RA-24-07105327-4/A Ed. 1

"This report cancels and replaces the test report n° RA-24-07105327-4/A Edition 0"

RADIO Measurement Technical Report

Standard to apply:
FCC Part 15

Equipment under test:
BIOMETRIC ACCESS CONTROL TERMINAL
MA521

FCC ID:
V7AMA521

Company:
SAGEM SECURITE

DISTRIBUTION: Mr CRUCHAGA **Company: SAGEM SECURITE**

Number of pages: 17 including 2 annexes

Ed.	Date	Modified pages	Written by Name	Visa	Technical Verification Quality Approval Name	Visa
1	23-Jul-08	6	L. BERTHAUD	LB	P. BONNENFANT	

PRODUCT:	**BIOMETRIC ACCESS CONTROL TERMINAL**
Reference / model:	MA521
Serial number:	not communicated
MANUFACTURER:	not communicated

COMPANY SUBMITTING THE PRODUCT:

Company:	SAGEM SECURITE
Address:	21, avenue du Gros Chêne 95610 ERAGNY SUR OISE FRANCE
Responsible:	Mr CRUCHAGA
DATE(S) OF TEST:	20 and 27 February 2008
TESTING LOCATION:	EMITECH ATLANTIQUE laboratory at ANGERS (49) FRANCE EMITECH ATLANTIQUE open area test site in LA POUEZE (49) FRANCE Registration Number by FCC: 101696/FRN: 0006 6490 08
TESTED BY:	L. BERTHAUD M. DUMESNIL

CONTENTS

TITLE **PAGE**

1. INTRODUCTION

This report presents the results of radio test carried out on the following equipment: BIOMETRIC ACCESS CONTROL TERMINAL MA521, in accordance with normative reference.

2. PRODUCT DESCRIPTION

Class: B

Utilization: biometric access control terminal with RFID function

Antenna type: incorporated antenna

Power level, frequency range and channels characteristics are not user adjustable.

The details pictures of the product and the circuit boards are joined with this file.

3. NORMATIVE REFERENCE

The standards and testing methods related throughout this report are those listed below.
They are applied on the whole test report even though the extensions (version, date and amendment) are not repeated.

FCC Part 15 (2006)	Code of Federal Regulations Title 47 - Telecommunication Chapter 1 - Federal Communications Commission Part 15 - Radio frequency devices Subpart C - Intentional Radiators
ANSI C63.4 (03)	American National Standard for Methods of measurement of Radio-Noise from low-voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

4. TEST METHODOLOGY

Radio performance tests procedures given in part 15:

Paragraph 33: frequency range of radiated measurements
Paragraph 35: measurement detector functions and bandwidths
Paragraph 203: antenna requirement
Paragraph 209: radiated emission limits; general requirements
Paragraph 225: operation within the band 13.110 – 14.010 MHz

5. TESTS RESULTS SUMMARY

Test procedure	Description of test	Criteria respected ?				Comment
		Yes	No	NAp	NAs	
FCC Part 15.203	ANTENNA REQUIREMENT	X				
FCC Part 15.209	RADIATED EMISSION LIMITS	X				
FCC Part 15.225	OPERATION WITHIN THE BAND 13.110 – 14.010 MHz					
	a) Field strength of any emission within the band 13.553 – 13.567 MHz	X				
	b) Field strength of any emission within the bands 13.410 – 13.553 MHz and 13.567 – 13.710 MHz	X				*Note*
	c) Field strength of any emission within the band 13.110 – 13.410 MHz and 13.710 – 14.010 MHz	X				*Note*
	d) Field strength of any emission outside the band 13.110 – 14.010 MHz	X				See §15.209
	e) Frequency tolerance	X				
	f) Powered tags			X		

NAp: Not Applicable NAs: Not Asked

Note: there is no emission radiated in these bands.

Conclusion:

The sample of BIOMETRIC ACCESS CONTROL TERMINAL MA521 submitted to the tests complies with the regulations of the standard FCC Part 15 in accordance with the limits or criteria defined in this report.

