monarch**2**
GM02S & GM02SP Modules

LTE-M & NB-IoT
GNSS*

Dual-mode power-optimized LTE-M & NB-IoT modules for IoT applications

The Monarch® 2 GM02S module family is based on Sequans' second-generation Monarch 2 LTE-M & NB-IoT platform. Beyond its support of an industry-leading power-optimized LTE stack, the modules bring a versatile toolbox of integrated features covering all IoT application needs, including one variant, GM02SP, with integrated GNSS. Monarch 2 GM02S modules also deliver remarkably high levels of security and reliability.

Highlights

- Global band support (617 MHz to 2.2 GHz) allowing for flexible support of public and private LTE bands
- 3GPP LTE Release 14 (upgradable up to Release 17)
- Dual-mode single-image LTE-M & NB-IoT with instant switch (Cat M1, NB1, NB2)
- Assisted and non-assisted integrated GNSS*
- Power supply supports 2.2-5.5V
- Industry lowest deep sleep mode at 1µA and best-in-class eDRX and PSM
- Up to 2 external SIM/eSIM interfaces, and 1 integrated SIM/eSIM**
- Embedded IP stack (TCP w/ TLS1.3, UDP w/ DTLS1.2, CoAP/MQTT, HTTP/FTP...), and LwM2M client
- LwM2M client for FOTA services
- Open SDK for customer applications

Monarch 2 LTE Platform

At the heart of Monarch 2 GM02S is a flexible platform offering a variety of services. These include a world-first GSMA-compliant integrated eSIM (or ieUICC), an open SDK environment allowing customer application development, and LwM2M-based FOTA services. A variant of Monarch 2 GM02S, GM02SP, offers an integrated GNSS capability, notably optimized in power consumption.

Applications

The Monarch 2 GM02S module is ideal for adding LPWA connectivity to M2M and IoT devices, including utility meters, industrial sensors, health and fitness bands, asset trackers, and smart home devices. The flexible feature set enables a further degree of integration, depending on the end device constraints, on cost, power consumption, and size. The use of LTE-M or NB-IoT is enabled with IoT-Select™, a feature that allows Monarch to dynamically select its operation mode, thereby allowing uninterrupted coverage in areas that have only one or the other deployed. Monarch 2 GM02S also operates on private LTE bands.

Key Features

Ultra-low power consumption

Monarch 2 GM02S leads the industry in low power consumption. It adapts sleep and active state power consumption according to use case and integrates the industry's first single rail power supply, starting at 2.2 V, which allows lower voltage battery chemistries without additional components, thereby lowering total cost of ownership.

Next-level security

Monarch 2 GM02S features SEQure™, a suite of security tools that allows customers to securely boot and upgrade the firmware, ensuring authenticated firmware transfer, integrity verification, and protection against unauthorized modifications.

Integrated SIM/eSIM**

The Common Criteria EAL5+ ANSSI certified secure enclave in Monarch 2 enables an integrated SIM/eSIM function that is compliant with SGP.32 GSMA standards for IoT eSIM and enables customers to streamline operations, reduce complexity, and lower their total cost of ownership.

Integrated GNSS

Monarch 2 GM02SP offers an innovative GNSS functionality embedded into the module through the addition of an external SAW and LNA, and a dedicated GNSS antenna. A full set of AT commands provides a flexible application implementation, adapted to any low power IoT use case. No performance compromise was made compared to conventional GNSS solutions with substantial savings in terms of power consumption.
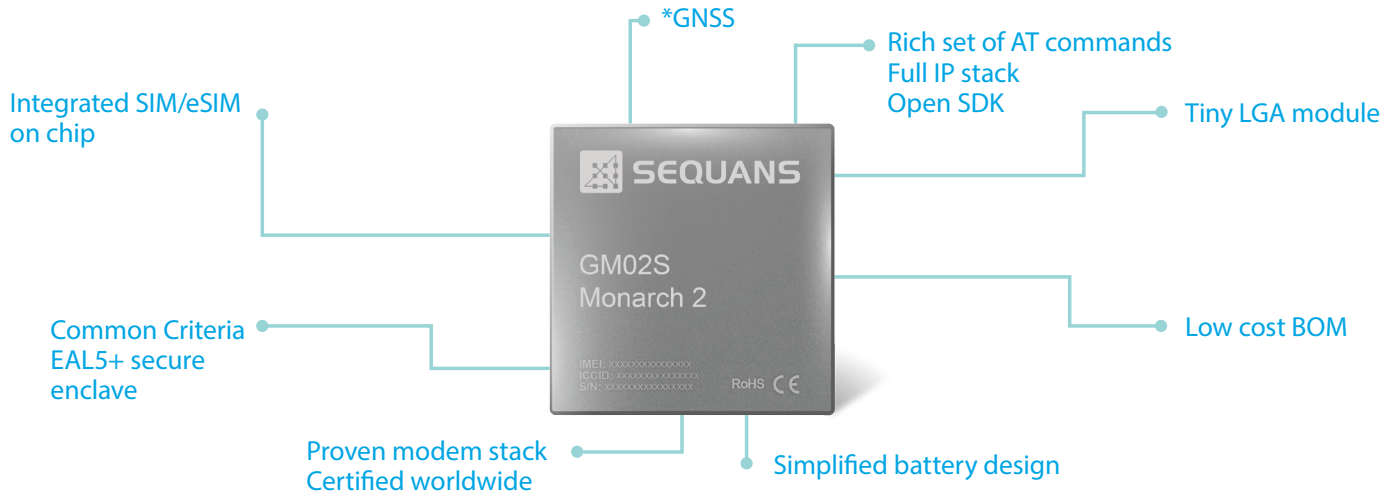
LwM2M FOTA service

An embedded LwM2M FOTA client enables over-the-air Monarch 2 firmware upgrades using a third party LwM2M FOTA server.

* Available with GM02SP variant

** For future support

SEQUANS

Dual-mode power-optimized LTE-M & NB-IoT modules for IoT applications

*GNSS

Rich set of AT commands
Full IP stack
Open SDK

Integrated SIM/eSIM
on chip

Tiny LGA module

SEQUANS

GM02S
Monarch 2

IMEI: xxxxxxxxxxxxxx
ICCID: xxxxxxxxxxxxxx
S/N: xxxxxxxxxxxxxx
RoHS C€

Low cost BOM

Common Criteria
EAL5+ secure
enclave

Proven modem stack
Certified worldwide

Simplified battery design

Product Characteristics

LTE Modem

- 16.3 x 17 x 2.2 (typ.) 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, 85
- 3GPP Release 14 (upgradeable up to Release 17)
- Max transmit power up to +23 dBm
- Single power supply: 2.2 - 5.5V

Throughput

- 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

GNSS*

- L1 band
- Very low-power consumption per fix (with configurable performance vs. power levels)

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 cellular antenna interface
- Dedicated GNSS RF input*

Software

- Field proven LTE-M & NB-IoT LTE software stack
- Rich set of AT commands compatible with other Sequans platforms

- IP and non-IP data delivery
- HTTPS, MQTTS, CoAP to connect to all cloud platforms
- AT Command driven GNSS navigation modes*

Environmental

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

Certifications

- Certified with all major MNOs, and FCC, ISED, RED, UKCA, JATE/TELEC, ACMA, NCC, GCF/PTCRB

* Available with GM02SP variant

More information here

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