国兆光电
GUO ZHAO OPTOELECTRONICS

GZ061PBC01

Silicon-based OLED Microdisplay

Datasheet

Version 1.0

Nanjing Guozhao Optoelectronics Technology Co., Ltd.
Address: No.166 Zhengfang Middle Road, Nanjing, Jiangsu
www.gzot.com
Tel：0086-25-68005379

Revision

Version	Date	Page No.	Description
1.0	2024-08-29		Release official version

Contents

1 Overview / Applications

The GZ061PBC01 microdisplay is a top-emitting, high-efficiency, active-matrix-driven silicon-based OLED microdisplay independently developed by Nanjing Guozhao Optoelectronics Technology Co., Ltd. Its silicon substrate is manufactured by 0.18μm CMOS technology. This product integrates some modules like signal enhancement circuit, row and column drive circuit, logic control circuit, etc. It supports the 8/16/24bit digital video signal. Through the I^2C-bus interface, it can realize the control and adjustment of display mode, display position, brightness, contrast and other functions. This product has the characteristics of low power consumption, high-resolution, high-integration, miniaturization, etc., and it can be widely used in various near-eye display systems with miniaturization, high-resolution, low power consumption, and wide-temperature range.

1.1 Key Features

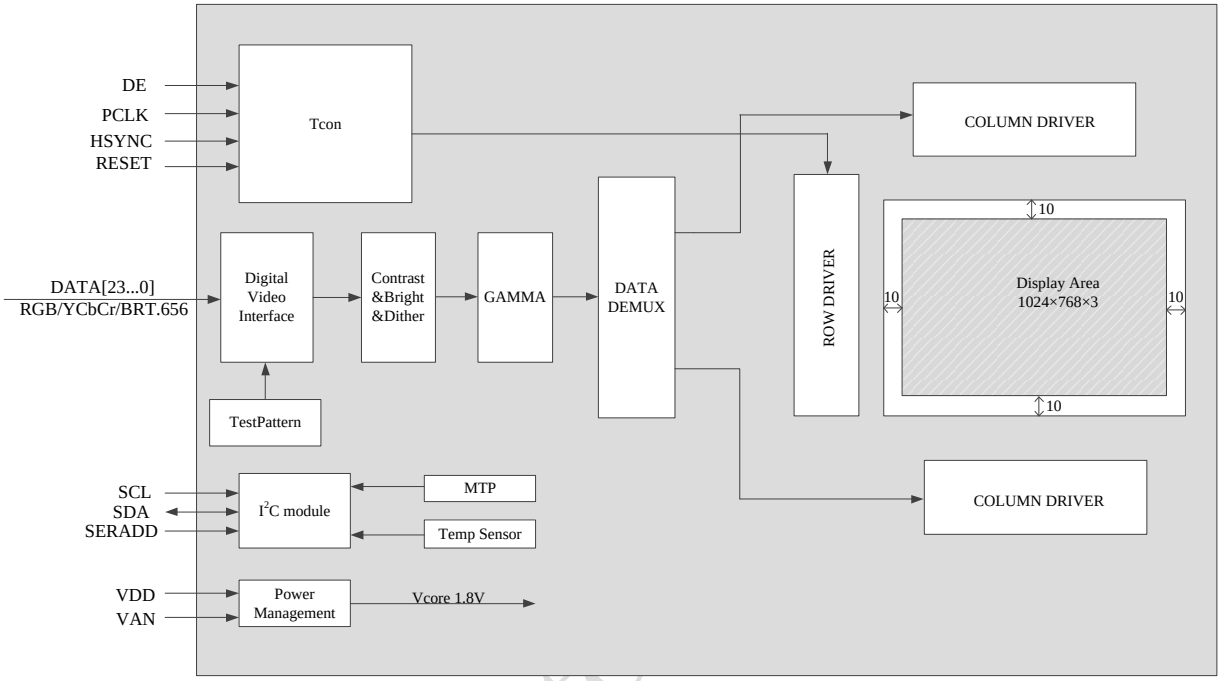
- Low power consumption
- High contrast
- The communication interface supports I^2C
- The video interface supports RGB, YCbCr and ITU-R BT.656
- Embedded digital temperature sensor
- Support PWM-mode brightness adjustment function
- Support automatic brightness-temperature compensation function
- Support image brightness and contrast digital signal enhancement functions
- Support horizontal / vertical inverse display of video images and timed movement function
- Compatible with low-resolution image display

1.2 **General Features**

Parameter	Specification
Product category	Color
Resolution	1024×768 (1044×788 reserved)
Pixel arrangement	RGB vertical bar
Pixel size	12μm×12μm
Display size	12.3mm×9.2mm
Gray levels	Up to 256 per primary color
Uniformity@200cd/m^2	≥ 90%
Contrast Ratio	＞10000:1
Refresh rate	25Hz～75Hz
Video interface	24bit-RGB, 8/16bit-YCbCr, ITU-R BT.656
Typical brightness	200 cd/m^2
Recommended brightness range	40cd/m^2～400 cd/m^2
Supply voltage	1.8V、5.0V
Typical power consumption	150mW @60Hz
	120mW @25Hz
Weight	<1.7g

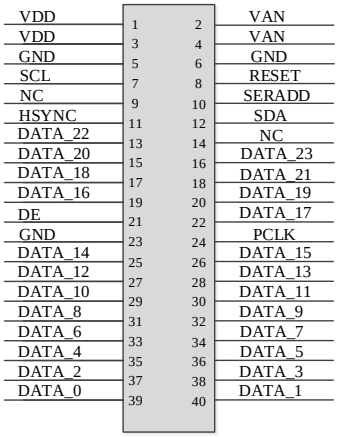
2 Function Overview and Interfaces

2.1 System Block Diagram



2.2 Pin Description

The electrical interface of the microdisplay adopts a 40pin in-line connector with a spacing of 0.5mm.



Note:

Please refer to Chapter 6 for detailed dimensions of connectors.

The electrical interface pins of the microdisplay are defined as follows.

