



Federal Office  
for Information Security

# Certification Report

**BSI-CC-PP-0096-V3-2018**

for

**FIDO Universal Second Factor (U2F) Authenticator  
Version 3**

developed by

**Federal Office for Information Security**

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Deutsches  IT-Sicherheitszertifikat  
erteilt vom Bundesamt für Sicherheit in der Informationstechnik

**BSI-CC-PP-0096-V3-2018**

Common Criteria Protection Profile

**FIDO Universal Second Factor (U2F) Authenticator**  
Version 3

developed by Federal Office for Information Security

Assurance Package claimed in the Protection Profile:  
Common Criteria Part 3 conformant  
EAL 4 augmented by  
AVA\_VAN.5

Valid until 17 December 2028



SOGIS Recognition  
Agreement



The Protection Profile identified in this certificate has been evaluated at an approved evaluation facility using the Common Methodology for IT Security Evaluation (CEM), Version 3.1 for conformance to the Common Criteria for IT Security Evaluation (CC), Version 3.1. CC and CEM are also published as ISO/IEC 15408 and ISO/IEC 18045.

This certificate applies only to the specific version and release of the Protection Profile and in conjunction with the complete Certification Report.

The evaluation has been conducted in accordance with the provisions of the certification scheme of the German Federal Office for Information Security (BSI) 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 Protection Profile by the Federal Office for Information Security or any other organisation that recognises or gives effect to this certificate, and no warranty of the Protection Profile by the Federal Office for Information Security or any other organisation that recognises or gives effect to this certificate, is either expressed or implied.



Common Criteria  
Recognition  
Arrangement

Bonn, 18 December 2018

For the Federal Office for Information Security

Bernd Kowalski  
Head of Division

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## Contents

A Certification.....	6
1 Preliminary Remarks.....	6
2 Specifications of the Certification Procedure.....	6
3 Recognition Agreements.....	7
3.1 European Recognition of CC – Certificates (SOGIS-MRA).....	7
3.2 International Recognition of CC – Certificates (CCRA).....	7
4 Performance of Evaluation and Certification.....	8
5 Validity of the certification result.....	8
6 Publication.....	9
B Certification Results.....	10
1 Protection Profile Overview.....	11
2 Security Functional Requirements.....	11
3 Assurance Requirements.....	12
4 Results of the PP-Evaluation.....	12
5 Obligations and notes for the usage.....	13
6 Protection Profile Document.....	13
7 Definitions.....	13
7.1 Acronyms.....	13
7.2 Glossary.....	13
8 Bibliography.....	14
C Annexes.....	16

# A Certification

## 1 Preliminary Remarks

Under the Act on the Federal Office for Information Security (BSIG), the Federal Office for Information Security (BSI) has the task of issuing certificates for information technology products as well as for Protection Profiles (PP).

A PP defines an implementation-independent set of IT security requirements for a category of products which are intended to meet common consumer needs for IT security. A PP claimed by a user, consumer or stakeholder for IT gives them the possibility to express their IT security needs without referring to a special product. Product certifications can be based on Protection Profiles. For products which have been certified based on a Protection Profile an individual certificate will be issued but the results from a PP certification can be re-used for the Security Target evaluation within a product evaluation when conformance to the PP has been claimed.

Certification of the Protection Profile is carried out on the instigation of the BSI or a sponsor. A part of the procedure is the technical examination (evaluation) of the Protection Profile according to Common Criteria [1]. The evaluation is normally carried out by an evaluation facility recognised by the BSI or by BSI itself. The result of the certification procedure is the present Certification Report. This report contains among others the certificate (summarised assessment) and the detailed Certification Results.

