4.3 inch
E-paper Display Series

GooDisplay®

GDE043A3

Dalian Good Display Co., Ltd.

Product Specifications

Customer	**Standard**
Description	**4.3” E-PAPER DISPLAY**
Model Name	**GDE043A3**
Date	**2020/12/30**
Revision	**1.0**

	Design Engineering		
	Approval	**Check**	**Design**

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Contents

Version	Content	Datete	Producer
1.0	New release	2020/12/30	

1. General Descriptionn

GDE043A3 is an Active Matrix Electrophoretic Display(AM EPD), High-Resolution AM TFT Black/White display module can be used in portable electronic devices, such as E-book Reader.

The module is a TFT-array driving electrophoretic display, with integrated circuits including source and gate drivers. The resolution of the module is 800×600（SVGA），and the active area is 4.3 inch diagonal.

2. Featurees

- ◆ 800×600 display
- ◆ White Reflectance above 33%(0 minute)
- ◆ Contrast Ratio above 8:1(0 minute)
- ◆ 4:3 aspect ratio
- ◆ 230 dpi
- ◆ Wide viewing angle
- ◆ Ultra low power consumption
- ◆ Reflective mode
- ◆ Bi -stable display
- ◆ Commercial temperature range
- ◆ Landscape, portrait modes
- ◆ Parallel e-paper display
- ◆ Support 16 grayscale

3. Application

E-book reader or others.

4. Pin Assignment

No.	Pin Name	Description
1	VNEG	Negative power supply source driver
2	VPOS	Positive power supply source driver
3	VSS	Ground
4	VDD	Digital power supply drivers
5	CLK	Clock source driver
6	LE	Latch enable source driver
7	OE	Output enable source driver
8	SHR	Shift direction source driver
9	SPH	Start pulse source driver
10	D0	Data signal source driver
11	D1	Data signal source driver
12	D2	Data signal source driver
13	D3	Data signal source driver
14	D4	Data signal source driver
15	D5	Data signal source driver
16	D6	Data signal source driver
17	D7	Data signal source driver
18	VCOM	Common connection
19	VGH	Positive power supply gate driver
20	VGL	Negative power supply gate driver
21	GMODE2	Output mode selection gate driver (H)
22	GMODE1	Output mode selection gate driver (H)
23	L/R	Shift direction gate driver
24	STV	Start pulse gate driver
25	CPV	Shift clock input
26	VBORDER	Border connection

5. Electrical Characteristics

5.1 Module interface description

This module can be driven by ASIC AVT6201A Timing Controller(T-Con).

5.2 Module DC Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Signal ground	VSS		-	0	-	V
Logic Voltage supply	VDD		3.0	3.3	3.6	V
	IVDD	VDD=3.3V		3.0		mA
Gate Positive supply	VGH		21	22	23	V
	IVGH			0.35		mA
Gate Negative supply	VGL		-21	-	-19	V
	IVGL			3.0		mA
Source Positive supply	VPOS		14.6	15	15.4	V
	IPOS	VPOS=15V	-	20	-	mA
Source Negative supply	VNEG		-15.4	-15	-14.6	V
	INEG	VNEG=-15V		-20		mA
Asymmetry source	VASYM	VPOS+VNEG	-80	0	80	mV
Common voltage	VCOM		-2.5	Adjusted	0	V
	ICOM		-	-1.5	-	mA
Standby power module	PSTBY			-	0.4	mW
Typical power module	PTYP		-	600	1100	mW
Operating temperature	Top		0		50	℃
Operating relative humidity	RHop		0		70	%
Storage temperature	Tst		-20	-	70	℃
Storage relative humidity	RHst		30		60	%
Maximum image update time at 25℃				960	1200	ms

Notes:

1. The maximum power and maximum current are specified for the worst case power consumption.

2. The typical power is measured when "typical images" are displayed.

3. The standby power is the consumed power when the module controller is in standby mode.

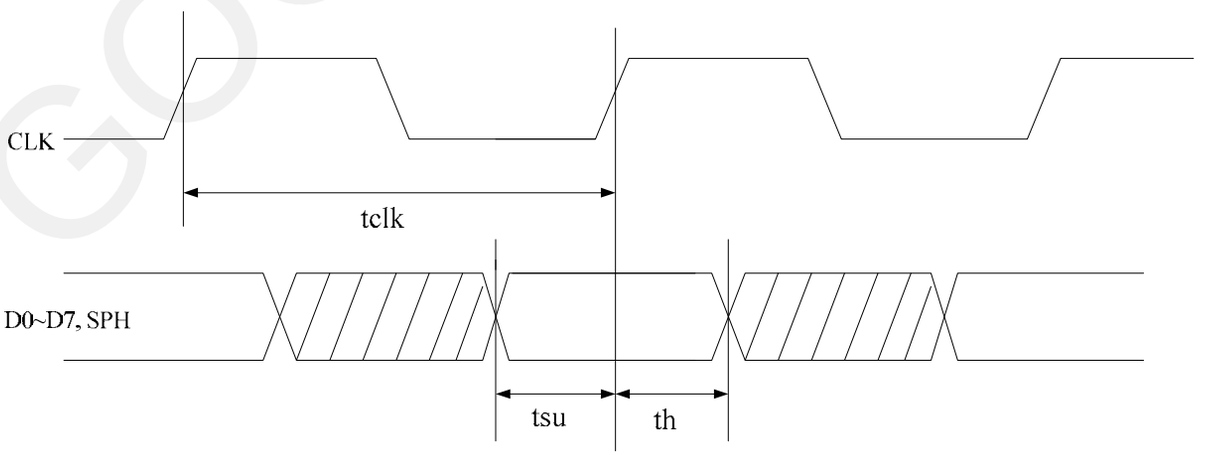
4. The listed electrical/optical characteristics are only guaranteed under the controller & waveform provided by Good Display.

5.3 Module AC characteristics

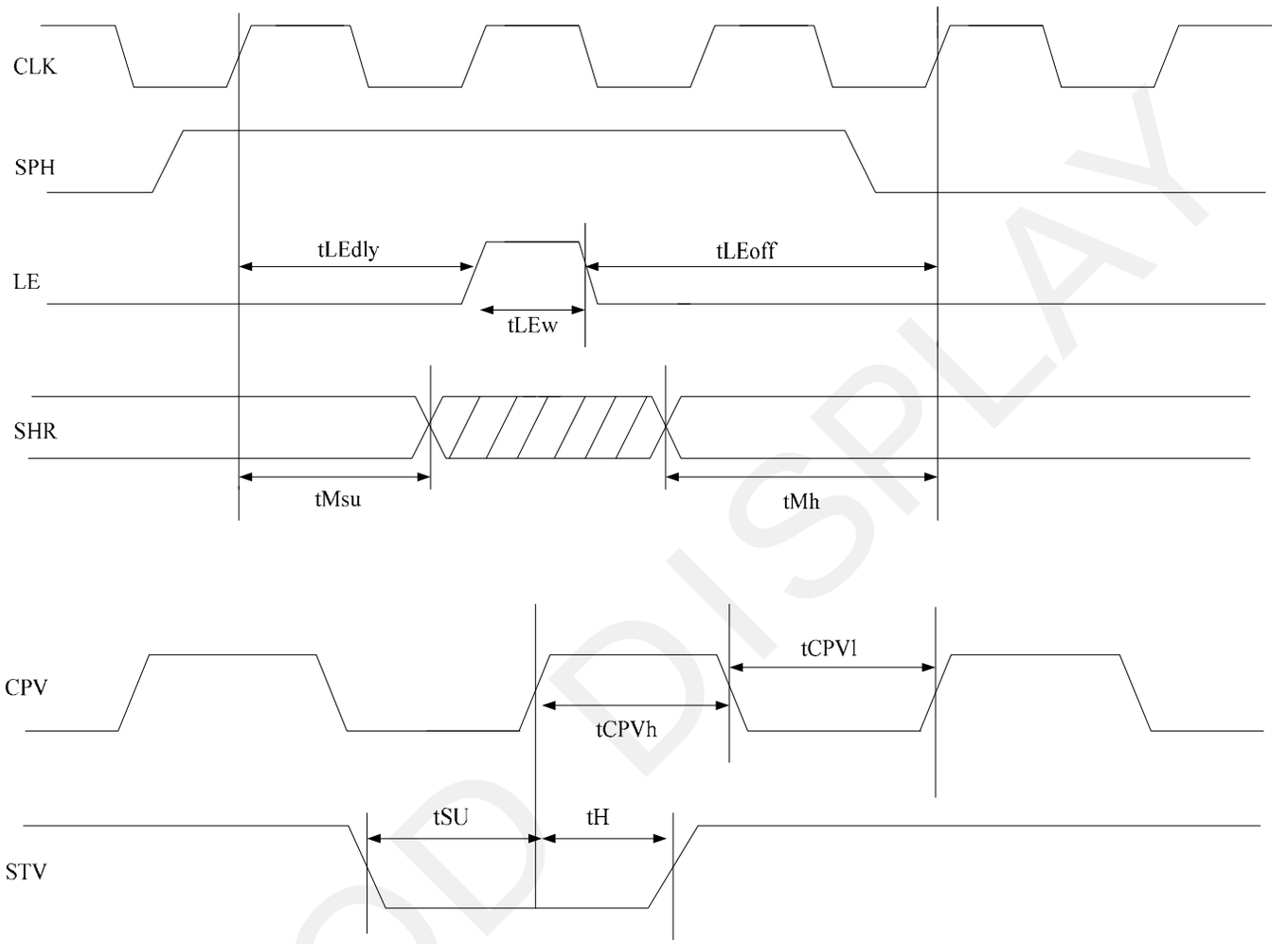
Note:VDD=3.0V to 3.6V, unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit	App Pin
Clock frequency	fcpv			200	kHz	CPV
Clock CPV high time	tCPVh	0.5	-	-	us	
Clock CPV low time	tCPVl	0.5	-	-	us	
Data setup time	tSU	100	-	-	ns	CPV STV
Data hold time	tH	300	-	-	ns	
Clock CLK cycle time	tclk	40	-	-	ns	Below table
D0 .. D7, SPH setup time	tsu	8	-	-	ns	
D0 .. D7, SPH hold time	th	8	-	-	ns	
LE on delay time	tLEdly	40	-	-	ns	
LE high-level pulse width	tLEw	40	-	-	ns	
LE off delay time	tLEoff	40	-	-	ns	
SHR setup time	tMsu	100	-	-	ns	
SHR hold time	tMh	10	-	-	ns	

