

Certification Report

Crypto Library V2.0 on P60x017/041PVE

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Certificate

Standard Common Criteria for Information Technology Security Evaluation (CC),
Version 3.1 Revision 4 (ISO/IEC 15408)

Certificate number **CC-17-46874**

TÜV Rheinland Nederland B.V. certifies:

Certificate holder
and developer

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Product and
assurance level

Crypto Library V2.0 on P60x017/041PVE

Assurance Package:

- EAL6 augmented with ALC_FLR.1 and ASE_TSS.2

Protection Profile Conformance:

- Security IC Platform Protection Profile, Version 1.0, 15.06.2007,
registered under the reference BSI-CC-PP-0035-2007

Project number

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Evaluation facility

BrightSight BV located in Delft, the Netherlands



Common Criteria Recognition
Arrangement for components
up to EAL2



SOGIS Mutual Recognition
Agreement for components
up to EAL7

Applying the Common Methodology for Information Technology Security
Evaluation (CEM), Version 3.1 Revision 4 (ISO/IEC 18045)

The IT product identified in this certificate has been evaluated at an accredited and licensed/approved evaluation facility using the Common Methodology for IT Security Evaluation version 3.1 Revision 4 for conformance to the Common Criteria for IT Security Evaluation version 3.1 Revision 4. This certificate applies only to the specific version and release of the product in its evaluated configuration and in conjunction with the complete certification report. The evaluation has been conducted in accordance with the provisions of the Netherlands scheme for certification in the area of IT security [NSCIB] and the conclusions of the evaluation facility in the evaluation technical report are consistent with the evidence adduced. This certificate is not an endorsement of the IT product by TÜV Rheinland Nederland B.V. or by other organisation that recognises or gives effect to this certificate, and no warranty of the IT product by TÜV Rheinland Nederland B.V. or by any other organisation that recognises or gives effect to this certificate, is either expressed or implied.

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Accredited by the Dutch
Council for Accreditation

A handwritten signature in blue ink, consisting of a large, stylized 'R' and 'V' followed by a horizontal line.

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Foreword

The Netherlands Scheme for Certification in the Area of IT Security (NSCIB) provides a third-party evaluation and certification service for determining the trustworthiness of Information Technology (IT) security products. Under this NSCIB, TÜV Rheinland Nederland B.V. has the task of issuing certificates for IT security products, as well as for protection profiles and sites.

Part of the procedure is the technical examination (evaluation) of the product, protection profile or site according to the Common Criteria assessment guidelines published by the NSCIB. Evaluations are performed by an IT Security Evaluation Facility (ITSEF) under the oversight of the NSCIB Certification Body, which is operated by TÜV Rheinland Nederland B.V. in cooperation with the Ministry of the Interior and Kingdom Relations.

An ITSEF in the Netherlands is a commercial facility that has been licensed by TÜV Rheinland Nederland B.V. to perform Common Criteria evaluations; a significant requirement for such a license is accreditation to the requirements of ISO Standard 17025 "General requirements for the accreditation of calibration and testing laboratories".

By awarding a Common Criteria certificate, TÜV Rheinland Nederland B.V. asserts that the product or site complies with the security requirements specified in the associated (site) security target, or that the protection profile (PP) complies with the requirements for PP evaluation specified in the Common Criteria for Information Security Evaluation. A (site) security target is a requirements specification document that defines the scope of the evaluation activities.

The consumer should review the (site) security target or protection profile, in addition to this certification report, in order to gain an understanding of any assumptions made during the evaluation, the intended environment, its security requirements, and the level of confidence (i.e., the evaluation assurance level) that the product or site satisfies the security requirements stated in the (site) security target.

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Recognition of the certificate

Presence of the Common Criteria Recognition Arrangement and SOG-IS logos on the certificate indicates that this certificate is issued in accordance with the provisions of the CCRA and the SOG-IS agreement and will be recognised by the participating nations.

International recognition

The CCRA has been signed by the Netherlands in May 2000 and provides mutual recognition of certificates based on the CC. Starting September 2014 the CCRA has been updated to provide mutual recognition of certificates based on cPPs (exact use) or STs with evaluation assurance levels up to and including EAL2+ALC_FLR. The current list of signatory nations and approved certification schemes can be found on: <http://www.commoncriteriaportal.org>.

