



# TEST REPORT FROM RFI GLOBAL SERVICES LTD

Test of: Proximity Slimline Reader / 697-411

To: FCC Parts 15.207, 15.209 and 15.215: 2008

**Test Report Serial No:**  
RFI/RPT3/RP75732JD01A

**Supersedes Test Report Serial No:**  
RFI/RPT2/RP75732JD01A

<b>This Test Report Is Issued Under The Authority Of Brian Watson, Operations Director:</b>	pp 
<b>Checked By:</b>	Robert Graham
<b>Signature:</b>	
<b>Date of Issue:</b>	21 September 2009

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**1. Customer Information**







<b>Company Name:</b>	Paxton Access Ltd
<b>Address:</b>	Paxton House Home Farm Brighton Sussex BN1 9HU United Kingdom

## 2. Summary of Testing

### 2.1. General Information

<b>Specification Reference:</b>	47CFR15.207, 47CFR15.209 & 47CFR15.215
<b>Specification Title:</b>	Code of Federal Regulations Volume 47 (Telecommunications) 2008: Part 15 Subpart B (Radio Frequency Devices ) - Sections 15.207, 15.209 & 15.215
<b>Site Registration:</b>	FCC: 209735
<b>Location of Testing:</b>	RFI Global Services Ltd, Wade Road, Basingstoke, Hampshire, RG24 8AH, England
<b>Test Dates:</b>	30 July 2009

### 2.2. Summary of Test Results

FCC Reference (47CFR)	Measurement	Port Type	Result
Part 15.207	Transmitter AC Conducted Spurious Emissions	AC Mains	
Part 15.209	Transmitter Radiated Spurious Emissions (Fundamental)	Antenna	
Part 15.209	Transmitter Radiated Spurious Emissions	Antenna	
Part 15.215(c)	Transmitter 20 dB Bandwidth	Antenna	
<b>Key to Results</b>			
 = Complied  = Did not comply			

### 2.3. Methods and Procedures

<b>Reference:</b>	ANSI C63.4 (2003)
<b>Title:</b>	American National Standard Methods of Measurement of Electromagnetic Emissions from Low Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

### 2.4. Deviations from the Test Specification

For the measurements contained within this test report, there were no deviations from, additions to, or exclusions from the test specification identified above.

### **3. Equipment Under Test (EUT)**

#### **3.1. Identification of Equipment Under Test (EUT)**

<b>Brand Name:</b>	Proximity Slimline Reader
<b>Model Name or Number:</b>	697-411
<b>Serial Number:</b>	361014
<b>Hardware Version Number:</b>	z-2828 rev 230402
<b>Software Version Number:</b>	N/A
<b>FCC ID Number:</b>	USE697411

#### **3.2. Description of EUT**

The equipment under test was a proximity reader for access control. It has functionality for reading tokens with 125 kHz carrier frequencies.

#### **3.3. Modifications Incorporated in the EUT**

No modifications were applied to the EUT during testing.

#### **3.4. Additional Information Related to Testing**

<b>Tested Technology:</b>	RFID
<b>Modulation Type:</b>	Amplitude Modulation
<b>Transmit / Receive Frequency:</b>	125 kHz

#### **3.5. Support Equipment**

The following support equipment was used to exercise the EUT during testing:

<b>Description:</b>	Net2 1 door ACU with 2A PSU
<b>Brand Name:</b>	Paxton Access
<b>Model Name or Number:</b>	411-501
<b>Serial Number:</b>	None stated

## **4. Operation and Monitoring of the EUT during Testing**

### **4.1. Operating Modes**

The EUT was tested in the following operating mode(s):

- Transceive mode
- The reader has only one mode of operation as it is constantly transmitting and receiving when in operation. It does not have a dedicated 'receive only' mode.

### **4.2. Configuration and Peripherals**

The EUT was tested in the following configuration(s):

- Connected to a Net2 1 door ACU with 2A PSU in a plastic cabinet. This provided power and data connection to the EUT.
- AC conducted emissions were performed with the EUT connected to the Net2 ACU and the Net2 ACU connected to a 120 VAC 60 Hz supply through a LISN.

