LoRa Kit 151

LoRa Node Development Kit
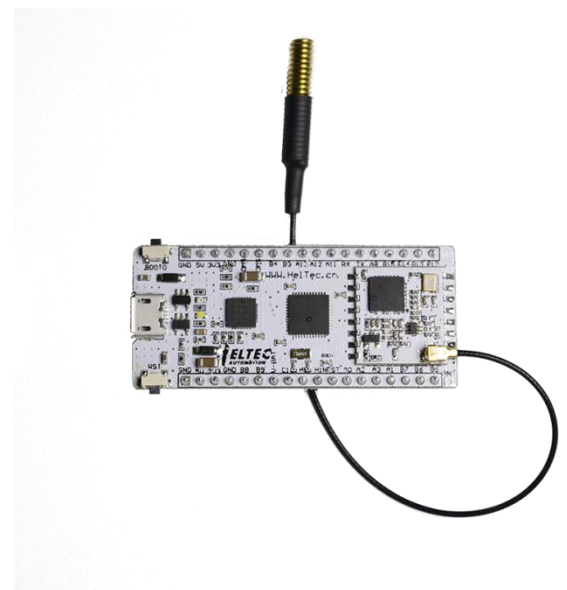
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V1.0	2019-12-15	Documents creating
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Content

1. Description

1.1　Overview

In order to meet the user's requirements for Ultra-Low-Power and standard

LoRaWAN protocol, we designed this product. On the basis of STM32L151CBU6MCU

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and SX1278 LoRa chip(433、470MHz), the low power current can reach to 6uA.

LoRa Kit 151 are available in two product variants:

Table 1.1 Product model list

No.	Model	Description
1	LoRa-Kit-151-L	470~510MHz working LoRa frequency, used for China mainland (CN470) LPW band.
2	LoRa-Kit-151-F	For EU868, IN865, US915, AU915, AS923, KR920 and other LPW networks with operating frequencies between 863~928MHz.

1.2　Product features

➢ CE Certificate;

➢ Microprocessor: STM32L151CBU6 (Ultra-low-power ARM Cortex-M3 MCU with 128 Kbytes Flash), with LoRa node chip SX1278 (433MHz ~ 510MHz);

➢ Micro USB interface with a complete voltage regulator, ESD protection, short circuit protection, and other protection measures;

➢ Onboard SH1.25-2 battery interface, integrated lithium battery interface, integrated battery management system (battery power detection, USB / battery power automatic switching);

➢ Integrated CP2102 USB to serial port chip, convenient for program downloading, debugging information printing;

➢ This product supports DFU mode download (need to cooperate with relevant

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download software).

- System resource：FLASH – 128K，RAM – 16K，EEPROM – 4K;

- User available resources: FLASH – 64K, RAM – 8K, EEPROM – 4K;

- Provide standard LoRaWAN protocol routines;

- With good RF circuit design and basic low-power design (sleep current ≤7uA), it is convenient for IoT application vendors to quickly verify

- LoRaWAN protocol easily.

2. Specifications

2.1   General specifications

Table 3-1: General specifications

Parameters	Description
Master Chip	STM32L151CBU6(Ultra-low-power 32-bit MCU ARM®-based Cortex®-M3)
LoRa Chipset	SX1278
Frequency	433~470MHz
Max TX Power	19dB ± 1dB
Receiving sensitivity	-135 dBm
Hardware Resource	UART x 3; SPI x 2; I2C x 2; 12-bits ADC input x 8; 12-bits DAC output x 2; GPIO x 23
Memory	128KB internal FLASH; 16KB internal SRAM
Interface	Micro USB x 1; LoRa Antenna interface(IPEX) x 1; 18 x 2.54 pin x 2

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Battery	3.7V Lithium(SH1.25 x 2 socket)
Operating temperature	-20 ~ 70 ℃
Dimensions	56.3 x 25.5 x 7.8 mm
Low Power	Deep Sleep 6uA

2.2 Power supply

Except when USB or 5V Pin is connected separately, lithium battery can be connected

to charge it. In other cases, only a single power supply can be connected.

Table 3-2: Power supply

Power supply mode	Minimum	Typical	Maximum	Company
USB powered(≥500mA)	4.7	5	6	V
Lithium battery(≥250mA)	3.3	3.6	4.2	V
5V pin(≥500mA)	4.7	5	6	V
3V3 pin(≥150mA)	2.7	3.3	3.5	V

2.3 Power output

Table 3-3: Power output

Output Pin	Minimum	Typical	Maximum	Company
3.3V Pin			500	mA
5V Pin (USB Powered only)		Equal to the input current		
Vext Pin			350	mA

2.4 Power characteristics

Table 3-4: Power characteristics

Mode	Condition	Min.	Typical	Max.	Company
Power **Consumption(mA)**	LoRa 10dB output		50		mA
	LoRa 12dB output		60		mA
	LoRa 15dB output		110		mA
	LoRa 20dB output		130		mA

2.5 LoRa RF characteristics

2.5.1 Transmit power

Table3-5 Transmit power

Operating frequency band	Maximum power value/[dBm]
433~470	19 ± 1

2.5.2 Receiving sensitivity

The following table gives typically sensitivity level of the LoRa Kit 151-(L/H).

Table3-6: Receiving sensitivity

Signal Bandwidth/[KHz]	Spreading Factor	Sensitivity/[dBm]
125	SF12	-135
125	SF10	-130
125	SF7	-124

2.6 Operation Frequencies

LoRa Kit 151(F) supports LoRaWAN frequency channels and models corresponding table.

Table3-7: Operation Frequencies

Region	Frequency (MHz)	Model
EU433	433.175~434.665	LoRa-Kit-151-L
CN470	470~510	LoRa-Kit-151-L

3. Resource

3.1 Relevant Resource

- [Schematic diagram](#)

- [Downloadable resource](#)

3.2 Contact Information

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