European recognition

The European SOGIS-Mutual Recognition Agreement (SOGIS-MRA) version 3 effective from April 2010 provides mutual recognition of Common Criteria and ITSEC certificates at a basic evaluation level for all products. A higher recognition level for evaluation levels beyond EAL4 (resp. E3-basic) is provided for products related to specific technical domains. This agreement was initially signed by Finland, France, Germany, The Netherlands, Norway, Spain, Sweden and the United Kingdom. Italy joined the SOGIS-MRA in December 2010. The current list of signatory nations, approved certification schemes and the list of technical domains for which the higher recognition applies can be found on: <http://www.sogisportal.eu>.

1 Executive Summary

This Certification Report states the outcome of the Common Criteria security evaluation of the Crypto Library V2.0 on P60x017/041PVE. The developer of the Crypto Library V2.0 on P60x017/041PVE is NXP Semiconductors GmbH, Business Unit Security & Connectivity located in Hamburg, Germany and they also act as the sponsor of the evaluation and certification. A Certification Report is intended to assist prospective consumers when judging the suitability of the IT security properties of the product for their particular requirements.

The Target of Evaluation – TOE (i.e. Crypto Library V2.0 on P60x017/041PVE) consists of the Crypto Library V2.0 and the NXP SmartMX2 P60x017/041 PVE Secure Smart Card Controller. For ease of reading the TOE is often called “Crypto Library on SmartMX2”.

The Crypto Library on SmartMX2 is a cryptographic library, which provides a set of cryptographic functions that can be used by the Smartcard Embedded Software. The cryptographic library consists of several binary packages that are intended to be linked to the Smartcard Embedded Software. The Smartcard Embedded Software developer links the binary packages that he needs to this Smartcard Embedded Software and the whole is subsequently implemented in arbitrary memory. The NXP SmartMX2 smart card processor provides the computing platform and cryptographic support by means of co-processors for the Crypto Library on SmartMX2.

The Crypto Library on SmartMX2 provides DES, Triple-DES (3DES), RSA, RSA key generation, RSA public key computation, ECDSA, ECC key generation, ECDH, ECC point addition, ECC curve parameter verification, and SHA-1, SHA-224, SHA-256, SHA-384, SHA-512 algorithms. In addition, the Crypto Library implements a software (pseudo) random number generator, which is initialised (seeded) by the hardware random number generator of the SmartMX2.

Finally, the TOE provides a secure copy routine and secure compare routine and includes internal security measures for residual information protection. For more details refer to the [ST], chapter 1.3.2.

The TOE has been originally evaluated by Brightsight B.V. located in Delft, The Netherlands and was certified on 27 July 2015. The re-evaluation also took place by Brightsight B.V. and was completed on 15 March 2017 with the approval of the ETR. The certification procedure has been conducted in accordance with the provisions of the Netherlands Scheme for Certification in the Area of IT Security [NSCIB].

The re-evaluation of the TOE was conducted as composite evaluation and uses the results of the CC evaluation of the underlying NXP SmartMX2 P60x017/041PVE Secure Smart Card Controller (re)certified under the German CC scheme ([HW CERT]). As part of the re-certification of the hardware, some updates to the hardware guidance were made. These were addressed in this re-certification of the composite including a reassessment of the original vulnerability analysis. No changes to the software part of the TOE (i.e. the Crypto Library) were made.

The scope of the evaluation is defined by the Security Target [ST], which identifies assumptions made during the evaluation, the intended environment for the Crypto Library on SmartMX2, the security requirements, and the level of confidence (evaluation assurance level) at which the product is intended to satisfy the security requirements. Consumers of the Crypto Library on SmartMX2 are advised to verify that their own environment is consistent with the Security Target, and to give due consideration to the comments, observations and recommendations in this certification report.

The results documented in the evaluation technical report [ETR]¹ for this product provide sufficient evidence that it meets the EAL6 augmented (EAL6+) assurance requirements for the evaluated security functionality. This assurance level is augmented with ALC_FLR.1 (Basic flaw remediation) and ASE_TSS.2 (TOE summary specification with architectural design summary).

