

Product Specification

Part Name: OEL Display Module

Customer Part ID:

GM Part ID: 2.42-4PIIC_(4px2)

Ver: A

Customer:
Approved by

From: GoldenMorning Electronic CO.,LTD
Approved by

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Revision History

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1. Basic Specifications

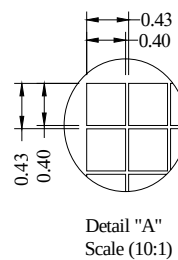
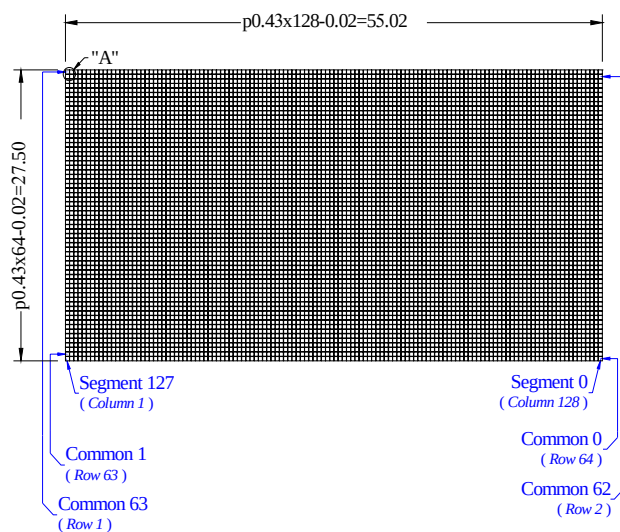
1.1 Display Specifications

- | | |
|-------------------|----------------|
| 1) Display Mode: | Passive Matrix |
| 2) Display Color: | Monochrome |
| 3) Drive Duty: | 1/64 Duty |

