



RR-032-C42-08-103330-5-A

RADIO MEASUREMENT TESTS REPORT

According to the standard:
FCC part 15 Edition 2007

Equipment under test:
MA520W Pack 1



Company:
SAGEM SECURITE

FCC listed: 910 701

Distribution: Mr BERNARD

(Company: SAGEM SECURITE)

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NAME OF THE EQUIPMENT UNDER TEST (E.U.T.) : BIOMETRIC ACCESS CONTROL TERMINAL

Serial number : MA 520W : Pack 1 (motherboard V1 / camera card V2)

Part number : To see photographs

Software Version : Not Communicated

MANUFACTURER'S NAME : SAGEM SECURITE

APPLICANT'S ADDRESS:

Company : SAGEM SECURITE

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FRANCE

Person present during the tests : Mr BERNARD

Responsibles : Mr BERNARD & Mr SANDRAZ

DATES OF TESTS : 2008, 29th of September and 1st of October

TESTS LOCATIONS : Laboratory EMITECH of Montigny-Le-Bretonneux (78) and open area test site of AUNAINVILLE (28)

TESTS SUPERVISOR : E. COEURET

TESTS OPERATORS : L. BOMBA & B. PELLERIN

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1. INTRODUCTION

This document submits the results of Electromagnetic Compatibility tests performed on the equipment « MA 520W» (denominated hereafter E.U.T.: equipment under test) according to documents listed below.

2. REFERENCE DOCUMENTS

FCC part 15 Edition 2007

Code of federal regulations.

Title 47 – Telecommunication.

Chapter 1 – Federal communication commission.

Part 15 – Radio frequency devices.

Subpart B – Unintentional radiators.

Limits and methods of measurement of radio disturbance. Characteristic of information technology equipment.

Spectrum Management and Telecommunications Policy

Interference-Causing Equipment Standard ICES-001 Issue 4 (draft) July 2004

Industrial, Scientific and Medical (ISM) Radio Frequency Generators

Canadian Standards Association Standard CAN/CSA-CEI/IEC CISPR 11:04

Industrial, Scientific and Medical (ISM) Radio-Frequency Equipment – Electromagnetic Disturbance Characteristics – Limits and Methods of Measurement.

3. EQUIPMENT UNDER TEST CONFIGURATION

Equipment under test (E.U.T.) description:

Equipment under test is a biometric access control terminal. It is powered to mains 12 Vdc (750 mA) or POE switch.

Cycle and operating mode during emission tests:

Communication Equipment.

Equipment modifications applied during tests: Yes, we must put a shield on the video card.

Product Description:

| | |
|----------------------------|------------------------------|
| ITU Emission code: | - |
| Class: | B |
| Operating frequency range: | 13.110 MHz - 14.010MHz |
| Number of channels: | - |
| Channel spacing: | - |
| Frequency generation: | - |
| Modulation: | - |
| Power source: | 12Vdc (750mA) or POE switch. |

4. SUMMARY OF TEST RESULTS

| Test procedure | Designation of test | Test results | | | | Comments |
|----------------|--|--------------|------|------|------|----------|
| | | Pass | Fail | N.A. | N.P. | |
| 15.107 | Measurement of conducted emission on AC mains ports | | | X | | |
| 15.109 | Unintentional radiated emissions in the band 9 kHz - 1 GHz | | X | | | |

N.P.: Not Performed.

N.A.: Not Applicable.

5. RADIATED EMISSION IN OPEN AREA TEST SITE*Temperature (°C):* 13*Humidity (%HR):* 80*Air pressure (hPa):* 996**Standard:** FCC PART 15: 2007**Sections:** 15.109**Equipment under test arrangement:**

The equipment under test (EUT) is placed on a non-conductive test table at 0.8 m above the horizontal metal ground plane.

For maximum meter reading at each frequency, the antenna height is adjusted between 1 m and 4 m above the ground plane. A 360 degrees rotation of the EUT is performed in vertical and horizontal polarization. The frequency azimuth and antenna height are presented in the table on the next pages.

