

RETLIF TESTING LABORATORIES
TEST REPORT R-4519N1
December 21, 2005

FCC COMPLIANCE TEST REPORT
ON

Viisage Technology
iA-thenticate
Borderguard Passport Reader
With Integrated 13.56MHz RFID Smart Card Readers
FCC ID: TSP0B4000C

APPLICANT Viisage Technology 296 Concord Road, 3 rd Floor Billerica, MA 01821	MANUFACTURER SAME
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TEST SPECIFICATION: FCC Rules and Regulations Part 15, Subpart C, Para. 15.209

TEST PROCEDURE: ANSI C63.4:2001

TEST SAMPLE DESCRIPTION

BRANDNAME: iA-thenticate MODEL: B4000-C

TYPE: Borderguard Passport Reader With Integrated Dual 13.56MHz RFID Smart Card Readers

POWER REQUIREMENTS: 120VAC, 60Hz

FREQUENCY OF OPERATION: 13.56MHz

FCC ID: TSP0B4000C

APPLICABLE RULE SECTION: Part 15, Subpart C, Section 15.209

TESTS PERFORMED

15.209/15.205 Fundamental, Spurious & Restricted Band/Bandedge Emissions

15.207 (a) AC Line Conducted Emissions

TEST SAMPLE DESCRIPTION

The EUT is a Passport Reader with dual 13.56MHz RFID Smart Card Readers. The Borderguard Passport Reader is used to read new style passports containing data chips embedded in the front and/or back pages of the passport. The Passport Reader contains two identical 13.56MHz RFID Card Readers (top and front/bottom). Two Readers are necessary in order to read two different types of passports which be may be used (different data chip locations in the passport). Depending on the location of the data chip within the passport either the top or front/bottom RFID card reader will be activated and the other one will be disabled by software so that only one of the readers will be active (transmitting) at any given time. During normal use the Passport reader is connected to a host PC and receives power through the AC mains (120VAC, 60Hz). The Borderguard Passport Reader has also been tested and found to be compliant with Part 15, Subpart B as a computer peripheral/digital device and a separate test report issued.

ANTENNA DESCRIPTION

Each Card Reader has an integral antenna and thus the EUT had no external antenna/antenna ports.

TEST SAMPLE / TEST RESULTS SUMMARY

15.205 RESTRICTED BANDS OF OPERATION

No emissions from the EUT were observed in any of the restricted bands. As the 13.56MHz frequency of operation falls near the restricted band of 13.36 to 13.41MHz compliance at the band edge of the restricted band was verified at worst case operating mode (see attached data)

15.207 CONDUCTED EMISSIONS

No emissions above the limit specified in 15.207(a) was observed in any operating condition. Worst case emissions were observed in search/toggle mode and this data is included in this application (See attached)

15.209 RADIATED EMISSIONS

Fundamental Frequency
13.56MHz
Out of Band, Spurious, Harmonics
9kHz - 1000MHz

Field Strength Limits:

Fundamental Frequency: 13.56MHz

The maximum permitted fundamental field strength at 30 meters is $30\mu\text{V/M} = 29.5\text{dBuV}$:

Unwanted emissions cannot exceed the level of the fundamental emissions.

RADIATED EMISSIONS TEST RESULTS

The maximized peak field strength at 13.56MHz was below the limit specified in 15.209. The test sample was tested in 3 operating conditions (top reader active, front/bottom reader active and search/toggle mode in which each card reader is activated back and forth in turn while searching for a valid passport). The worst case fundamental emission at 13.56MHz was found to occur during search/toggle mode where the maximized emission was 3dB below the specified limit. Test data is included for this worst case operating condition. No harmonic or transmitter spurious emissions were observed at 1 or 3 meter test distances in any of the 3 operating conditions. Bandedge Compliance in the 13.36 to 13.41MHz restricted band was also verified at worst case operating mode (see attached plot).

