VALID eSIM
SOLUTIONS
FOR THE IoT
ECOSYSTEM

Valid

Seize Competitive Advantage with the Valid eSIM IoT Offer

From connected cars and smart cities to connected security systems and smart meters, the Internet of Things (IoT) is enriching our way of life – and it's expanding exponentially!

According to the GSMA, IoT connections are expected to double in growth by 105% year-over-year and reach nearly 25 billion and generate USD $1.1 trillion in revenue by 2025.

This extraordinary growth and digital transformation comes with growing pains that can only be overcome with innovation and trusted wireless expertise. In a world of exciting opportunities, Valid is helping customers seize a competitive advantage by simplifying and accelerating IoT projects with its cutting-edge mioSIM

eSIM (a.k.a. eUICC) technology and eReach Subscription Management Platform. Valid's eSIM for IoT solution helps OEMs, IoT device makers, service providers and MNOs remotely manage their devices and wireless subscriptions throughout the lifespan of devices.

The Complexity of Global IoT Connectivity

To meet the rigorous demands of IoT use cases, devices must be designed to provide highly efficient, secure connectivity in extremely harsh environments. What's more, connectivity has to remain reliable for more than a decade, even as technology and networks evolve.

To meet these demands, MNO-specific SIM cards are traditionally soldered into devices during manufacturing to strengthen durability, security and longevity. Essentially, this means each device is destined for use with only one MNO network in one global region. In order to deliver

global solutions, OEMs need to design and develop a multitude of product SKUs, which requires complicated and costly manufacturing and logistics that cut into ROI.

Valid's eSIM for IoT platform streamlines and simplifies all aspects of SIM technology to help accelerate IoT project timelines, optimize ROI, and extend the longevity of IoT devices.

Valid eSIM for IoT Offer Advantage

Valid's mioSIM eSIM for IoT is a tiny secure element based on latest GMSA eSIM specification and designed to securely store MNO profiles pushed to the eSIM after it's soldered into the device during manufacturing. Together with **Valid's**

eReach Management Services, IoT device makers and service providers can easily provision IoT connectivity **for virtually any MNO network from the first use of a device.** What's more, the platform allows seamless subscription management – **all from a single global eSIM** – across the device's entire lifespan.

Single SKU Simplicity

A single, flexible SKU is the ultimate game changer for widely dispersed IoT solutions that need to operate for 10-15 years without interruption. Physical updates and field maintenance are cost prohibitive, if not impossible. With Valid's solution, service providers have the ability to remotely activate the eSIM, load a new MNO profile without needing to remove it from the device, and update the MNO profile and provision service.

Contract Flexibility

With Valid's mioSIM eSIM for IoT, service providers no longer need to negotiate complicated contracts with MNOs. The ability to select and swap MNOs based on pre-determined business rules provides device makers and service providers with freedom of choice along with a powerful cost control tool.

Easy Evolution

The eSIM solution enables easy updates to accommodate evolving local regulations and GSMA specifications as well as network, security and application updates.

eSIM technology has come of age with projections expected to reach 231 million eSIM-enabled IoT devices by 2024, up from 95 million in 2018 according to ABI Research. Demand is skyrocketing due to enormous benefits to device makers, service providers and end users alike.

Benefits of Valid mioSIM eSIM for IoT and eReach Subscription Management services

Device maker/OEM benefits:

- **Improved logistics:** One eSIM SKU serves global deployments and virtually all MNOs with a single device variant to dramatically reducing costs for warehousing, logistics, and distribution.
- **Miniaturization:** Tiny, soldered form factors require less space in the PCB layout providing space for other components and minimizes the final product design.
- **Ruggedness:** Elimination of plugin SIMs reduces accidental damage during deployment and ensures that IoT solutions are dust and waterproof while strengthening durability in extreme conditions.
- **Futureproofing:** Agile, flexible OTA updates protect devices from the impact of network evolution and technology sunsets ensuring devices are deployed over longer periods of time.
- **Endurance:** The Industrial and Automotive grades of mioSIMs eSIM ensure extended lifespan and data retention for longer operation in the field.
- **Power efficiency:** Optimized power design enhances efficiency, extends battery life and longevity for IoT devices deployed in remote, off grid locations and reduces maintenance needs and/or replacement costs.
- **Enhanced Security:** Soldering during secure manufacturing hardens tamper resistance and protects against cyberattacks and hacking while hosting critical applications and sensitive device data with advanced encryption.