The equipment is in continuous transmission.

Frequency range: 9 kHz - 1 GHz**Detection mode:** Quasi-peak (for 9 kHz - 30 MHz)
Quasi-peak (for 30 MHz - 1 GHz)**Resolution bandwidth:** 9 kHz (for 9 kHz - 30 MHz)
120 kHz (for 30 MHz - 1 GHz)**Measurement distance:** 10 meters (for 9 kHz - 30 MHz)
3 meters (for 30 MHz - 1 GHz)**Test method deviation:** In communication.

Limit:

| Frequency range (MHz) | Limit (dB μ V/m) |
|-----------------------|----------------------|
| 30 to 88 | 40.0 |
| 88 to 216 | 43.5 |
| 216 to 960 | 46.0 |
| 960 to 5000 | 54.0 |

Test equipment list:

| CATEGORY | BRAND | TYPE | Nr EMITECH |
|-------------------|-----------------------|-------------|------------|
| Antenna | Schwarzbeck | UHALP 9108 | 3106 |
| Antenna | Schwarzbeck | VHBA 9123 | 1144 |
| Antenna | Rohde & Schwarz | HFH2-Z2 | 0315 |
| Antenna mast | HD GmbH | HD 100 | 2342 |
| Antenna mast | HD GmbH | MA 240 | 2341 |
| Cable | Câbles & Connectiques | N-13m | 2452 |
| Cable | Câbles & Connectiques | N-2m | 2451 |
| Cable HF | Câbles & Connectiques | HF-12m | 2450 |
| Cable | Cables & Connectiques | N-7m | 6087 |
| Cable | - | N-30m | 4359 |
| OATS | Emitech | Aunainville | 0187 |
| Receiver | Rohde & Schwarz | ESVP | 1057 |
| Receiver | Rohde & Schwarz | ESH3 | 0181 |
| Power supply | SODILEC | SDR 60/10 | 0213 |
| Spectrum analyzer | Rohde & Schwarz | FSP40 | 5175 |

Results:

● Power supply 12Vdc:

| FREQUENCY (MHz) | POLARIZATION | AZIMUT (degrees) | Gant (dBi) | Pcab (dB) | MEASURE (dB μ V/m) | LIMIT (dB μ V/m) |
|-----------------|--------------|------------------|------------|-----------|------------------------|----------------------|
| 13.5598 | 45° | 0 | - 30.9 | 0.9 | 46.3 | 104 |
| 27.1200 | 45° | 0 | - 27.3 | 1.2 | 31.3 | 49 |

$$M \text{ (dB}\mu\text{V/m)} = V_{\text{max}} - G_{\text{ant}} + P_{\text{cab}} + 51.5$$

| FREQUENCY (MHz) | POLARIZATION | ANTENNA HEIGHT (cm) | AZIMUT (degrees) | MEASURE (dB μ V/m) | LIMIT (dB μ V/m) |
|-----------------|--------------|---------------------|------------------|------------------------|----------------------|
| 40.674 | V | 100 | 253 | 31.3 | 40.0 |
| 144.005 | V | 100 | 347 | 41.1 | 43.5 |
| 192.196 | V | 100 | 187 | 38.4 | 43.5 |
| 287.900 | V | 200 | 0 | 38.4 | 46.0 |
| 383.997 | V | 100 | 327 | 41.3 | 46.0 |
| 480.036 | V | 123 | 0 | 37.7 | 46.0 |
| 629.217 | V | 100 | 355 | 32.2 | 46.0 |
| 143.993 | H | 114 | 0 | 32.2 | 43.5 |
| 191.994 | H | 146 | 6 | 39.6 | 43.5 |
| 288.078 | H | 110 | 32 | 39.8 | 46.0 |
| 384.016(*) | H | 100 | 0 | 48.0 | 46.0 |

V: Vertical

H: Horizontal

(*): To solve the problem requires a shield for the video card.

