

TFT-DISPLAY DATASHEET

ONation
Model: OT070PGDDLV-H0

BRIEF SPEC.:

Main Feature

Landscape Type

White LED Backlight

Active Screen Area

154,08 x 85.92 [mm]

Diagonal | Format

7" | 15:9

Resolution

800 x 480

Colors

R.G.B Stripe 16,7M

Backlight

LED, Edge-Light

Brightness

1000 cd/m²

LED Life Time

N/A

Interface

LVDS

Viewing Angle

-60~70(H), -40~50(V)

Touchscreen

No

Power Supply

3,3V (Typ.)

Module Outline

164,9 x 100 x 9.81 [mm]

Operation Temperature

-30... +85 °C

Storage Temperature

-30... +85 °C

Surface Treatment

N/A



ONation Corporation

TFT COLOR LCD MODULE

MODEL: OT070PGDDL-V-H0
(Complied with RoHS)

WVGA
LVDS interface

Version: P0.2

Customer : _____
Approved By : _____
Date: _____

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

[All information is subject to change without notice.](#)
[Please confirm the sales representative before starting to design your system](#)

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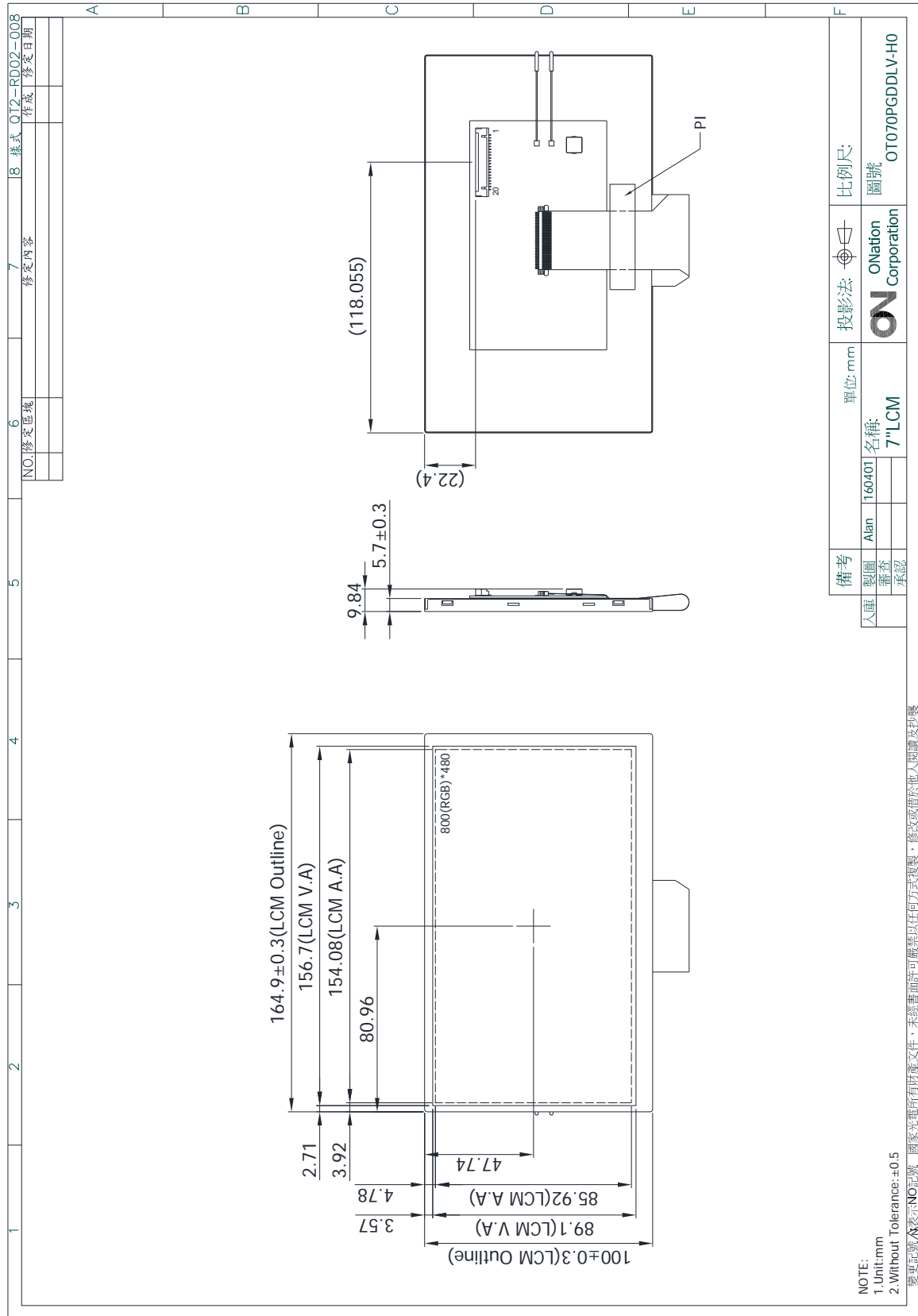
1.RECORD OF REVISION

