

PRODUCT SPECIFICATION

VGG13264C

132×64 GRAPHICS OLED DISPLAY MODULE



VGG13264C-S001



VGG13264C-S002

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1 Overview

VGG13264C is an OLED monochrome 132×64 dot matrix display module. The characteristics of this display module are high brightness, self-emission, high contrast ratio, slim/thin outline, wide viewing angle, wide temperature range, and low power consumption. It can be controlled by 8-bit Microprocessor directly. Different of S001 and S002 is S001 need external voltage (OLED luminosity can be adjusted),but S002 integrate with DC-DC circuit(OLED fixed luminosity).

2 Features

- 132×64 pixels
- Color:Green
- High contrast ratio
- Wide viewing angle
- Wide range of operating temperature
- low power consumption
- 8-bit 8080-Databus or 8-bit 6800-series parallel interface or series peripheral interface
- Display data is stored in Display Data RAM from MPU
- Built-in Solomon SSD1305 standard OLED controller

3 Mechanical Data

NO.	ITEM	SPECIFICATION	UNIT
1	Dot Matrix	132(W) x 64(H)	
2	Dot Size	0.18(W) x 0.23 (H)	mm
3	Pixel Pitch	0.24 (W) x 0.27(H)	mm
4	Aperture Rate	64	%
5	Active Area	31.62 (W) x 17.24 (H)	m ²
6	View Area	33.62 (W) x 19.24 (H)	m ²
7	Panel Size	46.3(W) x 32.1 (H)	mm
8	Module Size	51.5 (W) x 47.5 (H) x 7.5 (T)	mm
9	Duty	1/64	

4 Absolute Maximum ratings

Symbol	ITEM	MIN	MAX	UNIT
V _{DD}	Logic supply voltage	0	+3.5	V
V _{CC}	Operating voltage	0	+16	V
T _{op}	Operating Temp.	-20	+70	°C
T _{stg}	Storage Temp	-30	+80	°C

5 Electrical Characteristics

5.1 DC Electrical Characteristics

ITEM	Symbol	Test condition	MIN	TYPE	MAX	Unit
Logic Supply Voltage	V _{DD}	Ta=-20°C to +70°C	2.4	3.0	3.5	V
OLED Driver Supply Voltage	V _{CC}	Ta=-20°C to +70°C	8	9	10	V
High-level Input Voltage	V _{IH}		0.8*V _{DD}	-	V _{DD}	V
Low-level Input Voltage	V _{IL}		0	-	0.2*V _{DD}	V
High-level Output Voltage	V _{OH}	I _{out} =100uA,3.3Mhz	0.9*V _{DD}	-	V _{DD}	V
High-level Output Voltage	V _{OL}	I _{out} =100uA,3.3Mhz	0	-	0.1*V _{DD}	V

Note : The V_{CC} input must keep in a stable value; ripple and noise are not allowed.

