R F – T E S T R E P O R T

- Human Exposure -

Type / Model Name	:	MPH-AC008A
		HVIN: MPH-AC008A
Product Description	:	Access control terminal VisionPass SP
Applicant	:	IDEMIA Identity & Security France
Address	:	2 Place Samuel Champlain
		COURBEVOIE 92400, FRANCE
Manufacturer	:	IDEMIA Identity & Security France
Address	:	2 Place Samuel Champlain
		COURBEVOIE 92400, FRANCE

Test Result according to the standards listed in clause 1 test standards:	**POSITIVE**

Test Report No. : 80182763-03 Rev_2	15. April 2024 Date of issue

Deutsche Akkreditierungsstelle
D-PL-12030-01-03
D-PL-12030-01-04

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1 TEST STANDARDS

The tests were performed according to following standards:

FCC Rules and Regulations Part 1, Subpart I - Procedures Implementing the National Environmental Policy Act of 1969

Part 1, Subpart I, Section 1.1310	Radiofrequency radiation exposure limits
KDB 447498 D04	Interim General RF Exposure Guidance v01.
IEEE C95.3	IEEE Recommended Practice for Measurements and Computations of Electric, Magnetic, and Electromagnetic Fields with Respect to Human Exposure to such Fields, 0 Hz to 300 GHz

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2 EQUIPMENT UNDER TEST

2.1 Information provided by the Client

Please note, we do not take any responsibility for information provided by the client or his representative which may have an influence on the validity of the test results.

2.2 Sampling

The customer is responsible for the choice of sample. Sample configuration, start-up and operation is carried out by the customer or according his/her instructions.

2.3 Photo documentation of the EUT – See ATTACHMENT A

2.4 Equipment type, category

Radar equipment, field disturbance sensor

RFID device

2.5 Short description of the equipment under test (EUT)

The EUT is a field disturbance sensor in the operating band of 61.0 GHz – 61.5 GHz. This report covers the emissions of the host device VisionPass SP Terminal “MPH-AC008A” with the module “BGT60LTR11AIP” integrated into it. The channels 1-4 are for positioning evaluation and data transmission. The VisionPass SP series are access control terminals using biometric technology with RFID. Using RFID mode, the badge (card) of the user is identified by RFID reader. The user approaches the badge near the RFID zone and the system gives access or not to the user. The maximum hold time of the bagde near RFID reader is 2s.

Number of tested samples:	3
Serial number:	#1 (CW) 2337SMK0000017
	#2 (pulsed) 2337SMK0000016
	#3 (CW) 2337SMK0000024
Firmware version:	1.5.5-SNAPSHOT
	RF relevant register settings hard coded.
	Only channel selection in 61.0-61.5 GHz band possible (CH1-4)
	All samples with normal RFID mode

2.6 Variants of the EUT

There are two variants of the VisionPass SP series:

- Vision Pass SP MD
- Vision Pass SP MDI

2.7 Operation frequency and channel plan

The operating frequency of the FDS is 61.0 GHz to 61.5 GHz.

Channel	Frequency (GHz)
1	61.1
2	61.2
3	61.3
4	61.4

Note: The blue marked channels are measured.

The operating frequency f the RFID is 13.553 MHz to 13.567 MHz on 1 channel.

2.8 Transmit operating modes

TX modulated
TX CW

2.9 Antennas

The following antennas shall be used with the EUT:

Number	Characteristic	Model number	Plug	Frequency range (GHz)	Gain (dBi)
1	linear	On chip patch antenna for TX	-	61.0-61.5	5.0
2	linear	On chip patch antenna for RX	-	61.0-61.5	5.0

The antennas cannot be unattached by the user.

2.10 Power supply system utilised

Power supply voltage, V_{nom} : 12 - 24 V_{DC}, 12 V_{DC}

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3 TEST RESULT SUMMARY

Rule Part	Description	Result
KDB 447498, 7.1, FCC § 1.1310(e)(1)	MPE	passed
FCC § 1.1310(e)(1)	SAR exclusion consideration	passed
KDB 447498, 7.2	Co-location, Co-transmission	passed

3.1 Revision history of test report

Test report No	Rev.	Issue Date	Changes
80182763-03	0	-	Initial test report
80182763-03	1	03 April 2024	RFID measurements, 2 cm distance between body and device
80182763-03	2	15. April 2024	Only FCC testreport, RSS separate

The test report with the highest revision number replaces the previous test reports.