The evaluation was conducted using the Common Methodology for Information Technology Security Evaluation, Version 3.1 Revision 4 [CEM], for conformance to the Common Criteria for Information Technology Security Evaluation, version 3.1 Revision 4 [CC].

¹ The Evaluation Technical Report contains information proprietary to the developer and/or the evaluator, and is not releasable for public review.

TÜV Rheinland Nederland B.V., as the NSCIB Certification Body, declares that the Crypto Library V2.0 on P60x017/041PVE evaluation meets all the conditions for international recognition of Common Criteria Certificates and that the product will be listed on the NSCIB Certified Products list. It should be noted that the certification results only apply to the specific version of the product as evaluated.

2 Certification Results

2.1 Identification of Target of Evaluation

The Target of Evaluation (TOE) for this evaluation is the Crypto Library V2.0 on P60x017/041PVE, from NXP Semiconductors GmbH, Business Unit Security & Connectivity located in Hamburg, Germany.

The TOE is comprised of the following main components:

Type	Name	Release	Date	Form of delivery
IC hardware	NXP Secure Smart Card Controller P60x017/041PVE	VE	12 November 2014	wafer, module, inlay, package (dice have nameplate 9066C)
Security IC Dedicated Test Software	Test-ROM Software	0D.05	23 January 2014	Test-ROM on the chip acc. to 9066B_NC001_TESTROM_v1_btos_0Dv05_fos_Av10.hex
Security IC Dedicated Support Software	Boot-ROM Software	0D.05	23 January 2014	Boot-ROM on the chip acc. to 9066B_NC001_TESTROM_v1_btos_0Dv05_fos_Av10.hex
	Firmware Operating System	A.10	23 January 2014	Firmware Operating System on the chip acc. to 9066B_NC001_TESTROM_v1_btos_0Dv05_fos_Av10.hex
Library files	phSmx2CIDes.lib	1.0	2013-01-30	Electronic file
	phSmx2CIRsa.lib	1.1	2013-08-02	Electronic file
	phSmx2CIRsaKg.lib	1.1	2013-10-29	Electronic file
	phSmx2CIEccGfp.lib	1.1	2013-10-29	Electronic file
	phSmx2CISha.lib	1.0	2013-01-30	Electronic file
	phSmx2CISha512.lib	1.0	2013-01-30	Electronic file
	phSmx2CIRng.lib	1.1	2013-04-08	Electronic file
	phSmx2CIUtils.lib	1.2	2013-07-30	Electronic file
	phSmx2CISymCfg.lib	1.0	2013-10-30	Electronic file
Header file	phSmx2CIDes.h	1.0	2013-01-30	Electronic file
	phSmx2CIRsa.h	1.1	2013-08-02	Electronic file
	phSmx2CIRsaKg.h	1.1	2013-10-29	Electronic file
	phSmx2CIEccGfp.h	1.1	2013-10-29	Electronic file
	phSmx2CISha.h	1.0	2013-01-30	Electronic file
	phSmx2CISha512.h	1.0	2013-01-30	Electronic file
	phSmx2CIRng.h	1.1	2013-04-08	Electronic file
	phSmx2CIUtils.h	1.2	2013-07-30	Electronic file
	phSmx2CIUtils_ImportExportFcts.h	1.2	2013-07-30	Electronic file
	phSmx2CIUtils_RngAccess.h	1.2	2013-07-30	Electronic file
	phSmx2CITypes.h	1.1	2013-11-15	Electronic file
	phSmx2CISymCfg.h	1.0	2013-10-30	Electronic file
	phSmx2CISymCfg_Des.h	1.0	2013-10-30	Electronic file
Source code	phSmx2CIUtils_ImportExportFcts.a51	1.2	2013-07-30	Electronic file
	phSmx2CIUtils_RngAccess.a51	1.2	2013-07-30	Electronic file

To ensure secure usage a set of guidance documents is provided together with the Crypto Library V2.0 on P60x017/041PVE. Details can be found in section 2.5 of this report.

