

# TFT-DISPLAY DATASHEET

ONation  
Model: OT104FSDDLV-01

## BRIEF SPEC.:

Main Feature	Landscape Type White LED Backlight
Active Screen Area	211.2 x 158.4 (mm)
Diagonal   Format	10,4"   4:3
Resolution	800 x 600
Colors	R.G.B Vertical Stripe
Backlight	LED, White
Brightness	1000 cd/m <sup>2</sup>
LED Life Time	N/A
Interface	LVDS
Viewing Angle	-70~80(H), -50~60(V)
Touchscreen	no
Power Supply	3,3V (Typ.)
Module Outline	243.0 x 184.0 x 8,5 (mm)
Operation Temperature	-30... +85 °C
Storage Temperature	-30... +85 °C
Surface Treatment	Anti-Glare



# ONation Corporation

## TFT COLOR LCD MODULE

MODEL: OT104FSDDL V-01

SVGA  
LVDS interface (1port)

Version: P0.2

Customer : _____
Approved By : _____
Date: _____

ONATION		
APPROVAL	CHECKER	PREPARE
<i>John</i>	<i>Josh</i>	<i>Jan</i>

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

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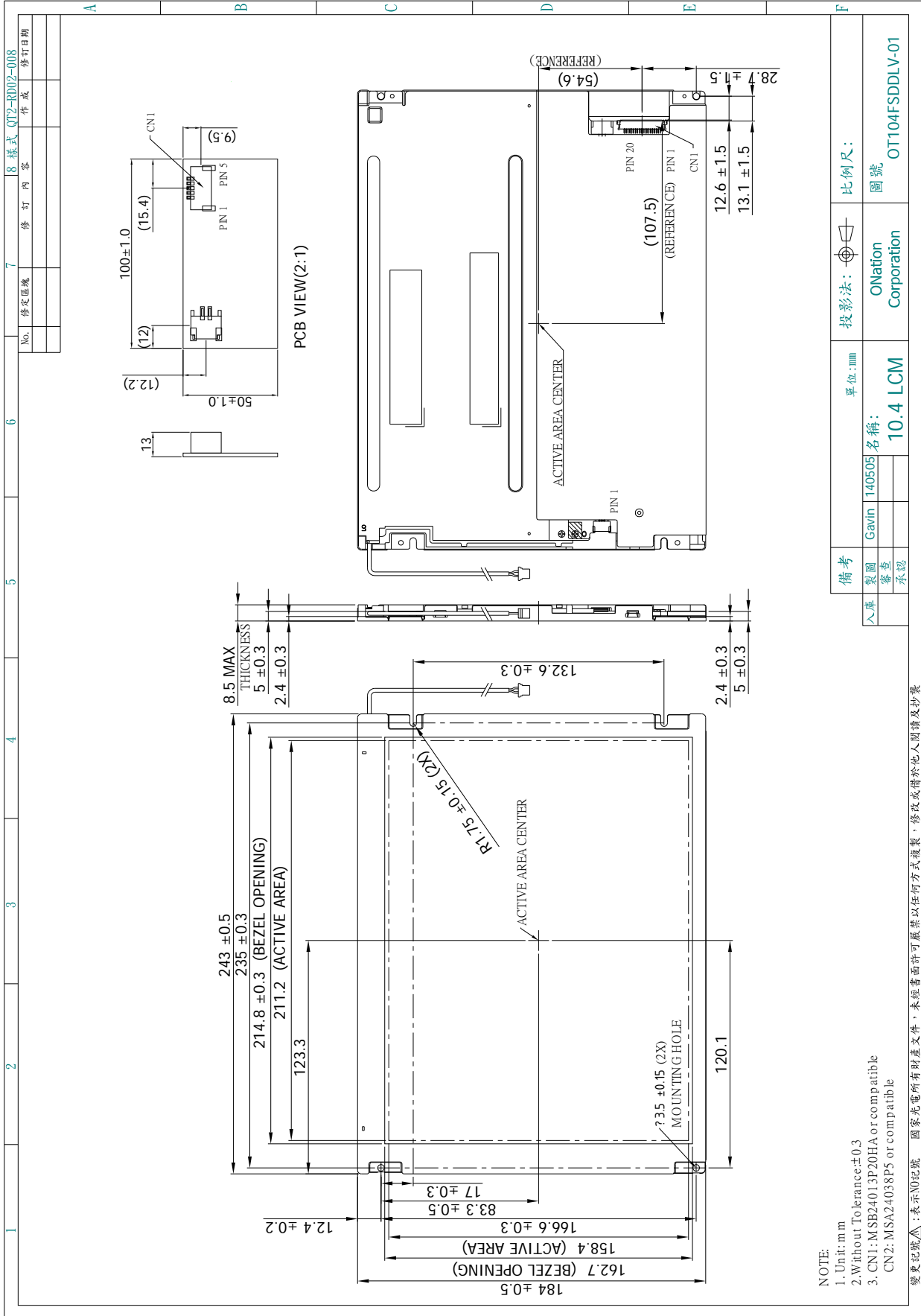
# 1.RECORD OF REVISION