REV	DATE	PAGE	SUMMARY																																																																																
0.1	2015.12.07	ALL	Preliminary specification was first issued.																																																																																
		2	Modify : 3. OUTLINE DIMENSIONS																																																																																
		5	Modify : 6.2 ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS <table border="1"> <thead> <tr> <th rowspan="2">ITEM^o</th> <th colspan="2">OPERATING^o</th> <th colspan="2">STORAGE^o</th> <th rowspan="2">REMARK^o</th> </tr> <tr> <th>MIN.^o</th> <th>MAX.^o</th> <th>MIN.^o</th> <th>MAX.^o</th> </tr> </thead> <tbody> <tr> <td>Ambient^o Temperature(°C)^o</td> <td>-20^o</td> <td>70^o</td> <td>-30^o</td> <td>80^o</td> <td>Note 1,2^o</td> </tr> <tr> <td>Humidity(% RH)^o</td> <td colspan="2">Note 3^o</td> <td colspan="2">Note 3^o</td> <td>Without condensation^o</td> </tr> </tbody> </table> <p>Note 1 : The response time will become lower when operated at low temperature.^o</p> <p>Note 2 : Background color changes slightly depending on ambient temperature.^o</p> <p>Note 3 : Storage Ta=60°C & RH=90% ≤ TBD Hrs.^o</p> <p>↓</p> <table border="1"> <thead> <tr> <th rowspan="2">ITEM^o</th> <th colspan="2">OPERATING^o</th> <th colspan="2">STORAGE^o</th> <th rowspan="2">REMARK^o</th> </tr> <tr> <th>MIN.^o</th> <th>MAX.^o</th> <th>MIN.^o</th> <th>MAX.^o</th> </tr> </thead> <tbody> <tr> <td>Ambient^o Temperature(°C)^o</td> <td>-30^o</td> <td>85^o</td> <td>-30^o</td> <td>85^o</td> <td>Note 1,2^o</td> </tr> <tr> <td>Humidity(% RH)^o</td> <td colspan="2">Note 3^o</td> <td colspan="2">Note 3^o</td> <td>Without condensation^o</td> </tr> </tbody> </table> <p>Note 1 : The response time will become lower when operated at low temperature.^o</p> <p>Note 2 : Background color changes slightly depending on ambient temperature.^o</p> <p>Note 3 : Storage Ta=60°C & RH=90% ≤ 96 Hrs.^o</p>	ITEM ^o	OPERATING ^o		STORAGE ^o		REMARK ^o	MIN. ^o	MAX. ^o	MIN. ^o	MAX. ^o	Ambient ^o Temperature(°C) ^o	-20 ^o	70 ^o	-30 ^o	80 ^o	Note 1,2 ^o	Humidity(% RH) ^o	Note 3 ^o		Note 3 ^o		Without condensation ^o	ITEM ^o	OPERATING ^o		STORAGE ^o		REMARK ^o	MIN. ^o	MAX. ^o	MIN. ^o	MAX. ^o	Ambient ^o Temperature(°C) ^o	-30 ^o	85 ^o	-30 ^o	85 ^o	Note 1,2 ^o	Humidity(% RH) ^o	Note 3 ^o		Note 3 ^o		Without condensation ^o																																				
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2.MECHANICAL SPECIFICATIONS

