EMV - CONTACTLESS TERMINAL LEVEL 1 TESTING

DEBUGGING TEST REPORT

Reference: *EMV Contactless* Specifications for Payment Systems V2.3

N° C14RAP07-25-2_antenna_2

Version: 1.0
Including: 17 pages and 02 pages in appendix

Vendor Name: New rFid Concept
Address: 1bis, rue d'Ouessant
35762 Saint Grégoire
France

Model of the Terminal: Antenna 50x50 pr533

Dates of the session: July 28 to July 29, 2014

Edited by:	Approved by:
Matthieu GERMAIN Test Technician 2014-08-06 17:31+02:00	Samuel OZANNE Head of activity 2014-08-06 18:18+02:00

This report shall be communicated only in full. In the event of a new report being sent, please return the previous one to us or destroy it. Test results described in this report only relate to the samples tested.

Table of Contents

REVISION HISTORY

Date	Version	Author	Comments
August 6, 2014	1.0	MGE	Initial Version

1 - TESTING LABORATORY INFORMATION

1.1 - Testing Laboratory Identification

The Testing Laboratory that issued this Test Report and the tests described in this report were conducted at the following premises:

FIME Europe Test Centre
8, rue Commodore J.H. Hallet
14000 CAEN - France
Tel. : +33. (0) 2.31.44.08.07
Fax: +33. (0) 2.31.44.44.77

1.2 - Test Personnel

The following persons were involved in the preparation, execution, and reporting of the tests:

Matthieu GERMAIN, Test Technician
Lionel HASENEYER, Expert
Samuel OZANNE, Head Of Activity

1.3 - References

Tests performed according to the specifications described in:

1.3.1 The reference specifications for test result

- EMV Contactless Specifications for Payment Systems – Book D – EMV Contactless Communication Protocol - Version 2.3.1 – November 2013.

1.3.2 The documents describing the test implementation of the laboratory

The procedures used for the tests are described in PAQ "PAQ_Read_EMVL1_CL". The applicable version of the document is the latest approved one when the test session starts.

- EMVCo Type Approval Contactless Terminal Level 1 – PCD Analogue Test Bench and Test Case Requirements – Version 2.3.1a – November, 2013.
- EMVCo Type Approval Contactless Terminal Level 1 – PCD Digital Test Bench & Test Cases – Version 2.3.1a – November, 2013.
- EMVCo Type Approval Contactless Terminal Level 1 – PCD Pre-Validation Test – Version 2.3.1a – November, 2013.

2 - VENDOR INFORMATION

The vendor that requested the tests described in this report is identified as:

Company: New rFid Concept
Address: 1bis, rue d'Ouessant
35762 Saint Grégoire
France

Tel.: +33 (0) 299 252 109
Fax: +33 (0) 222 441 928

Email: yves.eray@new-rfid-concept.com

3 - PRODUCT INFORMATION

3.1 - Product identification

The samples were received on July 28, 2014.
The tests were performed on the following device: C14STN07-25-2 N° 2

