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FCC CERTIFICATION E.M.C. Measurement Technical Report

**standard to apply:
FCC Part 15**

**Equipment under test:
READER VEGAS**

FCC ID : RXY-VEGRDE2

**Company:
BOURGOGNE ET GRASSET**

DISTRIBUTION: Mr GELINOTTE

Company: BOURGOGNE ET GRASSET

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PRODUCT: READER VEGAS

MANUFACTURER: BOURGOGNE ET GRASSET SA

COMPANY SUBMITTING THE PRODUCT:

Company: BOURGOGNE ET GRASSET SA

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Responsible: Mr GELINOTTE

DATE(S) OF TEST(S): 2 April 2004

TESTING LOCATION: EMITECH ATLANTIQUE open area test site in LA POUEZE
(49) FRANCE

TESTED BY: P. BONNENFANT

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1. INTRODUCTION

This document presents the result of E.M.C. test carried out on the following equipment:
READER VEGAS in accordance with normative reference.

2. PRODUCT DESCRIPTION

ITU Emission code:

400HA1D

Classe:

B (paragraph FCC part 15.3)

Utilization:

Reader of Casino chips

Antenna type:

dedicated antenna with no standard connecteur

Operating frequency range: 125 kHz

No of channels:

1

Frequency generation: SAW Resonator

Crystal

Synthetiser

Modulation: Amplitude

Digital

Frequency

Phase

Power source: Power supply 115 Vac

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

FCC Part 15 (2003)

Code of Federal Regulations
Title 47 - Telecommunication
Chapter 1 - Federal Communications Commission
Part 15 - Radio frequency devices
Subpart C - Intentional Radiators

ANSI C63.4 (01)

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 203: Antenna requirement
- Paragraph 207: Conducted limits
- Paragraph 209: radiated emission limits; general requirements
- Paragraph 33: frequency range of radiated measurements
- Paragraph 35: measurement detector functions and bandwidths

5. TEST UNIT CONFIGURATION

JOINED DOCUMENTATIONS

- “Block diagram”***
- “External photos and Product labeling”***
- “Assembly of components”***
- “Internal photos”***
- “Layout pcb”***
- “Bill of materials”***
- “Schematics”***
- “Product description”***
- “User guide”***

6.TESTS AND CONCLUSIONS

Test procedure	Description of test	Criteria respected ?				Comment
		Yes	No	NAp	NAs	
FCC Part 15.203	Antenna requirement	X				<i>Note</i>
FCC Part 15.207	Conducted limits	X				
FCC Part 15.209	RADIATED EMISSION LIMITS; general requirements	X				

NAp: Not Applicable

NAs: Not Asked

Note: the equipment is designed to ensure that no antenna other than furnished by the applicant shall be used with the device. A no standard connector in fact it's a screw DIN connector in which 3 pin males misses and 3 pin females is blocked ensure a unique coupling between antenna and the intentional radiator.

This modification of the connector is realized by the manufacturer of this device.

Conclusion:

The sample of READER VEGAS 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.

7.MEASUREMENT OF THE CONDUCTED DISTURBANCES**Standard:** FCC Part 15 (03)**Test procedure:** FCC Part 15 (03) Sec.15.207**Limits:** Class B**Test equipment:**

TYPE	BRAND	EMITECH NUMBER
Test receiver	Rohde & Schwarz ESH3	1558
Pulse limiter	Rohde & Schwarz ESH3-Z2	976
Artificial main network	PMM L3-25	834
AC Power Supply	KIKUSUI PCR 4000L	3132

Software used: BAT-EMC V3.0.7.21**Test set up:**

The test unit is placed on a wooden table, 0.8 m over an 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.

See photos in the appendix 2.

Equipment under test operating condition:

The equipment is powered with the AC power operating voltage of 115 V / 60 Hz.

Frequency range: 150 kHz - 30 MHz**Detection mode:** Peak / Quasi-peak / Average**Bandwidth:** 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

The frequencies which aren't 6 dB under the limit are analysed with Quasi-peak detector and average detector. The results are noted if necessary in the following tables and on the following curves.

