

RADIO TEST REPORT

According to the standard(s):

FCC part 15:2006

Equipment under test:

ON BOARD banknote card reloader BBR415

FCC ID: U36 BBR415

Company:

ACS-INC

Diffusion: Mrs DEJOUX

(Company: ACS-INC)

Number of pages: 16 including 1 annex

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NAME OF THE EQUIPMENT UNDER TEST (E.U.T.) : ON BOARD banknote card reloader BBR415

Serial number : Proto 1

Part number : None

Software Version : None

MANUFACTURER'S NAME : ACS-INC

APPLICANT'S ADDRESS:

Company : ACS-INC

Address : Rue Claude Chappe
BP 345
07500 GUILHERAND-GRANGES
FRANCE

Person(s) present during the tests : Mr VILLERET

Responsible : Mrs DEJOUX

DATE(S) OF TESTS : 11th and 12th of December, 2006

TESTS LOCATION(S) : Emitech Grand Sud Laboratory in
Vendargues (34)
Open area test site in Salinelles (30)
Registration number: 8127-19

TESTS SUPERVISOR(S) : None

TESTS OPERATOR(S) : Augustin ALVAREZ

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1. INTRODUCTION

This document submits the results of Electromagnetic Compatibility tests performed on the equipment ON BOARD banknote card reloader BBR415 (denominated hereafter E.U.T.: equipment under test) according to document(s) listed below.

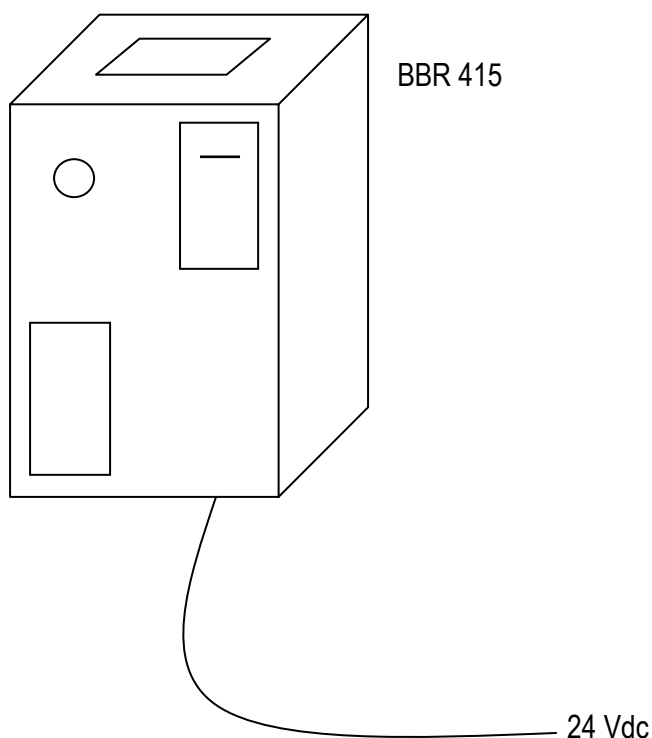
2. REFERENCE DOCUMENT(S)

FCC part 15:2006 Telecommunication
Part 15: Radio frequency devices

3. EQUIPMENT UNDER TEST CONFIGURATION

Product description: FCC ID: U36 BBR415
ITU emission code: /
Utilization: On board banknote card reloader
Antenna type: Incorporated antenna
Antenna gain: Unknown
Operating frequency range: 13.56 MHz
Number of channels: 1
Channel spacing: /
Modulation: /
Power source: 24 Vdc
Power level and frequency range are not user adjustable

4. EQUIPMENT UNDER TEST CONFIGURATION SCHEME



5. SUMMARY OF TEST RESULTS

Tests designation	Results satisfying?	Comments
Conducted emissions - section 15.207	N.A.	DC supplied
Radiated emissions - section 15-209 (below 30MHz)	YES	
Radiated emissions - section 15-209 (above 30MHz)	YES	
Field strength - section 15-225	YES	
Frequency tolerance - section 15.225	YES	

N.P.: Not Performed.

N.A.: Not Applicable.

- In emission:

Sample subject to the test complies with prescriptions of the standard(s) FCC part 15:2006 according to limits specified in this test report.