## 2 Specifications of the Certification Procedure

The certification body conducts the procedure according to the criteria laid down in the following:

- Act on the Federal Office for Information Security (BSIG)<sup>1</sup>
- BSI Certification and Approval Ordinance<sup>2</sup>
- BSI Schedule of Costs<sup>3</sup>
- Special decrees issued by the Bundesministerium des Innern (Federal Ministry of the Interior)
- DIN EN ISO/IEC 17065 standard
- BSI certification: Scheme documentation describing the certification process (CC-Produkte) [3], including PP Certification
- BSI certification: Scheme documentation on requirements for the Evaluation Facility, its approval and licencing process (CC-Stellen) [3]

<sup>1</sup> Act on the Federal Office for Information Security (BSI-Gesetz - BSIG) of 14 August 2009, Bundesgesetzblatt I p. 2821

<sup>2</sup> Ordinance on the Procedure for Issuance of Security Certificates and approval by the Federal Office for Information Security (BSI-Zertifizierungs- und -Anerkennungsverordnung - BSI ZertV) of 17 December 2014, Bundesgesetzblatt 2014, part I, no. 61, p. 2231

<sup>3</sup> Schedule of Cost for Official Procedures of the Bundesamt für Sicherheit in der Informationstechnik (BSI-Kostenverordnung, BSI-KostV) of 03 March 2005, Bundesgesetzblatt I p. 519

- Common Criteria for IT Security Evaluation (CC), Version 3.1<sup>4</sup> [1] also published as ISO/IEC 15408
- Common Methodology for IT Security Evaluation, Version 3.1 [2] also published as ISO/IEC 18045
- BSI certification: Application Notes and Interpretation of the Scheme (AIS) [4]
- Internal procedure for the issuance of a PP certificate

### 3 Recognition Agreements

In order to avoid multiple certification of the same Protection Profile in different countries a mutual recognition of IT security certificates - as far as such certificates are based on CC - under certain conditions was agreed. Therefore, the results of this evaluation and certification procedure can be re-used by the product certificate issuing scheme in the evaluation of a Security Target within a subsequent product evaluation and certification procedure.

#### 3.1 European Recognition of CC – Certificates (SOGIS-MRA)

The SOGIS-Mutual Recognition Agreement (SOGIS-MRA) Version 3 became effective in April 2010. It defines the recognition of certificates for IT-Products at a basic recognition level up to and including Common Criteria (CC) Evaluation Assurance Levels EAL 4, and in addition at higher recognition levels for IT-Products related to certain technical domains only. In addition, certificates issued for Protection Profiles based on Common Criteria are part of the recognition agreement.

The SOGIS-MRA logo printed on the certificate indicates that it is recognised under the terms of this agreement by the related bodies of the signatory nations. A disclaimer beneath the logo indicates the specific scope of recognition.

Details on recognition, the signatory nations, technical domains and the agreement itself can be found at [www.sogisportal.eu](http://www.sogisportal.eu).

#### 3.2 International Recognition of CC – Certificates (CCRA)

The international Common Criteria Recognition Arrangement (CCRA) became effective in September 2014 in its current version. It defines the recognition of certificates for IT-products based on collaborative Protection Profiles (cPP) (exact use), CC certificates based on assurance components up to and including EAL 2 or the assurance family Flaw Remediation (ALC\_FLR) and CC certificates for Protection Profiles and for collaborative Protection Profiles (cPP).

The Common Criteria Recognition Arrangement logo printed on the certificate indicates that this certification is recognised under the terms of this agreement by the related bodies of the signatory nations. A disclaimer beneath the logo indicates the specific scope of recognition.

Details on recognition, the signatory nations and the agreement itself can be found at <http://www.commoncriteriaportal.org>.

<sup>4</sup> Proclamation of the Bundesministerium des Innern of 12 February 2007 in the Bundesanzeiger dated 23 February 2007

## 4 Performance of Evaluation and Certification

The certification body monitors each individual evaluation to ensure a uniform procedure, a uniform interpretation of the criteria and uniform ratings.

The PP FIDO Universal Second Factor (U2F) Authenticator, Version 3 has undergone the certification procedure at BSI. This is a re-certification based on BSI-CC-PP-0096-V2-2018. Specific results from the evaluation process based on BSI-CC-PP-0096-V2-2018 were re-used.