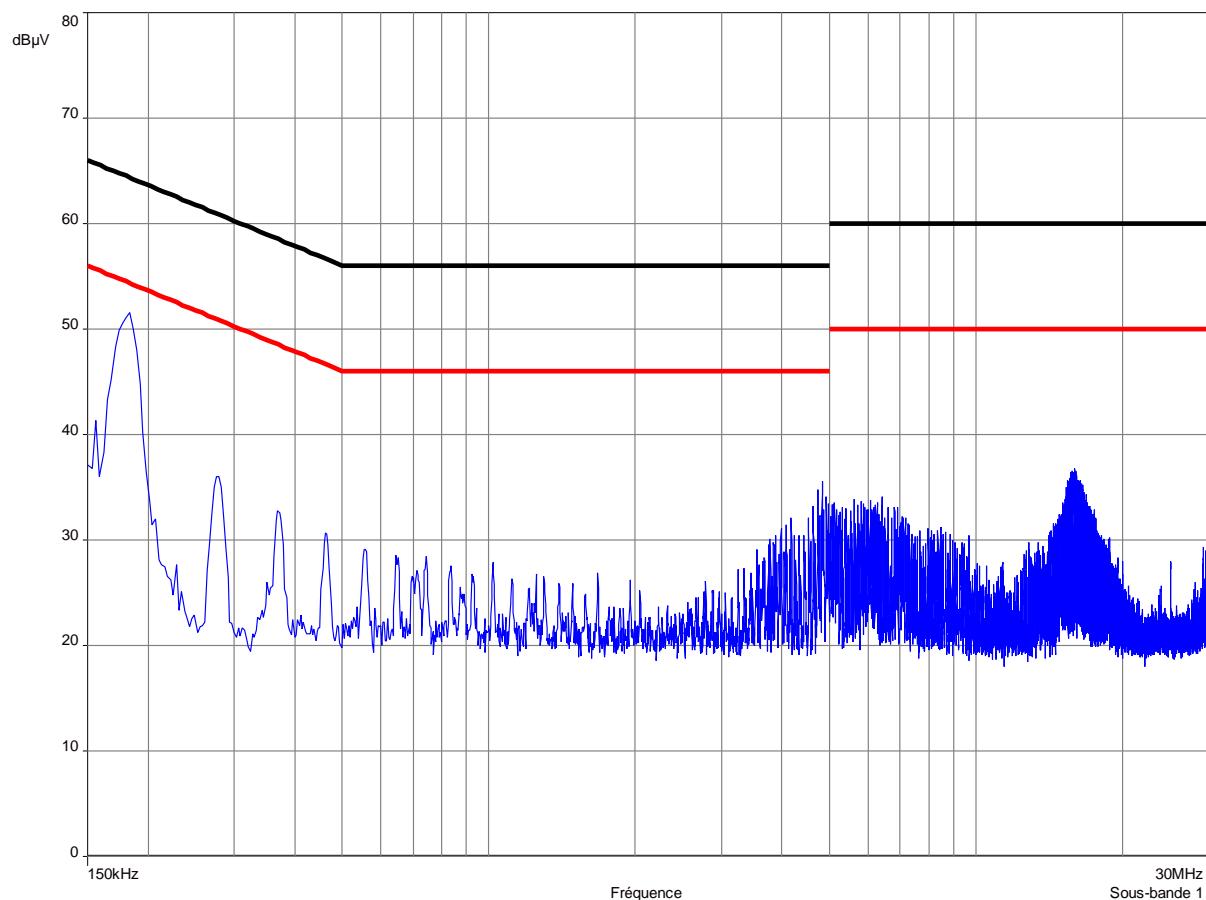
Measurement with Quasi-peak and Average detector:

FREQUENCIES (MHz)	QUASI-PEAK		AVERAGE	
	LIMITS (dB μ V)	NEUTRAL (dB μ V)	LIMITS (dB μ V)	NEUTRAL (dB μ V)
0.177	64.5	47.6	54.5	46.4

FREQUENCIES (MHz)	QUASI-PEAK		AVERAGE	
	LIMITS (dB μ V)	LINE (dB μ V)	LIMITS (dB μ V)	LINE (dB μ V)
0.177	64.5	47.6	54.5	46.4