Clock&Data Timing



Output Latch/Control Signals

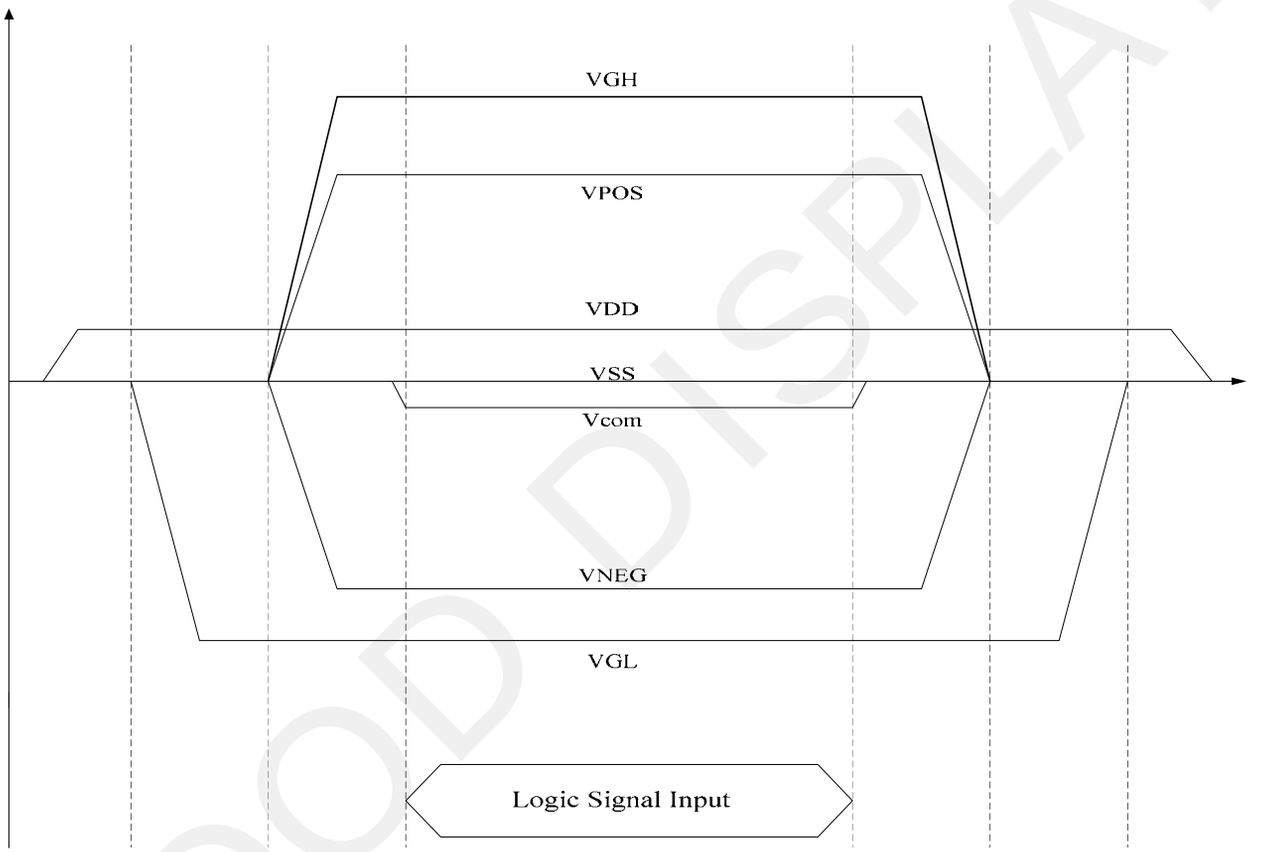


6. Power On/Off Sequence

To prevent the device from damage due to latch up, the power on/off sequence shown below must be followed.

