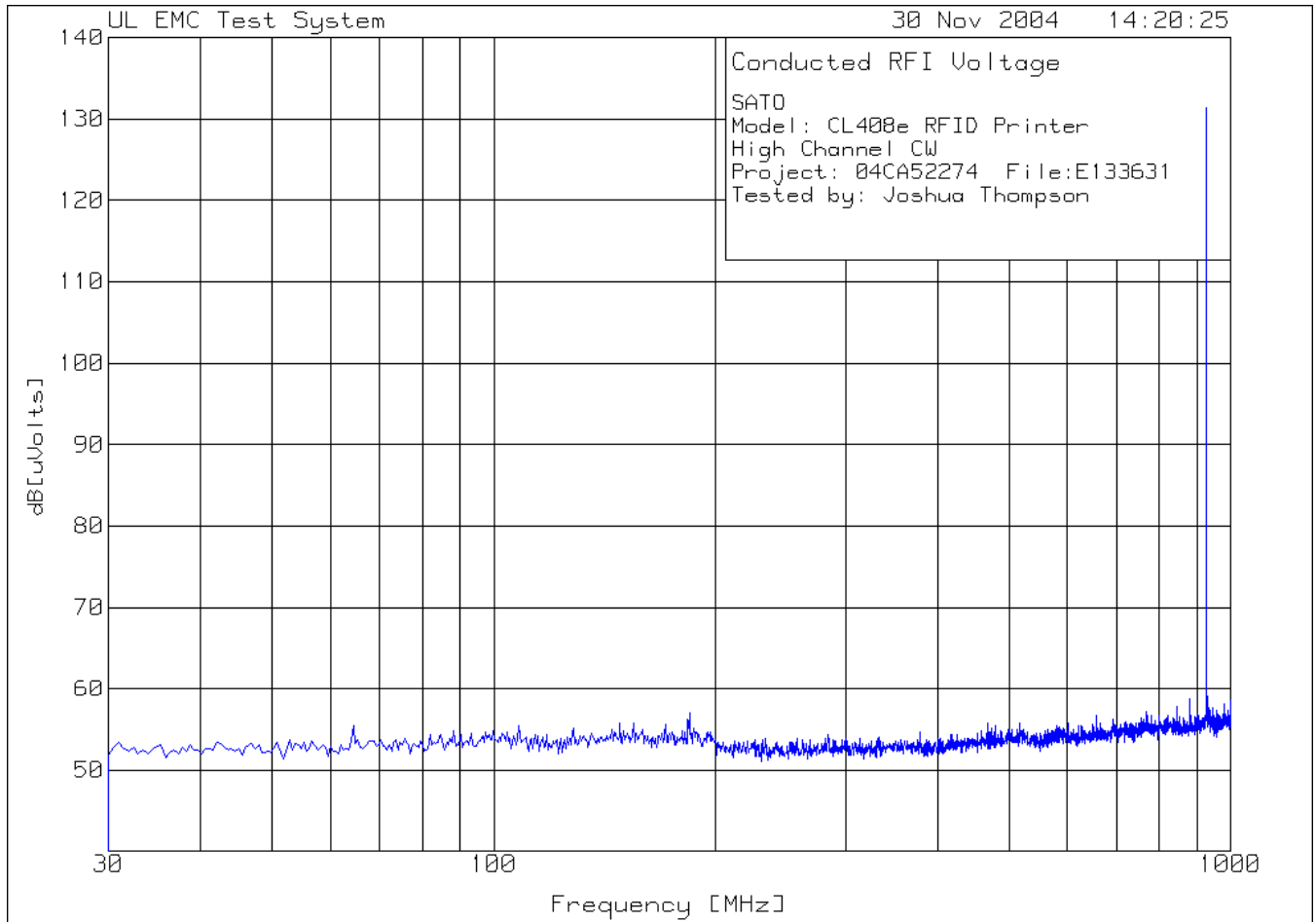
Range:7 8000 - 9000MHz -----

|   |          |          |      |   |       |   |   |   |
|---|----------|----------|------|---|-------|---|---|---|
| 8 | 8246.623 | 37.75 pk | 21.4 | 0 | 59.15 | - | - | - |
|---|----------|----------|------|---|-------|---|---|---|

Range:8 9000 - 10000MHz -----

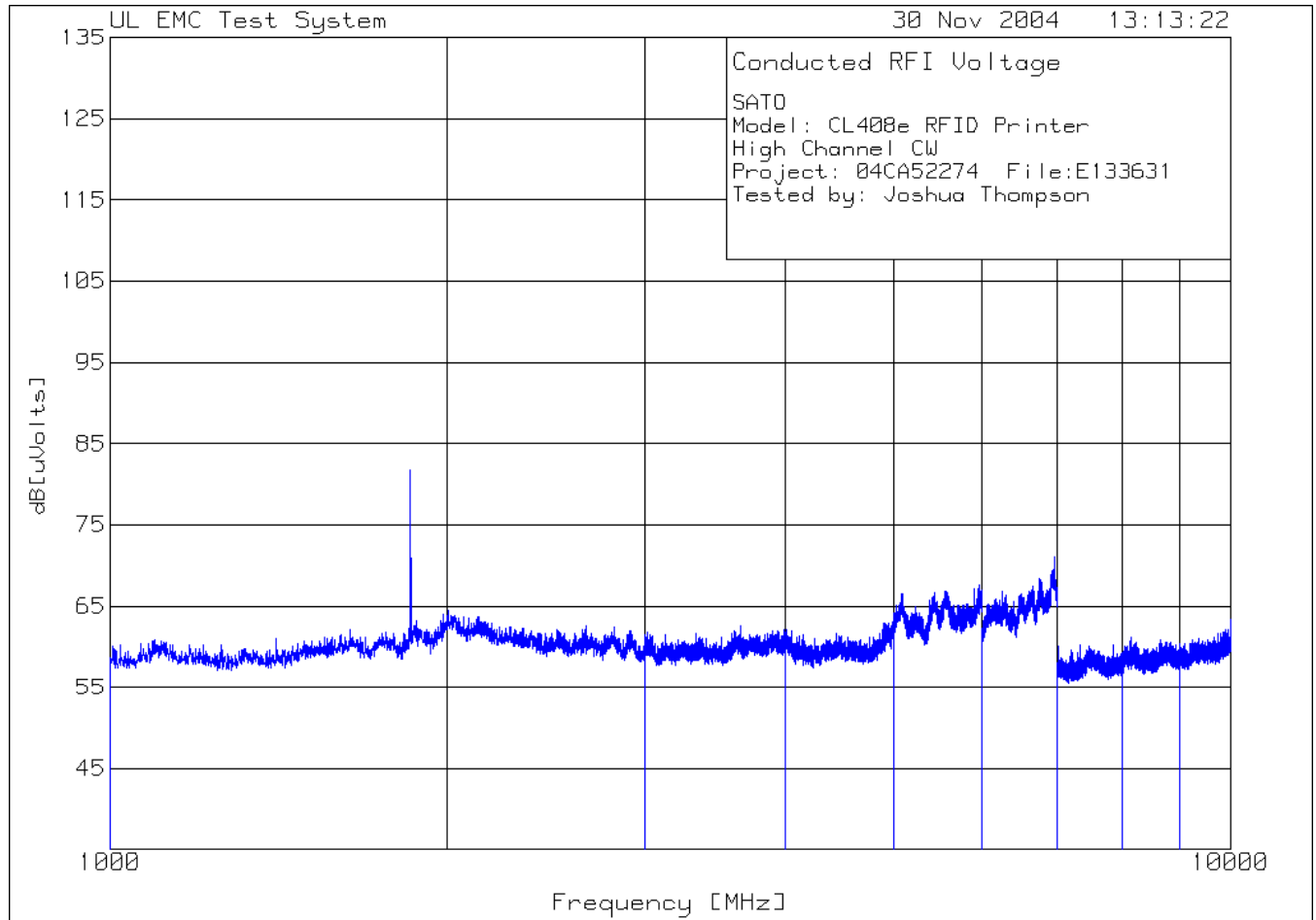
|   |          |          |      |   |       |   |   |   |
|---|----------|----------|------|---|-------|---|---|---|
| 9 | 9138.069 | 37.77 pk | 22.1 | 0 | 59.87 | - | - | - |
|---|----------|----------|------|---|-------|---|---|---|

pk - Peak detector



SATO  
 Model: CL408e RFID Printer  
 High Channel CW  
 Project: 04CA52274 File:E133631  
 Tested by: Joshua Thompson

| Test                        | Meter     | Gain/Loss | Transducer | Level  | Limit:1    | 2 | 3 |
|-----------------------------|-----------|-----------|------------|--------|------------|---|---|
| No.                         | Frequency | Reading   | Factor     | Factor | dB[uVolts] |   |   |
|                             | [MHz]     | [dB(uV)]  | [dB]       | [dB]   |            |   |   |
| =====                       |           |           |            |        |            |   |   |
| Range: 2 30 - 1000MHz ----- |           |           |            |        |            |   |   |
| 1                           | 926.7283  | 110.64 pk | 20.7       | 0      | 131.34     | - | - |
| pk - Peak detector          |           |           |            |        |            |   |   |



File Number: E133631  
Project Number: O4CA52274  
Model Number: CL4XXE  
FCC ID: MMFCL4XXEAW

Issued: 3/4/2005

SATO

Model: CL408e RFID Printer

High Channel CW

Project: 04CA52274 File:E133631

Tested by: Joshua Thompson

| No. | Test<br>Frequency<br>[MHz] | Meter<br>Reading<br>[dB(uV)] | Gain/Loss<br>Factor<br>[dB] | Transducer<br>Factor<br>[dB] | Level<br>dB[uVolts] | Limit:1 | 2 | 3 |
|-----|----------------------------|------------------------------|-----------------------------|------------------------------|---------------------|---------|---|---|
|-----|----------------------------|------------------------------|-----------------------------|------------------------------|---------------------|---------|---|---|

=====

|                               |          |          |      |   |       |   |   |   |
|-------------------------------|----------|----------|------|---|-------|---|---|---|
| Range: 2 1000 - 3000MHz ----- |          |          |      |   |       |   |   |   |
| 1                             | 1853.427 | 60.55 pk | 21.2 | 0 | 81.75 | - | - | - |
| 2                             | 2766.884 | 39.8 pk  | 21.6 | 0 | 61.4  | - | - | - |

|                              |          |          |      |   |       |   |   |   |
|------------------------------|----------|----------|------|---|-------|---|---|---|
| Range:2 3000 - 4000MHz ----- |          |          |      |   |       |   |   |   |
| 3                            | 3716.358 | 39.82 pk | 21.5 | 0 | 61.32 | - | - | - |

|                              |          |          |      |   |       |   |   |   |
|------------------------------|----------|----------|------|---|-------|---|---|---|
| Range:3 4000 - 5000MHz ----- |          |          |      |   |       |   |   |   |
| 4                            | 4631.816 | 38.61 pk | 21.9 | 0 | 60.51 | - | - | - |

|                              |          |          |      |   |       |   |   |   |
|------------------------------|----------|----------|------|---|-------|---|---|---|
| Range:4 5000 - 6000MHz ----- |          |          |      |   |       |   |   |   |
| 5                            | 5563.782 | 45.28 pk | 21.6 | 0 | 66.88 | - | - | - |

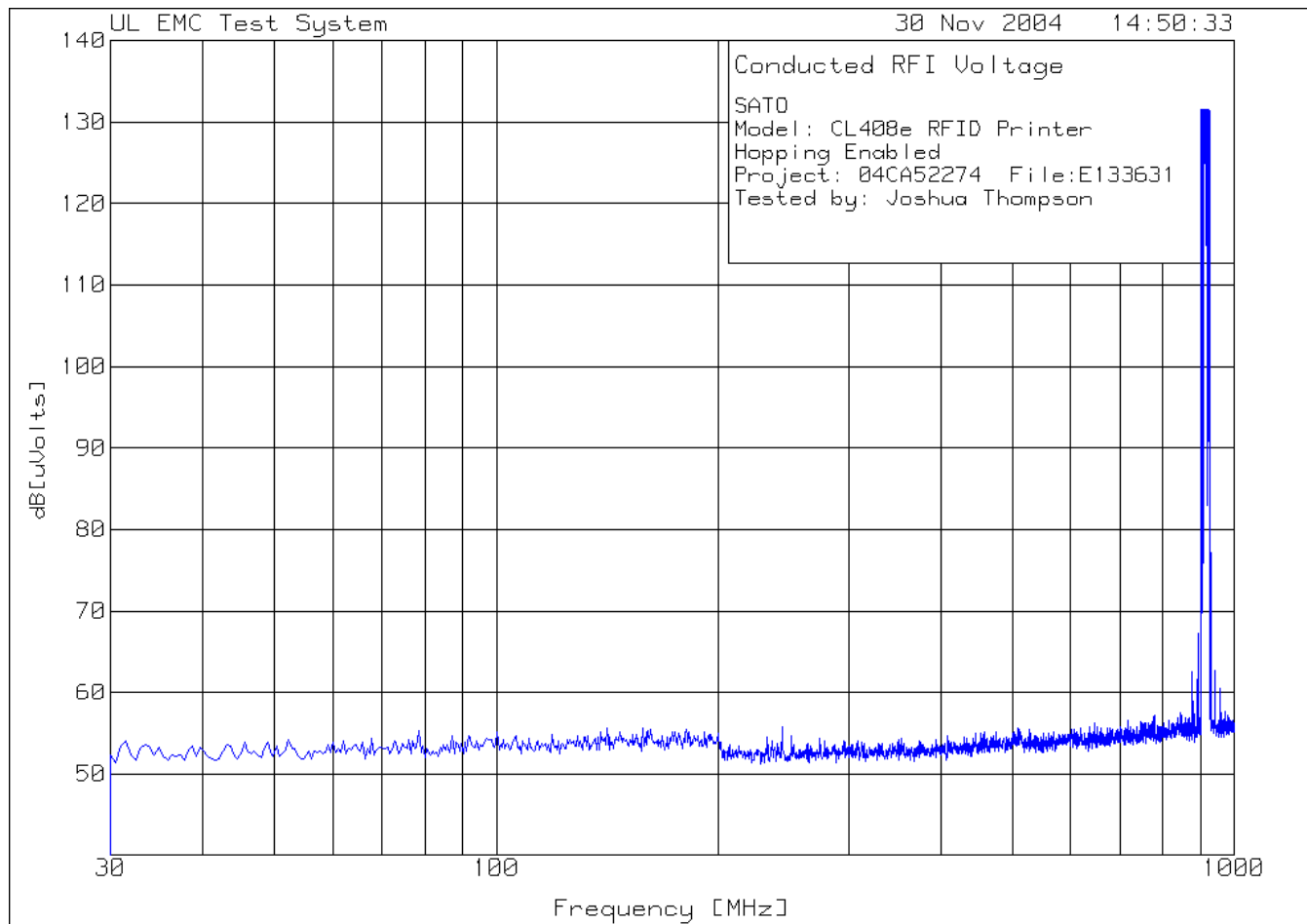
|                              |          |          |      |   |       |   |   |   |
|------------------------------|----------|----------|------|---|-------|---|---|---|
| Range:5 6000 - 7000MHz ----- |          |          |      |   |       |   |   |   |
| 6                            | 6488.744 | 45.08 pk | 21.3 | 0 | 66.38 | - | - | - |

|                              |          |          |      |   |       |   |   |   |
|------------------------------|----------|----------|------|---|-------|---|---|---|
| Range:6 7000 - 8000MHz ----- |          |          |      |   |       |   |   |   |
| 7                            | 7421.211 | 38.09 pk | 20.9 | 0 | 58.99 | - | - | - |

|                              |          |          |      |   |       |   |   |   |
|------------------------------|----------|----------|------|---|-------|---|---|---|
| Range:7 8000 - 9000MHz ----- |          |          |      |   |       |   |   |   |
| 8                            | 8334.667 | 37.69 pk | 21.5 | 0 | 59.19 | - | - | - |

|                               |          |          |      |   |       |   |   |   |
|-------------------------------|----------|----------|------|---|-------|---|---|---|
| Range:8 9000 - 10000MHz ----- |          |          |      |   |       |   |   |   |
| 9                             | 9267.634 | 38.25 pk | 22.2 | 0 | 60.45 | - | - | - |

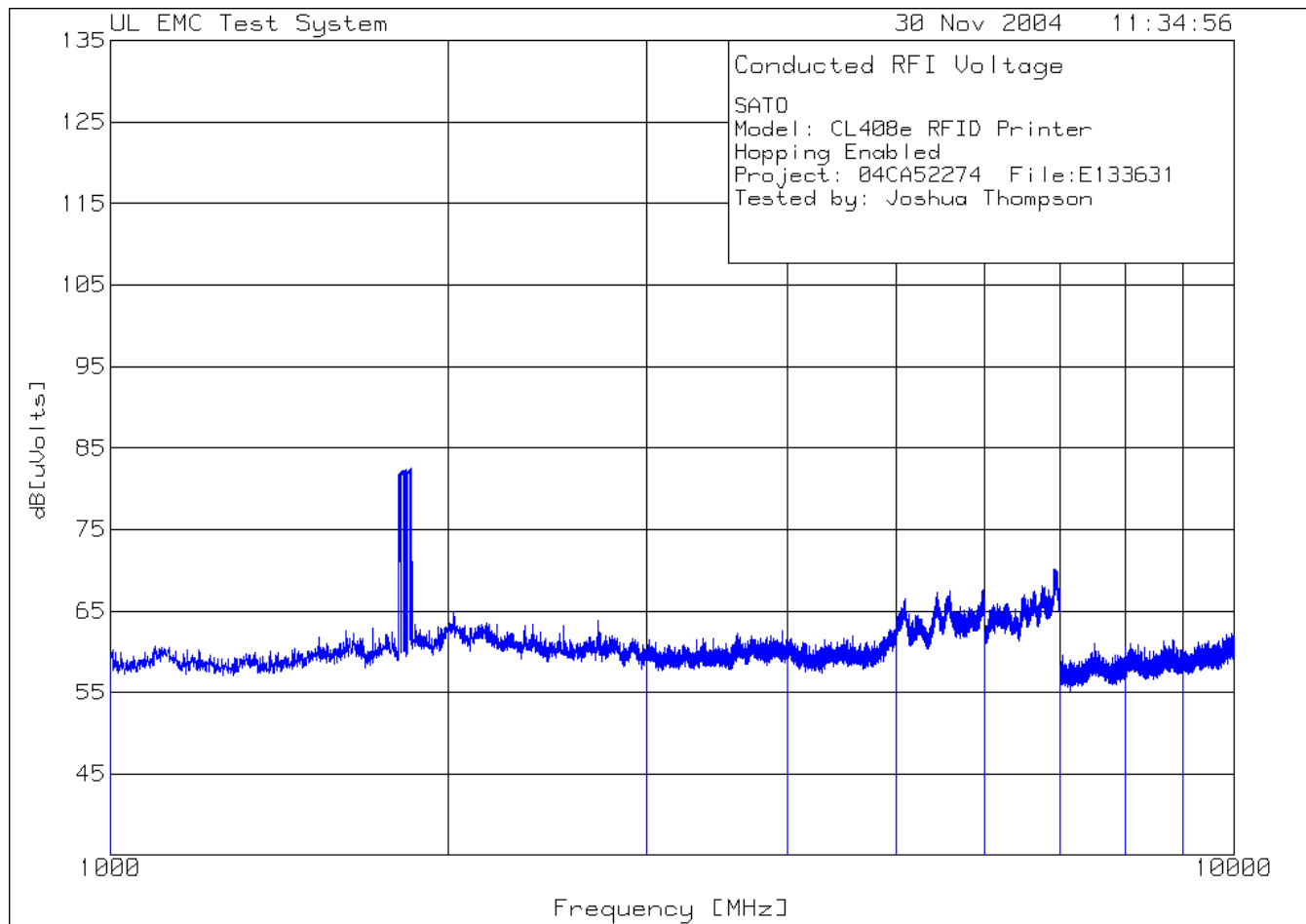
pk - Peak detector



SATO  
 Model: CL408e RFID Printer  
 Hopping Enabled  
 Project: 04CA52274 File:E133631  
 Tested by: Joshua Thompson

| Test                        |           | Meter     | Gain/Loss | Transducer | Level      | Limit:1 | 2 | 3 |
|-----------------------------|-----------|-----------|-----------|------------|------------|---------|---|---|
| No.                         | Frequency | Reading   | Factor    | Factor     | dB[uVolts] |         |   |   |
|                             | [MHz]     | [dB(uV)]  | [dB]      | [dB]       |            |         |   |   |
| =====                       |           |           |           |            |            |         |   |   |
| Range: 2 30 - 1000MHz ----- |           |           |           |            |            |         |   |   |
| 1                           | 903.4367  | 110.79 pk | 20.8      | 0          | 131.59     | -       | - | - |
| 2                           | 925.2726  | 110.68 pk | 20.7      | 0          | 131.38     | -       | - | - |

pk - Peak detector



File Number: E133631  
Project Number: O4CA52274  
Model Number: CL4XXE  
FCC ID: MMFCL4XXEAW

Issued: 3/4/2005

SATO

Model: CL408e RFID Printer

Hopping Enabled

Project: 04CA52274 File:E133631

Tested by: Joshua Thompson

| No. | Test<br>Frequency<br>[MHz] | Meter<br>Reading<br>[dB(uV)] | Gain/Loss<br>Factor<br>[dB] | Transducer<br>Factor<br>[dB] | Level<br>dB[uVolts] | Limit:1 | 2 | 3 |
|-----|----------------------------|------------------------------|-----------------------------|------------------------------|---------------------|---------|---|---|
|-----|----------------------------|------------------------------|-----------------------------|------------------------------|---------------------|---------|---|---|

Range: 2 1000 - 3000MHz -----

|   |          |          |      |   |       |   |   |   |
|---|----------|----------|------|---|-------|---|---|---|
| 1 | 1822.411 | 61.17 pk | 21   | 0 | 82.17 | - | - | - |
| 2 | 1850.425 | 61.07 pk | 21.5 | 0 | 82.57 | - | - | - |
| 3 | 2713.857 | 42.27 pk | 21.5 | 0 | 63.77 | - | - | - |

Range:2 3000 - 4000MHz -----

|   |          |          |      |   |       |   |   |   |
|---|----------|----------|------|---|-------|---|---|---|
| 4 | 3617.809 | 40.03 pk | 22.2 | 0 | 62.23 | - | - | - |
|---|----------|----------|------|---|-------|---|---|---|

Range:3 4000 - 5000MHz -----

|   |          |          |      |   |       |   |   |   |
|---|----------|----------|------|---|-------|---|---|---|
| 5 | 4524.762 | 39.51 pk | 21.9 | 0 | 61.41 | - | - | - |
|---|----------|----------|------|---|-------|---|---|---|

Range:4 5000 - 6000MHz -----

|   |         |          |      |   |       |   |   |   |
|---|---------|----------|------|---|-------|---|---|---|
| 6 | 5439.72 | 45.14 pk | 22.1 | 0 | 67.24 | - | - | - |
|---|---------|----------|------|---|-------|---|---|---|

Range:5 6000 - 7000MHz -----

|   |          |          |      |   |       |   |   |   |
|---|----------|----------|------|---|-------|---|---|---|
| 7 | 6323.662 | 43.05 pk | 21.9 | 0 | 64.95 | - | - | - |
|---|----------|----------|------|---|-------|---|---|---|

Range:6 7000 - 8000MHz -----

|   |          |          |      |   |       |   |   |   |
|---|----------|----------|------|---|-------|---|---|---|
| 8 | 7270.135 | 37.99 pk | 20.8 | 0 | 58.79 | - | - | - |
|---|----------|----------|------|---|-------|---|---|---|

Range:7 8000 - 9000MHz -----

|   |          |          |      |   |       |   |   |   |
|---|----------|----------|------|---|-------|---|---|---|
| 9 | 8134.567 | 38.85 pk | 21.4 | 0 | 60.25 | - | - | - |
|---|----------|----------|------|---|-------|---|---|---|

Range:8 9000 - 10000MHz -----

|    |          |          |    |   |       |   |   |   |
|----|----------|----------|----|---|-------|---|---|---|
| 10 | 9032.016 | 37.87 pk | 22 | 0 | 59.87 | - | - | - |
|----|----------|----------|----|---|-------|---|---|---|

pk - Peak detector

### 5.1.3 Occupied Bandwidth

Frequency hopping systems shall have hopping channel frequencies separated by a minimum of 25 KHz or the 20dB Bandwidth of the hopping channel, whichever is greater.

Occupied bandwidth was measured with a direct connection between the antenna port of the transmitter and the spectrum analyzer. The measurement was made with the spectrum analyzer's resolution bandwidth set to (RBW) = 100 kHz. The VBW > RBW. The frequency difference of two frequencies that are 20 dB from the peak of the fundamental are recorded. The difference of these two frequencies gives the 20 dB occupied bandwidth.

#### Results

The system met the requirements for Occupied Bandwidth. Data Pages follow.

|                      |                  |
|----------------------|------------------|
| Temperature:         | 21.0°C           |
| Humidity:            | 47 %RH           |
| Pressure:            | 1014mbar         |
| Date test performed: | 23 November 2004 |

1 fully configured sample was scanned over the following frequency range

| Frequency Range | Measurement Point | Mode*    |              |
|-----------------|-------------------|----------|--------------|
|                 |                   | Power    | Operation    |
| 902-928         | Antenna Port      | <u>1</u> | <u>1,2,3</u> |

\*See Power Interface and EUT Operating Modes for details

#### Test Data

| Channel | Frequency (MHz) | 20dB Bandwidth (MHz) |
|---------|-----------------|----------------------|
| Low     | 902.4           | 0.324                |
| Mid     | 915.2           | 0.322                |
| High    | 926.5           | 0.323                |

Note: The graphics presented below contain a misprint. The maximum allowable 20dB bandwidth is 500 kHz not 100 kHz. The 20dB bandwidth measurements shown are correct.

