



# **GlobalTech Display**

*A Professional LCD Displays Provider*

## **TFT LCD Display Specification**

**PN: GLT0881280320IR1**

### Overview:

- 8.8" Diagonal
- IPS, Full View Angle
- Driver: EK79202
- 16.7M Colors
- 400 Nits
- 1280 x 320 Pixels
- Transmissive/Normally Black
- LVDS Interface
- No Touch Panel
- RoHS Compliant

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**1. Record of Revision**

<b>Rev</b>	<b>Issued Date</b>	<b>Description</b>	<b>Page</b>
1.0	1/31/2023	First Release	-

## 2. General Specifications

Item	Specification	Unit
LCD Size	8.8	inch
Number of Pixels	1280 (H) RGB x 320 (V)	pixels
Display Mode	Normally Black	-
Viewing Direction	Free	o' clock
Interface	LVDS	-
Display Colors	16.7M	colors
Outline Dimension	229.66 (H) x 67.50 (V) x 3.50 (D)	mm
Active Area	216.96 (H) x 54.24 (V)	mm
Pixel Pitch	0.1695 (H) x 0.1695 (V)	mm
Driver IC	EK79202	-
Operation Temperature	-20~70	°C
Storage Temperature	-30~80	°C
Weight	~85	g

Note1: Requirements on environmental protection RoHS compliant.

### 3. Input / Output Interface

Recommended connector: FH12-40S-0.5SH manufactured by HIROSE

No.	Symbol	Description
1	NC	No connection
2-3	VDD	Power supply
4	NC	No connection
5	RESET	Global reset pin
6	STBYB	Standby mode
7	GND	Ground
8	RXIN0-	- LVDS differential data input
9	RXIN0+	+ LVDS differential data input
10	GND	Ground
11	RXIN1-	- LVDS differential data input
12	RXIN1+	+ LVDS differential data input
13	GND	Ground
14	RXIN2-	- LVDS differential data input
15	RXIN2+	+ LVDS differential data input
16	GND	Ground
17	RXCLK-	-LVDS differential clock input
18	RXCLK+	+LVDS differential clock input
19	GND	Ground
20	RXIN3-	- LVDS differential data input
21	RXIN3+	+ LVDS differential data input
22	GND	Ground
23	SDA	Serial data input/output signal
24	SCL	Serial clock signal
25	GND	Ground
26	CS	Chip select pin
27	NC	No connection
28	LVBIT	6-bit / 8-bit input select for LVDS mode
29	NC	No connection
30	GND	Ground
31	LEDK-	Power for LED backlight (Cathode)
32	LEDK-	Power for LED backlight (Cathode)
33-38	NC	No connection
39	LEDA+	Power for LED backlight (Anode)
40	LEDA+	Power for LED backlight (Anode)

## 4. Absolute Maximum Ratings

Item	Symbol	MIN.	MAX.	Unit	Note
Analog Supply voltage	VDD	-0.3	5.0	V	Note 1

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.

## 5. Electrical Characteristics

### 5.1 Recommended Operating Condition for TFT LCD

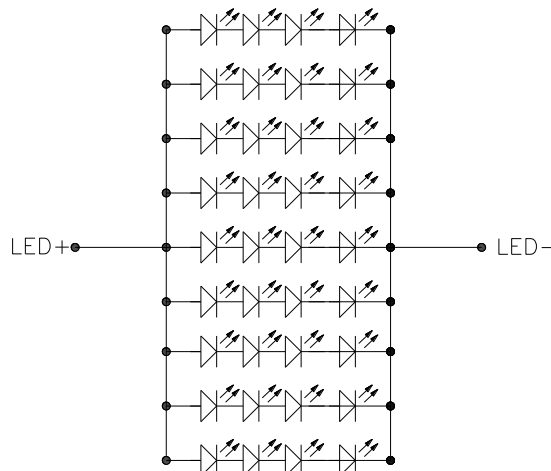
Item	Symbol	Min.	Typ.	Max.	Unit	Note
Analog Supply voltage	VDD	3.0	3.3	3.6	V	
Analog supply current	$I_{VDD}$	-	TBD	-	mA	VDD=3.3V
Logic input voltage	VIH	0.7*VDD	-	VDD	V	
	VIL	GND	-	0.3*VDD	V	

### 5.2 Recommended Driving Condition for Backlight

Item	Symbol	Min.	Typ.	Max.	Unit	Note
Driving Current	$I_F$	-	180	-	mA	
Driving Voltage	$V_F$	10.8	-	13.6	V	
Power consumption	$W_{BL}$	1.944	-	2.448	W	
LED Life-Time	N/A	30,000	-	-	Hours	Ta=25°C Note 1

