SPECIFICATION OF MODULE

MODULE NO：ZC-024201-0561

Customer Approval:

☐ **Accept** ☐ **Reject**

ZOYO FOCUS	SIGNATURE	DATE
PREPARED BY	JYQ	2024.04.18
CHECKED BY	YG	2024.04.18
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Sample Version	Doc. Version	DATE	DESCRIPTION	CHECKED BY
01	A	2024.04.18	First Release.	YG

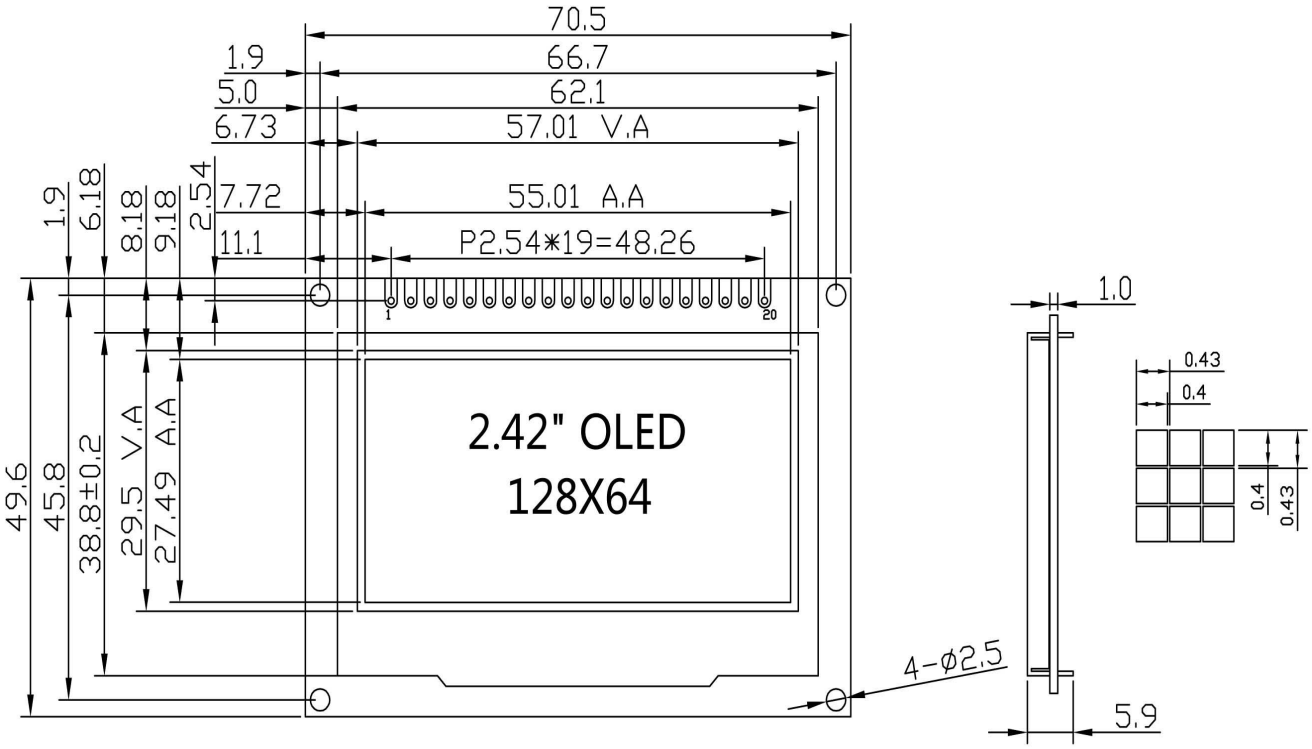
1. FUNCTIONS & FEATURES

Features
- 128X64 dots
- Font Color:YELLOW/WHITE/GREEN
- Driver IC:SSD1309
- 8-BIT 68XX/80XX Parallel,4-wire SPI,I2C

