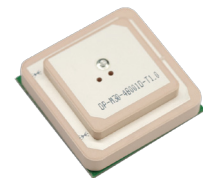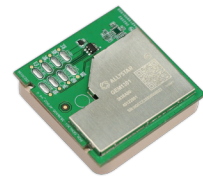# GEM1301

Dual-Band High Precision GNSS Antenna Module

PRODUCT DESCRIPTION

GEM1301 is a high-performance dual-band high precision GNSS positioning module with antenna built-in, which is based on the state of the art CYNOSURE III GNSS SoC chip. It supports BDS-3 signals, along with global civil navigation satellite systems, including GPS, BDS, GLONASS, Galileo, QZSS and SBAS.

HIGHLIGHTS

- Supports GPS, BDS, GLONASS, Galileo, QZSS and SBAS
- Integrates RTK technology
- With the latest low-power consumption architecture design
- Supports multi-system multi-band high precision raw data output for the third party integration
- Being the cost-effective position solution integrated with antenna

Product Selector:

Product	GNSS								Feature								Interface			Accuracy		
	Band (S/D/T)	GPS	BDS	GLONASS	Galileo	NavIC	QZSS	SBAS	Built-in LNA	Programmable (flash)	Data Logging	D-GNSS	Raw data	RTK	Oscillator	Built-in inductor	UART	USB	SPI	Meter	Sub-meter	Centimeter
GEM1301	D	•	•	*	•		•	•	•		•	•	•	•	T		•					•

T = TCXO   * = Supported upon specific firmware.

GENERAL SPECIFICATIONS

GNSS Reception

GPS/QZSS: L1C/A, L5
BDS: B1I, B2a
GLONASS: G1
Galileo: E1, E5a
SBAS: L1

GNSS Channels

40 GNSS tracking channels

Update Rate

PVT	5 Hz
RTK	1 Hz

Position Accuracy

GNSS	1.0m CEP
D-GNSS	< 1.0m CEP
RTK	1.0 cm + 1 ppm (H)
	3.0 cm + 1 ppm (V)

Time to First Fix (TTFF)

Hot start	< 2s
Cold start	< 30s
RTK convergence	< 10s

Sensitivity

Cold start	-148 dBm
Hot start	-155 dBm
Reacquisition	-158 dBm
Tracking	-162 dBm

Velocity & Time Accuracy

GNSS	0.1 m/s CEP
1PPS	20 ns

Interfaces

RS232/TTL*	1

*GEM1301-3838A01 supports RS232 level
 GEM1301-3838A02 supports TTL level

Protocols

NMEA 0183 V4.11 (Default)/V4.10
Cynosure GNSS receiver protocol
RTCM 3.0/3.2

Operation Limit

Velocity	515 m/s
Altitude	18,000m

Operating Condition

Main voltage	3.3-12 V
Digital I/O voltage	3.0-3.6 V
Backup voltage	1.8-3.6 V

Power Consumption

Operating	Acquisition	55 mA @ 3.3V
	Tracking	51 mA @ 3.3V
Standby	12 uA	

ESD

Contact	±8 kV
Air discharge	±12 kV

ENVIRONMENT DATA

Operation temperature	-40°C to +85°C
Storage temperature	-40°C to +85°C
Certification	RoHS 2.0 & REACH

PACKAGE

Dimensions	38*38*13.2 mm

ALLYSTAR