REV	DATE	PAGE	SUMMARY																																																																												
0.1	2014.05.08	ALL	Preliminary specification was first issued.																																																																												
0.2	2014.05.13	5	<p><b>10. RELIABILITY TEST</b></p> <table border="1"> <thead> <tr> <th rowspan="2">ITEM</th> <th colspan="2">OPERATING</th> <th colspan="2">STORAGE</th> <th rowspan="2">REMARK</th> </tr> <tr> <th>MIN</th> <th>MAX</th> <th>MIN</th> <th>MAX</th> </tr> </thead> <tbody> <tr> <td>Ambient Temperature(°C)</td> <td>0</td> <td>50</td> <td>-20</td> <td>70</td> <td>Note 1,2</td> </tr> <tr> <td>Humidity(% RH)</td> <td colspan="2">Note 3</td> <td colspan="2">Note 3</td> <td>Note 3</td> </tr> </tbody> </table> <p>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=40°C &amp; RH=90% ≤ 300Hrs.</p>	ITEM	OPERATING		STORAGE		REMARK	MIN	MAX	MIN	MAX	Ambient Temperature(°C)	0	50	-20	70	Note 1,2	Humidity(% RH)	Note 3		Note 3		Note 3																																																						
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## 2.MECHANICAL SPECIFICATIONS

(1)	Number Of Dots (Dots)	800(R.G.B) X 600
(2)	Module Size(mm)	243.0(H) X 184.0(V) X 8.5(D)
(3)	Active Area(mm)	211.2(H) X 158.4(V)
(4)	Pixel Pitch(mm)	0.264 (H) X 0.264(V)
(5)	LCD / Polarizer Model	TFT , Transmissive, Normally/ White, Anti-Glare
(6)	Backlight Color	White, LED
(7)	Viewing Direction	12 O'clock Horizontal : Right side 80°(typ.), Left side 80°(typ.) Vertical : Up side 60°(typ.), Down side 80°(typ.)
(8)	Gray Scale Inversion Direction	6 O'clock
(9)	Electrical Interface	LVDS Interface
(10)	Color Configuration	R.G.B Stripe
(11)	Module Weight(g)	(365)±5%

### 3. OUTLINE DIMENSIONS



NOTE:

1. Unit: mm
2. Without Tolerance: ±0.3
3. CN1: MSB24013P20HA or compatible  
CN2: MSA24038P5 or compatible

變更記號: 表示NO記號。國家光電所有財產文件，未經書面許可嚴禁以任何方式複製、修改或借於他人閱讀及抄襲。

8 樣式 Q12-F002-008	7 修訂內容	6 修訂日期	5	4	3	2	1
No.	修訂日期	修訂內容					
備考			單位: mm	投影法:	比例尺:		
入庫	製圖	Gavin	140505	名稱:	10.4 LCM	圖號	OT104FSDDL-01
審核	承認						

