

Certification Report

BSI-DSZ-CC-0915-2016

for

**BCM_SPS02 Secure Processing System with IC
Dedicated Software, Version 1.0**

from

Broadcom Corporation

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Bundesamt
für Sicherheit in der
Informationstechnik

Deutsches IT-Sicherheitszertifikat

erteilt vom



Bundesamt für Sicherheit in der Informationstechnik

BSI-DSZ-CC-0915-2016 (*)

Secure Processing System

BCM_SPS02 Secure Processing System with IC Dedicated Software
Version 1.0

from: Broadcom Corporation

PP Conformance: Security IC Platform Protection Profile with
Augmentation Packages Version 1.0, 13 January
2014, BSI-CC-PP-0084-2014

Functionality: PP conformant plus product specific extensions
Common Criteria Part 2 extended

Assurance: Common Criteria Part 3 conformant
EAL 5 augmented by AVA_VAN.5 and ALC_DVS.2



SOGIS
Recognition Agreement



The IT Product identified in this certificate has been evaluated at an approved evaluation facility using the Common Methodology for IT Security Evaluation (CEM), Version 3.1 extended by Scheme Interpretations and by advice of the Certification Body for components beyond EAL 5 and CC Supporting Documents as listed in the Certification Report 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 product in its evaluated configuration and in conjunction with the complete Certification Report and Notification. For details on the validity see Certification Report part A chapter 4

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 IT Product by the Federal Office for Information Security or any other organisation that recognises or gives effect to this certificate, and no warranty of the IT Product by the Federal Office for Information Security or any other organisation that recognises or gives effect to this certificate, is either expressed or implied.

Bonn, 25 February 2016

For the Federal Office for Information Security



Common Criteria
Recognition Arrangement
for components up to
EAL 4

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Preliminary Remarks

Under the BSIG¹ Act, the Federal Office for Information Security (BSI) has the task of issuing certificates for information technology products.

Certification of a product is carried out on the instigation of the vendor or a distributor, hereinafter called the sponsor.

A part of the procedure is the technical examination (evaluation) of the product according to the security criteria published by the BSI or generally recognised security criteria.

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.

The Certification Results contain the technical description of the security functionality of the certified product, the details of the evaluation (strength and weaknesses) and instructions for the user.

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

Contents

A. Certification.....	7
1. Specifications of the Certification Procedure.....	7
2. Recognition Agreements.....	7
3. Performance of Evaluation and Certification.....	9
4. Validity of the Certification Result.....	9
5. Publication.....	10
B. Certification Results.....	11
1. Executive Summary.....	12
2. Identification of the TOE.....	13
3. Security Policy.....	14
4. Assumptions and Clarification of Scope.....	14
5. Architectural Information.....	14
6. Documentation.....	15
7. IT Product Testing.....	15
8. Evaluated Configuration.....	17
9. Results of the Evaluation.....	18
10. Obligations and Notes for the Usage of the TOE.....	19
11. Security Target.....	19
12. Definitions.....	20
13. Bibliography.....	22
C. Excerpts from the Criteria.....	25
CC Part 1:.....	25
CC Part 3:.....	26
D. Annexes.....	33

A. Certification

1. 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 Security²
- BSI Certification and Approval Ordinance³
- BSI Schedule of Costs⁴
- 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]
- BSI certification: Scheme documentation on requirements for the Evaluation Facility, its approval and licencing process (CC-Stellen) [3]
- Common Criteria for IT Security Evaluation (CC), Version 3.1⁵ [1] also published as ISO/IEC 15408.
- Common Methodology for IT Security Evaluation (CEM), Version 3.1 [2] also published as ISO/IEC 18045.
- BSI certification: Application Notes and Interpretation of the Scheme (AIS) [4]

2. Recognition Agreements

In order to avoid multiple certification of the same product in different countries a mutual recognition of IT security certificates - as far as such certificates are based on ITSEC or CC - under certain conditions was agreed.

2.1. European Recognition of ITSEC/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 and, in addition, at higher recognition levels for IT-Products related to certain SOGIS Technical Domains only.

² Act on the Federal Office for Information Security (BSI-Gesetz - BSIG) of 14 August 2009, Bundesgesetzblatt I p. 2821

³ Ordinance on the Procedure for Issuance of Security Certificates and approval by the Federal Office for Information Security (BSI-Zertifizierungs- und -Anerkennungsverordnung - BSIZertV) of 17 December 2014, Bundesgesetzblatt 2014, part I, no. 61, p. 2231

⁴ 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

⁵ Proclamation of the Bundesministerium des Innern of 12 February 2007 in the Bundesanzeiger dated 23 February 2007, p. 3730

The basic recognition level includes Common Criteria (CC) Evaluation Assurance Levels EAL 1 to EAL 4 and ITSEC Evaluation Assurance Levels E1 to E3 (basic). For "Smartcards and similar devices" a SOGIS Technical Domain is in place. For "HW Devices with Security Boxes" a SOGIS Technical Domains is in place, too. In addition, certificates issued for Protection Profiles based on Common Criteria are part of the recognition agreement.

The new agreement has been signed by the national bodies of Austria, Finland, France, Germany, Italy, The Netherlands, Norway, Spain, Sweden and the United Kingdom. The current list of signatory nations and approved certification schemes, details on recognition, and the history of the agreement can be seen on the website at <https://www.sogisportal.eu>.

The SOGIS-MRA logo printed on the certificate indicates that it is recognised under the terms of this agreement by the nations listed above.

This certificate is recognized under SOGIS-MRA for all assurance components selected.

2.2. International Recognition of CC – Certificates (CCRA)

The international arrangement on the mutual recognition of certificates based on the CC (Common Criteria Recognition Arrangement, CCRA-2014) has been ratified on 08 September 2014. It covers CC certificates 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 CCRA-2014 replaces the old CCRA signed in May 2000 (CCRA-2000). Certificates based on CCRA-2000, issued before 08 September 2014 are still under recognition according to the rules of CCRA-2000. For on 08 September 2014 ongoing certification procedures and for Assurance Continuity (maintenance and re-certification) of old certificates a transition period on the recognition of certificates according to the rules of CCRA-2000 (i.e. assurance components up to and including EAL 4 or the assurance family Flaw Remediation (ALC_FLR)) is defined until 08 September 2017.