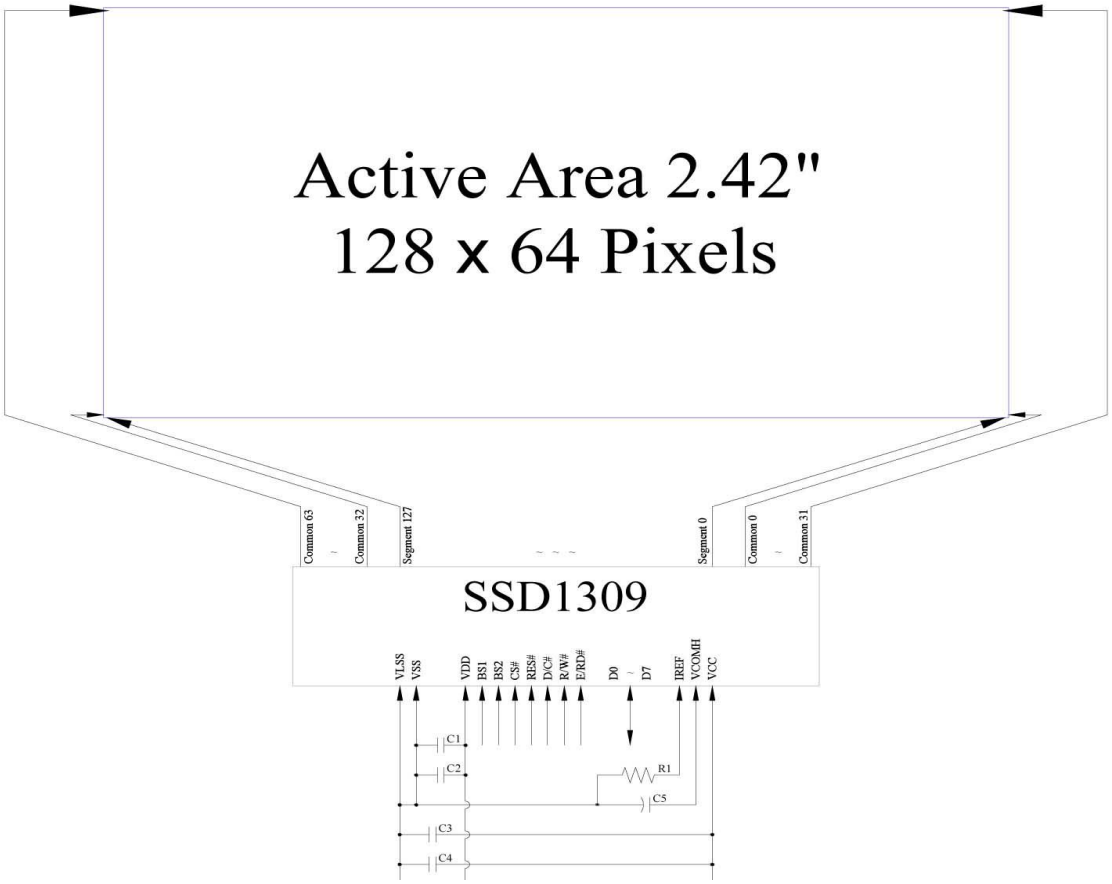
2. MECHANICAL SPECIFICATIONS

ITEM	SPECIFICATIONS	UNIT
Module Size	70.5L×49.6W×5.9（max）H	mm
View Area	57.0×29.5	mm
Effective Area	128×64	dots
Dot Size	0.39×0.39	mm
Dot Pitch	0.43×0.43	mm

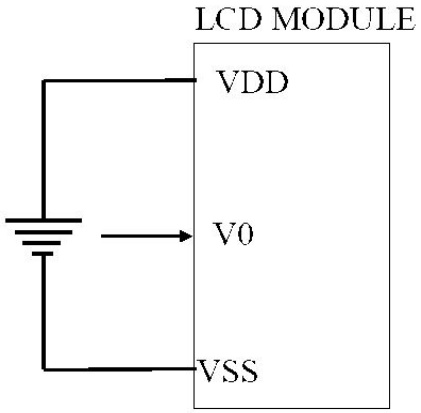
3. EXTERNAL DIMENSIONS



4. BLOCK DIAGRAM



5. POWER SUPPLY



6. PIN DESCRIPTION

6.1 J1 PIN DESCRIPTION

Parallel Interface(8080):

ITEM	SYMBOL	LEVEL	FUNCTION
1	GND	0V	Power Ground
2	VDD	+3.3V	Power Supply For Logic
3	NC	-	No connect
4	D/C	H/L	H：Data　L：Command
5	WR	H/L	H：Read　L：Write
6	RD	H，H->L	Enable Signal
7～14	D0～D7	H/L	Data Bus
15	/CS	L	Chip Select
16	/RST	H/L	Active LOW Reset signal.
17～19	NC	-	No connect
20	FG	-	Frame Ground

8080: R2: USE,R3:NO USE;　R4:USE ,R5:NO USE; R6~R13:NO USE;

Parallel Interface(6800):

ITEM	SYMBOL	LEVEL	FUNCTION
1	GND	0V	Power Ground
2	VDD	+3.3V	Power Supply For Logic
3	NC	-	No connect
4	D/C	H/L	H：Data　L：Command
5	WR	H/L	H：Read　L：Write