6. RADIATED EMISSION LIMITS

Standard: FCC Part 15

Test procedure: paragraph 209

Test equipment:

TYPE	BRAND	EMITECH NUMBER
Test receiver	Rohde & Schwarz ESVS 10	1219
Biconical antenna	Hewlet Packard 11966 C	728
Log periodic antenna	Rohde & Schwarz HL 223	1999
Spectrum analyzer	Rohde & Schwarz FSP40	4088
Open area test site	EMITECH	1274
Test receiver	Rohde & Schwarz ESH3	4112
Active loop antenna	EMCO 6502	1406
Power source	Hewlett Packard E3610A	4195

Test set up:

The system is tested in an open area test site (OATS).
The test unit is placed on a rotating table, 0.8 m from a ground plane. Zero degree azimuths correspond to the front of the equipment under test.
Only the emissions radiated by the cabinet and the structure are checked.

Frequency range: from 9 kHz to harmonic 10 ($F_{carrier} \leq 1$ GHz)

Detection mode: Quasi-peak or average (F < 1 GHz)
Peak (F ≥ 1 GHz)

Bandwidth: 120 kHz (F < 1 GHz)
1 MHz (F ≥ 1 GHz)

Distance of antenna: 3 meters (above 30 MHz)
10 meters (below 30 MHz)

Antenna height: 1 to 4 meters

Antenna polarization: vertical and horizontal

Equipment under test operating condition:

The equipment is blocked in continuous modulated transmission mode at the highest output power level which the transmitter is intended to operate.
The measure is realized on two supply modes: with a 12 Vd.c. regulated power supply and via a POE switch.

Results:

Ambient temperature (°C): 17.5
Relative humidity (%): 61

Power source: POE switch

The polarity column refers to the antenna polarity at which the maximum emissions level is measured.

FREQUENCIES (MHz)	Antenna height (cm)	Polarization of antenna H: Horizontal V: Vertical	Azimuth (degrees)	Field strength (dBµV/m)	Limits (dBµV/m)	Margin (dB)
27.12	100	V	281	24.3	48.62*	24.32
40.69	100	V	321	28	40	12

Power source: regulated power supply (12 Vd.c.)

The polarity column refers to the antenna polarity at which the maximum emissions level is measured.

FREQUENCIES (MHz)	Antenna height (cm)	Polarization of antenna H: Horizontal V: Vertical	Azimuth (degrees)	Field strength (dBµV/m)	Limits (dBµV/m)	Margin (dB)
27.12	100	V	291	24.5	48.62*	24.12
40.69	100	V	325	30.2	40	9.8

* the applicable limit at 30 m is extrapolated at 10 m by using the square of an inverse linear distance (40 dB/decade).

Any radiated emission which has more than 20 dB margin compared to the limit is not necessary reported.

TEST CONCLUSION:

RESPECTED STANDARD

7. OPERATION WITHIN THE BAND 13.110 – 14.010 MHz

Standard: FCC Part 15

Test procedure: paragraph 15.225

Test equipment:

TYPE	BRAND	EMITECH NUMBER
Test receiver	Rohde & Schwarz ESH3	4112
Active loop antenna	EMCO 6502	1406
Open area test site	EMITECH	1274
Modulation analyzer	Hewlett Packard HP8901B	1211
Power source	Hewlett Packard E3610A	4195

Test set up:

The system is tested in an open area test site (OATS).
The test unit is placed on a rotating table, 0.8 m from a ground plane. Zero degree azimuth corresponds to the front of the equipment under test.
The frequency tolerance measure is realized in near-field.

Distance of antenna: 10 meters

Antenna height: 1 meter

Antenna polarization: vertical

Equipment under test operating condition:

The equipment is blocked in continuous modulated transmission mode, at the highest output power level which the transmitter is intended to operate.
The measure is realized on two supply modes: with a 12 Vd.c. regulated power supply and via a POE switch.

Results:

Carrier field strength

Ambient temperature (°C): 19
Relative humidity (%): 56

Sample N° 1

Power supply: POE switch

	Field strength (dBµV/m) at frequency: 13.56 MHz
Normal test conditions	54.9
Limits	103.08*

Polarization of test antenna: vertical (height: 100 cm)
Position of equipment: use position (azimuth: 300 degrees)

Sample N° 1

Power supply: regulated power source (12 Vd.c.)