CONDUCTED EMISSIONS TEST RESULTS

The AC line conducted emissions met the limit specified in 15.207 (a) in all three operating conditions. Worst case emissions were observed in search/toggle mode. Data is included for this worst case mode. (See attached)

MEASUREMENT PROCEDURES

15.209 Field Strength of Fundamental, Harmonic/Spurious and Band Edge Emissions

The field strength of the fundamental, harmonic/spurious and bandedge emissions were measured. The EUT and support equipment were placed on a 80cm high wooden test stand which was located 3 meters from the test antenna on an FCC listed open area test site. Emissions from the EUT were maximized by rotating the test sample and adjusting the test sample cabling and antenna polarization. The maximized field strength of each observed emission was measured, recorded and compared to the specified limits of 15.209. Bandedge measurements were made to verify compliance in 13.36 to 13.41MHz restricted band. When necessary the marker/delta method was used to verify bandedge compliance.

15.207 AC Line Conducted Emissions

The EUT and support equipment were placed on a 0.8m high wooden test stand above the floor of the test area (ground plane). The rear of the test sample was aligned flush with the rear of the test stand. The test stand was situated such that the test sample was located 0.4m from all other grounded surfaces. The power cord of the test sample was connected to an artificial mains network (LISN). The spectrum analyzer was connected to the RF port of the LISN and measurements were taken in the frequency range of 150kHz to 30MHz on each the hot and neutral leads. Emissions were evaluated in all three operating conditions (top reader active, front/bottom reader active, search/toggle).

TEST EQUIPMENT LISTS

FUNDAMENTAL & SPURIOUS EMISSIONS

EN	Type	Manufacturer	Description	Model No.	Cal Date	Due
3207	Loop Antenna	EMCO	10 KHz - 30 MHz	6502	07/22/2005	07/22/2006
4202	Biconilog	EMCO	26 MHz - 2 GHz	3142	12/13/2004	12/13/2005
713	EMI Test Receiver	Rohde & Schwarz	20 Hz - 26.5 GHz	ESI26	03/22/2005	03/22/2006

AC LINE CONDUCTED EMISSIONS

EN	Type	Manufacturer	Description	Model No.	Cal Date	Due
4027	LISN	Solar Electronics	10 KHz - 30 MHz	9252-50-R-24BNC	11/21/2005	11/21/2006
4028	Isolation Transformer	Acme	N/A	120x240	01/31/2005	01/31/2006
4895	Spectrum Analyzer	Hewlett Packard	9kHz - 22GHz	8593EM	09/20/2005	09/20/2006
5030	10 DB Atten. (50 ohm)	Narda	DC - 12.4 GHz	757C-10	02/07/2005	02/07/2006

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RADIATED EMISSIONS TEST SETUP PHOTOGRAPH
9kHz to 30MHz



RADIATED EMISSIONS TEST SETUP PHOTOGRAPH
30MHz to 1GHz



CONDUCTED EMISSIONS SETUP PHOTOGRAPH
.15 to 30MHz



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RETLIF TESTING LABORATORIES

EMISSIONS DATA SHEET

Test Method:

Spurious Radiated Emissions

Customer

Viisage

Job No.

R-4519N1

Test Sample

Passport Reader w/13.56MHz RFID

Model No.

B4000-C

Serial No.

03-00176

Test Specification:

FCC Part 15

Paragraph: 15.209

Operating Mode:

Searching For RFID Card

Technician:

T. Hannemann

Date:

December 6, 2005

Notes:

Test Distance: 3 Meters

No RFID Card Present

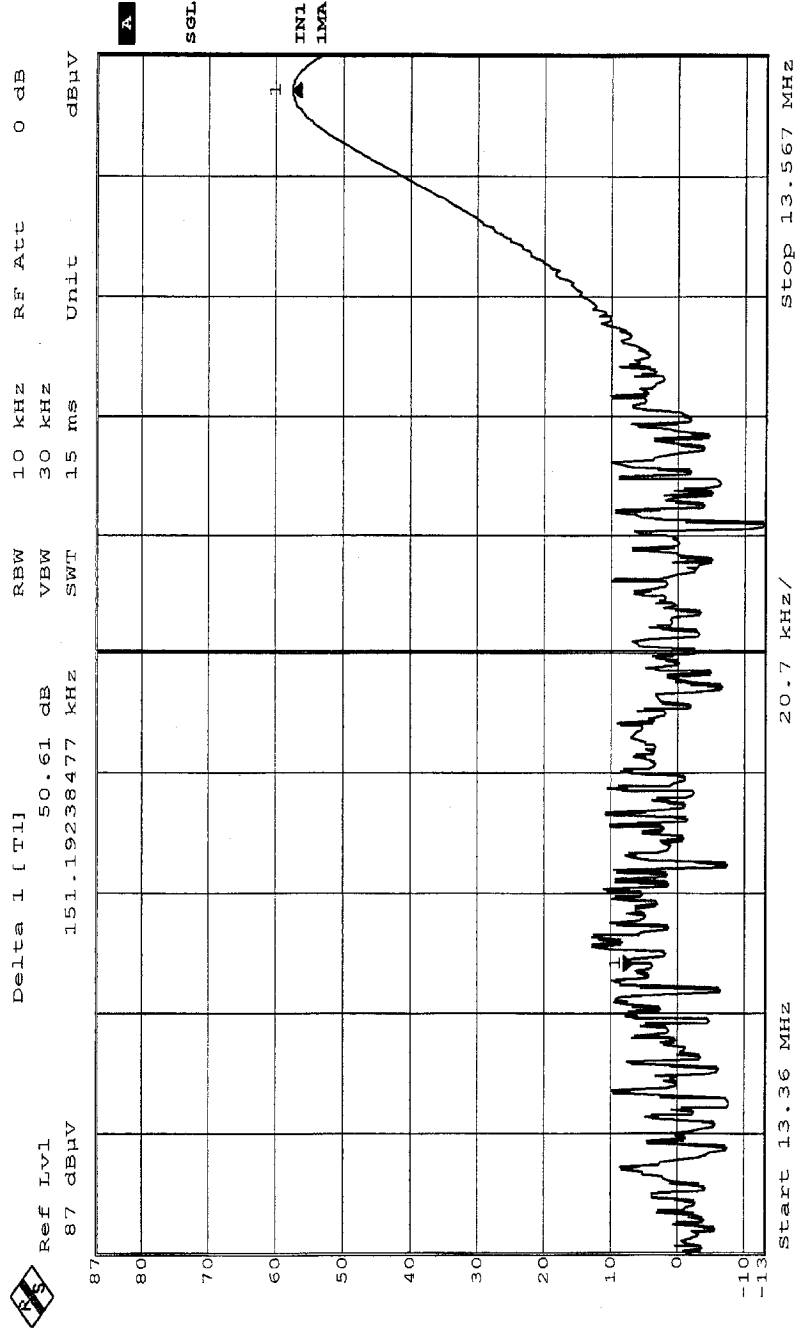
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No EUT emissions within 20 dB of the specified test limit were observed at the specified test distance throughout the given frequency spectrum.

RETILF TESTING LABORATORIES

EMISSIONS DATA SHEET

Test Method:		Bandedge Emissions	
Customer:	Model No:	Test Sample:	Job No:
	B4000-C	Passport Reader w/13.56MHz RFID	R-4519N1
Test Specification:	Operating Mode:	Serial No:	Technician:
	Searching for RFID Card	03-00176	T. Hannemann
Notes:		Paragraph: 15.209	Date:
			November 30, 2005



