OLED DISPLAY MODULE DATASHEET

Datasheet Release Date 2021-03-11
for
CFAL12896A0-0127-F

Crystalfontz America, Inc.

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CONTENTS

1. General Information 3
2. Module Description 4
3. Features 4
4. Mechanical Data 4
5. Active Area 4
5.1. Memory Mapping & Pixel Construction 4
6. Mechanical Drawing 5
7. Interface Pin Function 6
8. System Block Diagram 8
9. Absolute Maximum Ratings 9
10. Electrical Characteristics 9
11. AC Characteristics 10
11.1. 68XX-Series MPU Parallel Interface Timing Characteristics 10
11.2. 80XX-Series MPU Parallel Interface Timing Characteristics 11
11.3. Serial Interface Timing Characteristics (4-wire SPI) 12
11.4. Serial Interface Timing Characteristics (3-wire SPI) 13
12. Functional Specification 14
12.1. Commands 14
12.2. Power Down and Power Up Sequence 14
12.3. Reset Circuit 14
12.4. Actual Application Example 15
13. Optical Characteristics 17
14. OLED Lifetime 17
15. OLED Module Precautions 18
15.1. Modules 18
15.2. Handling Precautions 18
15.3. Storage Precautions 19
15.4. Designing Precautions 19
15.5. Disposing Precautions 19
15.6. Other Precautions 19

1. General Information

Datasheet Revision History
Datasheet Release: **2021-03-11** Datasheet for the CFAL12896A0-0127-F OLED graphic display module.

Product Change Notifications
You can check for or subscribe to Part Change Notices for this display module on our website.

Variations
Slight variations between lots are normal (e.g., contrast, color, or intensity).

Volatility
This display module has volatile memory.

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2. Module Description

This is a full color OLED graphic display module with a high contrast ratio and fast response time. This display is light-weight, thin, and durable. This display has a built-in Solomon Systech SSD1351 controller.

Please see Solomon Systech SSD1351 LCD Datasheet for further reference.

3. Features

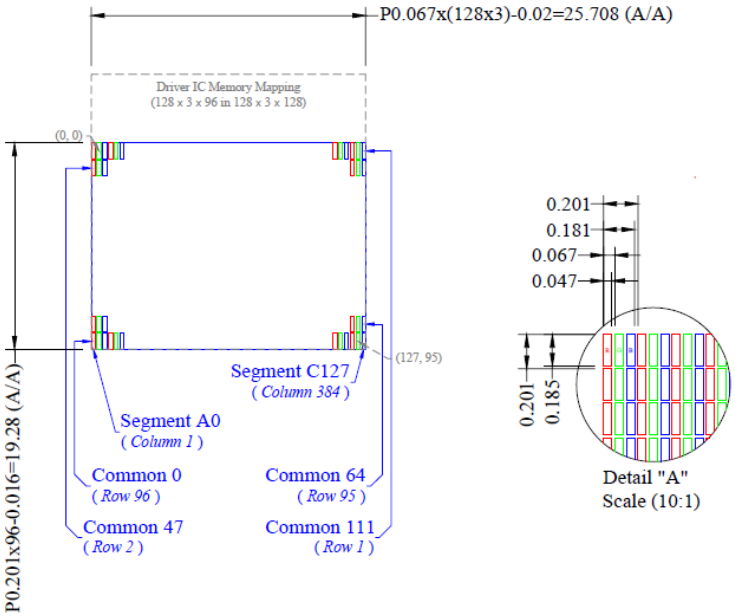
- 128*96 Dot Matrix
- Built-in Controller: SSD1351 (or equivalent)
- 3.3V Logic
- 12V Power
- 1/96 Duty
- Polarized
- Interface: 8-Bit Parallel, SPI

4. Mechanical Data

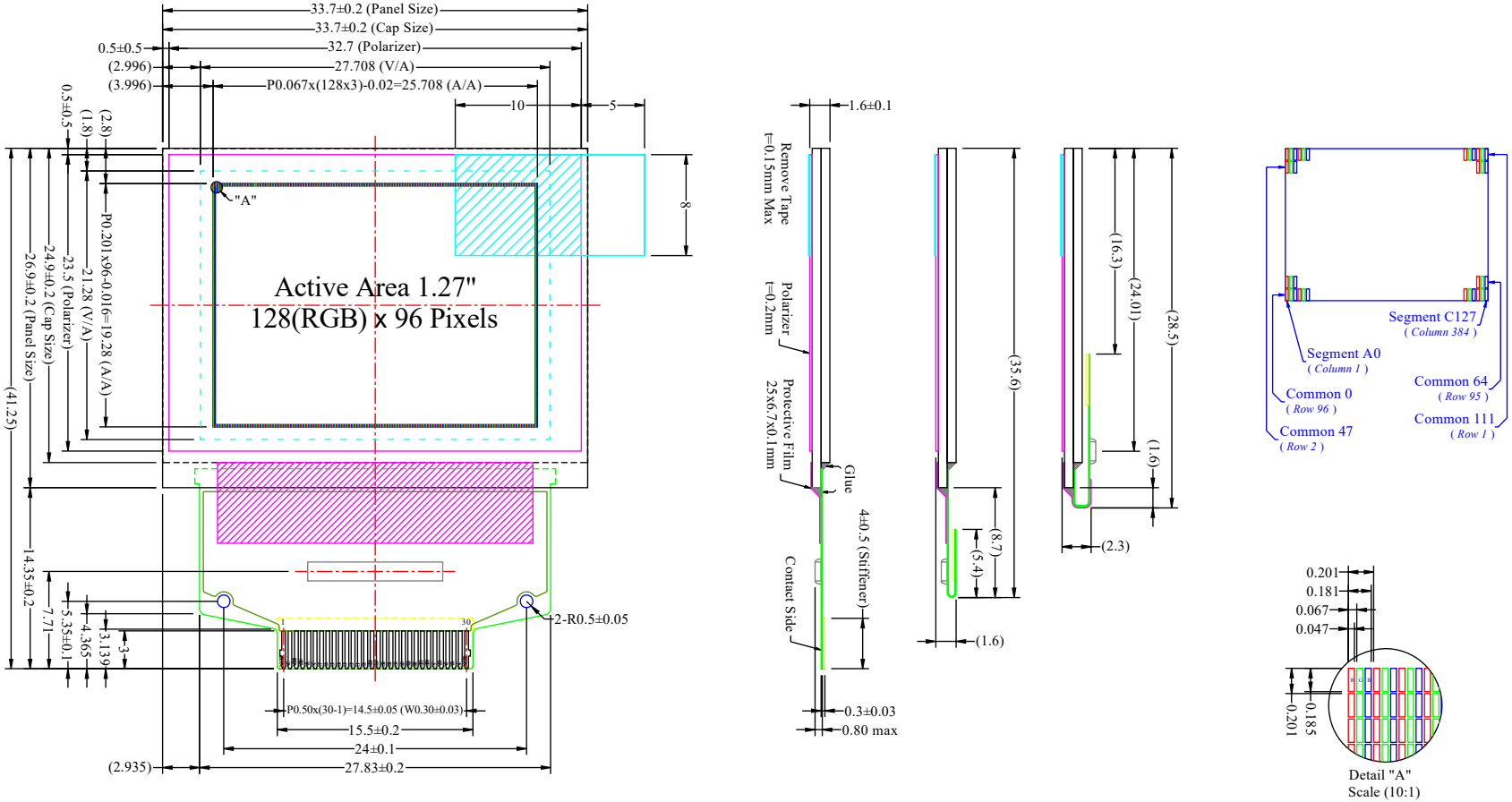
Item	Specification (mm)	Specification (inch, reference)
Overall Width and Height	33.70 (W) x 26.90 (H) x 1.60 (D)	1.327 (W) x 1.059 (H) x 0.063 (D)
Viewing Area	27.71 (W) x 21.28 (H)	1.091 (W) x 0.838 (H)
Active Area	25.71 (W) x 19.28 (H)	1.012 (W) x 0.759 (H)
Pixel Size	0.047 (W) x 0.185 (H)	0.002 (W) x 0.008 (H)
Pixel Pitch	0.067 (W) x 0.201 (H)	0.003 (W) x 0.008 (H)
Weight (Typical)	3 grams	0.11 ounces

