

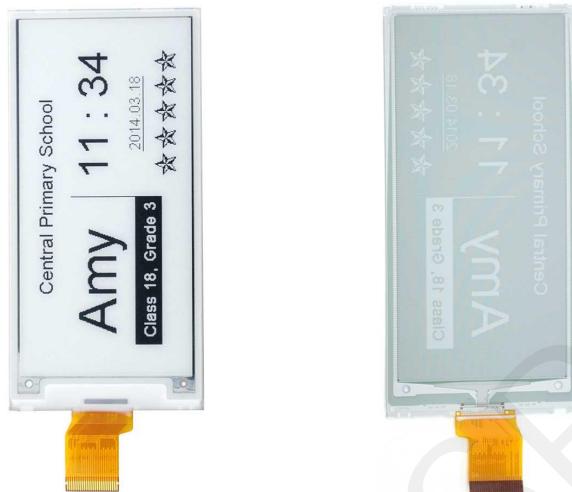


**3.5 inch
E-paper Display Series
GDEQ035T81**



Dalian Good Display Co., Ltd.

Product Specifications



Customer	Standard
Description	3.5" E-PAPER DISPLAY
Model Name	GDEQ035T81
Date	2022/11/28
Revision	1.0

	Design Engineering		
	Approval	Check	Design

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Version	Content	Date	Producer
1.0	New release	2022/11/28	

1. General Description

1.1 Overview

GDEQ035T81 is a reflective electrophoretic display module on an active matrix TFT substrate. The diagonal length of the active area is 3.5" and contains 184 x384 pixels. The panel is capable of displaying 1-bit black and white images depending on the associated lookup table used. The circuitry on the panel includes an integrated gate and source driver, timing controller, oscillator, DC-DC boost circuit, and memory to store the frame buffer and lookup tables, and additional circuitry to control VCOM and border settings.

