

TFT-DISPLAY DATASHEET

ONation
Model:OT121AXWDLN-H0

BRIEF SPEC.:

Main Feature	LandscapeType Wide Viewing Angle
Active Screen Area	245.76 x 184.32 (mm)
Diagonal Format	12.1" 4:3
Resolution	1024 X 768
Colors	[6 und 8 Bit]
Backlight	LED White
Brightness	1000 cd/m ²
LED Life Time	50K (h)
Interface	LVDS
Viewing Angle	80/80 L/R 80/80 up/down
Touchscreen	no
Power Supply	3.3 V (Typ.)
Module Outline	279.0 x 209.0 x 10.16 (mm)
Operation Temperature	-20... +70 °C
Storage Temperature	-30... +80 °C
Surface Treatment	Anti-Glare



ONation Corporation

TFT COLOR LCD MODULE

MODEL: OT121AXWDLV-H0
(Complied with RoHS)

XGA
LVDS Interface

Version: P0.1

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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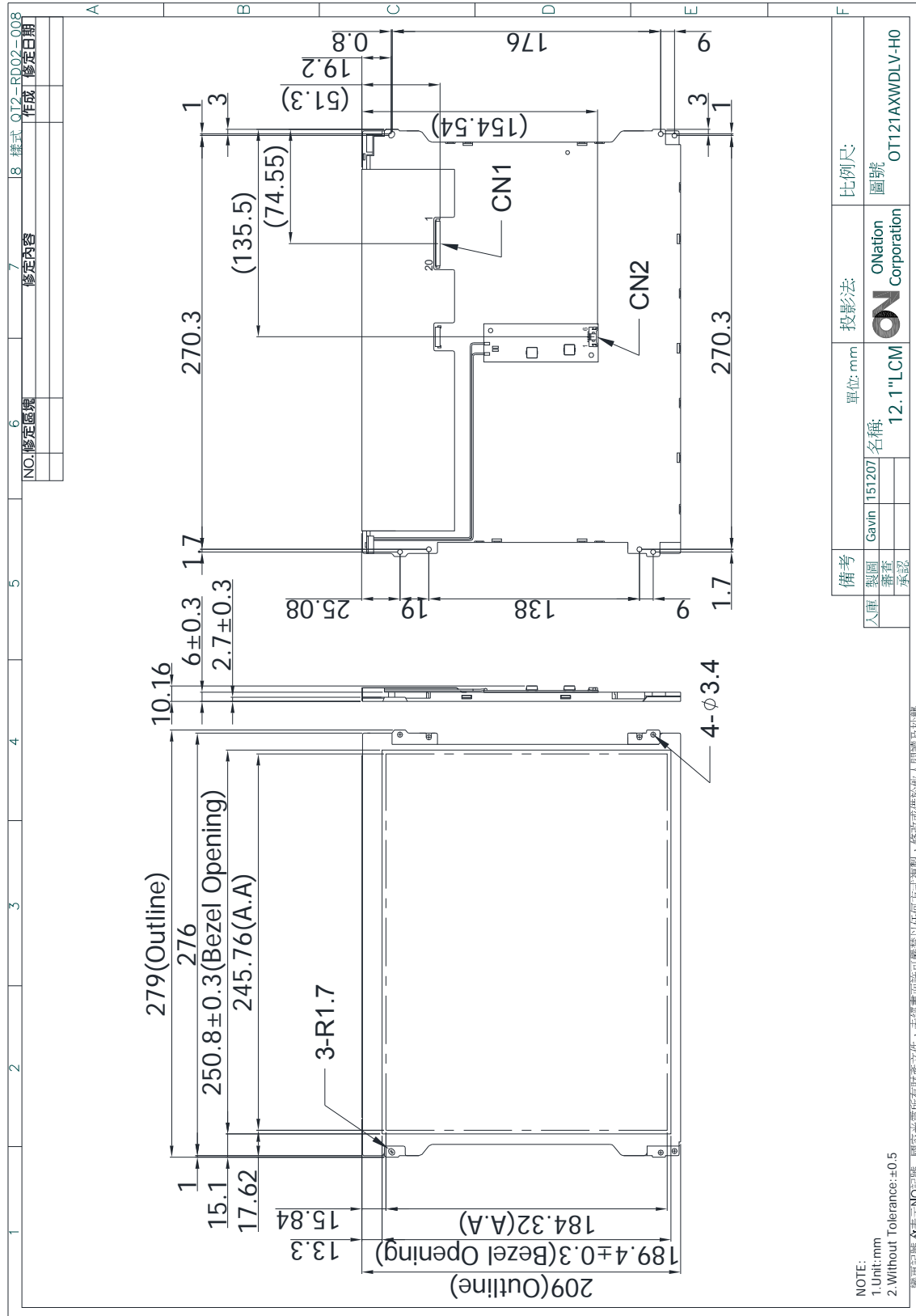
1.RECORD OF REVISION

