OLED 2828 color display module(.NET Gadgeteer Compatible) (SKU:TOY0005)

Contents

Instruction

An OLED display works without a backlight. Thus, it can display deep black levels and can be thinner and lighter than a liquid crystal display (LCD). In low ambient light conditions such as a dark room an OLED screen can achieve a higher contrast ratio than an LCD. OLED technology is used in commercial applications such as displays for mobile phones and portable digital media players, car radios and digital cameras among others.
Support arduino controller and .NET Gadgeteer-compatible mainboard

Specification

- Working Voltage：3.3V，5V
- 262,144 Colors(max)

- 128×128 RGB pixel resolution
- Interface：SPI or Gadgeteer
- temperature：-30℃ ~ +70℃
- OLED Size：26.855 × 26.864(mm)
- Module Size：52.00 × 42.00(mm)
- Weight：20 g
- Size：1.5 inch
- Driver IC：SSD1351

Pins Identification

***Arduino port：**

1、3.3：Logic power3.3V

2、5V：OLED power 5V （through boost circuit to supply 13V to screen）

3、G：GND

4、RST：reset

5、SCK：SCK

6、SI：MOSI

7、CS：Chip Select

8、DC：D/C

***Gadgeteer port：**

PIN1:3.3V

PIN2:5V

PIN3:NC

PIN4:RST

PIN5:DC

PIN6:CS

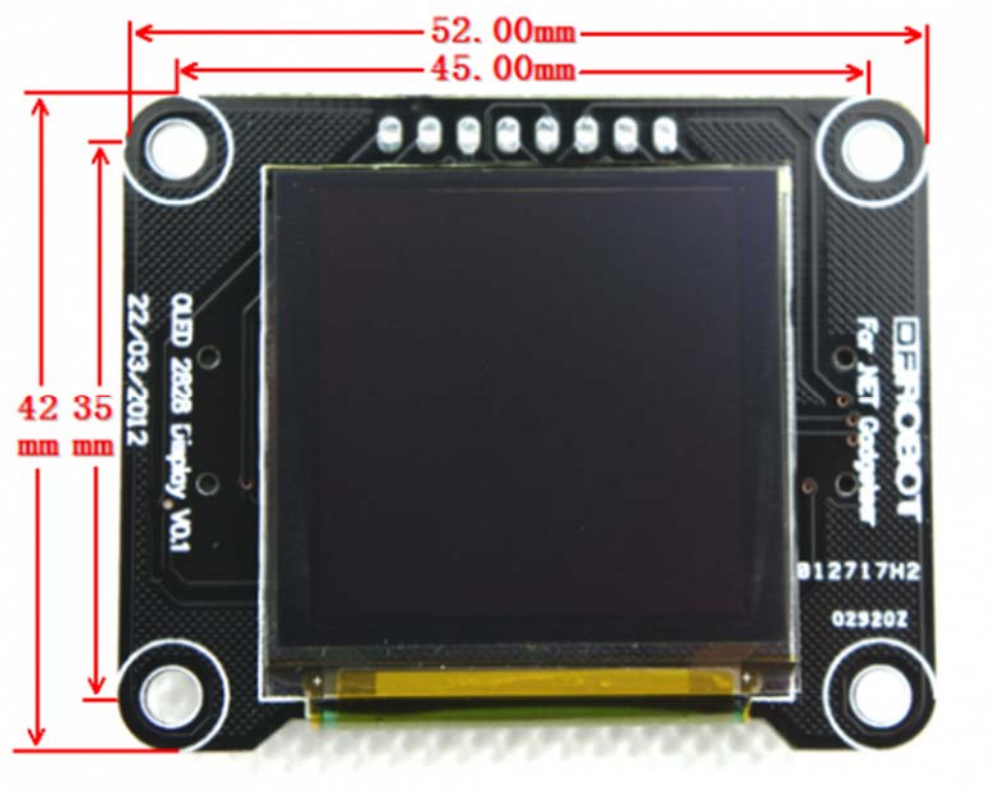
PIN7:SI

PIN8:NC

PIN9:SCK

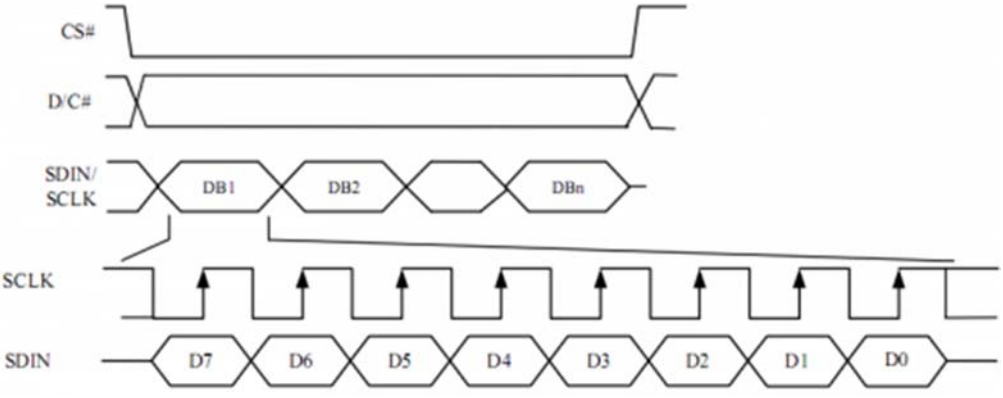
PIN10:G

Product Size



Product Size

SPI Sequence Diagram



Sequence Diagram

Commands List

The address of rows and columns and the display mode can be changed by setting command. For more detail refer to SSD1351.pdf **page 32~46**.

