monarch2
GM02S - MODULE

Low Power LTE-M/NB-IoT Module for Next-generation 5G Massive IoT

Monarch 2 GM02S is an LTE Cat M1/NB1/NB2 module based on Sequans' second generation Monarch 2 chip platform. It provides significant improvements in performance and power consumption while providing seamless migration because it is based on Sequans' existing LTE-M/NB-IoT protocol stack---one of the most mature and proven in the entire LTE ecosystem. Monarch 2 GM02S is the first member of Sequans next generation "S" series module family, featuring a very small yet cost-effective form factor that requires no external components.

Monarch 2 GM02S includes Sequans' Single-SKU™ RF front end, enabling deployment in any band worldwide, and an integrated EAL5+ secure enclave, enabling secure key storage and crypto applications and integrated SIM (iSIM). An open SDK environment allows customers to port their own code into the module with low power applications. Monarch 2 GM02S utilizes a single rail power supply starting at 2.2 V, the lowest voltage supported by any LTE-M/NB-IoT module in the industry today, thereby unlocking battery and eBOM savings. Sequans designs and owns the chipsets and software used in all its modules, thus ensuring fast time to market and lowest total cost of ownership for device makers.

Highlights

- 3GPP LTE Release 14/15 Cat M1, NB1 and NB2
- New tiny "S" LGA module form factor
- Single-rail power supply supporting 2.2-5.5V
- Programmable RF filtering for global band support in a Single-SKU design (617 MHz to 2.2 GHz)
- Adaptive output power supporting +23dBm, +20dBm and +14dBm providing the most efficient solution for deep indoor penetration
- Supports external SIM and eSIM as well as integrated SIM and integrated eSIM
- Embedded LWM2M client, TCP/IP stack, and Sequans Cloud Connector™
- Fully tested and calibrated for easy integration into product hardware
- Open SDK for customer applications
- Fully software-compatible with first generation Monarch GM01Q (LTE-M) and Monarch NB01Q (NB-IoT) modules, enabling ease of migration

Monarch 2 LTE Platform

At the heart of Monarch 2 GM02S is the Monarch 2 chip, the second generation of Sequans' Monarch LTE Cat M1/NB1/NB2 platform. The new generation Monarch 2 technology improves on the size, cost and power consumption of first-generation Monarch and includes new, powerful features such as an EAL5+ secure enclave, usable as an iSIM, and a low-power MCU that is fully available for running customer applications. The Monarch 2 GM02S module is 5G-ready and is designed for massive IoT.

Applications

The Monarch 2 GM02S module is ideal for adding LTE-M and/or NB-IoT LTE connectivity to narrowband, low data rate M2M and IoT devices, including utility meters, industrial sensors, health and fitness bands, asset trackers, and numerous additional devices for smart home, smart city, and wearable applications.

Key Features

Integrated security and iSIM

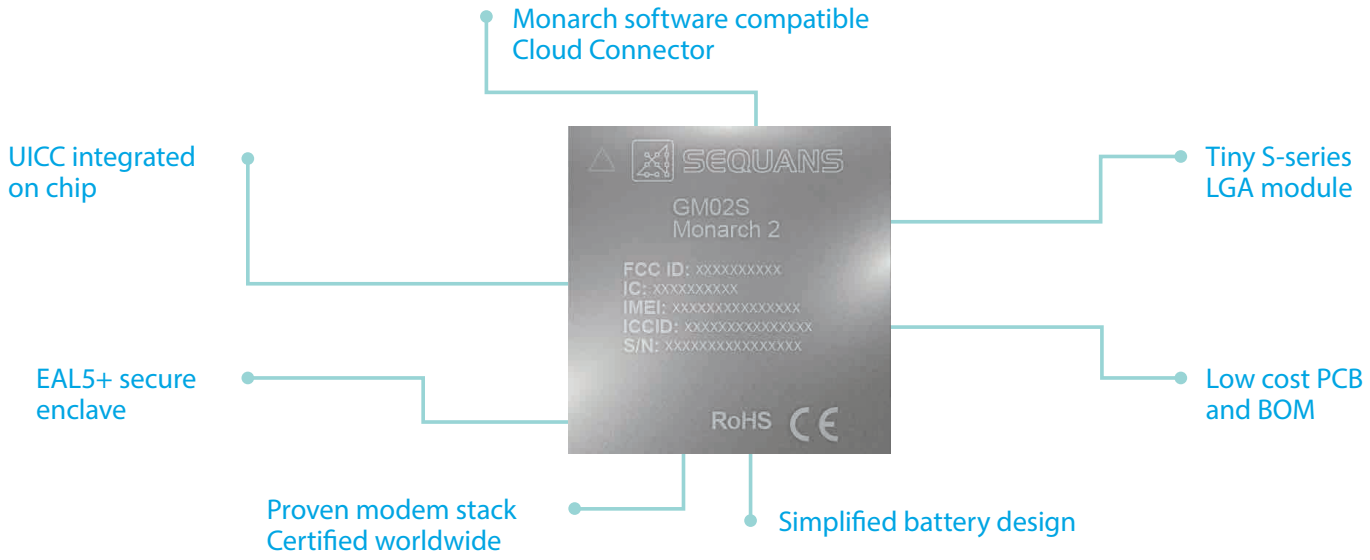
The secure enclave in Monarch 2 enables the iSIM function to operate with no additional components, reducing complexity and total cost of ownership for customers. Sequans makes no compromise on security and certifies its chipsets and processes to Common Criteria EAL5+, the same standard as for traditional SIM cards. Customers can also use the embedded secure enclave for secure key storage and cryptographic operations at the application level.

Ultra-low power consumption

Monarch 2 GM02S delivers up to a 60 percent improvement in power consumption, thanks to Sequans' proprietary Dynamic Power Management™ and eco-Paging™ technologies, which adapt sleep and active state power consumption according to use case, thus enabling 10-15 years of battery life in some cases. The single rail power supply starting at 2.2 V allows lower voltage battery chemistries without the need of any additional components, and higher overall efficiency further optimizes the power consumption.

LTE-M/NB-IoT Module Enabling Next-generation 5G Massive IoT

Monarch 2 GM02S in a nutshell



Product Characteristics

LTE Modem

- 16.3 x 17 x 1.85 mm LGA module
- Single-SKU with support for LTE bands: 1, 2, 3, 4, 5, 8, 12, 13, 14, 17, 18, 19, 20, 25, 26, 28, 66, 70, 71, 85
- Cat M1: up to 590 kbps DL and 1.1 Mbps UL
- Cat NB1/NB2: up to 120.7 kbps DL and 160 kbps UL
- 3GPP Release 14/15
- SMS
- Max transmit power up to +23 dBm
- Single power supply: 2.2-5.5V

Interfaces

- JTAG
- I2C
- SPI
- ADC
- GPIO including multiple module wake inputs and high precision LTE-synchronized GPIOs
- UART x 4
- USIM x 2 (ISO7816)
- 50 ohm antenna interface

Software

- Field proven LTE-M & NB-IoT LTE software stack
- Rich set of AT commands compatible with previous generation
- IP and non-IP data delivery
- LPP and certified LWM2M stack
- Cloud Connector for direct HTTPS, MQTTS, CoAP to connect to all cloud platforms

Environmental

- Operating temperature: -40° C to +85° C
- Storage: JEDEC MSL 3

Certifications

- GCF and PTCRB
- FCC, ISED, RED, UKCA, JATE/TELEC, ACMA, NCC
- AT&T, AT&T FirstNet, Vodafone, Verizon, Deutsche Telekom, KDDI, NTT Docomo, Chunghwa Telecom

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