3.2 Final assessment

The equipment under test fulfils the requirements cited in clause 1 test standards.

Date of receipt of test sample : acc. to storage records

Testing commenced on : 27 February 2024

Testing concluded on : 19 March 2024

Checked by:

Thomas Weise Digitally signed by Thomas Weise Date: 2024.04.15 15:37:50 +02'00'

Thomas Weise
Laboratory Manager

Tested by:

C. Thaller Christopher Thaller 2024.04.15 15:05:04 +02'00'

Christopher Thaller
Radio Team

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4 TEST ENVIRONMENT

4.1 Address of the test laboratory

CSA Group Bayern GmbH
Ohmstrasse 1-4
94342 STRASSKIRCHEN
GERMANY

4.2 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15 - 35 °C
Humidity:	30 - 60 %
Atmospheric pressure:	86 - 106 kPa

4.3 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. It is noted that the expanded measurement uncertainty corresponds to the measurement results from the standard measurement uncertainty multiplied by the coverage factor k = 2. The true value is located in the corresponding interval with a probability of 95 %. The measurement uncertainty was calculated for all measurements listed in this test report on basis of the ETSI Technical Report TR 100 028 Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 1 and Part 2. The results are documented in the quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

4.4 Conformity Decision Rule

The applied conformity decision rule is based on ILAC G8:09/2019 clause 4.2.1 Binary Statement for Simple Acceptance Rule (w = 0).
Details can be found in the procedure CSA_B_V50_29.

5 HUMAN EXPOSURE

5.1 Test results

5.1.1 Test results of the maximum rf output power of the FDS at 61 GHz of the EUT

For test instruments and accessories used see section 6 Part **DC**.

The output power of the device for the FDS (field disturbance sensor) is taken from the RF Peak output power measurement in the test report 80182763-02 according to FCC Part 15 C, 15.255 issued by CSA Group Bayern GmbH.

Peak output power EIRP:

Frequency (MHz)	Level PK (dBm)	Limit PK (dBm)
61.1	9.8	43.0
61.2	9.8	43.0
61.4	10.9	43.0

With a Duty Cycle of:

Total length of period	500.05 µs
Max. On time	6.05 µs
DC	0.01
Correction factor	-38.3 dB

The average power is:

Level AV (dBm)	Limit AV (dBm)	Margin AV (dB)
-28.5	40.0	-68.5
-28.5	40.0	-68.5
-27.4	40.0	-67.4

Remarks: For more details regarding Duty Cycle see the following measurement plots.