(1)	Number Of Dots (Dots)	800(R.G.B) X 480
(2)	Module Size(mm)	164.9(H) X 100.0(V) X981(D)
(3)	Active Area(mm)	154.08(H) X 85.92(V)
(4)	Pixel Pitch(mm)	0.1926 (H) X 0.1790(V)
(5)	LCD / Polarizer Model	TFT , Transmissive, Normally/White
(6)	Backlight Color	White, LED
(7)	Viewing Direction	12O'clock Horizontal : Right side 70°(typ.), Left side 70°(typ.) Vertical : Up side 50°(typ.), Down side 70°(typ.)
(8)	Gray Scale Inversion Direction	6O'clock
(9)	Electrical Interface	LVDS Interface
(10)	Color Configuration	R.G.B Stripe,16.7M Color
(11)	Module Weight(g)	TBD±5%

3. OUTLINE DIMENSIONS



4. INTERFACE PIN CONNECTION

4.1 LCM PANEL DRIVING SECTION

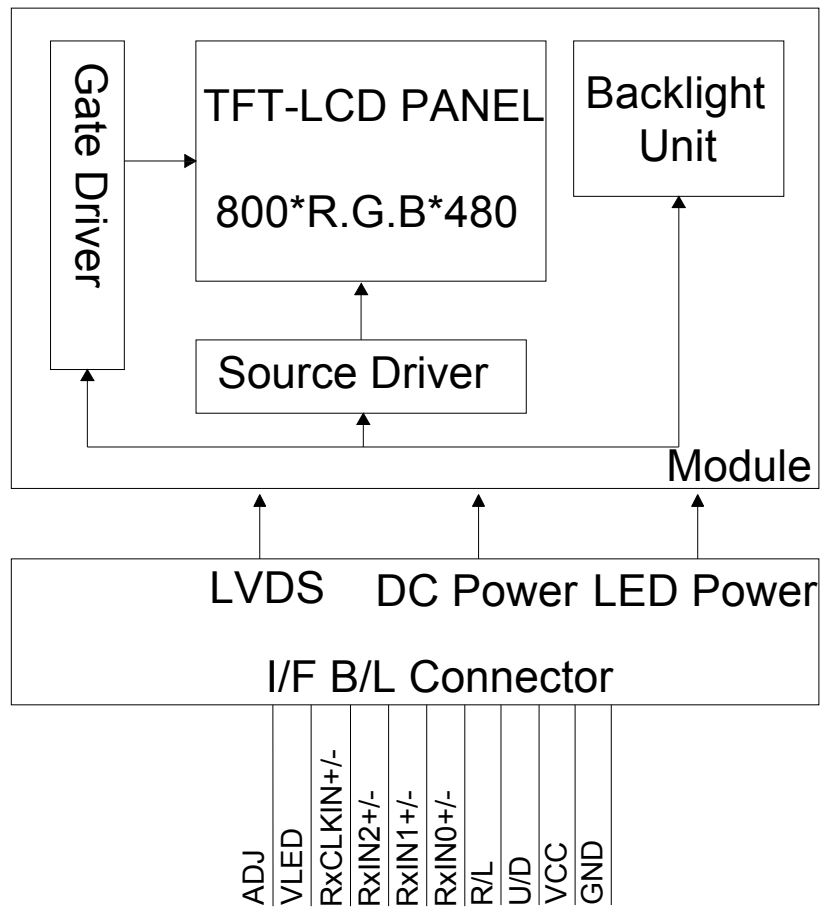
CN4 Connector : STM MS240420G or Equivalent

PIN NO.	SIGNAL	FUNCTION	REMARK
1	VCC	Digital Power	
2	VCC	Digital Power	
3	U/D	Vertical Display Mode Select Signal Up/Down Scan Control Input	Note1
4	L/R	Horizontal Display Mode Select Signal Left/Right Scan Control Input	Note1
5	RxIN0-	Differential Clock Input,CH0(Negative)	
6	RxIN0+	Differential Clock Input,CH0(Positive)	
7	GND	Ground	
8	RxIN1-	Differential Clock Input,CH1(Negative)	
9	RxIN1+	Differential Clock Input,CH1(Positive)	
10	GND	Ground	
11	RxIN2-	Differential Clock Input,CH2(Negative)	
12	RxIN2+	Differential Clock Input,CH2(Positive)	
13	GND	Ground	
14	RxCLKIN-	Differential Clock Input (Negative)	
15	RxCLKIN+	Differential Clock Input (Positive)	
16	GND	Ground	
17	VLED	Power Supply for LED Driver Circuit(5V)	
18	VLED	Power Supply for LED Driver Circuit(5V)	
19	GND	Ground	
20	ADJ	Adjust The Back Light Brightness	

