



# FOCUS LCDs

LCDs MADE SIMPLE®

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TFT | OLED | GRAPHIC | CHARACTER | UWVD | SEGMENT | CUSTOM

## Graphic OLED Module

Part Number

O12896A-GW-TW3

### Overview:

- 128x96 Graphic OLED
- White Pixel Color
- Overall Size: 31.50mm x 26.70mm
- Parallel Interface
- -40C to 70C Operating Temperature
- 2.8V
- Controller: SSD1327Z
- RoHS Compliant

**Graphic OLED Features:**

Resolution: 128 x 96

Interface: Parallel

Controller: SSD1327Z

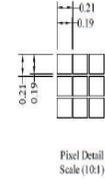
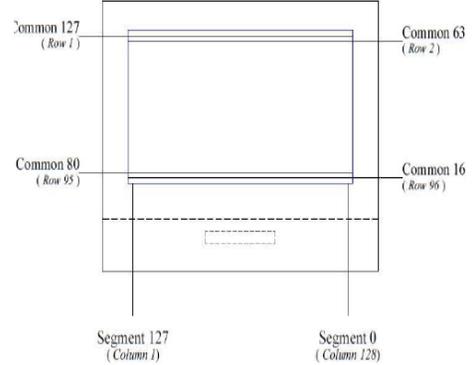
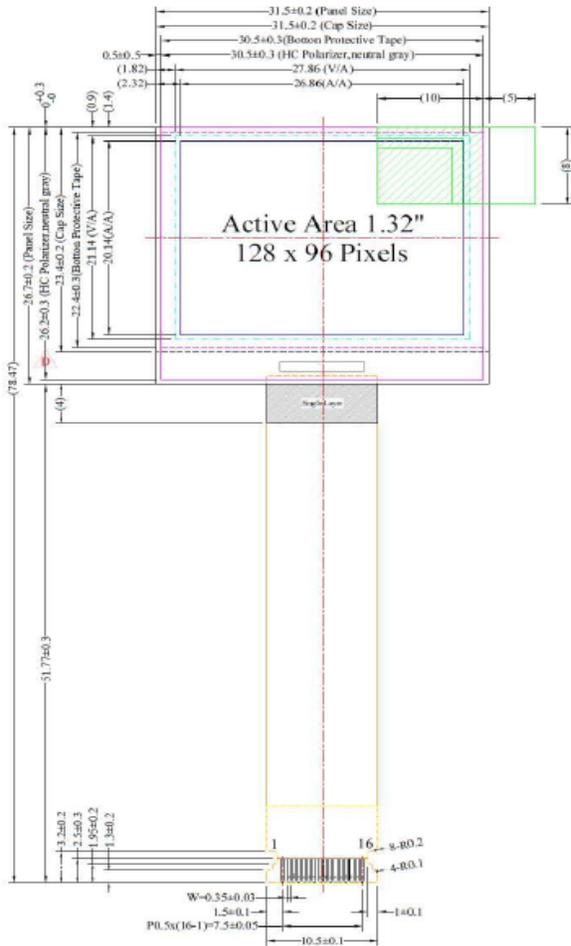
RoHS Compliant

General Information Items	Specification	Unit	Note
	Main Panel		
Viewing Area	27.86 x 21.14	mm	-
Pixel Color	White	-	-
Viewing Direction	Full	degrees	-
Voltage	2.8	V	-
Resolution	128x64	-	-
Controller IC	SSD1327Z	-	-
Interface	Parallel	-	-
Operating temperature	-40~+70	°C	-
Storage temperature	-40~+85	°C	-

**Mechanical Information**

Item		Min	Typ.	Max	Unit	Note
Module size	X (Width)	-	31.50	-	mm	-
	Y (Height)	-	26.70	-	mm	-
	Z (Depth)	-	-	1.40	mm	-

# 1. Outline Dimensions



Pin	Symbol
1	N/C
2	VCC
3	VCOMH
4	N/C
5	VCL
6	VED
7	N/C
8	VSS
9	DBP
10	CS
11	RES
12	DC
13	SCLA
14	SMP
15	N/C
16	VSS

- Notes:
- Pixel Color: White
  - OLED Type: Graphic
  - Temperature Range: Wide
  - Resolution: 128x96
  - Interface: 4-wire SPI
  - IC Controller: SSD1327Z



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		PARTS NO.	O12896A-GW-TW3	
TOLERANCE UNLESS OTHERWISE SPECIFIED	X.X±0.3	Drawn		Unit
OTHERWISE SPECIFIED	X.XX±0.2	Checked		mm
Scale	1:1	Approve		Page 1/1