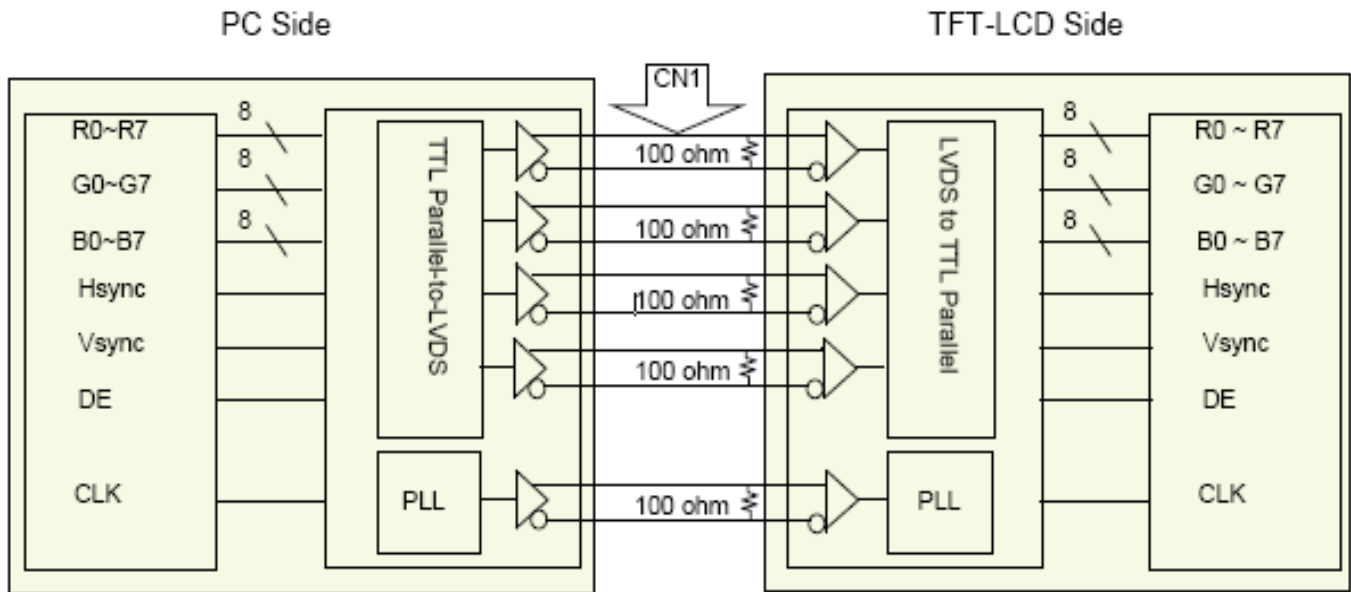
Note 1: LED lifetime is defined as the module brightness decay 50% of original brightness at Ta=25 degree, typical current.

Note 2: LED circuit:



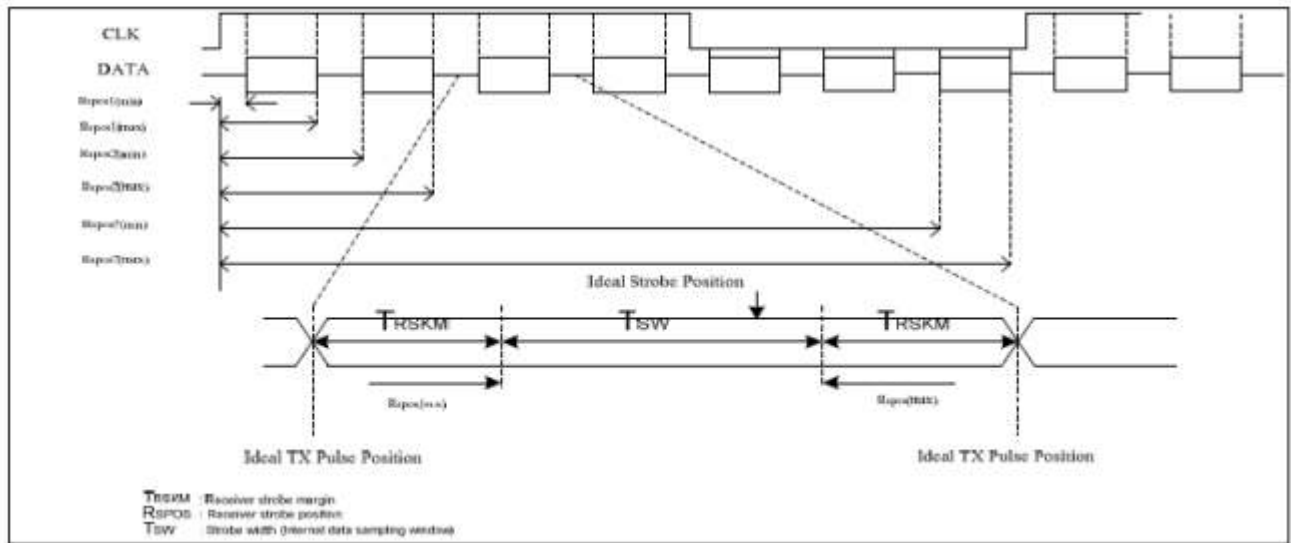
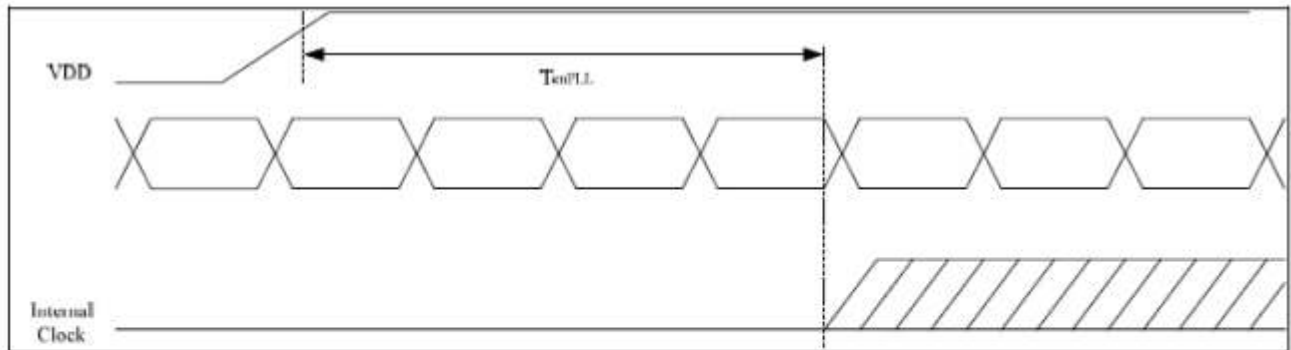
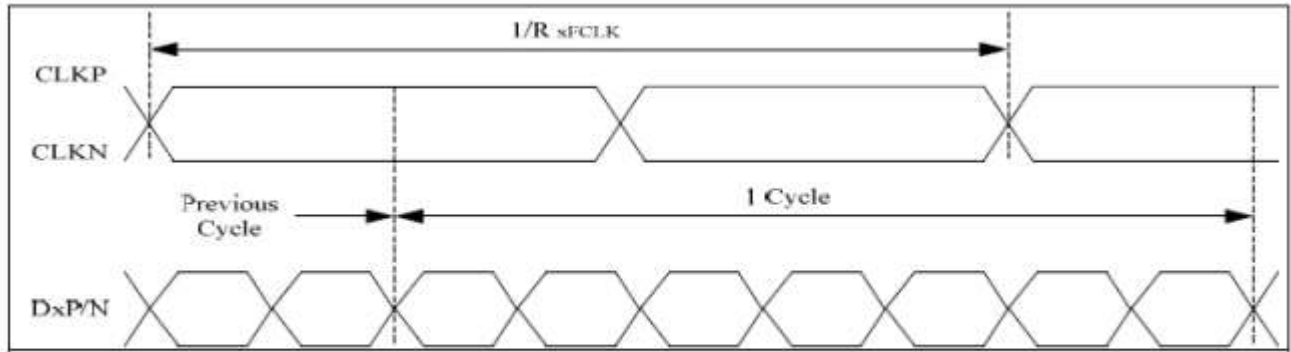
## 6. Interface Characteristics