## 4. INTERFACE PIN CONNECTION

### 4.1 LCM PANEL DRIVING SECTION

CN1 Connector : STM MSB24013P20HA or Equivalen

Mating Connector : STM P24013P20 or Equivalen

PIN NO.	SIGNAL	FUNCTION
1	VCC	Power Supply For Digital Circuit
2	VCC	Power Supply For Digital Circuit
3	GND	Ground
4	DPS	Reverse Scan Function[H: Enable ; L/NC: Disable]
5	RxIN0-	Differential Data Input, CH0(Negative)
6	RxIN0+	Differential Data Input, CH0(Positive)
7	GND	Ground
8	RxIN1-	Differential Data Input, CH1(Negative)
9	RxIN1+	Differential Data Input, CH1(Positive)
10	GND	Ground
11	RxIN2-	Differential Data Input, CH2(Negative)
12	RxIN2+	Differential Data Input, CH2(Positive)
13	GND	Ground
14	CLKIN-	Differential Clock Input(Negative)
15	CLKIN+	Differential Clock Input(Positive)
16	GND	Ground
17	RxIN3-	Differential Data Input, CH3(Negative)
18	RxIN3+	Differential Data Input, CH3(Positive)
19	RSV	Reverse Scan Function [H: Enable; L/NC: Disable]
20	SEL6/8	6/8 bits LVDS data input selection [H: 8bits ; L/NC: 6bits]