REV	DATE	PAGE	SUMMARY
0.1	2015.12.10	ALL	Preliminary specification was first issued.

2.MECHANICAL SPECIFICATIONS

(1)	Number Of Dots (Dots)	1024(R.G.B) X 768
(2)	Module Size(mm)	279.0(H) X 209.0(V) X10.16(D)
(3)	Active Area(mm)	245.76(H) X 184.32(V)
(4)	Pixel Pitch(mm)	0.24 (H) X 0.24(V)
(5)	LCD / Polarizer Model	TFT , Transmissive, Normally/White, Anti-Glare & Hardness 3H
(6)	Backlight Color	White, LED
(7)	Viewing Direction	Wide Viewing Angle Horizontal : Right side 80°(typ.), Left side 80°(typ.) Vertical : Up side 80°(typ.), Down side 80°(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 : MSB240420HE or Equivalent

PIN NO.	SIGNAL	FUNCTION	REMARK
1	VCC	Power Supply , 3.3V(typical)	
2	VCC	Power Supply , 3.3V(typical)	
3	GND	Ground	
4	REV	Reverse Scan selection	Note 1
5	RxIN1-	-LVDS differential data input	
6	RxIN1+	+LVDS differential data input	
7	GND	Ground	
8	RxIN2-	-LVDS differential data input	
9	RxIN2+	+LVDS differential data input	
10	GND	Ground	
11	RxIN3-	-LVDS differential data input	
12	RxIN3+	+LVDS differential data input	
13	GND	Ground	
14	CLKIN-	-LVDS differential clock input	
15	CLKIN+	+LVDS differential clock input	
16	GND	Ground	
17	RxIN4-	-LVDS differential data input	
18	RxIN4+	+LVDS differential data input	
19	SEL	6/8 Bits LVDS data input selection(H:8bit)	
20	NC	Non Connection	

Note 1: I REV = LOW/NC

Gate Scan

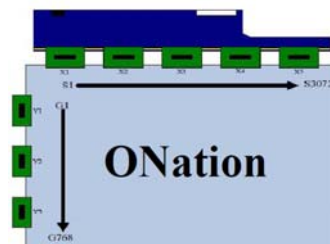
Y1→Y2→Y3

Y1 : G1→G2 - - - - - →G258

Source Scan :

X1→X2→X3→X4→X5

X1 : S1→S2 - - - - - →S600



II REV = High

Gate Scan

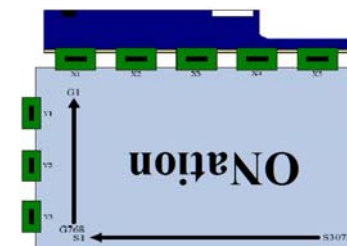
Y3→Y2→Y1

Y1 : G258→257 - - - - - →G1

Source Scan :