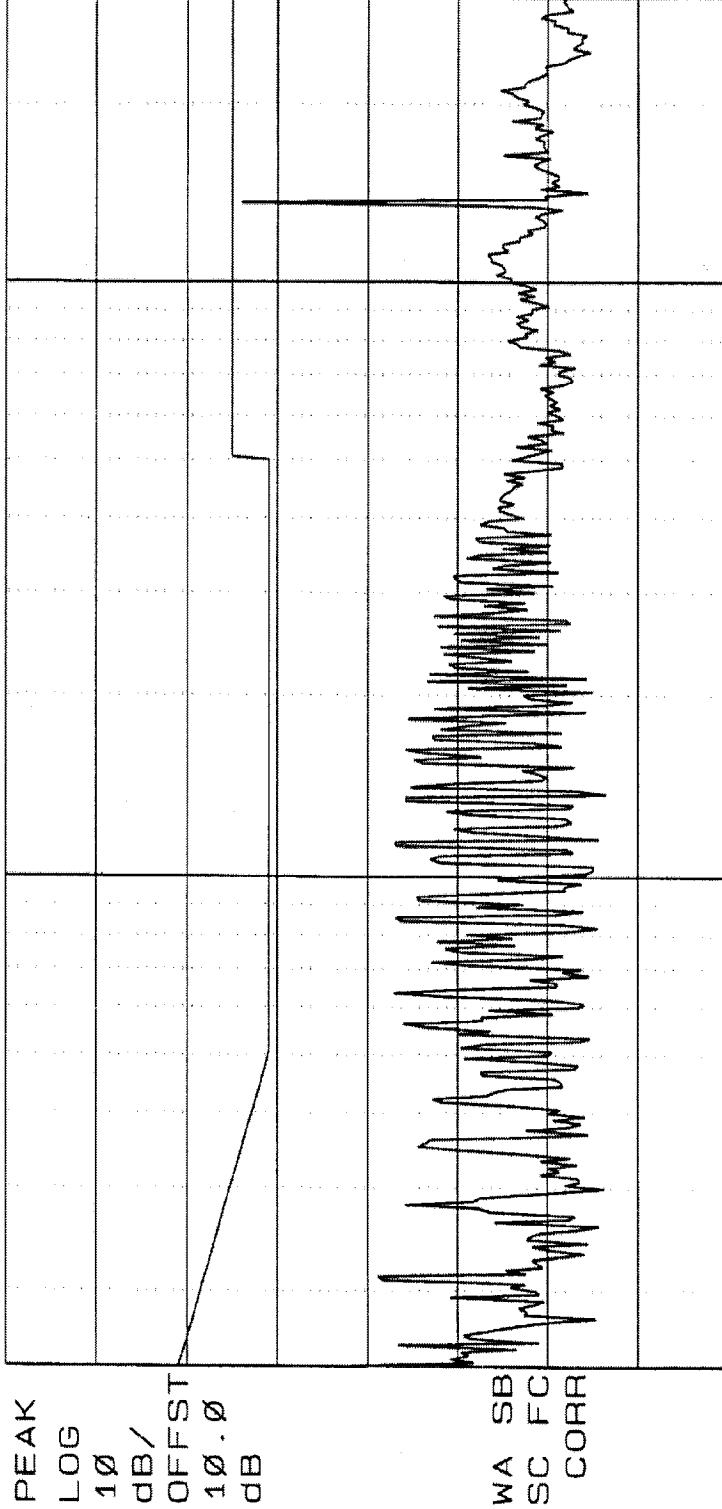
RETILF TESTING LABORATORIES

EMISSIONS DATA SHEET

Test Method:		Conducted Emissions 150 kHz to 30 MHz	
Customer:	Visage	Test Sample:	Passport Reader w/13.56MHz RFID
Model No:	B4000-C	Serial No:	03-00176
Test Specification:	FCC Part 15, Subpart C		
Operating Mode:	Searching for RFID card		
Notes:	Lead Tested: 120 VAC 60 Hz Hot Peak Readings to Average Limits.		
Job No:	R-4519N1		
Technician:	T. Hannemann		
Date:	November 30, 2005		

