



TEST REPORT

Test Report No. : UL-RPT-RP81268JD05A V3.0

Manufacturer : Paxton Ltd.
Model No. : Proximity mullion HID reader/345-220
FCC ID : USE345220
Technology : RFID – 13.56 MHz
Test Standard(s) : FCC Parts 15.207, 15.209(a) & 15.225

1. This test report shall not be reproduced in full or partial, without the written approval of UL VS LTD.
2. The results in this report apply only to the sample(s) tested.
3. The sample tested is in compliance with the above standard(s).
4. The test results in this report are traceable to the national or international standards.
5. Version 3.0 supersedes all previous versions.

Date of Issue: 15 JULY 2015

Checked by:

Ian Watch
Senior Engineer, Radio Laboratory

Issued by :

pp

John Newell
Quality Manager,
UL VS LTD



This laboratory is accredited by UKAS. The tests reported herein have been performed in accordance with its terms of accreditation.

UL VS LTD

Pavilion A, Ashwood Park, Ashwood Way, Basingstoke, Hampshire, RG23 8BG, UK
Telephone: +44 (0)1256 312000
Facsimile: +44 (0)1256 312001

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1. Customer Information







Company Name:	Paxton Ltd.
Address:	Paxton House Home Farm Brighton Sussex BN1 9HU United Kingdom

2. Summary of Testing

2.1. General Information

Specification Reference:	47CFR15.207, 47CFR15.209 and 47CFR15.215
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2010: Part 15 Subpart C (Intentional Radiators) - Sections 15.207, 15.209 & 15.215
Site Registration:	FCC: 209735
Location of Testing:	UL VS LTD, Wade Road, Basingstoke, Hampshire, RG24 8AH.
Test Dates:	08 June to 11 June 2011

2.2. Summary of Test Results

FCC Reference (47CFR)	Measurement	Result
Part 15.207	Transmitter AC Conducted Emissions	
Part 15.209	Transmitter Fundamental Field Strength	
Part 15.209	Transmitter Radiated Emissions	
Part 15.215(c)	Transmitter 20 dB Bandwidth	
Key to Results	 = Complied  = Did not comply	

2.3. Methods and Procedures

Reference:	ANSI C63.4 (2009)
Title:	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

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)

Brand Name:	Paxton
Model Name or Number:	345-220
Serial Number:	Not stated
Hardware Version Number:	z-hd02 rev 2
Software Version Number:	Not stated
FCC ID:	USE345220

3.2. Description of EUT

The equipment under test was a Proximity mullion HID reader with 119 kHz carrier frequency.

3.3. Modifications Incorporated in the EUT

No modifications were applied to the EUT during testing.

3.4. Additional Information Related to Testing

Tested Technology:	RFID	
Power Supply Requirement:	Nominal	12 V
Type of Unit:	Transceiver	
Modulation:	AM	
Transmit Frequency:	119 kHz	

3.5. Support Equipment

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

Description:	Net2 1 door ACU with 2A PSU in plastic cabinet
Brand Name:	Net2 1 door ACU with 2A PSU in plastic cabinet
Model Name or Number:	411-501
Serial Number:	Not marked or stated

4. Operation and Monitoring of the EUT during Testing

4.1. Operating Modes

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

- Constantly transceiving.

4.2. Configuration and Peripherals

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

- Connected via a 5 metre multicore cable to a Net2 ACU reader port contained inside a 2A PSU cabinet. Net2 1 door ACU was connected to a 120 VAC 50 Hz supply for all tests

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:

Test Engineer:	Patrick Jones	Test Date:	08 Junes 2011
Test Sample:	Not Stated		

FCC Part:	15.207
Test Method Used:	As detailed in ANSI C63.10 Section 6.2 referencing ANSI C63.4

Environmental Conditions:

Temperature (°C):	25
Relative Humidity (%):	24

Results: Live/Quasi Peak

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.150000	Live	45.1	66.0	20.9	Complied
0.163500	Live	37.9	65.3	27.4	Complied
0.208500	Live	36.8	63.3	26.5	Complied
0.276000	Live	31.1	60.9	29.8	Complied
0.429000	Live	37.5	57.3	19.8	Complied
24.225000	Live	30.3	60.0	29.7	Complied

Results: Live/Average

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.154500	Live	30.4	55.8	25.4	Complied
0.177000	Live	29.7	54.6	24.9	Complied
0.204000	Live	26.9	53.4	26.5	Complied
0.424500	Live	25.8	47.4	21.6	Complied
0.433500	Live	30.6	47.2	16.6	Complied
0.658500	Live	16.8	46.0	29.2	Complied
27.816000	Live	18.3	50.0	31.7	Complied
28.293000	Live	19.2	50.0	30.8	Complied
28.536000	Live	18.3	50.0	31.7	Complied
28.774500	Live	15.0	50.0	35.0	Complied
29.013000	Live	15.3	50.0	34.7	Complied
29.251500	Live	16.8	50.0	33.2	Complied
29.490000	Live	19.5	50.0	30.5	Complied
29.733000	Live	18.4	50.0	31.6	Complied