Service provider benefits:

- **Cost Control:** MNO connectivity flexibility empowers service providers to negotiate with carriers for the best connectivity tariff possible. Eliminates the expense of purchasing new SIM cards and physically replacing legacy SIMs.
- **Expanded global coverage:** Provides the ability to use the same devices across all global regions.
- **Enhanced security:** Provides additional security features including a secure element inside the device, a secure container for other applications such as device ID, location, operation and mechanisms for sending information. eSIMs can also be used as a mechanism to prevent false information.
- **5G ready:** On 5G networks, mioSIM eSIM provides lower latency, expanded devices per network while eliminating connectivity quality issues due to congestion.
- **Streamlined logistics:** Eliminates need to warehouse and manage SKUs and costly, time-consuming service visits to specific geographic locations.
- **Maximize ROI:** By reducing costs and improving operational and logistical efficiencies, organizations are empowered to minimize total cost of ownership of connected devices and maximize return on IoT investments.

MNO benefits:

- **New business stream:** IoT connected devices are new customers for MNOs to provide connectivity. It opens a new array of possibilities and business streams for MNOs.
- **Enhanced security:** Tamper-resistant eSIM technology protects the integrity of the IoT ecosystem, including MNO network assets, and allows security updates across the lifespan of devices.
- **Network evolution ease:** eSIMs streamline and increases the speed of over-the-air updates required as MNO networks evolve.

Technical Specifications:

- **mioSIM® OS is compliant with ETSI Release 15 Specifications**
- **GSMA specifications (SGP.01/SGP.02) Embedded SIM in M2M Devices**
- **Oracle Java Card™ Specification**
- **Global Platform Card Specification**
- **Global Platform Car Specification, Amendment B**
- **Global Platform Device Technology**
- **Secure Elements Access Control**
- **SIM/USIM/ISIM**
- **CAT/SAT/USAT**
- **5G Ready**
- **OTA**
- **BIP/CAT TP**

Valid eSIM for IoT Supported Form Factors and Grades:

| mioSIM eUICC M2M/IoT ARCHITECTURE					
GRADES	**FORM FACTORS**		**MAIN SUPPORTED CHARACTERISTICS**		
	Repluggable	Soldered	Temperature (C)	Write/Erase Cycles	Data Retention Lifespan
Consumer	2FF/3FF/4FF Adapt	MFF2	85°	100k	10 years
Industrial	2FF/3FF/4FF (ruggedized plastic)	MFF2 (a.k.a. VFQFN8, DFN8, SON8) **WLP (wafer level package)**	105°	500k	15 years
Automotive	Not available	MFF2	105°	500k	17 years

Valid eReach Susbscription Management Services for IoT

The Valid eReach platform integrates seamlessly with mioSIM eSIM for IoT and any other GSMA compliant eSIM technology to manage secure over the air remote service provisioning and management. It provides two essential services that keep IoT devices operating securely and reliably:

- Improved logistics: One eSIM SKU serves global deployments and virtually all MNOs with a single device variant to dramatically reduce costs for warehousing, logistics, and distribution.

Over the long life of the IoT device, the eReach services work in tandem to remotely update MNO subscriptions as needed to maintain secure, reliable connectivity and optimized cost efficiency, without ever needing to change a SIM card or handle the device.