The hardware part of the TOE is delivered by NXP either as wafer, module, inlay or packaged form together with the IC Dedicated Support Software. The Crypto Library is delivered in Phase 1 of the TOE lifecycle (for a detailed and precise description of the TOE lifecycle refer to the [ST], chapter

1.2.2.) as a software package (a set of binary files) to the developers of the Smartcard Embedded Software. The Smartcard Embedded Software may comprise in this case an operating system and/or other smart card software (applications). The Software developers can incorporate the Crypto Library into their product.

As explained in the user guidance, as part of the delivery procedure, the customer shall verify the correctness of the delivered files by calculating the SHA-256 hash value of the delivered files and comparing them to reference values provided in the user guidance. For the identification of the hardware please refer to section 2.8 of this report.

2.2 Security Policy

The TOE provides the cryptographic algorithms DES, Triple-DES (3DES), RSA, RSA key generation, RSA public key computation, ECDSA, ECC key generation, ECDH, ECC point addition, ECC curve parameter verification, and SHA-1, SHA-224, SHA-256, SHA-384, SHA-512 algorithms in addition to the functionality described in the Hardware Security Target [*ST-HW*] for the hardware platform. The cryptographic algorithms (except SHA) are resistant against Side Channel Attacks, including Simple Power Analysis (SPA), Differential Power Analysis (DPA), Differential Fault Analysis (DFA) and timing attacks. SHA is only resistant against Side Channel Attacks and timing attacks. Details on the resistance claims are provided in the Security Target [*ST*], relevant details are provided in the user guidance documents.

The TOE implements a software (pseudo) random number generator, which is initialised (seeded) by the hardware random number generator of the SmartMX2.

The TOE also provides a secure copy routine and secure compare routine and includes internal security measures for residual information protection.

Note that the TOE does not restrict access to the functions provided by the hardware: these functions are still directly accessible to the Smartcard embedded Software.

2.3 Assumptions and Clarification of Scope

2.3.1 Assumptions

The assumptions defined in the Security Target are not covered by the TOE itself. These aspects lead to specific Security Objectives to be fulfilled by the TOE-Environment. Detailed information on these security objectives that must be fulfilled by the TOE environment can be found in section 4.2 and 4.3 of the [*ST*].

2.3.2 Clarification of scope

The evaluation did not reveal any threats to the TOE that are not countered by the evaluated security functions of the product.

2.4 Architectural Information

The TOE contains a Crypto Library, which provides a set of cryptographic functionalities that can be used by the Smartcard Embedded Software. The Crypto Library consists of several binary packages that are intended to be linked to the Smartcard Embedded Software. The Smartcard Embedded Software developer links the binary packages that he needs to his Smartcard Embedded Software and the whole is subsequently implemented in arbitrary memory. Please note that the crypto functions are supplied as a library rather than as a monolithic program, and hence a user of the library may include only those functions that are actually required. However, some dependencies exist; details are described in the User Guidance.

The TOE is implemented as a set of subsystems. The division into subsystems is chosen according to the cryptographic algorithms provided.

2.5 Documentation

The following documentation is provided with the product by the developer to the customer:

Type	Name	Release	Date	Form of delivery
Document	Product Data Sheet SmartMX2 family P60x017/41PVE, Secure high-performance smart card controller	5.3	2014-11-13	Electronic document
Document	Instruction Set for the SmartMX2 family, Secure high-performance smart card controller	3.1	2012-02-02	Electronic document
Document	NXP Secure Smart Card Controller P60x017/041PVE Guidance and Operation Manual	0.7	2016-10-18	Electronic document
Document	SmartMX2 family P60x017/041PVE Wafer and delivery specification	3.2	2014-11-13	Electronic document
Document	Product data sheet addendum: SmartMX2 family, Post Delivery Configuration (PDC)	3.2	2013-02-04	Electronic document
Document	Product data sheet addendum: SmartMX2 family, Chip Health Mode (CHM)	3.0	2012-05-11	Electronic document
Document	Product data sheet addendum: SmartMX2 family, Firmware Interface Specification (FIS)	3.9	2014-01-28	Electronic document
Documents	User Guidance Manual [14]	1.1	2016-12-21	Electronic document
	User Guidance: DES [16]	1.1	2016-11-21	Electronic document
	User Guidance: RSA [19]	1.1	2016-11-21	Electronic document
	User Guidance: RSA Key Generation [20]	1.1	2016-11-21	Electronic document
	User Guidance: ECC over GF(p) [21]	1.1	2016-11-21	Electronic document
	User Guidance: SHA [17]	1.1	2016-11-22	Electronic document
	User Guidance: SHA512 [18]	1.1	2016-11-22	Electronic document
	User Guidance: RNG [15]	1.1	2016-11-21	Electronic document
	User Guidance: Utils [22]	1.0	2014-08-11	Electronic document
	User Guidance: SymCfg [23]	1.1	2016-12-22	Electronic document

