Heron

Datasheet

Version 1.1 Teleron

About This Document

This document provides the specifications for the Heron development board module.

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1. Overview

Heron allows receiving and processing Gnss and MPU data with Esp32 microcontroller and transmitting data over LoRa, Xbee, LTE modules over UART Protocol. In addition, the settings of the GNSS receiver can be changed with the ports found on the card itself.

At the center of this module is the ESP32-Wroom chip. Embedded chips are designed to be scalable and adaptable. There are two CPU cores that can be controlled separately, and the CPU clock frequency can be adjusted between 80 MHz and 240 MHz. Users can also turn off the CPU and use a low-power coprocessor to constantly monitor peripherals for changes or threshold violations. ESP32 integrates rich peripherals such as capacitive touch sensors, Hall sensor, SD card interface, Ethernet, high speed SPI, UART, I2S and I2C.

The integration of Bluetooth, Bluetooth LE and Wi-Fi ensures that a wide range of applications can be targeted, and that the module is all-around: using Wi-Fi allows a large physical range and direct connection to the Internet through a Wi-Fi router. The Wi-Fi module allows users to easily connect to a mobile phone while using Bluetooth or broadcast low energy beacons for detection. The sleep current of the ESP32 chip is less than 5 μA, making it suitable for battery-powered and wearable electronics applications. The module supports up to 150 Mbps data rate and 20 dBm output power at antenna to provide the widest physical range. As a result, the module offers industry-leading features and best-in-class performance in terms of electronic integration, range, power consumption and connectivity.

Table 1 provides the specifications of Heron.

Table 1: Heron Specifications

Categories	Items	Specifications
Wi-Fi	Protocols	802.11 b/g/n (802.11n up to 150 Mbps)
		A-MPDU and A-MSDU aggregation and 0.4 μs guard interval support
	Frequency range	2.4 GHz ~2.5 GHz
Bluetooth	Protocols	Bluetooth v4.2 BR/EDR and Bluetooth LE specification
	Radio	NZIF receiver with –97 dBm sensitivity
		Class-1, class-2 and class-3 transmitter
NRF24L01	Frequency range	It can broadcast in the 2.4GHz band.
	Communication speed	Speeds such as 250 KBps, 1 MBps and 2 MBps can also be selected
	Operating voltage	1.9-3.6V
	I/O Ports Operating Voltage	0-3.3V/5V
	Transmitter Signal Strength	+7 dB
	Receiver Sensitivity	≤90dB
	Communication Distance	250m in Open Area
	Dimensions	15x29mm

Categories	Items	Specifications
XB24CZ7WIT-004 XBee Module	TX Peak Current	40 mA
	RX Current	40 mA (@3.3 V)
	Power-down Current	< 1 μA
	Indoor/Urban	up to 133 ft (40 m)
	Outdoor line-of-sight	up to 400 ft (120 m)
	Transmit Power	2 mW (3 dBm)
	Receiver Sensitivity	-96 dBm
	Dimensions	24mm x 28mm x 9mm (0.94in x 1.1in x 0.3in)
Hardware	Module interfaces	SD card, UART, SPI, SDIO, I2C, LED PWM, Motor PWM, I2S, IR, pulse counter, GPIO, capacitive touch sensor, ADC, DAC
	On-chip Sensor	Hall sensor
	Integrated crystal	40 MHz crystal
	Integrated SPI flash	4 MB
	Operating voltage/ Power supply	2.7 V ~ 3.6 V
	Operating current	Average: 80 mA
	Minimum current delivered by power supply	500 mA
	Recommended Operating Temperature Range	–40 °C ~+85 °C
	Package size	(18.00±0.10) mm × (25.50±0.10) mm × (3.10±0.10) mm

2. Heron RTK-GPS System

2.1 Heron RTK-GPS Base Station

The multi-band Heron RTK-GPS Base station receiver delivers centimeter accuracy in seconds. The base station simultaneously connects with GPS, GLONASS, GALILEO and BeiDou Satellite Systems.