File Number: E133631  
Project Number: O4CA52274  
Model Number: CL4XXE  
FCC ID: MMFCL4XXEAW

Issued: 3/4/2005

**Test equipment used for Occupied Bandwidth**  
**E7402A**

**Agilent  
Technologies**

**EMI Spectrum Analyzer**

**Equipment No.: ME5B-123**

**RBW 100 kHz  
VBW 300 kHz**

Range: 902-928 MHz

Last Calibration Date: 17 August 2004

Calibration Due Date: 17 August 2005

**Test Accessories for Occupied Bandwidth**

**BW-N20W5**

**Mini-Circuits**

**20 dB Attenuator**

**Equipment No.: A01**

Range: 0.03 – 10 GHz

Last Calibration Date: 22 November 2004

Calibration Due Date: 22 November 2005

**99760-00**

**Cole-Parmer**

**Hygrometer/Temp/Baro  
meter**

**Equipment No.: ME4-268**

Ranges

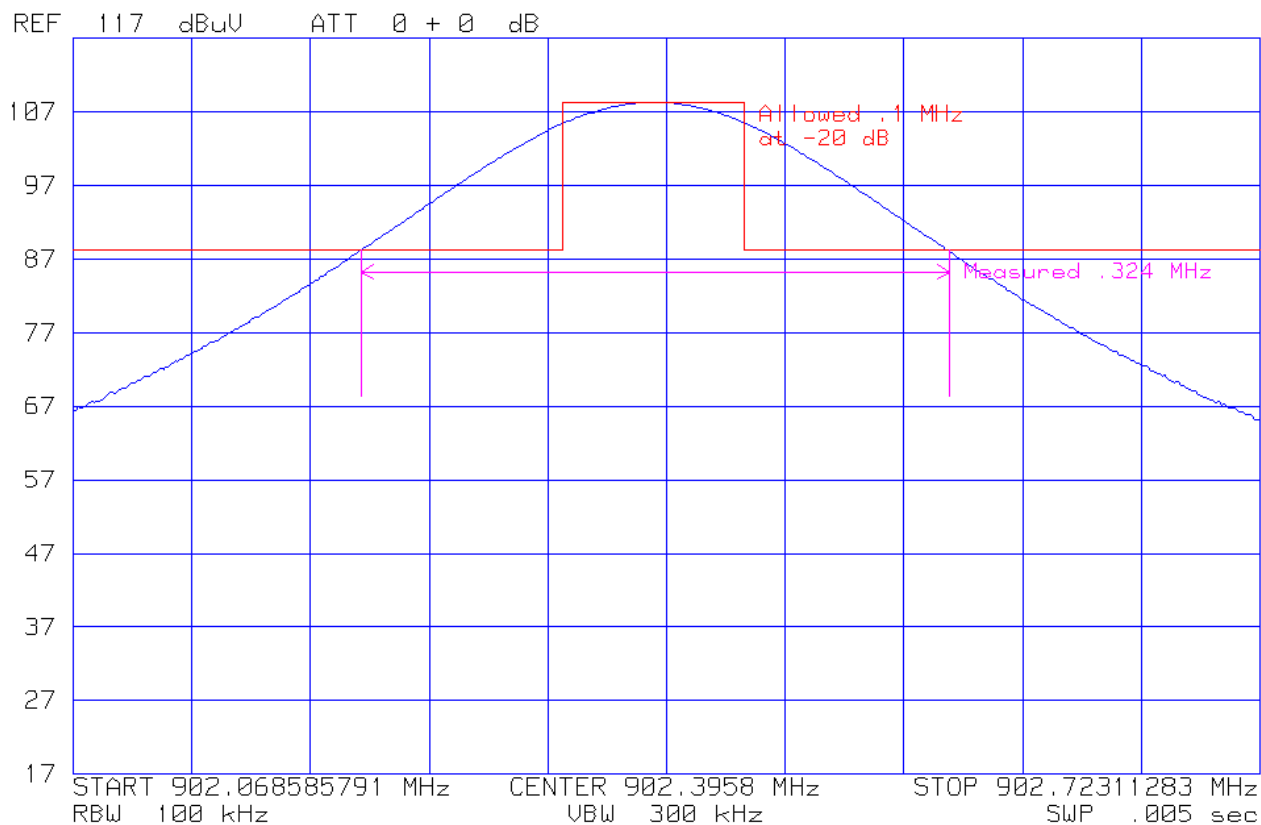
Temp: 0°C-55°C

Humidity: 25% to 95 %RH

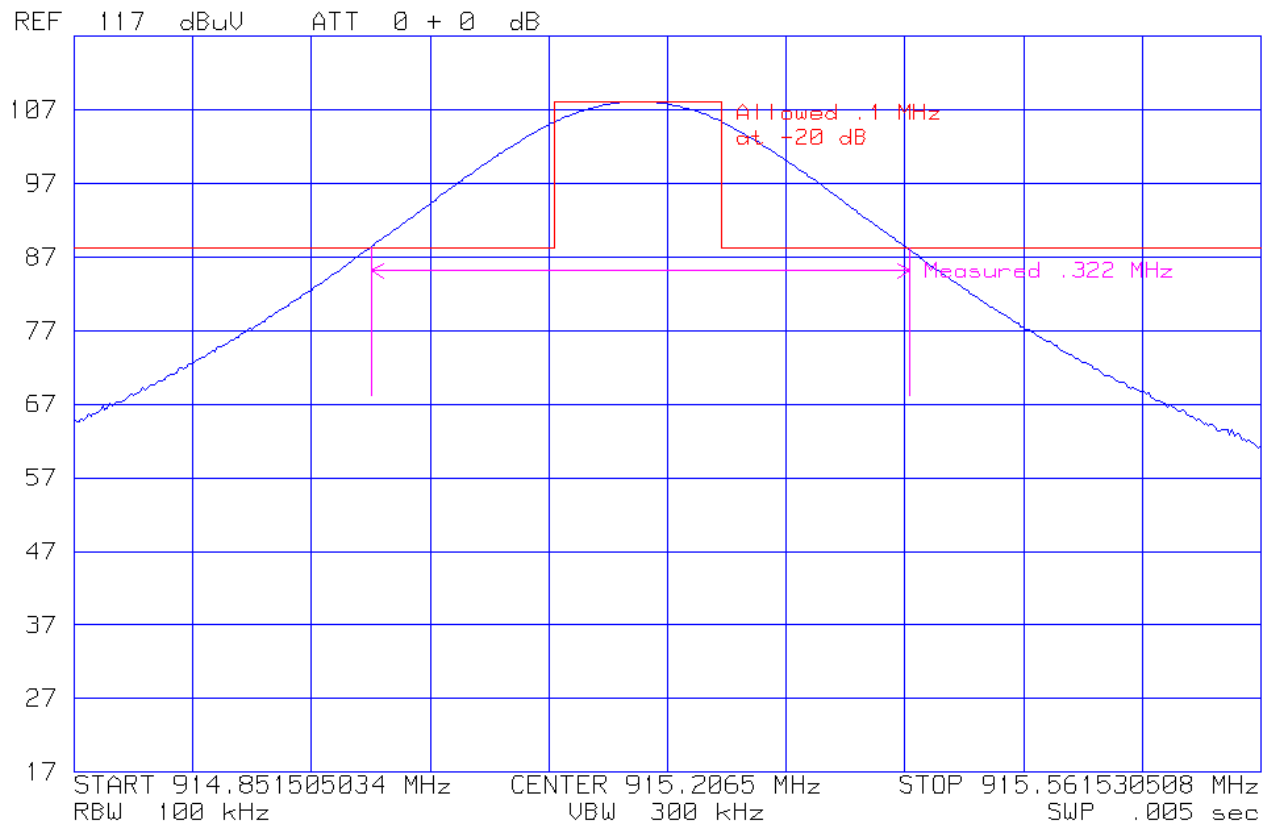
Pressure: 795 to 1050 mbar

Last Calibration Date: 18 June 2004

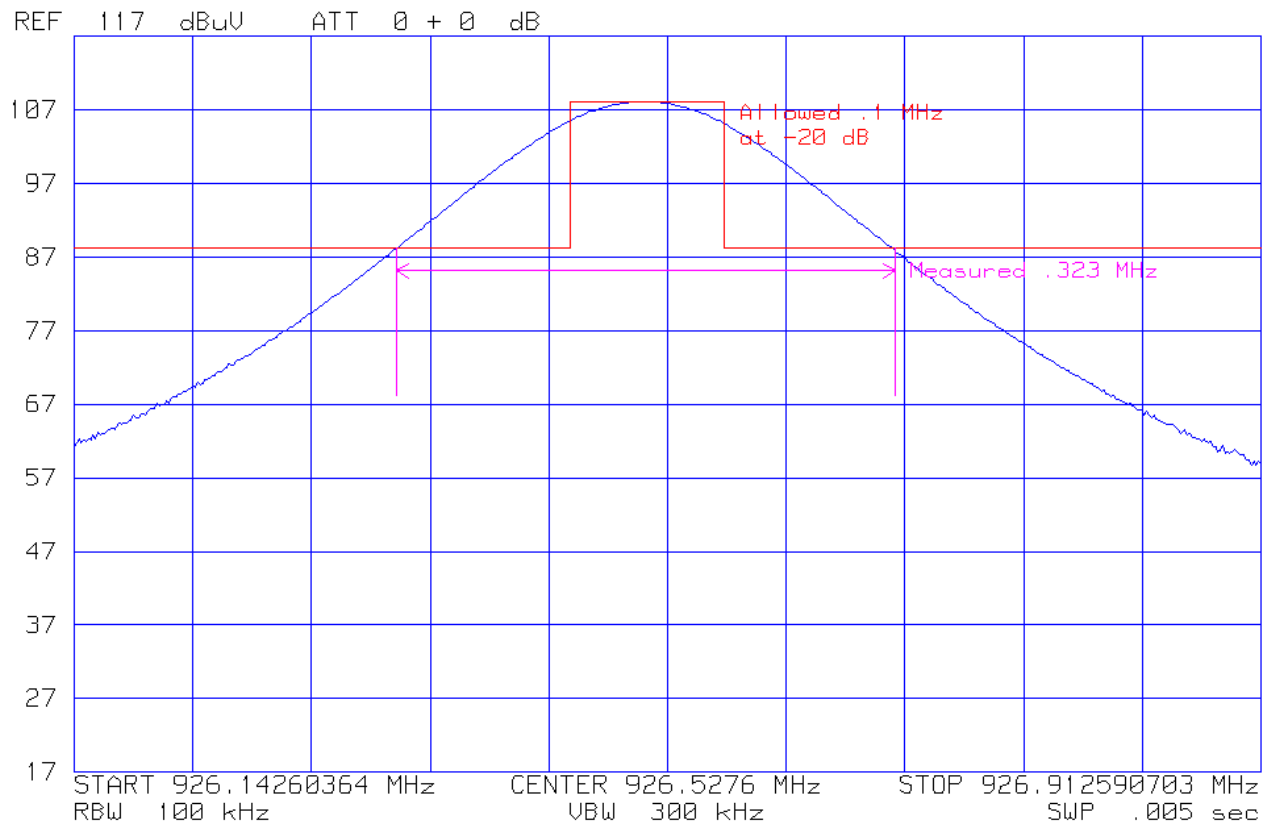
Calibration Due Date: 18 June 2005



**20 dB Occupied Bandwidth at 902.4 MHz**



### 20 dB Occupied Bandwidth at 915.2 MHz



### 20 dB Occupied Bandwidth at 926.5 MHz

## 5.1.4 Peak Output Power

The maximum peak output power of the intentional radiator shall not exceed 1 Watt. Peak output power was measured with a direct connection between the antenna port of the transmitter and the spectrum analyzer.

Sweep = auto  
Detector function = peak  
Trace = max hold

Allowed the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power.

### Results

The system met the requirements for Peak Output Power. Data Pages follow.

|                      |                  |
|----------------------|------------------|
| Temperature:         | 21.0°C           |
| Humidity:            | 47 %RH           |
| Pressure:            | 1014mbar         |
| Date test performed: | 23 November 2004 |

External 20dB attenuation was utilized and added to the measurements depicted on the plots below.

| Channel | Frequency (MHz) | Measured Output power (dBm) | External Attenuator | Output Power (dBm) | Output Power (mWatt) | Limit (Watt) |
|---------|-----------------|-----------------------------|---------------------|--------------------|----------------------|--------------|
| Low     | 902.4           | 1.23                        | 23.6                | 24.83              | 304.09               | 1            |
| Mid     | 915.2           | 1.27                        | 23.7                | 24.97              | 314.05               | 1            |
| High    | 926.5           | 1.15                        | 23.8                | 24.95              | 312.61               | 1            |

### Test equipment used for Peak Output Power

ESI 26

Rhode & Schwartz EMI Receiver

Equipment No.: ME5B-081

RBW 500 kHz

VBW 1MHz

Range: 902-928 MHz

Last Calibration Date: 7 September 2004

Calibration Due Date: 7 September 2005

EMI Software Version

9.2

### Test Accessories for Peak Output Power

BW-N20W5

Mini-Circuits

20 dB Attenuator

Equipment No.: A01

Range: 0.03 – 10 GHz

Last Calibration Date: 22 November 2004

Calibration Due Date: 22 November 2005

99760-00

Cole-Parmer

Hygrometer/Temp/Barometer Equipment No.: ME4-268

Ranges

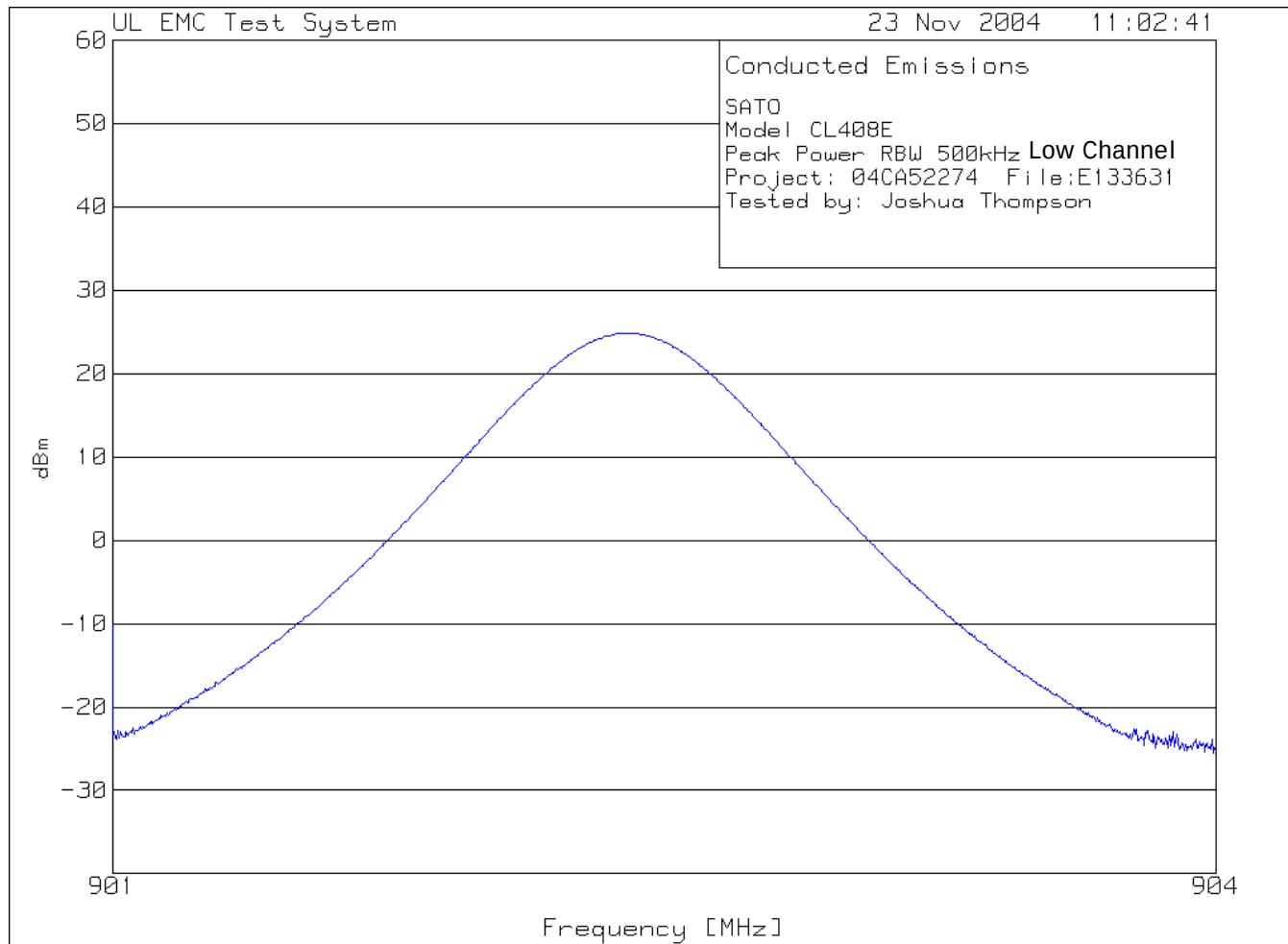
Temp: 0°C-55°C

Humidity: 25% to 95 %RH

Pressure: 795 to 1050 mbar

Last Calibration Date: 18 June 2004

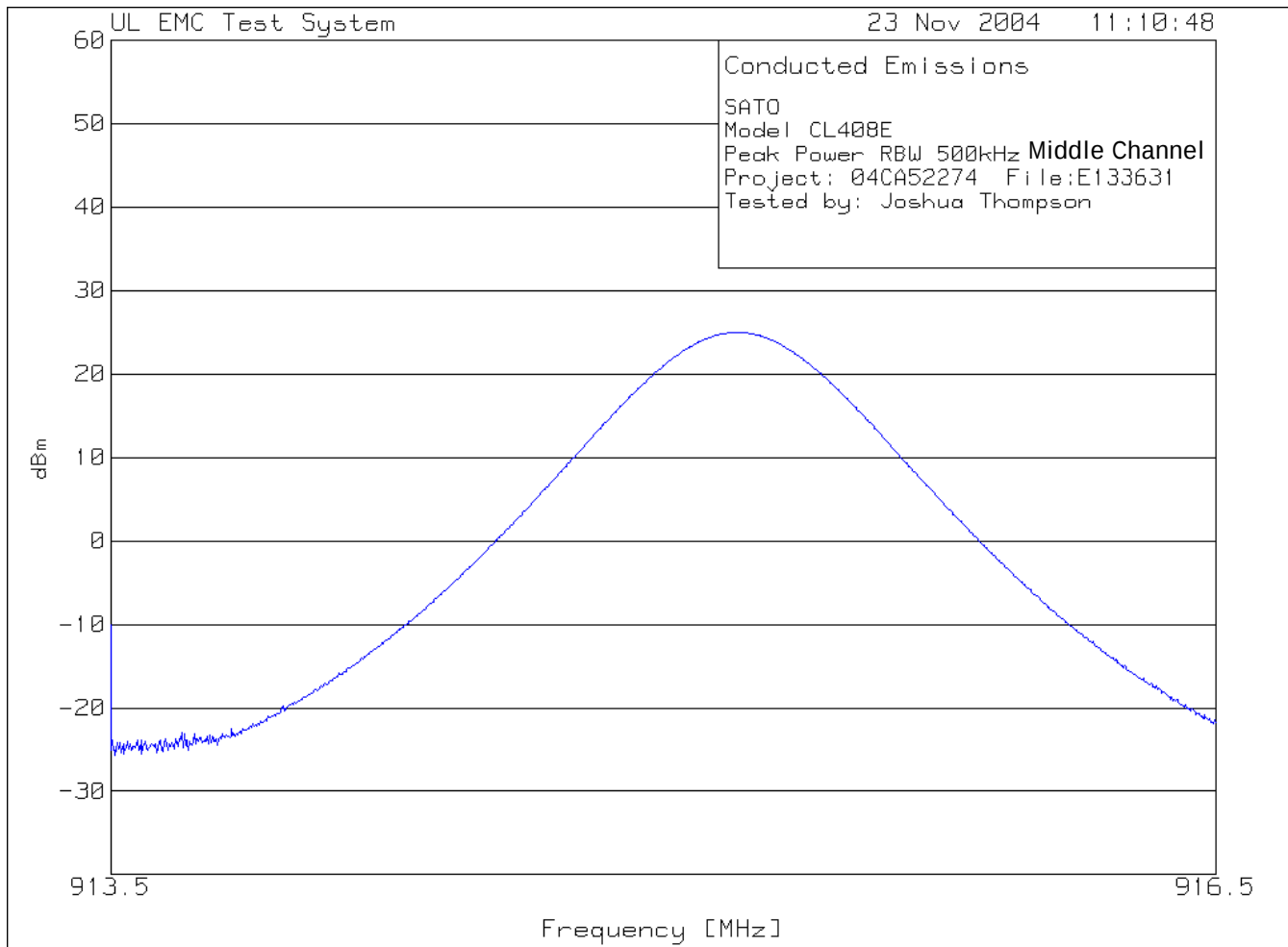
Calibration Due Date: 18 June 2005



SATO  
 Model CL408E  
 Peak Power RBW 500kHz  
 Project: 04CA52274 File: E133631  
 Tested by: Joshua Thompson

| No.                        | Test<br>Frequency<br>[MHz] | Meter<br>Reading<br>[dB(uV)] | Gain/Loss<br>Factor<br>[dB] | Transducer<br>Factor<br>[dB] | Level<br>dBm | Limit:1 | 2 | 3 |
|----------------------------|----------------------------|------------------------------|-----------------------------|------------------------------|--------------|---------|---|---|
| =====                      |                            |                              |                             |                              |              |         |   |   |
| Range 1 901 - 904MHz ----- |                            |                              |                             |                              |              |         |   |   |
| 1                          | 902.3994                   | 108.23 pk                    | 23.6                        | -107                         | 24.83        | -       | - | - |

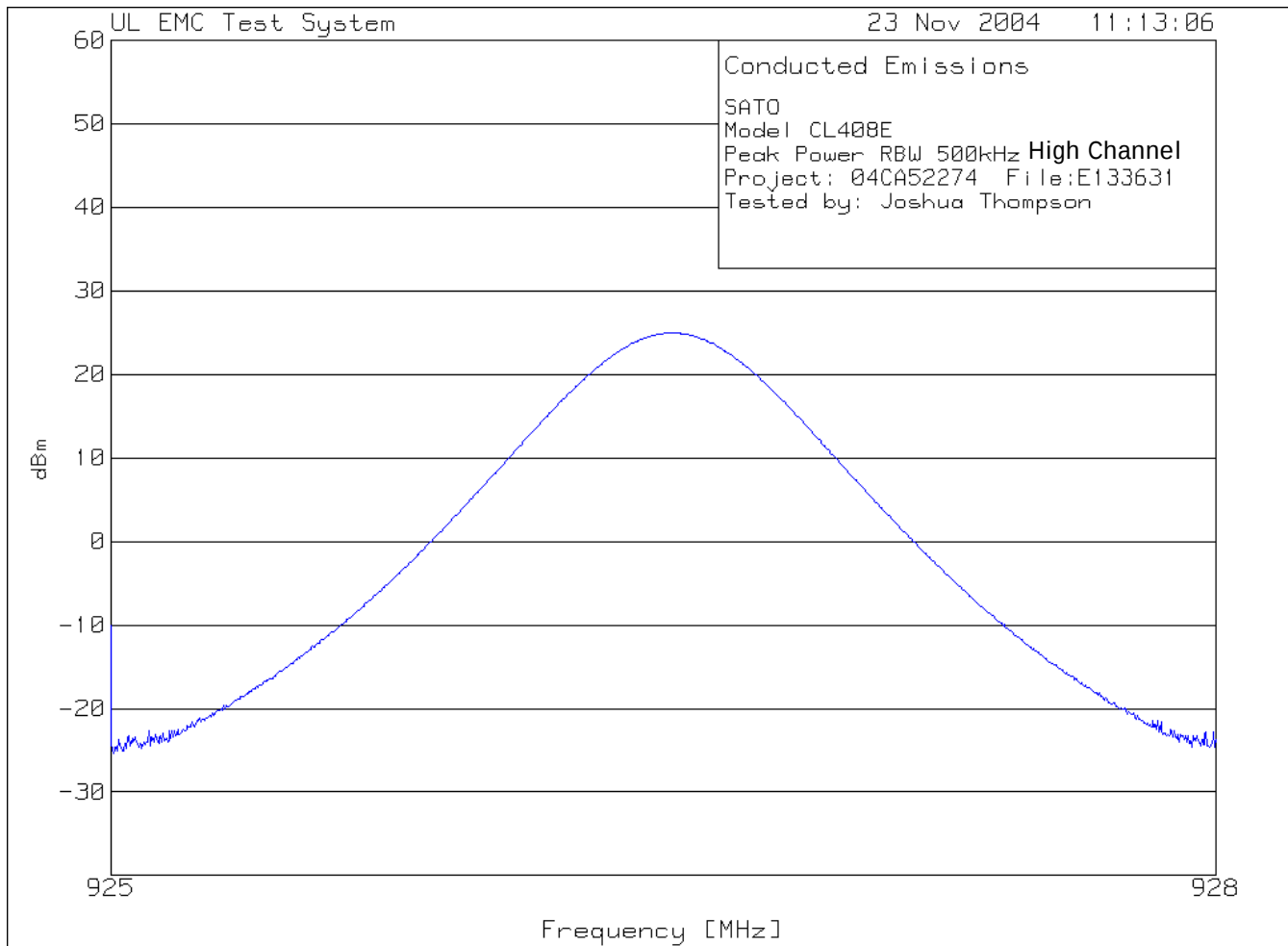
pk - Peak detector



SATO  
 Model CL408E  
 Peak Power RBW 500kHz  
 Project: 04CA52274 File:E133631  
 Tested by: Joshua Thompson

| Test                           |           | Meter     | Gain/Loss | Transducer | Level | Limit:1 | 2 | 3 |
|--------------------------------|-----------|-----------|-----------|------------|-------|---------|---|---|
| No.                            | Frequency | Reading   | Factor    | Factor     | dBm   |         |   |   |
|                                | [MHz]     | [dB(uV)]  | [dB]      | [dB]       |       |         |   |   |
| =====                          |           |           |           |            |       |         |   |   |
| Range 1 913.5 - 916.5MHz ----- |           |           |           |            |       |         |   |   |
| 1                              | 915.2012  | 108.27 pk | 23.7      | -107       | 24.97 | -       | - | - |

pk - Peak detector



SATO  
 Model CL408E  
 Peak Power RBW 500kHz  
 Project: 04CA52274 File:E133631  
 Tested by: Joshua Thompson

| No.                        | Test<br>Frequency<br>[MHz] | Meter<br>Reading<br>[dB(uV)] | Gain/Loss<br>Factor<br>[dB] | Transducer<br>Factor<br>[dB] | Level<br>dBm | Limit:1 | 2 | 3 |
|----------------------------|----------------------------|------------------------------|-----------------------------|------------------------------|--------------|---------|---|---|
| =====                      |                            |                              |                             |                              |              |         |   |   |
| Range 1 925 - 928MHz ----- |                            |                              |                             |                              |              |         |   |   |
| 1                          | 926.5195                   | 108.15 pk                    | 23.8                        | -107                         | 24.95        | -       | - | - |

pk - Peak detector

## 5.1.5 Number of Hopping Frequencies

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

Span = the frequency band of operation  
RBW  $\geq$  1% of the span  
VBW  $\geq$  RBW  
Sweep = auto  
Detector function = peak  
Trace = max hold

Allow the trace to stabilize. It may prove necessary to break the span up to sections, in order to clearly show all of the hopping frequencies.

