# ENGINEERING TEST REPORT

## xL LCD Keypad/Suite Security 4 Zone Keypad
## Model(s): XLK1 and XLC1
## FCC ID: X78XLK1

*Applicant:*

**Guardall, A Division of CSG Security Corp.**
5201 Explorer Drive
Mississauga, Ontario
Canada L4W 4H1

***In Accordance With***
**Federal Communications Commission (FCC)**
**Part 15, Subpart C, Section 15.209**

**UltraTech's File No.: CHB-135F15C209**

This Test report is Issued under the Authority of
Tri M. Luu, BASc
Vice President of Engineering
UltraTech Group of Labs

Date: September 10, 2010

| | |
|---|---|
| Report Prepared by: Dan Huynh | Tested by: Hung Trinh and Satish Patel |
| Issued Date: September 10, 2010 | Test Dates: March 9, 11 & 12, 2010 |

- *The results in this Test Report apply only to the sample(s) tested, and the sample tested is randomly selected.*
- *This report must not be used by the client to claim product endorsement by NVLAP or any agency of the US Government.*


**UltraTech**

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| FCC | VCCI | Industry Canada / Industrie Canada Approved Test Facility | NVLAP | BSMI | Korea KCC-RRL |
|---|---|---|---|---|---|
| 91038 | 1309 | 46390-2049 | NvLap Lab Code 200093-0 | SL2-IN-E-1119R | CA2049 |

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# EXHIBIT 1. INTRODUCTION

## 1.1. SCOPE

| | |
|---|---|
| **Reference:** | FCC Part 15, Subpart C |
| **Title:** | Code of Federal Regulations (CFR), Title 47, Telecommunication - Part 15 |
| **Purpose of Test:** | To gain FCC Equipment Certification for part 15C devices. |
| **Test Procedures:** | Both conducted and radiated emissions measurements were conducted in accordance with American National Standards Institute ANSI C63.4 - American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz. |
| **Environmental Classification:** | Commercial, industrial or business environment |

## 1.2. RELATED SUBMITTAL(S)/GRANT(S)

None.

## 1.3. NORMATIVE REFERENCES

| Publication | Year | Title |
|---|---|---|
| FCC 47 CFR 15 | 2009 | Code of Federal Regulations – Telecommunication |
| ANSI C63.10 | 2009 | American National Standard for Testing Unlicensed Wireless Devices |
| ANSI C63.4 | 2003 | American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 KHz to 40 GHz |
| CISPR 22<br>EN 55022 | 2008-09, Edition 6.0<br>2006 | Information Technology Equipment - Radio Disturbance Characteristics - Limits and Methods of Measurement |
| CISPR 16-1-1<br>+A1<br>+A2 | 2006<br>2006<br>2007 | Specification for radio disturbance and immunity measuring apparatus and methods.<br>Part 1-1: Measuring Apparatus |
| CISPR 16-1-2<br>+A1<br>+A2 | 2003<br>2004<br>2006 | Specification for radio disturbance and immunity measuring apparatus and methods.<br>Part 1-2: Conducted disturbances |

# EXHIBIT 2. PERFORMANCE ASSESSMENT

## 2.1. CLIENT INFORMATION

| APPLICANT | |
|---|---|
| **Name:** | Guardall, A Division of CSG Security Corp. |
| **Address:** | 5201 Explorer Drive<br>Mississauga, Ontario<br>Canada L4W 4H1 |
| **Contact Person:** | George Grzeslo<br>Phone #: 905-629-2600 x 3624<br>Fax #: 905-629-4970<br>Email Address: george.grzeslo@guardall.com |

| MANUFACTURER | |
|---|---|
| **Name:** | Guardall, A Division of CSG Security Corp. |
| **Address:** | 5201 Explorer Drive<br>Mississauga, Ontario<br>Canada L4W 4H1 |
| **Contact Person:** | George Grzeslo<br>Phone #: 905-629-2600 x 3624<br>Fax #: 905-629-4970<br>Email Address: george.grzeslo@guardall.com |

## 2.2. EQUIPMENT UNDER TEST (EUT) INFORMATION

The following information (with the exception of the Date of Receipt) has been supplied by the applicant.

| | |
|---|---|
| **Brand Name:** | Guardall |
| **Product Name:** | xL LCD Keypad/Suite Security 4 Zone Keypad |
| **Model Name or Number:** | XLK1 and XLC1 |
| **Serial Number:** | Test sample |
| **Type of Equipment:** | Low Power Transceiver |
| **Input Power Supply Type:** | 12VDC to 13.8 VDC |
| **Primary User Functions of EUT:** | Present RFID card into field to allow reader to read card information.<br>Use keypad to operate and interact with intrusion security system. |

## 2.3. EUT'S TECHNICAL SPECIFICATIONS

| TRANSMITTER | |
|---|---|
| **Equipment Type:** | Mobile |
| **Intended Operating Environment:** | Commercial, light industry & heavy industry |
| **Power Supply Requirement:** | 12 VDC to 13.8 VDC |
| **RF Output Power Rating:** | 52.80 dBµV/m peak at 10m distance |
| **Operating Frequency Range:** | 124 to 126 kHz |
| **Duty Cycle:** | 100% |
| **20 dB Bandwidth:** | 0.950 kHz |
| **Modulation Type:** | ASK |
| **Oscillator Frequencies:** | 119 - 135 kHz |
| **Antenna Connector Type:** | Integral custom wound wire loop |

## 2.4. LIST OF EUT'S PORTS

| Port Number | EUT's Port Description | Number of Identical Ports | Connector Type | Cable Type (Shielded/Non-shielded) |
|---|---|---|---|---|
| 1 | Power and communication and one output | 1 | Screw terminal block | User supplied, typically communication is 4 conductor non-shielded |
| 2 | Input points x 4 | 1 | Screw terminal block | User supplied non-shielded |

