

# TFT-DISPLAY DATASHEET

ONation  
Model: OT104EXWDLV-H1

## BRIEF SPEC.:

Main Feature

Landscape Type

White LED Backlight

Wide Viewing Angle

Active Screen Area

210.4 x 157.8 [mm]

Diagonal | Format

10,4" | 4:3

Resolution

1024 x 768

Colors

R.G.B Stripe

Backlight

LED, White

Brightness

1000 cd/m<sup>2</sup>

LED Life Time

50,000h (Typ.)

Interface

LVDS

Viewing Angle

-80~88(H), -80~88(V)

Touchscreen

no

Power Supply

3,3V (Typ.)

Module Outline

225.5 x 176.3 x 13.2 [mm]

Operation Temperature

-20... +70 °C

Storage Temperature

-30... +80 °C

Surface Treatment

Anti-glare



# ONation Corporation

## TFT COLOR LCD MODULE

**MODEL: OT104EXWDLV-H1**  
(Complied with RoHS)

**XGA**  
**LVDS interface (1port)**

**Version: P0.2**

<b>Customer :</b> _____
<b>Approved By :</b> _____
<b>Date:</b> _____

ONATION		
APPROVAL	CHECKER	PREPARE
<i>Jan</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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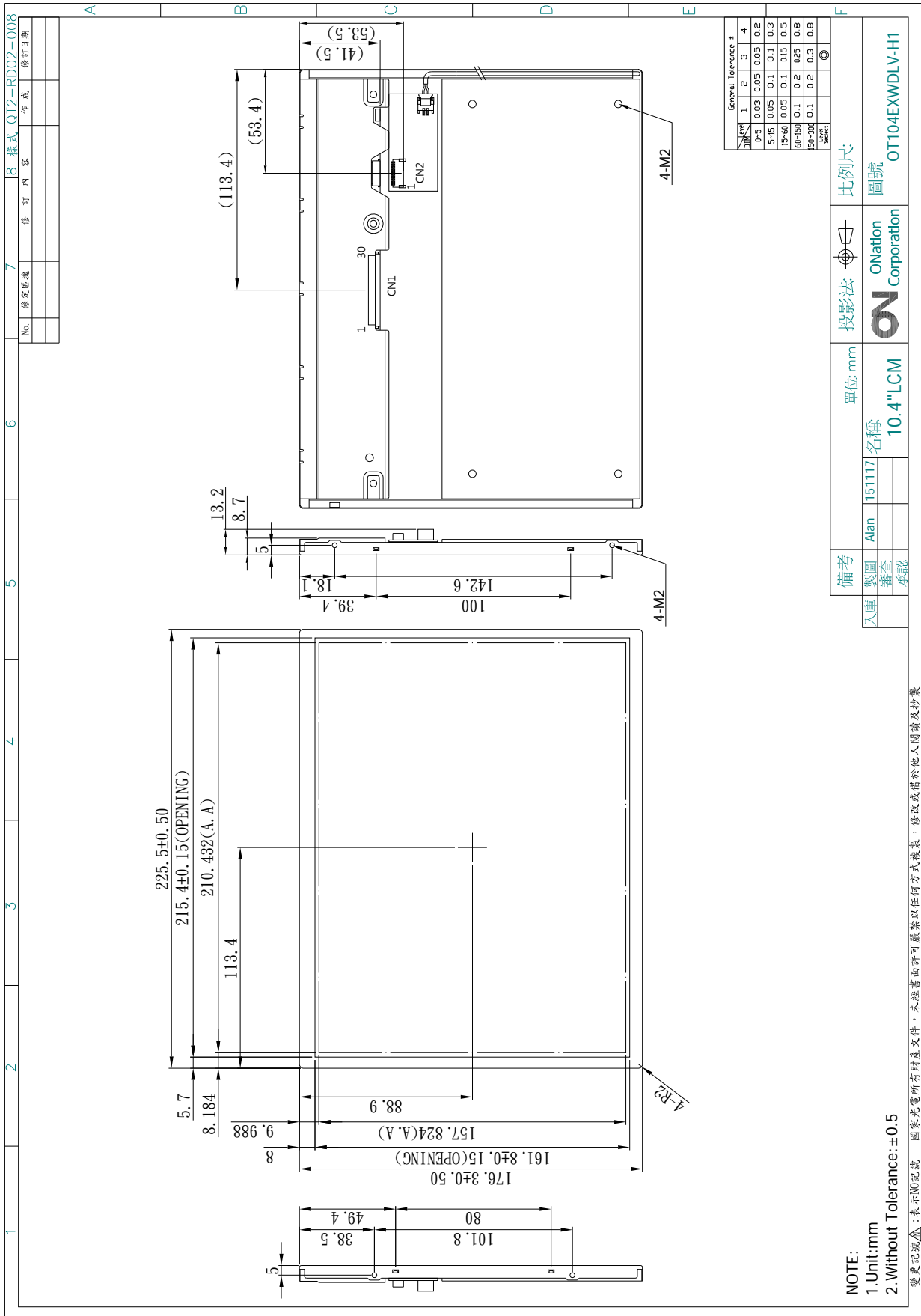
**1.RECORD OF REVISION**