X5→X4→X3→X2→X1

X1 : S600→S599 - - - - - →S1

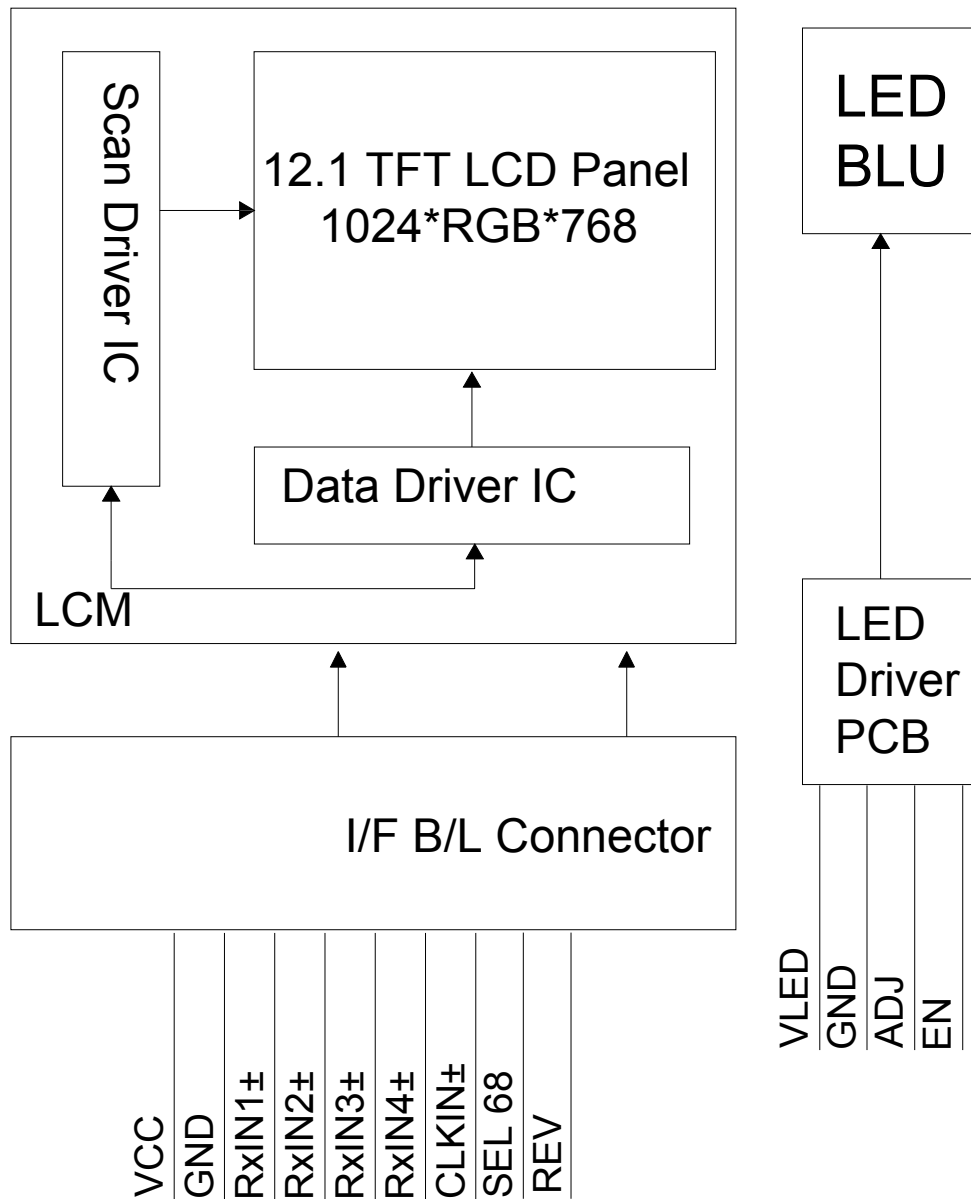


4.2 INPUT LED SIGNAL PIN ASSIGNMENT

Connector : 3808K-Q06N-03R or Equivalen

PIN NO.	SIGNAL	FUNCTION
1	VLED	Converter input voltage
2	VLED	Converter input voltage
3	EN	Enable pin (3.3V-ON,0V-OFF)
4	ADJ	Dimming(PWM)
5	GND	Converter ground Ground
6	GND	Converter ground Ground