## 2.5. ANCILLARY EQUIPMENT

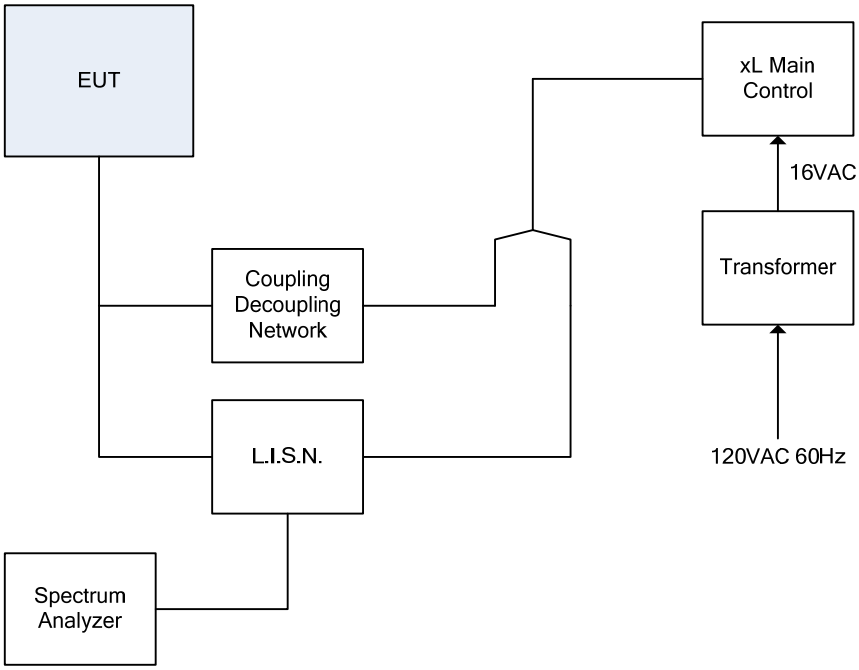
The EUT was tested while connected to the following representative configuration of ancillary equipment necessary to exercise the ports during tests:

| **Ancillary Equipment # 1** | |
|---|---|
| Description: | xL Main Control |
| Brand Name: | Guardall |
| Model Name or Number: | 650-3600 |
| Serial Number: | 03756 |
| Cable Length & Type: | > 3 m, Shielded |
| Connected to EUT's Port: | N/A |

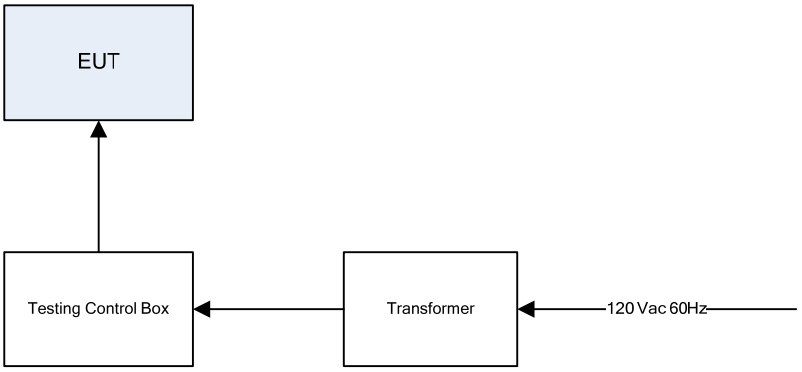
| **Ancillary Equipment # 2** | |
|---|---|
| Description: | 120 VAC to 16 VAC 60 Hz transformer |
| Brand Name: | Guardall |
| Model Name or Number: | FTC3716 |
| Serial Number: | N/A |
| Cable Length & Type: | > 3 m, Shielded |
| Connected to EUT's Port: | N/A |

## 2.6. TEST SETUP BLOCK DIAGRAM

### 2.6.1. Power Line Conducted Emission Test Setup




### 2.6.2. Radiated Emission Test Setup



# EXHIBIT 3. EUT OPERATING CONDITIONS AND CONFIGURATIONS DURING TESTS

## 3.1. CLIMATE TEST CONDITIONS

The climate conditions of the test environment are as follows:

| | |
|---|---|
| Temperature: | 21°C |
| Humidity: | 51% |
| Pressure: | 102 kPa |
| Power input source: | 13.8 VDC |

## 3.2. OPERATIONAL TEST CONDITIONS & ARRANGEMENT FOR TESTS

| | |
|---|---|
| **Operating Modes:** | The EUT was configured for continuous transmission for the duration of testing. |
| **Special Test Software:** | N/A |
| **Special Hardware Used:** | N/A |
| **Transmitter Test Antenna:** | The EUT was tested with the antenna fitted in a manner typical of normal intended use as integral antenna equipment. |

| **Transmitter Test Signals** | |
|---|---|
| **Frequency Band(s):** | 124 to 126 kHz |
| **Test Frequency(ies):** | 124 kHz and 126 kHz |
| **RF Power Output:** | 52.80 dBµV/m peak at 10m distance |
| **Normal Test Modulation:** | ASK |
| **Modulating Signal Source:** | Internal |

# EXHIBIT 4. SUMMARY OF TEST RESULTS

## 4.1. LOCATION OF TESTS

All of the measurements described in this report were performed at Ultratech Group of Labs located in the city of Oakville, Province of Ontario, Canada.

- AC Power Line Conducted Emissions were performed in UltraTech's shielded room, 24'(L) by 16'(W) by 8'(H).

- Radiated Emissions were performed at the Ultratech's 3-10 TDK Semi-Anechoic Chamber situated in the Town of Oakville, province of Ontario. This test site been calibrated in accordance with ANSI C63.4, and found to be in compliance with the requirements of Sec. 2.948 of the FCC Rules. The descriptions and site measurement data of the Oakville 3-10 TDK Semi-Anechoic Chamber has been filed with FCC office (FCC File No.: 91038) and Industry Canada office (Industry Canada File No.: 2049A-3). Expiry Date: 2011-05-01.

## 4.2. APPLICABILITY & SUMMARY OF EMC EMISSION TEST RESULTS

| FCC Section(s) | Test Requirements | Compliance (Yes/No) |
|---|---|---|
| 15.203 | Antenna Requirement | Yes |
| 15.207(a) | Power Line Conducted Emissions | Yes |
| 15.209(a) | 20 dB Bandwidth | Yes |
| 15.209 | Transmitter Radiated Emissions - Fundamental, Harmonic and Spurious Emissions | Yes |

## 4.3. MODIFICATIONS INCORPORATED IN THE EUT FOR COMPLIANCE PURPOSES

None.

# EXHIBIT 5. MEASUREMENTS, EXAMINATIONS & TEST DATA FOR EMC EMISSIONS

## 5.1. TEST PROCEDURES

This section contains test results only. Details of test methods and procedures can be found in ANSI C63.4 and Ultratech's test procedures ULTR-P001-2004.

## 5.2. MEASUREMENT UNCERTAINTIES

The measurement uncertainties stated were calculated in accordance with the requirements of CISPR 16-4-2 @ IEC:2003 and JCGM 100:2008 (GUM 1995) – Guide to the Expression of Uncertainty in Measurement.
Please refer to Exhibit 7 for Measurement Uncertainties.