As of September 2014 the signatories of the new CCRA-2014 are government representatives from the following nations: Australia, Austria, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, India, Israel, Italy, Japan, Malaysia, The Netherlands, New Zealand, Norway, Pakistan, Republic of Korea, Singapore, Spain, Sweden, Turkey, United Kingdom, and the United States.

The current list of signatory nations and approved certification schemes can be seen on the website: <http://www.commoncriteriaportal.org>.

The Common Criteria Recognition Arrangement logo printed on the certificate indicates that this certification is recognised under the terms of this agreement by the nations listed above.

As the product certified has been accepted into the certification process before 08 September 2014, this certificate is recognized according to the rules of CCRA-2000, i.e. up to and including CC part 3 EAL 4 components. The evaluation contained the components ADV_FSP.5, ADV_INT.2, ADV_TDS.4, ALC_CMS.5, ALC_DVS.2, ALC_TAT.2, ATE_DPT.3 and AVA_VAN.5 that are not mutually recognised in accordance with the provisions of the CCRA-2000, for mutual recognition the EAL 4 components of these assurance families are relevant.

3. 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 product BCM_SPS02 Secure Processing System with IC Dedicated Software, Version 1.0 has undergone the certification procedure at BSI.

The evaluation of the product BCM_SPS02 Secure Processing System with IC Dedicated Software, Version 1.0 was conducted by TÜV Informationstechnik GmbH. The evaluation was completed on 23 February 2016. TÜV Informationstechnik GmbH is an evaluation facility (ITSEF)⁶ recognised by the certification body of BSI.

For this certification procedure the sponsor and applicant is: Broadcom Corporation.

The product was developed by: Broadcom Corporation.

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

4. Validity of the Certification Result

This Certification Report only applies to the version of the product as indicated. The confirmed assurance package is only valid on the condition that

- all stipulations regarding generation, configuration and operation, as given in the following report, are observed,
- the product is operated in the environment described, as specified in the following report and in the Security Target.

For the meaning of the assurance levels please refer to the excerpts from the criteria at the end of the Certification Report or in the CC itself.

The Certificate issued confirms the assurance of the product claimed in the Security Target at the date of certification. As attack methods evolve over time, the resistance of the certified version of the product against new attack methods needs to be re-assessed. Therefore, the sponsor should apply for the certified product being monitored within the assurance continuity program of the BSI Certification Scheme (e.g. by a re-certification). Specifically, if results of the certification are used in subsequent evaluation and certification procedures, in a system integration process or if a user's risk management needs regularly updated results, it is recommended to perform a re-assessment on a regular e.g. annual basis.

In order to avoid an indefinite usage of the certificate when evolved attack methods require a re-assessment of the products resistance to state of the art attack methods, the maximum validity of the certificate has been limited. The certificate issued on 25 February 2016 is valid until 24 February 2021. Validity can be re-newed by re-certification.

The owner of the certificate is obliged:

1. when advertising the certificate or the fact of the product's certification, to refer to the Certification Report as well as to provide the Certification Report, the Security Target and user guidance documentation mentioned herein to any customer of the product for the application and usage of the certified product,

⁶ Information Technology Security Evaluation Facility

2. to inform the Certification Body at BSI immediately about vulnerabilities of the product that have been identified by the developer or any third party after issuance of the certificate,
3. to inform the Certification Body at BSI immediately in the case that security relevant changes in the evaluated life cycle, e.g. related to development and production sites or processes, occur, or the confidentiality of documentation and information related to the Target of Evaluation (TOE) or resulting from the evaluation and certification procedure where the certification of the product has assumed this confidentiality being maintained, is not given any longer. In particular, prior to the dissemination of confidential documentation and information related to the TOE or resulting from the evaluation and certification procedure that do not belong to the deliverables according to the Certification Report part B, or for those where no dissemination rules have been agreed on, to third parties, the Certification Body at BSI has to be informed.

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

5. Publication

The product BCM_SPS02 Secure Processing System with IC Dedicated Software, Version 1.0 has been included in the BSI list of certified products, 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.

Further copies of this Certification Report can be requested from the developer⁷ of the product. The Certification Report may also be obtained in electronic form at the internet address stated above.

⁷ Broadcom Corporation
5300 California Ave.
Irvine CA 92617
USA

B. Certification Results

The following results represent a summary of

- the Security Target of the sponsor for the Target of Evaluation,
- the relevant evaluation results from the evaluation facility, and
- complementary notes and stipulations of the certification body.

1. Executive Summary

The Target of Evaluation (TOE) is the BCM_SPS02 Secure Processing System with IC Dedicated Software. The BCM_SPS02 is intended to protect critical User Data, TSF Data (including the Security IC Embedded Software executing on the TOE) and provide a platform to load application software which provides functions to support financial transactions with embedded devices.

The BCM_SPS02 is designed to be very flexible and to be able to support several different devices. These can include devices which use direct transaction media (point of sale terminals) or those which use Near Field Communication (NFC) such as cellular telephones.

The TOE is the physical representation of a die isolated hard macro that can be instantiated in an ASIC design. The BCM_SPS02 is self-sufficient at the boundary of the hard macro.

The Security Target [6] is the basis for this certification. It is based on the certified Protection Profile Security IC Platform Protection Profile with Augmentation Packages Version 1.0, 13 January 2014, BSI-CC-PP-0084-2014 [8].

The TOE Security Assurance Requirements (SAR) are based entirely on the assurance components defined in Part 3 of the Common Criteria (see part C or [1], Part 3 for details). The TOE meets the assurance requirements of the Evaluation Assurance Level EAL 5 augmented by AVA_VAN.5 and ALC_DVS.2.

The TOE Security Functional Requirements (SFR) relevant for the TOE are outlined in the Security Target [6] and [9], chapter 6. They are selected from Common Criteria Part 2 and some of them are newly defined. Thus the TOE is CC Part 2 extended.

