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Electromagnetic Compatibility

Test of: RF Card Entry Reader

Model Number: 20381

Applicant: PAC International Ltd

Test Type: Compliance

Test Specification: FCC CFR47, part 15.209
(up-to 30 MHz) only.

Test Result: Complied

SGS Serial Number: DUR 24095.3/EMC/LS/02

Date of Receipt: 20th June 2002

Date of Test(s): 20th June 2002

Date of Issue: 10th January 2003

Issue Number: 3

This report refers only to the sample submitted for test.

This report shall not be reproduced except in full without the written approval of the testing laboratory.

Test Engineer

L.Steel

Authorised Signatory

A. Reynard
Technical Manager

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1. Client Information

Company Name: PAC International Ltd

Address: 1 Park Gate Close,
Bredbury,
Stockport,
SK6 2SZ.

Contact Person: Shaun Byrne

Telephone: 0161 406 3400

Facsimile: 0161 430 8658

2. Details Of Test Laboratory

Company Name: SGS International Electrical Approvals

UKAS Accreditation Number: 1116

Address: South Industrial Estate,
Bowburn,
Co. Durham,
DH6 5AD.

Contact Persons: Mr Alan Reynard

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3. Equipment Under Test (EUT)

3.1 Identification Of EUT

Model Number:	20381
Unique Identifier:	1973717
Description of EUT:	RF Card Entry Reader
Internal Clock Frequencies: (Maximum)	614 kHz
Supply Voltage:	12V DC from a Controller (Controller supply = 120 V AC, 60 Hz)
Classification:	Intentional and Unintentional Radiator
Accessories Supplied:	21446/2 Easikey 1000+ Controller (Manufactured by PAC International)

4. Test Specification, Methods and Procedures

4.1 Test Specification(s)

Specification(s)	Title
FCC CFR 47 : October 1999 Part 15.209 only	Code Of Federal Regulations

4.2 Purpose Of Test

To perform the radiated emissions test to the above specification in the frequency range 9 kHz to 30 MHz only, as requested by the client.

4.3 Methods and Procedures

The standard listed above refers to the following tests: -

CFR 47 Clause	Test
15.209	Radiated Emissions

5. Deviations or Exclusions from the Test Specifications

There were no deviations from the test specifications.

6. Operation of the EUT During Testing / Configuration and Peripherals

6.1 Operation of EUT during testing.

Refer to individual test results sections for details of EUT operation during testing.

6.2 Configuration and Peripherals

The EUT was connected to a controller, (Manufacturer: PAC International, Model No: 21446/2, Serial No: Not supplied) in order to provide power to the EUT. The controller was not placed on the test support during tests, since the controller front panel is an intentional transmitter also, which operates at the same frequency as the EUT.

The controller had its ports terminated as follows:

- i) relay ports – 1m leads attached with 150 ohm terminating resistors
 - ii) Tamper/Override, six wire bus port, printer RS232 port – 1m leads attached with 150 ohm resistors in series with a 100 nF capacitors as terminations
-

7. Test Results

7.1 General Comments

The test methods used are referred to in the individual test results sections of this test report.

7.2 Modifications Made to the EUT

No modifications were made to the EUT during the testing process.

7.3 Summary of Test Results

CFR 47 Clause	Test	Result
15.209 (Up-to 30 MHz)	Radiated Emissions	Complied

Result

In the configuration tested, the EUT complies with the requirements of Clause 15.209 of CFR 47 : October 1999, up-to a frequency of 30 MHz.

7.4 Radiated Emissions Test Results – 15.209

CFR Clause	15.209
Frequency Range	9 kHz to 30 MHz

Operating Mode

The compliance test was performed with an authorised card presented to the reader.

Test Results**Peak Measurements**

Frequency MHz	Corrected Peak Measurement** (dB μ V/m)	Limit (dB μ V/m)	Measurement Distance (metres)
*0.154	-18.26	23.5	300
0.309	-38.60	17.80	300
0.463	-46.15	14.29	300
¹ 0.250	-53.98	19.64	300
¹ 0.400	-53.98	15.56	300
¹ 0.550	-14.08	32.79	30
¹ 0.700	-14.08	30.70	30
¹ 0.850	-14.08	29.01	30
¹ 0.900	-14.08	28.51	30

*Indicates EUT carrier frequency. The supply voltage to the controller was varied between 85% and 115% to maximise the carrier level.

¹Indicates typical noise floor figures of test equipment.

Test Method

As per ANSI 63.4 : 1992

** Measurements performed at a test distance of 1m and extrapolated to correct distance of 300m and 30m respectively using a factor of 40 dB/decade. Hence a correction factor of – 99.08 for 300m and –59.08 for 30m was used. The corrected levels are shown above.

Measurement detector details: Peak Detector, 300 Hz bandwidth where $F \leq 150\text{kHz}$, 10 kHz bandwidth where $F > 150\text{ kHz}$

Radiated Emissions Test Configuration**Radiated Emissions Environmental Conditions**

Power Supply (to controller)	120V AC, 60 Hz
Temperature	13°C
Relative Humidity	59%
Barometric Pressure	976mb

Radiated Emissions Measurement Uncertainties

Frequency	± 200kHz
Amplitude	± 4.6dB

The uncertainties stated are calculated in accordance with the requirements of UKAS with a confidence level of 95%.

Test Equipment Used

Equipment Type	Model Number	Last Calibration Date
Loop Antenna	EMCO 6502	Dec 00
Spectrum Analyser	HP8563E	Nov 00