R051-24-10-102014-2/A Ed. 1

"This report cancels and replaces the test report n° R051-24-10-102014-2/A Edition 0"

RADIO test report

according to standard:
FCC Part 15

Equipment under test:
BIOMETRIC ACCESS CONTROL TERMINAL
MorphoAccess® J-Dual

FCC ID:
V7A-MA1XXBC

Company:
SAGEM SECURITE

DISTRIBUTION: Mr COMBES **Company: SAGEM SECURITE**

Number of pages: 25 including 3 annexes

Ed.	Date	Modified pages	Written by Name	Visa	Technical Verification Quality Approval Name	Visa
1	16-Jul-10	Rewriting	L. BERTHAUD	LB	P. BONNENFANT	

Duplication of this document is only permitted for an integral photographic facsimile. It includes the number of pages referenced here above.
This document is the result of testing a specimen or a sample of the product submitted. It does not imply an assessment of the conformity of the whole manufactured products of the tested sample.

PRODUCT:	**BIOMETRIC ACCESS CONTROL TERMINAL**
Trademark:	MorphoAccess® J-Dual
Serial number:	not communicated
MANUFACTURER:	SAGEM SECURITE

COMPANY SUBMITTING THE PRODUCT:

Company:	SAGEM SECURITE
Address:	18, Chaussée Jules César 95520 OSNY FRANCE
Responsible:	Mr COMBES
DATE(S) OF TEST:	31 May 2010 01 June 2010
TESTING LOCATION:	EMITECH ATLANTIQUE laboratory at ANGERS (49) FRANCE EMITECH ATLANTIQUE open area test site in LA POUEZE (49) FRANCE FCC Registration Number: 101696/FRN: 0006 6490 08
TESTED BY:	L. BERTHAUD

CONTENTS

TITLE **PAGE**

1. INTRODUCTION

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

2. PRODUCT DESCRIPTION

Class: B (residential environment)

Utilization: biometric access control terminal

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 (2009)	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 107: conducted limits
Paragraph 109: radiated emission limits
Paragraph 203: antenna requirement
Paragraph 207: conducted limits
Paragraph 209: radiated emission limits; general requirements
Paragraph 225: operation within the band 13.110 – 14.010 MHz

5. TESTS RESULTS SUMMARY

5.1. Intentional radiator (subpart C)

Test procedure	Description of test	Criteria respected ?				Comment
		Yes	No	NAp	NAs	
FCC Part 15.203	ANTENNA REQUIREMENT	X				
FCC Part 15.207	CONDUCTED LIMITS	X				
FCC Part 15.209	RADIATED EMISSION LIMITS, GENERAL REQUIREMENTS	X				
FCC Part 15.225	OPERATION WITHIN THE BAND 13.110 – 14.010 MHz					
	a) 13,553-13,567 MHz, field strength	X				
	b) 13,410-13,553 MHz et 13,567-13,710 MHz, field strength	X				
	c) 13,110-13,410 MHz et 13,710-14,010 MHz, field strength	X				
	d) spurious outside 13,110 MHz and 14,010 MHz	X				See §15.209
	e) frequency tolerance	X				
	f) Powered tag			X		

NAp: Not Applicable NAs: Not Asked

5.2. Unintentional radiator (subpart B)

Test procedure	Description of test	Criteria respected ?				Comment
		Yes	No	NAp	NAs	
FCC Part 15.107	CONDUCTED LIMITS			X		See §15.207(1)
FCC Part 15.109	RADIATED EMISSION LIMITS	X				

NAp: Not Applicable NAs: Not Asked

(1) The transmitter transmit in continuous mode

Conclusion:

The sample of BIOMETRIC ACCESS CONTROL TERMINAL MorphoAccess® J-Dual 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. MEASUREMENT OF RADIATED INTERFERENCE FIELD STRENGTH

Standard: FCC Part 15

Test procedure: § 15.109

Limits: Class B

Test equipment:

TYPE	BRAND	EMITECH NUMBER
Test receiver	Rohde & Schwarz ESVS 10	1219
Biconical antenna	Hewlet Packard 11966 C	0728
Log periodic antenna	Rohde & Schwarz HL 223	1999
Open area test site	EMITECH	1274

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.

Cables disposition of unit under test:

See photos of the test unit configuration in annex 2.