REV	DATE	PAGE	SUMMARY
0.1	2015.11.17	ALL	Preliminary specification was first issued.
0.2	2015.12.09	1	Modify (2) Module Size(mm) 225.5(H) X 176.3(V) X 13.2(D)
		2	Modify 4.OUTLINE DIMENSIONS

## 2.MECHANICAL SPECIFICATIONS

(1)	Number Of Dots (Dots)	1024(R.G.B) X 768
(2)	Module Size(mm)	225.5(H) X 176.3(V) X 13.2(D)
(3)	Active Area(mm)	210.432(H) X 157.824(V)
(4)	Pixel Pitch(mm)	0.2055 (H) X 0.2055(V)
(5)	LCD / Polarizer Model	TFT , Transmissive, Normally/ Black, Anti-Glare
(6)	Backlight Color	White, LED
(7)	Viewing Direction	Wide Viewing Angle Horizontal : Right side 88°(typ.), Left side 88°(typ.) Vertical : Up side 88°(typ.), Down side 88°(typ.)
(8)	Gray Scale Inversion Direction	No GSI
(9)	Electrical Interface	LVDS Interface
(10)	Color Configuration	R.G.B Stripe
(11)	Module Weight(g)	TBD±5%

### 3. OUTLINE DIMENSIONS



## 4. INTERFACE PIN CONNECTION

### 4.1 LCM PANEL DRIVING SECTION

CN1 Connector : JAE FI-XB30SRL-HF11 or STARCONN 093F30-B0B01A or Equivalen

Mating Connector : JAE FI-X30C2L or Equivalen

PIN NO.	SIGNAL	FUNCTION
1	VCC	Power Supply For Digital Circuit
2	VCC	Power Supply For Digital Circuit
3	VCC	Power Supply For Digital Circuit
4	GND	Ground
5	GND	Ground
6	GND	Ground
7	RPMI	Reverse Panel Function (Display Rotation)
8	NC	No Connection
9	NC	No Connection
10	NC	No Connection
11	SEL6/8	6/8 bits LVDS data input selection [H: 6bits ; L/NC: 8bits]
12	GND	Ground
13	NC	No Connection
14	GND	Ground
15	RxIN0-	Differential Data Input, CH0(Negative)
16	RxIN0+	Differential Data Input, CH0(Positive)
17	GND	Ground
18	RxIN1-	Differential Data Input, CH1(Negative)
19	RxIN1+	Differential Data Input, CH1(Positive)
20	GND	Ground
21	RxIN2-	Differential Data Input, CH2(Negative)
22	RxIN2+	Differential Data Input, CH2(Positive)
23	GND	Ground
24	CLKIN-	Differential Clock Input(Negative)
25	CLKIN+	Differential Clock Input(Positive)
26	GND	Ground
27	RxIN3-	Differential Data Input, CH3(Negative)
28	RxIN3+	Differential Data Input, CH3(Positive)
29	GND	Ground
30	NC	No Connection