## 5.3. MEASUREMENT EQUIPMENT USED

The measurement equipment used complied with the requirements of the Standards referenced in the Methods & Procedures ANSI C63.4 and CISPR 16-1-1.

## 5.4. ANTENNA REQUIREMENTS [47 CFR § 15.203]

### 5.4.1. Requirements

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

N**otes**: This requirement does not apply to carrier current devices operated under the provisions of @ 15.211, 15.213, 15.217, 17.219 or 15.221.

### 5.4.2. Engineering Analysis

The antenna is an integral part of the EUT; it is soldered onto the radio printed circuit board and located inside the enclosure.

## 5.5. POWERLINE CONDUCTED EMISSION [47 CFR 15.207(a)]

### 5.5.1. Limit(s)

The equipment shall meet the limits of the following table:

| Frequency of emission (MHz) | Conducted Limits (dBμV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15–0.5 .....…….. | 66 to 56* ..... | 56 to 46* |
| 0.5–5 .....…….. | 56 ..... | 46 |
| 5-30 …….. | 60 ..…….. | 50 |

*Decreases linearly with the logarithm of the frequency

### 5.5.2. Method of Measurements

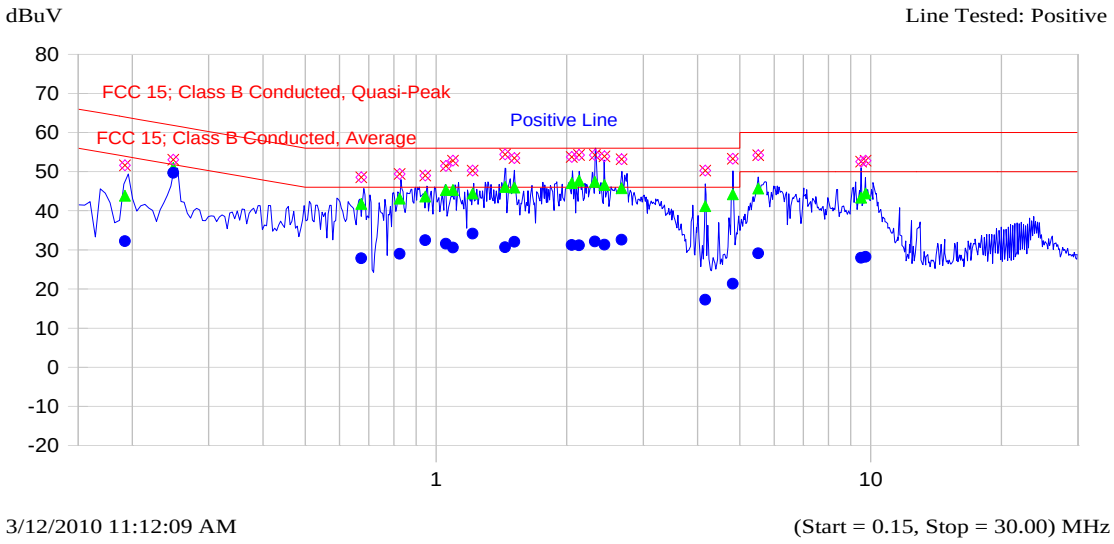
Refer to ANSI C63.4.