Frequency range: The highest frequency generated in the device is f = 13.56 MHz
According the Sec.15.33 of the FCC Part 15 standard, the frequency range measured is indicated in the following table:

For unintentional radiator, including a digital device (Sec.15.33, §(b)(1) of the FCC Part 15standard) :

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30
1.705 – 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	5^{th} harmonic of the highest frequency or 40GHz, whichever is lower

Detection mode: Quasi-peak for the range 30 MHz - 1 GHz

Bandwidth: 120 kHz for the range 30 MHz - 1 GHz

Distance of antenna: class B: 3 meters

Antenna height: 1 to 4 m

Antenna polarization: vertical and horizontal

Equipment under test operating condition:

The equipment is blocked in reception mode.
The measure is repeated on two supply modes: 12 Vd.c regulated supply and via a P.O.E. switch.

Results:

Ambient temperature (°C): 18
Relative humidity (%): 60

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

Sample N°1:

Power supply: 12 Vd.c

FREQUENCIES (MHz)	Antenna height (cm)	Polarization H: Horizontal V: Vertical	Azimuth (degrees)	Field strength (dBµV/m)	Limits (dBµV/m)	Margin (dB)
499.99	180	V	54	42.3	46	3.7

Note: any radiated emission which has more than 20 dB of margin compared to the applicable limit is not necessarily reported.

Sample N°1:

Power supply: P.O.E. switch

FREQUENCIES (MHz)	Antenna height (cm)	Polarization H: Horizontal V: Vertical	Azimuth (degrees)	Field strength (dBµV/m)	Limits (dBµV/m)	Margin (dB)
499.99	180	V	54	42.3	46	3.7

Note: any radiated emission which has more than 20 dB of margin compared to the applicable limit is not necessarily reported.

Measurement uncertainty: ± 6 dB

Test conclusion:

RESPECTED STANDARD

7. CONDUCTED LIMITS

Standard: FCC Part 15

Test procedure: Paragraph 15.207

Limits: Class

Test equipment:

TYPE	BRAND	EMITECH NUMBER
AC Power supply ALT 2000	K. SERRAS	2441
Test receiver ESH3	Rohde & Schwarz	1058
Pulse limiter ESH3-Z2	Rohde & Schwarz	0976
Artificial main network L3-25	PMM	0834
Spectrum analyzer FSBS	Rohde & Schwarz	3133

Software used: BAT-EMC V3.1.7.1

Test set up:

The test unit is placed on a wooden table at 0.8 m over a horizontal reference plane and 0.4 m from a vertical reference plane. It is powered by an artificial main network placed on the ground reference plane.

Equipment under test operating condition:

The equipment is powered with the AC power operating voltage of 115 V / 60 Hz.
The measure has been realized with the transmitter ON with the antenna connected.

Frequency range: 150 kHz - 30 MHz

Detection mode: Peak / Average

Bandwidth: 10 kHz / 9 kHz

Results:

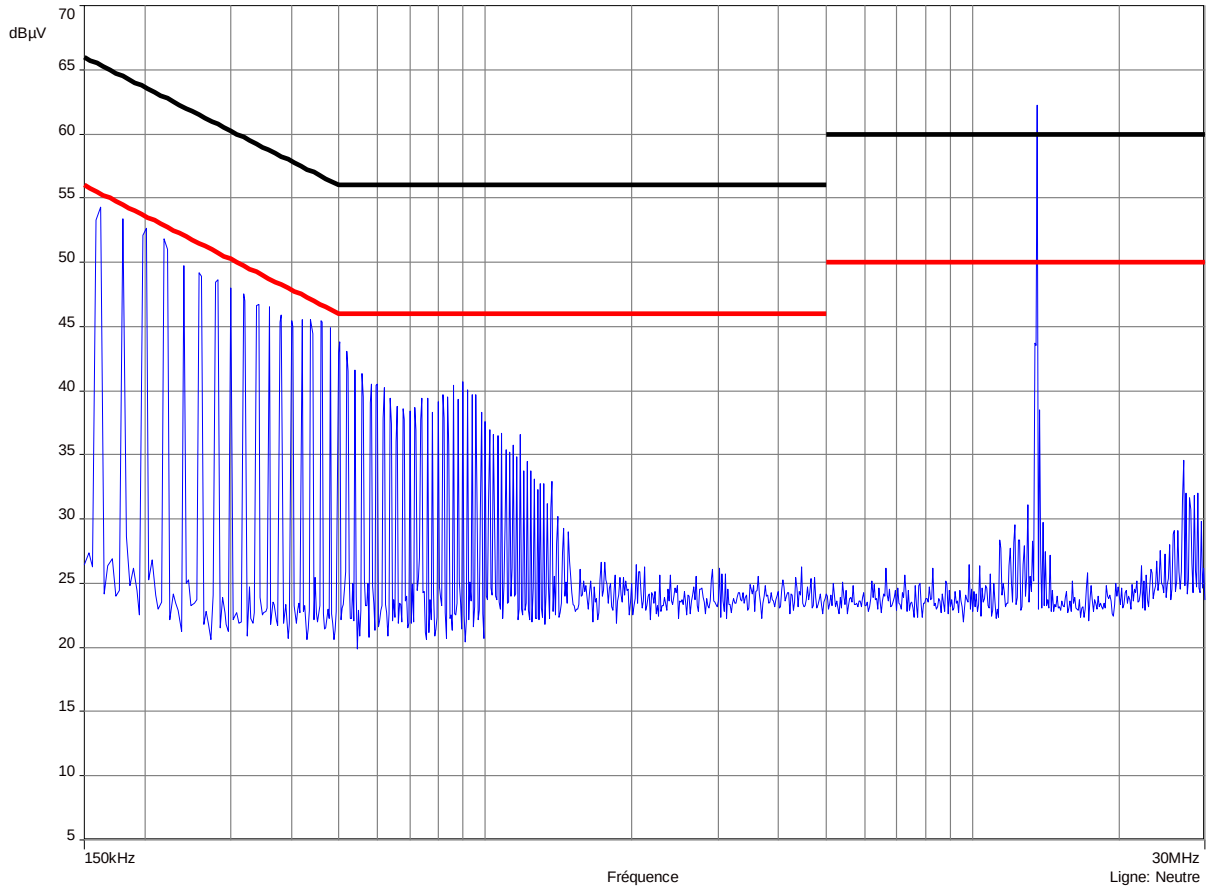
Measurement on the mains power supply:

The measurement is made with peak detector.

Curve N° 1: measurement on the Neutral with peak detector
Curve N° 2: measurement on the Line with peak detector

CURVE N°: 1.

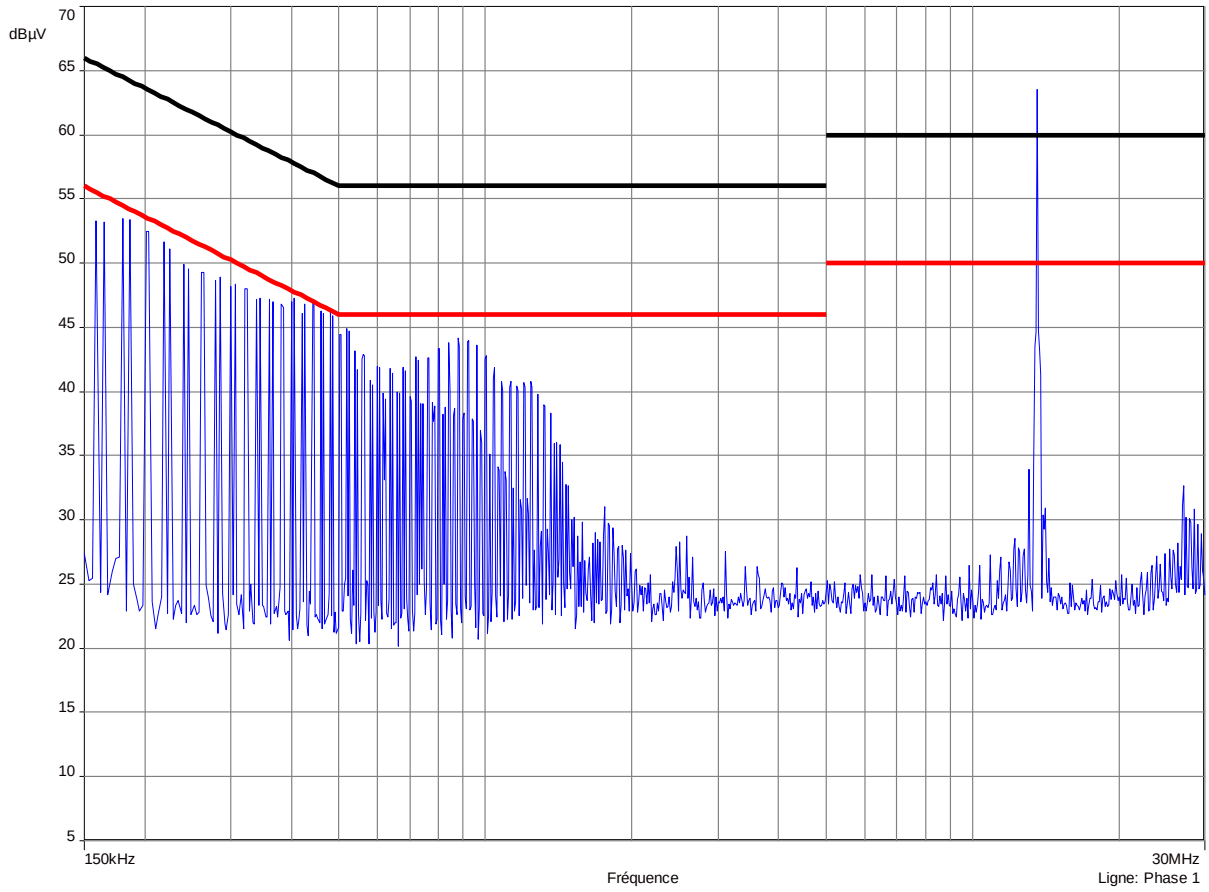
Measurement on the neutral with peak detection