5.2 Electro-optical Characteristics

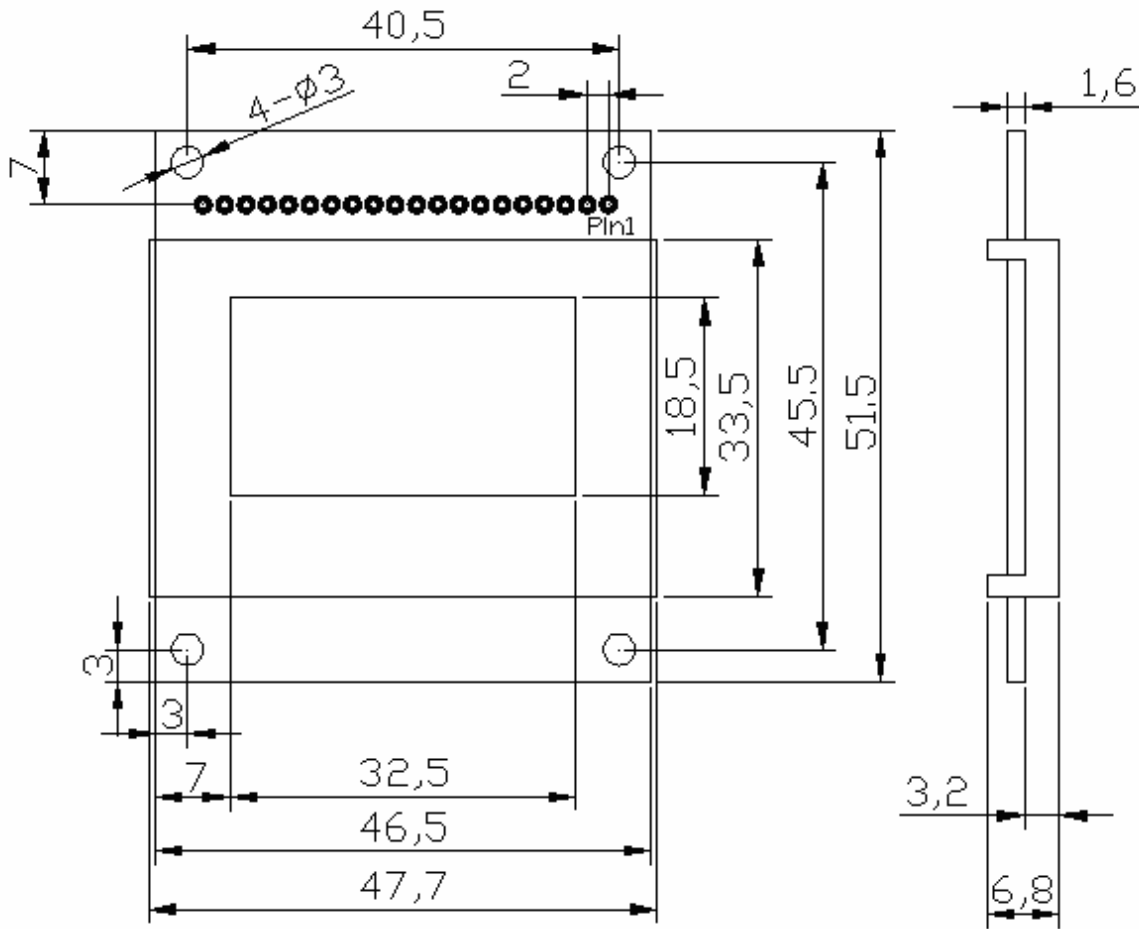
Item	Symbol	Test condition	MIN	TYPE	MAX	Unit
Normal mode Power consumption	VGG13264 C-S001	All pixels on(1)	-	-	200	mW
	VGG13264 C-S002	All pixels on(2)	-	-	400	mW
Brightness	L _{br}	With polarizer	30	40	-	cd/m ²
Dark room contrast	CR		100:1	-	-	
View angle			160			degree

Note(1):

- Driving Voltage : 9V
- Contrast setting : 0x80
- Frame rate : 105Hz
- Duty setting : 1/64

Note(2):

- VDD :9V,
- VCC embed
- Contrast setting : 0x80
- Frame rate : 105Hz
- Duty setting : 1/64