5. BLOCK DIAGRAM



6. ABSOLUTE MAXIMUM RATINGS

6.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	MIN.	MAX.	UNIT	REMARK
Power Supply Voltage	VCC	-0.5	5	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)	10~85		10~95		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=50°C & RH=90% ≤ TBD Hrs.

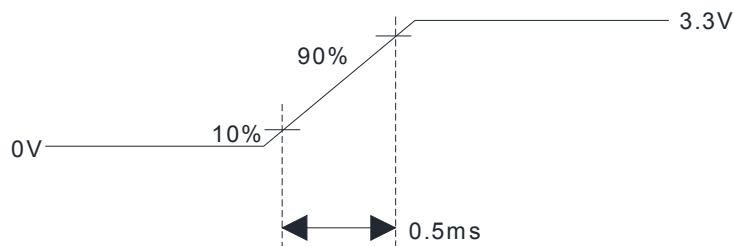
7. ELECTRICAL CHARACTERISTICS

7.1 ELECTRICAL CHARACTERISTICS OF LCD

Ta=25°C

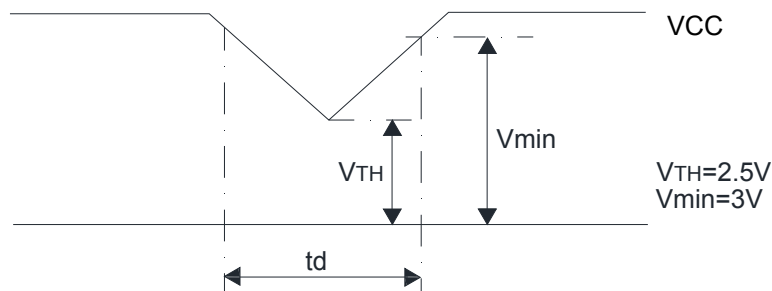
ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
Power Voltage For LCD	VCC	3.0	3.3	3.6	V	
	ICC			250	mA	Frame Rate=60Hz VCC=3.3V
	PCC	-	-	0.825	W	
Rush Current	Irush	-	-	3	A	Note 1
Allowable Logic/LCD Drive Ripple Voltage	VCCrp	-	-	200	mV	Note 2
Differential Input High Threshold	Vth	-	-	+100	mV	V _{CM} =+1.2V
Differential Input Low Threshold	Vtl	-100	-	-	mV	V _{CM} =+1.2V
Magnitude Differential Input Voltage	V _{ID}	100	-	600	mV	-
Common Mode Voltage	V _{CM}	V _{ID} /2+0.6	1.2	1.8- V _{ID} /2	V	-
Common Mode Voltage Offset	ΔV _{CM}	-	-	50	mV	V _{CM} =+1.2V

Note 1: Measure Condition



Note 2: VCC Power Dip Condition

If $V_{TH} < V_{CC} \leq V_{min}$, then $t_d \leq 10ms$; When the voltage return to normal out panel must revive automatically.



