

TFT-DISPLAY DATASHEET

ONation
Model:OT104BSWDLV-H0

BRIEF SPEC.:

Main Feature	LandscapeType Wide Viewing Angle
Active Screen Area	211.2 x 158.4 [mm]
Diagonal Format	10.4" 4:3
Resolution	800 X 600
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 70/70 up/down
Touchscreen	no
Power Supply	3.3 V [Typ.]
Module Outline	243.0 x 184.0 x 10.55 [mm]
Operation Temperature	-20... +70 °C
Storage Temperature	-30... +80 °C
Surface Treatment	Anti Glare



ONation Corporation

TFT COLOR LCD MODULE

MODEL: OT104BSWDLV-H0
(Complied with RoHS)

SVGA
LVDS interface (1port)

Version: P0.1

Customer : _____
Approved By : _____
Date: _____

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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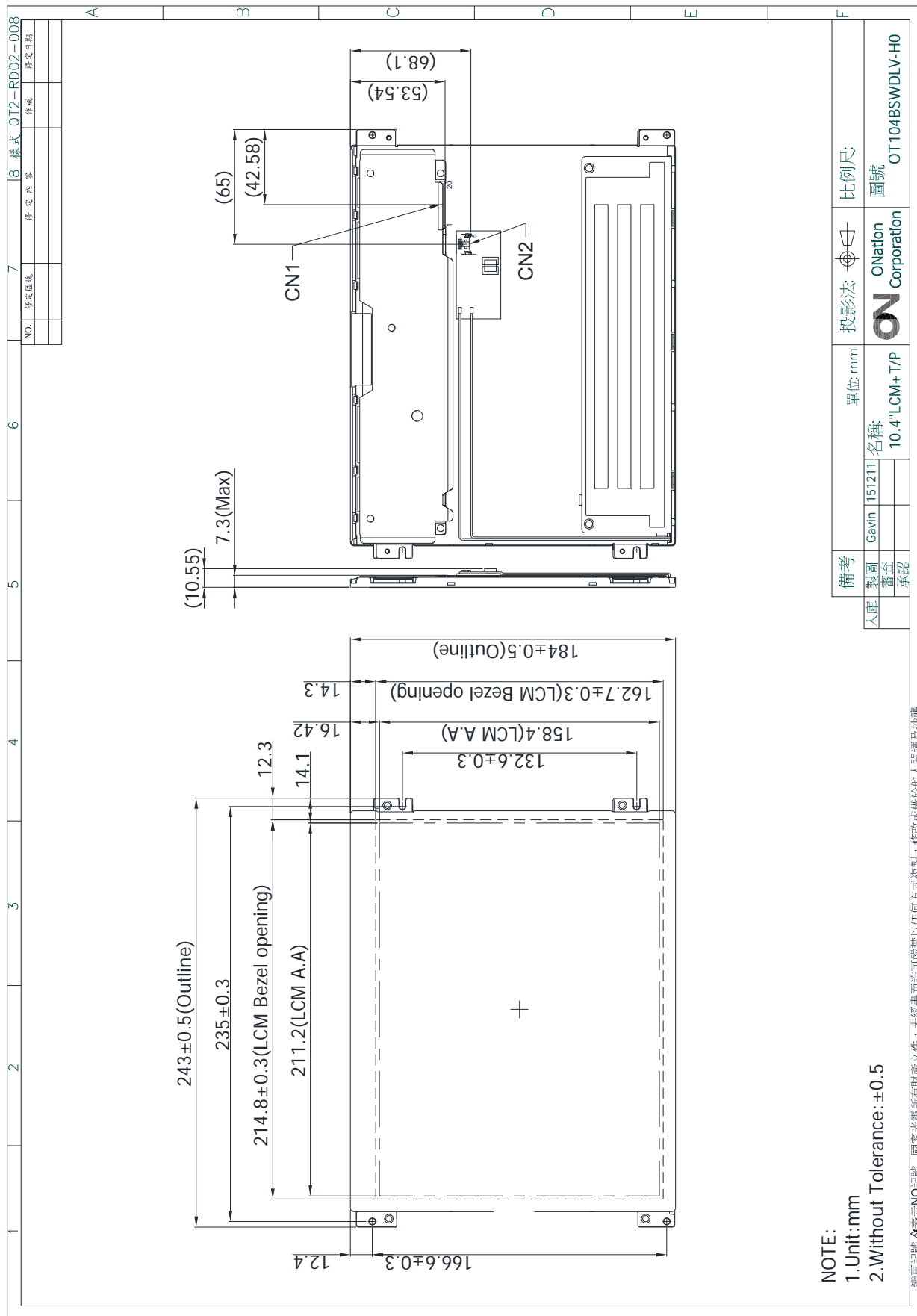
1.RECORD OF REVISION

REV	DATE	PAGE	SUMMARY
0.1	2015.12.11	ALL	Preliminary specification was first issued.