The TOE Security Functional Requirements are implemented by the following TOE Security Functionality:

TOE Security Functionality	Addressed issue
F.Corr-Operation	Guarantee of Correct Operation
F. Phys-Protection	Physical Protection against Physical Probing and Manipulation
F. Logical-Protection	Logical Protection against Leakage
F.Prev-Abuse	Prevent Abuse of Functionality
F-Identification	TOE Identification
F.Crypto	Cryptographic Operations
F. Memory-Access	Area based Memory Access Control
F. Flash Loader	Secure Flash Loader

Table 1: TOE Security Functionalities

For more details please refer to the Security Target [6] and [9], chapter 7.

The assets to be protected by the TOE are defined in the Security Target [6] and [9], chapter 3.1. Based on these assets the TOE Security Problem is defined in terms of

Assumptions, Threats and Organisational Security Policies. This is outlined in the Security Target [6] and [9], chapter 3.2 to 3.4.

This certification covers the configurations of the TOE as outlined in chapter 8.

The vulnerability assessment results as stated within this certificate do not include a rating for those cryptographic algorithms and their implementation suitable for encryption and decryption (see BSIG Section 9, Para. 4, Clause 2).

The certification results only apply to the version of the product indicated in the certificate and on the condition that all the stipulations are kept as detailed in this Certification Report. This certificate is not an endorsement of the IT product by the Federal Office for Information Security (BSI) or any other organisation that recognises or gives effect to this certificate, and no warranty of the IT product by BSI or any other organisation that recognises or gives effect to this certificate, is either expressed or implied.

2. Identification of the TOE

The Target of Evaluation (TOE) is called:

BCM_SPS02 Secure Processing System with IC Dedicated Software, Version 1.0

The following table outlines the TOE deliverables:

No	Type	Identifier	Release	Form of Delivery
1	HW	BCM_SPS02, Secure Processing System	0x1C404230	Hard macro instantiated within packaged product
2	FW	BCM_SPS02 Secure Firmware	001.010	Flash
3	FW	BCM_SPS02 Secure Bootloader	001.010	Flash
4	DOC	Datasheet 20211 [13]	1.0	Electronic media, PDF file
5	DOC	BCM_SPS02 User's Guide [12]	2.14	Electronic media, html files
6	DOC	BCM20211 – Update of FW and Secure OS [14]	1.5	Electronic media, PDF file
7	DOC	ARM Architecture v6M Reference Manual, ARMDDI0419C(ID092410) [15]	C	Electronic media, PDF file

Table 2: Deliverables of the TOE

The TOE will be delivered after Phase 4 (see [8]) as modules on Tape & Reel.

The TOE is designed as a hard macro to be merged as an IP together into a non-TOE GDS. Since security relevant design data cannot be sent out of the secure development environment the non-TOE GDS file has to be imported into the development environment. To enable the External Hardware Developer to generate the non-TOE GDS file it is required to send out interface information of the TOE GDS file to the External Hardware Developer.

The TOE or parts of it are delivered between the following four parties.

- IC Embedded Software Developer,
- TOE Manufacturer (compromises all roles before TOE delivery),
- External Hardware Developer,

- Composite Product Manufacturer (compromises all roles after TOE delivery except the end consumer).

Details about the identification of configuration items are described in [12].

3. Security Policy

The Security Policy is expressed by the set of Security Functional Requirements and implemented by the TOE. It covers the following issues:

The Security Policy of the TOE is to provide basic security functionalities to be used by the operating system and the application thus providing an overall system security. Therefore, the TOE will implement the symmetric and asymmetric cryptographic block cipher algorithm to ensure the confidentiality of plain text data by encryption and to support secure authentication protocols and it will provide a physical true hardware random number generator (physical TRNG).

As the TOE is a hardware security platform, the security policy of the TOE is also to provide protection against leakage of information (e.g. to ensure the confidentiality of cryptographic keys during cryptographic functions performed by the TOE), against physical probing, against malfunctions, against physical manipulations and against abuse of functionality.

Hence the TOE shall

- maintain the integrity and the confidentiality of data stored in the memory of the TOE and
- maintain the integrity, the correct operation and the confidentiality of security functionalities (security mechanisms and associated functions) provided by the TOE.

Specific details concerning the above mentioned security policies can be found in the Security Target [6] and [9], chapter 7.

4. Assumptions and Clarification of Scope

The Assumptions defined in the Security Target and some aspects of Threats and Organisational Security Policies are not covered by the TOE itself. These aspects lead to specific security objectives to be fulfilled by the TOE-Environment. The following topics are of relevance:

- Treatment of user data of the Composite TOE,
- Protection during composite product manufacturing,
- Secure communication and usage of the Loader.

Details can be found in the Security Target [6] and [9], chapter 4.2 and 4.3.

5. Architectural Information

The TOE consists of the following hardware :

Processor, DMA, Bus Matrix, SRAM, ROM, static RAM dedicated to ROM patches, SPS containing internal FLASH memory, Analog and digital sensors, dedicated Isolation Bridge as the only interface for TOE communication, FLASH Interface, True Random Number Generator (TRNG) according to class PTG.2 of the AIS31.

Furthermore the hardware supports accelerators for AES, HMAC, CRC and Triple DES (TDES) cryptographic operations.

The firmware consists of the Secure Firmware and the Secure Bootloader.

6. Documentation

The evaluated documentation as outlined in table 3 is being provided with the product to the customer. This documentation contains the required information for secure usage of the TOE in accordance with the Security Target.

Additional obligations and notes for secure usage of the TOE as outlined in chapter 10 of this report have to be followed.

7. IT Product Testing

7.1. Developer's Test according to ATE_FUN

The developer divided the tests documentation in three main areas:

1. ATE (Automated Test Equipment),
2. DVT (device and verification test) and
3. SVT (system verification and test).

Ad 1) The ATE testing is intended to screen out any manufacturing defects.

Ad 2) The DVT testing is performed on the implemented silicon.

Ad 3) By the SVT approach the TOE encompasses complete set of firmware and operating system and hence the full system functionality is checked by this approach.

Each TOE undergoes the ATE testing, the DVT and SVT are only performed on a limited number of samples and represent qualification tests.

7.2. Evaluator Tests

7.2.1 Independent Testing according to ATE_IND

The evaluator's testing effort is described as follows, outlining the testing approach, configuration, depth and results.