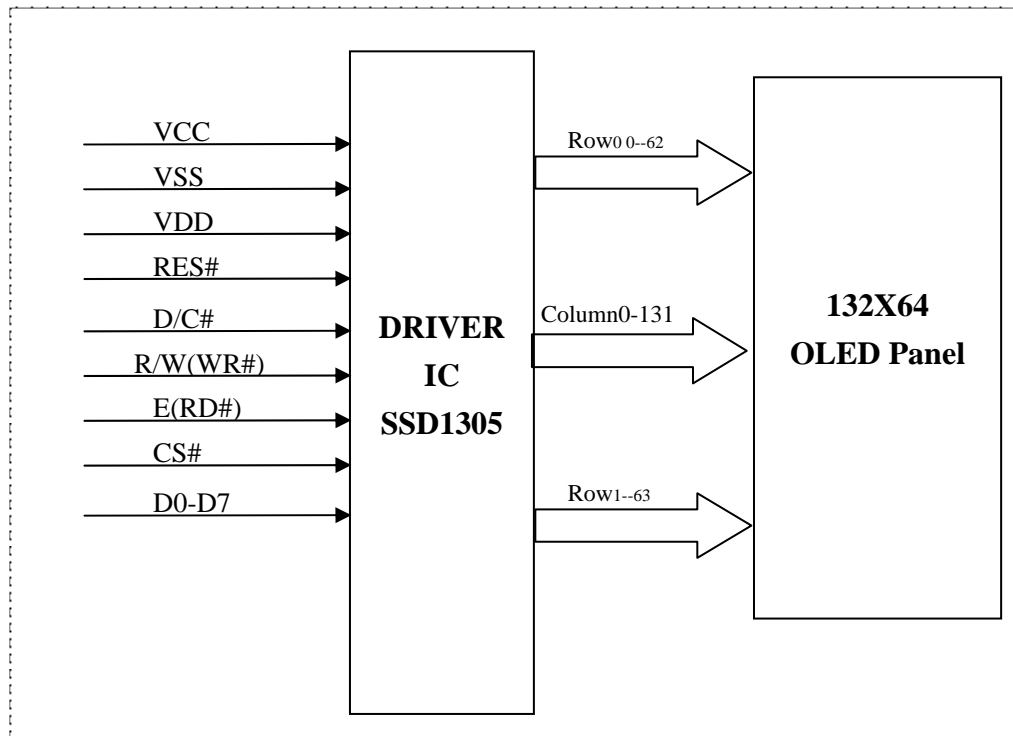


管脚定义如下:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
NC	NC	CSN	VDD	RESH	I/C	WR#	RD#	VDD	D0	D1	D2	D3	D4	D5	D6	D7	GND	AGND	FG

Type II (VGG13264C-S002)

7 Function Block Diagram



NOTE: Some pins omitted, VGG13264C-S002 have no 'VCC'.

8 Module Interface

Type I (VGG13264C-S001)

PIN NAME	PIN NO	DESCRIPTION
NC	1	No Connection
VCC	2	OLED drive voltage, It should be supplied externally.
VCOMH	3	This is an input pin for the voltage output high level for COM signals. A capacitor should be connected between this pin and VSS.
IREF	4	This is a segment current reference pin. A resistor should be connected between this pin and VSS. Set the current at 10uA.
D7-D0	5-12	These are 8-bit bi-directional data bus to be connected to the microprocessor's data bus. When serial interface mode is selected, D1 will be the serial data input, SDIN, and D0 will be the serial clock input, SCLK.
E(RD#)	13	This is a MCU interface input pin. When 6800-series Parallel Interface is selected, this pin is used as Enable (E) signal. Read/Write operation is initiated when this pin is pulled HIGH and the CS# pin is pulled LOW. When 8080-series Parallel Interface is selected, this pin is used to receive the Read Data (RD#) signal. Data read operation is initiated when this pin is pulled LOW and CS# pin is pulled LOW.

R/W(WR#)	14	This is a MCU interface input pin. When 6800-series Parallel Interface mode is selected, this pin is 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 8080-series Parallel Interface mode is selected, this pin is used as Write (WR#) selection input. Pull this pin to LOW for write mode. Data write operation is initiated when this pin is pulled LOW and the CS# is pulled LOW.			
D/C	15	Data/Command Select. This is the Data/Command control pin. When it is pulled HIGH, the input at D7-D0 is treated as display data. When it is pulled LOW, the input at D7-D0 is transferred to the command registers. For detail relationship to MCU interface signals, please refer to the Timing Characteristics Diagrams.			
RES#	16	Reset,active low			
CS#	17	Chip Select,active low			
NC	18	No Connection			
BS2	19	These are MCU interface input selection pins. See the following table for selecting different interfaces:			
			6800-paralle interface	8080-parallel interface	Serial interface
BS1	20	BS1	0	1	0
		BS2	1	1	0
VDD	21	Logic Voltage +3V			
NC	22	No Connection			
NC	23	No Connection			
NC	24	No Connection			
VBREF	25	This is an internal voltage reference pin for booster circuit. A stabilization capacitor, typ. 1uF, should beconnected to Vss.			
RESE	26	This is a source current pin of the external NMOS of the booster circuit.			
FB	27	This is a feedback resistor input pin for the booster circuit. It is used to adjust the booster output voltagelevel, Vcc.			
VDDB	28	This is a power supply pin for the internal buffer of the DC-DC voltage converter. It must be connected to VDD when the converter is used.			
GDR	29	This is an output pin drives the gate of the external NMOS of the booster circuit.			
VSS	30	Ground			
NC	31	No Connection			

