

TFT-DISPLAY DATASHEET

ONation
Model: OT080ZGDDDN-00

BRIEF SPEC.:

Main Feature

Landscape Type

White LED Backlight

Active Screen Area	176,64 x 99.36 [mm]
Diagonal Format	8" 15:9
Resolution	800 x 480
Colors	R.G.B Vertical Stripe
Backlight	LED, White
Brightness	450 cd/m ²
LED Life Time	20,000h (Typ.)
Interface	TTL
Viewing Angle	-60~70(H), -40~50(V)
Touchscreen	No
Power Supply	3,3V (Typ.)
Module Outline	176.64 x 116.9 x 6.4 [mm]
Operation Temperature	-30... +85 °C
Storage Temperature	-30... +85 °C
Surface Treatment	N/A



ONation Corporation

TFT COLOR LCD MODULE

MODEL: OT080ZGDDDN-00
(Complied with RoHS)

WVGA
TTL interface

Version: P0.1

Customer : _____
Approved By : _____
Date: _____

ONATION		
APPROVAL	CHECKER	PREPARE
<i>Ian</i>	<i>Josh</i>	<i>Aiden</i>

All information is subject to change without notice.
Please confirm the sales representative before starting to design your system

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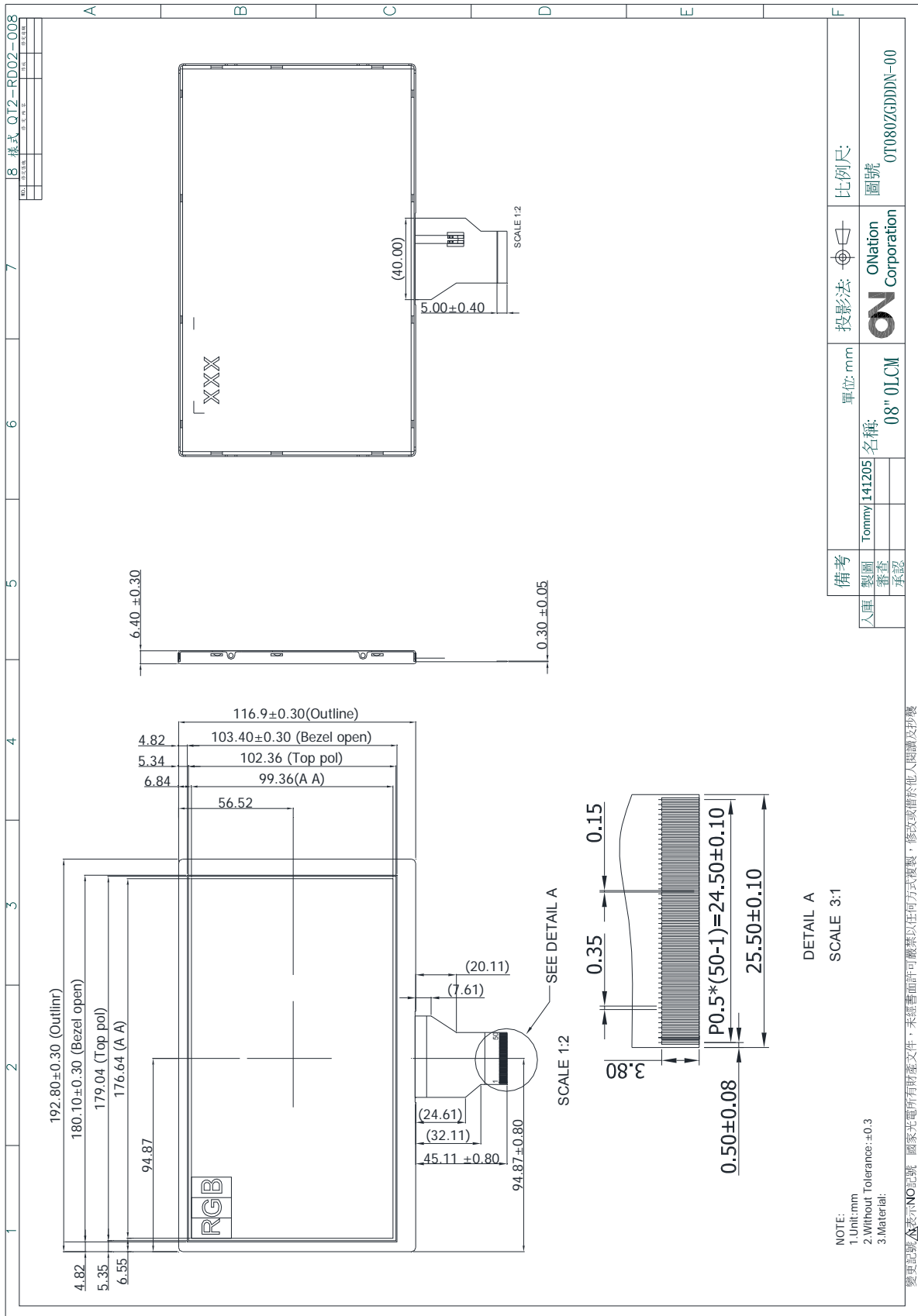
1.RECORD OF REVISION

Rev	DATE	PAGE	SUMMARY
0.1	2014.12.11	ALL	Preliminary specification was first issued.

2.MECHANICAL SPECIFICATIONS

(1)	Number Of Dots (Dots)	800X3(R.G.B) X 480
(2)	Module Size(mm)	192.8(W) X 116.9(H) X 6.4(D)
(3)	Active Area(mm)	176.64(H) X99.36(V)
(4)	Dot Pitch(mm)	0.0736(H) X 0.2070(V)
(5)	LCD / Polarizer Model	TFT , Transmissive, Normally White
(6)	LED Backlight Color	White
(7)	Viewing Direction	12O'Clock. Horizontal :Right side 70°(Typ),Left side70°(Typ) Vertical: Up side 50°(Typ),Down side 70°(Typ)
(8)	Gray Scale Inversion Direction	6O'Clock.
(9)	Color Configuration	R.G.B Vertical Stripe
(10)	Module Weight(g)	TBD

3. OUTLINE DIMENSIONS



4. INTERFACE PIN CONNECTION

4.1 LCM PANEL DRIVING SECTION

FPC Connector is used for the module electronics interface . The recommended model is FH12A-50S-0.5SH manufactured by Hirose.

PIN NO.	SYMBOL	FUNCTION	REMARKS
1	VLED+	Power for LED backlight (Anode)	
2	VLED+	Power for LED backlight (Anode)	
3	VLED-	Power for LED backlight (Cathode)	
4	VLED-	Power for LED backlight (Cathode)	
5	GND	Power ground	
6	VCOM	Common voltage	
7	VCC	Power for Digital Circuit	
8	MODE	DE/SYNC mode select	Note1
9	DE	Data Input Enable	
10	VS	Vertical Sync Input	
11	HS	Horizontal Sync Input	
12	B7	Blue data(MSB)	
13	B6	Blue data	
14	B5	Blue data	
15	B4	Blue data	
16	B3	Blue data	
17	B2	Blue data	
18	B1	Blue data	Note 2
19	B0	Blue data(LSB)	Note 2
20	G7	Green data(MSB)	
21	G6	Green data	
22	G5	Green data	
23	G4	Green data	
24	G3	Green data	
25	G2	Green data	
26	G1	Green data	Note2
27	G0	Green data(LSB)	Note2
28	R7	Red data(MSB)	
29	R6	Red data	
30	R5	Red data	
31	R4	Red data	
32	R3	Red data	

33	R2	Red data	
34	R1	Red data	Note2
35	R0	Red data(LSB)	Note2
36	GND	Power Ground	
37	DCLK	Sample clock	Note3
38	GND	Power Ground	
39	L/R	Left / right selection	Note4,5
40	U/D	Up/down selection	Note4,5
41	VGH	Gate ON Voltage	
42	VGL	Gate OFF Voltage	
43	AVDD	Power for Analog Circuit	
44	RESET	Global reset pin.	Note6
45	NC	No connection	
46	VCOM	Common Voltage	
47	DITHB	Dithering function	Note7
48	GND	Power Ground	
49	NC	No connection	
50	NC	No connection	

Note 1: DE/SYNC mode select. Normally pull high.

When select DE mode, MODE="1", VS and HS can pull high or be ground.

When select SYNC mode, MODE="0", DE can pull high or be ground.

Note 2: When input 18 bits RGB data, the two low bits of R,G and B data must be grounded.

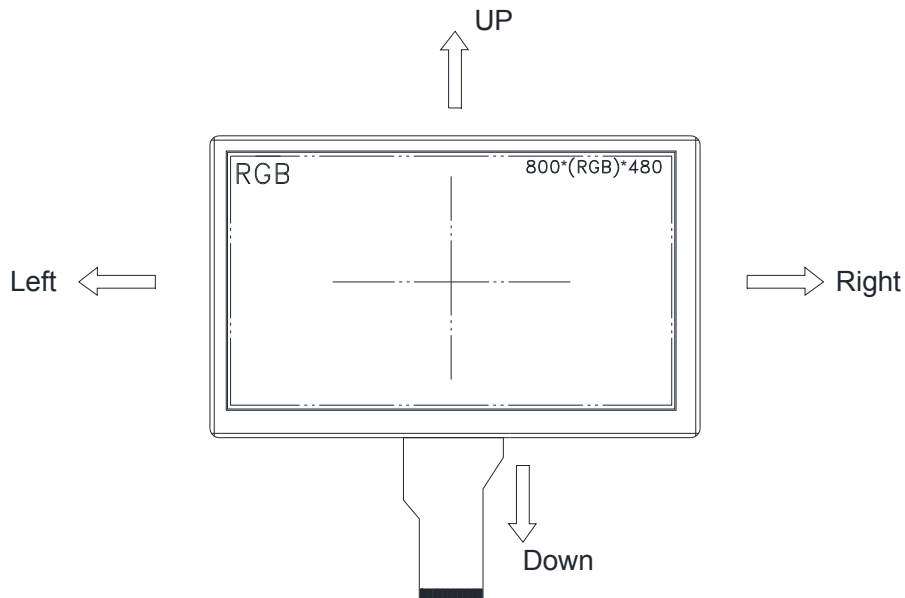
Note 3: Data shall be latched at the falling edge of DCLK.

Note 4: Selection of scanning mode

Setting of scan control input		Scanning direction
U/D	L/R	
GND	VCC	Up to down, left to right
VCC	GND	Down to up, right to left
GND	GND	Up to down, right to left
VCC	VCC	Down to up, left to right

Note 5: Definition of scanning direction

Refer to the figure as below:



Note 6: Global reset pin. Active low to enter reset state.

Suggest to connect with an RC reset circuit for stability.

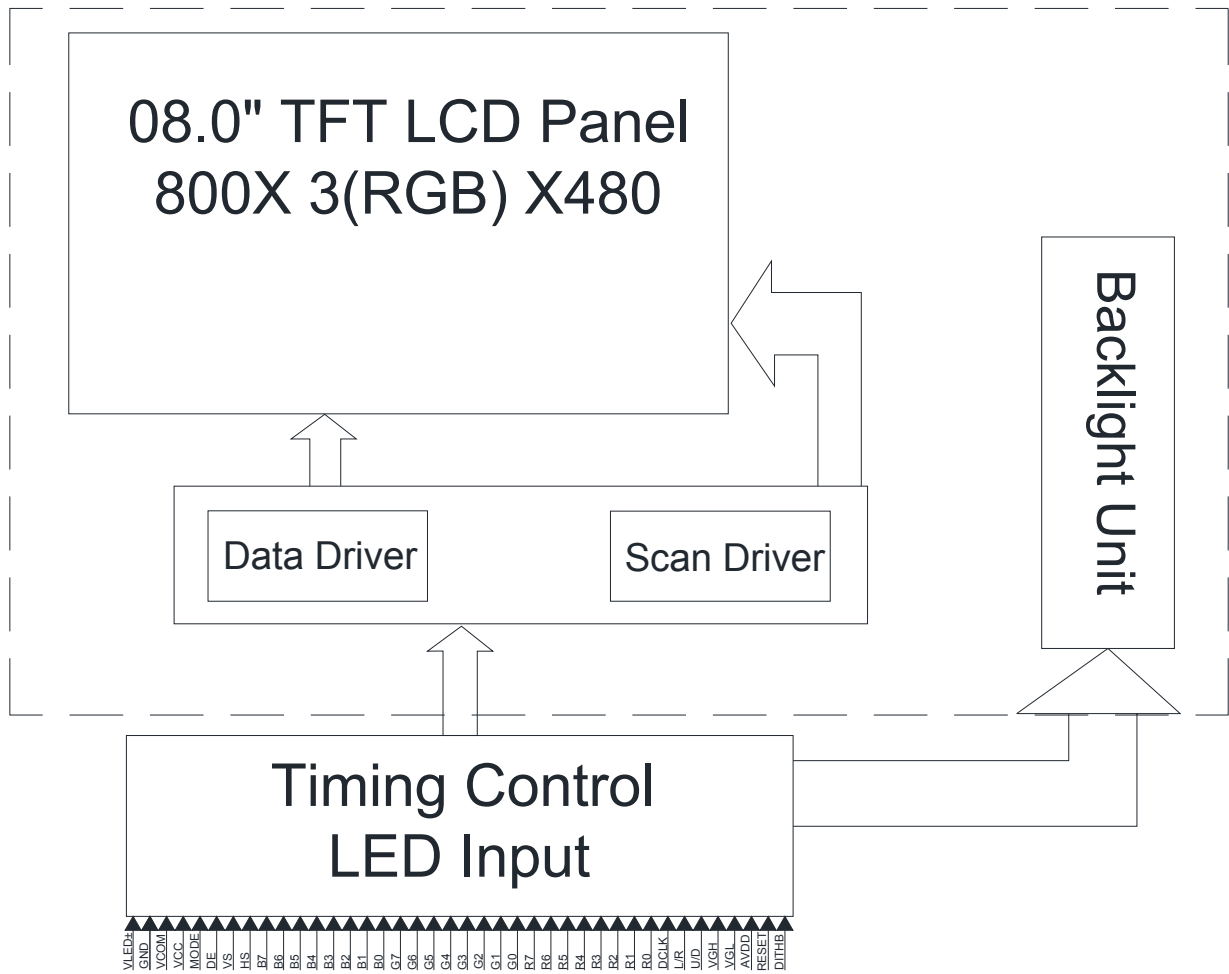
Normally pull high.

Note 7: Dithering function enable control, normally pull high.

When DITHB="1", Disable internal dithering function,

When DITHB="0", Enable internal dithering function,

5. BLOCK DIAGRAM



6.ABSOLUTE MAXIMUM RATINGS

6.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	MIN.	MAX.	UNIT	REMARK
Power voltage	VCC	-0.3	5.0	V	
	AVDD	6.5	13.5	V	
	VGH	-0.3	40.0	V	
	VGL	-20.0	0.3	V	
	VGH-VGL	-	40.0	V	
LED Reverse Voltage	VR	-	1.2	V	Each LED Note2
LED Forward Current	IF	-	25	mA	Each LED

Note1: 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.

Note2:VR Conditions : Zener Diode 20mA

6.2 ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS

ITEM	OPERATING		STORAGE		REMARK
	MIN	MAX	MIN	MAX	
Ambient Temperature(°C)	-30	85	-30	85	Note 1 , 2
Humidity(% RH)	Note3		Note3		Without condensation

Note 1 : The response time will become lower when operated at low temperature.

Note 2 : Background color changes slightly depending on ambient temperature.

Note 3 :Operation Ta=60°C &RH=90% ≤ 240Hrs

7.ELECTRICAL CHARACTERISTICS

7.1 ELECTRICAL CHARACTERISTICS OF LCD

Ta=25°C

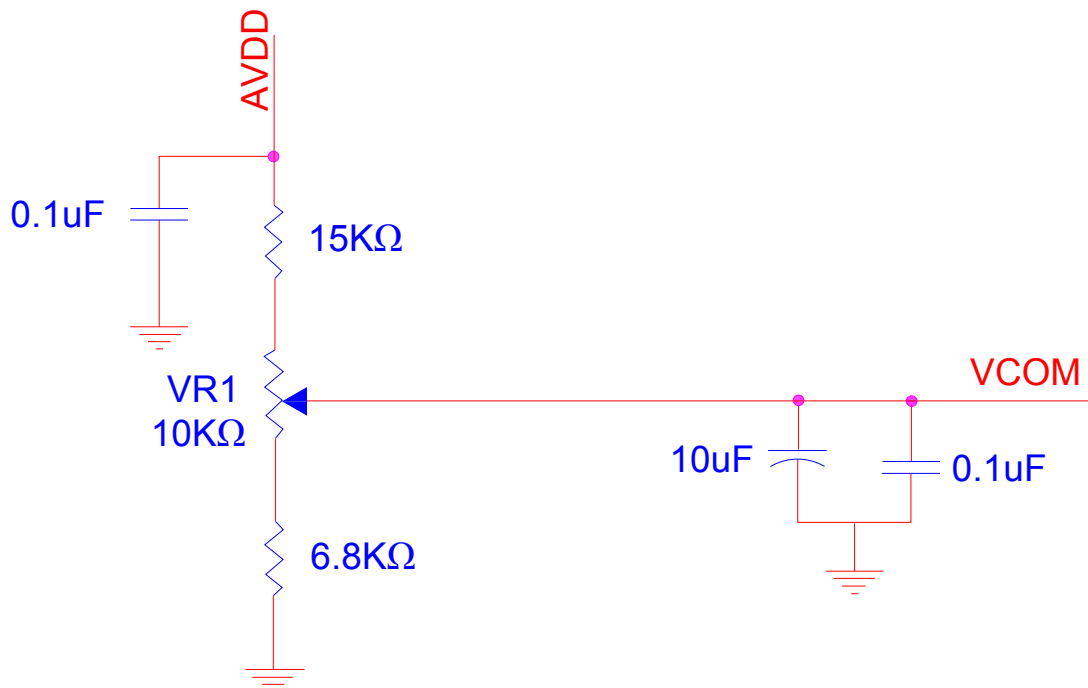
ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
Power voltage	VCC	3.0	3.3	3.6	V	Note2
	AVDD	10.2	10.4	10.6	V	
	VGH	15.3	16.0	16.7	V	
	VGL	-7.7	-7.0	-6.3	V	
Input signal voltage	VCOM	3.4	4.4	5.4	V	Note4
Input logic low voltage	VIH	0.7VCC	-	VCC	V	
Input logic low voltage	VIL	0	-	0.3VCC	V	

Note 1: Be sure to apply VCC and VGL to the LCD first, and then apply VGH.

Note 2: VCC setting should match the signals output voltage (refer to Note 3) of customer's system board.

Note 3: DCLK,HS,VS,RESET,U/D,L/R,DE,R0~R7,G0~G7,B0~B7,MODE,DITHB.

Note 4: Typ. Vcom is only a reference value, it must be optimized according to each LCM. Be sure to use VR;



7.2 BACKLIGHT UNIT

						Ta=25°C
ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
Voltage for LED backlight	VL	8.4	9.3	10.2	V	Note1
Current for LED backlight	IL	216	240	264	mA	
LED life time	-	20.000	-	-	Hr	Note2

Note 1: The LED Supply Voltage is defined by the number of LED at Ta=25°C and IL=240mA.

Note2: The “LED life time” is defined as the module brightness decrease to 50% original brightness at Ta=25°C and IL=240mA. The LED lifetime could be decreased if operating IL is larger than 240mA

8.OPTICAL CHARACTERISTICS

Ta=25°C

ITEM	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT	REMARK
Contrast Ratio	CR	Viewing Normal Angle $\Theta_x = \Theta_y = 0^\circ$	400	500	-	-	Note (1)
Response Time	T _{ON}		-	10	20	ms	Note (2)
	T _{OFF}		-	15	30	ms	
Chromaticity	White	W _x	0.260	0.310	0.360	-	Note (4)
		W _y	0.280	0.330	0.380	-	
Viewing Angle	Hor.	Θ_L	60	70	-	Deg.	Note (3)
		Θ_R	60	70	-		
	Ver.	Θ_T	40	50	-		
		Θ_B	60	70	-		
Luminance	L	IL=240mA	360	450	-	cd/m ²	-
Luminance uniformity	YU		70	75	-	%	Note (5)

*Note (1) Definition of Contrast Ratio (CR):

The contrast ratio can be calculated by the following expression.

$$\text{Contrast Ratio (CR)} = L_{63} / L_0$$

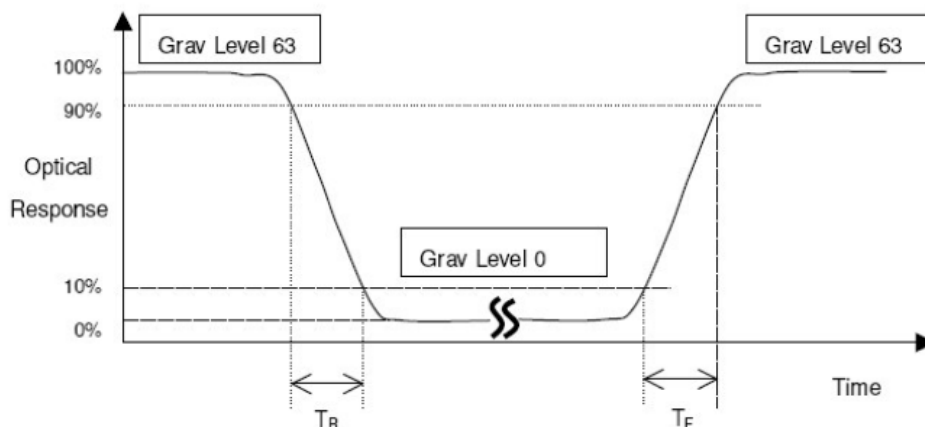
L₆₃: Luminance of gray level 63

L₀: Luminance of gray level 0

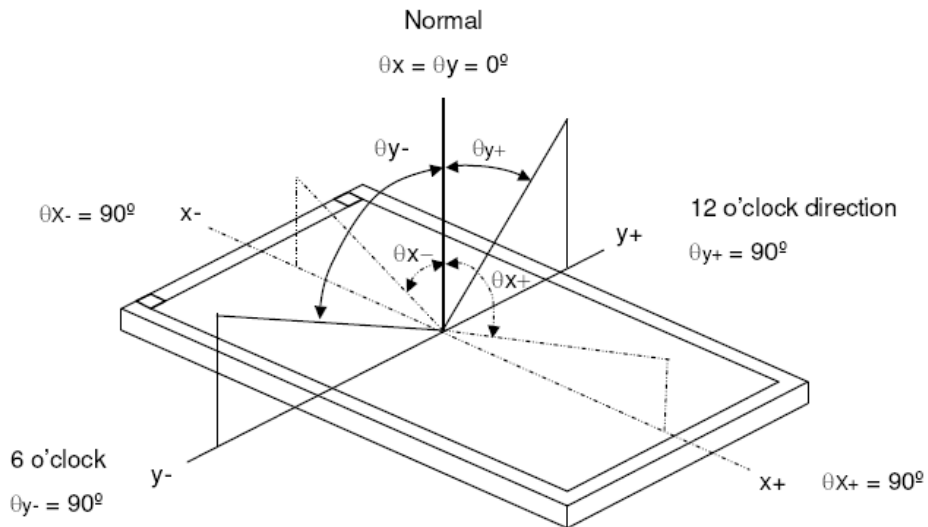
$$CR = CR (5)$$

CR (X) is corresponding to the Contrast Ratio of the point X at Figure in Note (5).

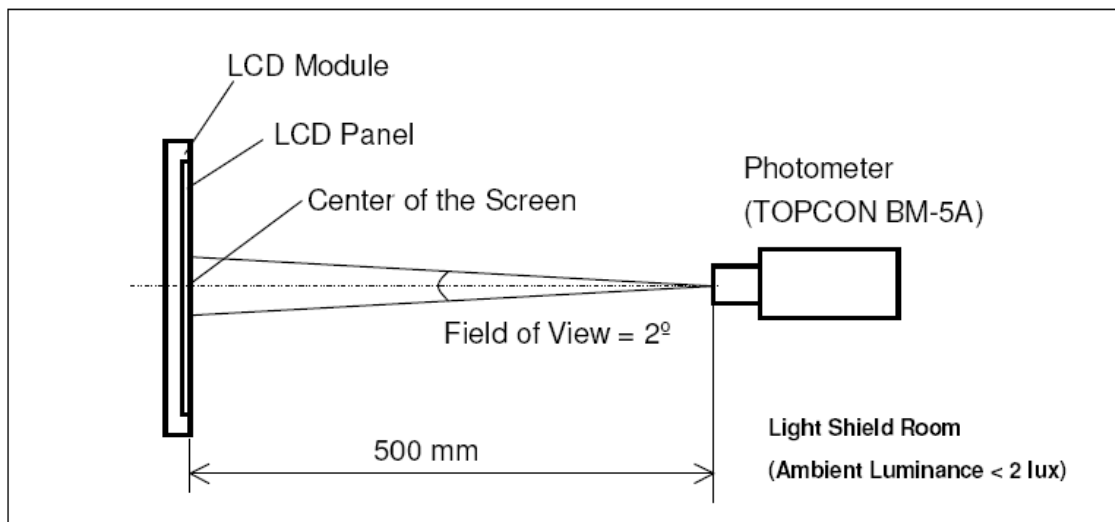
*Note (2) Definition of Response Time (T_R, T_F):



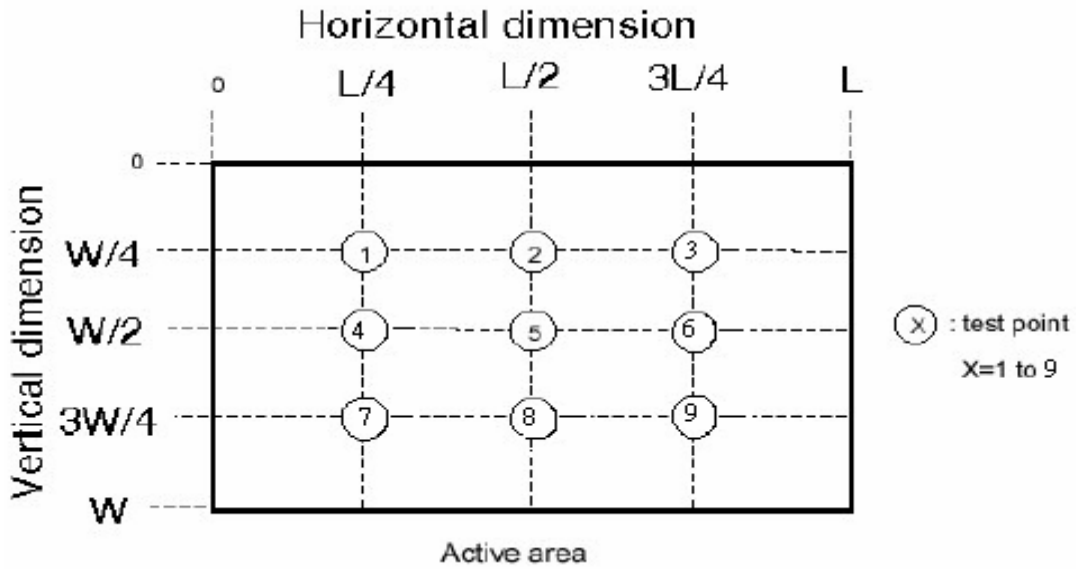
*Note(3) Definition of Viewing Angle



The LCD module should be stabilized at a given temperature for 20 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 20 minutes in a windless room.



*Note (5)

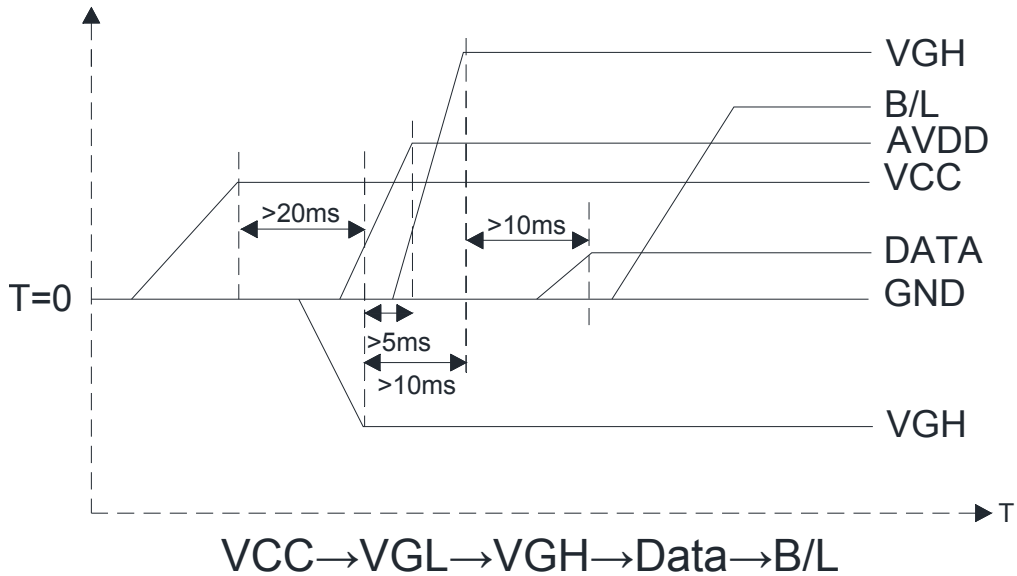


$$\left(1 - \frac{\text{MAX Luminance} - \text{Average Luminance}}{\text{Average Luminance}} \right) \times 100\% \geq 70\%$$

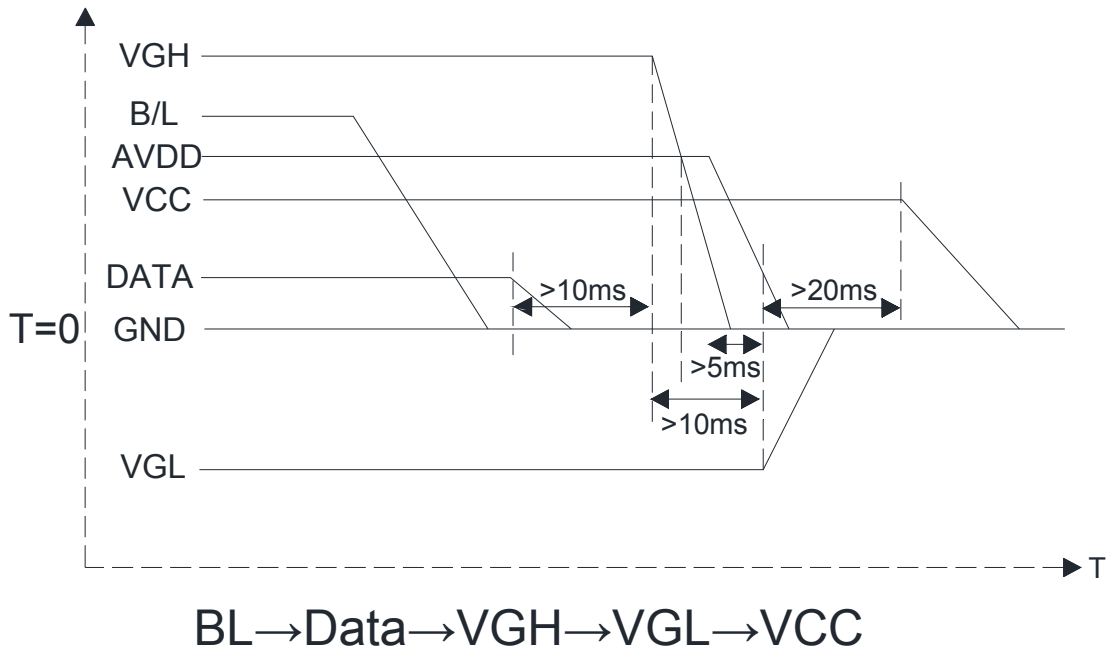
9. TIMING SPECIFICATIONS

9.1 Power Sequence

9.1.1 Power on:



9.1.2 Power off:



9.2 Timing Characteristics

9.2.1 AC Electrical Characteristics

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
HS setup time	Thst	8	-	-	ns	
HS hold time	Thhd	8	-	-	ns	
VS setup time	Tvst	8	-	-	ns	
VS hold time	Tvhd	8	-	-	ns	
VS setup time	Tdsu	8	-	-	ns	
Data hole time	Tdhd	8	-	-	ns	
DE setup time	Tesu	8	-	-	ns	
DE hole time	Tehd	8	-	-	ns	
VCC Power On Slew rate	Tpor	-	-	20	ms	From 0 to 90%VCC
RESET pulse width	Trst	1	-	-	ms	
DCLK cycle time	Tcoh	20	-	-	ns	
DCLK pulse duty	Tcwh	40	50	60	%	

