



Technical Specification Document

C16QS

Cat 1.bis LTE Module

Contact: sales@cavliwireless.com
Visit : www.cavliwireless.com



Cavli
C Series

RoHS
Compliant

LTE Cat 1.bis

CAVLI
wireless

C16QS

PN: C16QS - XXXX
SN: XXXXXXXX
IMEI: XXXXXXXXXXXXXXXX



Cavli C-Series C16QSModule

Cat 1.bis LTE Module



C16QS is a series of new LTE Cat1.bis modules with optional integrated GNSS and eSIM optimised 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 processes 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 5 variants - Europe and Asia, South East Asia, North America, Latin America and Global variant respectively, covering different countries and regions. Being pin compatible with Cavli C42QM and C42GM modules which enables easy migration.

Key features



LTE Cat 1.bis



Integrated GNSS



Small Form Factor Design



USB 2.0 Interface



eSIM



Cavli Hubble Platform



Low Power Consumption



Power Saving Mode

	C16QS-EA EMEA and APAC	C16QS-NA North America	C16QS-AN Australia, New Zealand, Taiwan, Japan and S. Korea	C16QS-LA Latin America	C16QS-WW Global
--	----------------------------------	----------------------------------	--	----------------------------------	---------------------------

Basic Information

CPU	ARM Cortex M3 processor @ 204MHz clock	ARM Cortex M3 processor @ 204MHz clock	ARM Cortex M3 processor @ 204MHz clock	ARM Cortex M3 processor @ 204MHz clock	ARM Cortex M3 processor @ 204MHz clock
Memory	4MB NOR Flash + 1.25MB RAM	4MB NOR Flash + 1.25MB RAM	4MB NOR Flash + 1.25MB RAM	4MB NOR Flash + 1.25MB RAM	4MB NOR Flash + 1.25MB RAM
OS	FreeRTOS	FreeRTOS	FreeRTOS	FreeRTOS	FreeRTOS
Package	LGA & mPCIe ³	LGA & mPCIe ³	LGA & mPCIe ³	LGA & mPCIe ³	LGA & mPCIe ³
Dimensions	26.5 x 22.5 x 2.3 mm	26.5 x 22.5 x 2.3 mm	26.5 x 22.5 x 2.3 mm	26.5 x 22.5 x 2.3 mm	26.5 x 22.5 x 2.3 mm
weight	3.9 mg	3.9 mg	3.9 mg	3.9 mg	3.9 mg
Operating Temperature	-35 °C to +75 °C	-35 °C to +75 °C	-35 °C to +75 °C	-35 °C to +75 °C	-35 °C to +75 °C
Storage Temperature	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C

Radio Frequency Bands

RAT	Cat1.bis	Cat1.bis	Cat1.bis	Cat1.bis	Cat1.bis
Transmission Rates (Peak)	DL 10Mbps & UL 5 Mbps	DL 10Mbps & UL 5 Mbps	DL 10Mbps & UL 5 Mbps	DL 10Mbps & UL 5 Mbps	DL 10Mbps & UL 5 Mbps
LTE Band List	B1/ B3/ B5/ B8/ B20	B2/ B4/ B5/ B12/ B13/ B66	B1/ B3/ B5/ B8/ B18/ B19/ B26/ B28	B2/ B3/ B4/ B7/ B8/ B28	B1/ B2/ B3/ B4/ B5/ B8/ B12/ B18/ B19/ B20/ B26/ B28/ B66