## 5.5.3. Test Data

### 5.5.3.1. Test Configuration 1: xL LCD Keypad (Model XLK1)

**Plot 5.5.3.1.1.** Power Line Conducted Emission
Line Voltage: 13.8 VDC
Line Tested: Positive

**Current Graph**

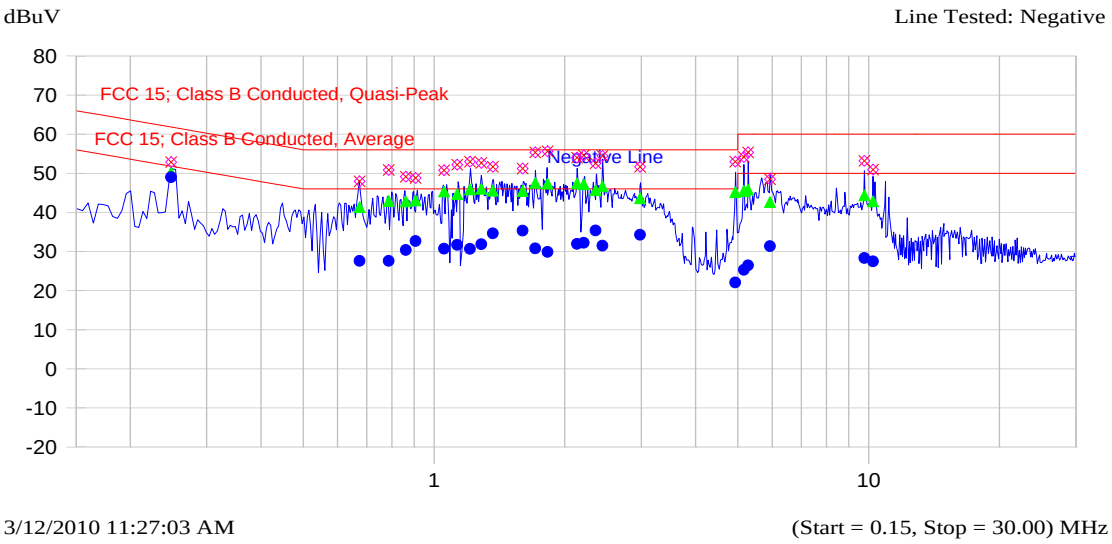



**Current List**

| Frequency MHz | Peak dBuV | QP dBuV | Delta QP-QP Limit dB | Avg dBuV | Delta Avg-Avg Limit dB | Trace Name |
|---|---|---|---|---|---|---|
| 0.192 | 51.6 | 43.8 | -20.9 | 32.2 | -22.5 | Positive Line |
| 0.249 | 53.0 | 50.9 | -12.2 | 49.7 | -3.4 | Positive Line |
| 0.673 | 48.5 | 41.8 | -14.2 | 27.8 | -18.2 | Positive Line |
| 0.824 | 49.4 | 43.1 | -12.9 | 29.0 | -17.0 | Positive Line |
| 0.945 | 49.0 | 43.6 | -12.4 | 32.5 | -13.5 | Positive Line |
| 1.054 | 51.5 | 45.3 | -10.7 | 31.6 | -14.4 | Positive Line |
| 1.094 | 52.8 | 45.3 | -10.7 | 30.6 | -15.4 | Positive Line |
| 1.214 | 50.3 | 44.4 | -11.6 | 34.1 | -11.9 | Positive Line |
| 1.441 | 54.4 | 46.1 | -9.9 | 30.7 | -15.3 | Positive Line |
| 1.515 | 53.4 | 45.9 | -10.1 | 32.1 | -13.9 | Positive Line |
| 2.053 | 53.7 | 47.1 | -8.9 | 31.2 | -14.8 | Positive Line |
| 2.133 | 54.2 | 47.7 | -8.3 | 31.1 | -14.9 | Positive Line |
| 2.321 | 54.2 | 47.4 | -8.6 | 32.1 | -13.9 | Positive Line |
| 2.441 | 53.9 | 46.6 | -9.4 | 31.3 | -14.7 | Positive Line |
| 2.673 | 53.2 | 45.7 | -10.3 | 32.6 | -13.4 | Positive Line |
| 4.167 | 50.3 | 41.2 | -14.8 | 17.2 | -28.8 | Positive Line |
| 4.817 | 53.3 | 44.2 | -11.8 | 21.3 | -24.7 | Positive Line |
| 5.509 | 54.2 | 45.7 | -14.3 | 29.1 | -20.9 | Positive Line |
| 9.506 | 52.6 | 43.3 | -16.7 | 28.0 | -22.0 | Positive Line |
| 9.735 | 52.8 | 44.4 | -15.6 | 28.2 | -21.8 | Positive Line |

**Plot 5.5.3.1.2.** Power Line Conducted Emission
Line Voltage: 13.8 VDC
Line Tested: Return

### Current Graph



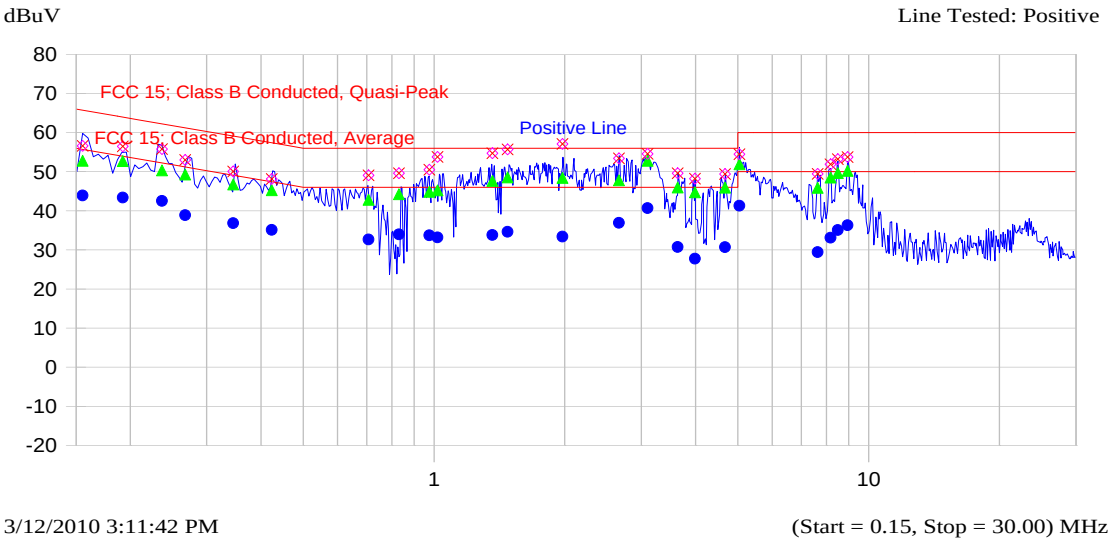

### Current List

| Frequency MHz | Peak dBuV | QP dBuV | Delta QP-QP Limit dB | Avg dBuV | Delta Avg-Avg Limit dB | Trace Name |
|---|---|---|---|---|---|---|
| 0.248 | 52.8 | 50.2 | -12.9 | 49.0 | -4.1 | Negative Line |
| 0.674 | 47.9 | 41.3 | -14.7 | 27.6 | -18.4 | Negative Line |
| 0.787 | 50.8 | 42.9 | -13.1 | 27.6 | -18.4 | Negative Line |
| 0.861 | 49.1 | 42.8 | -13.2 | 30.4 | -15.6 | Negative Line |
| 0.907 | 48.8 | 43.0 | -13.0 | 32.7 | -13.3 | Negative Line |
| 1.055 | 50.7 | 45.3 | -10.7 | 30.7 | -15.3 | Negative Line |
| 1.131 | 52.2 | 44.7 | -11.3 | 31.7 | -14.3 | Negative Line |
| 1.209 | 53.0 | 45.9 | -10.1 | 30.7 | -15.3 | Negative Line |
| 1.284 | 52.6 | 46.0 | -10.0 | 31.8 | -14.2 | Negative Line |
| 1.366 | 51.6 | 45.5 | -10.5 | 34.6 | -11.4 | Negative Line |
| 1.599 | 51.2 | 45.5 | -10.5 | 35.3 | -10.7 | Negative Line |
| 1.710 | 55.3 | 47.6 | -8.4 | 30.8 | -15.2 | Negative Line |
| 1.824 | 55.6 | 47.4 | -8.6 | 29.9 | -16.1 | Negative Line |
| 2.134 | 54.0 | 47.4 | -8.6 | 31.9 | -14.1 | Negative Line |
| 2.210 | 54.6 | 47.2 | -8.8 | 32.2 | -13.8 | Negative Line |
| 2.355 | 52.5 | 45.7 | -10.3 | 35.4 | -10.6 | Negative Line |
| 2.440 | 54.4 | 46.6 | -9.4 | 31.5 | -14.5 | Negative Line |
| 2.978 | 51.7 | 43.7 | -12.3 | 34.3 | -11.7 | Negative Line |
| 4.935 | 52.9 | 45.2 | -10.8 | 22.1 | -23.9 | Negative Line |
| 5.163 | 54.1 | 45.5 | -14.5 | 25.3 | -24.7 | Negative Line |
| 5.279 | 55.4 | 45.8 | -14.2 | 26.5 | -23.5 | Negative Line |
| 5.930 | 48.5 | 42.7 | -17.3 | 31.4 | -18.6 | Negative Line |
| 9.775 | 53.1 | 44.4 | -15.6 | 28.3 | -21.7 | Negative Line |
| 10.232 | 50.9 | 42.8 | -17.2 | 27.5 | -22.5 | Negative Line |