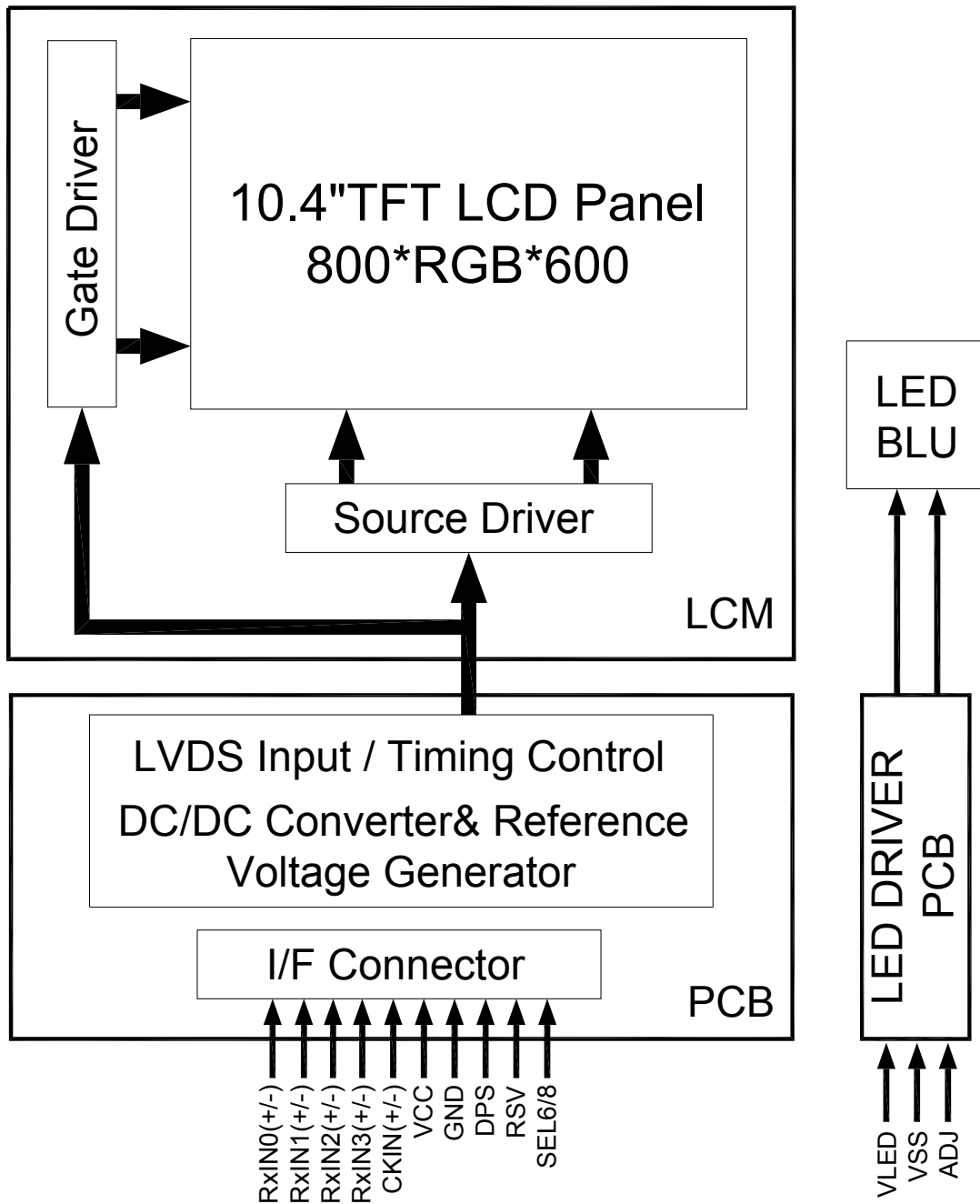
### 4.2 BACKLIGHT DRIVING SECTION

CN1 Connector : STM MSA24038P5 or Equivalen

Mating Connector : STM P24038P5 or Equivalen

PIN NO.	SIGNAL	FUNCTION
1	VLED	Power Supply : +12V
2	VLED	Power Supply : +12V
3	VSS	Ground
4	VSS	Ground
5	ADJ	Adjust Brightness Control For LED B/L

### 5. BLOCK DIAGRAM





## 6. ABSOLUTE MAXIMUM RATINGS

### 6.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	MIN.	MAX.	UNIT	REMARK
Power Supply Voltage	VCC	-0.3	4.0	V	
	VLED	-0.3	60.0	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		Note 3

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=40°C & RH=90% ≤ 96Hrs.

## 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	-	(280)	(350)	mA	Note 1

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

### 7.2 BACKLIGHT UNITS

Ta=25°C

ITEM		SYMBOL	MIN.	TYP.	MAX.	UNIT
LED Driving Voltage		VLED	9	12	15	V
		ILED	-	TBD	TBD	mA
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 <sub>PWM</sub>	100	-	2000	Hz

### 8. OPTICAL CHARACTERISTICS

Ta=25°C

ITEM	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT	REMARK
Contrast Ratio	CR	Viewing Normal Angle $\Theta_x = \Theta_y = 0^\circ$	(300)	(400)	-	-	Note 1
Response Time	TR		-	20	30	ms	Note 2
	TF		-	10	20	ms	
Chromaticity	White	x	(0.26)	(0.31)	(0.36)	-	Note 4
		y	(0.28)	(0.33)	(0.38)	-	
Viewing Angle	Hor.	$\theta_{x+}$	70	80	-	Deg.	Note 3
		$\theta_{x-}$	70	80	-		
	Ver.	$\theta_{y+}$	50	60	-		
		$\theta_{y-}$	70	80	-		
Luminance	L	PWM=100%	900	1000	-	cd/m <sup>2</sup>	-
Uniformity	-	-	70	-	-	%	Note 5

Note 1 : Definition of Contrast Ratio (CR) :

The contrast ratio can be calculated by the following expression.

