

OLED Module SPECIFICATIONS

MODEL NO. : IE-PP28025664W3-1
PRODUCT TYPE: STANDARD

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History of versions and modifications

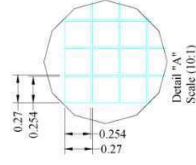
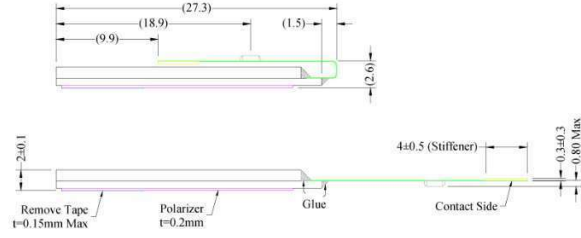
Revision	Date	Description	Changed By
1.0		Preliminary specification	

Functions and Features

- ⌚ 256X64 Graphic
- ⌚ Built-in controller
- ⌚ viewing angle Free
- ⌚ Wide Temperature -40°C ~ +85°C (Operation)
- ⌚ RoHS compliant

Mechanical Specification

Item	Description	
Product No.	PG25664BW	
Inch	2.8"	
Color	White	
Active Area	69.104(W)×17.264(H)	mm
Panel Size	84.00(W)×25.80(H)×2.00(D)	mm
Dot Size	0.254(W)×0.254(H)	mm
Dot Pitch	0.270(W)×0.270(H)	mm
Display Format	256×64	
Duty Ratio	1/64	Duty
Controller	SSD1322 or Equivalent	
Operation Temperature	-40~85	°C
Storage Temperature	-40~90	°C
Response Time	≤10	us
Assembly	Connector	



Pin	Symbol N.C. (GND)
1	VSS
2	VCC
3	VCC
4	VCOMH
5	VSS
6	D7
7	D6
8	D5
9	D4
10	D3
11	D2
12	D1
13	D0
14	E/RD#
15	BS#
16	BS0
17	BS1
18	DC#
19	CS#
20	RES#
21	IFR
22	IREF
23	N.C
24	VDDIO
25	VDD
26	VCI
27	VSS
28	VSS
29	VCC
30	N.C. (GND)

1. Color:
2. Driver IC: SSD1322
3. Die Size: 12374um x 1526um
4. COF Number: SSD1322U
5. Interface:
6. 8-bit 68XX/80XX Parallel, 3-/4-wire SPI  
7. The total thickness (2.10 Max) is without polarizer protective film & remove tape; The actual assembled total thickness with above materials should be 2.35 Max.

Pin Description

Power Supply

Pin Number	Symbol	Type	Function
26	VCI	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 VDD & VDDIO.
25	VDD		Power Supply for Core Logic Circuit This is a voltage supply pin. It can be supplied externally (within the rang of 2.4~2.6V) or regulated internally from VCI. A capacitor should be connected between this pin & VSS under all circumstances.
24	VDDIO		Power Supply for I/O Pin This pin is a power supply pin of I/O buffer. It should be connected to VDD or external source. All I/O signal should have VIH reference to VDDIO. When I/O signals pins (BS0~BS1, D0~D7, control signals...) pull high, they should be connected to VDDIO.
2	VSS		Ground of Logic Circuit This is a ground pin. It also acts as a reference for the logic pins. It must be connected to external ground.
3,29	VCC		Power Supply for OEL Panel These are the most positive voltage supply pin of the chip. They must be connected to external source.
5,28	VLSS		Ground of Analog Circuit These are the analog ground pins. They should be connected to VSS externally.

Driver

Pin Number	Symbol	Type	Function
22	IREF	I	Current Reference for Brightness Adjustment This pin is segment current reference pin. A resistor should be connected between this pin and VSS. Set the current lower than 10uA.
4	VCOMH	P	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 VSS.
27	VSL	P	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 VSL is used, this pin should connect with resistor and diode to ground.

Testing Pads

Pin Number	Symbol	Type	Function
21	FR	O	This pin will send out a signal that could be used to identify the driver status. Nothing should be connected to this pin. It should be left open individually.

Interface

Pin Number	Symbol	Type	Function
16 17	BS0 BS1	I	Communicating Protocol Select These pins are MCU interface selection input. See the following table:
			3-wire SPI
			4-wire SPI
			8-bit 68xx Parallel
			8-bit 80xx Parallel
20	RES#		Power Reset for Controller and Driver This pin is reset signal input. When the pin is low, initialization of the chip is executed.
19	CS#		Chip Select This pin is the chip select input. The chip is enabled for MCU communication only when CS# is pulled low.
18	D/C#		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. For detail relationship to MCU interface signals, please refer to the Timing Characteristics Diagrams.
14	E/RD#		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 VSS.
15	R/W#		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 or I2C mode is selected, this pin must be connected to VSS.