Testing approach:

The evaluator's objective regarding this aspect was to test the functionality of the TOE as described in the functional specification and the design documentation, and to verify the developer's test results by repeating developer's tests and additionally add independent tests.

In the course of the evaluation of the TOE the following classes of tests were carried out:

- Module tests,
- Simulation tests,
- Tests in user mode,
- Tests in ICDT mode,
- Hardware tests,

- Firmware tests.

With this kind of tests the entire security functionality of the TOE was tested.

TOE test configuration:

The tests are performed with the chip BCM_SPS02 uniquely identified by their serial numbers. For the tests, different chip types are prepared. One of these types is the configuration which is finally delivered to the user. The others contain special download functionality for test programs or have some security mechanisms deactivated. The entire functionality is the same for all chips.

Selection criteria:

All security mechanisms and security features (portions of the TSF) and related interfaces were tested. Therefore no selection criteria are applied. All security mechanisms and related interfaces are tested regarding their functional behaviour. The tests were chosen to perform at minimum one test for each security mechanism of TSF and related interfaces.

Interfaces tested:

The evaluator included most security mechanisms of security features and related interfaces into the testing subset.

Developer tests performed:

- The developer performed following categories of tests
 - Production testing on wafers using test functions implemented in the IC Dedicated Software,
 - Simulation tests (design verification) which are performed to verify functionality, which is not visible at the accessible interfaces of the TOE including automated regression testing and manual simulation tests,
 - Characterization tests to verify the electrical properties of the device, which are specified with regard to limiting values, thresholds and timings of several electrical parameters like voltages, currents, frequencies, capacitors, resistances and latches,
 - Verification tests which are performed on single samples of the device to verify specific security functionality, which is not testable for each device during production test or within the scope of characterization testing (SVT approach). The SVT tests are verified using a complete set of firmware and operating system and hence target full system functionality.
- The evaluator has checked the simulation tests, characterization tests and verification tests of the developer by sampling. The production tests are repeated always for each individual chip before delivery. The evaluator's sample of developer tests covers all portions of TSF and related interfaces.

Verdict for the activity:

- The results of the specified and conducted independent evaluator tests confirm the TOE functionality as specified.
- The results of the developer tests, which have been repeated by the evaluator, matched the results as stated by the developer.

- Overall the TSF have been tested against the functional specification, the TOE design and the security architecture description. The tests demonstrate that the TSF performs as specified.

7.2.2 Penetration Testing according to AVA_VAN

- Overview:

The penetration testing was partially performed using the developer's testing environment, partially using the test environment of the evaluation body.

All configurations of the TOE being intended to be covered by the current evaluation were tested.

The overall test result is that no deviations were found between the expected and the actual test results; moreover, no attack scenario with the attack potential high was actually successful.

- Penetration testing approach:

Systematic search for potential vulnerabilities and known attacks in public domain sources, use of a list of vulnerabilities (AIS26 [4]), and from a methodical analysis of the evaluation documents.

Analysis why these vulnerabilities are unexploitable in the intended environment of the TOE.

If the rationale is suspect in the opinion of the evaluator penetration tests are devised.

Even if the rationale is convincing in the opinion of the evaluator penetration tests are devised for some vulnerabilities, especially to support the argument of non-practicability of exploiting time in case of SPA, DPA and FI attacks.

- TOE test configurations:

The tests are performed with the chip BCM_SPS02. For the tests different chip types are prepared with different patch. With the loaded patch code the defined tests could be performed. The entire functionality is the same for all chips.

8. Evaluated Configuration

This certification covers the following configurations of the TOE:

BCM_SPS02 Secure Processing System with IC Dedicated Software, Version 1.0

The following table outlines the configuration items of the TOE:

No	Type	Identifier	Release	Form of Delivery
1	HW	BCM_SPS02, Secure Processing System		Hard macro instantiated within packaged product
2	FW	BCM_SPS02 Secure Firmware	001.010	Flash
3	FW	BCM_SPS02 Secure Bootloader	001.010	Flash
	DOC	Datasheet 20211	1.0	Electronic media, PDF file
	DOC	BCM_SPS02 User's Guide	2.14	Electronic media, html files
	DOC	BCM20211 – Update of FW and Secure OS	1.5	Electronic media, PDF file

No	Type	Identifier	Release	Form of Delivery
	DOC	ARM Architecture v6M Reference Manual, ARMDDI0419C(ID092410)	C	Electronic media, PDF file

Table 3: TOE configuration

9. Results of the Evaluation

9.1. CC specific results

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 interpretations and guidelines of the Scheme (AIS) [4] as relevant for the TOE.

The Evaluation Methodology CEM [2] was used for those components up to EAL 5 extended by advice of the Certification Body for components beyond EAL 5 and guidance specific for the technology of the product [4] (AIS 34).

The following guidance specific for the technology was used:

- The Application of CC to Integrated Circuits (see [4], AIS 25).
- The Application of Attack Potential to Smartcards (see [4], AIS 26).
- Methodology for cryptographic rating of memory encryption schemes used in smartcards and similar devices (see [4], AIS 46).
- Minimum Requirements for Evaluating Side-Channel Attack Resistance of RSA, DSA and Diffie-Hellman Key Exchange Implementations (see [4], AIS 46).
- Minimum Requirements for Evaluating Side-Channel Attack Resistance of Elliptic Curve Implementations (see [4], AIS 46).
- *Guidance, Smartcard Evaluation (see [4], AIS 37).*

For RNG assessment the scheme interpretations AIS 31 was used (see [4]).

To support composite evaluations according to AIS 36 the document ETR for composite evaluation [10] was provided and approved. This document provides details of this platform evaluation that have to be considered in the course of a composite evaluation on top.

The assurance refinements outlined in the Security Target were followed in the course of the evaluation of the TOE.

As a result of the evaluation the verdict PASS is confirmed for the following assurance components:

- All components of the EAL 5 package including the class ASE as defined in the CC (see also part C of this report)
- The components AVA_VAN.5 and ALC_DVS.2 augmented for this TOE evaluation.

The evaluation has confirmed:

- PP Conformance: Security IC Platform Protection Profile with Augmentation Packages Version 1.0, 13 January 2014, BSI-CC-PP-0084-2014 [8]
- for the Functionality: PP conformant plus product specific extensions
Common Criteria Part 2 extended

- for the Assurance: Common Criteria Part 3 conformant
EAL 5 augmented by AVA_VAN.5 and ALC_DVS.2

For specific evaluation results regarding the development and production environment see annex B in part D of this report.

