eSIM Compliance and Certification

February 2025

GSMA eSIM Team

Gloria Trujillo, GSMA, gtrujillo@gsma.com
Stephen Packer spacker@gsma.com

GSMA

Agenda

Time	Overview	Speaker
14:00	Welcome and housekeeping	Izzy Watson **GSMA**
14:05	Explore the importance of eSIM Compliance and Certification	Gloria Trujillo Gonzalez, SIM Group Director, **GSMA**
14:10	Deep Dive on eSIM Security (Site, Software and Hardware)	Gloria Trujillo Gonzalez, SIM Group Director, **GSMA**
14.20	Outline the main elements of the eSIM Functional Certification	Stephen Packer, Working Group Director, **GSMA**
14:25	Fundamentals of GCF Certification and its importance for eSIM Device Certification	Hajo Schulze, Head of Section Device Certification (TGDC), **Vodafone GmbH**
14.35	Fundamentals of GlobalPlatform Certification for eUICC Certification	Guido Abate, Secure Mobile Standardization Manager , **STMicroelectronics**
14.45	Illustrate the eSIM Compliance Process	Gloria Trujillo Gonzalez, SIM Group Director, **GSMA**
14:50 – 15.00	Q&A and closing remarks	Izzy Watson **GSMA**

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GSMA Remote SIM Provisioning Technology

Definition: Remote SIM Provisioning, is a way to manage and switch mobile network profiles on a device without needing a physical SIM card swap while ensuring a good customer experience. Think of it like having a digital SIM card that you can update or change remotely. This technology is particularly useful for devices like smartphones, tablets, and IoT devices, allowing them to connect to different networks easily and **securely**.

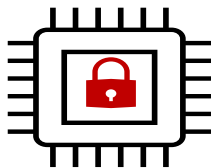## Why is RSP technology secure? What makes it secure?
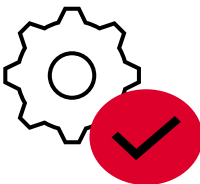
The important of Compliance and Certification
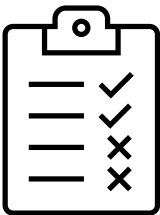
Compliance and Certification Requirements

eSIM

	Security	**Functionality**	**Compliance**
eIM / **SM-XX**	GSMA Security Accreditation Scheme — Accredited Supplier	TEST / TEST	**Annex A.1 + A.4 (SM-DP+)** **Annex A.1 + A.5 (SM-DS)** **Annex A.1 + A.6 (eIM)**
eUICC Discrete or Integrated	GSMA Security Accreditation Scheme — Accredited Supplier / GSMA eUICC Security Assurance Consumer Device Certificate	Global Platform™	**Annex A.1 + A.3 (eUICC Cons)** **Annex A.1 + A.8 (eUICC IoT)**
Consumer Device (LPAd) **IoT Device (IPAd)**	SECURITY PROVIDED BY SECURE ELEMENT (eUICC)	GCF / PTCRB	**Annex A.1 + A.2 (Device Cons)** **Annex A.1 + A.7 (Device IoT)**
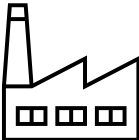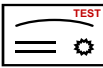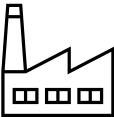
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eSIM Security

eSIM Security

eUICC and SM Site Security
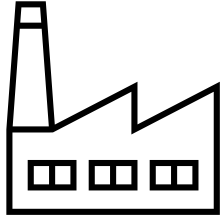
GSMA security **site audit** schemes for suppliers
- **UICC/eUICC production (SAS-UP)**
- **Subscription Management (SAS-SM)**

Requirements set by GSMA members

4/5-day on-site audit by GSMA-appointed auditors.

100+ audits/year;

Sites certified for 1-2 years

eUICC Software Security
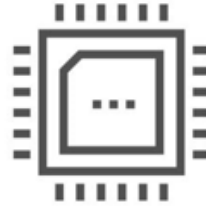
GSMA accepted methodologies to demonstrate **eUICC software security** provide assurance and trust for **eUICC Software Product**.

Requirements set by GSMA members **(Protection Profile SGP.25/PP-0100)**

eSA Scheme
- Evaluation and certification by GSMA Licensed Labs (SOGIS) and CB.
- Certification validity 5 years

Common Criteria
- Evaluation done by SOGIS licensed laboratories.
- Certification validity 5 years

eUICC Hardware Security

Common Criteria certification ensures assurance and trust for the **eUICC Product Hardware.**

Requirements set by Eurosmart members **(Protection Profiles PP-0084 or PP-0117)**

Evaluation done by SOGIS licensed laboratories.

Certification validity 5 years

Specific information on Common Criteria process, Labs, CB, etc. can be found under:
https://commoncriteriaportal.org/index.cfm

GSMA Security Accreditation Scheme (SAS)

SAS Certification Scope

SAS for UICC/eUICC Production (SAS-UP)

- Generation of data for personalisation
- Personalisation
- Management of PKI certificates
- Post-personalisation packaging
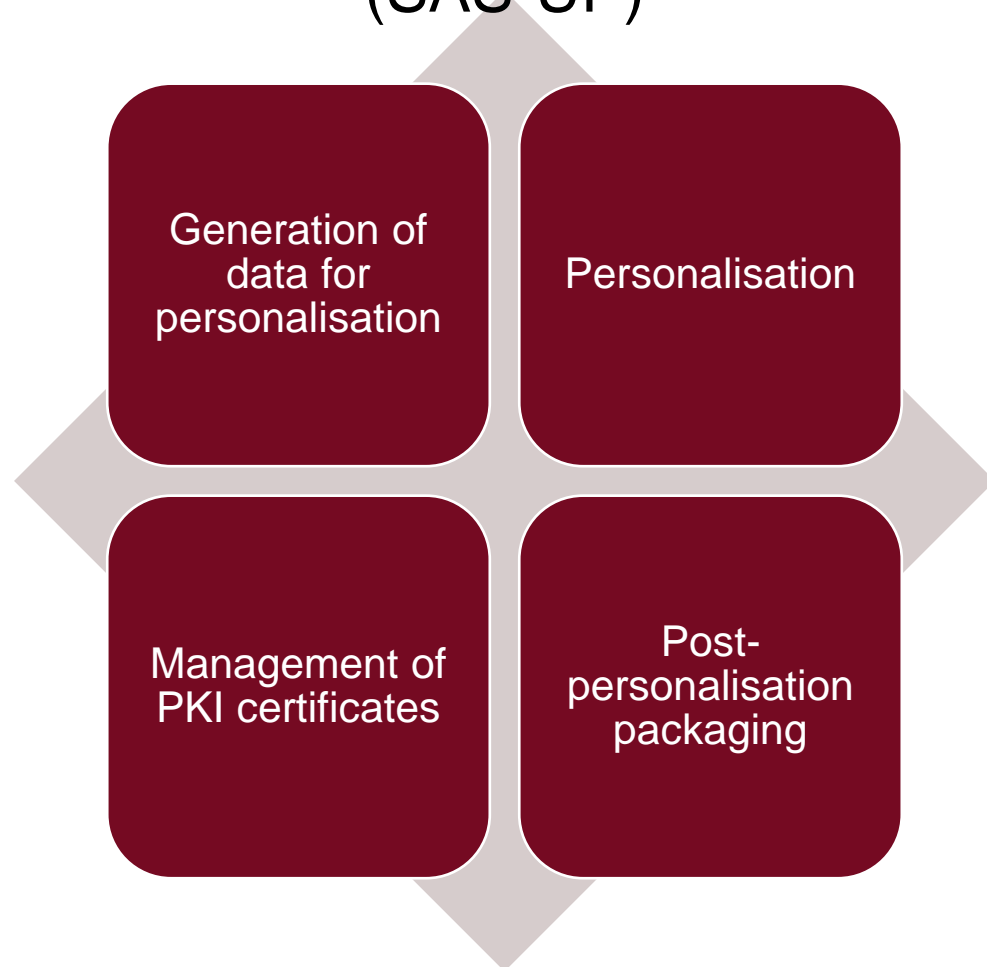
SAS for Subscription Management (SAS-SM)