5. Active Area

5.1. Memory Mapping & Pixel Construction



6. Mechanical Drawing



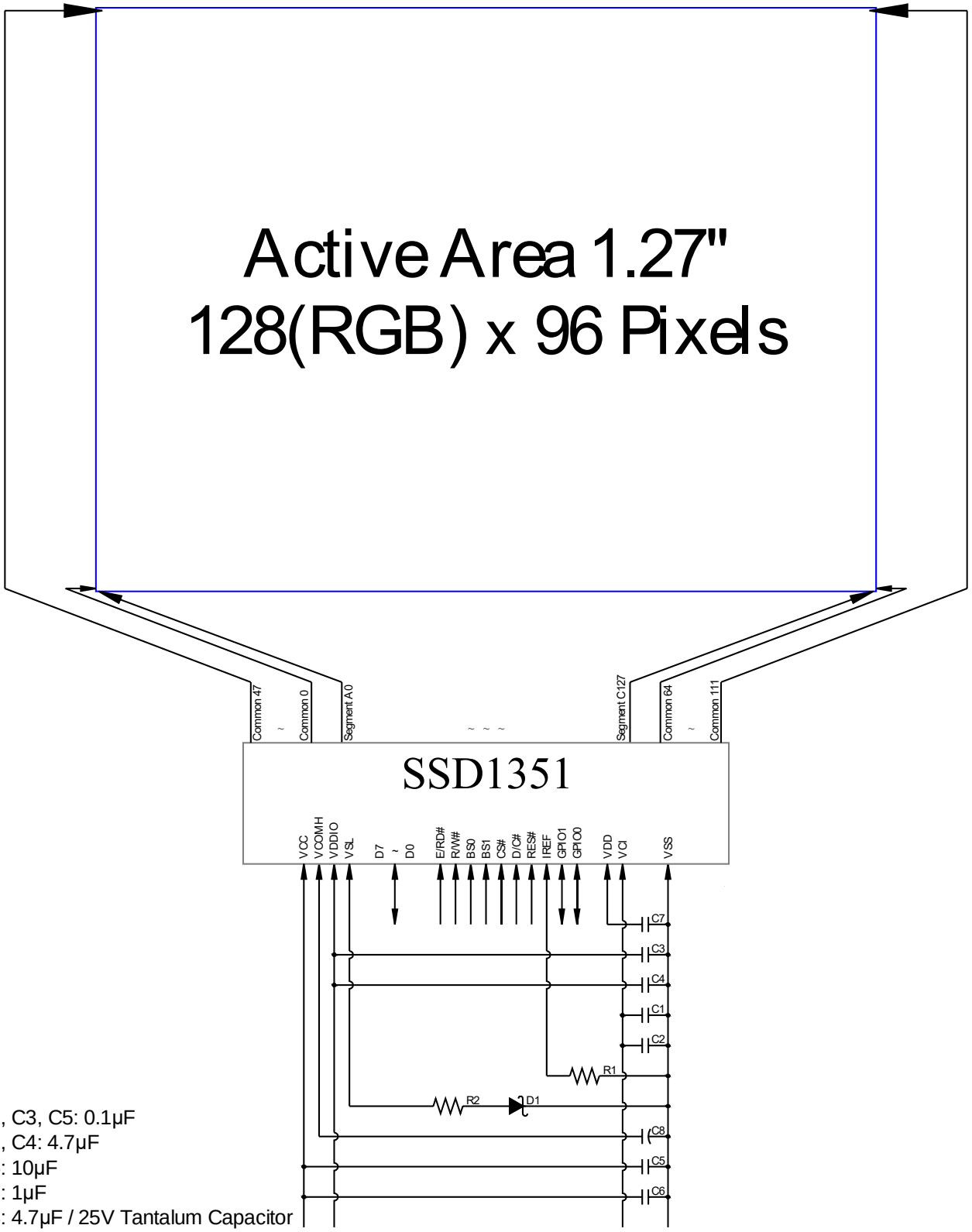
Crystalfontz ©2021 Crystalfontz America, Inc.	Part Number: CFAL12896A0-0127-F	Date: 2021-03-11	Filename: CFAL12896A0-0127-F Drawing	Revision: 1.0
		Web: www.crystalfontz.com/product/CFAL12896A0-0127-F		Sheet: 1 of 1