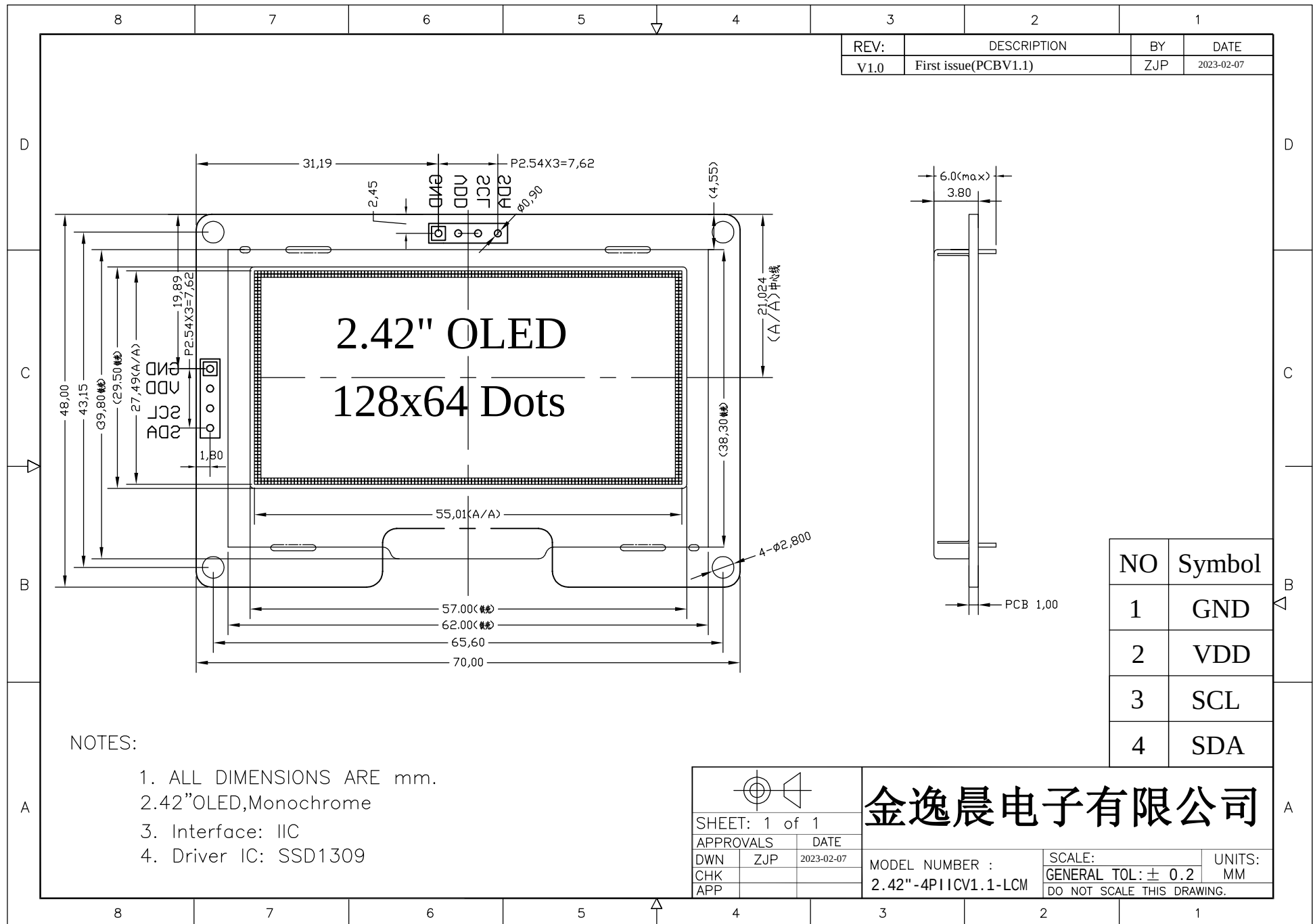
1.2 Mechanical Specifications

- | | |
|----------------------|--|
| 1) Outline Drawing: | According to the annexed outline drawing |
| 2) Number of Pixels: | 128 × 64 |
| 3) Module Size: | 70.00×48.00 × 6.00max (mm) |
| 4) Active Area: | 55.01 × 27.50(mm) |
| 5) Pixel Pitch: | 0.43 × 0.43 (mm) |
| 6) Pixel Size: | 0.40 × 0.40 (mm) |
| 7) Weight: | TBD |

1.3 Active Area / Memory Mapping & Pixel Construction



1.4 Mechanical Drawing



1.5 Pin Definition

PIN	SYMBOL	Descriptions
1	GND	Ground of Logic Circuit
2	VDD	Power Supply for Logic
3	SCL	Serial clock input.
4	SDA	Serial data input.

2. Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	Notes
Supply Voltage for Logic	V_{DD}	-0.3	4	V	1, 2
Supply Voltage for Display	V_{CC}	0	15	V	1, 2
Operating Temperature	T_{OP}	-40	70	°C	3
Storage Temperature	T_{STG}	-40	85	°C	3
Life Time (80 cd/m ²)		30,000	-	hour	4
Life Time (60 cd/m ²)		50,000	-	hour	4

Note 1: All the above voltages are on the basis of " $V_{SS} = 0V$ ".

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.

Note 3: The defined temperature ranges do not include the polarizer. The maximum withstood temperature of the polarizer should be 80°C.

Note 4: $V_{CC} = 13.0V$, $T_a = 25^{\circ}C$, 50% Checkerboard.

Software configuration follows Section 4.4 Initialization.

End of lifetime is specified as 50% of initial brightness reached. The average operating lifetime at room temperature is estimated by the accelerated operation at high temperature conditions.

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3. Optics & Electrical Characteristics

3.1 Optics Characteristics

Characteristics	Symbol	Conditions	Min	Typ	Max	Unit
Brightness	L_{br}	Note 5	60	80	-	cd/m ²
C.I.E. (White)	(x) (y)	C.I.E. 1931	0.25 0.27	0.29 0.31	0.33 0.35	
Dark Room Contrast	CR		-	>10,000:1	-	
Viewing Angle			-	Free	-	degree

* Optical measurement taken at $V_{DD} = 2.8V$, $V_{CC} = 13.0V$.
Software configuration follows Section 4.4 Initialization.

