

calliope²

GC02S1 Modules



Low cost, low power LTE Cat 1 connectivity for M2M and massive IoT applications

The Calliope 2 GC02S1 modules are based on Sequans' second-generation Calliope 2 chip and deliver optimized 4G LTE Cat 1 connectivity for IoT, M2M and consumer devices such as wearables and hearables that require support for voice and speed higher than LTE-M. Calliope 2 provides significant improvements in performance and power consumption over Calliope 1, while providing seamless migration because it is based on Sequans' existing 4G LTE protocol stack, one of the most mature and proven in the entire LTE ecosystem. The Calliope 2 GC02S1 modules comprise Sequans Calliope 2 platform and all other elements for a complete modem system, including an LTE-optimized transceiver, RF front end, and key interfaces in a compact, cost-effective form factor that requires no external components and includes an integrated EAL5+ secure enclave, enabling secure key storage, crypto applications, and integrated SIM (iSIM). Calliope 2 GC02S1 modules are optimized to support three regional variants covering North America, Japan, and Europe.



Highlights

- 3GPP LTE Cat 1 Release 14/15 including PSM and eDRX support
- Cost-effective support for Cat 1 data rate
- Ultra-low power consumption
- Ultra-small "S1" LGA module package
- Power supply supporting 3.1V-5.5V
- Supports external SIM and eSIM as well as integrated SIM (iUICC) and integrated eSIM (ieUICC)
- Embedded LW/M2M client, TCP/IP stack, and Sequans Cloud Connector™
- Fully tested and calibrated for easy integration into product hardware
- VoLTE support
- Differential firmware upgrade
- Easy migration from Monarch 2 GM02S LTE-M/NB-IoT platform

Calliope 2 LTE Platform

At the heart of Calliope 2 GC02S1 modules is the Calliope 2 chip platform, the second generation of Sequans Calliope LTE Cat 1 platform. Calliope 2 is a 5G-compliant LTE Cat 1 solution compliant with the 3GPP Release 15 massive IoT standard. Calliope 2 improves on the size, cost and power consumption of first-generation Calliope and includes new, powerful features such as an EAL5+ secure enclave usable as an iSIM. Calliope 2 GC02S1 modules utilize a single rail power supply starting at 3.1 V. Sequans designs and owns all chipsets and software used in its modules, thus ensuring lowest total cost of ownership and fast time to market.

Applications

The Calliope 2 GC02S1 modules are ideal connectivity for M2M and IoT devices, including utility meters, industrial sensors, security and alarm systems, payment systems, asset trackers, and numerous additional devices for smart home, smart city, and wearable applications leveraging the mature 4G Cat 1 network deployed all over the world even in regions where LTE-M or NB-IoT are not fully available.

Key Features

Integrated security and iSIM

The secure enclave in Calliope 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 its chips and processes are certified to Common Criteria EAL5+, the same high standard as traditional SIM cards. Customers can also use the embedded secure enclave for secure key storage and cryptographic operations at the application level.

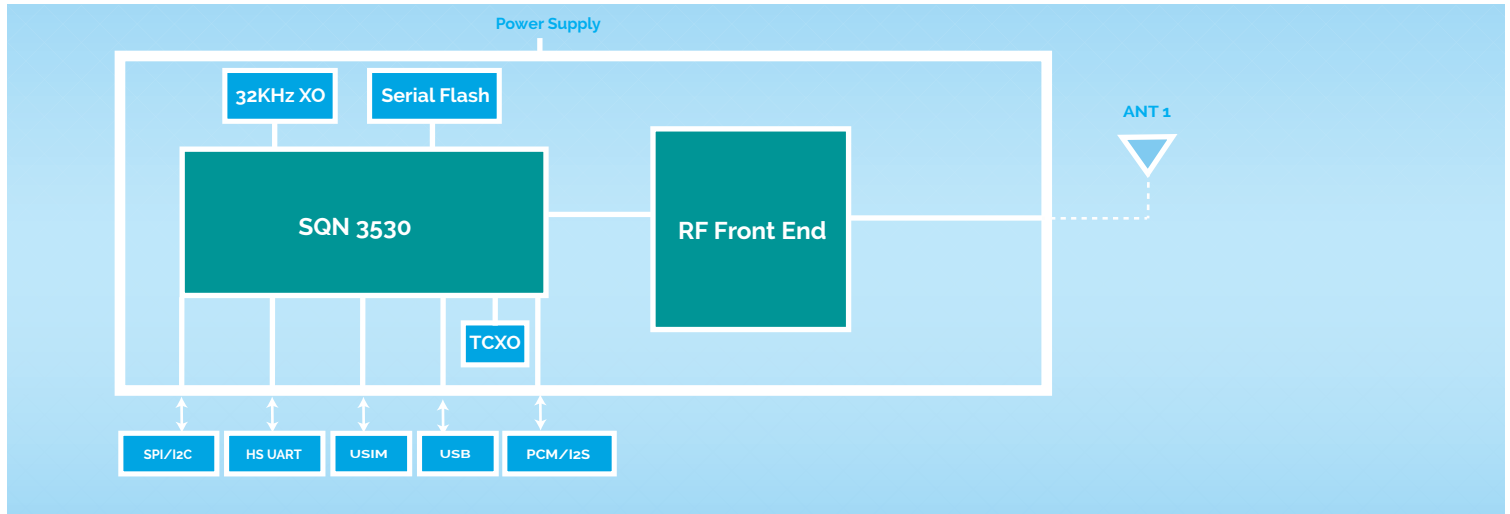
Ultra-low power consumption

Calliope 2 GC02S1 modules deliver significant improvement in power consumption, thanks to Sequans' proprietary Dynamic Power Management™ technology, which adapts sleep and active state power consumption enabling battery-powered Cat 1 IoT devices.

Module Variants	Regions	LTE bands Supported
GC02S1-NA	North America	2, 4, 5, 12, 13, 17, 25, 66
GC02S1-JP	Japan	1, 18, 19, 26
GC02S1-EU	Europe	1, 3, 8, 20, 28A

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Calliope 2 GC02S module block diagram



Product Characteristics

LTE Modem

- ❖ 21 x 19.5 x 1.9 mm LGA module
- ❖ 3GPP Cat 1 Release 14/15
- ❖ SMS support
- ❖ VoLTE support
- ❖ Max transmit power up to +23 dBm
- ❖ Single power supply: 3.1V-5.5V

Throughput

- ❖ LTE Cat 1: up to 10 Mbps DL; 5 Mbps UL

Interfaces

- ❖ UART x 4
- ❖ USB
- ❖ x2 USIM interface
- ❖ PCM for digital audio
- ❖ JTAG
- ❖ I2C
- ❖ SPI
- ❖ ADC
- ❖ GPIO including multiple module wake inputs
- ❖ 50 ohm antenna interface

Software

- ❖ Field proven LTE software stack
- ❖ Rich set of AT commands compatible with LTE-M/NB-IoT Monarch 2 GM02S
- ❖ LWM2M stack compliant with mobile network operators needs
- ❖ Audio
 - o Support of G711/AMR-NB/AMR-WB/AMR-SWB/EVS codecs
 - o Echo cancelation, noise suppression, comfort noise generation, and DTMF support
- ❖ Support of HTTPS, MQTTS, CoAP to connect to all cloud platforms
- ❖ USB Windows driver

Environmental

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