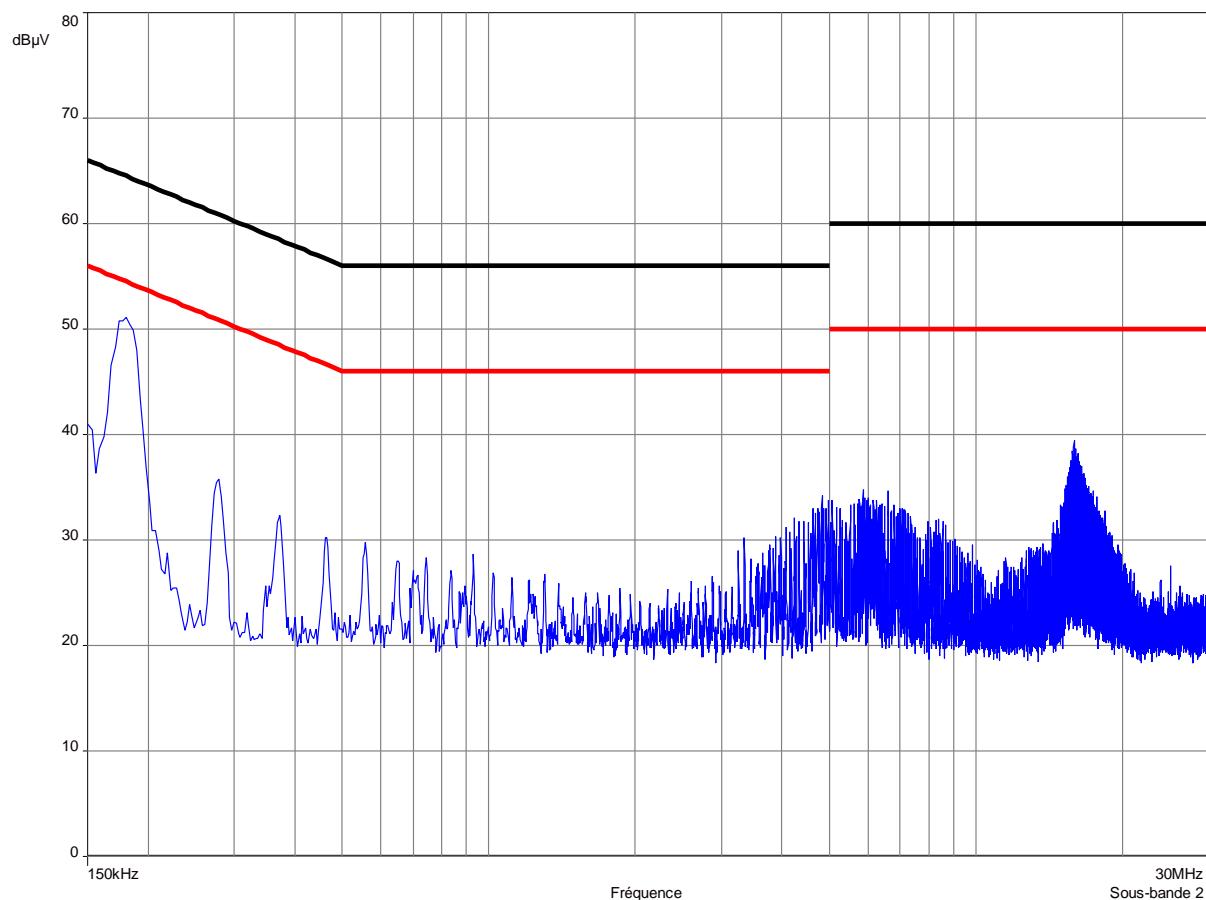
CURVE N°: 1.

Measurement on the Neutral with peak detector



CURVE N°: 2.

Measurement on the Line with peak detector



8. RADIATED EMISSION LIMITS; GENERAL REQUIREMENTS**Standard:** FCC Part 15 (03)**Test procedure:** paragraph 209**Test equipment:**

TYPE	BRAND	EMITECH NUMBER
Test receiver ESH3	Rohde & Schwarz	1058
Test receiver ESVS 10	Rohde & Schwarz	1219
Loop Antenna	EMCO	1406
Biconical antenna 11966 C	Hewlet Packard	728
Log periodic antenna HL 223	Rohde & Schwarz	1999
Spectrum analyser FSEM30	Rohde & Schwarz	1244
Open area test site	EMITECH	1274
Variac R213	Dereix	1419

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.

See photos in the appendix 2.