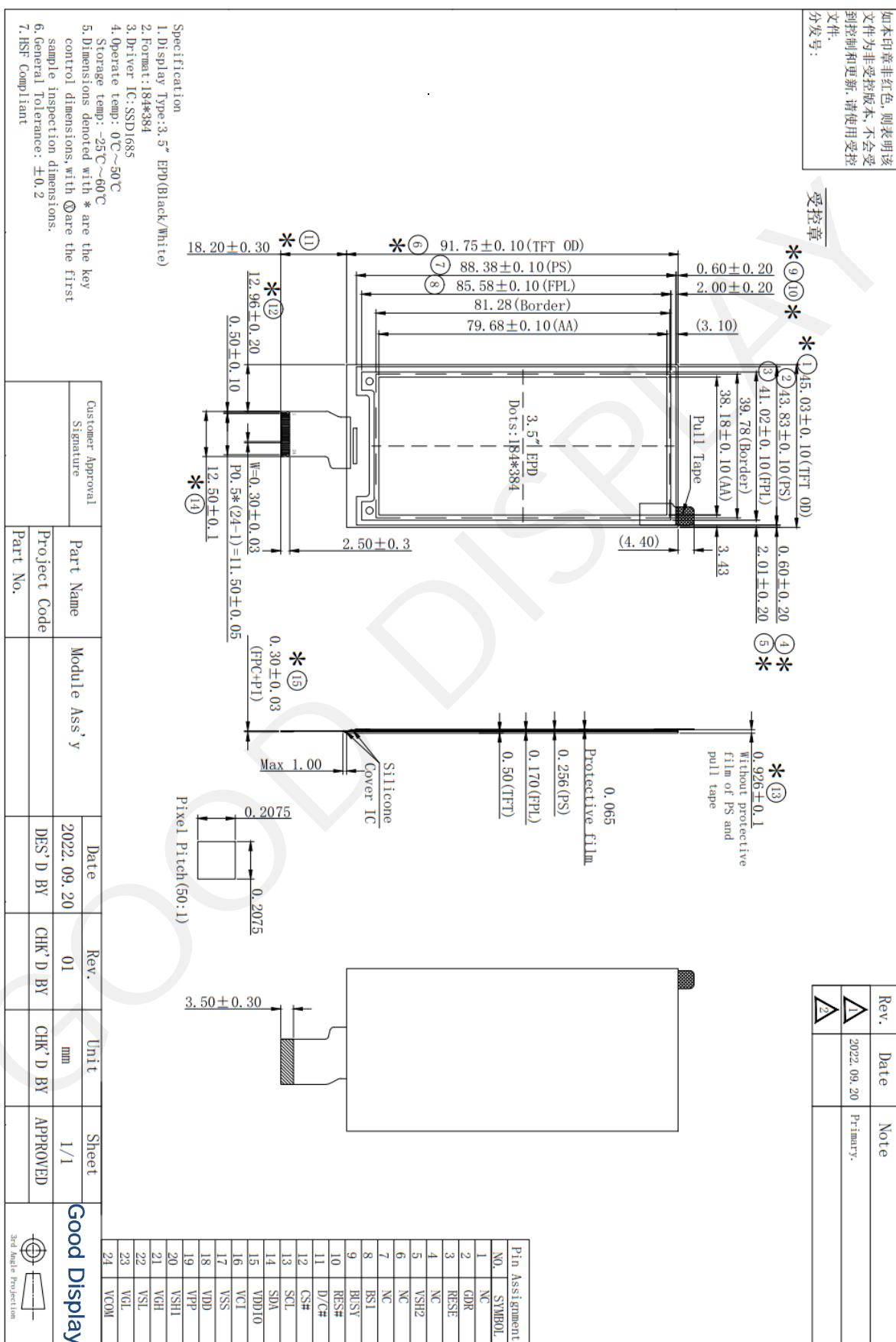
1.2 Features

- Ultra wide viewing angle
- Ultra low power consumption
- I²C Signal Master Interface to read external temperature sensor.
- On chip display RAM
- Interface :4-Wire SPI or 3-Wire SPI
- Wide range of operating temperature: 0 to 50
- Wide range of storage temperature: -25 to 60
- High reflectance and contrast TFT electrophoretic.

1.3 Mechanical Specifications

NO.	ITEM	SPECIFICATION	UNIT
1	Dot Matrix	184(H)×384(V)	-
2	Screen Size	3.5	Inch
3	Active Area	38.18(H)×79.68(V)	mm
4	Pixel Pitch	0.2075×0.2075	mm
5	Pixels Per Inch	121.66	-
6	TFT Area	45.03(H)×91.75 (V)	mm
7	Outline Dimension	45.03 (H)×109.95(V) ×0.926(D)	mm
8	Pixel Configuration	Rectangle	-
9	Driver IC	SSD1685	-
10	Module Weight	7.8±10%	gram

1.4 Mechanical Drawing of EPD module



1.5. Module Interface

PIN NO.	PIN NAME	DESCRIPTION
1	NC	No Connection
2	GDR	This pin is N-Channel MOSFET gate drive control pin.
3	RESE	Current Sense Input for the control loop
4	NC	No Connection
5	VSH2	This pin is Positive Source driving voltage, VSH2 connect a stabilizing capacitor between VSH2 and VSS in the application circuit.
6	NC	No Connection
7	NC	No Connection
8	BS1	This pin is for selecting 3-wire(H active) or 4-wire(L active) SPI interface.
9	BUSY	This pin indicates the driver status. BUSY= "0" : Driver is busy, data/VCOM is transforming. BUSY= "1" : non-busy. Host side can send command/data to driver.
10	RES#	This pin is reset signal input (Active Low).
11	D/C#	This pin is Data/Command control pin connecting to the MCU
12	CS#	This pin is the chip select input connecting to the MCU.
13	SCL	This pin is serial clock pin for interface.
14	SDA	This pin is serial data pin for interface.
15	VDDIO	Power input pin for the Interface. Connect to VCI in the application circuit.
16	VCI	Power input pin for the chip.
17	VSS	Ground
18	VDD	Core logic power pin VDD can be regulated internally from VCI. A capacitor should be connected between VDD and VSS under all circumstances
19	VPP	Power Supply for OTP Programming.
20	VSH1	This pin is Positive Source driving voltage, VSH1 Connect a stabilizing capacitor between VSH1 and VSS in the application circuit.
21	VGH	This pin is Positive Gate driving voltage. Connect a stabilizing capacitor between VGH and VSS in the application circuit.
22	VSL	This pin is Negative Source driving voltage. Connect a stabilizing capacitor between VSL and VSS in the application circuit.
23	VGL	This pin is Negative Gate driving voltage. Connect a stabilizing capacitor between VGL and VSS in the application circuit.
24	VCOM	This pins is VCOM driving voltage Connect a stabilizing capacitor between VCOM and VSS in the application circuit.

1.6 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/219.html>

2. Environmental

2.1 Handling, Safety and Environmental Requirements

WARNING

The display glass may break when it is dropped or bumped on a hard surface. Handle with care. Should the display break, do not touch the electrophoretic material. In case of contact with electrophoretic material, wash with water and soap.

CAUTION

The display module should not be exposed to harmful gases, such as acid and alkali gases, which corrode electronic components.

Disassembling the display module can cause permanent damage and invalidate the warranty agreements.

IPA solvent can only be applied on active area and the back of a glass. For the rest part, it is not allowed.

Observe general precautions that are common to handling delicate electronic components. The glass can break and front surfaces can easily be damaged.

Moreover the display is sensitive to static electricity and other rough environmental conditions.

Mounting Precautions

- (1) It's recommended that you consider the mounting structure so that uneven force (ex. Twisted stress) is not applied to the module.
- (2) It's recommended that you attach a transparent protective plate to the surface in order to protect the EPD. Transparent protective plate should have sufficient strength in order to resist external force.
- (3) You should adopt radiation structure to satisfy the temperature specification.
- (4) Acetic acid type and chlorine type materials for the cover case are not desirable because the former generates corrosive gas of attacking the PS at high temperature and the latter causes circuit break by electro-chemical reaction.
- (5) Do not touch, push or rub the exposed PS with glass, tweezers or anything harder than HB pencil lead. And please do not rub with dust clothes with chemical treatment. Do not touch the surface of PS for bare hand or greasy cloth. (Some cosmetics deteriorate the PS)
- (6) When the surface becomes dusty, please wipe gently with absorbent cotton or other soft materials like chamois soaks with petroleum benzene. Normal-hexane is recommended for cleaning the adhesives used to attach the PS. Do not use acetone, toluene and alcohol because they cause chemical damage to the PS.
- (7) Wipe off saliva or water drops as soon as possible. Their long time contact with PS causes deformations and color fading.