### 6.1 LVDS Interface



### 6.2 LVDS mode AC Electrical Characteristics

Parameter	Symbol	Spec.			Unit	Condition
		Min.	Typ.	Max.		
Clock frequency	$R_{x\text{FCLK}}$	30	-	TBD	MHz	Refer to input timing table for each display resolution
Input data skew margin	$T_{\text{RSKM}}$	500	-	-	ps	$ VID  = 200\text{mV}$ $R_{x\text{VCM}} = 1.2\text{V}$ $R_{x\text{FCLK}} = 81\text{MHz}$
Clock high time	$T_{\text{LVCH}}$	-	$4/(7 * R_{x\text{FCLK}})$	-	ns	
Clock low time	$T_{\text{LVCL}}$	-	$3/(7 * R_{x\text{FCLK}})$	-	ns	
PLL wake-up time	$T_{\text{enPLL}}$	-	-	150	us	



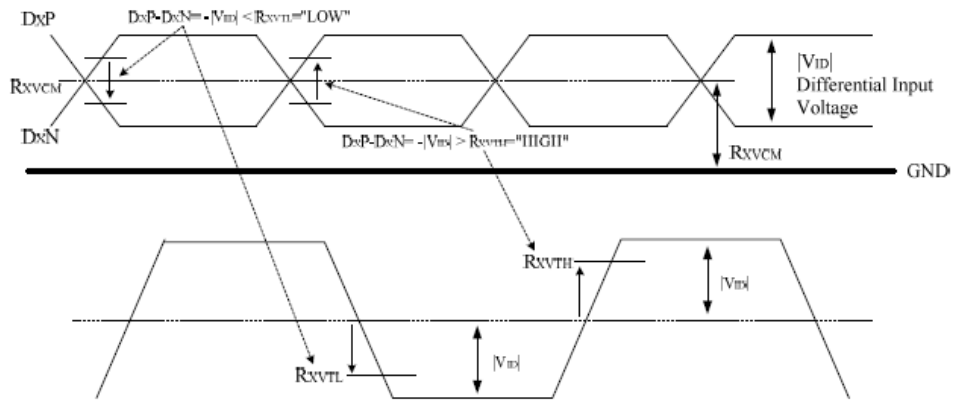


### 6.3 LVDS DC Electrical Characteristics

(VDD=VDDIO=VDDIF=2.3 to 3.6V, VSS=VSSA=VSS\_IF=0V, TA=-20 to +85°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Differential input high threshold voltage	R <sub>XVTH</sub>	+0.1	0.2	0.3	V	R <sub>XVCM</sub> =1.2V
Differential input low threshold voltage	R <sub>XVTL</sub>	-0.3	-0.2	-0.1	V	
Input voltage range (singled-end)	R <sub>XVIN</sub>	0.7	-	1.7	V	
Differential input common mode voltage	R <sub>XVCM</sub>	1	1.2	1.4	V	V <sub>ID</sub>  =0.2
Differential input impedance	Z <sub>ID</sub>	80	100	125	ohm	
Differential input voltage	V <sub>ID</sub>	0.2	-	0.6	V	
Differential input leakage current	I <sub>LCLVDS</sub>	-10	-	+10	uA	
LVDS Digital Operating Current	I <sub>VDDMIPI</sub>	-	15	20	mA	F <sub>DCLK</sub> =80MHz, VDD=3.3V, Input pattern: 55h->Aah->55h->Aah
LVDS Digital Stand-by Current	I <sub>STMIPI</sub>	-	-	250	uA	Clock & all Functions are stopped