RBW filter: 10 kHz
VBW filter: 10 kHz
Sweep time: 500 ms/MHz

CURVE N°: 2.

Measurement on the line with peak detection



RBW filter: 10 kHz
VBW filter: 10 kHz
Sweep time: 500 ms/MHz

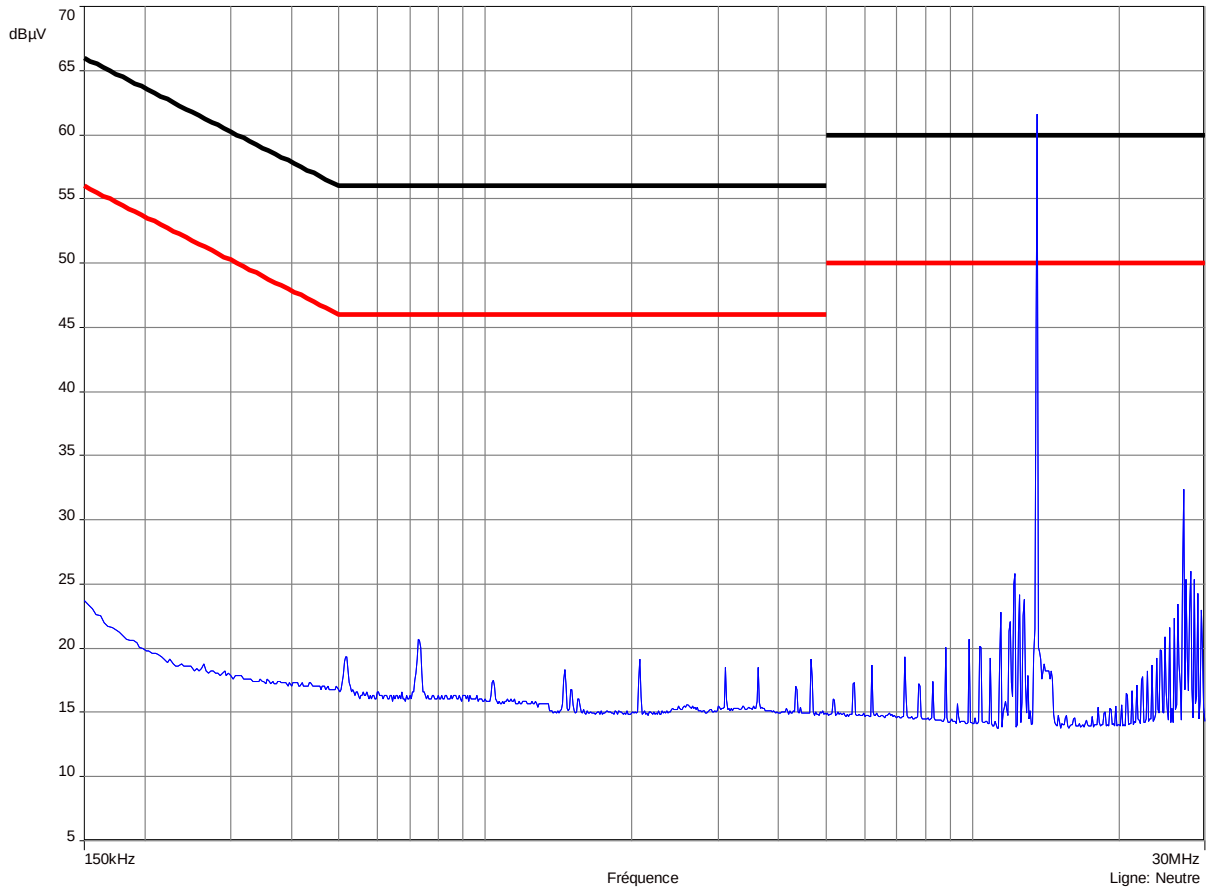
The frequencies which aren't 6 dB under the limit are analyzed with Average detector.