Product specification The data sheet contains final product specifications.

Limiting values
Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.
Application information
Where application information is given, it is advisory and does not form part of the specification.

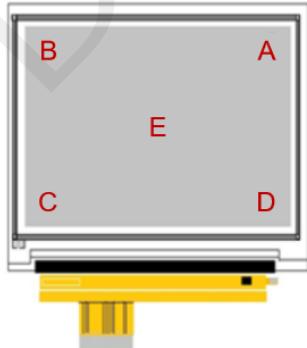
Product Environmental certification
ROHS

REMARK
All The specifications listed in this document are guaranteed for module only. Post-assembled operation or component(s) may impact module performance or cause unexpected effect or damage and therefore listed specifications is not warranted after any Post-assembled operation.

2.2 Reliability

NO	Test items	Test condition	QUANTITY
1	Low-Temperature Storage	T = -25°C , low temperature film T= -30°C; White screen state, for 240h.	5pcs
2	Low-Temperature Operation	T = 0°C, 240 h; Put the product into the experimental procedure, run it in the temperature box, and check it every 24 hours.	5pcs
3	High-Temperature Operation	T = 50°C, RH = 35%, 240 h; Put the product into the experimental procedure, run it in the temperature box, and check it every 24 hours.	5pcs
4	High-Temperature Storage	T=60°C, RH=35%; White screen state, for 240h.	5pcs
5	Temperature Cycle	1 cycle:[-25°C 30min]→[+60 °C 30 min]; 100 cycles.	5pcs
6	High-Temperature/ High- humidity Storage	T=50°C, RH=90%; White screen state, for 240h.	5pcs
7	UV exposure Resistance	765W/m ² for 168hrs,T = 40°C, RH=35%;	5pcs
8	ESD Contact discharge	±200V, Test 5 point; Each point discharge 10 times. Time interval is not less than 1 second.	5pcs

ESD test location



Test and measurement conditions

After the end of the experiment, the sample was taken out of the temperature chamber, and stood at room temperature for 1h, and then the sample was inspected for appearance, function and optical inspection.

Criteria for qualification (pass the test if all qualified) :

- (1) The product can be normal refresh.
- (2) There are no new point defects or line defects in the display screen.
- (3) No discoloration, blurred handwriting and barcode can be read on the complex screen.

2.3 Outgoing Quality Control Specifications

2.3.1 Sampling Method

- (1) GB/T 2828.1, inspection level II, normal inspection, single sample inspection
- (2) AQL: Major 0.65; Minor 1.0

2.3.2 Inspection Conditions

The environmental conditions for test and measurement are performed as follows.

Temperature: $23 \pm 3^\circ\text{C}$

Humidity: $55 \pm 15\%$ R.H

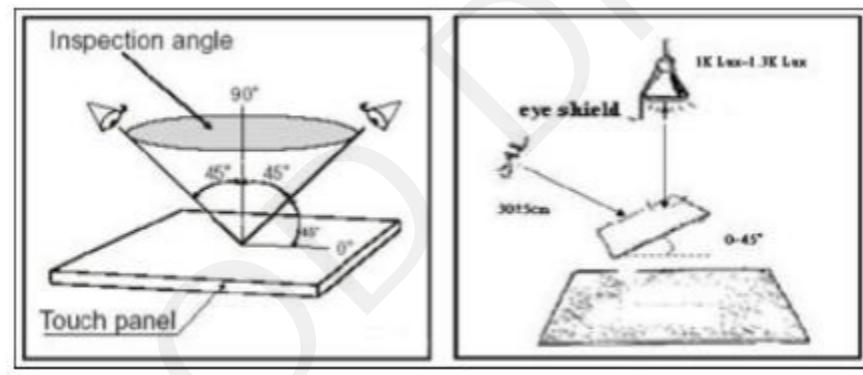
Inspection of illuminance: 800~1200 Lux

Inspection time: signal face 5S-10S

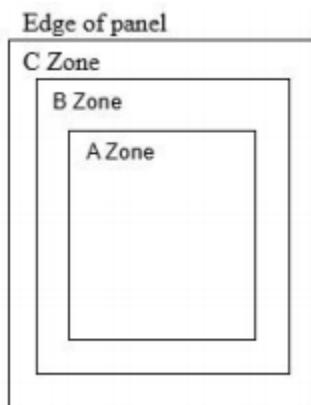
Distance between the Panel & Eyes: $30 \pm 10\text{cm}$

Viewing angle from the vertical in each direction: $\pm 45^\circ$

(See the sketch below)