7.2 BACKLIGHT UNITS

Ta=25°C

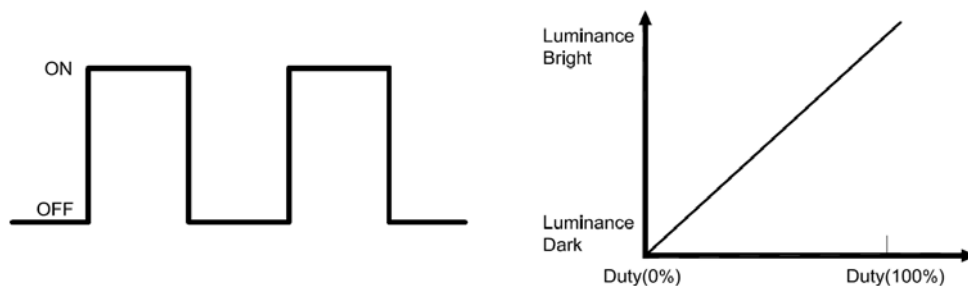
ITEM		SYMBOL	MIN.	TYP.	MAX.	UNIT
LED Driving Voltage		VLED	9.0	12.0	15.0	V
		ILED (VLED=12.0V)	-	TBD	TBD	A
PWM Control Level	PWM High Level	-	3.0	3.3	3.6	V
	PWM Low Level	-	0	-	1.0	V
PWM Control Duty Ratio		-	0	-	100	%
PWM Control Frequency		f _{PWM}	100	-	2000	Hz
LED Life Time (For Reference Only)		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 PWM=100%(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 $\Theta_x = \Theta_y = 0^\circ$	(720)	(800)	-	-	Note 1
Response Time	TR+TF		-	16	19	ms	Note 2
Chromaticity	White	x	(0.255)	(0.305)	(0.355)	-	Note 4
		y	(0.275)	(0.325)	(0.375)	-	
Viewing Angle	Hor.	θ_{x+}	70	80	-	Deg.	Note 3
		θ_{x-}	70	80	-		
	Ver.	θ_{y+}	70	80	-		
		θ_{y-}	70	80	-		
Luminance	L	PWM=100%	(800)	(1000)	-	cd/m2	
Luminance Uniformity	YU		70	-	-	%	Note 5

Note 1 : Definition of Contrast Ratio (CR) :

The contrast ratio can be calculated by the following expression.