2.6 IT Product Testing

Testing (depth, coverage, functional tests, independent testing): The evaluators examined the developer's testing activities documentation and verified that the developer has met their testing responsibilities.

2.6.1 Testing approach and depth

For the Crypto Library, the developer has performed extensive testing on FSP, subsystem and module level. All parameter choices have been addressed at least once. All boundary cases identified have been tested explicitly, and additionally the near-boundary conditions have been covered probabilistically. The testing was largely automated using a test-OS that allows access to the functionalities. Test scripts were extensively used to verify that the functions return the expected values.

The hardware test results are extendable to composite evaluations on this hardware TOE, as the hardware is operated according to its guidance and the composite evaluation requirements are met.

For the testing performed by the evaluators, the developer has provided samples and a test environment. The evaluators have reproduced a selection of the developer tests, as well as a small number of test cases designed by the evaluator.

2.6.2 Independent Penetration Testing

The penetration tests performed in the previous full evaluation were devised after performing the Evaluator Vulnerability Analysis. This analysis has followed the following steps: The reference for attack techniques against which smart card-based devices controllers such as the Crypto Library on SmartMX2 must be protected against is the document "Attack methods for smart cards" [JIL-AM]. The vulnerability of the Crypto Library for these attacks has been analysed in a white box investigation conforming to AVA_VAN.5.

1. *Inventory of required resistance*

This step uses the JIL attack list [JIL-AM] as a reference for completeness and studies the ST claims to decide which attacks in the JIL attack list apply for the NXP Crypto Library. Lab-internal attack lists are used to complement this analysis.

2. *Validation of security functionalities*

This step identifies the implemented security functionalities and performs tests to verify implementation and to validate proper functioning. (ATE)

3. *Vulnerability analysis*

This step first gives an overview against which attacks the implemented security functionalities are meant to provide protection. Secondly in this step the design of the implemented security functionalities is studied. Thirdly, an analysis is performed to determine whether the design contains vulnerabilities against the respective attacks of step 1. (AVA)

4. *Analysis of input from other evaluation activities*

This step first analyses the input from other CC-evaluation classes expressed as possible vulnerabilities. Secondly, the evaluators made an analysis of the TOE in its intended environment to check whether the developer vulnerability analysis provides sufficient assurance or whether penetration testing is needed to provide sufficient assurance. (AVA)

5. *Design assurance evaluation*

This step analyses the results from an attack perspective as defined in step 1. Based on this design analysis the evaluators determine whether the design provides sufficient assurance or whether penetration testing is needed to provide sufficient assurance. (AVA)

6. *Penetration testing*

This step performs the penetration tests identified in step 4 and step 5. (AVA)

7. *Conclusions on resistance*

This step performs a [JIL-AM] compliant rating on the results of the penetration tests in relation with the assurance already gained by the design analysis.

Based on the ratings the evaluators draw conclusions on the resistance of NXP Crypto Library against attackers possessing a high attack potential.

In total 9 side channel analysis and 2 perturbation attacks were performed.

For this re-certification, the evaluators repeated their vulnerability analysis and devised additional penetration testing. They concluded that the resistance of NXP Crypto Library against attackers possessing a high attack potential remained intact.

2.6.3 Test Configuration

Since the TOE is not an end-user product it is not possible to perform testing without first embedding it in a testable configuration. To this end, the developer has created a proprietary test operating system. The main purpose of the test OS is to provide access to the crypto library's functionality. The test OS, and its documentation, was provided to the evaluators, and was used in all the testing. See the [ETR] for details.

The following items were used to provide support during the tests:

- A set of card samples (the TOE) containing
 - Hardware samples (P60D017PVE and P60D041PVE)
 - Cryptographic library version 1.6.0-2.0, loaded into the hardware sample
 - CryptOS 1.1.1, 1.2.1 loaded into the hardware sample

- A toolset provided by the developer in order to facilitate re-creation of the Cryptographic library, and loading the library and the CryptOS into samples
- A copy of the PC software required to perform (samples of) the developer testing
- A PC/SC smart card reader

2.6.4 Testing Results

The testing activities, including configurations, procedures, test cases, expected results and observed results are summarised in the [ETR], with references to the documents containing the full details.

The developer's tests and the independent functional tests produced the expected results, giving assurance that the TOE behaves as specified in its ST and functional specification.

No exploitable vulnerabilities were found with the independent penetration tests.

The algorithmic security level of cryptographic functionality has not been rated in this certification process, but the current consensus on the algorithmic security level in the open domain, i.e. from the current best cryptanalytic attacks published, has been taken into account.

The algorithmic security level exceeds 100 bits for all evaluated cryptographic functionality as required for high attack potential (AVA_VAN.5).

The strength of the implementation of the cryptographic functionality has been assessed in the evaluation, as part of the AVA_VAN activities. These activities revealed that for some cryptographic functionality the security level could be reduced. As the remaining security level still exceeds 80 bits, this is considered sufficient. So no exploitable vulnerabilities were found with the independent penetration tests.

For composite evaluations, please consult the [ETRFc] for details.

2.7 Re-used evaluation results

This is a re-certification: direct re-use has been made of previous evaluation results from the original certification NSCIB-CC-14-46874. It was noted that some updates to the hardware guidance were made as a result of the re-assessment of the underlying hardware. These were addressed in this re-certification of the composite. This re-certification also included a reassessment of the original vulnerability analysis. No changes to the software part of the TOE (i.e. the Crypto Library) were made.

There has been extensive re-use of the ALC aspects for the sites involved in the software component of the TOE (NXP Semiconductors Hamburg, NXP Semiconductors Austria GmbH Styria, NXP Semiconductors Leuven). Sites involved in the development and production of the hardware platform were re-used by composition.

No sites have been visited as part of this evaluation.

2.8 Evaluated Configuration

The TOE is defined uniquely by its name and version number Crypto Library V2.0 on P60x017/041PVE The TOE consists of a hardware part and a software part. This certification covers the configurations of the TOE identified as follows:

- The reference of the hardware part of the TOE is defined in the [HW CERT] section "Evaluated Configuration" and checked by visual inspection of the die inscription on the surface of the TOE and by reading out the data stored in the memory, as documented in [HW-UG-Wafer] and [HW-P60-DATASHEET].
- The reference of the software part of the TOE is checked by calculating the SHA-256 hash value of the delivered files and comparing them to reference values provided in the user guidance.

2.9 Results of the Evaluation

The evaluation lab documented their evaluation results in the [ETR]² which references the ASE Intermediate Report and other evaluator documents. To support composite evaluations according to [CCDB-2007-09-01] a derived document [ETRF³C] was provided and approved. This document provides details of the TOE evaluation that have to be considered when this TOE is used as platform in a composite evaluation.

The verdict of each claimed assurance requirement is “**Pass**”.

Based on the above evaluation results the evaluation lab concluded the Crypto Library V2.0 on P60x017/041PVE to be **CC Part 2 extended**³, **CC Part 3 conformant** and to meet the requirements of **EAL 6 augmented with ALC_FLR.1 and ASE_TSS.2**. This implies that the product satisfies the security technical requirements specified in Security Target [ST].

The Security Target claims 'strict' conformance to the Security IC Platform Protection Profile, Version 1.0, 15.06.2007, registered under the reference BSI-PP-0035.

2.10 Comments/Recommendations

The user guidance as outlined in section 2.5 contains necessary information about the usage of the TOE. Certain aspects of the TOE's security functionality, in particular the countermeasures against attacks, depend on accurate conformance to the user guidance of both the software and the hardware part of the TOE. There are no particular obligations or recommendations for the user apart from following the user guidance. Please note that the documents contain relevant details with respect to the resistance against certain attacks.