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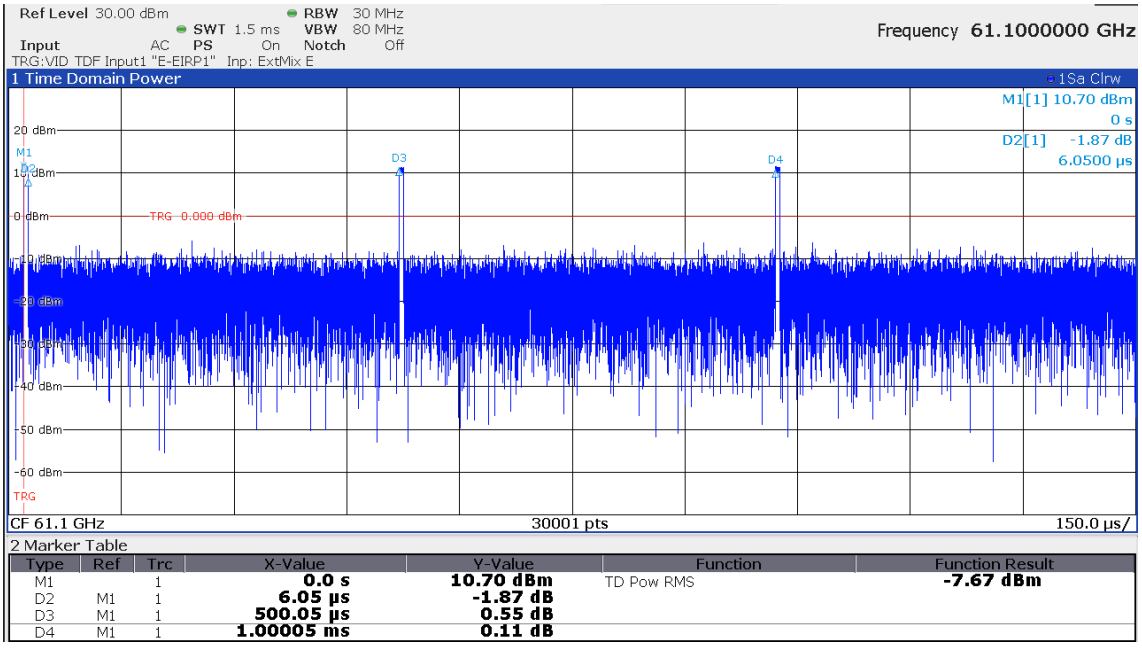
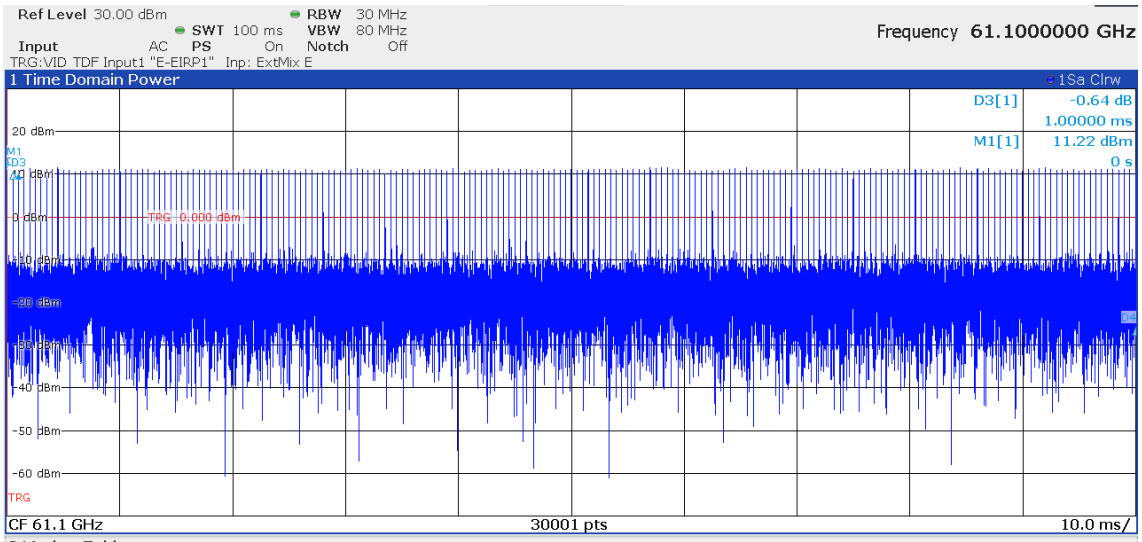
Duty Cycle 1.5ms sweep time:



2 Marker Table

Type	Ref	Trc	X-Value	Y-Value	Function	Function Result
M1		1	**0.0 s**	**10.70 dBm**	TD Pow RMS	**-7.67 dBm**
D2	M1	1	**6.05 µs**	**-1.87 dB**		
D3	M1	1	**500.05 µs**	**0.55 dB**		
D4	M1	1	**1.00005 ms**	**0.11 dB**		

Duty Cycle 100ms sweep time:



2 Marker Table

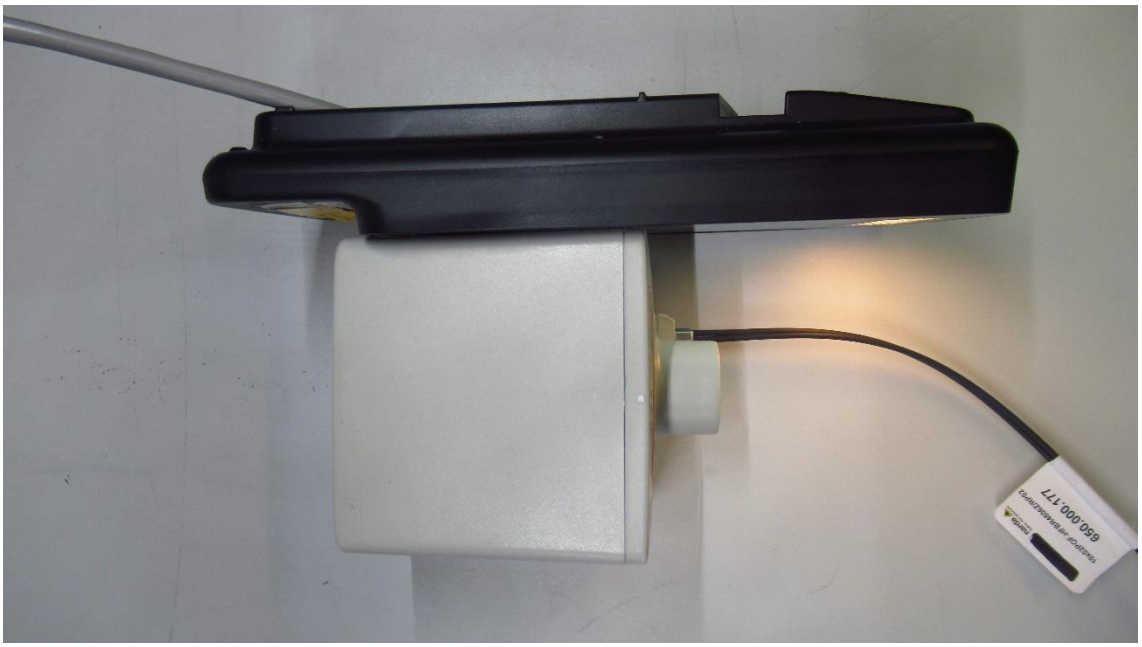
Type	Ref	Trc	X-Value	Y-Value	Function	Function Result
M1		1	**0.0 s**	**11.22 dBm**	TD Pow RMS	**-7.66 dBm**
D2	M1	1	**500.0 µs**	**-0.43 dB**		
D3	M1	1	**1.0 ms**	**-0.64 dB**		
D4	M1	1	**99.98 ms**	**-37.01 dB**		

5.1.2 Test results for human exposure of the RFID at 13.56 MHz of the EUT

For test instruments and accessories used see section 6 Part **MB**.

measurement points	E-Feld (V/m)	H-Feld (A/m)
1	2.37	0.082
2	1.91	0.034
3	3.41	0.038
4	0.56	0.022
5	4.21	0.151
6	2.38	0.144
7	0.63	0.038

Max: Position 5:



Maximum measurement 4.21 V/m calculated into power: 0.0054 mW

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The normal use case of the RFID of the EUT has a maximum hold time of 2s.
Evaluation time of 6min comparing to 2s user to device usage: Factor 0.0056

measurement points	E-Feld (V/m)	H-Feld (A/m)
1	0.0133	0.0005
2	0.0107	0.0002
3	0.0191	0.0002
4	0.0031	0.0001
5	0.0236	0.0008
6	0.0133	0.0008
7	0.0035	0.0002

Remarks: The EUT was evaluated at 7 positions with 3 axis. 4.21 V/m was the maximum e-field measurement. The normal use case of the RFID of the EUT has a maximum hold time of 2s. This is also used for evaluation of human exposure.

5.2 Maximum permissible exposure (MPE)

5.2.1 Applicable standard

According to FCC Part 15, Section 15.255(g):
Systems operating under the provisions of this section shall be operated in a manner that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines.

According to KDB 447498 D04, Section 2.1.4 MPE-Based Exemption:
An alternative to the SAR-based exemption is provided in § 1.1307(b)(3)(i)(C), for a much wider frequency range, from 300 kHz to 100 GHz, applicable for separation distances greater or equal to λ/2π, where λ is the free-space operating wavelength in meters. The MPE-based test exemption condition is in terms of ERP, defined as the product of the maximum antenna gain and the delivered maximum time-averaged power.10 For this case, a RF source is an RF exempt device if its ERP (watts) is no more than a frequency-dependent value, as detailed tabular form in Appendix B. These limits have been derived based on the basic specifications on Maximum Permissible Exposure (MPE) considered for the FCC rules in § 1.1310(e)(1).

5.2.2 Description of Determination

The maximum rated output power conducted included the tune up tolerance is used to calculate the EIRP. Through the Friis transmission formula, the known maximum gain of the antenna and the maximum power, can be calculated the MPE in a defined distance away from the product.