## 2. Input Terminal Pin Assignment

Recommended Connector: FH19C-20S-0.5SH(10)

NO.	Symbol	Description
1	NC	No connection
2	VCC	Power Supply for OEL Panel
3	VCOMH	Voltage Output High Level for COM Signal
4	NC	No connection
5	VCI	Power Supply for Operation
6	VDD	Power Supply for Core Logic Circuit
7	NC	No connection
8	VSS	Ground of Logic Circuit
9	IREF	Current Reference for Brightness Adjustment
10	CS	Chip Select
11	RES	Power Reset for Controller and Driver
12	DC	Data/Command Control
13	SCLK	Serial Clock Input Signal
14	SDIN	Serial Data Input Signal
15	NC	No connection

### 3. Optical Characteristics

Characteristic	Symbol	Condition	Min	Typ.	Max	Unit
Brightness	L	$V_{CI} = 3.0V$ $V_{CC} = 15.0V$	60	80	-	cd/m <sup>2</sup>
White Color	CIE	-	X=0.25 Y=0.29	X=0.29 Y=0.33	X=0.33 Y=0.37	-
Contrast Ratio	CR	-	5000	10000	-	-
Viewing Angle	-	-	160	-	-	degrees

### 4. DC Electrical Characteristics

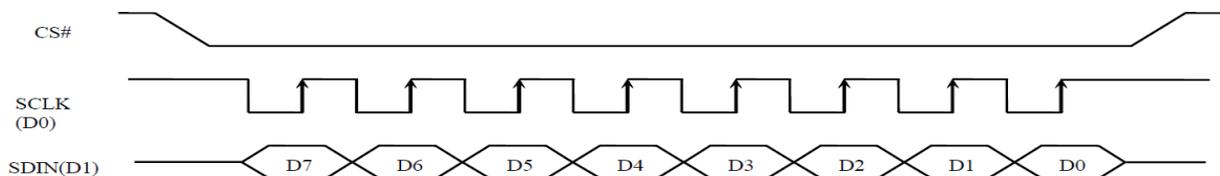
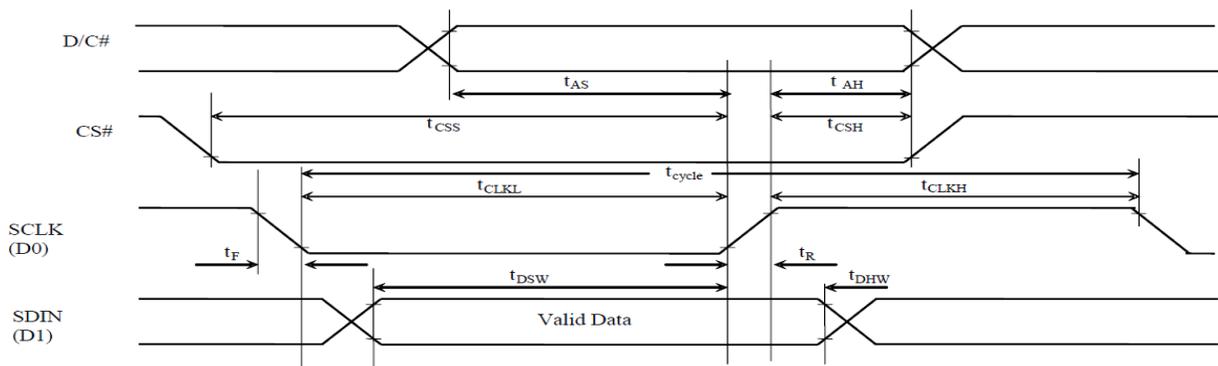
Characteristics	Symbol	Conditions	Min	Typ.	Max	Unit
Supply Voltage for Operation	$V_{CI}$	-	1.65	2.8	3.5	V
Supply Voltage for Logic	$V_{DD}$	-	1.65	-	2.6	V
Supply Voltage for Display	$V_{CC}$	-	14.5	15.0	15.5	V
High Level Input	$V_{IH}$	-	$0.8V_{CI}$	-	$V_{CI}$	V
Low Level Input	$V_{IL}$	-	0	-	$0.2V_{CI}$	V
High Level Output	$V_{OH}$	$I_{out}=100\mu A,$ 3.3 MHz	$0.9V_{CI}$	-	$V_{CI}$	V
Low Level Output	$V_{OL}$	$I_{out}=100\mu A,$ 3.3 MHz	0	-	$0.1V_{CI}$	V
Operating Current for $V_{CI}$	$I_{CI}$	-	-	180	300	$\mu A$
Operating Current for $V_{CC}$	$I_{CC}$	-	-	21.1	26.4	mA
Sleep Mode Current for $V_{CI}$	$I_{CI, SLEEP}$	Enable internal $V_{DD}$ during sleep mode	-	40	60	$\mu A$
		Disable internal $V_{DD}$ during sleep mode	-	2	10	$\mu A$
Sleep Mode Current for $V_{CC}$	$I_{CC, SLEEP}$	-	-	2	10	$\mu A$

**NOTE:** If the maximum rating of the above parameters is exceeded, even momentarily, the quality of the product may be degraded. The maximum ratings specify the values which the product may be physically damaged if exceeded. Be sure to use the product within the range of the specified parameters.