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

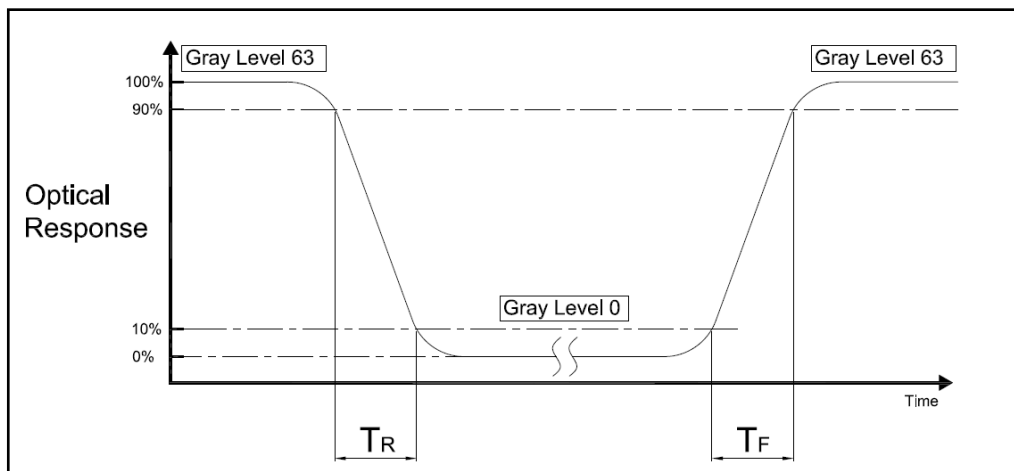
L63 : Luminance of gray level 63

L0 : Luminance of gray level 0

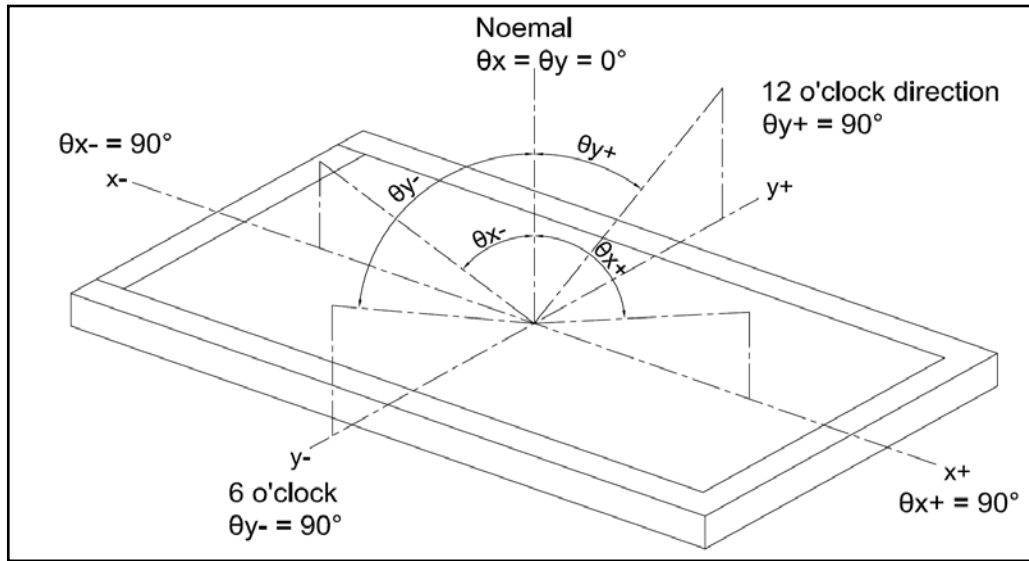
$$CR = CR(5)$$

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

