HTDS Series

Single Color OLED Display

128x64 Dot Matrix

Low power waste、No need back light

High contrast、Drive chip inside

catalog

1. Model description

HTDS-□◇XX

HTDS is short from HelTec Display Single color；

XX→ Display size：96 – 0.96 inch，13 – 1.3 inch；

□→ Display dot color：D—yellow & blue，W—white，B—blue；

◇→ Communication protocol：S—4 wire SPI，I—I^{2}C；

Examples：

HTDS-DS96：0.96 inch yellow & blue version SPI OLED Display

HTDS-BI13：1.3 inch blue I^{2}C version OLED display

2. OLED Catalogue

SIZE	0.96 inch[1]			1.3 inch	
Drive	SSD1306			SH1106	
COLOR	BLUE	WHITE	YELLOW&BLUE	BLUE	WHITE
SPI (6 Pins)					
I²C (4 Pins)					

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[1]：The display area of 0.96 inch version is 21.74(W)×10.86(H)，while 1.3 inch is 29.42(W)×14.70(H).

3. OLED Summary

OLED is a light-emitting diode (LED) in which the emissive electroluminescent layer is a film of organic compound that emits light in response to an electric current. This layer of organic semiconductor is situated between two electrodes; typically, at least one of these electrodes is transparent. OLEDs are used to create digital displays in devices such as television screens, computer monitors, portable systems such as mobile phones, handheld game consoles and PDAs. A major area of research is the development of white OLED devices for use in solid-state lighting applications

Different from LCD, OLED don't need back light，it's self-luminous. The power waste of OLED is much lower than that of LCD, very suitable for portable devices.