6~13	D7~D0	I/O	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 SDIN and D0 will be the serial clock input SCLK. Unused pins must be connected to VSS except for D2 in serial mode.
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Reserve

Pin Number	Symbol	Type	Function
23	N.C.	-	Reserved Pin The N.C. pin between function pins is reserved for compatible and flexible design.
1,30	N.C. (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.

Block Diagram



MCU Interface Selection: BS0 and BS1

Pins connected to MCU interface: D7~D0, E/RD#, R/W#, D/C#, CS#, and RES#

C1, C3, C5: 0.1 μ F

C2, C4: 4.7 μ F

C6: 10 μ F

C7: 1 μ F

C8: 4.7 μ F / 25V Tantalum Capacitor

R1: 680k Ω , $R1 = (V_{DDIO} - V_{SS}) / I_{REF}$

R2: 50 Ω , 1/4W

DC Characteristics

Item	Symbol	Condition	Min.	Type	Max.	Unit
Supply Voltage for Operation	V _{CI}		2.4	2.8	3.5	Volt
Supply Voltage for Logic	V _{DD}		2.4	2.5	2.6	Volt
Supply Voltage for I/O Pins	V _{DDIO}		1.65	1.8	V _{CI}	Volt
Supply Voltage for Display	V _{CC}	Note 5	11.5	12	12.5	Volt
Operating Current for V _{CI}	I _{CI}		-	180	300	μA
Operating Current for V _{CC}	I _{CC}	Note 6	-	17.8	22.3	mA
		Note 7	-	28.1	35.1	mA
		Note 8	-	47.7	59.7	mA
Sleep Mode Current for V _{CI}	I _{CI} ,SLEEP		-	20	100	μA
Sleep Mode Current for V _{CC}	I _{CC} ,SLEEP		-	2	10	μA

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

Note 6: V_{CI} = 2.8V, V_{CC} = 12.0V, 30% Display Area Turn on.

Note 7: V_{CI} = 2.8V, V_{CC} = 12.0V, 50% Display Area Turn on.

Note 8: V_{CI} = 2.8V, V_{CC} = 12.0V, 100% Display Area Turn on

Optical Characteristics

Item	Symbol	Conditions	Min.	Type	Max.	Unit
Brightness	Lbr	With Polarizer (Note 3)	-	80	-	cd/m ²
C.I.E.	(X)	With Polarizer	0.28	0.32	0.36	
	(Y)		0.29	0.33	0.37	
Dark Room Contrast	CR	-	-	>10000:1	-	
Viewing angle range	-	-	-	Free	-	Degree

* Optical measurement taken at V_{DD} = 2.8V, V_{CC} = 12V.

Absolute Maximum rating

Item	Symbol	Min.	Typ.	Max.	Unit	Notes
Supply Voltage for Operation	VCI	-0.3	-	4	Volt	1,2
Supply Voltage for Logic	VDD	-0.5	-	2.75	Volt	1,2
Supply Voltage for I/O Pins	VDDIO	-0.5	-	VCI	Volt	1,2
Supply Voltage for Display	Vcc	-0.5	-	16	Volt	1,2
Life Time (50 cd/m ²)		---	30,000	---	Hour	

Lifetime 50cd/m² , 30,000 hours (TYP) Note 4.

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 condition according to Section “Optics ”. If this module is used beyond these conditions, malfunctioning of the module can occur and the reliability of the module may deteriorate.