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

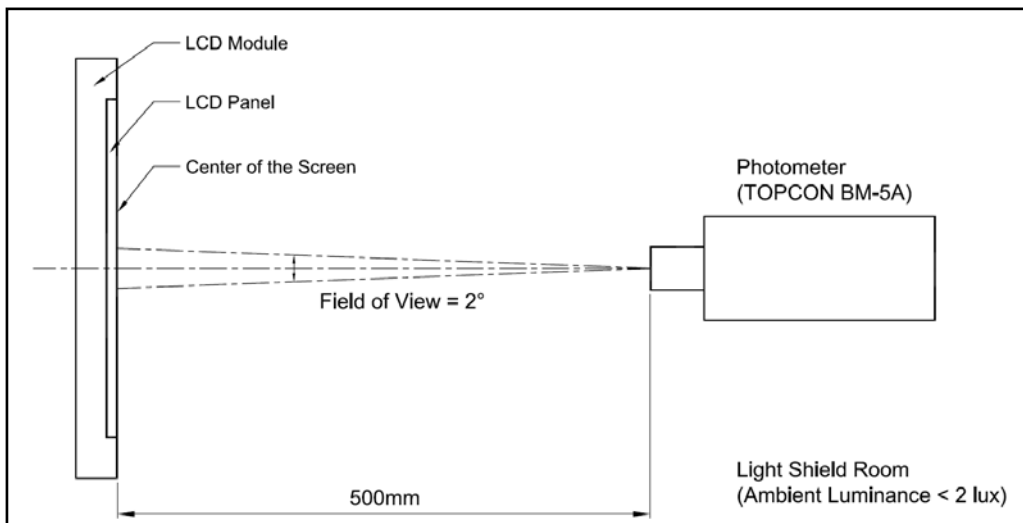


Note 3 : Definition of Viewing Angle

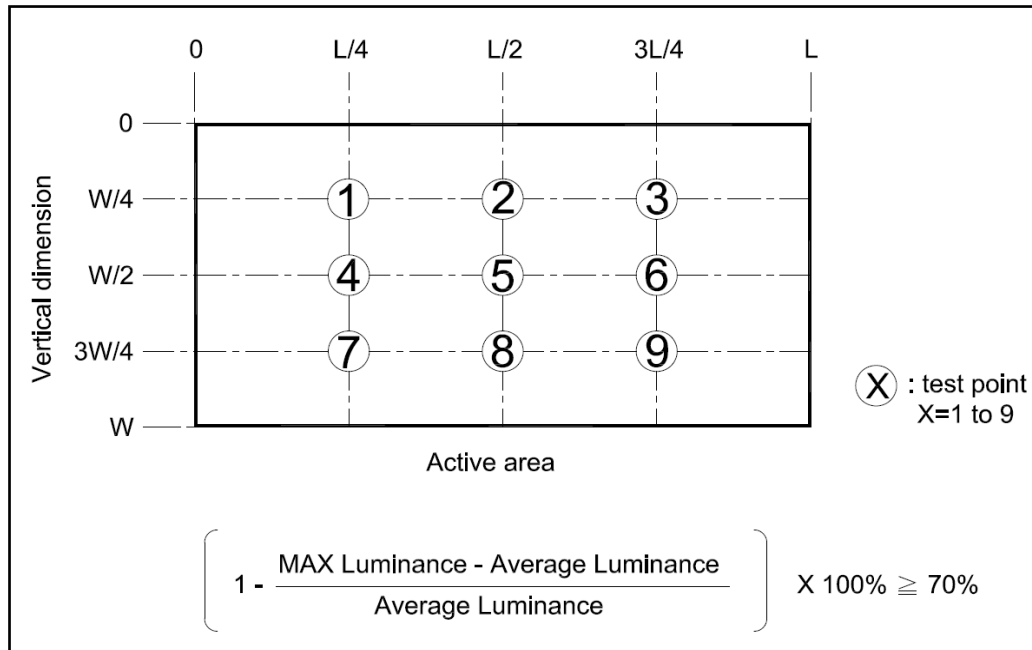


Note 4 : Measurement Set-Up:

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.

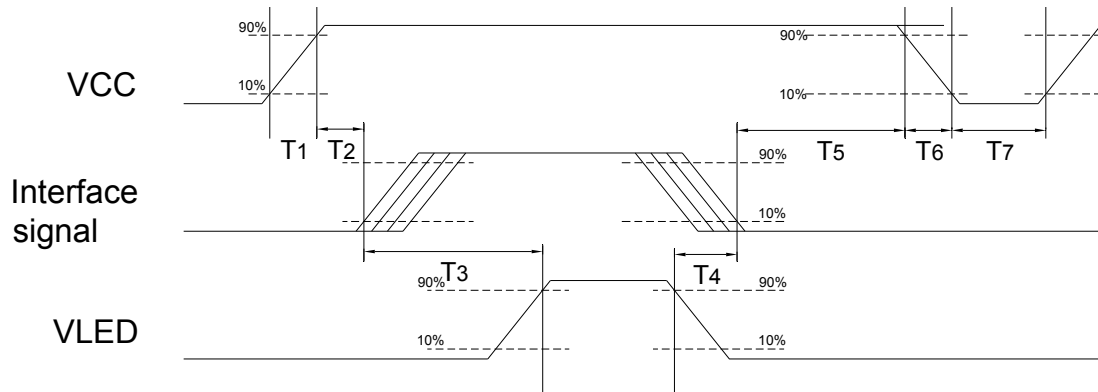


Note 5 :