When power on: VDD -> VGL -> VNEG/VGH/VPOS -> Vcom

When power off: Vcom -> VNEG/VGH/VPOS -> VGL -> VDD



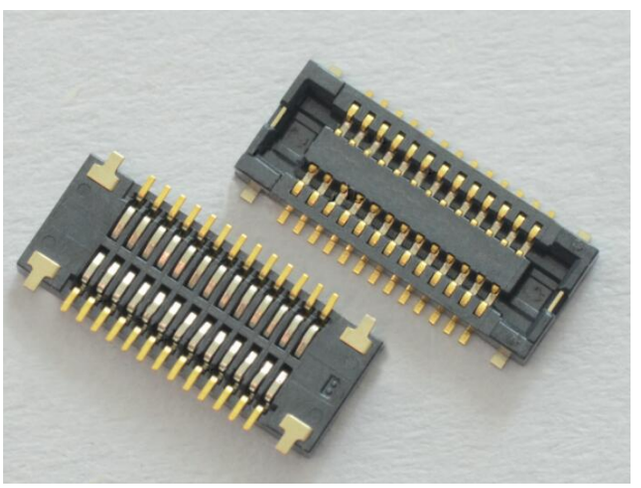
7. Mechanical Specifications

7.1 Dimension

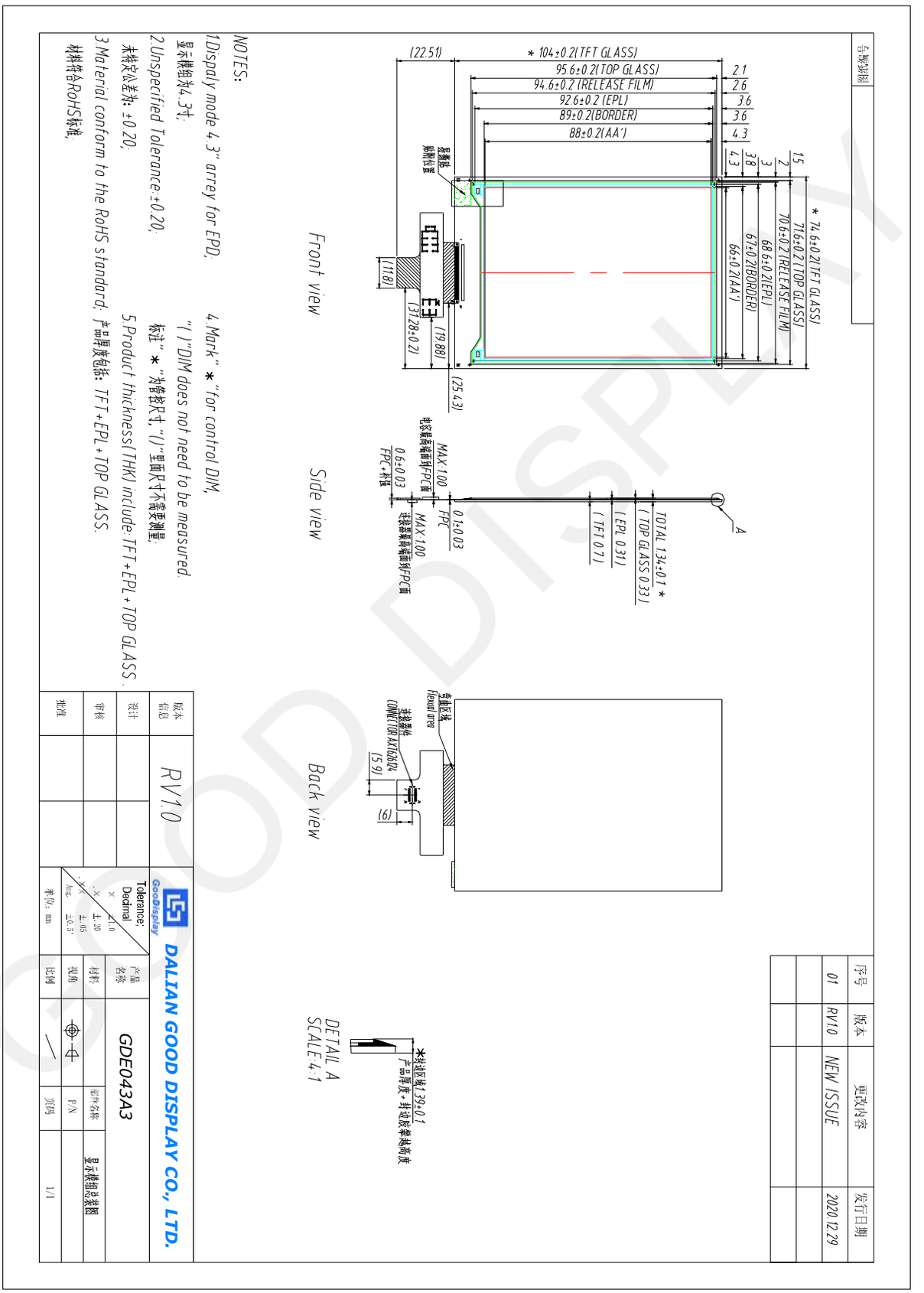
PARAMETER	VALUE	UNIT	Remark
Display Resolution	800×600	dots	
Active area dimensions			
Width	88	mm	
Height	66	mm	
Screen size	4.3（4:3 diagonal）	Inch	
Resolution	230	dpi	
Pixel pitch			
Horizontal	0.11	mm	
Vertical	0.11	mm	
Pixel configuration	Rectangle		
Overall dimensions			
Width	104.0	mm	
Height	74.6	mm	
Thickness	1.34	mm	
Mass of the module	17.63	g	

7.2 Electrical Connector

SERVICE	CONNECTOR	TYPE NUMBER	NUMBER OF PINS	MATING CONNECTOR
Interface	PANASONIC	AXT526124	26	FPC pitch=0.4mm



7.3 Mechanical Drawing of EPD Module



8. Matched Development Kit

Our Development Kit designed for SPI E-paper Display aims to help users to learn how to use E-paper Display more easily. It can refresh black-white E-paper Display and three-color (black, white and red/Yellow) Good Display 's E-paper Display. And it is also added the functions of USB serial port, Raspberry Pi and LED indicator light ect.
DESPI Development Kit consists of the development board and the pinboard.

More details about the Development Kit, please click to the following link:

https://www.good-display.com/product/254.html

9. Optical Characteristics

Parameter	Conditions	Values			Units	Notes
		Min.	Typ.	Max		
White Reflectivity	0 min	33			%	
Contrast Ratio (CR)	0 min	8:1				1
Image Update Time:	GC16(T=0℃)		1500	1600	ms	
	GC16(T=25℃)		960	1200		
	GC16(T≥35℃)		760	960		
	DU (T=0℃)		500	540		
	DU(T≥20℃)		300	360		

(T_{amb}=25℃, f_v=50Hz. Measurements are made with Eye-One Pro Spectrophotometer.)