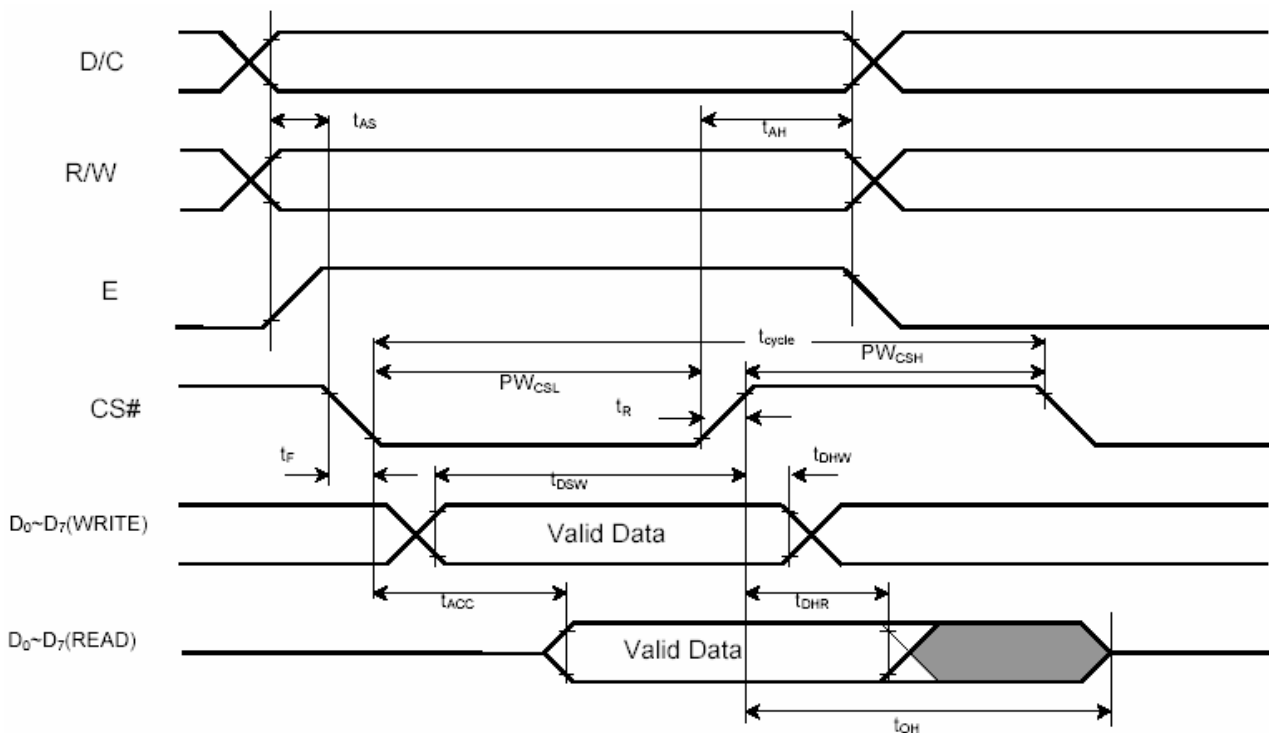
Type II (VGG13264C-S002)

PIN NAME	PIN NO	DESCRIPTION
NC	1	No Connection
NC	2	No Connection
CS#	3	Chip Select, active low
VDD	4	Logic Voltage +3V
RES#	5	Reset, active low
D/C	6	Data/Command Select
WR#	7	Write Select
RD#	8	Read Select
VDD	9	Logic Voltage +3V
D0-D7	10-17	8-bit bi-directional data bus
GND	18	Ground
AGND	19	Ground
FR	20	Frame Ground

9 Timing Characteristics

6800-Series MPU Parallel Interface Timing Characteristics (VDD - VSS = 2.4 to 3.5V, TA = 25°C)