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

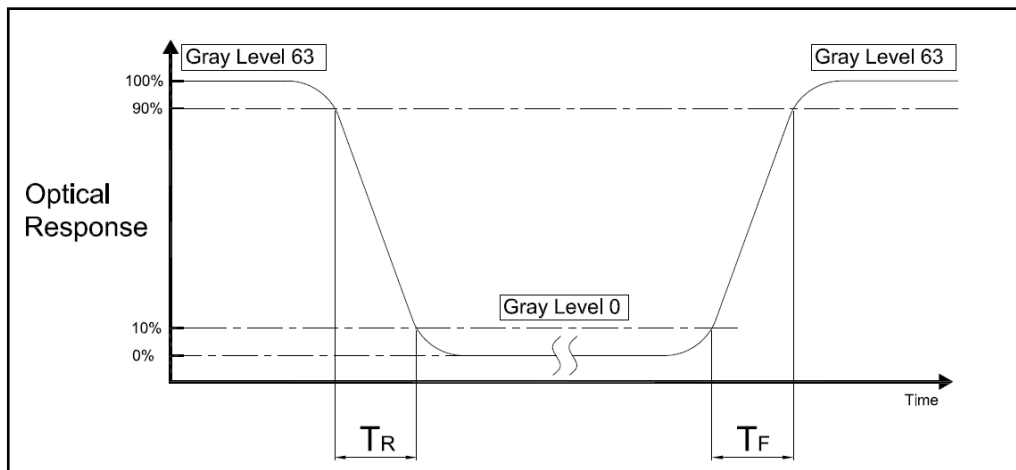
L63 : Luminance of gray level 63

L0 : Luminance of gray level 0

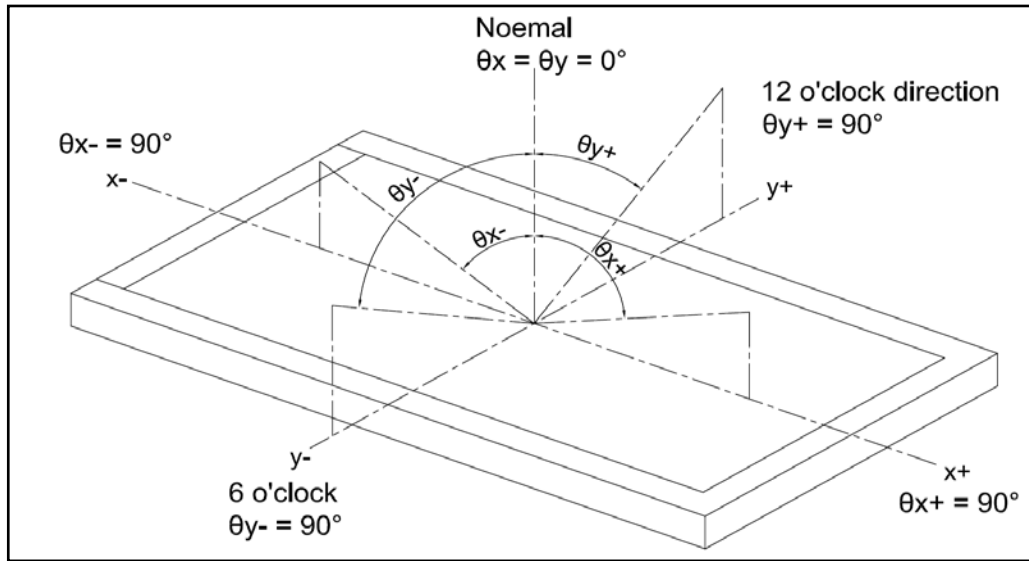
$$CR = CR(5)$$

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)