Note:

1. CR=Surface Reflectance with all white pixel/Surface Reflectance with all black pixels;

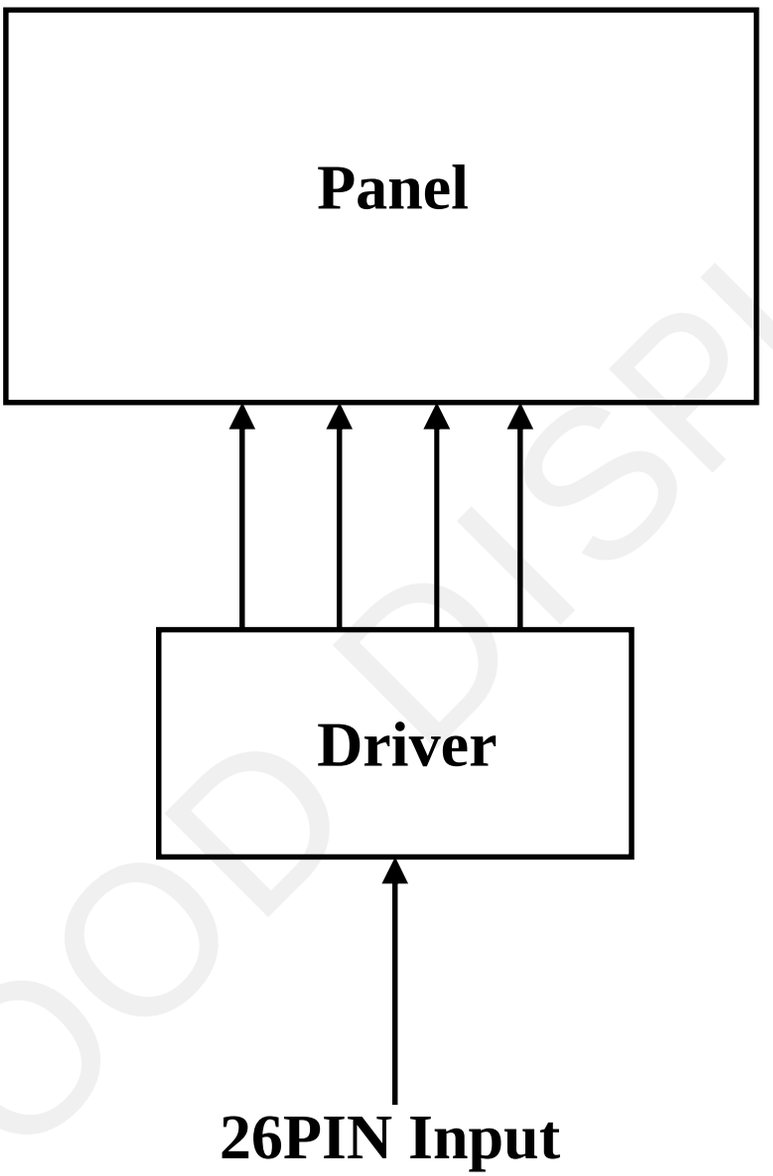
10. Handling, Safety, and Environment Requirements

1. The EPD Panel / Module is manufactured from fragile materials such as glass and plastic, and may be broken or cracked if dropped. Please handle with care. Do not apply force such as bending or twisting to the EPD panel
2. The display module should not be exposed to harmful gases, such as acid and alkali gases, which corrode electronic components.
3. Do not apply pressure to the EPD panel in order to prevent damaging it
4. Do not connect or disconnect the interface connector while the EPD panel is in operation
5. Do not stack the EPD panels / Modules.
6. Keep the EPD Panel / Module in the specified environment and original packing boxes when storage in order to avoid scratching and keep original performance.
7. Do not disassemble or reassemble the EPD panel
8. Use a soft dry cloth without chemicals for cleaning. Please don't press hard for cleaning because the surface of the protection sheet film is very soft and without hard coating. This behavior would make dent or scratch on protection sheet
9. Please be mindful of moisture to avoid its penetration into the EPD panel, which may cause damage during operation
10. It's low temperature operation product. Please be mindful the temperature different to make frost or dew on the surface of EPD panel. Moisture may penetrate into the EPD panel because of frost or dew on surface of EPD panel, and makes EPD panel damage.
11. High temperature, high humidity, sunlight or fluorescent light may degrade the EPD panel's performance. Please do not expose the unprotected EPD panel to high temperature, high humidity, sunlight, or fluorescent for long periods of time. Please store the EPD panel in controllable environment of warehouse and original package. Without sunlight, without condensation a temperature range of 15ºC to 35ºC, and humidity from 30%RH to 60%RH.