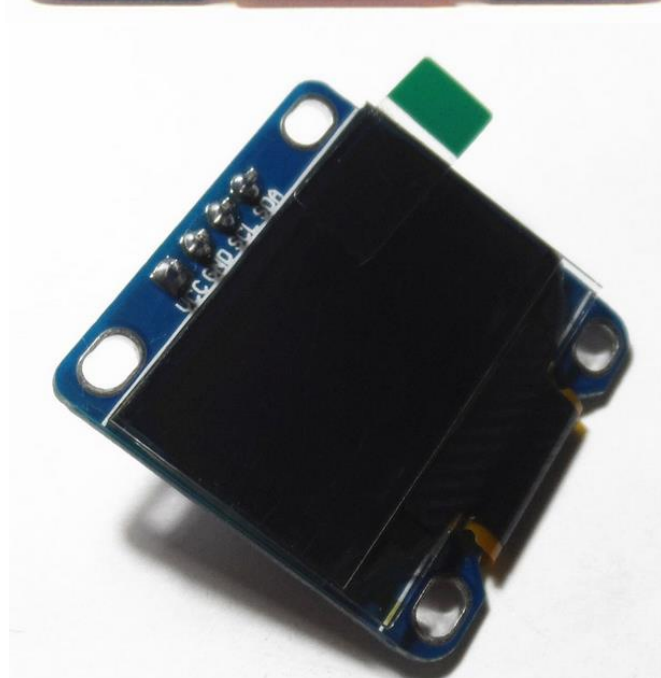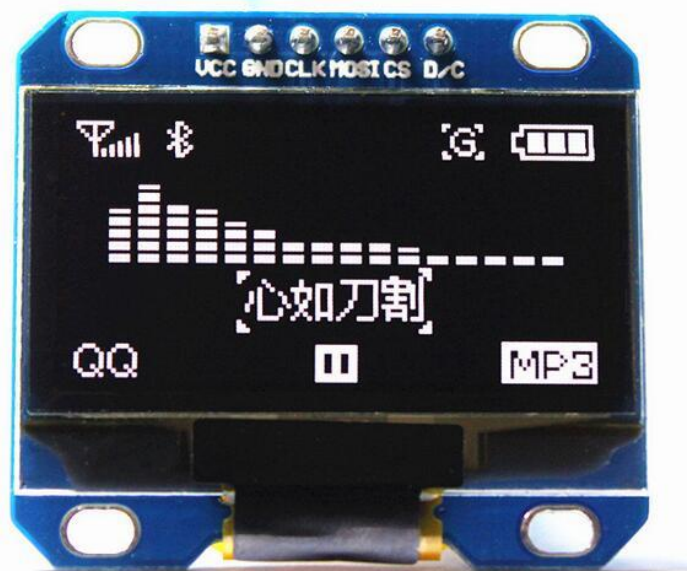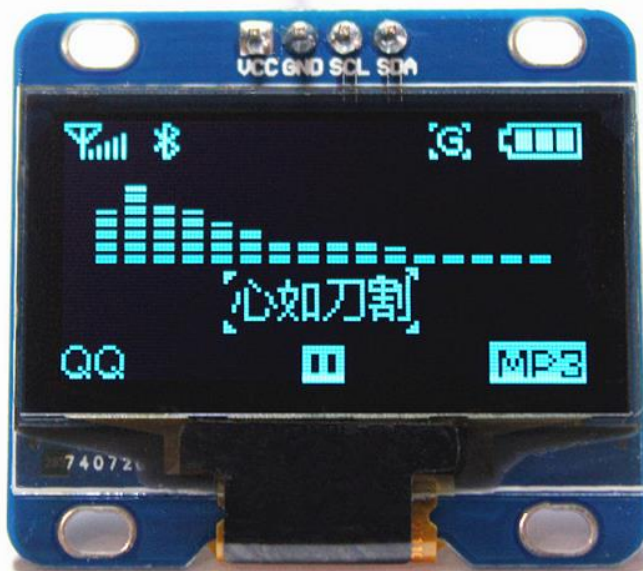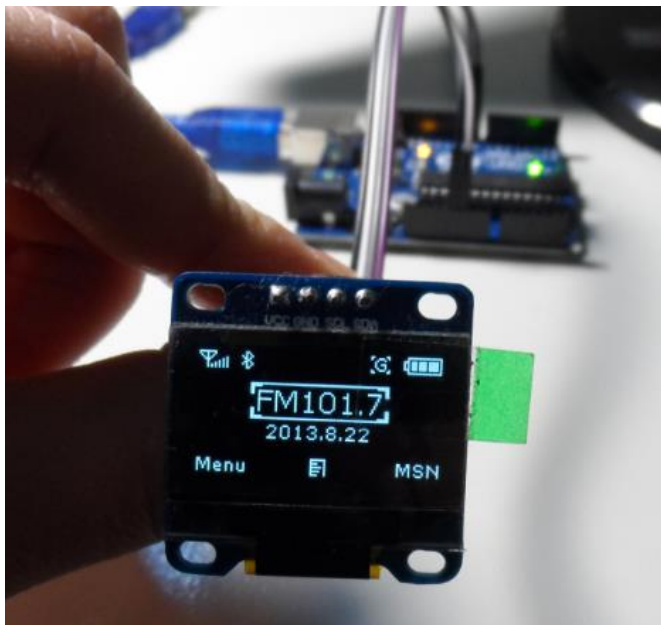## 3.1　Our products had been used in such applications

● Smart watch;

● Automatic controller system;

● Swipe machine;

● Bluetooth device tester;

● MP3;

● Portable medical equipment;

● Smart meters;

● Label printer.

3.2 Why we use OLED?

✓ **Quite Small volume**, 0.96" : 23.00MM*27MM*3.6MM   1.3" : 35.5MM*32MM*3.6MM

✓ **Ultra-low power consumption**, it consumes 0.08W when the whole screen is lighten up, and 0.06W is enough when the screen fully display ASCII characters normally. (far lower than TFT,LCD etc.)