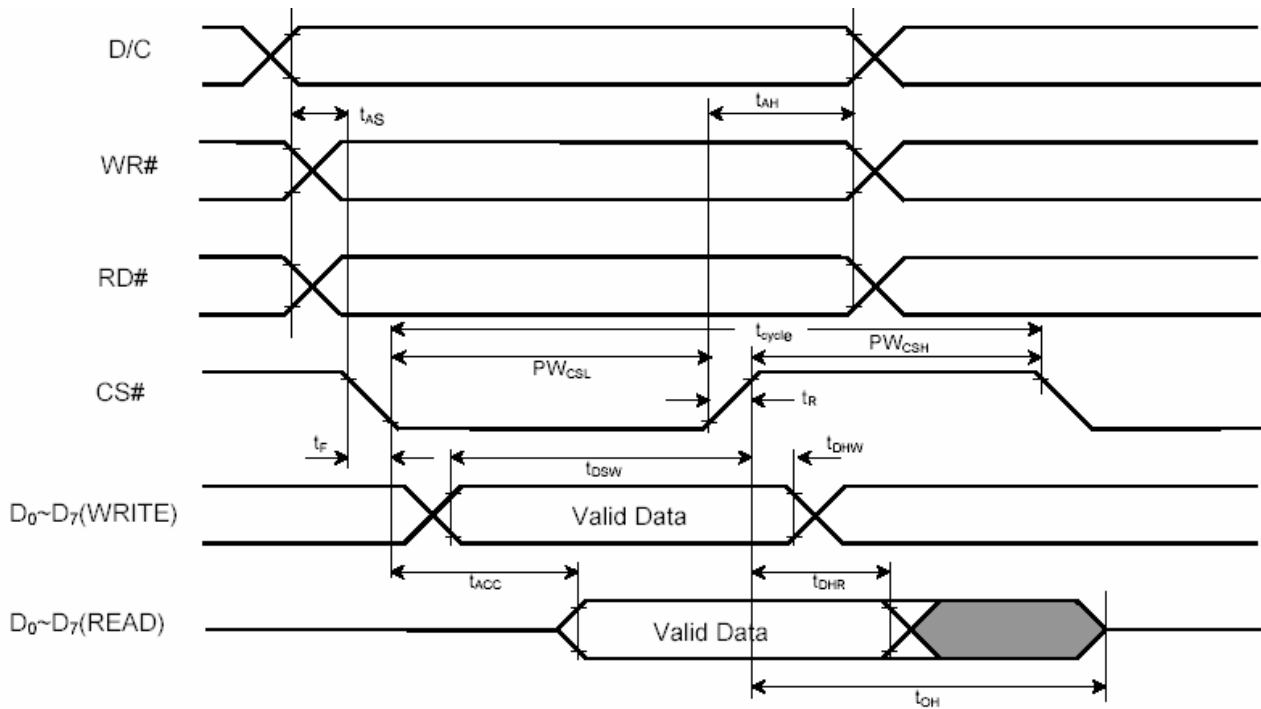
Symbol	Parameter	Min	Typ	Max	Unit
t _{cycle}	Clock Cycle Time	300	-	-	ns
t _{AS}	Address Setup Time	0	-	-	ns
t _{AH}	Address Hold Time	0	-	-	ns
t _{DSW}	Write Data Setup Time	40	-	-	ns
t _{DHW}	Write Data Hold Time	15	-	-	ns
t _{DHR}	Read Data Hold Time	20	-	-	ns
t _{OH}	Output Disable Time	-	-	70	ns
t _{ACC}	Access Time	-	-	140	ns
PW _{CSL}	Chip Select Low Pulse Width (read) Chip Select Low Pulse Width (write)	120 60	-	-	ns
PW _{CSH}	Chip Select High Pulse Width (read) Chip Select High Pulse Width (write)	60 60	-	-	ns
t _R	Rise Time	-	-	15	ns
t _F	Fall Time	-	-	15	ns



6800-series MPU parallel interface characteristics

8080-Series MPU Parallel Interface Timing Characteristics (VDD - VSS = 2.4 to 3.5V, TA = 25°C)