- M2M (Secure Routing/Data Preparation)
- Data Preparation+ (DP+)
- Data Centre Operations & Management
- Discovery Service (DS)
- eSIM Remote Manager (eIM)
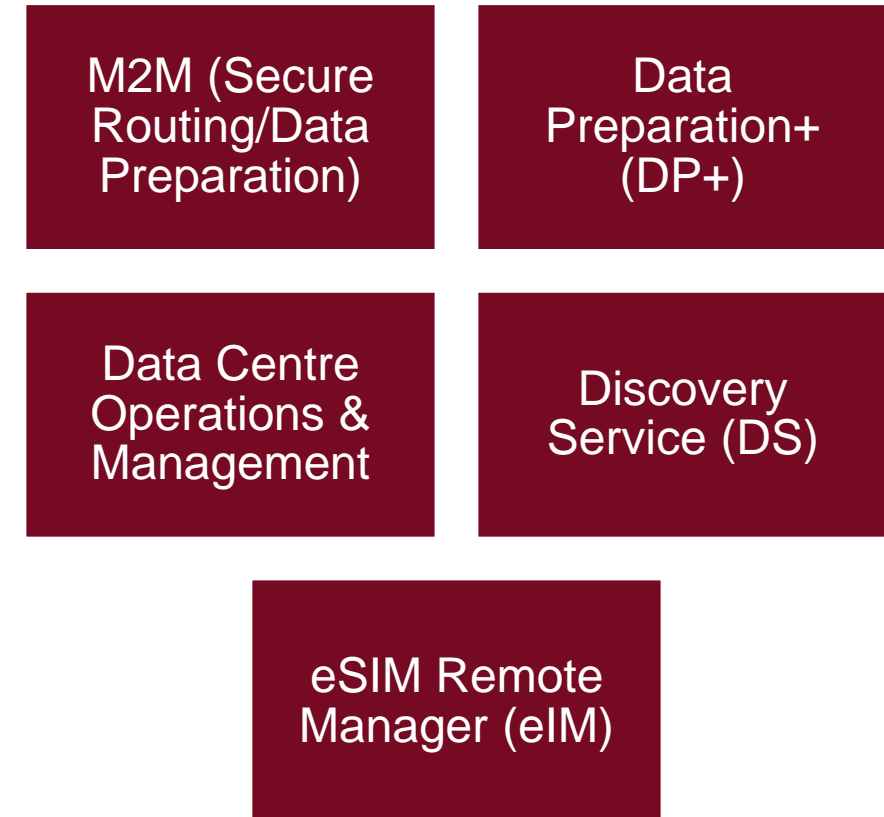
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Risks without SAS …

Without (SAS-SM)

Disclosure of IMSI, Ki pairs

Fake entity accepted as authorised

Unauthorized profile management requests sent to eSIM

Without (SAS-UP)

Disclosure of IMSI, Ki pairs

Loss or theft of branded cards, logos etc.

Thousands of UICCs may be affected

SIM clones

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Steps Towards SAS Certification

SAS Documentation
Review SAS documentation

Budget
Budget for audits & site security improvements

Book audit
Apply to GSMA & reserve audit dates (3-6 months ahead)

Prepare
Identify gaps; enhance controls; gather evidence.

Audit
Host audit (4-5 days, 2 auditors on-site)

Resolution
Resolve non-compliances (within 3 months) & host re-audit(s)

Certification
Receive SAS certification

Maintenance
Maintain security controls

Renewal
Renew certification (after 1 year, then every 2 years.)

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SAS Certified Sites Regional Distribution (JAN 2024)

SAS-UP: 69 sites

- N. America 6%
- Africa 3%
- S. America 2%
- Middle East 6%
- Asia 54%
- Europe 29%

SAS-SM: 42 sites

- Africa 3%
- N. America 18%
- Middle East 15%
- Asia 27%
- Europe 37%
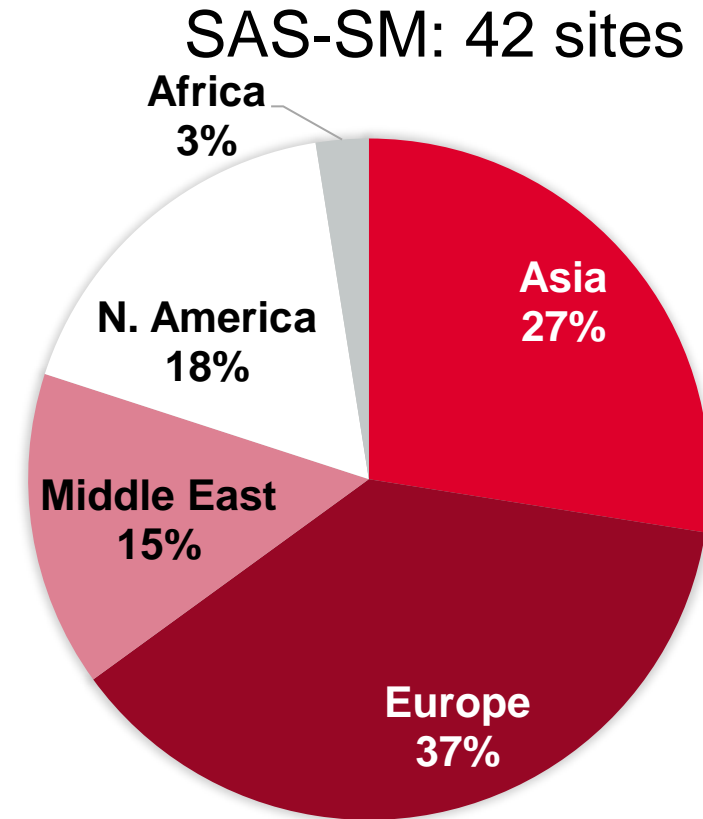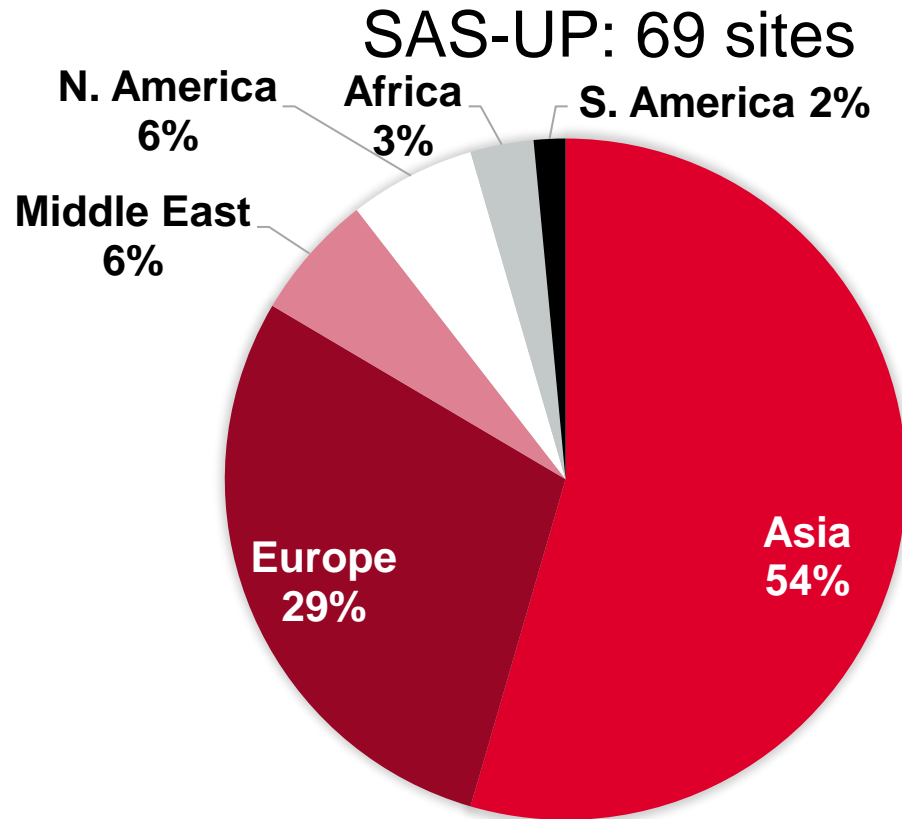
+ Cloud Service Providers (AWS, Google, Azure, Oracle)