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 10.55(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	Wide Viewing Angle Horizontal : Right side 80°(typ.), Left side 80°(typ.) Vertical : Up side 70°(typ.), Down side 70°(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 107A20-0022RA-G3-R or Equivalent

Mating Connector : STARCONN 093A20-010010-T4 or Equivalent

PIN NO.	SIGNAL	FUNCTION	REMARK
1	VCC	Power Supply For Digital Circuit	
2	VCC	Power Supply For Digital Circuit	
3	GND	Ground	
4	DPS	Reverse Scan Function [High : Enable , Low : Disable]	Note 1
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	Reserved	
20	SEL68	LVDS 6/8 bit select function control, Low or NC → 6 bit Input Mode High → 8bit Input Mode	Note 1

Note 1 “Low” stands for 0V. “High” stands for 3.3V. “NC” stands for “No Connected”.

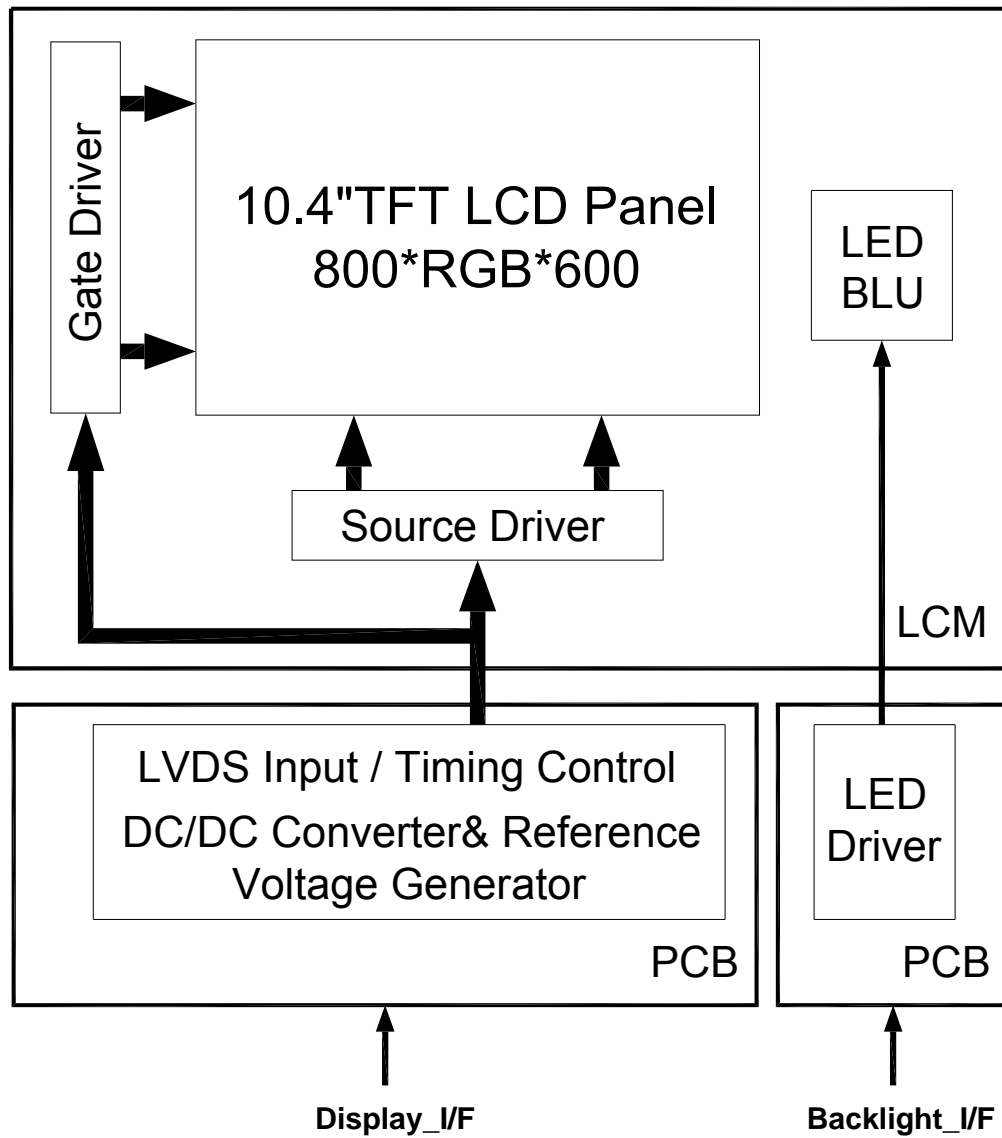
4.2 BACKLIGHT UNIT

CN2 Connector : 3808K-Q05N-03R or Equivalent

Mating Connector : H208K-P05N-02B or Equivalent

PIN NO.	SIGNAL	FUNCTION
1	VLED	Power Supply for LED Circuit
2	VLED	Power Supply for LED Circuit
3	GND	Ground
4	GND	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