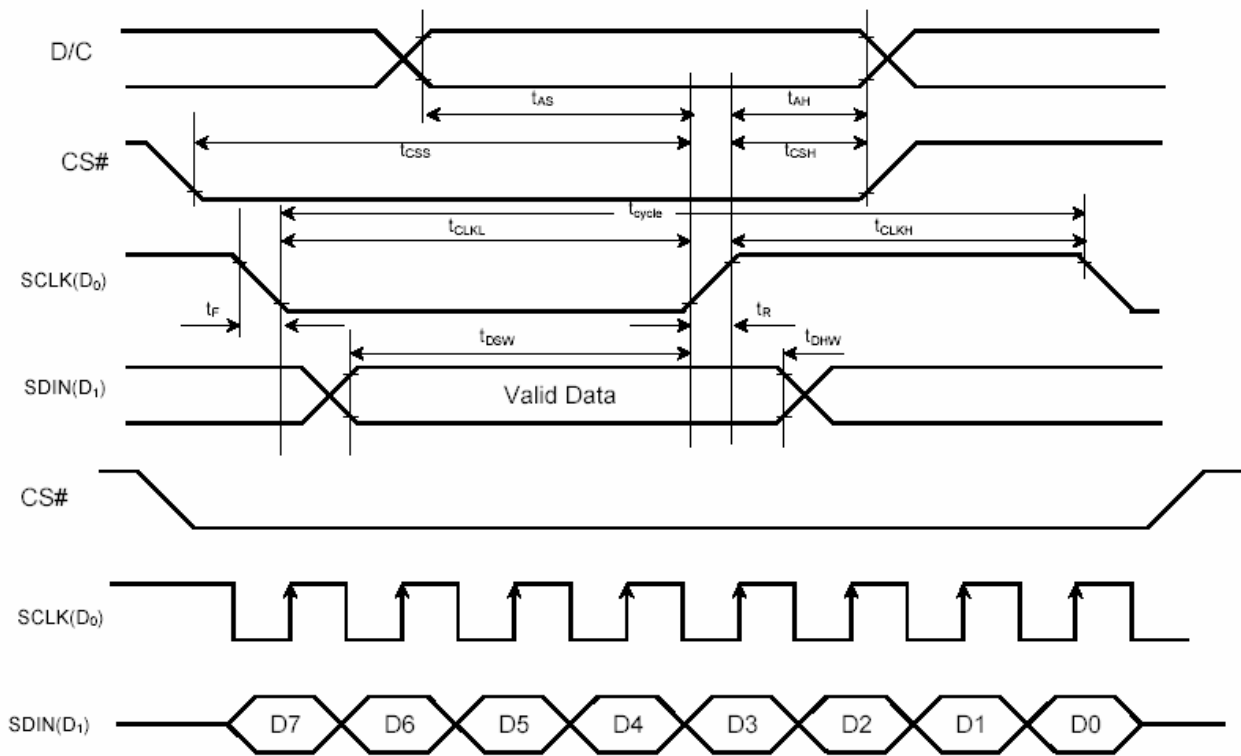
Symbol	Parameter	Min	Typ	Max	Unit
t_{cycle}	Clock Cycle Time	300	-	-	ns
t_{AS}	Address Setup Time	0	-	-	ns
t_{AH}	Address Hold Time	0	-	-	ns
t_{DSW}	Write Data Setup Time	40	-	-	ns
t_{DHW}	Write Data Hold Time	15	-	-	ns
t_{DHR}	Read Data Hold Time	20	-	-	ns
t_{OH}	Output Disable Time	-	-	70	ns
t_{ACC}	Access Time	-	-	140	ns
PW_{CSL}	Chip Select Low Pulse Width (read) Chip Select Low Pulse Width (write)	120 60	-	-	ns
PW_{CSH}	Chip Select High Pulse Width (read) Chip Select High Pulse Width (write)	60 60	-	-	ns
t_R	Rise Time	-	-	15	ns
t_F	Fall Time	-	-	15	ns



8080-series MPU parallel interface characteristics

Serial Interface Timing Characteristics (VDD - VSS = 2.4 to 3.5V, TA = 25°C)

Symbol	Parameter	Min	Typ	Max	Unit
t_{cycle}	Clock Cycle Time	250	-	-	ns
t_{AS}	Address Setup Time	150	-	-	ns
t_{AH}	Address Hold Time	150	-	-	ns
t_{CSS}	Chip Select Setup Time	120	-	-	ns
t_{CSH}	Chip Select Hold Time	60	-	-	ns
t_{DSW}	Write Data Setup Time	100	-	-	ns
t_{DHW}	Write Data Hold Time	100	-	-	ns
t_{CLKL}	Clock Low Time	100	-	-	ns
t_{CLKH}	Clock High Time	100	-	-	ns
t_R	Rise Time	-	-	15	ns
t_F	Fall Time	-	-	15	ns



Serial interface characteristics

10 Display Control Instruction

Command table (D/C =0, R/W (WR#)=0, E (RD#)=1)