Pin No.	Symbol	Description
1	VDD	Digital circuit power supply
2	VAN	Analog circuit power supply
3	VDD	Digital circuit power supply
4	VAN	Analog circuit power supply
5	GND	Power GND
6	GND	Power GND
7	SCL	I²C clock
8	$\overline{\text{RESET}}$	Reset signal, active low
9	NC	Not used, recommended to connect to GND
10	SERADD	I²C slave address selection
11	HS	Video horizontal synchronization
12	SDA	I²C data
13	DATA_22	Data signal R[6]
14	NC	Not used, recommended to connect to GND
15	DATA_20	Data signal R[4]
16	DATA_23	Data signal R[7]
17	DATA_18	Data signal R[2]
18	DATA_21	Data signal R[5]
19	DATA_16	Data signal R[0]
20	DATA_19	Data signal R[3]
21	DE	Video data enable
22	DATA_17	Data signal R[1]
23	GND	Power GND
24	PCLK	Video point clock
25	DATA_14	Data signal G[6]
26	DATA_15	Data signal G[7]
27	DATA_12	Data signal G[4]
28	DATA_13	Data signal G[5]
29	DATA_10	Data signal G[2]
30	DATA_11	Data signal G[3]
31	DATA_8	Data signal G[0]
32	DATA_9	Data signal G[1]

Pin No.	Symbol	Description
33	DATA_6	Data signal B[6]
34	DATA_7	Data signal B[7]
35	DATA_4	Data signal B[4]
36	DATA_5	Data signal B[5]
37	DATA_2	Data signal B[2]
38	DATA_3	Data signal B[3]
39	DATA_0	Data signal B[0]
40	DATA_1	Data signal B[1]

3 Electrical Characteristics

3.1 Absolute Maximum Ratings

Symbol	Description	Min.	Max.	Unit
VDD	Digital circuit power supply	-0.3	2.2	V
VAN	Analog circuit power supply	-0.3	5.5	V
V_I	Input digital signal level	-0.3	VAN-0.3	V
Tst	Storage temperature	-55	+70	℃
Top	Operating temperature	-20	+65	℃

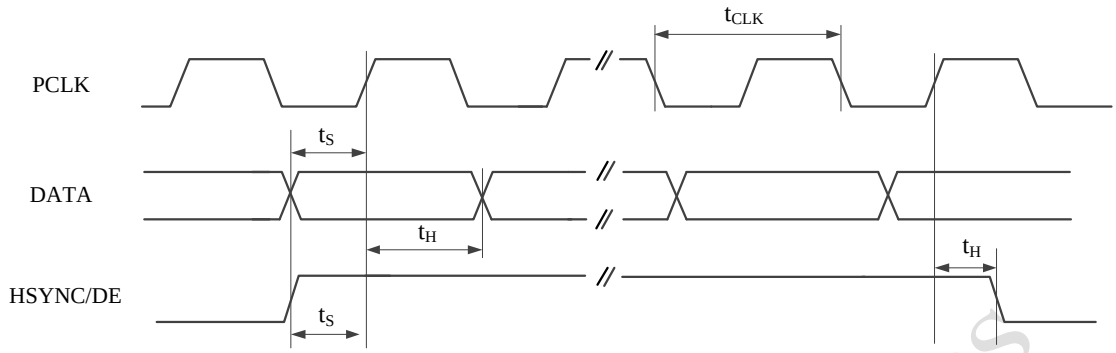
3.2 DC Characteristics

Symbol	Description	Min.	Typ.	Max.	Unit
V_D	VDD voltage	1.70	1.80	1.90	V
I_D	VDD current	—	—	40	mA
V_A	VAN voltage	4.90	5.00	5.10	V
I_A	VAN current	—	—	25	mA
V_{IL}	Valid low level of digital signal	-0.3	—	0.5	V
V_{IH}	Valid high level of digital signal	1.2	—	3.6	V

Note:

Digital input signals are compatible with level standards such as 1.8V, 2.5V, 3.3V, etc., but must meet the electrical standards in the table above.

3.3 AC Characteristics



Symbol	Description	Min.	Typ.	Max.	Unit
t_S	Setup time	4	—	—	ns
t_H	Hold time	1.5	—	—	ns
t_{CLK}	Clock cycle	—	15.4	—	ns
d_{CLK}	Duty cycle	45	50	55	%

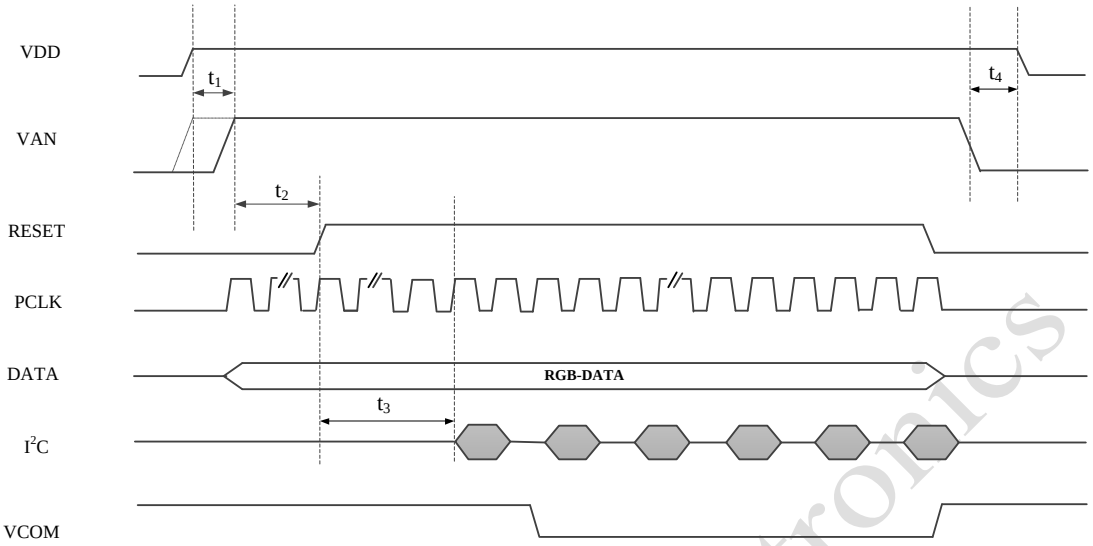
3.4 Power consumption

Symbol	Description	Typ.	Typ.	Unit
		60Hz	25Hz	
P_{VDD}	VDD power consumption	70	43	mW
P_{VAN}	VAN power consumption	80	77	mW
P_{POWER}	Total power consumption	150	120	mW

Note:

All white display, brightness = 200cd/m^2, temperature = +25°C ± 2°C.