- Miniaturization: Tiny, soldered form factors require less space in the PCB layout providing space for other components and minimizes the final product design.
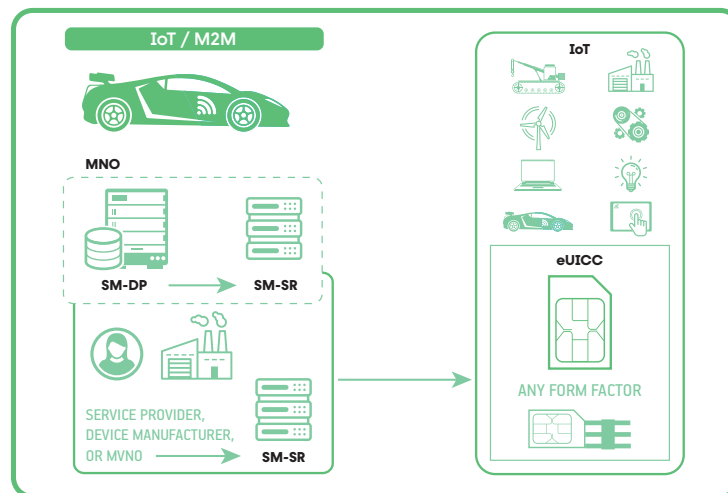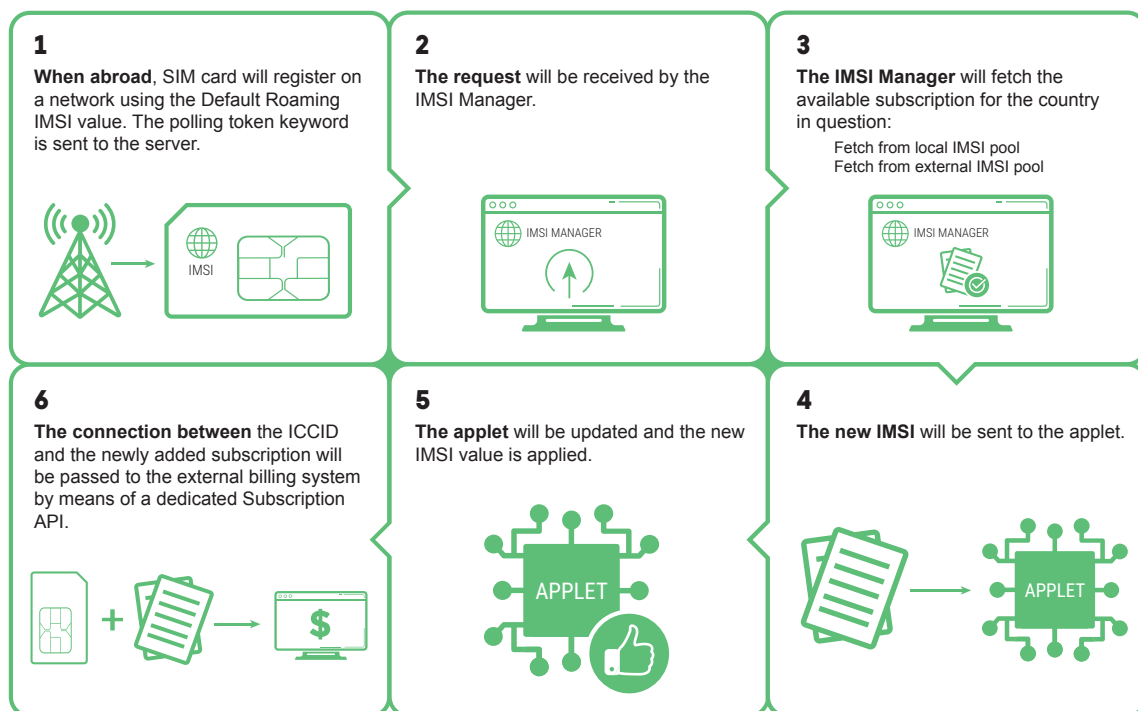

Valid eReach Subscription Management Services for IoT Main Technical Aspects

- Multi-tenant capabilities for MNOs and MVNEs that want to enable Subscription Management platforms
- Download, enable, disable, and delete subscriptions plans (IPP Interoperable Profile Packages) in IoT devices Over the Air (OTA)
- Run your business 24/7 with Geo-redundant systems supported by our two SAS-SM certified data centers in Europe and USA

Maximizing Connectivity Management Efficiency with Valid's Dynamic Multi-IMSI

IoT service providers who want to update their preferred MNO service or subscription must first confirm that the new MNO is equipped with the corresponding SM-DP (MNO data) and the new data must be integrated with the IoT Service Provider's SM-SR. Unfortunately, if this process isn't tightly managed, IoT deployments can suffer significant downtime while confirming that the new network implementation meets all the proper requirements.

Valid's multi-IMSI solution streamlines the process by leveraging an advanced Java application running on the SIM to swap IMSIs following predetermined business rules and logic. In other words, IoT devices can instantly switch cellular networks using a single MNO profile. If your device needs to connect in one of the few places where Permanent Roaming is banned, the eUICC ecosystem provides a solution. The combination of mioSIM eSIM+ Multi-IMSI technologies maximizes the geographical scope using a single eSIM SKU while minimizing the integration and testing burden and associated extra costs.

1

When abroad, SIM card will register on a network using the Default Roaming IMSI value. The polling token keyword is sent to the server.

IMSI

2

The request will be received by the IMSI Manager.

IMSI MANAGER

3

The IMSI Manager will fetch the available subscription for the country in question:

Fetch from local IMSI pool
Fetch from external IMSI pool

IMSI MANAGER

6

The connection between the ICCID and the newly added subscription will be passed to the external billing system by means of a dedicated Subscription API.

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5

The applet will be updated and the new IMSI value is applied.

APPLET

4

The new IMSI will be sent to the applet.

APPLET

VALID eSIM SOLUTIONS FOR THE IoT ECOSYSTEM

Valid Trust is Power

Valid provides tailored solutions that integrate emerging technologies to enable secure, trusted experiences. From Data, Payments, Identity, and Mobile to IoT, Track and Trace, Digital Certification, and Agritech, Valid offers a wide portfolio of services and solutions that accelerate the digital transformation of our clients' business. With over 60 years of experience and more than 6,000 employees in 16 countries, Valid is the largest issuer of identification documents in Brazil, among the top 5 producers of SIM cards and among the world's largest manufacturers of banking cards.

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