Latest SAS documents & accredited sites :
www.gsma.com/sas
sas@gsma.com

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eSIM Security Assurance Scheme (eSA)

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eSA Certification Scope

The Application Layer	**The Platform Layer**
The secure IC/SOC platform and OS	**The Runtime Environment**

eUICC Protection Profile Scope
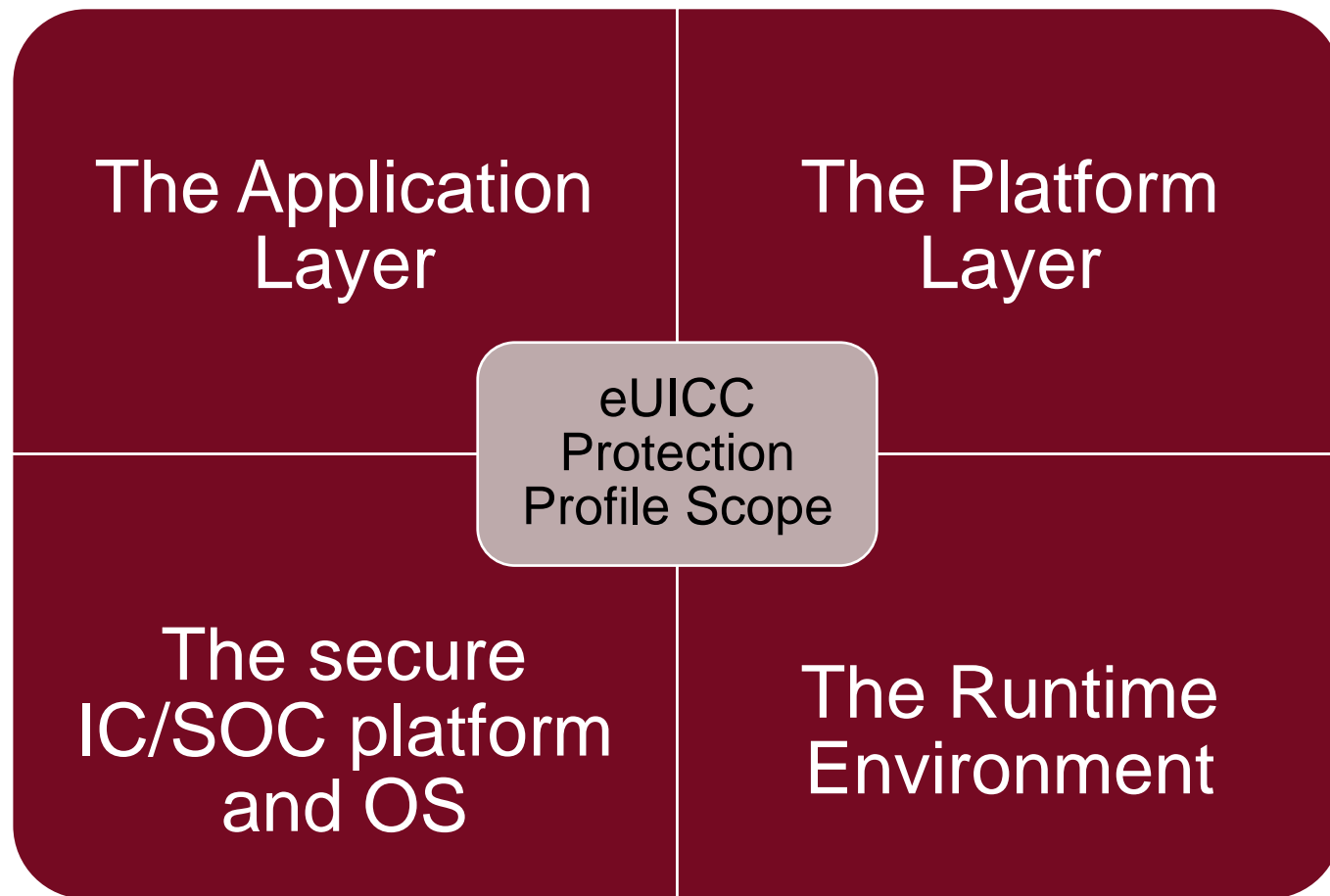
The eSA evaluation scope is the **combination of the hardware and software** components
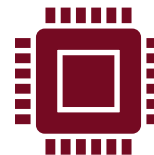
Secure IC or a secure subsystem integrated in a SoC

Risks without eUICC SW Certification…

Unauthorised Profile/Platform management

eUICC Cloning

Physical Attacks

Logical attacks

Identity Tampering

Unauthorised access to mobile Network
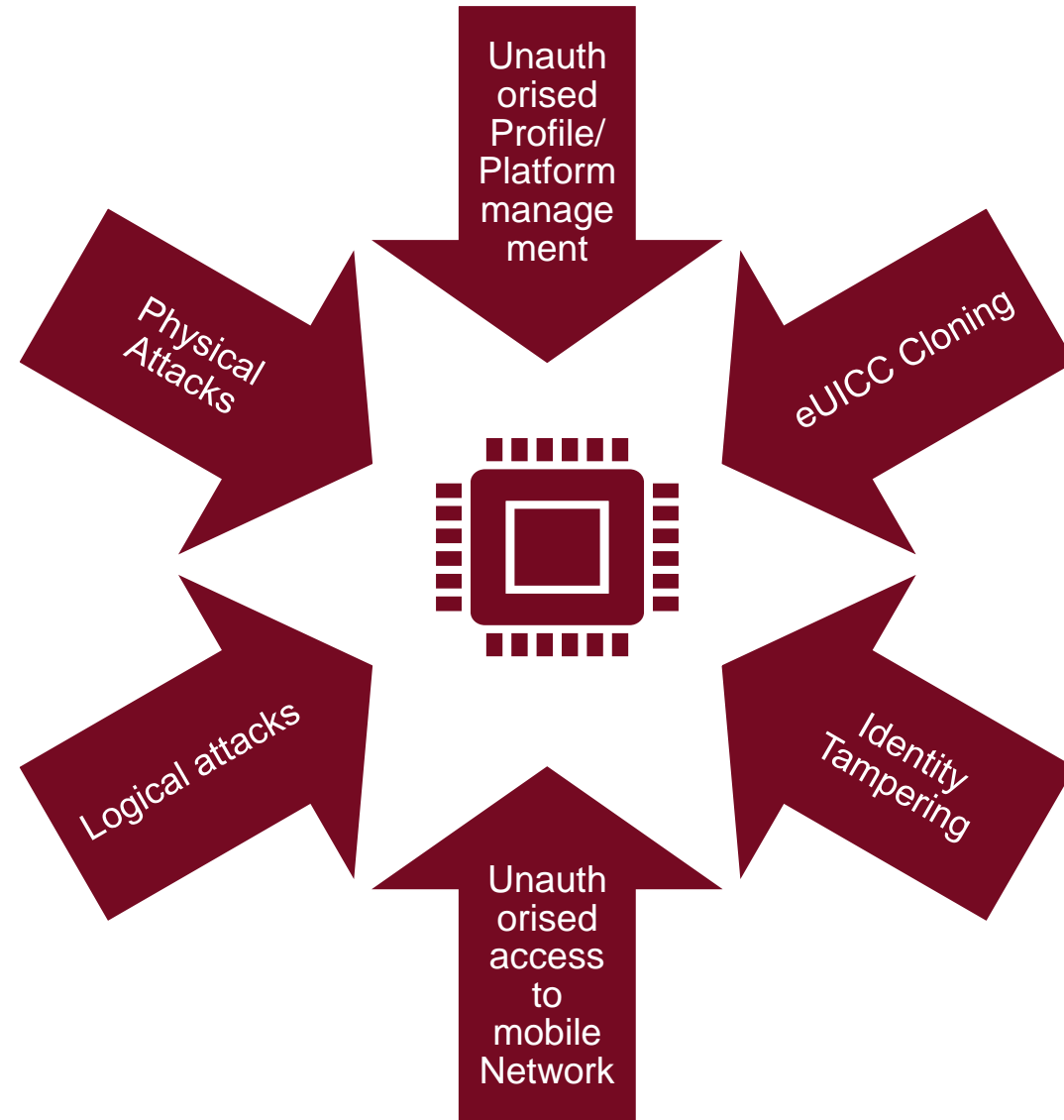
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Steps Towards eSA Certification