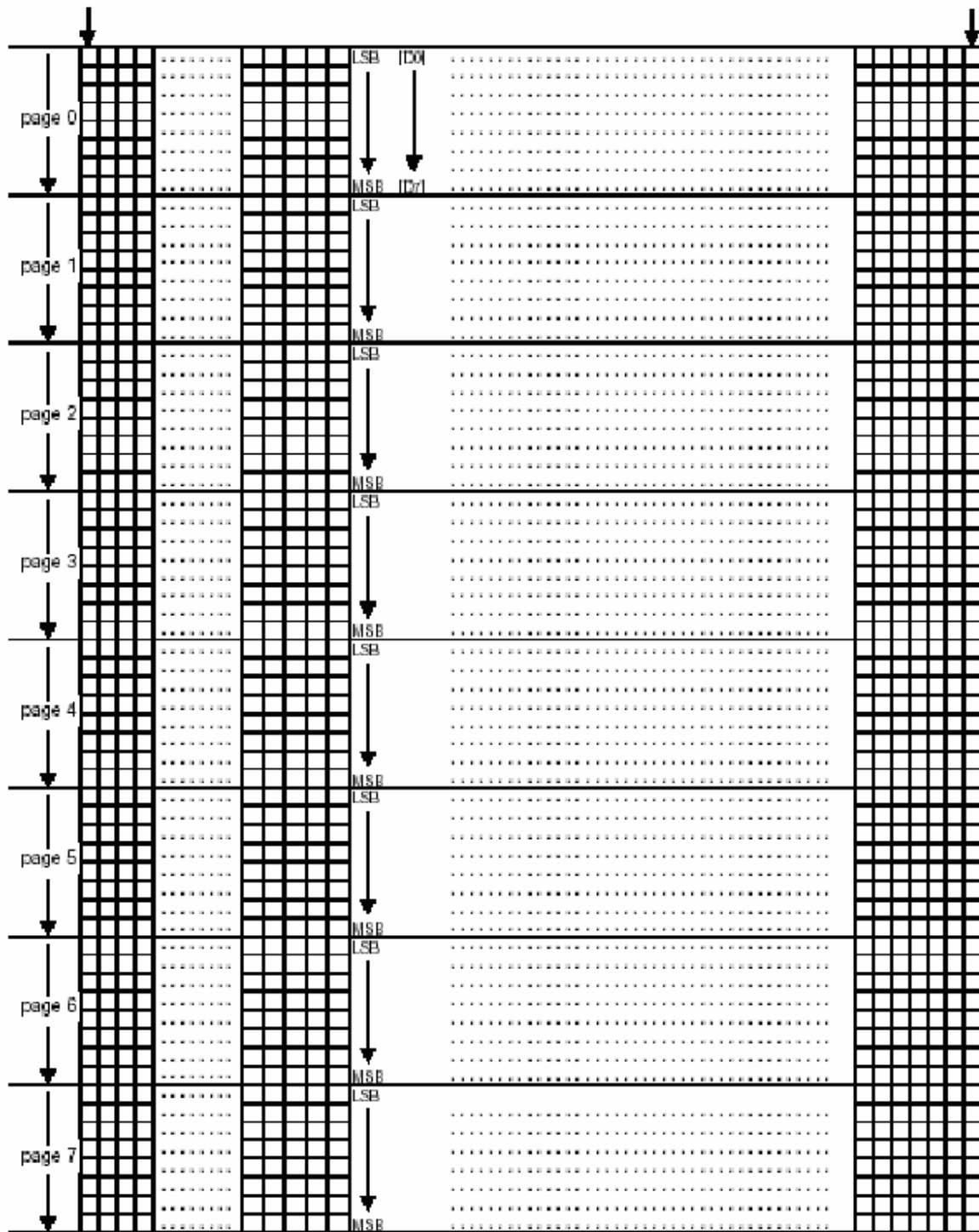
Bit Pattern	Command	Description
0000 X3X2X1X0	Set Lower Column Address **	Set the lower nibble of the column address register using X3X2X1X0 as data bits. The initial display line register is reset to 0000b after POR.
0001 X3X2X1X0	Set Higher Column Address **	Set the higher nibble of the column address register using X3X2X1X0 as data bits. The initial display line register is reset to 0000b after POR.
00101111	Activate horizontal scroll	Start horizontal scrolling
00101110	Deactivate horizontal scroll	Stop horizontal scrolling
001001100 A[2:0] B[2:0] C[1:0] D[2:0]	Horizontal scroll setup	A[2:0] Set the number of column scroll per step Valid value: 001b, 010b, 011b, 100b B[2:0] Define start page address C[1:0] Set time interval between each scroll step in terms of frame frequency 00b – 12 frame 01b – 64 frames 10b – 128 frames 11b – 256 frames D[2:0] Define end page address Set the value of D[2:0] larger or equal to B[2:0]
10000001 A[7:0]	Set Contrast Control Register **	Double byte command to select 1 out of 256 contrast steps. Contrast increases as the value increases. (POR = 80h)
1010010X0	Set Entire Display ON/OFF **	X0=0: normal display (POR) X0=1: entire display ON
1010011X0	Set Normal/Inverse Display **	X0=0: normal display (POR) X0=1: inverse display
10101000 A[5:0]	Set Multiplex Ratio **	The next command, A[5:0] determines multiplex ratio N from 16MUX-64MUX, POR= 64MUX
1010111X0	Set Display ON/OFF **	X0=0: turns OFF OLED panel (POR) X0=1: turns ON OLED panel
1011X3X2X1X0	Set Page Address **	Set GDDRAM Page Address (0~7) for read/write using X3X2X1X0
1100X3 * * *	Set COM Output Scan Direction **	X3=0: normal mode (POR) Scan from COM 0 to COM [N – 1] X3=1: remapped mode. Scan from COM [N-1] to COM0 Where N is the Multiplex ratio.