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REF 75.0 dBμV #AT 0 dB



START 150 kHz #RES BW 9.0 kHz VBW 30 kHz STOP 30.00 MHz #SWP 2.00 sec

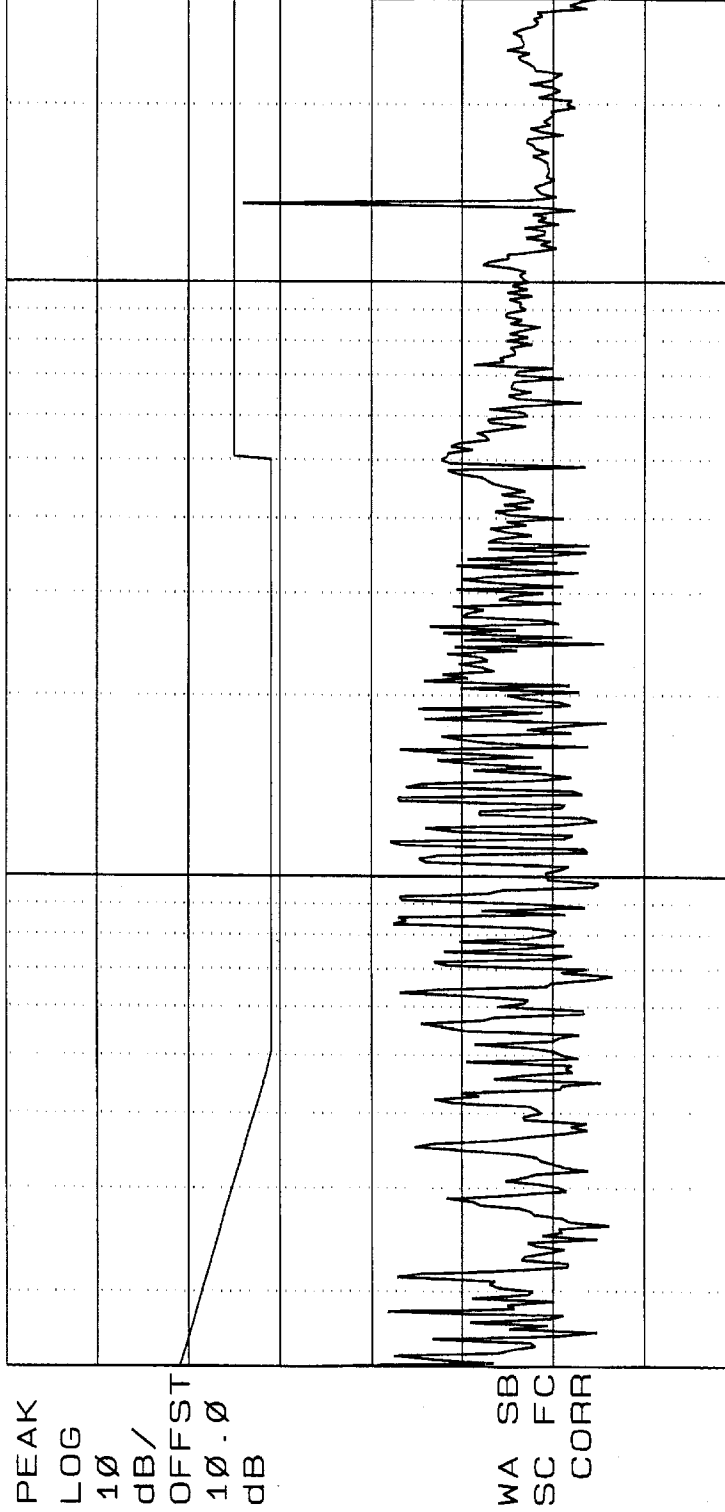
RETILF TESTING LABORATORIES

EMISSIONS DATA SHEET

Test Method:		Conducted Emissions 150 kHz to 30 MHz	
Customer:	Viisage	Test Sample:	Passport Reader w/13.56MHz RFID
Model No:	B4000-C	Serial No:	03-00176
Test Specification:	FCC Part 15, Subpart C		
Operating Mode:	Searching for RFID card		
Notes:	Lead Tested: 120 VAC 60 Hz Neutral	Peak readings to Average Limits	
Job No:	R-4519N1		
Technician:	T. Hannemann		
Date:	November 30, 2005		

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REF 75.0 dBμV #AT 0 dB



START 150 kHz STOP 30.00 MHz
#RES BW 9.0 kHz #SWP 2.00 sec
VBW 30 kHz