### 5.5.3.2. Test Configuration 2: Suite Security 4 Zone Keypad (Model XLC1)

**Plot 5.5.3.2.1.** Power Line Conducted Emission
Line Voltage: 13.8 VDC
Line Tested: Positive

**Current Graph**

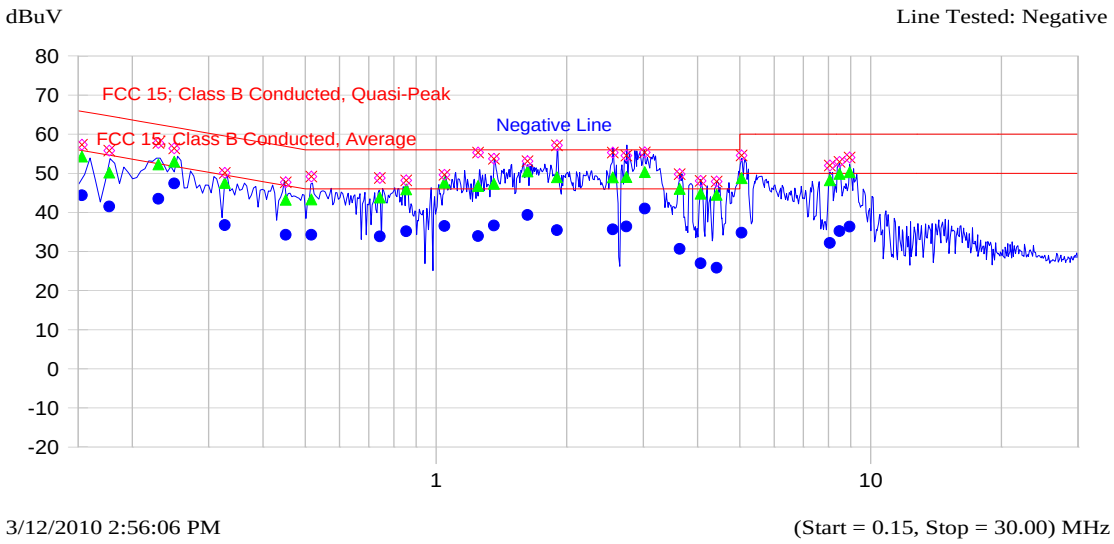



**Current List**

| Frequency MHz | Peak dBuV | QP dBuV | Delta QP-QP Limit dB | Avg dBuV | Delta Avg-Avg Limit dB | Trace Name |
|---|---|---|---|---|---|---|
| 0.155 | 56.6 | 52.8 | -13.1 | 43.9 | -11.9 | Positive Line |
| 0.192 | 56.5 | 52.7 | -12.0 | 43.4 | -11.4 | Positive Line |
| 0.237 | 55.8 | 50.3 | -13.1 | 42.5 | -11.0 | Positive Line |
| 0.267 | 53.0 | 49.3 | -13.3 | 38.9 | -13.7 | Positive Line |
| 0.345 | 50.0 | 46.7 | -13.7 | 36.8 | -13.5 | Positive Line |
| 0.423 | 48.1 | 45.2 | -12.9 | 35.1 | -13.1 | Positive Line |
| 0.707 | 49.1 | 42.8 | -13.2 | 32.6 | -13.4 | Positive Line |
| 0.831 | 49.6 | 44.3 | -11.7 | 34.0 | -12.0 | Positive Line |
| 0.975 | 50.5 | 44.8 | -11.2 | 33.7 | -12.3 | Positive Line |
| 1.019 | 53.7 | 45.2 | -10.8 | 33.2 | -12.8 | Positive Line |
| 1.362 | 54.7 | 47.6 | -8.4 | 33.8 | -12.2 | Positive Line |
| 1.477 | 55.7 | 48.5 | -7.5 | 34.6 | -11.4 | Positive Line |
| 1.976 | 57.1 | 48.4 | -7.6 | 33.4 | -12.6 | Positive Line |
| 2.665 | 53.4 | 47.8 | -8.2 | 36.9 | -9.1 | Positive Line |
| 3.100 | 54.5 | 52.8 | -3.2 | 40.7 | -5.3 | Positive Line |
| 3.638 | 49.6 | 45.9 | -10.1 | 30.7 | -15.3 | Positive Line |
| 3.985 | 48.2 | 44.7 | -11.3 | 27.7 | -18.3 | Positive Line |
| 4.675 | 49.4 | 45.9 | -10.1 | 30.7 | -15.3 | Positive Line |
| 5.039 | 54.4 | 51.9 | -8.1 | 41.3 | -8.7 | Positive Line |
| 7.631 | 49.4 | 45.9 | -14.1 | 29.4 | -20.6 | Positive Line |
| 8.170 | 51.9 | 48.5 | -11.5 | 33.1 | -16.9 | Positive Line |
| 8.496 | 53.2 | 49.7 | -10.3 | 35.0 | -15.0 | Positive Line |
| 8.937 | 53.7 | 50.2 | -9.8 | 36.3 | -13.7 | Positive Line |

**Plot 5.5.3.2.2.** Power Line Conducted Emission
Line Voltage: 13.8 VDC
Line Tested: Return

**Current Graph**




**Current List**

| Frequency MHz | Peak dBuV | QP dBuV | Delta QP-QP Limit dB | Avg dBuV | Delta Avg-Avg Limit dB | Trace Name |
|---|---|---|---|---|---|---|
| 0.153 | 57.3 | 54.3 | -11.6 | 44.4 | -11.5 | Negative Line |
| 0.177 | 55.8 | 50.2 | -15.0 | 41.5 | -13.7 | Negative Line |
| 0.230 | 57.7 | 52.3 | -11.4 | 43.5 | -10.2 | Negative Line |
| 0.250 | 56.4 | 53.0 | -10.1 | 47.4 | -5.7 | Negative Line |
| 0.326 | 50.1 | 47.5 | -13.4 | 36.7 | -14.1 | Negative Line |
| 0.451 | 47.7 | 43.2 | -14.1 | 34.3 | -13.1 | Negative Line |
| 0.517 | 49.1 | 43.3 | -12.7 | 34.2 | -11.8 | Negative Line |
| 0.743 | 48.8 | 43.8 | -12.2 | 33.9 | -12.1 | Negative Line |
| 0.853 | 48.2 | 45.9 | -10.1 | 35.1 | -10.9 | Negative Line |
| 1.046 | 49.6 | 47.6 | -8.4 | 36.5 | -9.5 | Negative Line |
| 1.249 | 55.3 | 46.7 | -9.3 | 34.0 | -12.0 | Negative Line |
| 1.359 | 53.7 | 47.3 | -8.7 | 36.6 | -9.4 | Negative Line |
| 1.624 | 53.1 | 50.4 | -5.6 | 39.4 | -6.6 | Negative Line |
| 1.899 | 57.1 | 49.0 | -7.0 | 35.5 | -10.5 | Negative Line |
| 2.551 | 55.3 | 48.9 | -7.1 | 35.6 | -10.4 | Negative Line |
| 2.742 | 54.5 | 49.0 | -7.0 | 36.4 | -9.6 | Negative Line |
| 3.021 | 55.3 | 50.3 | -5.7 | 41.0 | -5.0 | Negative Line |
| 3.638 | 49.8 | 46.0 | -10.0 | 30.7 | -15.3 | Negative Line |
| 4.061 | 48.0 | 44.8 | -11.2 | 27.0 | -19.0 | Negative Line |
| 4.425 | 47.9 | 44.5 | -11.5 | 25.8 | -20.2 | Negative Line |
| 5.049 | 54.5 | 48.8 | -11.2 | 34.8 | -15.2 | Negative Line |
| 8.055 | 51.9 | 48.2 | -11.8 | 32.2 | -17.8 | Negative Line |
| 8.478 | 52.9 | 49.9 | -10.1 | 35.2 | -14.8 | Negative Line |
| 8.937 | 54.0 | 50.3 | -9.7 | 36.4 | -13.6 | Negative Line |

