ST19WR08
SECURITY TARGET

COMMON CRITERIA FOR IT SECURITY EVALUATION

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1 INTRODUCTION

1.1 IDENTIFICATION

1 Document identification: ST19WR08 SECURITY TARGET.

2 Version number: V01.02, issued April 2006.

3 Registration: registered at ST Microelectronics under number SMD_ST19WR08_ST_05_001_V01.02.

4 TOE identification: given in Chapter 2.

1.2 PURPOSE

5 This document presents **the ST19WR08 Security Target (ST)** of Smartcard Integrated Circuit (IC), with its Dedicated Software (DSW), designed on the **ST19W platform of STMicroelectronics**.

6 This document is a sanitized version of the Security Target used for the evaluation. It is classified as public information.

7 The precise references of the Target of Evaluation (TOE) and the secure IC general features are given in Chapter 2.

8 A glossary of terms and abbreviations used in this document is given in Annex A.

1.3 CONTEXT

9 The Target of Evaluation (TOE) referred in Chapter 2, is evaluated under the French IT Security Evaluation and Certification Scheme and is developed by the Smartcard IC's division of STMicroelectronics (STM).

10 The assurance level of the performed Common Criteria (CC) IT Security Evaluation is EAL 5 augmented. The minimum strength level for the TOE Security Functions (SFs) is SOF-high for all the security functions implemented by the TOE.

11 The intent of this ST is to specify the Security Functional Requirements (SFRs) and Security Assurance Requirements (SARs) applicable to the ST19WR08 secure IC, and to summarise its chosen SFs and assurance measures.

12 This ST claims to be an ***extended*** instantiation of the "Smartcard Integrated Circuit" Protection Profile (PP) registered and certified under the reference PP/9806 in the French IT Security Evaluation and Certification Scheme. The original text of this PP is typeset as indicated here when it is reproduced in this document.

13 This ST claims to be an instantiation of the "Smartcard IC Platform" Protection Profile (PP) registered and certified under the reference BSI-PP-002-2001 in the German IT Security Evaluation and Certification Scheme ***with the following augmentations***:

- Addition #1: “Support of Cipher Schemes” from AUG
- Addition #4: "Area based Memory Access Control" from AUG

The original text of this PP is typeset as indicated here, its augmentations from AUG as indicated here, when they are reproduced in this document.

14 Certifying authorities have recognized both Protection Profiles to lead to comparable chip security evaluations, as stated in "BSI_9806_0002_2001" and in "DCSSI_CCN.624", although with slightly different conclusions with respect to composition, see "DCSSI_CCN.648".

15 Extensions introduced in this ST to the SFRs of both Protection Profile (PP) are **exclusively** drawn from the Common Criteria part 2 standard SFRs.

16 This ST makes various refinements to the above mentioned PPs. They are all properly identified in the text typeset as ***indicated here***. The original text of the PPs is repeated as scarcely as possible in this document for reading convenience. All PPs identifiers have been however prefixed by their respective PP origin label: ***9806*** for PP/9806, ***BSI*** for BSI-PP-002-2001, ***AUG1*** for Addition #1 of AUG and ***AUG4*** for Addition #4 of AUG. This conservative approach leads undoubtedly to some redundancy but enables full traceability.

1.4 COMMON CRITERIA CONFORMANCE CLAIMS

17 The ST19WR08 Security Target is:

- PP/9806 conformant, extended with two CCIMB-2004-01-002 SFRs,
- BSI-PP-002-2001 conformant, augmented with AUG additions #1 and #4,
- ***EAL 5*** augmented by ALC_DVS.2, AVA_MSU.3 and AVA_VLA.4,
- The minimum strength of functions level for the SFRs is **SOF-high**,
- CCIMB-2004-01-002 extended (as per BSI-PP-002-2001 requirements)
- CCIMB-2004-01-003 conformant.

2 ST19WR08 TOE DESCRIPTION

2.1 ST19WR08 PRODUCT DESCRIPTION

18 This section describes the ST19WR08 product as assembly of the highly reliable CMOS ST19W platform.

19 The general features of the circuit are:

- 8-bit processing unit
- volatile (SRAM) and non volatile memories (ROM and EEPROM)
- security blocks : Memory Access Control Logic (MACL), clock generator, security administrator, power manager
- supporting functions : I/O ports (contact and contactless), 8-bit timers, Unpredictable Number Generator

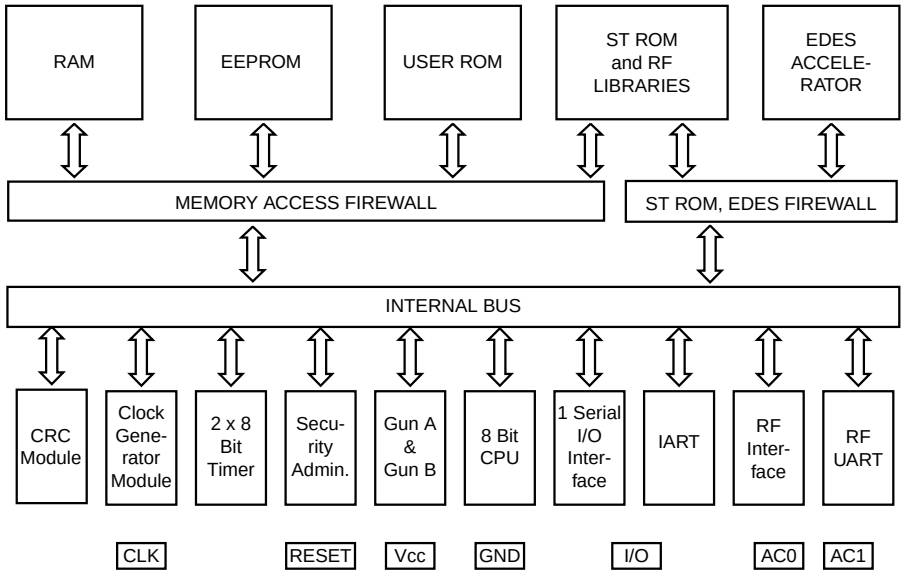
20 The TOE also includes in the ROM a Dedicated Software which comprises test capabilities (test operating system, called "autotest") and libraries (system ROM library, cryptographic library for DES (EDES implentation), AES algorithms).

21 The TOE is a silicon chip with its Dedicated Software.

22 The TOE submitted to evaluation does not comprise any specific application : there is no applicative Embedded Software, but the ROM of the tested samples contains an operating system called "Card Manager" that allows the evaluators to use a set of commands with the I/O, and to load in EEPROM (or in RAM) test softwares.

23 Figure 1 provides a block diagram overview of the ST19WR08.

Figure 1 ST19WR08 block diagram



2.2 SECURE IC BASED PRODUCT LIFE-CYCLE

24 The secure IC based product life-cycle is decomposed into 7 phases. Each of these phases have the very same boundaries as those defined in both claimed protection profiles.

25 The authorities involved in each phase are described in Table 1.

26 The **limit of the evaluation** defines the scope of responsibility of STM in terms of security. This limit, corresponding to the term "TOE Delivery" of BSI-PP-002-2001, is phase 3.

27 The limit of ***the evaluation*** corresponds to phases 2 and 3, including the delivery and verification procedures of phase 1, and the TOE delivery to the IC packaging manufacturer ; procedures corresponding to phases 1, 4, 5, 6 and 7 are outside the scope of this ***evaluation***.

28 Figure 2 describes the secure IC based product life cycle.

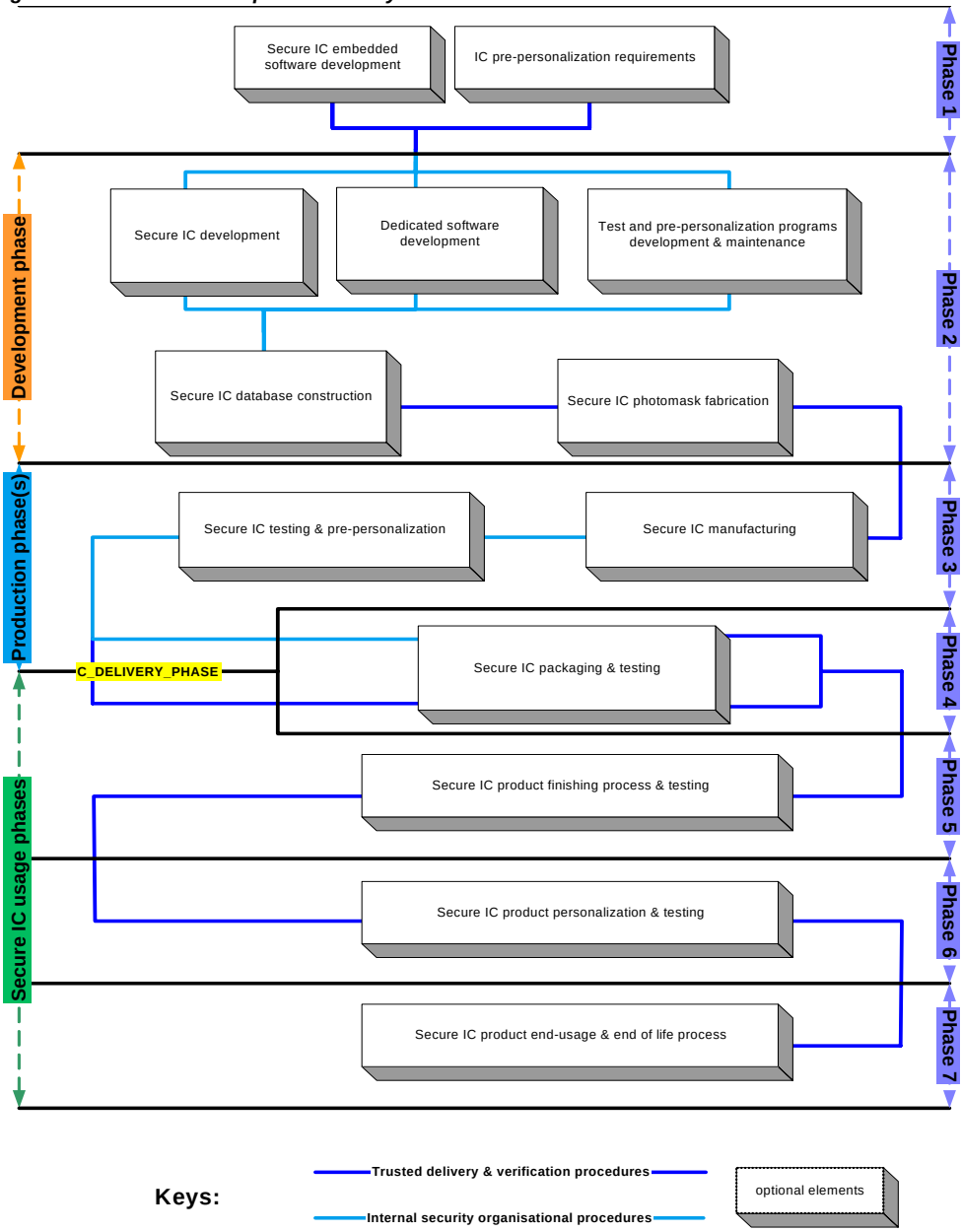
Table 1 ***Secure IC based product authorities by life-cycle phase***

Phase	Name, authority and description
1	***Secure IC*** embedded software development: the **secure IC embedded software developer** is in charge of the ***secure IC*** embedded software development and the specification of IC pre-personalization requirements.