3.5 **Power Sequence**



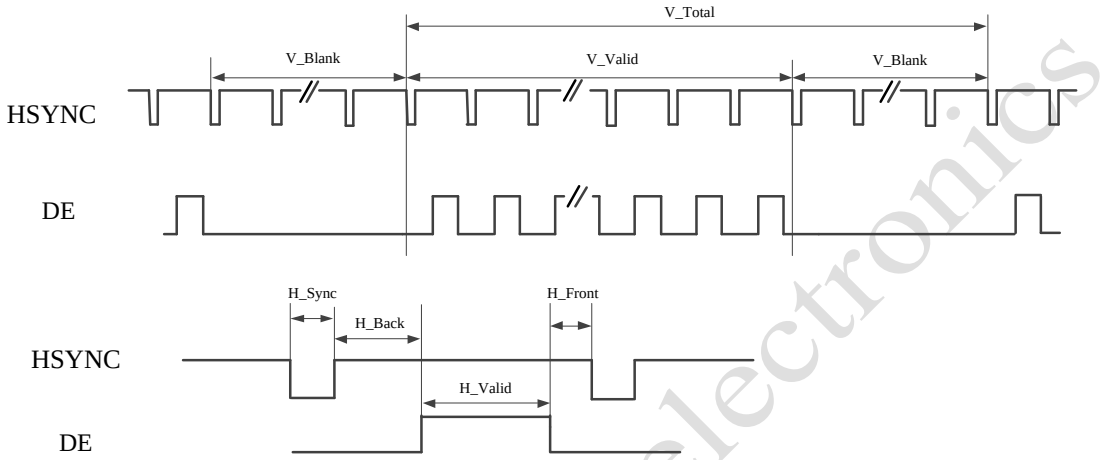
Symbol	Description	Min.	Typ.	Max.	Unit
t_1	Power on time between VDD and VAN	0	—	—	ms
t_2	Reset time	5	—	—	ms
t_3	MTP reload time	5 frames time	—	—	—
t_4	Power-off interval time	0	—	—	ms

Note:

1. In order to avoid display errors when the screen is powered on, it is necessary to ensure that the video data is accurate and at least one frame time later, then configure the 94H register with 0xDA, turn on the VCOM voltage and light up the screen.
2. Before powering off, to avoid unstable graphics during shutdown, it is recommended to turn off the VCOM voltage first and set the 94H register to 0xD8. During the power-off process, as long as the VDD voltage is not lower than the VAN voltage, the two power supplies can be turned off at the same time.
3. PCLK needs to be in a stable state before RESET is pulled high.

3.6 **Video Sequence**

The timing of the video signal input to the microdisplay shall be in accordance with VESA Standard. When the timing of the video signal is not in accordance with VESA Standard, the parameters below can be configured according to the timing requirements as shown in figure.



Symbol	Min.	Typ.	Max.	Unit
V_Blank	22	38	240	HSYNC
V_Valid	—	768	—	HSYNC
H_Sync	20	136	500	PCLK
H_Back	20	160	500	PCLK
H_Front	20	24	500	PCLK
H_Valid	—	1024	—	PCLK

4 Function Description

4.1 Register Map

Address	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0	Default
01H	0	0	Test pattern selection			Input video format selection			0x03
03H	Signal scanning starting position selection								0x00
07H	Synchronization mode		1	0	Interlaced / progressive scanning		Vertical scanning	Horizontal scanning	0x20
08H	0	0	Direction of movement	Number of columns to move to the left / right					0x00
09H	0	0	Direction of movement	Number of rows to move up / down					0x00
0AH	0	Left / right movement enable	Up / down movement enable	Timed movement distance (number of rows / columns)					0x00
0BH	Time interval for movement TIME [31:24], the unit is the length of one frame time								0x00
0CH	Time interval for movement TIME [23:16], the unit is the length of one frame time								0x00
0DH	Time interval for movement TIME [15:8], the unit is the length of one frame time								0x00
0EH	Time interval for movement TIME [7:0], the unit is the length of one frame time								0x00
78H	Image brightness digital adjustment								0x80
7CH	Image contrast digital adjustment								0x80
8BH	Data mode selection								0x09
8CH	Temperature reading								read only
94H	VCOM voltage enable control								0xD8
A9H	Automatic brightness-temperature compensation function enable control								0x01
ACH	Counter range selection								0x11
ADH	Parity field difference								0x00
AEH	Counter starting position selection								0x1F
B0H	Set 256-level red gray of test pattern								0x00
B1H	Set 256-level green gray of test pattern								0x00
B2H	Set 256-level blue gray of test pattern								0x00
B4H	Horizontal total pixels H_Total [7:0]								0x40
B5H	0	0	0	0	Horizontal total pixels H_Total [11:8]				0x05
B7H	Horizontal valid pixels H_Valid [7:0]								0x00
B8H	0	0	0	0	Horizontal valid pixels H_Valid [11:8]				0x04
BAH	Number of valid rows per frame V_Valid [7:0]								0x00
BBH	0	0	0	0	Number of valid rows per frame V_Valid[11:8]				0x03
BEH	Number of total rows per frame V_Total [7:0]								0x26
BFH	0	0	0	0	Number of total rows per frame V_Total [11:8]				0x03
C2H	First row display position								0x00
C3H	Last row display position								0x00
C4H	First column display position								0x00
C5H	Last column display position								0x00

C6H	0	1	0	0	PWM scanning mode selection	0x44
CEH	PWM value					0x64

4.2 **Test Pattern Selection**

The microdisplay is equipped with various test patterns, and when used, only a stable clock signal PCLK needs to be provided.

