# Cellular connectivity

**A simpler path to bringing your products to market**

# Managing connectivity throughout the device lifecycle

When looking for a connectivity solution for connected devices, Original Equipment Manufacturers (OEMs) must consider the challenges in each part of the device lifecycle

## 1
Assembly and test in a factory, potentially offshore: Cost-optimized data plan for the assembly line test scenario

## 2
Change of ownership: Once assembled, appliances sold to several companies each packaging their own services with custom configuration

## 3
Field deployment in many regions via distributors, installers, retail: Different MNOs

## 4
Operational life where a service is offered to end-customers: Different data plans depending on end-customer level of service
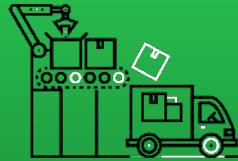
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# Simplifying secure device connectivity

Avnet Silica's eUICC (Embedded Universal Integrated Circuit Card) provides the most flexible, secure, and open cellular connectivity option in the market

## Flexible service

A GSMA 3.2 eUICC (Embedded Universal Integrated Circuit Card) manufactured by IDEMIA able to host several MNO profiles concurrently
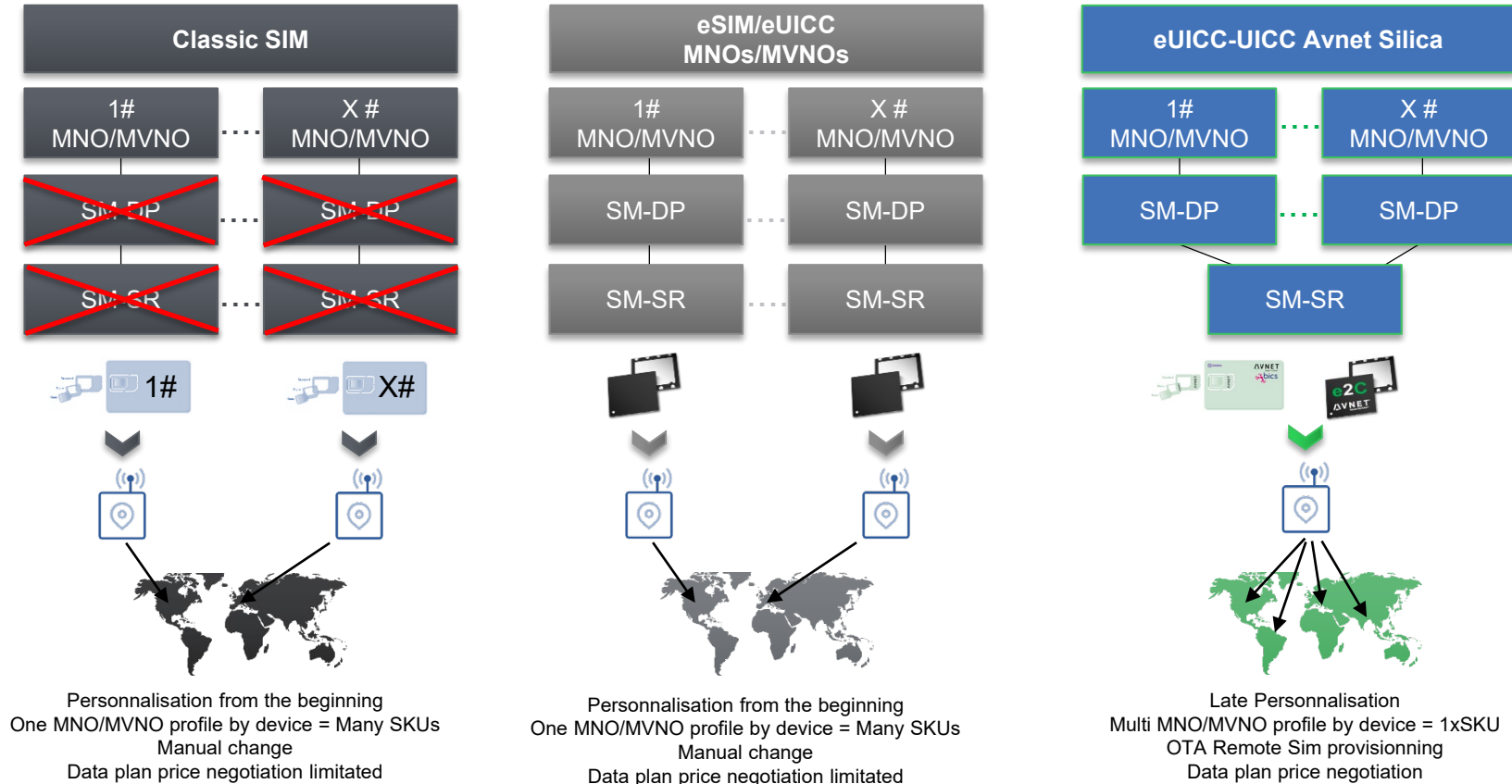
## Out of the box ready