## 9. TIMING SPECIFICATIONS

### 9.1 POWER SIGNAL SEQUENCE



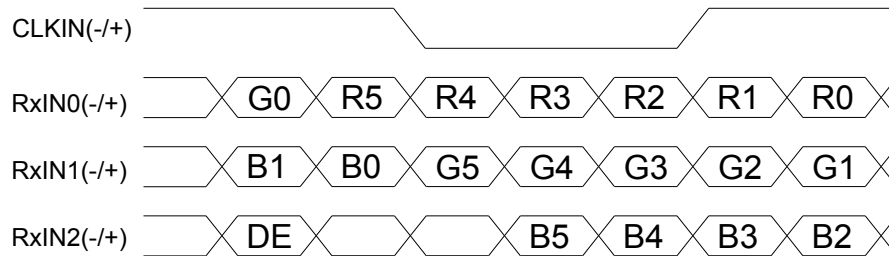
Power ON/OFF sequence timing

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

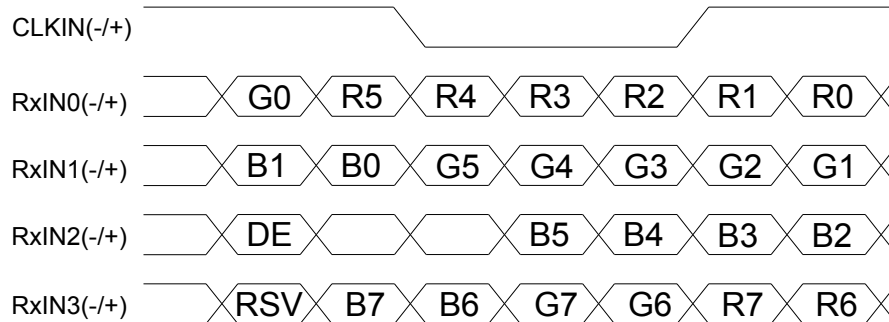
The above on/off sequence should be applied to avoid abnormal function in the display. Please make sure to turn off the power when you plug the cable into the input connector or pull the cable out of the connector.

## 9.2 THE INPUT DATA FORMAT

SEL68="Low" or "NC" for 6 bits LVDS Input



SEL68="High" for 8 bits LVDS Input



SIGNAL NAME	DESCRIPTION	REMARK
R7	Red Data 7	Red-pixel Data
R6	Red Data 6	
R5	Red Data 5	For 8Bit LVDS input
R4	Red Data 4	MSB : R7 ; LSB : R0
R3	Red Data 3	
R2	Red Data 2	For 6Bits LVDS input
R1	Red Data 1	MSB : R5 ; LSB : R0
R0	Red Data 0	
G7	Green Data 7	Green-pixel Data
G6	Green Data 6	
G5	Green Data 5	For 8Bit LVDS input
G4	Green Data 4	MSB : G7 ; LSB : G0
G3	Green Data 3	
G2	Green Data 2	6Bits LVDS input
G1	Green Data 1	MSB : G5 ; LSB : G0
G0	Green Data 0	
B7	Blue Data 7	Blue-pixel Data
B6	Blue Data 6	
B5	Blue Data 5	For 8Bit LVDS input
B4	Blue Data 4	MSB : B7 ; LSB : B0
B3	Blue Data 3	
B2	Blue Data 2	6Bits LVDS input
B1	Blue Data 1	MSB : B5 ; LSB : B0
B0	Blue Data 0	
CLKIN	LVDS Data Clock	
DE	Data Enable Signal	When the signal is high, the pixel data shall be valid to be displayed.