Address	Bit	Description
01H	bit5 - bit3	000: With registers B0H, B1H and B2H, 0~255 grayscale of R, G, B signals can be set respectively 001: White field 010: Red field 011: Green field 100: Blue field 101: Transition grayscale pattern from left to right 110: Color bar 111: Checkerboard

4.3 **Video Signal Transfer Format**

4.3.1 Selection of Video Signal Format

The microdisplay supports various video signal formats, the details are as follows.

Address	Bit	Description
01H	bit2 - bit0	000: 8bit - YCbCr, progressive mode, 8bit - BT.656, interlaced mode; 001: 16bit - YCbCr, 4:2:2 mode; 011: 24bit - RGB, 4:4:4 mode; 101: Test pattern;

When inputting video signals in different formats, the corresponding relationship between pins is as follows.

Interfaces	BT.656 (Interlaced)	YCbCr (Progressive)	YCbCr 4:2:2	RGB 4:4:4
DATA23	GND	GND	GND	R[7]
DATA22				R[6]
DATA21				R[5]
DATA20				R[4]
DATA19				R[3]
DATA18				R[2]
DATA17				R[1]
DATA16				R[0]
DATA15	Y/Cb/Cr[7]	Y/Cb/Cr[7]	Y[7]	G[7]
DATA14	Y/Cb/Cr[6]	Y/Cb/Cr[6]	Y[6]	G[6]
DATA13	Y/Cb/Cr[5]	Y/Cb/Cr[5]	Y[5]	G[5]
DATA12	Y/Cb/Cr[4]	Y/Cb/Cr[4]	Y[4]	G[4]
DATA11	Y/Cb/Cr[3]	Y/Cb/Cr[3]	Y[3]	G[3]
DATA10	Y/Cb/Cr[2]	Y/Cb/Cr[2]	Y[2]	G[2]
DATA9	Y/Cb/Cr[1]	Y/Cb/Cr[1]	Y[1]	G[1]
DATA8	Y/Cb/Cr[0]	Y/Cb/Cr[0]	Y[0]	G[0]
DATA7	GND	GND	Cb/Cr[7]	B[7]
DATA6			Cb/Cr[6]	B[6]
DATA5			Cb/Cr[5]	B[5]
DATA4			Cb/Cr[4]	B[4]
DATA3			Cb/Cr[3]	B[3]
DATA2			Cb/Cr[2]	B[2]
DATA1			Cb/Cr[1]	B[1]
DATA0			Cb/Cr[0]	B[0]

4.3.2 ITU-R BT.656 Configuration Instructions

The microdisplay supports ITU-R BT.656 signals in embedded synchronous format. Take the standard PAL-D video as an example, the register settings when the image is centered are shown below.

Address	Value	Description
01H	0x00	The BT.656 (interlaced) format: 0x00
03H	0x01	The BT.656 (interlaced) format: 0x01
07H	0x24	Embedded synchronization, interlaced scanning
8BH	0x08	When the number of horizontal valid pixels is less than 1024, set to 0x08
ACH	0x10	When the number of horizontal valid pixels is less than 1024, set to 0x10
ADH	0x01	Set to 0x01
AEH	0x10	Set to 0x10
B4H	0x60	H_Total: 0x360
B5H	0x03	
B7H	0xD0	H_Valid: 0x2D0
B8H	0x02	
BAH	0x20	V_Valid: 0x120
BBH	0x01	
BEH	0x38	V_Total: 0x138
BFH	0x01	
C2H	0x60	The first row display starting position, (768-576)/2=96, and set to 0x60
C3H	0x60	The last row display starting position, (768-576)/2=96, and set to 0x60
C4H	0x98	The first column display starting position, (1024-720)/2=152, and set to 0x98
C5H	0x98	The last column display starting position, (1024-720)/2=152, and set to 0x98
C6H	0x47	The BT.656 (interlaced) format: 0x47
CEH	0x64	PWM value for brightness adjustment

Note:

When the input video signal is in ITU-RBT.656 format, it is not compatible with the default factory 24bit-RGB format. The brightness adjustment and other functions are special, you need to contact

Guozhao Company for technical support.

4.3.3 YCbCr Format Signal Description

When the input digital video signal is in YCbCr encoding format, the chip needs to perform color space transformation on the YCbCr digital signal, and the conversion relationship is as follows.

$$R = Y + Cr \times 179/128 - 179$$

$$G = Y - Cb \times 44/128 - Cr \times 91/128 + 135$$

$$B = Y + Cb \times 227/128 - 227$$

Note:

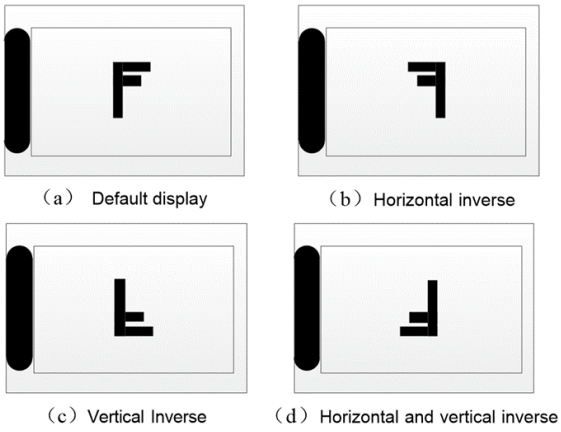
The use status of YCbCr encoding mode is not compatible with the default factory 24bit-RGB mode, the use scope and use method need to be redefined. If you need to use YCbCr mode, contact Guozhao Company for technical support.

4.4 Up / Down and Left / Right Inverse Display

The microdisplay supports inverse display of video images in horizontal and vertical directions.