Pre-installed with a multi-IMSI profile and initial pre-paid global cellular network (2G/3G/4G/Cat-M/Cat-NB) data allowance
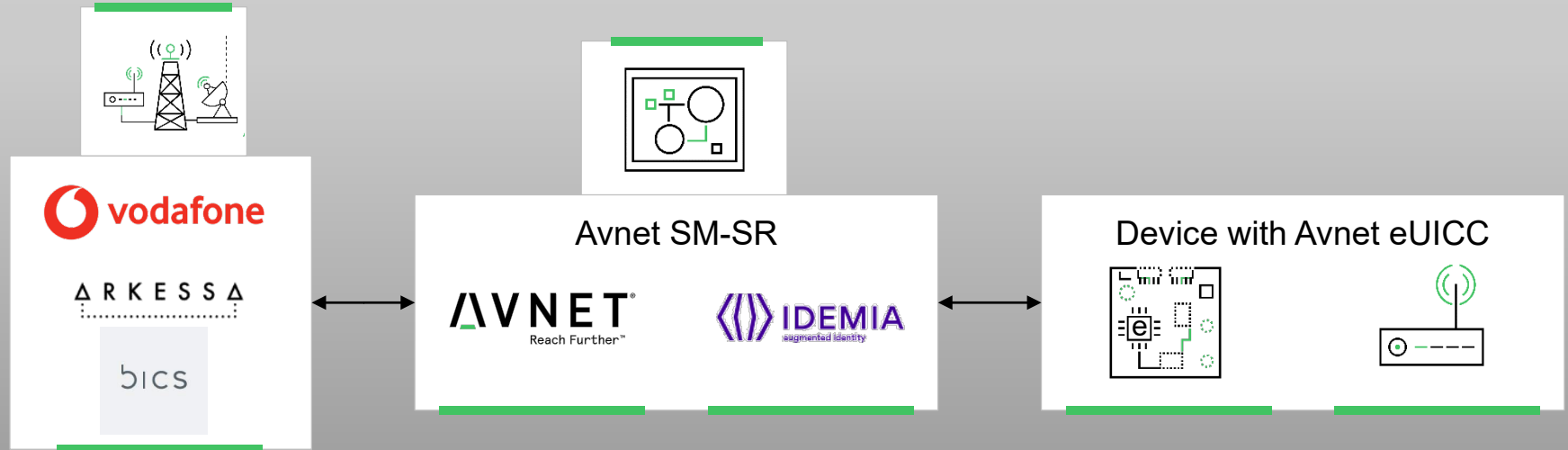
## Remote management

Provision and reprogram devices from Avnet's Subscription Management Platform (SMP), enabling secure management of MNO profiles

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# What's currently available on the market?

| Classic SIM | eSIM/eUICC MNOs/MVNOs | eUICC-UICC Avnet Silica |
|---|---|---|

| 1# MNO/MVNO | X # MNO/MVNO | 1# MNO/MVNO | X # MNO/MVNO | 1# MNO/MVNO | X # MNO/MVNO |
|---|---|---|---|---|---|
| ~~SM-DP~~ | ~~SM-DP~~ | SM-DP | SM-DP | SM-DP | SM-DP |
| ~~SM-SR~~ | ~~SM-SR~~ | SM-SR | SM-SR | SM-SR | |

