



Wireless Paper

E-ink Display with ESP32 and LoRa





Document version

Version	Time	Description	Remark
Rev. 1.0	2023-5-16	Preliminary version	Aaron

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1 Description

1.1 Overview

Wireless Paper is an E-Ink development kit with multiple wireless drive methods. Collaborate with the sample programs and development tools we provide, users can operate the display via Bluetooth, Wi-Fi and LoRa.

This board is equipped with a default 2.13-inch black and white E-Ink display screen, continuous display for 180 days after power outage. It can be used to develop applications such as electronic tags and identity tags.

Wireless Paper are available in two product variants:

Table 1.1: Product model list

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



1.2 Product features

- ESP32-S3FN8 + SX1262 Chipset, device can be driven via Wi-Fi, BLE and LoRa.
- Default 250 x 122 pixels black-white display, it can also be used to drive E-Ink screens of other sizes.
- High contrast, high reflectance, ultra-wide viewing angle.
- Low power consumption, 20uA in deep sleep.
- Internal integrated display screen refresh page function, users can drag and drop BMP images to achieve refresh.
- Commercial temperature range: -25 ~ 70°C
- Onboard USB-UART bridge, facilitate user secondary development.



2 Specifications

2.1 General specification

Table 2.1: General specification

Parameters	Description
MCU	ESP32-S3FN8
LoRa chipset	SX1262
Storage temperature	-25~70℃
Operating temperature	0~50℃
Power Supply	lithium battery, USB Type-C
Supply voltage	3~5v
Optimal storage humidity	55±10%
Connection method	Wi-Fi, LoRa, BLE
Screen Size	2.13 Inch
Display Resolution	122(H)x250(V) Pixel
Active Area	23.705x48.55
Pixel Pitch	0.1942X0.1942
Pixel Configuration	Square

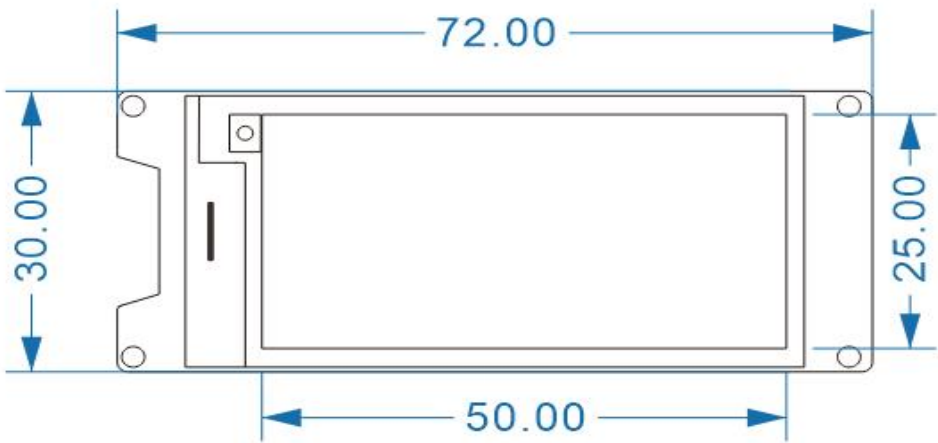


2.2 Power consumption

Table 2.2: Working current

Mode	Condition	Consumption	
		@3.7v	@5v
LoRa	14dBm	165mA	223mA
	17dBm	180mA	243mA
	22dBm	215mA	290mA
Wi-Fi	Scan	115mA	155mA
	AP	150mA	203mA
BT		115mA	155mA
Sleep		20uA	27uA
Deep sleep		5uA	7uA

3 Physical dimensions





4 Resource

4.1 Relevant resource

- [Heltec ESP \(ESP32 & ESP8266\) framework](#) (Already included Heltec ESP32 LoRaWAN library)
- [Heltec LoRaWAN test server based on SnapEmu](#)
- [User Manual Document](#)
- [The E-Ink Display Datasheet](#)

4.2 Heltec Contact Information

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