Address	Bit	Description
07H	bit1	Vertical display settings 0: Vertical normal display 1: Vertical inverse display
	bit0	Horizontal display settings 0: Horizontal normal display 1: Horizontal inverse display

The schematic diagram of inverse display in horizontal and vertical directions is as follows.



4.5 Image Display Position Setting

The microdisplay supports the display setting of the full-screen image at any position, and the horizontal and vertical offset position values can be set separately, with a maximum value of 0x0A.

Address	Bit	Description
08H	bit5	Enable setting in horizontal position 0: Display start point moves to the right; 1: Display start point moves to the left;
	bit4-bit0	Number of columns to move, ranging from 0x00 to 0x0A
09H	bit5	Enable setting in vertical position 0: Display start point moves down; 1: Display start point moves up;
	bit4-bit0	Number of rows to move, ranging from 0x00 to 0x0A

4.6 Image Timed Movement

The microdisplay supports timed dynamic movement of the entire screen image in the horizontal or vertical direction. When the timed movement function is turned on, the entire screen image will automatically move at the set time interval in the order of down, right, up and left. The number of rows/columns moved up and down and left and right will be the same, and finally return to the initial position before movement.

Address	Bit	Description
0AH	bit6	Horizontal timed movement control 0: Dynamic movement function is turned off; 1: Dynamic movement function is turned on;
	bit5	Vertically timed movement control 0: Dynamic movement function is turned off; 1: Dynamic movement function is turned on;
	bit4-bit0	Number of rows/columns to move, range from 0x00 to 0x0A
0BH	bit7-bit0	The time interval for movement STICK_TIME, with a unit time interval of one frame; Register 0BH value is STICK_TIME[31:24]; Register 0CH value is STICK_TIME[23:16]; Register 0DH value is STICK_TIME[15:8]; Register 0EH value is STICK_TIME[7:0];
0CH	bit7-bit0	
0DH	bit7-bit0	
0EH	bit7-bit0	

Note:

There are 10 redundant pixels on the top, bottom, left and right of the display screen, and when the dynamic movement function is turned on, the range of movement cannot exceed the range of redundant pixels.

4.7 Compatible with Low-resolution Image Display

The microdisplay is compatible with images below 1024×768 resolution for display, such as 800×600, 640×480 resolution or other irregular resolution. When compatible with low-resolution images for display, the registers need to be configured accordingly.

Take 800×600 resolution video image conforming to VESA standard as an example, with point clock = 40MHz, refresh rate = 60Hz, H_Total = 1056 pixels, and V_Total = 628 lines. The register configuration is shown below when the input image in 24bit-RGB format is displayed in the center.

Address	Value	Description
01H	0x03	0x03: in 24bit-RGB format
8BH	0x08	Set to 0x08
ACH	0x10	Set to 0x10
B4H	0x20	H_Total: 0x420
B5H	0x04	
B7H	0x20	H_Valid: 0x320
B8H	0x03	
BAH	0x58	V_Valid: 0x258
BBH	0x02	
BEH	0x74	V_Total: 0x274
BFH	0x02	
C2H	0x54	The first row display starting position, (768-600)/2=84, and set to 0x54
C3H	0x54	The last row display starting position, (768-600)/2=84, and set to 0x54
C4H	0x70	The first column display starting position, (1024-800)/2=112, and set to 0x70
C5H	0x70	The last column display starting position, (1024-800)/2=112, and set to 0x70

Note:

The minimum resolution must be no less than 534×278.

4.8 **Image Stretching**

Image stretching is independent of the input signal format, only related to the input resolution and stretched to 1024×768 full-screen display. The supported typical resolutions and configurations are shown in the table below.

Address	Value	Description
01H	0x03	0x03: in 24bit-RGB format
05H	0x08	Image stretching function enable
06H	0x80	
9CH	0xFB	800x600 image stretching display
	0xC8	720x576 image stretching display (See the table below for BT.656 data configuration))
	0xCE	640x480 image stretching display

When inputting the BT.656 signal, the register settings of image stretching display are shown in the table below.

Address	Value	Description
01H	0x00	Refer to the table in Section 4.3.2 for details.
03H	0x01	
07H	0x24	
8BH	0x08	
ACH	0x10	
ADH	0x01	
AEH	0x10	
B4H	0x60	
B5H	0x03	
B7H	0xD0	
B8H	0x02	
BAH	0x20	
BBH	0x01	
BEH	0x38	
BFH	0x01	
C6H	0x47	
CEH	0x64	
05H	0x08	Image stretching function enable
06H	0x80	
9CH	0xC8	BT.656 image stretching display

4.9 **Temperature Detection**

The microdisplay has temperature detection function, and the temperature conversion formula is shown as below.

$$T = 0.48 \times Reg(8CH) - 47.3$$

T is the actual temperature value and Reg(8CH) is the reading of the temperature register 8CH.

Note:

1. During the initialization period when the microdisplay is powered on, the temperature reading changes significantly. It is recommended to stabilize for a few seconds before reading the temperature value;
2. During normal operation, the temperature reading update cycle is four frame image cycles.

4.10 **Brightness Adjustment**

The factory default brightness of the microdisplay is about 200cd/m^2, and the recommended brightness range is 40cd/m^2 ~ 400cd/m^2. Users can adjust the brightness appropriately according to the needs of the use. The brightness adjustment method is the PWM method, the corresponding configuration register address is CEH, and the brightness adjustment can be realized only by changing the value of the register. The factory default value of the CEH register is 0x64, and the adjustment step is 0x01. The higher the PWM value, the greater the brightness. The PWM value corresponding to the minimum brightness is 0x01, and the PWM value corresponding to the maximum brightness is 0xC9.