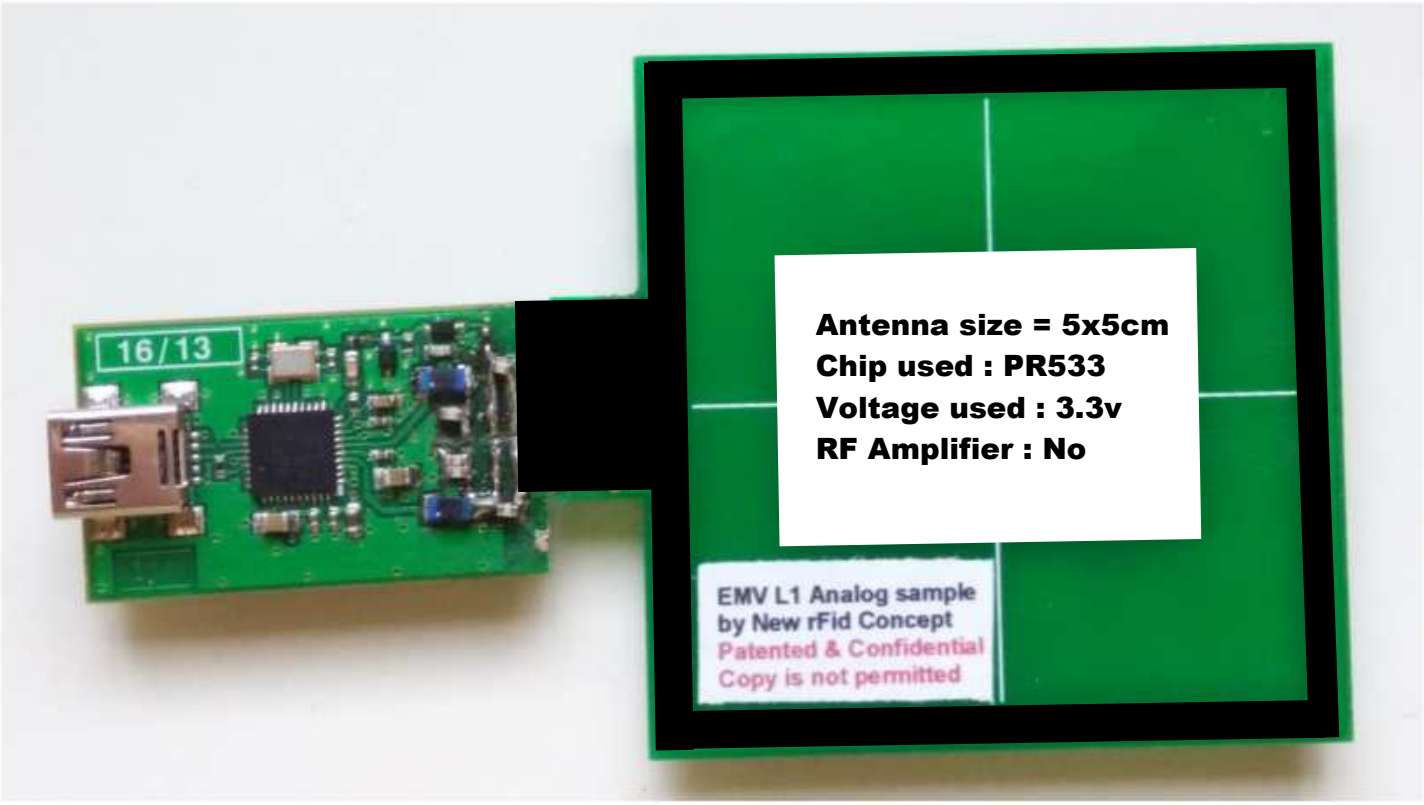
Family identification:

- Brand: New rFid Concept
- Name of PCD–ID Device: Antenna 50x50 pr533

Sample identification:

Sample Reference	Serial Number
Sample N°1	Not Provided

Pictures:



4 - EMV CONTACTLESS LEVEL 1 TEST BENCH

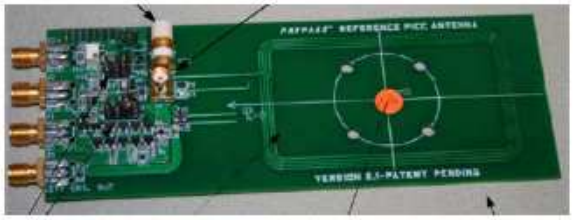
The following devices were used for conducting the tests:

- Protocol Contactless Card Simulator:

Brand:	MICROPROSS
Model or Type:	MP300
Serial Number:	MP3.07.13.04
Embedded Application:	Boot v1.07 and Syst v5.00
INQ Test Tool Platform:	v.7.16 built 1003
Current PC Library:	EMD Extension' Test Suite v.1.1.1