## 4.2 BACKLIGHT DRIVING SECTION

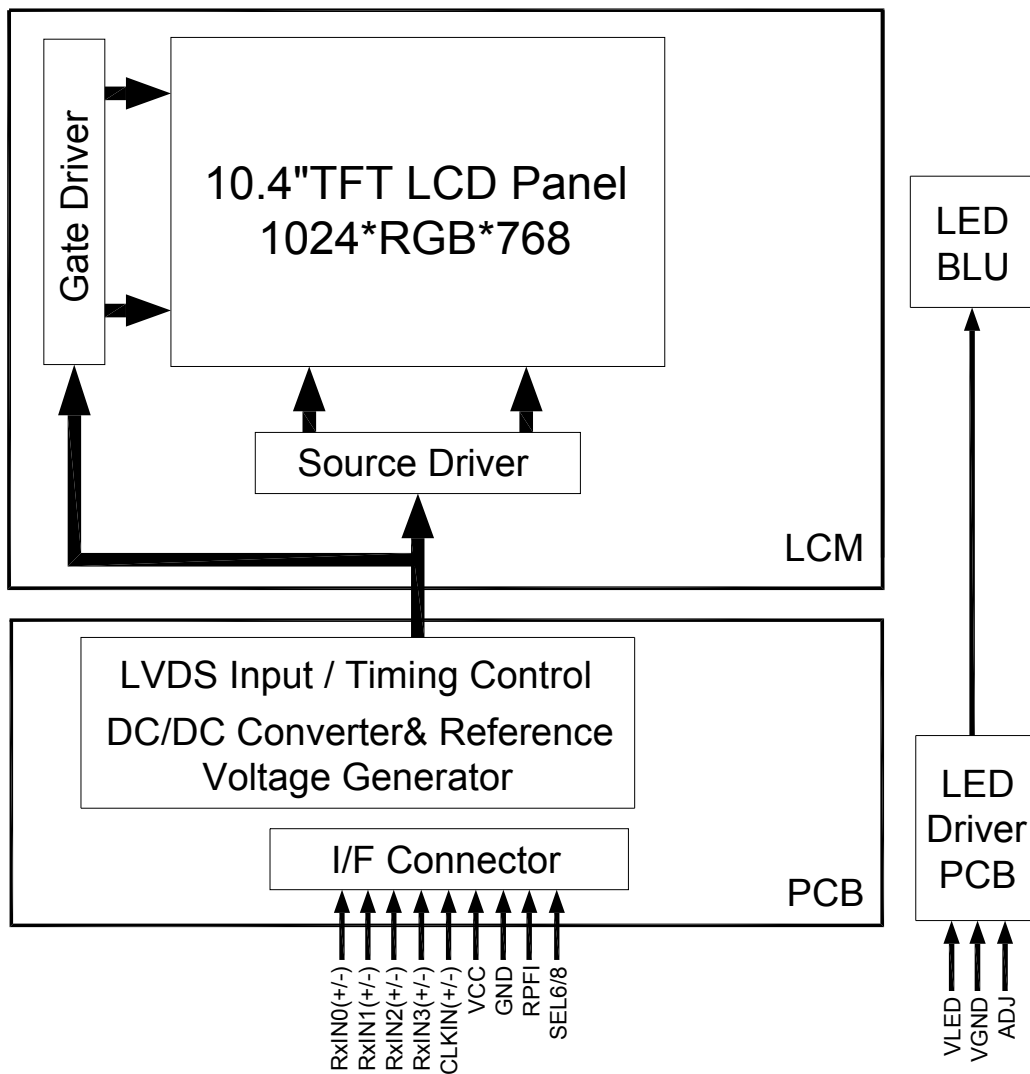
CN2 Connector : ACES 91208-01001 or Equivalent

Mating Connector : ACES 91209-01011 or Equivalent

PIN NO.	SIGNAL	FUNCTION
1	VLED	Converter input voltage
2	VLED	Converter input voltage
3	VLED	Converter input voltage
4	VLED	Converter input voltage
5	VGND	Converter ground Ground
6	VGND	Converter ground Ground
7	VGND	Converter ground Ground
8	VGND	Converter ground Ground
9	NC	No Connection
10	ADJ	Backlight Adjust



### 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	7.0	V	
	VLED	-0.3	50	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)	-20	70	-30	80	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=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 For LCD	VCC	3.0	3.3	3.6	V	
	ICC	-	(570)	(620)	mA	Note 1

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

### 7.2 BACKLIGHT UNITS

Ta=25°C

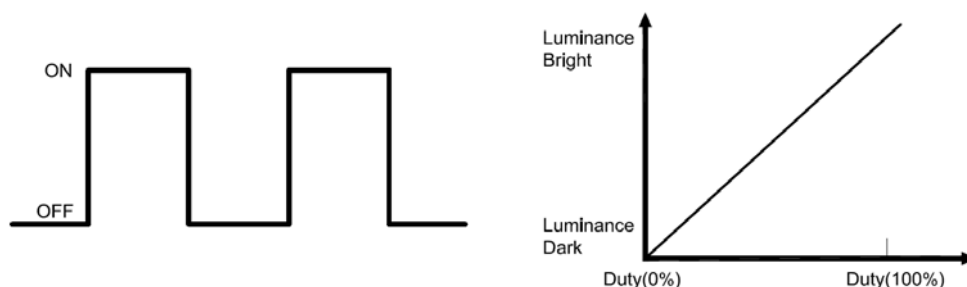
ITEM		SYMBOL	MIN.	TYP.	MAX.	UNIT
LED Driving Voltage		VLED	8.0	12.0	15.0	V
		ILED (VLED=12.0V)	-	(1.2)	(1.5)	A
PWM Control Level	PWM High Level	-	3.0	3.3	3.6	V
	PWM Low Level	-	0	-	1.0	V
PWM Control Duty Ratio		-	0	-	100	%
PWM Control Frequency		f <sub>PWM</sub>	100	-	2000	Hz
LED Life Time (For Reference Only)		Ta=25°C 60-70%RH (Note 1)	-	50000	-	Hr

Note 1: The LED of B/L is drive by current only, drive voltage is for reference only. drive voltage can make driving current under safety area(current between minimum and maximum). 50,000 hours is only an estimate for reference.

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

Note 3: 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 $\Theta_x=\Theta_y=0^\circ$	(800)	(1000)	-	-	Note 1
Response Time	TR		-	14	19	ms	Note 2
	TF		-	11	16	ms	
Chromaticity	White		x	(0.263)	(0.313)	(0.363)	-
		y	(0.279)	(0.329)	(0.379)	-	
Viewing Angle	Hor.	$\theta_{x+}$	80	88	-	Deg.	Note 3
		$\theta_{x-}$	80	88	-		
	Ver.	$\theta_{y+}$	80	88	-		
		$\theta_{y-}$	80	88	-		
Luminance	L	PWM=100%	900	1000	-	cd/m2	-
Uniformity	-	-	70	-	-	%	Note 5

Note 1 : Definition of Contrast Ratio (CR) :

The contrast ratio can be calculated by the following expression.

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

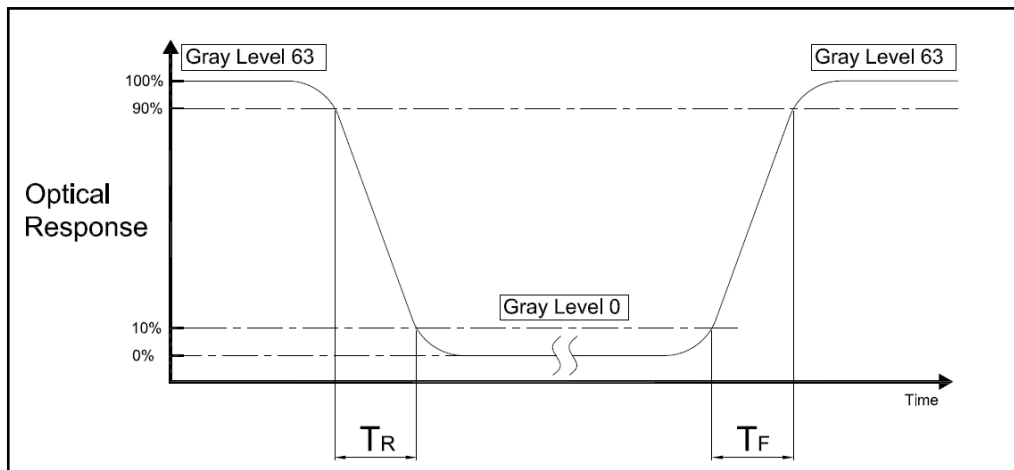
L63 : Luminance of gray level 63

L0 : Luminance of gray level 0

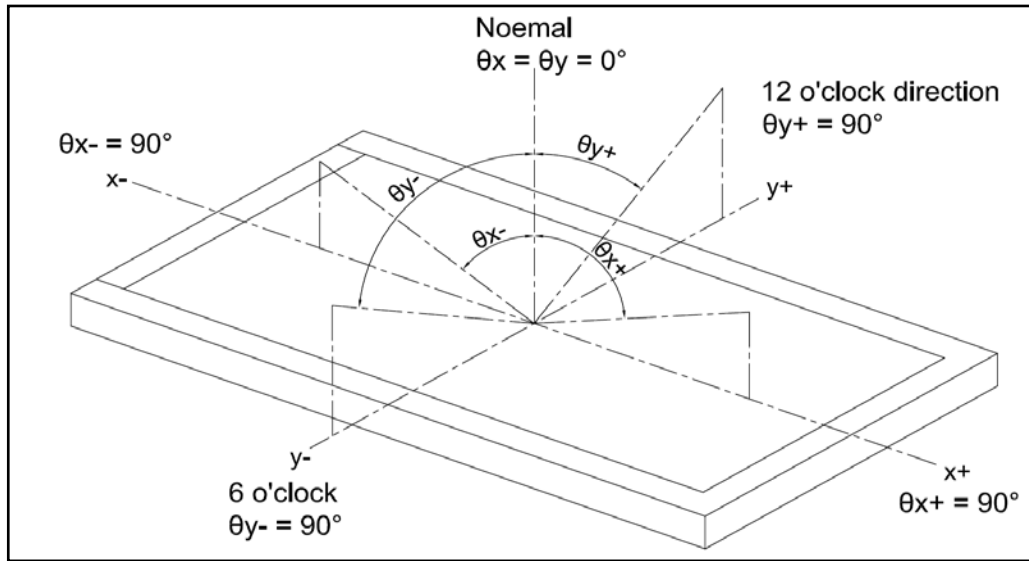
$$CR = CR(5)$$

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)

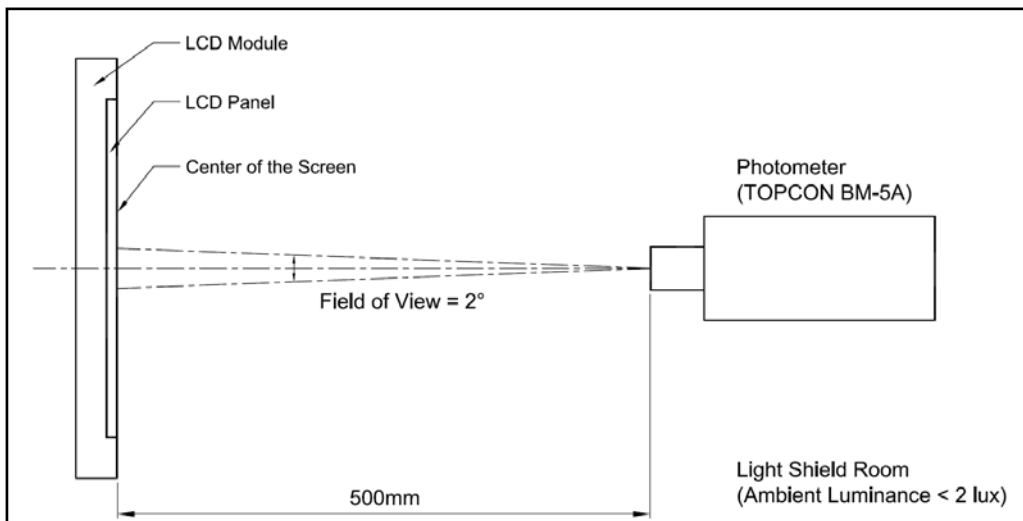


Note 3 : Definition of Viewing Angle

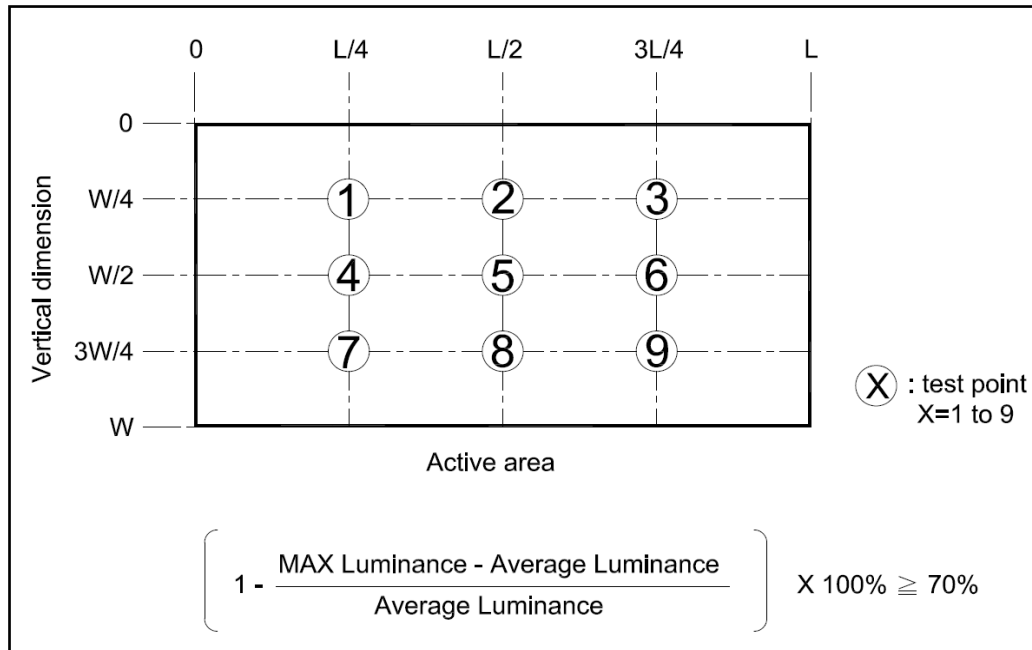


Note 4 : Measurement Set-Up:

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.

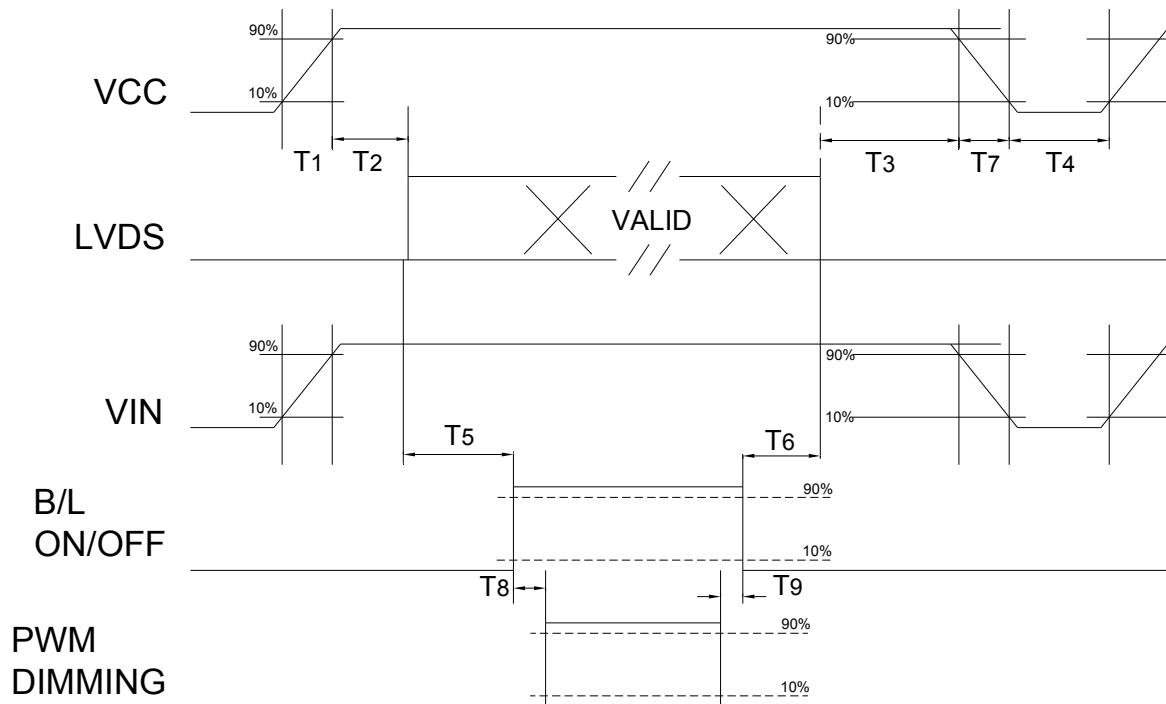


Note 5 :



## 9. TIMING SPECIFICATIONS

### 9.1 POWER SIGNAL SEQUENCE



Power ON/OFF sequence timing

Note 1 : Please avoid floating state of interface signal at invalid period.

Note 2 : When the interface signal is invalid, be sure to pull down the power supply of LCD VCC to 0 V.

Note 3 : The Backlight converter power must be turned on after the power supply for the logic and the interface signal is valid. The Backlight converter power must be turned off before the power supply for the logic and the interface signal is invalid.

ITEM	MIN.	TYP.	MAX.	UNIT
T1	0.5	-	10	ms
T2	0	-	50	ms
T3	0	-	50	ms
T4	500	-	-	ms
T5	200	-	-	ms
T6	20	-	-	ms
T7	5	-	300	ms
T8	10	-	-	ms
T9	10	-	-	ms

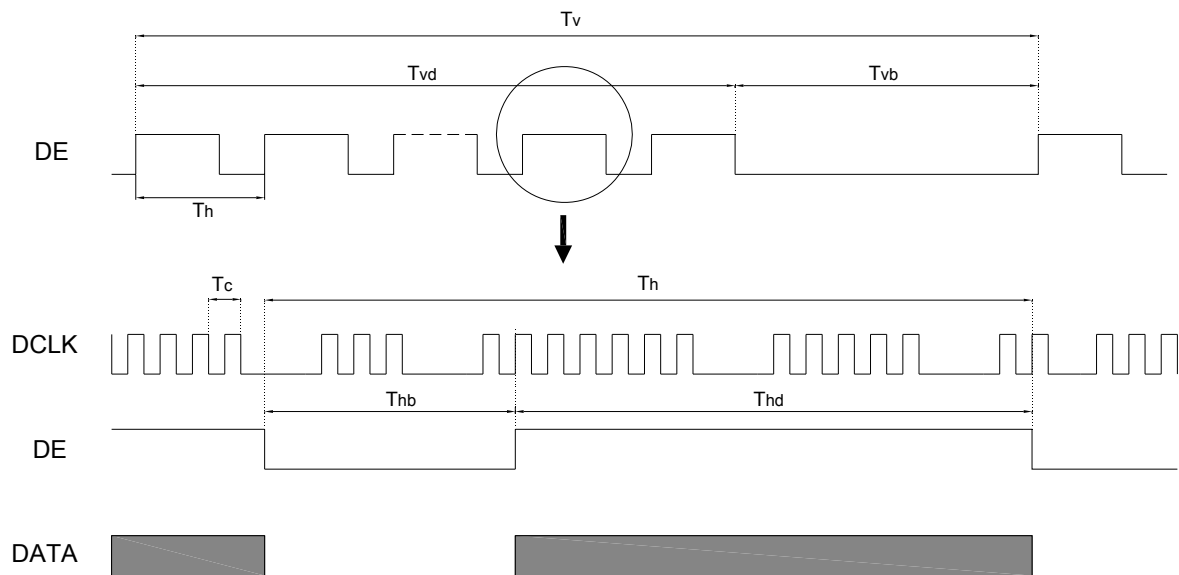
### 9.2 INPUT SIGNAL TIMING SPECIFICATIONS

SIGNAL	ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
DCLK	Frequency	Fc	55	65	75	MHz	
Vertical Active Display Term	Total	Tv	770	806	950	Th	Tv= Tvd+ Tvb
	Display	Tvd	768	768	768	Th	-
	Blank	Tvb	2	38	182	Th	-
Horizontal Active Display Term	Total	Th	1104	1344	1800	Tc	Th= Thd+ Thb
	Display	Thd	1024	1024	1024	Tc	
	Blank	Thb	76	320	776	Tc	

Note 1 : Since this assembly is operated in DE only mode, Hsync and Vsync input signals should be set to low logic level. Otherwise, this assembly would operate abnormally.

Note 2 : Frame rate is 60Hz

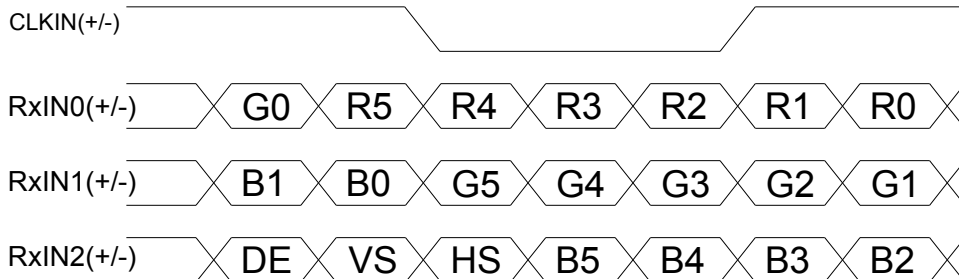
INPUT SIGNAL TIMING DIAGRAM



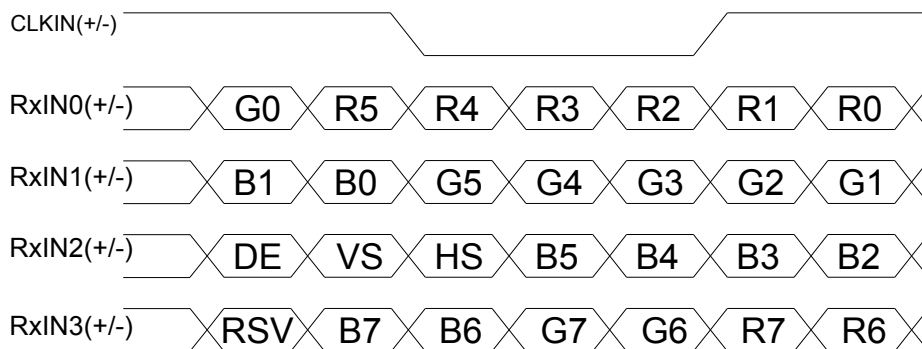


### 9.3 THE INPUT DATA FORMAT

SEL6/8 ="High" for 6 bits LVDS Input



SEL6/8 ="Low" or "NC" for 8 bits LVDS Input



SIGNAL NAME	DESCRIPTION	REMARK
R7	Red Data 7	Red-pixel Data  For 8Bit LVDS input MSB : R7 ; LSB : R0
R6	Red Data 6	
R5	Red Data 5	
R4	Red Data 4	
R3	Red Data 3	
R2	Red Data 2	
R1	Red Data 1	
R0	Red Data 0	
G7	Green Data 7	Green-pixel Data  For 8Bit LVDS input MSB : G7 ; LSB : G0
G6	Green Data 6	
G5	Green Data 5	
G4	Green Data 4	
G3	Green Data 3	
G2	Green Data 2	
G1	Green Data 1	
G0	Green Data 0	
B7	Blue Data 7	Blue-pixel Data  For 8Bit LVDS input MSB : B7 ; LSB : B0
B6	Blue Data 6	
B5	Blue Data 5	
B4	Blue Data 4	
B3	Blue Data 3	
B2	Blue Data 2	
B1	Blue Data 1	
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.

## 10. RELIABILITY TEST

ENVIRONMENTAL TEST				
NO.	ITEM	CONDITIONS	TIME PERIOD	REMARK
1	High Temperature Storage	80°C	240HRS	
2	Low Temperature Storage	-30°C	240HRS	
3	High Temperature Operation	70°C	240HRS	
4	Low Temperature Operation	-20°C	240HRS	
5	Temperature Cycle	-20°C ← 25°C → 70°C (30min) (5min) (30min)	100CYCLE	
6	High Temperature & High Humidity Storage Test	60°C 90%RH (No condensation)	240HRS	

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 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
OT104EXWDLV-H1	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.