✓ **High contrast**, even in the strong sunlight, it also good looking;

✓ **Work without backlight**, display dot self-luminous;

✓ Broad voltage support, work with DC 2.7V~6V;

✓ Independent communication method via SPI or IIC, in I^{2}C method, it can work with only two IO interface;

✓ 128*64 Dot matrix;

✓ Broad visual angle: maximum visual angle 160°;

✓ Industrial-grade operating temperature: -30 ~ 70 ℃

3.3 Some Details Show

4. Technical Summary

Key:

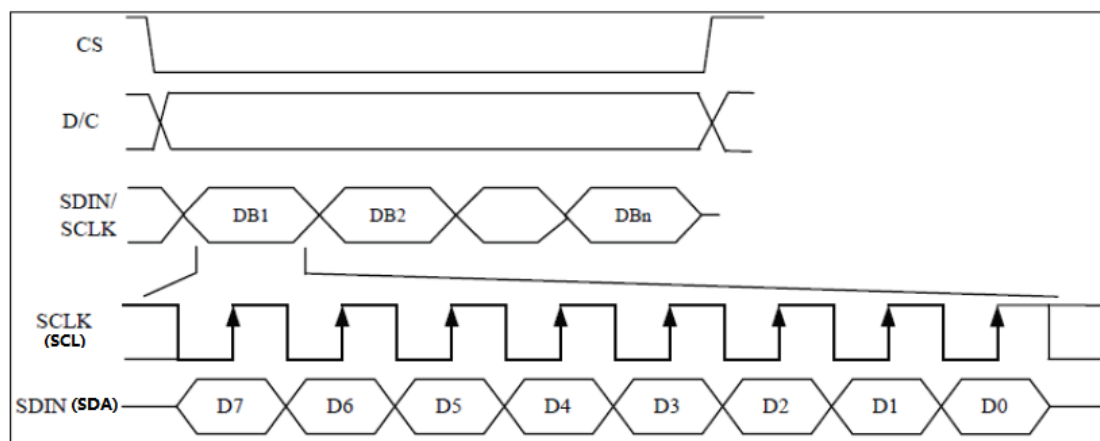| High = High-level in signal	Low = Low-level in signal
I/O = Bi-directional (input/output)	NC = Not Connected

4.1   SPI Version

The 4-wire serial interface consists of:

● CLK: serial clock

● MOSI: serial data input

● D/C: Data or Command choose (High – data; Low -- command)

● CS: Chip select(Low available)

MOSI is shifted into an 8-bit shift register on every rising edge of CLK in the order of D7, D6, ... D0. D/C is sampled on every eighth clock and the data byte in the shift register is written to the Graphic Display Data RAM (GDDRAM) or command register in the same clock.

Under serial mode, only write operations are allowed.

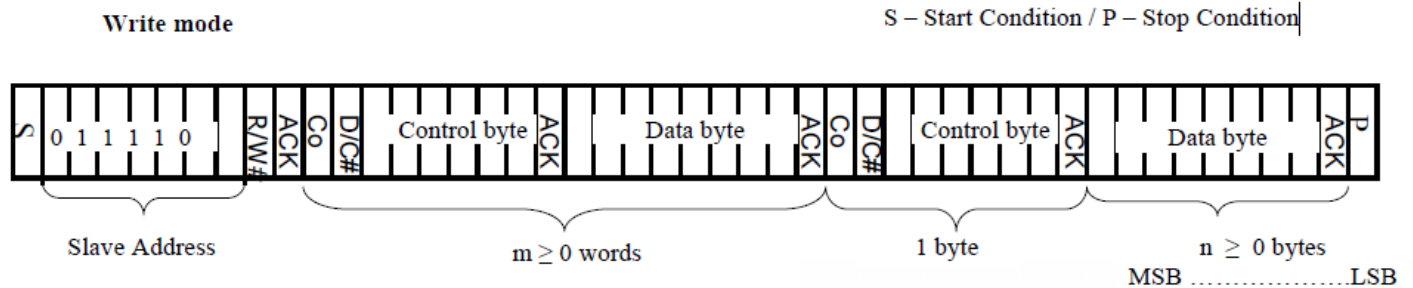Write procedure in 4-wire Serial interface mode:

4.2 I²C Version

The I²C communication interface consists of 0x7A or 0x78 slave address. It can be choose via the address select resistance. if the I²C register is 7 bits, the slave address is 0x3C or 0x3D.