The evaluation of the PP FIDO Universal Second Factor (U2F) Authenticator, Version 3 was conducted by the ITSEF Bundesamt für Sicherheit in der Informationstechnik. The evaluation was completed on 18 December 2018. The Department D15 of the Bundesamt für Sicherheit in der Informationstechnik is accepted as an evaluation facility (ITSEF)<sup>5</sup> by the certification body of BSI.

For this certification procedure the sponsor and applicant is: Federal Office for Information Security.

The certification is concluded with the comparability check and the production of this Certification Report. This work was completed by the BSI.

## 5 Validity of the certification result

This Certification Report only applies to the version of the Protection Profile as indicated.

In case of changes to the certified version of the Protection Profile, the validity can be extended to new versions and releases, provided the sponsor applies for assurance continuity (i.e. re-certification or maintenance) of the modified Protection Profile, in accordance with the procedural requirements, and the evaluation does not reveal any security deficiencies.

For the meaning of the CC concepts and terms please refer to CC [1] Part 1 for the concept of PPs, to CC [1] Part 2 for the definition of Security Functional Requirements components (SFR) and to CC [1] Part 3 for the definition of the Security Assurance Components, for the class AVA Vulnerability assessment and for the cross reference of Evaluation Assurance Levels (EALs) and assurance components.

The validity of this certificate ends as outlined on the certificate. The applicant and the sponsor of this certificate are recommended to review the technical content of the Protection Profile certified according to the evolution of the technology and of the intended operational environment of the type of product concerned as well as according to the evolution of the evaluation criteria. Such review should result in an update and a re-certification of the Protection Profile accordingly. Typically, technical standards are reviewed on a five years basis.

The limitation of validity of this PP certificate does not necessarily impact the validity period of a product certificate referring to this Protection Profile, but the certification body issuing a product certificate based on this Protection Profile should take it into its consideration on validity.

<sup>5</sup> Information Technology Security Evaluation Facility



## 6 Publication

The PP FIDO Universal Second Factor (U2F) Authenticator, Version 3 has been included in the BSI list of the certified Protection Profiles, which is published regularly (see also Internet: <https://www.bsi.bund.de> and [5]). Further information can be obtained from BSI-Infoline +49 228 9582-111.

The Certification Report may be obtained in electronic form at the internet address stated above.

## **B Certification Results**

The following results represent a summary of

- the certified Protection Profile,
- the relevant evaluation results from the evaluation facility, and
- complementary notes and stipulations of the certification body.

## 1 Protection Profile Overview

The Protection Profile FIDO Universal Second Factor (U2F) Authenticator, Version 3 [6] is established by the Federal Office for Information Security as a basis for the development of Security Targets in order to perform a certification of an IT-product, the Target of Evaluation (TOE).

In this PP a specific implementation of the U2F token is considered. The authenticator is physically implemented as a security chip with an application and is used to securely access online services. The authenticator, also referred to as a „U2F token“ (or just „token“), communicates with an external server controlled by a relying party (RP) that supports the standardised FIDO U2F protocol.

The assets to be protected by a TOE claiming conformance to this PP are defined in the Protection Profile [6], chapter 3.1. Based on these assets the security problem definition is defined in terms of assumptions, threats and organisational security policies. This is outlined in the Protection Profile [6], chapter 3.2 to 3.4.

These assumptions, threats and organisational security policies are split into security objectives to be fulfilled by a TOE claiming conformance to this PP and security objectives to be fulfilled by the operational environment of a TOE claiming conformance to this PP. These objectives are outlined in the PP [6] chapter 3.5 and 3.6.

The Protection Profile [6] requires a Security Target based on this PP or another PP claiming this PP to fulfil the CC requirements for strict conformance.

To support proper and consistent usage of the PP, it is supplemented by the Supporting Documents [8] and [9].

