CAVLI wireless

Technical Specification Document

C16QS

Cat 1.bis LTE Module

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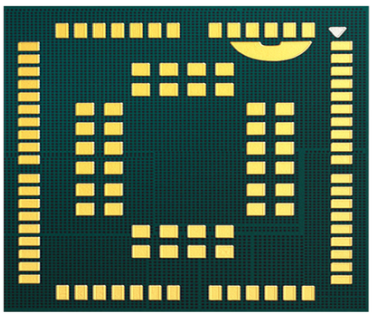
Cavli C Series

Cavli C-Series C16QS Module

LTE Cat 1.bis Module



C16QS is a series of new LTE Cat1.bis modules with optional integrated GNSS and eSIM optimized for IoT applications with low cost and low power consumption. It is compliant to 3GPP Rel14 Cat.1bis standards and ideal for customers interested in switching from legacy 2G and 3G solutions to LTE.

C16QS comes with unique features that enables easy product development and faster go to market for product makers. Its enhanced tracking features that process GPS data on the edge, independent LTE and GNSS power supply and sleep features and low power modes making it ideal for applications such as asset tracking, POS and remote monitoring and energy metering.

C16QS comes in 7 variants - Eurasia and Japan, North America, Latin America, South-East Asia, Europe alone, Indian alone and Global variant respectively, covering different countries and regions.

Key features

- CAT 1.bis — LTE Cat 1.bis
- Integrated GNSS
- LGA — Small Form Factor Design
- USB 2.0 Interface
- eSIM — eSIM
- Cavli Hubble Platform
- Low Power Consumption
- Power Saving Mode

C16QS

Basic Information

Region	EAJ / EU/ NA/ AN/ LA / IN / WW
CPU	ARM Cortex M3 processor @204MHz clock
Memory	4MB NOR Flash + 1.25MB RAM
OS	FreeRTOS
Package	LGA & mPCIe
Pin Count	102
Dimensions	26.5 x 22.5 x 2.3 mm
Weight	3.9g
Operating Temperature	-40 °C to +85 °C

Radio Frequency Bands

RAT	Cat 1.bis
Transmission Rates	DL 10Mbps & UL 5 Mbps
LTE Band List	EAJ - 1/ 3/ 5/ 7/ 8/ 18/19/20/26/28/40/41 EU - 1/ 3/ 5/ 7/ 8/ 20/ 28 NA - 2/ 4/ 5/ 12/ 13/ 25/ 66 AN - 1/ 3/ 5/ 8/ 18/ 19/ 26/ 28 LA - 1/ 2/ 3/ 4/ 5/ 7/ 8 IN - 1/ 3/ 5/ 8/ 40/ 41 WW - 1/ 2/ 3/ 4/ 5/ 7/ 8/ 12/ 13/ 18/ 19/ 20/ 25/ 26/ 28/ 40/ 41/ 66
3GPP Release	14

GNSS Capability

GNSS (GNA Variant)	GPS/ BeiDou

Network Protocols

Internet Protocols	TCP(S), HTTP(S), FTP(S), MQTT(S), UDP, PPP

Interfaces

UART	x3
USB 2.0	x1
USIM (DSSS) (1.8V / 3.0V)	x1
SWD	x1
Network Status Indicator	x1
Power ON Status Indicator	x1
ADC	x2
I2S [2]	x1

[1] Optional

[2] Needs SDK

[3] In Progress

I2C [2]	x1
SPI [2]	x1
GPIO [2]	x4
Main ANT	x1
GNSS ANT	x1

Electrical Characteristics

Operating Voltage	Range: 3.4 V to 4.2 V Typical: 3.7 V
Tx Peak (@23dBm)	650.88 mA
Tx Idle (USB Connected)	EAJ : 34.2 mA EU : 34.2 mA NA : 34.1 mA AN : 34.2 mA LA : 34.2 mA IN : 34.1 mA WW : 34.3 mA
Tx Idle (USB disconnected)	5.1 mA
Sleep Mode (Hibernate)	11 µA
GNSS (Fix)	60 mA

