

Ruggedized SIM and eSIM for the IoT

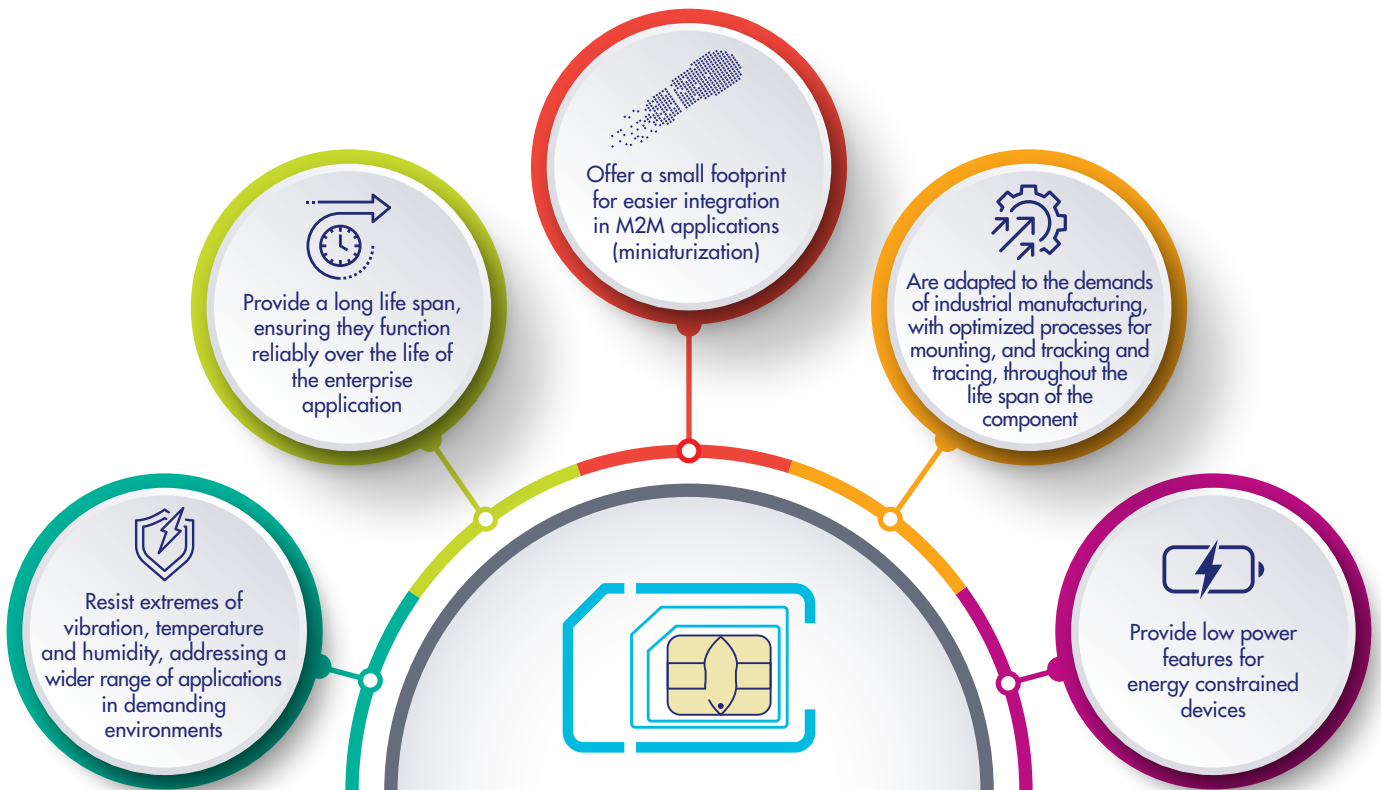
At Thales, we believe in a future where billions of connected machines and a secure Internet of Things (IoT) improve life for everyone. To achieve this, the IoT requires more robust, or 'ruggedized', SIM and eSIM than those employed in consumer devices. Depending on the use case, SIM and eSIM in the IoT may need to withstand greater extremes of temperature, humidity and vibration. Also, SIM and eSIM will typically need to be adapted to longer product lifecycles, and low power designs that extend battery life.

Thales offers unique competence in ruggedized SIM and eSIM for the IoT. Thales M2M/IoT technology is integrated to improve business processes, productivity and security across a diverse array of vertical markets. These include energy, automotive, track and trace, metering and smart grids, healthcare, security systems, routers and gateways, remote maintenance and control, and many more.