Evaluation

Certification

- Download eSA Registration Pack
- Send Documentation to esa@gsma.com
- Received admin fee invoice from GSMA
- Run evaluation with selected GSMA Laboratory**
- Send Application form and Security Target to GSMA CB*
- Receive Registration Confirmation from GSMA
- Obtain Technical Report
- Report Assessment and approval by GSMA CB

GSMA eSA Certification of eUICC Product

GSMA eUICC Security Assurance Consumer Device Certificate

Registration Pack can be found **HERE**.
To certify your eUICC Product, please contact eSA@gsma.com

eSA Evaluation and Certification Overview

Product Registration

Kick-off meeting (OPTIONAL)

Security Target Evaluation

Evaluation Meetings 1 and 2 (may be combined)

Final Evaluation Reporting

Final Evaluation Meeting

Certification
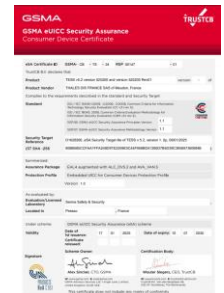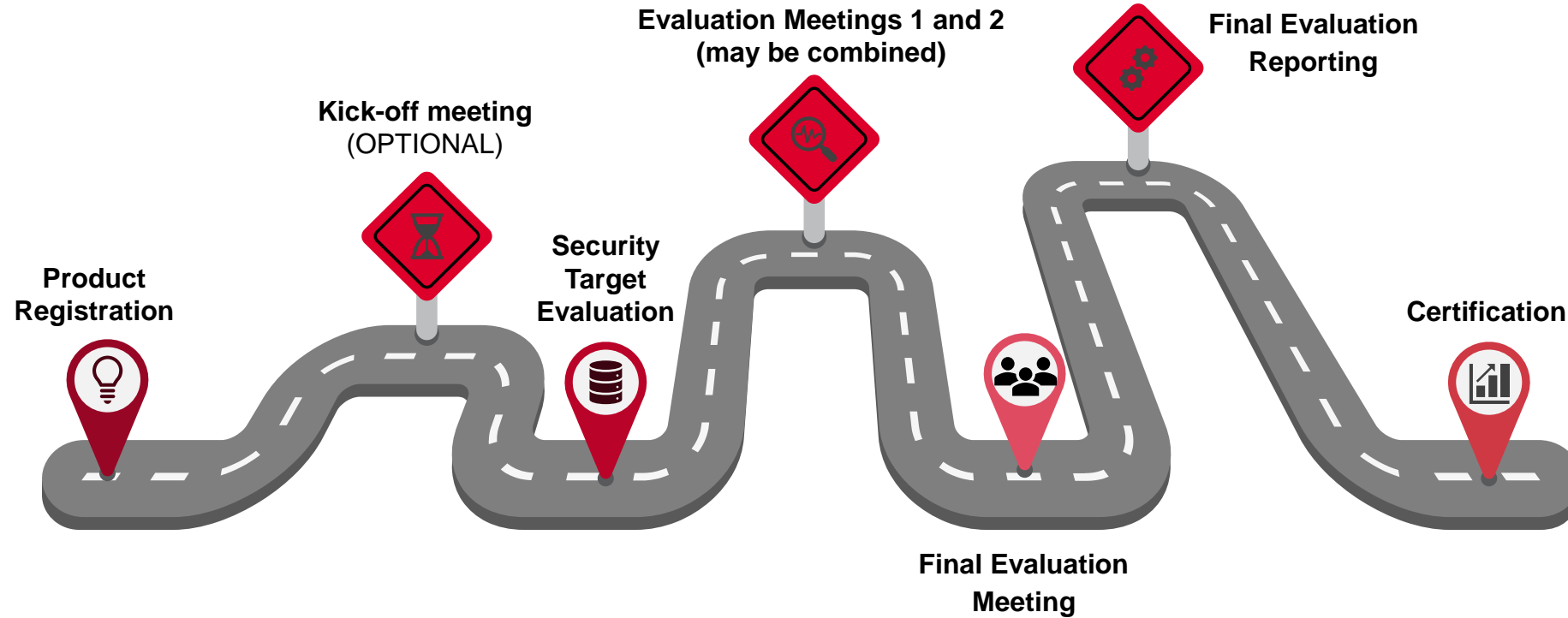
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eSA Certified Products

eSA Certified Products

Pie chart:
- 12, 38% — Ongoing Certifications
- 20, 62% — Completed Certifications
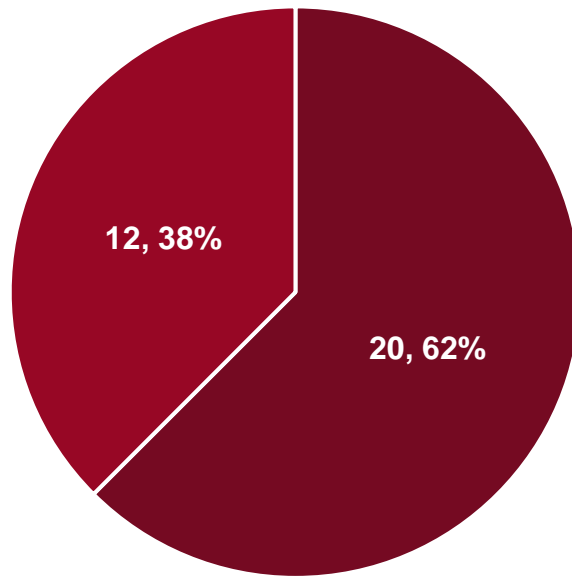
■ Completed Certifications ■ Ongoing Certifications

Type of Certified Products

Bar chart:
- No. eSA Applicatoins M2M: 2
- No. eSA Applicatoins Consumer: 23
- No. eSA Applicatoins Consumer/IoT: 7
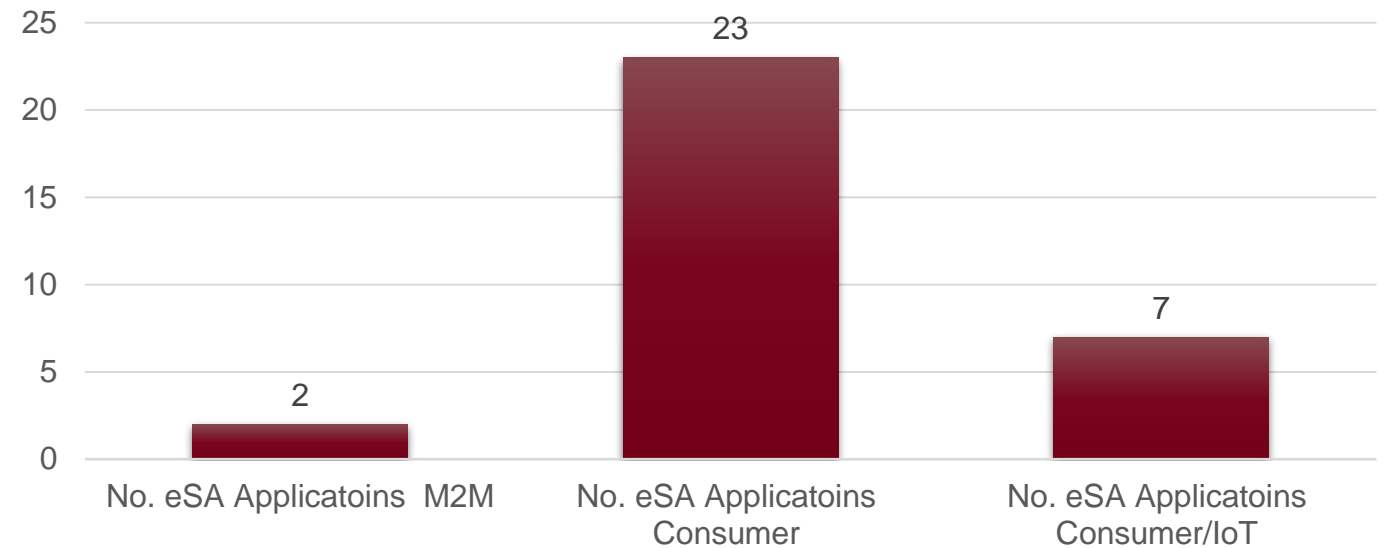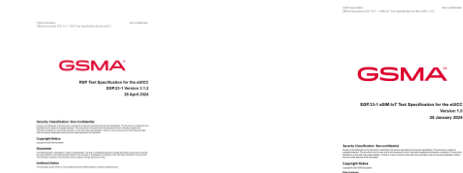
eSA@gsma.com

