



HURSLEY
EMC
SERVICES

EMC TEST REPORT

No. 15R001 FR

Issue#2: 23rd April 2015

UKAS Accredited
EU Notified Body
FCC & VCCI Registered
BSMI Lab ID: SL2-IN-E-3008
KC Lab ID: EU0184

FCC Part 15C Certification Report for the ACCESS-IS NFC RFID Card Reader

FCC ID: ZERNM01

Project Engineer:
R. Pennell

Approval Signatory

Approved signatories: R. P. St John James S. M. Connolly J. A. Jones

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Document History:

Issue#1: 12th January 2015 was withdrawn and replaced by Issue#2: references to standards and sections corrected, photos added.

1.0 DECLARATION

1.1 FCC Part 15C Statement

The Equipment Under Test (EUT) operates at a transmit frequency of 13.56 MHz and complies with CFR 47 part 15.225 emission requirements.

For emissions outside the 13.110-13.410 MHz band the EUT, as described and reported within this document, complies with the part 15.209 of the CFR 47 FCC rules for radiated emissions under 30MHz..

The EUT uses passive tags without their own power source and will only work when collocated with the EUT.

1.2 Related Submittal(s) Grants

None

1.3 EUT Manufacturer

| | |
|-------------------------|---|
| Trade name: | Access-IS Ltd |
| Company name: | Access-IS Ltd |
| Company address: | 18 Suttons Business Park Reading Berkshire RG6 1AZ United Kingdom |
| Manufacturing address: | As above. |
| Company representative: | Mr Mohamed Ismail Bari Tel: +44 (0) 118 966 3333 |

2.0 EUT DESCRIPTION

2.1 Identity

| | |
|------------------------|----------------------|
| EUT: | NFC RFID Card Reader |
| Serial numbers: | 10615802#1 |
| Sample build: | N/A |
| Powered: | USB |

2.2 Product Operation

The NFC RFID reader (EUT) device operates at the frequency of 13.56MHz.

2.3 Support Equipment

Dell Laptop Model Precision M90 S/N 247MG3J with Windows XP0 and Dell power supply Model DA130PE1-00 (no serial number)

2.4 Exerciser Program

For the purpose of testing the following program was used to monitor the device under test.

Software: "Realterm"

Settings Display: (Hex Space), Port: (Baud 115200) (Port 30)

The software was running on the Laptop with the software active the EUT continually transmitted, The EUT was tested without tags placed on EUT

During radiated emissions the EUT was connected to the Dell laptop via two 10m USB cables with the laptop outside of the measurement chamber or the open area test site.

3.0 MEASUREMENT PROCEDURE AND INSTRUMENTATION

3.1 EMI Site Address & Test Date

| | |
|----------------------|---|
| EMI Company Offices | Hursley EMC Services Ltd Trafalgar House , Trafalgar Close, Chandlers Ford, Eastleigh Hampshire, SO53 4BW , UK |
| EMI Measurement Site | Hursley EMC Services Ltd Hursley Park, Winchester, SO21 2JK, UK; FCC Registered UK Designation number: UK0006 Canada Registration Number: 7104A |
| Test Dates | 05 th January 2015 |
| HEMCS References: | 15R001 |

3.2 General Operating Conditions

Testing was performed according to the procedures in FCC - †ANSI C63.4:2009. Initial H-field scans were performed at an EUT to antenna distance of 3m in the anechoic test chamber. Final H-field radiated testing was performed at an EUT to antenna distance of 30 metres (below 30 MHz).

Instrumentation, including receiver and spectrum analyser bandwidth, comply with the requirements of ANSI C63.2:1996.

Note: † This test standard is not currently included in the UKAS Accreditation Schedule for Hursley EMC Services.

3.3 Environmental Ambient

| Test Type | Temperature | Humidity | Atmospheric Pressure |
|-----------|----------------------|--------------|----------------------|
| Radiated | 15.9 degrees Celsius | 98% relative | 1019 millibars |

3.4 Radiated Emissions

Initial Scan

Below 30 MHz the loop antenna was set at a height of 1m, the EUT was measured with the antenna in the vertical and horizontal polarity and for each polarity a radiated emission profile obtained by revolving the system on the turntable. Instrumentation used in the chamber as below:

| #ID | CP | Manufacturer | Type | Serial No | Description | Calibration due date |
|-----|----|-----------------|---------|------------|----------------------------------|----------------------|
| 040 | 1 | HP | 8593EM | 3536A00137 | Spectrum analyser (9kHz-26.5GHz) | 10/10/2014 |
| 050 | 1 | HP | 8447D | 1937A02341 | Pre-amplifier (30-1000MHz) | Internal |
| 552 | 1 | Rohde & Schwarz | ESCI 7 | 1166595007 | CISPR 7GHz Receiver | 17/04/2015 |
| 242 | 3 | Rohde & Schwarz | HFH2-Z2 | 881056/4 | Loop antenna (9kHz-30MHz) | 31/05/2015 |

The data obtained from the profile scan was used as a guide for the final Open Area Test Site (OATS) measurements.

