

TFT-DISPLAY DATASHEET

ONation
Model: OT121ZBVDLV-00

BRIEF SPEC.:

Main Feature	Landscape Type White LED Backlight Wide Viewing Angle
Active Screen Area	261.12 x 163.2 (mm)
Diagonal Format	12,1" 16:10
Resolution	1280 x 800
Colors	R.G.B Stripe
Backlight	LED, White
Brightness	400 cd/m ²
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	278 x 184 x 10 (mm)
Operation Temperature	-10... +70 °C
Storage Temperature	-20... +80 °C
Surface Treatment	Anti-Glare & Hardness



ONation Corporation

TFT COLOR LCD MODULE

MODEL: OT121ZBWDLV-00

(Complied with RoHS)

XGA

LVDS interface (1port)

Version: P0.2

Customer : _____
Approved By : _____
Date: _____

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

[All information is subject to change without notice.](#)

[Please confirm the sales representative before starting to design your system](#)

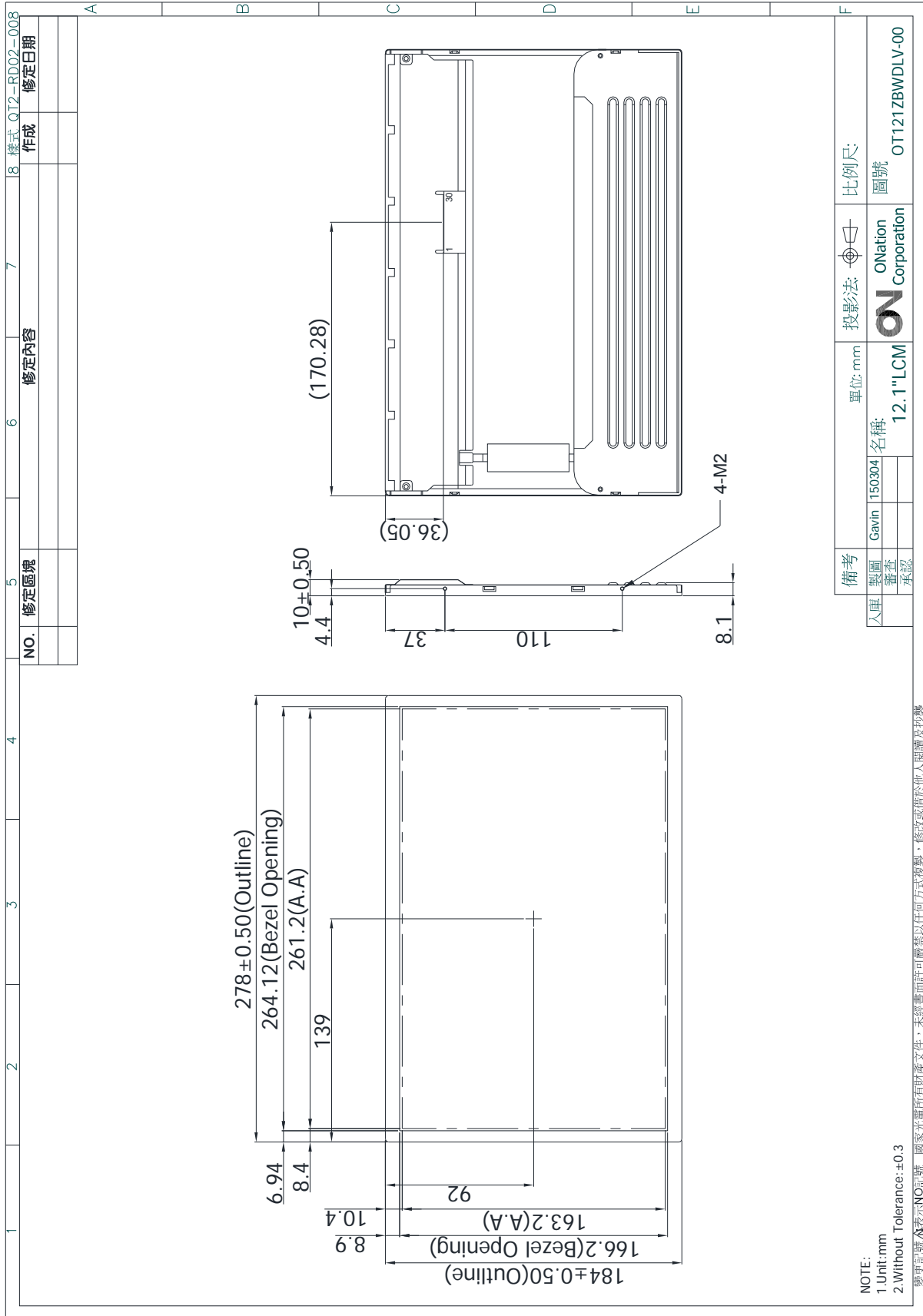
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2.MECHANICAL SPECIFICATIONS

(1)	Number Of Dots (Dots)	1280(R.G.B) X 800
(2)	Module Size(mm)	278.0(H) X 184.0(V) X100(D)
(3)	Active Area(mm)	261.12(H) X 163.2(V)
(4)	Pixel Pitch(mm)	0.204 (H) X 0.204(V)
(5)	LCD / Polarizer Model	TFT , Transmissive, Normally/Black, Anti-Glare & Hardness 3H
(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

3. OUTLINE DIMENSIONS



4. INTERFACE PIN CONNECTION

4.1 LCM PANEL DRIVING SECTION

CN1 Connector : Starconn 093G30-B0001A-G4

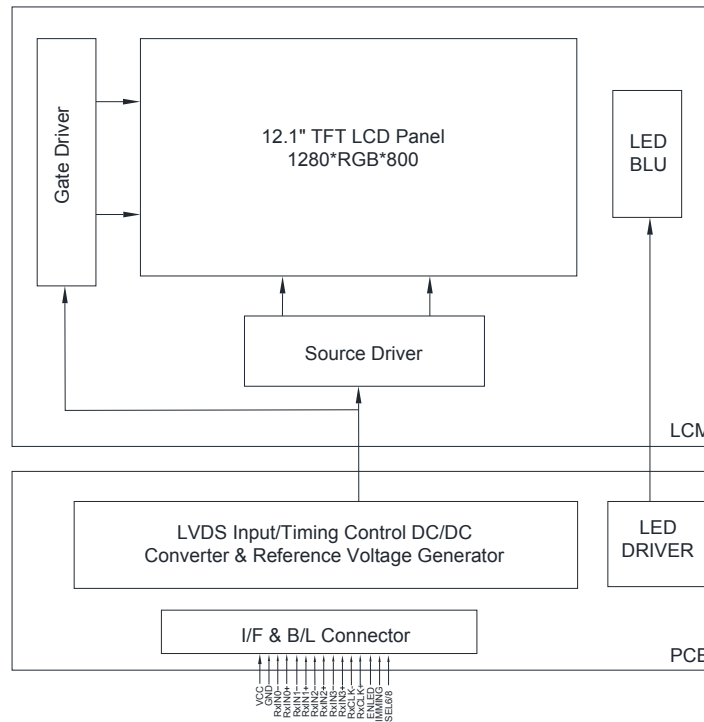
PIN NO.	SIGNAL	FUNCTION	REMARK
1	VLED	LED Power	
2	VLED	LED Power	
3	VLED	LED Power	
4	VLED	LED Power	
5	ENLED	Enable Pin	
6	DIMMING	Backlight Adjust	
7	GND	Ground	
8	GND	Ground	
9	VCC	Power Supply	
10	VCC	Power Supply	
11	GND	Ground	
12	GND	Ground	
13	RxIN0-	Differential Data Input, CH0(Negative)	
14	RxIN0+	Differential Data Input, CH0(Positive)	
15	GND	Ground	
16	RxIN1-	Differential Data Input, CH1(Negative)	
17	RxIN1+	Differential Data Input, CH1(Positive)	
18	GND	Ground	
19	RxIN2-	Differential Data Input, CH2(Negative)	
20	RxIN2+	Differential Data Input, CH2(Positive)	
21	GND	Ground	
22	RxCLK-	Differential Data Input, CLOCK(Negative)	
23	RxCLK+	Differential Data Input, CLOCK(Positive)	
24	GND	Ground	
25	RxIN3-	Differential Data Input, CH3(Negative)	
26	RxIN3+	Differential Data Input, CH3(Positive)	
27	GND	Ground	
28	SEL6/8	LVDS 6/8 bit Select Function Control	Note1,2
29	GND	Ground	
30	GND	Ground	

Note 1: Low or NC → 6bit Input Mode

High → 8bit Input Mode

Note 2: "Low" stands for 0V. "High" stands for 3.3V

5. BLOCK DIAGRAM



6. ABSOLUTE MAXIMUM RATINGS

6.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
Supply Voltage	VCC	-0.3				

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	450	500	550	mA	White
		350	385	420		Black
Differential Input Threshold Voltage	VTH	-	-	+100	mV	VCM=1.2V
	VTL	-100	-	-	mV	
LVDS Common Mode Voltage	VCM	1.125	-	1.375	V	

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

7.2 BACKLIGHT UNITS

Ta=25°C

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
LED Converter Input Voltage	VLED	10.8	12	13.2	V	Duty=100%
LED Light Bar Input Current	ILED	0.8	0.7	0.6	A	Duty=100%
LED Light bar Voltage	VF	-	35.2	-	V	IF=80mA/EA
LED Current	IF	-	80	-	mA	Per EA
PWN control level	PWN High level	2.0	-	5.0	V	
	PWN low level	0	-	0.15	V	
PWM Control Frequency	f _{PWM}	190	200	20K	HZ	Note 3
PWM Control Duty Ratio		2	-	100	%	Note 3
LED Life Time	-	50,000	-	-	Hrs	Note1

Note (1) LED current is measured by utilizing a high frequency current meter as shown below:

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 ILED = 80mADC(LED forward current) until the brightness becomes ≤ 50% of its original value. Operating LED under high temperature environment will reduce life time and lead to color shift.

Note (3) :At 190 ~1KHz PWM control frequency, duty ratio range is restricted from 2% to 100%.
1K ~20KHz PWM control frequency , minimum duty on-time ≥ 20 us.

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		-	15	20	ms	Note 2
	TF		-	10	15		
Chromaticity	White	x	(0.263)	(0.313)	(0.363)	-	Note 4
		y	(0.279)	(0.329)	(0.379)	-	
Viewing Angle	Hor.	θ_{x+}	80	88	-	Deg.	Note 3
		θ_{x-}	80	88	-		
	Ver.	θ_{y+}	80	88	-		
		θ_{y-}	80	88	-		
Luminance	L	PWM=100%	300	400	-	cd/m2	Center

Note 1 : Definition of Contrast Ratio (CR) :

The contrast ratio can be calculated by the following expression.

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

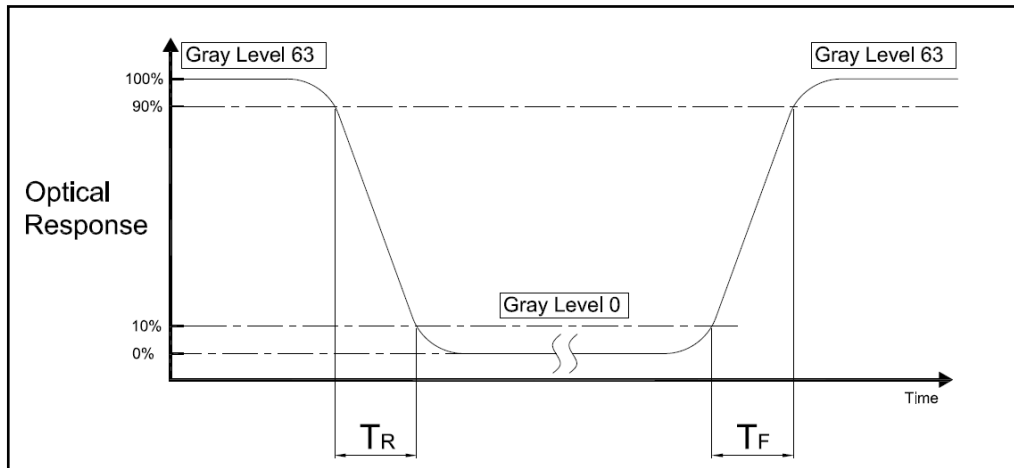
L63 : Luminance of gray level 63

L0 : Luminance of gray level 0

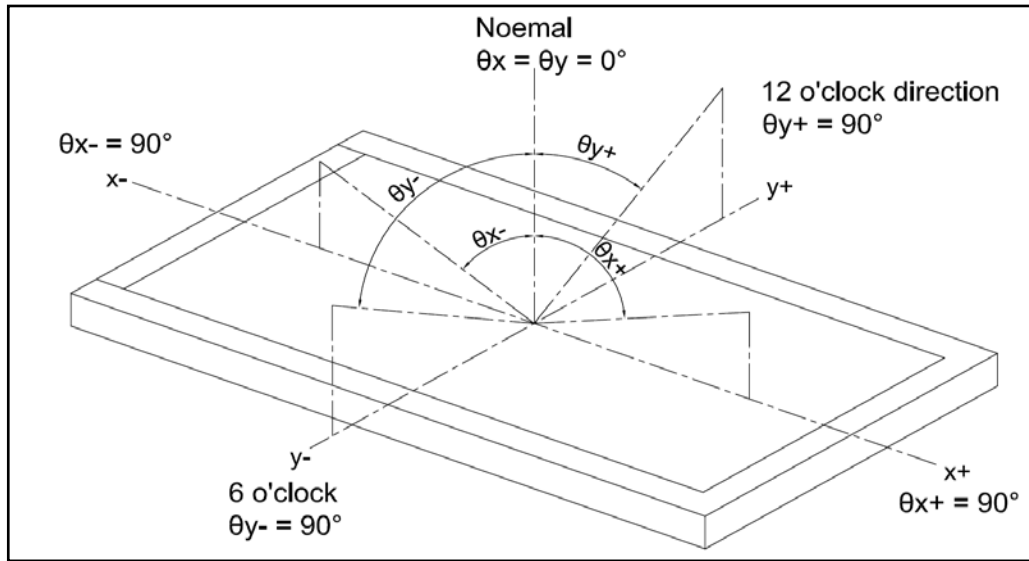
$$CR = CR(5)$$

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)

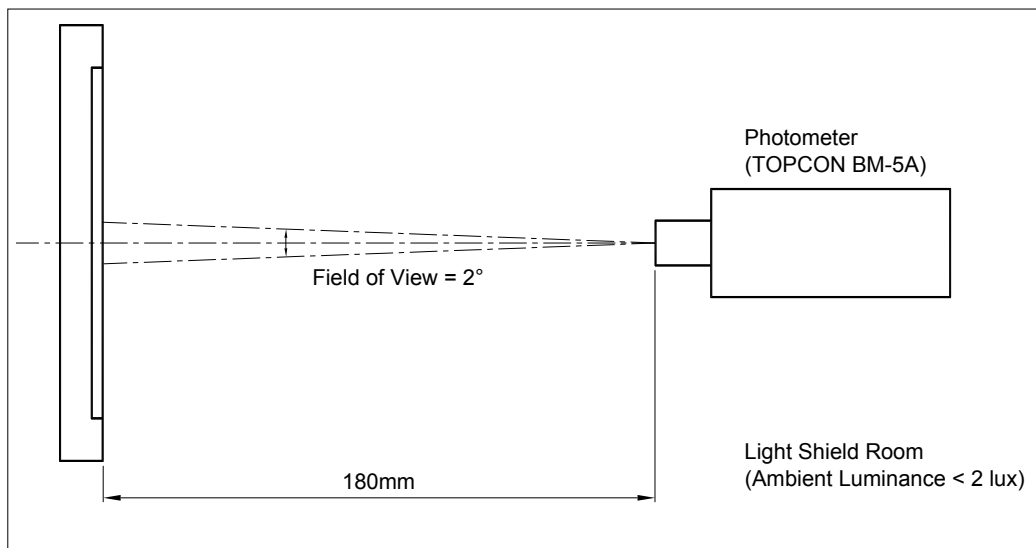


Note 3 : Definition of Viewing Angle



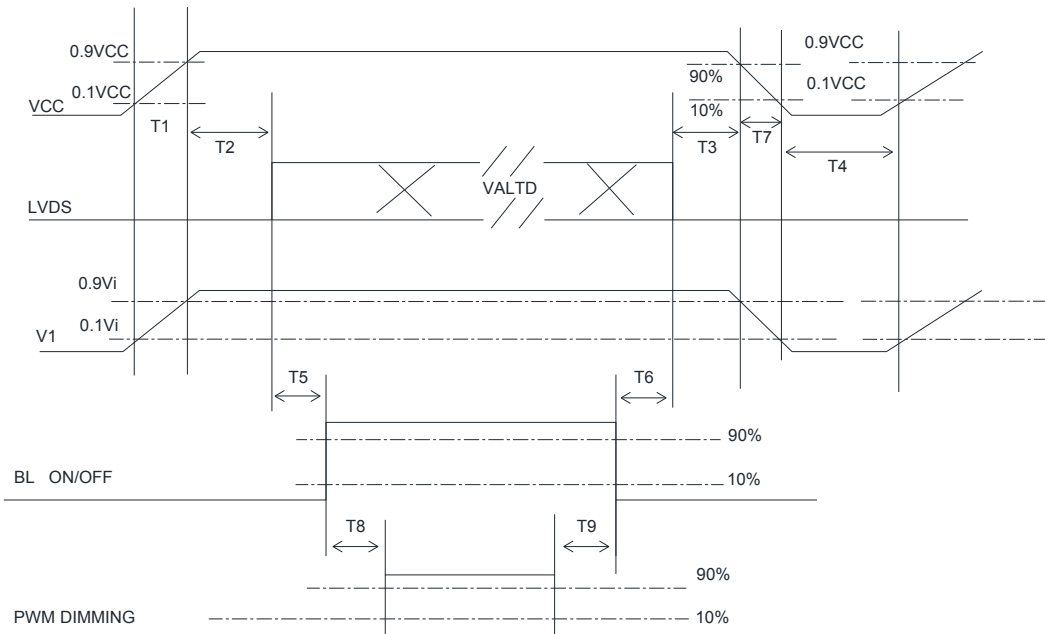
Note 4 : Measurement Set-Up:

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.



9. TIMING SPECIFICATIONS

9.1 POWER ON/OFF SEQUENCE



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.

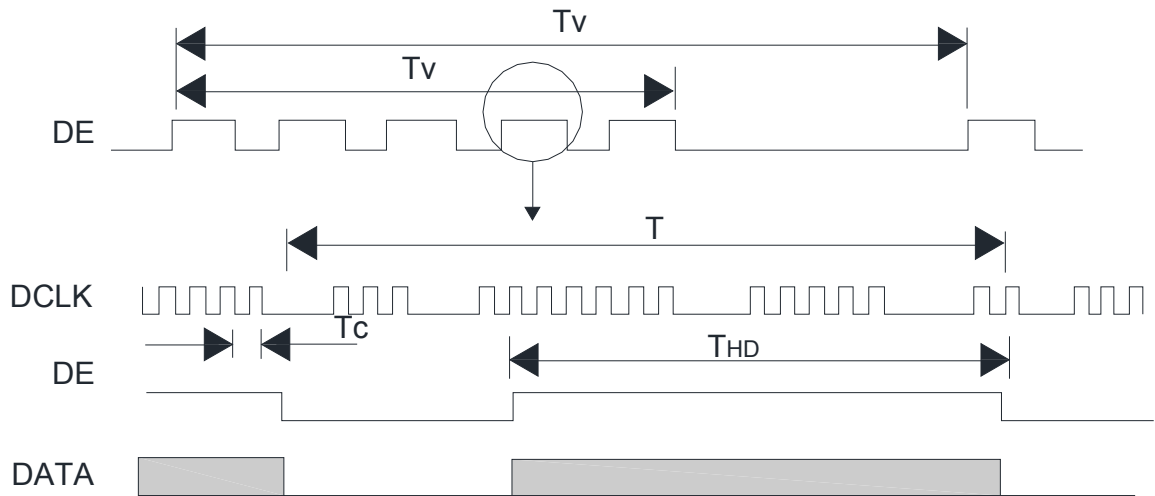
Note (3) The Backlight converter power must be turned on after the power supply for the logic and the interface signal is valid. The Backlight converter power must be turned off before the power supply for the logic and the interface signal is invalid.

ITEM	Min.	Typical	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 DISPLAY TIMING SPECIFICATIONS

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
DCLK Frequency	1/Tc	67.45	71	74.55	MHz	
DE Vertical Total Time	Tv	810	823	1000	TH	
DE Vertical Addressing Time	TVD	800	800	800	TH	
DE Horizontal Total Time	TH	1360	1440	1600	Tc	
DE Horizontal Addressing Time	THD	1280	1280	1280	Tc	

Note: Because this module is operated by DE only mode, Hsync and Vsync input signals are ignored.

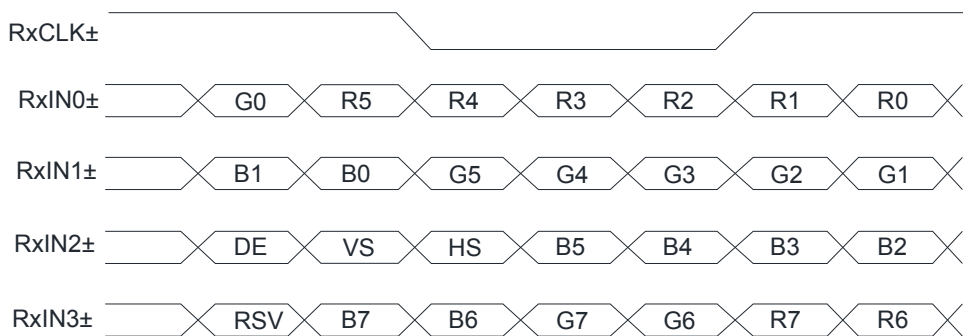


9.3 THE INPUT DATA FORMAT

SEL 6/8="LOW" or "NC" for 6 Bits LVDS



SEL 6/8="HIGH" or "NC" for 8 Bits LVDS



Note1: R/G/B data 7: MSB, R/B/G data 0: LSB

SIGNAL NAME	DESCRIPTION	REMARK
R7	Red Data 7	Red-pixel Data Each red pixel's brightness data consists of these 8 bits pixel data
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 Each red pixel's brightness data consists of these 8 bits pixel data
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 Each red pixel's brightness data consists of these 8 bits pixel data
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	
VS	Vertical Sync	
HS	Horizontal Sync	

10. RELIABILITY TEST

ENVIRONMENTAL TEST				
NO.	ITEM	CONDITIONS	TIME PERIOD	REMARK
1	High Temperature Storage	80°C	240HRS	
2	Low Temperature Storage	-20°C	240HRS	
3	High Temperature Operation	70°C	240HRS	
4	Low Temperature Operation	-10°C	240HRS	
5	Temperature Cycle	-20°C~80°C (30min) (30min)	1HRS/ 100CYCLE	
6	High Temperature Humidity Operation	60°C 90%RH	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 2 hours at room temperature.

10.1 VIBRATION TEST :

10.1.1 STATE LABORATORY ENVIRONMENT :

Room temperature : $25\pm 3^{\circ}\text{C}$
Relative humidity : $55\pm 20\% \text{RH}$

10.1.2 TEST METHOD / SPECIFICATION :

Sample Status : Non-packaged single state
Waveform : Sine
Frequency : 10~55~10Hz
Full amplitude : 1.5mm
Vibration direction : X,Y,Z Axis (3 Axial)
Test time : Each 2Hour / X,Y,Z Axis , Altogether 6 Hour

10.2 MECHANICAL SHOCK TEST :

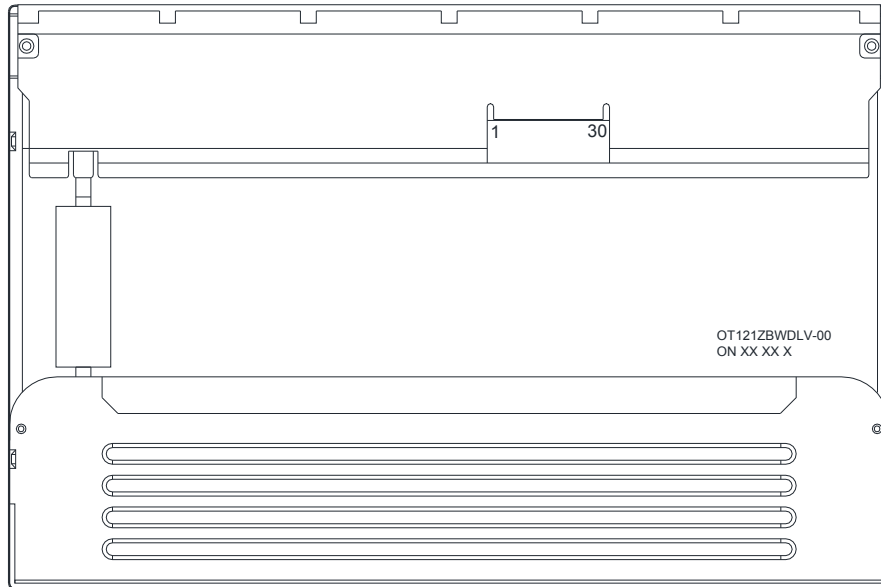
10.2.1 STATE LABORATORY ENVIRONMENT :

Room temperature : $25\pm 3^{\circ}\text{C}$
Relative humidity : $55\pm 20\% \text{RH}$

10.2.2 TEST METHOD / SPECIFICATION :

Sample Status : Non-packaged single state
Waveform : Half-sine
Acceleration : 1.5G
Shock Time : 6ms
Impact direction : 6 Directions ($\pm X, \pm Y, \pm Z$ axes)
Number of shocks : Each direction 3 Secondary , Altogether 18 Secondary

11.MODEL NUMBER SYSTEM



(a) MODEL NAME : OT121ZBWDLV-00

(b) LOT NO : XX XX X

CODE	MEANING	DESCRIPTION
<u>XX</u>	Year	2013=13, 2014=14, 2015=15,
<u>XX</u>	Month	01,02,03,04,05,06,07,08,09,10,11,12
<u>X</u>	Week	1,2,3,4,5,6

12. LCM INSPECTION STANDARD

Inspection specifications refer ONation Corporation LCM INSPECTION STANDARD Document.

Document Number : QT3-QC-A-I003

13 PACKAGE INFORMATION

LCM Model	LCM Qty. in the box	Inner Box Size (mm)	Weight	REMARK
OT121ZBWDLV-00	TBD	TBD	TBD	

14.PRECAUTIONS FOR USE

14.1 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.

14.2 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.

14.3 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.

14.4 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.