7. Interface Pin Function

<table>
<tr><th>Pin</th><th>Symbol</th><th>I/O</th><th>Function</th></tr>
<tr><td>1</td><td>NC (GND)</td><td>-</td><td>Reserved Pin (Supporting Pin)
The supporting pins can reduce the influences from stresses on the function pins. These pins must be connected to external ground as the ESD protection circuit.</td></tr>
<tr><td>2</td><td>VCC</td><td>P</td><td>Power Supply for OEL Panel
This is the most positive voltage supply pin of the chip. It must be connected to external source.</td></tr>
<tr><td>3</td><td>VCOMH</td><td>P</td><td>Voltage Output High Level for COM Signal
This pin is the input pin for the voltage output high level for COM signals. A tantalum capacitor should be connected between this pin and V_{SS}.</td></tr>
<tr><td>4</td><td>VDDIO</td><td>P</td><td>Power Supply for I/O Pin
This pin is a power supply pin of I/O buffer. It should be connected to V_{CI} or external source. All I/O signal should have V_{IH} reference to V_{DDIO}. When I/O signal pins (BS0~BS1, D0~D7, control signal) pull high, they should be connected to V_{DDIO}.</td></tr>
<tr><td>5</td><td>VSL</td><td>P</td><td>Voltage Output Low Level for SEG Signal
This is segment voltage reference pin. When external VSL is not used, this pin should be left open. When external V_{SL} is used, this pin should connect with resistor and diode to ground.</td></tr>
<tr><td>6</td><td>N.C.</td><td>-</td><td>Reserved Pin
The N.C. pins between function pins are reserved for compatible and flexible design.</td></tr>
<tr><td>7-14</td><td>D7-D0</td><td>I/O</td><td>Host Data Input/Output Bus
These pins are 8-bit bi-directional data bus to be connected to the microprocessor's data bus. When serial mode is selected, D1 will be the serial data input SD_{IN} and D0 will be the serial clock input S_{CLK}.
Unused pins must be connected to V_{SS} except for D2 in serial mode.</td></tr>
<tr><td>15</td><td>E/RD#</td><td>I</td><td>Read/Write Enable or Read
This pin is MCU interface input. When interfacing to a 68XX-series microprocessor, this pin will be used as the Enable (E) signal. Read/write operation is initiated when this pin is pulled high and the CS# is pulled low. When connecting to an 80XX-microprocessor, this pin receives the Read (RD#) signal. Data read operation is initiated when this pin is pulled low and CS# is pulled low. When serial mode is selected, this pin must be connected to V_{SS}.</td></tr>
<tr><td>16</td><td>R/W#</td><td>I</td><td>Read/Write Select or Write
This pin is MCU interface input. When interfacing to a 68XX-series microprocessor, this pin will be used as Read/Write (R/W#) selection input. Pull this pin to “High” for read mode and pull it to “Low” for write mode. When 80XX interface mode is selected, this pin will be the Write (WR#) input. Data write operation is initiated when this pin is pulled low and the CS# is pulled low. When serial mode is selected, this pin must be connected to V_{SS}.</td></tr>
<tr><td>17</td><td>BS0</td><td rowspan="2">I</td><td rowspan="2">Communicating Protocol Select
These pins are MCU interface selection input. Please see the following table:
<table>
<tr><th></th><th>BS0</th><th>BS1</th></tr>
<tr><td>3-wire SPI</td><td>1</td><td>0</td></tr>
<tr><td>4-wire SPI</td><td>0</td><td>0</td></tr>
<tr><td>8-bit 68XX Parallel</td><td>1</td><td>1</td></tr>
<tr><td>8-bit 80XX Parallel</td><td>0</td><td>1</td></tr>
</table></td></tr>
<tr><td>18</td><td>BS1</td></tr>
<tr><td>19</td><td>CS#</td><td>I</td><td>Chip Select
This pin is the chip select input. The chip is enabled for MCU communication only when CS# is pulled low.</td></tr>
</table>

Pin	Symbol	I/O	Function
20	D/C#	I	**Data/Command Control** This pin is Data/Command control pin. When the pin is pulled high, the input at D7~D0 is treated as display data. When the pin is pulled low, the input at D7~D0 will be transferred to the command register. When the pin is pulled high and serial interface mode is selected, the data at SDIN is treated as data. When it is pulled low, the data at SDIN will be transferred to the command register. When 3-wire serial mode is selected, this pin must be connected to V_{SS}. For detail relationship to MCU interface signals, please refer to the Timing Characteristics Diagrams.
21	RES#	I	**Power Reset for Controller and Driver** This pin is reset signal input. When the pin is low, initialization of the chip is executed. Keep this pin pull high during normal operation.
22	IREF	I	**Current Reference for Brightness Adjustment** This pin is the Segment Current Reference Pin. A resistor should be connected between this pin and V_{SS}. Set the current lower than 12.5μA maximum.
23	GPIO0	I/O	**General Purpose Input/Output** These pins could be left open individually or have signal inputted/outputted. It is able to use as the external DC/DC converter circuit enabled/disabled control or other applications.
24	GPIO1		
25	N.C.	-	**Reserved Pin** The N.C. pins between function pins are reserved for compatible and flexible design.
26	V_{DD}	P	**Power Supply for Core Logic Circuit** This is a voltage supply pin which is regulated internally from V_{CI}. A capacitor should be connected between this pin & V_{SS} under all circumstances.
27	V_{CI}	P	**Power Supply for Operation** This is a voltage supply pin. It must be connected to external source & always be equal to or higher than V_{DD} & V_{DDIO}.
28	V_{SS}	P	**Ground of OEL System** This is a ground pin. It also acts as a reference for the logic pins, the OEL driving voltages, and the analog circuits. It must be connected to external ground.
29	N.C.	-	**Reserved Pin** The N.C. pins between function pins are reserved for compatible and flexible design.
30	NC (GND)	-	**Reserved Pin (Supporting Pin)** The supporting pins can reduce the influences from stresses on the function pins. These pins must be connected to external ground as the ESD protection circuit.

8. System Block Diagram



- C1, C3, C5: 0.1µF
- C2, C4: 4.7µF
- C6: 10µF
- C7: 1µF
- C8: 4.7µF / 25V Tantalum Capacitor
- R1: 560kΩ, R1 = (Voltage at IREF – VSS) / IREF
- R2: 50Ω, 1/4W
- D1: ≈1.4V, 0.5W
- MCU Interface Selection: BS0 and BS1
- Pins Connected to MCU Interface: D7-D0, E/RD#, R/W#, CS#, D/C#, and RES#

9. Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	Notes
Supply Voltage for Operation	V_{CI}	-0.3	4	V	(1)(2)
Supply Voltage for Logic	V_{DD}	-0.5	2.75	V	(1)(2)
Supply Voltage for I/O Pins	V_{DDIO}	-0.5	V_{CI}	V	(1)(2)
Supply Voltage for Display	V_{CC}	-0.5	15	V	(1)(2)
Operating Temperature	T_{OP}	-40	+70	°C	(3)
Storage Temperature	T_{STG}	-40	+85	°C	(3)

Notes:
(1) The above voltages are based on V_{SS}=0V.
(2) Functional operation should be restricted to the limits in the Electrical Characteristics table below.
(3) The defined temperature ranges do not include the polarizer. The maximum withstood temperature of the polarizer should be 80°C.

