UBX-G6010-SA/ UBX-G6000-BA Automotive
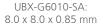
u-blox 6 GPS & Galileo chips

Highlights

- High level of design flexibility
- Cost effective automotive solution
- Supports FW upgrade[1]
- Supports u-blox Automotive Dead Reckoning (ADR)[1, 2]
- Qualified according to AEC-Q100
- Manufactured in ISO/TS 16949 certified production sites

UBX-G6010-SA:
8.0 x 8.0 x 0.85 mm

UBX-G6000-BA:
9.0 x 9.0 x 0.91 mm

UBX-G0010-QA:
4.0 x 4.0 x 0.85 mm

Features

- u-blox 6 position engine:
  - o Navigate down to –162 dBm and –148 dBm coldstart
  - o Faster acquisition with AssistNow Autonomous
  - o Configurable power management
  - o Hybrid GPS/SBAS engine (WAAS, EGNOS, MSAS)
  - o Anti-jamming technology
- Simple integration with u-blox wireless modules
- A-GPS: AssistNow Online and AssistNow Offline services, OMA SUPL compliant
- Galileo, GLONASS and QZSS ready[1]
- Backward compatible (hardware and firmware); easy migration from u-blox 5
- Operating temperature range: –40°C to 85°C
- 3GPP compliant
- Compatible with u-blox GPS Solution for Android

[1] External Flash required (UBX-G6000-BA/G0010-QA only).
[2] UBX-G6010-SA drop-in compatible with UBX-G6010-SA-DR Dead Reckoning chip.

Product description

The UBX-G6010-SA and UBX-G6000-BA/G0010-QA automotive grade GPS chips from u-blox meet the quality and reliability demands of automotive applications. The dedicated manufacturing process addresses automotive customers' expectations for continuous support and operation over a long product life cycle.

u-blox 6 has been designed with low power consumption and low costs in mind. Intelligent power management is a breakthrough for low-power applications. The minimal BoM requires as few as 16 passive components, an LDO and LNA are integrated and costly external memory is not needed. Lower price GPS crystals as well as TCXOs are supported, and 2-layer PCB integration capability and small footprint ensure further cost savings.

The UBX-G6010-SA is the ideal GPS chip solution for cost and space sensitive automotive applications, while the UBX-G6000-BA/G0010–QA supports external memory for firmware updates.

Product selector

Model	Type				Supply		Interfaces				Features						
	Standalone GPS	Standalone GLONASS	Timing & Raw Data	Dead Reckoning	1.75 V – 2.0 V	2.5 V – 3.6 V	UART	USB	SPI	DDC (I²C compliant)	Programmable (Flash) FW update	Oscillator	RTC crystal	Antenna supply and supervisor	Configuration pins	Timepulse	External interrupt / Wakeup
UBX-G6010-SA	•	F			•	•	1	•	•	•		C/T	o	o	10	2	2
UBX-G6000-BA/ UBX-G0010-QA	•	F	F	F	•	•	2	•	•	•	F	C/T	o	o	12	2	2

F = Requires external Flash
C/T = Crystal and TCXO supported

o = requires external components

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Receiver performance data

Receiver type	50-channel u-blox 6 engine GPS L1 C/A code Galileo L1 open service (with upgrade) SBAS: WAAS, EGNOS, MSAS QZSS, GLONASS[1]		
Navigation update rate	up to 5 Hz ROM / 2 Hz Flash		
Accuracy[2]	Position SBAS	2.5 m CEP 2.0 m CEP	
Acquisition[2]		TCXO	Crystal
	Cold starts:	26 s	27 s
	Aided starts[3]:	1 s	< 3 s
	Hot starts:	1 s	1 s
Sensitivity[4]		TCXO	Crystal
	Tracking:	−162 dBm	−161 dBm
	Cold starts:	−148 dBm	−147 dBm
	Hot starts:	−157 dBm	−156 dBm
Operational limits	Velocity: Altitude:	500 m/s 50,000 m	

[1] UBX-G6000-BA only, requires FW upgrade
[2] All SV @ −130 dBm
[3] Dependent on aiding data connection speed and latency
[4] Demonstrated with a good active antenna

Electrical data

Supply voltages	1.75 V – 2.0 V 2.5 V – 3.6 V
Digital I/O voltage level	1.65 V – 3.6 V
Power consumption	67 mW @ 1.8 V (continuous) 20 mW @ 1.8 V Power Save Mode (1Hz)
Backup supply	Voltage range: 1.4 V to 3.6 V
RTC input	32.768 kHz (optional)
Antenna supervision	Short and open circuit detection supported with external circuit
Antenna type	Active and passive

Interfaces

External memory interfaces[5]	Data width: Address space:	16 bits 3 x 4 M Bytes
Serial interfaces	1 UART (UBX-G6010) 2 UARTs (UBX-G6000) 1 USB V2.0 full speed 12 Mbit/s 1 DDC (I²C compliant) 1 SPI	
Digital I/O	Configurable time pulse 2 EXTINT interrupt inputs 10 configuration pins (UBX-G6010) 12 configuration pins (UBX-G6000)	

[5] UBX-G6000-BA only

Packages

UBX-G6010-SA:	56 Pin MLF: 8.0 x 8.0 x 0.85 mm
UBX-G0010-QA:	24 Pin MLF: 4.0 x 4.0 x 0.85 mm
UBX-G6000-BA:	100 Pin CVBGA: 9.0 x 9.0 x 0.91 mm

Environmental data, quality & reliability

Operating temp.	−40° C to 85° C
Storage temp.	−40° C to 85° C

RoHS compliant (lead-free) and green (no halogens)

Qualification according to ISO 16750

Manufactured in ISO/TS 16949 certified production sites

Support products

u-blox 6 Evaluation Kit: easy-to-use kit to get familiar with u-blox 6.

EVK-6H:	u-blox 6 Evaluation Kit with TCXO.
EVK-6P:	u-blox 6 Evaluation Kit with Crystal.
EVK-6N:	u-blox 6 Evaluation Kit GPS/GLONASS with TCXO.

u-blox 6 Chipset Development Kit

CDK-6X:	For information contact u-blox.

Ordering information

UBX-G6010-SA	u-blox 6 GPS single chip, 56 Pin MLF
UBX-G6000-BA	u-blox 6 baseband chip, 100 pin CVBGA
UBX-G0010-QA	u-blox 6 RF front-end chip, 24 pin MLF

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