## 5.6. TRANSMITTER RADIATED EMISSIONS [47 CFR §§ 15.209 & 15.205]

### 5.6.1. Limit(s)

§ 15.209:

(a) The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

**47 CFR 15.209(a) General Field Strength Limits**

| Frequency (MHz) | Field Strength (microvolts/meter) | Measurement Distance (meters) |
|---|---|---|
| 0.009 - 0.490 | 2400/F(kHz) | 300 |
| 0.490 - 1.705 | 24000/F(kHz) | 30 |
| 1.705 - 30.0 | 30 | 30 |
| 30 – 88 | 100 ** | 3 |
| 88 – 216 | 150 ** | 3 |
| 216 – 960 | 200 ** | 3 |
| Above 960 | 500 | 3 |
| ** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241. | | |

(b) In the emission table above, the tighter limit applies at the band edges.

(c) The level of any unwanted emissions from an intentional radiator operating under these general provisions shall not exceed the level of the fundamental emission. For intentional radiators which operate under the provisions of other Sections within this Part and which are required to reduce their unwanted emissions to the limits specified in this table, the limits in this table are based on the frequency of the unwanted emission and not the fundamental frequency. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.

(d) The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

(e) The provisions in Sections 15.31, 15.33, and 15.35 for measuring emissions at distances other than the distances specified in the above table, determining the frequency range over which radiated emissions are to be measured, and limiting peak emissions apply to all devices operated under this Part.

(f) In accordance with Section 15.33(a), in some cases the emissions from an intentional radiator must be measured to beyond the tenth harmonic of the highest fundamental frequency designed to be emitted by the intentional radiator because of the incorporation of a digital device. If measurements above the tenth harmonic are so required, the radiated emissions above the tenth harmonic shall comply with the general radiated emission limits applicable to the incorporated digital device, as shown in Section 15.109 and as based on the frequency of the emission being measured, or, except for emissions contained in the restricted frequency bands shown in Section 15.205, the limit on spurious emissions specified for the intentional radiator, whichever is the higher limit. Emissions which must be measured above the tenth harmonic of the highest fundamental frequency designed to be emitted by the intentional radiator and which fall within the restricted bands shall comply with the general radiated emission limits in Section 15.109 that are applicable to the incorporated digital device.

(g) Perimeter protection systems may operate in the 54-72 MHz and 76-88 MHz bands under the provisions of this section. The use of such perimeter protection systems is limited to industrial, business and commercial applications.

### 5.6.2. Method of Measurements

Ultratech Test Procedures, File # ULTR P001-2004 and ANSI C63.4 for measurement methods.

### 5.6.3. Test Data

**Remarks:**

- The measuring receiver shall be tuned over the frequency range 10 kHz to 30 MHz.
- All spurious emissions that are in excess of 20 dB below the specified limit shall be recorded.
- Extrapolation factor of 40dB/decade shall be used for frequencies below 30 MHz.
- EUT was placed in three different orthogonal positions to obtain maximum field strength level.

#### 5.6.3.1. Fundamental Emissions

**Remarks:**

- Field strength limit of the fundamental frequency at 300m distance is calculated using 20*log(2400/F), where F is in kHz.
- For frequency band 0.009- 0.490 MHz, the measured E-Field at 10m (column 2) will be extrapolated to 300m E-Field Level (column 3) using the extrapolation factor of 40*log(10/300) = -59.1 dB

| Frequency (MHz) | Peak E-Field @ 10m (dBµV/m) | Extrapolated E-Field Level @ 300m (dBµV/m) | Antenna Plane (H/V) | § 15.209 (a) Limits @ 300m (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|
| **Test Configuration 1: xL LCD Keypad (Model XLK1)** | | | | | |
| 0.124 | 51.96 | -7.14 | V | 25.7 | -32.8 |
| 0.124 | 52.80 | -6.30 | H | 25.7 | -32.0 |
| **Test Configuration 2: Suite Security 4 Zone Keypad (Model XLC1)** | | | | | |
| 0.126 | 51.57 | -7.53 | V | 25.6 | -33.1 |
| 0.126 | 52.22 | -6.88 | H | 25.6 | -32.5 |

### 5.6.3.2. Harmonic/Spurious Emissions

**Remarks:**

- For frequency band 0.009- 0.490 MHz, the measured E-Field at 10m (column 2) will be extrapolated to 300m E-Field Level (column 3) using the extrapolation factor of 40*log(10/300) = -59.1 dB
- For frequency bands 0.490-1.705 MHz and 1.705-30.0 MHz, the measured E-Field at 10m (column 2) will be extrapolated to 30m E-Field Level (column 3) using the extrapolation factor of 40*log(10/30) = -19.1 dB

| Frequency (MHz) | Peak E-Field @ 10m (dBµV/m) | Extrapolated E-Field Level (dBµV/m) | Antenna Plane (H/V) | § 15.209 (a) Limits (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|
| **Test Configuration 1: xL LCD Keypad (Model XLK1)** | | | | | |
| 0.010 - 0.490 | * | * | H / V | * | * |
| 0.490 - 1.705 | * | * | H / V | * | * |
| 1.705 - 30.0 | * | * | H / V | * | * |
| **Test Configuration 2: Suite Security 4 Zone Keypad (Model XLC1)** | | | | | |
| 0.010 - 0.490 | * | * | H / V | * | * |
| 0.490 - 1.705 | * | * | H / V | * | * |
| 1.705 - 30.0 | * | * | H / V | * | * |

* No emissions or harmonics were detected within 20 dB of the limit.