Frequency range: from 9 kHz to harmonic 10 ($F_{carrier} \leq 1 \text{ GHz}$)**Detection mode:** Quasi-peak ($F < 1 \text{ GHz}$) except for the frequency bands 9-90 kHz, 110-490 kHz which are based on measurements employing an average detector.**Bandwidth:**200 Hz ($F < 150 \text{ kHz}$)120 kHz ($F < 1 \text{ GHz}$)1 MHz ($F > 1 \text{ GHz}$)**Distance of antenna:** 3, 10, 30 meters**Antenna height:** 1 to 4 meters (above 30 MHz), 1 meter (below 30 MHz)**Antenna polarization:** vertical and horizontal**Equipment under test operating condition:**

The equipment is in continuous transmission mode.

Results:

Ambient temperature (°C): 20
 Relative humidity (%): 62

Power source: 115 V.a.c. through a variac, with the supply voltage varied between 85 % and 115 % of the nominal rated

Fundamental results: $F = 125$ kHz

Test Distance	Position antenna	Reading	Antenna Factor + cable	Radiated Field	limit
3 m	V //	104 dB μ V	10.5 dB	114.5 dB μ V/m	-
10 m	V //	63.3 dB μ V	10.5 dB	73.8 dB μ V/m	-
30 m	V //	44 dB μ V	10.5 dB	54.5 dB μ V/m	-
300 m		extrapolation		14.5 dB μ V/m	25.66 dB μ V/m

H: Horizontal

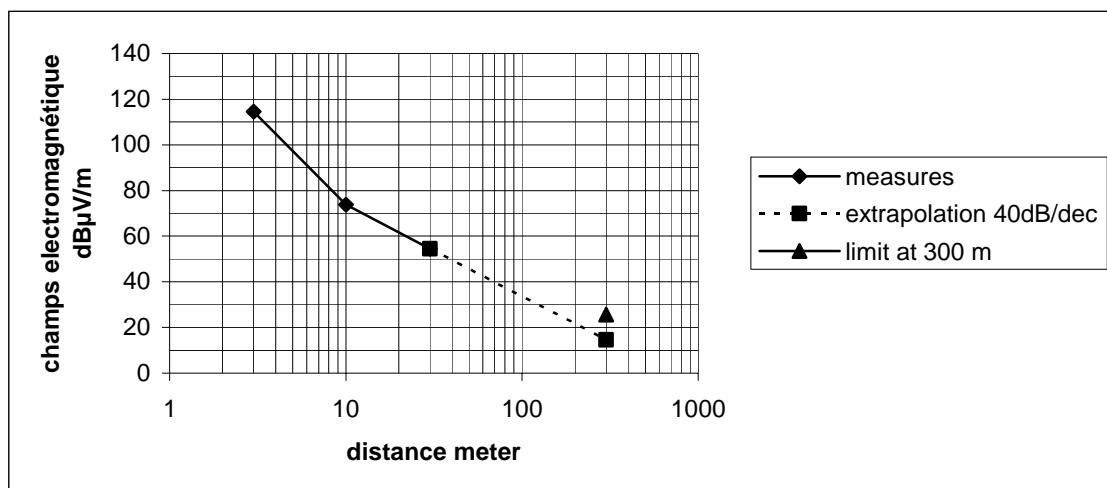
V: Vertical

// antenna loop measurement is parallel at the antenna equipment.

⊥ antenna loop measurement is perpendicular at the antenna equipment.

The same result has been observed within the tolerance voltage of the source power.

Extrapolation Plot:



Applicable limit:

$2400/F(\text{kHz})$ at 300 m. $F = 125$ kHz, limit = $19.2 \mu\text{V}/\text{m} = 25.66 \text{ dB}\mu\text{V}/\text{m}$

Non intentional radiators:

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

FREQUENCIES (kHz)	Position of the antenna EUT	Reading at 3 m (dB μ V)	Antenna factor + Cable (dB)	Radiated field at 3 m (dB μ V/m)	Field strength extrapolation at 300 m (dB μ V/m)	Limits at 300 m (dB μ V/m)
250	V //	45	10.5	55.5	-24.5	19.64
375	V //	37.6	10.5	48.1	-42.4	16.12

H: Horizontal

V: Vertical

// antenna loop measurement is parallel at the antenna equipment.

⊥ antenna loop measurement is perpendicular at the antenna equipment.

9.APPENDICES**Appendix 1: “PHOTOGRAPHIES OF THE EQUIPMENT UNDER TEST”**

This appendix includes 7 pages.

Appendix 2: “PHOTOGRAPHIES OF TEST SET UP”

This appendix includes 3 pages.

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