10. Electrical Characteristics

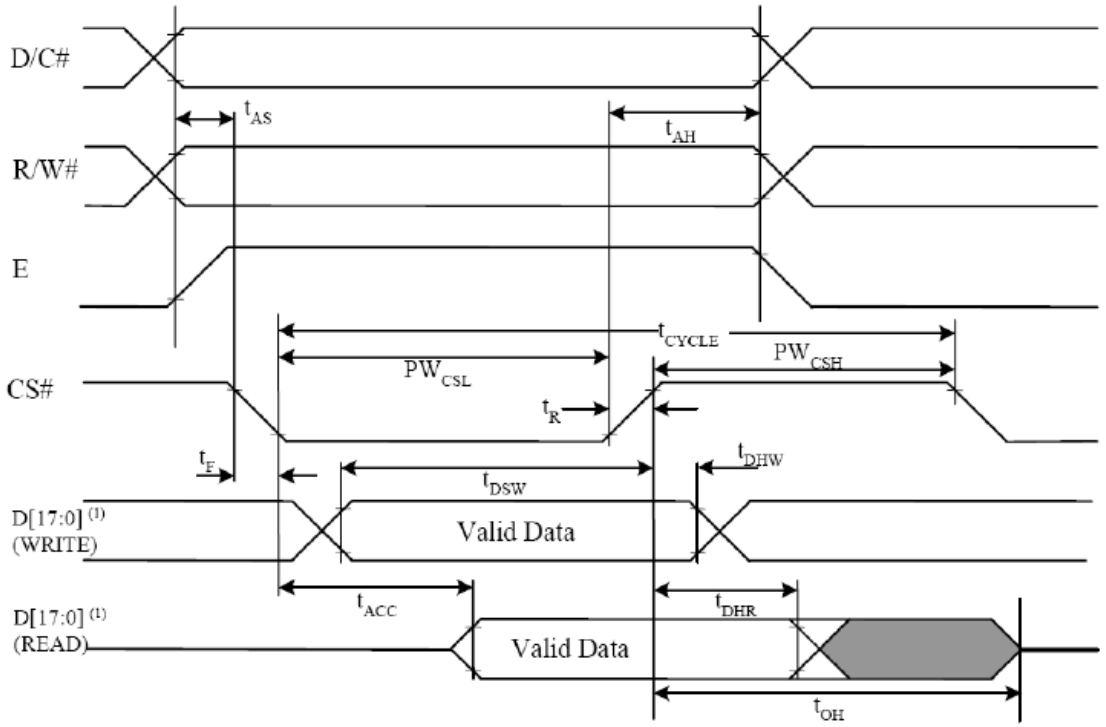
Item	Symbol	Condition	Min	Typ	Max	Unit	Note
Supply Voltage for Operation	V_{CI}	-	2.4	2.8	3.5	V	-
Supply Voltage for Logic	V_{DD}		2.4	2.5	2.6	V	-
Supply Voltage for I/O Pins	V_{DDIO}		1.65	1.8	V_{CI}	V	-
Supply Voltage for Display	V_{CC}	-	11.5	12.0	12.5	V	(1)
High-level Input	V_{IH}	-	0.8 x V_{DDIO}	-	V_{DDIO}	V	-
Low-level Input	V_{IL}	-	0	-	0.2 x V_{DDIO}	V	-
High-level Output	V_{OH}	I_{OUT} = 100µA, 3.3MHz	0.9 x V_{DDIO}	-	V_{DDIO}	V	-
Low-level Output	V_{OL}		0	-	0.1 x V_{DDIO}	V	-
Operating Current for V_{CI}	I_{CI}		-	320	400	µA	(2)
Operating Current for V_{CC}	I_{CC}	-	-	8.6	10.8	mA	(3)
			-	13.9	17.4	mA	(4)
			-	27.0	33.8	mA	-
Sleep Mode Current for V_{CI}	$I_{CI, SLEEP}$		-	10	50	µA	-
Sleep Mode Current for V_{CC}	$I_{CC, SLEEP}$		-	2	10	µA	-

Notes:
(1) Brightness (L_{br}) and Supply Voltage for Display (V_{CC}) are subject to the change of the panel characteristics.
(2) V_{CI} = 2.8V, V_{CC} = 12.0V, 30% Display Area Turn On.
(3) V_{CI} = 2.8V, V_{CC} = 12.0V, 50% Display Area Turn On.
(4) V_{CI} = 2.8V, V_{CC} = 12.0V, 100% Display Area Turn On.

11. AC Characteristics

11.1. 68XX-Series MPU Parallel Interface Timing Characteristics

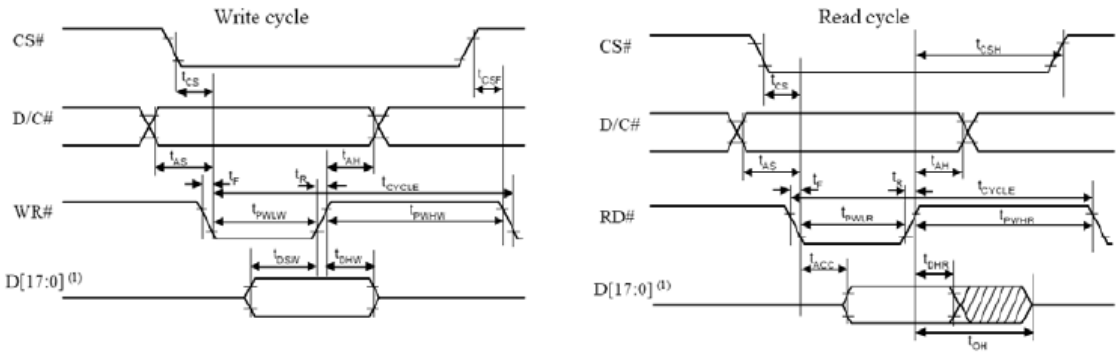
$V_{CI} – V_{SS}$ = 2.4V to 3.5V, $V_{DDIO} – V_{SS}$ = 1.65V to V_{CI}, Ta= 25°C				
Symbol	**Description**	**Min**	**Max**	**Unit**
t_{CYCLE}	Clock Cycle Time (Read)	320	-	ns
	Clock Cycle Time (Write)	300	-	ns
t_{AS}	Address Setup Time	24	-	ns
t_{AH}	Address Hold Time	0	-	ns
t_{DSW}	Write Data Setup Time	40	-	ns
t_{DHW}	Write Data Hold Time	7	-	ns
t_{DHR}	Read Data Hold Time	20	-	ns
t_{OH}	Output Disable Time	-	70	ns
t_{ACC}	Access Time	-	140	ns
PW_{CSL}	Chip Select Low Pulse Width (Read)	120	-	ns
	Chip Select Low Pulse Width (Write)	60		
PW_{CSH}	Chip Select High Pulse Width (Read)	60	-	ns
	Chip Select High Pulse Width (Write)	60		
t_R	Rise Time	-	15	ns
t_F	Fall Time	-	15	ns



Note: (1) When 8-bit is used, D[7:0] instead.