11. Reliability Test

No.	TEST	CONDITION	METHOD	REMARK
1	High-Temperature Operation	T = +50°C, RH = 30% for 168hrs	IEC 60 068-2-2Bp	At the end of the test, electrical, mechanical, and optical specifications shall be satisfied.
2	Low-Temperature Operation	T = 0°C for 168hrs	IEC 60 068-2-2Ab	At the end of the test, electrical, mechanical, and optical specifications shall be satisfied.
3	High-Temperature Storage	T = +70°C, RH=23% for 168 hrs	IEC 60 068-2-2Bp	At the end of the test, electrical, mechanical, and optical specifications shall be satisfied.
4	Low-Temperature Storage	T = -25°C for 168 hrs	IEC 60 068-2-1Ab	At the end of the test, electrical, mechanical, and optical specifications shall be satisfied.
5	High-Temperature, High-Humidity Operation	T = +40°C, RH = 90% for 168 hrs	IEC 60 068-2-3CA	At the end of the test, electrical, mechanical, and optical specifications shall be satisfied.
6	High Temperature, High- Humidity Storage	T = +60℃, RH=80% for 168hrs	IEC 60 068-2-3CA	At the end of the test, electrical, mechanical, and optical specifications shall be satisfied.
7	Thermal Shock	1 cycle:[-25℃ 30min]→[+70 ℃ 30 min] : 50 cycles	IEC 60 068-2-14	At the end of the test, electrical, mechanical, and optical specifications shall be satisfied.
8	Package Vibration	1.04G, Frequency: 10~500Hz Direction: X,Y,Z Duration: 1 hours in each direction	Full packed for shipment	At the end of the test, electrical, mechanical, and optical specifications shall be satisfied.
9	Package Drop Impact	Drop from height of 122 cm on concrete surface. Drop sequence: 1 corner, 3edges, 6 faces One drop for each	Full packed for shipment	At the end of the test, electrical, mechanical, and optical specifications shall be satisfied.
10	Electrostatic Effect (non-operating)	Machine model +/- 250V, 0Ω, 200pF	IEC 62179, IEC 62180	At the end of the test, electrical, mechanical, and optical specifications shall be satisfied.
11	Stylus Tapping	POLYACETAL Pen:Top R0.8mm Load: 200gf;Speed:30times/min; Speed: 30times/min Total 13,500times,		At the end of the test, electrical, mechanical, and optical specifications shall be satisfied.