Ruggedized SIM and eSIM for the IoT are designed for optimum reliability in the most extreme conditions. As a result, they ensure that mobile network operators can claim and retain a significant stake in this new market, providing miniaturized and robust security technology and creating new opportunities for OEMs, IoT Service providers, IoT integrators and other key stakeholders.

Ruggedized SIM and eSIM for the IoT:



The design and integration of M2M/ IoT solutions often involves complex logistics. Processes therefore require special attention to ensure fast and cost effective time to market. Ruggedized SIM and eSIM for the IoT simplify integration, saving time and money during implementation and safeguarding mobile network operators' stake in this growing market. Already field proven, this unique platform is powered by an advanced operating system and features extended memory management and data retention for up to 17 years. Available in several form factors, ruggedized SIM and eSIM are contributing to the success of M2M/IoT systems around the world, offering a dedicated component with the right combination of operating system intelligence, longevity and flexibility.

Key features:

- Designed specifically for M2M/IoT use cases (low power compatible product)
- Available in monoprofile (ruggedized SIM for IoT) and multiprofile (eSIM for IoT) versions
- Choice of grades (domestic, industrial, automotive)
- Available in removable and solderable form factors
- PK or non-PK option
- Multi-network support: 2G/3G/LTE/5G
- Extended life span
- Highly secure
- Automotive certifications and quality procedures (e.g. AECQ100, TS 16949)

Benefits:



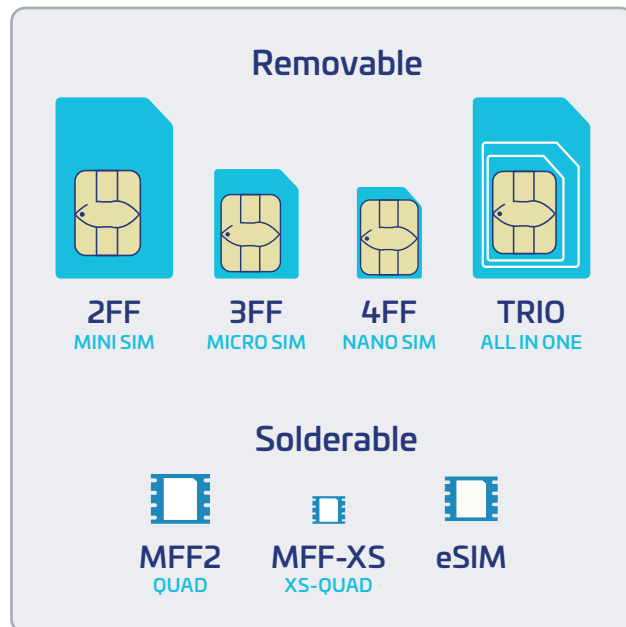
Associated technologies:

- Java™ Card OS
- eXtended life mechanism
- Global platform
- GSM standards
- Subscription management services

Thales offers a comprehensive range of card bodies for ruggedized SIM and eSIM for the IoT, with different form factors available for both removable and solderable options.



- Removable formats: traditional 2FF, 3FF, 4FF and Trio SIM plug-in available with limited (-25°C; +85°C) or extended (-40°C; +105°C) temperature support; cards delivered in either half or full size.
- Solderable formats: standardized MFF2 (5mm * 6mm) and miniaturized MFF-XS (2.2mm * 2.3mm) packages available with limited (-25°C; +85°C) or extended (-40°C; +105°C) temperature support; MFF-XS offers the same robustness as MFF2.



Product	Domestic +		Industrial			Automotive
	Plug 85	Quad	Plug 85	Plug 105	Quad	Quad
Temperature	-25..+85 °C	-25..+85 °C	-40..+85 °C (3)	-40..+105 °C	-40..+105 °C	-40..+105 °C
High humidity	-	✓	-	✓	✓	✓
Corrosion	-	NA	-	✓	NA	NA
Climatic tests	ETSI TS 102.221	✓	✓	✓	✓	✓
	ETSI TS 102.671	✓	✓	✓	✓	✓
	Additional Jedec (1)	-	✓	-	✓	✓
	AEC Q100	-	-	-	-	✓
Lifespan	5 Years		10 Years			17 Years
Memory cycles	>1M (Beyond 102.671 UC)		>1M (Beyond 102.671 UC)			>1M (Beyond 102.671 UC)
Operating System	M2M with eXtended-Life		M2M with eXtended-Life			M2M with eXtended-Life
Network Techno	2G, 3G, LTE, 5G		2G, 3G, LTE, 5G			2G, 3G, LTE, 5G
Low power support	Yes		Yes			No