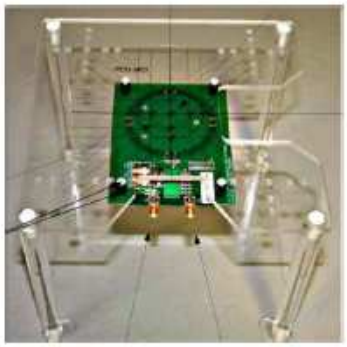
- EMV - Test PICC:

Brand:	FIME
Model:	EMV - Test PICC V2.1
Serial Number:	PICC-A02-061
Internal Reference:	C32/08



- EMV - Test PCD:

Brand:	FIME
Model:	EMV - Test PCD V1.2
Serial Number:	PCD-A01-008
Internal Reference:	C32/07



- EMV Test CMR :

Brand:	FIME
Model:	EMV - Test CMR V 2.1
Serial Number:	CMR-A02-001
Internal Reference:	C32/10

- Oscilloscope:

Brand:	Lecroy
Model or Type:	Waverunner 6050
Serial Number:	LCRY0602P12663 (C08/04)
Resolution:	5 G Samples / s

- Passive probe:

Brand:	Lecroy
Model or Type:	PP007-WR
Attenuation:	÷10 ± 1%
Input Resistance:	10 MΩ ± 1%
Input Capacitance:	9.5 pF
Bandwith:	500 MHz (-3dB)

- Spectrum Analyser:

Brand:	Agilent
Model or Type:	E4401B
Serial Number:	MY41440662
Range:	9 kHz to 1.5 GHz
Resolution:	1 Hz

- RF Amplifier:

Brand:	ADECE
Model or Type:	Amplificateur 10W 2 à 50 MHz
Serial Number:	Lot N° 439

- Logic Pattern Generator:

Brand:	Spincore
Model or Type:	Pulseblaster PB24-100-32K
Output Signal:	TTL
Pulse interval range:	50 ns to 2 years
Pulse interval Resolution:	10 ns (at 100 MHz)

- Acquisition Card:

Brand:	ADLINK
Model or Type:	PCI – 9820D/512-0
Input impedance:	50Ω / 1.5MΩ
Sampling rate:	65 MS/s
Resolution:	14 bits -12bit ENOB
Memory:	512 MB SDRAM

- Arbitrary Waveform Generator:

Brand:	Tabor
Model or Type:	8026
Serial Number:	205408 (C28/05)
Sampling Rate:	100MS/s
Resolution:	14 bit
Memory:	4Mpts
Bandwith:	50 MHz

- PICC Synchronization Device:

Brand:	Fime
Model or Type:	Smartspy Contactless
Serial Number:	C13/02
µControler / FPGA Version:	1.3 / 1.9

5 - SUMMARY OF TEST RESULTS

The following codification is used in this test report:

Code	Verdict
PASS	Passed Test
FAIL	Failed Test
N/T	Not Tested
INC	Inconclusive
N/I	Not Implemented
N/A	Not Applicable

Test Category	Sub-Test Category	Result	Test Number
Contactless symbol verification		N/T	General Requirements
Pre-validation Test		PASS	
Analog Tests	Radio frequency power	PASS	
		N/T	TAB112, TAB113, TAB114
	Signal interface PCD to PICC – Type A	PASS	
	Signal interface PICC to PCD – Type A	PASS	
		N/T	TA139
	Sequence, Frame bit coding and synchronisation - Type A	N/T	
	Signal interface PCD to PICC – Type B	PASS	
	Signal interface PICC to PCD – Type B	PASS	
	Sequence, Frame bit coding and synchronisation - Type B	N/T	
Protocol Tests	Polling test	N/T	
	Type A tests	N/T	
	Type B tests	N/T	

6 - DETAILED TEST RESULTS

6.1 - Prevalidation tests

Card number	Reference	Result	Comment
1	EMVco 001	PASS	
2	EMVco 002	PASS	
3	EMVco 003	PASS	
4	EMVco 004	PASS	
5	EMVco 301	PASS	
6	EMVco 302	PASS	
7	EMVco 303	PASS	
8	EMVco 304	PASS	