6. RADIATED EMISSIONS - SECTION 15-209

a) Radiated emissions (below 30MHz)

Standard: FCC part 15:2006

Test method: ANSI C63.4:2003

Test configuration:

Frequency band	Tested side	Resolution bandwidth	Video bandwidth	Detection mode	E.U.T. height
9kHz-35kHz	Front side	100Hz	300Hz	Peak	80cm
35kHz-75kHz	Front side	100Hz	300Hz	Peak	80cm
75kHz-150kHz	Front side	100Hz	300Hz	Peak	80cm
150kHz-240kHz	Front side	10kHz	30kHz	Peak	80cm
240kHz-500kHz	Front side	10kHz	30kHz	Peak	80cm
500kHz-1.1MHz	Front side	10kHz	30kHz	Peak	80cm
1.1MHz-2.4MHz	Front side	10kHz	30kHz	Peak	80cm
2.4MHz-5.5MHz	Front side	10kHz	30kHz	Peak	80cm
5.5MHz-12.5MHz	Front side	10kHz	30kHz	Peak	80cm
12.5MHz-30MHz	Front side	10kHz	30kHz	Peak	80cm

Test method deviation:

Measurements are made in peak detection instead of average mode (in italic):

- Measurements are given in dBμA/m instead of μV/m
- Measuring distance is 3 meters instead of 30 and 300 meters

Radiated emissions limits in this frequency band are specified at 30 or 300 meters. Measurement distance used during the test, subject of this report, is 3 meters. Then published limits come from a theoretical conversion using an extrapolation factor of 20dB / decade (worst case).

Test equipment list:

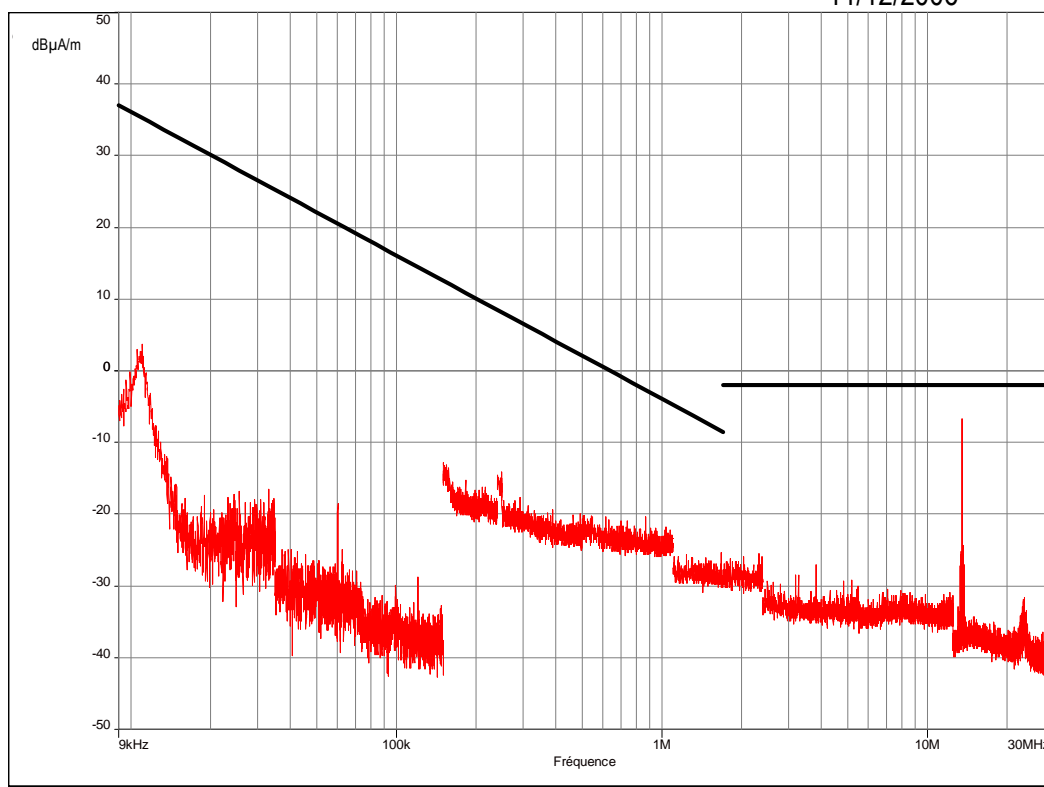
CATEGORY	BRAND	TYPE	N° EMITECH
Antenna	Electro-Metrics	ALR-25	0263
Cable			2702
Cable			2704
Cable			2711
Cable		N-5m	2898
Preamplifier	Miteq	AU-1447	3199
Receiver	Hewlett Packard	HP 8568 B	0809
Shielded enclosure	Ray Proof	C.GS1	1423

Results: See Graph(s) (pre-measurement) hereafter.