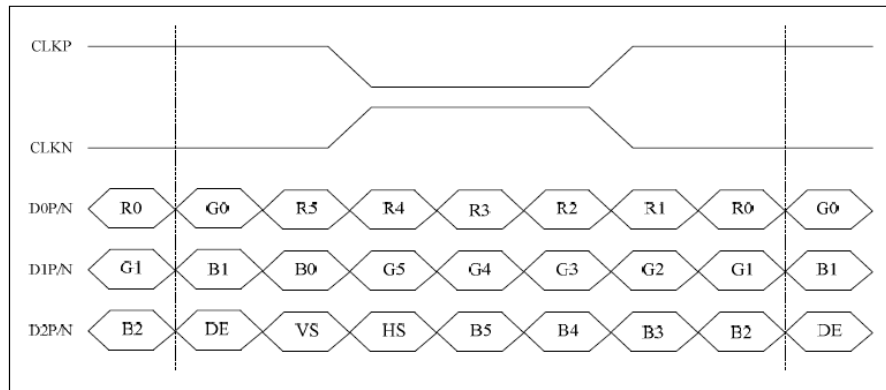
Single-end Signals



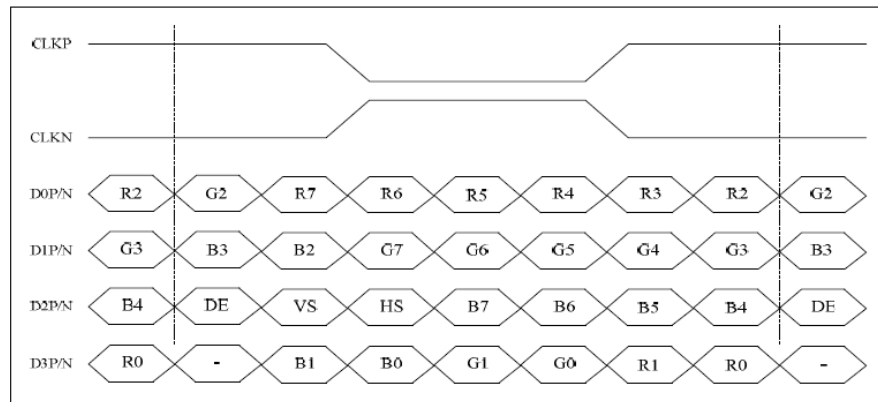
## 6.4 Timing

Item	Symbol	Min.	Typ.	Max.	Unit	
Frame Rate	-	-	60	-	Hz	
PCLK Frequency	FPCLK	-	31	-	MHz	
<b>Horizontal</b>	Ttotal line	TH	-	1440	-	DCLK
	Active pixels	THD	1280			DCLK
	Back porch	HBP		87	-	DCLK
	Pulse width	HPW	-	1	-	DCLK
	Front porch	HFP		72	-	DCLK
<b>Vertical</b>	Total time	TV	-	358	-	H
	Active lines	VD	320			H
	Back porch	VBP	-	22	-	H
	Pulse width	VPW	-	1	-	H
	Front porch	VFP	-	15	-	H

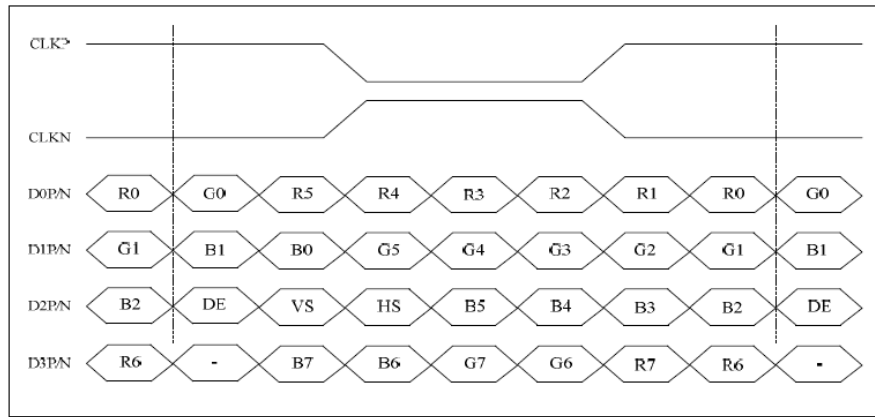
## 6.5 Data input format for LVDS



6-bit LVDS input (LVBIT=L, LVFMT=Don't care)



8-bit LVDS input (LVBIT=H, LVFMT=L)

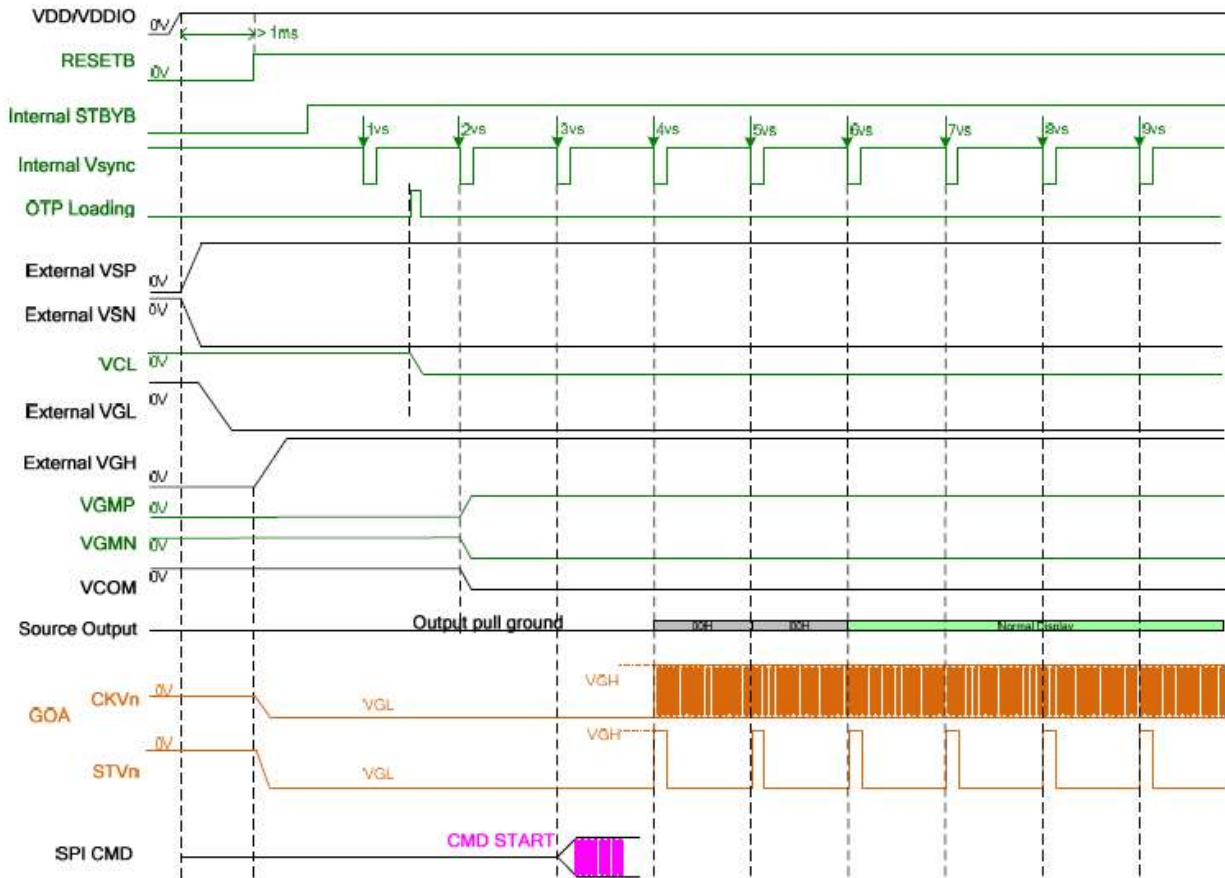


8-bit LVDS input(LVBIT=H, LVFMT=H)

