TAOGLAS®

Datasheet

Taoglas EDGE™ Locate EL20

Part No:
EL20

Description:

High Precision GNSS Solution

Ordering Information:
EL20A – Taoglas EDGE™ Locate - cmLevel Positioning Module (With USB to PMOD interface)
EL20B – Taoglas EDGE™ Locate - cmLevel Positioning Module (Module Only)

Features:

High-end RTK capable receiver

Integrated u-blox ZedF9P multi-band GNSS Receiver

Concurrent reception of GPS, GLONASS, Galileo and BeiDou

Anti-spoofing and anti-jamming

PMOD compatible and easy to integrate into third-party hardware

Pre-certified and validated electronics

Easy integration with EDGE Connect for full cellular connectivity

REACH & RoHS Compliant

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1. Introduction

The Taoglas EDGE™ Locate solution is an energy efficient IoT platform that provides high precision GNSS location for both large scale and niche navigation and autonomous applications in an off-the-shelf, compact form factor. The Taoglas EDGE™ Locate GNSS L1/L2/E5b combines the antenna, RF electronics and receiver technology in a single package delivering reliable high accuracy positioning.

Below is a list various application the EDGE™ Locate has been utilised.

Typical Applications

| UAV | Micro Mobility | Agriculture and Machine Control | Robotic Guidance | Professional Sports | Survey and Mapping |

Key Benefits

- Integrated u-blox ZED-F9P module for Multiband RTK to enable cm level positioning.
- Integrated Taoglas Antenna to maximise RF performance.
- Fast time to market, with an accurate navigation solution ready to use out of the box.
- Small form factor for ease of integration into your design.
- Industry standard UART & USB interfaces available.

2. Specifications

|	
Models Name:	EL20
GNSS Module:	u-blox ZED-F9P
Antenna:	Taoglas AGPSF.36G Embedded Active Dual-band GNSS L1/L2 Stacked Patch Antenna
GNSS Constellations:	GPS/QZSS (L1/L2) + GLONASS (G1/G3) + GALILEO (E1/E5b + BeiDou(B1/B2b)
Number of Channels:	184
TTFF:	Cold start: <60s / Warm start <10s
Interface:	SPI/UART via PMOD header
	Geofence output pin
	Power control pin (default On)
Operation Temperature:	-40°C to +85°C
Storage Temperature:	-40°C to +85°C
Weight:	40g
Input Voltage:	5.0V
Position accuracy:	Up to 0.01m + 1 ppm CEP (RTK)
	Up to 0.05m (without RTK)
Nav update rate:	Up to 20 Hz
Acquisition Sensitivity:	-129dBm
Tracking Sensitivity:	-147dBm

GNSS Electrical

Frequency (MHz)	1227.6	1561	1575.4	1602
Group Delay (ns)	25.6	50.4	42.4	44.5
PCO (cm)	0.6	0.5	0.6	1.1
PCV (cm)	4.5	1.4	2	3
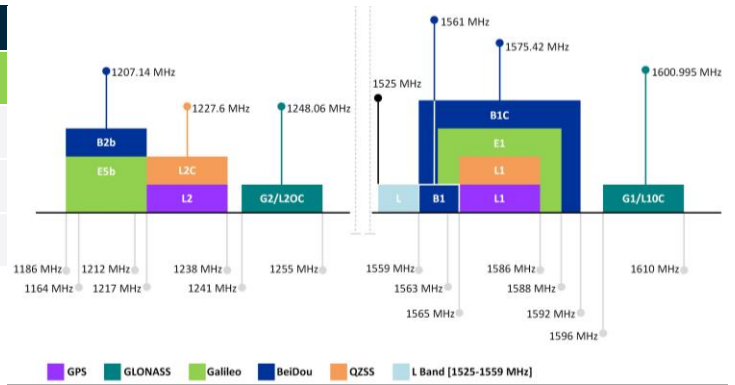
Power Consumption

Symbol	Parameter	Conditions	GPS+GLO+GAL+BDS	GPS	Unit
IPEAK	Peak current	Acquisition	130	120	mA
I_{VCC}[10]	VCC current	Acquisition	90	75	mA
I_{VCC}[10]	VCC current	Tracking	85	68	mA

Low Power Mode: 1.4 mA to achieve a warm start. VCC/VIN Range - 3.3-5.5V.
For more information please refer to the U-blox ZED-F9P datasheets.