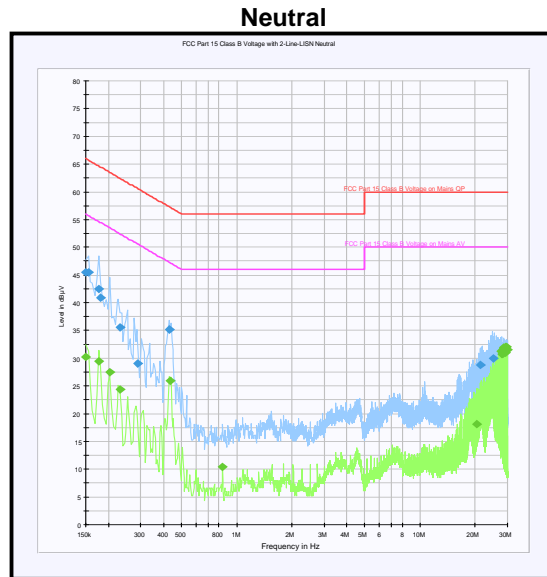
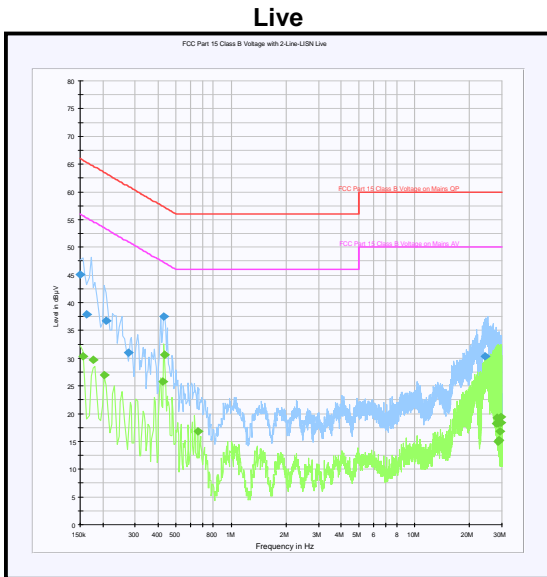
Transmitter AC Conducted Spurious Emissions (continued)**Results: Neutral/Quasi Peak**

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.150000	Neutral	45.4	66.0	20.6	Complied
0.154500	Neutral	45.4	65.8	20.4	Complied
0.177000	Neutral	42.4	64.6	22.2	Complied
0.181500	Neutral	40.9	64.4	23.5	Complied
0.231000	Neutral	35.6	62.4	26.8	Complied
0.289500	Neutral	29.0	60.5	31.5	Complied
0.429000	Neutral	35.2	57.3	22.1	Complied
21.327000	Neutral	28.8	60.0	31.2	Complied
25.165500	Neutral	30.0	60.0	30.0	Complied

Results: Neutral/Average

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.150000	Neutral	30.2	56.0	25.8	Complied
0.177000	Neutral	29.4	54.6	25.2	Complied
0.204000	Neutral	27.5	53.4	25.9	Complied
0.231000	Neutral	24.3	52.4	28.1	Complied
0.433500	Neutral	25.9	47.2	21.3	Complied
0.838500	Neutral	10.4	46.0	35.6	Complied
20.490000	Neutral	18.1	50.0	31.9	Complied
27.798000	Neutral	31.2	50.0	18.8	Complied
28.041000	Neutral	30.8	50.0	19.2	Complied
28.279500	Neutral	30.8	50.0	19.2	Complied
28.518000	Neutral	31.7	50.0	18.3	Complied
28.756500	Neutral	31.9	50.0	18.1	Complied
28.999500	Neutral	31.4	50.0	18.6	Complied
29.238000	Neutral	31.1	50.0	18.9	Complied
29.476500	Neutral	32.0	50.0	18.0	Complied
29.715000	Neutral	32.1	50.0	17.9	Complied
29.958000	Neutral	31.6	50.0	18.4	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 Fundamental Field Strength**Test Summary:**

Test Engineer:	Andrew Edwards	Test Date:	11 June 2011
Test Sample Serial No:	345-220		

FCC Part:	15.209
Test Method Used:	As detailed in ANSI C63.10 Section 6.4

Environmental Conditions:

Temperature (°C):	27
Relative Humidity (%):	22

Results: Quasi Peak

Frequency (kHz)	Antenna Polarity	Level (dB μ V/m)	Limit at 300 m (dB μ V/m)	Margin (dB)	Result
119.764	90° to EUT	0.4	26.1	25.7	Complied