● POE switch:

| FREQUENCY (MHz) | POLARIZATION | AZIMUT (degrees) | Gant (dBi) | Pcab (dB) | MEASURE (dBμV/m) | LIMIT (dBμV/m) |
|-----------------|--------------|------------------|------------|-----------|------------------|----------------|
| 13.5598 | 45° | 0 | - 30.9 | 0.9 | 45.3 | 104 |
| 27.1200 | 45° | 0 | - 27.3 | 1.2 | 30.6 | 49 |

$$M \text{ (dB}\mu\text{V/m)} = V_{\text{max}} - G_{\text{ant}} + P_{\text{cab}} + 51.5$$

30MHz to 1GHz: Not done waiting shielding on the video card.

Test conclusion:

The equipment does not comply with the requirements of the standard FCC part 15.
Must add a shield on the video card.

□□□ End of report, 2 annexes to be forwarded □□□

ANNEX 1:

ANTENNA FACTORS, INSERTION LOSSES AND AMPLIFIER VALUES

BILL OF MATERIAL

The test antenna used for the radiated emission between 30 MHz and 300 MHz is the biconical antenna n°1144. Antenna factors are given in table 1.

The test antenna used for the radiated emission between 300 MHz and 1 GHz is the log-periodic antenna n°3106. Antenna factors are given in table 2.

The test antenna used for the radiated emission between 9 kHz and 30 MHz is the frame antenna n°0315. Antenna factors are given in table 3.

The measuring receiver n°0181 used in the frequency range 9 kHz and 30 MHz has an integrated preamplifier.

The measuring receiver n°1057 used in the frequency range 30 MHz to 1 GHz has an integrated preamplifier.

The test cable used between 9 kHz and 30 MHz to connect the antennas to the receiver for measurements at a distance of 10 meters has losses given in table 4.

The test cable used between 30 MHz and 1 GHz to connect the antennas to the receiver for measurements at a distance of 3 meters has losses given in table 5.

| Frequency (MHz) | Antenna factor (dB/m) | Frequency (MHz) | Antenna factor (dB/m) |
|-----------------|-----------------------|-----------------|-----------------------|
| 30 | 12.5 | 120 | 10.9 |
| 35 | 10.4 | - | - |
| 40 | 9.3 | 140 | 11.1 |
| 45 | 8.9 | - | - |
| 50 | 8.4 | 160 | 12.9 |
| 60 | 8.5 | - | - |
| 70 | 8.5 | 180 | 14.1 |
| 80 | 9.2 | 200 | 15.8 |
| 90 | 9.5 | - | - |
| 100 | 10.0 | - | - |

TABLE 1 : BICONICAL ANTENNA

| Frequency (MHz) | Antenna factor (dB/m) | Frequency (MHz) | Antenna factor (dB/m) |
|-----------------|-----------------------|-----------------|-----------------------|
| 200 | 23.2 | - | - |
| 300 | 14.4 | 700 | 20.8 |
| 400 | 16.3 | 800 | 21.2 |
| 500 | 17.7 | 900 | 21.9 |
| 600 | 19.3 | 1000 | 22.5 |

TABLE 2 : LOG-PERIODIC ANTENNA

| Frequency (MHz) | Antenna factor (dB μ A/m) | Frequency (MHz) | Antenna factor (dB μ A/m) |
|-----------------|-------------------------------|-----------------|-------------------------------|
| 0.009 | -24.3 | 10 | -31.1 |
| 0.01 | -24.9 | 15 | -30.7 |
| 0.02 | -28.4 | 20 | -29.5 |
| 0.05 | -30.5 | 25 | -28.0 |
| 0.1 | -31.1 | 30 | -26.6 |
| 0.2 | -31.2 | - | - |
| 0.5 | -31.4 | - | - |
| 1 | -31.4 | - | - |
| 2 | -31.3 | - | - |
| 5 | -31.4 | - | - |

