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THALES
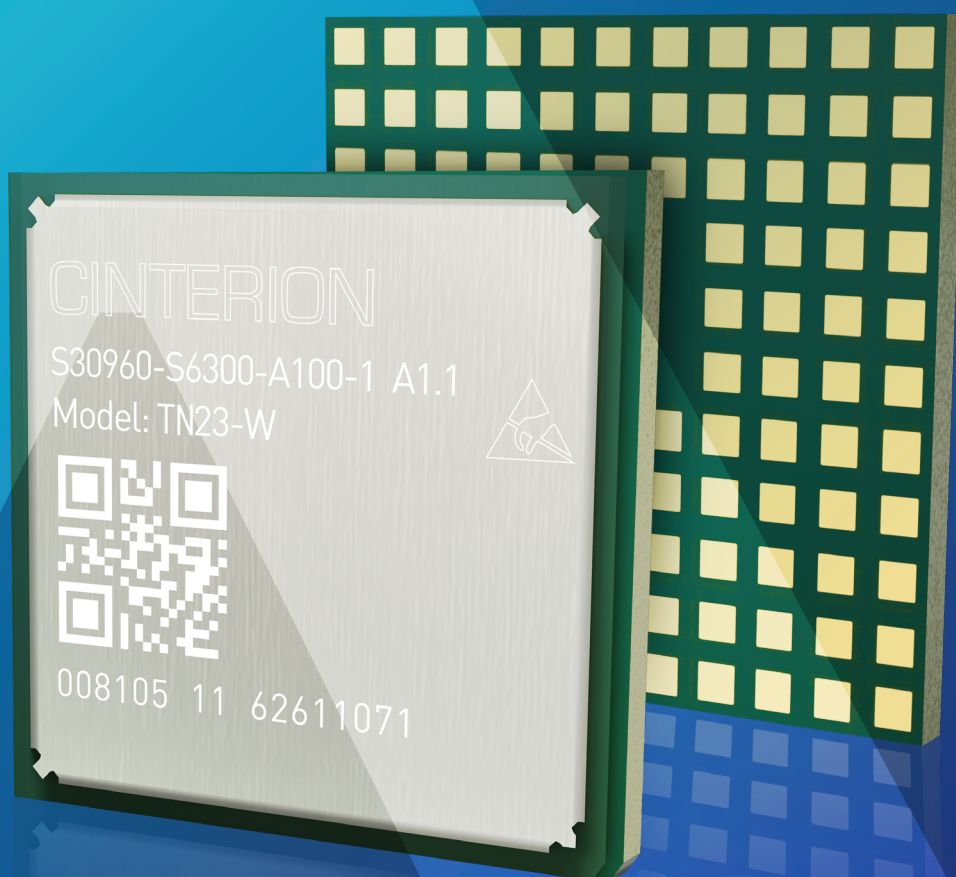**Building a future** we can all trust

Cinterion® TN23
IoT Module

LTE Cat NB1 and NB2 in breakthrough "Things" footprint

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TN23

Multiple MTC Technologies for Global Connectivity

- 3GPP Rel.14 Cat.NB1, Cat.NB2
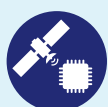- Global LPWA from a single package

Compact Things Footprint

- Compact form factor developed for the needs of small, battery-operated devices
- Large surface pads for improved soldering and reduced SMT warpage
- Easy routing and optimized antenna position

Ultra-Integrated for Lower Total Cost of Ownership

- Cinterion IoT Embedded Processing enables you to build a secure & robust embedded application that runs on Cinterion IoT Module leveraging module's onboard resources
- Embedded eSIM option

Secured by design

- Pre-provisioned digital identities in the root of device
- Secure key store and certificates for cloud enrollment
- Secure boot

Easy Connectivity and Lifecycle Management

- Secure enrollment into main cloud platforms including AWS IoT Core or Azure IoT Hub
- Remote updates and device management

Cinterion® TN23 IoT Module LTE Cat NB1 and NB2 in breakthrough "Things" footprint

The Cinterion® TN23 IoT Module delivers global LTE NB-IoT (NB1 and NB2) connectivity from a single SKU and it has the Thales revolutionary "Things" footprint. The compact form factor has been engineered to facilitate the design of small, battery-operated LPWA cellular devices such as small payment terminals, connected sensors, track and trace solutions, meterings application, monitoring for smart homes, cities and agriculture.