¹Optional

²Needs SDK. Not available currently

³In Progress

	C16QS-EA	C16QS-NA	C16QS-AN	C16QS-LA	C16QS-WW
3GPP Release	14	14	14	14	14
GNSS Capability					
GNSS (GNA Variant)	GPS/ BeiDou SBAS + QZSS Capable	GPS/ BeiDou SBAS + QZSS Capable	GPS/ BeiDou SBAS + QZSS Capable	GPS/ BeiDou SBAS + QZSS Capable	GPS/ BeiDou SBAS + QZSS Capable
Network Protocols					
Internet Protocols	TCP(S), HTTP(S), FTP(S), MQTT(S), UDP, PPP	TCP(S), HTTP(S), FTP(S), MQTT(S), UDP, PPP	TCP(S), HTTP(S), FTP(S), MQTT(S), UDP, PPP	TCP(S), HTTP(S), FTP(S), MQTT(S), UDP, PPP	TCP(S), HTTP(S), FTP(S), MQTT(S), UDP, PPP
Interfaces					
UART	x3	x3	x3	x3	x3
USB 2.0	x1	x1	x1	x1	x1
USIM (DSSS) (1.8V / 3.0V)	x1	x1	x1	x1	x1
SWD	x1	x1	x1	x1	x1
Network Status Indicator	x1	x1	x1	x1	x1
Power ON Status Indicator	x1	x1	x1	x1	x1
ADC ²	x2	x2	x2	x2	x2
I2S ²	x1	x1	x1	x1	x1
I2C ²	x1	x1	x1	x1	x1
SPI ²	x1	x1	x1	x1	x1

¹Optional

²Needs SDK. Not available currently

³In Progress

	C16QS-EA	C16QS-NA	C16QS-AN	C16QS-LA	C16QS-WW
GPIO ¹	x4	x4	x4	x4	x4
Main ANT	x1	x1	x1	x1	x1
GNSS ANT ¹	x1	x1	x1	x1	x1

Electrical Characteristics

Operating Voltage	Range: 3.4 V to 4.2 V Typical: 3.7 V	Range: 3.4 V to 4.2 V Typical: 3.7 V	Range: 3.4 V to 4.2 V Typical: 3.7 V	Range: 3.4 V to 4.2 V Typical: 3.7 V	Range: 3.4 V to 4.2 V Typical: 3.7 V
TxD Peak (@23dBm)	620 mA	620 mA	TBD	TBD	TBD
TxD Typical	70 mA	68 mA	TBD	TBD	TBD
TxD Idle (@23dBm)	18 mA	16 mA	TBD	TBD	TBD
Sleep Mode	TBD	TBD	TBD	TBD	TBD
GNSS (Fix)	60 mA	60 mA	60 mA	60 mA	60 mA

Enhanced Features

SMS-SG	Yes	Yes	Yes	Yes	Yes
DFOTA	Yes	Yes	Yes	Yes	Yes

Driver Support

USB Driver	Windows 7 and above, Linux Kernel 4.4 – 5.15	Windows 7 and above, Linux Kernel 4.4 – 5.15	Windows 7 and above, Linux Kernel 4.4 – 5.15	Windows 7 and above, Linux Kernel 4.4 – 5.15	Windows 7 and above, Linux Kernel 4.4 – 5.15
RNDIS Driver	Windows 7 and above	Windows 7 and above	Windows 7 and above	Windows 7 and above	Windows 7 and above
CDC ACM Driver	Linux Kernel 4.4 – 5.15	Linux Kernel 4.4 – 5.15	Linux Kernel 4.4 – 5.15	Linux Kernel 4.4 – 5.15	Linux Kernel 4.4 – 5.15