Latest eSA documents & Certified Products :
https://www.gsma.com/solutions-and-impact/industry-services/assurance-services/euicc-security-assurance-esa/

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eSIM Functional Certification

eSIM Functionality Certification

Test Object	Test Specification		Who Tests?	Test Result?
eUICC[1] Discrete or Integrated	**SGP.23-1 (Consumer)**	**SGP.33-1 (IoT)**	Qualified Laboratory using GlobalPlatform SCO (Supported Configuration Options)	GlobalPlatform Qualified Product (Letter of Qualification)
Consumer Device (LPAd) **IoT Device (IPAd)**	**SGP.23-2 (Consumer LPAd)**	**SGP.33-2 (IoT IPAd)**	RTO (Recognised Test Organisation) using GCF/PTCRB scheme documents	GCF/PTCRB Certification
eIM **SM-XX**	**SGP.23-3 (SM-DP+, SM-DS)**	**SGP.33-3 (eIM)**	Server Manufacturer using GSMA Test Specifications	Self-testing or third-party test tool

1 LPAe/IPAe is not covered by GlobalPlatform at this time and is outside of certification.

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GlobalPlatform Functional Certification

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Building Foundation of the Digital Security for 25 Years

1999 — GlobalPlatform founded to standardize secure chip technology

2000 — Publication of first specs for secure element (SE) technology, driving digitization across banking, transport, government, and more

2004 *Key Standards Bodies* — Collaboration with ETSI to align GlobalPlatform with SIM technology, delivering standardized security across the mobile phone market

2007 — Ushers in the era of mobile payments with the introduction of contactless standard

2010 — First release of Trusted Execution Environment (TEE) specifications, providing a framework for secure execution of applications and data isolation

2015 — Signs MOU with China's Telecommunication Terminal Testing Technology Association to bring TEE to China

2014 — Entertainment industry adopts TEE for securing premium content

2014 — Publishes first framework for IoT/M2M standardization

2012 — Publishes Secure Element Configuration V.1 to support the move from smart cards to embedded secure elements, enabling secure services in smartphone and IoT devices

2011 *Key Standards Bodies* — Collaboration with ISO to standardize use of NFC and contactless technologies in public transit services

2011 — Launch of first compliance program to ensure products adhere to GlobalPlatform standards

2015 *Key Standards Bodies* — TEE Protection Profile officially certified by Common Criteria

2016 — Launches TEE compliance program

2016 — Signs MOU with Car Connectivity Consortium to bring GlobalPlatform technologies to auto industry

2016 — **Half** of all SEs shipped are based on GlobalPlatform specifications

2016 — GSMA adopts eSIM specification based on GlobalPlatform testing platform

2017 — Global shipments of GlobalPlatform SEs surpass **22bn**

2018 — GlobalPlatform TEE adoption hits **10bn**

2024 — **90%** of all SEs shipped globally based on GlobalPlatform specs

2023 — **62bn** GlobalPlatform compliant SEs shipped globally

2022 *Key Standards Bodies* — SESIP adopted by CEN and CENELEC as European standard for IoT security

2021 *Key Standards Bodies* — GlobalPlatform certifications body achieves ISO 17065 accreditation

2020 — ETSI embeds GlobalPlatform iSE into secure platform for connected devices

2019 — GlobalPlatform-certified components (SE & TEE) in use surpass **53bn**

2019 — Launch of first specs for integrated SE (iSE) technology, opening up new form factors

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A2LA ACCREDITED CERT #5486.01

GlobalPlatform Certification Body is an ISO/IEC 17065 Certification Body (No.: 5486.01)

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GlobalPlatform Functional Certification Scope

Test cases to verify the compliance with TCA's Interoperable Profile Package specification

Test cases to verify the compliance of the eUICC interfaces.

TCA Profile Testing

Interface Compliance

Procedure Testing

Test cases to verify the functional behaviour of the eUICC in eSIM Procedures

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SGP.11 M2M eUICC

SGP.23-1 Consumer eUICC

SGP.33-1 IoT eUICC

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GlobalPlatform Supported Configuration Options

GlobalPlatform Supported Configuration Options (SCO)
for Secure Element Products
Version 5.5

GlobalPlatform submitted Configuration Description	
eUICC M2M and eUICC Consumer	
(Products qualified by GlobalPlatform based on GSMA & SIMalliance/TCA Test Specifications)	
eUICC M2M	
A.2.20 – The product submitted follows eUICC M2M SGP.02 v3.2	**Available**
A.2.21 – The product submitted follows eUICC M2M SGP.02 v4.2	**Available**
eUICC Consumer	
A.2.31 – The product submitted follows eUICC Consumer SGP.22 v2.2.x or v2.3 or v2.4 or v2.5	**Available**
A.2.XX The product submitted follows eUICC Consumer SGP.22 v3.1	**Ongoing**
eUICC IoT	
A.2.XX The product submitted follows eUICC IoT SGP.32 v1.2	**Ongoing**

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GlobalPlatform Functional Certification Steps

Product Vendors submit SCO to Laboratory

Laboratory Verifies SCO and returns to Product Vendor

Product Vendor Submit SCO to GlobalPlatform CB

GlobalPlatform CB verifies SCO and assigns SCO Number

The product is listed on GlobalPlatform's web page.
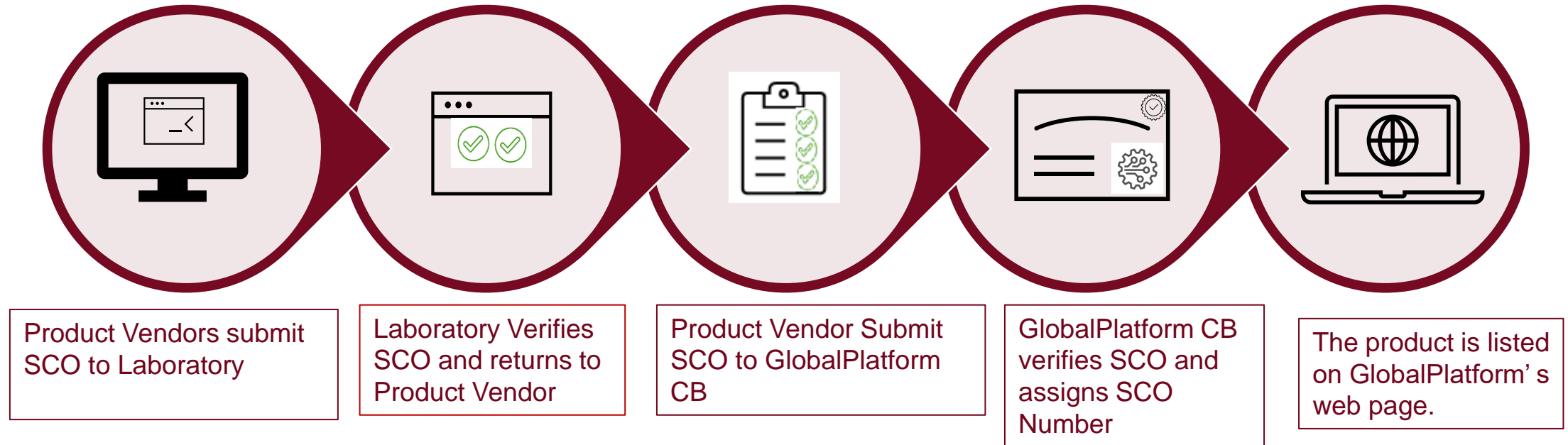
SCO :GlobalPlatform Supported Configuration Options for Secure Element Products Version 5.5