6	RD	H，H->L	Enable Signal
7～14	D0～D7	H/L	Data Bus
15	/CS	L	Chip Select
16	/RST	H/L	Active LOW Reset signal.
17～19	NC	-	No connect
20	FG	-	Frame Ground

6800: R2: NO USE,R3: USE; R4:USE ,R5:NO USE; R6~R13:NO USE;

4-SPI

ITEM	SYMBOL	LEVEL	FUNCTION
1	GND	0V	Power Ground
2	VDD	+3.3V	Power Supply For Logic
3	NC	-	No connect
4	D/C	H/L	H：Data L：Command
5	WR	-	No connect
6	RD	-	No connect
7	SCLK(D0)	H/L	Serial Clock signal.
8	SDIN(D1)	H/L	Serial Data input
9	NC(D2)	-	No connect
10～14	NC(D3～D7)	-	No connect
15	/CS	L	Chip Select
16	/RST	H/L	Active LOW Reset signal.
17～19	NC	-	No connect
20	FG	-	Frame Ground

SPI: R2: NO USE,R3: USE; R4:NO USE ,R5:USE; R6~R12: USE;R13: NO USE;

I2C Interface:

ITEM	SYMBOL	LEVEL	FUNCTION
1	GND	0V	Power Ground
2	VDD	+3.3V	Power Supply For Logic
3	NC	-	No connect
4	SA0(D/C)	H/L	Slave Address Selection signal
5	NC(WR)	-	No connect
6	NC(RD)	-	No connect
7	SCLK(D0)	H/L	Serial Clock signal.
8	SDIN(D1)	H/L	Serial Data input signal
9	SDIN(D2)		
10～14	NC(D3～D7)	-	No connect
15	/CS	L	Chip Select
16	/RST	H/L	Active LOW Reset signal.
17～19	NC	-	No connect
20	FG	-	Frame Ground

IIC: R2: USE,R3:NO USE; R4:NO USE ,R5:USE; R6~R13: USE;

Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	Notes
Supply Voltage for Logic	Vdd	2.4	3.6	V	1, 2
Supply Voltage for Display	Vcc	0	15	V	1, 2
Operating Temperature	Top	-30	85	℃	-
Storage Temperature	Tst	-40	90	℃	-

Note 1: All the above voltages are on the basis of “VSS = 0V”.
Note 2: When this module is used beyond the above absolute maximum ratings, permanent breakage of the module may occur. Also, for normal operations, it is desirable to use this module under the conditions according to Section 3. “Optics & Electrical Characteristics”. If this module is used beyond these conditions, malfunctioning of the module can occur and the reliability of the module may deteriorate.

7. ELECTRICAL CHARACTERISTICS

Items	Symbol	Condition	Min	TY	Max	Unit

				P		
Operating Temperature Range	Top	Absolute Max	-40	—	+85	C
Storage Temperature Range	Tst	Absolute Max	-40	—	+90	C
Supply Voltage	Vdd		3.0	3.3	3.6	V
Supply Current (logic)	Idd	Ta=25°C, VDD=3.3V	—	180	300	µA
Supply Current (display)	ICC	50% ON, VDD=3.3V	—	62	70	mA
		100% ON, VDD=3.3V	—	113	120	mA
Sleep Mode Current	IDD+ICCS LEEP		—	3	15	µA
“H” Level input	Vih		0.8*VDD	—	VDD	V
“L” Level input	Vil		VSS	—	0.2*VDD	V
“H” Level output	Voh		0.9*VDD	—	VDD	V
“L” Level output	Vol		VSS	—	0.1*VDD	V

Optical Characteristics

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Viewing Angle – Top	AV		—	80	—	
Viewing Angle – Bottom	AV		—	80	—	
Viewing Angle – Left	AH		—	80	—	
Viewing Angle – Right	AH		—	80	—	
Contrast Ratio	Cr		2000:1	—	—	—
Response Time (rise)	Tr	—	—	10	—	us
Response Time (fall)	Tf	—	—	10	—	us
Brightness		50% checkerboard	100	120	—	cd/m2
Lifetime		Ta=25°C, 50% checkerboard	10,000	—	—	Hrs

Note: Lifetime at typical temperature is based on accelerated high‐temperature operation. Lifetime is tested at average 50% pixels on and is rated as Hours until Half‐Brightness. The Display OFF command can be used to extend the lifetime of the display.

Luminance of active pixels will degrade faster than inactive pixels. Residual (burn‐in) images may occur. To avoid this, every pixel should be illuminated uniformly.

Built‐in SSD1309 controller.Instruction Table

For detailed instruction information, see SSD1309 datasheet .

