Product Type : EPD

Model Number : BLGDE060F3

Description : Screen Size: 6.0"
Color: Black and White
Display Resolution: 1024*758

1 General Description

Active Matrix Electrophoretic Display(AM EPD), High-Resolution AM TFT Black/White display module which 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 1024×758（XGA），and the active area is 6 inch diagonal.

2 Features

- 1024×758 display
- White Reflectance above 35%（0 minute）
- Contrast Ratio above 8:1（0 minute）
- 3:4 aspect ratio
- Wide viewing angle
- Ultra low power consumption
- Reflective mode
- Bi -stable display
- Commercial temperature range
- Landscape, portrait modes
- Hard-coat antiglare display surface

3 Application

E-book reader.

4 Input/output pin assignment

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

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	-	2.0	-	mA
Gate Positive supply	VGH		21	22	23	V
	IVGH	VGH=22V	-	0.6	-	mA
Gate Negative supply	VGL		-21	-20	-19	V
	IVGL	VGL=-20V	-	-3.0	-	mA
Source Positive supply	VPOS		14.6	15	15.4	V
	IPOS	VPOS=15V	-	30	-	mA
Source Negative supply	VNEG		-15.4	-15	-14.6	V
	INEG	VNEG=-15V	-	-30	-	mA
Asymmetry source	VASYM	VPOS+VNEG	-80	0	80	mV
Common voltage	VCOM		-2.5	Adjusted	-1.5	V
	ICOM		-	-2.0	-	mA
Standby power module	PSTBY			-	0.4	mW
Typical power module	PTYP		-	600	1200	mW
Operating temperature			0		50	℃
Storage temperature			-20	-	70	℃
Maximum image update time at 25℃				960	1200	ms
Humidity range			40	-	70	%RH

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.

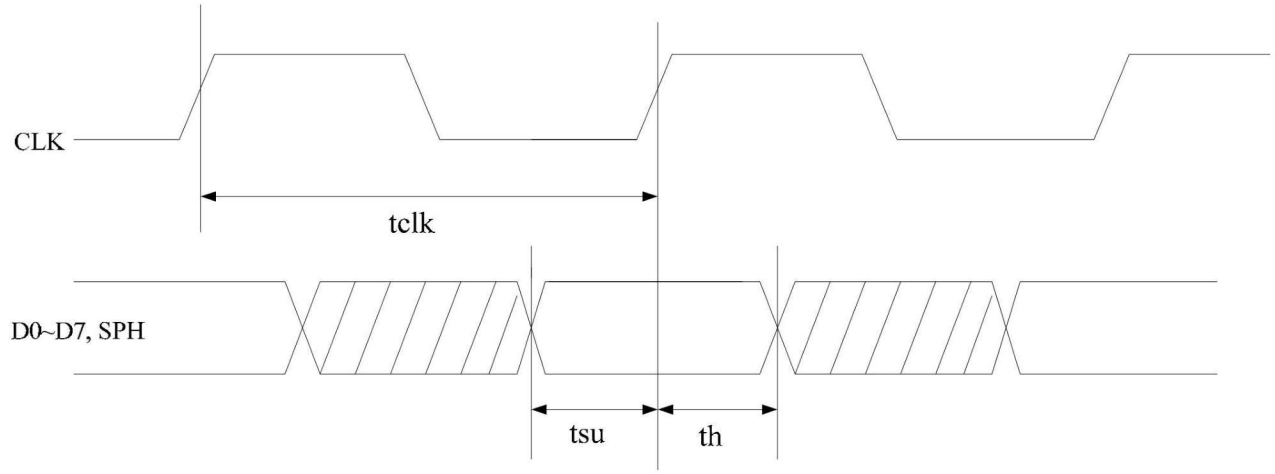
5. Avoid direct sunlight.

5.3 Module AC characteristics

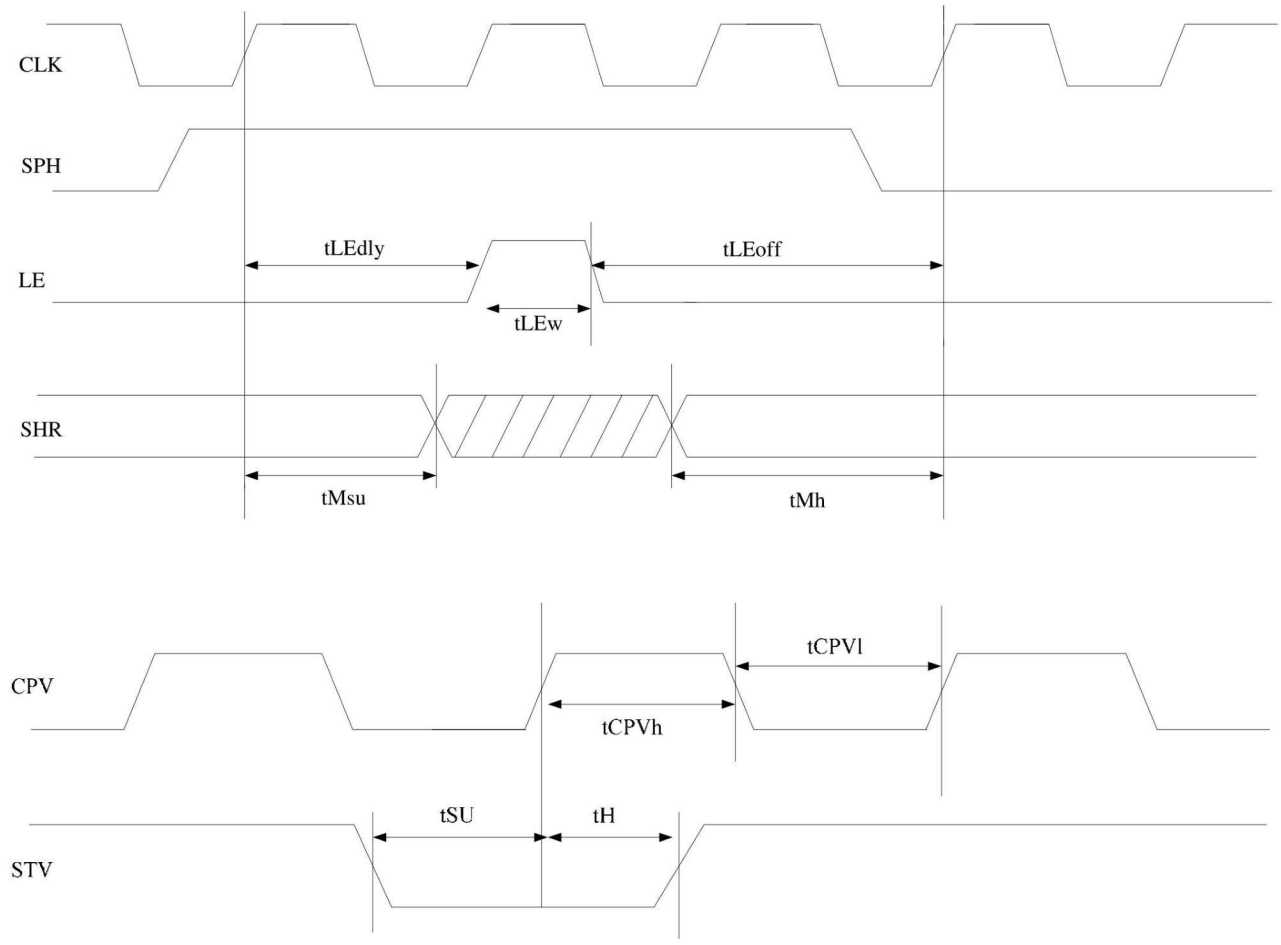
Note:VDD=3.0V to 3.6V, unless otherwise specified

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

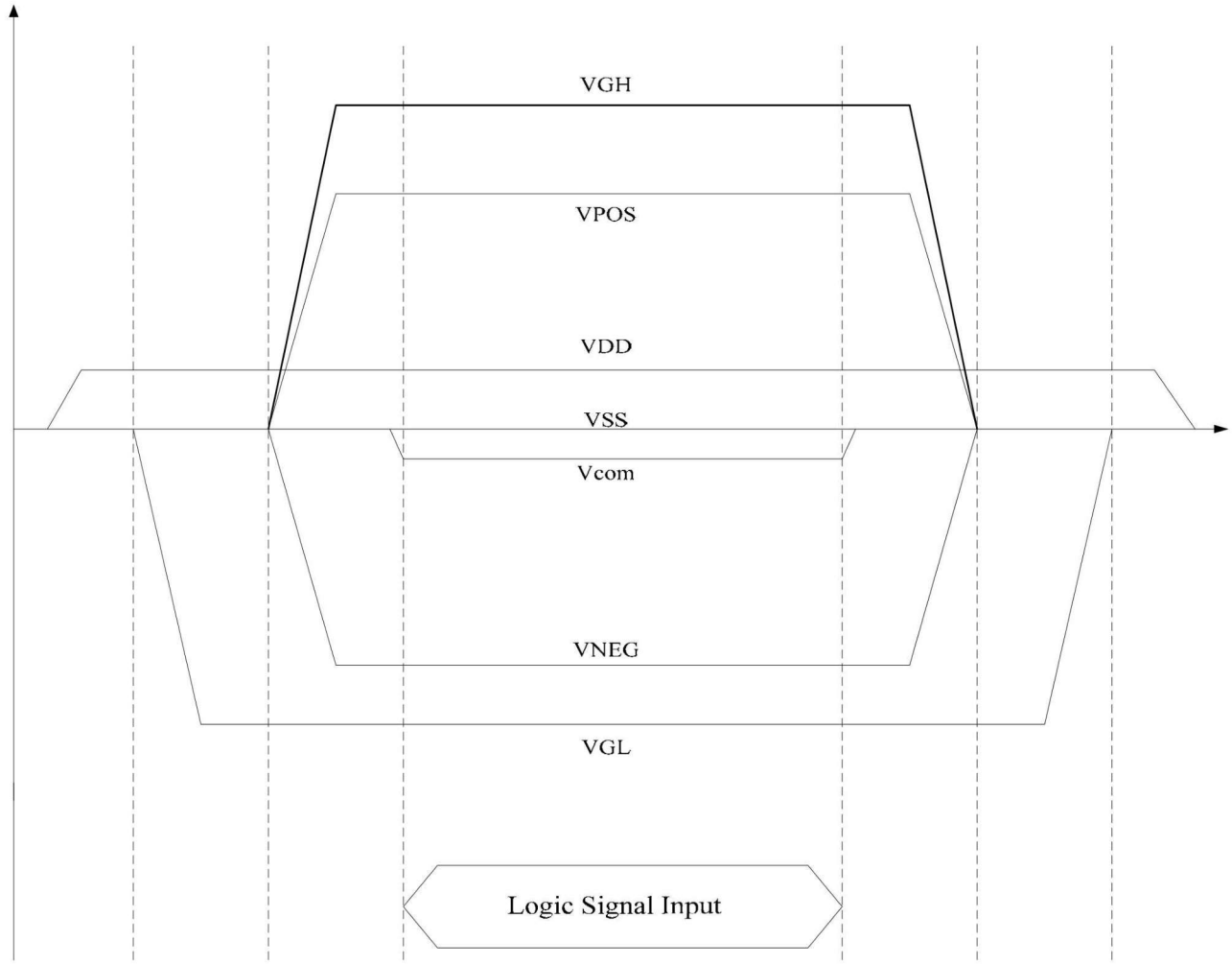


6 Power On/Off Sequence

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 Specification

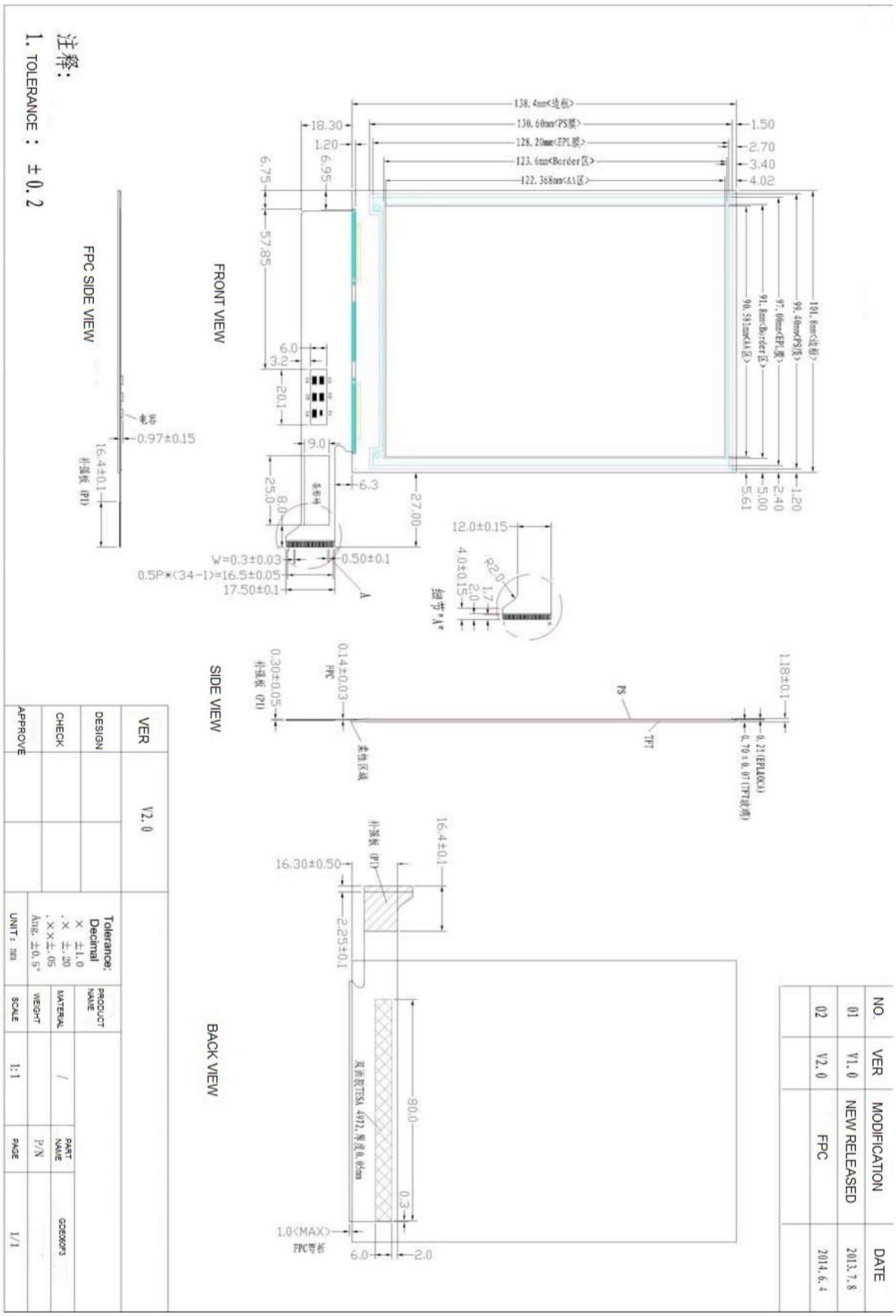
7.1 Dimension

PARAMETER	VALUE	UNIT	Remark
Display Resolution	1024×758	dots	
Active area dimensions Horizontal Vertical	 90.581 122.368	 mm mm	
Screen size	6.0（3:4 diagonal）	Inch	
Pixel pitch Horizontal Vertical	 0.1195 0.1195	 mm mm	
Pixel configuration	Square		
Overall dimensions Width Height Thickness	 101.8 138.4 1.18	 mm mm mm	
Mass of the module	34	g	

7.2 Electrical Connector

SERVICE	CONNECTOR	TYPE NUMBER	NUMBER OF PINS	MATING CONNECTOR
Interface	PANASONIC	/	34	FPC pitch=0.5mm

7.3 Mechanical Drawing of EPD Module



8 Optical Characteristics

Parameter	Conditions	Values			Units	Notes
		Min.	Typ.	Max		
White Reflectivity	0 minute	35			%	
Contrast Ratio (CR)	0 minute	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.)

Notes:

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

9 Handling, Safety, and Environment 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.

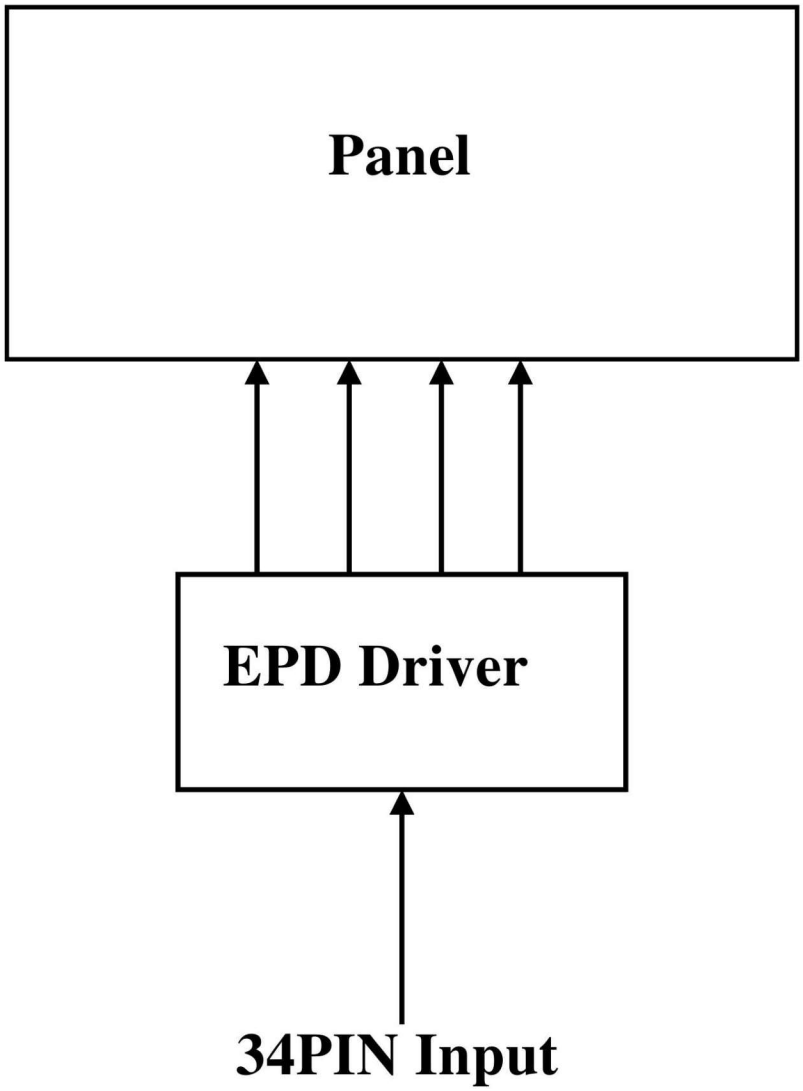
Disassembling the display module can cause permanent damage and invalidates the warranty agreements.

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 electricality and other rough environmental conditions.

10 Reliability test

No.	TEST	CONDITION	METHOD	REMARK
1	High-Temperature Operation	T = +50°C, RH = 30% for 168 hrs	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 168 hrs	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.

11 Block Diagram



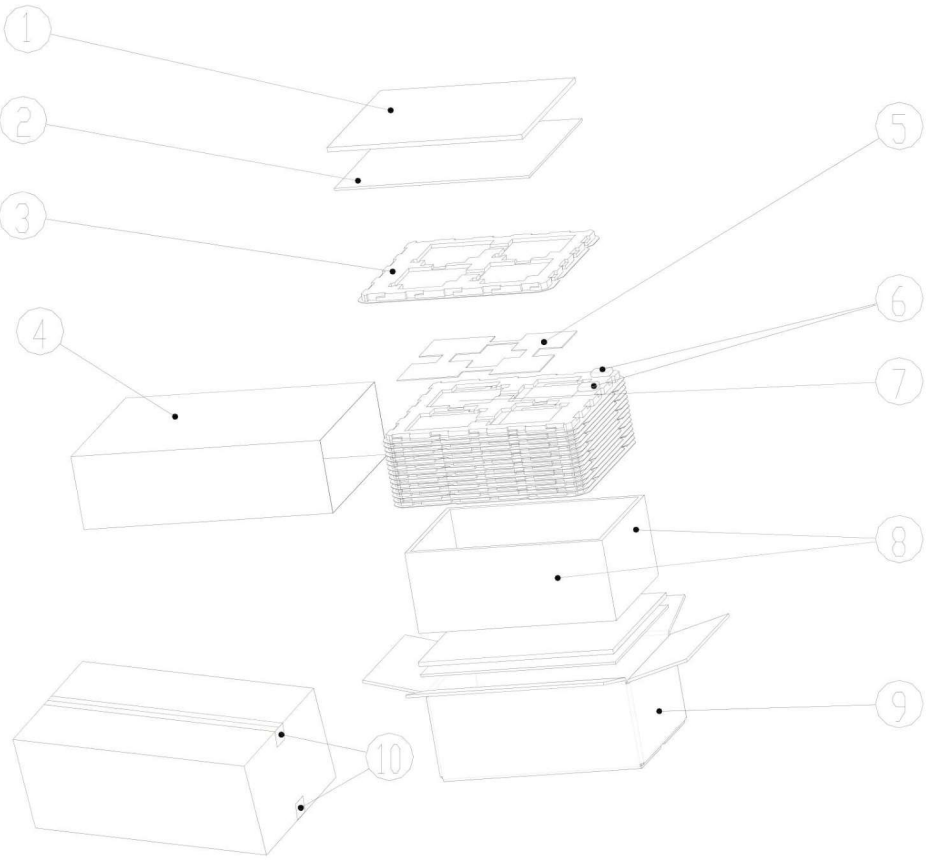
12 Packaging

Packing Form

a) Package quantity in one outer box:48 pcs

b) box size:470 mm X 390 mm X 170 mm

c) 1 outer box = 12 (full tray) + 1 (dummy / top tray)



No.	Description	Material
①	Upper & bottom paper plate	A=B
②	Upper & bottom foam plate	EPE
③	Packing tray (13 pcs/1 outer box)	PS
④	Aluminium foil bag	Aluminium foil
⑤	EPE FOAM	EPE
⑥	Desiccant	Desiccant
⑦	Board Ass'y	EPD
⑧	side plate	EPE
⑨	Outer carton	K=A
⑩	Tape (43mm*300m)	OPP