11.2. 80XX-Series MPU Parallel Interface Timing Characteristics

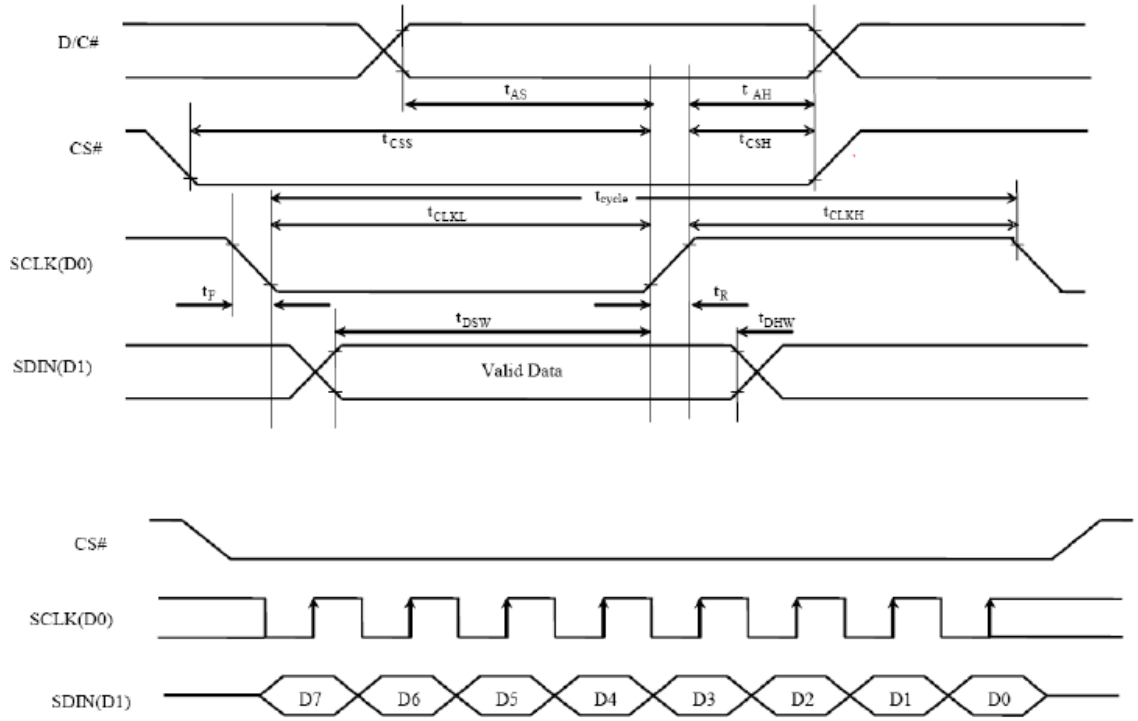
$V_{CI} – V_{SS}$ = 2.4V to 3.5V, $V_{DDIO} – V_{SS}$ = 1.65V to V_{CI}, Ta= 25°C				
Symbol	**Description**	**Min**	**Max**	**Unit**
t_{CYCLE}	Clock Cycle Time	300	-	ns
t_{AS}	Address Setup Time	10	-	ns
t_{AH}	Address Hold Time	0	-	ns
t_{DSW}	Write Data Setup Time	40	-	ns
t_{DHW}	Write Data Hold Time	7	-	ns
t_{DHR}	Read Data Hold Time	20	-	ns
t_{OH}	Output Disable Time	-	46	ns
t_{ACC}	Access Time	-	140	ns
t_{PWLR}	Read Low Time	150	-	ns
t_{PWLW}	Write Low Time	60	-	ns
t_{PWHR}	Read High Time	60	-	ns
t_{PWHW}	Write Low Time	60	-	ns
t_{CSS}	Chip Select Setup Time	0	-	ns
t_{CSH}	Chip Select Hold Time to Read Signal	0	-	ns
t_{CSF}	Chip Select Hold Time	20	-	ns
t_R	Rise Time	-	15	ns
t_F	Fall Time	-	15	ns



Note: (1) When 8-bit is used, D[7:0] instead.

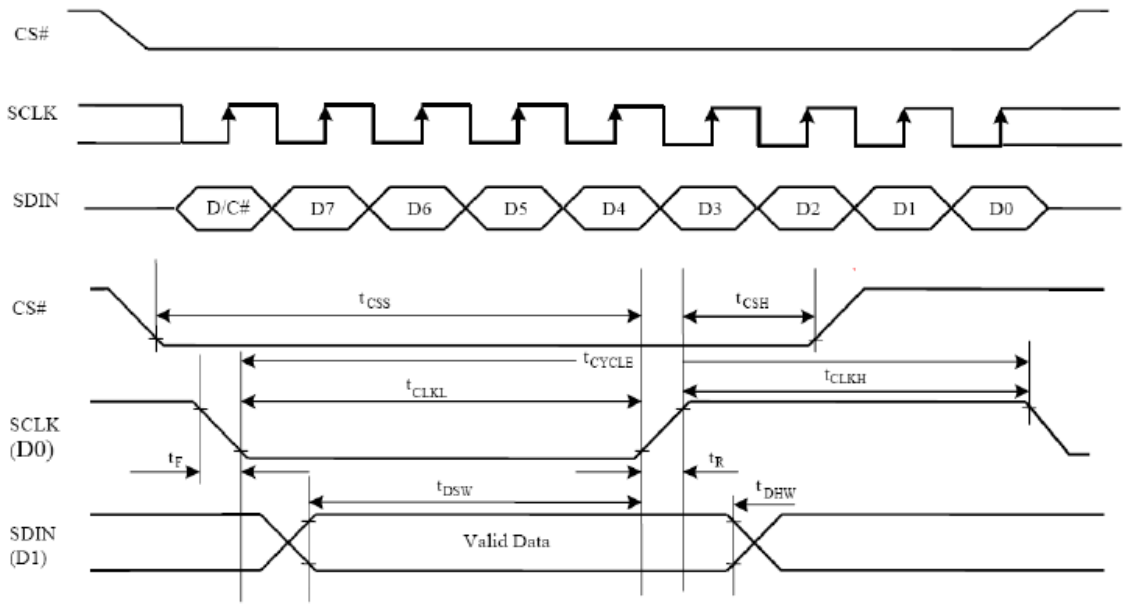
11.3. Serial Interface Timing Characteristics (4-wire SPI)

$V_{CI} – V_{SS}$ = 2.4V to 3.5V, $V_{DDIO} – V_{SS}$ = 1.65V to V_{CI}, Ta= 25°C				
Symbol	**Description**	**Min**	**Max**	**Unit**
t_{CYCLE}	Clock Cycle Time	220	-	ns
t_{AS}	Address Setup Time	15	-	ns
t_{AH}	Address Hold Time	42	-	ns
t_{CSS}	Chip Select Setup Time	20	-	ns
t_{CSH}	Chip Select Hold Time	10	-	ns
t_{DSW}	Write Data Setup Time	15	-	ns
t_{DHW}	Write Data Hold Time	20	-	ns
t_{CLKL}	Clock Low Time	20	-	ns
t_{CLKH}	Clock High Time	20	-	ns
t_R	Rise Time	-	15	ns
t_F	Fall Time	-	15	ns