## 2 Security Functional Requirements

Based on the security objectives to be fulfilled by a TOE claiming conformance to this PP the security policy is expressed by the set of security functional requirements (SFR) to be implemented by a TOE. It covers the following issues:

- Cryptographic Support: Cryptographic key generation, Cryptographic key destruction, Cryptographic operation, MAC, RNG for seed/nonce/MACKey generation, Cryptographic key derivation for U2F private keys.
- User data protection: Subset information flow control and Simple Security Attributes (specified for each of the FIDO processes Initialisation, Reset, Registration, Authentication), Stored data integrity monitoring.
- Identification and Authentication: User authentication before any action, Re-authenticating.
- Security Management: Security management functions, Security roles, Management of TSF data, Management of security attributes and Static attribute initialisation (specified for each of the FIDO processes Initialisation, Reset, Registration, Authentication).
- Privacy: Anonymity.
- Protection of the TSF: TOE Emanation, Resistance to physical attack, TSF testing.

These TOE security functional requirements are outlined in the PP [6], chapter 5.1. They are selected from Common Criteria Part 2 and some of them are newly defined. Thus the SFR claim is called:

Common Criteria Part 2 extended

### 3 Assurance Requirements

The TOE security assurance package claimed in the Protection Profile is based entirely on the assurance components defined in part 3 of the Common Criteria. Thus, this assurance package is called:

Common Criteria Part 3 conformant  
EAL 4 augmented by AVA\_VAN.5

(for the definition and scope of assurance packages according to CC see [1], part 3 for details).

### 4 Results of the PP-Evaluation

The Evaluation Technical Report (ETR) [7] was provided by the ITSEF according to the Common Criteria [1], the Methodology [2], the requirements of the Scheme [3] and all Application Notes and Interpretations of the Scheme (AIS) [4] as relevant for the TOE.

As a result of the evaluation the verdict PASS is confirmed for the assurance components of the class APE (Protection Profile evaluation).

The following assurance components were used:

APE\_INT.1 PP introduction  
APE\_CCL.1 Conformance claims  
APE\_SPD.1 Security problem definition  
APE\_OBJ.2 Security objectives  
APE\_ECD.1 Extended components definition  
APE\_REQ.2 Derived security requirements

As the evaluation work performed for this certification procedure was carried out as a re-evaluation based on the certificate BSI-CC-PP-0096-V2-2018, re-use of specific evaluation tasks was possible. The focus of this re-evaluation was on the following technical changes:

- Attestation Certificates and Keys (as required by the latest FIDO U2F spec) are addressed (in a minimal way).
- The TOE Definition was updated w.r.t. the above.
- Figure 3 was slightly changed to adapt to the above
- An OSP (P.Attestation) was added to address the FIDO attestation mechanism. A new security objective (OE.Attestation) is added as well.

There were also editorial changes (without security implications), intend to provide a better understanding of the underlying technical processes for the ST writer, and remove any potential ambiguities.

The results of the evaluation are only applicable to the Protection Profile as defined in chapter 1.

## 5 Obligations and notes for the usage

The following aspects need to be fulfilled when using the Protection Profile:

- The Protection Profile contains application notes, the author of a product specific security target needs to consider.
- Usage of the Supporting Documents [8] and [9].

## 6 Protection Profile Document

The Protection Profile FIDO Universal Second Factor (U2F) Authenticator, Version 3 [6] is being provided within a separate document as Annex A of this report.

## 7 Definitions

### 7.1 Acronyms

<b>AIS</b>	Application Notes and Interpretations of the Scheme
<b>BSI</b>	Bundesamt für Sicherheit in der Informationstechnik / Federal Office for Information Security, Bonn, Germany
<b>BSIG</b>	BSI-Gesetz / Act on the Federal Office for Information Security
<b>CCRA</b>	Common Criteria Recognition Arrangement
<b>CC</b>	Common Criteria for IT Security Evaluation
<b>CEM</b>	Common Methodology for Information Technology Security Evaluation
<b>EAL</b>	Evaluation Assurance Level
<b>ETR</b>	Evaluation Technical Report
<b>FIDO</b>	Fast Identification Online
<b>IT</b>	Information Technology
<b>ITSEF</b>	Information Technology Security Evaluation Facility
<b>PP</b>	Protection Profile
<b>SAR</b>	Security Assurance Requirement
<b>SF</b>	Security Function
<b>SFP</b>	Security Function Policy
<b>SFR</b>	Security Functional Requirement
<b>ST</b>	Security Target
<b>TOE</b>	Target of Evaluation
<b>TSF</b>	TOE Security Functionality
<b>U2F</b>	Universal Second Factor