Note 1: L/R&U/D scan direction setting:

Scan Control		Scan Direction
L/R	U/D	
High	Low	Left to right, up to down
High	High	Left to right, down to up
Low	High	Right to Left, down to up
Low	Low	Right to Left, up to down

5. BLOCK DIAGRAM



6. ABSOLUTE MAXIMUM RATINGS

6.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	MIN.	MAX.	UNIT	REMARK
Supply Voltage	VCC	-0.3	5.0	V	
	VLED	-0.3	40	V	

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.

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)	Note 3		Note 3		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 : Storage Ta=60°C & RH=90% ≤ 96 Hrs.

7. ELECTRICAL CHARACTERISTICS

7.1 ELECTRICAL CHARACTERISTICS OF LCD

Ta=25°C

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
Power Voltage For LCD	VCC	3.0	3.3	3.6	V	
	ICC	-	TBD	TBD	mA	Note1

Note 1 : Test Condition: VCC=3.3V ; Test Pattern:All Black.

7.2 BACKLIGHT UNITS

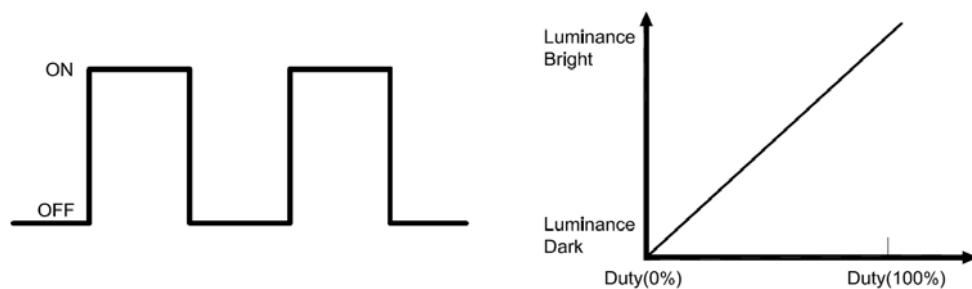
Ta=25°C

ITEM		SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
LED Driving Voltage		VLED	11.5	12	12.5	V	
LED Driving Current		ILED	-	TBD	TBD	mA	Note 1
PWM Control Level	PWM High Level		3.0	3.3	3.6	V	
	PWM Low Level		0	-	1.0	V	
PWM Control Duty Ratio			-	0	-	100	%
PWM Control Frequency		f _{PWM}	100	-	2k	Hz	

Note 1: The lifetime of LED is defined as the time when it continues to operate under the conditions at Ta= 25 ±2°C and PWM=100% (LED forward current) until the brightness becomes ≤ 50% of its original value.

Note 2: ADJ signal Vp-p =3.0 ~ 3.6 V, operation frequency: 100Hz ~ 2000Hz:

PWM DIMMING DUTY



8. OPTICAL CHARACTERISTICS

Ta=25°C

ITEM	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT	REMARK
Contrast Ratio	CR	Viewing Normal Angle $\Theta_x = \Theta_y = 0^\circ$	TBD	TBD	-	-	Note 1
Response Time	TR+TF		-	25	50	ms	Note 2
Chromaticity	White	x	(0.260)	(0.310)	(0.360)	-	Note 4
		y	(0.280)	(0.330)	(0.380)	-	
Viewing Angle	Hor.	θ_{x+}	60	70	-	Deg.	Note 3
		θ_{x-}	60	70	-		
	Ver.	θ_{y+}	40	50	-		
		θ_{y-}	60	70	-		
Luminance	L	PWM=100%	(800)	(1000)	-	cd/m ²	Note 5
Luminance Uniformity	YU		70	-	-	%	

Note 1 : Definition of Contrast Ratio (CR) :

The contrast ratio can be calculated by the following expression.