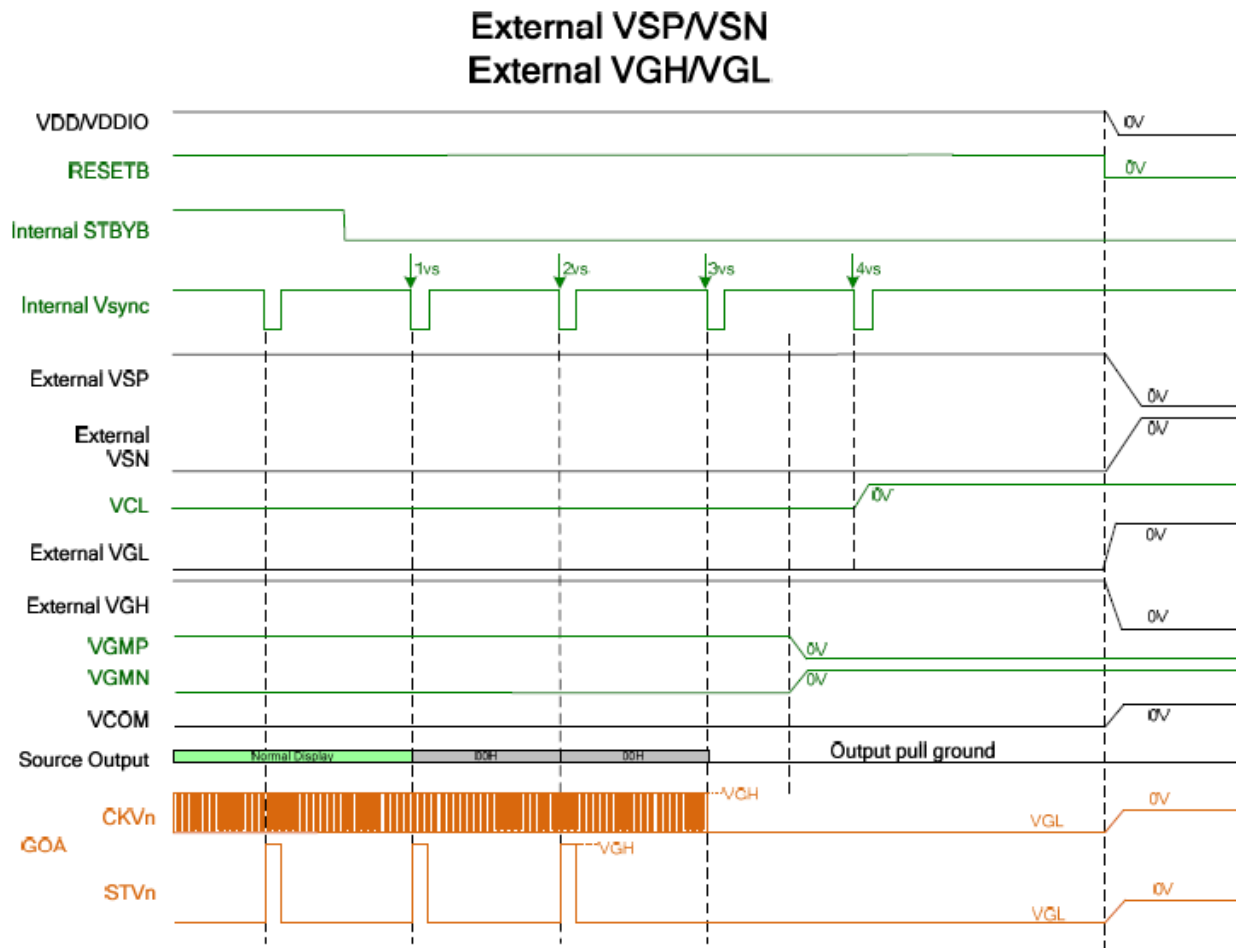
## 6.6 Power Sequence

### 5.6.1 Power on Sequence

#### External VSP/VSN External VGH/VGL



## 6.6.2 Power off Sequence

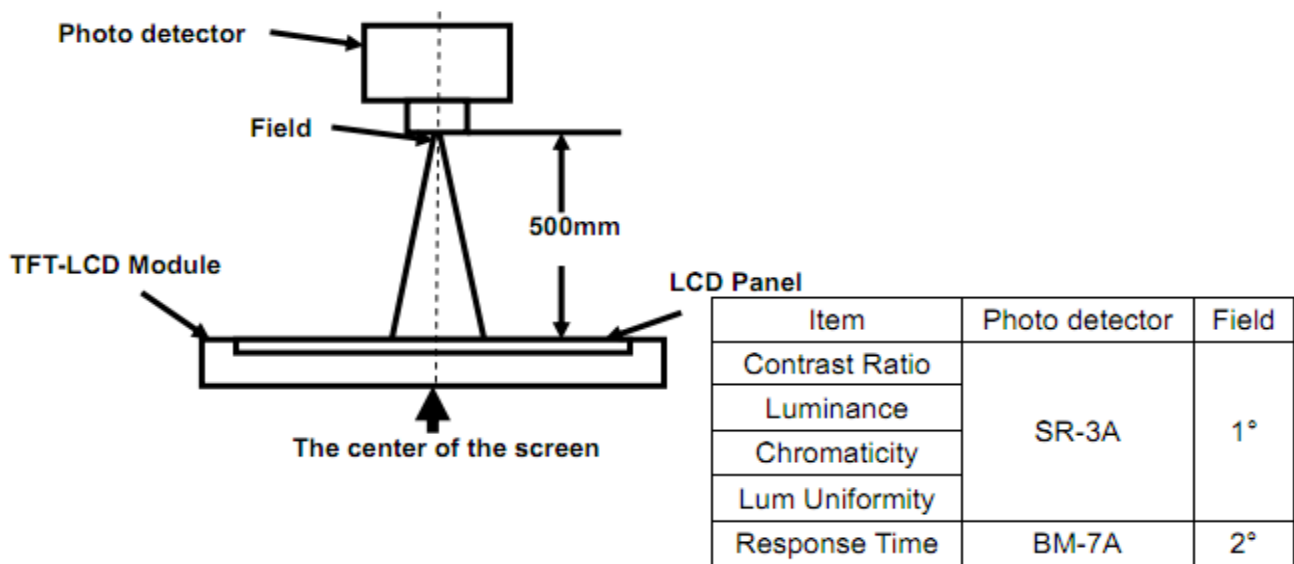


## 7. Optical Characteristics

Item	Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Viewing Angle (CR≥10) B/L ON	$\theta_T$	$\Phi=90^\circ$ (12 o'clock)	75	80	-	deg	Note2
	$\theta_B$	$\Phi=270^\circ$ (6 o'clock)	75	80	-	deg	Note2
	$\theta_L$	$\Phi=180^\circ$ (9 o'clock)	75	80	-	deg	Note2
	$\theta_R$	$\Phi=0^\circ$ (3 o'clock)	75	80	-	deg	Note2
Response Time	$T_{ON}$	Normal $\theta=\Phi=0^\circ$	-	12	17	msec	Note4
	$T_{OFF}$		-	12	17	msec	Note4
Contrast Ratio	CR		1000	1500	-	-	Note1 Note3
Color Chromaticity	$W_X$		0.268	0.318	0.368	-	Note1 Note5
	$W_Y$		0.307	0.357	0.407	-	Note1 Note5
Luminance	L		350	400	-	cd/m <sup>2</sup>	Note1 Note7
Luminance Uniformity	$Y_U$		75	80	-	%	Note1 Note6
NTSC	-		-	50	-	%	-

Note 1: Definition of optical measurement system

The optical characteristics should be measured in dark room. After 5 minutes operation, the optical properties are measured at the center point of the LCD screen. All input terminals LCD panel must be ground when measuring the center area of the panel.



Note 2: Definition of viewing angle range and measurement system  
 Viewing angle is measured at the center point of the LCD by CONOSCOPE (ergo-80).

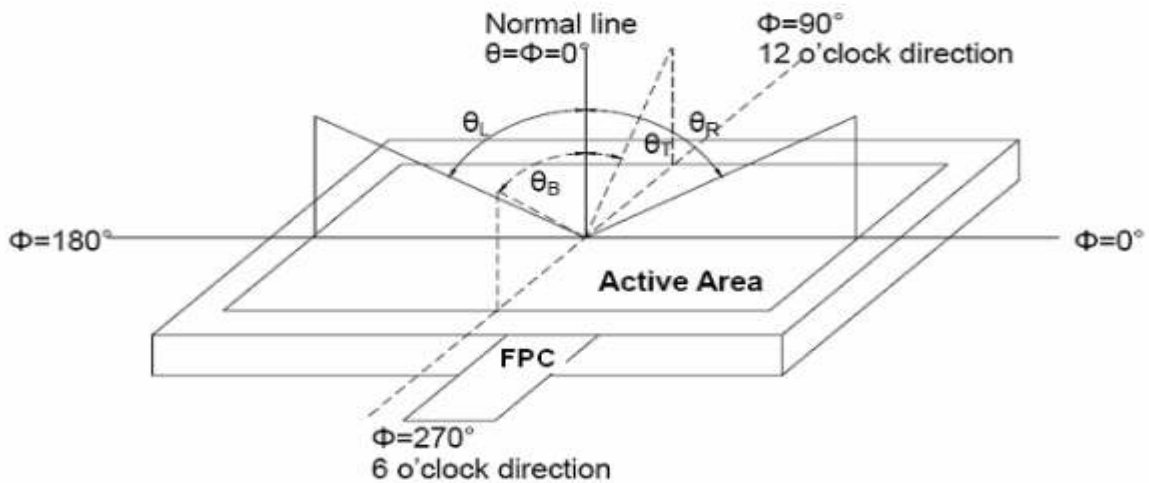


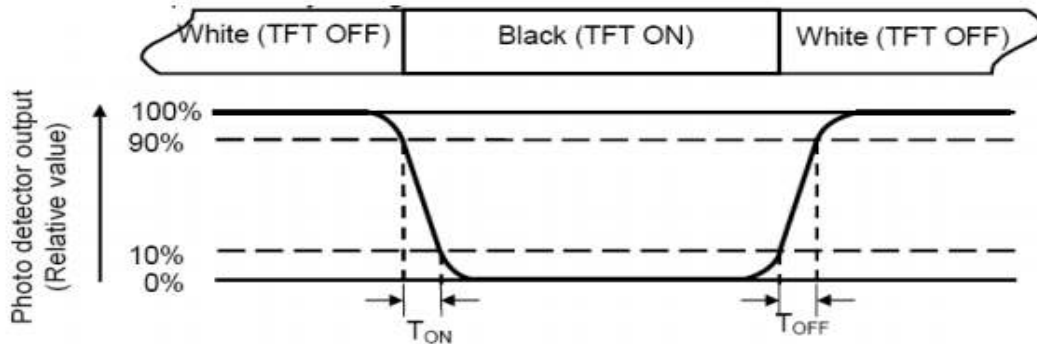
Fig. 1 Definition of viewing angle

Note 3: Definition of contrast ratio

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

**Note 4: Definition of Response time**

The response time is defined as the LCD optical switching time interval between “White” state and “Black” state. Rise time (TON) is the time between photo detector output intensity changed from 90% to 10%. And fall time (TOFF) is the time between photo detector output intensity changed from 10% to 90%.



**Note 5: Definition of color chromaticity (CIE1931)**

Color coordinates measured at center point of LCD.

**Note 6: Definition of Luminance Uniformity**

The luminance uniformity in surface luminance is determined by measuring luminance at each test position 1 through n, and then dividing the maximum luminance of n points luminance by minimum luminance of n points luminance. For more information see FIG.2.

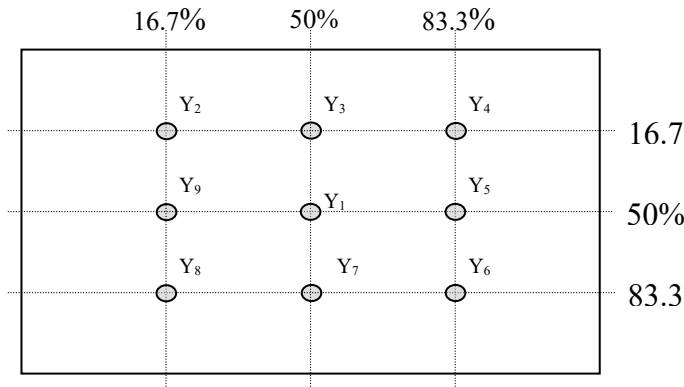


Fig. 2 Definition of points

**Note 7: Definition of Luminance (Refer Fig. 2)**

Surface luminance is the luminance with all pixels displaying white.

$L_v$  = Average Surface Luminance with all white pixels (P1,P2,P3, .....,Pn).

## 8. Reliability Tests

Test Item	Test Conditions
High Temperature Storage	Ta= +80°C 96hrs
Low Temperature Storage	Ta= -30°C 96hrs
High Temperature Operation	Ta= +70°C 96hrs
Low Temperature Operation	Ta= -20°C 96hrs
High Temperature and Humidity Storage	Ta= +60°C, 90% RH 96hrs
Thermal Shock (Non-operation)	-30°C/30 min ~ +80°C/30 min for 20 cycles Start with cold temperature end with high temperature
Electro Static Discharge	Contact = ± 4 kV, class B Air = ± 8 kV, class B R=330Ω,C=150pF
Vibration	Sweep: 10Hz~55Hz~10Hz Stroke: 1.5mm 2 hours for each direction of X .Y. Z.
Mechanical Shock	60G 6ms,±X,±Y,±Z 3 times for each direction
Package Drop Test	Height: 60 cm 1 corner, 3 edges, 6 surfaces

Notes: The test result shall be evaluated after the sample has been left at room temperature and humidity for 2 hours without load. No condensation shall be accepted. The sample will not be accepted if appear these defects:

- 1). Air bubble in the LCD
- 2). Seal leak or Glass crack
- 3). Non display or abnormal display
- 4). Brightness reduction >50%



# 9. Mechanical Drawing

**Front view**

\*67.50±0.2 LCM/CG OUTLINE  
57.24±0.3 BZ OPENING  
3.21  
54.24 LCD AA  
4.71  
219.66±0.2 LCM/CG OUTLINE  
219.96±0.3 BZ OPENING  
1280\*(RH)\*320  
5.92  
7.42

**Side view**

3.50±0.2 LCM  
3 MAX  
1.50 MAX

**Rear view**

Label  
80.18±0.5  
116.44±0.5  
67.18  
28.57±0.5  
Aluminum plate 0.5mm  
1.00 MAX  
\*32.40±0.5

**LVDS Interface**

Material code: PFC Connector (FH12-40S-0-5SH)  
DWN LHF 2023.1.31  
REV. 1.0 SHEET OF 1/1

**GlobalTech Display**

Part No: GLT0891280320R1  
TOLERANCE UNLESS SPECIFIED  
SCALE: #0.3

PROJECTION: 3RD ANGLE

**LVDS Interface**

VIEWING DIRECTION: Gray  
DIRECTION: Gray

**INTERFACE**

VIEWING DIRECTION: Gray  
DIRECTION: Gray

**REV**

REV: 1.0  
DATE: 2023.1.31  
MODIFICATION: First Issue

**LVDS Interface**

VIEWING DIRECTION: Gray  
DIRECTION: Gray

**Notes**

1. DISPLAY TYPE: 8.8 INCH TFT / TRANSMISSIVE
2. BACKLIGHT: 36CHP WHITE LED, ASSP  
VF = 10.8~13.6V/F = 209mA
3. OPERATING TEMP: -20°C~+70°C
4. STORAGE TEMP: -30°C~+80°C
5. LCD IC: -
6. Lumiance: 400cd/m2(TYP)
7. (\*)Preference dimension \*\*critical dimension
8. RoHS Compliant

**CIRCUIT DIAGRAM (4SP)**

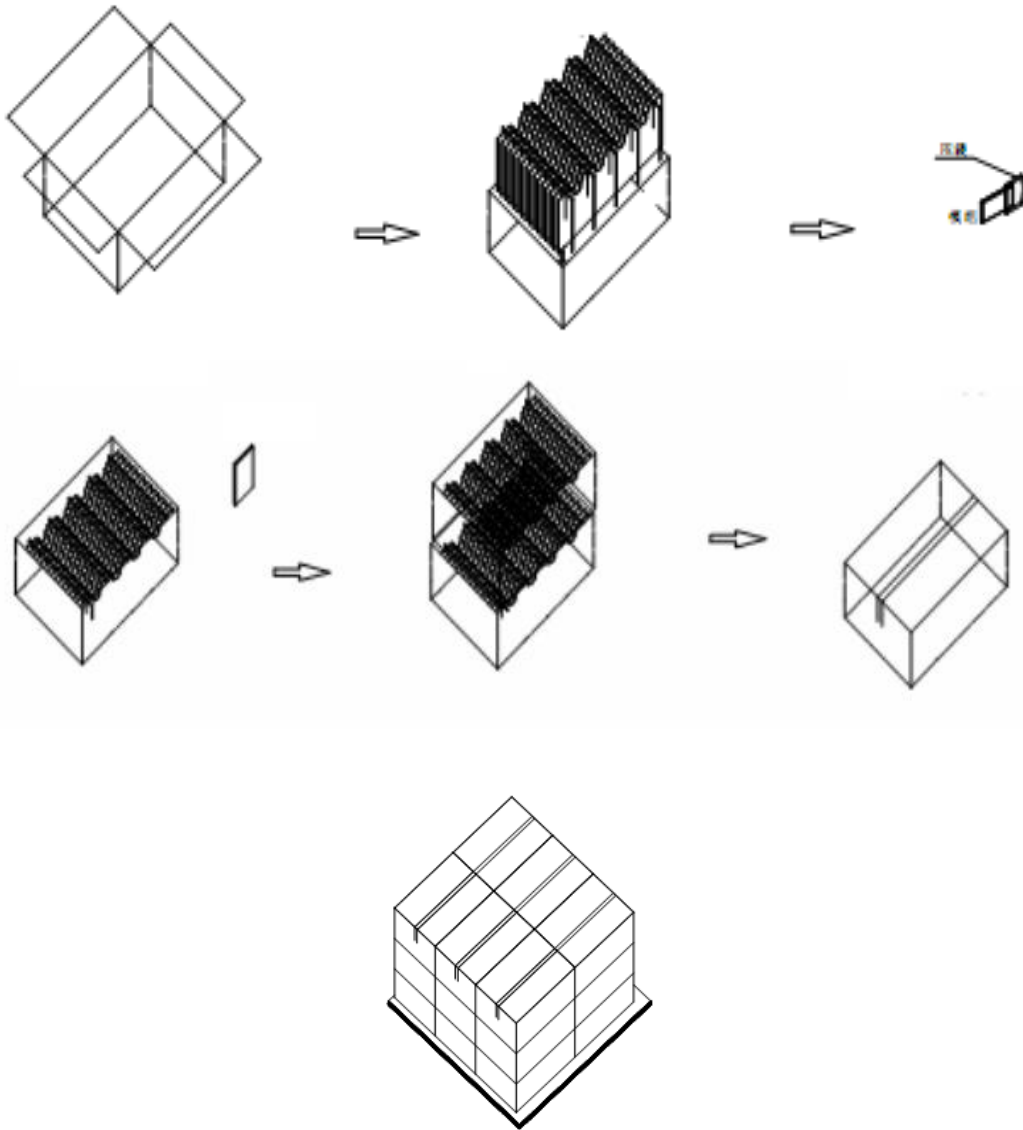
LED

LED

PN	SYMBOL	QTY
1	NC	
2	VDD	
3	VDD	
4	NC	
5	RESET	
6	STRBY	
7	GND	
8	RxIn0-	
9	RxIn0+	
10	GND	
11	RxIn1-	
12	RxIn1+	
13	GND	
14	RxIn2-	
15	RxIn2+	
16	GND	
17	RxClK-	
18	RxClK+	
19	GND	
20	RxIn3-	
21	RxIn3+	
22	GND	
23	SDA	
24	SCL	
25	GND	
26	CS	
27	NC	
28	LUBIT	
29	NC	
30	GND	
31	LEBK-	
32	LEBK+	
33	NC	
34	NC	
35	NC	
36	NC	
37	NC	
38	NC	
39	LED+	
40	LED+	

## 10. Packing

### Packing Method



#### Steps:

1. Put module into tray cavity
2. Tray stacking
3. Put 1 cardboard under the tray stack and 1 cardboard above
4. Fix the cardboard to the tray stack with adhesive tape
5. Put the tray stack into carton
6. Carton sealing with adhesive tape

## 11. Precautions for Use of LCD modules

### 11.1 Handling Precautions

11.1.1. The display panel is made of glass. Do not subject it to a mechanical shock by dropping it from a high place, etc.

11.1.2. If the display panel is damaged and the liquid crystal substance inside it leaks out, be sure not to get any in your mouth, if the substance comes into contact with your skin or clothes, promptly wash it off using soap and water.

11.1.3. Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary.

11.1.4. The polarizer covering the display surface of the LCD module is soft and easily scratched. Handle this polarizer carefully.

11.1.5. If the display surface is contaminated, breathe on the surface and gently wipe it with a soft dry cloth. If still not completely clear, moisten cloth with one of the following solvents:

- Isopropyl alcohol
- Ethyl alcohol

Solvents other than those mentioned above may damage the polarizer. Especially, do not use the following:

- Water
- Ketene
- Aromatic solvents

11.1.6. Do not attempt to disassemble the LCD Module.

11.1.7. If the logic circuit power is off, do not apply the input signals.

11.1.8. To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.

11.1.8.1. Be sure to ground the body when handling the LCD Modules.

11.1.8.2. Tools required for assembly, such as soldering irons, must be properly ground.

11.1.8.3. To reduce the amount of static electricity generated, do not conduct assembly and other work under dry conditions.

11.1.8.4. The LCD Module is coated with a film to protect the display surface. Be care when peeling off this protective film since static electricity may be generated.

### 11.2 Storage Precautions

11.2.1. When storing the LCD modules, avoid exposure to direct sunlight or to the light of fluorescent lamps.

11.2.2. The LCD modules should be stored under the storage temperature range if the LCD modules will be stored for a long time, the recommend condition is:

Temperature: 0°C ~40°C; Relative humidity: ≤80%

11.2.3. The LCD modules should be stored in the room without acid, alkali and harmful gas.

### 11.3 Transportation Precautions

The LCD modules should be no falling and violent shocking during transportation, and also should avoid excessive press, water, damp and sunshine.