## **5. Measurements, Examinations and Derived Results**

### **5.1. General Comments**

Measurement uncertainties are evaluated in accordance with current best practice. Our reported expanded uncertainties are based on standard uncertainties, which are multiplied by an appropriate coverage factor to provide a statistical confidence level of approximately 95%. Please refer to *Section 6. Measurement Uncertainty* for details.



**5.2. Test Results****5.2.1. Transmitter AC Conducted Spurious Emissions****Test Summary:**

<b>FCC Part:</b>	15.207(a)
<b>Test Method Used:</b>	As detailed in ANSI C63.4 Section 7 and relevant annexes

**Environmental Conditions:**

<b>Temperature (°C):</b>	27
<b>Relative Humidity (%):</b>	34

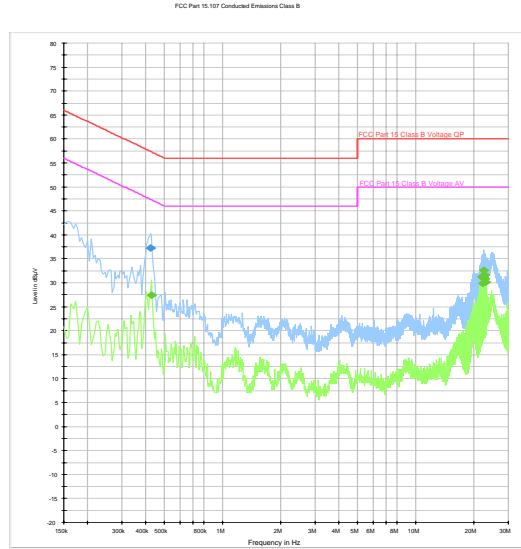
**Results: Quasi Peak Detector Measurements**

Frequency (MHz)	Line	Quasi Peak Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
0.420000	Neutral	37.2	57.4	20.2	Complied

**Results: Average Detector Measurements**

Frequency (MHz)	Line	Average Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
0.429000	Neutral	27.3	47.3	20.0	Complied
21.876000	Neutral	31.2	50.0	18.8	Complied
22.002000	Neutral	29.9	50.0	20.1	Complied
22.128000	Neutral	31.1	50.0	18.9	Complied
22.375500	Live 1	32.5	50.0	17.5	Complied
22.501500	Live 1	30.8	50.0	19.2	Complied
22.627500	Live 1	31.6	50.0	18.4	Complied
22.875000	Live 1	30.2	50.0	19.8	Complied

**Transmitter AC Conducted Spurious Emissions (continued)**



*Note: This plot is a pre-scan and for indication purposes only. For final measurements, see accompanying tables.*

**5.2.2. Transmitter Radiated Emissions (Fundamental)****Test Summary:**

<b>FCC Part:</b>	FCC 15.209
<b>Test Method Used:</b>	As detailed in ANSI C63.4 Section 8 and relevant annexes

**Environmental Conditions:**

<b>Temperature (°C):</b>	27
<b>Relative Humidity (%):</b>	39

**Results:**

<b>Frequency (MHz)</b>	<b>Antenna Polarity</b>	<b>Q-P Level (dB<math>\mu</math>V/m)</b>	<b>Limit (dB<math>\mu</math>V/m)</b>	<b>Margin (dB)</b>	<b>Result</b>
0.125	90° to EUT	-13.8	19.2 (at 300m)	33.0	Complied

**Note(s):**

- Limits below 30 MHz are specified at a test distance of 30 metres, whilst below 0.49 MHz they are specified at a test distance of 300 metres. However, as specified by FCC Section 15.31 (f)(2), measurements may be performed at a closer distance and the measured level corrected to the specified measurement distance by making the measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor.
- A transducer factor on the measuring instrument was used to extrapolate the results at 3 metres to the required test distance.