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Radiated magnetic field emission: spurious 9 kHz-30 MHz in peak detection

11/12/2006



Spurious 9k-30MHz / antenne cadre perpendiculaire

b) Radiated emissions (above 30MHz)

Standard: FCC part 15:2006

Test method: ANSI C63.4:2003

Test configuration:

Frequency band	Configuration	Resolution bandwidth	Video bandwidth	Detection mode	E.U.T. height
30MHz-200MHz	Front side (pre-measurement in semi anechoic chamber)	100kHz	300kHz	Peak	80cm
200MHz-1GHz	Front side (pre-measurement in semi anechoic chamber)	100kHz	300kHz	Peak	80cm
30MHz-1GHz	Open area measurement	120kHz	300kHz	Quasi peak	80cm

Test method deviation: No

Measuring distance: 3 meters

Test equipment list:

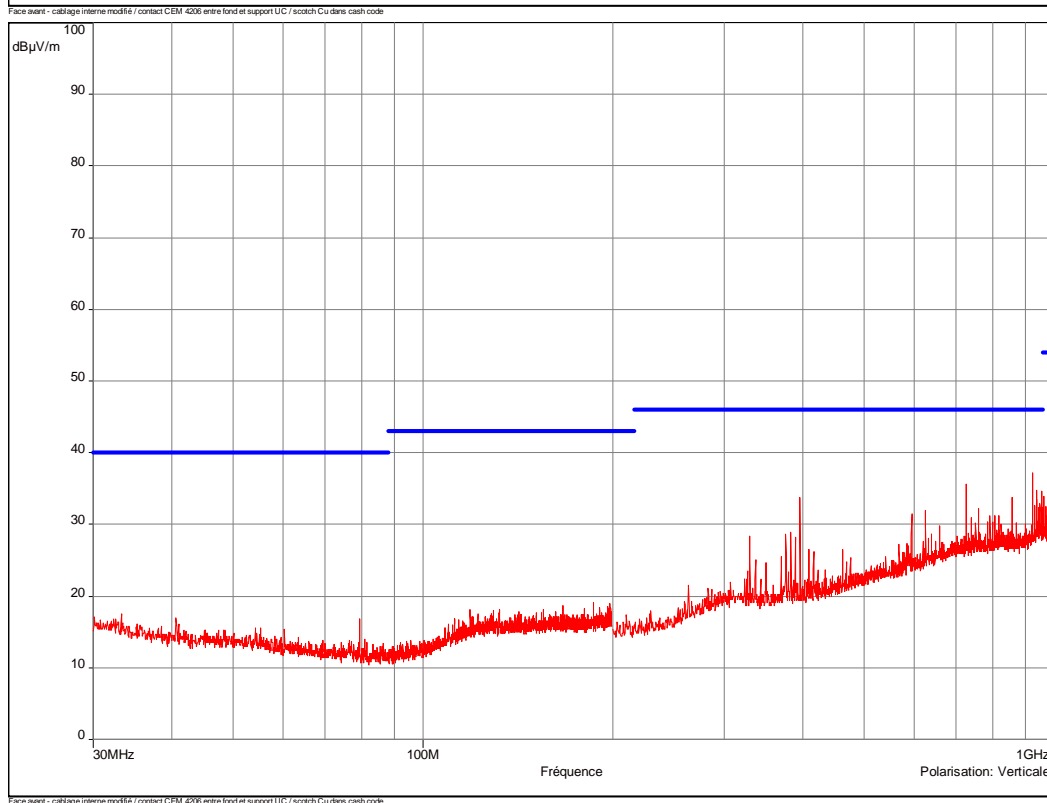
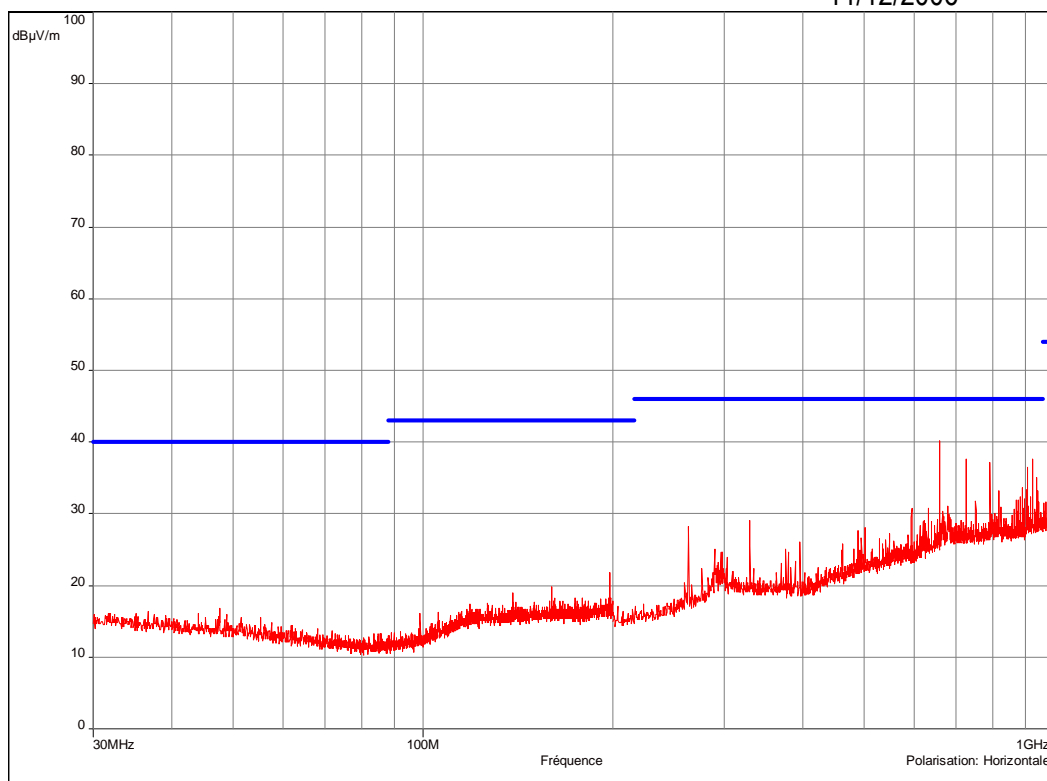
CATEGORY	BRAND	MODEL NUMBER	N° EMITECH
Antenna	Electro-Metrics	BIA-30HF	0824
Cable		N-8m	3694
Cable		N-6m	3610
Log-periodic antenna	Rohde & Schwarz	HL223	3126
OATS	Emitech	Salinelles	3482
Receiver	Rohde & Schwarz	ESVS10	3211
Software	Nexio	BAT EMC 3.1.7.1.	0000