Supply Voltage	VCC	-0.3	7.0	V	
	VLED	-0.3	36.0	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)	-20	70	-30	80	Note 1,2,3
Humidity(% RH)	5 ~ 90		5 ~ 90		Note 4

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 : Operation Ta=70°C & -20°C ≤ 72Hrs.

Note 4 : Storage Ta=60°C & RH=90% ≤ 72Hrs.

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	-	540	660	mA	Note 1

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

7.2 BACKLIGHT UNITS

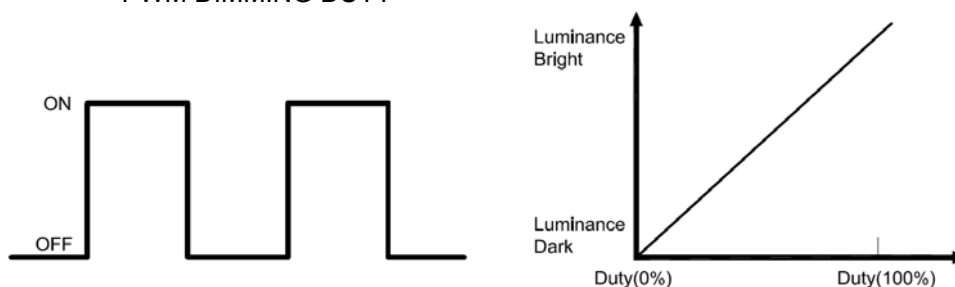
Ta=25°C

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 _{PWM}	100	-	2000	Hz
LED Life Time (For Reference Only)		Ta=25°C 60-70%RH (Note 1)	-	(50000)	-	Hr

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 $\Theta_x=\Theta_y=0^\circ$	500	700	-	-	Note 1
Response Time	TR		-	5	10	ms	Note 2
	TF		-	11	16	ms	
Chromaticity	White		x	(0.242)	(0.292)	(0.342)	-
		y	(0.284)	(0.334)	(0.384)	-	
Viewing Angle	Hor.	θ_{x+}	70	80	-	Deg.	Note 3
		θ_{x-}	70	80	-		
	Ver.	θ_{y+}	60	70	-		
		θ_{y-}	60	70	-		
Luminance	L	PWM=100%	900	1000	-	cd/m2	

Note 1 : Definition of Contrast Ratio (CR) :

The contrast ratio can be calculated by the following expression.