Table 1 ***Secure IC based product authorities by life-cycle phase***

Phase	Name, authority and description
2	IC development: **STM** designs the IC, develops IC dedicated software, provides information, software or tools to the ***secure IC*** embedded software developer, and receives the ***secure IC*** embedded software from the developer, through trusted delivery and verification procedures. From the IC design, IC dedicated software and ***secure IC*** embedded software, he constructs the ***secure IC*** database, necessary for the IC photomask fabrication.
3	IC manufacturing and testing: **STM** is responsible for producing the IC through three main steps: IC manufacturing, IC testing, and IC pre-personalization.
4	IC packaging and testing: the **IC packaging manufacturer** is responsible for the IC packaging and testing.
5	***Secure IC*** product finishing process: the **secure IC product manufacturer** is responsible for the ***secure IC*** product finishing process and testing.
6	***Secure IC*** personalization: the **personalizer** is responsible for the ***secure IC*** personalization and final tests. Other ***secure IC*** embedded software may be loaded onto the chip in the personalization process.
7	***Secure IC*** end-usage: the **secure IC issuer** is responsible for the ***secure IC*** product delivery to the ***secure IC*** end-user and for the end of life process.

Figure 2 ***Secure IC based product life-cycle***



2.3 TOE ENVIRONMENT

29 Considering the TOE, three types of environment are defined:

- Development environment corresponding to phase 2,
- Production environment corresponding ***to phase 3***,
- User environment, ***corresponding to phases 4 up to 7***.

2.3.1 TOE Development Environment

30 The development environment is described in the PP/9806, section 2.3.1.

31 This description has been refined in the ST19W Generic Security Target to include industrial parameters whose definition is reproduced hereafter for readers convenience.

32 The development centres actually involved in the development of the TOE are the following: **ST ROUSSET AND ST ANG MO KIO**, for the design activities, **ST ROUSSET**, for the engineering activities and for the software development activities.

2.3.2 TOE production environment

33 The production environment is described in the PP/9806, section 2.3.2.

34 This description has been refined in the ST19W Generic Security Target to include industrial parameters whose definition is reproduced hereafter for readers convenience.

35 The authorized front-end plant actually involved in the manufacturing of the TOE is **ST ROUSSET**.

36 The authorized sub-contractor actually involved in the TOE mask manufacturing is **DNP**.

37 The authorized EWS plant actually involved in the testing of the TOE is **ST ROUSSET**.

2.3.3 TOE user environment

38 The TOE User environment is described in the PP/9806, section 2.3.3.

2.4 TOE LOGICAL PHASES

39 During its construction and usage, the TOE is under several life logical phases. These phases are ordered under a logical controlled sequence. The change from one phase to the next ***is under control of the TOE***.

40 The logical phases available on the ST19WR08 are:

- TEST configuration, then
- ISSUER configuration, then
- USER configuration.

41 Once into a given configuration, the TOE cannot be stepped back to any previous configuration.

42 During phases 4 to 6, the TOE may be in ISSUER or USER configuration according to the SICESW developer request.

43 Table 2 shows what the different TOE configuration can be facing the authorities who perform the phase activities for phases 4 to 7.

Table 2 TOE configurations

Phase & condition	TOE Configuration	Authority
Phase 4	ISSUER or USER	Packaging manufacturer (not STM)
Phase 5	ISSUER or USER	Secure IC product manufacturer (not STM)
Phase 6	ISSUER or USER	Personalizer (not STM)
Phase 7	USER	End-usage

2.5 TOE INTENDED USAGE

44 The TOE can be incorporated in several applications such as:

- banking and finance market for credit/debit cards, electronic purse (stored value cards) and electronic commerce,
- network based transaction processing such as mobile phones (GSM SIM cards), pay-TV (subscriber and pay-per-view cards), communication highways (Internet access and transaction processing),
- transport and ticketing market (access control cards),
- governmental cards (ID-cards, healthcards, driver licenses etc....),
- new emerging sectors such as multimedia commerce and Intellectual Property Rights protection.

45 The TOE intended usage is further described in the PP/9806, section 2.5.

2.6 GENERAL IT FEATURES OF THE TOE

46 The TOE IT functionality consist of data storage and processing such as:

- arithmetical functions (e.g. incrementing counters in electronic purses, calculating currency conversion in electronic purses...);
- data communication;
- cryptographic operations (e.g. data encryption, digital signature verification...).

3 TOE SECURITY ENVIRONMENT

47 This section describes the security aspects of the environment in which the TOE is intended to be used and addresses the description of the assumptions, the assets to be protected, the threats and the organisational security policies.

48 A summary of all these security aspects and their respective conditions is provided in Table 3. Note that the origin of each aspect is clearly identified in the prefix of its label.

49 Most of these security aspects can therefore be easily found in the respective protection profiles. Only those originating in AUG are detailed in the following sections.

3.1 ASSETS

50 Assets are security relevant elements of the TOE that include:

- the application data of the TOE (such as IC pre-personalization requirements, IC and system specific data),
- the User Data, especially those that can be manipulated and/or disclosed while being stored or processed by the TOE,
- the ***secure IC*** embedded software,
- the IC dedicated software,
- the IC specification, design, development tools and technology,
- TOE's correct operation (including its random number generator ***and added functionality, if any)***.

51 The TOE itself is therefore an asset.

52 Assets have to be protected in terms of confidentiality and integrity.

53 In the following, unauthorized disclosure of an asset means that an attacker can determine a meaningful part of the asset that leads to a violation of the security policy enforced by the TOE (TSP).

54 In the following, unauthorized modification of an asset means that an attacker can perform an alteration of the asset, meaningful with respect to the security policy enforced by the TOE (TSP), that leads to a violation of the latter..

3.2 ASSUMPTIONS

55 The assumptions are described in the PP/9806, section 3.2 and in the BSI-PP-002-2001, section 3.2. Only those originating in AUG are detailed in the following sections.

Table 3 Summary of security environment

	Label	Title	Condition
Assumptions	9806.A.SOFT_ARCHI	Software Architecture	**Phase 1**
	BSI.A.Plat-Appl	Usage of Hardware Platform	
	BSI.A.Resp-APPL	Treatment of User Data	
	AUG1.A.Key-Function	Usage of key-dependent functions	
	9806.A.DEV_ORG	Development Organization	
	BSI.A.Process-Card	Protection during Packaging, Finishing, Personalisation	**Phases after delivery up to 7**
	9806.A.DLV_PROTECT	Delivery Protection	
	9806.A.DLV_AUDIT	Delivery Audit	
	9806.A.DLV_RESP	Delivery Responsibility	
	9806.A.USE_TEST	Use of Testing	**After delivery up to 6**
	9806.A.USE_PROD (BSI.A.Process-Card)	Use of Security Procedures	
	9806.A.USE_DIAG	Use of Secure Dialogue	**Phase 7**
	9806.A.USE_SYS	Use of Secure System	
TOE threats	9806.T.CLON	Functional cloning of the TOE	See Table 5 of the ST19W Generic Security Target
	9806.T.DIS_SOFT	Unauthorized disclosure of ***secure IC*** embedded software and data	
	9806.T.DIS_DSOFT	Unauthorized disclosure of IC dedicated software	
	BSI.T.Leak-Inherent	Inherent Information Leakage	
	BSI.T.Leak-Forced	Forced Information Leakage	
	BSI.T.Phys-Probing	Physical Probing	
	BSI.T.RND	Deficiency of Random Numbers	
	9806.T.DIS_DESIGN	Unauthorized disclosure of IC design	
	BSI.T.Abuse-Func	Abuse of Functionality	
	AUG4.T.Mem-Access	Memory Access Violation	
	9806.T.MOD_SOFT	Unauthorized modification of ***secure IC*** embedded software and data	
	9806.T.MOD_DSOFT	Unauthorized modification of IC dedicated software	
	9806.T.MOD_DESIGN	Unauthorized modification of IC design	
	BSI.T.Malfunction	Malfunction due to Environmental Stress	
	BSI.T.Phys-Manipulation	Physical Manipulation	

Table 3 Summary of security environment

	Label	Title	Condition
Environment threats	9806.T.DIS_INFO	Disclosure of assets delivered by STM	see Table 5 of the ST19W Generic Security Target
	9806.T.DIS_DEL	Disclosure of assets during delivery to STM	
	9806.T.DIS_TEST	Unauthorized disclosure of test information	
	9806.T.DIS_TOOLS	Unauthorized disclosure of development tools	
	9806.T.DIS_PHOTOMASK	Unauthorized disclosure of photomask information	
	9806.T.T_DEL	Theft of assets during delivery to STM	
	9806.T.T_SAMPLE	Theft or unauthorized use of TOE silicon samples	
	9806.T.T_PHOTOMASK	Theft or unauthorized use of TOE photomasks	
	9806.T.T_PRODUCT	Theft or unauthorized use of ***secure IC based*** products	
	9806.T.MOD_DEL	Modification of assets during delivery to STM	
	9806.T.MOD_PHOTOMASK	Theft or unauthorized use of TOEs photomasks	
OSPs	BSI.P.Process-TOE	Protection during TOE Development and Production	
	AUG1.P.Add Functions	Additional Specific Security Functionality (Cipher Scheme Support)	

3.2.1 Assumptions on phase 1

AUG1.A.Key-Function Usage of key-dependent functions:

Key-dependent functions, if any, shall be implemented in the Smartcard Embedded Software in a way that they are not susceptible to leakage attacks (as described under BSI.T.Leak-Inherent and BSI.T.Leak-Forced).

Note that here the routines that may compromise keys when being executed are part of the Smartcard Embedded Software. In contrast to this the threats BSI.T.Leak-Inherent and BSI.T.Leak-Forced address (i) the cryptographic routines which are part of the TOE and (ii) the processing of User Data including cryptographic keys.

3.3 THREATS

56 The threats are described in the PP/9806, section 3.3 and in BSI-PP-002-2001, section 3.3. Only those originating in AUG are detailed in the following sections.

3.3.1 Threats on phases 2 to 7

3.3.1.1 Theft or unauthorized use of assets.

AUG4.T.Mem-Access Memory Access Violation:

Parts of the Smartcard Embedded Software may cause security violations by accidentally or deliberately accessing restricted data (which may include code). Any restrictions are defined by the security policy of the specific application context and must be implemented by the Smartcard Embedded Software.

Clarification: This threat does not address the proper definition and management of the security rules implemented by the Smartcard Embedded Software, this being a software design and correctness issue. This threat addresses the reliability of the abstract machine targeted by the software implementation. To avert the threat, the set of access rules provided by this TOE should be undefeated if operated according to the provided guidance. The threat is not realized if the Embedded Software is designed or implemented to grant access to restricted information. It is realized if an implemented access denial is granted under unexpected conditions or if the execution machinery does not effectively control a controlled access.

Here the attacker is expected to (i)take advantage of flaws in the design and/or the implementation of the TOE memory access rules (refer to BSI.T.Abuse-Func ***but for functions available after TOE delivery), (ii)introduce flaws by forcing operational conditions (refer to*** BSI.T.Malfunction***) and/or by physical manipulation (refer to*** BSI.T.Phys-Manipulation***). This attacker is expected to have a high level potential of attack***

3.4 ORGANISATIONAL SECURITY POLICIES

57 The TOE provides specific security functionality that can be used by the Smartcard Embedded Software. In the following specific security functionality is listed which is not derived from threats identified for the TOE's environment because it can only be decided in the context of the smartcard application, against which threats the Smartcard Embedded Software will use the specific security functionality.

58 ***STM*** applies the policy Additional Specific Security Functionality (AUG1.P.Add Functions) as specified below.

59 ***STM*** applies the policy Protection during TOE Development and Production (BSI.P.Process-TOE) as specified below***.***

60 ***No other Organisational Security Policy (OSP) has been defined in this ST since their specifications depend heavily on the applications in which the TOE will be integrated. The security targets for the applications embedded in this TOE should further define them.***

AUG1.P.Add Functions Additional Specific Security Functionality:

The TOE shall provide the following specific security functionality to the Smartcard Embedded Software***:***

- Data Encryption Standard (DES),
- Triple Data Encryption Standard (3DES),
- Advanced Encryption Standard (AES).

Note that DES is no longer recommended as an encryption function in the context of smart card applications. Hence, Smartcard Embedded Software may need to use triple DES to achieve a suitable strength, see AUG1.A.Key-Function***.***

4 SECURITY OBJECTIVES

61 The security objectives of the TOE cover principally the following aspects:

- integrity and confidentiality of assets,
- protection of the TOE and associated documentation during development and production phases,
- provide random numbers,
- provide cryptographic support and access control functionality.

62 A summary of all security objectives is provided in Table 4. Note that the origin of each objective is clearly identified in the prefix of its label.

63 Most of these security aspects can therefore be easily found in the respective protection profiles. Only those originating in AUG are detailed in the following sections..

Table 4 Summary of security objectives

	Label	Title
TOE	9806.O.TAMPER	Prevent physical tampering of security critical parts
	BSI.O.Phys-Probing	Protection against Physical Probing
	BSI.O.Phys-Manipulation	Protection against Physical Manipulation
	9806.O.CLON	Prevent functional cloning
	BSI.O.Identification	TOE Identification
	9806.O.OPERATE	Ensure SF continued correct operation
	BSI.O.Malfunction	Protection against Malfunctions
	BSI.O.RND	Random Numbers
	AUG1.O.Add-Functions	Additional Specific Security Functionality
	9806.O.FLAW	Flawless design, implementation and operation
	9806.O.DIS_MECHANISM	Protection of hardware security mechanisms against unauthorized disclosure
	BSI.O.Abuse-Func	Protection against Abuse of Functionality
	9806.O.DIS_MEMORY	Protection of sensitive information stored in memories against unauthorized disclosure
	BSI.O.Leak-Inherent	Protection against Inherent Information Leakage
	BSI.O.Leak-Forced	Protection against Forced Information Leakage
	9806.O.MOD_MEMORY	Protection of sensitive information stored in memories against any controlled corruption or unauthorized modification
	AUG4.O.Mem Access	Area based Memory Access Control

Table 4 Summary of security objectives

	Label	Title
Environments	9806.O.DEV_DIS	Controlled distribution of TOE information for development
	9806.O.SOFT_DLV	Trusted delivery of ***secure IC*** embedded software
	9806.O.SOFT_MECH	Usage of ***secure IC*** as recommended in guidance
	BSI.OE.Plat-Appl	Usage of Hardware Platform with **AUG1.Clarification & AUG4.Clarification**
	BSI.OE.Resp-Appl	Treatment of User Data with **AUG1.Clarification & AUG4.Clarification**
	9806.O.DEV_TOOLS	Usage of secure development tools
	BSI.OE.Process-TOE	Protection during TOE Development and Production
	9806.O.SOFT_ACS	Controlled access to ***secure IC*** embedded software
	9806.O.DESIGN_ACS	Controlled access to the design of the ***secure IC***
	9806.O.DSOFT_ACS	Controlled access to the dedicated software
	9806.O.MECH_ACS	Controlled access to security mechanisms specifications
	9806.O.TI_ACS	Controlled access to security relevant technology
	9806.O.MASK_FAB	Protection of mask deliveries and fabrication
	9806.O.TOE_PRT	TOE protection during production
	9806.O.IC_DLV	Protection of ***secure IC*** during deliveries
	9806.O.DLV_PROTECT	Protection of TOE material/information under delivery
	9806.O.DLV_AUDIT	Tracked delivery process
	9806.O.DLV_RESP	Qualified personnel for delivery
	BSI.OE.Process-Card	Protection during Packaging, Finishing and Personalisation
	9806.O.TEST_OPERATE	Test securely operated
	9806.O.USE_DIAG	Secure communications in user environment
	9806.O.USE_SYS	Secure system in user environment

4.1 SECURITY OBJECTIVES FOR THE TOE

AUG1.O.Add-Functions Additional Specific Security Functionality:

The TOE must provide the following specific security functionality to the Smartcard Embedded Software*:*

- Data Encryption Standard (DES),
- Triple Data Encryption Standard (3DES),
- Advanced Encryption Standard (AES).

AUG4.O.Mem Access Area based Memory Access Control:

The TOE must provide the Smartcard Embedded Software with the capability to define restricted access memory areas. The TOE must then enforce the partitioning of such memory areas so that access of software to memory areas is controlled as required, for example, in a multi-application environment.

4.2 SECURITY OBJECTIVES FOR THE ENVIRONMENT

4.2.1 Objectives on phase 1

BSI.OE.Plat-Appl Usage of Hardware Platform:

To ensure that the TOE is used in a secure manner the Smartcard Embedded Software shall be designed so that the requirements from the following documents are met:

- (i)hardware data sheet for the TOE,
- (ii)TOE application notes dedicated software user manuals,
- (iii)TOE security user guidance, and
- (iii)findings of the TOE evaluation reports relevant for the Smartcard Embedded Software.

AUG1.Clarification: When the TOE supports cipher schemes as additional specific security functionality and if required, the Smartcard Embedded Software shall use these cryptographic services of the TOE and their interface as specified. When key-dependent functions implemented in the Smartcard Embedded Software are just being executed, the Smartcard Embedded Software must provide protection against disclosure of confidential data (User Data) stored and/or processed in the TOE by using the methods described under "Inherent Information Leakage" (BSI.T.Leak-Inherent) and "Forced Information Leakage" (BSI.T.Leak-Forced).

AUG4.Clarification: For the separation of different applications, the Smartcard Embedded Software may implement a memory management scheme based upon security mechanisms of the TOE as required by the security policy defined for the specific application context.

BSI.OE.Resp-Appl Treatment of User Data:

Security relevant User Data (especially cryptographic keys) are treated by the Smartcard Embedded Software as required by the security needs of the specific application context.

For example the Smartcard Embedded Software will not disclose security relevant user data to unauthorised users or processes when communicating with a terminal.

AUG1.Clarification: By definition cipher or plain text data and cryptographic keys are User Data. The Smartcard Embedded Software shall treat these data appropriately, use only proper secret keys (chosen from a large key space) as input for the cryptographic function of the TOE and use keys and functions appropriately in order to ensure the strength of cryptographic operation.

This means that keys are treated as confidential as soon as they are generated. The keys must be unique with a very high probability, as well as cryptographically strong. For example, it must be ensured that it is beyond practicality to derive the private key from a public key if asymmetric algorithms are used. If keys are imported into the TOE and/or derived from other keys, quality and confidentiality must be maintained. This implies that appropriate key management has to be realised in the environment.

AUG4.Clarification: The treatment of User Data is still required when a multi-application operating system is implemented as part of the Smartcard Embedded Software on the TOE. In this case the multi-application operating system should not disclose security relevant user data of one application to another application when it is processed or stored on the TOE.

4.3 SECURITY OBJECTIVES RATIONALE

64 The security objectives rationale has been established for the whole ST19W platform and has been presented and evaluated in the ST19W Generic Security Target.

65 For confidentiality reasons, this rationale is not reproduced here.

5 SECURITY REQUIREMENTS

66 This chapter on security requirements contains a section on security functional requirements (SFRs) for the TOE (Section 5.1), a section on security assurance requirements (SARs) for the TOE (Section 5.2), a section on the refinements of these SARs (Section 5.3) and a section on security requirements for the environment (Section 5.4) as required by the "BSI-PP-002-2001" Protection Profile. This chapter includes a section with the security requirements rationale (Section 5.5).

5.1 SECURITY FUNCTIONAL REQUIREMENTS FOR THE TOE

67 Security Functional Requirements (SFRs) from the "PP/9806" Protection Profile (PP) are **exclusively** drawn from CCIMB-2004-01-002.

68 The following SFRs from the "BSI-PP-002-2001" Protection Profile are **extensions** to CCIMB-2004-01-002:

- **FCS_RND** Generation of random numbers,
- **FMT_LIM** Limited capabilities and availability,
- **FAU_SAS** Audit data storage.

The reader can find their certified definitions in the text of the "BSI-PP-002-2001" Protection Profile.

69 All extensions to the SFRs of the "PP/9806" and of the "BSI-PP-002-2001" Protection Profiles (PPs) are **exclusively** drawn from CCIMB-2004-01-002.

70 All iterations, assignments, selections, or refinements on SFRs have been performed according to section 4.4.1.3.2 of CCIMB-2004-01-001. They are easily identified in the following text as they appear ***as indicated here***. Note that in order to improve readability, iterations are often expressed within tables.

71 The rules defined by the TOE Security Policy during phase 3 (access control and information flow control Security Functions Policies) ***are*** different from those prevailing during phases 4 to 7.

72 Since the TOE can be in the ISSUER configuration in Phases 4 to 6, as specified in Table 2, the functional requirements applicable only to phase 3 in the PP/9806, are refined into the functional requirements applicable to ***the logical phases TEST and ISSUER configurations (TST&ISR, for short)***.

73 The minimum strength of function level for the TOE security functions is SOF-high.

74 In order to ease the definition and the understanding of these security functional requirements, a simplified presentation of the TOE Security Policy (TSP) is given in the following section. For confidentiality reasons, security attributes and their related policies, TSF data, user data and acceptance/deny rules enforced by the TSF are not described in this document.

75 The selected security functional requirements for the TOE and their respective origin and type are summarized in the following pages in Table 5.

Table 5 Summary of functional security requirements for the TOE

	Label	Title	Addressing	Origin	Type
TST&ISR	FIA_ATD.1	User attribute definition	All objectives in TST&ISR	PP/9806 Operated	CCIMB-2004-01-002
	FIA_UID.2	User identification before any action		PP/9806	
	FIA_UAU.2	User authentication before any action		PP/9806	
	FPT_TST.1	TOE Security Functions testing	Correct operation	PP/9806 Operated	
	FDP_SDI.1	Stored data integrity monitoring	TOE Integrity	PP/9806 Operated	
	FAU_SAS.1	Audit storage	Lack of TOE identification	BSI-PP-002-2001	Extended

Table 5 Summary of functional security requirements for the TOE

	Label	Title	Addressing	Origin	Type
Phases 3 to 7	FMT_SMR.1	Security roles	Correct operation	PP/9806 Operated	CCIMB-2004-01-002
	FMT_MOF.1	Management of security functions behaviour			
	FMT_MSA.3	Static attribute initialisation			
	FMT_MSA.1	Management of security attribute			
	FMT_SMF.1	Specification of management functions		New dependency Operated	
	FMT_LIM.1	Limited capabilities	Abuse of functionality	BSI-PP-002-2001	Extended
	FMT_LIM.2	Limited availability			
	FDP_ACC.2	Complete Access control	Memory access violation	PP/9806 Operated	CCIMB-2004-01-002
	FDP_ACF.1	Security attribute based access control			
	FRU_FLT.2	Limited fault tolerance	Malfunction	BSI-PP-002-2001	
	FPT_FLS.1	Failure with preservation of secure state			
	FAU_SAA.1	Potential violation analysis		PP/9806 Operated	
	FPT_SEP.1	TSF domain separation		BSI-PP-002-2001	
	FDP_SDI.2	Stored data integrity monitoring and action	TOE Integrity	Security Target Operated	
	FPT_PHP.2	Notification of physical attack	Physical manipulation & probing	PP/9806 Operated	
	FPT_PHP.3	Resistance to physical attack		PP/9806 Operated BSI-PP-002-2001	
	FPR_UNO.1	Unobservability	Leakage	PP/9806 Operated	
	FDP_ITT.1	Basic internal transfer protection		BSI-PP-002-2001	
	FPT_ITT.1	Basic TSF data internal protection			
	FDP_IFC.1	Subset information flow control		PP/9806 Operated BSI-PP-002-2001	
	FDP_IFF.1	Simple security attributes		PP/9806 Operated	
	FDP_RIP.1	Subset residual information protection		Security Target Operated	
	FCS_RDN.1	Quality metrics for random numbers	Weak cryptographic quality of random numbers	BSI-PP-002-2001 Operated	Extended

Table 5 Summary of functional security requirements for the TOE

	Label	Title	Addressing	Origin	Type
USER	FCS_COP.1	Cryptographic operation	Cipher scheme support	AUG #1 Operated	CCIMB-2004-01-002
	FCS_CKM.1	Cryptographic key generation		Security Target Operated	

5.1.1 SUBJECTS, OBJECTS, OPERATIONS AND DATA

76 This section introduces in turn subjects, objects and operations relevant to the definition of the TSP.

5.1.1.1 Subjects

77 For any given TOE of the ST19W platform, the TSP identifies the following subjects:

S.TRUST STM **trusted process** always activated by a power on of the TOE. This process exhibits three different behaviours according to the TOE configuration. Please note that this process denotes all the active resources of the TOE controlled by the TSF, not only the executing DSW.

S.PLAIN **Untrusted process** activated by S.TRUST. This process denotes all the active resources of the TOE **not** controlled by the TSF, notably the SICESW in USER configuration.

S.LIB STM **trusted functional process** activated during a call to execute a service available in the STM library when the TOE is in USER configuration. This process denotes only the executing DSW.

S.ANY Any human user that can get access to the TOE either locally (i.e. that interacts with the TOE via TOE devices) or remotely (i.e. that interacts with the TOE via another IT product) when the TOE is in any configuration.

5.1.1.2 Objects and operations

78 For any given TOE of the ST19W platform, the TSP identifies the following objects with their associated operations. For confidentiality reasons, those objects are not completely described here.:

OB.**F**_IC	Secure IC carrying the TOE in any of its forms.
OB.ROM	Any part of the Read Only Memory. These objects contain executable programs and/or data of STM and of the user (ST_ROM & USR_ROM). The latter may also reside in OB.NVM. .
OB.RAM	Any part of the Volatile Memory. These objects are used for processing user and TSF data.
OB.REG	Any Register of the TOE. These objects are used to control TOE resources and to exchange data with the secure IC internal subjects.
OB.NVM	Non Volatile Memory that contains user data, TSF data and/or user programs.
OB.CMD_TST	Any command available to the user when the TOE is in TEST configuration.
OB.CMD_ISR	Any command available to the user when the TOE is in ISSUER configuration.
OB.CALL_USR	Any STM library service available to the user when the TOE is in USER configuration.

5.1.2 FUNCTIONAL REQUIREMENTS APPLICABLE TO *TST&ISR*

5.1.2.1 User attribute definition (FIA_ATD.1)

79 The TSF shall maintain the following list of security attributes belonging to individual users:

- ***the TOE configuration,***
- ***the user authentication status.***

5.1.2.2 User identification before any action (FIA_UID.2)

80 The TSF shall require each user to identify itself before allowing any other TSF mediated actions on behalf of that user.

5.1.2.3 User authentication before any action (FIA_UAU.2)

81 The TOE Security Functions (TSF) shall require each user to be successfully authenticated before allowing any other TSF mediated actions on behalf of that user.

5.1.2.4 TOE Security Functions testing (FPT_TST.1)

82 The TSF shall run a suite of self tests ***at the request of the authorised user and at TOE operating conditions*** to demonstrate the correct operation of ***the TSF***.

83 The TSF shall provide authorised users with the capability to verify the integrity of ***the TSF data***.

84 The TSF shall provide authorised users with the capability to verify the integrity of stored TSF executable code.

5.1.2.5 Stored data integrity monitoring (FDP_SDI.1)

85 The TSF shall monitor user data stored within the TSC for ***user ROM or NVM personalization integrity errors*** on all objects, based on the following attributes: ***memory content signature***.

5.1.2.6 Audit storage (FAU_SAS.1)

86 The TSF shall provide ***test personnel before TOE Delivery*** with the capability to store the ***Initialisation Data and/or Pre-personalisation Data and/or supplements of the Smartcard Embedded Software*** in the audit records.

Clarification:

- test personnel before TOE Delivery, ***means TEST administrator if TOE delivery is in ISSUER configuration,***
- test personnel before TOE Delivery, ***means TEST administrator and/or ISSUER administrator if TOE delivery is in USER configuration.***

5.1.3 FUNCTIONAL REQUIREMENTS APPLICABLE TO PHASES 3 TO 7

5.1.3.1 Security roles (FMT_SMR.1)

87 The TSF shall maintain the ***following*** roles:

- ***TEST administrator: this role allows to perform the test of the TOE in a secure environment.***
- ***ISSUER administrator: this role allows to perform reduced test operations and personalization of the TOE if needed during phases 4 to 6.***
- ***USER: this role has capabilities defined by the SICESW functionality and the STM library services in the DSW. The functionality available to the USER role is dependent on the SICESW, the pre-personalization and the customer mask options.***

88 The TSF shall be able to associate users with roles.

5.1.3.2 Management of security functions behaviour (FMT_MOF.1)

89 The TOE Security Functions shall restrict the ability to ***perform as indicated in*** Table 6 ***on*** the functions ***listed in*** Table 6 to ***the authorised identified roles in*** Table 6***.***

Table 6 FMT_MOF.1 iterations (management of security functions behaviour)

[selection: determine the behaviour of, disable, enable, modify the behaviour of]	[assignment: list of functions]	[assignment: the authorised identified roles]
modify the behaviour	- ***SF_INIT_A*** - ***SF_CONFIG_A*** - ***SF_INT_A*** - ***SF_AUTH_A*** - ***SF_TEST_A*** - ***SF_ADMINIS_A*** - ***SF_OBS_A***	***TEST administrator***
modify the behaviour	- ***SF_CONFIG_A*** - ***SF_INT_A*** - ***SF_AUTH_A*** - ***SF_TEST_A*** - ***SF_ADMINIS_A*** - ***SF_ALEA_A***	***ISSUER administrator***

5.1.3.3 Static attribute initialisation (FMT_MSA.3)

90 The TSF shall enforce the ***Location Based Access Control Policy and the Construction Flow Control Policy*** to provide default values for security attributes that are used to enforce the security function policy ***as indicated in*** Table 7.

91 The TOE Security Functions shall allow the ***authorised identified roles in*** Table 7 to specify alternate initial values to override the default values when an object or information is created.

5.1.3.4 Management of security attributes (FMT_MSA.1)

92 The TSF shall enforce the ***Location Based Access Control Policy and the Construction Flow Control Policy*** to restrict the ability to ***perform operations in*** Table 7 ***to*** security attributes ***in*** Table 7 to ***the authorised identified roles in*** Table 7***.***

Table 7 FMT_MSA.3 and FMT_MSA.1 iterations (initialisation and management)

[assignment: *list of security attributes*]	[selection: choose any of *restrictive, permissive,* [assignment: *other property*]]	FMT_MSA.3 [assignment: *the authorised identified roles*]	FMT_MSA.1 [selection: *change_default, query, modify, delete,* [assignment: *other operations*]]
			[assignment: *the authorised identified roles*]
For confidentiality reasons, this table content is detailed in the ST19W Generic Security Target			

5.1.3.5 Specification of management functions (FMT_SMF.1)

93 The TOE Security Functions shall be capable of performing the following security management function:

- ***Modifying the TOE configuration***
- ***Authenticating the TEST administrator and the ISSUER administrator***
- ***Modifying the security functions behaviour as indicated in*** Table 6

5.1.3.6 Limited capabilities (FMT_LIM.1)

94 The TSF shall be designed in a manner that limits their capabilities so that in conjunction with “Limited availability (FMT_LIM.2)” the following policy is enforced: Limited capability and availability Policy.

5.1.3.7 Limited availability (FMT_LIM.2)

95 The TSF shall be designed in a manner that limits their availability so that in conjunction with “Limited capabilities (FMT_LIM.1)” the following policy is enforced: Limited capability and availability Policy.

96 SFP_1: Limited capability and availability Policy

Deploying Test Features after TOE Delivery does not allow User Data to be disclosed or manipulated, TSF data to be disclosed or manipulated, software to be reconstructed and no substantial information about construction of TSF to be gathered which may enable other attacks.

97 Refinement:

Test Features are those provided by the commands in the DSW :

- OB.CMD_TST***, if TOE delivery is in ISSUER configuration;***
- OB.CMD_TST ***and*** OB.CMD_ISR***, if TOE delivery is in USER configuration.***

5.1.3.8 Complete access control (FDP_ACC.2)

98 The TOE Security Functions shall enforce the ***Location Based Access Control Policy*** on ***all subjects and objects in*** Table 8 and all operations among subjects and objects covered by the SFP.

99 The TOE Security Functions shall ensure that all operations between any subject in the TOE Scope of Control and any object within the TOE Scope of Control are covered by an access control security functions policy.

100 For confidentiality reasons, rules are not shown in Table 8. They can be found in the ST19W Generic Security Target.

Table 8 Subjects, objects and applicable access control rules

Subjects / Objects	S.TRUST	S.PLAIN	S.LIB	S.ANY
OB.F_IC	Not applicable			
OB.ROM	Memory Access Control Logics (MACL) rules			Not applicable
OB.CALL_USR	System Access Control Logics (SACL) rules			
OB.CMD_TST	Test Access Control Logics (TACL) rules			
OB.CMD_ISR	Issuer Access Control Logics (IACL) rules			
OB.REG	Register Access Control Logics (RACL) rules			
OB.RAM	Memory Access Control Logics (MACL) rules			
OB.NVM	Page Access Control Logics (PACL) rules			
	Lock Logics (LOCK) rules			

5.1.3.9 Security attribute based access control (FDP_ACF.1)

101 The TOE Security Functions shall enforce ***Location Based Access Control Policy*** to objects based on ***security attributes*** defined in the ST19W Generic Security Target.

102 The TOE Security Functions shall enforce the following rules to determine if an operation among controlled subjects and controlled objects is allowed:

- ***Grant*** S.TRUST ***initialisation access to*** OB.RAM ***and*** OB.REG***.***
- ***Grant*** S.TRUST ***flash access to*** OB.NVM***.***
- ***Those in Table 13*** of the ST19W Generic Security Target***.***
- ***Those in Table 14*** of the ST19W Generic Security Target, ***when TOE is not in test configuration.***

103 The TOE Security Functions shall explicitly authorise access of subjects to objects based on the following additional rules: ***None.***

104 The TOE Security Functions shall explicitly deny access of subjects to objects based on the following additional rules:

- ***Those "explicitly denied" of Table 13 and Table 14*** of the ST19W Generic Security Target***.***

For confidentiality reasons, Table 13 and Table 14 are not shown in this document. They can be found in the ST19W Generic Security Target***.***

5.1.3.10 Limited fault tolerance (FRU_FLT.2)

105 The TSF shall ensure the operation of all the TOE's capabilities when the following failures occur: ***exposure to operating conditions which are not detected according to the requirement Failure with preservation of secure state (FPT_FLS.1).***

5.1.3.11 Failure with preservation of secure state (FPT_FLS.1)

106 The TSF shall preserve a secure state when the following types of failures occur:

exposure to operating conditions which may not be tolerated according to the requirement Limited fault tolerance (FRU_FLT.2) and where therefore a malfunction could occur.

107 ***Refinement:***

The term “failure” above means “circumstances”. The TOE prevents failures for the “circumstances” defined above.

Regarding application note 16 of BSI-PP-002-2001, the TOE provides information on the operating conditions monitored during Smartcard Embedded Software execution and after a warm reset. No audit requirement is however selected in this security target.

5.1.3.12 Potential violation analysis (FAU_SAA.1)

108 The TOE Security Functions shall be able to apply a set of rules in monitoring the audited events and based upon these rules indicate a potential violation of the TOE Security Policy.

109 The TOE Security Functions shall enforce the following rules for monitoring audited events:

a) Accumulation or combination of auditable events ***in ISSUER and USER configurations, resulting from:***
- ***operating changes by the environment,***
- ***access control violation attempts,***
- ***bad NVM or CPU usages,***

known to indicate a potential security violation;

b) ***Make these indications available to the user after a warm reset.***

5.1.3.13 TSF domain separation (FPT_SEP.1)

110 The TSF shall maintain a security domain for its own execution that protects it from interference and tampering by untrusted subjects.

111 The TSF shall enforce separation between the security domains of subjects in the TSC.

112 ***Refinement:***

Those parts of the TOE that support the security functional requirements “Limited fault tolerance (FRU_FLT.2)” and “Failure with preservation of secure state (FPT_FLS.1)” shall be protected from interference of the Smartcard Embedded Software.

5.1.3.14 Stored data integrity monitoring and action (FDP_SDI.2)

113 The TSF shall monitor user data stored within the TSC for:

- ***single bit fails upon a read operation,***
- ***other actions are not described here,***

in OB.NVM***,*** on all objects, based on the following attributes: ***redundancy data***.

114 Upon detection of a data integrity error, the TSF shall perform actions that cannot be described here, for confidentiality reasons.

5.1.3.15 Notification of physical attack (FPT_PHP.2)

115 The TOE Security Functions shall provide unambiguous detection of physical tampering that might compromise the TOE Security Functions.

116 The TOE Security Functions shall provide the capability to determine whether physical tampering with the TOE security function's devices or elements has occurred.

117 For the ***clock and voltage supply operating changes by the environment in ISSUER and USER configurations,*** the TOE security functions shall monitor the devices and elements and notify the ***ISSUER administrator or the USER*** when physical tampering with the TOE security functions devices has occurred.

5.1.3.16 Resistance to physical attack (FPT_PHP.3)

118 The TOE Security Functions shall resist ***physical manipulation and physical probing,*** to the ***TSF*** by responding automatically such that the TOE security policy is not violated.

119 Note: as described in the CC part 2 annexes, technology limitations and relative physical exposure of the TOE must be considered.

120 Refinement

The TOE will implement appropriate measures to continuously counter physical manipulation and physical probing. Due to the nature of these attacks (especially manipulation) the TOE can by no means detect attacks on all of its elements. Therefore, permanent protection against these attacks is required ensuring that the TSP could not be violated at any time. Hence, “automatic response” means here (i)assuming that there might be an attack at any time and (ii)countermeasures are provided at any time.

5.1.3.17 Unobservability (FPR_UNO.1)

121 ***In this security target, ability to observe an operation means revealing the value of a data during an operation on this data.***

122 The TOE Security Functions shall ensure that ***all end-users*** are unable to observe the operations ***listed in*** Table 9 on ***objects listed in*** Table 9 by S.TRUST ***and*** S.LIB.

Table 9 FPR_UNO.1 iterations (unobservability)

[assignment: list of operations]	[assignment: list of objects]
READ	OB.ROM**,** OB.RAM**,** OB.REG ***and*** OB.NVM
WRITE	OB.RAM
PROGRAM, ERASE	OB.NVM

5.1.3.18 Basic internal transfer protection (FDP_ITT.1)

123 The TSF shall enforce the ***Data Processing Policy*** to prevent the ***disclosure*** of user data when it is transmitted between physically-separated parts of the TOE.

5.1.3.19 Basic internal TSF data transfer protection (FPT_ITT.1)

124 The TSF shall protect TSF data from ***disclosure*** when it is transmitted between separate parts of the TOE.

125 Refinement:

The different memories, the CPU and other functional units of the TOE (e.g. a cryptographic co-processor) are seen as separated parts of the TOE.

This requirement is equivalent to FDP_ITT.1 above but refers to TSF data instead of User Data. Therefore, it should be understood as to refer to the same ***Data Processing Policy***.

126 SFP_2: Data Processing Policy

User Data and TSF data shall not be accessible from the TOE except when the Smartcard Embedded Software decides to communicate the User Data via an external interface. The protection shall be applied to confidential data only but without the distinction of attributes controlled by the Smartcard Embedded Software.

5.1.3.20 Subset information flow control (FDP_IFC.1)

127 The TOE Security Functions shall enforce the ***Construction Flow Control Policy*** on ***all subjects defined in*** Section 5.1.1.1***, the content of all objects defined in*** Section 5.1.1.2***, and the commands available in*** OB.CMD_TST***,*** OB.CMD_ISR ***and*** OB.CALL_USR ***objects***.

5.1.3.21 Simple security attributes (FDP_IFF.1)

128 The TOE Security Functions shall enforce the ***Construction Flow Control Policy*** based on the following types of subject and information security attribute:

- ***subject and object locations and TOE configuration.***

129 The TOE Security Functions shall permit an information flow between a controlled subject and a controlled information via a controlled operation if the following rules hold:

- ***Those in Table 16*** of the ST19W Generic Security Target.

130 The TSF shall provide the additional information flow control SFP rules: ***None***.

131 The TSF shall enforce the following additional SFP capabilities: ***Data Processing Policy***.

132 The TSF shall explicitly authorise an information flow based on the following rules: ***None***.

133 The TSF shall explicitly deny an information flow based on the following rules: ***None***.

5.1.3.22 Subset residual information protection (FDP_RIP.1)

134 The TSF shall ensure that any previous information content of a resource is made unavailable upon ***the allocation of the resource to***, ***deallocation of the resource from*** the following objects: OB.RAM ***objects and*** OB.REG ***objects but the illegal condition register and the CRC control register when in warm reset***.

5.1.3.23 Quality metric for random numbers (FCS_RND.1)

135 The TSF shall provide a mechanism to generate random numbers that meets ***statistical test metrics of both*** NIST FIPS PUB-140-2:1999 ***standard for a Security Level 3 cryptographic module (statistical test upon demand)*** and BSI-AIS31 ***for P2 high level***.

5.1.4 FUNCTIONAL REQUIREMENTS APPLICABLE TO USER CONFIGURATION

5.1.4.1 Cryptographic operation (FCS_COP.1)

136 The TSF shall perform ***the operations in*** Table 10 in accordance with a specified cryptographic algorithm ***in*** Table 10 and cryptographic key sizes ***of*** Table 10 that meet the ***standards in*** Table 10***.***

Table 10 FCS_COP.1 iterations (cryptographic operations)

[assignment: list of cryptographic operations]	[assignment: cryptographic algorithm]	[assignment: cryptographic key sizes]	[assignment: list of standards]
- ***encryption*** - ***decryption*** ***in Electronic Code Book (ECB) mode***	***Data Encryption Standard (DES)***	***56 effective bits***	ISO 8372:1987 ISO 8731-1:1987 ISO/IEC 10116:1997
	Triple Data Encryption Standard (3DES)	***112 effective bits***	
- ***encryption*** - ***decryption*** ***in Cipher Block Chaining (CBC) mode*** - ***compute a Message Authentication Code (MAC)***	***Data Encryption Standard (DES)***	***56 effective bits***	ISO 8372:1987 ISO 8731-1:1987 ISO/IEC 9797:1994 ISO/IEC 10116:1997
	Triple Data Encryption Standard (3DES)	***112 effective bits***	
- ***cipher*** - ***inverse cipher*** - ***key expansion operations***	***Advanced Encryption Standard***	***128 bits***	NIST FIPS PUB 197 ***with block size of 128 bits and 10 rounds (AES-128 option)***

5.2 TOE SECURITY ASSURANCE REQUIREMENTS

137 The assurance requirements ***are*** EAL ***5*** augmented of additional assurance components listed in the following sections.

138 ***The components introduced by the*** PP/9806 ***and*** BSI-PP-002-2001 are hierarchical to the components specified in EAL ***5***.

139 The augmentations relative to EAL ***5*** are the following:

- ALC_DVS.2 Sufficiency of security measures

this increases the confidence in the vital area of developer security measures to the highest CC level,

- AVA_MSU.3 Analysis and testing for insecure states

  this adds evaluator testing of the potential for misuse of the TOE within the evaluation scope,

- AVA_VLA.4 Highly resistant

  this increases the attack potential assumed for the vulnerability analysis and penetration testing to its highest CC level.

140 Regarding application note 18 of BSI-PP-002-2001, the continuously increasing maturity level of evaluations of Smartcard ICs justifies the selection of a higher-level assurance package.

141 The set of security assurance requirements (SARs) is presented in Table 11, indicating the origin of the requirement.

Table 11 TOE security assurance requirements

Label	Title	Origin
ACM_AUT.1	Partial CM automation	EAL5/BSI-PP-002-2001/PP/9806
ACM_CAP.4	Generation support and acceptance procedures	EAL5/BSI-PP-002-2001/PP/9806
ACM_SCP.3	***Development tools CM coverage***	***EAL5***
ADO_DEL.2	Detection of modification	EAL5/BSI-PP-002-2001/PP/9806
ADO_IGS.1	Installation, generation and start-up procedures	EAL5/BSI-PP-002-2001/PP/9806
ADV_SPM.3	***Formal security policy model***	***EAL5***
ADV_FSP.3	***Semiformal functional specification***	***EAL5***
ADV_HLD.3	***Semiformal high-level design***	***EAL5***
ADV_INT.1	***Modularity***	***EAL5***
ADV_LLD.1	Descriptive low-level design	EAL5/BSI-PP-002-2001/PP/9806
ADV_IMP.2	Implementation of the TSF	EAL5/BSI-PP-002-2001/PP/9806
ADV_RCR.2	***Semiformal correspondence demonstration***	***EAL5***
AGD_USR.1	User guidance	EAL5/BSI-PP-002-2001/PP/9806
AGD_ADM.1	Administrator guidance	EAL5/BSI-PP-002-2001/PP/9806
ALC_DVS.2	Sufficiency of security measures	BSI-PP-002-2001/PP/9806
ALC_LCD.2	***Standardised life-cycle model***	***EAL5***
ALC_TAT.2	***Compliance with implementation standards***	***EAL5***
ATE_COV.2	Analysis of coverage	EAL5/BSI-PP-002-2001/PP/9806
ATE_DPT.2	***Testing: low-level design***	***EAL5***
ATE_FUN.1	Functional testing	EAL5/BSI-PP-002-2001/PP/9806
ATE_IND.2	Independent testing - sample	EAL5/BSI-PP-002-2001/PP/9806
AVA_VLA.4	Highly resistant	BSI-PP-002-2001/PP/9806
AVA_CCA.1	***Covert channel analysis***	***EAL5***

Table 11 TOE security assurance requirements

Label	Title	Origin
AVA_MSU.3	Analysis and testing for insecure states	BSI-PP-002-2001
AVA_SOF.1	Strength of TOE security function evaluation	EAL5/BSI-PP-002-2001/PP/9806

5.3 REFINEMENT OF THE SECURITY ASSURANCE REQUIREMENTS

142 As BSI-PP-002-2001 defines refinement for selected SARs, these refinements are also claimed in this security target. PP/9806 defines no refinement on SARs.

143 The main customizing is that the Dedicated Software is an operational part of the TOE after delivery, although the Test Dedicated Software is no more available.

144 Regarding application note 19 of BSI-PP-002-2001, the refinements for all the assurance families have been reviewed for the hierarchically higher-level assurance components selected in this security target.

145 The text of the impacted refinements of BSI-PP-002-2001 is to be found in the ST19W Generic Security Target.

146 For reader's ease, an impact summary is provided in Table 12.

Table 12 Impact of EAL5 selection on BSI-PP-002-2001 refinements

Assurance Family	BSI-PP-002-2001 Level	ST Level	Impact on refinement
ADO_DEL	2	2	None
ALC_DVS	2	2	None
ACM_SCP	2	**3**	None, refinement is still valid
ACM_CAP	4	4	None
ADV_FSP	2	**3**	***Presentation style changes***
ATE_COV	2	2	***Dedicated Software is included***
ADO_IGS	1	1	***Difference on ISSUER or USER delivery***
AGD_USR	1	1	***Terminal is not a direct user***
AGD_ADM	1	1	***Difference on ISSUER or USER delivery***

5.4 SECURITY REQUIREMENTS FOR THE ENVIRONMENT

147 Although security requirements specified below are respectively applicable:

- to the smart card embedded software for those in Section 5.4.1,
- to the embedded software developer and the card manufacturer for those in Section 5.4.2,

148 it is neither necessary nor appropriate for this security target to define functional and assurance security requirements for the TOE environment[1)]. These are however included here to be conformant to the claimed protection profiles.

5.4.1 Security requirements for the operational IT environment

149 BSI-PP-002-2001 selects no security requirement for the IT operational environment. However, the extra functionality provided by the ST19WR08, introduced in this security target as recommended in AUG, results in the security requirements summarized in Table 13.

Table 13 Summary of security requirements for the operational IT environment

Label	Title	Traces to…	Origin
FDP_ITC.1 **or** **FCS_CKM.1**	Import of user data without security attributes Cryptographic key generation	BSI.OE.Resp-Appl (FCS_COP.1)	CCIMB-2004-01-002
FCS_CKM.4	Cryptographic key destruction		
FMT_MSA.2	Secure security attributes		

5.4.2 Security requirements for the Non-IT environment

150 The security requirements for the Non-IT environment selected in this security target, after BSI-PP-002-2001 and AUG are summarized in Table 14. Do remark that they are not evaluated. Only those after AUG are detailed hereafter.

Table 14 Summary of security requirements for the non-IT environment

Label	Title	Traces to…
BSI.RE.Phase-1	Design & implementation of the smart card embedded software	AUG1.A.Key-Function BSI.A.Plat-Appl BSI.A.Resp-APPL AUG1.P.Add Functions AUG4.T.Mem-Access BSI.T.Leak-Inherent BSI.T.Phys-Probing BSI.T.Phys-Manipulation BSI.T.Leak-Forced BSI.T.Abuse-Func BSI.T.RND (BSI.A.Process-Card)
BSI.RE.Process-Card	Protection during packaging, finishing and personalisation	BSI.A.Process-Card
AUG1.RE.Cipher	Cipher schemes	BSI.OE.Plat-Appl BSI.OE.Resp-Appl (FCS_COP.1, Section 5.1.4.1)

1 The TOE being a product-type TOE, dependencies on the environment should remain at the assumption and security objective levels because they are not in the scope of the evaluation (as a matter of fact, they will not be evaluated). Satisfaction of these requirements is a design issue for the smart card embedded software developer and a design/organizational issue for the card manufacturer. They should state and provide evidence on how they comply with these "safe conditions of use" of the product in order to claim, as element of evidence, the certification report of a TOE in a composite evaluation. Evaluators of the composite TOE should then evaluate and test this provided evidence.

151

AUG1.RE.Cipher	**Cipher Schemas** The developers of Smartcard Embedded Software must not implement routines in a way which may compromise keys when the routines are executed as part of the Smartcard Embedded Software. Performing functions which access cryptographic keys could allow an attacker to misuse these functions to gather information about the key which is used in the computation of the function. Keys must be kept confidential as soon as they are generated. The keys must be unique with a very high probability, as well as cryptographically strong. For example, it must be ensured that it is not possible to derive the private key from a public key if asymmetric algorithms are used. If keys are imported into the TOE and/or derived from other keys, quality and confidentiality must be maintained. This implies that an appropriate key management has to be realised in the environment.

5.5 SECURITY REQUIREMENTS RATIONALE

152 The security requirements rationale has been established for the whole ST19W platform and has been presented and evaluated in the ST19W Generic Security Target.

153 For confidentiality reasons, this rationale is not reproduced here.

6 TOE SUMMARY SPECIFICATION

6.1 STATEMENT OF TOE SECURITY FUNCTIONS

154 The following security functions are an abstraction of the TOE Functional Specification.

6.1.1 SF_INIT_A: Hardware initialisation & TOE attribute initialisation

155 In TEST, ISSUER and USER configurations, this functionality ensures the following:

- the TOE starts running in a secure state,
- the TOE is securely initialised,
- the reset operation is correctly managed.

6.1.2 SF_CONFIG_A: TOE configuration switching and control

156 In TEST, ISSUER and USER configurations, this functionality ensures the switching and the control of TOE configuration.

157 This functionality ensures that the TOE is either in TEST, ISSUER or USER configuration.

158 The only authorised TOE configuration modifications are:

- TEST to ISSUER configuration by TEST administrator,
- ISSUER to USER configuration by ISSUER administrator.

159 This functionality is responsible for the TOE configuration detection and notification to the other resources of the TOE.

6.1.3 SF_INT_A: TOE logical integrity

160 This functionality is responsible for the following operations, performed according to actual TOE configuration:

- NVM, USR_ROM and ST_ROM integrity content verifications in TEST and ISSUER configurations,
- valid CPU usage and stack overflow verification in TEST, ISSUER and USER configurations.
- for correcting single bit fails upon a read operation,
- other actions are not described here.

161 This functionality is responsible for reporting to SF_ADMINIS_A detected errors on CPU usage, stack overflow and EEPROM.

6.1.4 SF_TEST_A: Test of the TOE

162 This functionality is responsible for restricting access of the TOE TEST functionality to the TEST administrator in TEST configuration.

163 This functionality is responsible for restricting access of the TOE ISSUER functionality to the ISSUER administrator in ISSUER configuration.

164 In USER configuration, this functionality ensures that neither TOE TEST nor TOE ISSUER functionality can be accessed.

165 In TEST configuration, this functionality ensures the test of TOE functionality with respect to the IC specification.

166 In ISSUER and USER configurations, it ensures that critical test functionality is disabled.

167 In TEST configuration, this functionality provides commands to store data and/or pre-personalisation data and/or supplements of the Smartcard Embedded Software (personnalisation). In ISSUER configuration, these commands are still available but in a more restricted operation mode.

6.1.5 SF_AUTH_A: Administrators authentication

168 In TEST configuration, this SF ensures that the only allowed TOE user is an authenticated TEST administrator.

169 In ISSUER configuration, this SF ensures the authentication of the ISSUER administrator.

170 A **SOF-high** strength of function is claimed for this SF.

6.1.6 SF_FWL_A: Storage and Function Access Firewall

171 TOE memories are partitioned. This partitioning is partially defined by the TOE user and partially by STM:

- ST_ROM mapping is STM defined,
- USR_ROM mapping is user defined,
- RAM and NVM mappings are partly STM defined and partly user defined.

172 In TEST, ISSUER and USER configurations, this security functionality monitors:

- access from memory locations to other locations for ROM, RAM and NVM,
- NVM use,
- register access,

and is responsible for the notification of violation attempts to SF_ADMINIS_A.

173 An access can be:

- a read, to registers, ROM, RAM or NVM,
- a write, to registers or RAM,
- a program, to NVM,
- an erase, to NVM.

174 Executability, Read, Write, Program and Erase right classes are defined by the user and STM for ROM, RAM and NVM.

6.1.7 SF_PHT_A: Physical tampering security function

175 In TEST, ISSUER and USER configurations, this functionality ensures the following:

- the TOE detects clock and voltage supply operating changes by the environment,
- the TOE detects attempts to violate its physical integrity,
- the TOE is always clocked with shape and timing within specified operating conditions.

6.1.8 SF_ADMINIS_A: Security violation administrator

176 In TEST, ISSUER and USER configurations, this functionality ensures the management of security violations attempts.

177 The security violations attempts which are managed are:

- access to unavailable or reserved memory locations,
- unauthorised access to user memories,
- unauthorised access to STM memories,
- bad CPU usage,
- bad NVM use,
- EEPROM single bit fails,
- clock and voltage supply operating changes,
- TOE physical integrity abuse.

6.1.9 SF_OBS_A: Unobservability

178 In ISSUER and USER configurations, this security function addresses the Unobservability (FPR_UNO.1)**,** the Basic internal transfer protection (FDP_ITT.1) and the Basic internal TSF data transfer protection (FPT_ITT.1) security functional requirements expressed in this document.

6.1.10 SF_SKCS_A: Symmetric Key Cryptography Support

179 In USER configuration, this security function implements the following standard symmetric key cryptography algorithms:

- Data Encryption Standard (DES) with 64 bits long keys (56 effective bits).

This functionality supports the following standard modes of operation, both for encryption and for decryption:

- DES by itself,
- Triple DES, chaining two DES encryption and one DES decryption.

Each of these modes of operation can be chained in the standard Cipher Block Chaining mode (CBC). In the encryption operation mode, this function can compute either a 64 bits long Message Authentication Code (MAC) or the encrypted data.

180 This functionality implements the following standard symmetric key cryptography algorithms:

- Advanced Encryption Standard (AES) with 128 bits long keys, 128 bits long blocks, 10 rounds, providing cipher, inverse cipher and key expansion operations.

6.1.11 SF_ALEAS_A: Unpredictable Number Generation Support

181 In all configurations, this security function provides two unpredictable and unrelated 8 bits numbers.

182 In ISSUER and USER configurations, this security function supports the prevention of information leakage.

183 This security function ensures the generation of unpredictable numbers of 1088 bits, in USER configuration.

184 This security function can be qualified, with :

- the statistical test metrics defined by the NIST FIPS PUB-140-2:1999 standard for a Security Level 3 cryptographic module (statistical test upon demand),
- the statistical test metrics defined by the BSI-AIS31 standard for a P2 class device.

6.2 STATEMENT OF ASSURANCE MEASURES

185 The ST19WR08 Documentation Report shows the assurance measures, through a list of documents delivered, which are claimed to satisfy the stated assurance requirements.

7 PP CLAIMS

7.1 PP REFERENCES

186 The ST19WR08 Security Target **is compliant with** the requirements of the Smartcard Integrated Circuit Protection Profile PP/9806, Revision 2.0.

187 The ST19WR08 Security Target **is compliant with** the requirements of the Smartcard IC Platform Protection Profile BSI-PP-002-2001, Revision 1.0.

7.2 PP REFINEMENTS

188 The main refinements operated on the PP/9806 are:

- "Smartcard product" is refined into "Secure IC based product" to emphasize the packaging independence of the TOE,
- The product life-cycle is refined to include industrial parameters such as the delivery phase and the sites where the life-cycle processes are performed,
- The SFR applicable to phase 3 are refined to be applicable to the logical phases TEST and ISSUER configurations.

189 PP/9806 refinements are indicated with type setting text ***as indicated here***, original text being typeset as indicated here. Deleted parts are ***[***~~as indicated here~~***]***. Text originating in AUG is typeset as indicated here.

190 The main refinements operated on the BSI-PP-002-2001 are:

- The definition of "Test Features" in the Limited capabilities (FMT_LIM.1) policy,
- Addition #1: “Support of Cipher Schemes” from AUG,
- Addition #4: "Area based Memory Access Control" from AUG,
- Refinement of assurance requirements.

191 BSI-PP-002-2001 refinements are indicated with type setting text ***as indicated here***, original text being typeset as indicated here. Deleted parts are ***[***~~as indicated here~~***]***. Text originating in AUG is typeset as indicated here.

7.3 PP ADDITIONS

192 The security environment additions relative to each PP are summarized in Table 3. Remind that most of them are redundant to each other but enable full traceability and rationale reuse.

193 The additional security objectives relative to each PP are summarized in Table 4. Remind that most of them are redundant to each other but enable full traceability and rationale reuse.

194 A simplified presentation of the TOE Security Policy (TSP) is added.

195 The additional SFRs for the TOE relative to each PP are summarized in Table 5. Remind that some of them are redundant to each other but enable full traceability and rationale reuse.

196 The additional SFRs for the environment relative to both PPs are summarized in Table 13 and Table 14.

197 The additional SARs relative to each PP are summarized in Table 11.

7.4 PP CLAIMS RATIONALE

198 The differences between this Security Target security objectives and requirements and those of PP/9806 and those of BSI-PP-002-2001, to both of which conformance is claimed, have been identified and justified in Chapter 4 and in Chapter 5. They have been recalled in the previous section.

199 The security objectives rationale referred to in Section 4.3 clearly identifies modifications and additions made to the rationale presented in the PP/9806 and in BSI-PP-002-2001.

200 Similarly, the security requirements rationale referred to in Section 5.5 has been consistently updated with respect to both protection profiles.

201 All PP requirements have been shown to be satisfied in the extended set of requirements whose completeness, consistency and soundness has been argued in the rationale sections of the ST19W Generic Security Target.

8 RATIONALE

202 The rationale has been established for the whole ST19W platform and has been presented and evaluated in the ST19W Generic Security Target.

203 For confidentiality reasons, the rationale is not reproduced here.

9 REFERENCES

204 Protection Profile references

Component description	Reference	Revision
Smartcard Integrated Circuit	PP/9806	2.0
Smartcard IC Platform	BSI-PP-002-2001	1.0

205 Generic Security Target reference

Component description	Reference
ST19W Generic Security Target	SCP_YQUEM_ST_03_001

206 Target of Evaluation referenced documents

207 For security reasons, all these documents are classified and their applicable revisions are referenced in th ST19W Documentation Report.

Component description	Reference
ST19WR08 Documentation Report	SMD_YQUEM_DR_05_003

208 Standards references

Identifier	Description
BSI-AIS31	A proposal for Functionality classes and evaluation methodology for true (physical) random number generators, W. Killmann & W. Schindler BSI, Version 3.1, 25-09-2001
NIST FIPS PUB-140-2:1999	Security Requirements for Cryptographic Modules
NIST FIPS PUB 180-1:1995	Secure Hash Standard
NIST FIPS PUB 186	Recommended simplified Rabin-Miller primality tests for DSS
NIST FIPS PUB 197	Advanced Encryption Standard (AES), November 2001
ISO 8372:1987	Information processing - Modes of operation for a 64-bit block cipher algorithm
ISO 8731-1:1987	Banking - Approved algorithms for message authentication -Part 1: DEA
ISO/IEC 9796-2:1997	Information technology - Security techniques - Digital signature scheme giving message recovery - Part 2: Mechanism using a hash function
ISO/IEC 9797:1994	Information technology - Security techniques - Data integrity mechanism using a cryptographic check function employing a block cipher algorithm
ISO/IEC 10116:1997	Information technology - Modes of operation of an n-bit block cipher algorithm
ISO/IEC 10118-3:1998	Information technology - Security techniques - Hash functions - Part 3: Dedicated hash functions
CCIMB-2004-01-001	Information technology - Security techniques - Evaluation criteria for IT security - Part 1: Introduction and general model, January 2004, version 2.2, revision 256
CCIMB-2004-01-002	Information technology - Security techniques - Evaluation criteria for IT security - Part 2: Security functional requirements, January 2004, version 2.2

Identifier	Description
CCIMB-2004-01-003	Information technology - Security techniques - Evaluation criteria for IT security - Part 3: Security assurance requirements, January 2004, version 2.2, revision 256
BSI_9806_0002_2001	Assessment on the substitution of an evaluation based on PP/9806 by an evaluation based on BSI-PP-0002-2001, BSI, version 1.1, May 2002
DCSSI_CCN.624	Fiche relative au profil de protection BSI-PP-0002-2001, C. Blad, version 1.1, 27 mai 2002
DCSSI_CCN.648	Fiche relative à l'utilisation du profile de protection BSI-PP-0002-2001 pour une évaluation PP/9911, DCSSI, 19 septembre 2002
AUG	Smartcard Integrated Circuit Platform Augmentations, Atmel, Hitachi Europe, Infineon Technologies, Philips Semiconductors, Version 1.0, March 2002.
MIT/LCS/TR-212	On digital signatures and public key cryptosystems, Rivest, Shamir & Adleman Technical report MIT/LCS/TR-212, MIT Laboratory for computer sciences, January 1979
JoCSS	Riemann's hypothesis and tests for primality, Miller Journal of computer and system sciences, vol 13 n°3 p300-317
JoNT	Probabilistic algorithm for testing primality, Miller Journal of number theory, vol 12 n°1 p 128-138

Annex A

Glossary

Authentication data

Information used to verify the claimed identity of a user.

Authorised user

A user who may, in accordance with the TSP, perform an operation.

Cryptographic sensitive data (CSD)

User data appearing in plain text or otherwise unprotected form and whose disclosure or modification can compromise the security of a cryptographic module or the security of the information protected by the module.

Differential Power Analysis (DPA)

An analysis in variations of the electrical power consumption of a device, using advanced statistical methods and/or error correction techniques, for the purpose of extracting information correlated to secrets processed in the device. When several consumption traces are recombined during analysis to remove randomisation counter-measures, the analysis is known as Higher Order DPA (HODPA).

Embedded software

Software embedded in a ***secure IC*** may be ***located*** in any part of the nonvolatile memory ***(ROM and NVM)*** of the IC.

Secure IC based product

Packaged secure IC integrated in its end-usage carrier such as a Smartcard, a card reader, a set-top box, a PC board or any other suitable device.

Integrated Circuit (IC)

Electronic component(s) designed to perform processing and/or memory functions.

IC Dedicated Software

STM proprietary Dedicated SoftWare (DSW), embedded in ST_ROM, whose design is parameterised by the STM product assembly definition. This software contributes to the enforcement of the TSP. It also includes testing functionality and system libraries that are part of the API of the TOE, it is embedded in the IC (it is also known as IC firmware).

IC *developer*

Institution (or its agent) responsible for the IC development.

IC manufacturer

Institution (or its agent) responsible for the IC manufacturing, testing, and pre-personalization.

IC packaging manufacturer

Institution (or its agent) responsible for the IC packaging and testing.

IC pre-personalization data

Any data that is stored in the nonvolatile memory for shipment between phases.

Memory access

Read and Modification (Write, Erase, Program) access.

Object

An entity within the TSC that contains or receives information and upon which subjects perform operations.

Packaged IC

IC embedded in a physical package such as micromodules, DIPs, SOICs or TQFPs.

Personalizer

Institution (or its agent) responsible for the ***secure IC based product*** personalization and final testing.

Secret

Information that must be known only to authorised users and/or the TSF in order to enforce a specific SFP.

Secure IC* Embedded SoftWare *(SICESW)

Embedded software in charge of generic functions of the ***secure IC*** such as Operating System, general routines and interpreters (***secure IC*** basic software) and embedded software dedicated to the applications (***secure IC*** application software).

***Secure IC* embedded software developer**

Institution (or its agent) responsible for the ***secure IC*** embedded software development and the specification of IC pre-personalization requirements***, if any***.

Security attribute

Information associated with subjects, users and/or objects that is used for the enforcement of the TSP.

Security derivation

The process by which a TOE summary specification is derived from the identification of the threatened assets in the TOE environment, establishing in turn: a security environment, a set of security objectives, a set of security requirements and finally a set of security functions and assurance measures (see CC, part 1, section 4.3 for a detailed explanation, notably figure 4.5).

Sensitive information

Any information identified as a security relevant element of the TOE such as:

– the application data of the TOE (such as IC pre-personalization requirements, IC and system specific data),

– the secure IC embedded software,

– the IC dedicated software,

– the IC specification, design, development tools and technology.

Simple Power Analysis (SPA)

A direct analysis, primarily visual, of patterns of instruction execution (or execution of individual instructions), obtained through monitoring the variations in electrical power consumption of a device, for the purpose of revealing the features and implementations of (cryptographic) algorithms and subsequently the values of the secrets they process in the device.

Smartcard

A card according to ISO 7816 requirements which has a non volatile memory and a processing unit embedded within it.

Software library

Set of software functions provided by STM in the DSW that implement driving and functional services offered to the embedded software of the secure IC based product.

Subject

An entity within the TSC that causes operations to be performed.

System integrator

Institution (or its agent) responsible for the ***secure IC based*** product system integration (terminal software developer, system developer ...).

TSF data

Data created by and for the TOE, that might affect the operation of the TOE.

User

Any entity (human user or external IT entity) outside the TOE that interacts with the TOE.

User data

Data created by and for the user, that doesn't affect the operation of the TOE.

Warm reset

Reset operation on the TOE without lowering power under the Power on Reset (POR) level.

Abbreviations

ACC

Accumulator register.

AES

Advanced Encryption Standard.

AIS

Application notes and Interpretation of the Scheme (BSI)

ALU

Arithmetical and Logical Unit.

ANSI

American National Standards Institute

API

Application Program Interface.

BSI

Bundesamt für Sicherheit in der Informationstechnik

CC

Common Criteria ***Version 2.2 (CCIMB).***

CCR

Condition Code Register.

CSD

Cryptographic Sensitive Data.

CSR

Code Segment Register.

CPU

Central Processing Unit.

DCSSI

Direction Centrale de la Sécurité des Systèmes Informatique

DES

Data Encryption Standard.

DIP

Dual-In-Line Package.

DPA

Differential Power Analysis.

DSR

Data Segment Register.

DSW

IC Proprietary Dedicated Software.

EAL

Evaluation Assurance Level.

ECC

Error Correcting Code.

EEPROM

Electrically Erasable Programmable Read Only Memory.

EMA

Electromagnetic Analysis.

FIPS

Federal Information Processing Standard.

GPIO

General Purpose Input Output.

HODPA

Higher Order Differential Power Analysis.

I2C

Inter Integrated Circuit bus.

IART

ISO-7816 Asynchronous Receiver Transmitter.

IOCI

Input Output and Control Interface.

ISO

International Standards Organisation.

IT

Information Technology.

Kbps

Kilo bits per second.

LPC

Low Pin Count.

MAP

Modular Arithmetical Processor.

NIST

National Institute of Standards and Technology.

NVM

Non Volatile Memory.

OP

Operation Performed.

OSP

Organisational Security Policy.

PC

Program Counter register.

PP

Protection Profile.

PUB

Publication Series.

RAM

Random Access Memory.

RF

Radio Frequency.

ROM

Read Only Memory.

SAR

Security Assurance Requirement.

SF

Security function.

SFP

Security Function Policy.

SFR

Security Functional Requirement.

SICESW

Secure IC Embedded SoftWare.

SOF

Strength of function.

SOIC

Small Outline IC.

SP

Stack Pointer register.

SPA

Simple Power Analysis.

ST

Security Target.

ST_ROM

STM reserved ROM.

STM

STMicroelectronics.

TOE

Target of Evaluation.

TQFP

Thin Quad Flat Package.

TSC

TSF Scope of Control.

TSF

TOE Security Functions.

TSFI

TSF Interface.

TST&ISR

The logical phases TEST and ISSUER configurations.

TSP

TOE Security Policy.

TSS

TOE Summary Specification.

RF-UART

Radio Frequency Universal Asynchronous Receiver Transmitter.

USR_ROM

User reserved ROM.

USB

Universal Serial Bus.

XIR

X Index Register.

YIR

Y Index Register.

CONFIDENTIALITY OBLIGATIONS:

THIS DOCUMENT CONTAINS CONFIDENTIAL INFORMATION.
ITS DISTRIBUTION IS SUBJECT TO THE SIGNATURE OF AN NON-DISCLOSURE AGREEMENT (NDA).
IT IS CLASSIFIED "PUBLIC"

AT ALL TIMES YOU SHOULD COMPLY WITH THE FOLLOWING SECURITY RULES
(REFER TO NDA FOR DETAILED OBLIGATIONS):

DO NOT COPY OR REPRODUCE ALL OR PART OF THIS DOCUMENT
KEEP THIS DOCUMENT LOCKED AWAY

FURTHER COPIES CAN BE PROVIDED ON A “NEED TO KNOW BASIS”, PLEASE CONTACT
YOUR LOCAL ST SALES OFFICE OR THE FOLLOWING ADDRESS:

STMicroelectronics SA
SMART CARDS PRODUCTS MARKETING DPT
BP2 / ZI de Peynier Rousset / F-13106 ROUSSET Cedex / FRANCE
Fax: +33 4 42 68 87 29