Document Title	E080AWAA R1 Product Specification			Page No.	1/28
Document No.		Issue date	2022/01/14	Revision	01

Product Specification

To:

Product Name: E080AWAA R1

Document Issue Date: 2022/01/14

Customer	InfoVision Optoelectronics
SIGNATURE _____ _____ _____ Please return 1 copy for your confirmation with your signature and comments.	**SIGNATURE** **REVIEWED BY CQM** _____ **PREPARED BY FAE** _____

Note : 1. Please contact InfoVision Company before designing your product based on this product.
2. The information contained herein is presented merely to indicate the characteristics and performance of our products. No responsibility is assumed by IVO for any intellectual property claims or other problems that may result from application based on the module described herein.

Revision	Date	Page	Revised Content/Summary	Remark
00	2020/08/24	--	First issued.	
01	2022/01/14	22	Figure 14 update	

CONTENTS

1.0 GENERAL DESCRIPTIONS

1.1 Introduction

The E080AWAA R1 is a Color Active Matrix Liquid Crystal Display. The matrix uses a-Si Thin Film Transistor as a switching device. This TFT LCD has a 8 inch diagonally measured active display area with HD resolution (1,280 horizontal by 720 vertical pixels array).

1.2 Features

- Supported HD Resolution
- LVDS Interface
- Wide View Angle
- Compatible with RoHS Standard

1.3 Product Summary

Items	Specifications	Unit
Screen Diagonal	8	inch
Active Area (H x V)	176.64 x 99.36	mm
Number of Pixels (H x V)	1,280 x 720	-
Pixel Pitch (H x V)	0.1380 x 0.1380	mm
Pixel Arrangement	R.G.B. Vertical Stripe	-
Display Mode	Normally Black	-
Contrast Ratio	900 (Typ.)	-
Response Time	35 (Max.)	ms
Input Voltage	3.3 (Typ.)	V
Power Consumption	0.700@ V stripe Pattern	W
Weight	65(Max.)	g
Outline Dimension (H x V x D)	185.08(Typ.) x 110.59(Typ.) x 1.9(Max.)	mm
Electrical Interface (Logic)	LVDS	-
Support Color	16.7 M (8bit)	-
NTSC	75(Typ.)	%
Surface Treatment	Anti-glare	-

1.4 Functional Block Diagram

Figure 1 shows the functional block diagram of the LCD module.

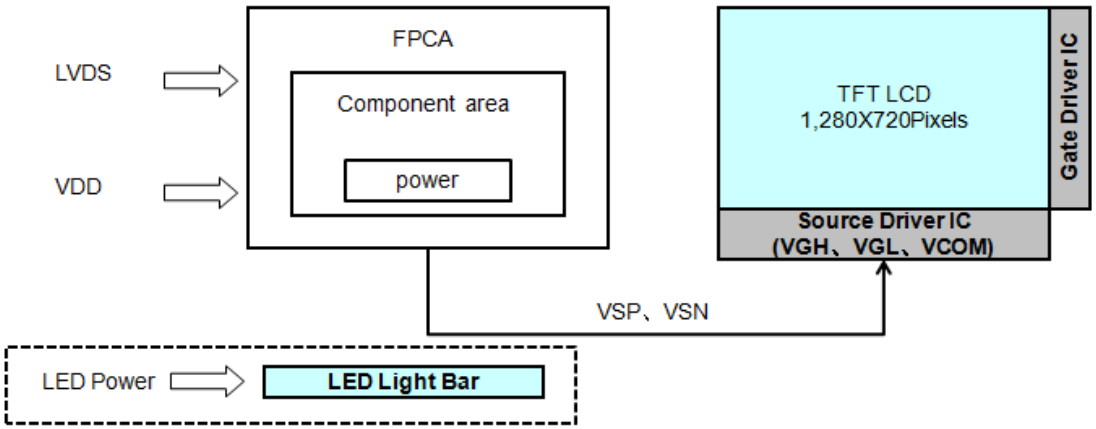


Figure 1 Block Diagram

1.5 Pixel Mapping

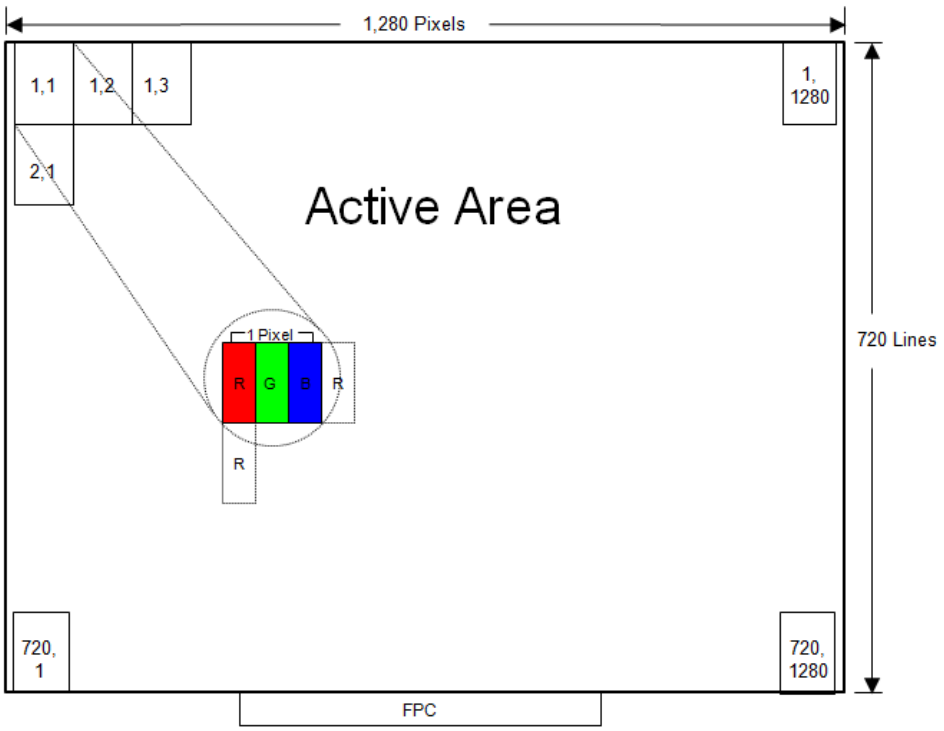


Figure2 Pixel Mapping

2.0 Absolute Maximum Ratings

Table 1 Electrical & Environment Absolute Rating

Item	Symbol	Min.	Max.	Unit	Note
Logic Supply Voltage	V_{DD}	-0.3	4.0	V	(1),(2),(3),(4)
Logic Input Signal Voltage	V_{Signal}	-0.3	V_{DD}	V	
Operating Temperature	T_{gs}	-30	85	℃	
Storage Temperature	T_a	-40	90	℃	

Note (1) All the parameters specified in the table are absolute maximum rating values that may cause faulty operation or unrecoverable damage, if exceeded. It is recommended to follow the typical value.