	Field strength (dBµV/m) at frequency: 13.56 MHz
Normal test conditions	55.6
Limits	103.08*

Polarization of test antenna: vertical (height: 100 cm)
Position of equipment: use position (azimuth: 300 degrees)

* the applicable limit at 30 m is extrapolated at 10 m by using the square of an inverse linear distance (40 dB/decade).

Frequency stability

Sample N° 1

Power supply: POE switch

			Measured differences (ppm) at frequency: 13.560528 MHz	Limits (ppm)
Normal test conditions	Temperature (°C): 18.5 Humidity (%): 47	Nominal power source (V): POE switch		
Extreme test conditions	Minimal temperature (°C): -20	Minimal power source (V): POE switch	-1.6	±100
		Maximal power source (V): POE switch	-1.6	
	Maximal temperature (°C): +50	Minimal power source (V): POE switch	+3.7	
		Maximal power source (V): POE switch	+3.7	

Sample N° 1

Power supply: regulated power source (12 Vd.c.)

			Measured differences (ppm) at frequency: 13.560514 MHz	Limits (ppm)
Normal test conditions	Temperature (°C): 18.5 Humidity (%): 47	Nominal power source (V): 12		
Extreme test conditions	Minimal temperature (°C): -20	Minimal power source (V): 10.2	+1.2	±100
		Maximal power source (V): 13.8	+1.1	
	Maximal temperature (°C): +50	Minimal power source (V): 10.2	+3	
		Maximal power source (V): 13.8	+4.7	

Measurement uncertainty: $\pm 1 \times 10^{-7}$

Test conclusion:

RESPECTED STANDARD

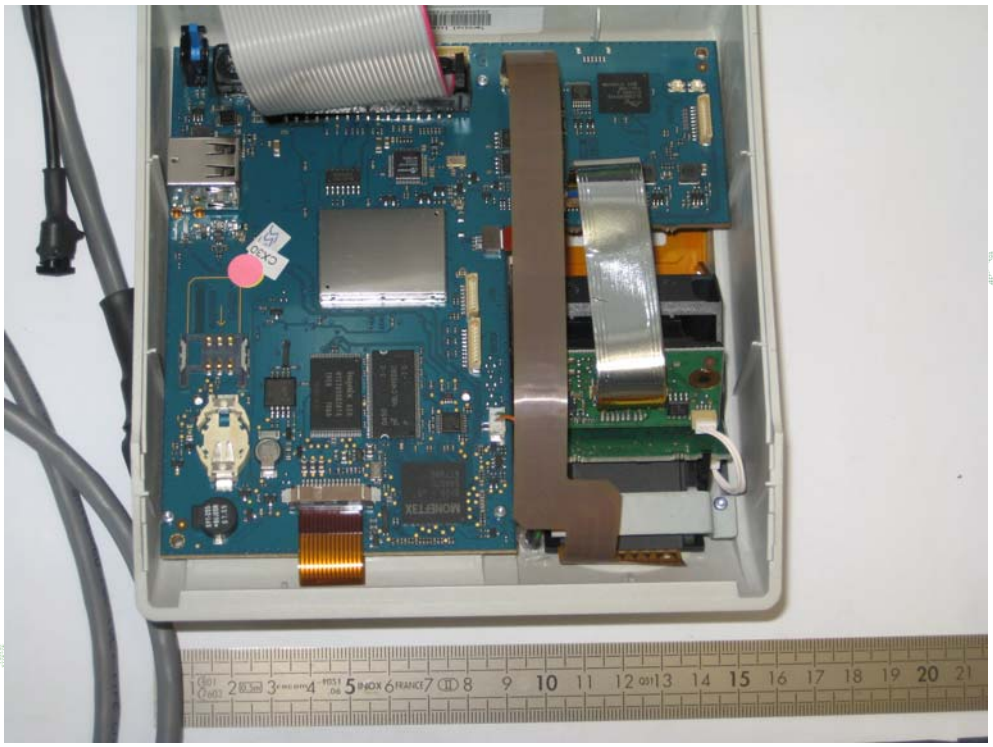
□□□ End of report, 2 annexes to be forwarded □□□