## 5.7. 20 dB BANDWIDTH [47 CFR 15.209 (a)]

### 5.7.1. Limit(s)

Emission bandwidth shall not be located in the restricted bands in 15.205 and the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz.

### 5.7.2. Method of Measurements

The measurements were performed in accordance with Ultratech Test Procedures, File # ULTR P001-2004 and ANSI C63.4:2003.

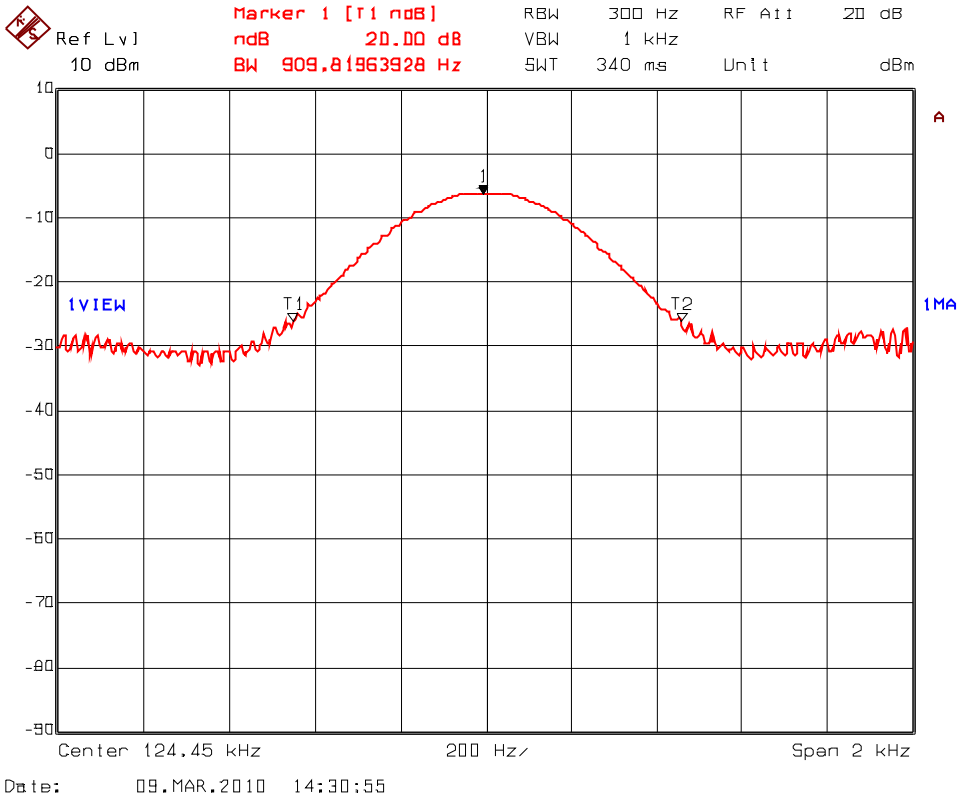
The transmitter output was loosely coupled to the spectrum analyzer through a receiving antenna. The bandwidth of the fundamental frequency was measured with the spectrum analyzer, with the resolution BW set to 1% to 3 % of the approximate emission width and video BW set to 3 times the resolution BW.

### 5.7.3. Test Data

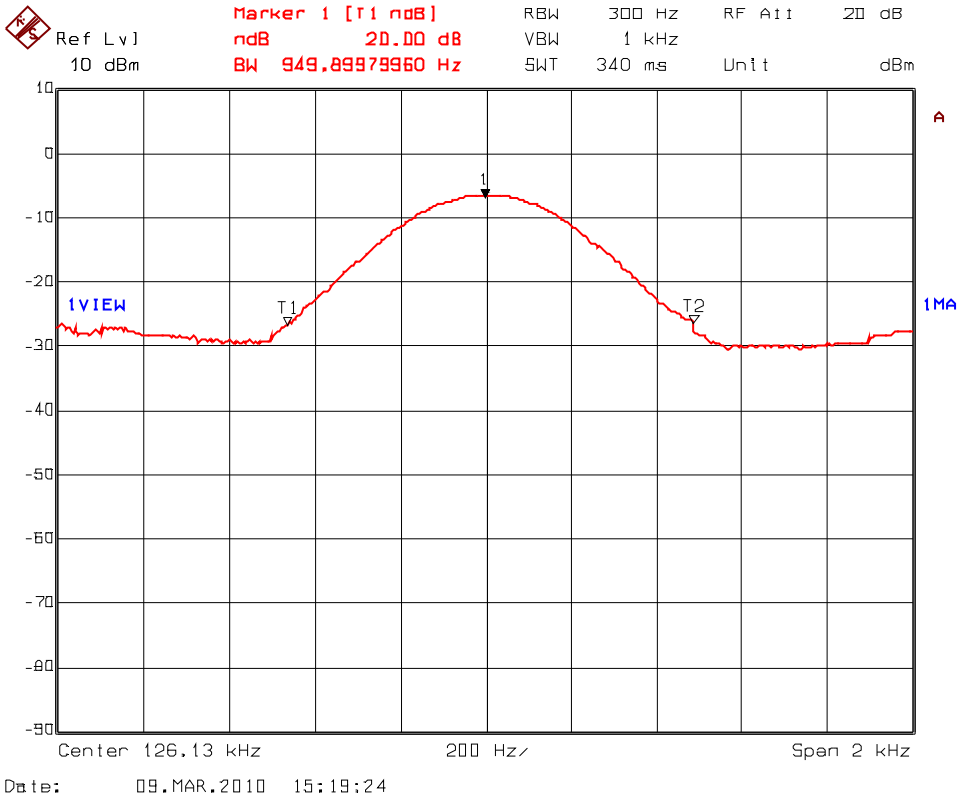
| Channel Frequency (kHz) | 20 dB Bandwidth (kHz) |
|---|---|
| **Test Configuration 1: xL LCD Keypad (Model XLK1)** | |
| 124.45 | 0.910 |
| **Test Configuration 2: Suite Security 4 Zone Keypad (Model XLC1)** | |
| 126.13 | 0.950 |

See the following plot for details.