## 5. Serial Interface Timing Characteristics (4 wire SPI)

Parameter	Symbol	Min	Max	Unit
Clock Cycle Time	$t_{\text{cycle}}$	160	-	ns
Address Setup Time	$t_{\text{AS}}$	15	-	ns
Address Hold Time	$t_{\text{AH}}$	15	-	ns
Chip Select Setup Time	$t_{\text{CSS}}$	20	-	ns
Chip Select Hold Time	$t_{\text{CSH}}$	10	-	ns
Write Data Setup Time	$t_{\text{DSW}}$	15	-	ns
Write Data Hold Time	$t_{\text{DHW}}$	15	-	ns
Clock Low Time	$t_{\text{CLKL}}$	20	-	ns
Clock High Time	$t_{\text{CLKH}}$	20	-	ns
Rise Time	$t_r$	-	15	ns
Fall Time	$t_f$	-	15	ns

Parameter	Symbol	Min	Max	Unit
Clock Cycle Time	$t_{\text{cycle}}$	220	-	ns
Address Setup Time	$t_{\text{AS}}$	15	-	ns
Address Hold Time	$t_{\text{AH}}$	15	-	ns
Chip Select Setup Time	$t_{\text{CSS}}$	20	-	ns
Chip Select Hold Time	$t_{\text{CSH}}$	10	-	ns
Write Data Setup Time	$t_{\text{DSW}}$	15	-	ns
Write Data Hold Time	$t_{\text{DHW}}$	30	-	ns
Clock Low Time	$t_{\text{CLKL}}$	25	-	ns
Clock High Time	$t_{\text{CLKH}}$	20	-	ns
Rise Time	$t_r$	-	15	ns
Fall Time	$t_f$	-	15	ns



## **6. Cautions and Handling Precautions**

### **6.1 Handling and Operating the Module**

1. When the module is assembled, it should be attached to the system firmly. Do not warp or twist the module during assembly work.
2. Protect the module from physical shock or any force. In addition to damage, this may cause improper operation or damage to the module and back-light unit.
3. Note that polarizer is very fragile and could be easily damaged. Do not press or scratch the surface.
4. Do not allow drops of water or chemicals to remain on the display surface. If you have the droplets for a long time, staining and discoloration may occur.
5. If the surface of the polarizer is dirty, clean it using some absorbent cotton or soft cloth.
6. The desirable cleaners are water, IPA (Isopropyl Alcohol) or Hexane. Do not use ketene type materials (ex. Acetone), Ethyl alcohol, Toluene, Ethyl acid or Methyl chloride. It might permanent damage to the polarizer due to chemical reaction.
7. If the liquid crystal material leaks from the panel, it should be kept away from the eyes or mouth. In case of contact with hands, legs, or clothes, it must be washed away thoroughly with soap.
8. Protect the module from static, it may cause damage to the CMOS ICs.
9. Use finger-stalls with soft gloves in order to keep display clean during the incoming inspection and assembly process.
10. Do not disassemble the module.
11. Protection film for polarizer on the module shall be slowly peeled off just before use so that the electrostatic charge can be minimized.
12. Pins of I/F connector shall not be touched directly with bare hands.
13. Do not connect, disconnect the module in the "Power ON" condition.
14. Power supply should always be turned on/off by the item Power On Sequence & Power Off Sequence.

### **6.2 Storage and Transportation**

1. Do not leave the panel in high temperature, and high humidity for a long time. It is highly recommended to store the module with temperature from 0 to 35 °C and relative humidity of less than 70%
2. Do not store the OLED module in direct sunlight.
3. The module shall be stored in a dark place. When storing the modules for a long time, be sure to adopt effective measures for protecting the modules from strong ultraviolet radiation, sunlight, or fluorescent light.
4. It is recommended that the modules should be stored under a condition where no condensation is allowed. Formation of dewdrops may cause an abnormal operation or a failure of the module. In particular, the greatest possible care should be taken to prevent any module from being operated where condensation has occurred inside.
5. This panel has its circuitry FPC on the bottom side and should be handled carefully in order not to be stressed.