2.3.3 Quality Assurance Zones



Zone A : Active Area

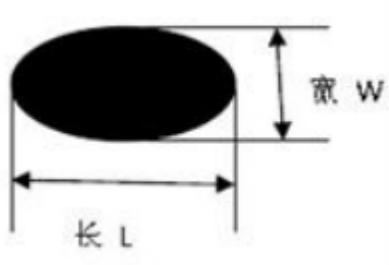
Zone B : Black Frame Area

Zone C : Outside Black Frame Area

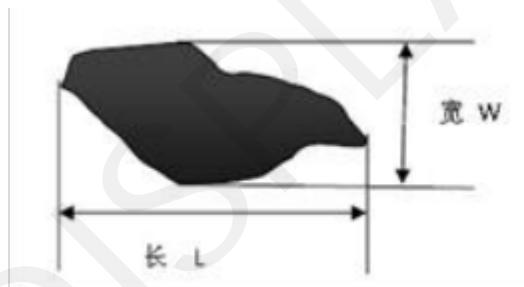
2.4 Inspection Standard

Defects Definition of &L&W (Unit:mm)

2.4.1 Dot defects:

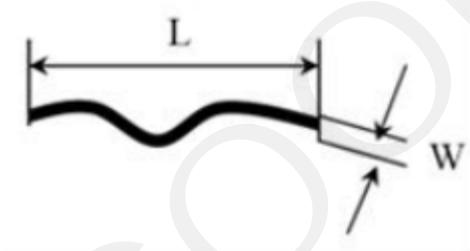


$$\Phi D = \text{Max}(L, W)$$

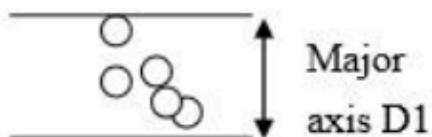


$$\Phi D = \text{Max}(L, W)$$

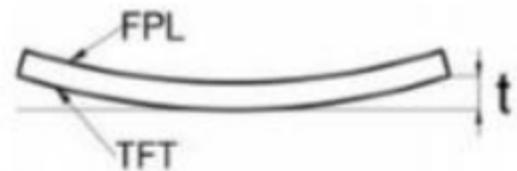
2.4.2 Line defect:



2.4.3 Small bubble aggregation and large bubble definition:



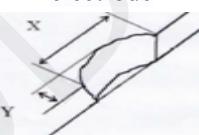
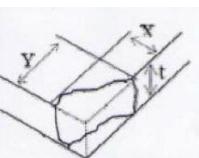
2.4.4 TFT warpage:



Identification and packaging inspection

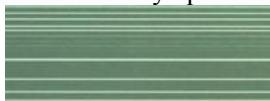
NO.	ITEM	CRITERIA	Method	Defect level
1	Package	(1). The products are completely placed in the anti-static tray without overlapping. (2). Products with different models cannot be mixed in one internal packaging bag. (3) There is a desiccant in the packaging bag, with good internal packaging and no expansion of the packaging bag. (4) The Tray model, quantity and way used for packaging meet the requirements of product specifications.	Sight Check	Minor
2	Inner and outer packing	(1) There is no obvious deformation or damage in the packing case; (2) The type, quantity and method of the packing case used shall meet the requirements of the product specification. (3) There is no font or unclear design in the outer packing box.	Sight Check	Minor
3	Labels for inner and outer cases	(1). Any unnecessary marks or marks are not allowed to exist; (2). The label information such as model, specification, quantity, weight, material number, month label and environmental protection label should be clear and correct, which should be in line with product specifications or marked according to customer requirements.	Sight Check	Minor

Appearance Defects

NO.	ITEM	CRITERIA	Acceptable range	Method	Defect level	Area
1	Dot defects (Black or White spot, Dirty spot, Foreign matter, Bubble)	$D \leq 0.25\text{mm}$	Ignore	Film Card	Minor	Zone A
		$0.25\text{mm} < D \leq 0.4\text{ mm}, \text{Distance} \geq 5\text{mm}$	$N \leq 4$			
		$0.4\text{mm} < D \leq 0.5\text{ mm},$	$N \leq 1$			
		$D > 0.5\text{ mm}$	$N=0$			
		$0.1\text{mm} < D \leq 0.25\text{ mm}(Dense point)$	$N \leq 3/\text{cm}^2$			
2	Line defects (Foreign material, Scratch)	$L \leq 2\text{mm}, W \leq 0.1\text{mm}$	Ignore	Film Card	Minor	Zone A
		$2\text{mm} < L \leq 8\text{mm}, 0.1 < W \leq 0.2\text{mm}$	$N \leq 4$			
		$L > 8\text{mm}, W > 0.2\text{mm}$ (Note: FPL scratch is not allowed)	$N=0$			
	steel pit	Strip pits are not allowed	$N=0$	Sight Check	Major	Zone A
3	Glass Crack	Extensial cracks are not allowed 	$N=0$	Sight Check	Major	Zone B,C
4	Edge breakage	$X \leq 3\text{mm}, Y \leq 0.5\text{mm}$, It does not affect the electrode 	$N \leq 2$	Sight Check/ Microscope	Minor	Zone C
5	Chip Package Chip Off	$X \leq 2\text{mm}, Y \leq 2\text{mm}$, It does not affect the electrode(FPC edge) $X \leq 1\text{mm}, Y \leq 1\text{mm}$, It does not affect the electrode((Not FPC edge)) 	$N \leq 2$	Sight Check/ Microscope	Minor	Zone C
6	Squallidity	No dirt (finger print, dust, residual glue, etc.)	Ignore	Sight Check	Minor	Zone A,B,C
7	Silicone	The maximum diameter of a single bubble cannot exceed 2mm	$N \leq 2$	Sight Check/ Film card	Minor	Zone C
		Crack is not allowed and there are no visible impurities in the glue of the lead part	$N=0$			

NO.	ITEM	CRITERIA	Acceptable range	Method	Defect level	Area
		The adhesive must completely cover the ACF, lead area and IC and should be applied evenly	N=0			
		No glue leakage, no obvious lack of glue in the lead area	N=0			
		Glue height exceeds PS surface	N=0			
		FPC Front overflow glue width>0.5mm or Back side overflow glue width>1mm	N=0			
8	Edge Sealing Adhesive	No glue leakage	N=0	Sight Check/ Film card	Major	Zone C
		The height of sealant exceeds PS surface	N=0		Minor	
		The edge sealing adhesive shall not leak TFT glass substrate	N=0			
		Bubbles and impurities (from frame edge to EC glue edge) 1.54 for products, a + b > 1.3mm For other products, a + b > 1.5mm	N=0		Minor	
9	Protective film	Foreign body in protective film	N=0	Sight Check	Minor	Zone A
		The protective film punctures and injures FPL	N=0			
10	Pull Tape	Attachment position is wrong Cannot tear up the protective film	N=0	Sight Check	Minor	Zone C
11	FPC	FPC has break, scratch, gold finger stripping or oxidation, dirty, residual glue	N=0	Sight Check	Major	Zone C
12	Glass edge bulge	X≤3mm , Y≤0.3mm	N≤1	Sight Check	Minor	Zone C
13	Warping	T ≤ 1% of glass length	N=0	Plug Gage	Minor	Zone C
14	Chromatism	Color difference in silver paste area (Not in Zone A)	Ignore	Sight Check	Minor	Zone C
		FPL Peeling occurs, chromatic aberration occurs	N=0	Sight Check	Major	Zone A
		FPL edge loss color difference in zone B ≥ 1 / 2 width	N=0	Sight Check	Major	Zone A,B
15	Silver pulp point	FPL and TFT substrate conduction, silver point ≥1.3mm (Single silver point and double silver point shall meet this specification)	N=0	Film card	Major	Zone C
16	Inkjet code	The inkjet font shall be clear and recognizable, and shall not be missing	N=0	Sight Check	Minor	Zone C

Displaying Defects

NO.	ITEM	CRITERIA	Acceptable range	Method	Defect level	Area
1	Dot defects (Black or White spot)	D \leq 0.25mm	Ignore	Film Card	Major	Zone A
		0.25mm < D \leq 0.4 mm, Distance \geq 5mm	N \leq 4			
		0.4mm < D \leq 0.5 mm	N \leq 1			
		D > 0.5mm	N=0			
		0.1mm < D \leq 0.25 mm, (Black and white module)	N \leq 3/cm ²			
2	Line defects	White or black lines running through the entire screen under any operation interface 	N=0	Sight Check	Major	Zone A
3	ghost	Ghosts appear only during screen switching	Ignore	Sight Check	Major	Zone A
4	Flash Point	Flash point occurs during screen switching only	Ignore	Sight Check	Major	Zone A
5	Flash Line	Flash Line occurs during screen switching only	N=0	Sight Check	Major	Zone A
6	Display screen error	Unable to display a fixed screen correctly	N=0	Sight Check	Major	Zone A
7	Display abnormal	No display, The red matrix darkens, Note fuzzy, bar code can not be scanned, After refresh, the previous template remains	N=0	Sight Check	Major	Zone A
8	Residual shadow	Residual image inspection (visual inspection, refer to optical specifications for final judgment)	N=0	Sight Check	Major	Zone A
9	Mura anomaly	White / gray screen mura not allowed	N=0	Sight Check	Major	Zone A

3. Electrical Characteristics

3.1 Absolute Maximum Rating

ITEM	SYMBOL	MIN	MAX	UNIT	REMARK
Logic supply voltage	VCI/VDD	-0.5	+6.0	V	-
I/O supply voltage	VDDIO	-0.5	+6.0		
Logic Input voltage	V _{IN}	-0.5	VDDIO+0.5	V	-
Logic Output voltage	V _{OUT}	-0.3	VDDIO+0.3	V	-
Operating Temp.	Top	0	+50	°C	-
Storage Temp	Tstg	-25	+60	°C	-

Note (1): All of the voltages are on the basis of "VSS = 0V".

Note (2): Maximum ratings are those values beyond which damages to the device may occur.

Functional operation should be restricted to the limits in the Panel DC Characteristics tables.

3.2 DC Characteristics

The following specifications apply for: VSS=0V, VCI=3.3V, TOPR =25°C.

Parameter	Symbol	Condition	Applicable pin	Min.	Typ.	Max.	Unit
Supply Voltage	VCI	-	VCI	2.2	3.0	3.7	V
IO supply voltage	VDDIO	-		2.2	3.0	3.7	V
Digital voltage	VDD			1.7	1.8	1.9	V
OTP Program voltage	V _{PP}	-	VPP	7.25	7.5	7.75	V
High level input voltage	V _{IH}	-	-	0.8V _{VDDIO}	-	-	V
Low level input voltage	V _{IL}	-		-	-	0.2V _{VDDIO}	V
High level output voltage	V _{OH}	IOH = - 100uA	-	0.9V _{VDDIO}	-	-	V
Low level output voltage	V _{OL}	IOL = 100uA	-	-	-	0.1V _{VDDIO}	V
Typical power panel	P _{TYP}	-	-	-	9.0		mW
Standby power panel	P _{STPY}	-	-	-	0.006		mW
Typical operating current(white state)	Iopr_VCI	-	-	-	3.0	-	mA
Full update time	-	23 °C	-	-	3.0	-	sec
Partial update time	-	23 °C	-	-	0.32	-	
Fast update time	-	23 °C	-	-	1.5	-	
Sleep mode current	Islp_VCI	VCI=3.3V DC/DC OFF No clock No output load Ram data retain	VCI	-	20	-	uA
Digital deep sleep current	I _{VDD}	VDDD OFF	VCI	-	1	-	uA

Note: The VPP, VCI, VDDIO input must be kept in a stable value; ripple and noise are not allowed.

1) Refresh time: the time it takes for the whole process from the screen change to the screen stabilization.

2) The difference between different refresh methods:

Full refresh: The screen will flicker several times during the refresh process;

Fast Refresh: The screen will flash once during the refresh process;

Partial refresh: The screen does not flicker during the refresh process.

Note: During the fast refresh or partial refresh of the electronic paper, it is recommended to add a full-screen refresh after 5 consecutive operations to reduce the accumulation of afterimages on the screen.

3.3 Panel DC Characteristics (Driver IC Internal Regulators)

The following specifications apply for: VSS=0V, VCI=3.3V, TOPR =25°C.

Parameter	Symbol	Condition	Applicable pin	Min.	Typ.	Max.	Unit
VCOM output voltage	VCOM	-	VCOM	-	-2.0	-	V
Positive Source output voltage	V _{SH}	-	S ₀ ~S ₁₈₃	-	+15	-	V
Negative Source output voltage	V _{SL}	-	S ₀ ~S ₁₈₃	-	-15	-	V
Positive gate output voltage	V _{gh}	-	G ₀ ~G ₃₈₃	19.5	+20	20.5	V
Negative gate output voltage	V _{gl}	-	G ₀ ~G ₃₈₃	-	-20	-	V

3.4 Optical Specification

Measurements are made with that the illumination is under an angle of 45 degree, the detection is perpendicular unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ.	Max	Units	Notes
R	White Reflectivity	White	30	35	-	%	Note1
CR	Contrast Ratio	indoor	25	-	-	-	Note2
T update	Image update time	23 °C	-	3	-	sec	
Tlife	Life	Topr	-	1000000 times or 5years	-	-	-

Notes1: Luminance meter: Eye-One Pro Spectrophotometer.

Notes2: CR=Surface Reflectance with all white pixel/Surface Reflectance with all black pixels.

3.5 AC Electrical Characteristics

Serial Peripheral Interface

The following specifications apply for: VDDIO - VSS = 2.2V to 3.7V, TOPR = 25°C, CL=20pF

Write mode

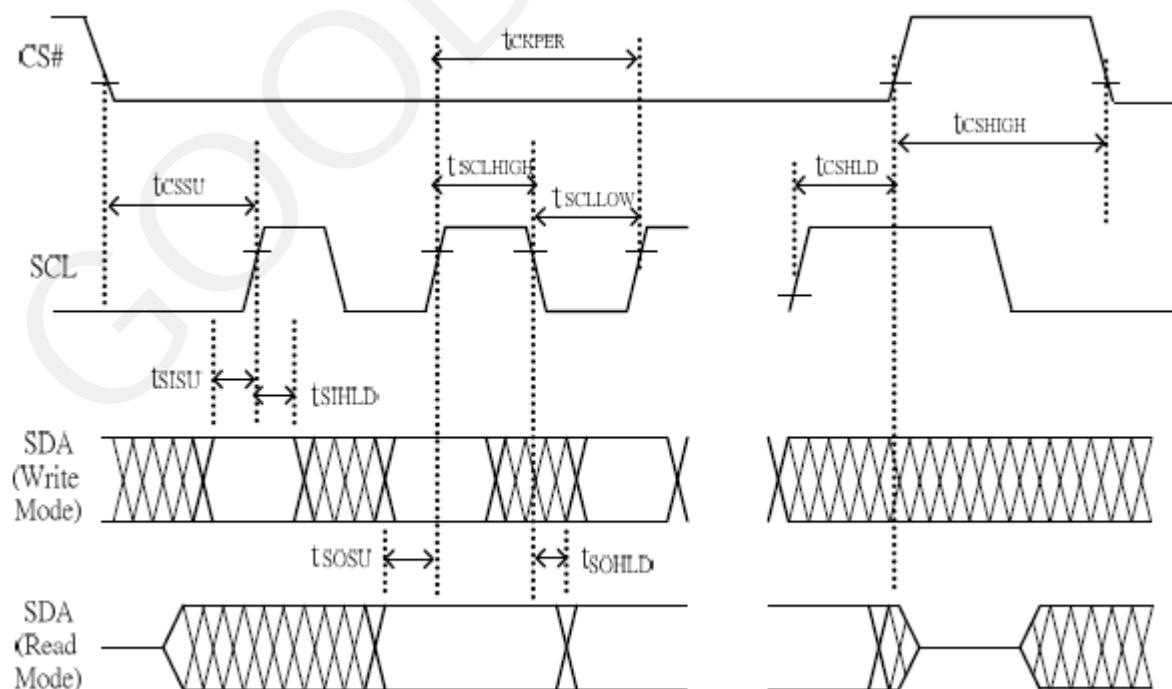
Symbol	Parameter	Min	Typ	Max	Unit
f _{SCL}	SCL frequency (Write Mode)	-	-	20	MHz
t _{CSSU}	Time CS# has to be low before the first rising edge of SCLK	TBD	-	-	ns
t _{CSHLD}	Time CS# has to remain low after the last falling edge of SCLK	TBD	-	-	ns
t _{CSHIGH}	Time CS# has to remain high between two transfers	TBD	-	-	ns
t _{SCLHIGH}	Part of the clock period where SCL has to remain high	TBD	-	-	ns
t _{SCLLOW}	Part of the clock period where SCL has to remain low	TBD	-	-	ns
t _{SI_{SU}}	Time SI (SDA Write Mode) has to be stable before the next rising edge of SCL	TBD	-	-	ns
t _{SI_{HLD}}	Time SI (SDA Write Mode) has to remain stable after the rising edge of SCL	TBD	-	-	ns

Read mode

Symbol	Parameter	Min	Typ	Max	Unit
f _{SCL}	SCL frequency (Read Mode)	-	-	2.5	MHz
t _{CSSU}	Time CS# has to be low before the first rising edge of SCLK	TBD	-	-	ns
t _{CSHLD}	Time CS# has to remain low after the last falling edge of SCLK	TBD	-	-	ns
t _{CSHIGH}	Time CS# has to remain high between two transfers	TBD	-	-	ns
t _{SCLHIGH}	Part of the clock period where SCL has to remain high	TBD	-	-	ns
t _{SCLLOW}	Part of the clock period where SCL has to remain low	TBD	-	-	ns
t _{SO_{SU}}	Time SO(SDA Read Mode) will be stable before the next rising edge of SCL	TBD	TBD	-	ns
t _{SO_{HLD}}	Time SO (SDA Read Mode) will remain stable after the falling edge of SCL	TBD	TBD	-	ns

Note: All timings are based on 20% to 80% of VDDIO-VSS

SPI timing diagram



3.6 Functional Specification and Application Circuit

3.6.1 Operation Flow and Code Sequence

General operation flow to drive display panel

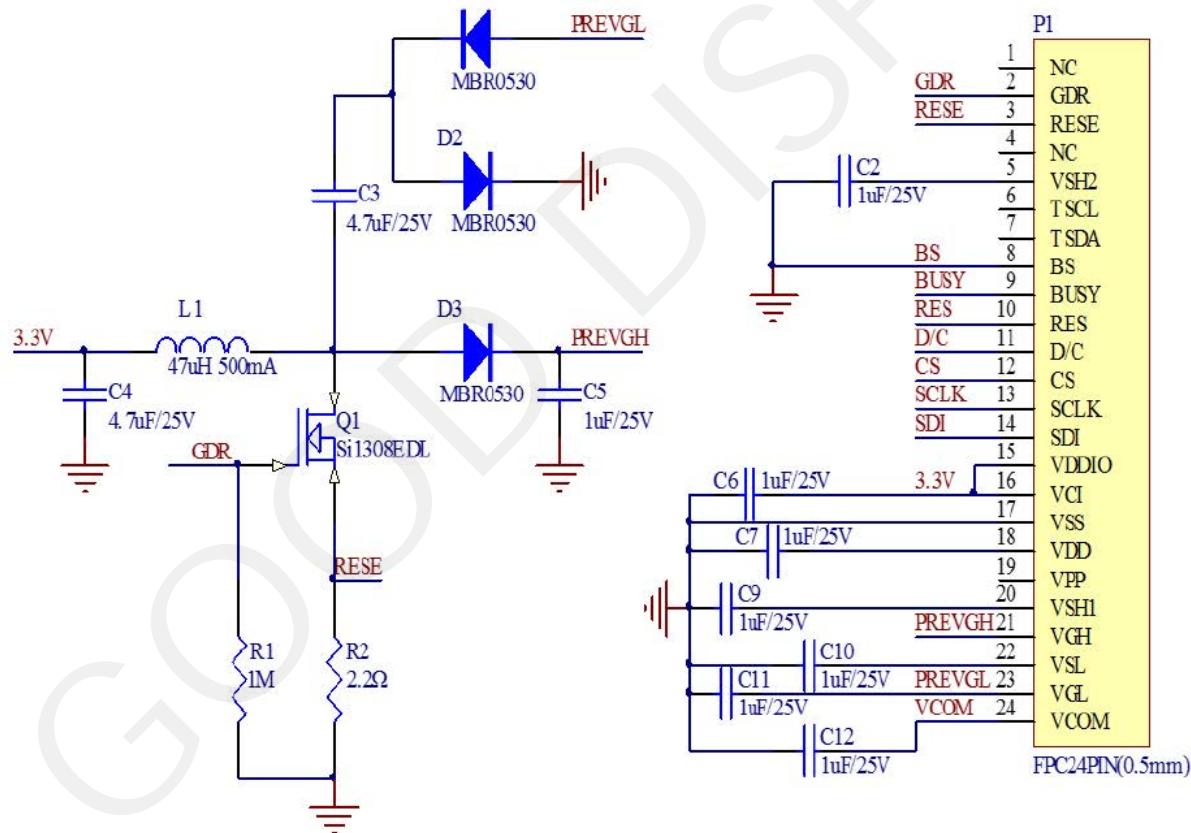
- EPD Driving Flow Chart



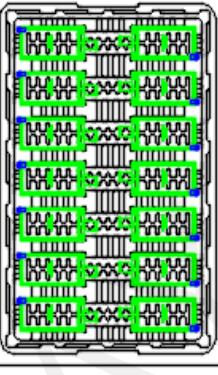
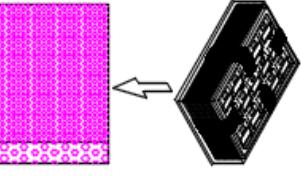
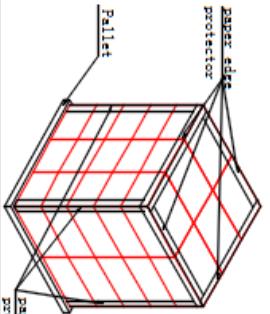
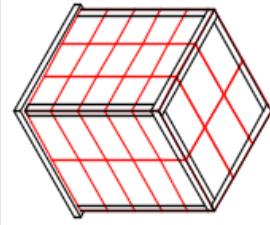
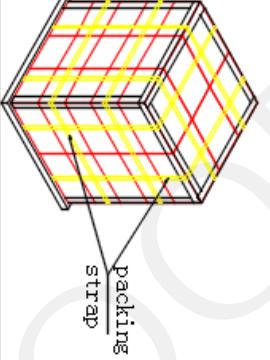
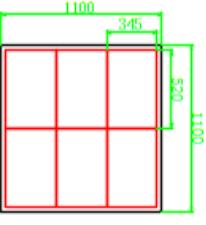
Start: To supply 2.3V – 3.6V on VDD/VDDA/VDDIO then wait $VDD = 95\% \times (2.3V \sim 3.6V)$ for at least > 1ms.

End: To remove 2.3V – 3.6V from VDD/VDDA/VDDIO to 0V.

3.7 Reference Circuit



4. Packing

Controlled Seal		Packing Process(1)~(12)
(1) TRAY Type: Display Faced up	(2) 	(3) order ①、②、①、② fix trays with tape 168 pcs of 1 carton 1 tray contain 14 pcs 12 contained trays, 1 empty tray
(5) After tray be packed, wrap the package in a bubble bag and seal with smooth tape.		(6) Put into the inner packing box: Type: : P750010-MC2-A
(9) Use paper edge protector Top face paper edge protector type : P410010-MC4-A Side paper edge protector type : P410010-MC5-A Size: 100*100mm, T=3mm		(7) 24 contained trays, 2 empty Package quantity products: 336 pcs of 1 carton. External packing box Type: P750010-MC1-A
(10) Enwind stretch film Wrap 3 layers of stretch film around the paper shash (All around and on top); Wrap paper pallets, pallets, and boxes underneath		(8) Pallet stack Pallet Type: 1100*1100*150mm Plastic Pallet *5
(11) Pack packing strap The packing tape should be tied to the carton: If Stack height greater than or equal to 3 layers: 2 turns in length width and height; If the stack height is less than 3 layers, the height direction is not used pack.		(12) Pack packing strap The surface of the packing belt shall not be twisted, skewed or cracked; After the packing is completed, the tightness of the packing belt is suitable. Use the packing iron buckle to fix the belt and cut off the excess packing belt. The remaining amount is less than or equal to 20mm
NOTE:1. The inner cartoster carton must be sealed with adhesive tape. 2. Fill up the gap with empty tray. 3. If the customer has special needs with the RoHS making, the inner carton and master carton need adhesive new RoHS marking at . 4. Packaging materials are not recommended for recycling.		

5. 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>