11.4. Serial Interface Timing Characteristics (3-wire SPI)

$V_{CI} – V_{SS}$ = 2.4V to 3.5V, $V_{DDIO} – V_{SS}$ = 1.65V to V_{CI}, Ta= 25°C				
Symbol	**Description**	**Min**	**Max**	**Unit**
t_{CYCLE}	Clock Cycle Time	220	-	ns
t_{CSS}	Chip Select Setup Time	20	-	ns
t_{CSH}	Chip Select Hold Time	44	-	ns
t_{DSW}	Write Data Setup Time	15	-	ns
t_{DHW}	Write Data Hold Time	20	-	ns
t_{CLKL}	Clock Low Time	20	-	ns
t_{CLKH}	Clock High Time	20	-	ns
t_R	Rise Time	-	15	ns
t_F	Fall Time	-	15	ns



12. Functional Specification

12.1. Commands

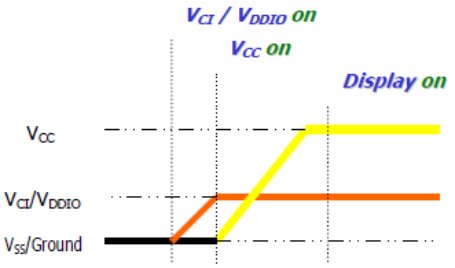
Please refer to the Solomon Systech SSD1351 LCD Datasheet.

12.2. Power Down and Power Up Sequence

To protect OEL panel and extend the panel life time, the driver IC power up/down routine should include a delay period between high voltage and low voltage power sources during turn on/off. It gives the OEL panel enough time to complete the action of charge and discharge before/after the operation.

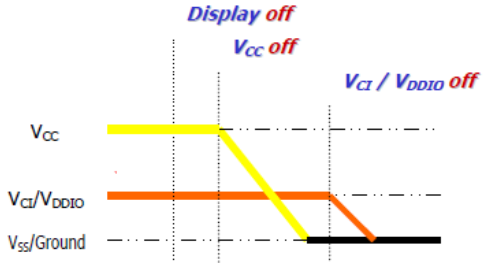
Power Up Sequence:

1. Power Up V_{CI} / V_{DDIO}
2. Send Display OFF command
3. Initialization
4. Clear Screen
5. Power up V_{CC}
6. Delay 200ms
   (When V_{CC} is stable)
7. Send Display on command



Power Down Sequence:

1. Send Display OFF command
2. Power down V_{CC}
3. Delay 100ms
   (When V_{CC} is reach 0 and panel is completely discharges)
4. Power down V_{CI} / V_{DDIO}



Notes:

(1) Since an ESD protection circuit is connected between V_{CI}, V_{DDIO}, and V_{CC} inside the driver IC, V_{CC} becomes lower than V_{CI} whenever V_{DD}, V_{DDIO} is ON and V_{CC} is OFF.
(2) V_{CC} should be kept disabled when it is OFF.
(3) Power Pins (V_{DD}, V_{DDIO}, V_{CC}) can never be pulled to ground under any circumstance.
(4) V_{CI}, V_{DDIO} should not be powered down before V_{CC} is powered down.

12.3. Reset Circuit

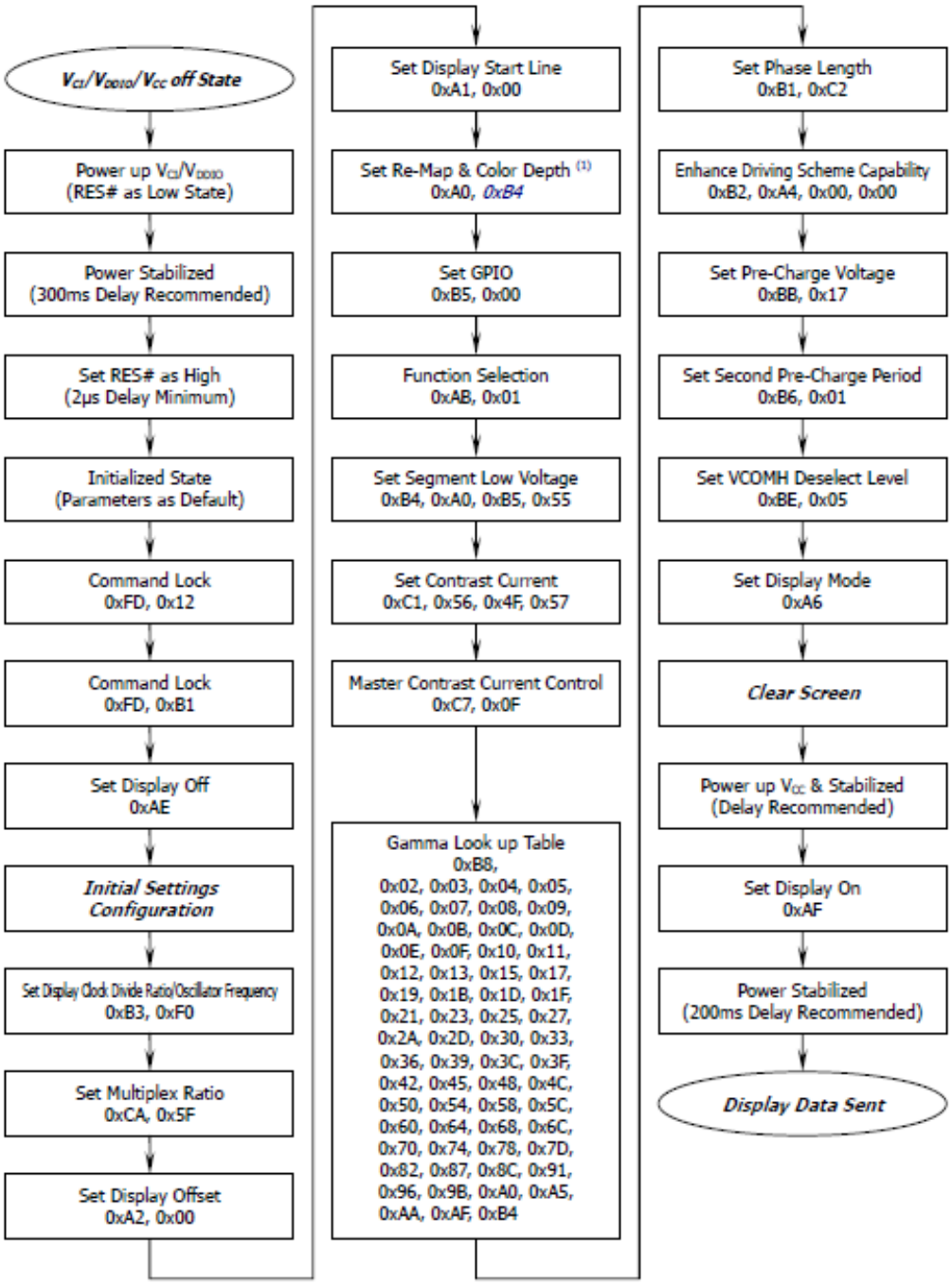
When RES# input is low, the chip is initialized with the following status:

1. Display is OFF
2. 128(RGB)×128 Display Mode
3. Normal segment and display data column and row address mapping (SEG0 mapped to column address 00h and COM0 mapped to row address 00h)
4. Display start line is set at display RAM address 0
5. Column address counter is set at 0
6. Normal scan direction of the COM outputs
7. Command A2h, B1h, B3h, BBh, BEh are locked by command FDh

12.4. Actual Application Example

Command usage with explanation.