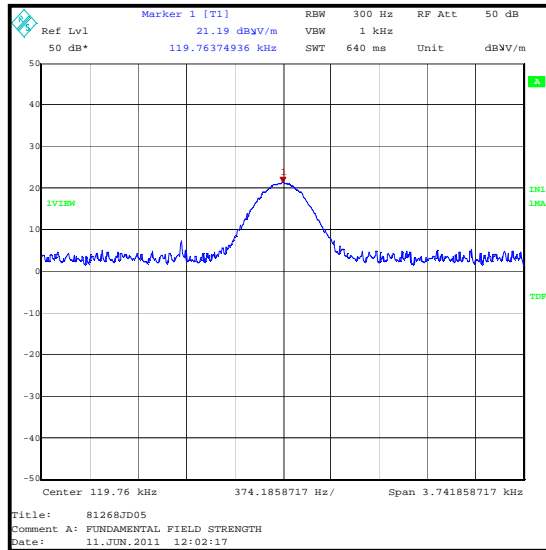
Note(s):

1. The limit is 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 using the square of an inverse linear distance extrapolation factor (40dB/decade).
2. A transducer factor on the measuring instrument was used to extrapolate the results at 3 metres to a distance of 30 metres. The transducer factor has a 40 dB extrapolation at a distance of 30 metres (1 decade). Measurements below 490 kHz should be performed at a distance of 300 metres (2 decades) therefore another 40 dB was subtracted from the measured value. The quasi peak level was measured as 20.4 dB μ V/m – 40 = -19.6 dB μ V/m.

Note: An additional 20 dB has been added to attain the final value shown in the table; this is to account for a transducer factor that was not included during the original measurement.

$$i.e.: -19.6 \text{ dB}\mu\text{V/m} + 20 \text{ dB} = 0.4 \text{ dB}\mu\text{V/m}$$

Transmitter Fundamental Field Strength (continued)



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

Test Engineer:	Andrew Edwards	Test Date:	11 June 2011
Test sample serial No	Not Stated		

FCC Part:	15.209
Test Method Used:	As detailed in ANSI C63.10 Section 6.3 and 6.5 referencing ANSI C63.4
Frequency Range:	30 MHz to 1000 MHz

Environmental Conditions:

Temperature (°C):	27
Relative Humidity (%):	22

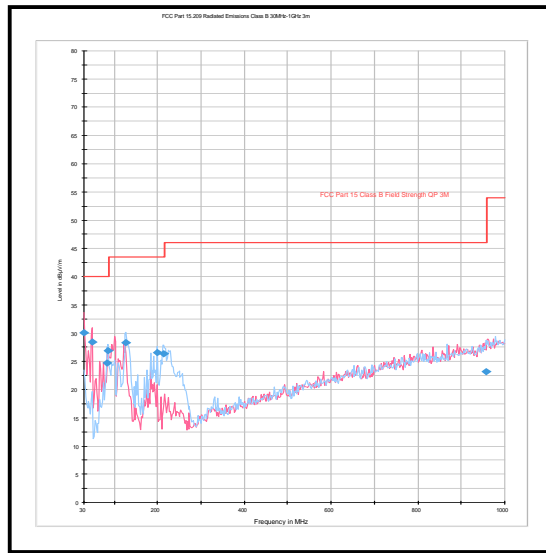
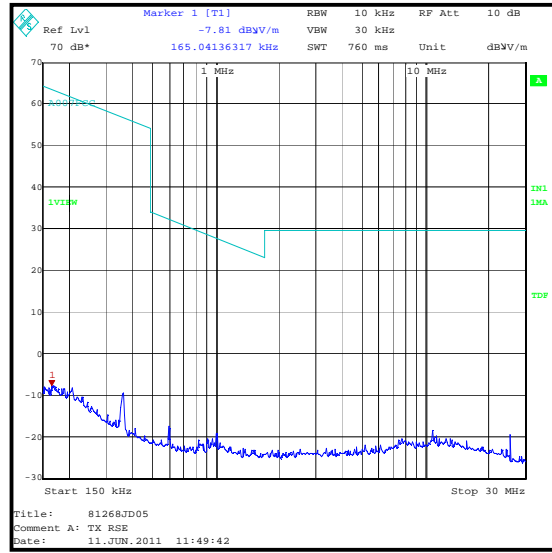
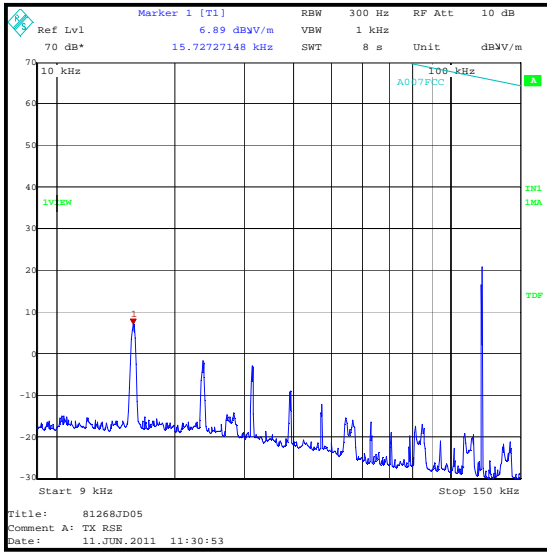
Results: Quasi Peak