¹Optional

²Needs SDK. Not available currently

³In Progress

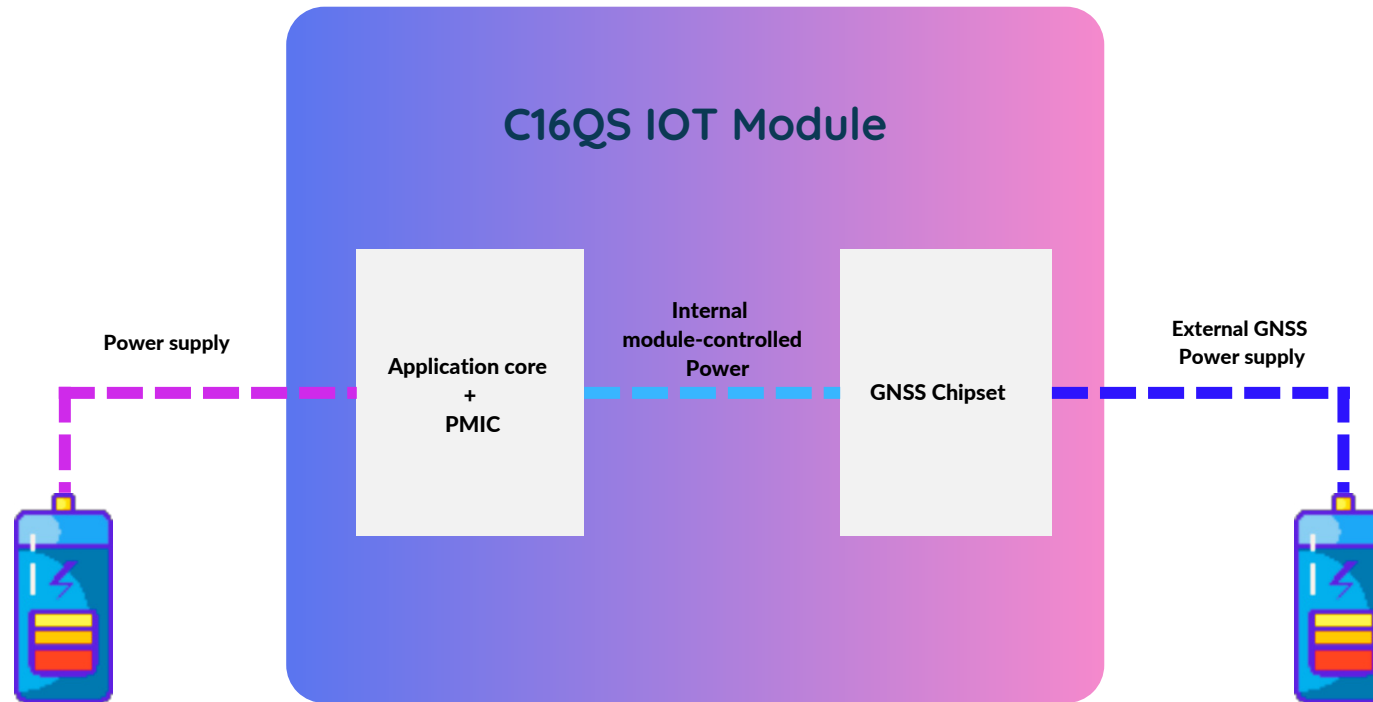
	C16QS-EA	C16QS-NA	C16QS-AN	C16QS-LA	C16QS-WW
Certifications					
Regulatory	Global : GCF ³ Europe : CE UK : UKCA ³	America : FCC ³ NA : PTCRB ³ Canada : IC ³	Europe : CE Taiwan : NCC ³	Europe : CE Brazil : ANATEL ³	Global : GCF ³ Europe : CE NA : PTCRB ³ America : FCC ³ Canada : IC ³
Carrier	Telefonica ³ /DT ³ /Orange ³	Verizon ³ /AT&T ³ /T-Mobile ³	TBD	TBD	Verizon ³ /AT&T ³ /TMobile ³
Others	RoHS/REACH	RoHS/REACH	RoHS/REACH	RoHS/REACH	RoHS/REACH
Other Features					
Integrated GNSS	Optional	Optional	Optional	Optional	Optional
Integrated eSIM + Hubble	Optional	Optional	Optional	Optional	Optional

¹Optional

²Needs SDK. Not available currently

³In Progress

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	EA EMEA and APAC	NA North America	AN Australia, New Zealand, Taiwan, Japan and South Korea	LA Latin America	WW Global
Modem Only	C16QS-EA-S00N	C16QS-NA-S00N	C16QS-AN-S00N	C16QS-LA-S00N	C16QS-WW-S00N
Modem + eSIM	C16QS-EA-S00H	C16QS-NA-S00H	C16QS-AN-S00H	C16QS-LA-S00H	C16QS-WW-S00H
Modem + GNSS (L1)	C16QS-EA-GNAN	C16QS-NA-GNAN	C16QS-AN-GNAN	C16QS-LA-GNAN	C16QS-WW-GNAN
Modem + eSIM + GNSS (L1)	C16QS-EA-GNAH	C16QS-NA-GNAH	C16QS-AN-GNAH	C16QS-LA-GNAH	C16QS-WW-GNAH

Cavli Inc. All rights reserved. No portions of this document may be reproduced without prior written consent of Cavli Inc. Specifications are subject to change without notice. Cavli, the Cavli logo are trademarks or registered trademarks of Cavli Inc. in the United States and/or other countries. All other brands or products are trademarks or registered trademarks of their respective holders and should be treated as such.

For more information

Contact : sales@cavliwireless.com | Visit : www.cavliwireless.com