SSD1351.pdf

We will simply explain these above-mentioned commands through the example Set Re-map / Color Depth (Display RAM to Panel) in Page 32 ：

A[7:6] Set Color Depth

00b 256 color

01b 65K color, [reset]

10b 262k color, 8/18-bit,16 bit (1stoption) MCU interface

11b 262k color, 16 - bit MCU interface (2ndoption)

With different mode, there are different bits for each pixel data as you can see below (refer to SSD1351.pdf **Page 21,22**）

For example: if written A[7:6]=01b to choose 65K color mode, we use 2 8-bit data to determine a pixel in which C0~C4 represents R、B0~B5 represents G, A0~A4 represents B.

Bus width	Color Depth	Input order	D17	D16	D15	D14	D13	D12	D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1	D0
8 bits/Serial	65k	1st	X	X	X	X	X	X	X	X	X	X	C_4	C_3	C_2	C_1	C_0	B_5	B_4	B_3
		2nd	X	X	X	X	X	X	X	X	X	X	B_2	B_1	B_0	A_4	A_3	A_2	A_1	A_0
8 bits/Serial	262k	1st	X	X	X	X	X	X	X	X	X	X	X	X	C_5	C_4	C_3	C_2	C_1	C_0
		2nd	X	X	X	X	X	X	X	X	X	X	X	X	B_5	B_4	B_3	B_2	B_1	B_0
		3rd	X	X	X	X	X	X	X	X	X	X	X	X	A_5	A_4	A_3	A_2	A_1	A_0
16 bits	65k		X	X	C_4	C_3	C_2	C_1	C_0	B_5	B_4	B_3	B_2	B_1	B_0	A_4	A_3	A_2	A_1	A_0
16 bits	262k format 1	1st	X	X	X	X	X	X	X	X	X	X	X	X	C_5	C_4	C_3	C_2	C_1	C_0
		2nd	X	X	X	X	B_5	B_4	B_3	B_2	B_1	B_0	X	X	A_5	A_4	A_3	A_2	A_1	A_0
16 bits	262k format 2	1st	X	X	X	X	$C1_5$	$C1_4$	$C1_3$	$C1_2$	$C1_1$	$C1_0$	X	X	$B1_5$	$B1_4$	$B1_3$	$B1_2$	$B1_1$	$B1_0$
		2nd	X	X	X	X	$A1_5$	$A1_4$	$A1_3$	$A1_2$	$A1_1$	$A1_0$	X	X	$C2_5$	$C2_4$	$C2_3$	$C2_2$	$C2_1$	$C2_0$
		3rd	X	X	X	X	$B2_5$	$B2_4$	$B2_3$	$B2_2$	$B2_1$	$B2_0$	X	X	$A2_5$	$A2_4$	$A2_3$	$A2_2$	$A2_1$	$A2_0$
18 bits	262k		C_5	C_4	C_3	C_2	C_1	C_0	B_5	B_4	B_3	B_2	B_1	B_0	A_5	A_4	A_3	A_2	A_1	A_0

A[2] Set Color Sequence

A[2]=0b, Color sequence: A-B-C [reset]

A[2]=1b, Color sequence is swapped: C-B-A

So , in depth 65k color with sequence C-B-A(RGB) mode , we can write data 0xf8,0x00 to make the screen red; and in sequence A-B-C(BGR) with same depth ,write 0x00, 0x1f to

make screen red.

Application in Arduino

Connecting Diagram

```
Board  ———  uno
3.3  ———  3.3V
5V  ———  5V
G  ———  GND
RST  ———  D7
SCK  ———  D13
SI  ———  D11
CS  ———  D8
DC  ———  D9
```

Sample Code

```
#include "U8glib.h"
U8GLIB_SSD1351_128X128_332 u8g(13, 11, 8, 9, 7); // Arduino UNO: SW SPI Com: SCK = 13, MOSI = 11, CS = 8, DC = 9, RESET = 7 (http://electronics.ilsoft.co.uk/ArduinoShield.aspx)


void draw(void) {
  // graphic commands to redraw the complete screen should be placed here
  u8g.setFont(u8g_font_unifont);
  //u8g.setFont(u8g_font_osb21);
  u8g.drawStr( 0, 22, "Hello World!");
}


void setup(void) {


  // flip screen, if required
  // u8g.setRot180();
```

```
  // set SPI backup if required
  //u8g.setHardwareBackup(u8g_backup_avr_spi);

  // assign default color value
  if ( u8g.getMode() == U8G_MODE_R3G3B2 ) {
    u8g.setColorIndex(255);     // white
  }
  else if ( u8g.getMode() == U8G_MODE_GRAY2BIT ) {
    u8g.setColorIndex(3);         // max intensity
  }
  else if ( u8g.getMode() == U8G_MODE_BW ) {
    u8g.setColorIndex(1);         // pixel on
  }
  else if ( u8g.getMode() == U8G_MODE_HICOLOR ) {
    u8g.setHiColorByRGB(255,255,255);
  }
}

void loop(void) {
  // picture loop
  u8g.firstPage();
  do {
    draw();
  } while( u8g.nextPage() );

  // rebuild the picture after some delay
  delay(500);
}
```