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

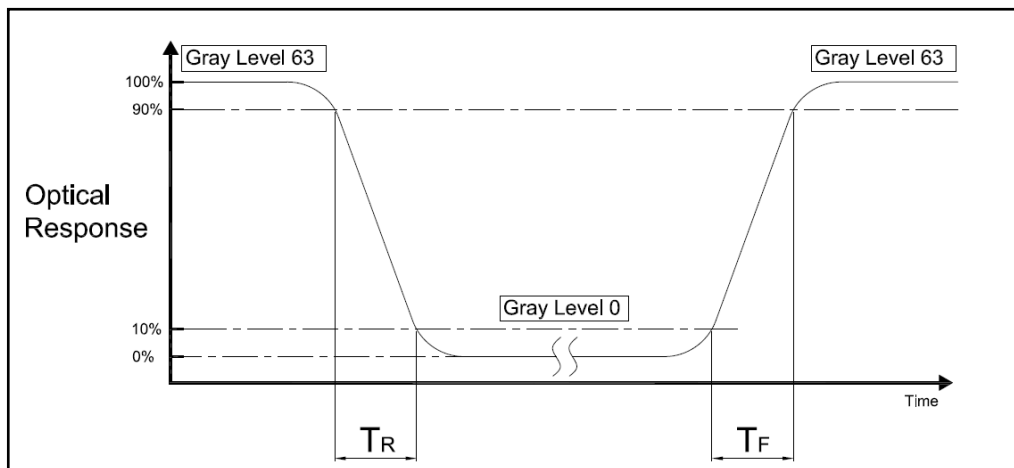
L63 : Luminance of gray level 63

L0 : Luminance of gray level 0

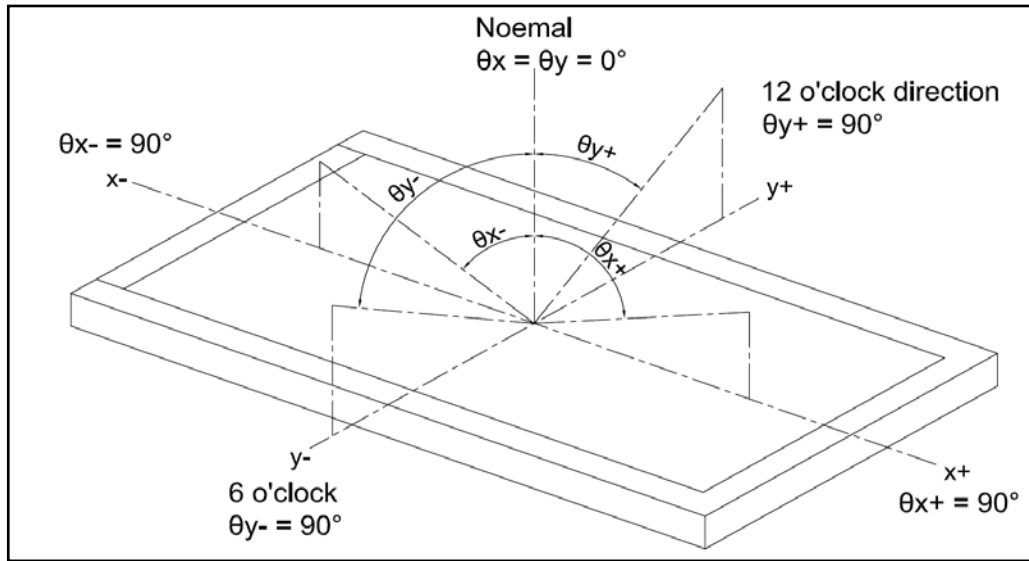
$$CR = CR(5)$$

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

Note 2 : Definition of Response Time (TR,TF)