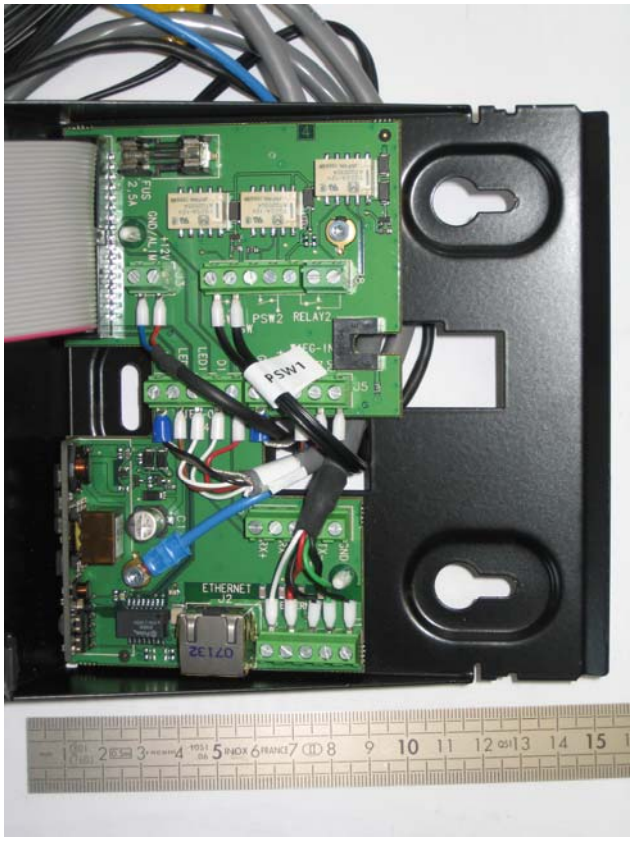
ANNEX 1: PHOTOS OF THE EQUIPMENT UNDER TEST

GENERAL VIEW

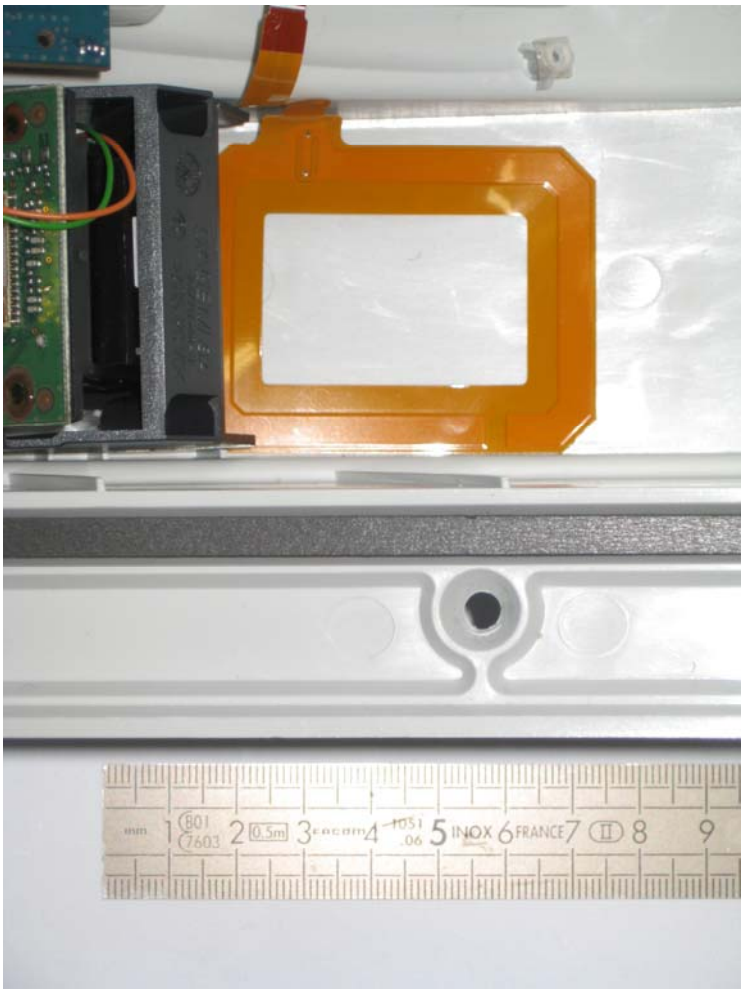
Internal view

Internal view





Antenna



ANNEX 2: OPEN AREA TEST SITE, TEST SET UP

Test set up

Test set up (POE switch)

Test set up (regulated power supply)

Open area test site