The SCO document is available at :

- https://globalplatform.org/wp-content/uploads/2024/07/GP_SCO_SE_Product_v55_240708.pdf

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Certified Products with GlobalPlatform

Since the creation of the eSIM Certification program, GlobalPlatform issued 137 certificates for GSMA eSIM

- 27 eUICC M2M
- 110 eUICC Consumer

GSMA

GCF Functional Certification

GCF Functional Certification

Hajo Schulze, Vodafone

Head of Section Device Certification and Director of the GCF Board

GCF – the mobile and IoT industry's mobile certification

- **GCF is a global device certification scheme**
  - GCF is incorporated as Global Certification Forum (GCF) Limited in the UK
  - Mutual trader providing services to its membership based on yearly fees paid by members
  - Works on a not-for-profit basis with a yearly turn-around of 2M Euros
- **Most major mobile and IoT global brands participate**
  - 350+ member companies
  - Collaborative participation between Operators and Service Providers, Device and IoT Manufacturers, Test Industry and Industry Partners
  - More than 600 device models certified annually
- A **GCF certified product provides confidence** that the device will work with the network, reducing time and costs for Operators/Service Providers and Manufacturers. **Test – Certify – Connect**

Since 1999 GCF has, together with the mobile industry, successfully developed and maintained certification for 3GPP based devices

GCF Certification helps to ensure that devices and services are interoperable with networks

eSIM Device Compliance

GCF's eSIM RSP (remote SIM provisioning) certification process provides functional means of test for RSP supporting consumer devices, as required for GSMA's e-SIM program.

GCF has designed its eSIM RSP test and certification requirements around GSMA's eSIM PRDs: SGP.21, SGP.22 and, for testing, SGP.23, ensuring correct functionality and interoperability which are key to this technology.

The certification can be of two types:

RSP Compliance

- This type of Device Products demonstrate compliance only with GCF requirements for RSP.

GCF Certified Products supporting RSP
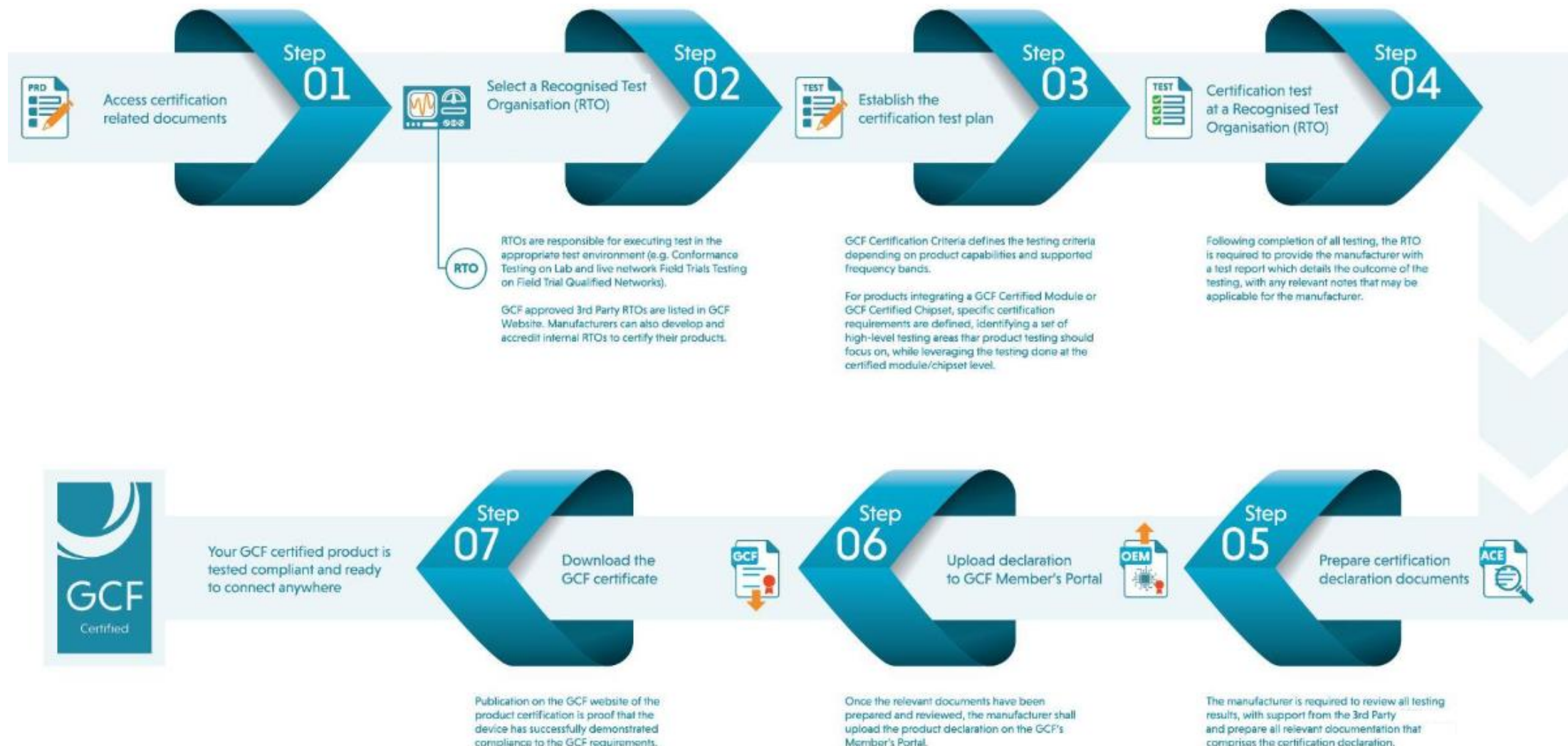
- This type of Device Products comply with the full GCF Certification Criteria.

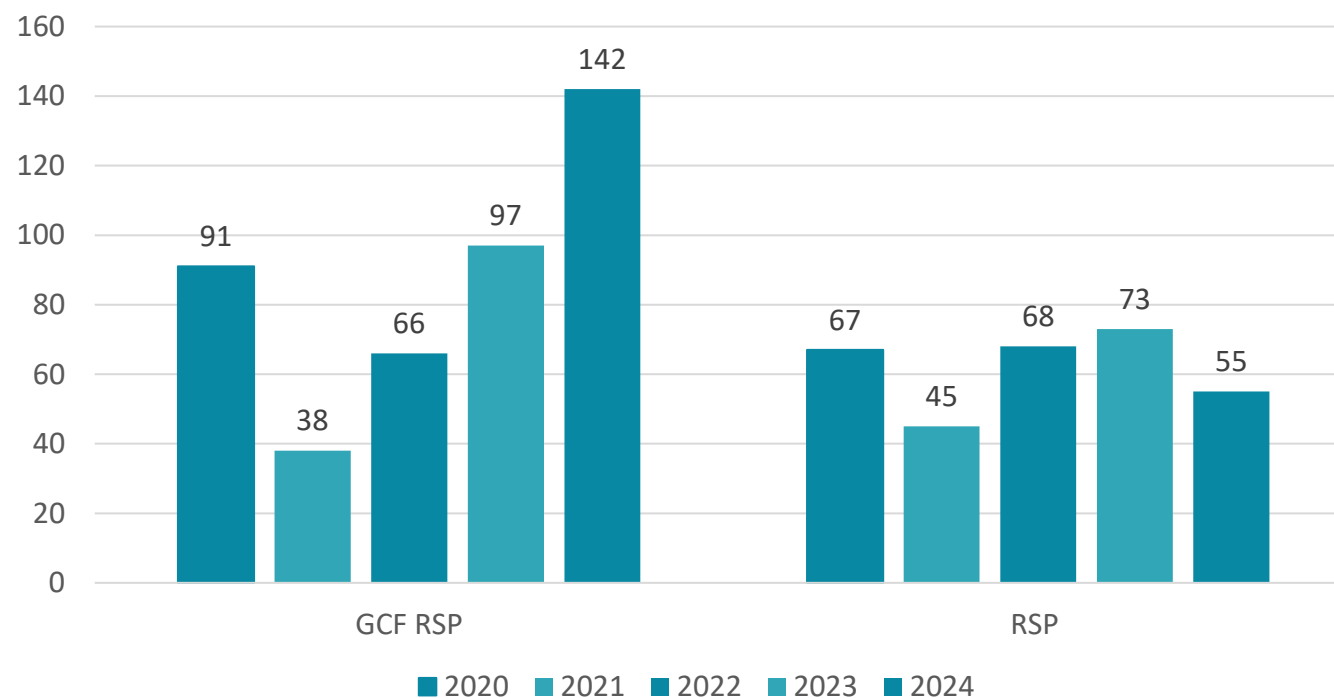**GCF Operator members or Associate Operator members can access detailed RSP Compliance declarations.**