The results of the evaluation are only applicable to the TOE as defined in chapter 2 and the configuration as outlined in chapter 8 above.

9.2. Results of cryptographic assessment

The strength of the cryptographic algorithms was not rated in the course of this certification procedure (see BSIG Section 9, Para. 4, Clause 2). But Cryptographic Functionalities with a security level of lower than 100 bits can no longer be regarded as secure without considering the application context. Therefore, for these functionalities it shall be checked whether the related crypto operations are appropriate for the intended system. Some further hints and guidelines can be derived from the 'Technische Richtlinie BSI TR-02102' (<https://www.bsi.bund.de>).

Any Cryptographic Functionality that is marked in column '*Security Level above 100 Bits*' of the table 17 in the Security Target [6] and [9] with '*no*' achieves a security level of lower than 100 Bits (in general context).

10. Obligations and Notes for the Usage of the TOE

The documents as outlined in table 2 contain necessary information about the usage of the TOE and all security hints therein have to be considered. In addition all aspects of Assumptions, Threats and OSPs 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 of the TOE is required and thus requested from the sponsor of the certificate.

Some security measures are partly implemented in this certified TOE, but require additional configuration or control or measures to be implemented by a product layer on top, e.g. the Embedded Software using the TOE. For this reason the TOE includes guidance documentation (see table 2) which contains obligations and guidelines for the developer of the product layer on top on how to securely use this certified TOE and which measures have to be implemented in order to fulfil the security requirements of the Security Target of the TOE. In the course of the evaluation of the composite product or system it must be examined if the required measures have been correctly and effectively implemented by the product layer on top. Additionally, the evaluation of the composite product or system must also consider the evaluation results as outlined in the document ETR for composite evaluation [10].

11. Security Target

For the purpose of publishing, the Security Target [9] of the Target of Evaluation (TOE) is provided within a separate document as Annex A of this report. It is a sanitised version of the complete Security Target [6] used for the evaluation performed. Sanitisation was performed according to the rules as outlined in the relevant CCRA policy (see AIS 35 [4]).

12. Definitions

12.1. Acronyms

AES	Advanced Encryption Standard (Accelerator)
AIS	Application Notes and Interpretations of the Scheme
BSI	Bundesamt für Sicherheit in der Informationstechnik / Federal Office for Information Security, Bonn, Germany
BSIG	BSI-Gesetz / Act on the Federal Office for Information Security
CCRA	Common Criteria Recognition Arrangement
CC	Common Criteria for IT Security Evaluation
CEM	Common Methodology for Information Technology Security Evaluation
cPP	Collaborative Protection Profile
CRC	Cyclic Redundancy Check (Accelerator)
EAL	Evaluation Assurance Level
ETR	Evaluation Technical Report
GDS	Grafic Database System
HMAC	Hash-based Message Authentication Code (Accelerator)
IT	Information Technology
ITSEF	Information Technology Security Evaluation Facility
PP	Protection Profile
SAR	Security Assurance Requirement
RNG	Random Number Generator
SFP	Security Function Policy
SFR	Security Functional Requirement
SoC	System on Chip
SPS	Secure Processing System
ST	Security Target
TDES	Triple Data Encryption Standard (Accelerator)
TOE	Target of Evaluation
TRNG	True Random Number Generator
TSF	TOE Security Functionality

12.2. Glossary

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

Collaborative Protection Profile - A Protection Profile collaboratively developed by an International Technical Community endorsed by the Management Committee.

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

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.

Package - named set of either security functional or security assurance requirements

Protection Profile - A formal document defined in CC, expressing an implementation independent set of security requirements for a category of IT Products that meet specific consumer needs.

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 - An IT Product and its associated administrator and user guidance documentation that is the subject of an Evaluation.

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.

13. Bibliography

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Part 2: Security functional components, Revision 4, September 2012
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<http://www.commoncriteriaportal.org>
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- [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 TOE⁸
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- [6] Security Target BSI-DSZ-CC-0915-2016, Version 3.3, 2016-01-21, Security Target for the BCM_SPS02, Broadcom Corporation (confidential document)
- [7] Evaluation Technical Report, Version 1, 2016-02-18, ETR Summary for BCM_SPS02, TÜV Informationstechnik GmbH (confidential document)
- [8] Security IC Platform Protection Profile with Augmentation Packages Version 1.0, 13 January 2014, BSI-CC-PP-0084-2014
- [9] Security Target BSI-DSZ-CC-0915-2016, Version 1.0, 2016-02-14, Security Target Lite for the BCM_SPS02, Broadcom Corporation (sanitised public document)
- [10] ETR for composite evaluation according to AIS 36, Version 1, 2016-02-18, ETR COMP for BCM_SPS02, TÜV Informationstechnik GmbH (confidential document)

⁸specifically

- AIS 25, Version 8, Anwendung der CC auf Integrierte Schaltungen including JIL Document and CC Supporting Document
- AIS 26, Version 9, Evaluationsmethodologie für in Hardware integrierte Schaltungen including JIL Document and CC Supporting Document
- AIS 31, Version 3, Funktionalitätsklassen und Evaluationsmethodologie für physikalische Zufallszahlengeneratoren
- AIS 32, Version 7, CC-Interpretationen im deutschen Zertifizierungsschema
- AIS 34, Version 3, Evaluation Methodology for CC Assurance Classes for EAL 5+ (CCv2.3 & CCv3.1) and EAL 6 (CCv3.1)
- AIS 35, Version 2, Öffentliche Fassung des Security Targets (ST-Lite) including JIL Document and CC Supporting Document and CCRA policies
- AIS 36, Version 4, Kompositionsevaluierung including JIL Document and CC Supporting Document
- AIS 37, Version 3, Terminologie und Vorbereitung von Smartcard-Evaluierungen
- AIS 46, Version 3, Informationen zur Evaluierung von kryptographischen Algorithmen und ergänzende Hinweise für die Evaluierung von Zufallszahlengeneratoren

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C. Excerpts from the Criteria

CC Part 1:

Conformance Claim (chapter 10.4)

“The conformance claim indicates the source of the collection of requirements that is met by a PP or ST that passes its evaluation. This conformance claim contains a CC conformance claim that:

- describes the version of the CC to which the PP or ST claims conformance.
- describes the conformance to CC Part 2 (security functional requirements) as either:
 - **CC Part 2 conformant** - A PP or ST is CC Part 2 conformant if all SFRs in that PP or ST are based only upon functional components in CC Part 2, or
 - **CC Part 2 extended** - A PP or ST is CC Part 2 extended if at least one SFR in that PP or ST is not based upon functional components in CC Part 2.
- describes the conformance to CC Part 3 (security assurance requirements) as either:
 - **CC Part 3 conformant** - A PP or ST is CC Part 3 conformant if all SARs in that PP or ST are based only upon assurance components in CC Part 3, or
 - **CC Part 3 extended** - A PP or ST is CC Part 3 extended if at least one SAR in that PP or ST is not based upon assurance components in CC Part 3.

Additionally, the conformance claim may include a statement made with respect to packages, in which case it consists of one of the following:

- Package name Conformant - A PP or ST is conformant to a pre-defined package (e.g. EAL) if:
 - the SFRs of that PP or ST are identical to the SFRs in the package, or
 - the SARs of that PP or ST are identical to the SARs in the package.
- Package name Augmented - A PP or ST is an augmentation of a predefined package if:
 - the SFRs of that PP or ST contain all SFRs in the package, but have at least one additional SFR or one SFR that is hierarchically higher than an SFR in the package.
 - the SARs of that PP or ST contain all SARs in the package, but have at least one additional SAR or one SAR that is hierarchically higher than an SAR in the package.

Note that when a TOE is successfully evaluated to a given ST, any conformance claims of the ST also hold for the TOE. A TOE can therefore also be e.g. CC Part 2 conformant.

Finally, the conformance claim may also include two statements with respect to Protection Profiles:

- PP Conformant - A PP or TOE meets specific PP(s), which are listed as part of the conformance result.
- Conformance Statement (Only for PPs) - This statement describes the manner in which PPs or STs must conform to this PP: strict or demonstrable. For more information on this Conformance Statement, see Annex D.”

CC Part 3:

Class APE: Protection Profile evaluation (chapter 10)

“Evaluating a PP is required to demonstrate that the PP is sound and internally consistent, and, if the PP is based on one or more other PPs or on packages, that the PP is a correct instantiation of these PPs and packages. These properties are necessary for the PP to be suitable for use as the basis for writing an ST or another PP.

Assurance Class	Assurance Components
Class APE: Protection Profile evaluation	APE_INT.1 PP introduction
	APE_CCL.1 Conformance claims
	APE_SPD.1 Security problem definition
	APE_OBJ.1 Security objectives for the operational environment APE_OBJ.2 Security objectives
	APE_ECD.1 Extended components definition
	APE_REQ.1 Stated security requirements APE_REQ.2 Derived security requirements

APE: Protection Profile evaluation class decomposition”

Class ASE: Security Target evaluation (chapter 11)

“Evaluating an ST is required to demonstrate that the ST is sound and internally consistent, and, if the ST is based on one or more PPs or packages, that the ST is a correct instantiation of these PPs and packages. These properties are necessary for the ST to be suitable for use as the basis for a TOE evaluation.”

Assurance Class	Assurance Components
Class ASE: Security Target evaluation	ASE_INT.1 ST introduction
	ASE_CCL.1 Conformance claims
	ASE_SPD.1 Security problem definition
	ASE_OBJ.1 Security objectives for the operational environment ASE_OBJ.2 Security objectives
	ASE_ECD.1 Extended components definition
	ASE_REQ.1 Stated security requirements ASE_REQ.2 Derived security requirements
	ASE_TSS.1 TOE summary specification ASE_TSS.2 TOE summary specification with architectural design summary

ASE: Security Target evaluation class decomposition

Security assurance components (chapter 7)

“The following Sections describe the constructs used in representing the assurance classes, families, and components.”

“Each assurance class contains at least one assurance family.”

“Each assurance family contains one or more assurance components.”

The following table shows the assurance class decomposition.

Assurance Class	Assurance Components
ADV: Development	ADV_ARC.1 Security architecture description
	ADV_FSP.1 Basic functional specification ADV_FSP.2 Security-enforcing functional specification ADV_FSP.3 Functional specification with complete summary ADV_FSP.4 Complete functional specification ADV_FSP.5 Complete semi-formal functional specification with additional error information ADV_FSP.6 Complete semi-formal functional specification with additional formal specification
	ADV_IMP.1 Implementation representation of the TSF ADV_IMP.2 Implementation of the TSF
	ADV_INT.1 Well-structured subset of TSF internals ADV_INT.2 Well-structured internals ADV_INT.3 Minimally complex internals
	ADV_SPM.1 Formal TOE security policy model
	ADV_TDS.1 Basic design ADV_TDS.2 Architectural design ADV_TDS.3 Basic modular design ADV_TDS.4 Semiformal modular design ADV_TDS.5 Complete semiformal modular design ADV_TDS.6 Complete semiformal modular design with formal high-level design presentation
	AGD: Guidance documents
ALC: Life cycle support	ALC_CMC.1 Labelling of the TOE ALC_CMC.2 Use of a CM system ALC_CMC.3 Authorisation controls ALC_CMC.4 Production support, acceptance procedures and automation ALC_CMC.5 Advanced support
	ALC_CMS.1 TOE CM coverage ALC_CMS.2 Parts of the TOE CM coverage ALC_CMS.3 Implementation representation CM coverage ALC_CMS.4 Problem tracking CM coverage ALC_CMS.5 Development tools CM coverage
	ALC_DEL.1 Delivery procedures
	ALC_DVS.1 Identification of security measures ALC_DVS.2 Sufficiency of security measures
	ALC_FLR.1 Basic flaw remediation ALC_FLR.2 Flaw reporting procedures ALC_FLR.3 Systematic flaw remediation
	ALC_LCD.1 Developer defined life-cycle model