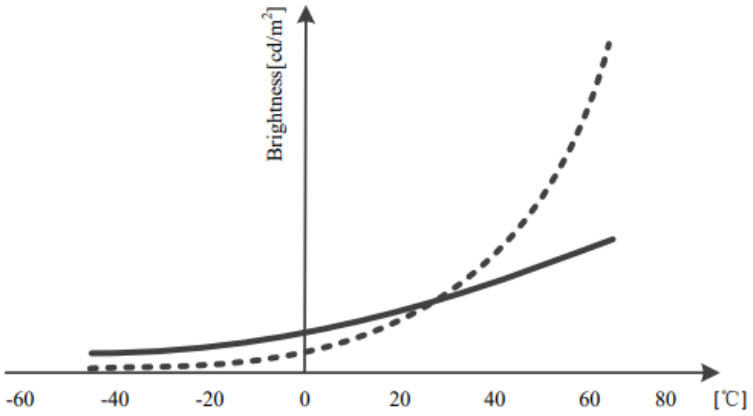
The PWM value is linearly proportional to brightness, and the relationship formula is as follows.

$$L = (400 * 4M)/N$$

M represents the value of the PWM register converted to decimal, N represents the number of V_Total, and L represents the brightness value. The value of PWM cannot exceed the number of total rows V_Total, which needs to be restricted.

4.11 **Automatic Brightness-Temperature Compensation**

Due to the inconsistent full temperature characteristics of the silicon-based OLED microdisplay, the brightness increases at high temperatures and decreases at low temperatures. In order to improve the consistency of brightness at different temperatures, the microdisplay has a built-in brightness adaptive adjustment mechanism, which automatically compensates for the brightness of the screen at different temperatures. Register A9H is the enable control register, and the default value is 0x01, which is in the enabled state. To turn off this function, the configuration value is set to 0x00.



In the figure above, the dashed line represents the brightness curve at full temperature when the brightness adaptive adjustment is turned off, while the solid line represents the brightness curve at full temperature when the brightness adaptive adjustment function is turned on. By testing, the brightness is effectively compensated in both high and low temperature stages after the brightness adaptive adjustment function is turned on, making the brightness at high and low temperatures as close as possible to the default brightness at room temperature. The image display effect basically meets the observation requirements at full temperature.

4.12 **Image Brightness Digital Adjustment**

The microdisplay has the image brightness digital adjustment function, and the brightness adjustment formula is as follows:

$$Y = Y_0 + (BRT - 128) \times 4$$

Y is the adjusted data value, Y_0 is the input image data value, and BRT is the configuration value of the 78H register. Data overflow may occur in the low gray stage and high gray stage after adjustment, resulting in image distortion. It is recommended to configure it appropriately.

4.13 **Image Contrast Adjustment**

The microdisplay has the image contrast adjustment function, that is, the input image data is processed in the same proportion multiplier mode to achieve the effect of image contrast change. The image contrast adjustment register address is 7CH, and the adjustment range is 0x00 to 0xFF.

The contrast adjustment formula is as follows.

$$Y = Y_0 \times C_{ONT} / 64$$

Y is the adjusted data value, Y_0 is the input image data value, and C_{ONT} is the 7CH register value.

4.14 I^2C Interface

The user can write or read the values of the register inside the screen through the I^2C interface. The I^2C interface communication mode conforms to the standard communication protocol. The host can realize functions of test pattern selection, brightness adjustment, contrast adjustment, temperature reading and so on by reading and writing internal registers of the microdisplay.

The communication rate supports 10KHz~400KHz.

Note:

1. SDA and SCL signals must be pulled up with resistors to V_{IH};
2. When the transmission distance of I^2C communication signal is long, please pay attention to the signal integrity and anti-interference measures of SDA and SCL;
3. When the I^2C communication signal is seriously disturbed, I^2C communication can be carried out during the vertical blanking interval, or the communication frequency can be appropriately reduced.

4.14.1 Slave Address Selection

The microdisplay is used as a slave device. Its address can be selected by the SERADD pin, which is 0x54 when the SERADD pin is low and 0x55 when the SERADD pin is high. The specific slave address and read / write instructions are as follows.

Slave address	Instructions	Bit7 (MSB)	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1 (SERADD)	Bit0 (R/W)	Valid bytes
0x54	Write	1	0	1	0	1	0	0	0	0xA8
	Read	1	0	1	0	1	0	0	1	0xA9
0x55	Write	1	0	1	0	1	0	1	0	0xAA
	Read	1	0	1	0	1	0	1	1	0xAB

4.14.2 Data Transfer Format

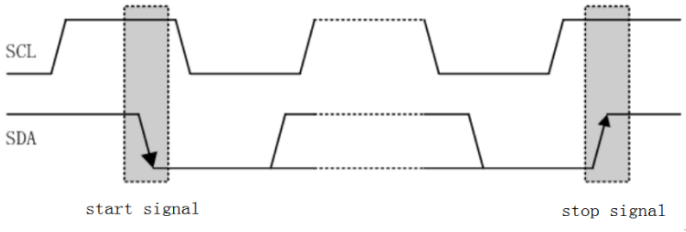
4.14.2.1 Flag Bit Description

Start signal(S): the change of SDA line from high level to low level when the SCL line is high level;

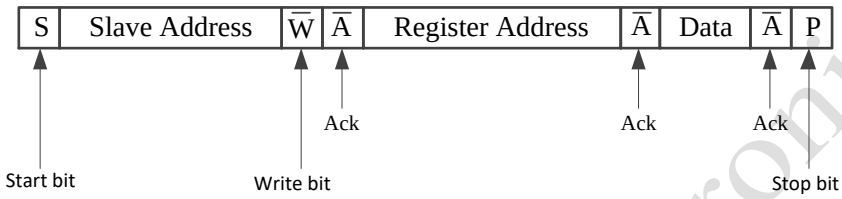
Pause signal (P): the change of SDA line from low level to high level when the SCL line is high level;

Active answer (ACK): SDA at low level indicates active answer;