### 9.3 TFT-LCD INTERFACE TIMING

#### 9.3.1 Timing Characteristics

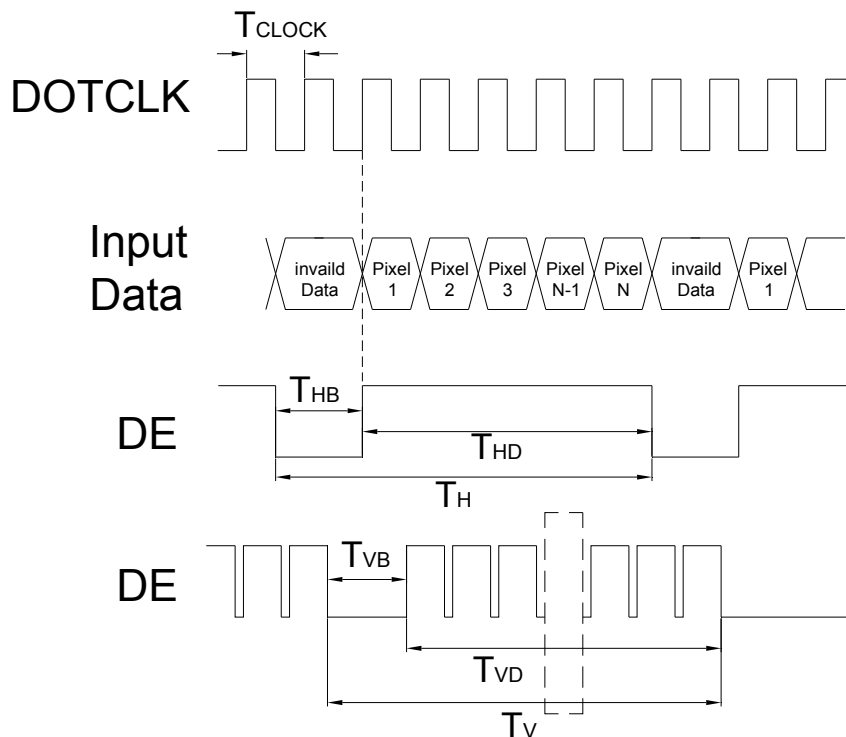
ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT
Clock frequency(DOTCLK)	$1/T_{\text{CLOCK}}$	30	40	50	MHz
Horizontal Section Period	$T_H$	960	1056	1060	$T_{\text{CLOCK}}$
Horizontal Section Active	$T_{\text{HD}}$	800			$T_{\text{CLOCK}}$
Horizontal Section Blanking	$T_{\text{HB}}$	160	256	260	$T_{\text{CLOCK}}$
Vertical Section Period	$T_V$	608	628	1024	$T_{\text{LINE}}$
Vertical Section Active	$T_{\text{VD}}$	600			$T_{\text{LINE}}$
Vertical Section Blanking	$T_{\text{VB}}$	8	28	424	$T_{\text{LINE}}$

Note 1: Frame rate is 60Hz

Note 2: DE mode

#### 9.3.2 Input Timing Diagram

#### Input Timing Definition(DE Mode)





## 10. RELIABILITY TEST

ENVIRONMENTAL TEST				
NO.	ITEM	CONDITIONS	TIME PERIOD	REMARK
1	High Temperature Storage	85°C	96HRS	
2	Low Temperature Storage	-30°C	96HRS	
3	High Temperature Operation	85°C	96HRS	
4	Low Temperature Operation	-30°C	96HRS	
5	Temperature Cycle	-20°C ← 25°C → 60°C (30min) (5min) (30min)	10CYCLE	
6	High Temperature Humidity Storage	40°C 90%RH (No condensation)	96HRS	

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 modlue 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 24 hours at room temperature.

## 11. LCM INSPECTION STANDARD

Inspection specifications refer ONation Corporation LCM INSPECTION  
STANDARD Document.  
Document Number : QT3-QC-A-I003

## 12. PACKAGE INFORMATION

LCM MODEL	LCM QTY. IN THE BOX	INNER BOX SIZE (mm)	WEIGHT	REMARK
OT104FSDDLX-01	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.