Assurance Class	Assurance Components
	ALC_LCD.2 Measurable life-cycle model
	ALC_TAT.1 Well-defined development tools ALC_TAT.2 Compliance with implementation standards ALC_TAT.3 Compliance with implementation standards - all parts
	ATE_COV.1 Evidence of coverage ATE_COV.2 Analysis of coverage ATE_COV.3 Rigorous analysis of coverage
ATE: Tests	ATE_DPT.1 Testing: basic design ATE_DPT.2 Testing: security enforcing modules ATE_DPT.3 Testing: modular design ATE_DPT.4 Testing: implementation representation
	ATE_FUN.1 Functional testing ATE_FUN.2 Ordered functional testing
	ATE_IND.1 Independent testing – conformance ATE_IND.2 Independent testing – sample ATE_IND.3 Independent testing – complete
AVA: Vulnerability assessment	AVA_VAN.1 Vulnerability survey AVA_VAN.2 Vulnerability analysis AVA_VAN.3 Focused vulnerability analysis AVA_VAN.4 Methodical vulnerability analysis AVA_VAN.5 Advanced methodical vulnerability analysis

Assurance class decomposition

Evaluation assurance levels (chapter 8)

“The Evaluation Assurance Levels (EALs) provide an increasing scale that balances the level of assurance obtained with the cost and feasibility of acquiring that degree of assurance. The CC approach identifies the separate concepts of assurance in a TOE at the end of the evaluation, and of maintenance of that assurance during the operational use of the TOE.

It is important to note that not all families and components from CC Part 3 are included in the EALs. This is not to say that these do not provide meaningful and desirable assurances. Instead, it is expected that these families and components will be considered for augmentation of an EAL in those PPs and STs for which they provide utility.”

Evaluation assurance level (EAL) overview (chapter 8.1)

“Table 1 represents a summary of the EALs. The columns represent a hierarchically ordered set of EALs, while the rows represent assurance families. Each number in the resulting matrix identifies a specific assurance component where applicable.

As outlined in the next Section, seven hierarchically ordered evaluation assurance levels are defined in the CC for the rating of a TOE’s assurance. They are hierarchically ordered inasmuch as each EAL represents more assurance than all lower EALs. The increase in assurance from EAL to EAL is accomplished by substitution of a hierarchically higher assurance component from the same assurance family (i.e. increasing rigour, scope, and/or depth) and from the addition of assurance components from other assurance families (i.e. adding new requirements).

These EALs consist of an appropriate combination of assurance components as described in Chapter 7 of this CC Part 3. More precisely, each EAL includes no more than one

component of each assurance family and all assurance dependencies of every component are addressed.

While the EALs are defined in the CC, it is possible to represent other combinations of assurance. Specifically, the notion of “augmentation” allows the addition of assurance components (from assurance families not already included in the EAL) or the substitution of assurance components (with another hierarchically higher assurance component in the same assurance family) to an EAL. Of the assurance constructs defined in the CC, only EALs may be augmented. The notion of an “EAL minus a constituent assurance component” is not recognised by the standard as a valid claim. Augmentation carries with it the obligation on the part of the claimant to justify the utility and added value of the added assurance component to the EAL. An EAL may also be augmented with extended assurance requirements.

Evaluation assurance level 1 (EAL 1) - functionally tested (chapter 8.3)

“Objectives

EAL 1 is applicable where some confidence in correct operation is required, but the threats to security are not viewed as serious. It will be of value where independent assurance is required to support the contention that due care has been exercised with respect to the protection of personal or similar information.

EAL 1 requires only a limited security target. It is sufficient to simply state the SFRs that the TOE must meet, rather than deriving them from threats, OSPs and assumptions through security objectives.

EAL 1 provides an evaluation of the TOE as made available to the customer, including independent testing against a specification, and an examination of the guidance documentation provided. It is intended that an EAL 1 evaluation could be successfully conducted without assistance from the developer of the TOE, and for minimal outlay.

An evaluation at this level should provide evidence that the TOE functions in a manner consistent with its documentation.”

Evaluation assurance level 2 (EAL 2) - structurally tested (chapter 8.4)

“Objectives

EAL 2 requires the co-operation of the developer in terms of the delivery of design information and test results, but should not demand more effort on the part of the developer than is consistent with good commercial practise. As such it should not require a substantially increased investment of cost or time.

EAL 2 is therefore applicable in those circumstances where developers or users require a low to moderate level of independently assured security in the absence of ready availability of the complete development record. Such a situation may arise when securing legacy systems, or where access to the developer may be limited.”

Evaluation assurance level 3 (EAL 3) - methodically tested and checked (chapter 8.5)

“Objectives

EAL 3 permits a conscientious developer to gain maximum assurance from positive security engineering at the design stage without substantial alteration of existing sound development practises.

EAL 3 is applicable in those circumstances where developers or users require a moderate level of independently assured security, and require a thorough investigation of the TOE and its development without substantial re-engineering.”

Evaluation assurance level 4 (EAL 4) - methodically designed, tested, and reviewed (chapter 8.6)

“Objectives

EAL 4 permits a developer to gain maximum assurance from positive security engineering based on good commercial development practises which, though rigorous, do not require substantial specialist knowledge, skills, and other resources. EAL 4 is the highest level at which it is likely to be economically feasible to retrofit to an existing product line.

EAL 4 is therefore applicable in those circumstances where developers or users require a moderate to high level of independently assured security in conventional commodity TOEs and are prepared to incur additional security-specific engineering costs.”

Evaluation assurance level 5 (EAL 5) - semiformally designed and tested (chapter 8.7)

“Objectives

EAL 5 permits a developer to gain maximum assurance from security engineering based upon rigorous commercial development practises supported by moderate application of specialist security engineering techniques. Such a TOE will probably be designed and developed with the intent of achieving EAL 5 assurance. It is likely that the additional costs attributable to the EAL 5 requirements, relative to rigorous development without the application of specialised techniques, will not be large.

EAL 5 is therefore applicable in those circumstances where developers or users require a high level of independently assured security in a planned development and require a rigorous development approach without incurring unreasonable costs attributable to specialist security engineering techniques.”

Evaluation assurance level 6 (EAL 6) - semiformally verified design and tested (chapter 8.8)

“Objectives

EAL 6 permits developers to gain high assurance from application of security engineering techniques to a rigorous development environment in order to produce a premium TOE for protecting high value assets against significant risks.

EAL 6 is therefore applicable to the development of security TOEs for application in high risk situations where the value of the protected assets justifies the additional costs.”

Evaluation assurance level 7 (EAL 7) - formally verified design and tested (chapter 8.9)

“Objectives

EAL 7 is applicable to the development of security TOEs for application in extremely high risk situations and/or where the high value of the assets justifies the higher costs. Practical application of EAL 7 is currently limited to TOEs with tightly focused security functionality that is amenable to extensive formal analysis.”

Assurance Class	Assurance Family	Assurance Components by Evaluation Assurance Level						
		EAL 1	EAL 2	EAL 3	EAL 4	EAL 5	EAL 6	EAL 7
Development	ADV_ARC		1	1	1	1	1	1
	ADV_FSP	1	2	3	4	5	5	6
	ADV_IMP				1	1	2	2
	ADV_INT					2	3	3
	ADV_SPM						1	1
	ADV_TDS		1	2	3	4	5	6
Guidance Documents	AGD_OPE	1	1	1	1	1	1	1
	AGD_PRE	1	1	1	1	1	1	1
Life cycle Support	ALC_CMC	1	2	3	4	4	5	5
	ALC_CMS	1	2	3	4	5	5	5
	ALC_DEL		1	1	1	1	1	1
	ALC_DVS			1	1	1	2	2
	ALC_FLR							
	ALC_LCD			1	1	1	1	2
ALC_TAT				1	2	3	3	
Security Target Evaluation	ASE_CCL	1	1	1	1	1	1	1
	ASE_ECD	1	1	1	1	1	1	1
	ASE_INT	1	1	1	1	1	1	1
	ASE_OBJ	1	2	2	2	2	2	2
	ASR_REQ	1	2	2	2	2	2	2
	ASE_SPD		1	1	1	1	1	1
ASE_TSS	1	1	1	1	1	1	1	
Tests	ATE_COV		1	2	2	2	3	3
	ATE_DPT			1	1	3	3	4
	ATE_FUN		1	1	1	1	2	2
	ATE_IND	1	2	2	2	2	2	3
Vulnerability assessment	AVA_VAN	1	2	2	3	4	5	5

Table 1: Evaluation assurance level summary”

Class AVA: Vulnerability assessment (chapter 16)

“The AVA: Vulnerability assessment class addresses the possibility of exploitable vulnerabilities introduced in the development or the operation of the TOE.”

Vulnerability analysis (AVA_VAN) (chapter 16.1)

“Objectives

Vulnerability analysis is an assessment to determine whether potential vulnerabilities identified, during the evaluation of the development and anticipated operation of the TOE or by other methods (e.g. by flaw hypotheses or quantitative or statistical analysis of the security behaviour of the underlying security mechanisms), could allow attackers to violate the SFRs.

Vulnerability analysis deals with the threats that an attacker will be able to discover flaws that will allow unauthorised access to data and functionality, allow the ability to interfere with or alter the TSF, or interfere with the authorised capabilities of other users.”

D. Annexes

List of annexes of this certification report

Annex A: Security Target provided within a separate document.

Annex B: Evaluation results regarding development
and production environment

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Annex B of Certification Report BSI-DSZ-CC-0915-2016

Evaluation results regarding development and production environment



The IT product BCM_SPS02 Secure Processing System with IC Dedicated Software, Version 1.0 (Target of Evaluation, TOE) has been evaluated at an approved evaluation facility using the Common Methodology for IT Security Evaluation (CEM), Version 3.1 extended by Scheme Interpretations, and by advice of the Certification Body for components beyond EAL 5 and CC Supporting Documents for conformance to the Common Criteria for IT Security Evaluation (CC), Version 3.1.

As a result of the TOE certification, dated 25 February 2016, the following results regarding the development and production environment apply. The Common Criteria assurance requirements ALC – Life cycle support (i.e. ALC_CMC.4, ALC_CMS.5, ALC_DEL.1, ALC_DVS.2, ALC_LCD.1, ALC_TAT.2)

are fulfilled for the development and production sites of the TOE listed below:

- a) ASE-Kaohsiung – ASE Kaohsiung, Nantze Export Processing Zone, Kaohsiung, Taiwan, R.O.C (WLBGA, Bumping, Final Test, Backend, Initialization and Pre-Personalization)
- b) BRCM-Andover – Broadcom Corporation, 200 Brickstone Square #401, Andover, MA 01810, USA (IC Design Remote support)
- c) BRCM-San Diego/Irvine (Development, Engineering Sample handling, Data Center, Global Command Center)
 - Broadcom Corporation - San Diego, 16340 West Bernardo Drive, San Diego, California 92127, USA
 - Broadcom Corporation - Irvine (Headquarter), 5300 California Avenue, Irvine, CA 92617, USA
 - Broadcom Global Command Center, 19000 MacArthur Blvd, Suite 100, Irvine, CA 92617, USA
 - Zayo Data Center, 17222 Von Karman, Ave, Irvine, CA 92614, USA
- d) BRCM-Singapore – Broadcom Asia Distribution Pte Ltd., 29 Woodlands Industrial Park E1, #01-05 Northtech (Lobby 1), Singapore 757716, Singapore (Warehouse)
- e) UTAC-Singapore – UTAC United Test & Assembly Center Ltd, 5 Serangoon, North Ave 5, Singapore 554916, Singapore (Final Test, Backend, Initialization and Pre-Personalization)
- f) TSMC-Hsinchu/Tainan – Taiwan Semiconductor Manufacturing Company Ltd. (Mask Data Preparation, Mask & Wafer Fabrication)
 - Fab-14, 1, Nan-Ke North Rd., Science Park Tainan, 741 Taiwan, R.O.C (Mask and Wafer fabrication)

Fab-7, 121, Park Ave., 3, Science Park, Hsinchu 300-77, Taiwan, R.O.C.
(GDS file import server)

For the sites listed above, the requirements have been specifically applied in accordance with the Security Target [6]. The evaluators verified, that the threats, security objectives and requirements for the TOE life cycle phases up to delivery (as stated in the Security Target [6] and [9]) are fulfilled by the procedures of these sites.