### Results

The system met the requirements for Number of Hopping Frequencies. Data Pages follow.

|                      |                  |
|----------------------|------------------|
| Temperature:         | 21.0°C           |
| Humidity:            | 47 %RH           |
| Pressure:            | 1014mbar         |
| Date test performed: | 23 November 2004 |

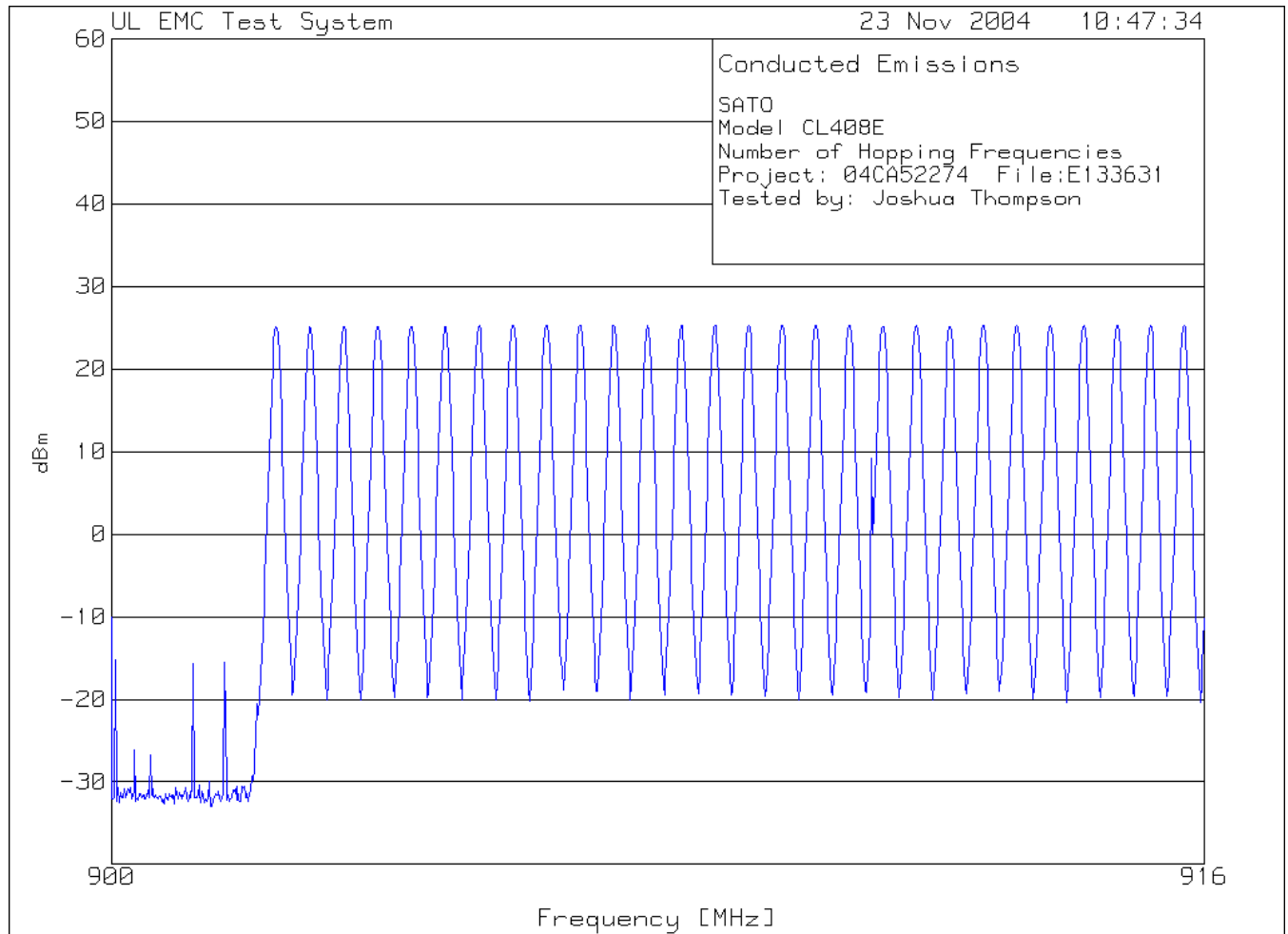
| Frequency Range | Measurement Point | Mode*    |           |
|-----------------|-------------------|----------|-----------|
|                 |                   | Power    | Operation |
| 902-928MHz      | Antenna Port      | <u>1</u> | <u>4</u>  |

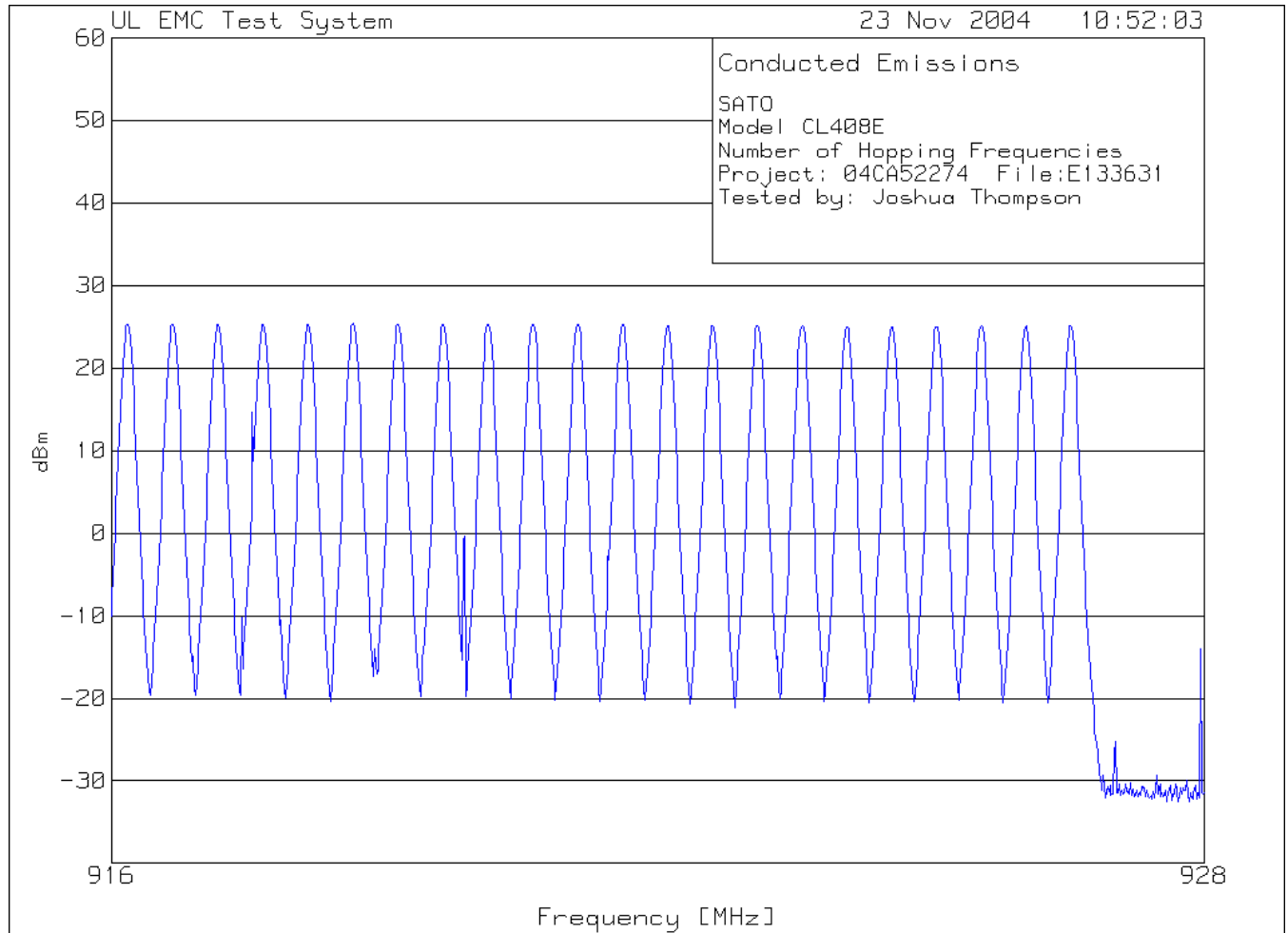
#### Test equipment used for Number of Hopping Frequencies

|                             |                                         |                     |                                        |
|-----------------------------|-----------------------------------------|---------------------|----------------------------------------|
| <b>ESI26</b>                | <b>Rhode &amp; Schwartz</b>             | <b>EMI Receiver</b> | <b>Equipment No.: ME5B-081</b>         |
|                             |                                         |                     | <b>RBW 100 kHz</b>                     |
|                             |                                         |                     | <b>VBW 300 kHz</b>                     |
| Range: 902-928 MHz          | Last Calibration Date: 7 September 2004 |                     | Calibration Due Date: 7 September 2005 |
| <b>EMI Software Version</b> | 9.2                                     |                     |                                        |

#### Test Accessories for Number of Hopping Frequencies

|                      |                                         |                                    |                                        |
|----------------------|-----------------------------------------|------------------------------------|----------------------------------------|
| <b>BW-N20W5</b>      | <b>Mini-Circuits</b>                    | <b>20 dB Attenuator</b>            | <b>Equipment No.: A01</b>              |
| Range: 0.03 – 10 GHz | Last Calibration Date: 22 November 2004 |                                    | Calibration Due Date: 22 November 2005 |
| <b>99760-00</b>      | <b>Cole –Parmer</b>                     | <b>Hygrometer/Temp/Baro</b>        | <b>Equipment No.: ME4-268</b>          |
|                      |                                         | <b>meter</b>                       |                                        |
|                      |                                         | <b>Ranges</b>                      |                                        |
|                      | Last Calibration Date :18 June 2004     |                                    |                                        |
|                      |                                         | Temp: 0°C-55°C                     |                                        |
|                      |                                         | Humidity: 25% to 95 %RH            |                                        |
|                      |                                         | Pressure: 795 to 1050 mbar         |                                        |
|                      |                                         | Calibration Due Date: 18 June 2005 |                                        |





### Measured Frequency List

|    |          |    |          |
|----|----------|----|----------|
| 1  | 902.3864 | 26 | 914.7107 |
| 2  | 902.8829 | 27 | 915.1992 |
| 3  | 903.3794 | 28 | 915.6957 |
| 4  | 903.8759 | 29 | 916.1742 |
| 5  | 904.3564 | 30 | 916.6667 |
| 6  | 904.8528 | 31 | 917.1592 |
| 7  | 905.3493 | 32 | 917.6517 |
| 8  | 905.8458 | 33 | 918.1441 |
| 9  | 906.3423 | 34 | 918.6426 |
| 10 | 906.8228 | 35 | 919.1351 |
| 11 | 907.3193 | 36 | 919.6216 |
| 12 | 907.8158 | 37 | 920.1141 |
| 13 | 908.3123 | 38 | 920.6126 |
| 14 | 908.7928 | 39 | 921.1051 |
| 15 | 909.2893 | 40 | 921.5976 |
| 16 | 909.7858 | 41 | 922.0901 |
| 17 | 910.2823 | 42 | 922.5826 |
| 18 | 910.7628 | 43 | 923.0751 |
| 19 | 911.2592 | 44 | 923.5676 |
| 20 | 911.7557 | 45 | 924.0601 |
| 21 | 912.2522 | 46 | 924.5525 |
| 22 | 912.7327 | 47 | 925.045  |
| 23 | 913.2292 | 48 | 925.5375 |
| 24 | 913.7257 | 49 | 926.03   |
| 25 | 914.2222 | 50 | 926.5225 |

## 5.1.6 Carrier Frequency Separation

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

Span = wide enough to capture the peaks of two adjacent channels

Resolution (or IF) Bandwidth (RBW)  $\geq$  1% of the span

Video (or Average) Bandwidth (VBW)  $\geq$  RBW

Sweep = auto

Detector function = peak

Trace = max hold

Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels.

### Results

The system met the requirements for Carrier Frequency Separation. Data Pages follow.

|                      |                  |
|----------------------|------------------|
| Temperature:         | 21.0°C           |
| Humidity:            | 47 %RH           |
| Pressure:            | 1014mbar         |
| Date test performed: | 23 November 2004 |

| Frequency Range | Measurement Point | Mode*    |           |
|-----------------|-------------------|----------|-----------|
|                 |                   | Power    | Operation |
| 902-928MHz      | Antenna Port      | <u>1</u> | <u>4</u>  |

#### Test equipment used for Carrier Frequency Separation

ESI26

Rhode & Schwartz

EMI Receiver

Equipment No.: ME5B-081

RBW 100 kHz

VBW 300 kHz

Range: 902-928MHz

Last Calibration Date: 7 September 2004

Calibration Due Date: 7 September 2005

EMI Software Version

9.2

#### Test Accessories for Carrier Frequency Separation

BW-N20W5

Mini-Circuits

20 dB Attenuator

Equipment No.: A01

Range: 0.03 – 10 GHz

Last Calibration Date: 22 November 2004

Calibration Due Date: 22 November 2005

99760-00

Cole –Parmer

Hygrometer/Temp/Baro  
meter

Equipment No.: ME4-268

Ranges

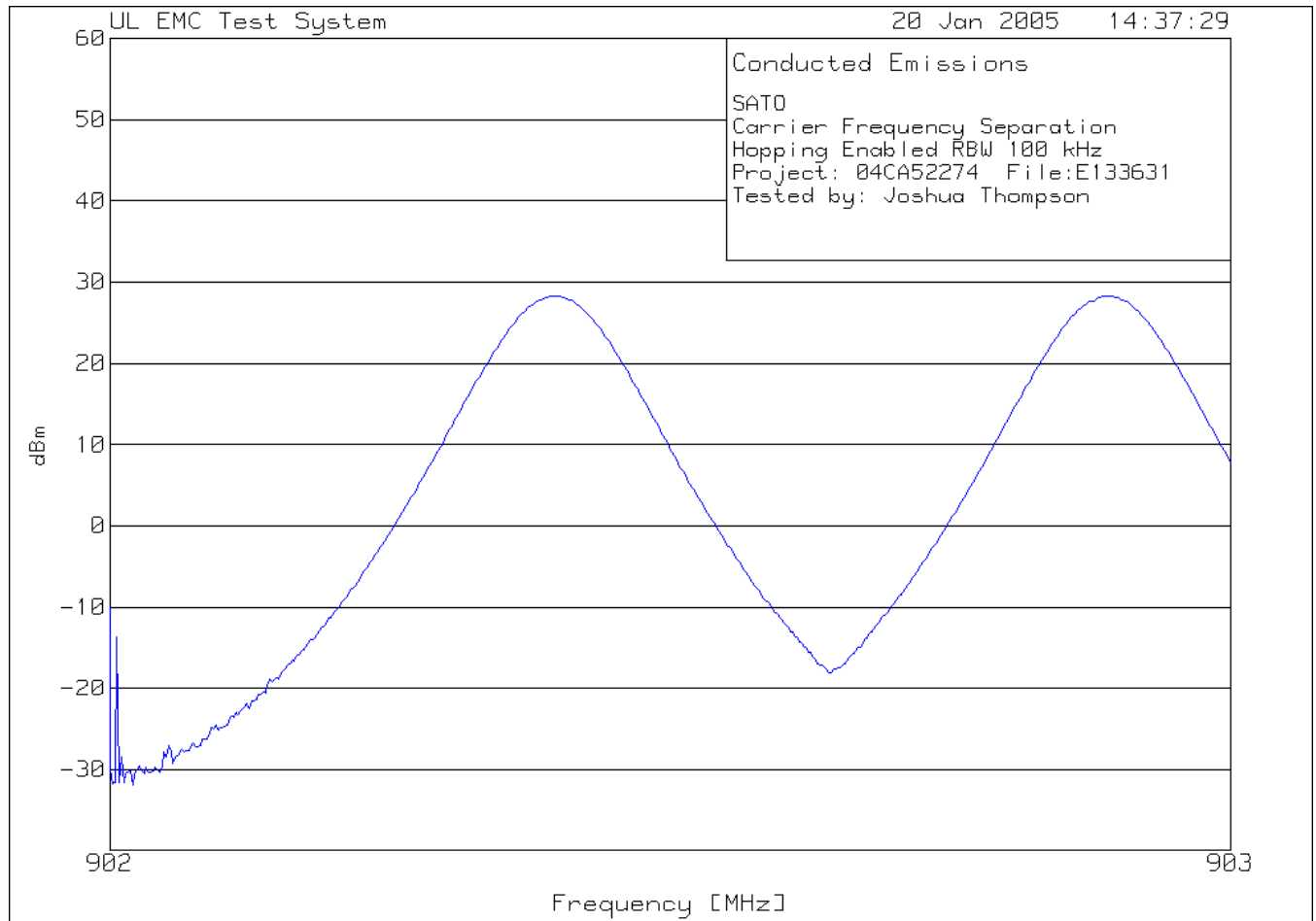
Temp: 0°C-55°C

Humidity: 25% to 95 %RH

Pressure: 795 to 1050 mbar

Last Calibration Date: 18 June 2004

Calibration Due Date: 18 June 2005



### Frequency Separation: Channels 1 and 2

|                 | Peak 1   | Peak 2   | Channel Separation |
|-----------------|----------|----------|--------------------|
| Frequency (MHz) | 902.3988 | 902.8908 | 0.492              |

**0.492 MHz > 20 dB Bandwidth**

## 5.1.7 Time of Occupancy (Dwell Time)

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

Span = zero span, centered on a hopping channel

RBW = 1 MHz

VBW  $\geq$  RBW

Sweep = as necessary to capture the entire dwell time per hopping channel

Detector function = peak

Trace = max hold

If possible, use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s). An oscilloscope may be used instead of a spectrum analyzer.

## Results

The system met the requirements for Time of Occupancy. Data Pages follow.

|                      |                  |
|----------------------|------------------|
| Temperature:         | 21.0°C           |
| Humidity:            | 47 %RH           |
| Pressure:            | 1014mbar         |
| Date test performed: | 23 November 2004 |

| Frequency Range | Measurement Point | Mode*    |           |
|-----------------|-------------------|----------|-----------|
|                 |                   | Power    | Operation |
| 902-928MHz      | Antenna Port      | <u>1</u> | <u>4</u>  |

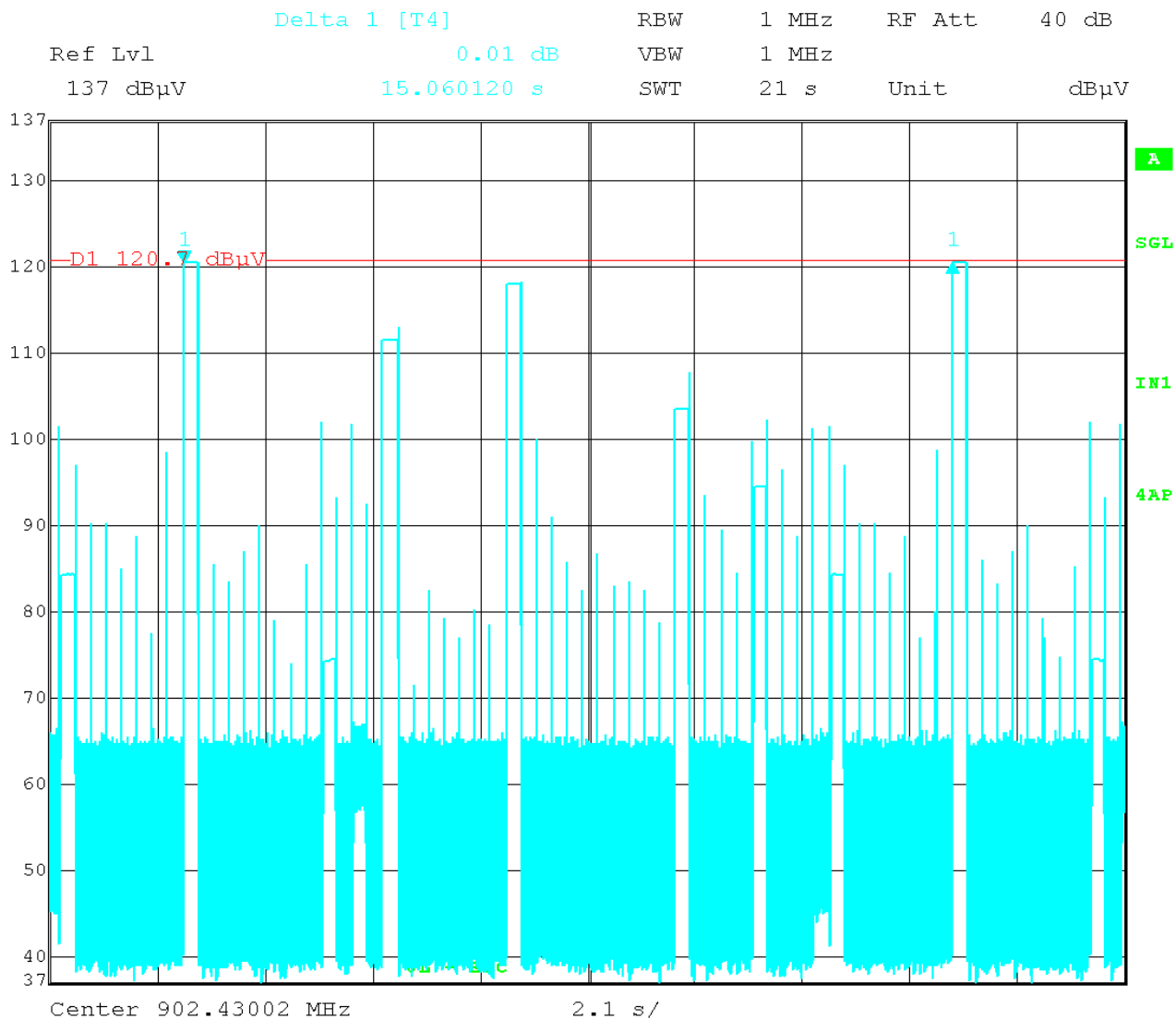
\*See Power Interface and EUT Operating Modes for details

### Test equipment used for Time of Occupancy

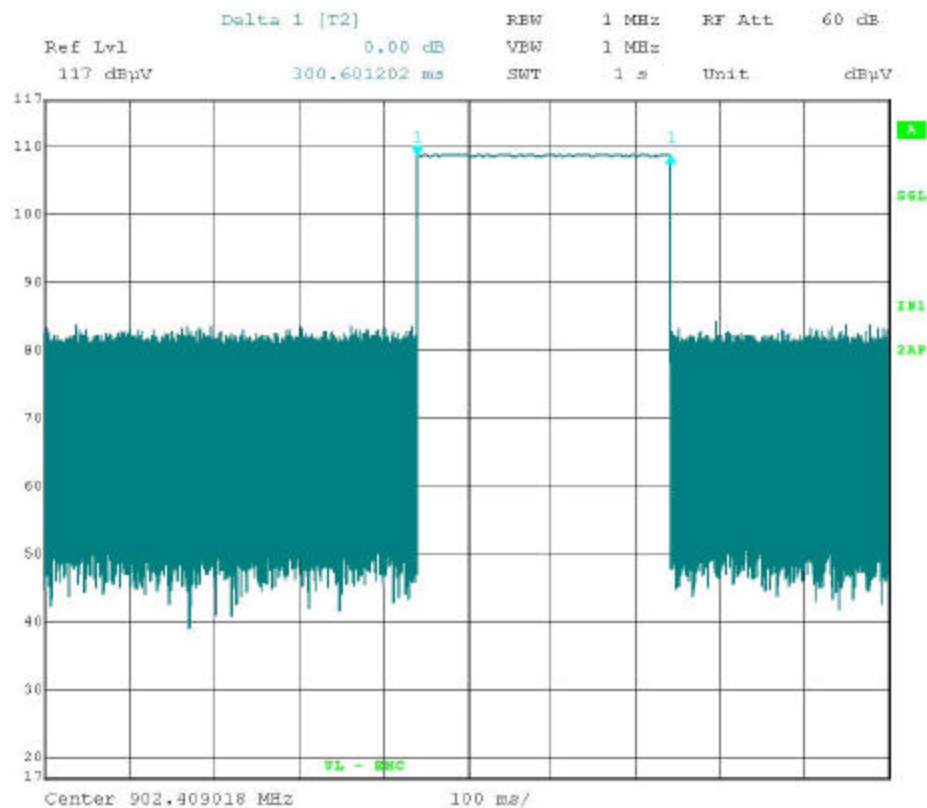
|                             |                                         |                                        |                                |
|-----------------------------|-----------------------------------------|----------------------------------------|--------------------------------|
| <b>ESI26</b>                | <b>Rhode &amp; Schwartz</b>             | <b>EMI Receiver</b>                    | <b>Equipment No.: ME5B-081</b> |
|                             |                                         |                                        | <b>RBW 1.0 MHz</b>             |
|                             |                                         |                                        | <b>VBW 1.0 MHz</b>             |
| Range: 902 – 928 MHz        | Last Calibration Date: 7 September 2004 | Calibration Due Date: 7 September 2005 |                                |
| <b>EMI Software Version</b> | 9.2                                     |                                        |                                |

### Test Accessories for Time of Occupancy

|                      |                                         |                                        |                               |
|----------------------|-----------------------------------------|----------------------------------------|-------------------------------|
| <b>BW-N10W5</b>      | <b>Mini-Circuits</b>                    | <b>10 dB Attenuator</b>                | <b>Equipment No.: 31625</b>   |
| Range: 902 – 928 MHz | Last Calibration Date: 22 November 2004 | Calibration Due Date: 22 November 2005 |                               |
| <b>99760-00</b>      | <b>Cole –Parmer</b>                     | <b>Hygrometer/Temp/Baro meter</b>      | <b>Equipment No.: ME4-268</b> |
|                      |                                         | Ranges                                 | Temp: 0°C-55°C                |
|                      |                                         |                                        | Humidity: 25% to 95 %RH       |
|                      |                                         |                                        | Pressure: 795 to 1050 mbar    |
|                      | Last Calibration Date: 18 June 2004     | Calibration Due Date: 18 June 2005     |                               |



**Time of Occupancy Over Two 10s Periods**



## Single Hop Dwell Time

### Explanation of the Graphs Provided

The first graph shows the hopping activity recorded over two 10 second periods on the 902.4 MHz channel. The scan also shows activity on the adjacent channels at lower amplitude due to the 1 MHz span suggested in DA 00-705 Measurement Guidelines. In this figure the 902.4 MHz channel is activated exactly twice, and those are the marked events.

The second graph is a closer look at a single activation event.

**The Time of Occupancy requirement is met based on the following calculations:**

**Limit: An average of 0.4 s per 10 s period, which yields a ratio of 0.04**

**Measured: 0.3 s per 15 s period, yields a ratio of  $0.02 < 0.04$**

## 5.1.8 Band-edge Compliance of RF Conducted Emissions

Use the following spectrum analyzer settings:

Span = wide enough to capture the peak level of the emission operating on the channel closest to the bandedge, as well as any modulation products which fall outside of the authorized band of operation

RBW  $\geq$  1% of the span

VBW  $\geq$  RBW

Sweep = auto

Detector function = peak

Trace = max hold

Allow the trace to stabilize. Set the marker on the emission at the bandedge, or on the highest modulation product outside of the band, if this level is greater than that at the bandedge. Enable the marker-delta function, then use the marker-to-peak function to move the marker to the peak of the in-band emission. The marker-delta value now displayed. Now, using the same instrument settings, enable the hopping function of the EUT. Allow the trace to stabilize. Follow the same procedure listed above to determine if any spurious emissions caused by the hopping function also comply with the specified limit. Submit this plot.