### 7.2 Glossary

**Augmentation** - The addition of one or more requirement(s) to a package.

**Extension** - The addition to an ST or PP of functional requirements not contained in part 2 and/or assurance requirements not contained in part 3 of the CC.

**FIDO Authenticator** - An authentication entity that meets the FIDO Alliance's requirements and which has related metadata.

**FIDO User Device** - The computing device where the FIDO Client operates, and from which the user initiates an action that utilizes FIDO.

**Formal** - Expressed in a restricted syntax language with defined semantics based on well-established mathematical concepts.

**Informal** - Expressed in natural language.

**Object** - A passive entity in the TOE, that contains or receives information, and upon which subjects perform operations.

**Protection Profile** - An implementation-independent statement of security needs for a TOE type.

**Security Target** - An implementation-dependent statement of security needs for a specific identified TOE.

**Semiformal** - Expressed in a restricted syntax language with defined semantics.

**Subject** - An active entity in the TOE that performs operations on objects.

**Target of Evaluation** - A set of software, firmware and/or hardware possibly accompanied by guidance.

**TOE Security Functionality** - Combined functionality of all hardware, software, and firmware of a TOE that must be relied upon for the correct enforcement of the SFRs.

## 8 Bibliography

- [1] Common Criteria for Information Technology Security Evaluation, Version 3.1, Part 1: Introduction and general model, Revision 5, April 2017  
Part 2: Security functional components, Revision 5, April 2017  
Part 3: Security assurance components, Revision 5, April 2017  
<https://www.commoncriteriaportal.org>
- [2] Common Methodology for Information Technology Security Evaluation (CEM), Evaluation Methodology, Version 3.1, Revision 5, April 2017  
<https://www.commoncriteriaportal.org>
- [3] BSI certification: Scheme documentation describing the certification process (CC-Produkte) and Scheme documentation on requirements for the Evaluation Facility, approval and licencing (CC-Stellen), <https://www.bsi.bund.de/zertifizierung>
- [4] Application Notes and Interpretations of the Scheme (AIS) as relevant for the TOE<sup>6</sup>.

<sup>6</sup> specially

- AIS 14, Version 7, Anforderungen an Aufbau und Inhalt der ETR-Teile für Evaluationen nach CC
- AIS 32, Version 7, CC-Interpretationen im deutschen Zertifizierungsschema
- AIS 38, Version 2.0, Reuse of evaluation results
- AIS 41, Version 2, Guidelines for PPs and STs

- [5] German IT Security Certificates (BSI 7148), periodically updated list published also on the BSI Website
- [6] Protection Profile for the FIDO Universal Second Factor (U2F) Authenticator Version 3, 05 November 2018, BSI
- [7] Evaluation Technical Report, Version 1.3, 26 June 2018, Evaluation Technical Report BSI-CC-PP-0096-V2-2018 EAL Level 4 Augmented, BSI (confidential document)
- [8] FIDO Alliance Universal 2nd Factor 1.2 Specifications, 11. July 2017, <https://fidoalliance.org/specs/fido-u2f-v1.2-ps-20170411>
- [9] FIDO Alliance, FIDO Authenticator Allowed Cryptography List, 24 May 2017, <https://fidoalliance.org/wp-content/uploads/fido-authenticator-allowed-cryptography-list-2.pdf>

## **C Annexes**

### **List of annexes of this certification report**

Annex A: Protection Profile FIDO Universal Second Factor (U2F) Authenticator, Version 3 [6] provided within a separate document.

Note: End of report