

TFT-DISPLAY DATASHEET

ONation
Model:OT150ZXUDLV-00

BRIEF SPEC.:

Main Feature	LandscapeType Wide Viewing Angle
Active Screen Area	304.12 x 228.09 (mm)
Diagonal Format	15 " 4:3
Resolution	1024 X 768
Colors	[8 Bit]
Backlight	LED White
Brightness	500 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	326.5 x 253.5 x 12 (mm)
Operation Temperature	-30... +85 °C
Storage Temperature	-30... +85 °C
Surface Treatment	Anti-Glare Hardness 3H



ONation Corporation

TFT COLOR LCD MODULE

MODEL: OT150ZXUDLV-00
(Complied with RoHS)

XGA
LVDS interface (1port)

Version: P0.2

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

C O N T E N T S

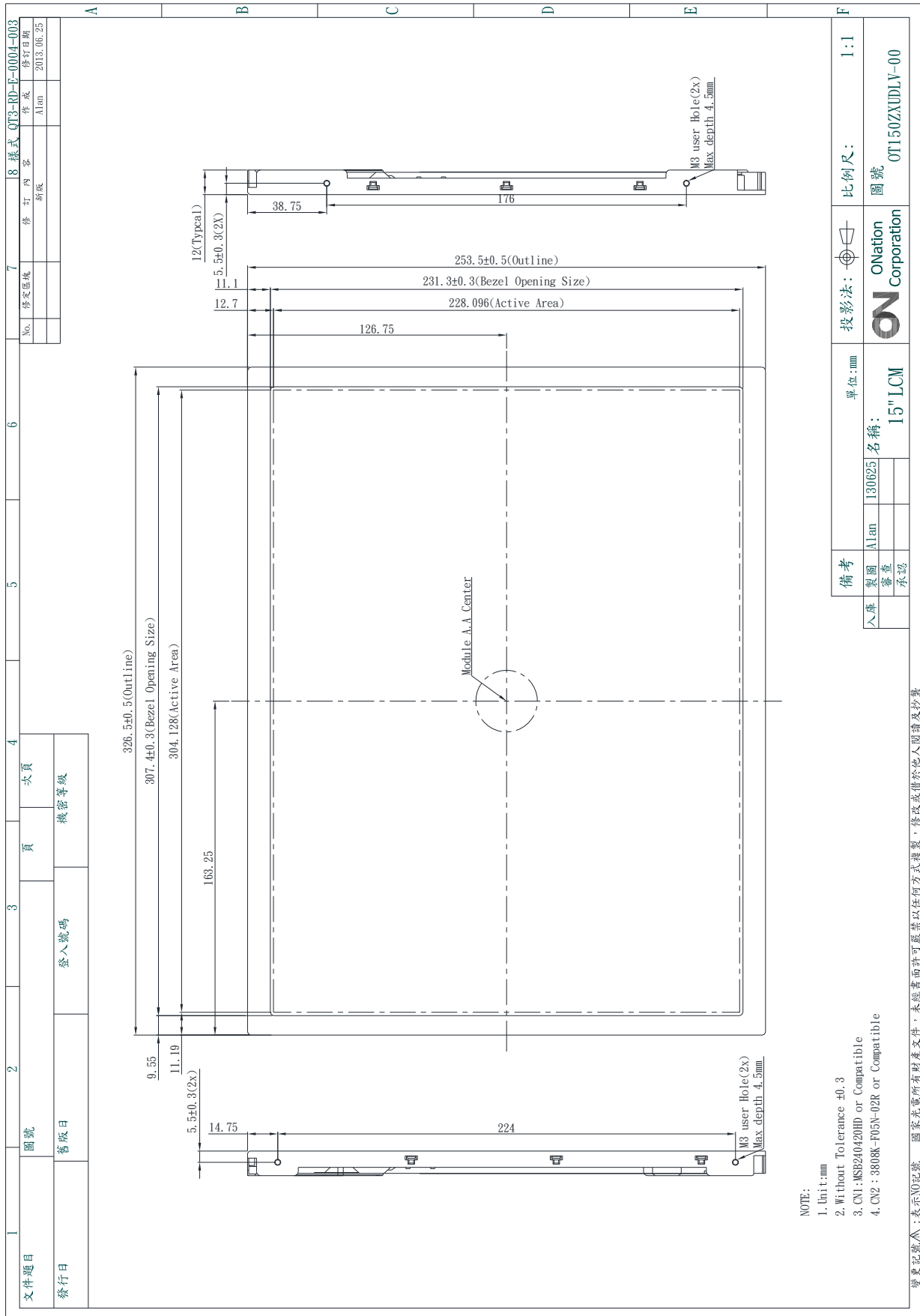
NO.	ITEM	PAGE
1	RECORD OF REVISION	0-1
2	MECHANICAL SPECIFICATIONS	1
3	OUTLINE DIMENSIONS	2 ~ 3
4	INTERFACE PIN CONNECTION	4 ~ 5
5	BLOCK DIAGRAM	6
6	ABSOLUTE MAXIMUM RATINGS	7
7	ELECTRICAL CHARACTERISTICS	8 ~ 9
8	OPTICAL CHARACTERISTICS	10 ~ 12
9	TIMING SPECIFICATIONS	13 ~ 14
10	RELIABILITY TEST	15 ~ 16
11	MODEL NUMBER SYSTEM	17
12	LCM INSPECTION STANDARD	18
13	PACKAGE INFORMATION	18
14	PRECAUTIONS FOR USE	19

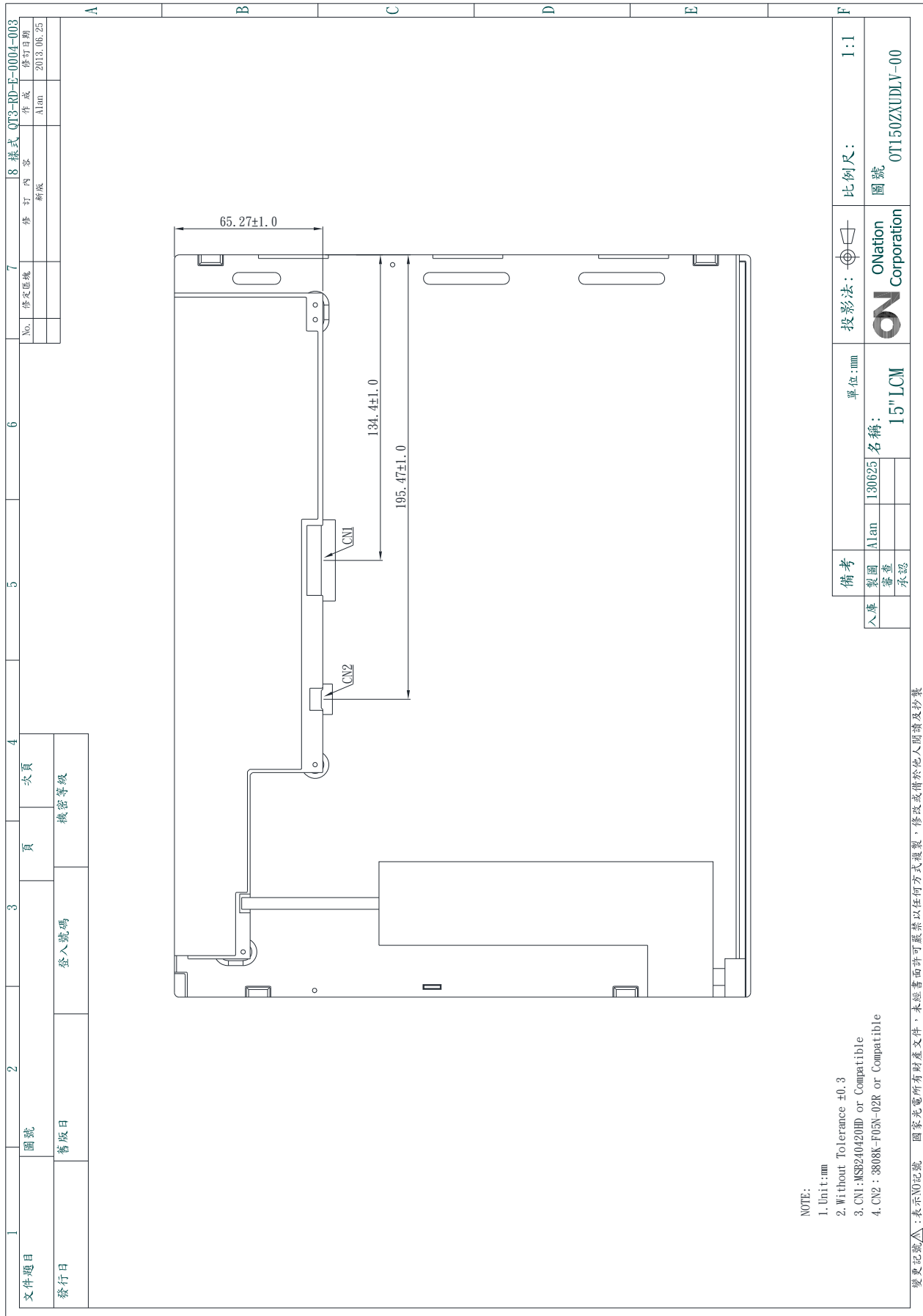
2.MECHANICAL SPECIFICATIONS

(1)	Number Of Dots (Dots)	1024(R.G.B) X 768
(2)	Module Size(mm)	326.5(H) X 253.5(V) X 12(D) **
(3)	Active Area(mm)	304.128(H) X 228.096(V)
(4)	Pixel Pitch(mm)	0.297(H) X 0.297(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 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)	Support Color	16.2M
(12)	Module Weight(g)	930TYP.

** Include connector thickness

3. OUTLINE DIMENSIONS





4. INTERFACE PIN CONNECTION

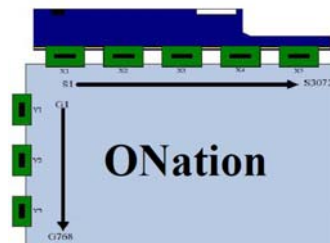
4.1 LCM PANEL DRIVING SECTION

CN1 Connector : STM MSB240420HD or Equivalen

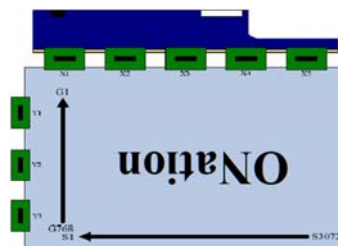
Mating Connector : STM P240420 or Equivalent

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	RxIN0-	-LVDS differential data input	
6	RxIN0+	+LVDS differential data input	
7	GND	Ground	
8	RxIN1-	-LVDS differential data input	
9	RxIN1+	+LVDS differential data input	
10	GND	Ground	
11	RxIN2-	-LVDS differential data input	
12	RxIN2+	+LVDS differential data input	
13	GND	Ground	
14	CLKIN-	-LVDS differential clock input	
15	CLKIN+	+LVDS differential clock input	
16	GND	Ground	
17	RxIN3-	-LVDS differential data input	
18	RxIN3+	+VDS differential data input	
19	GND	Ground	
20	NC	Not connect	

Note 1: I REV = LOW/NC



II REV = High



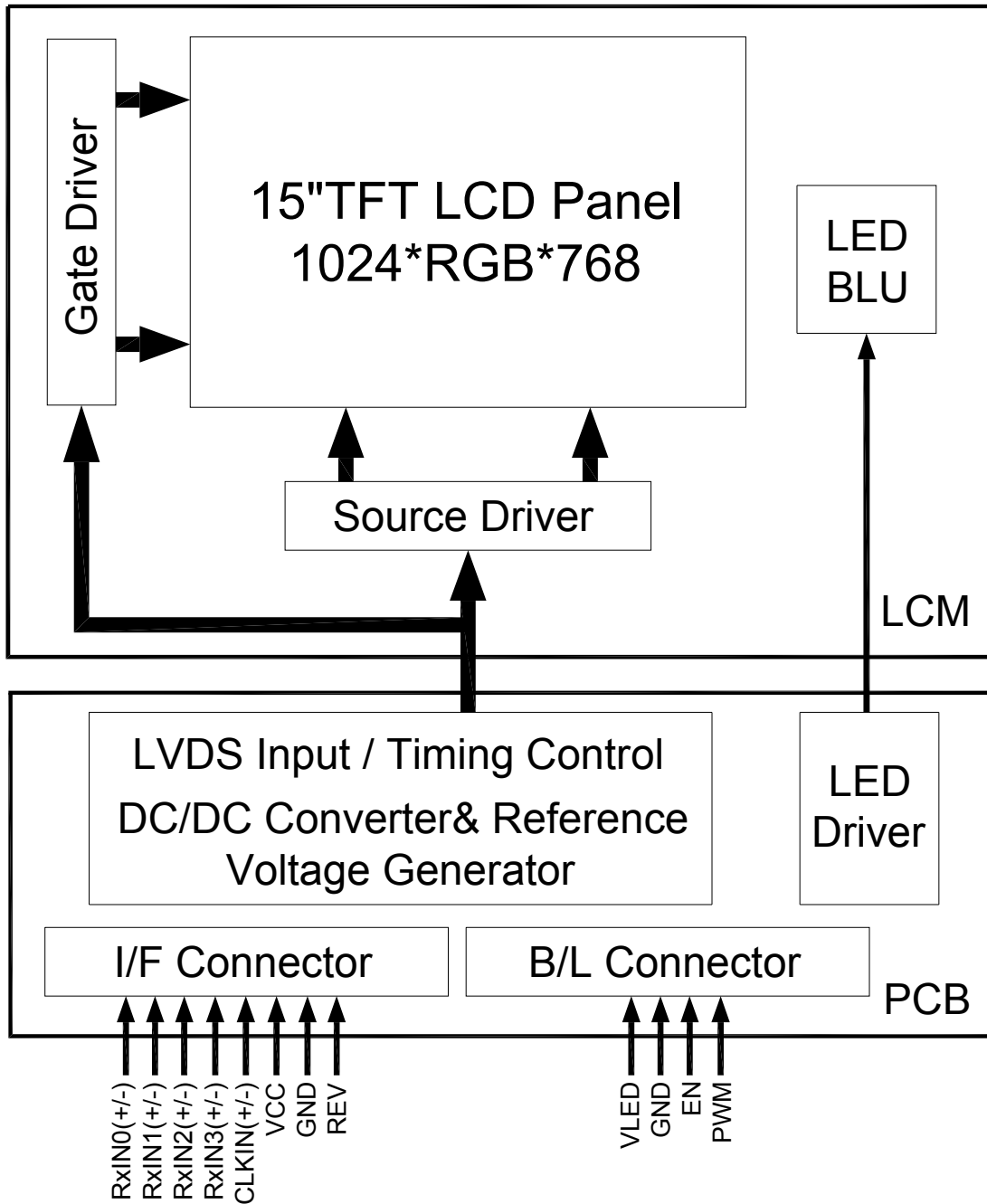
4.2 BACKLIGHT DRIVING SECTION

CN2 Connector : ENTERY 3808K-F05N-02R or Equivalent

Mating Connector : ENTERY H208K-P05N-02B or Equivalent

PIN NO.	SIGNAL	FUNCTION	REMARK
1	VLED	12V	
2	GND	GND	
3	EN	5V-On / 0V-Off	
4	PWM	PWM Dimming or Analog Dimming	
5	NC	No connect	

5. BLOCK DIAGRAM



6. ABSOLUTE MAXIMUM RATINGS

6.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	MIN.	MAX.	UNIT	REMARK
Supply Voltage	VCC	-0.5	+5.0	V	
	VLED	TBD	TBD	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)	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=95% ≤ 240Hrs.

7. ELECTRICAL CHARACTERISTICS

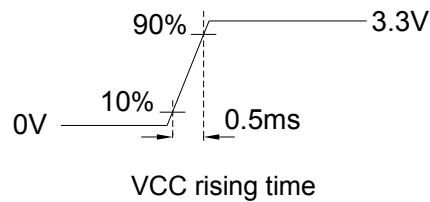
7.1 ELECTRICAL CHARACTERISTICS OF LCD

Ta=25°C

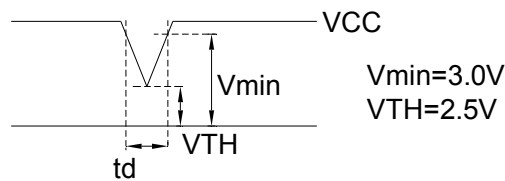
ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
Power Voltage For LCD	VCC	3.0	3.3	3.6	V	
	ICC	-	(250)	(320)	mA	Note 1
Differential Input Threshold Voltage	VCCrp	-	-	200	[mV]p-p	

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

Note 2: Measure Condition



Note 3: VCC Power Dip Condition



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

7.2 BACKLIGHT UNITS

Ta=25°C

ITEM		SYMBOL	MIN.	TYP.	MAX.	UNIT
LED Driving Voltage		VLED	10.8	12.0	12.6	V
		ILED (VLED=12V)	-	(1.0)	(1.2)	A
PWM Signal Voltage	High	VLED_PWM	4.5	5.0	5.5	V
	Low		-	-	0.8	V
ADJ Frequency		-	200	-	20K	Hz
LED Enable Voltage	High	VLED_EN	2.0	5.0	5.5	V
	Low		-	-	0.8	V
LED Life Time (For Reference Only)		Ta=25°C 60-70%RH (Note 1)	50,000	-	-	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% until the brightness becomes ≤ 50% of its original value.

8. OPTICAL CHARACTERISTICS

Ta=25°C

ITEM	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT	REMARK
Contrast Ratio	CR	Viewing Normal Angle $\Theta_x = \Theta_y = 0^\circ$	450	800	-	-	Note 1
Response Time	TR+TF		-	25	-	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-}	60	80	-		
Luminance	L	PWM=100%	400	500	-	cd/m2	
Luminance Uniformity	YU	PWM=100%	70	-	-	%	Note 5

Note 1 : Definition of Contrast Ratio (CR) :

The contrast ratio can be calculated by the following expression.

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

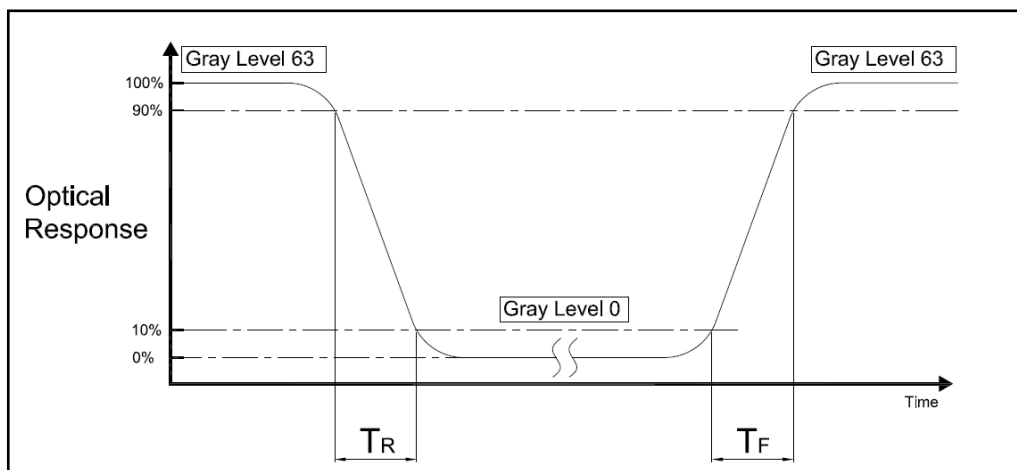
L63 : Luminance of gray level 63

L0 : Luminance of gray level 0

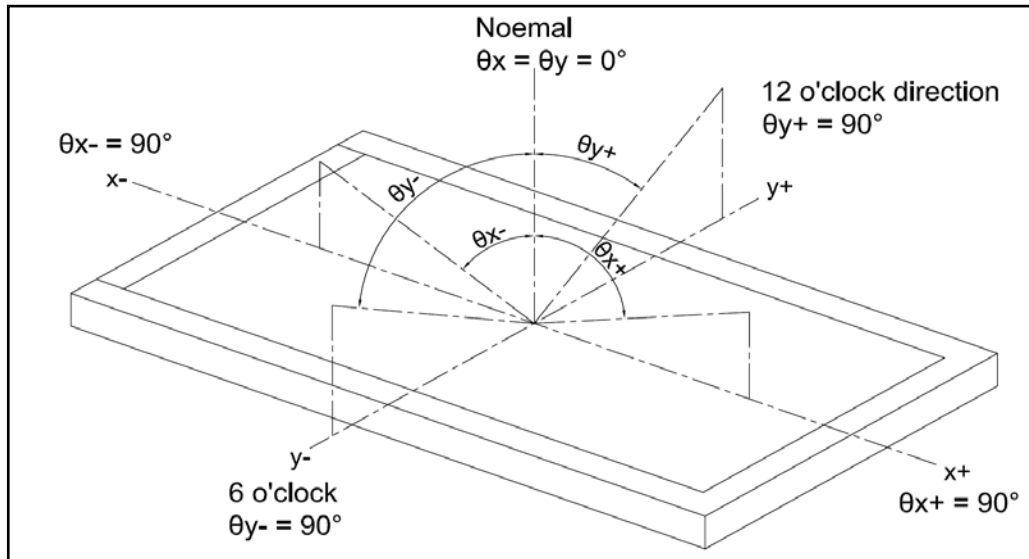
$$CR = CR(5)$$

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)

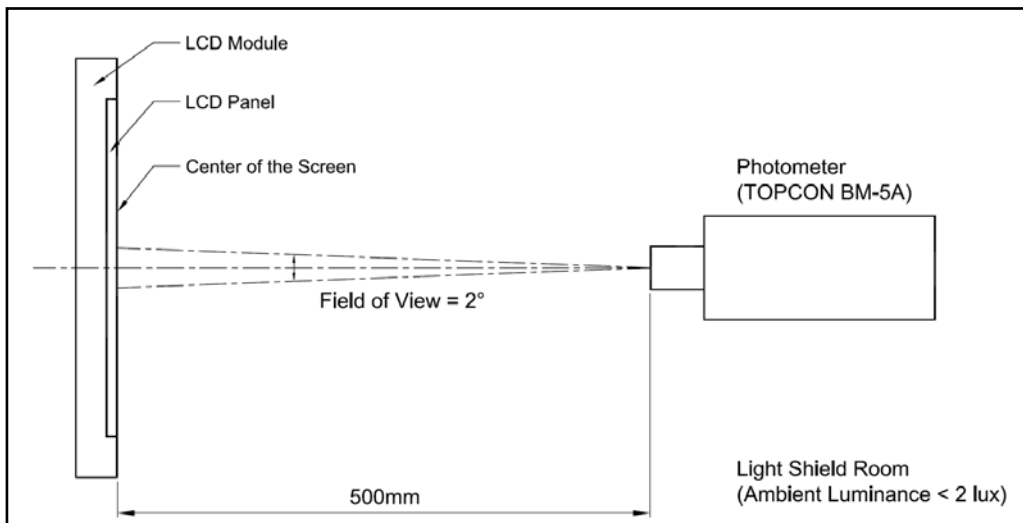


Note 3 : Definition of Viewing Angle

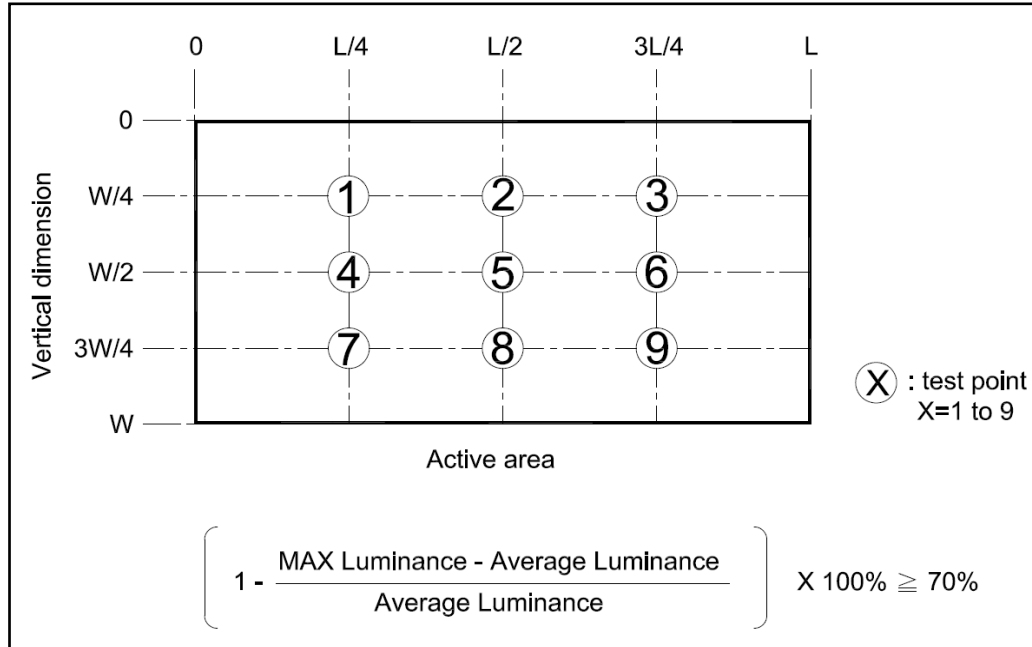


Note 4 : Measurement Set-Up:

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.



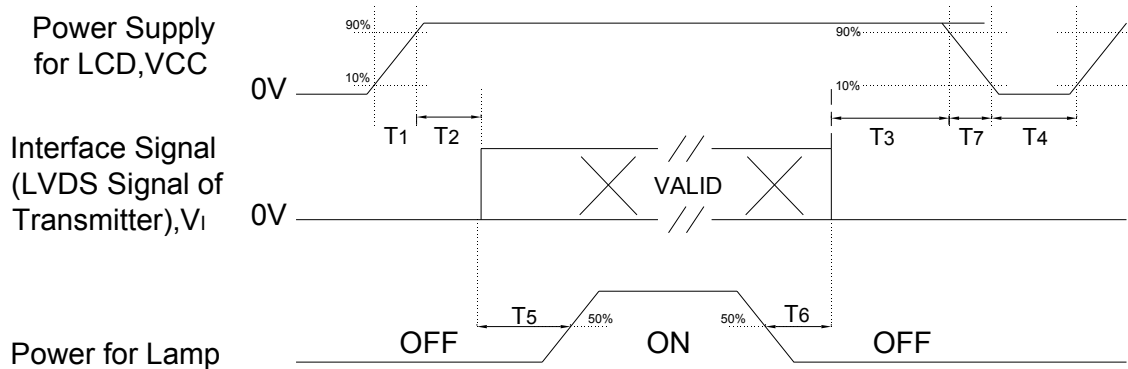
Note 5 :



9. TIMING SPECIFICATIONS

9.1 POWER SIGNAL SEQUENCE

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:



ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
VCC Rise Time	T1	0.5	-	10	ms	
VCC Good to Signal Valid	T2	0	-	20	ms	
Signal Disable to Power Down	T3	0	-	1000	ms	
Power Off	T4	1000	-		ms	
Signal Valid to Backlight On	T5	300	-		ms	
Backlight Off to Signal Disable	T6	200	-		ms	
VCC Fall Time	T7	0	-	100	ms	

9.2 INTERFACE TIMING

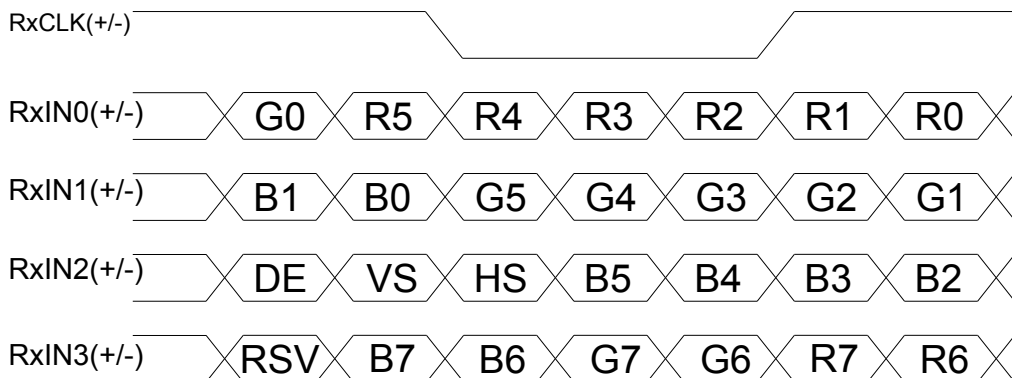
9.2.1 Timing Characteristics

Synchronization Method : DE only

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT
LVDS Clock Frequency <single >	fdck	50	65	80	MHz
H Total Time	Thp	1056	1344	1720	clocks
H Active Time	HA	1024	1024	1024	clocks
H Front Porch	Thfp	-	48	-	clocks
H Sync Pulse Width	HSPW	-	32	-	clocks
H Back Porch	Thbp	-	240	-	clocks
H Frequency	fh	46.32	48.36	59.40	kHz
V Total Time	Tvp	772	806	990	lines
V Active Time	VA	768	768	768	lines
V Front Porch	Tvfp	-	3	-	lines
V Sync Pulse Width	VSPW	-	12	-	lines
V Back Porch	Tvbp	-	23	-	lines
V Frequency	fv		60		Hz

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

9.2.2 Timing Diagram of Interface Signal



Note1 : Follow SPWG

Note2 : R/G/B data7 : MSB , R/G/B data0 : LSB

10. RELIABILITY TEST

ENVIRONMENTAL TEST				
NO.	ITEM	CONDITIONS	TIME PERIOD	REMARK
1	High Temperature Storage	85°C	240HRS	
2	Low Temperature Storage	-30±3°C	240HRS	
3	High Temperature Operation	85°C	240HRS	
4	Low Temperature Operation	-30°C	240HRS	
5	Temperature Cycle	-20°C ← 25°C → 60°C (30min) (5min) (30min)	100CYCLE	
6	High Temperature Humidity Storage	50°C 95%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 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 :

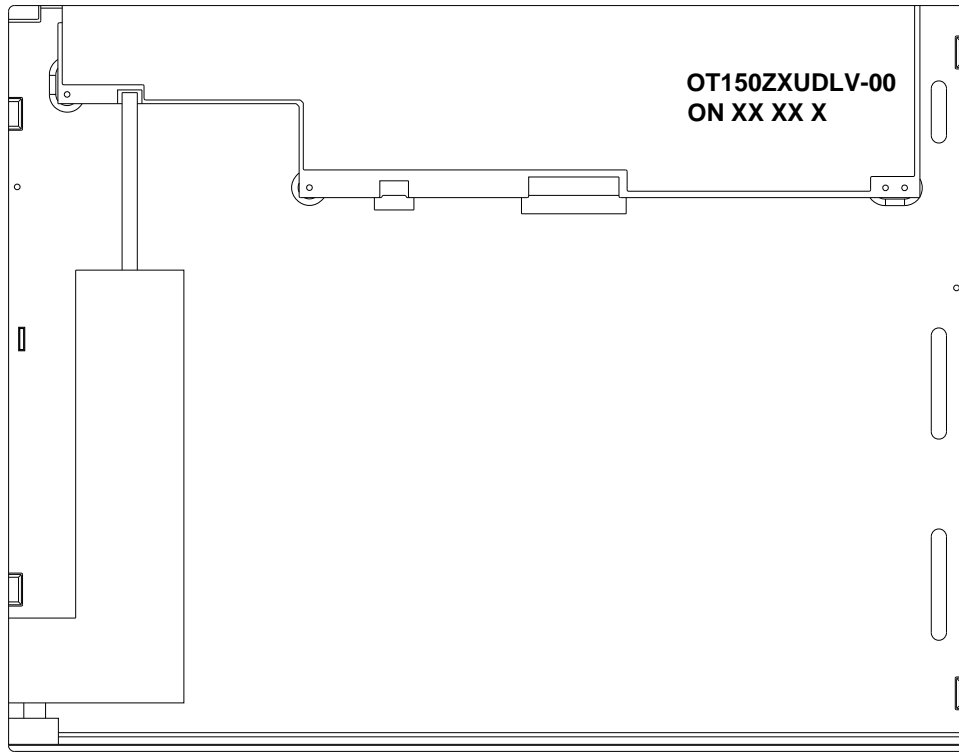
10.2.1 STATE LABORATORY ENVIRONMENT :

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 : 1G
Shock Time : 20ms
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 : OT150ZXUDLV-00

(b)LOT NO : XX XX X
 Year Month Week

CODE	MEANING	DESCRIPTION
<u>XX</u>	Year	2015=15, 2016=16, 2017=17,
<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 : TBD

13. PACKAGE INFORMATION

LCM Model	LCM Qty. in the box	Inner Box Size (mm)	Weight	REMARK
OT150ZXUDLV-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.