

TFT-DISPLAY DATASHEET

ONation
Model:OT104ASDDLV-02

BRIEF SPEC.:

Main Feature	LandscapeType
Active Screen Area	212.2 x 158.4 (mm)
Diagonal Format	10.4" 4:3
Resolution	800 X 600
Colors	(6 Bit)
Backlight	LED White
Brightness	330 cd/m ²
LED Life Time	50K (h)
Interface	LVDS
Viewing Angle	75/75 L/R 60/50 up/down
Touchscreen	no
Power Supply	3.3 V (Typ.)
Module Outline	246.4 x 175.4 x 6.28 (mm)
Operation Temperature	-20... +70 °C
Storage Temperature	-30... +80 °C
Surface Treatment	Anti Glare



ONation Corporation

TFT COLOR LCD MODULE

MODEL: OT104ASDDLV-02
(Complied with RoHS)

SVGA
LVDS interface (1port)

Version: P0.7

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	2015.11.27	ALL	Preliminary specification was first issued.																								
0.2	2015.12.10	1	Modify (2) Module Size(mm) 246.4(H) X 175.4(V) X 6285D) ** ADD (11)Color Depth 262K Colors																								
		2 ~ 3	Modify 4.OUTLINE DIMENSIONS																								
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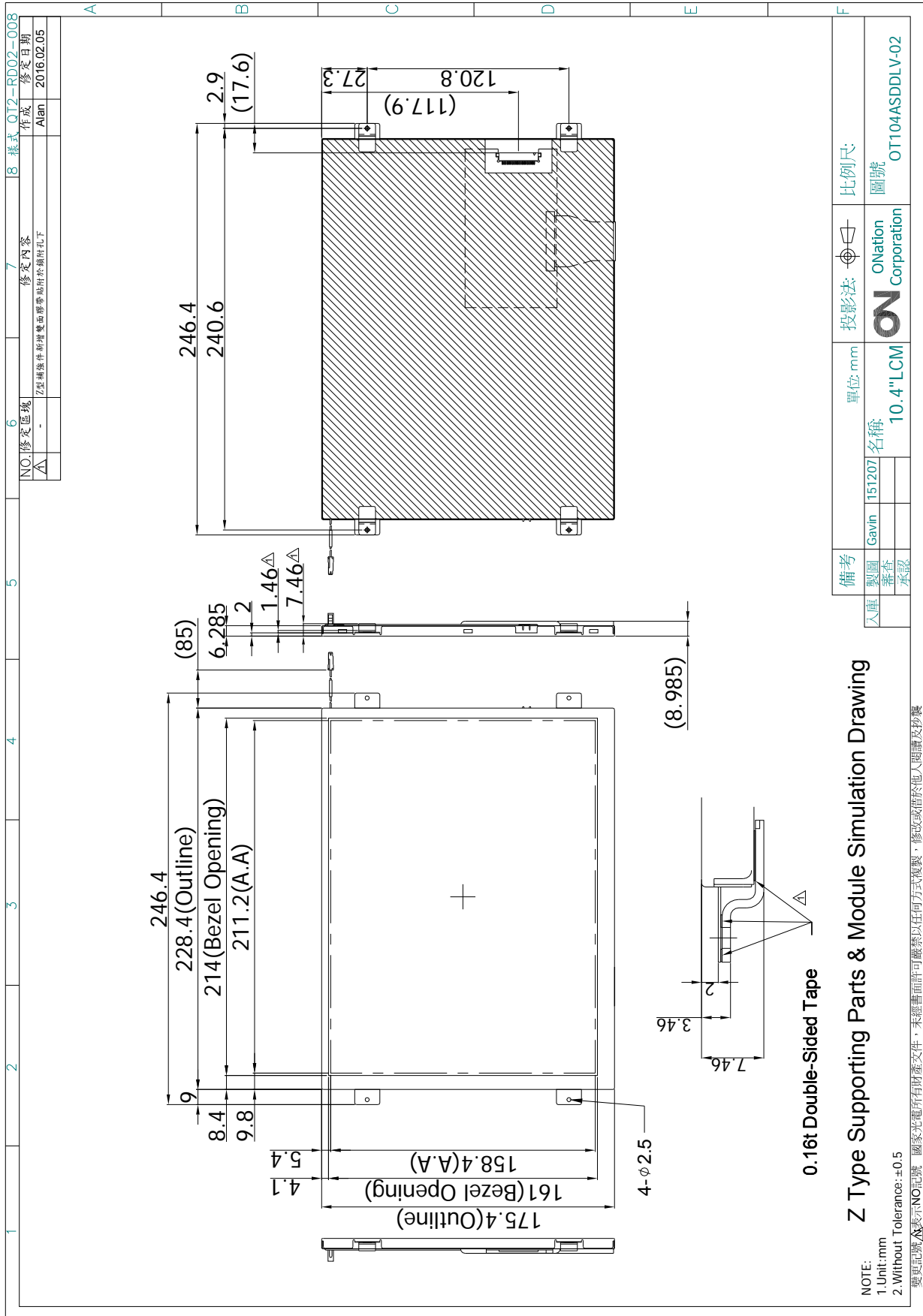
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Response Time	TR+TF		-	30	40	ms	Note 2																																																																																																																																																																																
Chromaticity	White	x ^o	0.280	0.330	0.380	-	Note 4																																																																																																																																																																																
	Red	x ^o	0.300	0.350	0.400	-																																																																																																																																																																																	
	Green	x ^o	0.317	0.367	0.417	-																																																																																																																																																																																	
	Blue	x ^o	0.306	0.356	0.406	-																																																																																																																																																																																	
	Viewing Angle	Hor. Ver.	Viewing Angle θx=θy=0°	65° 40° 50°	75° 50° 60°	-		Deg	Note 3																																																																																																																																																																														
Luminance	L _v	ILED=100mA	300	330	500	cd/m ²	Ta=25°C Ta=70°C																																																																																																																																																																																
Luminance Uniformity	YU	ILED=100mA	70	-	-	%	Note 5																																																																																																																																																																																
11	<p>9.2.1 INPUT DATA SIGNAL</p> <p>→</p>																																																																																																																																																																																						
0.7	2016.08.31	-	<p>Adds type item on table 4.1</p> <p>Adds LVDS VI symbol on table 6.1</p> <p>Will be deleted VIH/VIL symbol on table 7.1(already deleted at P0.7)</p> <p>Modify Note 2 description for VIC.</p> <p>Modify LED driving voltage on table 7.2</p> <p>Will be deleted „DC (LED forward current)“ at page 6. (already deleted at P0.7)</p> <p>Adds ILED symbol on diagram of Note3 at page 6.</p> <p>Adds a description on diagram 9.2.1</p> <p>Modify diagram 9.2.4 for correct timing.</p> <p>Adds CLK duty cycle on table 9.2.3</p> <p>Modify chromaticity of white at page 7.</p>																																																																																																																																																																																				

2.MECHANICAL SPECIFICATIONS

(1)	Number Of Dots (Dots)	800(R.G.B) X 600
(2)	Module Size(mm)	246.4(H) X 175.4(V) X 6285(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	12 O'clock Horizontal : Right side 75°(typ.), Left side75°(typ.) Vertical : Up side 60°(typ.), Down side 50°(typ.)
(8)	Gray Scale Inversion Direction	6 O'clock
(9)	Electrical Interface	LVDS Interface
(10)	Color Configuration	R.G.B Stripe
(11)	Color Depth	262K Colors
(12)	Module Weight(g)	450±5%

** Include connector thickness

3. OUTLINE DIMENSIONS



4. INTERFACE PIN CONNECTION

4.1 LCM PANEL DRIVING SECTION

CN1 Connector : HIROSE DF19L-20P-1H or equivalent

Mating Connector : HIROSE DF19G-20S-1C or equivalent

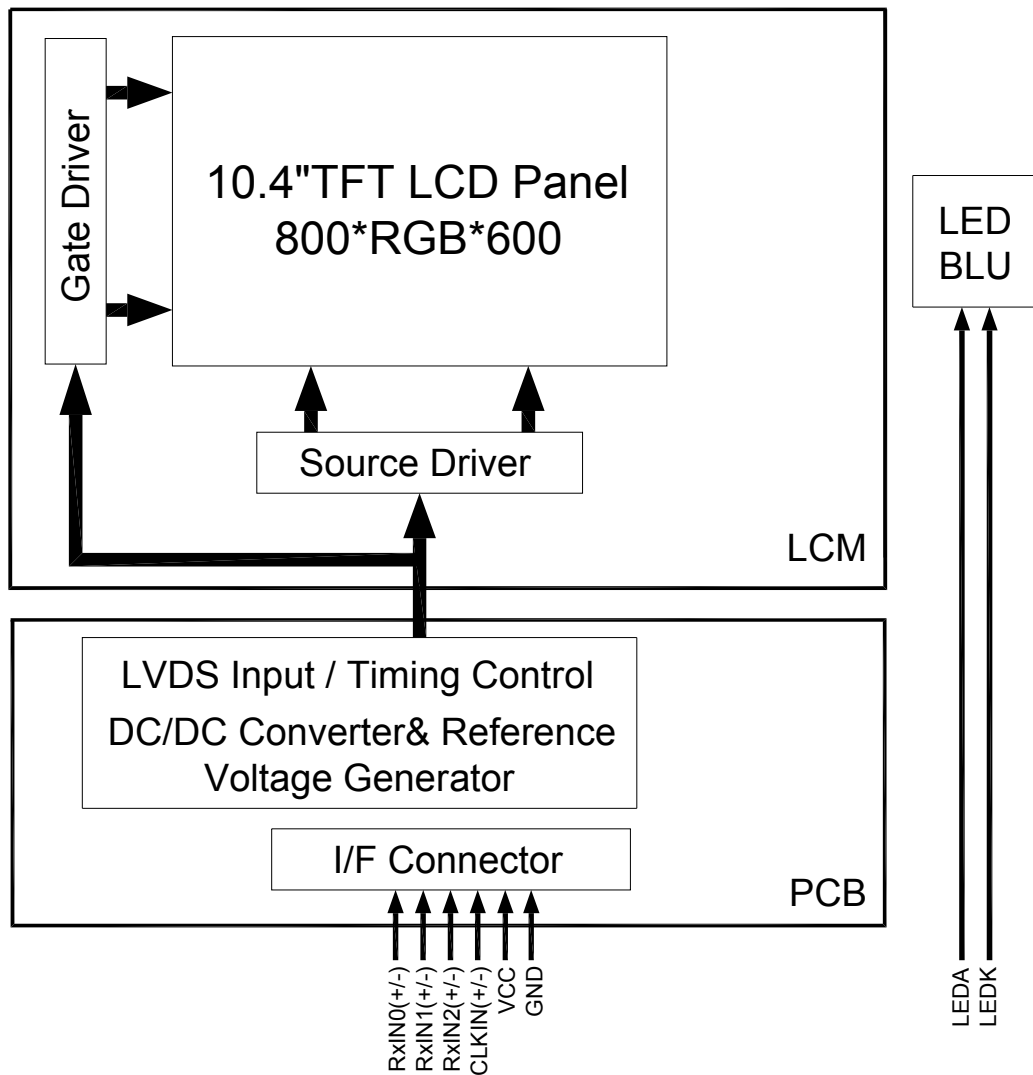
PIN NO.	SYMBOL	TYPE	DESCRIPTION
1	VCC	POWER	Power Supply For Digital Circuit
2	VCC	POWER	Power Supply For Digital Circuit
3	GND	POWER	Ground
4	GND	POWER	Ground
5	RxIN0-	LVDS IN	Differential Data Input, CH0(Negative)
6	RxIN0+	LVDS IN	Differential Data Input, CH0(Positive)
7	GND	POWER	Ground
8	RxIN1-	LVDS IN	Differential Data Input, CH1(Negative)
9	RxIN1+	LVDS IN	Differential Data Input, CH1(Positive)
10	GND	POWER	Ground
11	RxIN2-	LVDS IN	Differential Data Input, CH2(Negative)
12	RxIN2+	LVDS IN	Differential Data Input, CH2(Positive)
13	GND	POWER	Ground
14	CLKIN-	LVDS IN	Differential Clock Input(Negative)
15	CLKIN+	LVDS IN	Differential Clock Input(Positive)
16	GND	POWER	Ground
17	NC	-	Non Connection (open)
18	NC	-	Non Connection (open)
19	GND	POWER	Ground
20	GND	POWER	Ground

4.2 BACKLIGHT DRIVING SECTION

PIN NO.	SYMBOL	DESCRIPTION	WIRE COLOR
1	LEDA	LED driving anode (high voltage)	Red
2	LEDK	LED driving cathode (low voltage)	White

Note: CN2 Connector : JST PHR-2 or Equivalent

5. BLOCK DIAGRAM



6. ABSOLUTE MAXIMUM RATINGS

6.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	MIN.	MAX.	UNIT	REMARK
Supply Voltage	VCC	-0.3	+4.0	V	
LVDS Receiver Input Voltage	LVDS VI	-0.3	VCC+0.3	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	OPERATION		STORAGE		REMARK
	MIN.	MAX.	MIN.	MAX.	
Ambient Temperature(°C)	-20	70	-30	80	Note 1,2
Humidity(% RH)	5 ~ 90		5 ~ 90		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 : Operation Ta=50°C & RH=90% ≤ 240Hrs.

7. ELECTRICAL CHARACTERISTICS

7.1 ELECTRICAL CHARACTERISTICS OF LCD

Ta=25°C

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITION
Power Voltage For LCD	VCC	3.0	3.3	3.6	V	
	ICC	-	140	180	mA	Note 1
Differential Input Threshold Voltage	VTH	-	-	100	mV	VIC =1.2V Note 2
	VTL	-100	-	-	mV	

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

Note 2 : VIC stand for Common mode voltage input (LVDS receiver is THine THC63LVDR84B)

7.2 BACKLIGHT UNITS

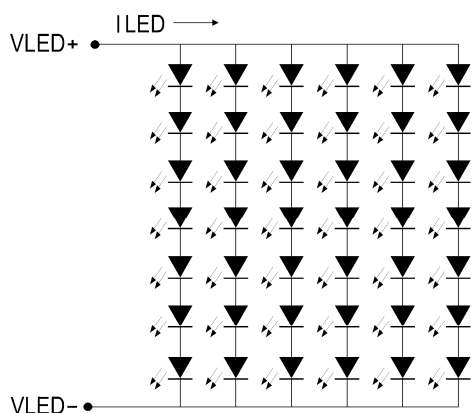
Ta=25°C

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
LED Driving Voltage	VLED	18.0	20.1	25.2	V	ILED=100mA
	ILED	-	100	-	mA	
LED Life Time (For Reference Only)	Ta=25°C 60-70%RH (Note 1)	40,000	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 ILED = 100mA until the brightness becomes ≤ 50% of its original value.

Note 3: The figure below shows the connection of backlight LED.



Note 4: LED type: OSRAMOPTO LUW JLSH-5B8B-I4Q7-EG-LP

8. OPTICAL CHARACTERISTICS

Ta=25°C

ITEM	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT	REMARK
Contrast Ratio	CR	Viewing Normal Angle $\Theta_x=\Theta_y=0^\circ$	300	400	-	-	Note 1
Response Time	TR+TF		-	30	40	ms	Note 2
Chromaticity	White	x	0.258	0.308	0.358	-	Note 4
		y	0.268	0.318	0.368	-	
	Red	x	0.550	0.600	0.650	-	
		y	0.317	0.367	0.417	-	
	Green	x	0.308	0.358	0.408	-	
		y	0.538	0.588	0.638	-	
	Blue	x	0.095	0.145	0.195	-	
		y	0.040	0.090	0.140	-	
Viewing Angle	Hor.	θ_{x+}	65	75	-	Deg.	Note 3
		θ_{x-}	65	75	-		
	Ver.	θ_{y+}	50	60	-		
		θ_{y-}	40	50	-		
Luminance	L	ILED=100mA	300	330	500	cd/m ²	Ta=25°C
			270	300	460	cd/m ²	Ta=70°C
Luminance Uniformity	YU		70	-	-	%	Note 5

Note 1 : Definition of Contrast Ratio (CR) :

The contrast ratio can be calculated by the following expression.

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

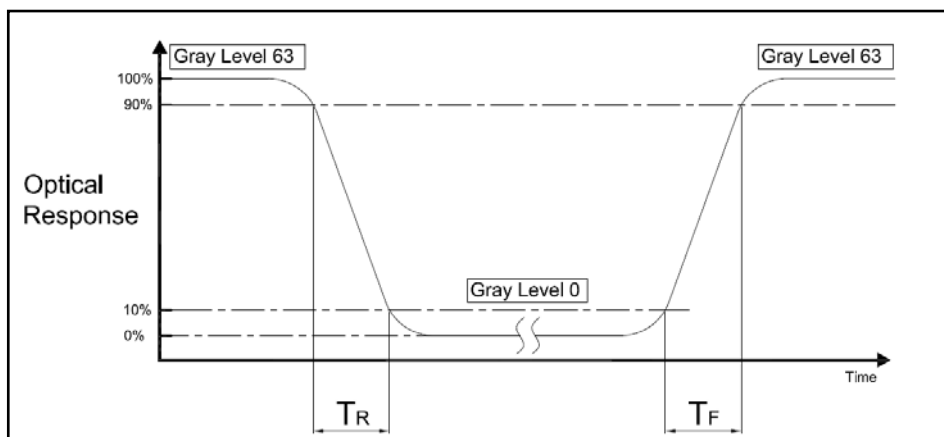
L63 : Luminance of gray level 63

L0 : Luminance of gray level 0

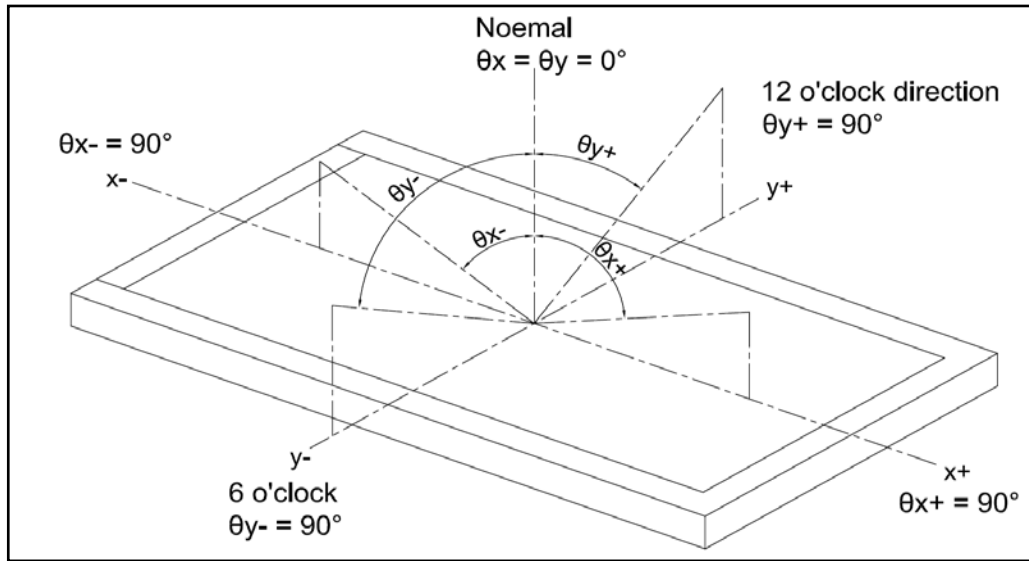
$$CR = CR(5)$$

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)

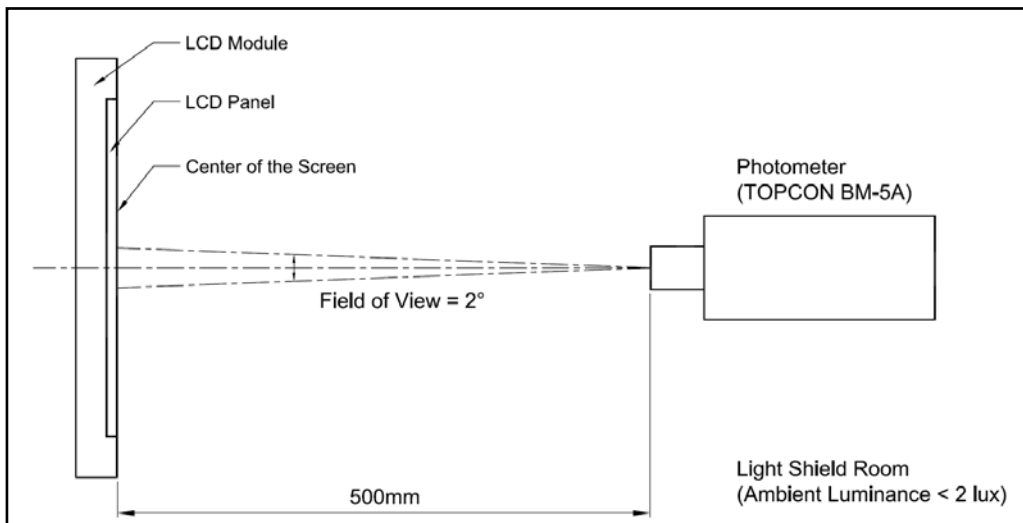


Note 3 : Definition of Viewing Angle

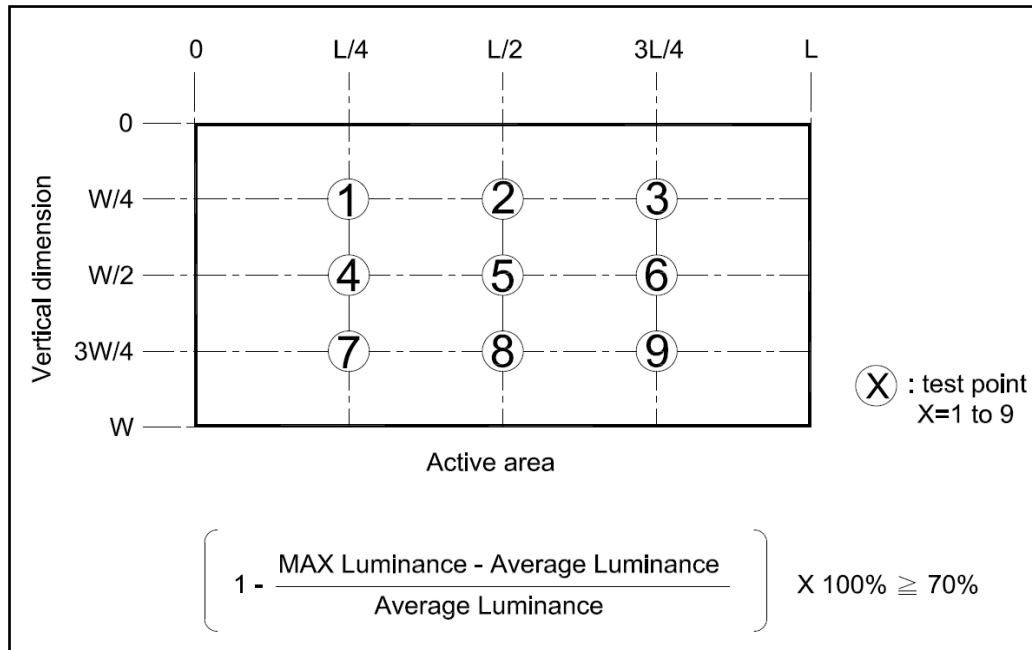


Note 4 : Measurement Set-Up:

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.



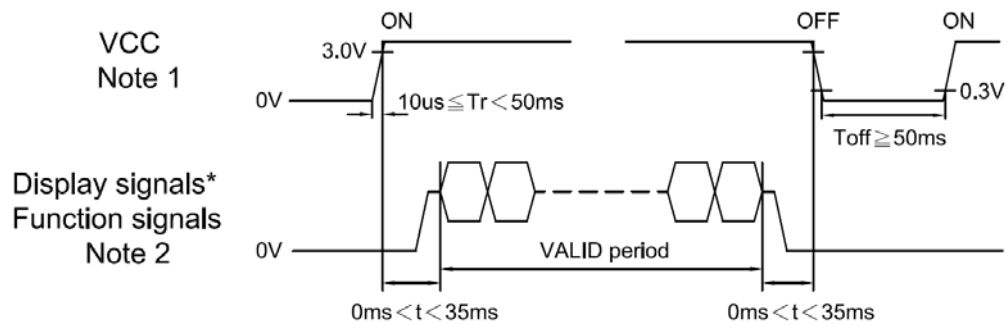
Note 5 :



9. TIMING SPECIFICATIONS

9.1 POWER SUPPLY VOLTAGE SEQUENCE

9.1.1 LCD panel signal processing board

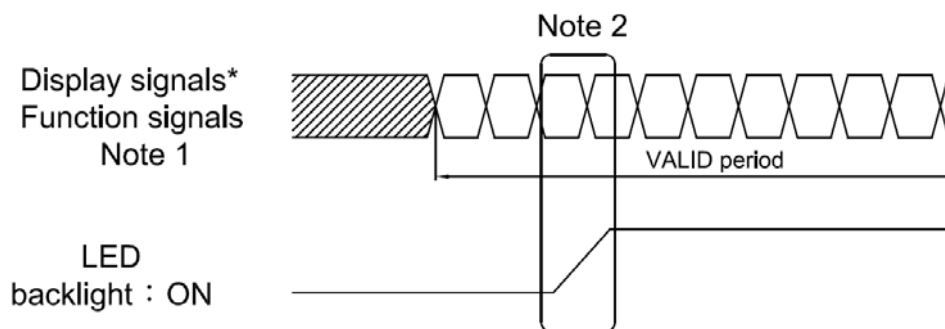


* These signals should be measured at the terminal of 100Ω resistance.

Note1: If there is a voltage variation (voltage drop) at the rising edge of VCC below 3.0V, there is a possibility that a product does not work due to a protection circuit.

Note2: Display signals (RxIN0+/-, RxIN1+/-, RxIN2+/- and CLKIN+/-), except the VALID period (See above sequence diagram), in order to avoid the circuitry damage. If some of display and function signals of this product are cut while this product is working, even if the signal input to it once again, it might not work normally. If a customer stops the display and function signals, VCC also must be shut down.

9.1.2 LED driver board

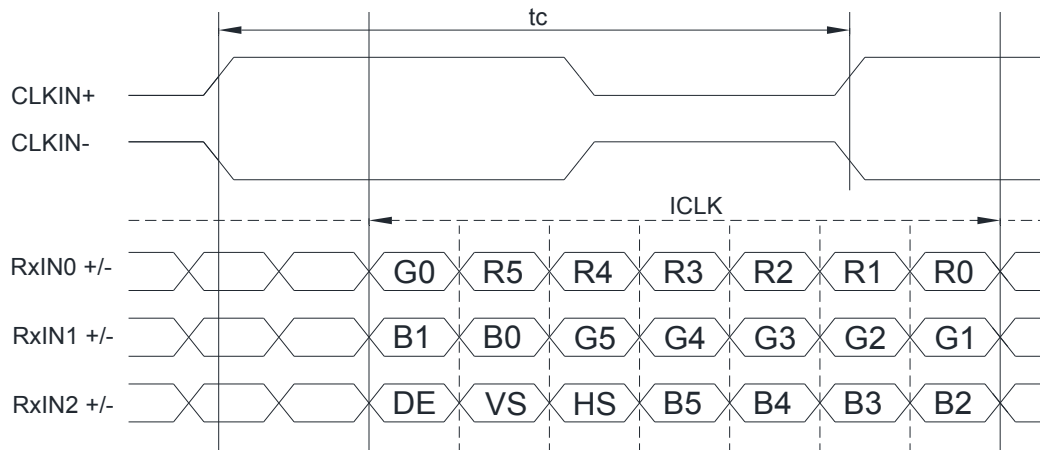


Note1: These are the display and function signals for LCD panel signal processing board.

Note2: The backlight should be turned on within the valid period of display and function signals, in order to avoid unstable data display.

9.2 INTERFACE TIMING

9.2.1 INPUT DATA SIGNAL

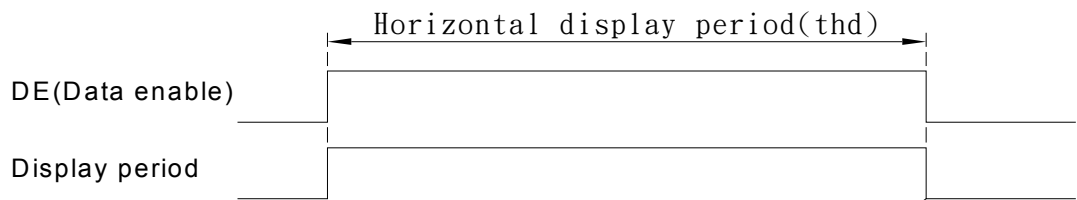


Note1: DE stand for data enable, VS stand for VSYNC, HS stand for HSYNC

9.2.2 OUTLINE OF INPUT SIGNAL TIMINGS

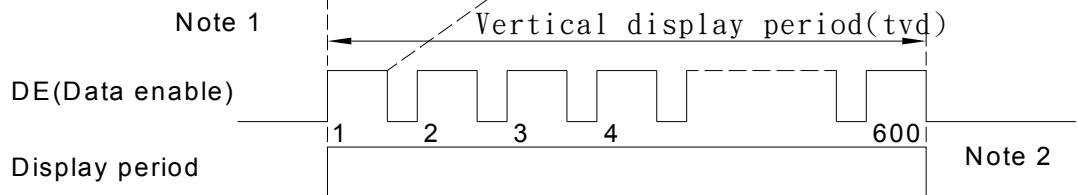
- Horizontal signal

Note 1



- Vertical signal

Note 1



Note 1: This diagram indicates virtual signal for set up to timing.

Note 2: See "9.2.4 Input signal timing chart" for the pulse number.

9.2.3 TIMING CHARACTERISTICS

ITEM		SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARKS
CLK	Frequency	1/tc	25	40.0	45.0	MHz	25.0ns(typ.)
	Duty	CLK	40	50	60	%	-
	Rise time, Fall time	-				ns	-
DATA	CLK-DATA	Setup time	-			ns	-
		Hold time	-			ns	
	Rise time, Fall time	-				ns	
DE	Horizontal	Cycle	th	1026	1056	1183	CLK
		Display period	thd	800			CLK
	Vertical (One frame)	Cycle	tv	-	628	635	Th
		Display period	tvd	600			Th
	CLK-DE	Setup time	-			ns	-
		Hold time	-			ns	
	Rise time, Fall time	-				ns	

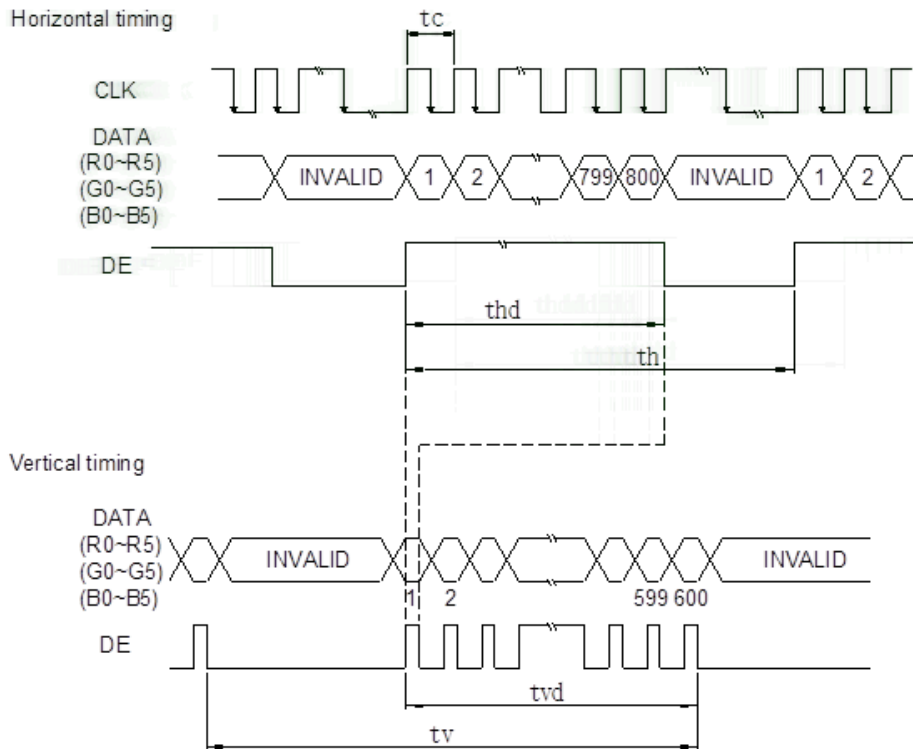
Note1: Definition of parameters is as follows.

tc=1CLK, th=1H

Note2: See the data sheet of LVDS transmitter.

Note3: Vertical cycle (tv) should be specified in integral multiple of Horizontal cycle (th).

9.2.4 Input signal timing char



10. RELIABILITY TEST

ENVIRONMENTAL TEST				
NO.	ITEM	CONDITIONS	TIME PERIOD	REMARK
1	High Temperature Storage	80°C	240HRS	
2	Low Temperature Storage	-30±3°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 Humidity Operation	50°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 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 :

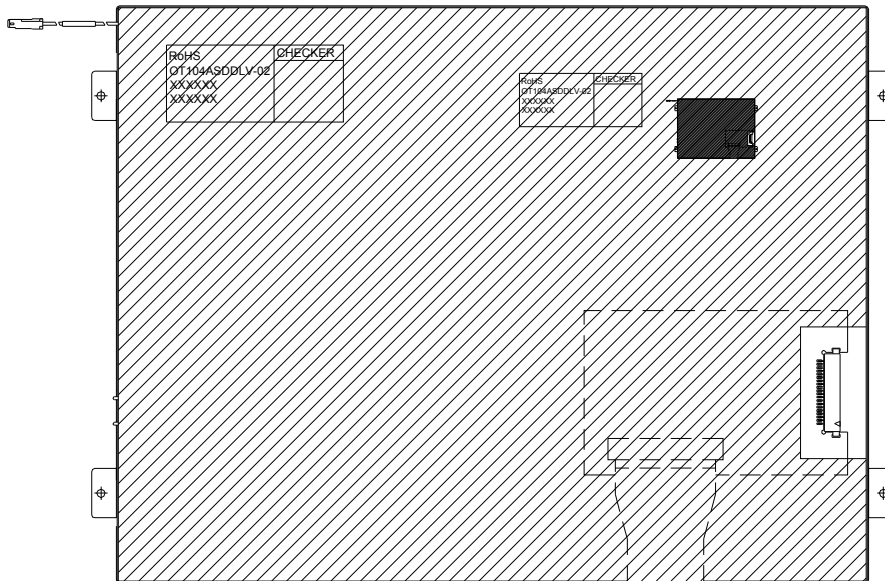
10.2.1 STATE LABORATORY ENVIRONMENT :

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 : 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



MODEL LABELS

RoHS OT104ASDDLV-02 XXXXXX XXXXXX	CHECKER
--	---------

(a)Model Name : OT104ASDDLV-02

(b)Lot NO. : XX XX XX

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>XX</u>	Day	01,02,03,04,05,06,~ ~ ~ ~,26,27,28,29,30,31

(c)Serial NO. : X XXXXXX

CODE	MEANING	DESCRIPTION
<u>X</u>	Number Block Code	A,B,C,D,E,F,G,H,I,J,K,L → A,B,C,D,E,F,G,H,I,J,K,L → A,B,.....
<u>XXXXXX</u>	Model Serial	00001,00002,00003,00004,00005,~ ~ ~ ~,99997,99998,99999

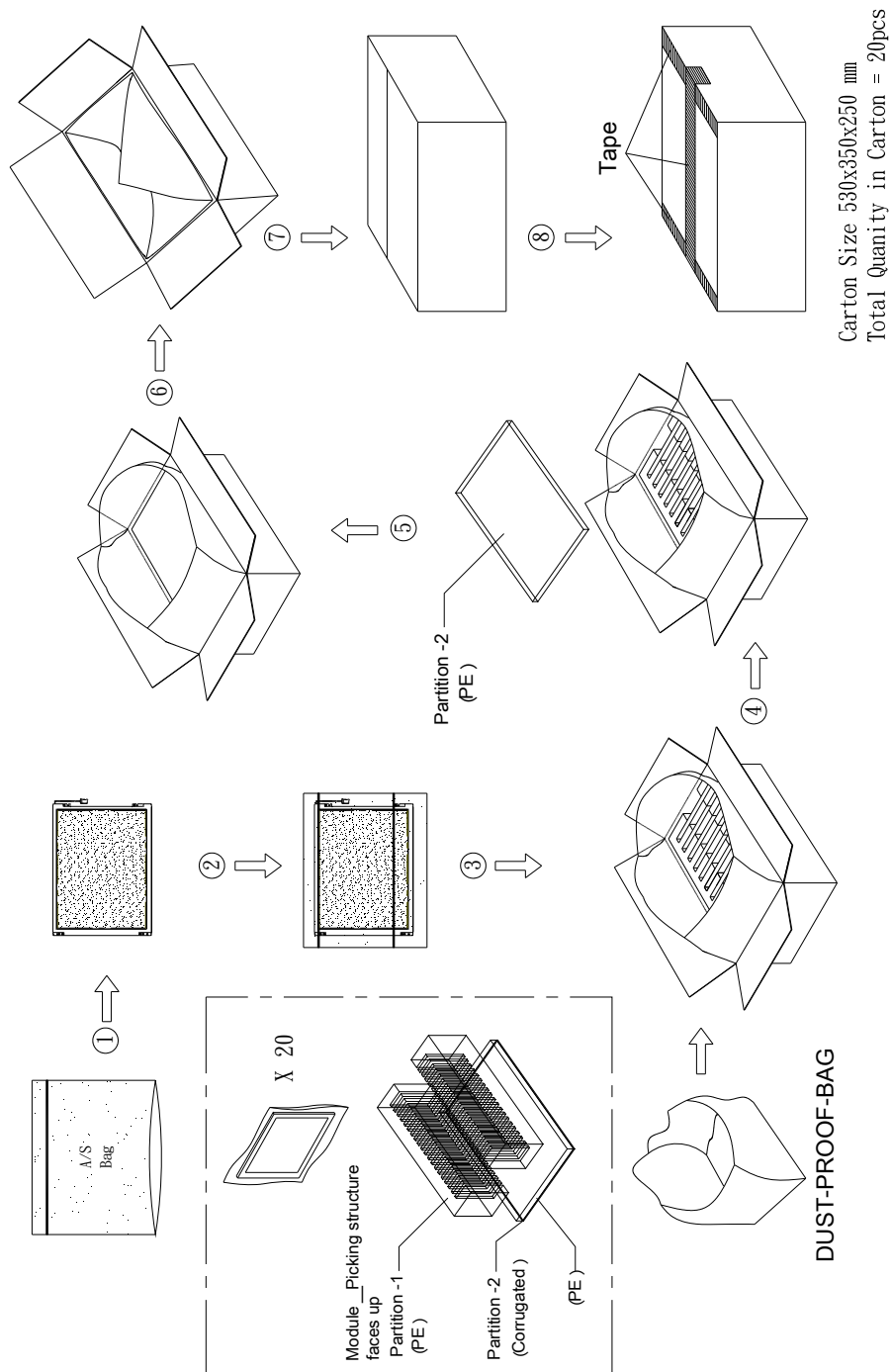
(d)CHECKER : CHECKER NAME

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
OT104ASDDLV-02	20PCS/Box	530*350*250	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.