Reference	Result	Comment
Contactless symbol verification	N/T	

6.2 - Analog tests – Radio frequency power

Test Case Number	Test Test Description	Result	Laboratory Comments
TAB111.zrf	Radio frequency power	PASS	See appendix A for the result
TAB112.200	PCD Carrier Frequency	N/T	
TAB113.200	PCD Operating Field Resetting	N/T	
TAB114.200	PCD Power-Off of the Operating Field	N/T	

6.3 - Analog tests – PCD to PICC signal interface for Type A Communications

Test Case Number	Test Test Description	Result	Laboratory Comments
TA121.z00	t_1 Timing	PASS	z = 0 cm: t_1 = 2.883 µs z = 1 cm: t_1 = 2.870 µs z = 2 cm: t_1 = 2.870 µs z = 3 cm: t_1 = 2.849 µs z = 4 cm: t_1 = 2.833 µs
TA122.z00	Monotonic decrease from V_4 to V_2	PASS	The decrease from V_4 to V_2 is not monotonic: z = 0 cm: t_5 = 108 ns, 113 ns, 101 ns, 107 ns.
TA123.z00	Ringing	PASS	
TA124.z00	t_2 Timing	PASS	z = 0 cm: t_2 = 2.179 µs z = 1 cm: t_2 = 2.570 µs z = 2 cm: t_2 = 2.186 µs z = 3 cm: t_2 = 1.831 µs z = 4 cm: t_2 = 1.572 µs
TA125.z00	t_3 and t_4 Timings	PASS	z = 0 cm: t_3 = 137 ns ; t_4 = 87 ns z = 1 cm: t_3 = 340 ns ; t_4 = 166 ns z = 2 cm: t_3 = 547 ns ; t_4 = 245 ns z = 3 cm: t_3 = 686 ns ; t_4 = 292 ns z = 4 cm: t_3 = 685 ns ; t_4 = 309 ns
TA127.z00	Monotonic increase from V_2 to V_4	PASS	
TA128.z00	Overshoot	PASS	

6.4 - Analog tests – PICC to PCD signal interface for Type A Communications

Test Case Number	Test Test Description	Result	Laboratory Comments
TA131.zrf	Positive Load modulation $V_{S1,pp,\ MIN}$	PASS	
TA132.zrf	Positive Load modulation $V_{S2,pp,MIN}$	PASS	
TA133.zrf	Positive Load modulation $V_{S1,pp,\ MAX}$	PASS	
TA134.zrf	Positive Load modulation $V_{S2,pp,\ MAX}$	PASS	
TA135.zrf	Negative Load modulation $V_{S1,pp,\ MIN}$	PASS	
TA136.zrf	Negative Load modulation $V_{S2,pp,MIN}$	PASS	
TA137.zrf	Negative Load modulation $V_{S1,pp,\ MAX}$	PASS	
TA138.zrf	Negative Load modulation $V_{S2,pp,\ MAX}$	PASS	
TA139.zrf	$FDT_{A,PICC}$ tolerance	N/T	

6.5 - Analog tests – Bit Level Coding Signal Interface for Type A Communications

Test Case Number	Test Description	Result	Laboratory Comments
TA141.200	PCD Transmitted Bit rate	N/T	
TA142.200	Bit Coding and De-synchronization of PCD to PICC	N/T	
TA143.200	Bit Coding and De-synchronization PICC to PCD	N/T	