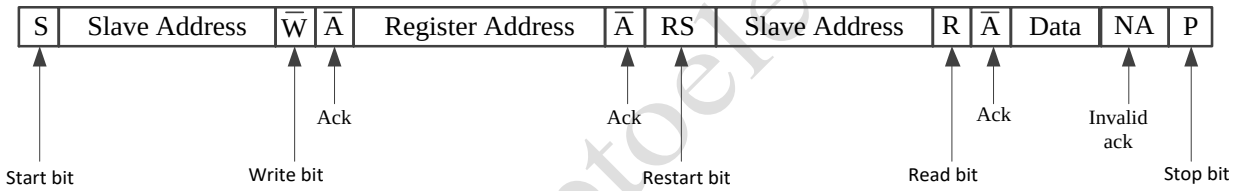
Negative answer (NAK): SDA at high level indicates negative answer;



4.14.2.2 Write Sequence



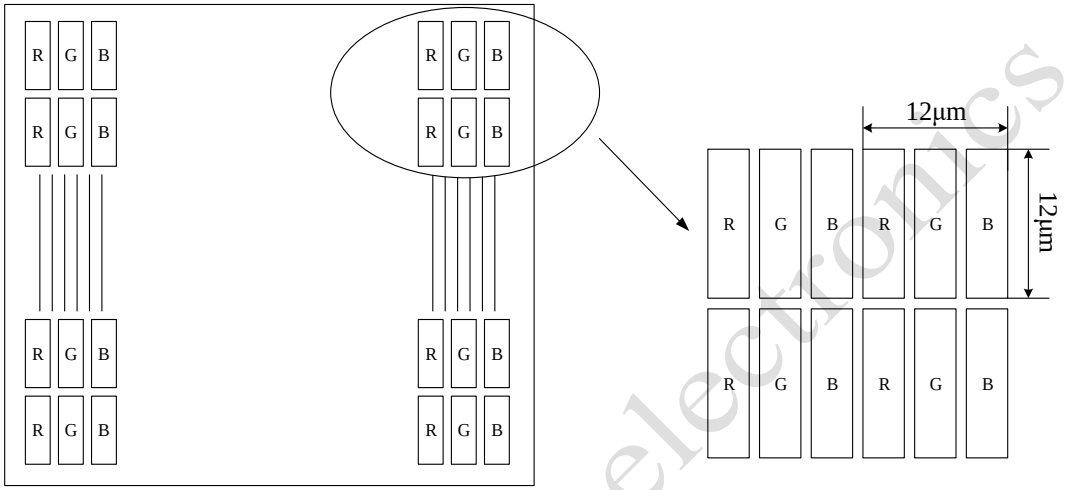
4.14.2.3 Read Sequence



5 Optical Characteristics

5.1 Pixel Arrangement

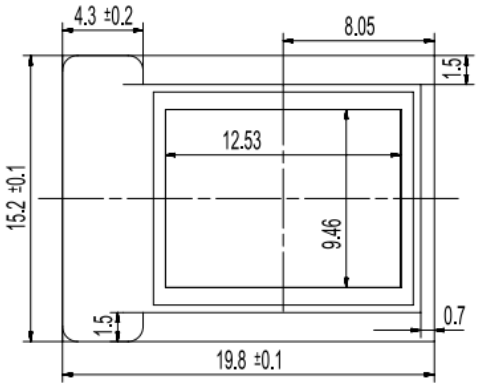
The pixel arrangement of the GZ061PBC01 silicon-based OLED microdisplay is shown below, where every three sub-pixels form a pixel. The pixel size is 12μm×12μm.



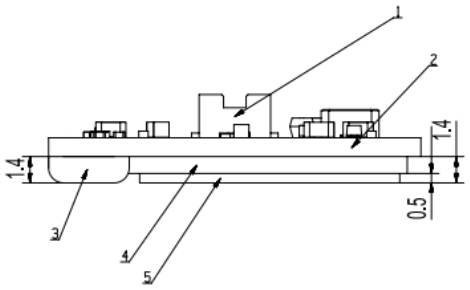
6 Structure and Packing

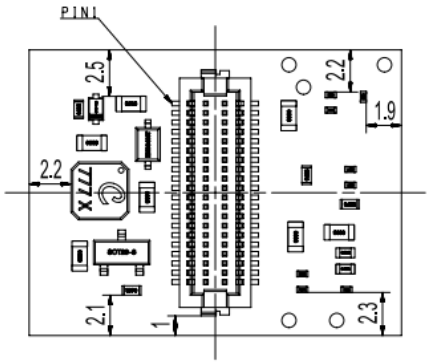
6.1 Product Structure

The overall size of the microdisplay is 19.8mm×15.2mm, and other dimensions are shown below.



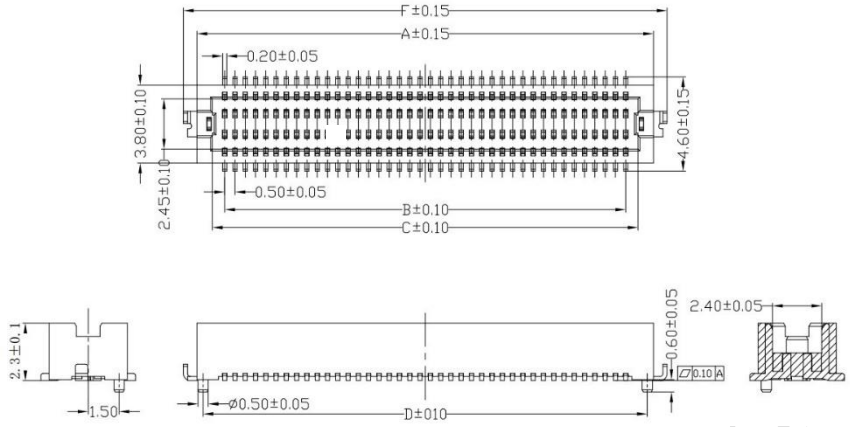
No.	Description
1	Connector
2	PCB substrate
3	Sealant between the silicon substrate and the PCB substrate
4	Silicon substrate
5	Glass





