Product Summary

CAM-M8 series

Omni-directional u-blox M8 GNSS antenna modules

Standard

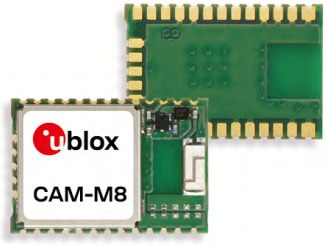
Professional

Automotive

Smart antenna module for omnidirectional GNSS reception

- Concurrent reception of up to 3 GNSS (GPS, Galileo, GLONASS, BeiDou)
- Miniature size and weight with low power consumption
- Embedded, omni-directional and wideband antenna
- Industry leading –167 dBm navigation sensitivity
- Product variants to meet performance and cost requirements
- Optional external antenna

9.6 × 14.0 × 1.95 mm



Product description

The u-blox CAM-M8 series antenna modules are built on the exceptional performance of the u-blox M8 GNSS engine. The CAM-M8 modules utilize concurrent reception of up to three GNSS systems (GPS/Galileo together with either BeiDou or GLONASS), offering high sensitivity and strong signal levels in an ultra compact form factor.

Incorporating the CAM-M8 series modules into customer designs is simple and straightforward, thanks to the embedded GNSS antenna, small footprint of 9.6 x 14 x 1.95 mm, and sophisticated interference suppression that ensures maximum performance even in GNSS-hostile environments. The low power consumption and thin design allow end devices to be slimmer and smaller. The CAM-M8 modules also support message integrity protection, geofencing, and spoofing detection.

Despite their miniature size, the chip antennas in the CAM-M8 series modules perform extremely well against traditional patch antennas. Optimal performance is achieved by following design instructions available in the Hardware Integration Manual as the customer PCB is part of the antenna solution. The omnidirectional radiation pattern increases flexibility for device installation. Optionally, CAM-M8 series modules can be connected to an external GNSS antenna. The SMD design keeps manufacturing costs to a minimum and the small mass ensures high reliability.

The CAM-M8 modules target industrial and consumer applications that require concurrent GPS/Galileo and GLONASS or GPS/Galileo and BeiDou reception. The CAM-M8C is optimized for cost-sensitive applications and has the lowest power consumption, while the CAM-M8Q provides best performance. The CAM-M8 modules are form-factor compatible with the UC530 and UC530M modules, allowing the upgrade of existing designs with minimal effort.

CAM-M8 modules use GNSS chips qualified according to AEC-Q100 and are manufactured in ISO/TS 16949 certified sites. Qualification tests are performed as stipulated in the ISO16750 standard: “Road vehicles – Environmental conditions and testing for electrical and electronic equipment”.

	CAM-M8C	CAM-M8Q
Grade		
Automotive		
Professional	•	•
Standard		
GNSS		
GPS / QZSS	•	•
GLONASS	•	•
Galileo	•	•
BeiDou	•	•
Number of concurrent GNSS	3	3
Interfaces		
UART	1	1
USB		
SPI	1	1
DDC (I²C compliant)	1	1
Features		
Additional SAW	•	•
Additional LNA	•	•
RTC crystal	♦	•
Oscillator	C	T
Built-in antenna	•	•
Timepulse	1	1
Power supply		
1.65 V – 3.6 V	•	
2.7 V – 3.6 V		•

♦ = Yes, but with higher backup current T = TCXO C = Crystal

CAM-M8 series

Features

Receiver type	72-channel u-blox M8 engine GPS/QZSS L1 C/A, GLONASS L10F, BeiDou B11, Galileo E1B/C SBAS L1 C/A: WAAS, EGNOS, MSAS, GAGAN	
Nav. update rate	Single GNSS: 2 Concurrent GNSS:	up to 18 Hz up to 10 Hz
Position accuracy	Autonomous	2.5 m CEP
Acquisition[1] Cold starts: Aided starts: Reacquisition:	CAM-M8Q 26 s 2 s 1 s	CAM-M8C 26 s 3 s 1 s
Sensitivity[1] Tracking & Nav.: Cold starts: Hot starts:	 –167 dBm –148 dBm –157 dBm	 –164 dBm –148 dBm –157 dBm
Assistance GNSS	AssistNow Online AssistNow Offline (up to 35 days) AssistNow Autonomous (GPS only, up to 3 days) OMA SUPL & 3GPP compliant	
Oscillator	TCXO (CAM-M8Q) Crystal (CAM-M8C)	
RTC crystal	Built-In (CAM-M8Q) or cost efficient solution with higher Backup current (CAM-M8C)	
Noise figure	On-chip LNA and extra LNA for lowest noise figure	
Anti jamming	Active CW detection and removal; extra onboard SAW band pass filter	
Memory	Onboard ROM	
Raw Data	Code phase output	
Odometer	Integrated in navigation filter	
Geofencing	Up to 4 circular areas GPIO for waking up external CPU	
Spoofing detection	Built-in	
Signal integrity	Signature feature with SHA 256	

1 For default mode: GPS incl. QZSS, SBAS

Electrical data

Supply voltage	1.6 V to 3.6 V (CAM-M8C) 2.7 V to 3.6 V (CAM-M8Q)
Digital I/O voltage level	1.6 V to 3.6 V (CAM-M8C) 2.7 V to 3.6 V (CAM-M8Q)
Power Consumption[2]	28 mA @ 3.0 V (Continuous) 10.1 mA @ 3.0 V Power Save mode (1 Hz)
Backup Supply	1.4 V to 3.6 V

2 CAM-M8C, GPS/SBAS/QZSS+GLONASS (default mode)

Package

31 pin LCC (Leadless Chip Carrier): 9.6 x 14.0 x 1.95 mm, 0.5 g

Environmental data, quality & reliability

Operating temp.	–40 °C to +85 °C
Storage temp.	–40 °C to +85 °C

RoHS compliant (lead-free)

Qualification according to ISO 16750

Manufactured in ISO/TS 16949 certified production sites

Uses u-blox M8 chips qualified according to AEC-Q100

Interfaces

Serial interfaces	1 UART 1 SPI (Optional) 1 DDC (I^2C compliant)
Digital I/O	Configurable timepulse 1 EXTINT input for Wakeup
Timepulse	Configurable: 0.25 Hz to 10 MHz
Protocols	NMEA, UBX binary, RTCM

Support products

u-blox M8 Evaluation Kits:

Easy-to-use kits to get familiar with u-blox M8 positioning technology, evaluate functionality, and visualize GNSS performance.

EVK-M8QCAM	u-blox M8 concurrent GNSS evaluation kit (TCXO), supports CAM-M8Q
EVK-M8CCAM	u-blox M8 concurrent GNSS evaluation kit, (Crystal), supports CAM-M8C

Product variants

CAM-M8Q	u-blox concurrent GNSS LCC antenna module, TCXO, SAW, LNA
CAM-M8C	u-blox concurrent GNSS LCC antenna module, Crystal, SAW, LNA

Further information

For contact information, see www.u-blox.com/contact-us.

For more product details and ordering information, see the product data sheet.