6.6 - Analog tests – PCD to PICC signal interface for Type B Communications

Test Case Number	Test Description	Result	Laboratory Comments
TB121.z00	Modulation index	PASS	z = 0 cm: m_i = 11.9 % z = 1 cm: m_i = 12.0 % z = 2 cm: m_i = 12.6 % z = 3 cm: m_i = 13.0 % z = 4 cm: m_i = 13.2 %
TB122.z00	Fall time	PASS	z = 0 cm: t_f = 108 ns z = 1 cm: t_f = 265 ns z = 2 cm: t_f = 395 ns z = 3 cm: t_f = 490 ns z = 4 cm: t_f = 557 ns
TB123.z00	Rise time	PASS	z = 0 cm: t_r = 158 ns z = 1 cm: t_r = 316 ns z = 2 cm: t_r = 546 ns z = 3 cm: t_r = 678 ns z = 4 cm: t_r = 731 ns
TB124.z00	Monotonic rising edge	PASS	
TB125.z00	Monotonic falling edge	PASS	
TB126.z00	Overshoots	PASS	
TB127.z00	Undershoots	PASS	

6.7 - Analog tests – PICC to PCD signal interface for Type B Communications

Test Case Number	Test Test Description	Result	Laboratory Comments
TB131.zrf	Positive Load modulation $V_{S1,pp,\ MIN}$	PASS	
TB132.zrf	Positive Load modulation $V_{S2,pp,MIN}$	PASS	
TB133.zrf	Positive Load modulation $V_{S1,pp,\ MAX}$	PASS	
TB134.zrf	Positive Load modulation $V_{S2,pp,\ MAX}$	PASS	
TB135.zrf	Negative Load modulation $V_{S1,pp,\ MIN}$	PASS	
TB136.zrf	Negative Load modulation $V_{S2,pp,MIN}$	PASS	
TB137.zrf	Negative Load modulation $V_{S1,pp,\ MAX}$	PASS	
TB138.zrf	Negative Load modulation $V_{S2,pp,\ MAX}$	PASS	

6.8 - Analog tests – Bit Level Coding Signal Interface for Type B Communications

Test Case Number	Test Description	Result	Laboratory Comments
TB141.200	PCD Transmitted Bit rate	N/T	
TB142.200	Synchronization, Bit Coding and De-synchronization of PCD to PICC	N/T	
TB145.200	Maximum Limit De-synchronization PICC to PCD ($t_{FSOFF,MAX}$)	N/T	
TB146.200	Synchronization, Bit Coding and De-synchronization of PICC to PCD	N/T	
TB147.200	Bit Boundaries with Type B Communications	N/T	
TB148.200	Minimum Limit De-synchronization PICC to PCD ($t_{FSOFF, MIN}$)	N/T	
TB149.200	Verifying the maximum limit EGT picc, eos PICC to PCD	N/T	

7 - TERMS AND CONDITIONS

7.1 - Disclaimers

Disclaimer 1

This Test Report does not constitute an official approval by the Test Authority of the samples under test.

Disclaimer 2

This Test Report contains only information about the tested samples. It is not an endorsement of the entire production of the product.

7.2 - Complaint Procedure

The Testing Laboratory has a policy and appropriate procedure for resolving customer complaints (Internal Ref. NC_CC). This procedure includes an investigation of the complaint. If the investigation indicates that a problem exists, the Testing Laboratory must document the actions taken to correct the problem. The complaint process should lead to the formal corrective action process (Internal Ref. COR_PREVACT).

7.3 - Property

The test report is the intellectual property of the Testing laboratory, and is the faithful rendition of the observed test results.

7.4 - Storage

The test results are stored by the Testing Laboratory for a period of 15 years.

7.5 - Test Results

The tests are conducted according to the operational procedures (see section 2.4), and the environmental conditions are free from disturbances.

The tests are performed on a qualified and accepted test bench, which was operational at time of Debugging Test Session, and whose results are indicated in section IV.

We certify that the results included in this test report are the precise results of the tests performed on the provider sample.

The test report is the faithful rendition of the observed test results. The card provider shall only use the Test report for internal corrective action to his products. The Test report does not constitute an approval of the sample under test by the Test Authority.