<Power up Sequence>

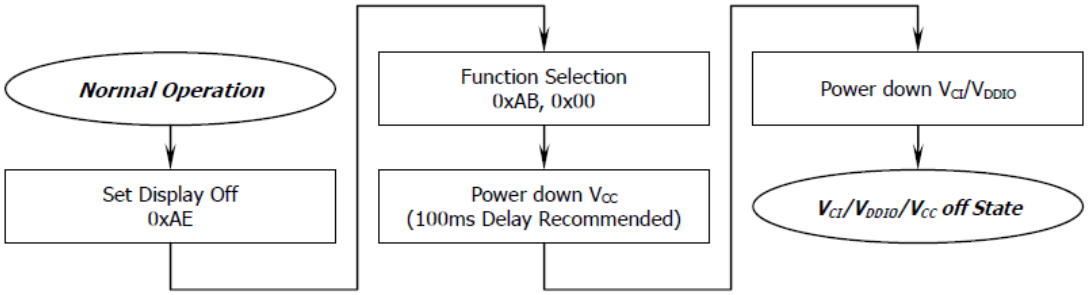


Note:

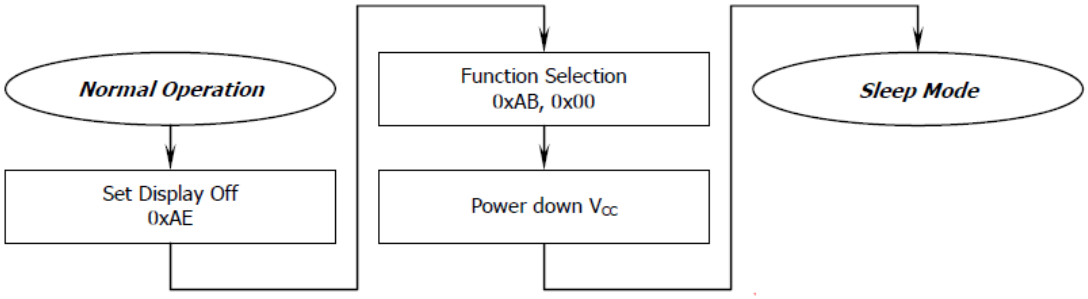
(1) This command could be programmable to fit various applications, for example
0xB4 = 262,144 Color Mode
0x74 = 65,536 Color Mode.

If noise accidentally occurs during the operation, please reset the display in order to recover the display function.

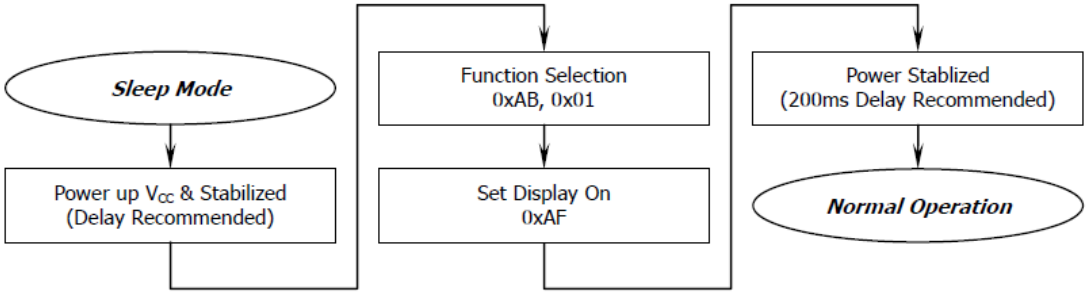
<Power down Sequence>



<Entering Sleep Mode>

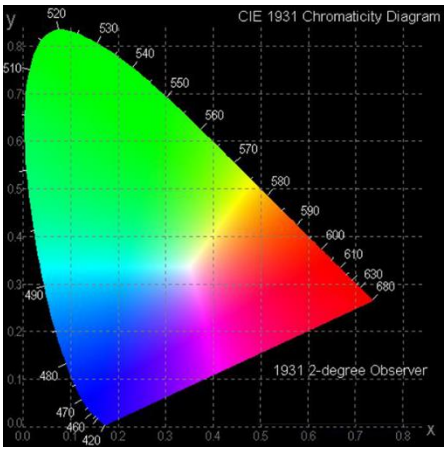


<Exiting Sleep Mode>



13. Optical Characteristics

Item	Symbol	Condition	Min	Typ	Max	Unit
Viewing Angle	-	V_{CI}=2.8V, V_{CC}= 12.0V	-	All	-	deg
Contrast Ratio	CR	Dark Room	>10,000:1	-	-	-
Brightness	L_{br}	Brightness (L_{br}) and Supply Voltage for Display (V_{CC}) are subject to the change of the panel characteristics.	80	100	-	cd/m^2
CIE (White)	x	CIE 1931	0.26	0.30	0.34	-
CIE (White)	y		0.29	0.33	0.37	-
CIE (Red)	x		0.60	0.64	0.68	-
CIE (Red)	y		0.30	0.34	0.38	-
CIE (Green)	x		0.27	0.31	0.35	-
CIE (Green)	y		0.58	0.62	0.66	-
CIE (Blue)	x		0.10	0.14	0.18	-
CIE (Blue)	y		0.12	0.16	0.20	-



14. OLED Lifetime

Item	Conditions	Min	Typ	Notes
Operating Lifetime	Ta=25°C Initial 50% check board brightness Typical Value	10,000 Hrs.	-	(1)(2)(3)

Notes:

(1) Lifetime is defined as the amount of time when the luminance has decayed to <50% of the initial value.
(2) This analysis method uses life data obtained under accelerated conditions to extrapolate an estimated Probability Density Function (PDF) for the product under normal use conditions.
(3) Screen saving mode will extend OLED lifetime.

15. OLED Module Precautions

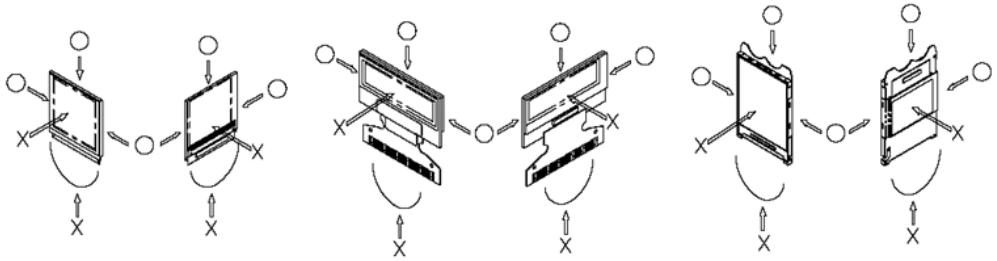
The precautions below should be followed when using OLED modules to help ensure personal safety, module performance, and compliance of environmental regulations.