Enhanced Features

SMS - SG	Yes
DFOTA	Yes

Driver Support

USB Driver	RNDIS / CDC-ECM / CDC-ACM

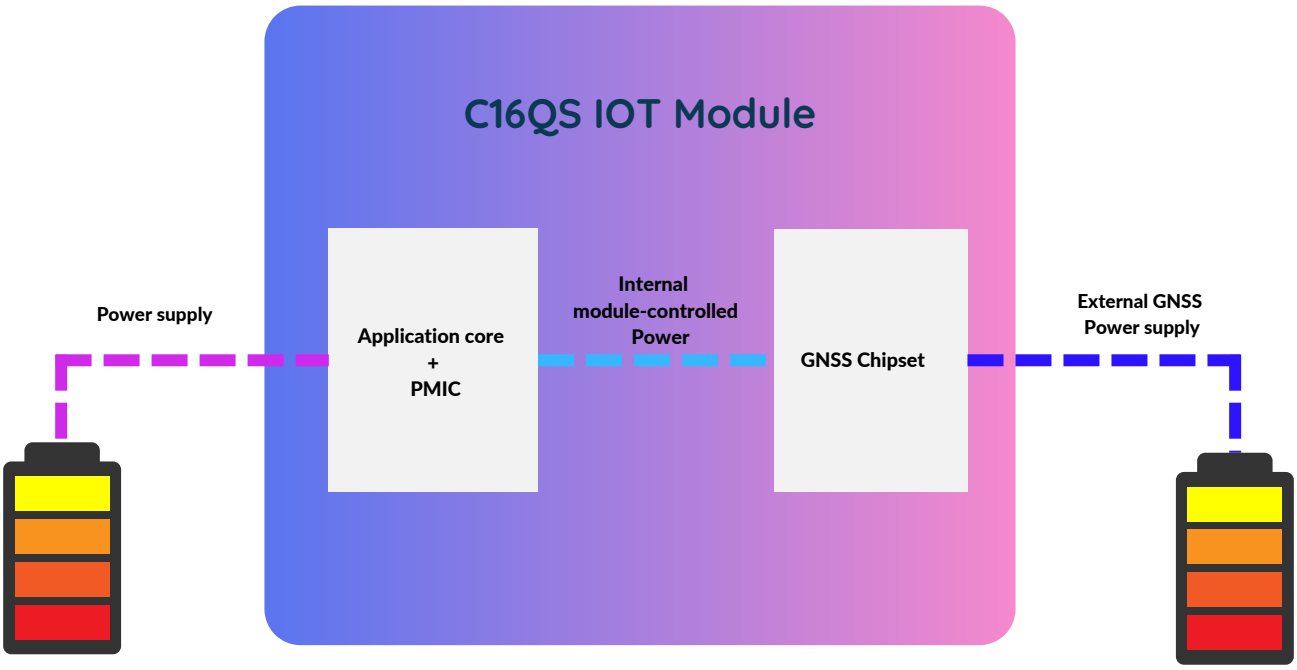
Certifications

Regulatory	Global : GCF [3] Europe : CE UK : UKCA [3] Taiwan : NCC [3] South Africa: ICASA N.A : PTCRB [3] Brazil : ANATEL [3] Australia : RCM [3] America : FCC Canada : IC Japan : TELEC [3]
Carrier	TBD
Others	RoHS / REACH

[1] Optional [2] Needs SDK [3] In Progress

Other Features	
Integrated GNSS	Optional
Integrated eSIM + Cavli Hubble Global Connectivity and Device Management Platform	Optional
miniPCIe Form Factor	Optional

Independent Operation of GNSS and Cellular



C16QS has a feature that enables independent functionality of its baseband and GNSS cores. The provision for an external supply to the GNSS core directly enables the user to utilize the location services without powering the baseband core. The GNSS services can also be accessed via the modem's Cavli proprietary AT commands.

Product Variants

Features	Modem Only	Modem + eSIM	Modem + GNSS (L1)	Modem + eSIM + GNSS (L1)
EAJ EMEA, APAC and Japan	C16QS-EAJ-S00N	C16QS-EAJ-S00H	C16QS-EAJ-GNAN	C16QS-EAJ-GNAH
EU Europe	C16QS-EU-S00N	C16QS-EU-S00H	C16QS-EU-GNAN	C16QS-EU-GNAH
NA North America	C16QS-NA-S00N	C16QS-NA-S00H	C16QS-NA-GNAN	C16QS-NA-GNAH
LA Latin America	C16QS-LA-S00N	C16QS-LA-S00H	C16QS-LA-GNAN	C16QS-LA-GNAH
AN Australia, New Zealand, Taiwan and South Korea	C16QS-AN-S00N	C16QS-AN-S00H	C16QS-AN-GNAN	C16QS-AN-GNAH
IN India	C16QS-IN-S00N	C16QS-IN-S00H	C16QS-IN-GNAN	C16QS-IN-GNAH
WW World Wide	C16QS-WW-S00N	C16QS-WW-S00H	C16QS-WW-GNAN	C16QS-WW-GNAH

For more information

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