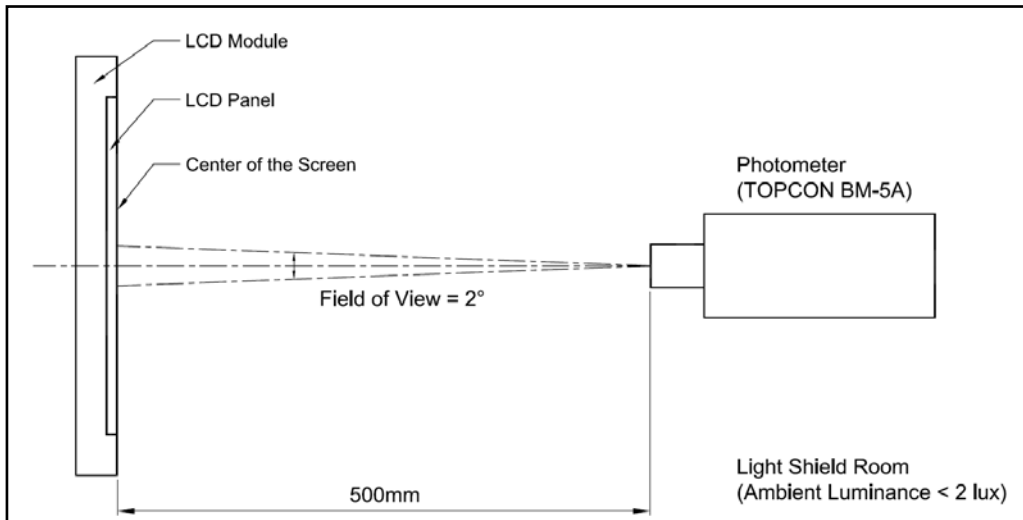


Note 3 : Definition of Viewing Angle

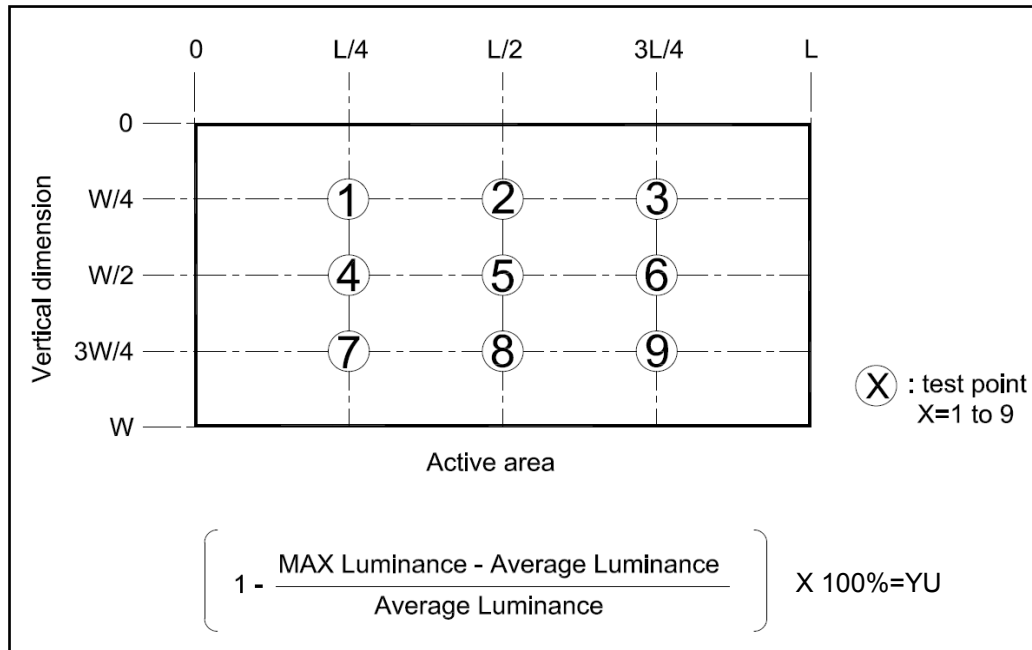


Note 4 : Measurement Set-Up:

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 :

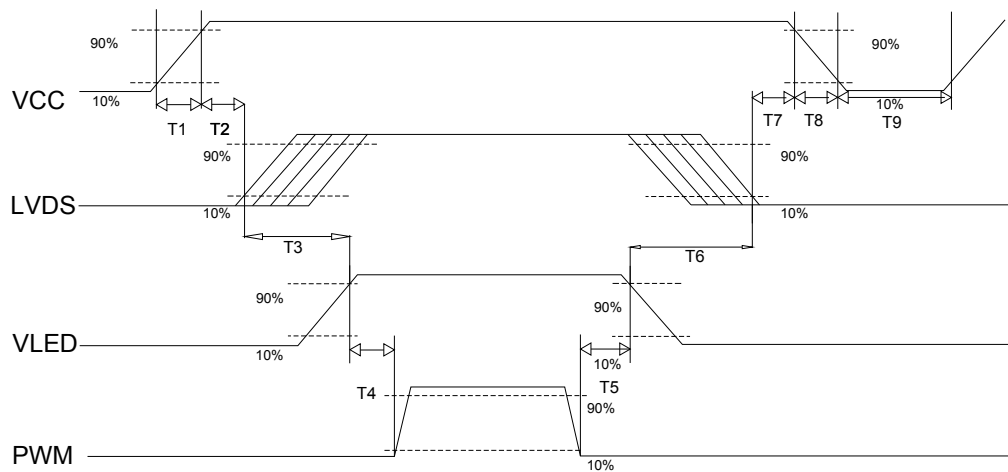


9. TIMING SPECIFICATIONS

9.1 POWER SUPPLY VOLTAGE SEQUENCE

VCC power on/off sequence is as follows. Interface signals are also shown in the chart. Signals from any system shall be Hi-Z state or low level when VCC is off. a. Power on sequence:

Power Sequence



Power ON/OFF sequence timing

Parameter	Min.	Typ.	Max.	Units
T1	0.5	-	10	ms
T2	30	40	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