Final Measurements

The system under test was transferred to the OATS from the semi-anechoic chamber. The data obtained from the chamber profile-scan was used to guide the test engineer. Below 30 MHz the loop antenna was set at a height of 1m, the EUT was measured with the antenna in the vertical and horizontal polarity and each emission was maximised by revolving the system on the turntable. The worst-case data is presented in this report. Test instrumentation used in the OAT's measurements was as follows:

| #ID | CP | Manufacturer | Type | Serial No | Description | Calibration due date |
|-----|----|-----------------|---------|-----------|---------------------------|----------------------|
| 242 | 3 | Rohde & Schwarz | HFH2-Z2 | 881056/4 | Loop antenna (9kHz-30MHz) | 31/05/2015 |
| 289 | 1 | R & S | ESCI7 | 100765 | 7GHz Receiver | 12/06/2015 |

CP = Interval period [year] prescribed for external calibrations

Note: 'Calibration due date' means that the instrument is certified with a UKAS or traceable calibration certificate.
'*' denotes that the calibration, as defined by Hursley EMC Services quality system, remains valid whilst within four calendar months of the due date.

3.5 FCC – Radiated Emissions (Transmitting)

A search was made of the frequency spectrum from 9 kHz to 30MHz and the measurements reported are the highest emissions relative to the 'FCC CFR 47 Section 15.209 and 15.225. Below 30 MHz the results have been measured at 30m.

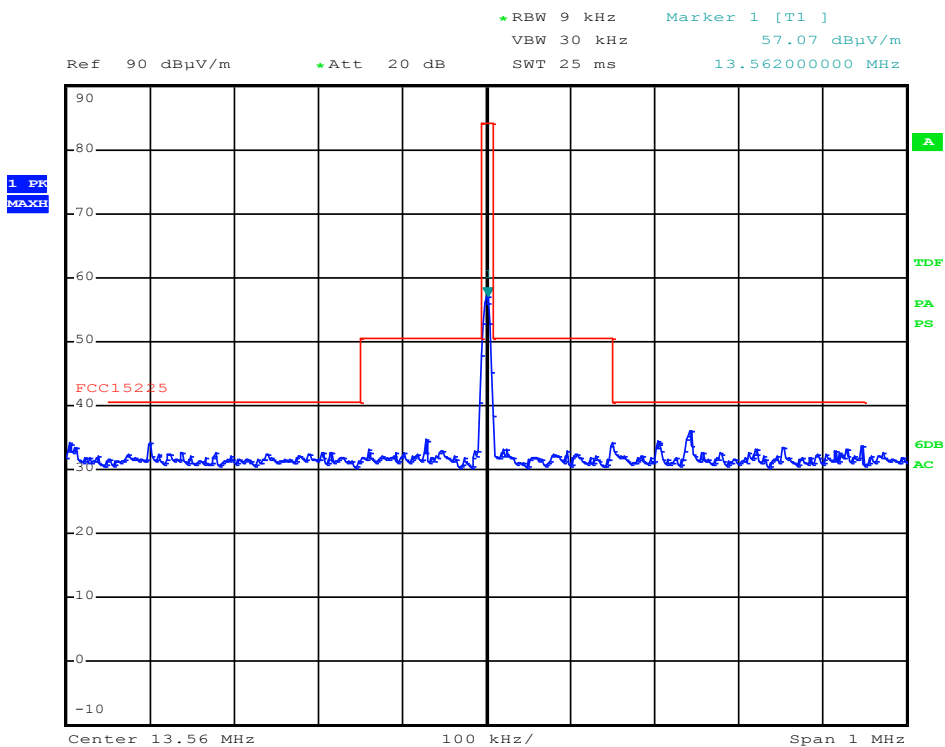
Measurements were made using a quasi-peak detector with a 9kHz bandwidth below 30MHz The only significant emission was from the transmitter at 13.56MHz. There is no idle state to test.