3.2 DC Characteristics

Characteristics	Symbol	Conditions	Min	Typ	Max	Unit
Supply Voltage for Logic	V_{DD}		1.65	2.8	3.3	V
Supply Voltage for Display	V_{CC}	Note 5	12.5	13.0	13.5	V
High Level Input	V_{IH}	$I_{OUT} = 100\mu A$, 3.3MHz	$0.8 \times V_{DD}$	-	V_{DD}	V
Low Level Input	V_{IL}	$I_{OUT} = 100\mu A$, 3.3MHz	0	-	$0.2 \times V_{DD}$	V
High Level Output	V_{OH}	$I_{OUT} = 100\mu A$, 3.3MHz	$0.9 \times V_{DD}$	-	V_{DD}	V
Low Level Output	V_{OL}	$I_{OUT} = 100\mu A$, 3.3MHz	0	-	$0.1 \times V_{DD}$	V
Operating Current for V_{DD}	I_{DD}		-	180	300	μA
Operating Current for V_{CC}	I_{CC}	Note 6	-	18.5	23.1	mA
		Note 7	-	27.1	33.9	mA
		Note 8	-	42.3	52.9	mA
Sleep Mode Current for V_{DD}	$I_{DD, SLEEP}$		-	1	5	μA
Sleep Mode Current for V_{CC}	$I_{CC, SLEEP}$		-	2	10	μA

Note 5: Brightness (L_{br}) and Supply Voltage for Display (V_{CC}) are subject to the change of the panel characteristics and the customer's request.

Note 6: $V_{DD} = 2.8V$, $V_{CC} = 13.0V$, 30% Display Area Turn on.

Note 7: $V_{DD} = 2.8V$, $V_{CC} = 13.0V$, 50% Display Area Turn on.

Note 8: $V_{DD} = 2.8V$, $V_{CC} = 13.0V$, 100% Display Area Turn on.

* Software configuration follows Section 4.4 Initialization.

4.Functional Specification

4.1 Commands

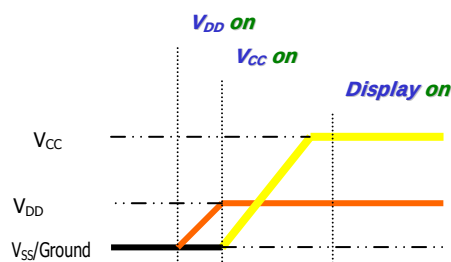
REFER TO 《SSD1309-Revision 1.1.pdf》

4.2 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.

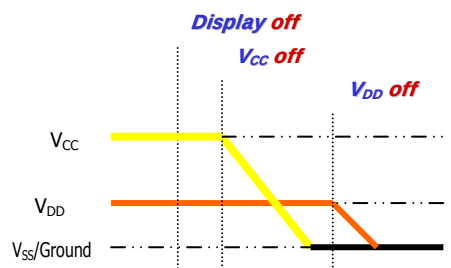
4.2.1 Power up Sequence:

1. Power up V_{DD}
2. Send Display off command
3. Initialization
4. Clear Screen
5. Power up V_{CC}
6. Delay 100ms
(When V_{CC} is stable)
7. Send Display on command



4.2.2 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_{DD}



Note 13:

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

4.3 Reset Circuit

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

1. Display is OFF
2. 128×64 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. Shift register data clear in serial interface
5. Display start line is set at display RAM address 0
6. Column address counter is set at 0
7. Normal scan direction of the COM outputs
8. Contrast control register is set at 7Fh
9. Normal display mode (Equivalent to A4h command)

4.4 Actual Application Example : REFER TO DEMO