### Results

The system met the requirements for Band-edge Conducted Emissions. Data Pages follow.

|                      |                  |
|----------------------|------------------|
| Temperature:         | 21°C             |
| Humidity:            | 47%RH            |
| Pressure:            | 1014mbar         |
| Date test performed: | 23 November 2004 |

| Frequency Range | Measure ment Point | Mode*    |           |
|-----------------|--------------------|----------|-----------|
|                 |                    | Power    | Operation |
| 902-928MHz      | Antenna Port       | <u>1</u> | <u>4</u>  |

\*See Power Interface and EUT Operating Modes for details

#### Test equipment used for Conducted Emissions

ESI26

Rhode & Schwartz

EMI Receiver

Equipment No.: ME5B-081

RBW 100 kHz

VBW 300 kHz

Range: 902 – 928 MHz

Last Calibration Date: 7 September 2004

Calibration Due Date: 7 September 2005

EMI Software Version

9.2

File Number: E133631  
Project Number: O4CA52274  
Model Number: CL4XXE  
FCC ID: MMFCL4XXEAW

Issued: 3/4/2005

**Test Accessories for Conducted Emissions**

**BW-N20W5**

Range: 0.03 – 10 GHz  
**99760-00**

**Mini-Circuits**

Last Calibration Date: 22 November 2004  
**Cole –Parmer**

**20 dB Attenuator**

**Hygrometer/Temp/Baro**

**meter**

Ranges

**Equipment No.: A01**

Calibration Due Date: 22 November 2005

**Equipment No.: ME4-268**

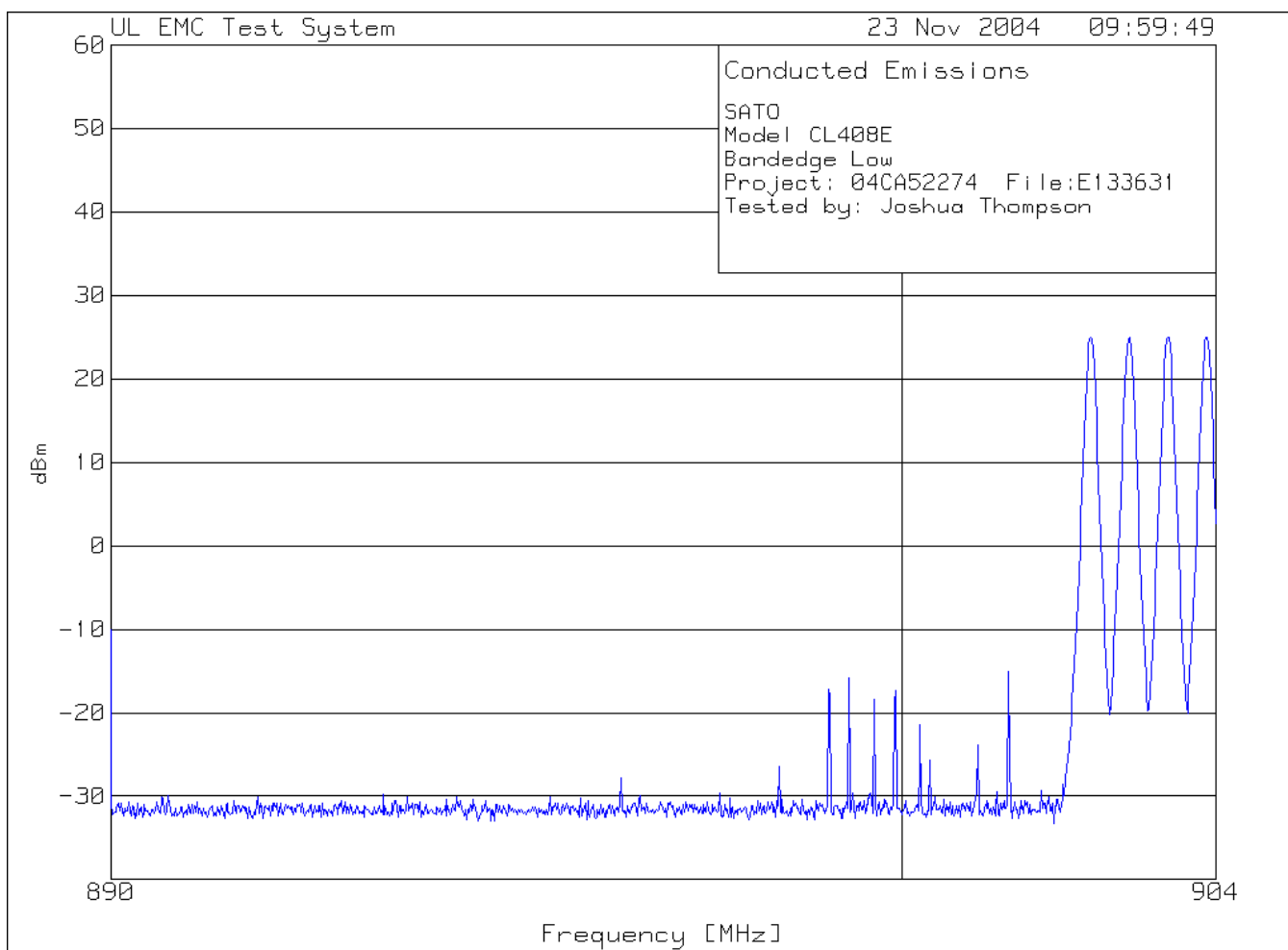
Temp: 0°C-55°C

Humidity: 25% to 95 %RH

Pressure: 795 to 1050 mbar

Last Calibration Date: 18 June 2004

Calibration Due Date: 18 June 2005



File Number: E133631  
Project Number: O4CA52274  
Model Number: CL4XXE  
FCC ID: MMFCL4XXEAW

Issued: 3/4/2005

SATO

Model CL408E

Bandedge Low

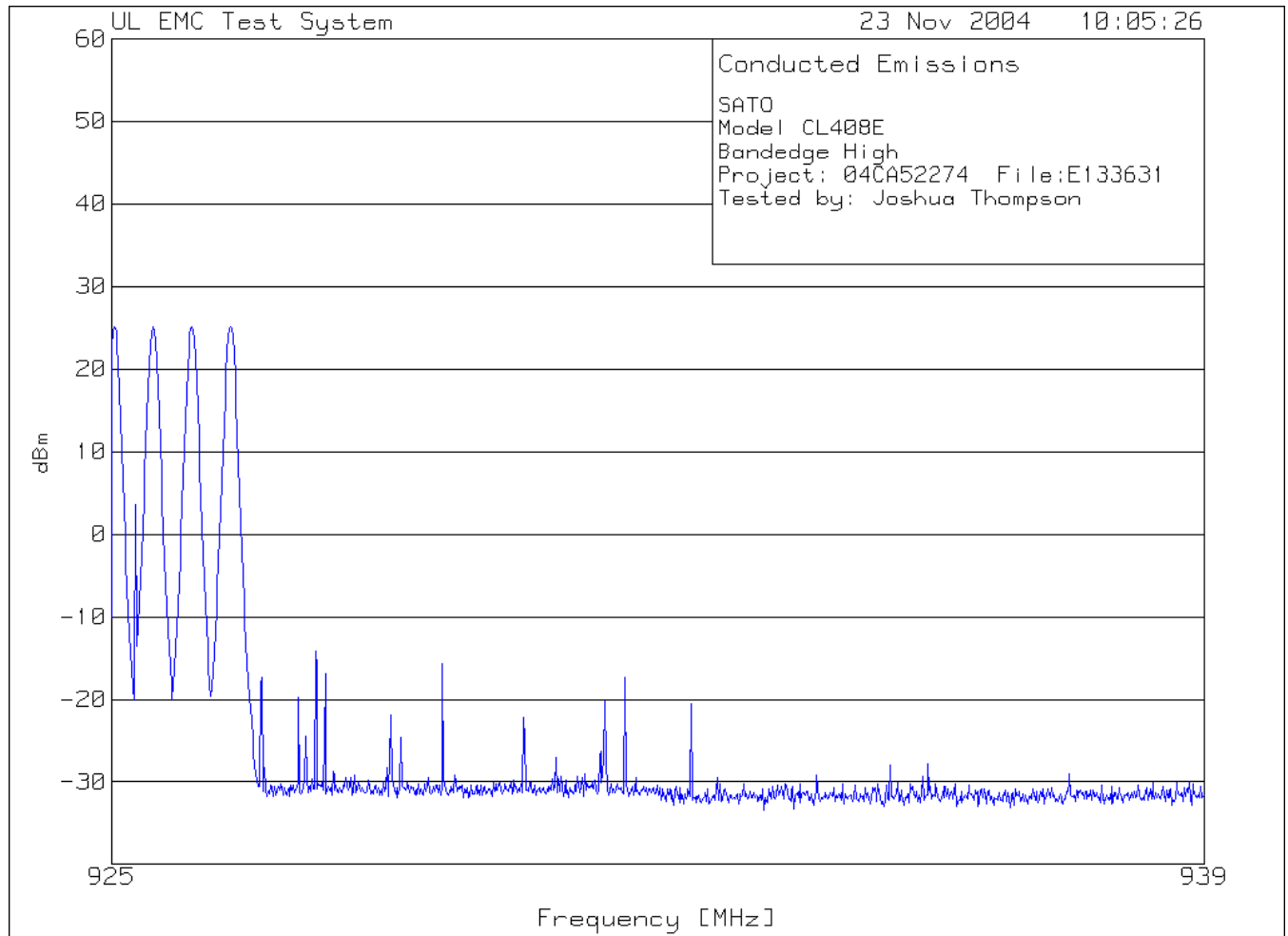
Project: 04CA52274 File:E133631

Tested by: Joshua Thompson

| No. | Test<br>Frequency<br>[MHz] | Meter<br>Reading<br>[dB(uV)] | Gain/Loss<br>Factor<br>[dB] | Transducer<br>Factor<br>[dB] | Level<br>dBm | Limit:1 | 2 | 3 |
|-----|----------------------------|------------------------------|-----------------------------|------------------------------|--------------|---------|---|---|
|-----|----------------------------|------------------------------|-----------------------------|------------------------------|--------------|---------|---|---|

|                            |          |           |      |      |        |   |   |   |
|----------------------------|----------|-----------|------|------|--------|---|---|---|
| =====                      |          |           |      |      |        |   |   |   |
| Range 1 890 - 904MHz ----- |          |           |      |      |        |   |   |   |
| 1                          | 902.4024 | 108.33 pk | 23.6 | -107 | 24.93  | - | - | - |
| 2                          | 901.3513 | 68.37 pk  | 23.6 | -107 | -15.03 | - | - | - |
| 3                          | 899.3193 | 67.65 pk  | 23.6 | -107 | -15.75 | - | - | - |

pk - Peak detector



File Number: E133631  
Project Number: O4CA52274  
Model Number: CL4XXE  
FCC ID: MMFCL4XXEAW

Issued: 3/4/2005

SATO

Model CL408E

Bandedge High

Project: 04CA52274 File:E133631

Tested by: Joshua Thompson

| No.                        | Test<br>Frequency<br>[MHz] | Meter<br>Reading<br>[dB(uV)] | Gain/Loss<br>Factor<br>[dB] | Transducer<br>Factor<br>[dB] | Level<br>dBm | Limit:1 | 2 | 3 |
|----------------------------|----------------------------|------------------------------|-----------------------------|------------------------------|--------------|---------|---|---|
| =====                      |                            |                              |                             |                              |              |         |   |   |
| Range 1 925 - 939MHz ----- |                            |                              |                             |                              |              |         |   |   |
| 1                          | 926.5135                   | 108.31 pk                    | 23.8                        | -107                         | 25.11        | -       | - | - |
| 2                          | 927.5926                   | 68.97 pk                     | 23.8                        | -107                         | -14.23       | -       | - | - |
| 3                          | 929.2182                   | 67.53 pk                     | 23.8                        | -107                         | -15.67       | -       | - | - |

pk - Peak detector

### 5.1.9 Radiated Emissions Test (10 Meter Semi-Anechoic Chamber)

Measurements were made in a 10-meter semi-anechoic chamber that complies to ANSI C63.4. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.

#### Field Strength Calculation

If a preamplifier was used during the Radiated Emissions testing, it is required that the amplifier gain be subtracted from the Spectrum Analyzer (Meter) Reading. In addition, a correction factor for the antenna, cable used and a distance factor, if any, must be applied to the Meter Reading before a true field strength reading can be obtained. These considerations are automatically presented as a part of the print out. This modified specification limit is referred to as the “Actual Level” or simply the level, which is the actual field strength present at the antenna. The quantity can be derived in the following manner:

$$\text{Level} = \text{Meter Reading} + \text{Gain/Loss} + \text{Transducer}$$

Where

Meter Reading = Spectrum Analyzer Reading

Transducer = Antenna Factor

Gain/Loss = Cable Loss – Amplifier Gain (if any)

The Margin on the printout will be the actual margin level from the limit

For Example:

At 6835.407MHz we had a meter reading of 28.7 dB/uV, a Gain/Loss of –23.7 dB and a transducer factor of 36.9 dB.

$$\text{Level} = 28.7 = (-23.7) + 36.9$$

$$\text{Level} = 41.9 \text{ dBuV/m}$$

This result is below the FCC Class B limit of 54 dBuV/m at 6835.407 MHz.

#### Results

The system met the requirements for Radiated Emissions inside and outside of Restricted Bands. Data Pages follow.

|                      |                  |                 |
|----------------------|------------------|-----------------|
| Temperature:         | 21.0°C           | 19.5°C          |
| Humidity:            | 47%RH            | 47%RH           |
| Pressure:            | 1014mbar         | 1027mbar        |
| Date test performed: | 23 November 2004 | 19 January 2005 |

File Number: E133631  
 Project Number: O4CA52274  
 Model Number: CL4XXE  
 FCC ID: MMFCL4XXEAW

Issued: 3/4/2005

1 fully configured sample was scanned over the following frequency range:

| Frequency Range | Measurement Point | Mode*    |                  |
|-----------------|-------------------|----------|------------------|
|                 |                   | Power    | Operation        |
| 902-928MHz      | Antenna Port      | <u>1</u> | <u>1,2,3,4,5</u> |

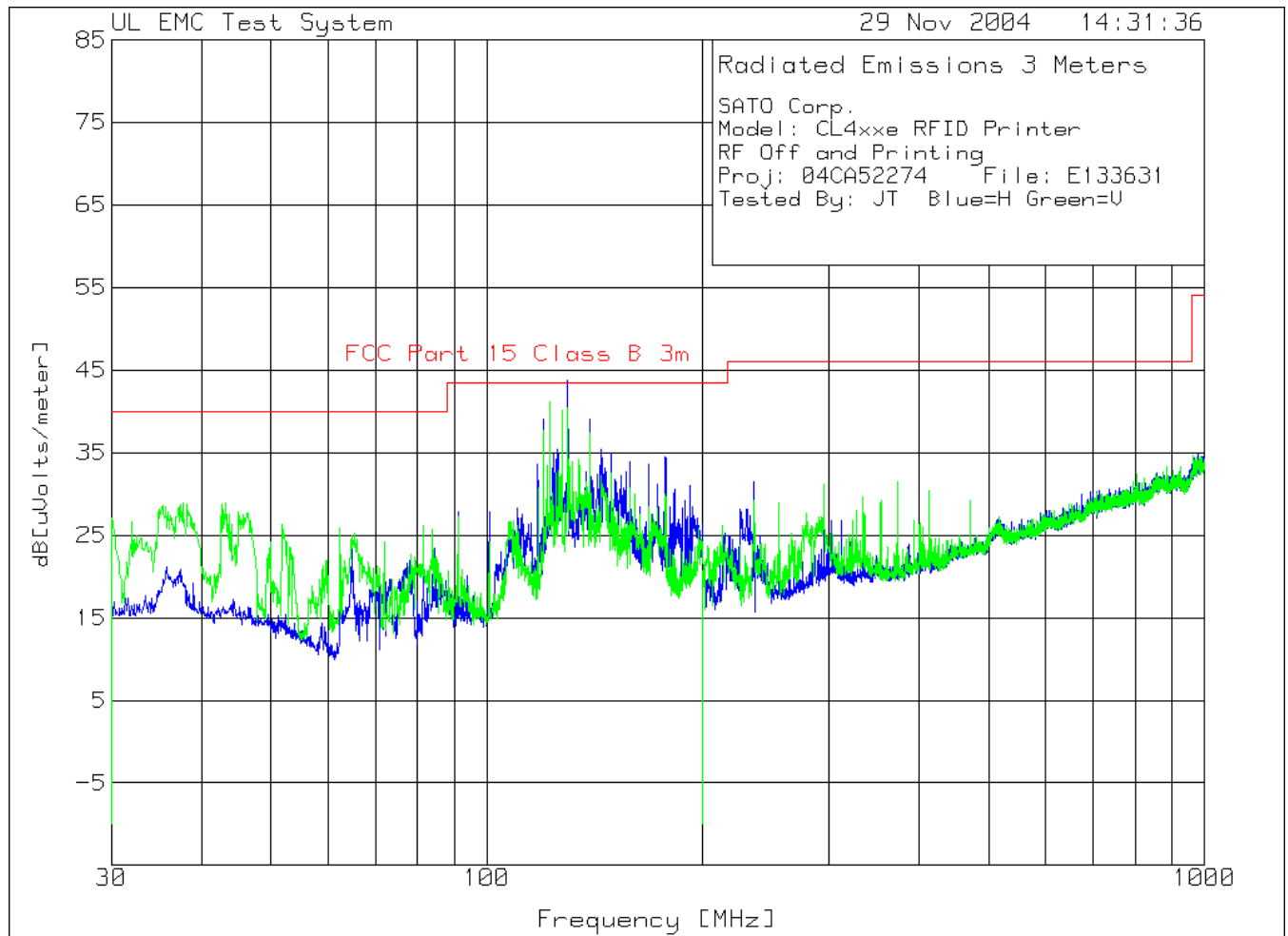
\*See Power Interface and EUT Operating Modes for details

#### Test equipment used for Radiated Emissions

|                       |                                         |                                        |
|-----------------------|-----------------------------------------|----------------------------------------|
| Range:                | Last Calibration Date:                  | Calibration Due Date:                  |
| <b>ESI26</b>          | <b>Rhode &amp; Schwartz</b>             | <b>EMI Receiver</b>                    |
|                       |                                         | <b>Equipment No.: ME5B-081</b>         |
|                       |                                         | <b>Quasi Peak BW: 200Hz</b>            |
|                       |                                         | <b>9kHz to 150kHz</b>                  |
|                       |                                         | <b>RBW 10 KHz</b>                      |
|                       |                                         | <b>Quasi Peak BW: 9kHz</b>             |
|                       |                                         | <b>150kHz to 30MHz</b>                 |
|                       |                                         | <b>RBW 100 KHz</b>                     |
|                       |                                         | <b>Quasi Peak BW: 120</b>              |
|                       |                                         | <b>30 to 1000MHz</b>                   |
|                       |                                         | <b>kHz</b>                             |
|                       |                                         | <b>RBW 1.0 MHz</b>                     |
|                       |                                         | <b>RBW 1.0 MHz</b>                     |
|                       |                                         | <b>1000-10000 MHz</b>                  |
| Range: 30 – 10000 MHz | Last Calibration Date: 7 September 2004 | Calibration Due Date: 7 September 2005 |

#### Test Accessories for Radiated Emissions

|                     |                                         |                                        |                               |
|---------------------|-----------------------------------------|----------------------------------------|-------------------------------|
| <b>BW-N10W5</b>     | <b>Mini-Circuits</b>                    | <b>10 dB Attenuator</b>                | <b>Equipment No.:31625</b>    |
| Range: 1-2 GHz      | Last Calibration Date: 22 November 2004 | Calibration Due Date: 22 November 2005 |                               |
| <b>HA-20N</b>       | <b>Microlab</b>                         | <b>High Pass Filter</b>                | <b>Equipment No.: 5B-458</b>  |
| Range: 2-4.6 GHz    | Last Calibration Date: 3 December 2004  | Calibration Due Date: 3 December 2005  |                               |
| <b>HD-50N</b>       | <b>Microlab</b>                         | <b>High Pass Filter</b>                | <b>Equipment No.: 5B-459</b>  |
| Range: 4.6-10 GHz   | Last Calibration Date: 3 December 2004  | Calibration Due Date: 3 December 2005  |                               |
| <b>3104C</b>        | <b>EMCO</b>                             | <b>Biconnical Antenna</b>              | <b>Equipment No.: ME5-810</b> |
| Range: 30-200 MHz   | Last Calibration Date: 1 April 2004     | Calibration Due Date: 1 April 2005     |                               |
| <b>94455-1</b>      | <b>Ailtech</b>                          | <b>Biconnical Antenna</b>              | <b>Equipment No.: ME5-439</b> |
| Range: 30 –200 MHz  | Last Calibration Date: 2 December 2003  | Calibration Due Date: 2 December 2004  |                               |
| <b>3146</b>         | <b>EMCO</b>                             | <b>Log Periodic Antenna</b>            | <b>Equipment No.: ME5-451</b> |
| Range: 200-1000 MHz | Last Calibration Date: 4 December 2003  | Calibration Due Date: 4 December 2004  |                               |
| <b>3146</b>         | <b>EMCO</b>                             | <b>Log Periodic Antenna</b>            | <b>Equipment No.: ME5-811</b> |
| Range: 200-1000 MHz | Last Calibration Date: 1 April 2004     | Calibration Due Date: 1 April 2005     |                               |
| <b>RGA-180</b>      | <b>EMCO</b>                             | <b>Horn Antenna</b>                    | <b>Equipment No.: ME5-565</b> |
| Range: 1-10 GHz     | Last Calibration Date: 7 July 2004      | Calibration Due Date: 7 July 2005      |                               |
| <b>8449B</b>        | <b>Hewlett Packard</b>                  | <b>1-26GHz Pre-Amp</b>                 | <b>Equipment No.: ME5-914</b> |
| Range: 1-10 GHz     | Last Calibration Date: 21 January 2004  | Calibration Due Date: 21 January 2005  |                               |
| <b>99760-00</b>     | <b>Cole –Parmer</b>                     | <b>Hygrometer/Temp/Baro</b>            | <b>Equipment No.: ME4-268</b> |
|                     |                                         | <b>meter</b>                           |                               |
|                     |                                         | <b>Ranges</b>                          |                               |
|                     |                                         | Temp: 0°C-55°C                         |                               |
|                     |                                         | Humidity: 25% to 95 %RH                |                               |
|                     |                                         | Pressure: 795 to 1050 mbar             |                               |
|                     | Last Calibration Date: 18 June 2004     | Calibration Due Date: 18 June 2005     |                               |



File Number: E133631  
Project Number: O4CA52274  
Model Number: CL4XXE  
FCC ID: MMFCL4XXEAW

Issued: 3/4/2005

SATO Corp.

Model: CL4xxe RFID Printer

RF Off and Printing

Proj: 04CA52274 File: E133631

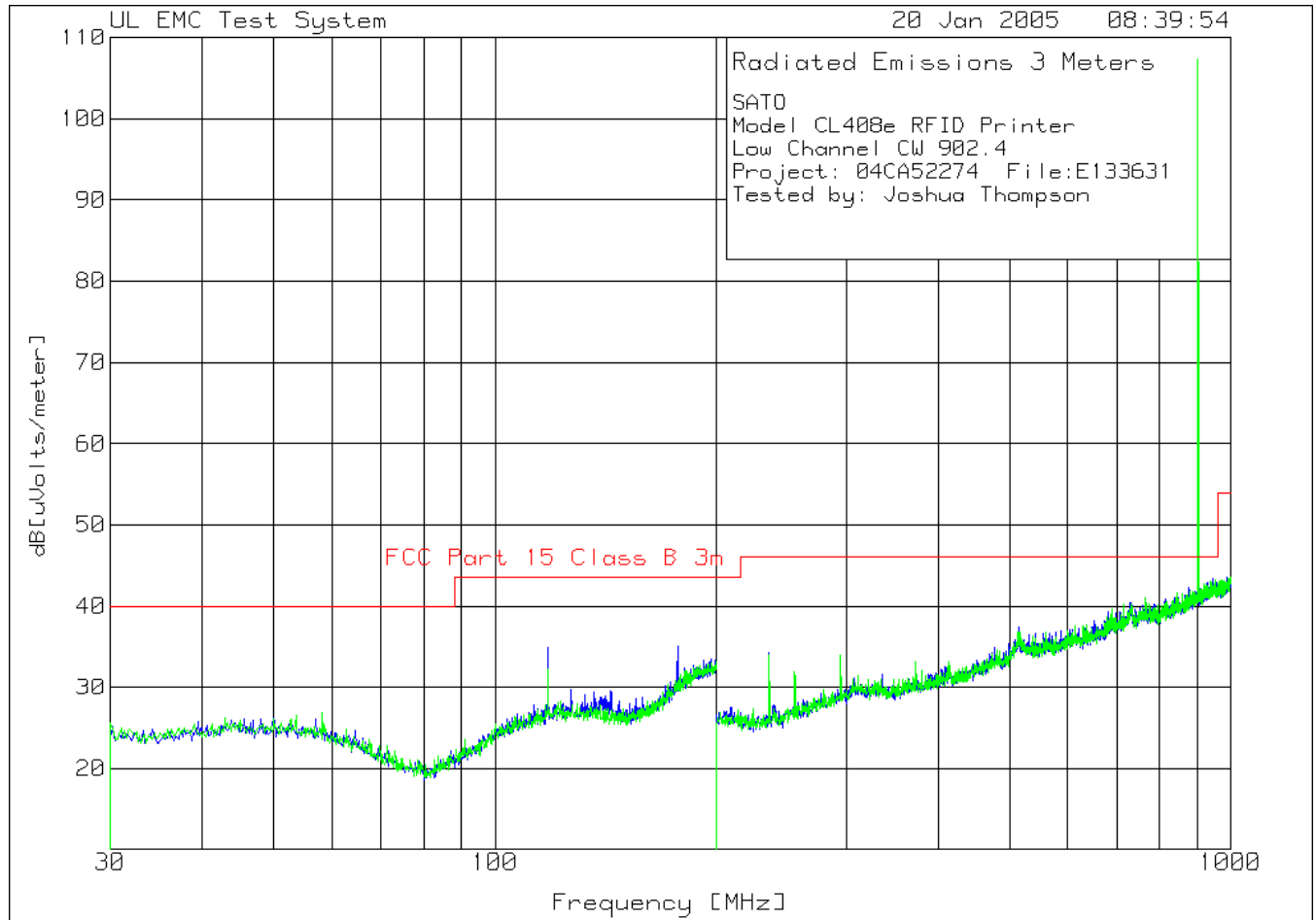
Tested By: JT Blue=H Green=V

| Test                   | Meter      | Gain/Loss | Transducer   | Level            | Limit:1 | 2 | 3 | 4 |
|------------------------|------------|-----------|--------------|------------------|---------|---|---|---|
| Frequency              | Reading    | Factor    | Factor       | dB[uVolts/meter] |         |   |   |   |
| [MHz]                  | [dB(uV)]   | [dB]      | [dB]         |                  |         |   |   |   |
| =====                  |            |           |              |                  |         |   |   |   |
| Horizontal 30 - 200MHz |            |           |              |                  |         |   |   |   |
| 119.975                | 18.27 qp   | 1.6       | 10.3         | 30.17            | 43.5    | - | - | - |
| Azimuth: 0             | Height:100 | Horz      | Margin [dB]: | -13.33           |         | - | - | - |
| 139.1247               | 15.34 qp   | 1.7       | 14.6         | 31.64            | 43.5    | - | - | - |
| Azimuth: 111           | Height:225 | Horz      | Margin [dB]: | -11.86           |         | - | - | - |
| 129.6                  | 25.41 qp   | 1.6       | 12.4         | 39.41            | 43.5    | - | - | - |
| Azimuth: 108           | Height:148 | Horz      | Margin [dB]: | -4.09            |         | - | - | - |
| Vertical 30 - 200MHz   |            |           |              |                  |         |   |   |   |
| 139.186                | 18.52 qp   | 1.7       | 14.6         | 34.82            | 43.5    | - | - | - |
| Azimuth: 0             | Height:124 | Vert      | Margin [dB]: | -8.68            |         | - | - | - |
| 129.6126               | 27.89 qp   | 1.6       | 12.4         | 41.89            | 43.5    | - | - | - |
| Azimuth: 216           | Height:121 | Vert      | Margin [dB]: | -1.61            |         | - | - | - |
| 127.2                  | 16.26 qp   | 1.6       | 11.9         | 29.76            | 43.5    | - | - | - |
| Azimuth: 187           | Height:229 | Vert      | Margin [dB]: | -13.74           |         | - | - | - |
| 122.409                | 13.32 qp   | 1.6       | 10.7         | 25.62            | 43.5    | - | - | - |
| Azimuth: 172           | Height:278 | Vert      | Margin [dB]: | -17.88           |         | - | - | - |
| 119.975                | 19.87 qp   | 1.6       | 10.3         | 31.77            | 43.5    | - | - | - |
| Azimuth: 172           | Height:278 | Vert      | Margin [dB]: | -11.73           |         | - | - | - |

LIMIT 1: FCC Part 15 Class B 3m

pk - Peak detector

qp - Quasi-Peak detector



File Number: E133631  
Project Number: O4CA52274  
Model Number: CL4XXE  
FCC ID: MMFCL4XXEAW

Issued: 3/4/2005

SATO

Model CL408e RFID Printer

Low Channel CW 902.4

Project: 04CA52274 File:E133631

Tested by: Joshua Thompson

| No. | Test<br>Frequency<br>[MHz] | Meter<br>Reading<br>[dB(uV)] | Gain/Loss<br>Factor<br>[dB] | Transducer<br>Factor<br>[dB] | Level<br>dB[uVolts/meter] | Limit:1 | 2 | 3 |
|-----|----------------------------|------------------------------|-----------------------------|------------------------------|---------------------------|---------|---|---|
|-----|----------------------------|------------------------------|-----------------------------|------------------------------|---------------------------|---------|---|---|

Horizontal 30 - 200MHz -----

|   |             |            |      |             |       |       |   |   |
|---|-------------|------------|------|-------------|-------|-------|---|---|
| 1 | 117.978     | 20.74 pk   | 1.5  | 12.6        | 34.84 | 43.5  | - | - |
|   | Azimuth:146 | Height:249 | Horz | Margin [dB] |       | -8.66 | - | - |
| 2 | 177.0271    | 17.7 pk    | 1.9  | 15.4        | 35    | 43.5  | - | - |
|   | Azimuth:358 | Height:102 | Horz | Margin [dB] |       | -8.5  | - | - |

Vertical 30 - 200MHz -----

|   |             |            |      |             |       |        |   |   |
|---|-------------|------------|------|-------------|-------|--------|---|---|
| 3 | 117.978     | 18.16 pk   | 1.5  | 12.6        | 32.26 | 43.5   | - | - |
|   | Azimuth:252 | Height:101 | Vert | Margin [dB] |       | -11.24 | - | - |

Horizontal 200 - 1000MHz -----

|   |             |            |      |             |        |       |   |   |
|---|-------------|------------|------|-------------|--------|-------|---|---|
| 4 | 902.3512    | 73.72 pk   | 4.4  | 23.3        | 101.42 | 46    | - | - |
|   | Azimuth:201 | Height:101 | Horz | Margin [dB] |        | 55.42 | - | - |
| 5 | 957.5788    | 14.41 pk   | 4.6  | 23.9        | 42.91  | 46    | - | - |
|   | Azimuth:201 | Height:249 | Horz | Margin [dB] |        | -3.09 | - | - |

Vertical 200 - 1000MHz -----

|   |             |            |      |             |       |       |   |   |
|---|-------------|------------|------|-------------|-------|-------|---|---|
| 6 | 902.3512    | 79.7 pk    | 4.4  | 23.3        | 107.4 | 46    | - | - |
|   | Azimuth:123 | Height:101 | Vert | Margin [dB] |       | 61.4  | - | - |
| 7 | 953.1766    | 14.59 pk   | 4.6  | 24          | 43.19 | 46    | - | - |
|   | Azimuth:202 | Height:249 | Vert | Margin [dB] |       | -2.81 | - | - |

LIMIT 1: FCC Part 15 Class B 3m

pk - Peak detector

File Number: E133631  
Project Number: O4CA52274  
Model Number: CL4XXE  
FCC ID: MMFCL4XXEAW

Issued: 3/4/2005

SATO

Model CL408e RFID Printer

Low Channel CW 902.4

Project: 04CA52274 File:E133631

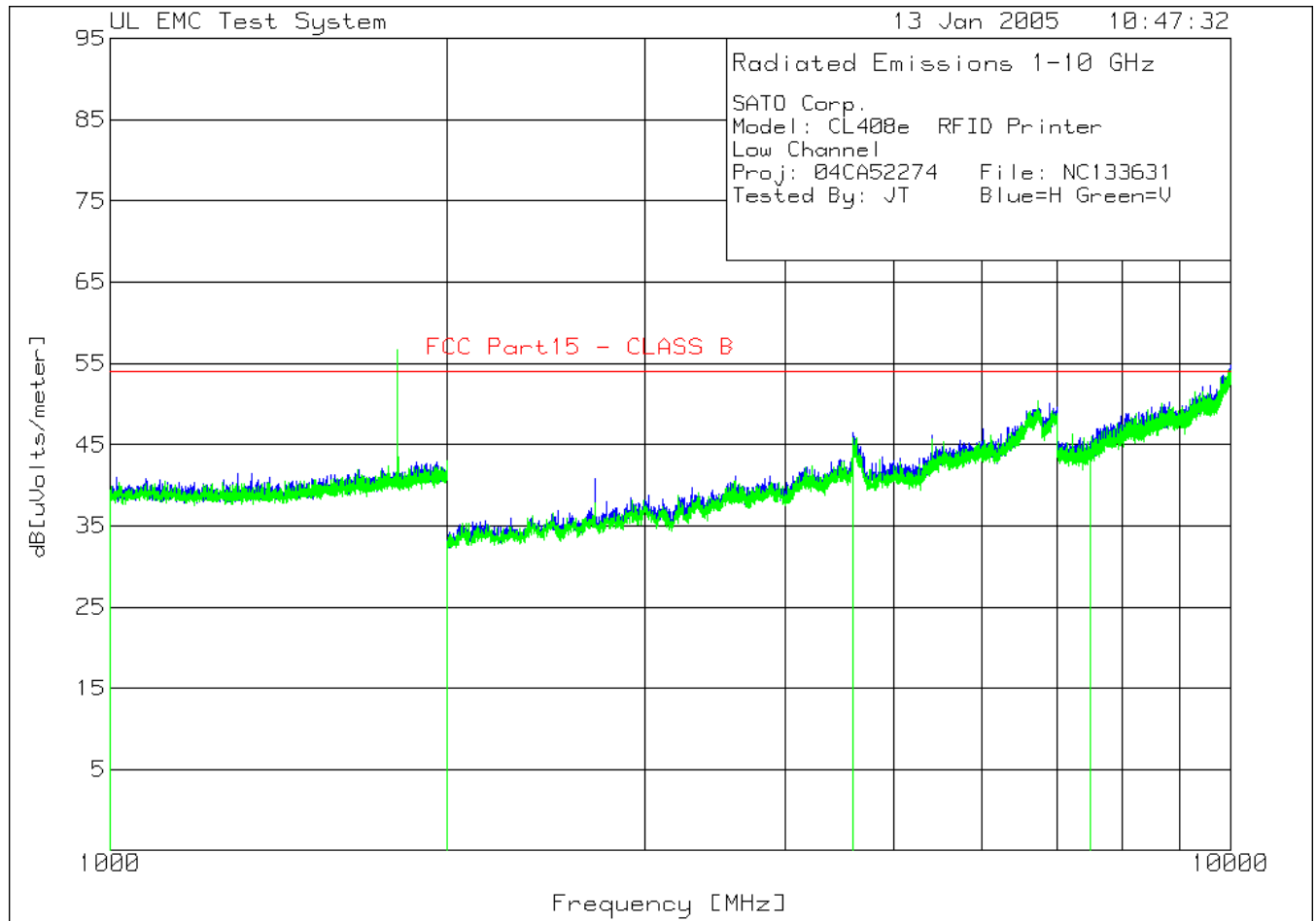
Tested by: Joshua Thompson

| Test                         | Meter    | Gain/Loss | Transducer   | Level            | Limit:1 | 2 | 3 | 4 |
|------------------------------|----------|-----------|--------------|------------------|---------|---|---|---|
| Frequency                    | Reading  | Factor    | Factor       | dB[uVolts/meter] |         |   |   |   |
| [MHz]                        | [dB(uV)] | [dB]      | [dB]         |                  |         |   |   |   |
| =====                        |          |           |              |                  |         |   |   |   |
| Horizontal 200 - 1000MHz     |          |           |              |                  |         |   |   |   |
| 957.2171                     | 8.62 qp  | 4.6       | 23.9         | 37.12            | 46      | - | - | - |
| Azimuth: 225 Height:313 Horz |          |           | Margin [dB]: |                  | -8.88   | - | - | - |
| Vertical 200 - 1000MHz       |          |           |              |                  |         |   |   |   |
| 957.9245                     | 8.52 qp  | 4.6       | 23.9         | 37.02            | 46      | - | - | - |
| Azimuth: 225 Height:132 Vert |          |           | Margin [dB]: |                  | -8.98   | - | - | - |

LIMIT 1: FCC Part 15 Class B 3m

pk - Peak detector

qp - Quasi-Peak detector



File Number: E133631  
 Project Number: O4CA52274  
 Model Number: CL4XXE  
 FCC ID: MMFCL4XXEAW

Issued: 3/4/2005

SATO Corp.  
 Model: CL408e RFID Printer  
 Low Channel  
 Proj: 04CA52274 File: NC133631  
 Tested By: JT Blue=H Green=V

| No.                              | Test<br>Frequency<br>[MHz] | Meter<br>Reading<br>[dB(uV)] | Gain/Loss<br>Factor<br>[dB] | Transducer<br>Factor<br>[dB] | Level<br>dB[uVolts/meter] | Limit:1 | 2 | 3 |
|----------------------------------|----------------------------|------------------------------|-----------------------------|------------------------------|---------------------------|---------|---|---|
| =====                            |                            |                              |                             |                              |                           |         |   |   |
| Horizontal 1000 - 2000MHz -----  |                            |                              |                             |                              |                           |         |   |   |
| 1                                | 1804.902                   | 40.5 pk                      | -19.7                       | 26.5                         | 47.3                      | 54      | - | - |
|                                  | Azimuth:101                | Height:101                   | Horz                        | Margin [dB]                  |                           | -6.7    | - | - |
| Horizontal 2000 - 4600MHz -----  |                            |                              |                             |                              |                           |         |   |   |
| 2                                | 2706.253                   | 37.02 pk                     | -25.4                       | 29.2                         | 40.82                     | 54      | - | - |
|                                  | Azimuth:111                | Height:101                   | Horz                        | Margin [dB]                  |                           | -13.18  | - | - |
| 3                                | 3610.205                   | 32.05 pk                     | -22.5                       | 31.5                         | 41.05                     | 54      | - | - |
|                                  | Azimuth:16                 | Height:101                   | Horz                        | Margin [dB]                  |                           | -12.95  | - | - |
| 4                                | 4484.242                   | 30.79 pk                     | -19.9                       | 32.3                         | 43.19                     | 54      | - | - |
|                                  | Azimuth:111                | Height:101                   | Horz                        | Margin [dB]                  |                           | -10.81  | - | - |
| Horizontal 4600 - 7500MHz -----  |                            |                              |                             |                              |                           |         |   |   |
| 5                                | 5413.857                   | 31.95 pk                     | -19.9                       | 34.1                         | 46.15                     | 54      | - | - |
|                                  | Azimuth:97                 | Height:101                   | Horz                        | Margin [dB]                  |                           | -7.85   | - | - |
| 6                                | 6317.659                   | 30.46 pk                     | -17.9                       | 34.6                         | 47.16                     | 54      | - | - |
|                                  | Azimuth:56                 | Height:101                   | Horz                        | Margin [dB]                  |                           | -6.84   | - | - |
| 7                                | 7228.714                   | 26.8 pk                      | -17.9                       | 36.2                         | 45.1                      | 54      | - | - |
|                                  | Azimuth:98                 | Height:101                   | Horz                        | Margin [dB]                  |                           | -8.9    | - | - |
| 20                               | 5413.857                   | 31.95 pk                     | -19.9                       | 34.1                         | 46.15                     | 54      | - | - |
|                                  | Azimuth:97                 | Height:101                   | Horz                        | Margin [dB]                  |                           | -7.85   | - | - |
| 21                               | 6317.659                   | 30.46 pk                     | -17.9                       | 34.6                         | 47.16                     | 54      | - | - |
|                                  | Azimuth:56                 | Height:101                   | Horz                        | Margin [dB]                  |                           | -6.84   | - | - |
| 22                               | 7228.714                   | 26.8 pk                      | -17.9                       | 36.2                         | 45.1                      | 54      | - | - |
|                                  | Azimuth:98                 | Height:101                   | Horz                        | Margin [dB]                  |                           | -8.9    | - | - |
| Horizontal 7500 - 10000MHz ----- |                            |                              |                             |                              |                           |         |   |   |
| 8                                | 8112.806                   | 27.49 pk                     | -15.7                       | 37                           | 48.79                     | 54      | - | - |
|                                  | Azimuth:177                | Height:101                   | Horz                        | Margin [dB]                  |                           | -5.21   | - | - |
| 9                                | 9024.512                   | 25.65 pk                     | -14.6                       | 38                           | 49.05                     | 54      | - | - |
|                                  | Azimuth:355                | Height:101                   | Horz                        | Margin [dB]                  |                           | -4.95   | - | - |
| 10                               | 9434.717                   | 27.03 pk                     | -13.2                       | 38.3                         | 52.13                     | 54      | - | - |
|                                  | Azimuth:1                  | Height:101                   | Horz                        | Margin [dB]                  |                           | -1.87   | - | - |
| 11                               | 9588.544                   | 27.38 pk                     | -13.6                       | 38.5                         | 52.28                     | 54      | - | - |
|                                  | Azimuth:39                 | Height:101                   | Horz                        | Margin [dB]                  |                           | -1.72   | - | - |
| 12                               | 9794.897                   | 26.05 pk                     | -12.3                       | 38.7                         | 52.45                     | 54      | - | - |
|                                  | Azimuth:223                | Height:101                   | Horz                        | Margin [dB]                  |                           | -1.55   | - | - |
| 13                               | 9851.176                   | 26.67 pk                     | -12                         | 38.8                         | 53.47                     | 54      | - | - |
|                                  | Azimuth:223                | Height:101                   | Horz                        | Margin [dB]                  |                           | -.53    | - | - |
| 14                               | 9962.481                   | 26.65 pk                     | -11.2                       | 38.9                         | 54.35                     | 54      | - | - |
|                                  | Azimuth:1                  | Height:101                   | Horz                        | Margin [dB]                  |                           | .35     | - | - |
| 15                               | 9988.744                   | 26.95 pk                     | -11.1                       | 38.9                         | 54.75                     | 54      | - | - |
|                                  | Azimuth:177                | Height:101                   | Horz                        | Margin [dB]                  |                           | .75     | - | - |

Vertical 1000 - 2000MHz -----  
 16 1804.902 49.83 pk -19.7 26.5 56.63 54 - -  
 Azimuth:101 Height:101 Vert Margin [dB] 2.63 - -

NOTE: Fundamental Harmonic Limit = Fundamental Signal Level - 20 dB =  
 107.4 dBuV - 20 dB = 87.4 dBuV, therefore no further investigation of this frequency  
 was performed.

Vertical 2000 - 4600MHz -----  
 17 2707.554 33.98 pk -25.3 29.2 37.88 54 - -  
 Azimuth:332 Height:101 Vert Margin [dB] -16.12 - -  
 18 3610.205 31.55 pk -22.5 31.5 40.55 54 - -  
 Azimuth:27 Height:101 Vert Margin [dB] -13.45 - -  
 19 4488.144 30.49 pk -19.9 32.3 42.89 54 - -  
 Azimuth:1 Height:101 Vert Margin [dB] -11.11 - -

Vertical 7500 - 10000MHz -----  
 23 8107.804 26.6 pk -15.7 37 47.9 54 - -  
 Azimuth:2 Height:101 Vert Margin [dB] -6.1 - -  
 24 9035.768 25.85 pk -14.6 38 49.25 54 - -  
 Azimuth:353 Height:101 Vert Margin [dB] -4.75 - -  
 25 9427.214 26.39 pk -13.2 38.3 51.49 54 - -  
 Azimuth:88 Height:101 Vert Margin [dB] -2.51 - -  
 26 9587.294 26.28 pk -13.6 38.5 51.18 54 - -  
 Azimuth:47 Height:101 Vert Margin [dB] -2.82 - -  
 27 9797.399 26.82 pk -12.3 38.7 53.22 54 - -  
 Azimuth:344 Height:101 Vert Margin [dB] -.78 - -  
 28 9797.399 26.82 pk -12.3 38.7 53.22 54 - -  
 Azimuth:344 Height:101 Vert Margin [dB] -.78 - -  
 29 9879.94 26.36 pk -11.8 38.8 53.36 54 - -  
 Azimuth:272 Height:101 Vert Margin [dB] -.64 - -  
 30 9953.727 26.62 pk -11.3 38.9 54.22 54 - -  
 Azimuth:2 Height:101 Vert Margin [dB] .22 - -  
 31 9953.727 26.62 pk -11.3 38.9 54.22 54 - -  
 Azimuth:2 Height:101 Vert Margin [dB] .22 - -

LIMIT 1: FCC Part15 - CLASS B

pk - Peak detector

File Number: E133631  
 Project Number: O4CA52274  
 Model Number: CL4XXE  
 FCC ID: MMFCL4XXEAW

Issued: 3/4/2005

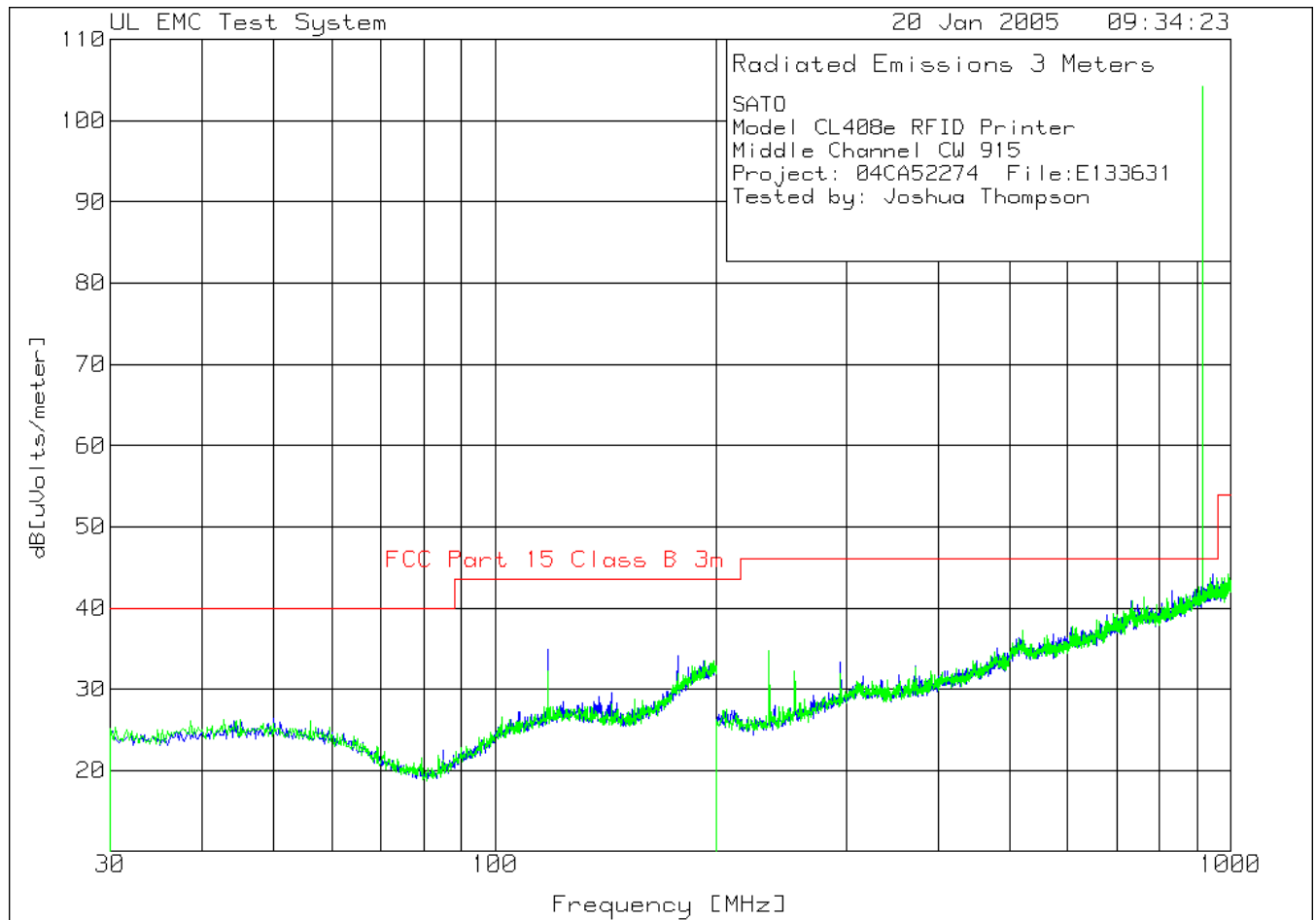
SATO Corp.  
 Model: CL408e RFID Printer  
 Low Channel  
 Proj: 04CA52274 File: NC133631  
 Tested By: JT Blue=H Green=V

| Test       | Meter           | Gain/Loss | Transducer   | Level            | Limit:1 | 2 | 3 | 4 |
|------------|-----------------|-----------|--------------|------------------|---------|---|---|---|
| Frequency  | Reading         | Factor    | Factor       | dB[uVolts/meter] |         |   |   |   |
| [MHz]      | [dB(uV)]        | [dB]      | [dB]         |                  |         |   |   |   |
| =====      |                 |           |              |                  |         |   |   |   |
| Horizontal | 7500 - 10000MHz |           |              |                  |         |   |   |   |
| 9434.717   | 22.49 ave       | -13.2     | 38.3         | 47.59            | 54      | - | - | - |
|            |                 |           | Margin [dB]: |                  | -6.41   | - | - | - |
| 9588.544   | 22.5 ave        | -13.6     | 38.5         | 47.4             | 54      | - | - | - |
|            |                 |           | Margin [dB]: |                  | -6.6    | - | - | - |
| 9794.897   | 23.08 ave       | -12.3     | 38.7         | 49.48            | 54      | - | - | - |
|            |                 |           | Margin [dB]: |                  | -4.52   | - | - | - |
| 9851.176   | 23.4 ave        | -12       | 38.8         | 50.2             | 54      | - | - | - |
|            |                 |           | Margin [dB]: |                  | -3.8    | - | - | - |
| 9962.481   | 23.6 ave        | -11.2     | 38.9         | 51.3             | 54      | - | - | - |
|            |                 |           | Margin [dB]: |                  | -2.7    | - | - | - |
| 9988.744   | 23.65 ave       | -11.1     | 38.9         | 51.45            | 54      | - | - | - |
|            |                 |           | Margin [dB]: |                  | -2.55   | - | - | - |
|            |                 |           |              |                  |         |   |   |   |
| Vertical   | 7500 - 10000MHz |           |              |                  |         |   |   |   |
| 9427.214   | 22.5 ave        | -13.2     | 38.3         | 47.6             | 54      | - | - | - |
|            |                 |           | Margin [dB]: |                  | -6.4    | - | - | - |
| 9587.294   | 22.54 ave       | -13.6     | 38.5         | 47.44            | 54      | - | - | - |
|            |                 |           | Margin [dB]: |                  | -6.56   | - | - | - |
| 9797.399   | 23.11 ave       | -12.3     | 38.7         | 49.51            | 54      | - | - | - |
|            |                 |           | Margin [dB]: |                  | -4.49   | - | - | - |
| 9797.399   | 23.11 ave       | -12.3     | 38.7         | 49.51            | 54      | - | - | - |
|            |                 |           | Margin [dB]: |                  | -4.49   | - | - | - |
| 9879.94    | 23.33 ave       | -11.8     | 38.8         | 50.33            | 54      | - | - | - |
|            |                 |           | Margin [dB]: |                  | -3.67   | - | - | - |
| 9953.727   | 23.62 ave       | -11.3     | 38.9         | 51.22            | 54      | - | - | - |
|            |                 |           | Margin [dB]: |                  | -2.78   | - | - | - |
| 9953.727   | 23.62 ave       | -11.3     | 38.9         | 51.22            | 54      | - | - | - |
|            |                 |           | Margin [dB]: |                  | -2.78   | - | - | - |

NOTE: "+" - Indicates an emission level in excess of the applicable limit (s).

pk - Peak detector  
 ave - denotes average detection

LIMIT 1: FCC Part15 - CLASS B



File Number: E133631  
 Project Number: O4CA52274  
 Model Number: CL4XXE  
 FCC ID: MMFCL4XXEAW

Issued: 3/4/2005

SATO  
 Model CL408e RFID Printer  
 Middle Channel CW 915  
 Project: 04CA52274 File:E133631  
 Tested by: Joshua Thompson

| No.                            | Test<br>Frequency<br>[MHz] | Meter<br>Reading<br>[dB(uV)] | Gain/Loss<br>Factor<br>[dB] | Transducer<br>Factor<br>[dB] | Level<br>dB[uVolts/meter] | Limit:1 | 2 | 3 |
|--------------------------------|----------------------------|------------------------------|-----------------------------|------------------------------|---------------------------|---------|---|---|
| =====                          |                            |                              |                             |                              |                           |         |   |   |
| Horizontal 30 - 200MHz -----   |                            |                              |                             |                              |                           |         |   |   |
| 1                              | 117.978                    | 20.81 pk                     | 1.5                         | 12.6                         | 34.91                     | 43.5    | - | - |
|                                | Azimuth:108                | Height:249                   | Horz                        | Margin [dB]                  |                           | -8.59   | - | - |
| Vertical 30 - 200MHz -----     |                            |                              |                             |                              |                           |         |   |   |
| 2                              | 117.978                    | 18.21 pk                     | 1.5                         | 12.6                         | 32.31                     | 43.5    | - | - |
|                                | Azimuth:214                | Height:101                   | Vert                        | Margin [dB]                  |                           | -11.19  | - | - |
| Horizontal 200 - 1000MHz ----- |                            |                              |                             |                              |                           |         |   |   |
| 3                              | 833.1166                   | 15.79 pk                     | 4.2                         | 22.2                         | 42.19                     | 46      | - | - |
|                                | Azimuth:1                  | Height:399                   | Horz                        | Margin [dB]                  |                           | -3.81   | - | - |
| 4                              | 915.1576                   | 71.27 pk                     | 4.4                         | 23.4                         | 99.07                     | 46      | - | - |
|                                | Azimuth:17                 | Height:101                   | Horz                        | Margin [dB]                  |                           | 53.07   | - | - |
| 5                              | 944.7724                   | 15.64 pk                     | 4.5                         | 24                           | 44.14                     | 46      | - | - |
|                                | Azimuth:343                | Height:399                   | Horz                        | Margin [dB]                  |                           | -1.86   | - | - |
| Vertical 200 - 1000MHz -----   |                            |                              |                             |                              |                           |         |   |   |
| 6                              | 915.1576                   | 76.48 pk                     | 4.4                         | 23.4                         | 104.28                    | 46      | - | - |
|                                | Azimuth:80                 | Height:101                   | Vert                        | Margin [dB]                  |                           | 58.28   | - | - |
| 7                              | 957.1786                   | 15.16 pk                     | 4.6                         | 23.9                         | 43.66                     | 46      | - | - |
|                                | Azimuth:2                  | Height:250                   | Vert                        | Margin [dB]                  |                           | -2.34   | - | - |

LIMIT 1: FCC Part 15 Class B 3m

pk - Peak detector  
 qp - Quasi-Peak detector

File Number: E133631  
 Project Number: O4CA52274  
 Model Number: CL4XXE  
 FCC ID: MMFCL4XXEAW

Issued: 3/4/2005

SATO

Model CL408e RFID Printer

Middle Channel CW 915

Project: 04CA52274 File:E133631

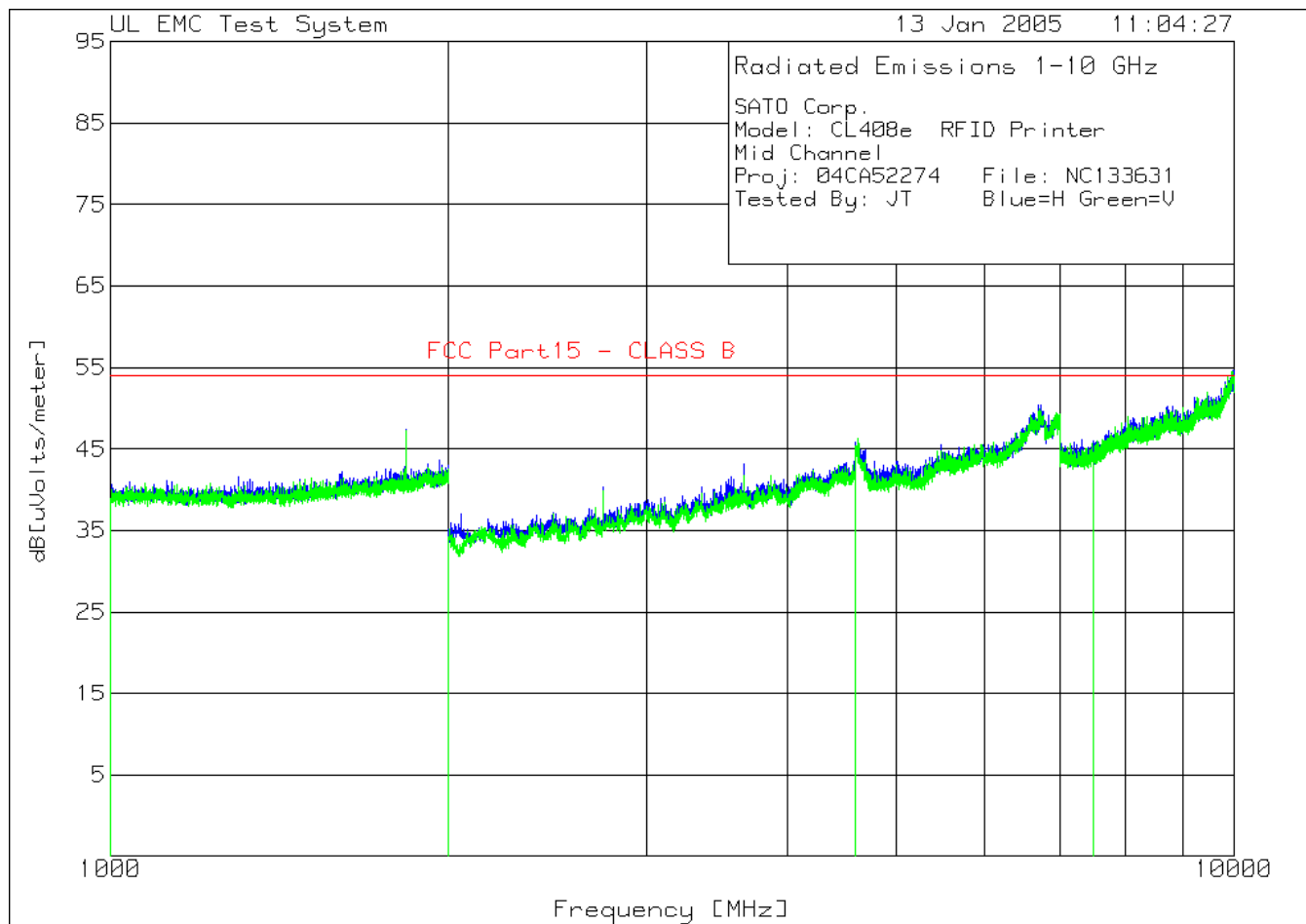
Tested by: Joshua Thompson

| Test         | Meter         | Gain/Loss | Transducer | Level            | Limit:1 | 2 | 3 | 4 |
|--------------|---------------|-----------|------------|------------------|---------|---|---|---|
| Frequency    | Reading       | Factor    | Factor     | dB[uVolts/meter] |         |   |   |   |
| [MHz]        | [dB(uV)]      | [dB]      | [dB]       |                  |         |   |   |   |
| =====        |               |           |            |                  |         |   |   |   |
| Horizontal   | 200 - 1000MHz |           |            |                  |         |   |   |   |
| 833.2533     | 8.24 qp       | 4.2       | 22.2       | 34.64            | 46      | - | - | - |
| Azimuth: 1   | Height:215    | Horz      |            | Margin [dB]:     | -11.36  | - | - | - |
| 944.9534     | 8.52 qp       | 4.5       | 24         | 37.02            | 46      | - | - | - |
| Azimuth: 316 | Height:261    | Horz      |            | Margin [dB]:     | -8.98   | - | - | - |
| Vertical     | 200 - 1000MHz |           |            |                  |         |   |   |   |
| 957.2488     | 8.52 qp       | 4.6       | 23.9       | 37.02            | 46      | - | - | - |
| Azimuth: 196 | Height:113    | Vert      |            | Margin [dB]:     | -8.98   | - | - | - |

LIMIT 1: FCC Part 15 Class B 3m

pk - Peak detector

qp - Quasi-Peak detector



File Number: E133631  
 Project Number: O4CA52274  
 Model Number: CL4XXE  
 FCC ID: MMFCL4XXEAW

Issued: 3/4/2005

SATO Corp.  
 Model: CL408e RFID Printer  
 Mid Channel  
 Proj: 04CA52274 File: NC133631  
 Tested By: JT Blue=H Green=V

| No.                              | Test<br>Frequency<br>[MHz] | Meter<br>Reading<br>[dB(uV)] | Gain/Loss<br>Factor<br>[dB] | Transducer<br>Factor<br>[dB] | Level<br>dB[uVolts/meter] | Limit:1 | 2 | 3 |
|----------------------------------|----------------------------|------------------------------|-----------------------------|------------------------------|---------------------------|---------|---|---|
| =====                            |                            |                              |                             |                              |                           |         |   |   |
| Horizontal 1000 - 2000MHz -----  |                            |                              |                             |                              |                           |         |   |   |
| 1                                | 1830.415                   | 40.54 pk                     | -19.7                       | 26.6                         | 47.44                     | 54      | - | - |
|                                  | Azimuth:358                | Height:101                   | Horz                        | Margin [dB]                  |                           | -6.56   | - | - |
| Horizontal 2000 - 4600MHz -----  |                            |                              |                             |                              |                           |         |   |   |
| 2                                | 2745.273                   | 36.18 pk                     | -25.1                       | 29.3                         | 40.38                     | 54      | - | - |
|                                  | Azimuth:111                | Height:101                   | Horz                        | Margin [dB]                  |                           | -13.62  | - | - |
| 3                                | 3660.93                    | 33.71 pk                     | -22.3                       | 31.7                         | 43.11                     | 54      | - | - |
|                                  | Azimuth:138                | Height:101                   | Horz                        | Margin [dB]                  |                           | -10.89  | - | - |
| 4                                | 4588.294                   | 30.22 pk                     | -19.3                       | 32.5                         | 43.42                     | 54      | - | - |
|                                  | Azimuth:56                 | Height:101                   | Horz                        | Margin [dB]                  |                           | -10.58  | - | - |
| Horizontal 4600 - 7500MHz -----  |                            |                              |                             |                              |                           |         |   |   |
| 5                                | 5490.745                   | 31 pk                        | -19.8                       | 34.3                         | 45.5                      | 54      | - | - |
|                                  | Azimuth:42                 | Height:101                   | Horz                        | Margin [dB]                  |                           | -8.5    | - | - |
| 6                                | 6394.547                   | 29.97 pk                     | -17.6                       | 34.6                         | 46.97                     | 54      | - | - |
|                                  | Azimuth:106                | Height:101                   | Horz                        | Margin [dB]                  |                           | -7.03   | - | - |
| 7                                | 7315.758                   | 27.91 pk                     | -18.1                       | 36.3                         | 46.11                     | 54      | - | - |
|                                  | Azimuth:151                | Height:101                   | Horz                        | Margin [dB]                  |                           | -7.89   | - | - |
| Horizontal 7500 - 10000MHz ----- |                            |                              |                             |                              |                           |         |   |   |
| 8                                | 8237.869                   | 26.48 pk                     | -15.5                       | 37.2                         | 48.18                     | 54      | - | - |
|                                  | Azimuth:184                | Height:101                   | Horz                        | Margin [dB]                  |                           | -5.82   | - | - |
| 9                                | 9107.054                   | 26.12 pk                     | -14.4                       | 38.1                         | 49.82                     | 54      | - | - |
|                                  | Azimuth:267                | Height:101                   | Horz                        | Margin [dB]                  |                           | -4.18   | - | - |
| 10                               | 9209.605                   | 27.2 pk                      | -14                         | 38.2                         | 51.4                      | 54      | - | - |
|                                  | Azimuth:17                 | Height:101                   | Horz                        | Margin [dB]                  |                           | -2.6    | - | - |
| 11                               | 9468.484                   | 26.24 pk                     | -13.2                       | 38.4                         | 51.44                     | 54      | - | - |
|                                  | Azimuth:46                 | Height:101                   | Horz                        | Margin [dB]                  |                           | -2.56   | - | - |
| 12                               | 9632.316                   | 26.31 pk                     | -13.4                       | 38.5                         | 51.41                     | 54      | - | - |
|                                  | Azimuth:17                 | Height:101                   | Horz                        | Margin [dB]                  |                           | -2.59   | - | - |
| 13                               | 9748.624                   | 26.61 pk                     | -12.8                       | 38.6                         | 52.41                     | 54      | - | - |
|                                  | Azimuth:17                 | Height:101                   | Horz                        | Margin [dB]                  |                           | -1.59   | - | - |
| 14                               | 9816.158                   | 26.76 pk                     | -12.2                       | 38.7                         | 53.26                     | 54      | - | - |
|                                  | Azimuth:276                | Height:101                   | Horz                        | Margin [dB]                  |                           | -.74    | - | - |
| 15                               | 9899.95                    | 26.25 pk                     | -11.6                       | 38.8                         | 53.45                     | 54      | - | - |
|                                  | Azimuth:322                | Height:101                   | Horz                        | Margin [dB]                  |                           | -.55    | - | - |
| 16                               | 9958.729                   | 27.08 pk                     | -11.3                       | 38.9                         | 54.68                     | 54      | - | - |
|                                  | Azimuth:1                  | Height:101                   | Horz                        | Margin [dB]                  |                           | .68     | - | - |

File Number: E133631  
Project Number: O4CA52274  
Model Number: CL4XXE  
FCC ID: MMFCL4XXEAW

Issued: 3/4/2005

|                                |             |            |       |             |       |        |   |   |
|--------------------------------|-------------|------------|-------|-------------|-------|--------|---|---|
| 17                             | 9988.744    | 26.89 pk   | -11.1 | 38.9        | 54.69 | 54     | - | - |
|                                | Azimuth:276 | Height:101 | Horz  | Margin [dB] |       | .69    | - | - |
| Vertical 1000 - 2000MHz -----  |             |            |       |             |       |        |   |   |
| 18                             | 1830.415    | 40.4 pk    | -19.7 | 26.6        | 47.3  | 54     | - | - |
|                                | Azimuth:102 | Height:101 | Vert  | Margin [dB] |       | -6.7   | - | - |
| Vertical 2000 - 4600MHz -----  |             |            |       |             |       |        |   |   |
| 19                             | 2745.273    | 35.73 pk   | -25.1 | 29.3        | 39.93 | 54     | - | - |
|                                | Azimuth:16  | Height:101 | Vert  | Margin [dB] |       | -14.07 | - | - |
| 20                             | 3660.93     | 32.42 pk   | -22.3 | 31.7        | 41.82 | 54     | - | - |
|                                | Azimuth:358 | Height:101 | Vert  | Margin [dB] |       | -12.18 | - | - |
| 21                             | 4598.699    | 30.37 pk   | -19.3 | 32.5        | 43.57 | 54     | - | - |
|                                | Azimuth:343 | Height:101 | Vert  | Margin [dB] |       | -10.43 | - | - |
| Vertical 4600 - 7500MHz -----  |             |            |       |             |       |        |   |   |
| 22                             | 5489.295    | 30.19 pk   | -19.8 | 34.3        | 44.69 | 54     | - | - |
|                                | Azimuth:46  | Height:101 | Vert  | Margin [dB] |       | -9.31  | - | - |
| 23                             | 6388.744    | 30.09 pk   | -17.8 | 34.6        | 46.89 | 54     | - | - |
|                                | Azimuth:212 | Height:101 | Vert  | Margin [dB] |       | -7.11  | - | - |
| 24                             | 7324.462    | 26.62 pk   | -18.1 | 36.3        | 44.82 | 54     | - | - |
|                                | Azimuth:144 | Height:101 | Vert  | Margin [dB] |       | -9.18  | - | - |
| Vertical 7500 - 10000MHz ----- |             |            |       |             |       |        |   |   |
| 25                             | 8261.631    | 25.9 pk    | -15.4 | 37.2        | 47.7  | 54     | - | - |
|                                | Azimuth:17  | Height:101 | Vert  | Margin [dB] |       | -6.3   | - | - |
| 26                             | 9118.309    | 24.99 pk   | -14.3 | 38.1        | 48.79 | 54     | - | - |
|                                | Azimuth:358 | Height:101 | Vert  | Margin [dB] |       | -5.21  | - | - |
| 27                             | 9254.627    | 26.97 pk   | -13.8 | 38.2        | 51.37 | 54     | - | - |
|                                | Azimuth:221 | Height:101 | Vert  | Margin [dB] |       | -2.63  | - | - |
| 28                             | 9454.727    | 26.69 pk   | -13.2 | 38.4        | 51.89 | 54     | - | - |
|                                | Azimuth:321 | Height:101 | Vert  | Margin [dB] |       | -2.11  | - | - |
| 29                             | 9781.141    | 25.79 pk   | -12.5 | 38.7        | 51.99 | 54     | - | - |
|                                | Azimuth:184 | Height:101 | Vert  | Margin [dB] |       | -2.01  | - | - |
| 30                             | 9809.905    | 26.33 pk   | -12.2 | 38.7        | 52.83 | 54     | - | - |
|                                | Azimuth:6   | Height:101 | Vert  | Margin [dB] |       | -1.17  | - | - |
| 31                             | 9858.679    | 26.94 pk   | -11.9 | 38.8        | 53.84 | 54     | - | - |
|                                | Azimuth:1   | Height:101 | Vert  | Margin [dB] |       | -.16   | - | - |
| 32                             | 9951.226    | 26.36 pk   | -11.3 | 38.9        | 53.96 | 54     | - | - |
|                                | Azimuth:184 | Height:101 | Vert  | Margin [dB] |       | -.04   | - | - |
| 33                             | 9966.233    | 26.8 pk    | -11.2 | 38.9        | 54.5  | 54     | - | - |
|                                | Azimuth:17  | Height:101 | Vert  | Margin [dB] |       | .5     | - | - |

LIMIT 1: FCC Part15 - CLASS B

pk - Peak detector

File Number: E133631  
 Project Number: O4CA52274  
 Model Number: CL4XXE  
 FCC ID: MMFCL4XXEAW

Issued: 3/4/2005

SATO Corp.

Model: CL408e RFID Printer

Mid Channel

Proj: 04CA52274 File: NC133631

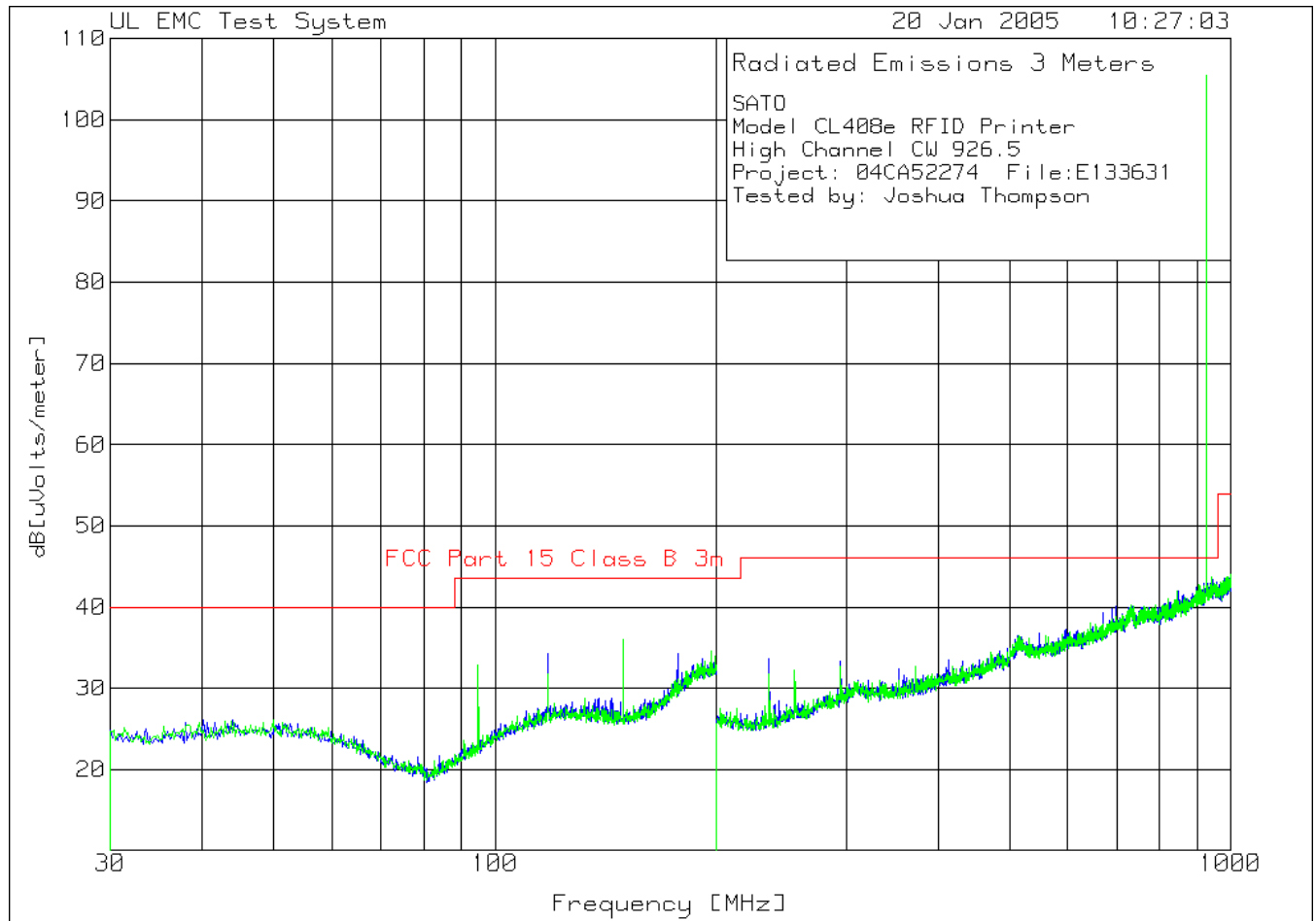
Tested By: JT Blue=H Green=V

| Test                       | Meter     | Gain/Loss | Transducer   | Level            | Limit:1 | 2 | 3 | 4 |
|----------------------------|-----------|-----------|--------------|------------------|---------|---|---|---|
| Frequency                  | Reading   | Factor    | Factor       | dB[uVolts/meter] |         |   |   |   |
| [MHz]                      | [dB(uV)]  | [dB]      | [dB]         |                  |         |   |   |   |
| =====                      |           |           |              |                  |         |   |   |   |
| Horizontal 7500 - 10000MHz |           |           |              |                  |         |   |   |   |
| 9209.605                   | 22.4 ave  | -14       | 38.2         | 46.6             | 54      | - | - | - |
|                            |           |           | Margin [dB]: |                  | -7.4    | - | - | - |
| 9468.484                   | 22.6 ave  | -13.2     | 38.4         | 47.8             | 54      | - | - | - |
|                            |           |           | Margin [dB]: |                  | -6.2    | - | - | - |
| 9632.316                   | 22.71 ave | -13.4     | 38.5         | 47.81            | 54      | - | - | - |
|                            |           |           | Margin [dB]: |                  | -6.19   | - | - | - |
| 9748.624                   | 22.73 ave | -12.8     | 38.6         | 48.53            | 54      | - | - | - |
|                            |           |           | Margin [dB]: |                  | -5.47   | - | - | - |
| 9816.158                   | 23.2 ave  | -12.2     | 38.7         | 49.7             | 54      | - | - | - |
|                            |           |           | Margin [dB]: |                  | -4.3    | - | - | - |
| 9899.95                    | 23.23 ave | -11.6     | 38.8         | 50.43            | 54      | - | - | - |
|                            |           |           | Margin [dB]: |                  | -3.57   | - | - | - |
| 9958.729                   | 23.6 ave  | -11.3     | 38.9         | 51.2             | 54      | - | - | - |
|                            |           |           | Margin [dB]: |                  | -2.8    | - | - | - |
| 9988.744                   | 23.67 ave | -11.1     | 38.9         | 51.47            | 54      | - | - | - |
|                            |           |           | Margin [dB]: |                  | -2.53   | - | - | - |
| Vertical 7500 - 10000MHz   |           |           |              |                  |         |   |   |   |
| 9254.627                   | 22.77 ave | -13.8     | 38.2         | 47.17            | 54      | - | - | - |
|                            |           |           | Margin [dB]: |                  | -6.83   | - | - | - |
| 9454.727                   | 22.63 ave | -13.2     | 38.4         | 47.83            | 54      | - | - | - |
|                            |           |           | Margin [dB]: |                  | -6.17   | - | - | - |
| 9781.141                   | 22.93 ave | -12.5     | 38.7         | 49.13            | 54      | - | - | - |
|                            |           |           | Margin [dB]: |                  | -4.87   | - | - | - |
| 9809.905                   | 23.19 ave | -12.2     | 38.7         | 49.69            | 54      | - | - | - |
|                            |           |           | Margin [dB]: |                  | -4.31   | - | - | - |
| 9858.679                   | 23.3 ave  | -11.9     | 38.8         | 50.2             | 54      | - | - | - |
|                            |           |           | Margin [dB]: |                  | -3.8    | - | - | - |
| 9951.226                   | 23.6 ave  | -11.3     | 38.9         | 51.2             | 54      | - | - | - |
|                            |           |           | Margin [dB]: |                  | -2.8    | - | - | - |
| 9966.233                   | 23.62 ave | -11.2     | 38.9         | 51.32            | 54      | - | - | - |
|                            |           |           | Margin [dB]: |                  | -2.68   | - | - | - |

NOTE: "+" - Indicates an emission level in excess of the applicable limit (s).

ave - denotes average detection

LIMIT 1: FCC Part15 - CLASS B



File Number: E133631  
 Project Number: O4CA52274  
 Model Number: CL4XXE  
 FCC ID: MMFCL4XXEAW

Issued: 3/4/2005

| SATO                            |                            |                              |                             |                              |                           |         |   |   |
|---------------------------------|----------------------------|------------------------------|-----------------------------|------------------------------|---------------------------|---------|---|---|
| Model CL408e RFID Printer       |                            |                              |                             |                              |                           |         |   |   |
| High Channel CW 926.5           |                            |                              |                             |                              |                           |         |   |   |
| Project: 04CA52274 File:E133631 |                            |                              |                             |                              |                           |         |   |   |
| Tested by: Joshua Thompson      |                            |                              |                             |                              |                           |         |   |   |
| No.                             | Test<br>Frequency<br>[MHz] | Meter<br>Reading<br>[dB(uV)] | Gain/Loss<br>Factor<br>[dB] | Transducer<br>Factor<br>[dB] | Level<br>dB[uVolts/meter] | Limit:1 | 2 | 3 |
| =====                           |                            |                              |                             |                              |                           |         |   |   |
| Horizontal 30 - 200MHz -----    |                            |                              |                             |                              |                           |         |   |   |
| 1                               | 96.1962                    | 12.94 pk                     | 1.4                         | 9.3                          | 23.64                     | 43.5    | - | - |
|                                 | Azimuth:343                | Height:399                   | Horz                        | Margin [dB]                  |                           | -19.86  | - | - |
| 2                               | 117.978                    | 20.16 pk                     | 1.5                         | 12.6                         | 34.26                     | 43.5    | - | - |
|                                 | Azimuth:107                | Height:250                   | Horz                        | Margin [dB]                  |                           | -9.24   | - | - |
| 3                               | 148.0981                   | 14.62 pk                     | 1.7                         | 12                           | 28.32                     | 43.5    | - | - |
|                                 | Azimuth:1                  | Height:101                   | Horz                        | Margin [dB]                  |                           | -15.18  | - | - |
| Vertical 30 - 200MHz -----      |                            |                              |                             |                              |                           |         |   |   |
| 4                               | 94.8348                    | 22.41 pk                     | 1.4                         | 9                            | 32.81                     | 43.5    | - | - |
|                                 | Azimuth:108                | Height:400                   | Vert                        | Margin [dB]                  |                           | -10.69  | - | - |
| 5                               | 117.978                    | 17.61 pk                     | 1.5                         | 12.6                         | 31.71                     | 43.5    | - | - |
|                                 | Azimuth:215                | Height:101                   | Vert                        | Margin [dB]                  |                           | -11.79  | - | - |
| 6                               | 149.4595                   | 22.23 pk                     | 1.7                         | 12                           | 35.93                     | 43.5    | - | - |
|                                 | Azimuth:108                | Height:101                   | Vert                        | Margin [dB]                  |                           | -7.57   | - | - |
| Horizontal 200 - 1000MHz -----  |                            |                              |                             |                              |                           |         |   |   |
| 7                               | 850.3252                   | 15.26 pk                     | 4.2                         | 22.5                         | 41.96                     | 46      | - | - |
|                                 | Azimuth:237                | Height:250                   | Horz                        | Margin [dB]                  |                           | -4.04   | - | - |
| 8                               | 926.7634                   | 68.85 pk                     | 4.5                         | 23.8                         | 97.15                     | 46      | - | - |
|                                 | Azimuth:18                 | Height:101                   | Horz                        | Margin [dB]                  |                           | 51.15   | - | - |
| 9                               | 956.7784                   | 14.54 pk                     | 4.6                         | 23.9                         | 43.04                     | 46      | - | - |
|                                 | Azimuth:316                | Height:101                   | Horz                        | Margin [dB]                  |                           | -2.96   | - | - |
| Vertical 200 - 1000MHz -----    |                            |                              |                             |                              |                           |         |   |   |
| 10                              | 845.923                    | 15.3 pk                      | 4.2                         | 22.5                         | 42                        | 46      | - | - |
|                                 | Azimuth:315                | Height:101                   | Vert                        | Margin [dB]                  |                           | -4      | - | - |
| 11                              | 926.7634                   | 77.19 pk                     | 4.5                         | 23.8                         | 105.49                    | 46      | - | - |
|                                 | Azimuth:80                 | Height:101                   | Vert                        | Margin [dB]                  |                           | 59.49   | - | - |
| 12                              | 950.3752                   | 14.25 pk                     | 4.6                         | 24                           | 42.85                     | 46      | - | - |
|                                 | Azimuth:18                 | Height:250                   | Vert                        | Margin [dB]                  |                           | -3.15   | - | - |

LIMIT 1: FCC Part 15 Class B 3m

pk - Peak detector

File Number: E133631  
 Project Number: O4CA52274  
 Model Number: CL4XXE  
 FCC ID: MMFCL4XXEAW

Issued: 3/4/2005

SATO

Model CL408e RFID Printer

High Channel CW 926.5

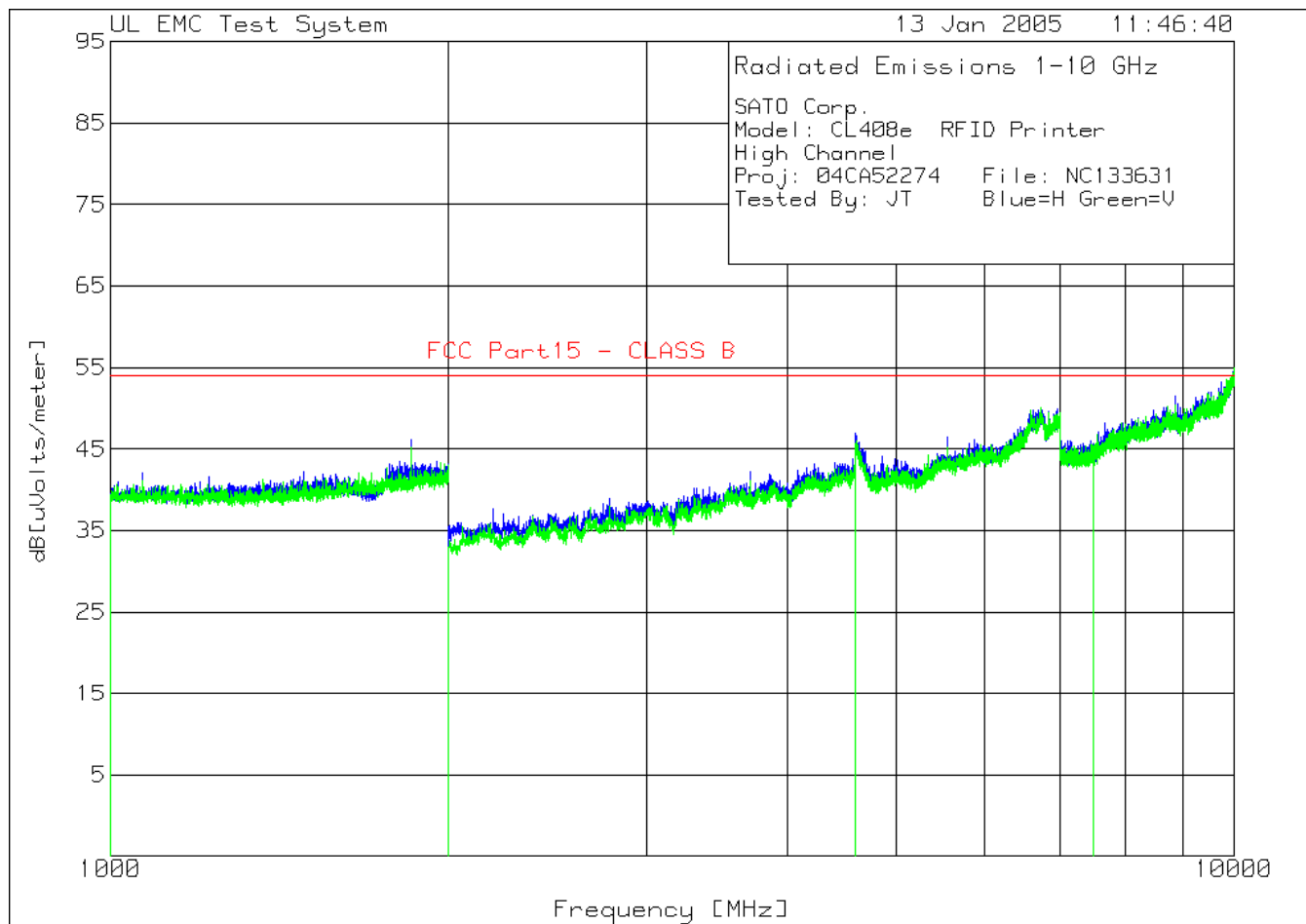
Project: 04CA52274 File:E133631

Tested by: Joshua Thompson

| Test                     | Meter      | Gain/Loss | Transducer | Level            | Limit:1 | 2 | 3 | 4 |
|--------------------------|------------|-----------|------------|------------------|---------|---|---|---|
| Frequency                | Reading    | Factor    | Factor     | dB[uVolts/meter] |         |   |   |   |
| [MHz]                    | [dB(uV)]   | [dB]      | [dB]       |                  |         |   |   |   |
| =====                    |            |           |            |                  |         |   |   |   |
| Horizontal 200 - 1000MHz |            |           |            |                  |         |   |   |   |
| 850.2781                 | 8.24 qp    | 4.2       | 22.5       | 34.94            | 46      | - | - | - |
| Azimuth: 133             | Height:291 | Horz      |            | Margin [dB]:     | -11.06  | - | - | - |
| 956.7784                 | 8.57 qp    | 4.6       | 23.9       | 37.07            | 46      | - | - | - |
| Azimuth: 95              | Height:201 | Horz      |            | Margin [dB]:     | -8.93   | - | - | - |
| Vertical 200 - 1000MHz   |            |           |            |                  |         |   |   |   |
| 846.38                   | 8.35 qp    | 4.2       | 22.5       | 35.05            | 46      | - | - | - |
| Azimuth: 264             | Height:375 | Vert      |            | Margin [dB]:     | -10.95  | - | - | - |
| 950.3752                 | 8.62 qp    | 4.6       | 24         | 37.22            | 46      | - | - | - |
| Azimuth: 151             | Height:103 | Vert      |            | Margin [dB]:     | -8.78   | - | - | - |

LIMIT 1: FCC Part 15 Class B 3m

qp - Quasi-Peak detector



File Number: E133631  
 Project Number: O4CA52274  
 Model Number: CL4XXE  
 FCC ID: MMFCL4XXEAW

Issued: 3/4/2005

SATO Corp.  
 Model: CL408e RFID Printer  
 High Channel  
 Proj: 04CA52274 File: NC133631  
 Tested By: JT Blue=H Green=V

| No. | Frequency [MHz] | Meter Reading [dB(uV)] | Gain/Loss Factor [dB] | Transducer Factor [dB] | Level dB[uVolts/meter] | Limit:1 | 2 | 3 |
|-----|-----------------|------------------------|-----------------------|------------------------|------------------------|---------|---|---|
|-----|-----------------|------------------------|-----------------------|------------------------|------------------------|---------|---|---|

=====

|                                 |           |            |       |             |       |       |   |   |
|---------------------------------|-----------|------------|-------|-------------|-------|-------|---|---|
| Horizontal 1000 - 2000MHz ----- |           |            |       |             |       |       |   |   |
| 1                               | 1852.926  | 39.12 pk   | -19.6 | 26.7        | 46.22 | 54    | - | - |
|                                 | Azimuth:2 | Height:101 | Horz  | Margin [dB] |       | -7.78 | - | - |

|                                 |             |            |       |             |       |        |   |   |
|---------------------------------|-------------|------------|-------|-------------|-------|--------|---|---|
| Horizontal 2000 - 4600MHz ----- |             |            |       |             |       |        |   |   |
| 2                               | 2779.09     | 34.55 pk   | -25.1 | 29.4        | 38.85 | 54     | - | - |
|                                 | Azimuth:222 | Height:101 | Horz  | Margin [dB] |       | -15.15 | - | - |
| 3                               | 3706.453    | 32.58 pk   | -22.1 | 31.8        | 42.28 | 54     | - | - |
|                                 | Azimuth:193 | Height:101 | Horz  | Margin [dB] |       | -11.72 | - | - |

|                                 |             |            |       |             |       |       |   |   |
|---------------------------------|-------------|------------|-------|-------------|-------|-------|---|---|
| Horizontal 4600 - 7500MHz ----- |             |            |       |             |       |       |   |   |
| 4                               | 4631.916    | 28.98 pk   | -15.8 | 32.6        | 45.78 | 54    | - | - |
|                                 | Azimuth:195 | Height:101 | Horz  | Margin [dB] |       | -8.22 | - | - |
| 5                               | 5558.929    | 31.84 pk   | -19.7 | 34.3        | 46.44 | 54    | - | - |
|                                 | Azimuth:3   | Height:101 | Horz  | Margin [dB] |       | -7.56 | - | - |
| 6                               | 6446.773    | 30.79 pk   | -17.6 | 34.6        | 47.79 | 54    | - | - |
|                                 | Azimuth:355 | Height:101 | Horz  | Margin [dB] |       | -6.21 | - | - |
| 7                               | 7365.083    | 27.13 pk   | -18.2 | 36.4        | 45.33 | 54    | - | - |
|                                 | Azimuth:144 | Height:101 | Horz  | Margin [dB] |       | -8.67 | - | - |

|                                  |             |            |       |             |       |       |   |   |
|----------------------------------|-------------|------------|-------|-------------|-------|-------|---|---|
| Horizontal 7500 - 10000MHz ----- |             |            |       |             |       |       |   |   |
| 8                                | 8334.167    | 26.26 pk   | -15.2 | 37.3        | 48.36 | 54    | - | - |
|                                  | Azimuth:6   | Height:101 | Horz  | Margin [dB] |       | -5.64 | - | - |
| 9                                | 8858.179    | 28.31 pk   | -14.7 | 37.9        | 51.51 | 54    | - | - |
|                                  | Azimuth:134 | Height:101 | Horz  | Margin [dB] |       | -2.49 | - | - |
| 10                               | 9285.893    | 26.42 pk   | -13.7 | 38.2        | 50.92 | 54    | - | - |
|                                  | Azimuth:88  | Height:101 | Horz  | Margin [dB] |       | -3.08 | - | - |
| 11                               | 9459.73     | 26.11 pk   | -13.2 | 38.4        | 51.31 | 54    | - | - |
|                                  | Azimuth:92  | Height:101 | Horz  | Margin [dB] |       | -2.69 | - | - |
| 12                               | 9528.514    | 26.86 pk   | -13.3 | 38.4        | 51.96 | 54    | - | - |
|                                  | Azimuth:343 | Height:101 | Horz  | Margin [dB] |       | -2.04 | - | - |
| 13                               | 9697.349    | 26.93 pk   | -13.1 | 38.6        | 52.43 | 54    | - | - |
|                                  | Azimuth:343 | Height:101 | Horz  | Margin [dB] |       | -1.57 | - | - |
| 14                               | 9738.619    | 27.45 pk   | -12.9 | 38.6        | 53.15 | 54    | - | - |
|                                  | Azimuth:7   | Height:101 | Horz  | Margin [dB] |       | -.85  | - | - |
| 15                               | 9844.922    | 26.62 pk   | -12   | 38.7        | 53.32 | 54    | - | - |
|                                  | Azimuth:7   | Height:101 | Horz  | Margin [dB] |       | -.68  | - | - |
| 16                               | 9924.962    | 26.47 pk   | -11.5 | 38.8        | 53.77 | 54    | - | - |
|                                  | Azimuth:343 | Height:101 | Horz  | Margin [dB] |       | -.23  | - | - |
| 17                               | 9964.982    | 26.76 pk   | -11.2 | 38.9        | 54.46 | 54    | - | - |
|                                  | Azimuth:1   | Height:101 | Horz  | Margin [dB] |       | .46   | - | - |

Vertical 1000 - 2000MHz -----

File Number: E133631  
 Project Number: O4CA52274  
 Model Number: CL4XXE  
 FCC ID: MMFCL4XXEAW

Issued: 3/4/2005

|                                |             |                 |       |             |       |        |   |   |
|--------------------------------|-------------|-----------------|-------|-------------|-------|--------|---|---|
| 18                             | 1853.427    | 38.12 pk        | -19.6 | 26.7        | 45.22 | 54     | - | - |
|                                | Azimuth:355 | Height:101 Vert |       | Margin [dB] |       | -8.78  | - | - |
| Vertical 2000 - 4600MHz -----  |             |                 |       |             |       |        |   |   |
| 19                             | 2779.09     | 33.73 pk        | -25.1 | 29.4        | 38.03 | 54     | - | - |
|                                | Azimuth:332 | Height:101 Vert |       | Margin [dB] |       | -15.97 | - | - |
| 20                             | 3706.453    | 31.42 pk        | -22.1 | 31.8        | 41.12 | 54     | - | - |
|                                | Azimuth:358 | Height:101 Vert |       | Margin [dB] |       | -12.88 | - | - |
| Vertical 4600 - 7500MHz -----  |             |                 |       |             |       |        |   |   |
| 21                             | 4613.057    | 28.54 pk        | -15   | 32.5        | 46.04 | 54     | - | - |
|                                | Azimuth:1   | Height:101 Vert |       | Margin [dB] |       | -7.96  | - | - |
| 22                             | 5558.929    | 30.61 pk        | -19.7 | 34.3        | 45.21 | 54     | - | - |
|                                | Azimuth:38  | Height:101 Vert |       | Margin [dB] |       | -8.79  | - | - |
| 23                             | 6471.436    | 30.18 pk        | -17.7 | 34.6        | 47.08 | 54     | - | - |
|                                | Azimuth:207 | Height:101 Vert |       | Margin [dB] |       | -6.92  | - | - |
| 24                             | 7381.041    | 27.07 pk        | -18.2 | 36.5        | 45.37 | 54     | - | - |
|                                | Azimuth:148 | Height:101 Vert |       | Margin [dB] |       | -8.63  | - | - |
| Vertical 7500 - 10000MHz ----- |             |                 |       |             |       |        |   |   |
| 25                             | 8336.668    | 26.89 pk        | -15.2 | 37.3        | 48.99 | 54     | - | - |
|                                | Azimuth:343 | Height:101 Vert |       | Margin [dB] |       | -5.01  | - | - |
| 26                             | 8853.177    | 27.1 pk         | -14.6 | 37.9        | 50.4  | 54     | - | - |
|                                | Azimuth:343 | Height:101 Vert |       | Margin [dB] |       | -3.6   | - | - |
| 27                             | 9269.635    | 25.65 pk        | -13.7 | 38.2        | 50.15 | 54     | - | - |
|                                | Azimuth:17  | Height:101 Vert |       | Margin [dB] |       | -3.85  | - | - |
| 28                             | 9470.985    | 26.62 pk        | -13.2 | 38.4        | 51.82 | 54     | - | - |
|                                | Azimuth:343 | Height:101 Vert |       | Margin [dB] |       | -2.18  | - | - |
| 29                             | 9587.294    | 26.54 pk        | -13.6 | 38.5        | 51.44 | 54     | - | - |
|                                | Azimuth:230 | Height:101 Vert |       | Margin [dB] |       | -2.56  | - | - |
| 30                             | 9631.066    | 25.91 pk        | -13.4 | 38.5        | 51.01 | 54     | - | - |
|                                | Azimuth:17  | Height:101 Vert |       | Margin [dB] |       | -2.99  | - | - |
| 31                             | 9794.897    | 26.1 pk         | -12.3 | 38.7        | 52.5  | 54     | - | - |
|                                | Azimuth:138 | Height:101 Vert |       | Margin [dB] |       | -1.5   | - | - |
| 32                             | 9867.434    | 26.42 pk        | -11.8 | 38.8        | 53.42 | 54     | - | - |
|                                | Azimuth:92  | Height:101 Vert |       | Margin [dB] |       | -.58   | - | - |
| 33                             | 9989.995    | 27.19 pk        | -11.1 | 38.9        | 54.99 | 54     | - | - |
|                                | Azimuth:230 | Height:101 Vert |       | Margin [dB] |       | .99    | - | - |
| 34                             | 7551.276    | 27.83 pk        | -17.7 | 36.7        | 46.83 | 54     | - | - |
|                                | Azimuth:1   | Height:101 Vert |       | Margin [dB] |       | -7.17  | - | - |

LIMIT 1: FCC Part15 - CLASS B

pk - Peak detector

File Number: E133631  
 Project Number: O4CA52274  
 Model Number: CL4XXE  
 FCC ID: MMFCL4XXEAW

Issued: 3/4/2005

SATO Corp.  
 Model: CL408e RFID Printer  
 High Channel  
 Proj: 04CA52274 File: NC133631  
 Tested By: JT Blue=H Green=V

| Test      | Meter    | Gain/Loss | Transducer | Level            | Limit:1 | 2 | 3 | 4 |
|-----------|----------|-----------|------------|------------------|---------|---|---|---|
| Frequency | Reading  | Factor    | Factor     | dB[uVolts/meter] |         |   |   |   |
| [MHz]     | [dB(uV)] | [dB]      | [dB]       |                  |         |   |   |   |

Horizontal 7500 - 10000MHz

|          |           |       |              |       |       |   |   |   |
|----------|-----------|-------|--------------|-------|-------|---|---|---|
| 8858.179 | 22.71 ave | -14.7 | 37.9         | 45.91 | 54    | - | - | - |
|          |           |       | Margin [dB]: |       | -8.09 | - | - | - |
| 9459.73  | 22.61 ave | -13.2 | 38.4         | 47.81 | 54    | - | - | - |
|          |           |       | Margin [dB]: |       | -6.19 | - | - | - |
| 9528.514 | 22.43 ave | -13.3 | 38.4         | 47.53 | 54    | - | - | - |
|          |           |       | Margin [dB]: |       | -6.47 | - | - | - |
| 9697.349 | 22.37 ave | -13.1 | 38.6         | 47.87 | 54    | - | - | - |
|          |           |       | Margin [dB]: |       | -6.13 | - | - | - |
| 9738.619 | 22.56 ave | -12.9 | 38.6         | 48.26 | 54    | - | - | - |
|          |           |       | Margin [dB]: |       | -5.74 | - | - | - |
| 9844.922 | 23.36 ave | -12   | 38.7         | 50.06 | 54    | - | - | - |
|          |           |       | Margin [dB]: |       | -3.94 | - | - | - |
| 9924.962 | 23.34 ave | -11.5 | 38.8         | 50.64 | 54    | - | - | - |
|          |           |       | Margin [dB]: |       | -3.36 | - | - | - |
| 9964.982 | 23.63 ave | -11.2 | 38.9         | 51.33 | 54    | - | - | - |
|          |           |       | Margin [dB]: |       | -2.67 | - | - | - |

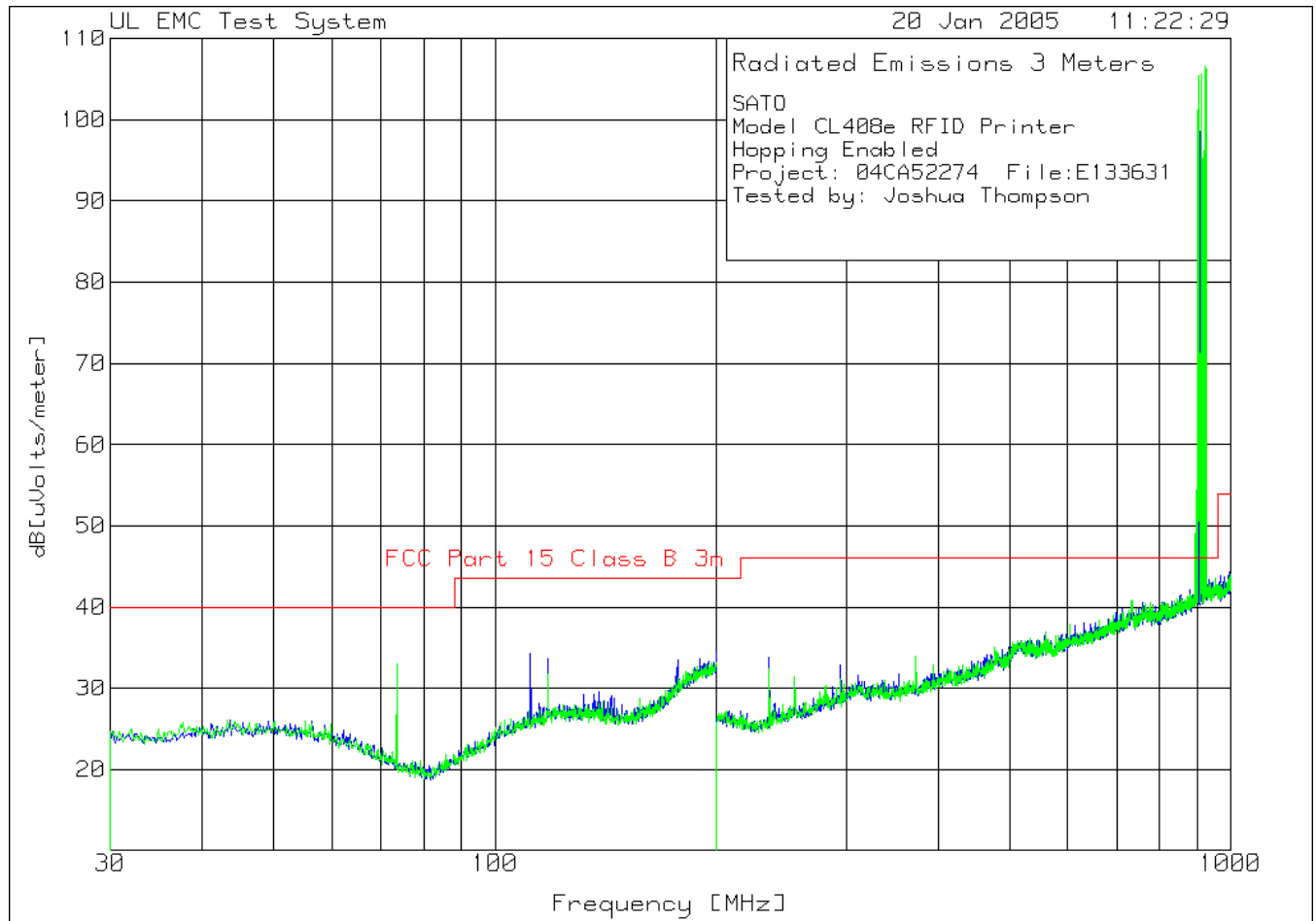
Vertical 7500 - 10000MHz

|          |           |       |              |       |        |   |   |   |
|----------|-----------|-------|--------------|-------|--------|---|---|---|
| 8853.177 | 22.71 ave | -14.6 | 37.9         | 46.01 | 54     | - | - | - |
|          |           |       | Margin [dB]: |       | -7.99  | - | - | - |
| 9470.985 | 22.59 ave | -13.2 | 38.4         | 47.79 | 54     | - | - | - |
|          |           |       | Margin [dB]: |       | -6.21  | - | - | - |
| 9587.294 | 22.64 ave | -13.6 | 38.5         | 47.54 | 54     | - | - | - |
|          |           |       | Margin [dB]: |       | -6.46  | - | - | - |
| 9631.066 | 22.73 ave | -13.4 | 38.5         | 47.83 | 54     | - | - | - |
|          |           |       | Margin [dB]: |       | -6.17  | - | - | - |
| 9794.897 | 23.12 ave | -12.3 | 38.7         | 49.52 | 54     | - | - | - |
|          |           |       | Margin [dB]: |       | -4.48  | - | - | - |
| 9867.434 | 23.35 ave | -11.8 | 38.8         | 50.35 | 54     | - | - | - |
|          |           |       | Margin [dB]: |       | -3.65  | - | - | - |
| 9989.995 | 23.68 ave | -11.1 | 38.9         | 51.48 | 54     | - | - | - |
|          |           |       | Margin [dB]: |       | -2.52  | - | - | - |
| 7551.276 | 23.07 ave | -17.7 | 36.7         | 42.07 | 54     | - | - | - |
|          |           |       | Margin [dB]: |       | -11.93 | - | - | - |

NOTE: "+" - Indicates an emission level in excess of the applicable limit (s).

ave - denotes average detection

LIMIT 1: FCC Part15 - CLASS B



File Number: E133631  
Project Number: O4CA52274  
Model Number: CL4XXE  
FCC ID: MMFCL4XXEAW

Issued: 3/4/2005

SATO

Model CL408e RFID Printer

Hopping Enabled

Project: 04CA52274 File:E133631

Tested by: Joshua Thompson

| No. | Test<br>Frequency<br>[MHz] | Meter<br>Reading<br>[dB(uV)] | Gain/Loss<br>Factor<br>[dB] | Transducer<br>Factor<br>[dB] | Level<br>dB[uVolts/meter] | Limit:1 | 2 | 3 |
|-----|----------------------------|------------------------------|-----------------------------|------------------------------|---------------------------|---------|---|---|
|-----|----------------------------|------------------------------|-----------------------------|------------------------------|---------------------------|---------|---|---|

Vertical 30 - 200MHz

|   |             |            |      |             |       |       |   |   |
|---|-------------|------------|------|-------------|-------|-------|---|---|
| 1 | 73.5636     | 24.58 pk   | 1.2  | 7.2         | 32.98 | 40    | - | - |
|   | Azimuth:252 | Height:250 | Vert | Margin [dB] |       | -7.02 | - | - |

Horizontal 200 - 1000MHz

|   |             |            |      |             |        |        |   |   |
|---|-------------|------------|------|-------------|--------|--------|---|---|
| 2 | 855.1276    | 14.98 pk   | 4.2  | 22.4        | 41.58  | 46     | - | - |
|   | Azimuth:123 | Height:249 | Horz | Margin [dB] |        | -4.42  | - | - |
| 3 | 903.952     | 72.68 pk   | 4.4  | 23.3        | 100.38 | 46     | - | - |
|   | Azimuth:280 | Height:101 | Horz | Margin [dB] |        | 54.38  | - | - |
| 4 | 919.96      | 67.35 pk   | 4.4  | 23.6        | 95.35  | 46     | - | - |
|   | Azimuth:43  | Height:249 | Horz | Margin [dB] |        | 49.35  | - | - |
| 5 | 963.5818    | 14.66 pk   | 4.6  | 23.8        | 43.06  | 54     | - | - |
|   | Azimuth:123 | Height:101 | Horz | Margin [dB] |        | -10.94 | - | - |

Vertical 200 - 1000MHz

|   |             |            |      |             |        |       |   |   |
|---|-------------|------------|------|-------------|--------|-------|---|---|
| 6 | 733.8669    | 13.75 pk   | 3.9  | 23.2        | 40.85  | 46    | - | - |
|   | Azimuth:80  | Height:249 | Vert | Margin [dB] |        | -5.15 | - | - |
| 7 | 905.1526    | 77.85 pk   | 4.4  | 23.2        | 105.45 | 46    | - | - |
|   | Azimuth:343 | Height:101 | Vert | Margin [dB] |        | 59.45 | - | - |
| 8 | 923.5618    | 78.34 pk   | 4.5  | 23.7        | 106.54 | 46    | - | - |
|   | Azimuth:343 | Height:101 | Vert | Margin [dB] |        | 60.54 | - | - |
| 9 | 952.3762    | 14.91 pk   | 4.6  | 24          | 43.51  | 46    | - | - |
|   | Azimuth:343 | Height:101 | Vert | Margin [dB] |        | -2.49 | - | - |

LIMIT 1: FCC Part 15 Class B 3m

pk - Peak detector

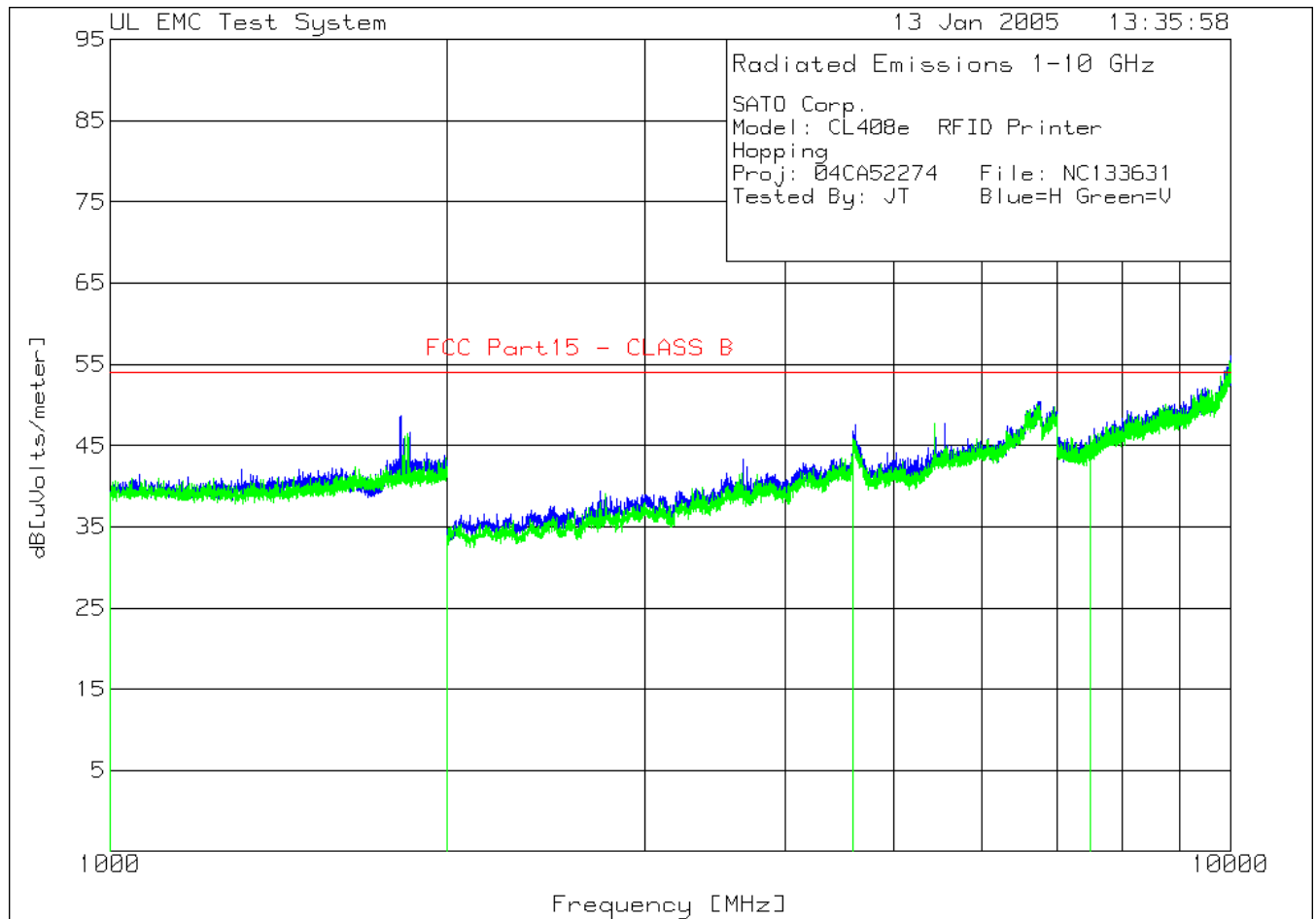
File Number: E133631  
 Project Number: O4CA52274  
 Model Number: CL4XXE  
 FCC ID: MMFCL4XXEAW

Issued: 3/4/2005

|                                    |            |           |              |                  |         |   |   |   |
|------------------------------------|------------|-----------|--------------|------------------|---------|---|---|---|
| SATO                               |            |           |              |                  |         |   |   |   |
| Model CL408e RFID Printer          |            |           |              |                  |         |   |   |   |
| Hopping Enabled                    |            |           |              |                  |         |   |   |   |
| Project: 04CA52274    File:E133631 |            |           |              |                  |         |   |   |   |
| Tested by: Joshua Thompson         |            |           |              |                  |         |   |   |   |
| Test                               | Meter      | Gain/Loss | Transducer   | Level            | Limit:1 | 2 | 3 | 4 |
| Frequency                          | Reading    | Factor    | Factor       | dB[uVolts/meter] |         |   |   |   |
| [MHz]                              | [dB(uV)]   | [dB]      | [dB]         |                  |         |   |   |   |
| =====                              |            |           |              |                  |         |   |   |   |
| Horizontal 200 - 1000MHz           |            |           |              |                  |         |   |   |   |
| 855.6056                           | 8.35 qp    | 4.2       | 22.4         | 34.95            | 46      | - | - | - |
| Azimuth: 278                       | Height:329 | Horz      | Margin [dB]: |                  | -11.05  | - | - | - |
| Vertical 200 - 1000MHz             |            |           |              |                  |         |   |   |   |
| 733.4602                           | 8.01 qp    | 3.9       | 23.1         | 35.01            | 46      | - | - | - |
| Azimuth: 167                       | Height:287 | Vert      | Margin [dB]: |                  | -10.99  | - | - | - |
| 952.3762                           | 8.52 qp    | 4.6       | 24           | 37.12            | 46      | - | - | - |
| Azimuth: 10                        | Height:217 | Vert      | Margin [dB]: |                  | -8.88   | - | - | - |
| 952.3762                           | 8.62 qp    | 4.6       | 24           | 37.22            | 46      | - | - | - |
| Azimuth: 47                        | Height:212 | Horz      | Margin [dB]: |                  | -8.78   | - | - | - |

LIMIT 1: FCC Part 15 Class B 3m

qp - Quasi-Peak detector



File Number: E133631  
 Project Number: O4CA52274  
 Model Number: CL4XXE  
 FCC ID: MMFCL4XXEAW

Issued: 3/4/2005

SATO Corp.  
 Model: CL408e RFID Printer  
 Hopping  
 Proj: 04CA52274 File: NC133631  
 Tested By: JT Blue=H Green=V

| No.                              | Test<br>Frequency<br>[MHz] | Meter<br>Reading<br>[dB(uV)] | Gain/Loss<br>Factor<br>[dB] | Transducer<br>Factor<br>[dB] | Level<br>dB[uVolts/meter] | Limit:1 | 2 | 3 |
|----------------------------------|----------------------------|------------------------------|-----------------------------|------------------------------|---------------------------|---------|---|---|
| =====                            |                            |                              |                             |                              |                           |         |   |   |
| Horizontal 1000 - 2000MHz -----  |                            |                              |                             |                              |                           |         |   |   |
| 1                                | 1815.908                   | 41.77 pk                     | -19.7                       | 26.6                         | 48.67                     | 54      | - | - |
|                                  | Azimuth:358                | Height:101                   | Horz                        | Margin [dB]                  |                           | -5.33   | - | - |
| Horizontal 2000 - 4600MHz -----  |                            |                              |                             |                              |                           |         |   |   |
| 2                                | 2740.07                    | 35.37 pk                     | -25.2                       | 29.3                         | 39.47                     | 54      | - | - |
|                                  | Azimuth:111                | Height:101                   | Horz                        | Margin [dB]                  |                           | -14.53  | - | - |
| 3                                | 3672.636                   | 33.85 pk                     | -22.3                       | 31.7                         | 43.25                     | 54      | - | - |
|                                  | Azimuth:193                | Height:101                   | Horz                        | Margin [dB]                  |                           | -10.75  | - | - |
| Horizontal 4600 - 7500MHz -----  |                            |                              |                             |                              |                           |         |   |   |
| 4                                | 4626.113                   | 30.45 pk                     | -15.5                       | 32.6                         | 47.55                     | 54      | - | - |
|                                  | Azimuth:1                  | Height:101                   | Horz                        | Margin [dB]                  |                           | -6.45   | - | - |
| 5                                | 5450.125                   | 31.58 pk                     | -19.8                       | 34.2                         | 45.98                     | 54      | - | - |
|                                  | Azimuth:38                 | Height:101                   | Horz                        | Margin [dB]                  |                           | -8.02   | - | - |
| 6                                | 5556.028                   | 33.2 pk                      | -19.7                       | 34.3                         | 47.8                      | 54      | - | - |
|                                  | Azimuth:0                  | Height:101                   | Horz                        | Margin [dB]                  |                           | -6.2    | - | - |
| 7                                | 6314.757                   | 30.63 pk                     | -17.9                       | 34.6                         | 47.33                     | 54      | - | - |
|                                  | Azimuth:358                | Height:101                   | Horz                        | Margin [dB]                  |                           | -6.67   | - | - |
| 8                                | 7218.559                   | 27.52 pk                     | -17.9                       | 36.1                         | 45.72                     | 54      | - | - |
|                                  | Azimuth:46                 | Height:101                   | Horz                        | Margin [dB]                  |                           | -8.28   | - | - |
| Horizontal 7500 - 10000MHz ----- |                            |                              |                             |                              |                           |         |   |   |
| 9                                | 8152.826                   | 27.62 pk                     | -15.6                       | 37.1                         | 49.12                     | 54      | - | - |
|                                  | Azimuth:138                | Height:101                   | Horz                        | Margin [dB]                  |                           | -4.88   | - | - |
| 10                               | 9019.51                    | 26.58 pk                     | -14.6                       | 38                           | 49.98                     | 54      | - | - |
|                                  | Azimuth:358                | Height:101                   | Horz                        | Margin [dB]                  |                           | -4.02   | - | - |
| 11                               | 9333.417                   | 27.17 pk                     | -13.5                       | 38.3                         | 51.97                     | 54      | - | - |
|                                  | Azimuth:180                | Height:101                   | Horz                        | Margin [dB]                  |                           | -2.03   | - | - |
| 12                               | 9438.469                   | 26.79 pk                     | -13.2                       | 38.4                         | 51.99                     | 54      | - | - |
|                                  | Azimuth:8                  | Height:101                   | Horz                        | Margin [dB]                  |                           | -2.01   | - | - |
| 13                               | 9498.499                   | 26.96 pk                     | -13.2                       | 38.4                         | 52.16                     | 54      | - | - |
|                                  | Azimuth:231                | Height:101                   | Horz                        | Margin [dB]                  |                           | -1.84   | - | - |
| 14                               | 9797.399                   | 26.92 pk                     | -12.3                       | 38.7                         | 53.32                     | 54      | - | - |
|                                  | Azimuth:8                  | Height:101                   | Horz                        | Margin [dB]                  |                           | -.68    | - | - |
| 15                               | 9858.679                   | 27.26 pk                     | -11.9                       | 38.8                         | 54.16                     | 54      | - | - |
|                                  | Azimuth:8                  | Height:101                   | Horz                        | Margin [dB]                  |                           | .16     | - | - |
| 16                               | 9928.714                   | 27.29 pk                     | -11.5                       | 38.8                         | 54.59                     | 54      | - | - |
|                                  | Azimuth:2                  | Height:101                   | Horz                        | Margin [dB]                  |                           | .59     | - | - |
| 17                               | 9989.995                   | 28.2 pk                      | -11.1                       | 38.9                         | 56                        | 54      | - | - |

|                                               |             |                 |       |             |       |        |   |   |
|-----------------------------------------------|-------------|-----------------|-------|-------------|-------|--------|---|---|
| Azimuth:231 Height:101 Horz Margin [dB] 2 - - |             |                 |       |             |       |        |   |   |
| Vertical 1000 - 2000MHz -----                 |             |                 |       |             |       |        |   |   |
| 18                                            | 1823.912    | 36.87 pk        | -19.7 | 26.6        | 43.77 | 54     | - | - |
|                                               | Azimuth:203 | Height:101 Vert |       | Margin [dB] |       | -10.23 | - | - |
| Vertical 2000 - 4600MHz -----                 |             |                 |       |             |       |        |   |   |
| 19                                            | 2733.567    | 33.86 pk        | -25.2 | 29.3        | 37.96 | 54     | - | - |
|                                               | Azimuth:16  | Height:101 Vert |       | Margin [dB] |       | -16.04 | - | - |
| 20                                            | 3657.028    | 32.34 pk        | -22.3 | 31.6        | 41.64 | 54     | - | - |
|                                               | Azimuth:358 | Height:101 Vert |       | Margin [dB] |       | -12.36 | - | - |
| Vertical 4600 - 7500MHz -----                 |             |                 |       |             |       |        |   |   |
| 21                                            | 4605.803    | 28.14 pk        | -14.8 | 32.5        | 45.84 | 54     | - | - |
|                                               | Azimuth:0   | Height:101 Vert |       | Margin [dB] |       | -8.16  | - | - |
| 22                                            | 5437.069    | 33.38 pk        | -19.8 | 34.2        | 47.78 | 54     | - | - |
|                                               | Azimuth:15  | Height:101 Vert |       | Margin [dB] |       | -6.22  | - | - |
| 23                                            | 6303.152    | 30.21 pk        | -18.1 | 34.6        | 46.71 | 54     | - | - |
|                                               | Azimuth:358 | Height:101 Vert |       | Margin [dB] |       | -7.29  | - | - |
| 24                                            | 7202.601    | 27.65 pk        | -17.8 | 36.1        | 45.95 | 54     | - | - |
|                                               | Azimuth:144 | Height:101 Vert |       | Margin [dB] |       | -8.05  | - | - |
| Vertical 7500 - 10000MHz -----                |             |                 |       |             |       |        |   |   |
| 25                                            | 8176.588    | 27.03 pk        | -15.6 | 37.1        | 48.53 | 54     | - | - |
|                                               | Azimuth:321 | Height:101 Vert |       | Margin [dB] |       | -5.47  | - | - |
| 26                                            | 9032.016    | 26.03 pk        | -14.6 | 38          | 49.43 | 54     | - | - |
|                                               | Azimuth:318 | Height:101 Vert |       | Margin [dB] |       | -4.57  | - | - |
| 27                                            | 9413.457    | 26.64 pk        | -13.2 | 38.3        | 51.74 | 54     | - | - |
|                                               | Azimuth:92  | Height:101 Vert |       | Margin [dB] |       | -2.26  | - | - |
| 28                                            | 9524.762    | 26.8 pk         | -13.3 | 38.4        | 51.9  | 54     | - | - |
|                                               | Azimuth:6   | Height:101 Vert |       | Margin [dB] |       | -2.1   | - | - |
| 29                                            | 9622.311    | 26.82 pk        | -13.5 | 38.5        | 51.82 | 54     | - | - |
|                                               | Azimuth:343 | Height:101 Vert |       | Margin [dB] |       | -2.18  | - | - |
| 30                                            | 9784.892    | 27.21 pk        | -12.4 | 38.7        | 53.51 | 54     | - | - |
|                                               | Azimuth:321 | Height:101 Vert |       | Margin [dB] |       | -.49   | - | - |
| 31                                            | 9906.203    | 26.91 pk        | -11.6 | 38.8        | 54.11 | 54     | - | - |
|                                               | Azimuth:6   | Height:101 Vert |       | Margin [dB] |       | .11    | - | - |
| 32                                            | 9961.231    | 26.61 pk        | -11.2 | 38.9        | 54.31 | 54     | - | - |
|                                               | Azimuth:6   | Height:101 Vert |       | Margin [dB] |       | .31    | - | - |
| 33                                            | 9982.491    | 27.64 pk        | -11.1 | 38.9        | 55.44 | 54     | - | - |
|                                               | Azimuth:230 | Height:101 Vert |       | Margin [dB] |       | 1.44   | - | - |

LIMIT 1: FCC Part15 - CLASS B

pk - Peak detector

File Number: E133631  
 Project Number: O4CA52274  
 Model Number: CL4XXE  
 FCC ID: MMFCL4XXEAW

Issued: 3/4/2005

SATO Corp.

Model: CL408e RFID Printer

Hopping

Proj: 04CA52274 File: NC133631

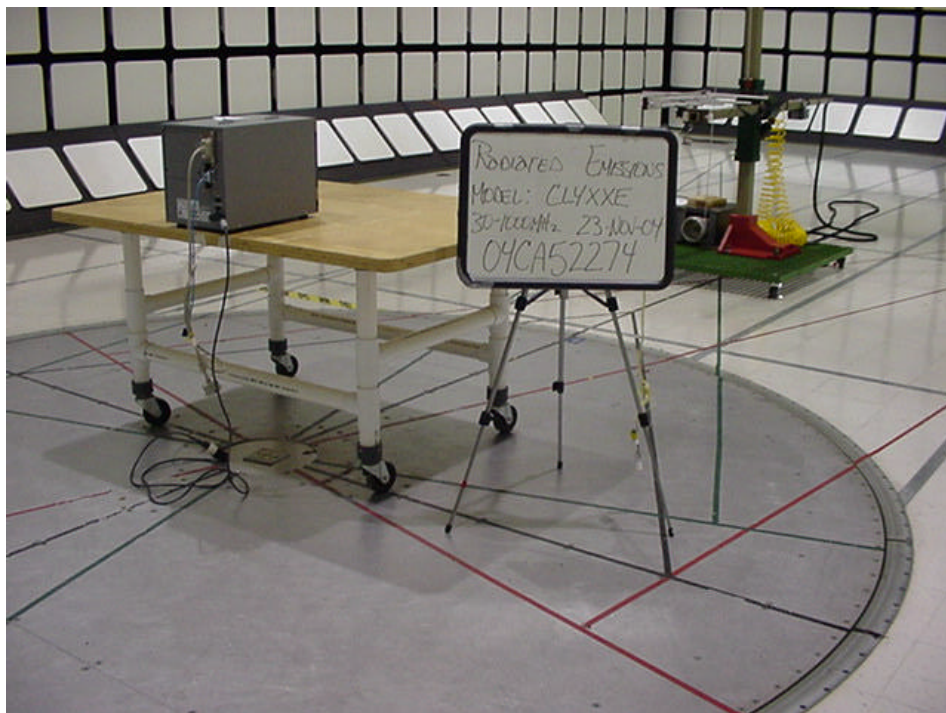
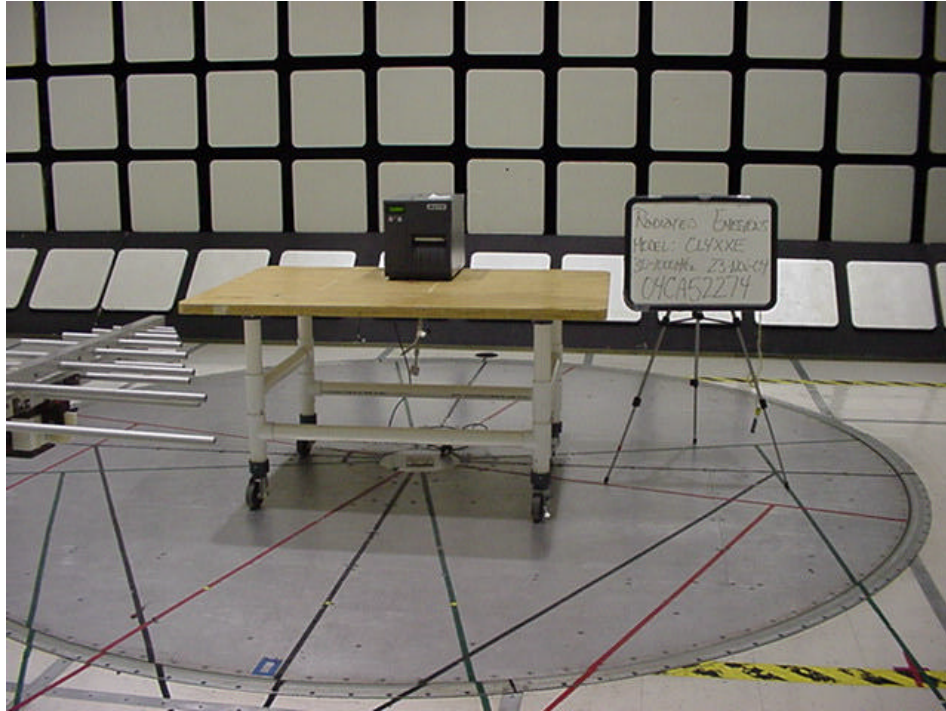
Tested By: JT Blue=H Green=V

| Test                       | Meter     | Gain/Loss | Transducer   | Level            | Limit:1 | 2 | 3 | 4 |
|----------------------------|-----------|-----------|--------------|------------------|---------|---|---|---|
| Frequency                  | Reading   | Factor    | Factor       | dB[uVolts/meter] |         |   |   |   |
| [MHz]                      | [dB(uV)]  | [dB]      | [dB]         |                  |         |   |   |   |
| =====                      |           |           |              |                  |         |   |   |   |
| Horizontal 7500 - 10000MHz |           |           |              |                  |         |   |   |   |
| 9333.417                   | 22.57 ave | -13.5     | 38.3         | 47.37            | 54      | - | - | - |
|                            |           |           | Margin [dB]: |                  | -6.63   | - | - | - |
| 9438.469                   | 22.57 ave | -13.2     | 38.4         | 47.77            | 54      | - | - | - |
|                            |           |           | Margin [dB]: |                  | -6.23   | - | - | - |
| 9498.499                   | 22.45 ave | -13.2     | 38.4         | 47.65            | 54      | - | - | - |
|                            |           |           | Margin [dB]: |                  | -6.35   | - | - | - |
| 9797.399                   | 23.13 ave | -12.3     | 38.7         | 49.53            | 54      | - | - | - |
|                            |           |           | Margin [dB]: |                  | -4.47   | - | - | - |
| 9858.679                   | 23.29 ave | -11.9     | 38.8         | 50.19            | 54      | - | - | - |
|                            |           |           | Margin [dB]: |                  | -3.81   | - | - | - |
| 9928.714                   | 23.35 ave | -11.5     | 38.8         | 50.65            | 54      | - | - | - |
|                            |           |           | Margin [dB]: |                  | -3.35   | - | - | - |
| 9989.995                   | 23.67 ave | -11.1     | 38.9         | 51.47            | 54      | - | - | - |
|                            |           |           | Margin [dB]: |                  | -2.53   | - | - | - |
| Vertical 7500 - 10000MHz   |           |           |              |                  |         |   |   |   |
| 9413.457                   | 22.52 ave | -13.2     | 38.3         | 47.62            | 54      | - | - | - |
|                            |           |           | Margin [dB]: |                  | -6.38   | - | - | - |
| 9524.762                   | 22.43 ave | -13.3     | 38.4         | 47.53            | 54      | - | - | - |
|                            |           |           | Margin [dB]: |                  | -6.47   | - | - | - |
| 9622.311                   | 22.72 ave | -13.5     | 38.5         | 47.72            | 54      | - | - | - |
|                            |           |           | Margin [dB]: |                  | -6.28   | - | - | - |
| 9784.892                   | 23.01 ave | -12.4     | 38.7         | 49.31            | 54      | - | - | - |
|                            |           |           | Margin [dB]: |                  | -4.69   | - | - | - |
| 9906.203                   | 23.3 ave  | -11.6     | 38.8         | 50.5             | 54      | - | - | - |
|                            |           |           | Margin [dB]: |                  | -3.5    | - | - | - |
| 9961.231                   | 23.6 ave  | -11.2     | 38.9         | 51.3             | 54      | - | - | - |
|                            |           |           | Margin [dB]: |                  | -2.7    | - | - | - |
| 9982.491                   | 23.63 ave | -11.1     | 38.9         | 51.43            | 54      | - | - | - |
|                            |           |           | Margin [dB]: |                  | -2.57   | - | - | - |

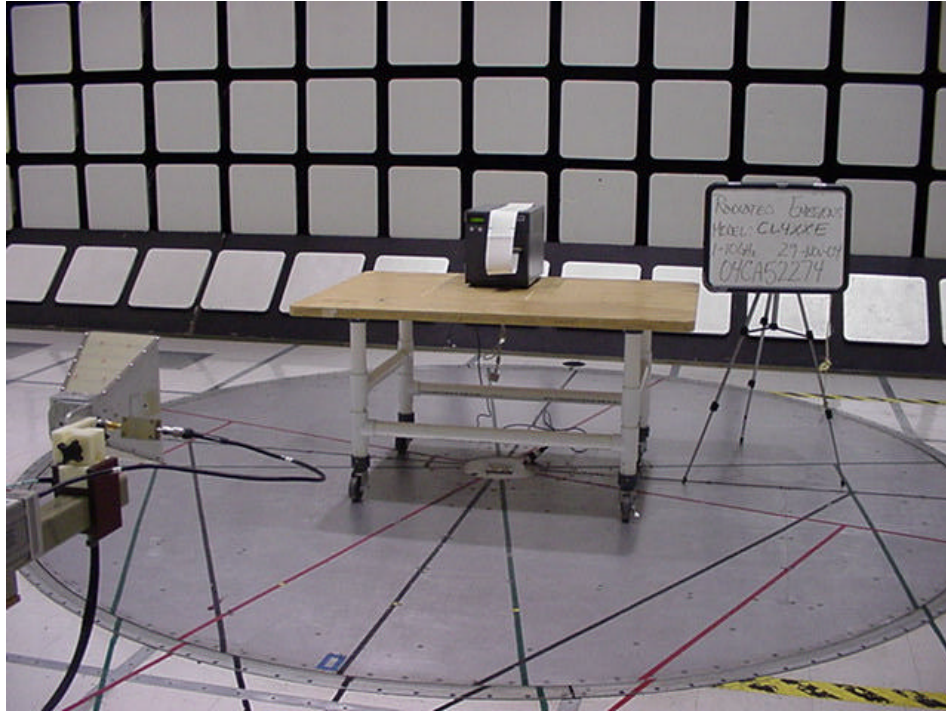
NOTE: "+" - Indicates an emission level in excess of the applicable limit (s).

ave - denotes average detection

LIMIT 1: FCC Part15 - CLASS B



### **Radiated Emissions Test Setup 30-1000 MHz**



**Radiated Emissions Test Setup 1-10 GHz**

## 5.1.10 Maximum Permissible Exposure

Maximum Permissible Exposure limits are as follows:

**FCC Limits for General Population/Uncontrolled Exposure**

| Frequency Range (MHz) | Electric Field Strength (E) (V/m) | Magnetic Field Strength (H) (A/m) | Power Density (S) (mW/cm <sup>2</sup> ) | Averaging Time $ E^2 $ , $ H^2 $ , or S (minutes) |
|-----------------------|-----------------------------------|-----------------------------------|-----------------------------------------|---------------------------------------------------|
| 0.3 - 1.34            | 614                               | 1.63                              | (100)*                                  | 30                                                |
| 1.34 - 30             | 824/f                             | 2.19/f                            | (180/f <sup>2</sup> )*                  | 30                                                |
| 30 - 300              | 27.5                              | 0.073                             | 0.2                                     | 30                                                |
| 300 - 1500            | -                                 | -                                 | f/1500                                  | 30                                                |
| 1500 - 100,000        | -                                 | -                                 | 1.0                                     | 30                                                |

\*Plane-wave equivalent power density

**Test Details:** This device is considered to possibly be located in either environment. See calculation for assumptions.

**Background:** Per the following guidance from OET Bulletin 65 Supplement C required minimum spacings are provided to the professional installer.

| Transmitter or Device Type <sup>18</sup>                                             | Output <sup>19</sup>                         | Applicable Methods to Ensure Compliance <sup>20</sup>                                                                                                                                                                                                                                                                                                                                                 |
|--------------------------------------------------------------------------------------|----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Transmitters using indoor antennas that operate at 20 cm or more from nearby persons | >2.5 W at 915 MHz                            | If the MPE distance is greater than that required for normal operation of the device, operating instructions, warning instructions and/or warning labels may be used to ensure compliance by indicating the minimal separation distance to comply with MPE limits.<br><br>If the antennas are professional installed to ensure compliance, warning instructions and warning labels are not necessary. |
|                                                                                      | =< 2.5 W at 915 MHz or<br>=< 4 W at 2450 MHz | Transmitters operating at 2.5W EIRP (1.5 ERP) or less at 915 MHz, or at 4 W EIRP (2.4 W ERP) or less at 2450 MHz, generally are not expected to exceed MPE limits when nearby persons are 20 cm or more from most antennas. Therefore, special instructions and warnings are normally not necessary to ensure compliance.                                                                             |

### MPE Calculation with highest EIRP:

Assuming the highest gain antenna intended for use (-5 dBi gain) and the CL4XXe is outputting at highest measured power continuously and no cable loss to the antenna, then MPE requirements in an uncontrolled environment are met at a distance of 20cm.

### Maximum Permissible Exposure

|                                                                                                                      |
|----------------------------------------------------------------------------------------------------------------------|
| $\text{Power Density} = \text{EIRP} / (4 * \text{Pi} * \text{R}^2),$ <p>where EIRP = Output Power * Antenna Gain</p> |
|----------------------------------------------------------------------------------------------------------------------|

### Uncontrolled/Occupational Exposure

|                     |            |             |                    |
|---------------------|------------|-------------|--------------------|
| Operating Frequency | 915MHz     |             |                    |
| Output Power (Peak) | 0.314Watts |             |                    |
| Antenna Gain        | -5dB       | or (linear) | 0.316228(unitless) |
| Separation Distance | 0.2m       | -or-        | 7.874 inches       |

|                    |                       |        |                          |
|--------------------|-----------------------|--------|--------------------------|
| Peak Power Density | 0.198W/m <sup>2</sup> | - or - | 0.0198mW/cm <sup>2</sup> |
|--------------------|-----------------------|--------|--------------------------|

|                                                      |      |
|------------------------------------------------------|------|
| Exposure %<br>(over 6 min timespan for uncontrolled) | 100% |
|------------------------------------------------------|------|

|                                                |      |
|------------------------------------------------|------|
| Transmit Duty Cycle<br>(Peak-to-Average Ratio) | 100% |
|------------------------------------------------|------|

|                       |                               |        |                                |
|-----------------------|-------------------------------|--------|--------------------------------|
| Average Power Density | <b>0.19754W/m<sup>2</sup></b> | - or - | <b>0.0198mW/cm<sup>2</sup></b> |
|-----------------------|-------------------------------|--------|--------------------------------|

Limit for **Uncontrolled**  
 Exposure at Operating  
 Frequency

|                           |        |                              |
|---------------------------|--------|------------------------------|
| <b>6.1W/m<sup>2</sup></b> | - or - | <b>0.61mW/cm<sup>2</sup></b> |
|---------------------------|--------|------------------------------|

## Appendix A

### Accreditations and Authorizations



NVLAP Lab code: 100255-0

NVLAP: Recognized under the National Voluntary Laboratory Accreditation Program (NVLAP) for satisfactory compliance with criteria established in Title 15, Part 285 Code of Federal Regulations. These criteria encompass the requirements of ISO/IEC EN17025 and the relevant requirements of ISO 9002 (ANSI/ASQC Q92-1987) as suppliers of calibration or test results. The specific scope includes IEC/CISPR 22:1997, Amendment 1:1995, Amendment 2:1997, EN 55022:1998, AS/NZS 1044, CNS 13438:1997, ANSI C63.4, FCC Method - 47 CFR Part 15, FCC Method - 47 CFR Part 68, AS/NZS 3548, IEC 61000-3-2, EN 61000-3-2, CISPR 14-1, EN 55014-1, AS/NZS 1044, CNS 13783-1, CISPR 22, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, and IEC 61000-4-11 testing.



FCC: Details of the measurement facilities used for these tests have been filed with the Federal Communications Commission's Laboratory in Columbia, Maryland and accepted in a letter dated September 24, 1997 (Ref. No. 91040).



Industry Canada Industrie Canada

Industry of Canada: Accredited by Industry Canada for performance of radiated measurements. Our test site complies with RSP 100, Issue 7, Section 3.3. File #: IC 2181



VCCI: Accepted as an Associate Member to the VCCI. The measurement facilities detailed in this test report have been registered in accordance with Regulations for Voluntary Control Measures, Article 8. Registration Nos.: (Radiated Emissions) R-797, (Conducted Emissions) C-832, C-833, C-834 and (Conducted Emissions - Telecommunications Ports) T-160.



ICASA: ICASA (Independent Communications Authority of South Africa) has appointed UL as a Designated Test Laboratory to test Telecommunications equipment for type approval in compliance with CISPR 22 to assist in fulfilling its mandate under section 54(1) of the Telecommunications Act, 1996 (Act 103 of 1996).



NIST/CAB: Validated by the European Commission as a U.S. Conformity Assessment Body (CAB) of the U.S.-EU Mutual Recognition Agreement (MRA) for the Electromagnetic Compatibility - Council Directive 89/336/EEC, Article 10 (2). Also validated for the Telecommunication Equipment-Council Directive 99/5/EC, Annex III and IV, Identification Number: 0983.

NIST/CAB: Provisioned to act as a U.S. Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the Asia Pacific Economic Cooperation (APEC) MRA between the American Institute in Taiwan (AIT) and the United States. Our laboratory is considered qualified to test equipment subject to the applicable EMC regulations of the Chinese Taipei Bureau of Standards, Metrology and Inspection (BSMI) which require testing to CNS 13438 (CISPR 22).

NIST/CAB: Recognized by the Infocomm Development Authority of Singapore (IDA) under the Asia Pacific Economic Cooperation Mutual Recognition Agreement (APEC MRA). Our laboratory is provisionally designated to act as a Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the APEC MRA. Our scope of designation includes IDA TS EMC (CISPR 22), IEC 61000-4-2, -4-3, -4-4, -4-5, and -4-6. U.S. Identifier Number: US0113