RA-24-08100682-1/A Ed. 0

RADIO Measurement Technical Report

Standard to apply:
FCC Part 15.225

Equipment under test:
NEAR READER BIOMETRIC MIFARE CBMPROX485

FCC ID:
WHM-CBMPROX485

Company:
EDEN

DISTRIBUTION: Mr LIBS **Company: EDEN**

Number of pages: 19 including 3 annexes

Ed.	Date	Modified pages	Written by Name	Visa	Technical Verification Quality Approval Name	Visa
0	14-May-08	Creation	M. DUMESNIL	M. D.	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:	**NEAR READER BIOMETRIC MIFARE**
Reference / model:	CBMPROX485
Serial number:	not communicated
MANUFACTURER:	EDEN

COMPANY SUBMITTING THE PRODUCT:

Company:	EDEN
Address:	994, rue de la Gare 13770 VENELLES FRANCE
Responsible:	Mr LIBS
DATE(S) OF TEST:	23 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:	M. DUMESNIL
TUTOR:	P. BONNENFANT

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1. INTRODUCTION

This report presents the results of radio test carried out on the following equipment: NEAR READER BIOMETRIC MIFARE – CBMPROX485, in accordance with normative reference.

2. PRODUCT DESCRIPTION

Class: B

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 (2007)	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 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

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	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 bands 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: *see plot annex 3.*

Conclusion:

The sample of NEAR READER BIOMETRIC MIFARE – CBMPROX485 submitted to the tests complies with the regulations of the standard FCC Part 15.225 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
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
Multimeter 77-2	Fluke	0812
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

Bandwidth: 120 kHz

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

Results:

Ambient temperature (°C): 20.5
Relative humidity (%): 51

Power supply: 12 Vd.c. by the central

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)
40.690	100	V	208	32.2	40	7.8
54.240	100	V	43	23.2	40	16.8
67.803	100	V	172	27.6	40	12.4
81.371	100	V	293	33.2	40	6.8
94.928	100	V	308	41.66	43.52	1.86
108.493	100	V	292	40.1	43.52	3.42
122.058	100	V	270	30.9	43.52	12.62
135.607	100	V	15	26.9	43.52	16.62

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
Spectrum analyzer	Rohde & Schwarz FSP40	4088
Multimeter 77-2	Fluke	0812
Metro station AB-888	Oregon Scientific	1639
Meteo station Météostar	Bioblock Scientific	0943

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.

Detection mode: Quasi-peak

Bandwidth: 10 kHz

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.

Results:

Carrier field strength

Ambient temperature (°C): 21.5
Relative humidity (%): 46

Sample N° 1

Power supply: 12 Vd.c. by central

	Field strength (dBµV/m) at frequency: 13.561 MHz
Normal test conditions	55.01
Limits	103.08 *

Polarization of test antenna: vertical (height: 100 cm)
Position of equipment: use position (azimuth: 87 degrees)

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

Note: there is no emission radiated in the bands 13.110 – 13.553 MHz and 13.567 – 14.010 MHz (see curve in annex 3).

Frequency stability

Sample N° 1

Power supply: 12 Vd.c. on central

			Measured differences (ppm) at frequency: 13.561337 MHz	Limits (ppm)
Normal test conditions	Temperature (°C): 20 Humidity (%): 45	Nominal power source (V): 12		
Extreme test conditions	Minimal temperature (°C): -20	Minimal power source (V): 10.2	+6.27	±100
		Maximal power source (V): 13.8	+7	
	Maximal temperature (°C): +50	Minimal power source (V): 10.2	-8.70	
		Maximal power source (V): 13.8	-7.08	

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

Test conclusion:

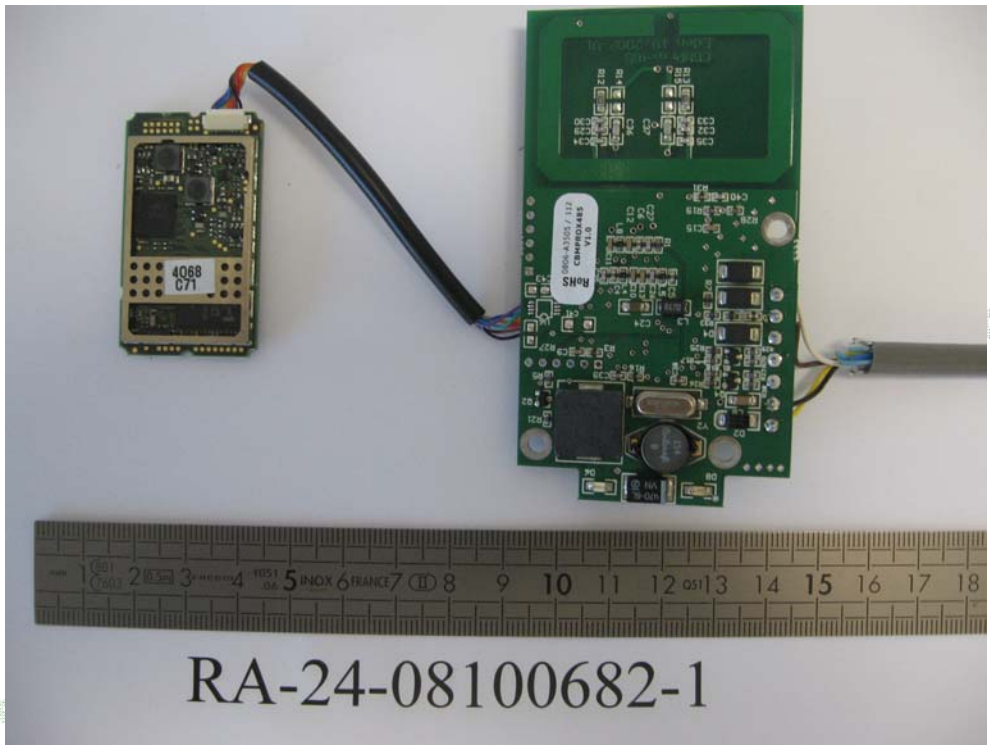
RESPECTED STANDARD

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

ANNEX 1: PHOTOS OF THE EQUIPMENT UNDER TEST

GENERAL VIEW

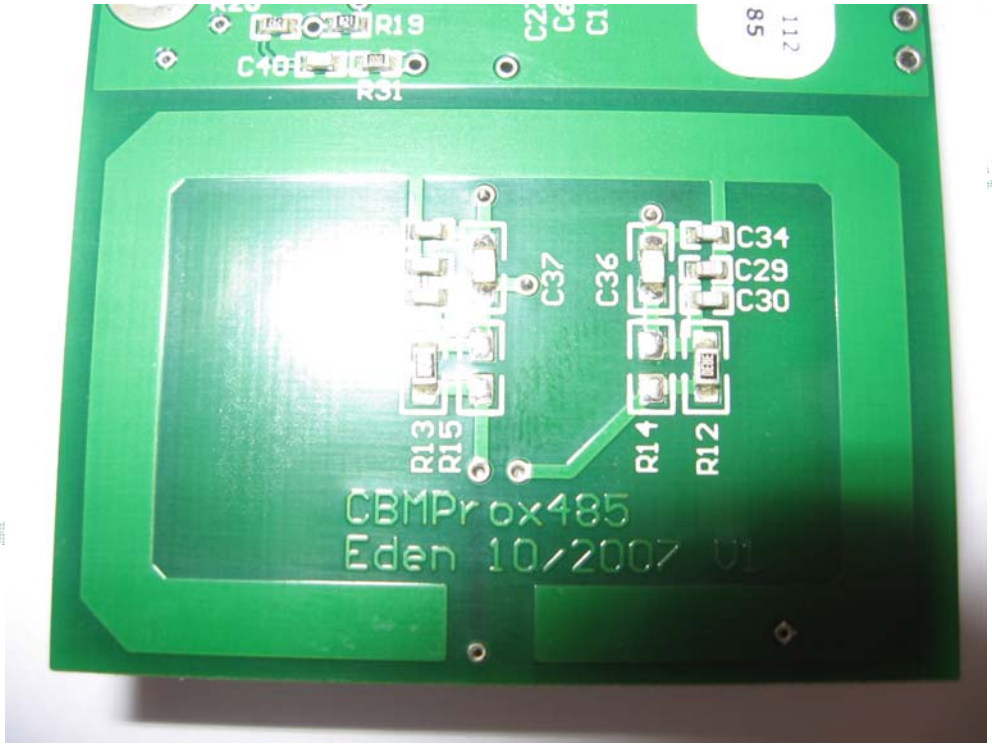
Printed circuit board: face 1



Printed circuit board: face 2

Radio module

Antenna



TEST SET UP RADIATED MEASUREMENT

OPEN AREA TEST SITE

ANNEX 2: RADIO APPLICATION FORM

- A - PARTIE ADMINISTRATIVE
Administrative Part

(Il est important de remplir complètement les questionnaires dans chaque langue du rapport désiré, car ils sont nécessaires à l'établissement de notre proposition technique et financière ainsi qu'au bon déroulement de la prestation).
(It's very important to fill in properly the forms in every language of required report, because they are necessary for the quotation and for a good progress of tests).