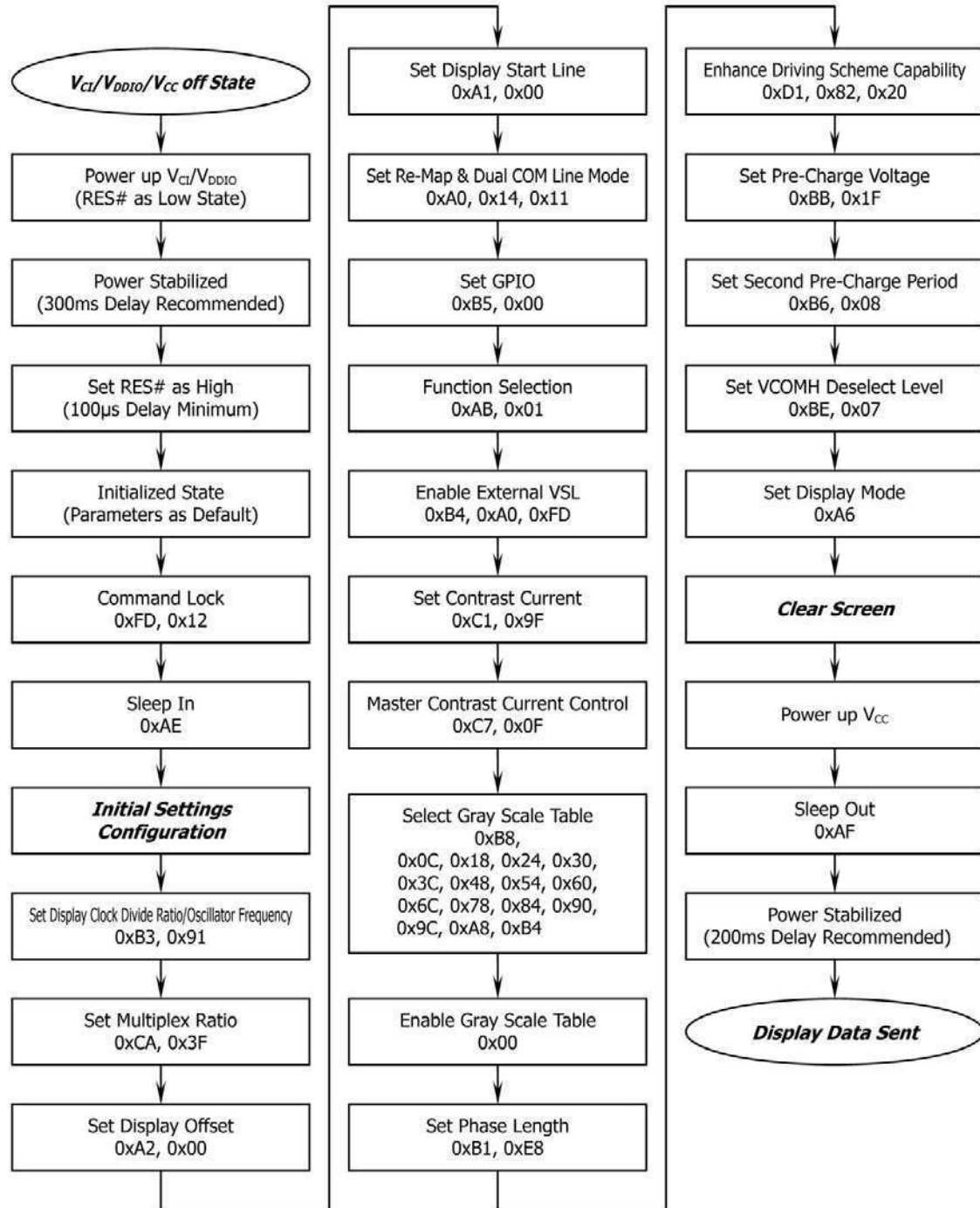
AC Characteristics

Please refer “SSD1322 specification”.

Actual Application Example

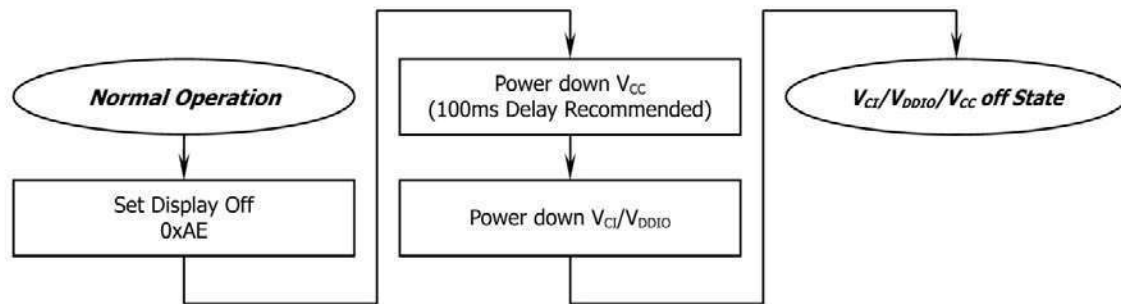
Command usage and explanation of an actual example

<Power up Sequence>

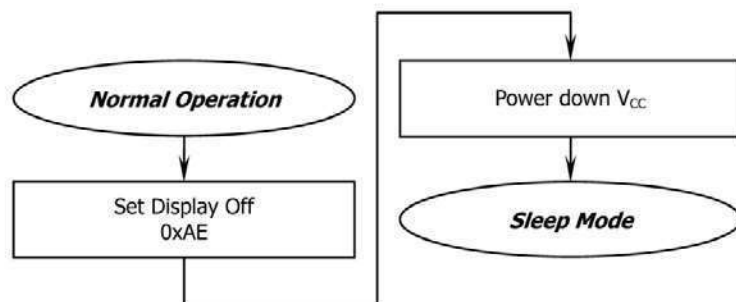


If the noise is accidentally occurred at the displaying window during the operation, please reset the display in order to recover the display function.

<Power down Sequence>



<Entering Sleep Mode>



<Exiting Sleep Mode>