In addition all aspects of assumptions, threats and policies as outlined in the Security Target not covered by the TOE itself need to be fulfilled by the operational environment of the TOE.

The customer or user of the product shall consider the results of the certification within his system risk management process. In order for the evolution of attack methods and techniques to be covered, he should define the period of time until a re-assessment for the TOE is required and thus requested from the sponsor of the certificate.

The strength of the implemented cryptographic algorithms was not rated in the course of this evaluation. To fend off attackers with high attack potential appropriate cryptographic algorithms with adequate key lengths must be used (references can be found in national and international documents and standards).

The user of the Crypto Library must implement the advices of the hardware user guidance.

² The Evaluation Technical Report contains information proprietary to the developer and/or the evaluator, and is not releasable for public review.

³The TOE is a composite TOE with a certified hardware platform. Claiming CC Part 2 extended is because the underlying platform claims CC Part 2 extended

3 Security Target

The Crypto Library V2.0 on P60x017/041 PVE Security Target, Rev. 0.4, 09 March 2017 [ST] is included here by reference.

4 Definitions

This list of Acronyms and the glossary of terms contains elements that are not already defined by the CC or CEM:

CBC	Cipher Block Chaining (a block cipher mode of operation)
CBC-MAC	Cipher Block Chaining Message Authentication Code
DES	Data Encryption Standard
DFA	Differential Fault Analysis
ECC	Elliptic Curve Cryptography
ECDH	Elliptic Curve Diffie-Hellman algorithm
ECDSA	Elliptic Curve Digital Signature Algorithm
IC	Integrated Circuit
IT	Information Technology
ITSEF	IT Security Evaluation Facility
NSCIB	Nederlands Schema voor Certificatie op het gebied van IT-Beveiliging
PP	Protection Profile
RNG	Random Number Generator
RSA	Rivest-Shamir-Adleman Algorithm
SHA	Secure Hash Algorithm
SPA/DPA	Simple/Differential Power Analysis
TOE	Target of Evaluation

5 Bibliography

This section lists all referenced documentation used as source material in the compilation of this report:

- [BSI-PP-0035] "Security IC Platform Protection Profile", Version 1.0, June 2007.
- [CC] Common Criteria for Information Technology Security Evaluation, Parts I, II and III, Version 3.1 Revision 4, September 2012.
- [CEM] Common Methodology for Information Technology Security Evaluation, Version 3.1 Revision 4, September 2012.
- [ETR] ETR for Crypto Library V2.0 on P60x017-041PVE EAL6+, document reference 16-RPT-489 v6.0, dated 13 March 2017.
- [ETRfC] ETR for Composite Evaluation for Crypto Library V2.0 on P60x017-041PVE EAL6+, document reference 16-RPT-490 v6.0, dated 13 March 2017.
- [HW-CERT] Certification report BSI-DSZ-CC-0954-2015 for NXP Secure Smart Card Controller P60x017/041PVE including IC Dedicated Software, 26 May 2015 and
Assurance Continuity Reassessment Report BSI-DSZ-CC-0954-RA-01 for NXP Smart Card Controller P60x017/041PVE with IC Dedicated Software.
- [HW-ETRfC] ETR for Composite Evaluation V4 - P60x017/041PVE, TÜV IT GmbH, Version 4, 10 November 2016.
- [HW-P60-DATASHEET] Product Data Sheet SmartMX2 family P60x017/41PVE Controller P60x017/041PVE, Revision 5.3, 13 November 2014.
- [HW-UG-Wafer] SmartMX2 family P60x017/041 VE Wafer and delivery specification, Revision 3.2, 13 November 2014.
- [HW-ST] NXP Secure Smart Card Controller P60x017/041PVE, Security Target, Revision 1.3, 14 November 2014.
- [JIL-AM] JIL, (Mandatory) Attack Methods for Smartcards and Similar Devices (controlled distribution), Version 2.2, January 2013.
- [NSCIB] Netherlands Scheme for Certification in the Area of IT Security, Version 2.2, August 10th, 2015.
- [ST] Crypto Library V2.0 on P60x017/041 PVE Security Target, Rev. 0.4, 09 March 2017.

(This is the end of this report).