Curve N° 3: average measurement on the Neutral
Curve N° 4: average measurement on the Line

Note: the peak frequency above the applicable limit is the carrier frequency of the equipment under test.

CURVE N°: 3.

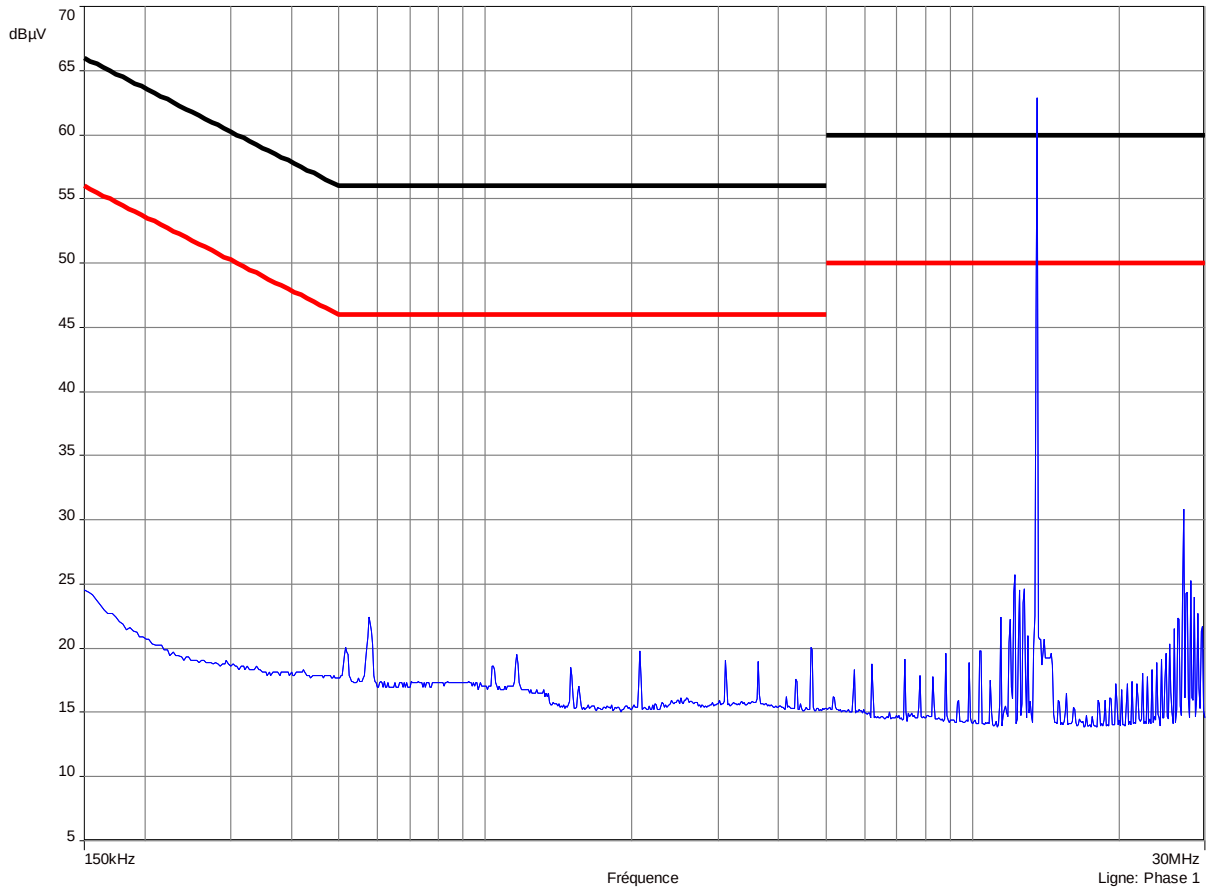
Measurement on the neutral with average detector



RBW filter: 9 kHz
Sweep time: 500 ms/MHz

CURVE N°: 4.

