Certification Report

MediaTek Trusted Execution Environment (M-TEE) hypervisor isolation platform v.1.0

Sponsor and developer: ***MediaTek Inc.***
No.1, Dusing 1st Rd., Hsinchu Science Park
Hsinchu, 30078
Taiwan

Evaluation facility: ***Riscure B.V.***
Delftechpark 49
2628 XJ Delft
The Netherlands

Report number: **NSCIB-CC-0486650-CR**

Report version: **1**

Project number: **0486650**

Author(s): **Jordi Mujal**

Date: **02 January 2023**

Number of pages: **12**

Number of appendices: **0**

Head Office:
Westervoortsedijk 73
NL-6827 AV Arnhem

P.O. Box 2220
NL-6802 CE Arnhem
The Netherlands

Location Leek:
Eiberkamp 10
NL-9351 VT Leek

P.O. Box 37
NL-9350 AA Leek
The Netherlands

info@nl.tuv.com
www.tuv.com/nl

Tel. +31 (0)88 888 7 888
Fax +31 (0)88 888 7 879

TÜV Rheinland Nederland B.V. is a registered company at the Netherlands Chamber of Commerce (KVK), under number 27288788.

VAT number: NL815820380B01
IBAN: NL61DEUT0265155096

CONTENTS

Foreword

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

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

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

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

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

Reproduction of this report is authorised only if the report is reproduced in its entirety.

Recognition of the Certificate

The presence of the Common Criteria Recognition Arrangement (CCRA) and the SOG-IS logos on the certificate indicates that this certificate is issued in accordance with the provisions of the CCRA and the SOG-IS Mutual Recognition Agreement (SOG-IS MRA) and will be recognised by the participating nations.

International recognition

The CCRA was signed by the Netherlands in May 2000 and provides mutual recognition of certificates based on the Common Criteria (CC). Since September 2014 the CCRA has been updated to provide mutual recognition of certificates based on cPPs (exact use) or STs with evaluation assurance components up to and including EAL2+ALC_FLR.

For details of the current list of signatory nations and approved certification schemes, see http://www.commoncriteriaportal.org.

European recognition

The SOG-IS MRA Version 3, effective since April 2010, provides mutual recognition in Europe of Common Criteria and ITSEC certificates at a basic evaluation level for all products. A higher recognition level for evaluation levels beyond EAL4 (respectively E3-basic) is provided for products related to specific technical domains. This agreement was signed initially by Finland, France, Germany, The Netherlands, Norway, Spain, Sweden and the United Kingdom. Italy joined the SOG-IS MRA in December 2010.

For details of the current list of signatory nations, approved certification schemes and the list of technical domains for which the higher recognition applies, see https://www.sogis.eu.

1 Executive Summary

This Certification Report states the outcome of the Common Criteria security evaluation of the MediaTek Trusted Execution Environment (M-TEE) hypervisor isolation platform v.1.0. The developer of the MediaTek Trusted Execution Environment (M-TEE) hypervisor isolation platform v.1.0 is MediaTek Inc. located in Hsinchu, Taiwan and they also act as the sponsor of the evaluation and certification. A Certification Report is intended to assist prospective consumers when judging the suitability of the IT security properties of the product for their particular requirements.

The TOE is the MediaTek Trusted Execution Environment (M-TEE) Hypervisor isolation platform. It supports the execution of MediaTek hypervisor applications (HAs) in Trusty VM, in a secured manner isolated from any applications running in REE, between them (isolating different HAs in Trusty) and isolated from the REE operating system. The TOE is integrated into a system-on-chip (SoC) and utilizes the underlying hardware platform of the SoC.

The TOE allows HAs to be loaded and installed post-issuance (in the OEM phase of the M-TEE-enabled device, not in the scope) and offers isolation between virtual domains (between REE and Trusty VM, between REE and Nebula VM, and between Trusty VM and Nebula VM) and access control between the components between Trusty HAs and those elements they attempt to access, according to the isolation mechanism.

This TOE is critically dependent on the operational environment to provide countermeasures against specific attacks, as described in the objectives for the environment specified in *[ST]* section 4.2 and the related guidance *Mediatek Trusted Execution Environment (M-TEE) AGD_PRE* section 3. As such it is vital that meticulous adherence to the user guidance of both the software and the hardware portions of the TOE environment are maintained.

The TOE has been evaluated by Riscure B.V. located in Delft, The Netherlands. The evaluation was completed on 02 January 2023 with the approval of the ETR. The certification procedure has been conducted in accordance with the provisions of the Netherlands Scheme for Certification in the Area of IT Security *[NSCIB]*.

The scope of the evaluation is defined by the security target *[ST]*, which identifies assumptions made during the evaluation, the intended environment for the MediaTek Trusted Execution Environment (M-TEE) hypervisor isolation platform v.1.0, the security requirements, and the level of confidence (evaluation assurance level) at which the product is intended to satisfy the security requirements. Consumers of the MediaTek Trusted Execution Environment (M-TEE) hypervisor isolation platform v.1.0 are advised to verify that their own environment is consistent with the security target, and to give due consideration to the comments, observations and recommendations in this certification report.

The results documented in the evaluation technical report *[ETR]* [1] for this product provide sufficient evidence that the TOE meets the EAL3 augmented (EAL3+) assurance requirements for the evaluated security functionality. This assurance level is augmented with ALC_FLR.1 (Basic Flaw Remediation).

The evaluation was conducted using the Common Methodology for Information Technology Security Evaluation, Version 3.1 Revision 5 *[CEM]* for conformance to the Common Criteria for Information Technology Security Evaluation, Version 3.1 Revision 5 *[CC]* (Parts I, II and III).

TÜV Rheinland Nederland B.V., as the NSCIB Certification Body, declares that the evaluation meets all the conditions for international recognition of Common Criteria Certificates and that the product will be listed on the NSCIB Certified Products list. Note that the certification results apply only to the specific version of the product as evaluated.

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

2 Certification Results

2.1 Identification of Target of Evaluation

The Target of Evaluation (TOE) for this evaluation is the MediaTek Trusted Execution Environment (M-TEE) hypervisor isolation platform v.1.0 from MediaTek Inc. located in Hsinchu, Taiwan.

The TOE is comprised of the following main components:

Delivery item type	Identifier	Identifier and version	Build date
Software	M-TEE Framework	mTEE_SDK: 2.2.2.003.S0MP1_GZ	18:07:19 Mar 10 2022
	M-TEE Services HA	KERNEL_SRV_HA:2.0.001.S0MP1_GZ	18:07:24 Mar 10 2022
	Echo HA	ECHO_HA:2.0.002.S0MP1_GZ	18:07:28 Mar 10 2022
	Testing HA	GZ-TEST_HA:2.0.000.S0MP1_GZ	18:07:37 Mar 10 2022
Hardware	Stage 2 MMU in GenieZone hypervisor	The Stage 2 MMU is identified by the following SoC models in which it is integrated: MT67XX: • 6771 • 6765 • 6779 • 6768 • 6785 • 6781 • 6789 MT68XX: • 6885 • 6889 • 6893 • 6873 • 6853 • 6833 • 6877 • 6879 • 6895 • 6855 • 6886 • 6835 MT69XX: • 6983 • 6985 MT81XX: • 8195 MT86XX: • 8675 MT87XX: • 8768 • 8771 • 8781	

		• 8786 • 8788 • 8791 • 8795 • 8797 • 8798	

To ensure secure usage a set of guidance documents is provided, together with the MediaTek Trusted Execution Environment (M-TEE) hypervisor isolation platform v.1.0. For details, see section 2.5 “Documentation” of this report.

2.2 Security Policy

The TOE security functionalities in the scope of the evaluation that are available in the end user phase are:

- **Isolation**: the TOE ensures the isolation between components in the TOE and:
  - Between REE VM and Trusty VM or HAs running in Trusty VM.
  - Between REE VM and Nebula VM.
  - Between different HAs running in Trusty VM
  - Between Nebula VM and Trusty VM
- **Access control to memory and resources**: the TOE provides sharing memory mechanisms and communication between components in a controlled and secure way.

2.3 Assumptions and Clarification of Scope

2.3.1 Assumptions

The assumptions defined in the Security Target are not covered by the TOE itself. These aspects lead to specific Security Objectives to be fulfilled by the TOE-Environment. For detailed information on the security objectives that must be fulfilled by the TOE environment, see section 4.2 of the *[ST]*.

2.3.2 Clarification of scope

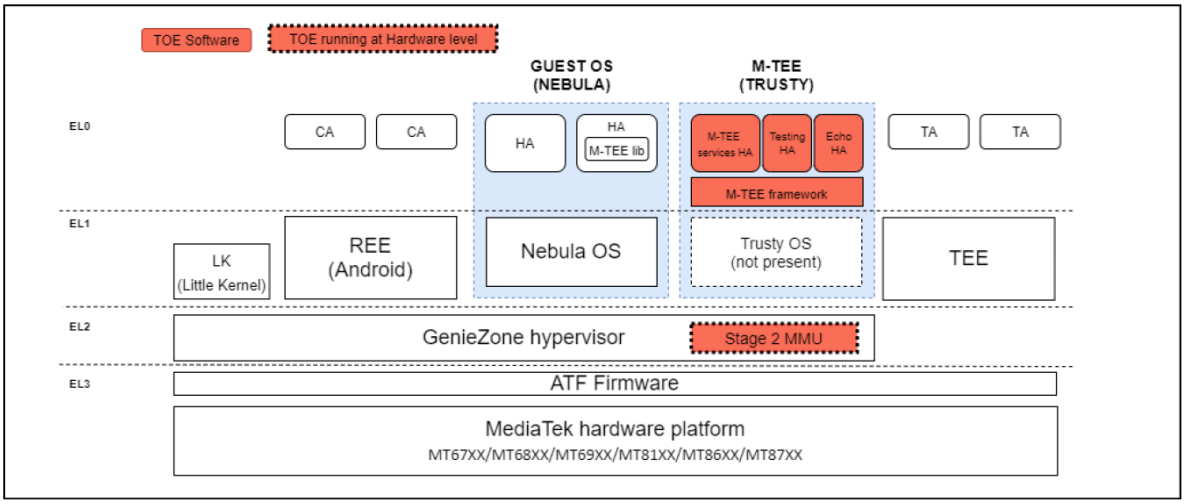
The evaluation did not reveal any threats to the TOE that are not countered by the evaluated security functions of the product.

Note that the TOE scope and functionality is only related to the Normal World and non-TEE part as it is defined in the *[ST],* and it can be seen in the Security Policy in Section 2.2 and the TOE architecture in section 2.4. The TOE is not involved or has security role in the isolation and security of the TEE.

There are three HAs that are part of the TOE identified in Section 2.1 “Identification of Target of Evaluation” above. Although they are part of the TOE, in the *[ST]* there is no security claim on them. In the same way, although the TOE provides means to load new HAs into the TOE, there is no security claim regarding this loading mechanism.

2.4 Architectural Information

The following figure depicts the TOE boundary and the main TOE architecture.



2.5 Documentation

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

Identifier	Version	Date
Mediatek Trusted Execution Environment (M-TEE) AGD_OPE	v1.1	-
Mediatek Trusted Execution Environment (M-TEE) AGD_PRE	v1.1	-
[MTEE] Feature Enabling Quick Guide	v1.0	-
Platform Security Solution Manual	v2.7a	08/07/2022
M-TEE Development Guide	v1.3	12/03/2021
KREE API of M-TEE	v1.0	04/10/2021
M-TEE Dynamic Loading HA User Guide	v1.0	18/03/2021
Meditatek API Specification	v0.1	-

2.6 IT Product Testing

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

2.6.1 Testing approach and depth

The developer has performed extensive testing on functional specification and TSFIs. The testing was largely automated using industry standard and proprietary test suites. Test scripts were extensively used to verify that the functions return the expected values.

All the developer ATE tests were repeated by the evaluator. The evaluator did not identify any gaps in the developer test campaign and no additional tests were performed.