MPU Interface

6800‐MPU Parallel Interface

The parallel interface consists of 8 bi‐directional data pins, R/W, D/C, E, and /CS.

A LOW on R/W indicates write operation, and HIGH on R/W indicates read operation.

A LOW on D/C indicates “Command” read or write, and HIGH on D/C indicates “Data” read or write.

The E input serves as data latch signal, while /CS is LOW. Data is latched at the falling edge of E signal.

Function	E	R/W	/CS	D/C
Write Command	↓	0	0	0
Read Status	↓	1	0	0
Write Data	↓	0	0	1
Read Data	↓	1	0	1

8080‐MPU Parallel Interface

The parallel interface consists of 8 bi‐directional data pins, /RD, /WR, D/C, and /CS.
A LOW on D/C indicates “Command” read or write, and HIGH on D/C indicates “Data” read or write.
A rising edge of /RS input serves as a data read latch signal while /CS is LOW.
A rising edge of /WR input serves as a data/command write latch signal while /CS is LOW.

Function	/RD	/WR	/CS	D/C
Write Command	1	↑	0	0
Read Status	↑	1	0	0
Write Data	1	↑	0	1
Read Data	↑	1	0	1

Alternatively, /RD and /WR can be kept stable while /CS serves as the data/command latch signal.

Function	/RD	/WR	/CS	D/C
Write Command	1	0	↑	0
Read Status	0	1	↑	0
Write Data	1	0	↑	1
Read Data	0	1	↑	1

Serial Interface

The serial interface consists of serial clock SCLK, serial data SDIN, D/C, and /CS.

D0 acts as SCLK and D1 acts as SDIN. D2 should be left open. D3~D7, E, and R/W should be connected to GND.

Function	/RD	/WR	/CS	D/C	D0
Write Command	0	0	0	0	↑
Write Data	0	0	0	1	↑

SDIN is shifted into an 8‐bit shift register on every rising edge of SCLK 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 GDRAM or command register in the same clock.
Note: Read is not available in serial mode.

I2C Interface

The I2C interface consists of a slave address bit SA0, I2C‐bus data signal SDA, and I2C‐bus clock signal SCL.
D1 and D2 can be tied together, and act as SDA. D0 acts as SCL. Both the data and clock signals must be connected to pull‐up resistors. /RES is used to initialize the device.
Note: SA0 bit allows the device to have a slave address of either “0111100” or “0111101”.
Note: Data and acknowledgement are sent through the SDA. The ITO track resistance and the pull‐up resistance at SDA becomes a voltage potential divider. As a result, it may not be possible to attain a valid logic
“0” level on SDA for the ACK signal. SDAIN must be connected, but SDAOUT may be disconnected and the ACK
signal will be ignored on the I2C bus.

8. DESIGN AND HANDING PRECAUTION

14.1 The OLED panel is made by glass. Any mechanical shock (eg. Dropping form high place) will damage the OLED module. Do not add excessive force on the surface of the display, which may cause the Display color change abnormally.

14.2 The polarizer on the OLED is easily get scratched. If possible, do not remove the OLED protective film until the last step of installation.

14.3 Never attempt to disassemble or rework the OLED module.
14.4 Only Clean the OLED with Isopropyl Alcohol or Ethyl Alcohol. Other solvents (eg. water) may damage the OLED.
14.5 When mounting the OLED module, make sure that it is free form twisting, warping and distortion.
14.6 Ensure to provide enough space(with cushion) between case and OLED panel to prevent external force adding on it, or it may cause damage to the OLED or degrade the display result
14.7 Only hold the OLED module by its side. Never hold OLED module by add force on the heat seal or TAB.
14.8 Never add force to component of the OLED module. It may cause invisible damage or degrade of the reliability.
14.9 OLED module could be easily damaged by static electricity. Be careful to maintain an optimum anti-static work environment to protect the OLED module.
14.10 When peeling of the protective film form OLED, static charge may cause abnormal display pattern. It is normal and will resume to normal in a short while.
14.11 Take care and prevent get hurt by the OLED panel edge.
14.12 Never operate the OLED module exceed the absolute maximum ratings.
14.13 Keep the signal line as short as possible to prevent noisy signal applying to OLED module.
14.14 Never apply signal to the OLED module without power supply.
14.15 IC chip (eg. TAB or COG) is sensitive to the light. Strong lighting environment could possibly cause malfunction. Light sealing structure casing is recommend.
14.16 OLED module reliability may be reduced by temperature shock.
14.17 When storing the OLED module, avoid exposure to the direct sunlight, high humidity, high temperature or low temperature. They may damage or degrade the OLED module.