Measurement on the line with average detector



RBW filter: 9 kHz
Sweep time: 500 ms/MHz

Test conclusion:

RESPECTED STANDARD

8. 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	Hewlett Packard 11966 C	0728
Log periodic antenna	Rohde & Schwarz HL 223	1999
Spectrum analyzer	Rohde & Schwarz FSP40	4088
Open area test site	EMITECH	1274
Test receiver	Rohde & Schwarz ESPC	5275
Active loop antenna	EMCO 6502	1406
Power source	Hewlett Packard E3610A	4195
Meteo station AB888	Oregon scientific	1539

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: depending of frequencies

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 repeated on two supply modes: 12 Vd.c. regulated power supply and via a P.O.E. switch.

Results:

Ambient temperature (°C): 18
Relative humidity (%): 60

Power supply: 12 Vd.c.

Not any spurious has been detected.

Power supply: P.O.E. switch

Not any spurious has been detected.

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

Test conclusion:

RESPECTED STANDARD

9. 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 ESPC	5275
Active loop antenna	EMCO 6502	1406
Open area test site	EMITECH	1274
Modulation analyzer	Rohde & Schwarz FSP40	4088
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 and spectrum mesh measures are realized in near-field.

Distance of antenna: 10 meters

Antenna height: 1 meter

Antenna polarization: oriented in the vertical plane. The lowest point of the loop is 1m above ground level.

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 repeated on two supply modes: 12 Vd.c. regulated supply and via a P.O.E. switch.

Results:

Carrier field strength

Ambient temperature (°C): 17.5
Relative humidity (%): 62

Sample N° 1

Power supply: 12 Vd.c.

	Field strength (dBµV/m) at frequency: 13.56 MHz
Normal test conditions	54.3
Limits	103.08*

Polarization of test antenna: vertical (height: 100 cm)
Position of equipment: use position (azimuth: 0 degree)

Sample N° 1

Power supply: P.O.E. switch

	Field strength (dBµV/m) at frequency: 13.56 MHz
Normal test conditions	67.3
Limits	103.08*

Polarization of test antenna: vertical (height: 100 cm)
Position of equipment: use position (azimuth: 0 degree)

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

Field strength out of 13.553-13.567 MHz band

See curves in annex 1.

Frequency stability

Sample N° 1

Power supply: 12 Vd.c.

			Measured differences (ppm) at frequency: 13.56 MHz	Limits (ppm)
Normal test conditions	Nominal temperature (°C): +20	Minimal power source (V): 10.8	+4.9	±100
Extreme test conditions	Nominal temperature (°C): +20	Maximal power source (V): 13.2	+4.7	
	Minimal temperature (°C): -20	Nominal power source (V): 12	+9.4	
	Maximal temperature (°C): +50	Nominal power source (V): 12	-2.7	

Power supply: P.O.E. switch

			Measured differences (ppm) at frequency: 13.56 MHz	Limits (ppm)
Normal test conditions	Nominal temperature (°C): +20	Nominal power source (V): P.O.E.	+5	±100
Extreme test conditions	Minimal temperature (°C): -20	Nominal power source (V): P.O.E.	+9.4	
	Maximal temperature (°C): +50	Nominal power source (V): P.O.E.	-3.2	

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

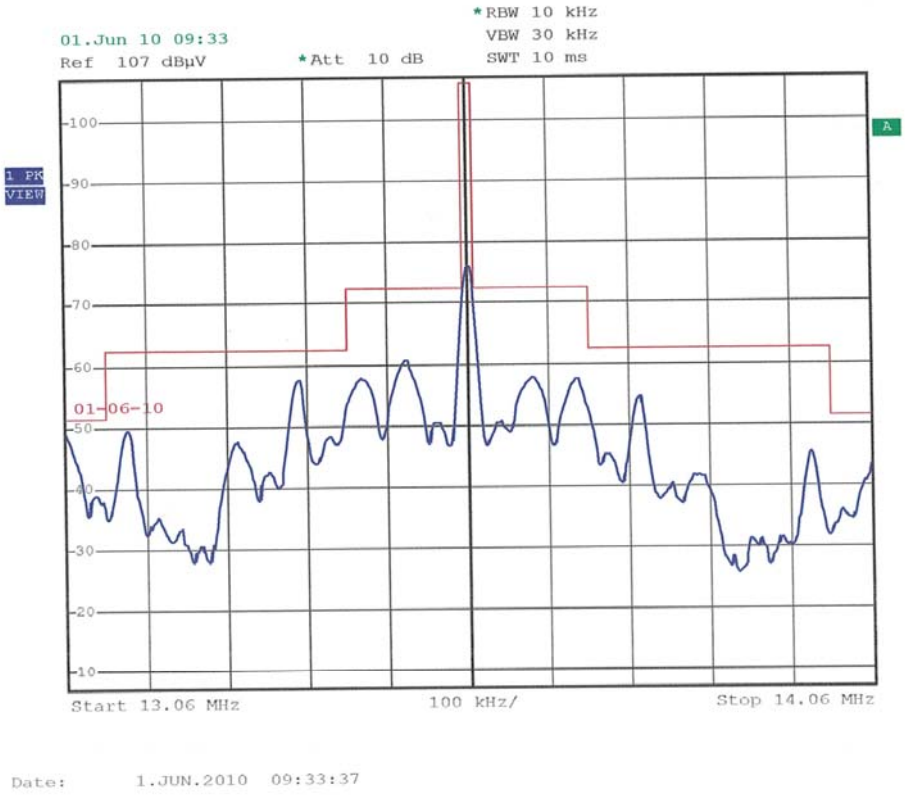
Test conclusion:

RESPECTED STANDARD

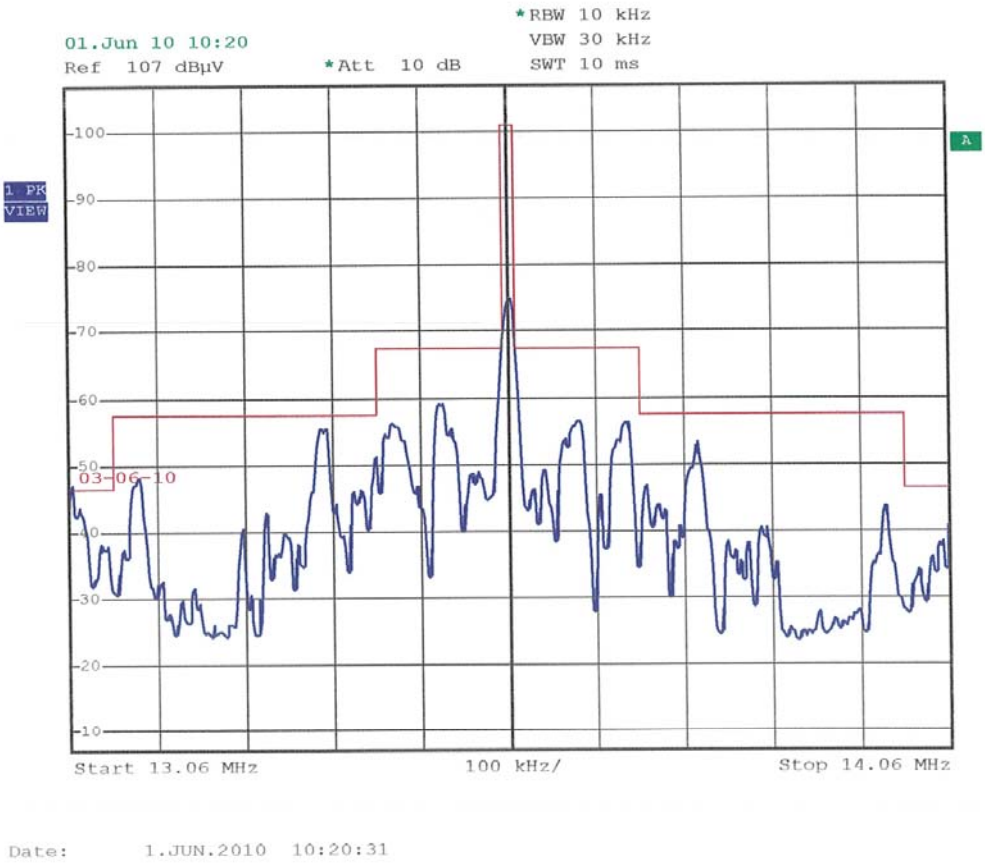
□□□ End of report, 3 annexes to be forwarded □□□

ANNEX 1: CURVES

Curve 1: 12 Vd.c.