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
30.197	Vertical	30.0	40.0	10.0	Complied
49.232	Vertical	28.5	40.0	11.5	Complied
82.942	Horizontal	24.7	40.0	15.3	Complied
86.012	Horizontal	26.9	40.0	13.1	Complied
126.353	Horizontal	28.3	43.5	15.2	Complied
199.085	Horizontal	26.6	43.5	16.9	Complied
213.817	Horizontal	26.3	43.5	17.2	Complied
957.634	Horizontal	23.1	46.0	22.9	Complied

Note(s):

1. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss.
2. All other emissions shown on the pre-scan plot were investigated and found to be ambient or >20 dB below the applicable limit or below the measurement system noise floor.
3. Measurements below 1 GHz were performed in a semi-anechoic chamber (RFI Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.
4. 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 using the square of an inverse linear distance extrapolation factor (40dB/decade).
5. A transducer factor on the measuring instrument was used to extrapolate the results at 3 metres to a distance of 30 metres where required. A distance extrapolation factor of 40 dB was used.
6. The emission shown at approximately 119 kHz is the fundamental.

Transmitter Radiated Spurious Emissions (continued)



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

5.2.4. Transmitter 20 dB Bandwidth

Test Summary:

Test Engineer:	Andrew Edwards	Test Date:	11 June 2011
Test Sample Serial No:	Not Stated		

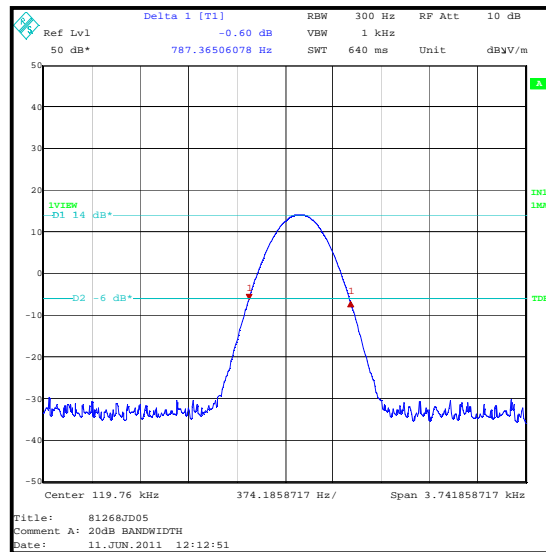
FCC Part:	15.215(c)
Test Method Used:	As detailed in ANSI C63.10 Section 6.9.1

Environmental Conditions:

Temperature (°C):	27
Relative Humidity (%):	22

Results:

20 dB Bandwidth (Hz)
787



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".

Measurement Type	Range	Confidence Level (%)	Calculated Uncertainty
AC Conducted Spurious Emissions	0.15 MHz to 30 MHz	95%	±3.25 dB
20 dB Bandwidth	119 kHz	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.

7. Report Revision History

Version Number	Revision Details		
	Page No(s)	Clause	Details
2.0	-	-	Previous Version
3.0	12	-	Corrected previously reported emission level by +20 dB. Corrected limit and included 30 to 300 metre distance extrapolation.

Appendix 1. Test Equipment Used

UL No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval
A1830	Pulse Limiter	Rhode & Schwarz	ESH3-Z2	100668	05 Mar 2012	12
A1834	Attenuator	Hewlett Packard	8491B	10444	30 Jun 2011	12
A649	LISN	Rohde & Schwarz	ESH3-Z5	825562/008	05 Apr 2012	12
A553	Antenna	Chase	CBL6111A	1593	26 Mar 2012	12
K0001	5m Semi-Anechoic Chamber	Rainford EMC	N/A	N/A	29 May 2012	12
M1263	Test Receiver	Rohde & Schwarz	ESIB7	100265	28 Jun 2011	12
M1273	Test Receiver	Rohde & Schwarz	ESIB 26	100275	04 Feb 2012	12
M1568	Antenna	Rohde & Schwarz	HFH2-Z2	879284/2	27 Jan 2012	12

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

--- END OF REPORT ---