Key Features:

The highly efficient Cinterion TN23 delivers global LPWAN LTE connectivity from a single SKU leveraging mature Rel. 14 second generation Cat.NB1/NB2. The ultra-integrated IoT module's unique architecture allows the flexibility to run applications with a host processor or inside the module itself using the integrated processor dedicated to customer application for onboard processing, which optimizes the size and cost of your solution. TN23 supports optimized 3GPP power modes PSM and eDRx revolutionizing design possibilities for battery-operated cellular devices. State of the art security features include trusted identities pre-integrated in the root of the module during manufacturing plus secure key storage and certificate handling to protect the device and data and enable trustful enrollment in cloud platforms. An optional integrated Thales eSIM further simplifies manufacturing and logistics while providing flexibility in the field with easy remote provisioning and dynamic subscription updates. What's more, the TN23 is supported by Cinterion® IoT Suite Services, an optional platform that manages the connectivity, lifecycle and security of IoT solutions ensuring continuity and long life.

Things footprint revolutionizes small, battery-operated industrial IoT

The tiny 15 x 15 mm Things footprint is revolutionizing possibilities for exceptionally small, battery-operated cellular IoT devices. The footprint design features an optimized and scalable pad position and pitch to prevents PCB warpage while taking full advantage of affordable PCB technology. In addition, the position of antennas and ground maximizes RF performance.
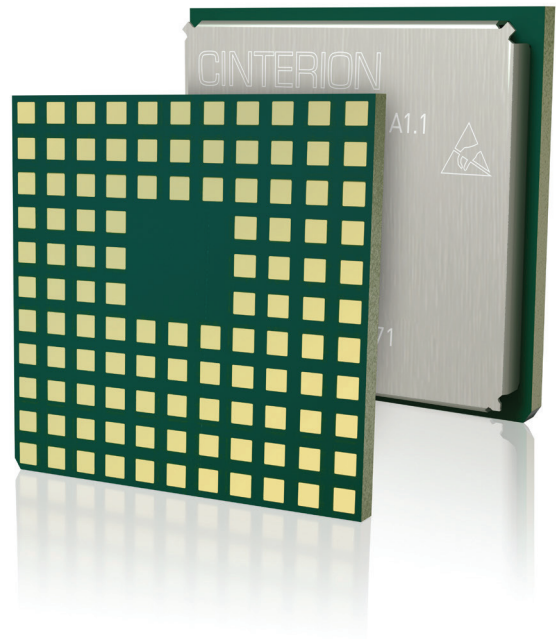
Embedded Processing lowers TCO

The Cinterion TN23 device features an integrated processor with Real-Time Operating System (RTOS), enabling hostless architecture offered with SDK to build and run your entire application on the small feature-packed module.

Optional Thales eSIM simplifies and secures IoT connectivity

An embedded Thales SIM strengthens security, authenticates devices, encrypts data and securely manages connections to cellular networks. It works seamlessly with Thales's subscription management solution to maintain connectivity for the lifecycle of devices. All this simplifies integration, manufacturing and logistics and lowers TCO.

Cinterion® TN23 Features

General Features

- 3GPP Rel.14 Compliant Protocol
- LTE Cat.NB1/NB2
- Power Class 23 dBm
- Compatible with Cinterion® Things footprint
- FDD-LTE Bands:

  1, 2, 3, 4, 5, 8, 12, 13, 17, 18, 19, 20, 25, 26, 27, 28, 66, 85
- Data only
- LTE Cat.NB1
  DL: max. 27 kbps, UL: max. 63 kbps
- LTE Cat.NB2
  DL: max. 124 kbps, UL: max. 158 kbps

- Embedded Processing
  - Cortex-M4 @60MHz
  - 256kB flash (XIP)
  - 128kB SRAM
  - Thales SDK based on Free RTOS

- eDRX 55µA* in 81.92s and PSM 1.4µA*
- Embedded IPv4 and IPv6 TCP/IP stack access via AT command and transparent TCP/UDP services: TCP & UDP Server/Client, Ping, HTTP Client, FTP(s)/FTPES Client, MQTT Client, CoAP Client, NTP client
- Secure Connection with TLS 1.3 / DTLS 1.2
- Secure boot
- 2 high-speed serial interface
- UICC and U/SIM card interface 1.8V (embedded SIM option)
- SPI, I2C, GPIO´s

- Cinterion IoT Suite Solution:
  - Firmware Update Over the Air (OTA) with incremental packages
  - Connectivity Activation

This solution is currently in an early release state and specifications may change. Samples can be requested via your Thales contact.

Thales in IoT:
Driving digital transformation with the power of the IoT

Thales delivers innovative IoT technology that simplifies and speeds enterprise digital transformation. For more than 20 years, our customers – in a wide range of industries - trust our IoT solutions to seamlessly connect and secure their IoT devices, maximise field insights, and accelerate their global business success.

Thales solutions:

- **Connect** assets to wireless networks and cloud platforms
- **Manage** the long lifecycle of IoT solutions
- **Secure** devices and their data
- **Analyse** real-time data transforming it into business intelligence that improves decision making

Our 360° approach provides the essential building blocks needed to simplify design, streamline development and accelerate time-to-market.

For more information, please visit **www.thalesgroup.com/IoT** or follow **@ThalesIoT on Twitter**

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