- SDA: I²C-bus data signal -- SDA acts as a communication channel between the transmitter and the receiver. The data and the acknowledgement are sent through the SDA.

- SCL: I²C-bus clock signal -- The transmission of information in the I2C-bus is following a clock signal, SCL. Each transmission of data bit is taken place during a single clock period of SCL.
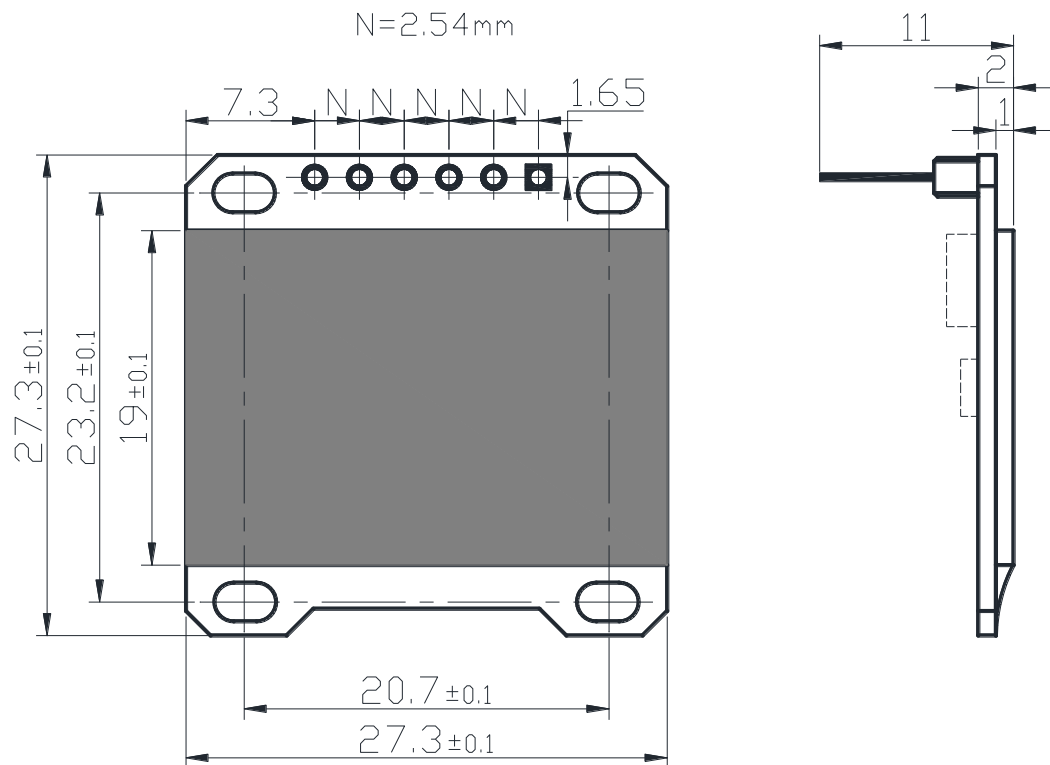
Note:
Co – Continuation bit
D/C# – Data / Command Selection bit
ACK – Acknowledgement
SA0 – Slave address bit
R/W# – Read / Write Selection bit
S – Start Condition / P – Stop Condition
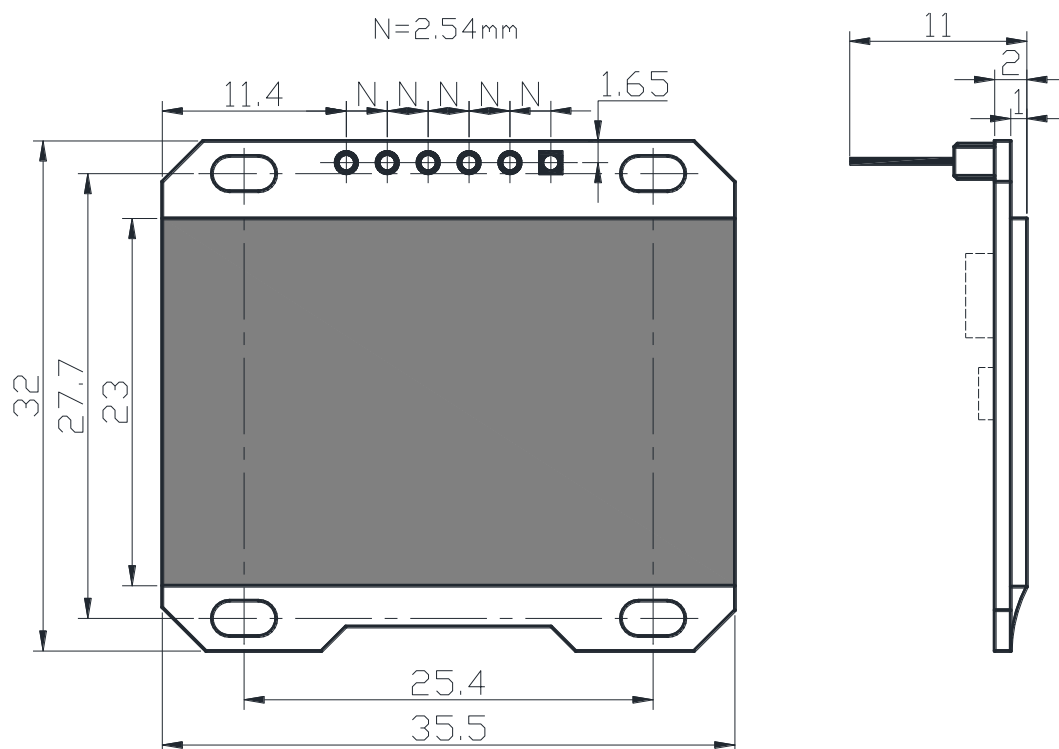
Write mode

Warning: the display's glass is very thin, please be careful while using it. If The glass is broken, display will not work well, and it not within the scope of our warranty.
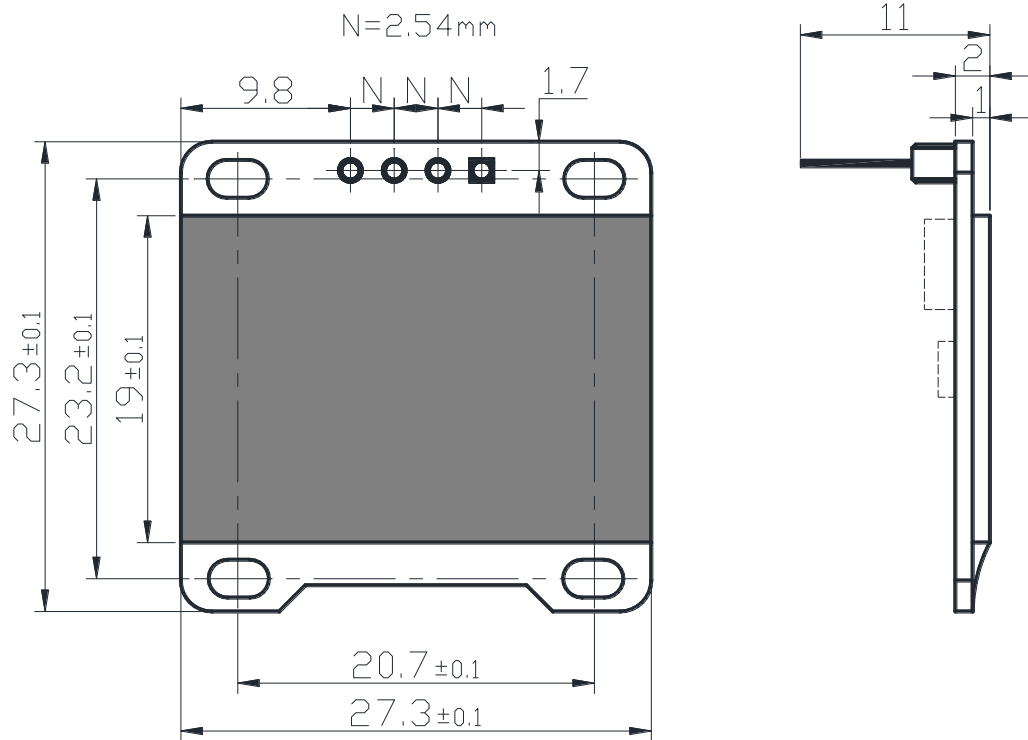
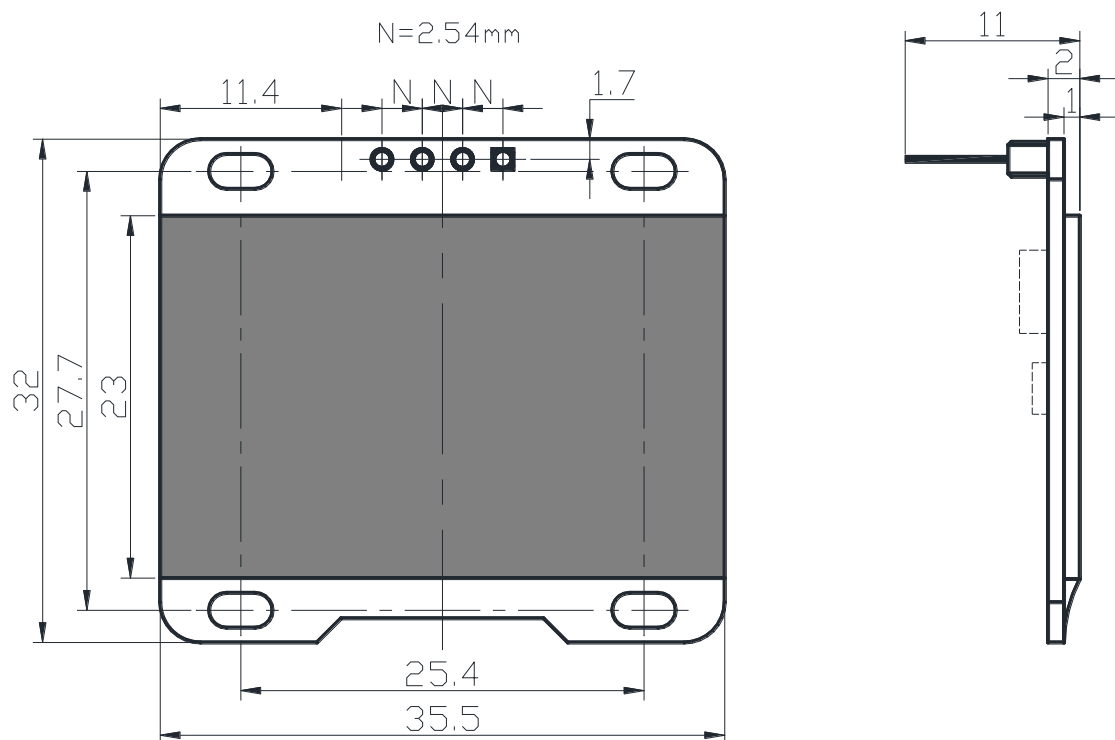## 4.3 Mechanical Dimensions

● **0.96" SPI Version:**

● **1.3" SPI Version:**

- **0.96" I²C Version:**

- **1.3" I²C Version:**

5. Summary

For more technical support, you can through the following ways:

- **Check the datasheet of SSD1306 or SH1106.**

- **Visit our website：** http://www.heltec.cn/projects

- **E-mail to our engineer: support@heltec.cn (English or Chinese only)**

Contacts : Dr. Lee

Mobile phone: +86 - 18080100260

Phone /Fax: +86 - 028-62374838

Official website : www.heltec.cn

E-mail: heltec@heltec.cn (Business Enquiry only)