8 - APPENDICES (2 PAGES)

Appendix A: Analog tests - Radio frequency power and signal interface: Result of the test TAB111.zrf (Including 1 Page)

---------- END OF DOCUMENT ----------

APPENDIX A
Test Report:
C14RAP07-25-2_antenna_2

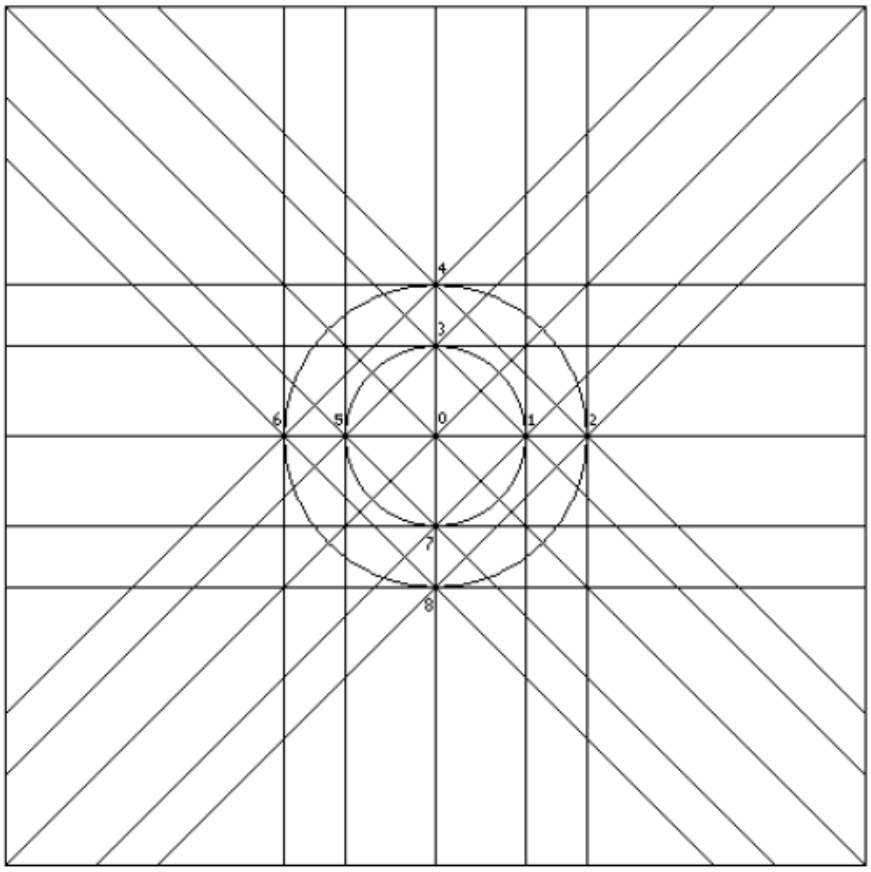
Analog tests
Radio frequency power and signal interface

Result of the test TAB111.zrf

(Including 1 page)

Test TAB111.zrf

The PCD generates enough field in the operating volume.



The following table shows the value of V_{OV} (DC) voltage measured at J1 of the EMV Test PICC.

Points (r, f) / Height/angle	0 (r=0,f=0) (in Volts)	1 (r=1,f=0) (in Volts)	2 (r=2,f=0) (in Volts)	3 (r=1,f=3) (in Volts)	4 (r=2,f=3) (in Volts)	5 (r=1,f=6) (in Volts)	6 (r=2,f=6) (in Volts)	7 (r=1,f=9) (in Volts)	8 (r=2,f=9) (in Volts)	Criteria
z = 0 cm	3,61	3,86		5,33		3,84		5,27		≥ 3,1 V ≤ 8.1 V
z = 1 cm	5,28		5,32		4,57		5,38		4,73	≥ 3,05 V ≤ 8.1 V
z = 2 cm	5,27		4,53		3,57		4,59		3,92	≥ 3,00 V ≤ 8.1 V
z = 3 cm	4,31		3,42		2,80		3,53		3,06	≥ 2,775 V ≤ 8.1 V
z = 4 cm	3,17	2,86		2,71		2,92		2,92		≥ 2,55 V ≤ 8.1 V