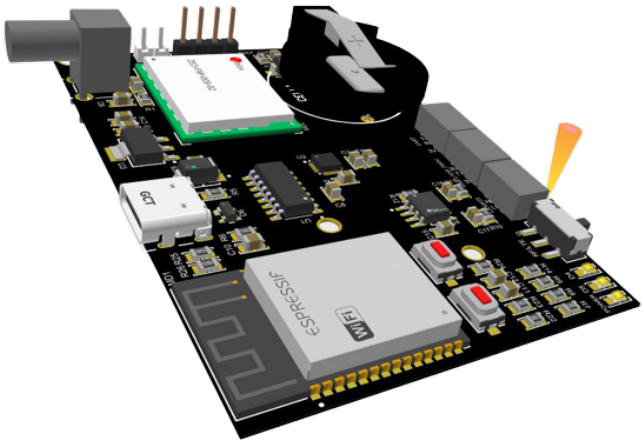

Figure 1: Heron RTK-GPS Base Station

2.2 Heron RTK- GPS 4G-LTE Data Link Module

Gnss and MPU data can be packaged together with the Esp32 microcontroller, and you can communicate via UART and with the 4G-LTE Data Link module without any distance.

To use this module, the switch on the main module must be in LTE mode.

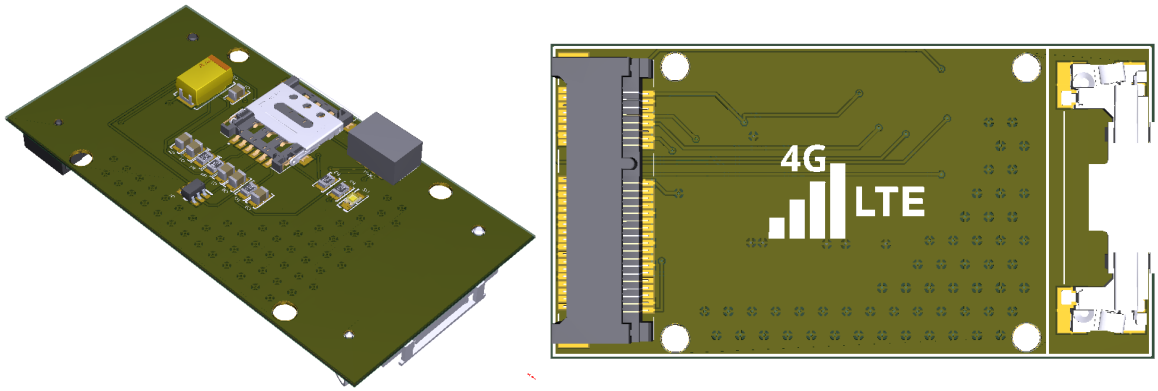

Figure 2: Heron RTK- GPS 4G-LTE Data Link Module

2.3 Heron RTK- GPS LoRa Data Link Module

Gnss and MPU data can be packaged together with the Esp32 microcontroller, and you can communicate via UART and LoRa Data Link Module up to 3 km without losing data.

To use this module, the switch on the main module must be in RF mode.

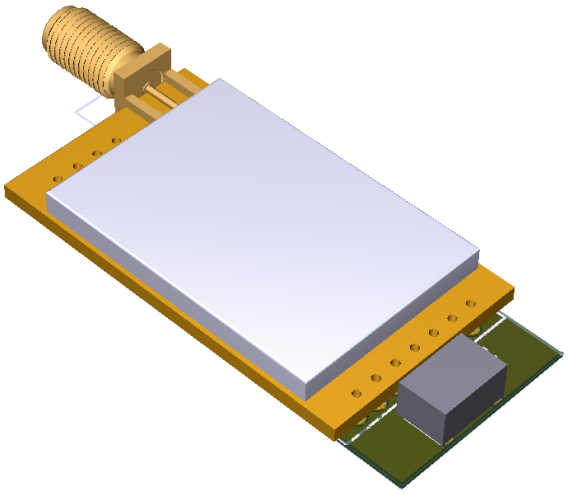

Figure 3: Heron RTK-GPS LoRa Data Link Module

2.4 Heron RTK- GPS Xbee Data Link Module

Gnss and MPU data can be packaged together with the Esp32 microcontroller, and you can communicate via UART and with the Xbee Data Link Module up to 3 km without losing data.