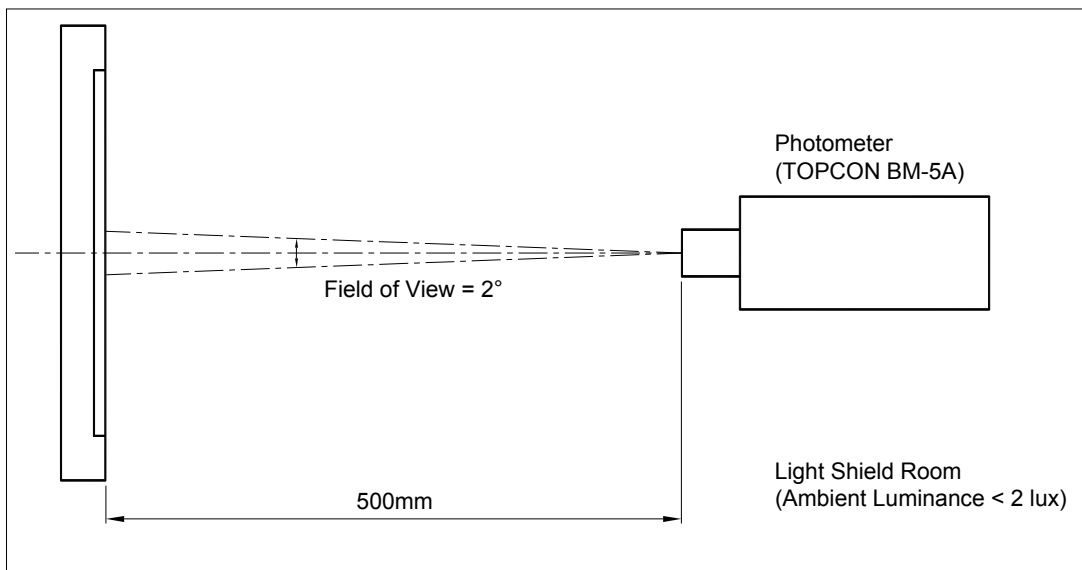


Note 3 : Definition of Viewing Angle

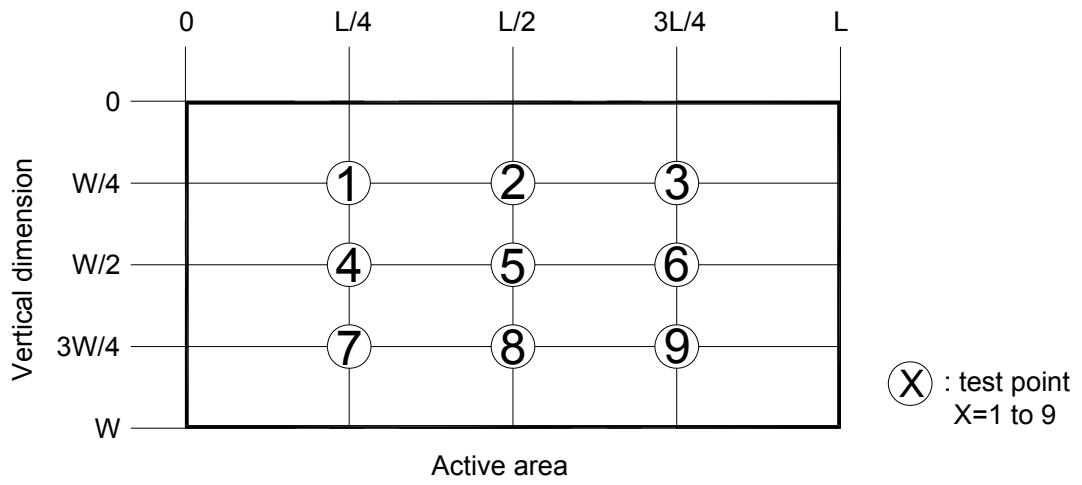


Note 4 : Measurement Set-Up:

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



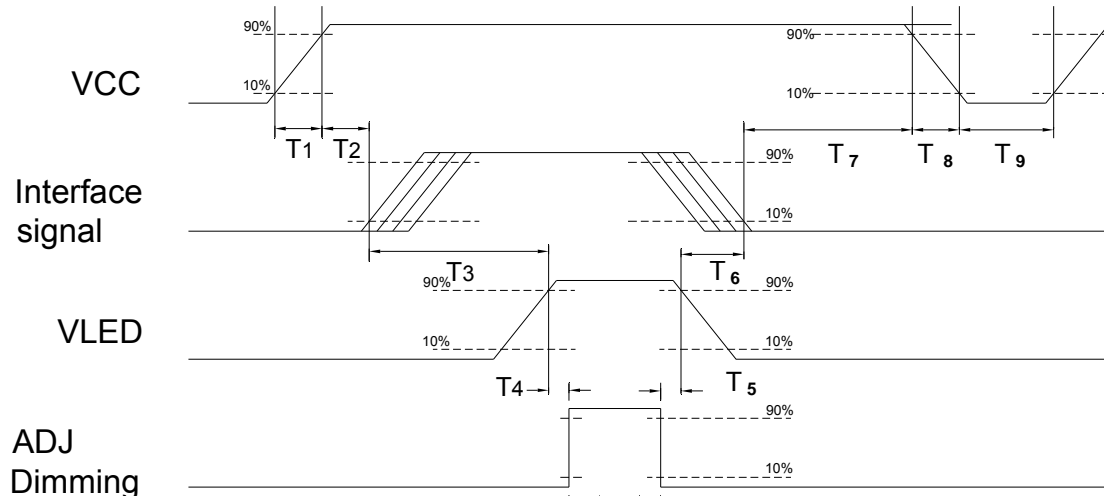
Note 5 :