9.2.2 Data Input Format

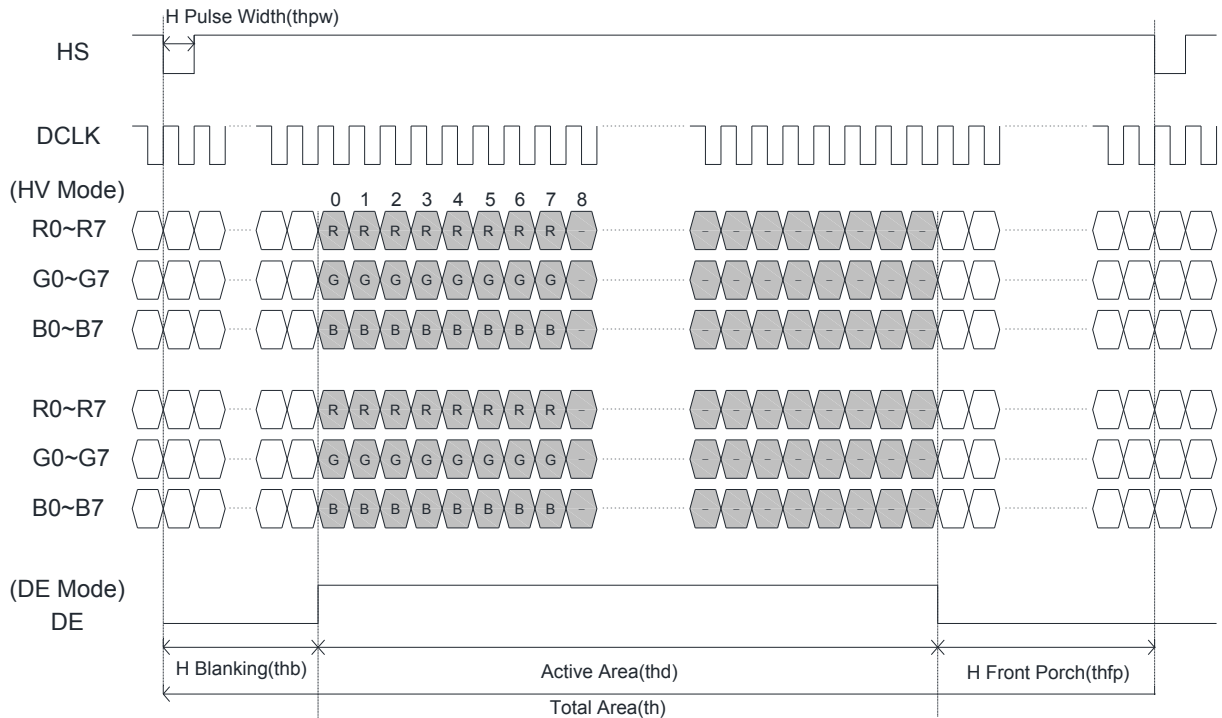


Figure 3.1 Horizontal input timing diagram

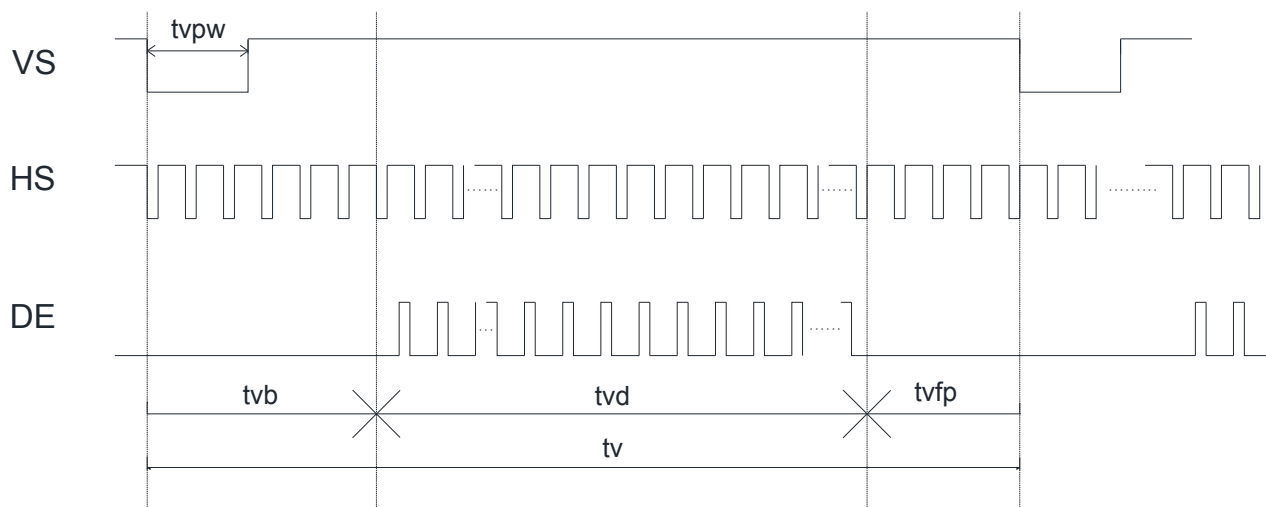


Figure 3.2 Vertical input timing diagram

9.2.3 Timing

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
Horizontal Display Area	thd	-	800	-	DCLK	
DCLK Frequency	fclk	26.4	33.3	46.8	MHz	
One Horizontal Line	th	862	1056	1200	DCLK	
HS pulse width	thpw	1	-	40	DCLK	
HS Blanking	thb	46	46	46	DCLK	
HS Front Porch	thfp	16	210	354	DCLK	

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
Vertical Display Area	tvd	-	480	-	TH	
VS period time	tv	510	525	650	TH	
VS pulse width	tvpw	1	-	20	TH	
VS Blanking	tvb	23	23	23	TH	
VS Front Porch	tvfp	7	22	147	TH	

10. RELIABILITY TEST

ENVIRONMENTAL TEST				
NO.	ITEM	CONDITIONS	TIME PERIOD	REMARK
1	High Temperature Storage	85°C	240HRS	Note1,4
2	Low Temperature Storage	-30°C	240HRS	Note1,4
3	High Temperature Humidity Storage	60°C, 90%RH	240HRS	Note4
4	High Temperature Operation	85°C	240HRS	Note2,4
5	Low Temperature Operation	-30°C	240HRS	Note1,4
6	Temperature Cycle	-30°C ~ 85°C (30min) (30min)	1HRS/100CYCLE	Note 4

Note1 : Ta is the ambient temperature of samples.

Note2 : Ts is the temperature of panel's surface.

Note3 : In the standard condition, there shall be no practical problem that may affect the display function. After the reliability test, the product only guarantees operation, but don't guarantee all of the cosmetic specification.

Note4 : Before cosmetic and function test, the product must have enough recovery time, at least 2 hours at room temperature.

11. LCM INSPECTION STANDARD

Inspection specifications refer ONation Corporation LCM INSPECTION STANDARD Document.

Document Number : TBD

12. PACKAGE INFORMATION

LCM Model	LCM Qty. in the box	Inner Box Size (mm)	Weight	REMARK
OT080ZGDDDN-00	TBD	TBD	TBD	

13. PRECAUTIONS FOR USE

13.1 SAFETY

- (1) Do not swallow any liquid crystal, even if there is no proof that liquid crystal is poisonous.
- (2) If the LCD panel breaks, be careful not to get liquid crystal to touch your skin.
- (3) If skin is exposed to liquid crystal, wash the area thoroughly with alcohol or soap.

13.2 STORAGE CONDITIONS

- (1) Store the panel or module in a dark place where the temperature is $23\pm 5^{\circ}\text{C}$ and the humidity is below $50\pm 20\% \text{RH}$.
- (2) Store in anti-static electricity container.
- (3) Store in clean environment, free from dust, active gas, and solvent.
- (4) Do not place the module near organics solvents or corrosive gases.
- (5) Do not crush, shake, or jolt the module.

13.3 HANDLING PRECAUTIONS

- (1) Avoid static electricity which can damage the CMOS LSI.
- (2) The polarizing plate of the display is very fragile. So, please handle it very carefully.
- (3) Do not give external shock.
- (4) Do not apply excessive force on the surface.
- (5) Do not wipe the polarizing plate with a dry cloth, as it may easily scratch the Surface of plate.
- (6) Do not use ketonics solvent & Aromatic solvent, use with a soft cloth soaked with a cleaning naphtha solvent.
- (7) Do not operate it above the absolute maximum rating.
- (8) Do not remove the panel or frame from the module.
- (9) When the module is assembled, it should be attached to the system firmly, Be careful not to twist and bend the module.
- (10) Wipe off water droplets or oil immediately . If you leave the droplets for a long time, staining and discoloration may occur.
- (11) If the liquid crystal material leaks from the panel, it should be kept away from the eyes or mouth. In case of contact with hands, legs or clothes, it must be washed away thoroughly with soap.

13.4 WARRANTY

- (1) Acceptance inspection period
The period is within one month after the arrival of contracted commodity at the buyer's factory site.
- (2) Applicable warrant period
The period is within 12 months since the date of shipping out under normal using and storage conditions.