**Plot 5.7.3.1.** 20 dB Bandwidth
Carrier Frequency: 124.45 kHz, Bi-Phase modulation
Test Configuration 1: xL LCD Keypad (Model XLK1)



**Plot 5.7.3.2.** 20 dB Bandwidth
Carrier Frequency: 126.13 kHz, Bi-Phase modulation
Test Configuration 2: Suite Security 4 Zone Keypad (Model XLC1)



## EXHIBIT 6. TEST EQUIPMENT LIST

| Test Instruments | Manufacturer | Model No. | Serial No. | Frequency Range | Cal. Due Date |
|---|---|---|---|---|---|
| EMI Receiver System/ Spectrum Analyzer with built-in Amplifier | Hewlett Packard | 8546A | 3650A00371 | 9kHz - 6.5GHz | 25 Jan 2011 |
| Attenuator | Pasternack | PE7010-20 | --- | DC to 2 GHz 20dB attenuation | 4 Jan 2011 |
| L.I.S.N. | EMCO | 3810/2 | 2209 | 9 kHz – 30 MHz | 18 Dec 2010 |
| Coupling Decoupling Network | Fischer Custom Communications Inc. | FCC-801-S9 | 24 | 150 kHz - 230 MHz | 8 Feb 2011 |
| RF Shielded Chamber | RF Shielding | … | .. | … | |
| Loop Antenna | EMCO | 6502 | 2611 | 10 kHz – 30 MHz | 27 Jul 2011 |
| Biconi-Log Antenna | Emco | 3142C | 00026873 | 26 – 3000 MHz | 18 Apr 2011 |
| Horn Antenna | Emco | 3155 | 9911-5955 | 1 – 18 GHz | 9 Oct 2010 |
| RF Amplifier | Com-Power | PA-103A | 161243 | 10 MHz – 1 GHz | 2 Nov 2011 |
| RF Amplifier | Hewlett Packard | 84498 | 3008A00769 | 1 – 26.5 GHz | 2 Nov 2011 |
| Spectrum Analyzer | Rohde & Schwarz | ESU40 | 100037 | 20 Hz – 40 GHz | 9 Mar 2011 |
| Spectrum Analyzer | Rohde & Schwarz | FSEK30 | 100077 | 20 Hz – 40 GHz | 14 Aug 2011 |
| Spectrum Analyzer | Hewlett Packard | 8593EM | 3412A00103 | 9 kHz – 26.5 GHz | 5 Oct 2010 |
| Pre Amplifier | AH System | PAM-0118 | 225 | 20 MHz to 18 GHz | 8 Mar 2011 |
| Semi-Anechoic Chamber | TDK | FCC: 91038 IC: 2049A-3 | -- | -- | 1 May 2011 |



*All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)*

# EXHIBIT 7. MEASUREMENT UNCERTAINTY

The measurement uncertainties stated were calculated in accordance with the requirements of CISPR 16-4-2 @ IEC:2003 and JCGM 100:2008 (GUM 1995) – Guide to the Expression of Uncertainty in Measurement.

## 7.1. LINE CONDUCTED EMISSION MEASUREMENT UNCERTAINTY

| | **Radiated Emission Measurement Uncertainty @ 3m, Horizontal (30-1000 MHz):** | **Measured** | **Limit** |
|---|---|---|---|
| **$u_c$** | **Combined standard uncertainty:** $u_c(y) = \sqrt{\sum_{I=1}^{m} u_i^2(y)}$ | **± 2.15** | **± 2.6** |
| **U** | **Expanded uncertainty U:** $U = 2u_c(y)$ | **± 4.30** | **± 5.2** |

## 7.2. RADIATED EMISSION MEASUREMENT UNCERTAINTY

| | **Radiated Emission Measurement Uncertainty @ 3m, Horizontal (30-1000 MHz):** | **Measured** | **Limit** |
|---|---|---|---|
| **$u_c$** | **Combined standard uncertainty:** $u_c(y) = \sqrt{\sum_{I=1}^{m} u_i^2(y)}$ | **± 2.15** | **± 2.6** |
| **U** | **Expanded uncertainty U:** $U = 2u_c(y)$ | **± 4.30** | **± 5.2** |

| | **Radiated Emission Measurement Uncertainty @ 3m, Vertical (30-1000 MHz):** | **Measured** | **Limit** |
|---|---|---|---|
| **$u_c$** | **Combined standard uncertainty:** $u_c(y) = \sqrt{\sum_{I=1}^{m} u_i^2(y)}$ | **± 2.39** | **± 2.6** |
| **U** | **Expanded uncertainty U:** $U = 2u_c(y)$ | **± 4.78** | **± 5.2** |

| | **Radiated Emission Measurement Uncertainty @ 3 m, Horizontal & Vertical (1 – 18 GHz):** | **Measured** | **Limit** |
|---|---|---|---|
| **$u_c$** | **Combined standard uncertainty:** $u_c(y) = \sqrt{\sum_{I=1}^{m} u_i^2(y)}$ | **± 1.87** | Under consideration |
| **U** | **Expanded uncertainty U:** $U = 2u_c(y)$ | **± 3.75** | Under consideration |

| | Radiated Emission Measurement Uncertainty @ 10m, Horizontal (30-1000 MHz): | Measured | Limit |
|---|---|---|---|
| $u_c$ | **Combined standard uncertainty:** $u_c(y) = \sqrt{\sum_{I=1}^{m} u_i^2(y)}$ | **± 2.15** | **± 2.6** |
| **U** | **Expanded uncertainty U:** $U = 2u_c(y)$ | **± 4.30** | **± 5.2** |

| | Radiated Emission Measurement Uncertainty @ 10m, Vertical (30-1000 MHz): | Measured | Limit |
|---|---|---|---|
| $u_c$ | **Combined standard uncertainty:** $u_c(y) = \sqrt{\sum_{I=1}^{m} u_i^2(y)}$ | **± 2.17** | **± 2.6** |
| **U** | **Expanded uncertainty U:** $U = 2u_c(y)$ | **± 4.33** | **± 5.2** |

| | Radiated Emission Measurement Uncertainty @ 10m, Horizontal & Vertical (1 – 18 GHz): | Measured | Limit |
|---|---|---|---|
| $u_c$ | **Combined standard uncertainty:** $u_c(y) = \sqrt{\sum_{I=1}^{m} u_i^2(y)}$ | **± 1.87** | Under consideration |
| **U** | **Expanded uncertainty U:** $U = 2u_c(y)$ | **± 3.75** | Under consideration |