A 1- Client (pour lequel l'essai ou la certification est demandé) :
Client (for whom the testing/certification is requested)

Société / *Company* **:EDEN**
Contact / Contact name : **David Libs**
Adresse / *Address* : **994 RUE DE LA GARE 13770 VENELLES**

Tél : **0820 346 223** Fax : **0820 320 907** Email :**d.libs@tech-eden.com**

A 2- Représentant ou Mandataire (pour le client ci-dessus si différent du client) :
Authorised Representative (if different than client)

Société / *Company* **:**
Contact / Contact name :
Adresse / *Adress* :

Tél : Fax : Email :

A 3- Fabricant (si différent du client) :
Manufacturer (if different than client)

Société / *Company* **:**
Contact / Contact name :
Adresse / *Adress* :

Tél : Fax : Email :

Nota important : *Ce formulaire A (administratif) ainsi que le formulaire B (parties techniques) et les questionnaires spécifiques CEM & Radio seront intégrés dans le rapport d'essai.*

Important notice: *This form A (administrative) and the form B (technical part) and the specific EMC & Radio forms will be integrated in the test report.*

EMITECH-DTI-009 Rév 32

-B - PARTIE TECHNIQUE

Technical part (for all types of equipment)

Descriptif de la configuration à tester (joindre des photos et/ou des schémas)
Equipment's specification to test (join photos and/or schemes)

Désignation - fonction /
Designation - function: **Lecteur de proximité MIFARE Biométrique**

Marque commerciale / *Trade mark* :

Référence – Modèle – Type /
Reference – model – type : **CBMPROX485**

Produit / *product* : x **OUI** ☐ **NON** **Système/*system* :** x **OUI** ☐ **NON**

Nbre d'éléments (si système) / *Nb of element (if system)* : 1

Gamme de produits / *product's range :*

Série / *serial :* x **OUI** ☐ **NON**
Présérie / *pilot run :* ☐ **OUI** x **NON**
Prototype / *prototype :* ☐ **OUI** x **NON**

Alimentation / *supply* : mono : Vac tri : Vac
avec ou sans neutre / *with or without neutral:*
Adaptateur secteur / adaptor:
Batterie / *battery:* Vdc
Autre / *other*:
Préciser / *specify*:

Plage de tension / *voltage range* : **9-14VDC**
Fréquence ou plage de fréquence / *frequency range* : **13,56MHz**
Courant nominal / *nominal current* : **300m** A
Puissance / *power* : W ou/or VA

Si le produit est embarqué / *has the equipment been fitted*:
Type de véhicule / *kind of vehicle*:

Connexion à un réseau de télécommunication/*connection to telecom network* :
RTC / *CRT* : ☐ **OUI** x **NON**
RNIS / *ISDN :* ☐ **OUI** x **NON**
ADSL : ☐ **OUI** x **NON**
Ethernet : x **OUI** ☐ **NON**
Liaison radio / *radio link* : ☐ **OUI** x **NON**
Autres / *others*:

Poids / *weight*: **165g** Taille / *size*: (L x l x h): **120x77x40mm**
Température max. d'utilisation / *max. temperature use* : **+50°C**
Présence de liquide (ou produit dangereux) / *liquid's presence (or dangerous product)* : -
Connexions particulières (eau, gaz…) / *specific connection (water, gas…)* : -

-B- PARTIE TECHNIQUE (suite)

Technical part (continued)

Préciser le type de câbles d'entrées/sorties / *state the input/output cable's type*

	Blindé / *shielded* ? O (yes) /N (no)	**Si L > 3 m préciser la longueur/ *if L > 3 m state the length***
Câble/*cable*		
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ANNEX 3: RADIATED EMISSIONS WITHIN THE BAND 13.110 – 14.010 MHz