Curve 2: P.O.E. switch

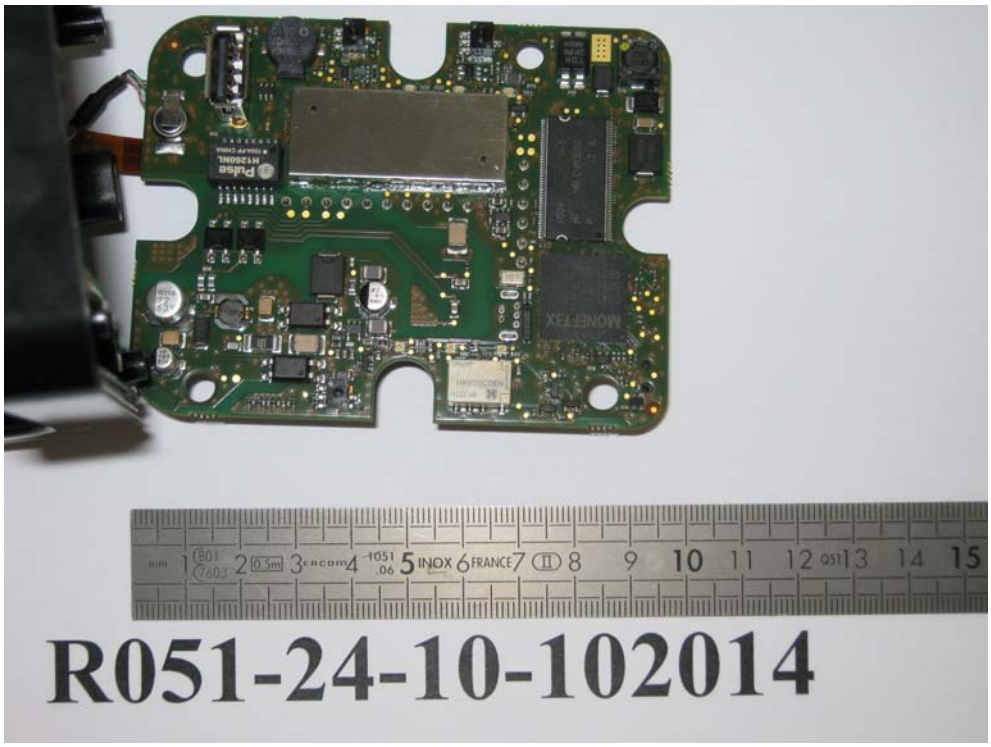


ANNEX 2: PHOTOS OF THE EQUIPMENT UNDER TEST

GENERAL VIEW

Internal view

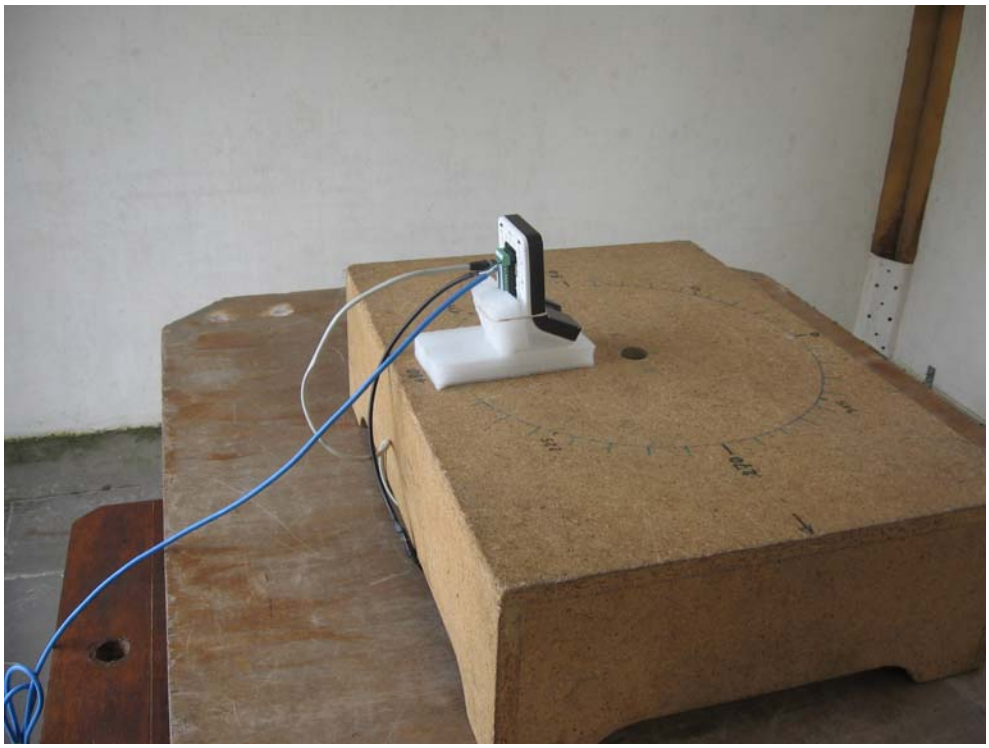
Printed circuit board: face 1



Printed circuit board: face 2

ANNEX 3: TEST SET UP

RADIATED MEASUREMENTS



OPEN AREA