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

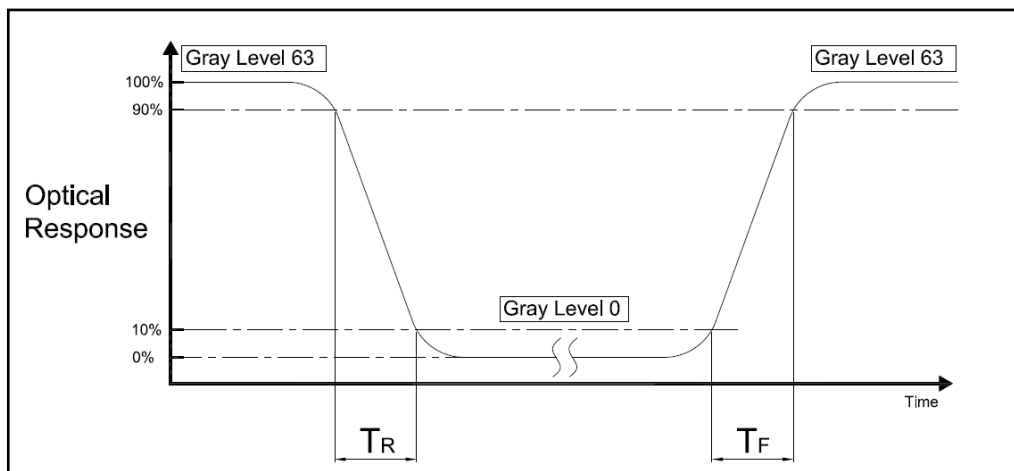
L63 : Luminance of gray level 63

L0 : Luminance of gray level 0

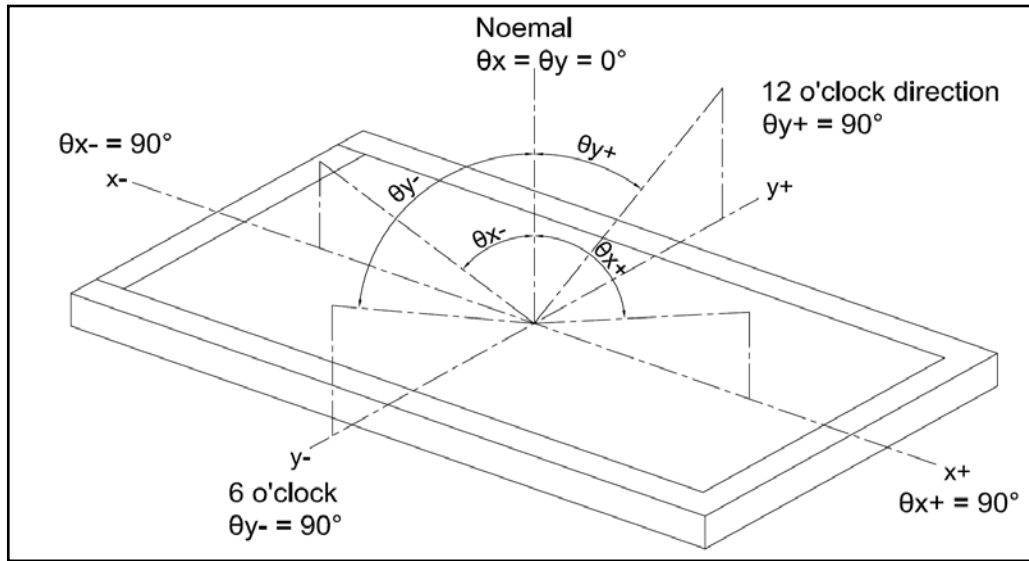
$$CR = CR(5)$$

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)