RESULTS - 9 kHz to 30 MHz

| Frequency MHz | Receiver amplitude dB μ V | Antenna factor db | Measured amplitude @ 30m dB μ V/m | Specified limit @ 30m | |
|------------------|-------------------------------------|-------------------------|--|--------------------------|-----------|
| | | | | dB μ V/m | μ V/m |
| 13.560 | 42.40 | 20 | 62.40 | 84.0 | 15,848 |
| 13.554 | 33.26 | 20 | 53.26 | 84.0 | 15,848 |
| 13.566 | 37.98 | 20 | 57.98 | 84.0 | 15,848 |
| 13.567 | 29.44 | 20 | 49.44 | 50.5 | 334 |
| 13.553 | 17.85 | 20 | 37.85 | 50.5 | 334 |
| 13.700 | 17.36 | 20 | 37.36 | 50.5 | 334 |
| 13.420 | 12.41 | 20 | 32.41 | 50.5 | 334 |
| 13.410 | 10.56 | 20 | 30.56 | 40.5 | 106 |
| 13.710 | 19.46 | 20 | 39.46 | 40.5 | 106 |
| 13.110 | -15.83 | 20 | 4.17 | 29.5 | 30 |
| 14.010 | -17.22 | 20 | 2.78 | 29.5 | 30 |

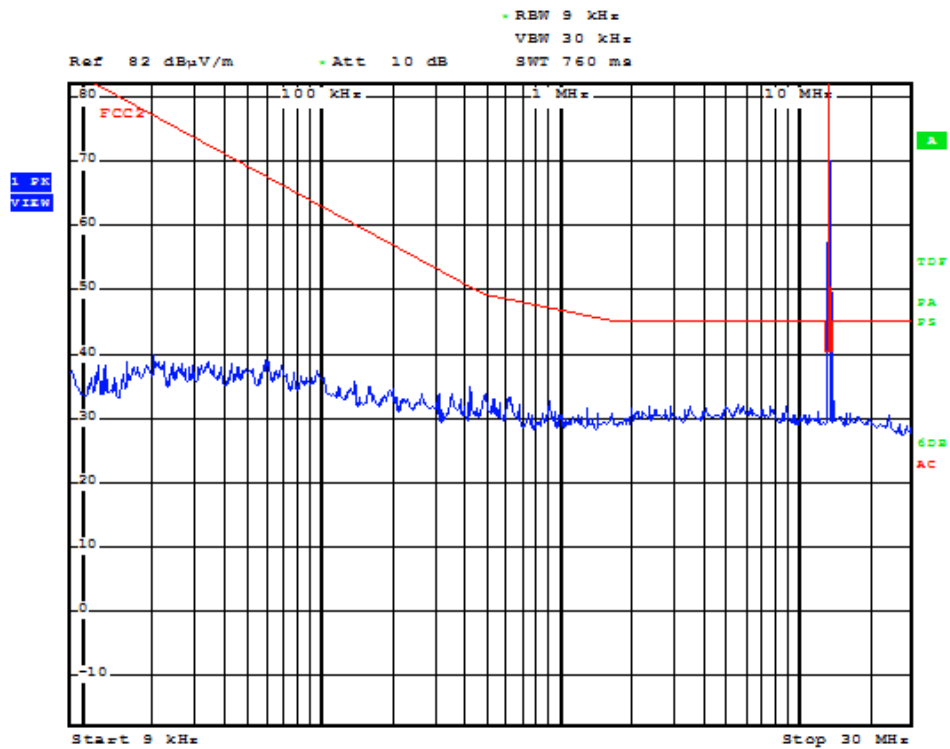
The attached plot shows the transmitter emission relative to the FCC part 15.225 limit envelope/mask.

3.6 Transmitter Mask



Date: 5.JAN.2015 17:11:25

3.7 Emissions Plots



4.0 PHOTO LOG



5.0 FCC DETAILS

FEDERAL COMMUNICATIONS COMMISSION

Laboratory Division
7435 Oakland Mills Road
Columbia, MD 21046

February 13, 2006

Hursley EMC Services Ltd.
Unit 16
Brickfield Lane
Chandlers Ford - Hampshire, SO53 4DB
United Kingdom
Attention: R P St John James

Re: Accreditation of Hursley EMC Services Ltd.
Designation Number: UK0006

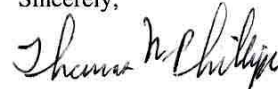
Dear Sir or Madam:

We have been notified by Department of Trade and Industry (DTI) that Hursley EMC Services Ltd. has been accredited as a Conformity Assessment Body (CAB).

At this time your organization is hereby designated to perform compliance testing on equipment subject to Declaration Of Conformity (DOC) and Certification under Parts 15 and 18 of the Commission's Rules.

This designation will expire upon expiration of the accreditation or notification of withdrawal of designation.

Sincerely,



Thomas Phillips
Electronics Engineer