

TFT-DISPLAY DATASHEET

ONation
Model: OT070AGUDLT-00

BRIEF SPEC.:

Main Feature	LandscapeType Transmissive Wide Viewing Angle
Active Screen Area	152.4 x 91.44 (mm)
Diagonal Format	7 " 15:9
Resolution	800 X 480
Colors	16.7M (8 Bit)
Backlight	LED
Brightness	600 cd/m ²
LED Life Time	30K (h)
Interface	LVDS
Viewing Angle	85/85 L/R 85/85 up/down
Touchscreen	yes
Power Supply	3.3 V (Typ.)
Module Outline	187.6 x 126.64 x 9.53 (mm)
Operation Temperature	-20... +70 °C
Storage Temperature	-30... +80 °C
Surface Treatment	Anti-Glare



ONation Corporation

TFT COLOR LCD MODULE

MODEL: OT070AGUDLT-00
(Complied with RoHS)

WVGA
LVDS interface

Version: P0.1

Customer : _____
Approved By : _____
Date: _____

ONATION		
APPROVAL	CHECKER	PREPARE
<i>Ian</i>	<i>Ian</i>	<i>Louis.</i>

[All information is subject to change without notice.](#)
[Please confirm the sales representative before starting to design your system](#)

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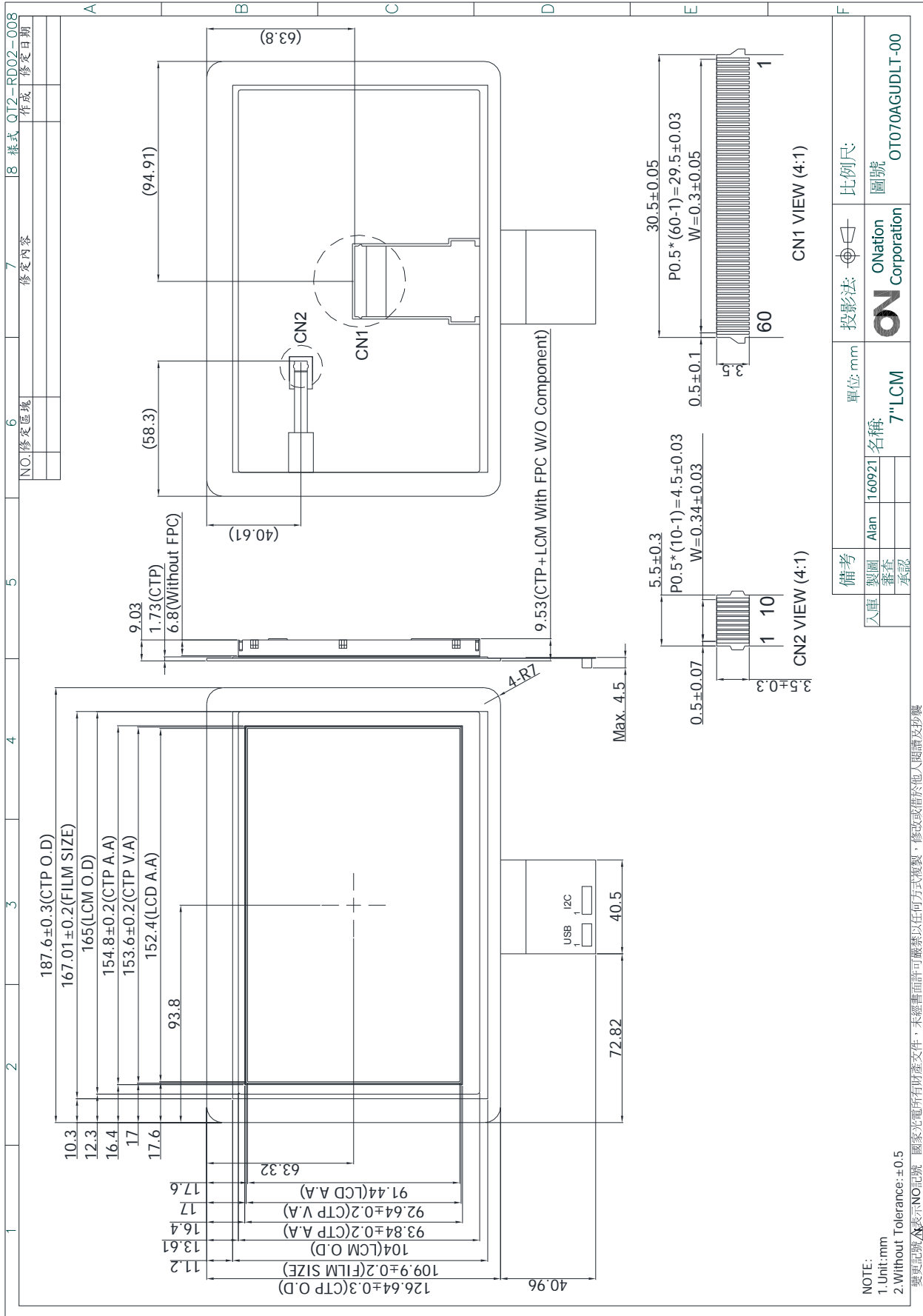
1.RECORD OF REVISION

REV	DATE	PAGE	SUMMARY
0.1	2016.09.26	ALL	Preliminary specification was first issued.

2.MECHANICAL SPECIFICATIONS

(1)	Number Of Dots (Dots)	800(R.G.B) X 480
(2)	Module Size(mm)	187.60(H) X 126.64(V) X9.53(D)
(3)	Active Area(mm)	152.40(H) X 91.44(V)
(4)	Pixel Pitch(mm)	0.1905 (H) X 0.1905(V)
(5)	LCD / Polarizer Model	TFT , Transmissive, Normally/Black, Anti-Glare
(6)	Backlight Color	White, LED
(7)	Viewing Direction	Wide Viewing Angle Horizontal : Right side 85°(typ.), Left side 85°(typ.) Vertical : Up side85°(typ.), Down side 85°(typ.)
(8)	Electrical Interface	LVDS Interface
(9)	Color Configuration	R.G.B Stripe,16.7M Color
(10)	Module Weight(g)	(TBD)

3. OUTLINE DIMENSIONS



4. INTERFACE PIN CONNECTION

4.1 LCM PANEL DRIVING SECTION

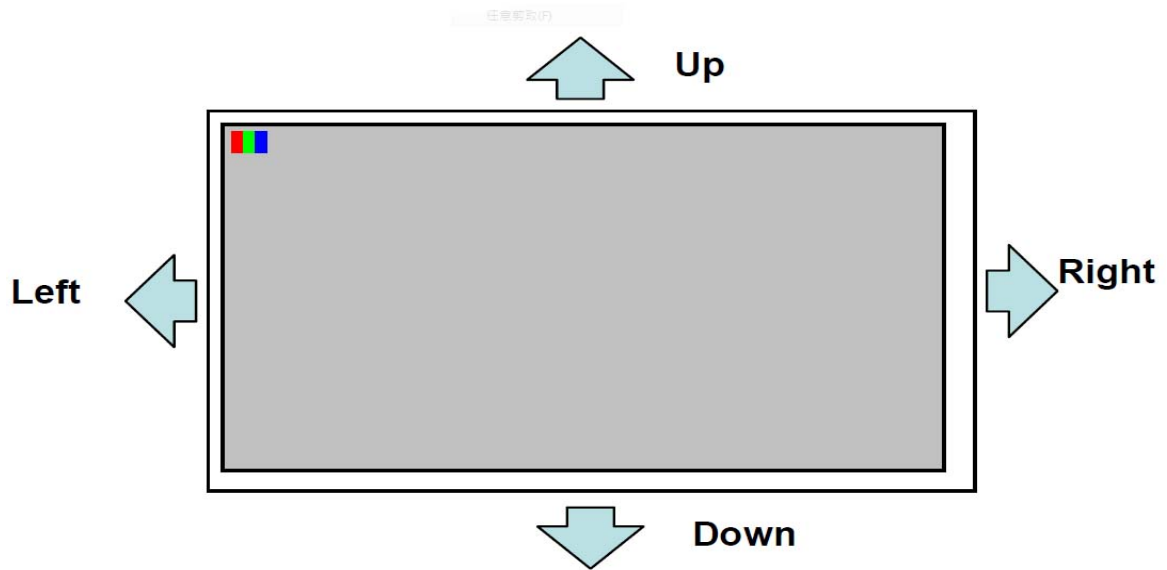
CN1 connector : PITCH=0.5mm,60PIN

PIN NO.	SIGNAL	FUNCTION	REMARK
1	AGND	Analog Ground	
2	AVDD	Analog Power	
3	VCC	Digital Power	
4	GND	Digital ground	
5	NC	No connection	
6	VCC	Digital power	
7	GND	Digital ground	
8	V14	Gamma correction voltage reference	
9	V13	Gamma correction voltage reference	
10	V12	Gamma correction voltage reference	
11	V11	Gamma correction voltage reference	
12	V10	Gamma correction voltage reference	
13	V9	Gamma correction voltage reference	
14	V8	Gamma correction voltage reference	
15	GND	Digital ground	
16	DVDD_LVDS	LVDS power	
17	GND	Digital ground	
18	RxIN3+	Positive LVDS differential data input	
19	RxIN3-	Negative LVDS differential data input	
20	GND	Digital ground	
21	RxCLKIN+	Positive LVDS differential clock input	
22	RxCLKIN-	Negative LVDS differential clock input	
23	GND	Digital ground	
24	RxIN2+	Positive LVDS differential data input	
25	RxIN2-	Negative LVDS differential data input	
26	GND	Digital ground	
27	RxIN1+	Positive LVDS differential data input	
28	RxIN1-	Negative LVDS differential data input	
29	GND	Digital ground	
30	RxIN0+	Positive LVDS differential data input	
31	RxIN0-	Negative LVDS differential data input	
32	GND	Digital ground	
33	GND_LVDS	LVDS ground	
34	GRB	Global reset pin.Active low to enter reset state. Suggest to connecting with an RC reset circuit for stability.Normally pull high.(R=47KΩ , C=0.1μF)	

35	STBYB	STBYB="1" , normal operation(normally) STBYB="0" , timing control,source driver will turn off,all output are high-Z	
36	SHLR	Left or Right display control	
37	VCC	Digital power	
38	UPDN	Up or Down display control	
39	AGND	Analog Ground	
40	AVDD	Analog Power	
41	NC	No connection	
42	DITH	Dithering function enable control.Normally pull low DITHER="1" , Enable internal dithering fuction DITHER="0" , Disable internal dithering fuction	
43	GND	Digital ground	
44	VCC	Digital power	
45	GND	Digital ground	
46	V7	Gamma correction voltage reference	
47	V6	Gamma correction voltage reference	
48	V5	Gamma correction voltage reference	
49	V4	Gamma correction voltage reference	
50	V3	Gamma correction voltage reference	
51	V2	Gamma correction voltage reference	
52	V1	Gamma correction voltage reference	
53	GND	Digital ground	
54	VCC	Digital power	
55	SELB	6bit or 8bit mode select. SELB="0" , LVDS input data is 8bits SELB="1" , LVDS input data is 6bits	
56	VGH	Positive power for TFT	
57	VCC	Digital power for Gate IC	
58	VGL	Negstive power for TFT	
59	GND	Digital ground for Gate IC	
60	NC	No connection	

Note1: UPDN and SHLR control function

SHLR	UPDN	Data shifting
VCC	GND	Left→Right , Up→Down(default)
GND	GND	Right→ Left , Up→Down
VCC	VCC	Left→Right , Down→Up
GND	VCC	Right→ Left , Down→Up



4.2 BACKLIGHT DRIVING SECTION

CN1 connector : PITCH=0.5mm,10PIN

PIN NO.	SIGNAL	FUNCTION	REMARK
1	LEDA	LED driving anode (high voltage)	
2	LEDA	LED driving anode (high voltage)	
3	NC	No connection	
4	NC	No connection	
5	NC	No connection	
6	NC	No connection	
7	NC	No connection	
8	NC	No connection	
9	LEDK	LED driving cathode (low voltage)	
10	LEDK	LED driving cathode (low voltage)	

4.3 T/P PANEL DRIVING SECTION

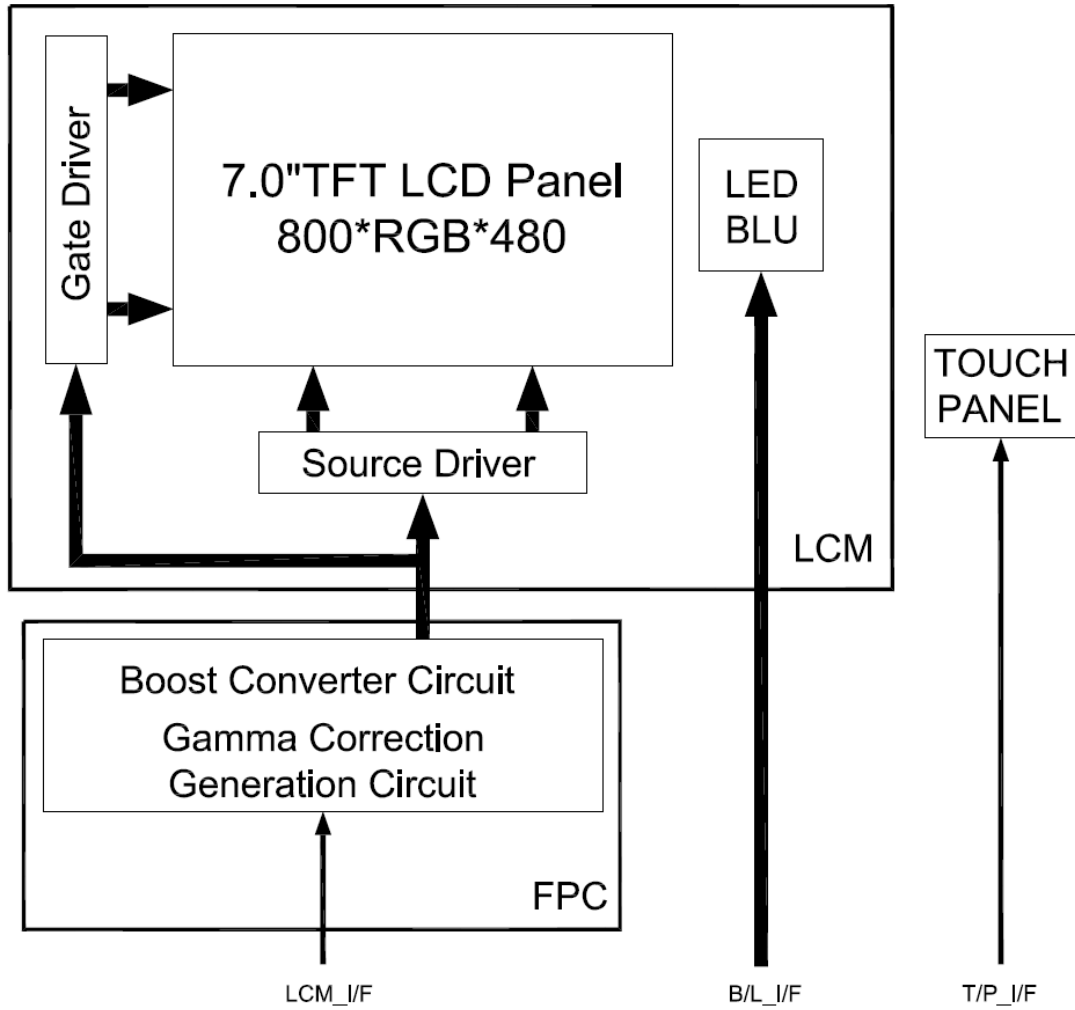
USB:E&T 3802-E05N-01R

PIN NO.	SIGNAL	FUNCTION
1	GND-EARTH	
2	VDD	5V
3	GND	Ground
4	D+	USB D+
5	D-	USB D-

I2C: E&T 3802-E06N-01R

PIN NO.	SIGNAL	FUNCTION
1	NC	GND
2	NC	I ² C-SDA
3	NC	I ² C-SCL
4	NC	VDD
5	NC	I ² C-INT
6	NC	/RST

5. BLOCK DIAGRAM



6. ABSOLUTE MAXIMUM RATINGS

6.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	MIN.	MAX.	UNIT	REMARK
Supply Voltage	VCC	-0.3	5.0	V	
	AVDD	-0.5	15.0	V	
	VGH	-0.3	42.0	V	
	VGL	-20.0	0.3	V	
	VGH~VGL	-0.3	40.0	V	
	RxIN0+~ RxIN3+ RxIN0-~ RxIN3- RxCLKIN+ RxCLKIN-	-0.5	5	V	
LED Forward Current	IF	-	80	mA	

Note1: The absolute maximum rating values of this product are not allowed to be exceeded at any times. Should a module be used with any of the 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)	Note 3		Note 3		Without condensation

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=60°C & RH=90% ≤ 240Hrs.

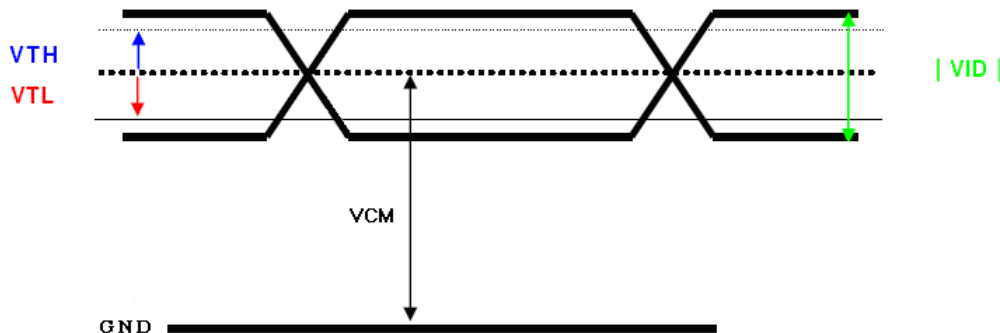
7. ELECTRICAL CHARACTERISTICS

7.1 ELECTRICAL CHARACTERISTICS OF LCD

Ta=25°C

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
Power Voltage For LCD	VDD	3.0	3.3	3.6	V	
	VCM	VID /2	-	2.4-MIN.	V	Note1
	VID	300	-	600	mV	Note1
	VTH	-	-	150	mV	VCM=1.2V Note1
	VTL	-150	-	-	mV	
	AVDD	12.8	13	13.2	V	
	VGH	19	20	21	V	
	VGL	-6.6	-6	-5.4	V	
Input Signal Voltage	VCOM	(5.5)	(5.7)	(5.9)	V	Note2
Input Logic high Voltage	VIH	0.7VDD	-	VDD	V	
Input Logic low Voltage	VIL	0	-	0.3VDD	V	
Current for Driver	IGH	-	0.5	1.0	mA	VGH=20V
	IGL	-	0.5	1.0	mA	VGL=-6V
	IVDD	-	15	25	mA	VDD=3.3V
	IAVDD	-	35	55	mA	AVDD=13V

Note 1: LVDS signal



Note 2: Vcom is the reference voltage for customer, it should be adjust VCOM to make the flicker level

7.2 BACKLIGHT UNITS

Ta=25°C

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
LED Driving Voltage	VLED	18.55	21	24.15	V	
LED Driving Current	ILED	-	160	-	mA	
LED Life Time (For Reference Only)	Ta=25°C 60-70%RH (Note 1)	30000			Hrs	

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). 30,000 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 $\Theta_x=\Theta_y=0^\circ$	600	900	-	-	Note 1
Response Time	TR+TF		-	25	35	ms	Note 2
Chromaticity	White		x	0.255	0.295	0.335	-
		y	0.275	0.315	0.355	-	
Viewing Angle	Hor.	θ_{x+}	75	85	-	Deg.	Note 3
		θ_{x-}	75	85	-		
	Ver.	θ_{y+}	75	85	-		
		θ_{y-}	75	85	-		
Luminance	L	ILED=160mA	400	600	-	cd/m ²	Note 5
Luminance Uniformity	YU		70	80	-	%	

Note 1 : Definition of Contrast Ratio (CR) :

The contrast ratio can be calculated by the following expression.

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

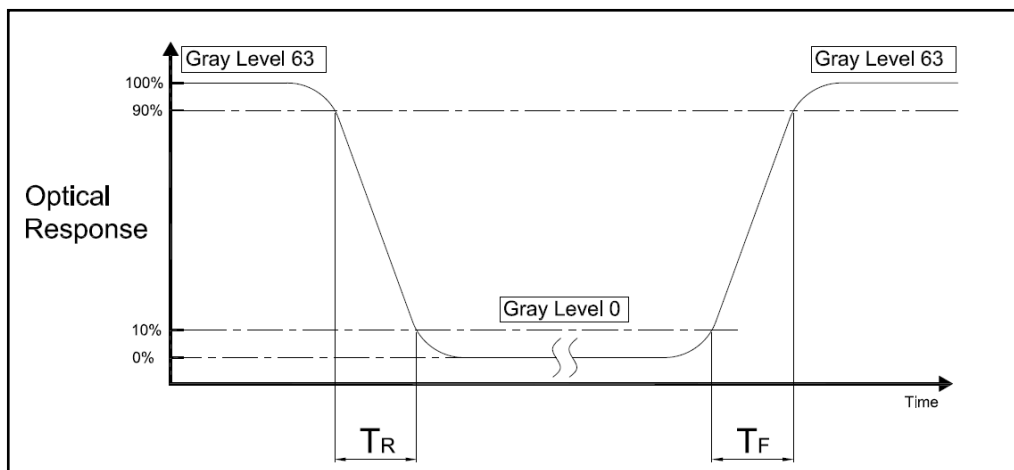
L63 : Luminance of gray level 63

L0 : Luminance of gray level 0

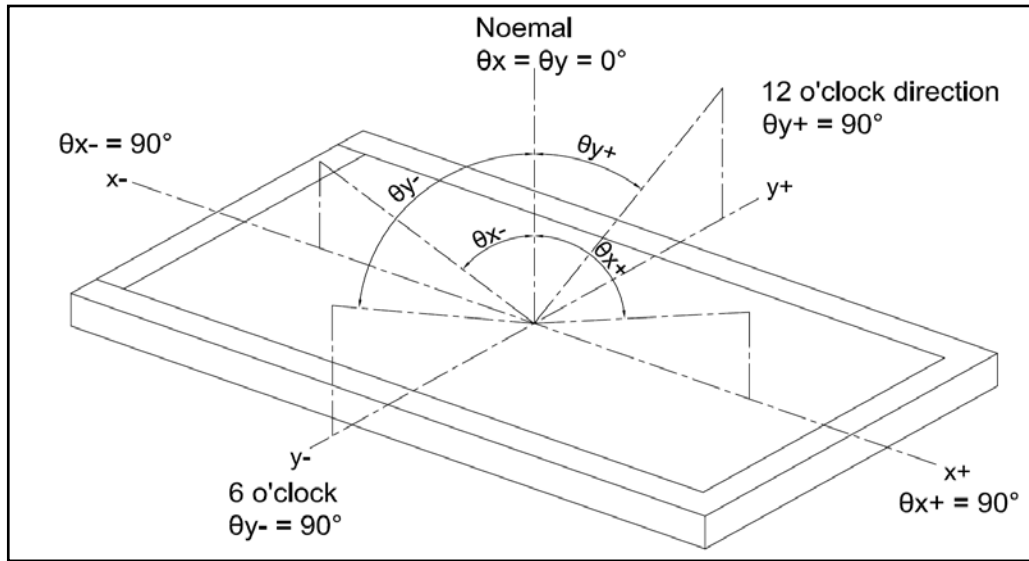
$$CR = CR(5)$$

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)

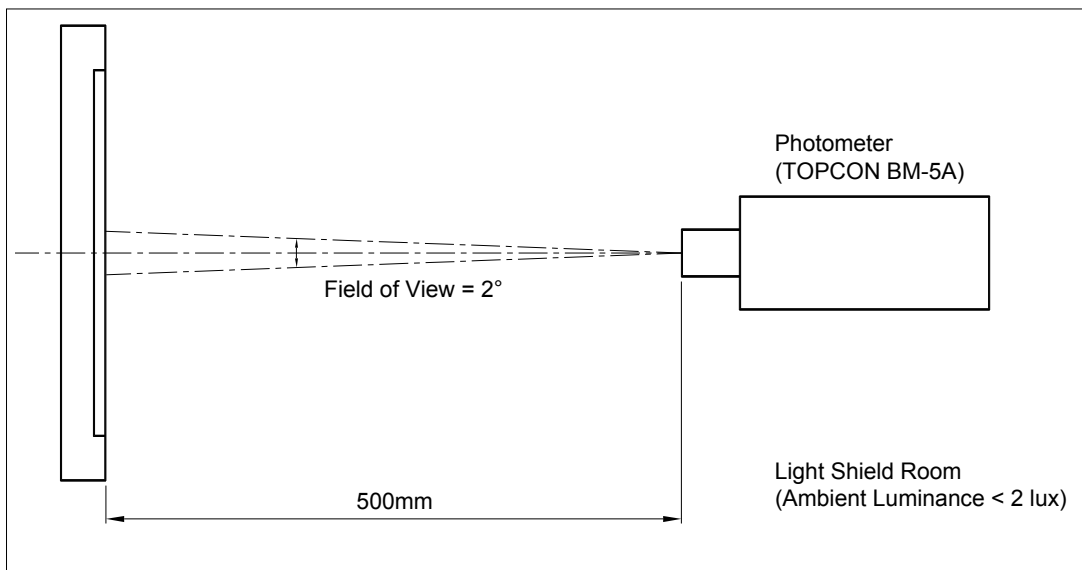


Note 3 : Definition of Viewing Angle

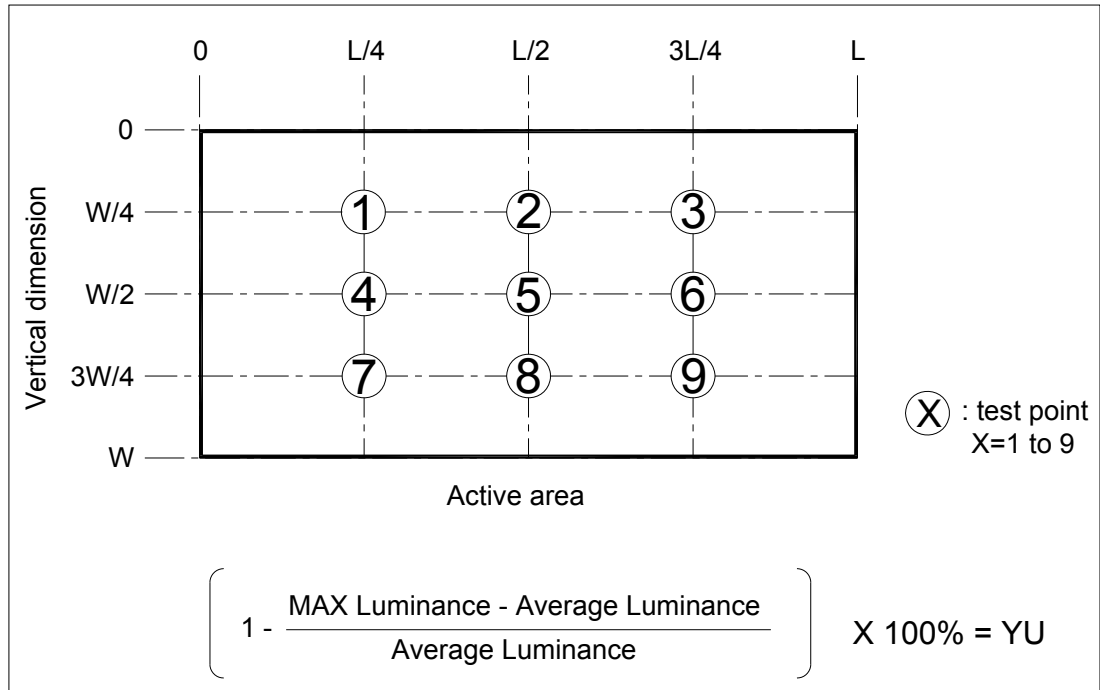


Note 4 : Measurement Set-Up:

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. TOUCH PANEL SPECIFICATIONS

9.1 Features

ITEM	SPECIFICATIONS
Type	Projected Capacitive
Input Mode	Finger
Connector	Ref. Dimension Drawing

9.2 Features

ITEM	SPECIFICATIONS
Haze	<2%

9.3 Electrical Characteristics

ITEM	SPECIFICATIONS
Response	According to Integration Time of Controller
Accuracy	Line Drawing: 1pt +/- 1mm offset / 10mm 2pt +/- 2mm offset / 10mm Touch Point: 1pt +/- 2.5mm 2pt +/- 5.0mm Refer to Windows 7 Logo Regulation
Multi-Touch Fingers Pitch	Between the Fingers Pitch > 10mm . (Note)

*Note: Channel Pitch Should be 5mm~7mm

9.4 Durability

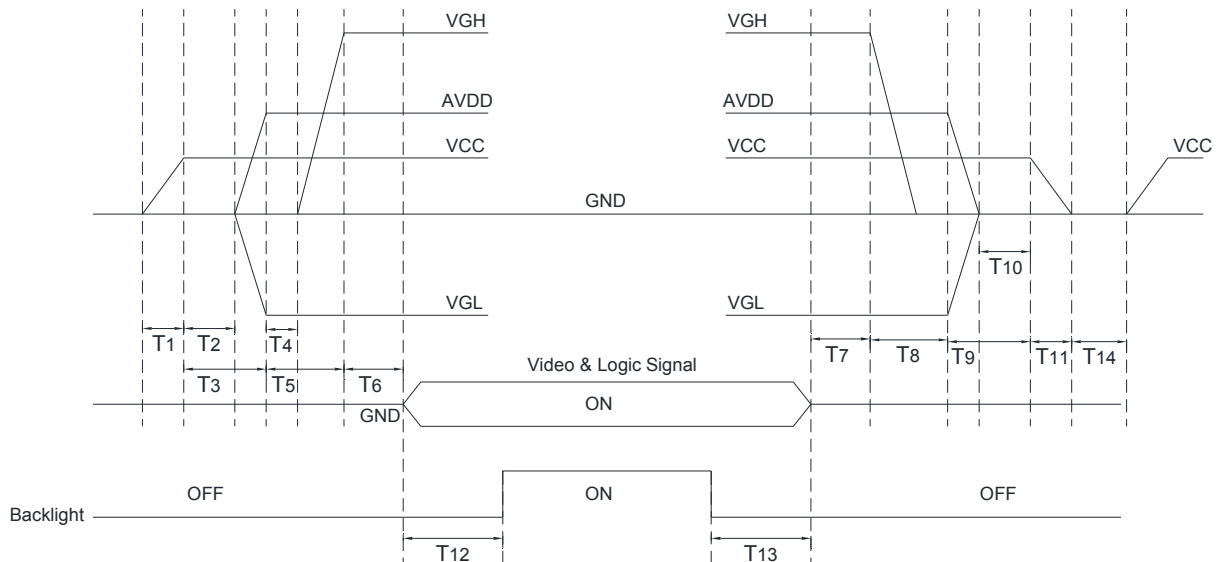
ITEM	SPECIFICATIONS
Operating Force	Finger $\leq 10g$, $\geq 8\psi$
Hardness	7H pencil, pressure 750g/45°
Knock Test	100,000,000 Times

10. TIMING SPECIFICATIONS

10.1 POWER SEQUENCE

Power On : VCC→AVDD/VGL→VGH→Video & Logic Signal→Backlight

Power Off : Backlight→Video & Logic Signal→VGH→AVDD/VGL→VCC



$$0 < T1 \leq 10\text{ms}$$

$$T2 > 0\text{ms}$$

$$T3 > 20\text{ms}$$

$$T4 > 0\text{ms}$$

$$T5 > 10\text{ms}$$

$$0 < T6 \leq 10\text{ms}$$

$$0 < T7 < 50\text{ms}$$

$$0 < T8 < 50\text{ms}$$

$$T9 > 0\text{ms}$$

$$T10 > 0\text{ms}$$

$$0 < T11 \leq 10\text{ms}$$

$$T12 \geq 200\text{ms}$$

$$T13 \geq 200\text{ms}$$

$$T14 \geq 200\text{ms}$$

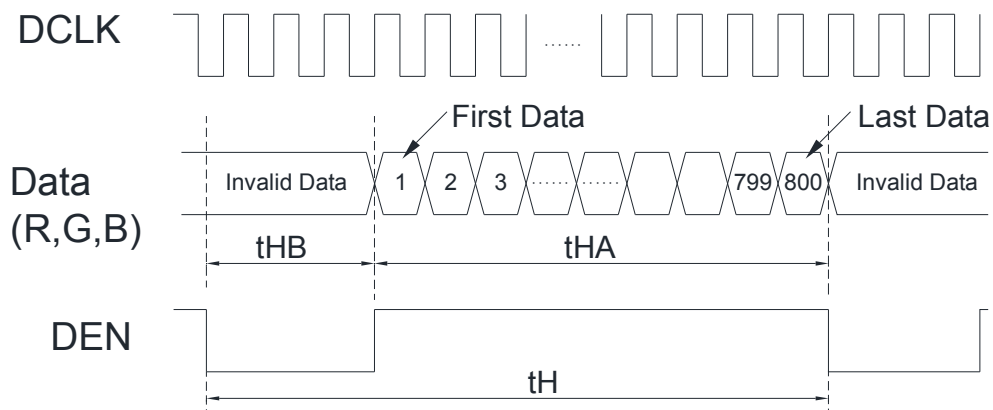
10.2 INPUT SIGNAL(DE ONLY MODE)

10.2.1 Timing Specification

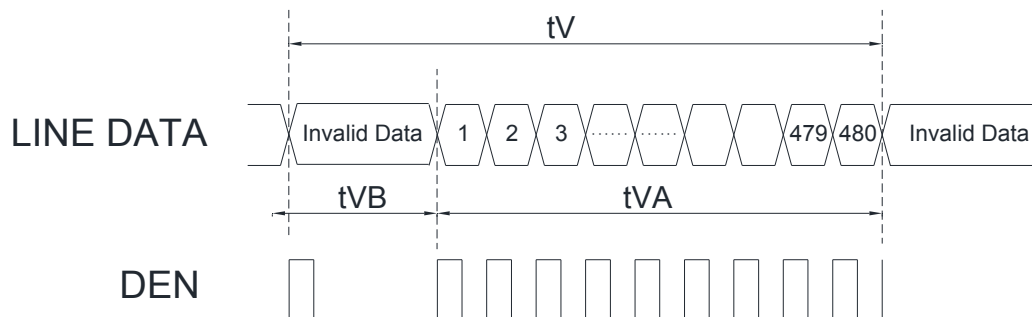
ITEM			SYMBOL	MIN.	TYP.	MAX.	UNIT	
LVDS input signal sequence	CLK Frequency		tclk	26	29	33	MHz	
LCD input signal sequence (Input LVDS Transmitter)	DENA	Horizontal	Horizontal total Time	tH	908	928	948	tCLK
			Horizontal effective Time	tHA	800			tCLK
			Horizontal Blank Time	tHB	108	128	148	tCLK
		Vertical	Vertical total Time	tV	515	525	535	tH
			Vertical effective Time	tVA	480			tH
			Vertical Blank Time	tVB	35	45	55	tH

10.2.2 Timing sequence(Timing chart)

10.2.2.1 Horizontal Timing Sequence

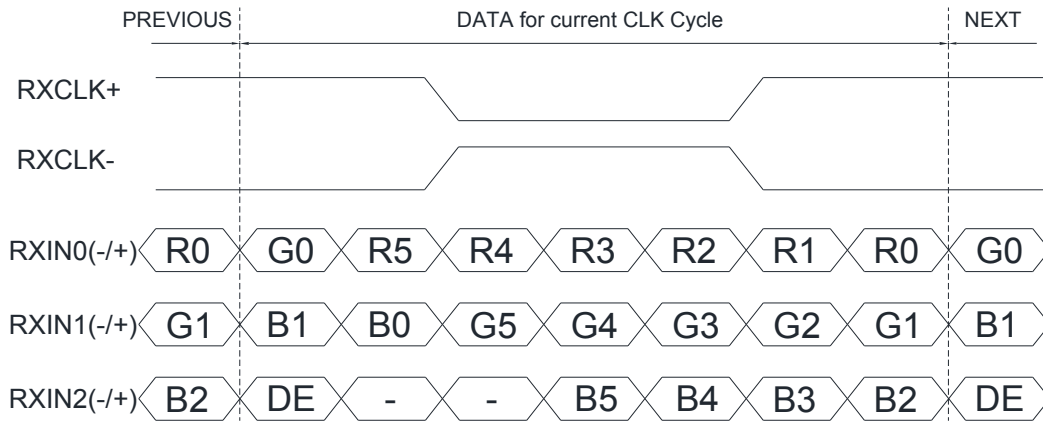


10.2.2.2 Vertical Timing Sequence

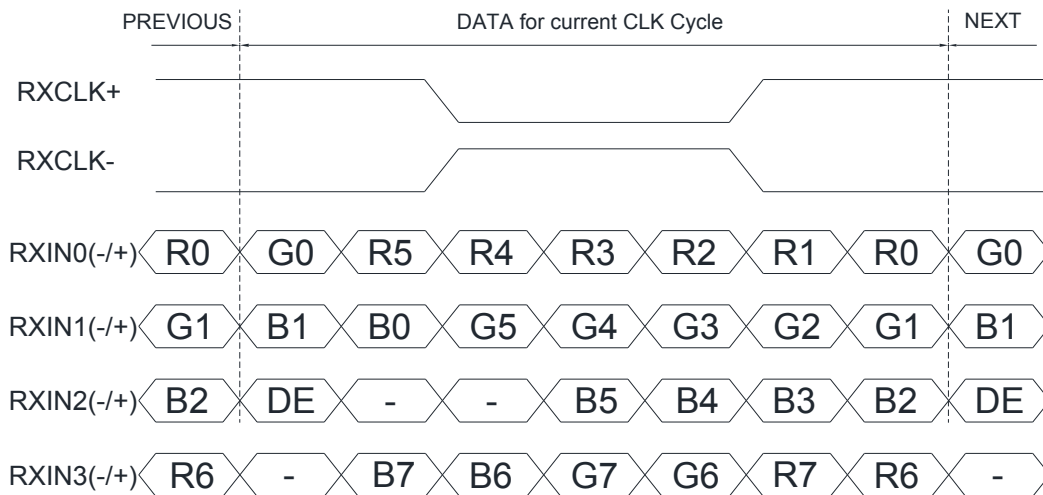


10.2.2.3 LVDS Input Data mapping

6 Bit LVDS input



8 Bit LVDS input



10.2.2.4 LVDS Input Data mapping

COLOR	INPUT DATA	R DATA								G DATA								B DATA							
		R7	R6	R5	R4	R3	R2	R1	R0	G7	G6	G5	G4	G3	G2	G1	G0	B7	B6	B5	B4	B3	B2	B1	B0
		MSB							LSB	MSB							LSB	MSB							LSB
BASIC COLOR	BLACK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RED(255)	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	GREEN(255)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	BLUE(255)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	CYAN	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	MAGENTA	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	YELLOW	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	WHITE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
RED	RED(0)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RED(1)	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RED(2)	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RED(254)	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RED(255)	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	GREEN(0)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	GREEN(1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
GREEN	GREEN(2)																								
	GREEN(254)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
	GREEN(255)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	BLUE(0)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	BLUE(1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	BLUE(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
BLUE	BLUE(254)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0
	BLUE(255)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1

Note 1 Gray level:

Color(n) : n is level order; higher n means brighter level.

Note 2 DATA: 1: high , 0: low

11. RELIABILITY TEST

ENVIRONMENTAL TEST				
NO.	ITEM	CONDITIONS	TIME PERIOD	REMARK
1	High Temperature Storage	80°C	240HRS	
2	Low Temperature Storage	-30°C	240HRS	
3	High Temperature Operation	70°C	240HRS	
4	Low Temperature Operation	-20°C	240HRS	
5	Temperature Cycle	-30°C~80°C	1HRS/ 50CYCLE	
6	High Temperature Humidity Storage	60°C 90%RH	240HRS	

NOTE 1 : a. The module should word properly.

b. Before and after function test, The difference of consumptive current. Should be within 10%.

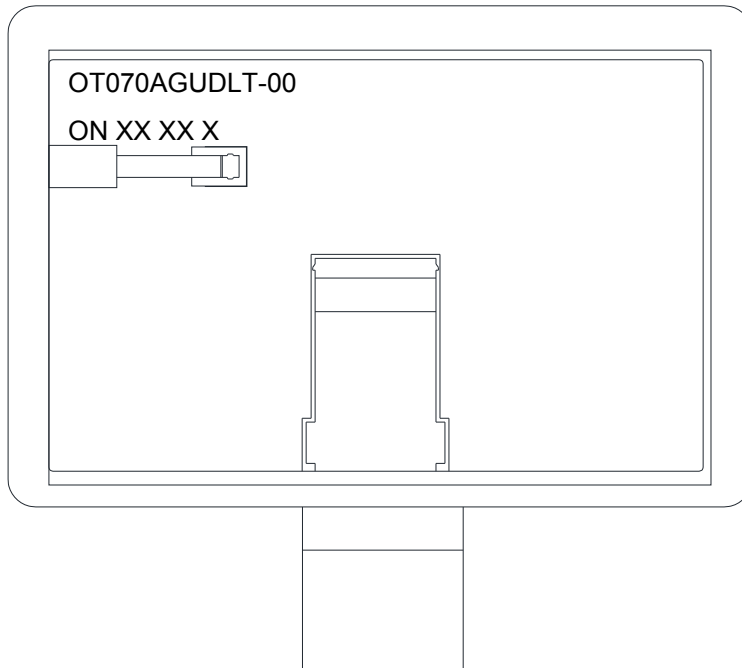
NOTE 2 : a. The module should work properly.

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.

12.MODEL NUMBER SYSTEM



(a) MODEL NAME : OT070AGUDLT-00

(b) LOT NO : ON XX XX X

CODE	MEANING	DESCRIPTION
<u>XX</u>	Year	2016=16, 2017=17, 2018=18,
<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

13. LCM INSPECTION STANDARD

Inspection specifications refer ONation Corporation LCM INSPECTION STANDARD Document.
Document Number : QT3-QC-A-I002

14 PACKAGE INFORMATION

LCM Model	LCM Qty. in the box	Inner Box Size (mm)	Weight	REMARK
OT070AGUDLT-00	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.