Note (2) All the contents of electro-optical specifications and display fineness are guaranteed under Normal Conditions. All the display fineness should be inspected under normal conditions. Normal conditions are defined as follow: Temperature: 25℃, Humidity: 55± 10%RH.

Note (3) Unpredictable results may occur when it was used in extreme conditions. T_a= Ambient Temperature, T_{gs}= Glass Surface Temperature. All the display fineness should be inspected under normal conditions.

Note (4) Temperature and relative humidity range are shown in the figure below. Wet bulb temperature should be lower than 57.8℃, and no condensation of water. Besides, protect the module from static electricity.

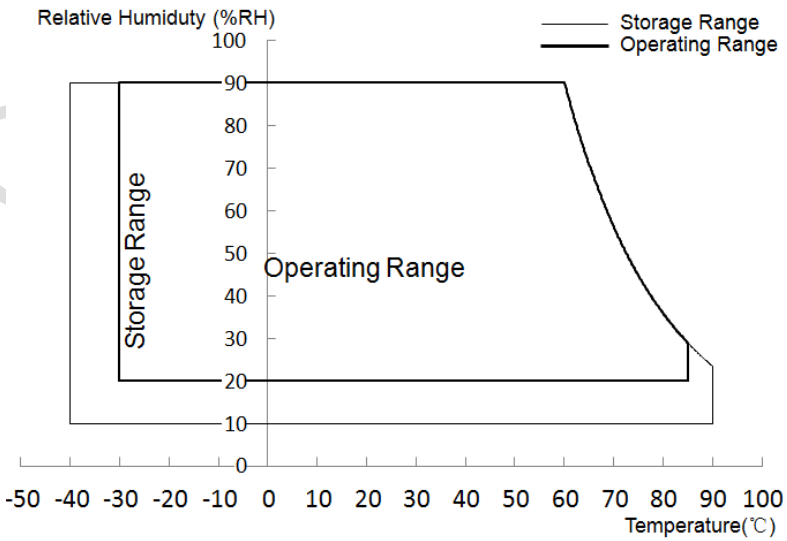


Figure 3 Absolute Ratings of Environment of the LCD Module

3.0 Optical Characteristics

The optical characteristics are measured under stable conditions as following notes.

Table 2 Optical Characteristics

Item	Conditions		Min.	Typ.	Max.	Unit	Note
Viewing Angle （CR≥10）	Horizontal	θ_{x+}	80	85	-	degree	(1),(2),(3),(4)(8)
		θ_{x-}	80	85	-		
	Vertical	θ_{y+}	80	85	-		
		θ_{y-}	80	85	-		
Contrast Ratio	Center		800	900	-	-	(1),(2),(4),(8) θx=θy=0°
Response Time	Rising + Falling		-	-	35	ms	(1),(2),(5),(8) θx=θy=0°
Transmittance	-		2.9	3.3	-	-	θx=θy=0° (Under C-light)
CF Color Chromaticity (CIE1931)	Red x		Typ. -0.03	0.664	Typ. +0.03	-	(1),(2),(3),(8) θx=θy=0° (Under C-light)
	Red y			0.328		-	
	Green x			0.253		-	
	Green y			0.601		-	
	Blue x			0.138		-	
	Blue y			0.093		-	
	White x		Typ. -0.04	0.299	Typ. +0.04	-	
	White y			0.323		-	
NTSC	-		70	75	-	%	

Note (1) Measurement Setup:

The LCD module should be stabilized at given ambient temperature (25℃) for 30 minutes to avoid abrupt temperature changing during measuring. In order to stabilize the luminance, the measurement should be executed after lighting backlight for 30 minutes in the windless room.

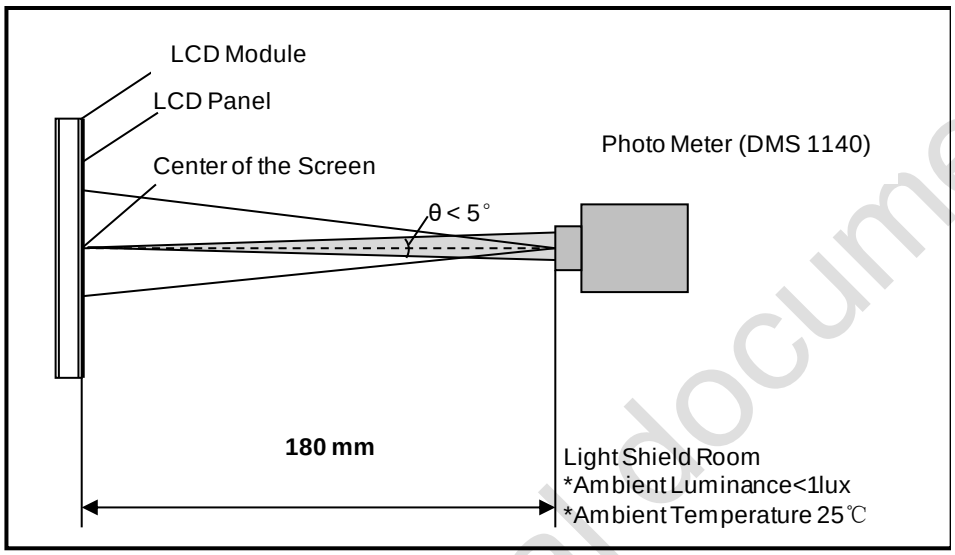
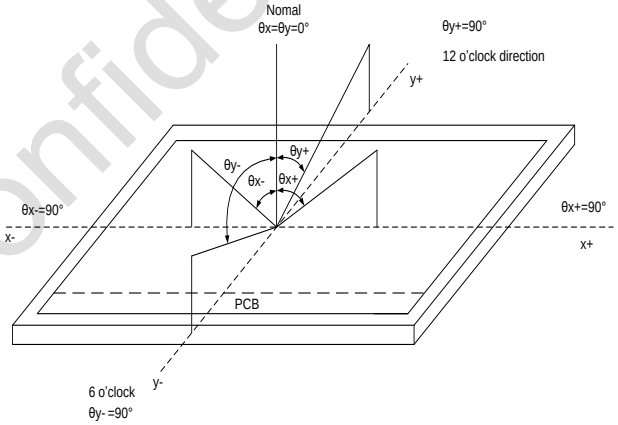


Figure 4 Measurement Setup

Note (2) Definition of Viewing Angle



Note (3) Definition of Contrast Ratio (CR)

The contrast ratio can be calculated by the following expression:

Contrast Ratio (CR) = The luminance of White pattern/ The luminance of Black pattern

Note (4) Definition of Response Time (T_R, T_F)

.

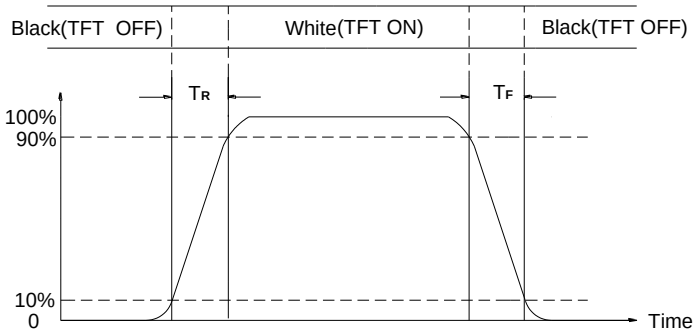


Figure 5 Definition of Response Time

Note (5) C-Light Spectrum

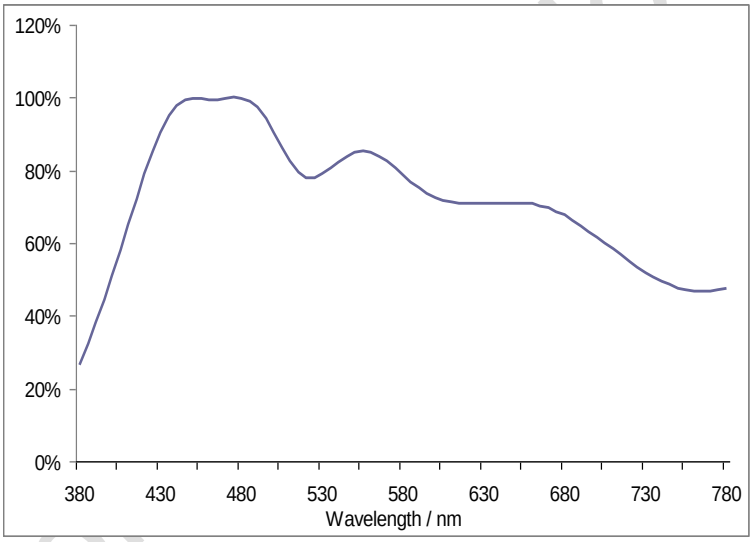


Figure 6 C-Light Spectrum

Note (6) Light source is the BL which is supplied by Customer.

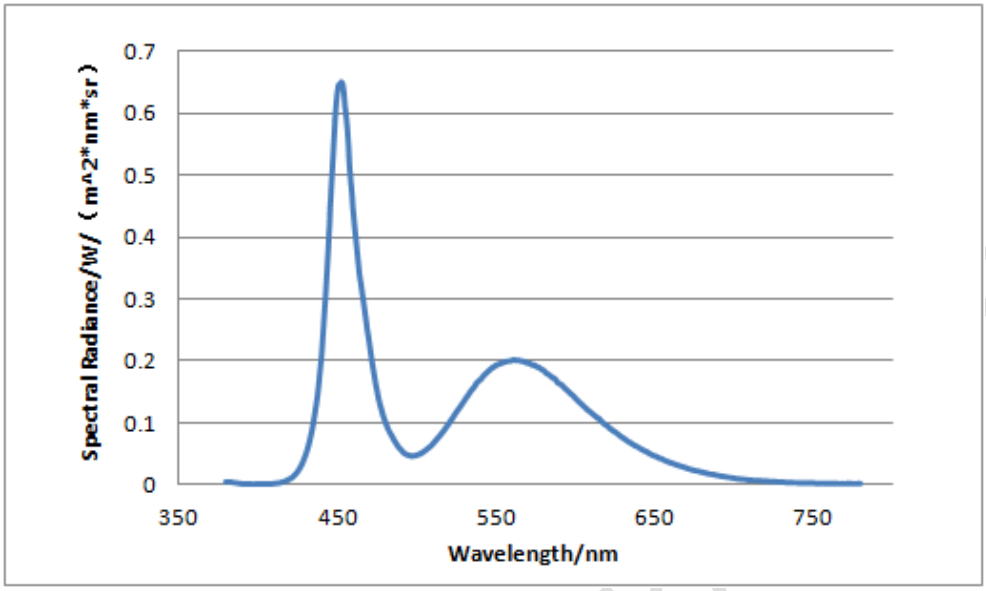


Figure 7 Back Light Spectrum

Note (7) All optical data are based on IVO given system & nominal parameter & testing machine in this document.

4.0 Electrical Characteristics

4.1 Interface Connector

Table 3 Signal Connector Type

Item	Description
Manufacturer / Type(Reference)	IRISO ELECTRONICS AORORA 12003S-40A-GSN1

Table 4 Signal Connector Pin Assignment

Pin No.	Symbol	Description	Remarks
1	NC/BIST	IVO internal test pin, dummy for normal mode; pull high bist mode. When it is not used,Connecting to GND is recommended,don't floating	-
2	NC	Dummy	-
3	SHLR	Horizontal scan direction control. "H" Left to Right;"L" Right to Left. H:3.0V~3.6V;L:0V~0.4V	-
4	UPDN	Vertical scan direction control. "H" Down to Up;"L" Up to Down. H:3.0V~3.6V;L:0V~0.4V	-
5	VDD	System supply voltage.(3.3Vtyp.)3.0V~3.6V current capacity>1.5A	-
6	NC	Dummy	-
7	GND	Ground	-
8	CLKP	Positive LVDS differential clock input.	-
9	CLKN	Negative LVDS differential clock input.	-
10	GND	Ground	-
11	PIND0	Positive LVDS differential input.	-
12	NIND0	Negative LVDS differential input.	-
13	GND	Ground	-
14	PIND1	Positive LVDS differential input.	-
15	NIND1	Negative LVDS differential input.	-
16	GND	Ground	-
17	PIND2	Positive LVDS differential input.	-
18	NIND2	Negative LVDS differential input.	-
19	GND	Ground	-

20	PIND3	Positive LVDS differential input.	-
21	NIND3	Negative LVDS differential input.	-
22	GND	Ground	-
23	NC	Dummy	-
24	VDD	System supply voltage. (3.3Vtyp.)3.0V~3.6V current capacity>1.5A	-
25	NC/VPP	Dummy	-
26	GND	Ground	-
27	NC/AVDD	Dummy	-
28	NCAVDD	Dummy	-
29	NC	Dummy	-
30	NC/CSB	Dummy	
31	NC/SCL	Dummy	
32	NC/SDA	Dummy	-
33	NC/ATREN	Dummy	-
34	GND	Ground	-
35	NC	Dummy	-
36	NC/VGH	Dummy	-
37	NC	Dummy	-
38	NC/VGL	Dummy	-
39	NC	Dummy	-
40	NC	Dummy	-

Note (1) H：3.0V~3.6V；L/NC： 0~0.4V；

SHLR	UPDN	Scan direction
H	H	Data scan from left to right; Gate scan from down to up
L	H	Data scan from right to left; Gate scan from down to up
H	L	Data scan from left to right; Gate scan from up to down
L	L	Data scan from right to left; Gate scan from up to down

4.2 Signal Electrical Characteristics

4.2.1 Signal Electrical Characteristics For LVDS Receiver

The built-in LVDS receiver is compatible with (ANSI/TIA/TIA-644) standard.

Table 5 LVDS Receiver Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Differential Input High Threshold	Vth	-	-	+100	mV	V_{CM}=+1.2V
Differential Input Low Threshold	Vtl	-100	-	-	mV	-
Magnitude Differential Input Voltage	$\|V_{ID}\|$	100	-	600	mV	-
Common Mode Voltage	V_{CM}	1	1.2	1.7-|VID|/2	V	-

Note (1) Input signals shall be low or Hi- resistance state when VDD is off.

Note (2) All electrical characteristics for LVDS signal are defined and shall be measu red at the interface connector of LCD.

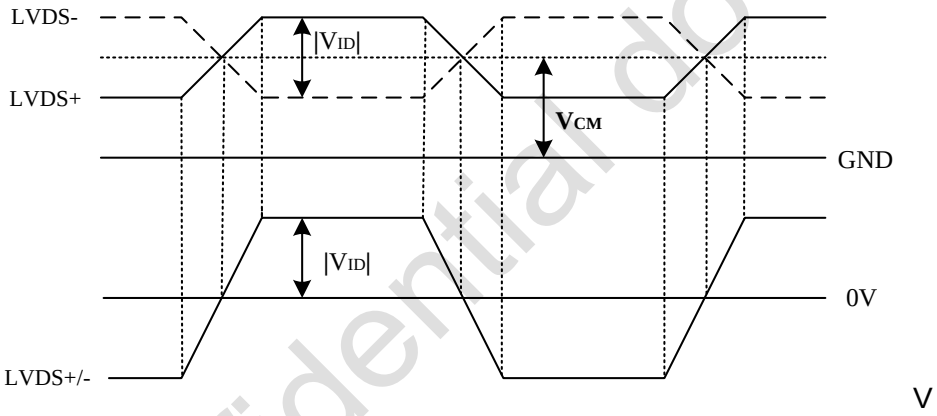


Figure 8 Voltage Definitions

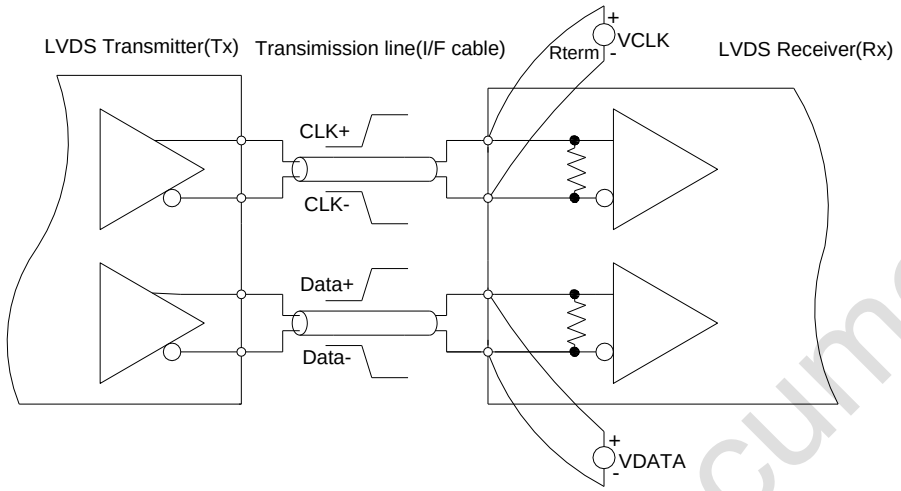


Figure 9 Measurement System

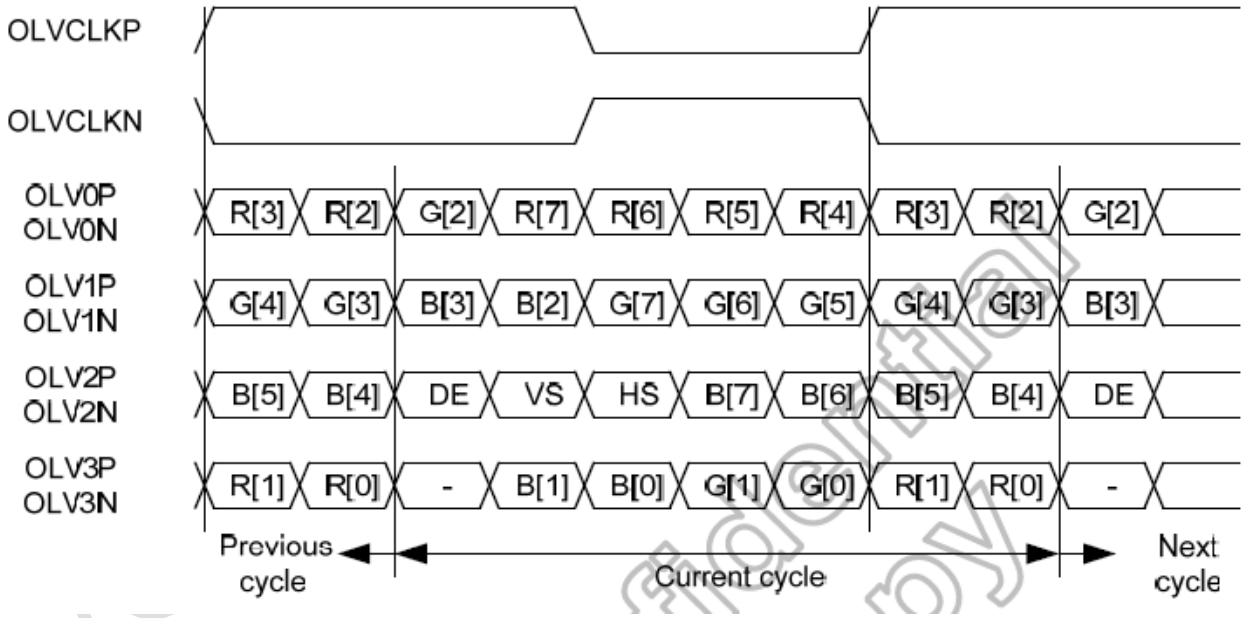


Figure 10 Data Mapping

4.2.2 LVDS Receiver Internal Circuit

Figure 11 shows the internal block diagram of the LVDS receiver. This LCD module equips termination resistors for LVDS link.

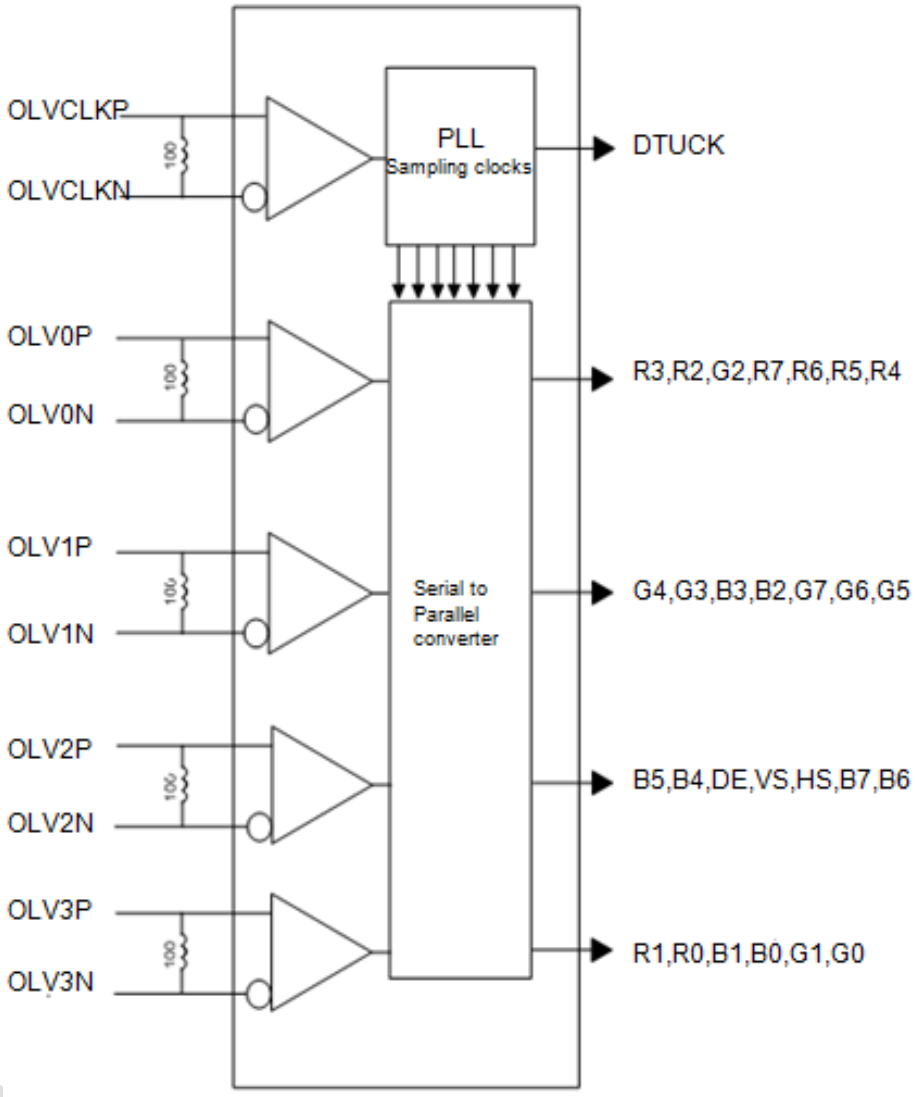


Figure 11 LVDS Receiver Internal Circuit

4.3 Interface Timings

Table 6 Interface Timings

Parameter		Symbol	Min.	Typ.	Max.	Unit
LVDS Clock Frequency		Fclk	69.49	71.15	75.54	MHz
HSYNC	Period	TH	1524	1540	1566	Clocks
	Horizontal display area	THD	1280			Clocks
	Blanking	THBP+ THFP	244	260	286	Clocks
VSYNC	Period	TV	760	770	804	HS
	Vertical display area	TVD	720			HS
	Blanking	TVBP + TVFP	40	50	84	HS
Frame Rate		F_V	-	60	-	Hz

Note1：HT * VT *Frame Frequency≤75.54 MHz

Note2: All reliabilities are specified for timing specification based on refresh rate of 60Hz.

E080AWAA R1 is secured only for function under lower refresh rate; 60Hz at Normal mode.

4.4 Input Power Specifications

Input power specifications are as follows.

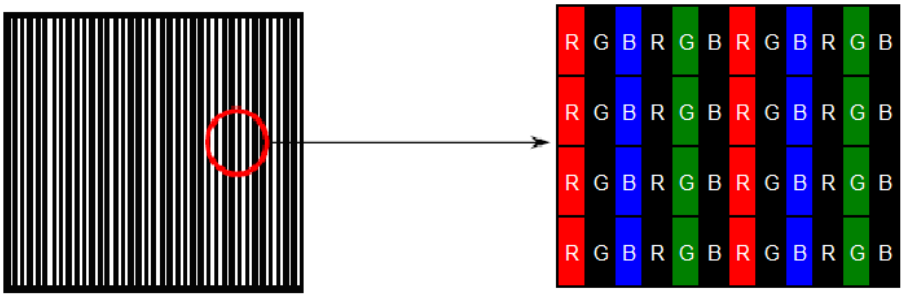
Table 7 Input Power Specifications

Parameter		Symbol	Min.	Typ.	Max.	Unit	Note
System Power Supply							
LCD Drive Voltage (Logic)		V_{DD}	3	3.3	3.6	V	(1),(2)
VDD Current	V stripe Pattern	I_{DD}	-	-	212	mA	(1),(4)
VDD Power Consumption	V stripe Pattern	P_{DD}	-	-	700	mW	

Note (1) All of the specifications are guaranteed under normal conditions. Normal conditions are defined as follow: Temperature: 25℃, Humidity: 55± 10%RH.

Note (2) All of the absolute maximum ratings specified in the table, if exceeded, may cause faulty operation or unrecoverable damage. It is recommended to follow the typical value.

Note (3) The specified V_{DD} current and power consumption are measured under the V_{DD} = 3.3 V, FV= 60 Hz condition and V-Stripe pattern.



Note (4) The figures below is the measuring condition of V_{DD}. Rush current can be measured when T_{RUSH} is 0.5 ms.

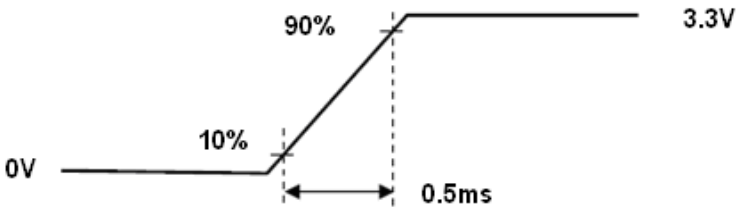


Figure 12 V_{DD} Rising Time

4.5 Power ON/OFF Sequence

1.Interface signals are also shown in the chart. Signals from any system shall be Hi-resistance state or low level when VDD voltage is off.

2. When system first start up, should keep the VDD high time longer than 200ms, otherwise may cause image sticking when VDD drop off.

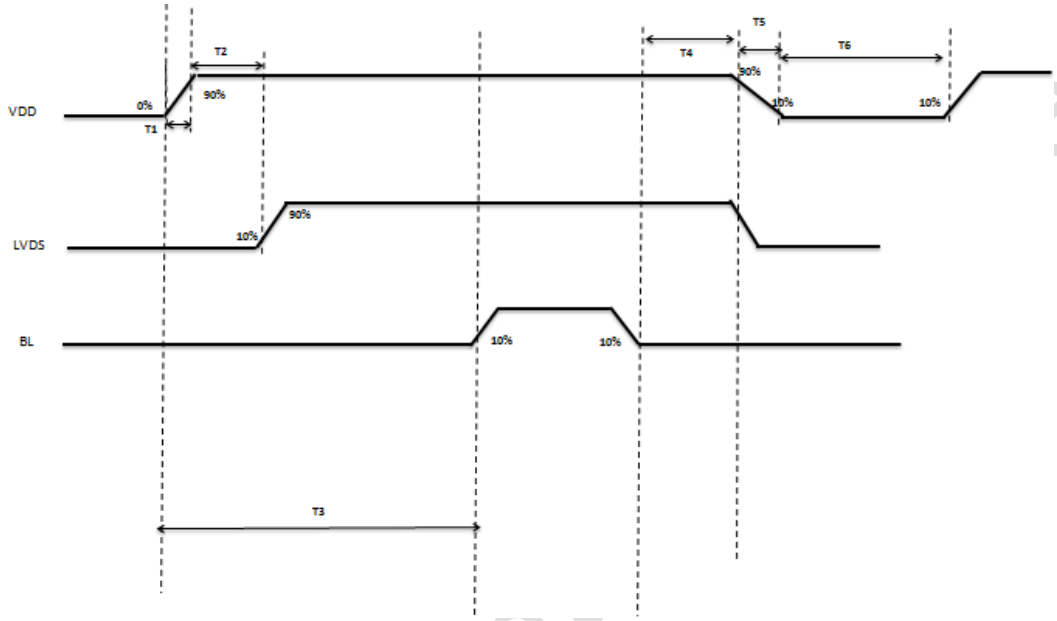


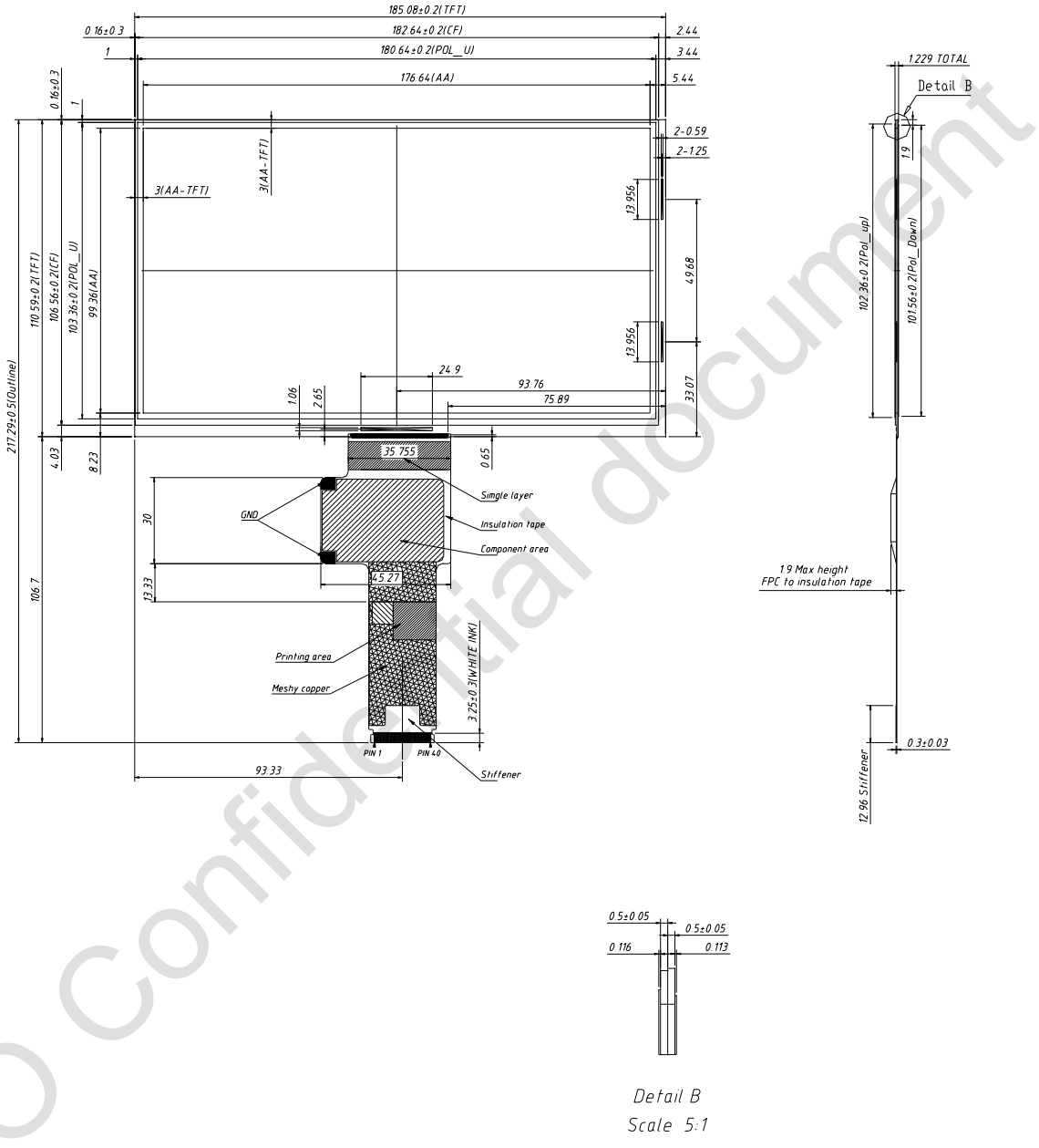
Figure 13 Power Sequence

Table 8 Power Sequencing Requirements

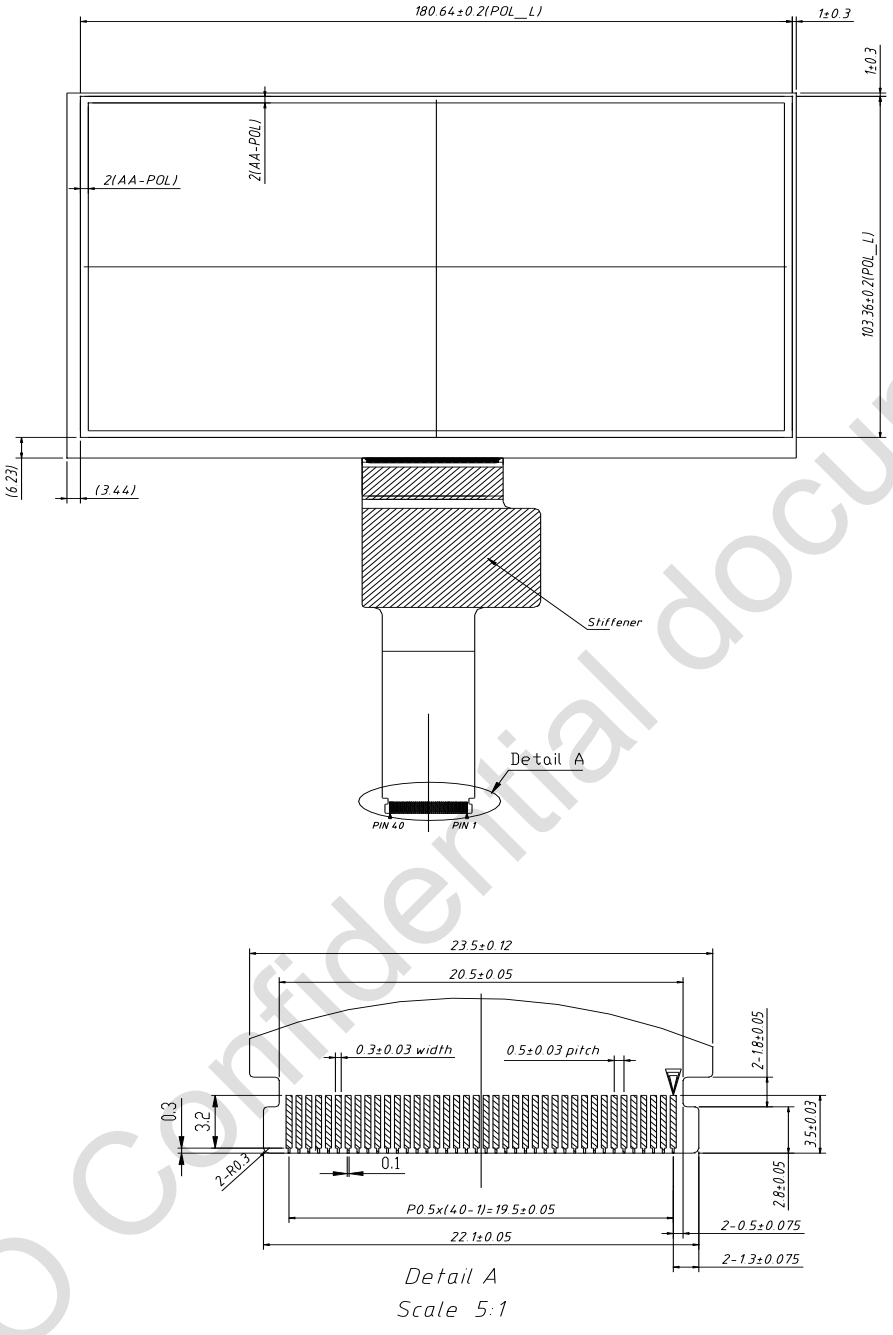
Parameter	Symbol	Min.	Typ.	Max.	Unit
VDD rising time 0%~90%	T1	1	-	10	ms
VDD90% to LVDS10%	T2	2	-	-	ms
VDD rising time 0%to BL10%	T3	190	-	-	ms
BL Off to VDD off	T4	90	-	-	ms
VDD falling time	T5	-	-	1	s
VDD restart time	T6	1	-	-	s

5.0 Mechanical Characteristics

5.1 Outline Drawing



Unit:mm



Unit:mm

Figure 14 Reference Outline Drawing

5.2 Dimension Specifications

Table 9 Module Dimension Specifications

Item		Min.	Typ.	Max.	Unit
Width		184.88	185.08	185.28	mm
Height		110.39	110.59	110.79	mm
thinckness	With FPCA	-	-	1.9	mm
Weight		-	-	65	g

Note：Outline dimension measure instrument: Vernier Caliper.

6.0 Reliability Conditions

Table 10 Reliability Condition

Item		Package	Test Conditions		Note
High Temperature/High Humidity Operating Test		FOG	T_{gs}=60℃, 90%RH, 504 hours		(1),(2),(3),(4)
High Temperature Operating Test		FOG	T_{gs}=85℃, 504 hours		
Low Temperature Operating Test		FOG	T_a=-30℃, 504 hours		
High Temperature Storage Test		FOG	T_a=90℃, 504 hours		(1),(3),(4)
Low Temperature Storage Test		FOG	T_a=-40℃, 504 hours		
ESD Test	Operating	Module	Contact	±8KV, 150pF(330Ohm)	(1),(2),(6)
			Air	±15KV, 150pF(330Ohm)	

Note (1) A sample can only have one test. Outward appearance, image quality and optical data can only be checked at normal conditions according to the IVO document before reliable test. Only check the function of the module after reliability test.

Note (2) The setting of electrical parameters should follow the typical value before reliability test.

Note (3) During the test, it is unaccepted to have condensate water remains. Besides, protect the module from static electricity.

Note (4) The sample must be released for 24 hours under normal conditions before judging. Furthermore, all the judgment must be made under normal conditions. Normal conditions are defined as follow: Temperature: 25℃, Humidity: 55± 10%RH. T_a= Ambient Temperature, T_{gs}= Glass Surface Temperature.

Note (5) The module should be fixed firmly in order to avoid twisting and bending.

Note (6) It could be regarded as pass, when the module recovers from function fault caused by ESD after resetting.

7.0 Package Specification

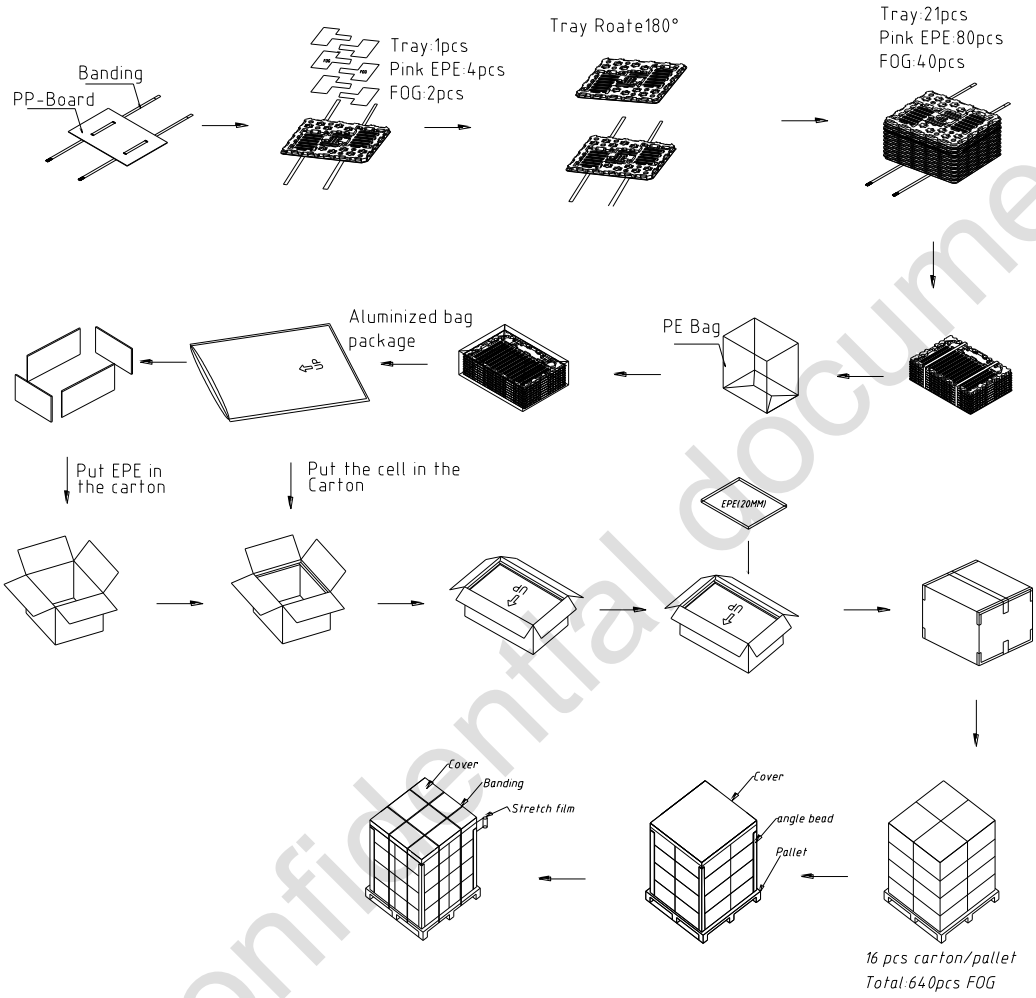
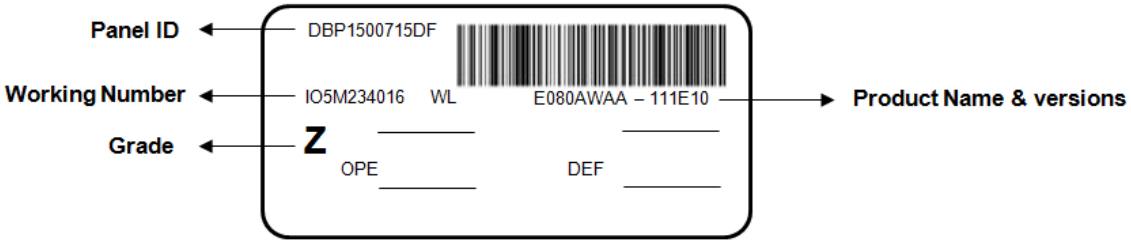


Figure 15 Packing Method

8.0 Lot Mark



9.0 General Precaution

9.1 Using Restriction

This product is not authorized for using in life supporting systems, aircraft navigation control systems, military systems and any other appliance where performance failure could be life-threatening or lead to be catastrophic.

9.2 Operation Precaution

(1)The LCD product should be operated under normal conditions.
Normal conditions are defined as below:

Temperature: 25℃

Humidity: 55±10%

Display pattern: continually changing pattern (Not stationary)

(2) Brightness and response time depend on the temperature. (It needs more time to reach normal brightness in low temperature.)

(3) It is necessary for you to pay attention to condensation when the ambient temperature drops suddenly. Condensate water would damage the polarizer and electrical contacted parts of the module. Besides, smear or spot will remain after condensate water evaporating.

(4) If the absolute maximum rating value was exceeded, it may damage the module.

(5) Do not adjust the variable resistor located on the module.

(6) Sufficient suppression to the electromagnetic interference shall be done by system manufacturers. Grounding and shielding may be important to minimize the interference.

(7) Image sticking may occur when the module displayed the same pattern for long time.

(8) Do not connect or disconnect the module in the “power on” condition. Power supply should always be turned on/off by the “power on/off sequence”

(9) Ultra-violet ray filter is necessary for outdoor operation.

9.3 Mounting Precaution

(1) All the operators should be electrically grounded and with Ion-blown equipment turning on when mounting or handling. Dressing finger-stalls out of the gloves is important for keeping the panel clean during the incoming inspection and the process of assembly.

(2) It is unacceptable that the material of cover case contains acetic or chloric. Besides, any other material that could generate corrosive gas or cause circuit break by electro-chemical reaction is not desirable.

(3) The case on which a module is mounted should have sufficient strength so that external force is not transmitted to the module directly.

(4) It is obvious that you should adopt radiation structure to satisfy the temperature specification.

(5) It should be attached to the system tightly by using all holes for mounting, when the module is assembled. Be careful not to apply uneven force to the module， especially to the PCB on the back.

(6) A transparent protective film needs to be attached to the surface of the module.

(7) Do not press or scratch the polarizer exposed with anything harder than HB pencil lead. In addition, don't touch the pin exposed with bare hands directly.
(8) Clean the polarizer gently with absorbent cotton or soft cloth when it is dirty.
(9) Wipe off saliva or water droplet as soon as possible. Otherwise, it may cause deformation and fading of color.
(10) Desirable cleaners are IPA (Isopropyl Alcohol), Ethyl alcohol or hexane. Do not use Ketone type materials (ex. Acetone), Toluene, Ethyl acid or Methyl chloride. It might permanent damage to the polarizer due to chemical reaction.
(11) Do not disassemble or modify the module. It may damage sensitive parts in the LCD module, and cause scratches or dust remains. IVO does not warrant the module, if you disassemble or modify the module.

9.4 Handling Precaution

(1) Static electricity will generate between the film and polarizer, when the protection film is peeled off. It should be peeled off slowly and carefully by operators who are electrically grounded and with Ion-blown equipment turning on. Besides, it is recommended to peel off the film from the bonding area.
(2) The protection film is attached to the polarizer with a small amount of glue. When the module with protection film attached is stored for a long time, a little glue may remain after peeling.
(3) If the liquid crystal material leaks from the panel, keep it away from the eyes and mouth. In case of contact with hands, legs or clothes, it must be clean with soap thoroughly.

9.5 Storage Precaution

When storing modules as spares for long time, the following precautions must be executed.
(1) Store them in a dark place. Do not expose to sunlight or fluorescent light. Keep the temperature between 5℃ and 35℃ at normal humidity.
(2) The polarizer surface should not come in contact with any other object. It is recommended that they be stored in the container in which they were shipped.
(3) It is recommended to use it in a short-time period, after it's unpacked. Otherwise, we would not guarantee the quality.

9.6 Others

When disposing LCD module, obey the local environmental regulations.