**5.2.3. Transmitter Radiated Spurious Emissions****Test Summary:**

<b>FCC Part:</b>	15.209 (a)
<b>Test Method Used:</b>	As detailed in ANSI C63.4 Section 8 and relevant annexes
<b>Frequency Range:</b>	9 kHz to 1000 MHz

**Environmental Conditions:**

<b>Temperature (°C):</b>	27
<b>Relative Humidity (%):</b>	39

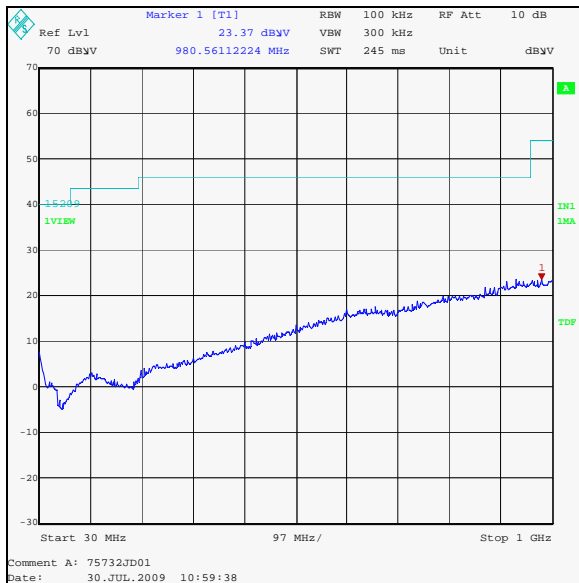
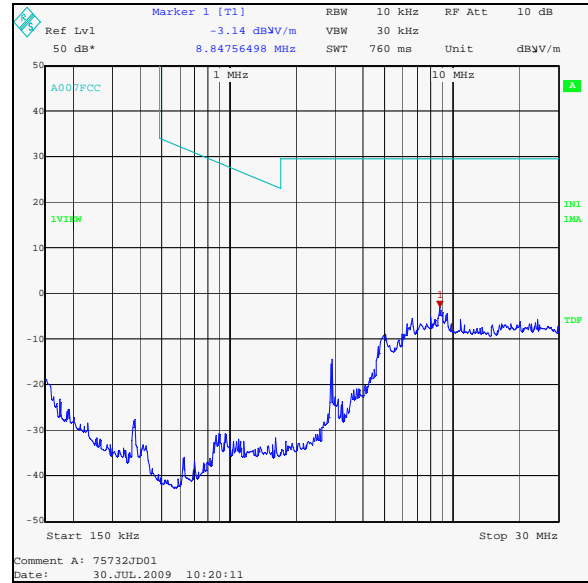
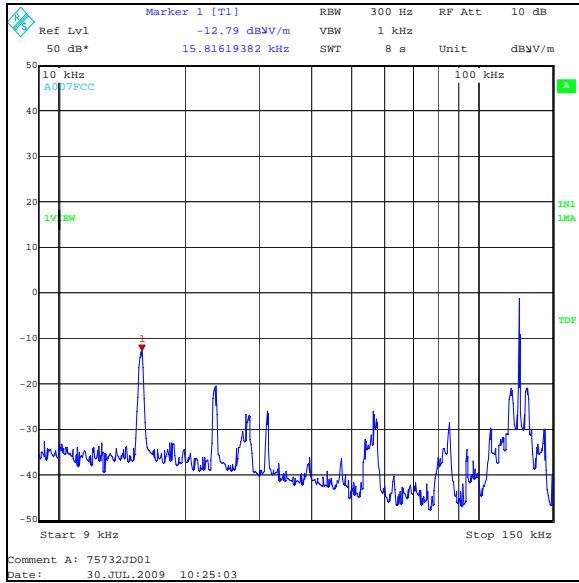
**Results:**

<b>Frequency (MHz)</b>	<b>Antenna Polarity</b>	<b>Level (dB<math>\mu</math>V/m)</b>	<b>Limit (dB<math>\mu</math>V/m)</b>	<b>Margin (dB)</b>	<b>Result</b>
980.561	Vertical	23.4	54.0	30.6	Complied

**Note(s):**

- Limits below 30 MHz are specified at a test distance of 30 metres, whilst below 0.49 MHz they are specified at a test distance of 300 metres. However, as specified by FCC Section 15.31 (f)(2), measurements may be performed at a closer distance and the measured level corrected to the specified measurement distance by making the measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor.
- All emissions noted on the pre-scan pots were investigated and found to be ambients, therefore the highest level of the noise floor was recorded in the above table.
- The carrier is shown on the 9 kHz to 150 kHz pre-scan plot at approximately 125 kHz.

