Valid

mioSIM®

Valid's mioSIM® family is an innovative suite of SIM products for the telecommunications industry

Standard SIM cards

SIM cards are secure elements designed to protect, identify and authenticate subscribers to mobile networks all around the world. Since its invention in the 1990s, SIMs have been an important asset to MNOs in order to protect their networks and correctly identify their users.

The data encryption technology inside these smart cards guarantee secure access to the designated

network and verify the user's identity in order to prevent fraud and ensure costs are being allocated to the right customer.

Through time, the SIM card has evolved with the digital transformation, the evolution of the mobile network generations, as well as the need for more capability and functionality.



mioSIM[®] Classic

A SIM card is a smart card placed inside mobile phones and smartphones. It is a standard created by ETSI to ensure greater security for the operator's network. It securely stores the data of its users and their applications based on data encryption, which takes place inside the SIM card itself. It is your identity with the chosen MNO. Depending on the memory capacity, size, format and functionalities you need, Valid offers you an entire portfolio of SIMs tailored to your needs. From higher security to value-added solutions, Valid can give you access to an interoperable and removable platform solution compliant with worldwide regulations and fully capable of integrating with 2G and 3G networks.

	mio SIM classic	
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mioSIM® Classic Specifications

- > 2G and 3G ready
- mioSIM® OS compliant with ETSI Release 5 and 6 Specifications
- > Oracle Java Card Specification
- > SIM/USIM
- > CAT/SAT/USAT

- > OTA
- > BIT/CAT-TP
- > EAP-SIM/EAP-AKA
- > WIB 1.3
- > Form factors (2FF, 3FF and 4FF)



mioSIM® LTE

With the advance of the fourth generation network (4G), Valid has developed mioSIM LTE – a SIM card to address the increased demand for better connectivity. Through Long Term Evolution (LTE) technology, data transmission can be more effective than ever, improving consumer experiences with their smartphones, with faster download rates and a broader spectrum of users connected to the network. In 2019, there were already **4.7 billion 4G subscriptions worldwide, according to Statista.** Due to the high demand for smartphones over the past few years, GSMA stated that the LTE generation **became the fastest generation so far to be implemented around the world** – improving connectivity to meet consumer demands.

mioSIM[®] LTE Specifications

- mioSIM[®] OS compliant with ETSI release 8 Specifications
- > Oracle Java CardTM Specification
- > Global Platform Card Specifications
- Global Platform Card Specifications, Amendment B
- > SIM/USIM/USAT
- > IOTA
- > BIP/CAT_TP
- > EAP-SIM / EAP-AKA
- > MBMS
- > Form factors (2FF, 3FF and 4FF)



mioSIM[®] LTE Advanced

mioSIM LTE Advanced is adapted to the new LTE generation network, offering consumers an even better range of connectivity, significantly improving network speed and frequencies.

LTE Advanced is already **commercially implemented in 134 countries** and until the 5G network implementation is complete, some MNOs are working on maximizing the LTE Advanced and Advanced Pro for their users.



mioSIM[®] LTE Advanced Specifications

- mioSIM[®] OS compliant with ETSI release 12 Specifications
- > Oracle Java CardTM Specification
- Global Platform Card Specifications

- Global Platform Card
 Specifications, Amendment B
- > SIM/USIM/ISIM
- > OTA / RAM / RFM
- > TUAK

mioSIM[®] 5G

Deliver the full 5G promise to your customers with the 5G SIM, through data anonymization and quality of experience for virtualized networks.

5G SIM is a tamper-proof secure element to protect access to a 5G network, addressing key necessities of this wireless grid such as critical communications, massive deployment of IoT projects and better broadband for MNOs. It follows the Release 15 UICC (SIM) specifications and the 5G standardization body ETSI-3GPP as well asthe recommendations made by TCA according to the IPP interoperable profile package.

This SIM is designed to support 5G networks that have higher bandwidth and network capacity as well as lower latency compared to its previous network generations. It has the potential to bring the smart services closer than ever to the end user, improving their customer experience like never before.

Valid's **mioSIM**[®] **5G** is a **SIM** card product designed for the fifth network generation (5G) specializing in virtualized networks, offering higher security and enhancing mobile broadband for critical communications solutions. mioSIM 5G gives customers **data anonymization** and a trusted environment while connected to the mobile network. The new Subscription Concealed Identifier (SUCI) prevents a malicious actor from tracking the mobile subscribers due to the 5G SIM card encrypting the subscriber identifier – IMSI encryption. This approach preserves the user's data privacy, which is a high priority for consumers and providers today, while enhancing quality of experience and network resource optimization.

Valid's mioSIM 5G is **cyber-proof.** By remotely changing the authentication algorithm inside the SIM, mobile operators have a tool to fight cyber-attacks.

Mobile operators are now able to leverage the full power of 5G with advanced features related to cybersecurity, data privacy protection, QoS monitoring, network management, etc.

mioSIM[®] 5G comes in all form factors (removable SIM, M2M SIM, and eSIM) according to your project's needs.

mioSIM[®] 5G Technical Specifications

- > mioSIM[®] OS compliant with ETSI releases 15 and 16 Specifications
- > Oracle Java Card[™] Specification
- > Global Platform Card Specifications
- Global Platform Card Specification, Amendment B
- > SIM/USIM/ISIM
- > OTA/RAM/RFM
- > TUAK
- > SUCI calculation





Physical Characteristics

Valid's mioSIM portfolio comes in different shape & sizes. From the material to plugins and customization, you name your preferences and we can make it happen.

Standard Form Factors

All Valid's mioSIM products are available in different standard formats including 2FF/3FF/4FF. You can have them in one single cutting, double cutting (2FF/3FF) and triple cutting (2FF/3FF/4FF).

mioSIM® Adapt

On top of the standard SIM plug-in cuttings, Valid's portfolio also includes **mioSIM Adapt options**, a unique best in class triple cutting to avoid the standard 3 in 1 hassle when trying to attach/detach the adapters.

The SIM card comes with precise cuts and pluggable adapters on the side, improving the customer experience with a simple and ready to use solution.

mioSIM[®] Adapt Specifications

- > Form factors (2FF, 3FF and 4FF)
- > ISO/IEC 781 O, ISO/IEC 7816 and ETSI TS 102 221 compliant

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mioSIM® Green

Regarding plastic materials, compostable SIMs (product degradation per ASTM D3826 and ASTM D 5208-1 after 18 months under aerobe landfill conditions with average temperature of 20° C, and UV and oxygen availability), such as our **mioSIM Green options**, are fully compliant with telecommunication standards and can be either made out of recycled PVC, Bio PVC (PVC with additives that speed up the recyclability process), recycled ABS, H-ABS or other materials such as recycled PET or PETG according to specific requirements. Offering a Green SIM card option to your customers means you are reducing the environmental impact while providing the high-standard technical properties of Valid's mioSIM[®] product line to the market.

In order to reduce this plastic footprint, Valid launched a plastic-free packing specification offer. Valid is now able to deliver plastic-free shipments without compromising the integrity and the security of the goods during transportation, while still complying with GSMA's regulations, **substituting plastic packaging for paper at all levels of the boxing process.** **mioSIM Green and plastic-free packaging options** are all solutions relevant to the industry to reduce environmental impacts and support a greener manufacture of products. However, in order to make a significant difference and bring a real benefit to our environment and planet, Valid decided to create, together with Plastic Bank, an **environmental compensation program**.

Plastic Bank is a social enterprise empowering a regenerative society. They build ethical recycling ecosystems in coastal communities, and reprocess the materials for reintroduction into the global supply chain as Social Plastic[™]. With this goal, Plastic Bank is relying on companies like Valid to support the collection process of the plastic. For every SIM card that our customers sell to their consumers,Valid will collect one plastic bottle from the ocean. The plastic bottle collection process is completely traceable via a mobile app, and it is submitted to regular audits.

Download our mioSIM Green Offer brochure to know more.



Valid Is

mioSIM® Green Specifications

> Recycled & Compostable*

*Product degradation per ASTM D3826 and ASTM D 5208-1 after 18 months under aerobe landfill conditions with average temperature of 20° C, and UV and oxygen availability

- > Improvements in your carbon footprint
- > High consistency
- > Plastic-free packaging

M2M SIMs & Form Factors

With the advance of Internet of Things (IoT) and Machine to Machine (M2M) communication, mobile operators see an opportunity to increase revenue, tackle new markets, and evolve their mobile services.

M2M-ready SIM cards and embedded modules were developed to improve IoT applications mainly to the industrial sector, as they tend to need a robust secure element in order to resist higher temperatures, extreme levels of vibration and humidity, bad connectivity, data transmission in remote areas, endure a long life span, and a faster implementation.

While standard SIMs are all about the software, M2M SIMs are the hardware's primary piece, making IoT connectivity possible to devices. For industries such as automotive, consumer electronics, tracking, industrial analytics, healthcare, agriculture, and many more, IoT is the driving factor for digital transformation and the SIM cards and its form factors can help you offer new value-added services and provide security to the ecosystem via mobile networks.

These SIMs are configured to work with 2G and 3G networks when in remote areas or to reduce battery usage for data transmission or remote management, as well as 4G and 5G use cases whenever a project demands higher speeds for data sharing or real-time services.

mioSIM[®] M2M

With Valid's mioSIM M2M, your company can support IoT market growth and have the ability to offer connectivity and data analysis to the robust industrial market via IoT services such as metering, remote subscription management and data monitoring, all in a secure element product range.