**Classic SIM**

Personnalisation from the beginning
One MNO/MVNO profile by device = Many SKUs
Manual change
Data plan price negotiation limitated

**eSIM/eUICC MNOs/MVNOs**

Personnalisation from the beginning
One MNO/MVNO profile by device = Many SKUs
Manual change
Data plan price negotiation limitated

**eUICC-UICC Avnet Silica**

Late Personnalisation
Multi MNO/MVNO profile by device = 1xSKU
OTA Remote Sim provisionning
Data plan price negotiation

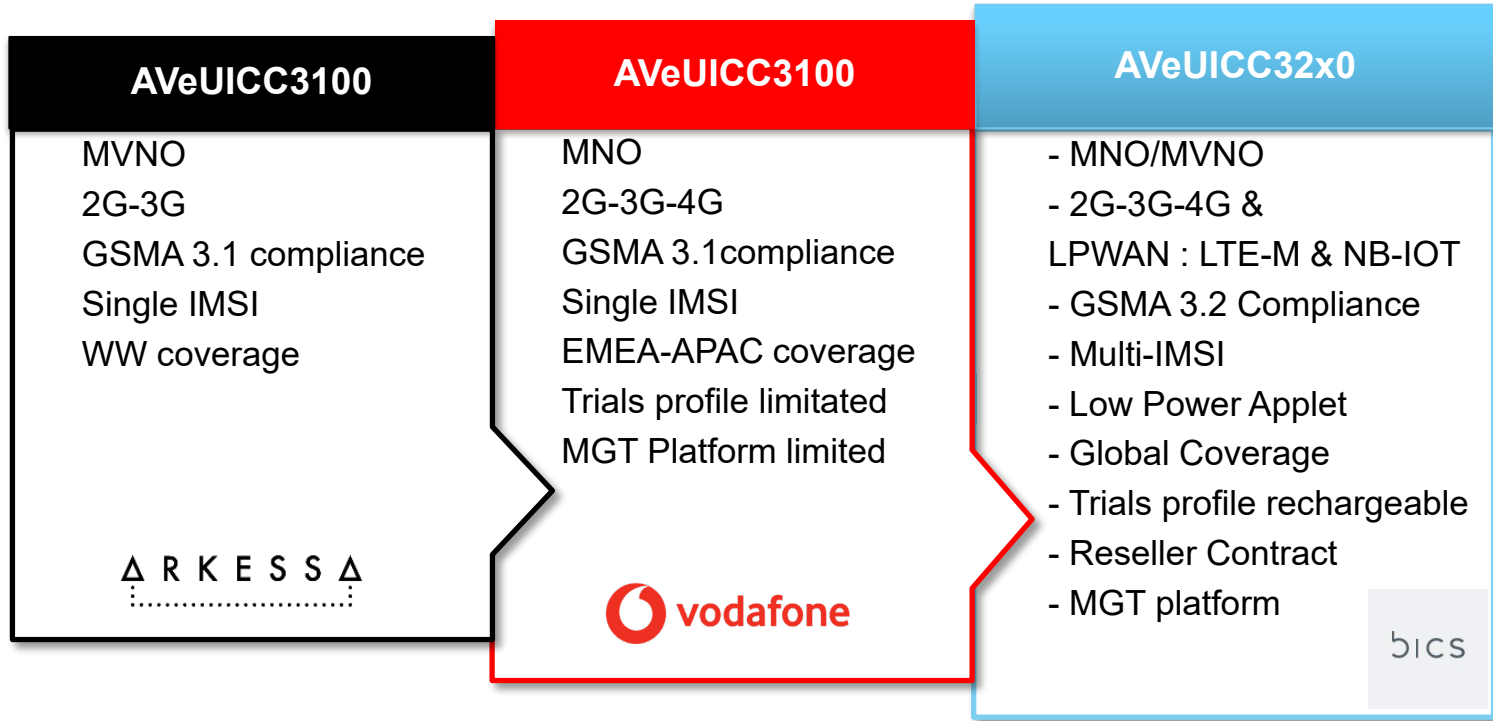https://www.gsma.com/esim/wp-content/uploads/2018/12/esim-whitepaper.pdf