Note 1: Power On Sequence: VCC-LVDS-VLED

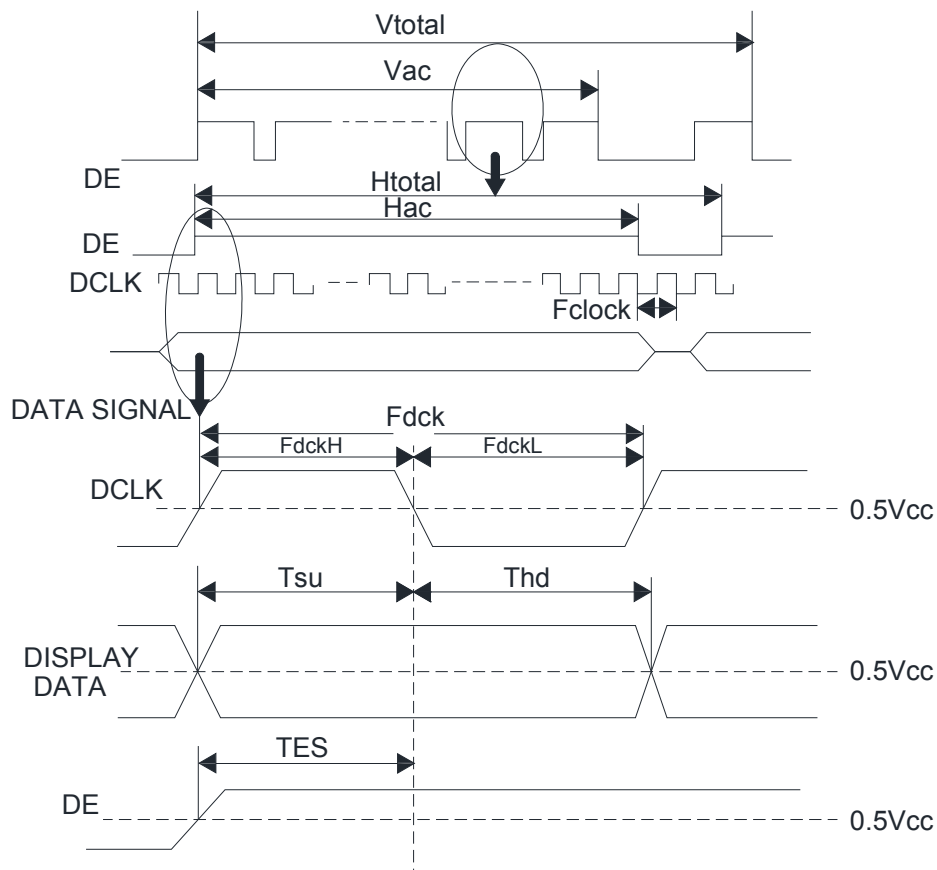
Note 2: Power Off Sequence: VLED -LVDS -VCC

9.2 TIMING CHARACTERISTIC

9.2.1 Interface Timings

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
LVDS Clock Frequency	Fclk	50	65	80	MHz	
H Total Time	HT	1100	1344	2047	Clocks	
H Active Time	HA	1024	1024	1024	Clocks	
H Blanking Time	HBL	76	320	1023	Clocks	
V Total Time	VT	776	806	1023	Lines	
V Active Time	VA	768	768	768	Lines	
V Blanking Time	VBL	8	38	255	Lines	
Frame Rate	Vsync	55	60	65	Hz	

Note: H Blank area and V Blank area can not be changed at every frame



10. RELIABILITY TEST

ENVIRONMENTAL TEST				
NO.	ITEM	CONDITIONS	TIME PERIOD	REMARK
1	High Temperature Storage	80°C	TBD HRS	
2	Low Temperature Storage	-30°C	TBD HRS	
3	High Temperature Operation	(70)°C	TBD HRS	
4	Low Temperature Operation	-20°C	TBD HRS	
5	Temperature Cycle	-30°C ← 25°C → 80°C (30min) (5min) (30min)	TBD YCLE	
6	High Temperature Humidity Storage	50°C 90%RH (No condensation)	TBD 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 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 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
OT121AXWDLV-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.