**Transmitter Radiated Spurious Emissions (continued)**



Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

**5.2.4. Transmitter 20 dB Bandwidth**

**Test Summary:**

<b>FCC Part:</b>	15.215(c)
<b>Test Method Used:</b>	As detailed in ANSI C63.4 Section 13.1.7 and relevant annexes (see note below)

**Environmental Conditions:**

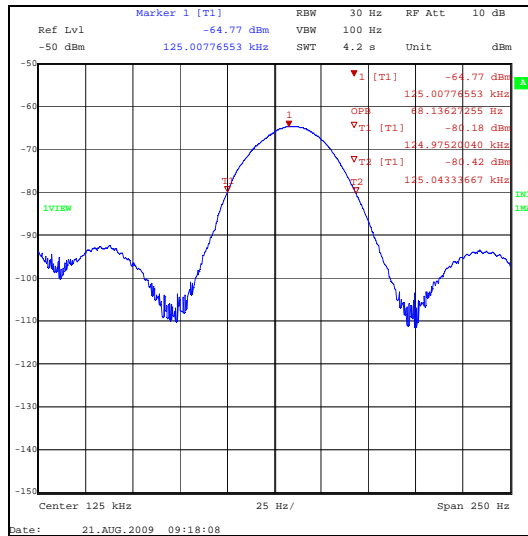
<b>Temperature (°C):</b>	25
<b>Relative Humidity (%):</b>	32

**Results:**

<b>Transmitter 20 dB Bandwidth (Hz)</b>
68

**Note(s):**

- In lieu of the test method detailed in ANSI C63.4 Section 13.1.7 the 20 dB bandwidth was measured using the Occupied Bandwidth function of the spectrum analyser.



## **6. Measurement Uncertainty**

No measurement or test can ever be perfect and the imperfections give rise to error of measurement in the results. Consequently the result of a measurement is only an approximation to the value of the measurand (the specific quantity subject to measurement) and is only complete when accompanied by a statement of the uncertainty of the approximation.

The expression of uncertainty of a measurement result allows realistic comparison of results with reference values and limits given in specifications and standards.

The uncertainty of the result may need to be taken into account when interpreting the measurement results.

The reported expanded uncertainties below are based on a standard uncertainty multiplied by an appropriate coverage factor such that a confidence level of approximately 95% is maintained. For the purposes of this document “approximately” is interpreted as meaning “effectively” or “for most practical purposes”.

<b>Measurement Type</b>	<b>Range</b>	<b>Confidence Level (%)</b>	<b>Calculated Uncertainty</b>
AC Conducted Emissions	0.15 MHz to 30 MHz	95%	±3.25 dB
20 dB Bandwidth	N/A	95%	±0.92 ppm
Radiated Spurious Emissions	9 kHz to 30 MHz	95%	±3.53 dB
Radiated Spurious Emissions	30 MHz to 1000 MHz	95%	±2.94 dB

The methods used to calculate the above uncertainties are in line with those recommended within the various measurement specifications. Where measurement specifications do not include guidelines for the evaluation of measurement uncertainty the published guidance of the appropriate accreditation body is followed.

## Appendix 1. Test Equipment Used

RFI No.	Instrument	Manufacturer	Type No.	Serial No.	Date Last Calibrated	Cal. Interval (Months)
A007	Antenna	Rohde & Schwarz	HFH2-Z2	880 458/020	29 Mar 2009	12
A1299	Antenna	Schaffner	CBL6143	5094	13 Aug 2008	12
A1069	LISN	Rohde & Schwarz	ESH3-Z5	837469/012	03 Apr 2009	12
A1829	Pulse Limiter	Rhode & Schwarz	ESH3-Z2	100671	28 Nov 2008	12
K0001	5m SA Chamber	Rainford EMC	N/A	N/A	04 May 2009	12
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	26 Aug 2008	12
M127	Spectrum Analyser	Rhode & Schwarz	FSEB 30	842 659/016	12 Aug 2008	12
M1273	Test Receiver	Rhode & Schwarz	ESIB 26	100275	01 Apr 2009	12

**NB** In accordance with UKAS requirements all the measurement equipment is on a calibration schedule.