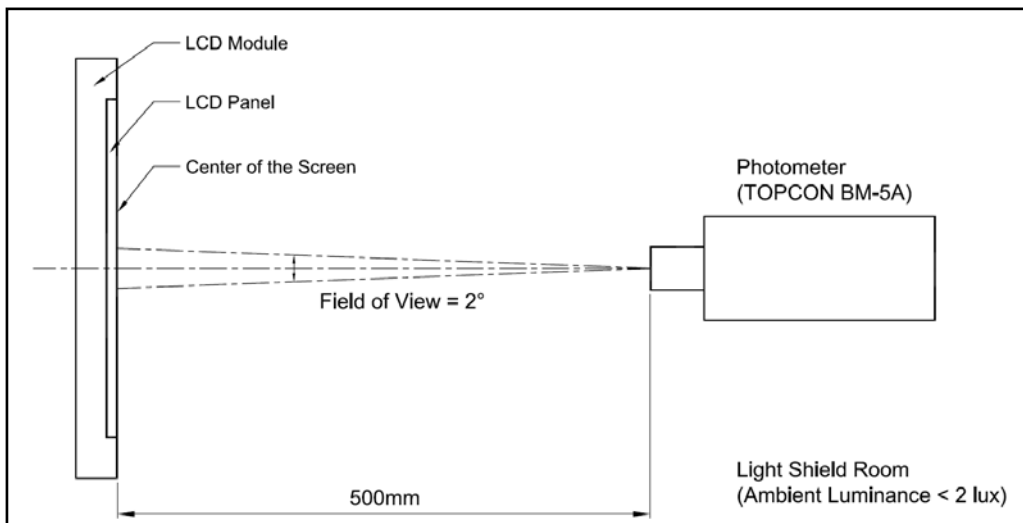


Note 3 : Definition of Viewing Angle

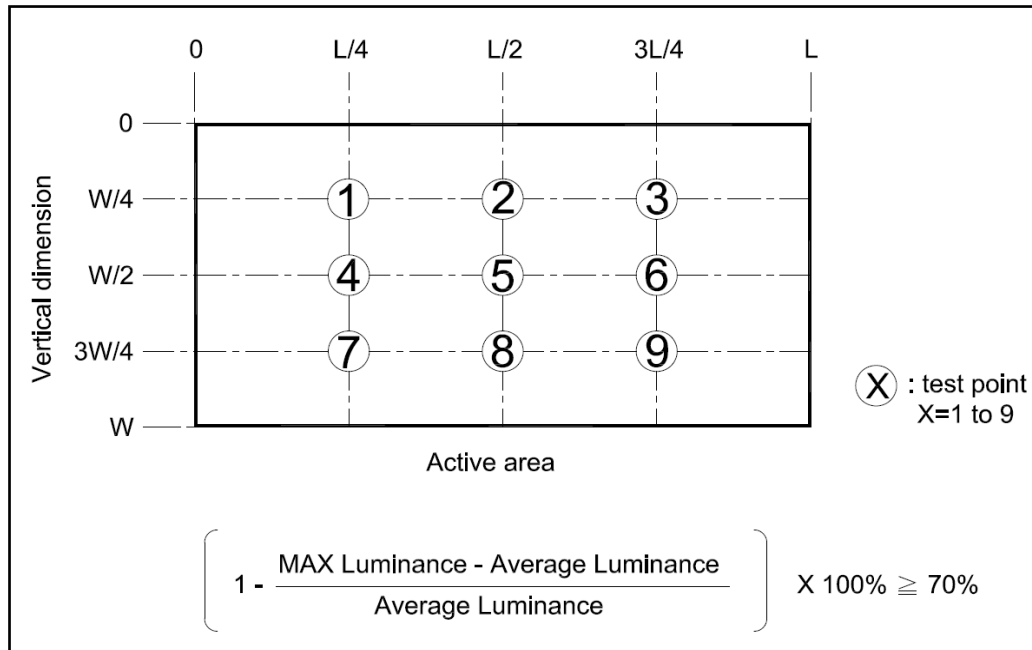


Note 4 : Measurement Set-Up:

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.

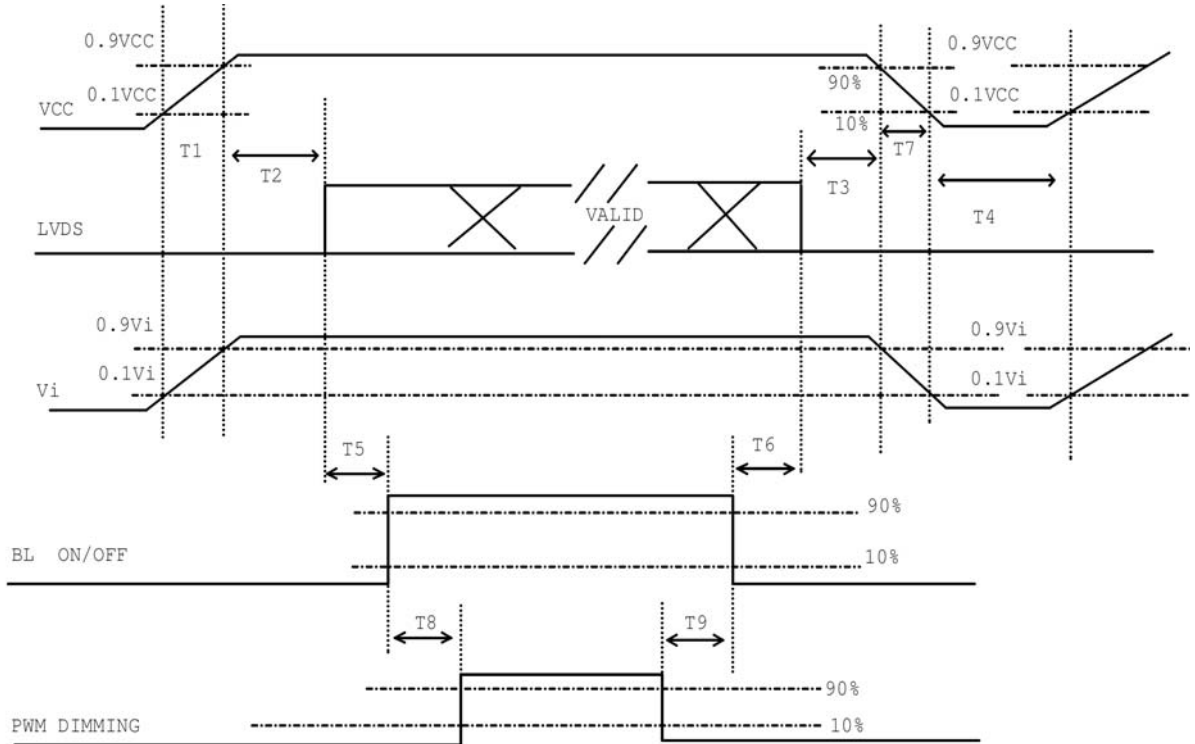


Note 5 :



9. TIMING SPECIFICATIONS

9.1 POWER SUPPLY VOLTAGE SEQUENCE



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

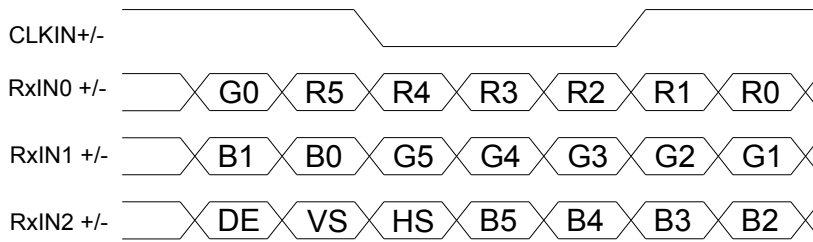
Note 2. When the interface signal is invalid, be sure to pull down the power supply of LCD VCC to 0 V.

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.

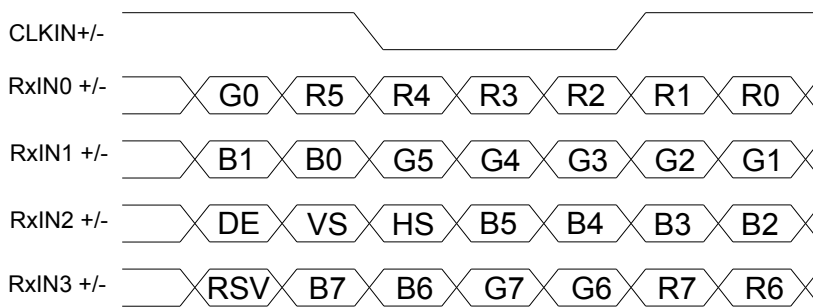
PARAMETER	MIN.	TYP.	MAX.	UNIT
T1	0.5	-	10	ms
T2	0	-	50	ms
T3	0	-	50	ms
T4	500	-	-	ms
T5	200	-	-	ms
T6	200	-	-	ms
T7	5	-	300	ms
T8	10	-	-	ms
T9	10	-	-	ms

9.2 THE INPUT DATA FORMAT

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



SEL68="High" for 8bits LVDS Input



Note (1) R/G/B data 7: MSB, R/G/B data 0: LSB

Note (2) Please follow PSWG

SIGNAL NAME	DESCRIPTION	REMARK
R7	Red Data 7	Red-pixel Data 8Bits 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 8Bits 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 8Bits 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	
VS	Vertical Sync	
HS	Horizontal Sync	

Note 3 : Output signals from any system shall be low or Hi-Z state when VCC is off.

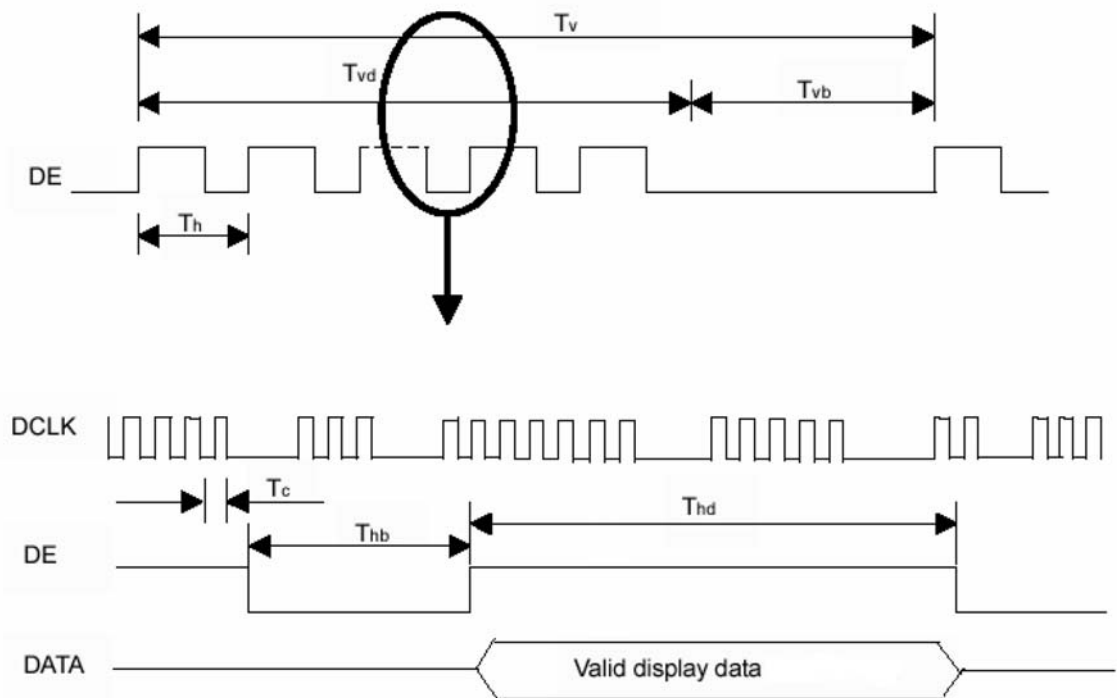
9.3 AC TIMING CHARATERISTICS

PARAMETER		SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
DCLK	Frequency	Fc	35	40	45	MHz	
Vertical Active Display Term	Total	Tv	608	628	750	Th	Tv= Tvd+Tvb
	Display	Tvd	-	600	-	Th	
	Blank	Tvb	8	28	150	Th	
Horizontal Active Display Term	Total	Th	960	1056	1160	Tc	Th= Thd+Thb
	Display	Thd	-	800	-	Tc	
	Blank	Thb	160	256	260	Tc	

Note 1. Because this module is operated by DE only mode, Hsync and Vsync input signals should be set to low logic level or ground. Otherwise, this module would operate abnormally.

Note 2. Frame rate is 60Hz

INPUT SIGNAL TIMING DIAGRAM



10. RELIABILITY TEST

ENVIRONMENTAL TEST				
NO.	ITEM	CONDITIONS	TIME PERIOD	REMARK
1	High Temperature Storage	80°C	72HRS	
2	Low Temperature Storage	-30±3°C	72HRS	
3	High Temperature Operation	70°C	72HRS	
4	Low Temperature Operation	-20°C	72HRS	
5	Temperature Cycle	-20°C ← 25 → 70°C (30min) (5min) (30min)	10CYCLE	
6	High Temperature Humidity Storage	60°C 90%RH (No condensation)	72HRS	

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.

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 : 10G
Shock Time : 6ms
Impact direction : 6 Directions ($\pm X, \pm Y, \pm Z$ axes)
Number of shocks : Each direction 3 Secondary , Altogether 18 Secondary

13. LCM INSPECTION STANDARD

Inspection specifications refer ONation Corporation LCM INSPECTION STANDARD Document.
Document Number : TBD

14. PACKAGE INFORMATION

LCM MODEL	LCM QTY. IN THE BOX	INNER BOX SIZE (mm)	WEIGHT	REMARK
OT104BSWDLV-H0	TBD	TBD	TBD	

15.PRECAUTIONS FOR USE

15.1 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.

15.2 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.

15.3 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.

15.4 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.