For information regarding RSP compliance or certification access rights, please contact GCFTechnical@globalcertificationforum.org or GCF@globalcertificationforum.org for general enquiries.
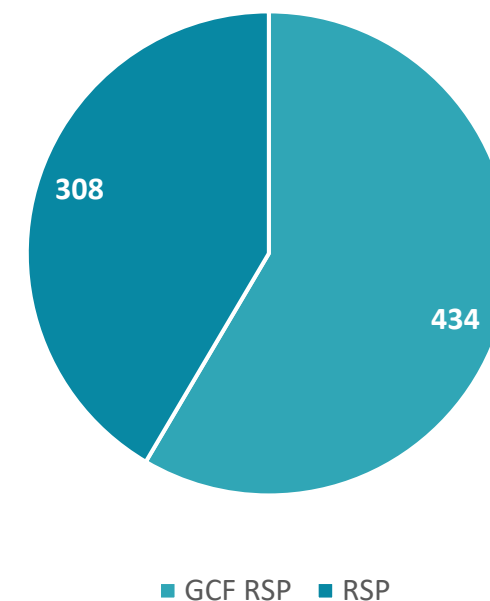
GCF Functional Certification Steps

Step 01 — Access certification related documents

Step 02 — Select a Recognised Test Organisation (RTO)

RTOs are responsible for executing test in the appropriate test environment (e.g. Conformance Testing on Lab and live network Field Trials Testing on Field Trial Qualified Networks).

GCF approved 3rd Party RTOs are listed in GCF Website. Manufacturers can also develop and accredit internal RTOs to certify their products.

Step 03 — Establish the certification test plan

GCF Certification Criteria defines the testing criteria depending on product capabilities and supported frequency bands.

For products integrating a GCF Certified Module or GCF Certified Chipset, specific certification requirements are defined, identifying a set of high-level testing areas that product testing should focus on, while leveraging the testing done at the certified module/chipset level.

Step 04 — Certification test at a Recognised Test Organisation (RTO)

Following completion of all testing, the RTO is required to provide the manufacturer with a test report which details the outcome of the testing, with any relevant notes that may be applicable for the manufacturer.

Step 07 — Download the GCF certificate

Your GCF certified product is tested compliant and ready to connect anywhere

Publication on the GCF website of the product certification is proof that the device has successfully demonstrated compliance to the GCF requirements.

Step 06 — Upload declaration to GCF Member's Portal

Once the relevant documents have been prepared and reviewed, the manufacturer shall upload the product declaration on the GCF's Member's Portal.

Step 05 — Prepare certification declaration documents

The manufacturer is required to review all testing results, with support from the 3rd Party and prepare all relevant documentation that comprises the certification declaration.

Source: https://www.globalcertificationforum.org/services.html

Certified Products with GCF

GCF Certified Devices

	GCF RSP	RSP
2020	91	67
2021	38	45
2022	66	68
2023	97	73
2024	142	55

GCF Certified Devices Totals

GCF RSP: 434
RSP: 308

■ GCF RSP ■ RSP

Why does Vodafone support GCF Certification?

- Device Certification and Qualification is absolutely required – we eliminate a lot of defects

- Device Testing is costly and time consuming

- Testing by multiple operators is inefficient

- Conformance Test Equipment is costly and requires a lab environment – not an Operator's key competence!

- GCF covers the vast majority of our test cases

- GCF drives standardised test methods and test equipment – good value for money!

- Test Industry is key for the success of the GCF!

Test once – use anywhere. Operators shall support GCF by all means!

Make GCF certification a matter of course for the entire industry, in order to keep the standards ecosystem secure, efficient and reliable.

eSIM Compliance Process

GSMA

The eSIM Compliance Process

The **eSIM Compliance Process** ensures the quality of eSIM products by verifying their compliance with GSMA Industry Specifications SGP.24 for eSIM Consumer and IoT Products and SGP.16 for eSIM M2M Products.

This process involves the issuance of Digital Certificates or Confirmation of Compliance, giving compliant eSIM products secure access to the GSMA eSIM ecosystem.

The specifications provide templates for manufacturers, developers, and service providers to declare their products' functionality, security, and robustness through selected certification programs.

GSMA

The eUICC Certification Journey

Discrete or Integrated

eUICC

Hardware Certification

Common Criteria

Common Criteria

eSA Certificate

Software Certification

Site Security Certification

GSMA Verification

Send Declaration Forms

Download Declaration Forms

Global Platform™

Functional Certification

Confirmation of PKI Issuance
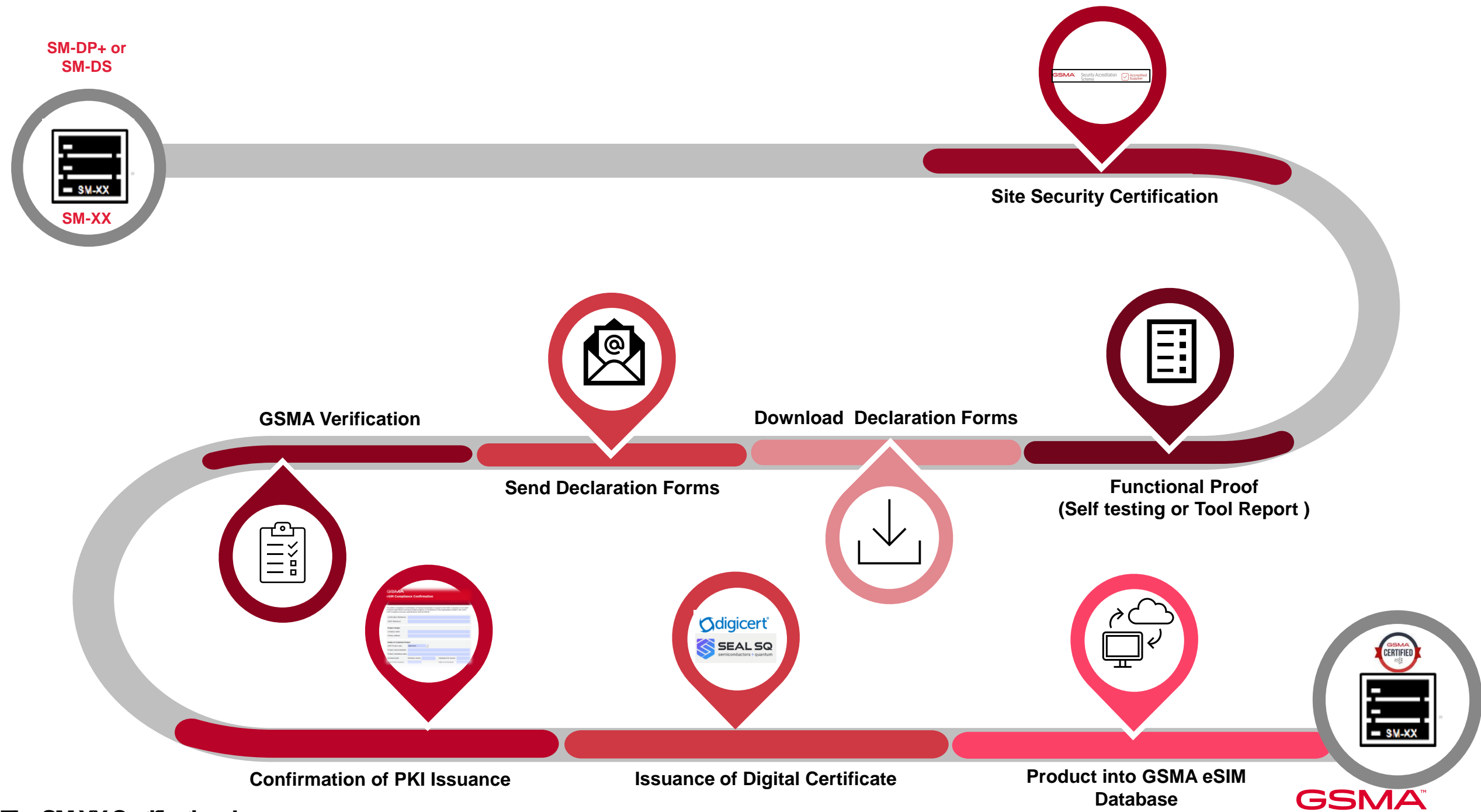
Issuance of Digital Certificate