Results: See Graph(s) (indoor pre-measurements) and Board(s) hereafter

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Radiated electric emission (pre-measurement): front side - peak detection

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HORIZONTAL POLARIZATION

Frequency (MHz)	Azimut (degrees)	Antenna height (cm)	Measure (dB μ V/m)	Standard limit (dB μ V/m)	Comments
263.96	130	100	40.0	46	C
329.98	180	100	36.5	46	C
659.95	0	220	45.9	46	C
725.94	0	100	45.5	46	C
792.94	0	180	42.1	46	C
923.92	0	130	43.1	46	C
989.92	0	130	41.4	54	C

C= Compliant

NC= Not compliant

VERTICAL POLARIZATION

Frequency (MHz)	Azimut (degrees)	Antenna height (cm)	Measure (dB μ V/m)	Standard limit (dB μ V/m)	Comments
329.98	0	140	31.3	46	C
395.95	10	140	32.4	46	C
593.95	230	120	41.3	46	C
626.95	-	-	< 19	46	C
725.94	0	120	40.9	46	C
857.92	0	100	40.1	46	C
923.92	0	160	39.1	46	C

C= Compliant

NC= Not compliant

All other spurious emissions are very lower than limits of the standard.

7. OPERATING WITHIN THE BAND 13.110-14.010 MHz - SECTION 15-225

a) Field strength

Standard: FCC part 15:2006

Test method: ANSI C63.4:2003

Test configuration:

Frequency band	Tested side	Resolution bandwidth	Video bandwidth	Detection mode	E.U.T. height
13.11MHz-14.01MHz	Front side	10kHz	30kHz	Peak	80cm

Test method deviation:

Measurements are given in dB μ A/m instead of dB μ V/m (conversion factor: 51.5 dB)

Measuring distance is 3 meters instead of 30 m

Test equipment list:

CATEGORY	BRAND	MODEL NUMBER	N° EMITECH
1 input powermeter	Hewlett Packard	HP	2001
Antenna	Electro-Metrics	ALR-25	0263
Cable		N-5m	2898
OATS	Emitech	Salinelles	3482
Preamplifier	Miteq	AU-1447	3199

Results: See Graph(s) hereafter (indoor pre-measurement).