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

9. TIMING SPECIFICATIONS

9.1 POWER SIGNAL SEQUENCE



Power ON/OFF sequence timing

ITEM	MIN.	TYP.	MAX.	UNIT
T1	0.5	-	10	ms
T2	0	-	50	ms
T3	200	-	-	ms
T4	10	-	-	ms
T5	10	-	-	ms
T6	100	-	-	ms
T7	0	16	50	ms
T8	-	-	10	ms
T9	1000	-	-	ms

9.2 THE INPUT DATA FORMAT

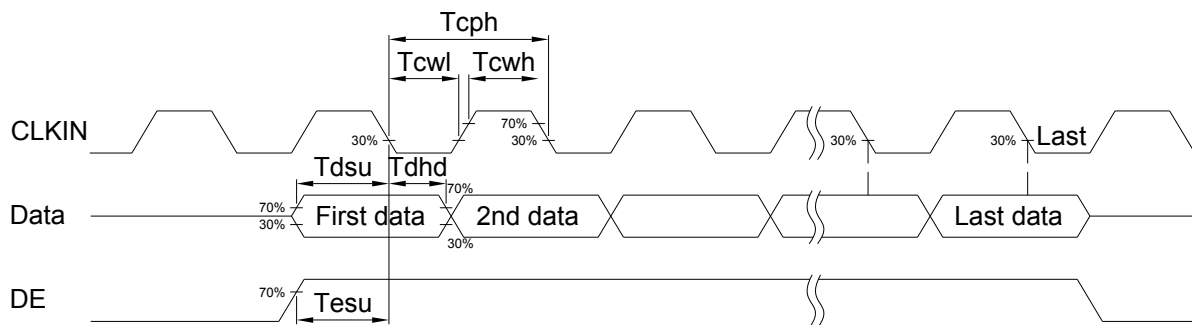


9.3 AC TIMING CHARACTERISTICS

ITEM		SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
Clock	Frequency	1/Tc	31.95	33.26	34.6	MHz	Note1
	Clk Pulse Duty	Tcwh	40	50	60	%	Note1
	Clk Cycle Time	Tcph	25	-	-	ns	Note1
Data	Setup Time	Tdsu	5	-	-	ns	Note1
	Hold Time	Tdhd	5	-	-	ns	Note1
ENAB Signal	Setup Time	Tesu	5	-	-	ns	Note1
	Hold Time	Tehd	5	-	-	ns	Note1

Note1: Frame rate is 60Hz at 3.3V VDD

9.4 CLOCK AND DATA TIMING DIAGRAM



10. RELIABILITY TEST

ENVIRONMENTAL TEST				
NO.	ITEM	CONDITIONS	TIME PERIOD	REMARK
1	High Temperature Storage	85°C	96 HRS	
2	Low Temperature Storage	-30°C	96 HRS	
3	High Temperature Operation	85°C	96 HRS	
4	Low Temperature Operation	-30°C	96 HRS	
5	Temperature Cycle	-30°C~85°C	1HRS/ 10CYCLE	
6	High Temperature Humidity Storage	60°C 90%RH	96 HRS	

NOTE 1 : a. The module should work properly.

b. Before and after function test, The difference of consumptive current. Should be within 10%.

NOTE 2 : a. The module should work properly.

b. The module won't be deformative, Color changeable or broken.

c. The modules can't be apart.

NOTE 3 : a. 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
OT070PGDDLX-H0	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.