M2M SIMs authenticate machines and protect long-term data sharing across networks in extreme conditions, resisting higher temperatures, extreme levels of vibration and humidity, bad connectivity and enduring a long life span, while answering the biggest industry challenges. Combined with operating system intelligence, it's a powerful tool for long-lasting wireless communication projects. From small form factors, to rugged and flexible needs, Valid's M2M SIMs help your IoT project come to life.

M2M SIMs can be used for 2G, 3G, 4G and 5G use cases. Depending on your projects' needs, we can offer you the best option possible from remote management, to high speed data sharing, reduce battery usage or real-time services.

Valid's mioSIM M2M is available in multiple form factors and grades to better suit different IoT project requirements.

mioSIM[®] M2M Specifications

- mioSIM[®] OS compliant with ETSI release 12 Specifications
- > Oracle Java CardTM Specification
- > Global Platform Card Specifications
- > SIM/USIM
- > CAT/SAT/USAT

- > OTA
- > BIP/CAT_TP
- > HTTPS
- > EAP
- > Voltage: from 1.8V to 5V





M2M Form Factors & Grades

There are diverse options to choose from once you are selecting your M2M SIM or form factor: the industry standard 2FF - miniSIM - that it's typically used in vending machines and payment point of sales use cases; the 3FF format - microSIM generally used on GPS, mHealth, tablets and mobile IoT devices and the 4FF format - nanoSIM -, usually selected for smaller IoT devices that don't necessary need to operate in harsh environments.

No one can deny the popularity of the MFF - a convenient size form factor to offer durability, ruggedness and long lasting life-span for your device.

M2M MFF2

For better ruggedness and performance under extreme conditions, mioSIM M2M/M2M MFF2 is a recommended option. MFF is a solder secure element form factor that can be incorporated into your industrial devices, making your application long lasting and even guarantee a tamper-proof device – protecting it from theft. Since it is soldered into the circuit board, it's much more resistant than plug-in SIMs, as it can operate in bad conditions, such as high temperatures, humidity and extreme levels of vibration.

MFF2 are perfect for smart metering, smart cities, track and trace, automotive and industrial use cases.

The M2M UICC physical characteristic is standardized according to the ETSI standard ETSI TS 102 671, making the distinction between a MFF1 and MFF2. The MFF2 offers the possibility to have a large heat sink in the middle while MFF1 in its central part contains the chip.

Difference in size between soldered form factor and standard SIM cards:





2FF - Mini SIM 25mm x 15mm x 0.76mm



3FF - Micro SIM 15mm x 12mm x 0.76mm



4FF - Nano SIM 12.3mm x 8.8mm x 0.67mm

MFF2 M2M Form Factor



Understanding M2M Grades

Consumer

Designed for IoT projects that need connectivity and remote management without extra durability. It is recommended for IoT devices that work in simple, rather than harsh environments.





Industrial

Industrial M2M SIMs or form factors are designed to be much more durable and survive rugged environments. They resist high/low temperatures, corrosion, humidity and extreme levels of vibrations, while maintaining connectivity, remote management and data sharing at its finest - therefore ideal for industrial IoT device use cases.

Automotive

The growth of IoT markets is attributed to its unlimited use cases inside the M2M communications spectrum. For the automotive sector, it includes a set of applications that can only improve drivers' lives and their safety. From car-sharing services, geo-localization and monitoring of vehicle life-span to eCall applications that can call emergency servicesin the event of an accident, automotive SIM cards or form factors are the central piece of their wireless communication channel. It ensures the functioning of these new applications all while keeping the data safe.

Much like the Industrial use cases, the automotive M2M SIMs and form factors are built to be much more resistant than the consumer options. To withstand the vibration and motion of a moving vehicle, they need to be resistant to extreme conditions, without compromising their performance in the field.

Valid's M2M automotive form factor uses extremely robust materials and follows key certifications (ISO TS 16949 - Quality Management Systems & Automotive supply chain, AEC Q100 - Qualification requirements for automotive environment).



mioSIM M2M Physical Characteristics

See Valid's range of mioSIM M2M products characteristics below:

mioSIM M2M AVAILABILITY								
GRADES	FORM FACTORS		MAIN SUPPO	ORTED CHARA	CTERISTICS			
	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)	105°	500k	15 years			
Automotive	Not available	MFF2	105°	500k	17 years			





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Valid (B³: VLID3 - ON) provides tailored solutions that integrate emerging technologies to enable secure, trusted experiences. From Data, Payments, Identity, and Mobile to IoT, Track andTrace, 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 the world's largest manufacturers of banking cards. To learn more, visit www.valid.com.