Product into GSMA eSIM Database

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SM-DP+ or SM-DS

SM-XX

Site Security Certification

GSMA Verification

Send Declaration Forms

Download Declaration Forms

**Functional Proof
(Self testing or Tool Report)**

Confirmation of PKI Issuance

Issuance of Digital Certificate
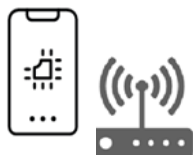
**Product into GSMA eSIM
Database**

The SM-XX Certification Journey
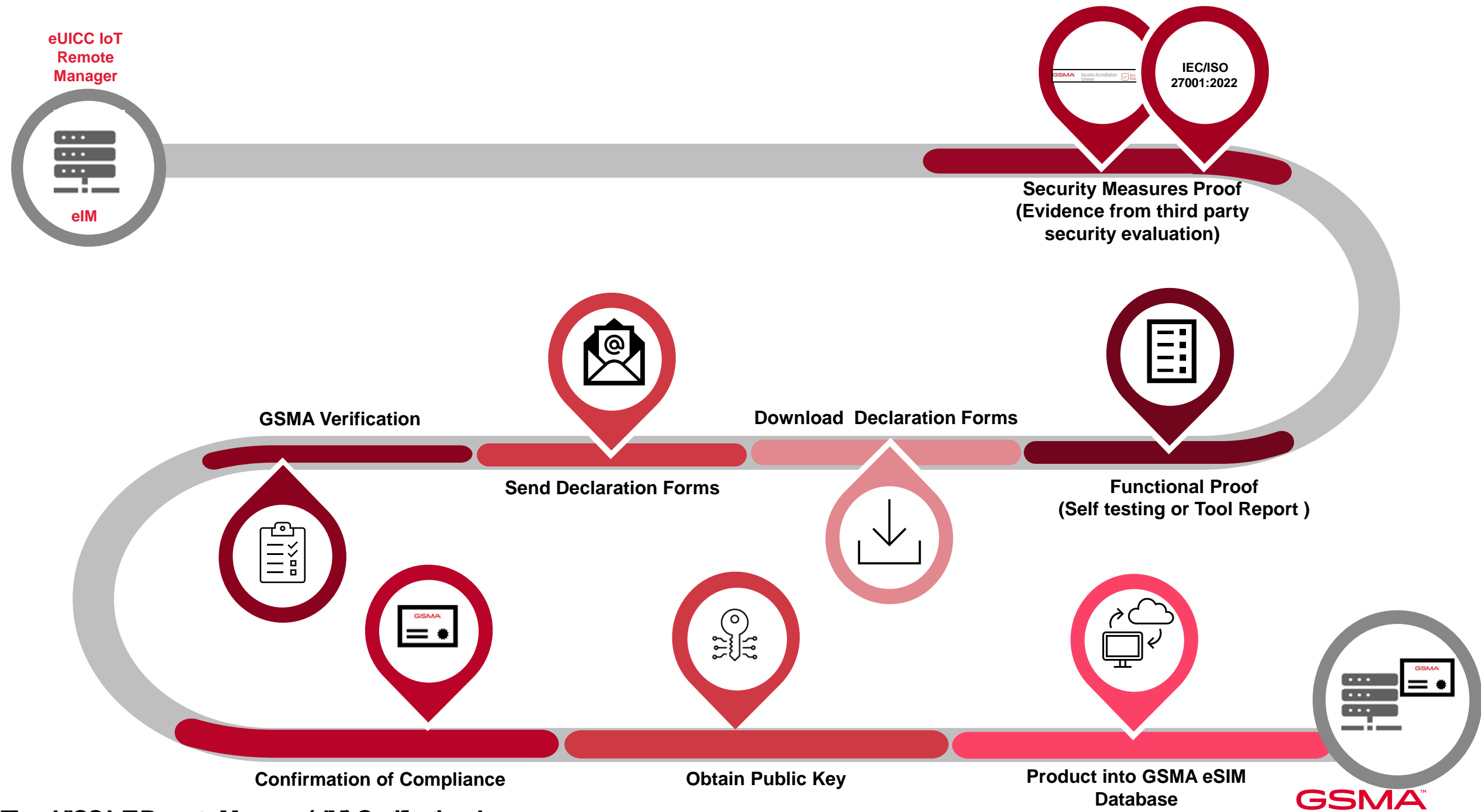
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The eUICC IoT Remote Manager (eIM) Certification Journey

Consumer or IoT Device

LPAd or IPAd

IMEI/TAC Database Registration

Device Identifier

GSMA Verification

Send Declaration Forms

Download Declaration Forms

Functional Certification

GCF

PTCRB

Confirmation of Compliance
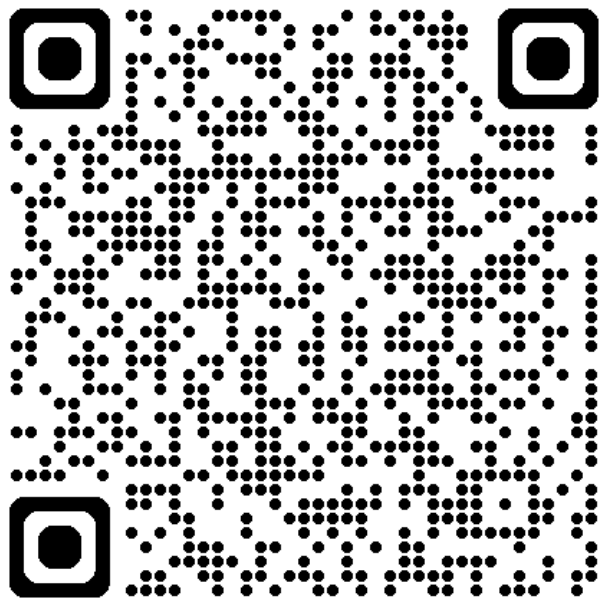
Product into GSMA eSIM Database

The Device (LPAd or IPAd) Certification Journey
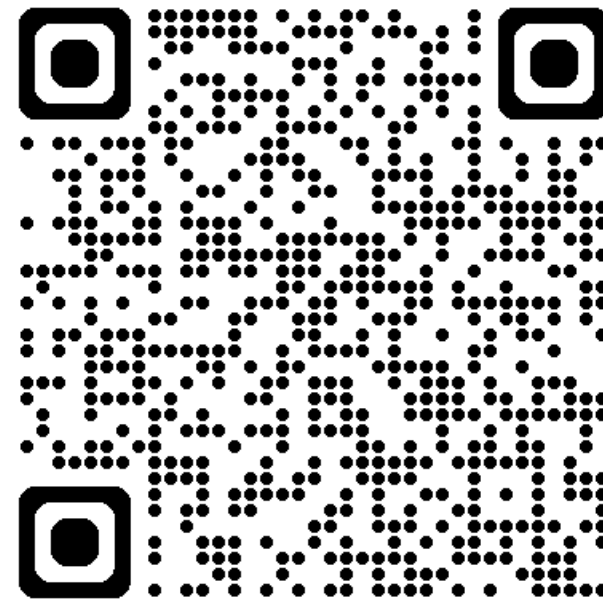
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eSIM Resources

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Discover More on GSMA eSIM Compliance

eSIM Compliance Report

eSIM Compliance Consumer Page

RSPCompliance@gsma.com

GSMA™

And that is a wrap

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REMEMBER

**Thank you
for joining, any
questions?**

GSMA™