11010011 A[5:0]	Set Display Offset **	Set vertical scroll by COM from 0-63. The value is reset to 00H after POR.
11011001 X7X6X5X40010	Set Pre-charge period	Set length of pre-charge period in number of DCLK Default value of X7X6X5X4 is 0010b
11011010 000X40010	Set COM pins hardware configuration	X4=0, Sequential COM pin configuration (i.e. COM31, 30, 29...0 ; SEG0-132; COM31,32...62,63) X4=1(POR), Alternative COM pin configuration (i.e. COM62,60,58,...2,0; SEG0-132;COM1,3,5...61,63)
11100010	Reserved	Reserved
11100011	NOP **	Command for No Operation

11 Graphic Display Data Ram Address Map

Column address 00H

Column address 7FH



12 Precautions for operation and Storage

12.1 Precautions for Operation

- (1) Since OLED panel is made of glass, in order to prevent from glass broken, please do not apply any mechanical shock or impact or excessive force to it when installing the OLED module. Any strong mechanical impact due to falling dropping etc. may cause damage (breakage or cracking).
- (2) The polarizer on the OLED surface is made of soft material and is easily scratched. Please take most care when handling.
- (3) If OLED surface is contaminated, please wipe it off gently by using moisten soft cloth with normal ethanol, do not use acetone, ketone, isopropyl alcohol or water. If there is saliva or water on the OLED surface, please wipe it off immediately.
- (4) When handling OLED module, please be sure that the body and the tools are properly rounded. And do not touch I/O pins with bare hands or contaminate I/O pins, it will cause disconnection or defective insulation of terminals.
- (5) Do not attempt to disassemble or process the OLED module.
- (6) OLED module should be used under recommended operating conditions shown in the specification. Since the higher voltage leads to the shorter lifetime, be sure to use the specified operating voltage.
- (7) Foggy dew, moisture condensation or water droplets deposited on surface and contact terminals will cause polarizer stain or damage, the deteriorated display quality and electrochemical reaction then leads to the shorter life time and permanent damage to the module probably. Please pay attention to the environmental temperature and humidity.

12.2 Soldering

- (1) Use the high quality solder. (60-63% tin mixed with lead)
- (2) Iron: no higher than 260°C and less than 3~4 sec during soldering.
- (3) Soldering: only to the I/O terminals.
- (4) Rewiring: no more than 3 times.

12.3 Precautions for Storage

- (1) Please store OLED module in a dark place, avoid exposure to sunlight, the light of fluorescent lamp or any ultraviolet ray.
- (2) Keep the environment temperature at between 10°C and 35°C and the relative humidity less than 60%. Avoid high temperature, high humidity.
- (3) That keeps the OLED modules stored in the container shipped from supplier before using them is recommended.
- (4) Do not leave any article on the OLED module surface for an extended period of time.

12.4 Warranty period

Visionox Technology Co. Ltd. warrants for a period of 12 months from the shipping date when stored or used under normal condition

13 Test Status

TEST ITEM	TEST CONDITION	QUANTITY
High temperature (storage)	70°C, 240 hours	3pcs
Low temperature (storage)	- 30°C, 120 hours	3pcs
High temperature (operating)	70°C, 120hours	3pcs
Low temperature (operating)	-20°C, 120 hours	3pcs
Humidity (storage)	+60°C, 90%RH, 24hours	3pcs

Note: After test 2 hours (room temperature), check function & appearance.

14 Contact us

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