To use this module, the switch on the main module must be in RF mode.

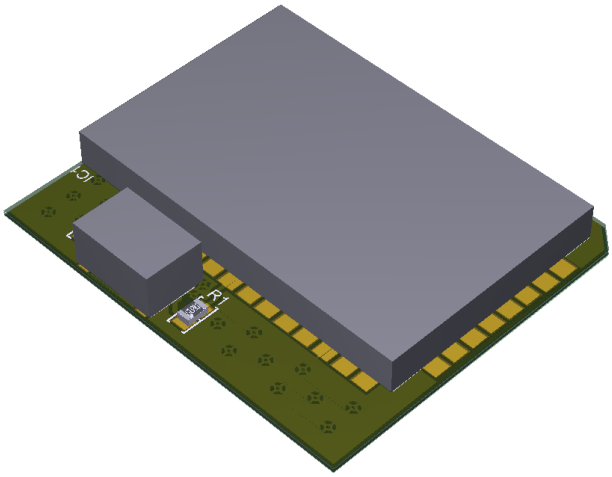

Figure 4: Heron RTK- GPS Xbee Data Link Module

3. Physical Dimensions

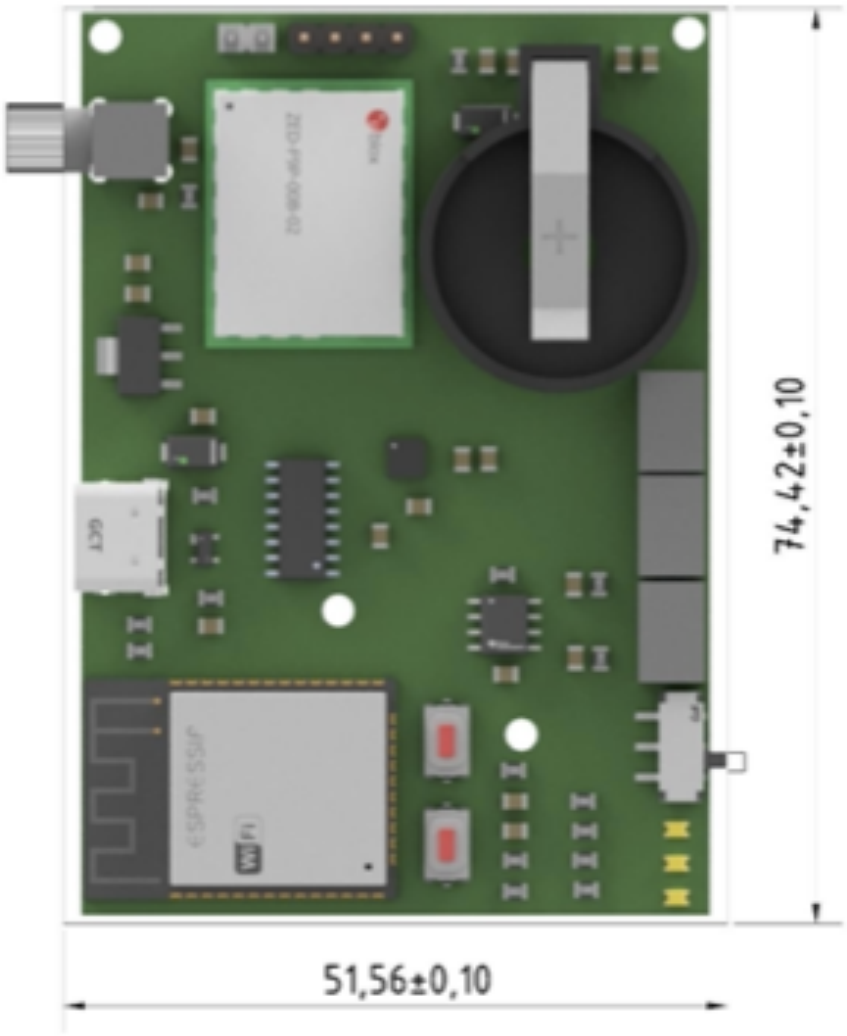

Figure 5: Physical Dimensions of Heron