2.6.2 Independent penetration testing

Considering the security assurance requirements for the AVA_VAN.2 level, the following approach was considered by the Lab:

- Collect and review information available in the public domain.
- Collect and review information and prior work on the security evaluation evidences.
- Determine viable attack scenarios based on available information.

- Select attacks for the penetration testing phase.

The total test effort expended by the evaluators was 4 weeks. During that test campaign, 100% of the total time was spent on logical tests.

2.6.3 Test configuration

The configuration of the sample used for independent evaluator testing and penetration testing was the same as described in the *[ST]*. Specifically, the tests were carried out in one of the SoC versions described in Section 2.1 “Identification of Target of Evaluation” above (MT6983). The Lab concluded that the tests and results are equally applicable to the rest of the SoC models with which the TOE is integrated.

2.6.4 Test results

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

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

No exploitable vulnerabilities were found with the independent penetration tests.

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

2.7 Reused Evaluation Results

There is no reuse of evaluation results in this certification.

2.8 Evaluated Configuration

The TOE is defined uniquely by its name and version number MediaTek Trusted Execution Environment (M-TEE) hypervisor isolation platform v.1.0.

2.9 Evaluation Results

The evaluation lab documented their evaluation results in the *[ETR]*, which references an ASE Intermediate Report and other evaluator documents.

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

Based on the above evaluation results the evaluation lab concluded the MediaTek Trusted Execution Environment (M-TEE) hypervisor isolation platform v.1.0, to be **CC Part 2 extended, CC Part 3 conformant**, and to meet the requirements of **EAL 3 augmented with ALC_FLR.1**. This implies that the product satisfies the security requirements specified in Security Target *[ST]*.

2.10 Comments/Recommendations

The user guidance as outlined in section 2.5 “Documentation” contains necessary information about the usage of the TOE.

This TOE is critically dependent on the operational environment to provide countermeasures against specific attacks, as described in the objectives for the environment specified in *[ST]* section 4.2 and the related guidance *Mediatek Trusted Execution Environment (M-TEE) AGD_PRE* section 3. As such it is vital that meticulous adherence to the user guidance of both the software and the hardware portions of the TOE environment are maintained.

In addition, all aspects of assumptions, threats and policies as outlined in the Security Target not covered by the TOE itself must 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. For the evolution of attack methods and techniques to be covered, the customer should define the period of time until a re-assessment for the TOE is required and thus requested from the sponsor of the certificate.

The strength of the cryptographic algorithms and protocols was not rated in the course of this evaluation. This specifically applies to the following proprietary or non-standard algorithms, protocols and implementations: none.

3 Security Target

The Mediatek Trusted Execution Environment (M-TEE) hypervisor isolation platform security target, version 1.91, 22 December 2022 *[ST]* is included here by reference.

4 Definitions

This list of acronyms and definitions contains elements that are not already defined by the CC or CEM:

CA	Client Application
IT	Information Technology
ITSEF	IT Security Evaluation Facility
HA	Hypervisor Application
JIL	Joint Interpretation Library
MMU	Memory Management Unit
NSCIB	Netherlands Scheme for Certification in the area of IT Security
OEM	Original Equipment Manufacturer
PP	Protection Profile
REE	Rich Execution Environment
SoC	System on Chip
TEE	Trusted Execution Environment
TOE	Target of Evaluation
VM	Virtual Machine

5 Bibliography

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

[CC]	Common Criteria for Information Technology Security Evaluation, Parts I, II and III, Version 3.1 Revision 5, April 2017
[CEM]	Common Methodology for Information Technology Security Evaluation, Version 3.1 Revision 5, April 2017
[ETR]	ETR for MediaTek Trusted Execution Environment (M-TEE) hypervisor isolation platform v.1.0, 20210018-D3, version 1.4, 22 December 2022
[NSCIB]	Netherlands Scheme for Certification in the Area of IT Security, Version 2.5, 28 March 2019
[ST]	Mediatek Trusted Execution Environment (M-TEE) hypervisor isolation platform security target, version 1.91, 22 December 2022

(This is the end of this report.)