The EUT is designed to be used that radiating structures are 2 cm outside of the body of the user. (r = 2 cm)

5.2.3 Determination of MPE according to FCC

FDS (field disturbance sensor) at 61 GHz:

Antenna gain max: 5.0 dBi
Maximum EIRP Average: -27.4 dBm
ERP Average: -29.55 dBm
Tune-up tolerance: 2.0 dB
Minimum distance r: 2 cm

Channel No.	EIRP (dBm)	EIRP (mW)	Limit mW
1	-26.5	0.002	7.7
2	-26.5	0.002	7.7
4	-25.4	0.003	7.7

Threshold for separation distance: λ/2π = 0.00079m

0.02m > 0.00079m

TABLE B.1—THRESHOLDS FOR SINGLE RF SOURCES SUBJECT TO ROUTINE ENVIRONMENTAL EVALUATION

RF Source Frequency			Minimum Distance			Threshold ERP
f_L MHz		f_H MHz	$\lambda_L / 2\pi$		$\lambda_H / 2\pi$	W
0.3	–	1.34	159 m	–	35.6 m	1,920 R^2
1.34	–	30	35.6 m	–	1.6 m	3,450 R^2/f^2
30	–	300	1.6 m	–	159 mm	3.83 R^2
300	–	1,500	159 mm	–	31.8 mm	0.0128 $R^2 f$
1,500	–	100,000	31.8 mm	–	0.5 mm	19.2R^2
Subscripts L and H are low and high; λ is wavelength. From § 1.1307(b)(3)(i)(C), modified by adding Minimum Distance columns.						

Threshold ERP: 19.2 x 0.02 x 0.02 = 7.7 mW

The requirements are **FULFILLED.**

Remarks: None.

5.3 SAR test exclusion considerations for FCC

5.3.1 Applicable standard

Limits in § 1.1310 can be used for the purpose of equipment authorization in lieu of SAR evaluations
Systems operating under the provisions of this section shall be operated in a manner that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines.

5.3.2 Evaluation of field strength of the RFID of the EUT for FCC

The minimum separation distance results from the application of the EUT which is handled by hand. This distance is assumed to ≤ 50 mm from antenna to the hand of the user.

RFID at 13.56 MHz:

measurement points	E-Feld (V/m)	H-Feld (A/m)	E-Feld Limit 13.56 MHz (V/m)	H-Feld Limit (A/m)
1	0.0133	0.0005	60.77	0.162
2	0.0107	0.0002	60.77	0.162
3	0.0191	0.0002	60.77	0.162
4	0.0031	0.0001	60.77	0.162
5	0.0236	0.0008	60.77	0.162
6	0.0133	0.0008	60.77	0.162
7	0.0035	0.0002	60.77	0.162

Limits:

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(B) Limits for General Population / Uncontrolled Exposure				
0.3 – 1.34	614	1.63	100	30
1.34 – 30	824/*f*	2.19/*f*	180/ f^2	30
30 - 300	27.5	0.073	0.2	30
300-1500	---	---	*f*/1500	30
1500-100000	**---**	**---**	**1.0**	**30**

f = Frequency in MHz

Conclusion: The measured values are lower than the limit, SAR measurement is not necessary.

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5.4 Co-location and Co-transmission FCC

Applicable standard:
KDB 447498 D04 Appendix C

The FCC's MPE limits vary with frequency. Therefore, in mixed or broadband RF fields where several sources and frequencies are involved, the fraction of the recommended limit (in terms of power density or square of the electric or magnetic field strength) incurred within each frequency interval should be determined, and the sum of all fractional contributions should not exceed 1.0, or 100 % in terms of percentage.

1. E-field of RFID:	E_{max} = 0.024 V/m Limit: 60.77 V/m Fraction of E-field: 0.04 %
2. MPE of FDS:	P_d = 0.004 mW Limit: 7.7 mW Fraction of MPE: 0.05 %
Calculation of the sum of MPE ratios	Transmitter 1 + Transmitter 2 ≤ 100 %; **0.04 % + 0.05 % = 0.09 % ≤ 100 %;**

The requirements are **FULFILLED.**

Remarks: None.

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6 USED TEST EQUIPMENT AND ACCESSORIES

All test instruments used are calibrated and verified regularly. The calibration history is available on request.

Test ID	Model Type	Equipment No.	Next Calib.	Last Calib.	Next Verif.	Last Verif.
DC	EHP-200AC	09-16/24-24-001	19/02/2025	19/02/2024		
MB	FS-Z90	02-02/11-14-003	08/05/2024	08/05/2023	08/05/2024	08/05/2023
	QWH-EPRR00/WR-12/60-90	02-02/24-14-004				
	ESW44	09-16/03-24-001	21/11/2024	21/11/2023		