6.2 **Connector Dimensions**

Unit: mm

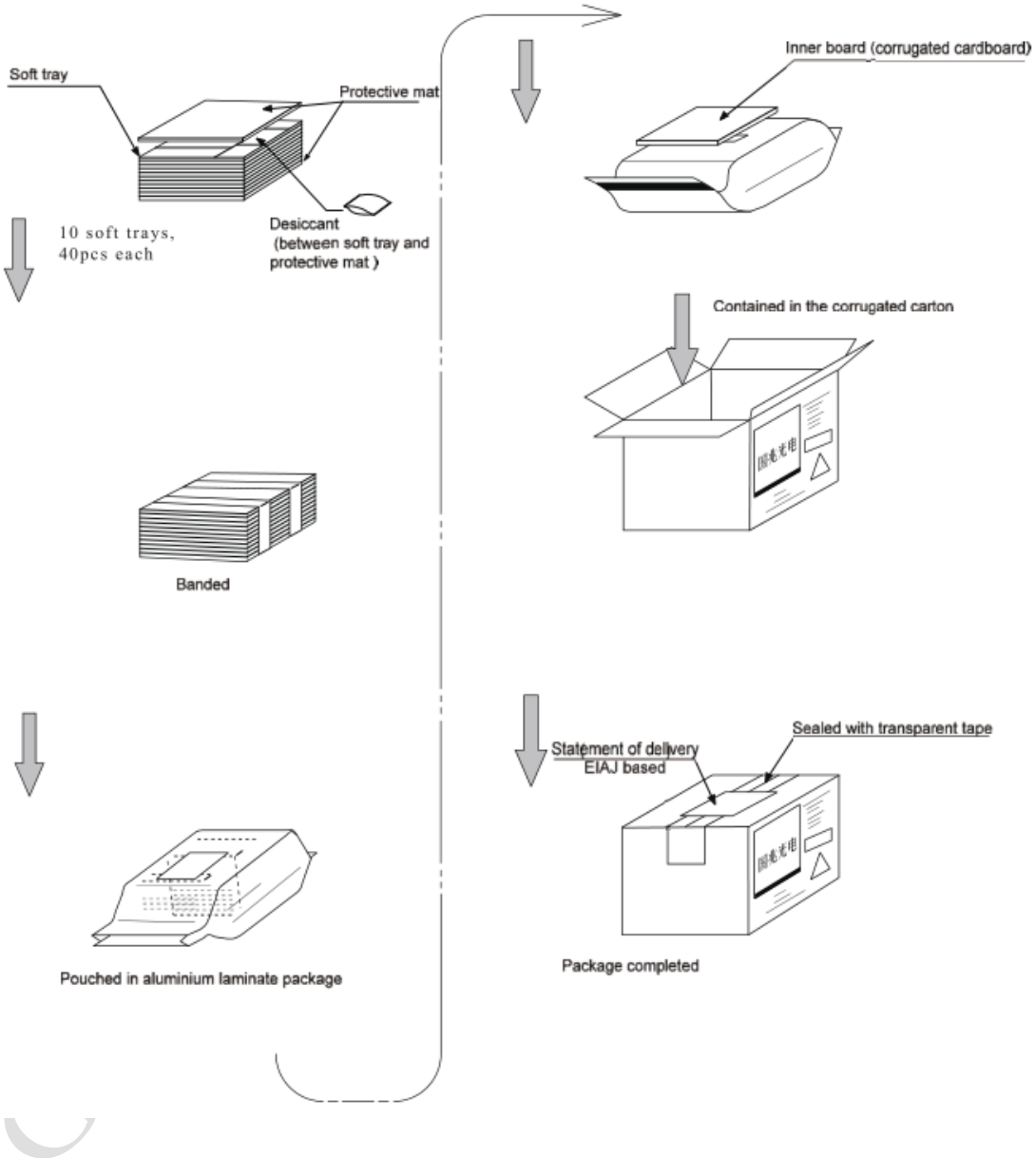


Number of Contacts	Dimension(mm)					
	A	B	C	D	E	F
40	12.20	9.50	10.70	11.60	10.80	13.52

6.3 **Packing Specification**

Forms: Soft tray (40 pieces)

Carton (40 pieces×10 trays=400 pieces)



7 Product Precautions

7.1 Use Precautions

1. The GZ061PBC01 silicon-based OLED microdisplay shall be strictly in accordance with the definition of the electrical interface in this datasheet for power supply and signal lines connection. Maintain the stability of the power supply, and illegal power supply is not allowed;
2. During the use of the microdisplay, if abnormal phenomena such as short circuit or overheating are found, it is prohibited to repeatedly power on to test. Please timely find the problem or contact Guozhao Optoelectronics Company for maintenance;
3. In order to improve the service life of the product and avoid the aggravation of residual images affecting use, it is necessary to minimize the time for the product to display a fixed image under high temperature or high brightness conditions;
4. The glass and silicon edges of the silicon-based OLED microdisplay are easily damaged and shall not be subject to physical stress;

7.2 Cleaning Precautions

1. It is prohibited to use any acid, alkali, organic solvent/reagent and other chemicals to scrub or come into contact with the product;
2. Use lens paper or a clean cloth to dip a small amount of water or organic solvent, wring dry and then wipe the silicon-based OLED microdisplay surface. Do not wipe it directly with a wet cloth;
3. When wiping the screen with organic solvents, try to avoid wiping the edge of the screen, otherwise it may damage the rubber layer.

7.3 Storage Requirements

1. Short-term storage requirements: the silicon-based OLED microdisplay allows short-term storage in a dry environment between -55 °C ~ 70 °C (≤ 100 hours);
2. Long-term storage requirements:

1) Room temperature of 25 °C ± 5 °C;
2) The dry nitrogen or vacuum sealed container;
3) Avoid violent shaking.

7.4 **Others**

1. Keep the silicon-based OLED microdisplay away from ultraviolet rays and ionizing radiation;
2. Do not bend the silicon-based OLED microdisplay by external force;
3. Keep the silicon-based OLED microdisplay away from heat sources during storage or use;
4. Avoid falling of the silicon-based OLED microdisplay at high altitude.