Measurement at 3m: 8 dB μ A/m (\approx 60 dB μ V/m)

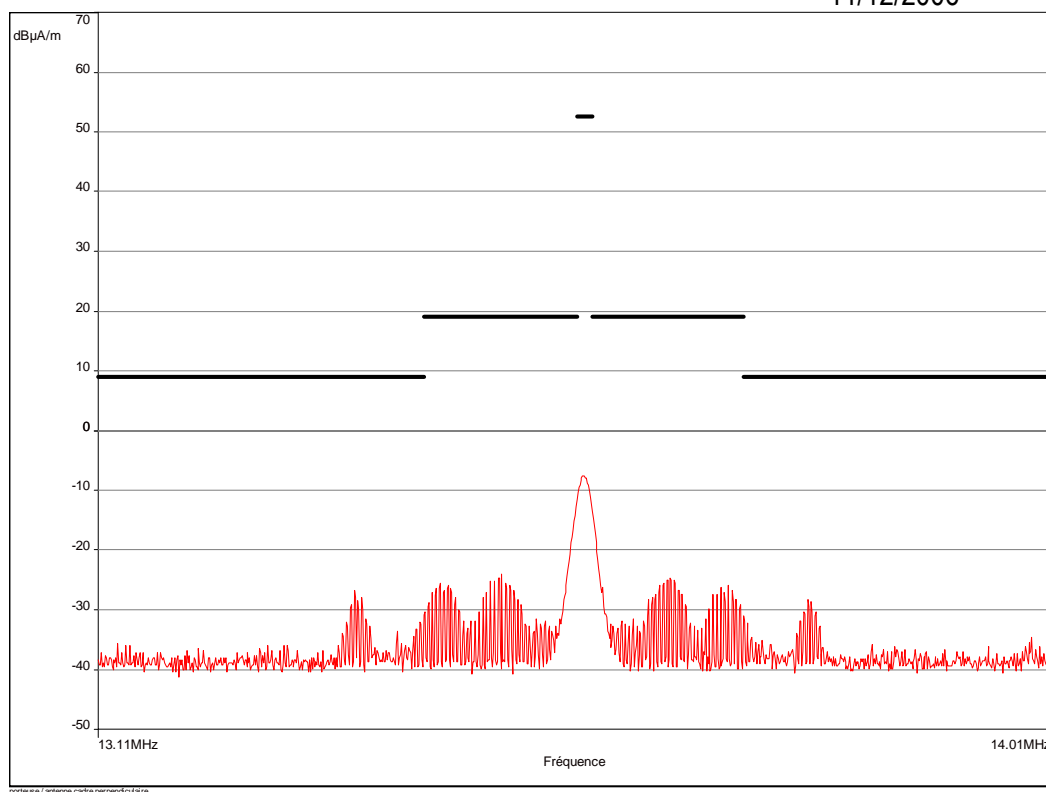
Using an extrapolation factor of 20 dB/decade (worst case), the level is about 40 dB μ V/m (0.1 mV/m) for a limit at 15.848 mV/m.

Using an extrapolation factor of 40 dB/decade (as described in section 15.31 (f)), the level is about 20 dB μ V/m (10 μ V/m) for a limit at 15.848 mV/m.

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Radiated magnetic field emission: in peak detection

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b) Frequency tolerance*Temperature: 19°C**Humidity: 30%**Pressure: 1018 hPa*Standard: FCC part 15:2006Test method: ANSI C63.4:2003Test method deviation: NoTest equipment list:

CATEGORY	BRAND	MODEL NUMBER	N° EMITECH
Climatic enclosure	Sécasi	SM600C	1670
Power supply	Kikusui	PCR2000L	800
Spectrum analyzer	Hewlett Packard	8590L	2001

Results: See Board(s) hereafter

Test condition	Frequency (MHz)	Limit ($\pm 0.01\%$)	Comments
Nominal voltage (24Vdc) Nominal temperature (20°C)	13.560012	-	-
115% voltage (27.6V)	13.560012 (0Hz)	$\pm 1.356\text{kHz}$	C
85% voltage (20.4V)	13.560012 (0Hz)	$\pm 1.356\text{kHz}$	C
-20°C, nominal voltage	13.560112 (+100Hz)	$\pm 1.356\text{kHz}$	C
+50°C, nominal voltage	13.559888 (-124Hz)	$\pm 1.356\text{kHz}$	C
36Vdc supplied (maximum voltage)	13.560012 (0Hz)	-	For information
16Vdc supplied (minimum voltage)	13.560012 (0Hz)	-	For information

□□□ End of report – 1 annex to be forwarded □□□

ANNEX: PHOTOGRAPH(S)

EQUIPEMENT UNDER TEST (E.U.T.) PHOTOGRAPH(S)

ON BOARD banknote card reloader BBR415

E.U.T. Photograph(s)



Radiated magnetic field emission



Radiated electric
emission