Mechanical Specifications
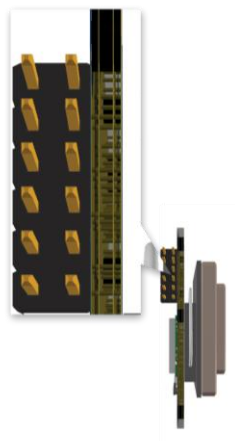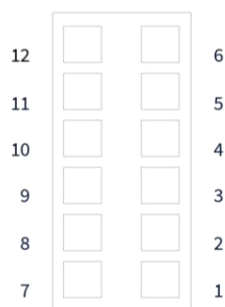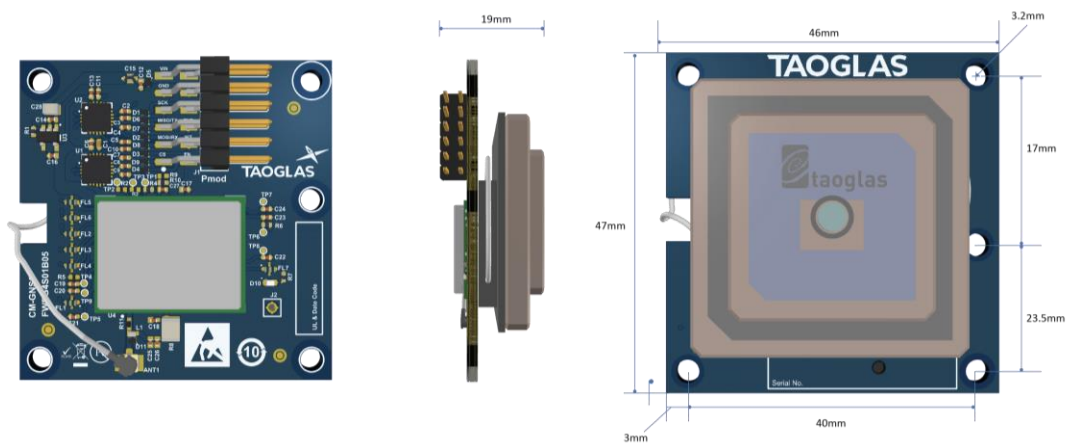
| Pin	Name	Description
1	CS	SPI Chip select
2	MOSI	SPI input / UART_TXD
3	MISO	SPI output / UART_RXD
4	SCK	SPI clock
5 , 11	0VDC	GND
6 , 12	VIN	3.3V Min / 5.0V Typical / 5.5V Max
7	EN	Power enable, Active high (Internally Pulled up)
8	INT	GNSS module external interrupt, unused
9	TXR	SPI Module TX ready
10	GEO	Geofence status from GNSS module

3. Field Test

Taoglas have tested the EL20 in Static and Dynamic environments to verify the performance of the unit.

Field tests were performed in static surroundings in a roof-top open-sky test station for at least 6 hours.

Open-Sky Roof Top testing – Static

Receiver: u-blox ZED-F9P

Correction service: u-blox PointPerfect PPP-RTK

Characteristics:

- Multi-band GNSS: 184-channel GPS L1/L2, GLONASS: G1/G2 Galileo: E1/E5a, BeiDou: B1/B2b, QZSS: L1/L2C
- Multi-band RTK with fast convergence times and reliable performance
- Nav. update rate RTK up to 20 Hz

RTK Availability

- No RTK
- Float
- Fixed
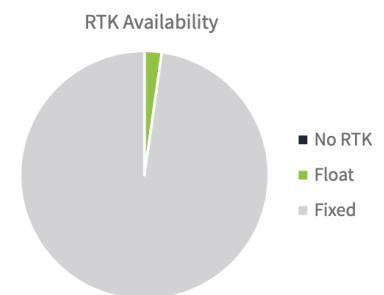
2D Accuracy Table					
Test Condition	Correction Service	CEP (50%)	DRMS (68%)	2DRMS (95-98.2%)	TTFF (sec)
EDGE Locate Board	PPP-RTK DISABLED	54.2 cm	64.97cm	129.93 cm	15
	PPP-RTK ENABLED	11.15 cm	13.38 cm	26.75 cm	

Additionaly dynamic testing was performed on emobility vehicles in various urban setting over a number of separate trials. A detailed report on this test is available on request.

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