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# Architecture

Avnet Silica's eUICC is managed through our SM-SR (Subscription Manager – Secure Routing) platform allowing management of connectivity to multiple global network providers (MNO/MVNO) with more being added soon

# eUICC family range

| AVeUICC3100 | AVeUICC3100 | AVeUICC32x0 |
|---|---|---|
| MVNO | MNO | - MNO/MVNO |
| 2G-3G | 2G-3G-4G | - 2G-3G-4G & |
| GSMA 3.1 compliance | GSMA 3.1compliance | LPWAN : LTE-M & NB-IOT |
| Single IMSI | Single IMSI | - GSMA 3.2 Compliance |
| WW coverage | EMEA-APAC coverage | - Multi-IMSI |
| | Trials profile limitated | - Low Power Applet |
| | MGT Platform limited | - Global Coverage |
| | | - Trials profile rechargeable |
| | | - Reseller Contract |
| | | - MGT platform |

ARKESSA

vodafone

bics

# AVeUICC32x0

## eUICC/UICC for cellular IoT connectivity

**An Avnet Silica eUICC/UICC manufactured by IDEMIA**

- **2FF/3FF/4FF**: Plastic format, **MFF2** : Chip format (VQFN8)
- T° grade : Consumer, Industrial and Automotive (on request)
- Pre-installed BICS **Multi-IMSI** (**I**nternational **M**obile **S**ubscriber **I**dentity) profile
- **GSMA** 3.2-compliant
- Low Power Applet

- **Connectivity**
  - Pre-installed Global Bootstrap of partner carrier
  - 100KB of pre-paid Global communication for factory testing

- **Service**
  - Provisioned for life on Avnet's **S**ubscription **M**anagement **P**latform (SMP)
  - On-demand : Carrier change campaigns (Swap Service)

and/or
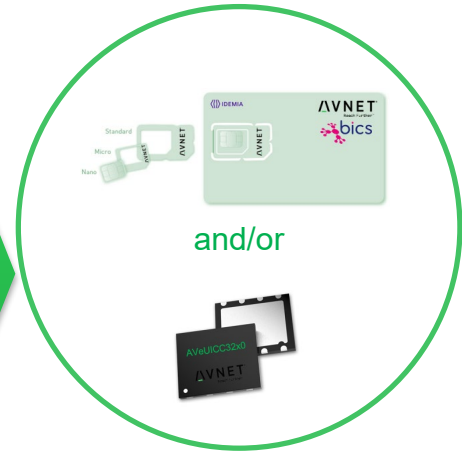
# eUICC + connectivity: a complete solution

## Easy to start

- All in one package : HW + Connectivity & management platform
- Documentation: Quick start guide, trial kit

## Quality of Service

- Get access to the BICS support
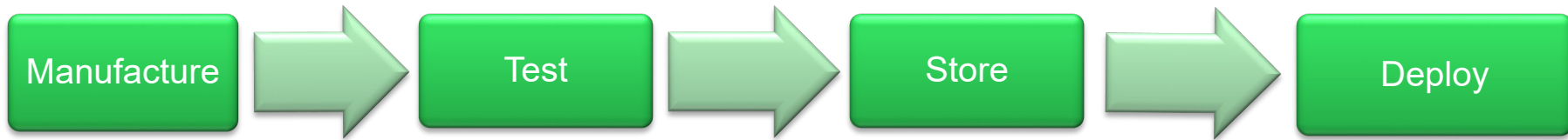- A several level of support within AvS

## Collaterals

- GW manufacturers: Teltonika, Miromico…
- Suppliers Dev kit: Renesas

## An industrial view of Connectivity

- Automatic flow for profile activation
- Customers = resellers
- 5G enabled

**Global coverage, 5G & LPWAN access**

# An easy flow: manufacture, test, store & deploy

| Manufacture | → | Test | → | Store | → | Deploy |
|---|---|---|---|---|---|---|

**Manufacture**

Available documentation:

 - Datasheet
 - Application Note

Delivering anywhere in the world

eUICC status: Ready to activate

**Test**

Get a preloaded bootstrap profile

100KB of prepaid connectivity

eUICC status: Active Test

**Store**

No charge during that period

Max duration is 6 months

eUICC status: Active Inventory

**Deploy**

Billing starts after having consumed 1KB

Activate/Suspend eUICC

Deactivate

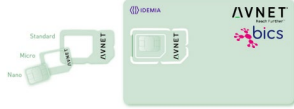eUICC status: Active

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# How to use Cellular Connectivity to accelerate your IOT project

# e2C – Trials eUICC

## Turnkey solution to start your cellular IoT design
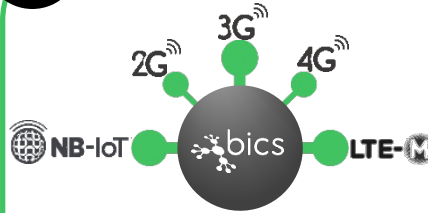
### Packaging

**1**

or

Standardized form factors

SIMfit - **2FF/3FF/4FF**
or
**MFF2** (chip)

### Connectivity

**2**

3G

2G     4G

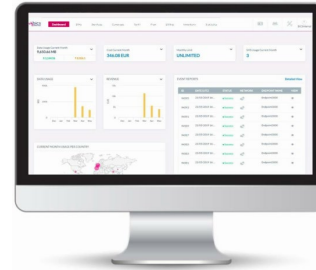NB-IoT     bics     LTE-M

An initial cellular Connectivity allowance of **50MB** **rechargeable on request**

Valid for **3** months after activation

**Global** Coverage

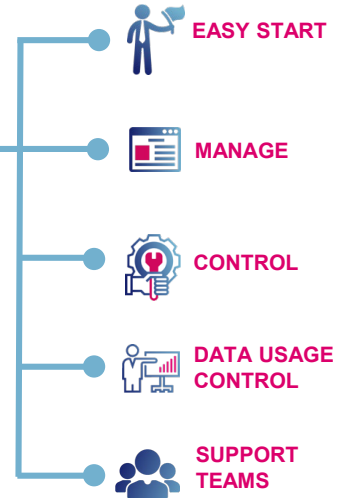### Management

**3**

Free access to BICS **C**onnectivity **M**anagement **P**latform (CMP)

EASY START

MANAGE

CONTROL

DATA USAGE CONTROL

SUPPORT TEAMS

**All of our technologies and services in one solution**

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# HoriZone RA Kit – Cat M1/NB1/2G

## E2E POC kit



**Room Monitor**

**Sensor**
- Condition
- Sound
- Pressure
- Motion

**Control**

**Actuator**
- Motor
- LED
- Speaker

**Cellular Network**

**/IOTCONNECT Solutions Suite**
- Database/Storage
- Device Management
- Condition Monitoring
- Predictive Maintenance
- Automation
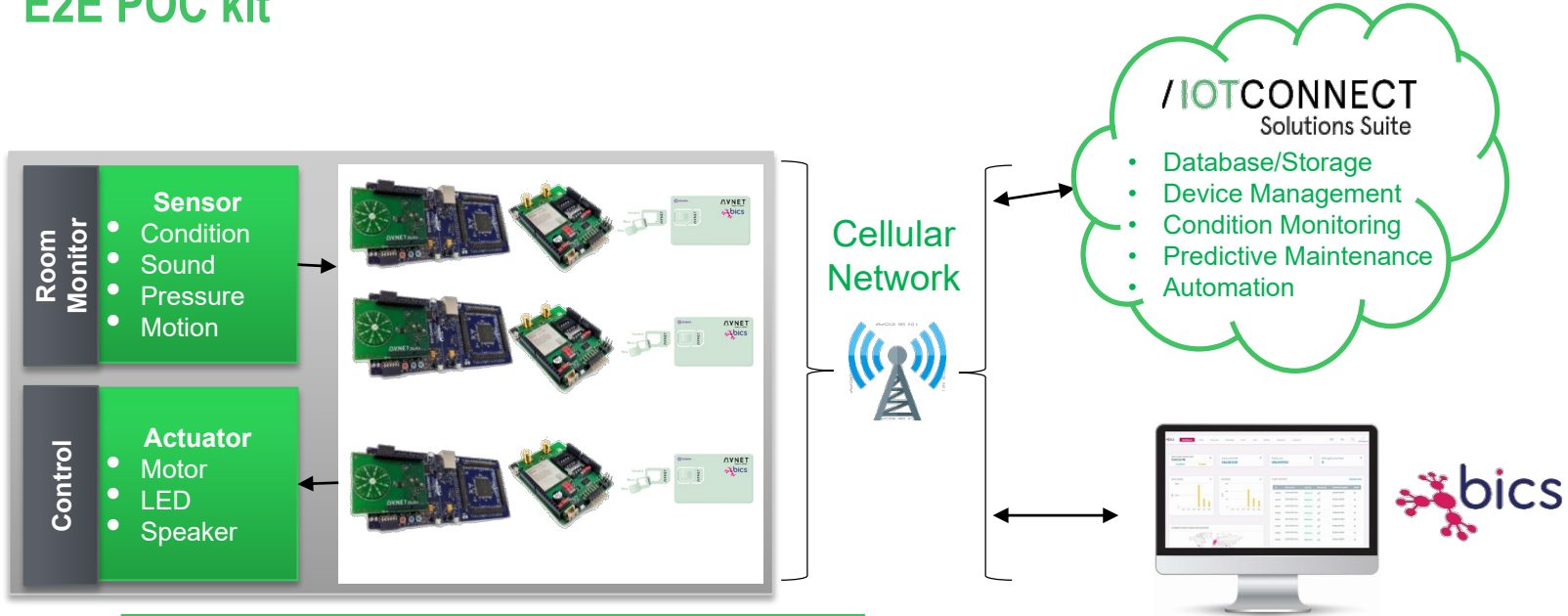
**AVSHORIZONE-RENRA-BICS**
- Cloud-ready Renesas RA EK-RA6M3 Board
- IoTConnect SDK
- Multisensor Arduino Shield : AVSSENSOR-REN-SHIELD-A
- CAT M1/NB1 Shield : AVSNBIOT-BG96-SHIELD-B
- BiCS eUICC : AVe2C-BICS-50M-WT-03-F234-E-TRIALS

**Available – 279€**

# LoRaWAN Gateway

miromico **+** LoRa **+** bics

Basic version: supports Ethernet and Wifi connectivity

LTE version: supports Ethernet, Wifi, LTE & Connectivity

https://miromico.ch/portfolio/gateway/?lang=en

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# Gateways and routers

## LoRaWAN Gateway

miro Edge: Modular LoRaWAN Gateway



Basic version, supports ethernet and WIFI connectivity

LTE version, supports ethernet, WIFI, LTE and PoC connectivity



https://miromico.ch/portfolio/gateway/?lang=en

## Cellular Industrial Router & Gateway



>100 Routers & Gateways available

https://teltonika-networks.com/fr/



https://www.digi.com/products/networking/gateways

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# eUICC

**The starting point for your project journey**



**Cellular Modem**
- QUECTEL Build a Smarter World
- NORDIC SEMICONDUCTOR
- DIGI
- SEQUANS COMMUNICATIONS
- THALES

**Gateway/Router**
- DIGI
- TELTONIKA
- miromico
- Raspberry Pi

**EvalKits, Devkits**
- ST life.augmented
- NXP
- RENESAS BIG IDEAS FOR EVERY SPACE
- QUECTEL Build a Smarter World
- Insight SiP it's all in the package
- NORDIC SEMICONDUCTOR

**Avnet Collateral Solution**
- AVNET Reach Further
- Microsoft
- codit

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# Project to mass production

**Support throughout your project lifetime**

| POC/POV, Design, Proto | Mass production |
|---|---|
| **Trials eUICC** | **AVeUICC32x0 + BICS**<br><br>**Or**<br><br>**One-Stop-Shop** |

**Project life cycle**
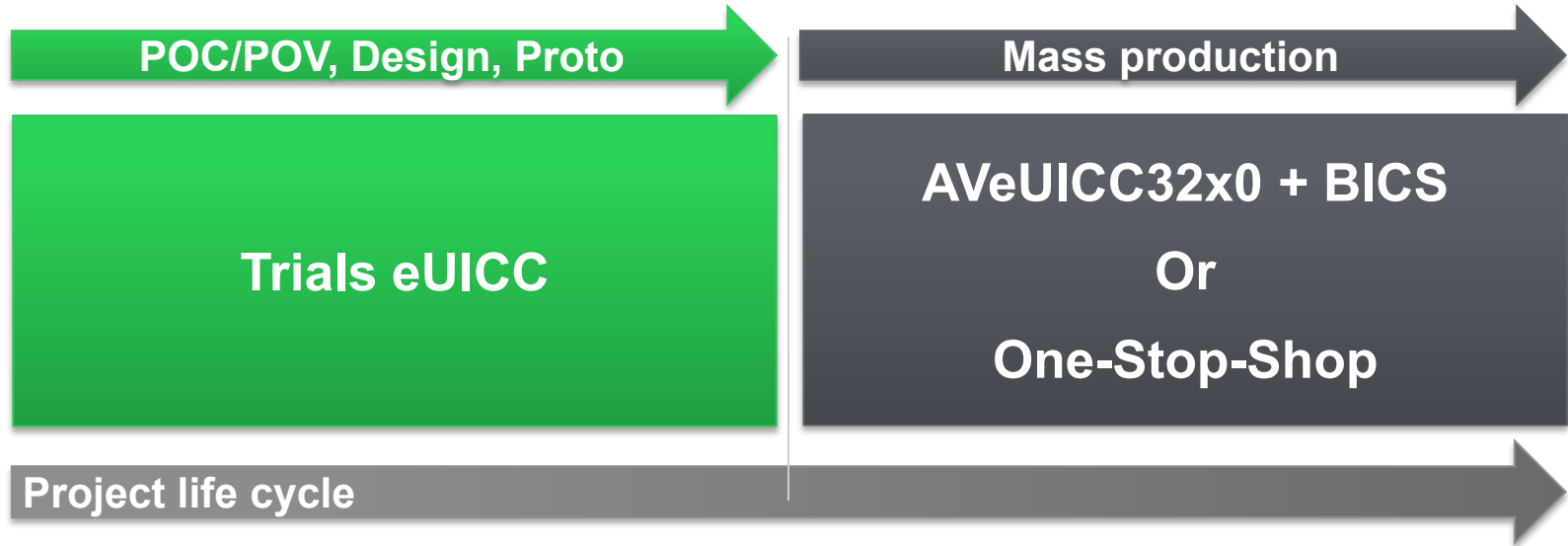
More information :

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**eUICC from Avnet Silica**

**The right connectivity solution**

**euicc@avnet.eu**

**Contact us!**

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# Acronym - Vocabulary

| | |
|---|---|
| **SIM** | **S**ubscriber **I**dentity **M**odule |
| **eSIM** | **E**mbedded **S**ubscriber **I**dentity **M**odule |
| **UICC** | **U**niversal **I**ntegrated **C**ircuit **C**ard |
| **eUICC** | **E**mbedded **U**niversal **I**ntegrated **C**ircuit **C**ard |
| **MNO** | **M**obile **N**etwork **O**perator |
| **MVNO** | **M**obile **V**irtual **N**etwork Operator |
| **OTA** | **O**ver **T**he **A**ir |
| **RSP** | **R**emote **S**im **P**rovisioning |
| **SKU** | **S**tock **K**eeping **U**nit |
| **2FF** | Plastic SIM **Standard** Format |
| **3FF** | Plastic SIM **Micro** Format |
| **4FF** | Plastic SIM **Nano** Format |
| **MFF2** | Chipset SIM – **QFN8** package |
| **SIMfit** | all in one Plastic SIM format |
| **SM-DP** | **S**ubscription **M**anager **D**ata **P**reparation |
| **SM-SR** | **S**ubscription **M**anager **S**ecure **R**outing |

https://www.gsma.com/esim/wp-content/uploads/2018/12/esim-whitepaper.pdf

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