TABLE 3 : FRAME ANTENNA

| Frequency (MHz) | loss (dB) | Frequency (MHz) | loss (dB) |
|-----------------|-----------|-----------------|-----------|
| 0.009 | 0.0 | 10 | -0.7 |
| 0.05 | 0.4 | 13.56 | -0.9 |
| 0.1 | 0.4 | 15 | -1.1 |
| 0.5 | 0.4 | 20 | -1.2 |
| 1 | 0.1 | 25 | -1.3 |
| 5 | -0.6 | 30 | -1.4 |

TABLE 4 : TEST CABLE FOR 10M MEASUREMENT INTO 9kHz and 30MHz

| Frequency (MHz) | loss (dB) | Frequency (MHz) | loss (dB) |
|-----------------|-----------|-----------------|-----------|
| 30 | 0.8 | 160 | 2.0 |
| 35 | 0.9 | 180 | 2.2 |
| 40 | 1.0 | 200 | 2.3 |
| 45 | 1.1 | 250 | 2.6 |
| 50 | 1.1 | 300 | 2.8 |
| 60 | 1.2 | 400 | 3.3 |
| 70 | 1.3 | 500 | 3.7 |
| 80 | 1.4 | 600 | 4.0 |
| 90 | 1.5 | 700 | 4.3 |
| 100 | 1.6 | 800 | 4.7 |
| 120 | 1.7 | 900 | 5.0 |
| 140 | 1.9 | 1000 | 5.3 |

TABLE 5 : TEST CABLE FOR 3M MEASUREMENT INTO 30MHz and 1GHz

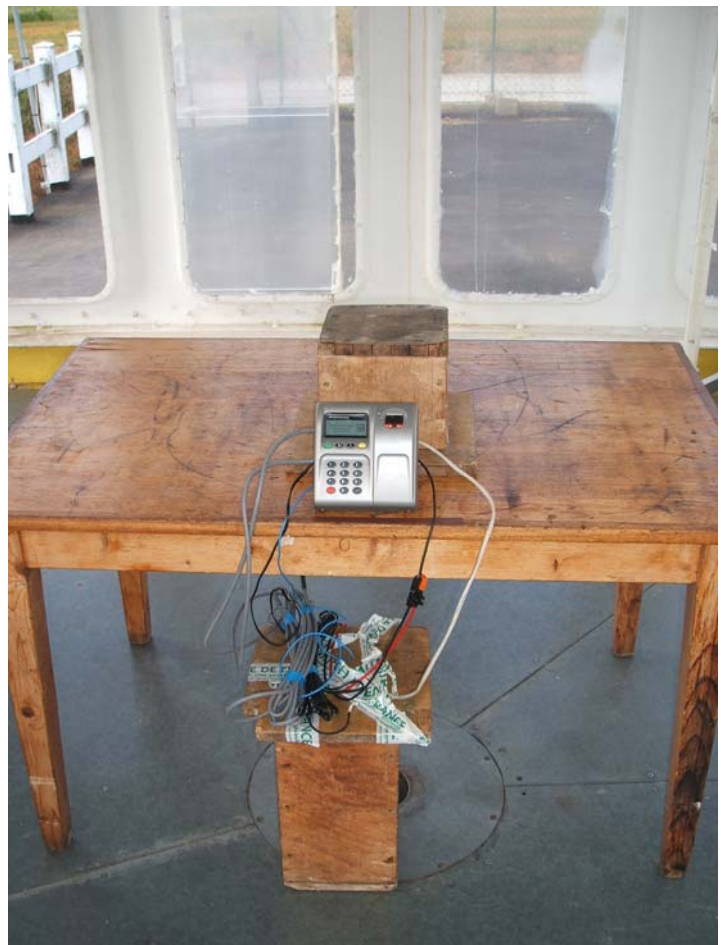
ANNEX 2:

PHOTOGRAPHIES

EQUIPMENT UNDER TEST (E.U.T.) PHOTOGRAPHIES

MA 520W

E.U.T. Photographies:



Measurement of electromagnetic field in open area test site:



Measurement of electromagnetic field in open area test site:

