



## 8 inch TFT Display Series

**GDTL080LL-S02**

Dalian Good Display Co., Ltd.



- Tentative Specification
- Preliminary Specification
- Approval Specification

# MODEL NAME: GDTL080LL-S02

## Version: D3

<b>Customer: Common</b>	
<b>APPROVED BY</b>	<b>SIGNATURE</b>
<b>Name / Title</b> _____	_____
Note	
_____	
Please return 1 copy for your confirmation with your signature and comments.	

Approved By	Checked By	Prepared By
		



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GOODDISPLAY



## 1. Technology Specifications

### 1.1 Features

Item	Standard Value
Display	1280(RGB) x 720
LCD Type	Normally Black
Viewing Direction	Landscape Mode Optimized
Backlight	3 parallels 7 serials
Interface	LVDS
Display Colors	16.7M

### 1.2 Mechanical Specifications

Item	Standard Value	Unit
Outime Dimension	192.8 (H)×116.9 (V)×6.4 (D)	mm
Active Area	176.64 (H)×99.36(V)	mm
Pixel pitch	0.138(H)×0.138(V)	mm
LCM Luminance	650(Min)	cd/m <sup>2</sup>

**Note: For detailed information please refer to LCM drawing**

### 1.3 Absolute Maximum Ratings

Item	Symbol	Condition	Min	Max	Unit
Power Voltage	VDD	-	-0.3	3.96	V
	VGH	-	-0.3	+40	V
	VGL	-	-25	+0.3	V
Operating Temperature	T <sub>OP</sub>	-	-30	85	°C
Storage Temperature	T <sub>ST</sub>	-	-40	90	°C
Storage Humidity	H <sub>D</sub>	T <sub>a</sub> <60°C	-	80	%RH

Note: The absolute maximum rating values of this product not allowed to be exceeded at any times. Should be module be used with any of absolute maximum ratings exceeded. The characteristics of the module may not be recovered, or in an extreme case, the module may be permanently destroyed.

## 1.4 Electrical Characteristics

VCC = 2.4~5.0V, VDD3=1.65~3.3V, VSS = 0V, Ta = 25°C

Item	Symbol	Min	Typ	Max	Unit	Remark
Power voltage	DVDD	3.0	3.3	3.6	V	Note2
	VGH	17	18	19	V	
	VGL	-12.0	-11.0	-10.0	V	
Input signal voltage	VCOM	-	-	-	V	
Input logic high voltage	V <sub>IH</sub>	-0.1	-	-	V	Note3
Input logic low voltage	V <sub>IL</sub>	0.2	-	0.6	V	

## 1.5 Optical Characteristics

Ta = 25°C

Item	Symbol	Conditions	Min	Typ	Max	Refernce
View Angle	θX+	C > 10, ∅=0°	80	85	-	(1)(2)(3)(4)
	θX-		80	85	-	
	θY+		80	85	-	
	θY-		80	85	-	
Contrast Ratio	C	θ=0°, ∅=0°	600	900	-	(1) (2)
Response Time(rise+falling)	Trt	θ=0°, ∅=0°	-	35ms	40ms	(1)(3)
LCM luminance	B	θ=0°, ∅=0°	650	800	-	cd/m <sup>2</sup>
CF Color Chromaticity (CIE 1931)	white	x	(Typ -0.03)	0.30	(Typ +0.03)	(1)(2) (3) θ <sub>x</sub> =θ <sub>y</sub> =0
		y		0.33		
NTSC	-	-	70	75	-	(1) θ <sub>x</sub> =θ <sub>y</sub> =0

**Note (1) Measurement Setup:**

The LCD module should be stabilized at given ambient temperature (25°C) 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.

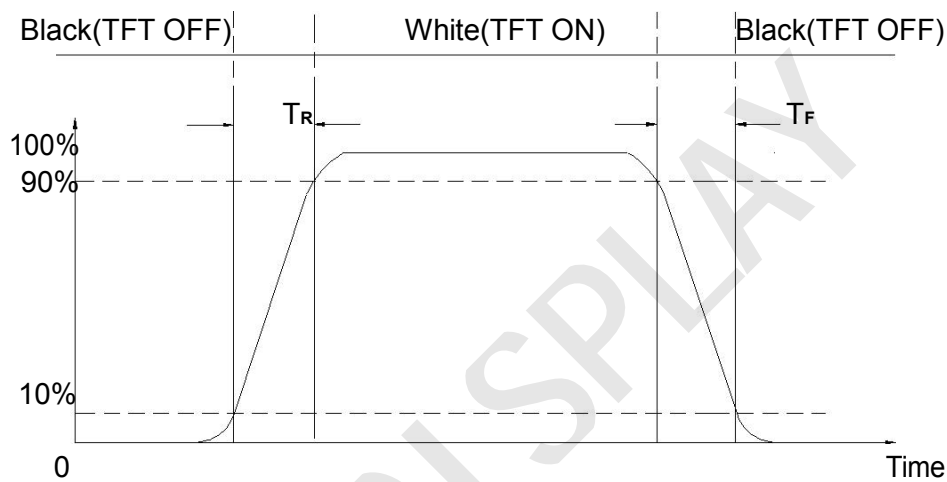
**Note (2) Definition of Contrast Ratio (CR):**

The contrast ratio can be calculated by the following expression:

$$\text{Contrast Ratio (CR)} = L_{255} / L_0$$

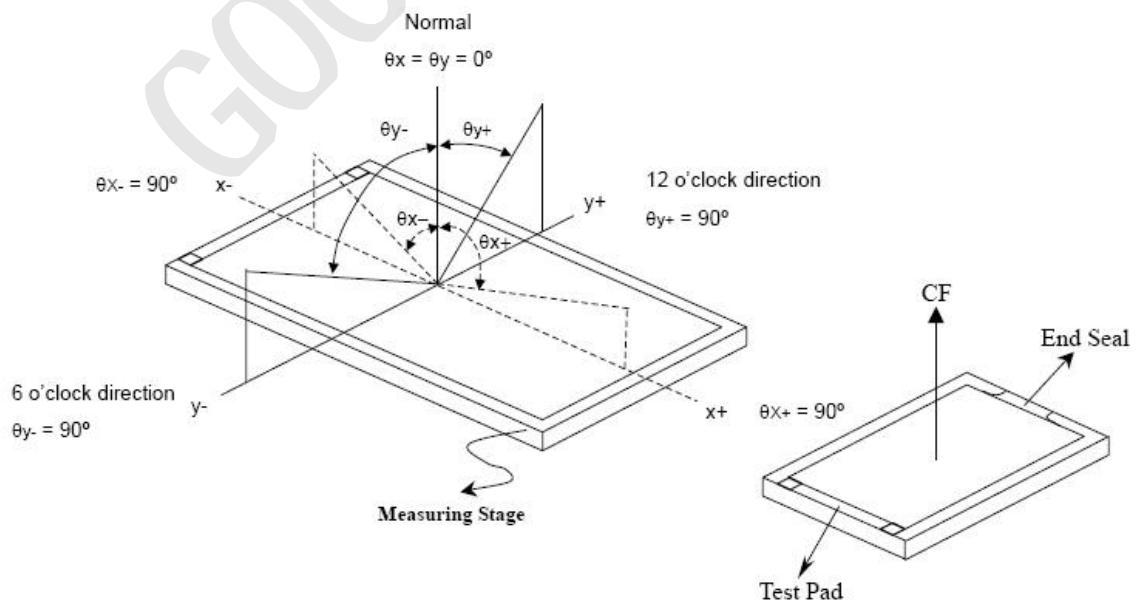
L255: Luminance of gray level 255, L0: Luminance of gray level 0

**Note (3) Definition of Response Time (TR, TF):**



Definition of Response Time

**Note(4) Definition of Viewing Angle:**



## 2. Module Structure

### 2.1 Interface Pin Description

No	Symbol	I/O	Description	Remark
1	NC	-	MUST be non-connection.	
2	VDD	P	Power supply 3.3V(Type)	
3	VDD	P	Power supply 3.3V(Type)	
4	GND	P	Power Ground	
5	RESET	I	Global reset signal	
6	STBYB	I	Standby mode control signal	
7	GND	P	Power Ground	
8	SDA	I/O	Not connect	
9	SCL	I	Not connect	
10	CSB	I	Not connect	
11	GND	P	Power Ground	
12	TB	I	Vertical shift direction (gate output) selection	
13	RL	I	Horizontal shift direction (source output) selection	
14	GND	P	Power Ground	
15	LV0N	I	Negative LVDS Differential data input(0)	
16	LV0P	I	Positive LVDS Differential data input(0)	
17	GND	P	Power Ground	
18	LV1N	I	Negative LVDS Differential data input(1)	
19	LV1P	I	Negative LVDS Differential data input(1)	
20	GND	P	Power Ground	
21	LV2N	I	Negative LVDS Differential data input(2)	
22	LV2P	I	Positive LVDS Differential data input(2)	
23	GND	P	Power Ground	
24	CLKN	I	Negative LVDS Differential clock input	
25	CLKP	I	Positive LVDS Differential clock input	
26	GND	P	Power Ground	
27	LV3N	I	Negative LVDS Differential data input(3)	
28	LV3P	I	Positive LVDS Differential data input(3)	
29	GND	P	Power Ground	
30	VDDOT	P	Power input for OTP programming	

Note1: All of GND pins should be connected to system ground.

Note2: I/O definition.

I---Input, O---Output, P--- Power/Ground, N--- No connection

Note3: VCOM is DC power supply

Note4:

Scan Control		Scanning Direction
TB	RL	
L	H	Bottom →Top, Left →Right
H	L	Top →Bottom, Right →Left
H	H	Top →Bottom, Left →Right
L	L	Bottom →Top, Right →Left

Scan direction Description

The recommended resistance of pull high/low resistor in UPDN or SHLR pin is 4.7K ohm.

## 2.2 Backlight Pin

PIN NO.	Symbol
1	A
2	A
3	A
4	NC
5	NTC+
6	NTC -
7	NC
8	C3
9	C2
10	C1

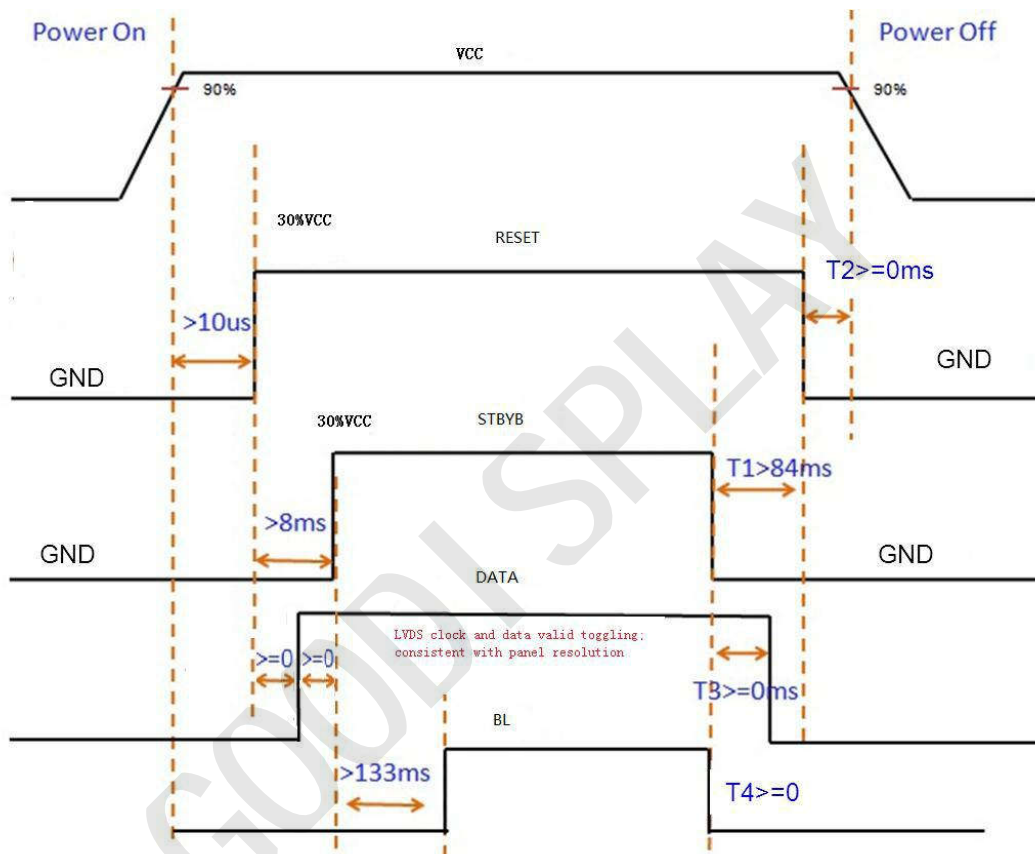
Connectortype:FH28-10S-0.5SH Hirose;

### 3. Signal timing diagram

#### 3.1 Signal Timing Diagram

##### 3.1.1 Power ON/OFF Sequence

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



Note1: The low level of these signals and analog powers are GND level.

Note2: All of power and signals should be kept GND level before power on.

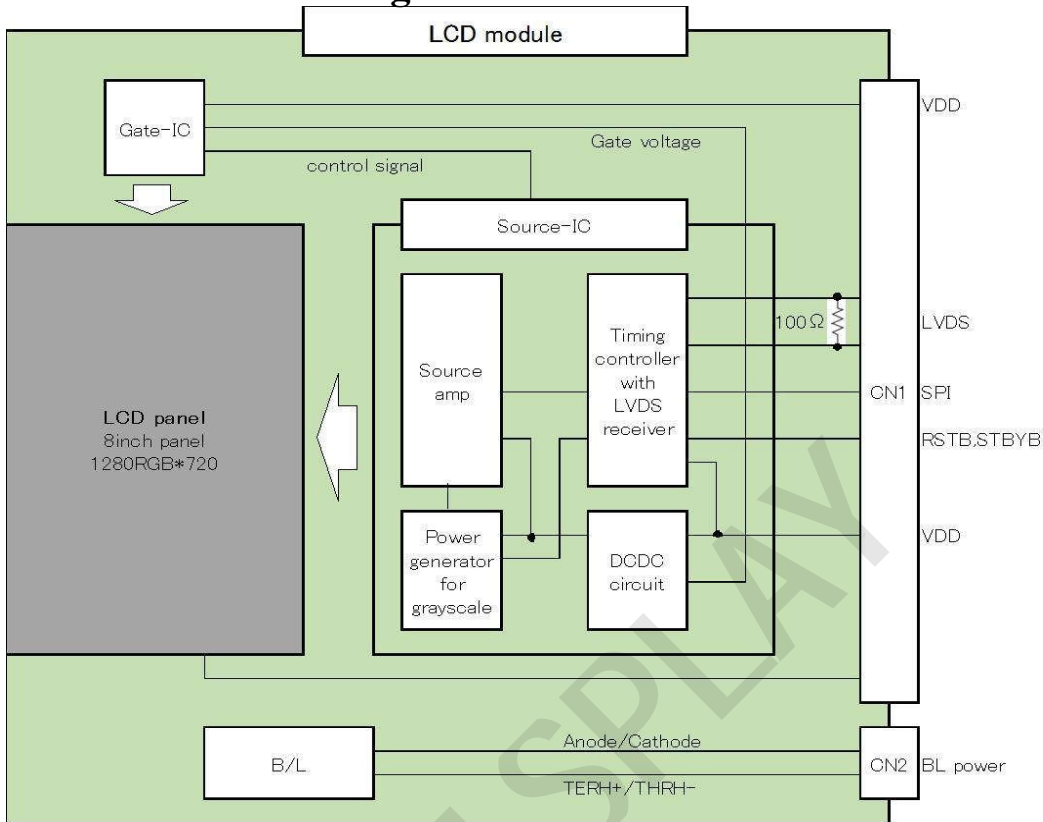
IF there are remaining voltages on them, LCD might become abnormal.

Note3: BL is the voltage applied to backlight, and it will stay low level before display stability; and it need to be turned off before STBYB off, refer to T4 in above figure.

Note4: DATA stands for LVDS signals. The valid LVDS signals (clock pair and data pairs in toggling state) should be consistent with panel solution and timing specification.



### 3.1.2 LCD Block Diagram



### 3.1.3 DC Characteristics for Backlight Driving

Item	Symbol	Min	Typ	Max	Unit	Remark
Forward Current	$I_{BL}$	-	95	-	mA	Note1
Forward Voltage	$V_{BL}$	18.9	21.7	23.8	V	
LED Life Time	-	30000	100000	-	Hrs	Note2
Backlight Power Consumption		0	6.2	6.8	W	

LED backlight characteristics

Note 1:  $I_{BL}$  is defined for one channel LED, There are total three LED channels in back light unit Under LCM operating, and the stable forward current should be inputted.

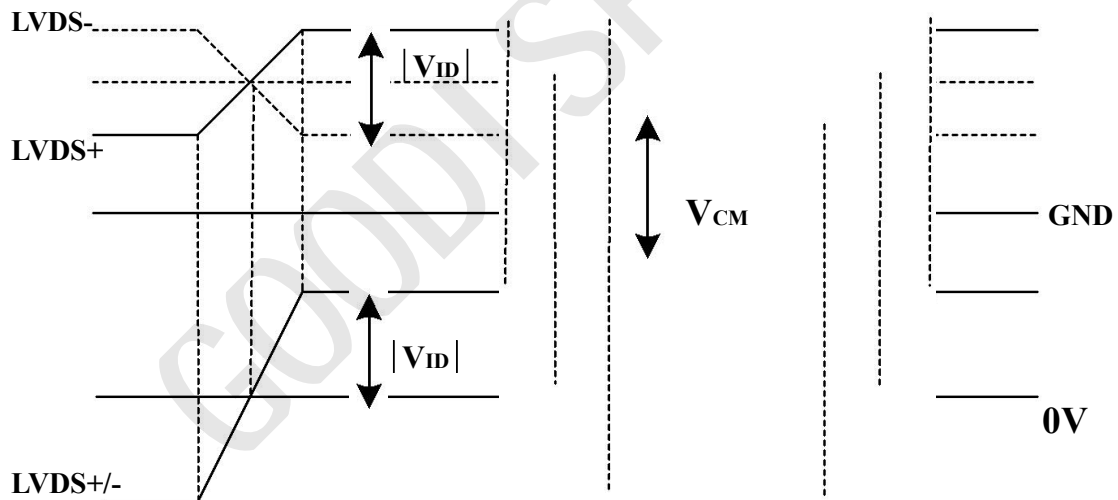
Note 2: It is estimation result based on LED supplier data. Optical performance should be evaluated at  $T_a=25^{\circ}\text{C}$  only. Operating life means brightness goes down to 50% of original brightness.

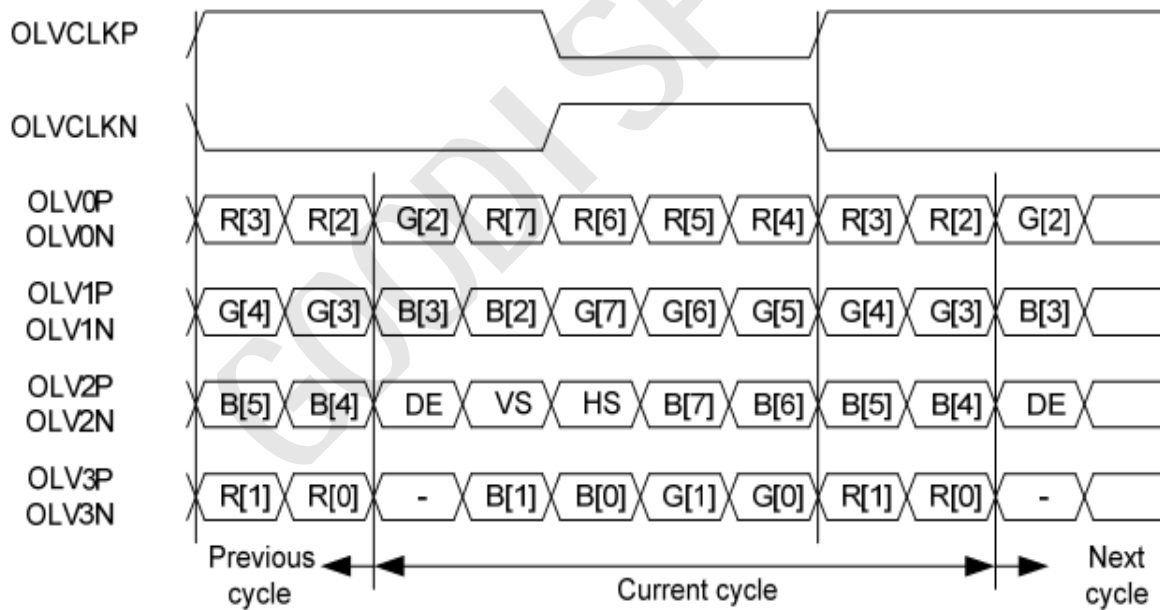
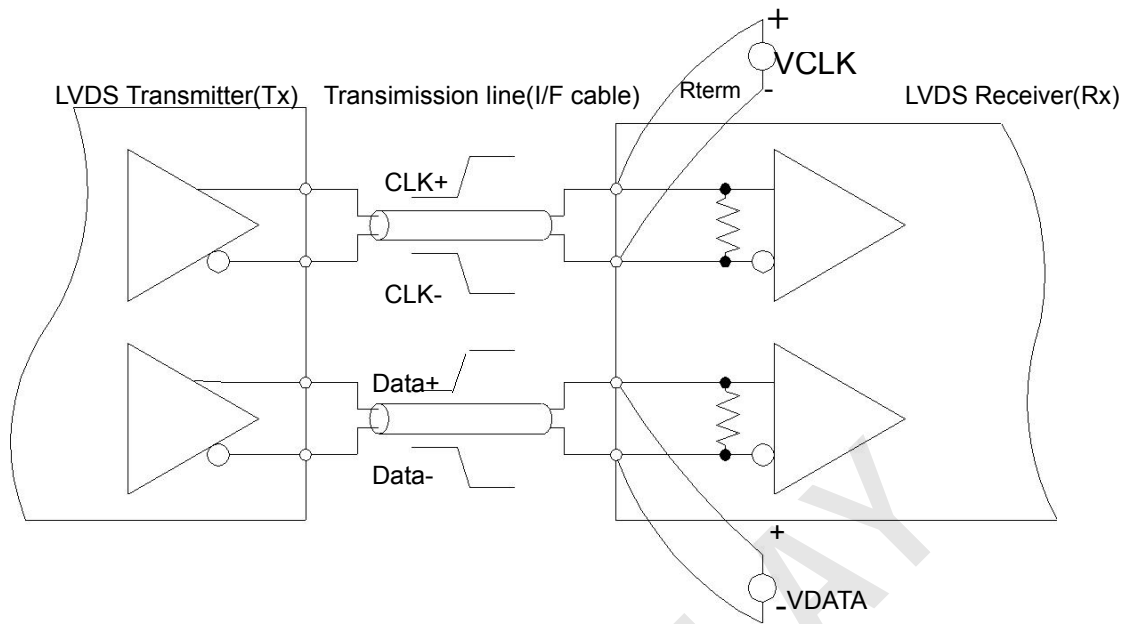
### 3.1.4 Signal Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Differential Input High Threshold	Vth	(+100)	-	-	mV	V <sub>CM</sub> =+1.2V
Differential Input Low Threshold	Vtl	-	-	(-100)	mV	V <sub>CM</sub> =+1.2V
Magnitude Differential Input Voltage	V <sub>ID</sub>	(300)	-	(600)	mV	-
Common Mode Voltage	V <sub>CM</sub>	(1)	(1.2)	(1.7- V <sub>ID</sub>  /2)	V	-
Common Mode Voltage Offset	ΔV <sub>CM</sub>	-	-	(200)	mV	-

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

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





### 3.1.5 Timing Diagram (DE Mode)

Parameter	Symbol	1280*720 RGB (One Port)			Unit
		Min.	Typ.	Max.	
DCLK frequency	$F_{DCLK}$	57.6	58.1	70	MHz
Horizontal valid data	$t_{hd}$	1280			DCLK
1 horizontal line	$t_h$	1320	1322	1536	DCLK
Vertical valid data	$t_{vd}$	720			H
1 vertical field	$t_v$	727	733	760	H
Frame rate	FR	-	60	-	Hz

It just needs DE signal only, when DE only mode enable.

• **Horizontal**

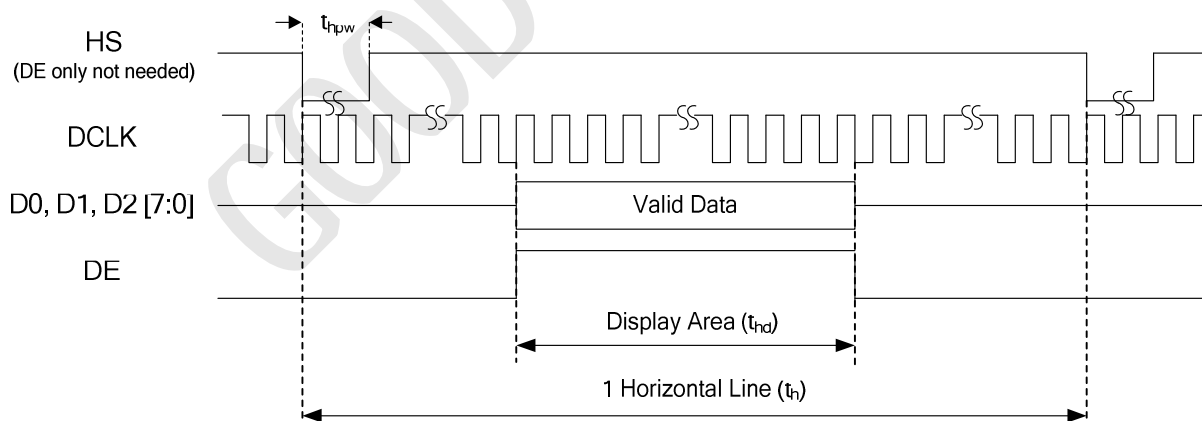


Figure 3.1.5: Horizontal input timing at DE only mode

## • Vertical

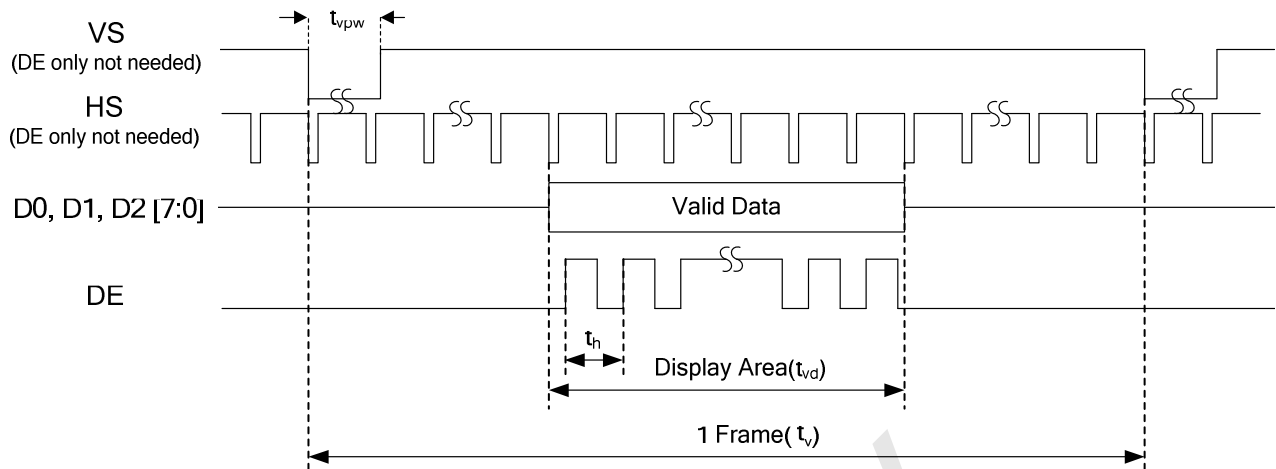


Figure 3.1.5: Vertical input timing at DE only mode

## 4 Reliability Test Conditions And Methods

NO	Item	Condition	Method
1	High / Low Temperature Storage	90°C/-40°C 240Hrs RH<=45% Restore 2H at 25°C	Check and record every 48Hrs
2	High / Low Temperature Operating	85°C/-30°C 240Hrs RH<=45% Restore 2H at 25°C	Check and record every 48Hrs
3	High Temperature、High Humidity Operating	60°C±2°C, 90±2%RH 240Hrs operation	Check and record every 48hrs
4	Thermal Shock (Non operating mode)	-40°C→ change→+85°C 30min 30s 30min 100cycle	Each 10 cycles end , check
5	Static Electricity	Air discharged ±15KV Connected discharged ±8KV 9 points, 5times/point	Air discharged ±15KV Connected - discharged ±8KV 9 points, 5times/point

## **5. PRECAUTION RELATING PRODUCT HANDLING**

### **5.1 SAFETY**

- 5.1.1** If the LCD panel breaks , be careful not to get the liquid crystal to touch your skin.
- 5.1.2** If the liquid crystal touches your skin or clothes , please wash it off immediately by  
using soap and water.

### **5.2 HANDLING**

- 5.2.1** Avoid any strong mechanical shock which can break the glass.
- 5.2.2** Avoid static electricity which can damage the CMOS LSI—When working with the module, be sure to ground your body and any electrical equipment you may be using.
- 5.2.3** Do not remove the panel or frame from the module.
- 5.2.4** The polarizing plate of the display is very fragile. So , please handle it very carefully, Do not touch, push or rub the exposed polarizing with anything harder than an HB pencil lead (glass , tweezers , etc.)
- 5.2.5** Do not wipe the polarizing plate with a dry cloth, as it may easily scratch the Surface of plate.
- 5.2.6** Do not touch the display area with bare hands , this will stain the display area.
- 5.2.7** Do not use ketonic solvent & aromatic solvent. Use with a soft cloth soaked with A cleaning naphtha solvent.
- 5.2.8** To control temperature and time of soldering is  $280 \pm 10^{\circ}\text{C}$  and 3-5 sec.
- 5.2.9** To avoid liquid (include organic solvent) stained on LCM.

### **5.3 STORAGE**

- 5.3.1** Store the panel or module in a dark place where the temperature is  $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$  and the humidity is below 65% RH.
- 5.3.2** Do not place the module near organics solvents or corrosive gases.
- 5.3.3** Do not crush, shake , or jolt the module.

## **6 、 Outline Figure**

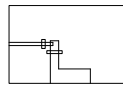




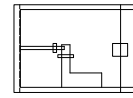
**7、Packing assembly drawings**



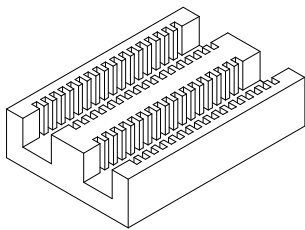
1. packing bag



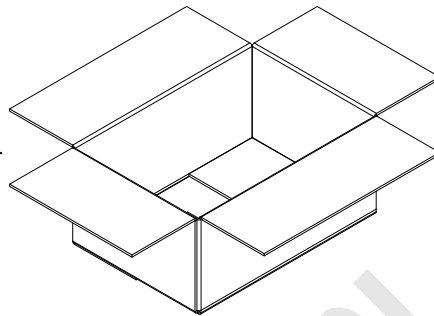
2. LCM



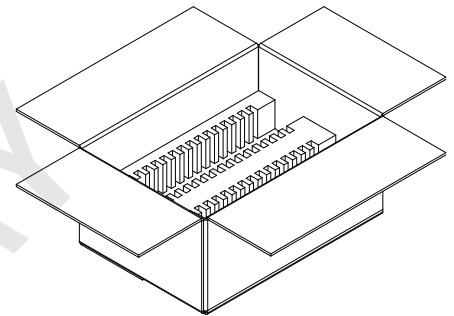
3. LCM into the packaging bag (backlight line facing inward), Seal the opening of the packing bag with sticky tape



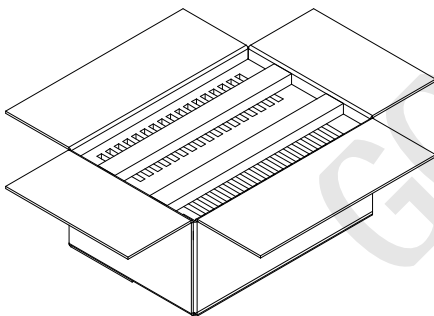
4. Bottom pearl wool



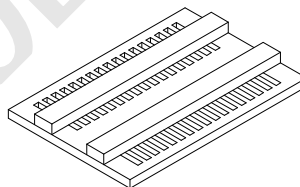
5. BOX



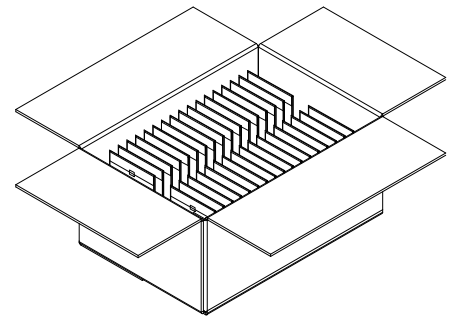
6. Put the bottom pearl wool into the box



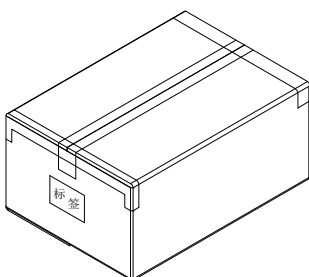
9. Cover with Top pearl wool



8. Top pearl wool



7. Put the products in the packaging bag, 1PCS for each card slot, with the backlight line facing down



10. Seal the case with transparent adhesive into "work" type seal, affixed to the outer label

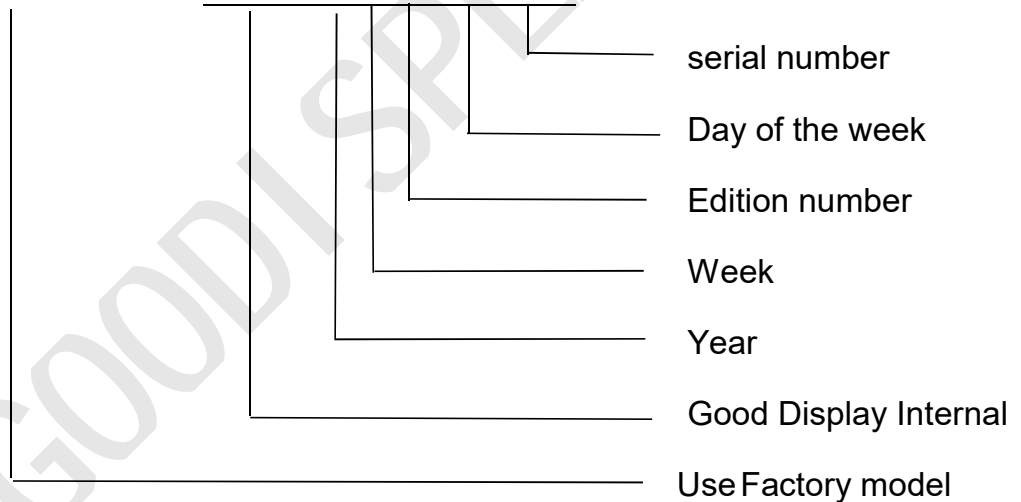
### 8. GOOD DISPLAY MODULE LABEL

The barcode nameplate is pasted on each module as illustration, and its definitions are as following explanation.



(a) Model Name: GDTL080LL-S02

(b) Serial ID: XXXXXXXXXXX-XX XXXXX Y W XX X XXXX



Serial ID includes the information as below:

(a) Manufactured Date:

Year: 00~99, ... 2019=19, 2020=20, 2021=21..., 2028=28.

Week: 01~56, first week of the year=01; second week of the year=02; ...

Day of the week: A~G=Monday~Sunday

(b) Edition number: cover all the change; A1, A2... Sample order;

C for mass production, C1, C2... change of order

(c) Serial No.: Manufacturing sequence of product