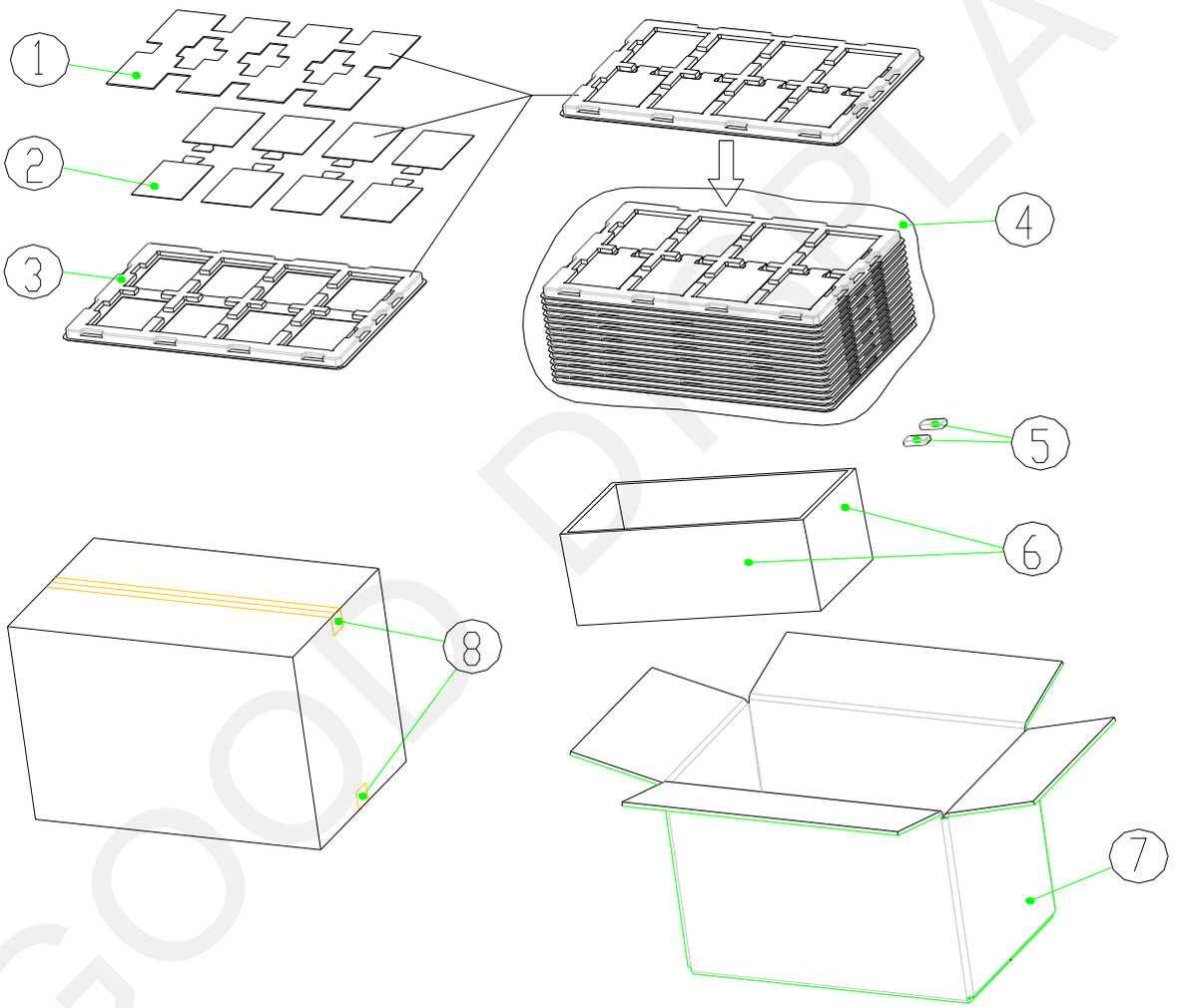
12. Block Diagram



13. Packaging

Packing Form

a) Package quantity in one outer box: 96 pcs
b) box size: 458 mm X 303 mm X 310 mm
c) 1 outer box = 12 (full tray) + 1 (dummy / top tray)



No.	Description	Material
①	PE Foam	EPE
②	Board Ass'y (96 pcs/1 Box)	EPD Panel
③	Packing, tray (13 pcs/1 outer box)	PS
④	Aluminium foil bag	Aluminium foil
⑤	Desiccant	Desiccant
⑥	side plate	EPE
⑦	Outer carton	K=A
⑧	Tape (43mm*300m)	OPP

14. Precautions

(1) Do not apply pressure to the EPD panel in order to prevent damaging it.

(2) Do not connect or disconnect the interface connector while the EPD panel is in operation.

(3) Do not touch IC bonding area. It may scratch TFT lead or damage IC function.

(4) Please be mindful of moisture to avoid its penetration into the EPD panel, which may cause damage during operation.

(5) If the EPD Panel / Module is not refreshed every 24 hours, a phenomena known as
"Ghosting" or "Image Sticking" may occur. It is recommended to refreshed the ESL /EPD Tag every 24 hours in use case. It is recommended that customer ships or stores the ESL / EPD Tag with a completely white image to avoid this issue

(6) High temperature, high humidity, sunlight or fluorescent light may degrade the EPD panel's performance. Please do not expose the unprotected EPD panel to high temperature, high humidity, sunlight, or fluorescent for long periods of time.

(7) For more precautions, please click on the link:
https://www.good-display.com/news/80.html