15.1. Modules

- Avoid applying excessive shocks to module or making any alterations or modifications to it.
- Do not make extra holes on the printed circuit board, modify its shape or change the components of OLED display module.
- Do not disassemble the OLED display module.
- Do not operate the OLED display module above the absolute maximum rating.
- Do not drop, bend or twist the OLED display module.
- Soldering: only to the I/O terminals.
- Store in an anti-static electricity container and clean environment.
- It is common to use the "screen saver" to extend the lifetime of the OLED display module.
  - Do not use the fixed information for long periods of time in real application.
  - Do not use fixed information in OLED panel for long periods of time to extend "screen burn" effect time.
- Crystalfontz has the right to change the passive components, including R2 and R3 adjust resistors. (Resistors, capacitors and other passive components will have different appearance and color caused by the different supplier.)
- Crystalfontz have the right to change the PCB Rev. (In order to satisfy the supplying stability, management optimization and the best product performance, etc., under the premise of not affecting the electrical characteristics and external dimensions, Crystalfontz has the right to modify the version.).

15.2. Handling Precautions

- Since the display panel is made of glass, do not apply mechanical impacts such as dropping from a high position.
- If the display panel is accidently broken, and the internal organic substance leaks out, be careful not to inhale or touch the organic substance.
- If pressure is applied to the display surface or its neighborhood of the OLED display module, the cell structure may be damaged, so be careful not to apply pressure to these sections.
- The polarizer covering the surface of the OLED display module is soft and can be easily scratched. Please be careful when handling the OLED display module.
- Clean the surface of the polarizer covering the OLED display module if it becomes soiled using following adhesion tape.
  - Scotch Mending Tape No. 810 or an equivalent
  - Never breathe the soiled surface or wipe the surface using a cloth containing solvent such as ethyl alcohol, since the surface of the polarizer will become cloudy.
  - The following liquids/solvents may spoil the polarizer:
    - Water
    - Ketone
    - Aromatic Solvents
- Hold the OLED display module very carefully when placing the OLED display module into the system housing.
- Do not apply excessive stress or pressure to the OLED display module. And, do not over bend the film with electrode pattern layouts. These stresses will influence the display performance. Also, be sure to secure the sufficient rigidity for the outer cases.



- Do not apply stress to the LSI chips and the surrounding molded sections.
- Do not disassemble or modify the OLED display module.
- Do not apply input signals while the logic power is off.
- Pay sufficient attention to the working environments when handing the OLED display module to prevent occurrence of element breakage accidents by static electricity.
    - Be sure to make human body grounding when handling OLED display modules.
    - Be sure to ground tools to use for assembly such as soldering irons.
    - To suppress generation of static electricity, avoid carrying out assembly work under dry environments.
    - Protective film is being applied to the surface of the display panel of the OLED display module. Be careful since static electricity may be generated when exfoliating the protective film.
- Protection film is being applied to the surface of the display panel and removes the protection film before assembling it. At this time, if the OLED display module has been stored for a long period of time, residue adhesive material of the protection film may remain on the surface of the display panel after the film has been removed. In such a case, remove the residue material by the method discussed above.
- If electric current is applied when the OLED display module is being dewed or when it is placed under high humidity environments, the electrodes may become corroded. If this happens proceed with caution when handling the OLED display module.

15.3. Storage Precautions

- When storing the OLED display modules put them in static electricity preventive bags to avoid exposure to direct sunlight and fluorescent lamps. Also avoid high temperature and high humidity environments and low temperatures (less than 0°C) environments. (We recommend you store these modules in the packaged state when they were shipped from Crystalfontz). Be careful not to let water drops adhere to the packages or bags, and do not let dew gather on them.
- If electric current is applied when water drops are adhering to the surface of the OLED display module the OLED display module may have become dewed. If a dewed OLED display module is placed under high humidity environments it may cause the electrodes to become corroded. If this happens proceed with caution when handling the OLED display module.

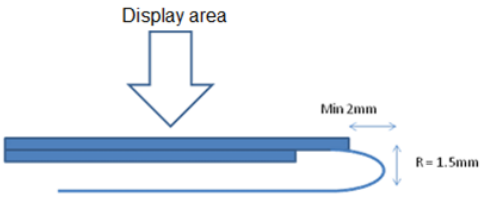
15.4. Designing Precautions

- The absolute maximum ratings are the ratings that cannot be exceeded for OLED display module. If these values are exceeded, panel damage may happen.
- To prevent occurrence of malfunctioning by noise pay attention to satisfy the V_{IL} and V_{IH} specifications and, at the same time, to make the signal line cable as short as possible.
- We recommend that you install excess current preventive unit (fuses, etc.) to the power circuit (V_{DD}). (Recommend value: 0.5A)
- Pay sufficient attention to avoid occurrence of mutual noise interference with the neighboring devices.
- As for EMI, take necessary measures on the equipment side.
- When fastening the OLED display module, fasten the external plastic housing section.
- If the power supply to the OLED display module is forcibly shut down, by such errors as taking out the main battery while the OLED display panel is in operation, we cannot guarantee the quality of this OLED display module.
    - Connection (contact) to any other potential than the above may lead to rupture of the IC.

15.5. Disposing Precautions

- Request the qualified companies to handle the industrial wastes when disposing of the OLED display modules. Or, when burning them, be sure to observe the environmental and hygienic laws and regulations.

15.6. Other Precautions

- When an OLED display module is operated for a long period of time with a fixed pattern, the fixed pattern may remain as an after image or a slight contrast deviation may occur.
    - If the operation is interrupted and left unused for a while, normal state can be restored.

  - This will not cause a problem in the reliability of the module.
- To protect the OLED display module from performance drops by static electricity rapture, etc., do not touch the following sections whenever possible while handling the OLED display modules.
  - Pins and electrodes
  - Pattern layouts such as the TCP & FPC
- With this OLED display module, the OLED driver is being exposed. Generally speaking, semiconductor elements change their characteristics when light is radiated according to the principle of the solar battery. Consequently, if this OLED driver is exposed to light, malfunctioning may occur.
  - Design the product and installation method so that the OLED driver may be shielded from light in actual usage.
  - Design the product and installation method so that the OLED driver may be shielded from light during the inspection processes.
- Although this OLED display module stores the operation state data by the commands and the indication data, when excessive external noise, etc. enters into the module, the internal status may be changed. Therefore, it is necessary to take appropriate measures to suppress noise generation or to protect from influences of noise on the system design.
- We recommend that you construct its software to make periodical refreshment of the operation statuses (re-setting of the commands and re-transference of the display data), to cope with catastrophic noise.
- Resistors, capacitors, and other passive components will have different appearance and color caused by the different supplier.
- Crystalfontz has the right to upgrade and modify the product function.
- The limitation of FPC bending: