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Mechanical design



深圳市优瑞泰克科技有限公司
SHENZHEN YOURITECH TECHNOLOGY CO.,LTD

Customer	
Customer NO.	
Approve By	

For Solution ---15.6inch ;1920(W)XRGBX1080(H)

Owner:

Version: V02

Document ID:ET156FH02-H V.1

Record of Revisions

Rev	Date	Sub-Model	Description of change
V01	Jan. 18 th 2024	ET156FH02-H V.1	Preliminary Product Specification was first issued.
V02	Sept. 12 th 2024		Correct the Drawling and some mistaken

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1. General description

1.1 Introduction

YOURITECH model ET156FH02-H V.1 is a color active matrix thin film transistor (TFT) liquid crystal display (LCD) that uses amorphous silicon TFT as a switching device. This model is composed of a TFT LCD panel, a driving circuit and a back light system. This TFT LCD has a 15.6 (16:9) inch diagonally measured active display area with Full WU (1920 horizontal by 1080 vertical pixel) resolution.

1.2 Features

15.6 (16:9 diagonal) inch configuration

Edp (Embedded display port) interface

1920x3x1080 dots panel with16.7 M colors

Edp Transfer rate Specification: Edp /2lane

Transflective Type display

LED Backlight

RoHS Compliance

1.3 Applications

Personal Navigation Device

Multimedia applications and Others AV system

1.4 General information

Item		Specification	Unit
Outline Dimension		358.0 x 211.5x 5.3 (Typ.)	mm
Display area		344.16(H) x193.59(V)	mm
Number of Pixel		1920 RGB(H) x 1080(V)	pixels
Pixel pitch		0.17925(H) x 0.17925(V)	mm
Pixel arrangement		RGB Vertical stripe	
Display mode/NTSC		Normally black/72%	
Surface treatment		Antiglare, Hard-Coating(3H)	
Weight		TBD(Typ.)	g
Back-light		Single LED (Side-Light type)	
Power Consumption		10.0(Max)	W

1.5 Mechanical Information

item		Min.	Typ.	Max.	Unit
Module Size	Horizontal(H)	357.70	358	358.3	mm
	Vertical(V)	211.2	211.5	211.2	mm
	Depth(D)	5.1	5.3	5.6	mm

2.0 ABSOLUTE MAXIMUM RATINGS

2.1 Electrical Absolute Rating

2.1.1 TFT LCD Module

Item	Symbol	Min.	Max.	Unit.	Note
Power supply voltage	LCD_VCC	-0.3	4.0	V	GND=0
	VOP	--	4.2	V	GND=0
				V	GND=0
				V	
				V	
Input Voltage(eDP)	V1	-0.3	1.5	V	

2.1.2 Back-Light Unit

Item	Symbol	MIN.	TYP.	MAX.	Unit	Note
Forward voltage	Vf	--	29	32	V	(1)(2)(3)
Forward current	If	--	300		mA	(1)(2) (3)
Power Consumption	PBL	--	8.7		W	

Note:

(1) Permanent damage may occur to the LCD module if beyond this specification. Functional operation should be restricted to the conditions described under normal operating conditions.

(2) Ta =25±2℃

(3) Test Condition: LED current 450 mA

2.2 Environment Absolute Rating

Item	Symbol	Min.	Max.	Unit	Remarks
Operating Temperature	Topa	-30	+80	℃	
Storage Temperature	Tstg	-40	+90	℃	

3.0 OPTICAL CHARACTERISTICS

3.1 Optical specification:

Item	Symbol	Temp	Min.	Typ.	Max	Unit	Condition
Response Time	Tr+Rf	25℃	--	5	--	msec	Reflectance mode θ =0 °,φ=0 ° (Note 1,3)
Response Time	Tr+Rf	25℃	--	15	--	msec	Transmittance mode θ =0 °,φ=0 ° (Note 1,3)
White Reflectance	RW%		--	14.0	--	%	Note 8;Note 9
White Transmittance	TR%		--	1.5	--	%	Note 3,Note 4
Contrast Rate	Cr	25℃	--	8	--	--	θ =0 °, φ=0 ° LED:ON, LIGHT:OFF(Note1,2)
Brightness	YL	25℃	70	100		Cd/m2	(IL=300mA)(Note1,4) Transmittance mode
Visual angle range front and rear	θ	25℃		(θL)70	--	De-gree	φ = 0°, CR≧10 LED:ON LIGHT:OFF(Note 1,4)
				(θR 70	--		
Visual angle range left and right	θ	25℃		(θU) 70	--	De-gree	φ =90°, CR≧10 LED:ON LIGHT:OFF(Note 1,4)
				(θD) 70	--		
Brightness uniformity	BUNI		75			%	⊙ =0(Note5,7)
Visual angle			--				(Note 6)
Item	Symbol	Transmissive				Conditions	
		Min.	Typ.	Max.			
Red	XR				Reference: LCD Panel, CIE (x, y) chromaticity (Note 1,4)		
	YR						
Green	XG						
	YG						
Blue	XB						
	YB						
White	XW	0.295	0.325	0.355			
	YW	0.333	0.363	0.393			

3.2 Measuring Condition

Measuring surrounding: dark room ,LED current I_L : 300mA

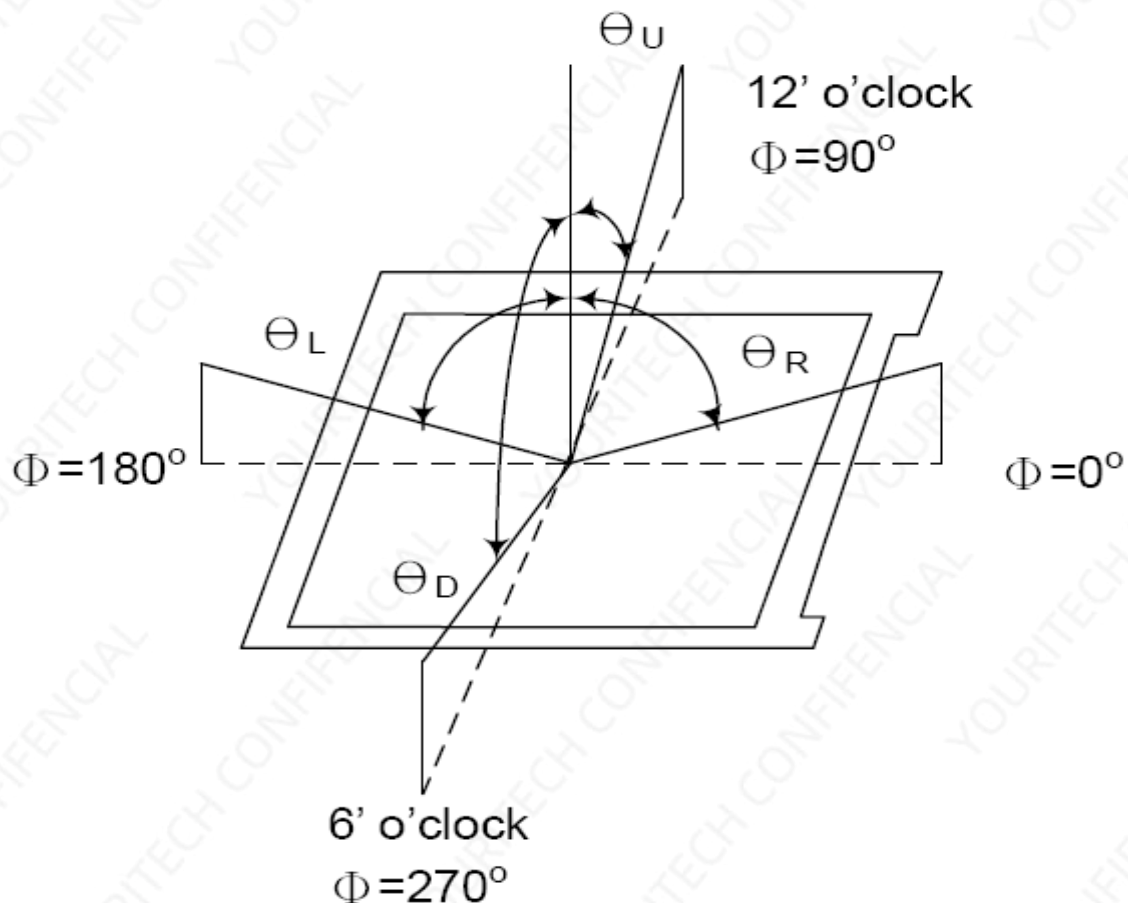
Ambient temperature: $25 \pm 2^\circ\text{C}$

15min. warm-up time.

3.3 Measuring Equipment

FPM520 of Westar Display technologies, INC., which utilized SR-3 for Chromaticity and BM-5A for other optical characteristics. Measuring spot size: 20 ~ 21 mm

Note (1) Definition of Viewing Angle :

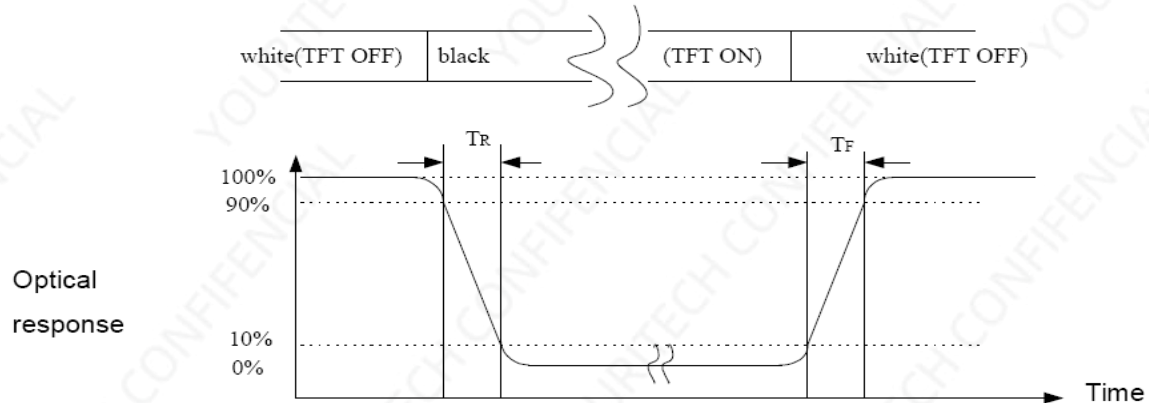


Note (2) Definition of Contrast Ratio (CR):

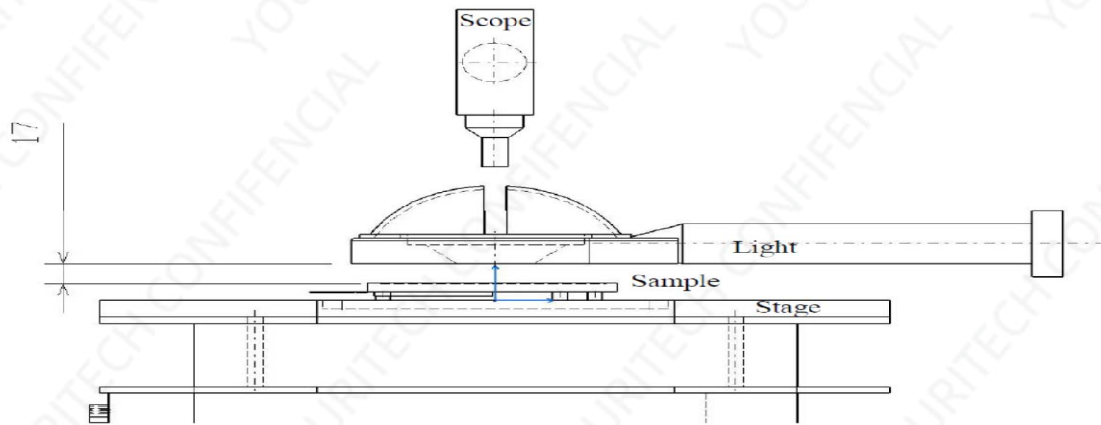
Measured at the center point of panel

$$\text{CR} = \frac{\text{Luminance with all pixels white}}{\text{Luminance with all pixels black}}$$

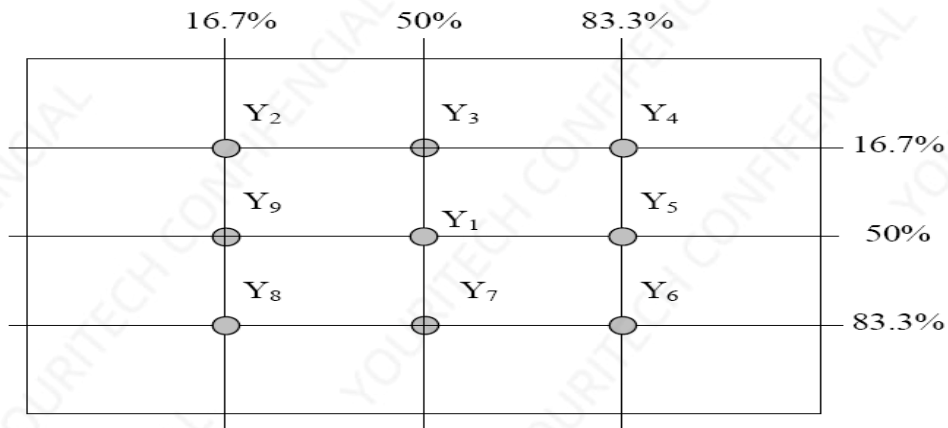
Note (3) Definition of Response Time: Sum of TR and TF



Note (4) Definition of optical measurement setup



Note (5) Definition of brightness uniformity



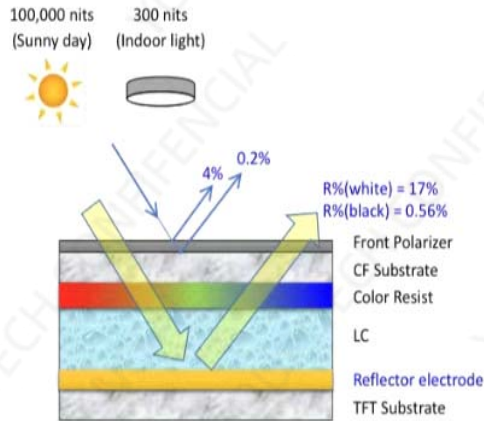
$$\text{Luminance uniformity} = \frac{(\text{Min Luminance of 9 points})}{(\text{Max Luminance of 9 points})} \times 100\%$$

Note (6) Rubbing Direction (The different Rubbing Direction will cause the different optimal view direction).

Note (7) Measured at the brightness of the panel when all terminals of LCD panel are electrically open.

Note (8) Reflectance display characteristics :

反射式顯示器在強光下的特性



- 顯示反射的光強度 > 表面反射的光強度

$$CR = \frac{(100,000 \text{ or } 300) \times 17\%}{(100,000 \text{ or } 300) \times 0.56\%} = \text{keep } 30.35$$

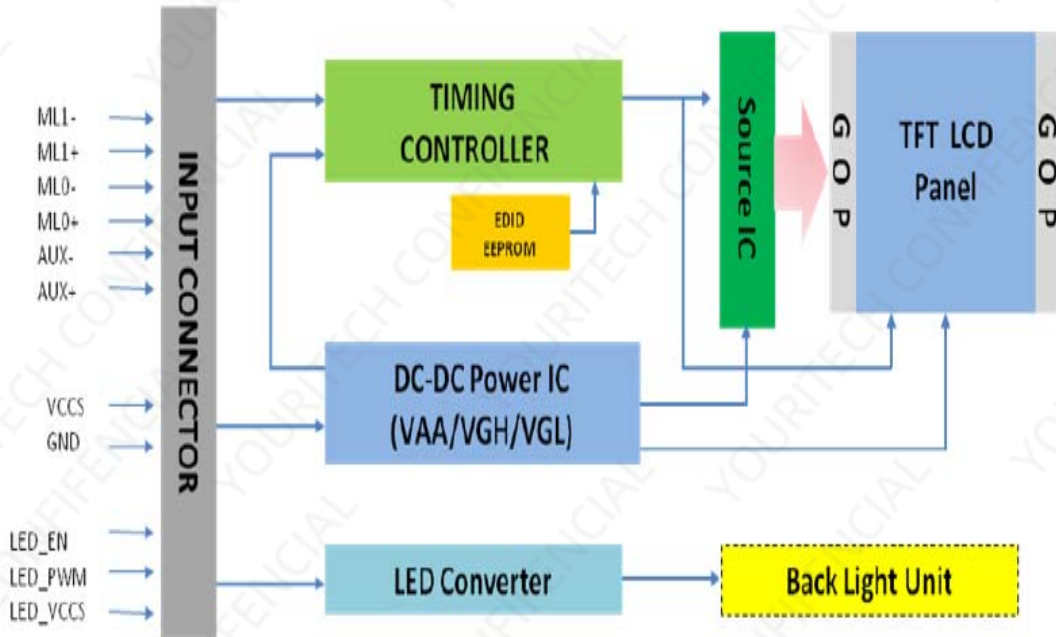
- 在任何環境光條件下具有完美的可閱讀性
- 無須背光源，具輕薄、節能、省電、護眼優勢
- 缺點：
 - 環境光源需充足，確保可閱讀性

Note (9) Ambient brightness reference

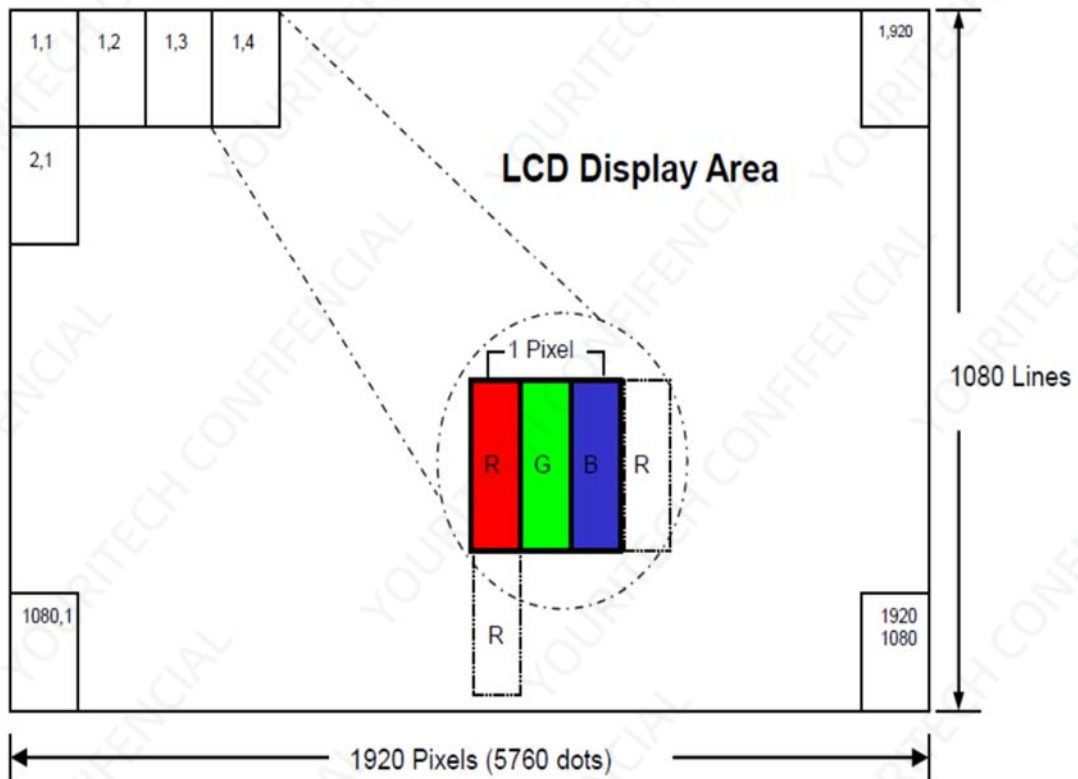
場所/環境	光照度	生产车间	10~500 lux
晴天	30000 ~ 300000 lux	办公室	30~50 lux
晴天室內	100 ~ 1000 lux	餐厅	10~30 lux
阴天	3000 ~ 10000 lux	走廊	5~10 lux
阴天室外	50 ~ 500 lux	停车场	1~5 lux
阴天室內	5 ~ 50 lux	距60W台灯60cm桌面	300 lux
黄昏室內	10 lux	室内日光灯	100 lux
日出日落	300 lux	电视台演播室	1000 lux
黑夜	0.001 ~ 0.02 lux	黑白电视机荧光屏	120 lux
月夜	0.02 ~ 0.3 lux	彩色电视机荧光屏	80 lux
月圆	0.30 ~ .03 lux	阅读书刊时所需的照度	50~60 lux
星光	0.0002 ~ 0.00002 lux		
阴暗夜晚	0.003 ~ 0.0007 lux		
夜间路灯	0.1 lux		

4.0 BLOCK DIAGRAM

4.1 TFT LCD Module



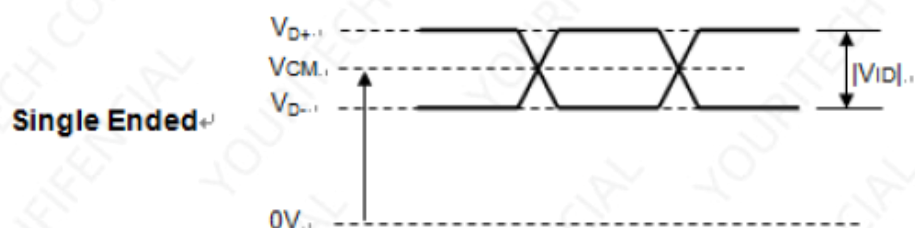
4.2 Pixel Format



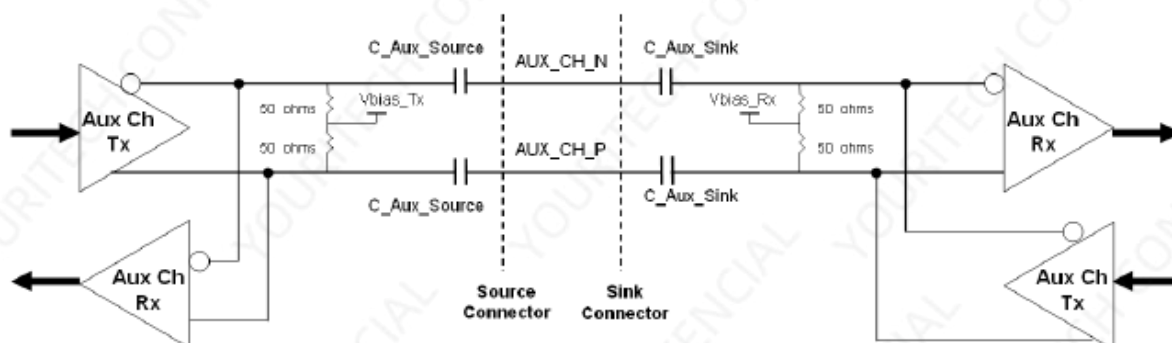
4.3 Edp interface

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Differential Signal Common Mode Voltage(MainLink and AUX)	VCM	0		2	V	(1)(4)
AUX AC Coupling Capacitor	C_AUX_Source	75		200	nF	(2)
Main Link AC Coupling Capacitor	C_ML_source	75		200	nF	(3)

Note (1) Display port interface related AC coupled signals should follow VESA DisplayPort Standard Version1. Revision 1a and VESA Embedded DisplayPort™ Standard Version 1.2. There are many optional items described in eDP1.2. If some optional item is requested, please contact us.

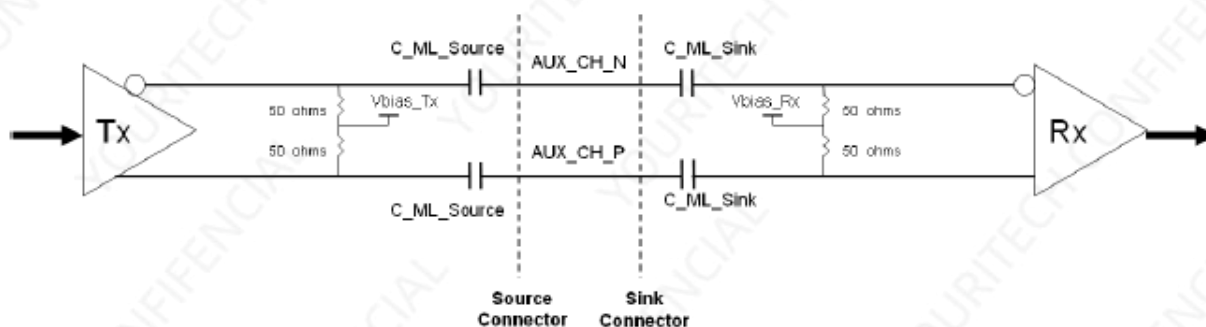


(2) Recommended eDP AUX Channel topology is as below and the AUX AC Coupling Capacitor (C_Aux_Source) should be placed on the source device..



]

(3) Recommended Main Link Channel topology is as below and the Main Link AC Coupling Capacitor (C_ML_Source) should be placed on the source device.



(4) The source device should pass the test criteria described in DisplayPort Compliance Test Specification(CTS) 1.1

4.4 COLOR DATA INPUT ASSIGNMENT

The brightness of each primary color (red, green and blue) is based on the 8-bit gray scale data input for the color. The higher the binary input the brighter the color. The table below provides the assignment of color versus data input.

Color		Data Signal																							
		Red								Green								Blue							
		R7	R6	R5	R4	R3	R2	R1	R0	G7	G6	G5	G4	G3	G2	G1	G0	B7	B6	B5	B4	B3	B2	B1	B0
Basic Colors	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Green	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	Cyan	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Magenta	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	Yellow	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	White	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gray Scale Of Red	Red(0)/Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(1)	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(2)	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Red(253)	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(254)	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(255)	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gray Scale Of Green	Green(0)/Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Green(1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
	Green(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Green(253)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0
	Green(254)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
	Green(255)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
Gray Scale Of Blue	Blue(0)/Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Blue(1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	Blue(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Blue(253)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1
	Blue(254)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0
	Blue(255)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1

Note (1) 0: Low Level Voltage, 1: High Level Voltage

5.0 Interface Connections

5.1 Input Conn PIN Assignment

LCM Input Connector: 20455-030E-76(I-PEX) (EDP Signal ,3.3V DC Supply)

The recommended connector is: 20453-030T-03 (I-PEX) or other Equivalent

Terminal No.	Symbol	IO	Functions
1	NC	--	Not connected
2	H-GND	P	High Speed ground
3	Lane1_N	I	Complement signal link Lane1
4	Lane1_P	I	True signal Link Lane1
5	H-GND	P	High Speed ground
6	Lane0_N	I	Complement signal link Lane0
7	Lane0_P	I	True signal Link Lane0
8	H-GND	P	High Speed ground
9	AUX_CH_P	I	True signal Auxiliary channel
10	AUX_CH_N	I	Complement signal Auxiliary channel
11	H_GND	P	High Speed ground
12	LCD_VCC	P	LCD logic and driver Power
13	LCD_VCC	P	LCD logic and driver Power
14	NC	--	Not connected
15	LCD_GND	P	LCD logic and driver ground
16	LCD_GND	P	LCD logic and driver ground
17	HPD	O	Hpd signal Pin
18--30	NC	--	Not connected

Notes:

*1 P: POWER I: Input O: Output

The shielding case is connected with signal GND

- Connector used :20455-030E-76 (I-PEX)
- Corresponding connector : 20453-030T (I-PEX)

(Panda is not responsible to its product quality, if the user applies a connector not corresponding to the above model.)

All terminals except NC terminal must be connected to input signal described as above or supply voltage or GND each.

[Note 4-1-1] Do not input any signals or any powers into a NC pin. Keep the NC pin open.

6.0 ELECTRICAL CHARACTERISTICS

Item	Symbol	Min.	Type	Max.	Unit.	Note
Power supply voltage	LCD_VCC	3.0	3.3	3.6	V	GND=0
	Vrp			100	mVp-p	Vcc=+3.3V
	VGL	--	-10	--	V	GND=0
	VGH	--	23.0	--	V	GND=0
	VCOM	3.7	--	5.7	V	GND=0
	Vsig	0.2	--	4.2	V	GND=0
	IDD	-	180	200	mA	AGND=0, Test Pattern: White Pattern
	Irush			1.0	A	
Operation Temperature	Top	-30		80	°C	
	Tst	-40		90	°C	
Storage Temperature						

6.1: Back-Light Unit

CN LED Power Source (BHSR-02VS-1) or equivalent

Mating connector:(SBHT-002T-P0.5) or equivalent

The characteristics of the LED are shown in the following tables.

Item	Symbol	Min.	Typ.	Max.	Unit	Note
LED current	IL	-	450	-	mA	(2)
LED Voltage	VL	-	29	32	V	
Operating LED life time	Hr	50000	-	-	Hour	(1)(2)

Note (1) LED life time (Hr) can be defined as the time in which it continues to operate under the condition: $T_a=25\pm3\text{ }^{\circ}\text{C}$, typical IL value indicated in the above table until the brightness becomes less than 50%.

Note (2) The “LED life time” is defined as the module brightness decrease to 50% original brightness at $T_a=25^{\circ}\text{C}$ and $IL=300\text{mA}$. The LED lifetime could be decreased if operating IL is larger than 300mA. The constant current driving method is suggested.

6.3 TFT LCD Module

The input signal timing specifications are shown as the following table and timing diagram.

Refresh rate 60Hz

Signal	Item	Symbol	Min.	Typ.	Max.	Unit	Note
DCLK	Frequency	1/Tc	151.6	152.84	154.04	MHz	-
DE	Vertical Total Time	TV	1128	1132	1136	TH	-
	Vertical Active Display Period	TVD	1080	1080	1080	TH	-
	Vertical Active Blanking Period	TVB	TV-TVD	52	TV-TVD	TH	-
	Horizontal Total Time	TH	2240	2250	2260	Tc	-
	Horizontal Active Display Period	THD	1920	1920	1920	Tc	-
	Horizontal Active Blanking Period	THB	TH-THD	330	TH-THD	Tc	-

Refresh rate 50Hz (Power Saving Mode)

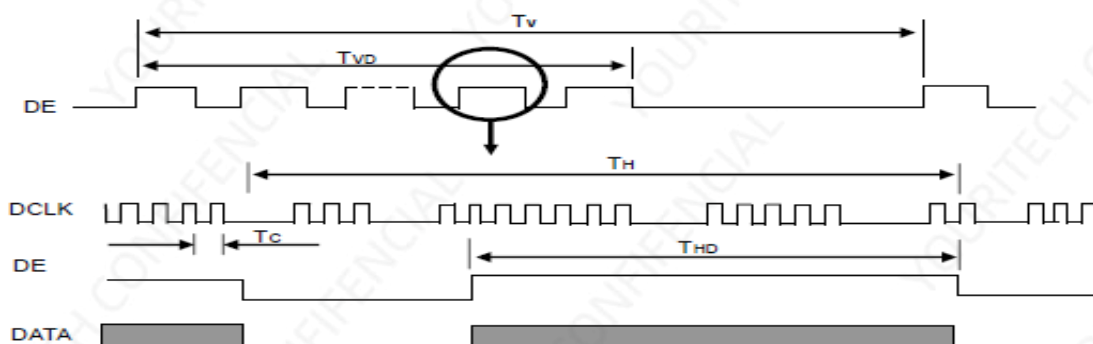
Signal	Item	Symbol	Min.	Typ.	Max.	Unit	Note
DCLK	Frequency	1/Tc	126.35	127.35	128.35	MHz	-
DE	Vertical Total Time	TV	1128	1132	1136	TH	-
	Vertical Active Display Period	TVD	1080	1080	1080	TH	-
	Vertical Active Blanking Period	TVB	TV-TVD	52	TV-TVD	TH	-
	Horizontal Total Time	TH	2240	2250	2260	Tc	-
	Horizontal Active Display Period	THD	1920	1920	1920	Tc	-
	Horizontal Active Blanking Period	THB	TH-THD	330	TH-THD	Tc	-

Refresh rate 50Hz (Power Saving Mode)

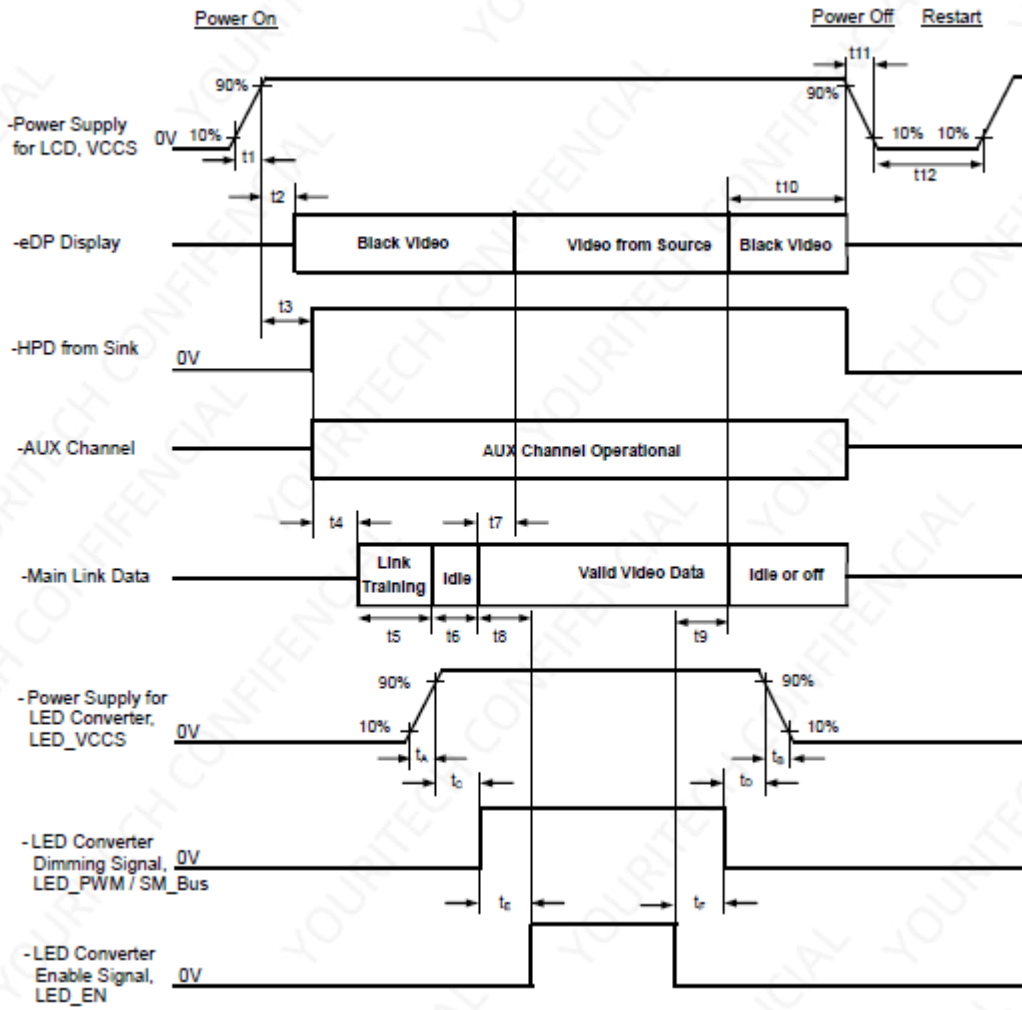
Signal	Item	Symbol	Min.	Typ.	Max.	Unit	Note
DCLK	Frequency	1/Tc	121.3	122.26	123.22	MHz	-
DE	Vertical Total Time	TV	1128	1132	1136	TH	-
	Vertical Active Display Period	TVD	1080	1080	1080	TH	-
	Vertical Active Blanking Period	TVB	TV-TVD	52	TV-TVD	TH	-
	Horizontal Total Time	TH	2240	2250	2260	Tc	-
	Horizontal Active Display Period	THD	1920	1920	1920	Tc	-
	Horizontal Active Blanking Period	THB	TH-THD	330	TH-THD	Tc	-

Note (1) The panel can operate at 60Hz normal mode and power saving mode, respectively. All reliability tests are based on specific timing of 60Hz refresh rate. We can only assure the panel's electrical function at power saving mode.

INPUT SIGNAL TIMING DIAGRAM



6.1 POWER ON/OFF SEQUENCE



Timing Specifications:

Parameter	Description	Reqd. By	Value		Unit	Notes
			Min	Max		
t1	Power rail rise time, 10% to 90%	Source	0.5	10	ms	-
t2	Delay from LCD,VCCS to black video generation	Sink	0	200	ms	Automatic Black Video generation prevents display noise until valid video data is received from the Source (see Notes:2 and 3 below)
t3	Delay from LCD,VCCS to HPD high	Sink	0	200	ms	Sink AUX Channel must be operational upon HPD high (see Note:4 below)
t4	Delay from HPD high to link training initialization	Source	0	500	ms	Allows for Source to read Link capability and initialize
t5	Link training duration	Source	0	500	ms	Dependant on Source link training protocol
t6	Link idle	Source	0	500	ms	Min accounts for required BS-Idle pattern. Max allows for Source frame synchronization
t7	Delay from valid video data from Source to video on display	Sink	0	50	ms	Max value allows for Sink to validate video data and timing. At the end of T7, Sink will indicate the detection of valid video data by setting the SINK_STATUS bit to logic 1 (DPCD 00205h, bit 0), and Sink will no longer generate automatic Black Video
t8	Delay from valid video data from Source to backlight on	Source	80	500	ms	Source must assure display video is stable *: Recommended by INX. To avoid garbage image.
t9	Delay from backlight off to end of valid video data	Source	50	500	ms	Source must assure backlight is no longer illuminated. At the end of T9, Sink will indicate the detection of no valid video data by setting the SINK_STATUS bit to logic 0 (DPCD 00205h, bit 0), and Sink will automatically display Black Video. (See Notes: 2 and 3 below) *: Recommended by INX. To avoid garbage image.
t10	Delay from end of valid video data from Source to power off	Source	0	500	ms	Black video will be displayed after receiving idle or off signals from Source
t11	VCCS power rail fall time, 90% to 10%	Source	0.5	10	ms	See Note 5 below

t12	VCCS Power off time	Source	500	-	ms	-
tA	LED power rail rise time, 10% to 90%	Source	0.5	10	ms	-
tB	LED power rail fall time, 90% to 10%	Source	0	10	ms	-
tC	Delay from LED power rising to LED dimming signal	Source	1	500	ms	-
tD	Delay from LED dimming signal to LED power falling	Source	1	500	ms	-
tE	Delay from LED dimming signal to LED enable signal	Source	1	500	ms	-
tF	Delay from LED enable signal to LED dimming signal	Source	1	500	ms	-

Note (1) Please don't plug or unplug the interface cable when system is turned on.

Note (2) The Sink must include the ability to automatically generate Black Video autonomously. The Sink must automatically enable Black Video under the following conditions:

- Upon LCD VCCS power-on (within T2 max)
- When the "NoVideoStream_Flag" (VB-ID Bit 3) is received from the Source (at the end of T9)

Note (3) The Sink may implement the ability to disable the automatic Black Video function, as described in Note (2), above, for system development and debugging purposes.

Note (4) The Sink must support AUX Channel polling by the Source immediately following LCD VCCS power-on without causing damage to the Sink device (the Source can re-try if the Sink is not ready). The Sink must be able to response to an AUX Channel transaction with the time specified within T3 max.

Note (5) The VCCS power rail is recommended to rise and fall linearly. If not, please contact us to conduct risk assessment.

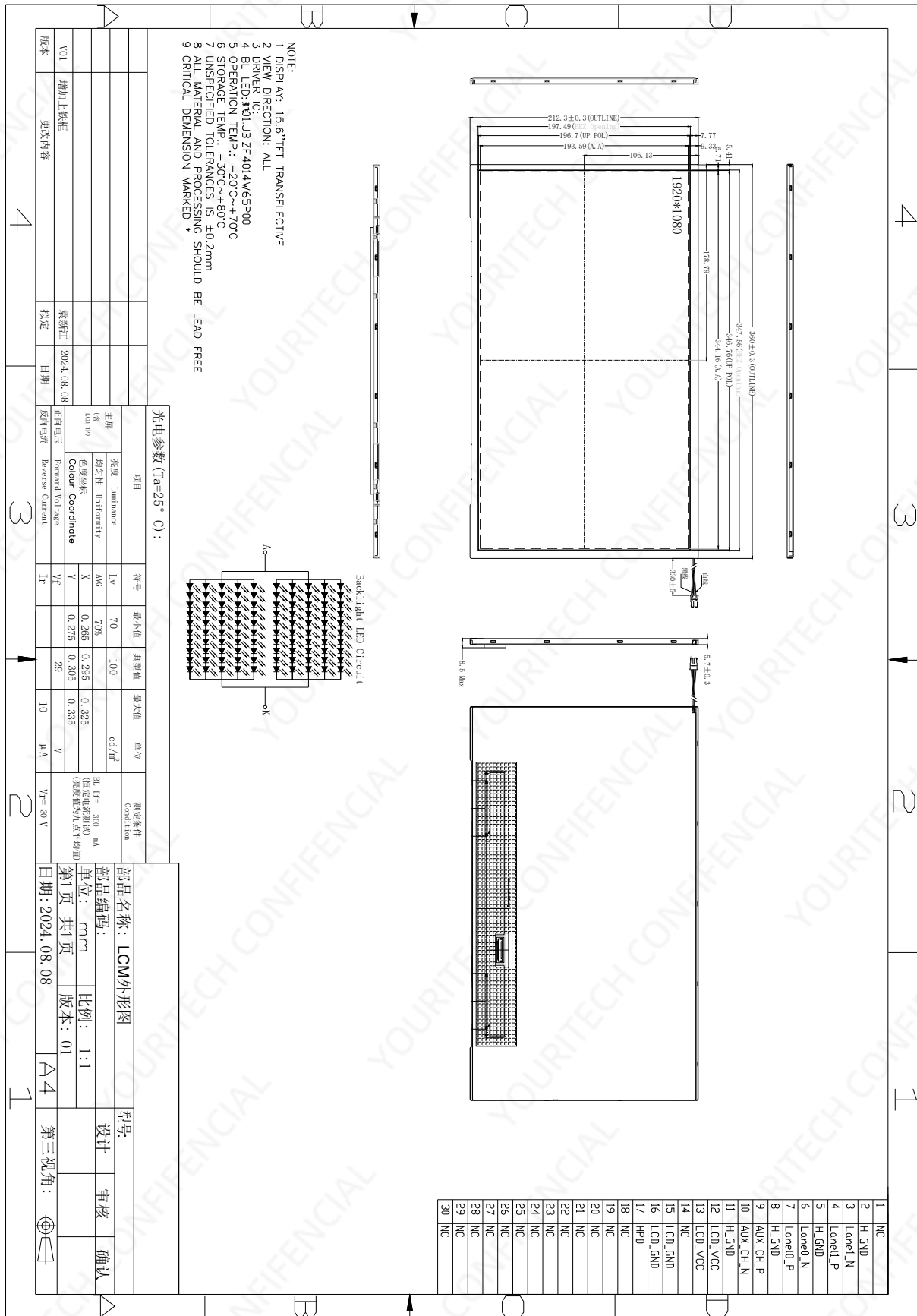
7.0 Reliability test items

NO.	Item	Conditions	Remark
1	High Temperature Storage	Ta=+90℃,240hrs	Inspection after 2~4 hours storage at room temperature, the sample shall be free from defects 1. Air bubble in the LCD 2. Sealleak 3. non-display 4. missing segmnents 5. glass crack 6. current idd is twice higher than initial value.
2	Low Temperature Storage	Ta=-40℃,240hrs	
3	High Temperature Operation	Ta=+80℃,240hrs	
4	Low Temperature Operation	Ta=-30℃,240hrs	
5	High Temperature and High Humidity(Operation)	Ta=+60℃,90%RH,240hrs	
6	Thermal cycling Test (non operation)	-30℃(30min)→+80℃(30min),100cycles	
7	Electrostatic discharge	200V 200pf(0ohm) 1time/each terminal	
8	Vibration	1. Random: 1.04 Grms,5~500HZ, X/Y/Z,30min/each direction 2. Sine: Freq.Range:8~33.3hz Stoke:1.3mm Sweep:2.9G,33.3~400HZ X/Z:2hr,Y:4hr,cyc:15min	
9	Shock	100G,6ms,±X, ±Y, ±Z 3 times for each direction	JIS C7021,A-10 (Condition)
10	Vibration(with carton)	Random:0.015G ∧ 2/HZ,5~200HZ -6dB/octave,200~400HZ XYZ each dirction:2hr	
11	Drop (with carton)	Height:60cm 1corner,3edges,6surfaces	JIS Z0202

Note:

1. There is no display function NG issue occurred, all the cosmetic specification is judged before the reliability stress.
2. the test samples should be applied to only one test item
3. for damp proof test, Pure water(resistance>10M ohm) should be used
4. in case of malfunction defect caused by ESD damage, if it would be recovered to normal state after resetting, it would be judged as a good part
5. Failure Judgment Criterion: Basic Specification, Electrical Characteristic, Mechanical Characteristic, Optical Characteristic

8.0: OUTLINE DIMENSION



9.0 GENERAL PRECAUTION

9.1 Use Restriction

This product is not authorized for use in life supporting systems, aircraft navigation control systems, military systems and any other application where performance failure could be life threatening or otherwise catastrophic.

9.2 Disassembling or Modification

Do not disassemble or modify the module. It may damage sensitive parts inside LCD module, and may cause scratches or dust on the display. YOURITECH does not warrant the module, if customers disassemble or modify the module.

9.3 Breakage of LCD Panel

9.3.1. If LCD panel is broken and liquid crystal spills out, do not ingest or inhale liquid crystal, and do not contact liquid crystal with skin.

9.3.2. If liquid crystal contacts mouth or eyes, rinse out with water immediately.

9.3.3. If liquid crystal contacts skin or cloths, wash it off immediately with alcohol and rinse thoroughly with water.

9.3.4. Handle carefully with chips of glass that may cause injury, when the glass is broken.

9.4 Electric Shock

9.4.1. Disconnect power supply before handling LCD module.

9.4.2. Do not pull or fold the LED cable.

9.4.3. Do not touch the parts inside LCD modules and the fluorescent LED's connector or cables in order to prevent electric shock.

9.5 Absolute Maximum Ratings and Power Protection Circuit

9.5.1. Do not exceed the absolute maximum rating values, such as the supply voltage variation, input voltage variation, variation in parts' parameters, environmental temperature, etc., otherwise LCD module may be damaged. 9.5.2. Please do not leave LCD module in the environment of high humidity and high temperature for a long time. 11.5.3. It's recommended to employ protection circuit for power supply.

9.6 Operation

9.6.1 Do not touch, push or rub the polarizer with anything harder than HB pencil lead.

9.6.2 Use fingerstalls of soft gloves in order to keep clean display quality, when persons handle the LCD module for incoming inspection or assembly.

9.6.3 When the surface is dusty, please wipe gently with absorbent cotton or other soft material.

9.6.4 Wipe off saliva or water drops as soon as possible. If saliva or water drops contact with polarizer for a long time, they may causes deformation or color fading.

9.6.5 When cleaning the adhesives, please use absorbent cotton wetted with a little petroleum benzine or other adequate solvent.

9.7 Mechanism

Please mountLCD module by using mouting holes arranged in four corners tightly.

9.8 Static Electricity

9.8.1 Protection film must remove very slowly from the surface of LCD module to prevent from electrostatic occurrence.

9.8.2. Because LCD module use CMOS-IC on circuit board and TFT-LCD panel, it is very weak to electrostatic discharge. Please be careful with electrostatic discharge. Persons who handle the module should be grounded through adequate methods.

9.9 Strong Light Exposure

The module shall not be exposed under strong light such as direct sunlight. Otherwise, display characteristics may be changed.

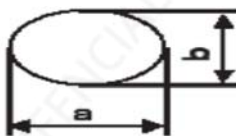
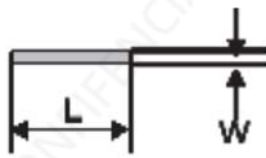
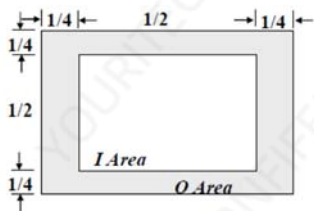
9.10 Disposal

When disposing LCD module, obey the local environmental regulations.

10. Package Specification

10.1 Packing format

Sept.12th, 2024**11. Visuals Specification:****1) Note**

General	1.Customer identified anomalies not defined within this inspection standard shall be reviewed by YOURITECH , and an additional standard shall be determined by mutual consent. 2.This inspection standard about the image quality shall be applied to any defect within the effective viewing area and shall not be applicable to outside of the area. 3.Inspection conditions Luminance : 500 Lux min. Inspection distance : 300 mm. Temperature : 25±5°C Direction : Directly above			
Definition of inspection item	Dot defect	Bright dot defect	The dot is constantly “on” when power applied to the LCD, even when all “Black” data sent to the screen. Inspection tool: 5% Transparency neutral density filter.Count dot: If the dot is visible through the filter. Don’t count dot: If the dot is not visible through the filter.  dot defect	
		Black dot defect	The dot is constantly “off” when power applied to the LCD, even when all “White” data sent to the screen.	
		Adjacent dot	Adjacent dot defect is defined as two or more bright dot defects or black dot defects.  dot defect	
	External inspection	Bubble ,scratch(foreign Particle polarizer, Cell, Backlight)		Visible operating (all pixels “Black” or “White”) and non operating.
		Appearance inspection	Does not satisfy the value at the spec.	
Others	LED wires	Damaged to the LED wires, connector, pin, functional failure or appearance failure.		
Definition of Size	Definition of circle :  $d = (a + b) / 2$ definition of linear size  definition Area I/O 			

2) Standard

Classification		Inspection item		Judgment Standard	
Defect (in LCD glass)	Dot defect	Area		I	O
		Bright dots(Note: Visible under:ND5%) 1:D≤0.15mm:No count); D>0.15mm acceptable: 2		N≤3	
		Dark dots (0.15mm<D≤0.3mm), D>0.3mm Not allowable		N≤4	
		Bright dot-2Adjacent		N≤0	
		Dark dot-2Adjacent		N≤4	
		Dark or bright dots-3 and more Adjacent(note6)		N≤0	
		Total bright and dark dots		N≤6	
		Minimum distance between bright dots		15mm	
		Minimum distance between dark dots		5mm	
		Minimum distance between bright and bright dots		5mm	
	Other	White dot ,dark dot (circle)	Size (mm)	Acceptable number	
			d≤0.2	Neglected	
			0.2mm<D≤0.3mm	N≤4	
			0.3mm<D≤0.4mm	N≤2	
			D>0.4mm	Not allowable	
Visual defect		Foreign partial	Circular foreign material: dark/bright sport	Visible under:ND5% 1:D≤0.2mm:No count 2:0.2mm<D≤0.5mm,N≤3 3:D>0.5mm:Not allowable	
			Linear foreign material: bright or dark line	Invisible under ND5% 0.1mm<W≤0.3mm, 0.3mm<L≤5mm,N≤3 Visible under ND5% 0.03mm≤w≤0.1mm, 0.3mm≤L≤3mm,N≤2	
		Polarizer	Linear scratch	1:BM:No Count 2:Pixel area 0.05mm≤w≤0.2mm, 1.0mm≤L≤5.0mm,N≤3	
			Bubble peeling	1:BM:No Count 2:Pixel area 0.2mm≤D<0.5mm,N≤4	
		Mura & leak		ND5%	