

# TFT-DISPLAY DATASHEET

ONation  
Model: OT050EGUDDN-01

## BRIEF SPEC.:

Main Feature	LandscapeType Transmissive
Active Screen Area	108.0 x 64.8 (mm)
Diagonal   Format	5 "   15:9
Resolution	800 X 480
Colors	(8 Bit)
Backlight	LED
Brightness	380 cd/m <sup>2</sup>
LED Life Time	30K (h)
Interface	TTL
Viewing Angle	70/70 L/R 50/70 up/down
Touchscreen	No
Power Supply	3.3 V (Typ.)
Module Outline	120.7 x 76.3 x 3.25 (mm)
Operation Temperature	-20... +70 °C
Storage Temperature	-30... +80 °C
Surface Treatment	Anti-Glare



# ONation Corporation

## TFT COLOR LCD MODULE

**MODEL: OT050EGUDDN-01**  
(Complied with RoHS)

**WVGA**  
**TTL interface**

**Version: V3.0**

<b>Customer :</b> _____
<b>Approved By :</b> _____
<b>Date:</b> _____

ONATION		
APPROVAL	CHECKER	PREPARE
<i>Jan</i>	<i>Josh</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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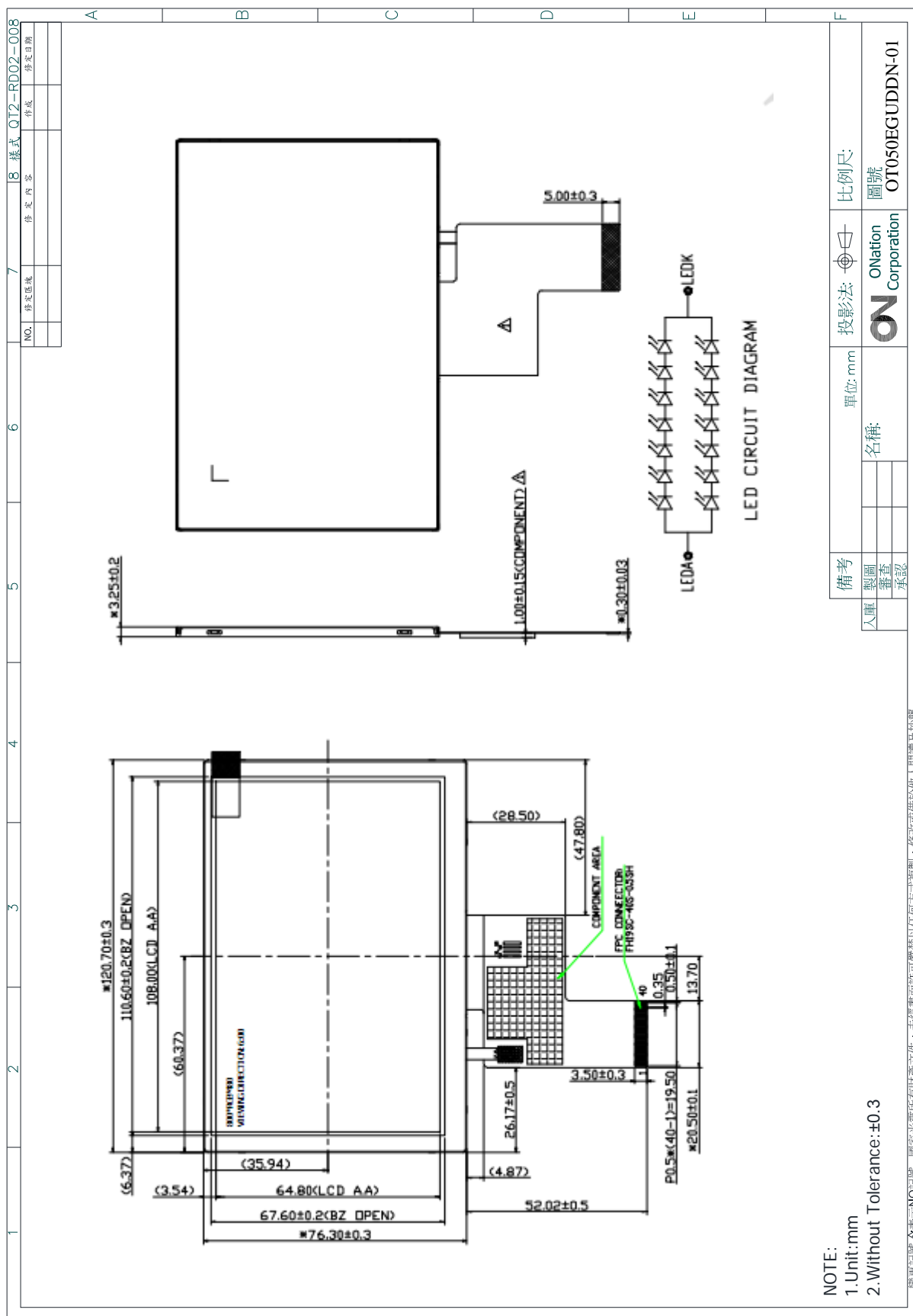
## 1.RECORD OF REVISION

REV	DATE	PAGE	SUMMARY
0.1	2016.07.27	ALL	Preliminary specification was first issued.
1.0	2016.09.06	1	Viewing Direction 12 O'clock → 6 O'clock Delete Gray Scale Inversion Direction
		7	7.1 ELECTRICAL CHARACTERISTICS OF LCD ICC=TBD→ICC=114mA 7.2 BACKLIGHT UNITS: LED Life Time(20000)Hrs-->20000Hrs
		8	8. OPTICAL CHARACTERISTICS Cromaticity white x: TBD TBD TBD-->0.26 0.31 0.36 y: TBD TBD TBD-->0.27 0.32 0.37 Luminance: (380)(Typ)-->300(min) 380(Typ) Luminance Uniformity:75%(Typ)-->70%(Min) 75%(Typ)
		14	11. LCM INSPECTION STANDARD Document Number :TBD --> Document Number : 5.0-7.9-QT3-QC-A-I002 P0.3
		14	12. PACKAGE INFORMATION
2.0	2016.11.07	15	Add Chapter 11 "MODEL NUMBER SYSTEM"
3.0	2016.11.16	16	Add "PACKING INFORMATION" Diagram

## 2.MECHANICAL SPECIFICATIONS

(1)	Number Of Dots (Dots)	800(R.G.B) X 480
(2)	Module Size(mm)	120.70(H) X76.30(V) X3.25(D)
(3)	Active Area(mm)	108.0(H) X 64.8(V)
(4)	Pixel Pitch(mm)	0.135 (H) X 0.135(V)
(5)	LCD / Polarizer Model	TFT , Transmissive, Normally/White, Anti-Glare
(6)	Backlight Color	White, LED
(7)	Viewing Direction	6 O'clock Horizontal : Right side 70°(typ.), Left side 70°(typ.) Vertical : Up side 50°(typ.), Down side 70°(typ.)
(8)	Electrical Interface	TTL Interface
(9)	Color Configuration	R.G.B Stripe
(10)	Module Weight(g)	TBD

### 3. OUTLINE DIMENSIONS



NOTE:  
 1. Unit:mm  
 2. Without Tolerance:±0.3

變更記錄/表示NO記錄 國家光電所有財產文件，未經書面許可嚴禁以任何方式複製、修改或借於他人閱讀及抄襲

## 4. INTERFACE PIN CONNECTION

### 4.1 LCM PANEL DRIVING SECTION

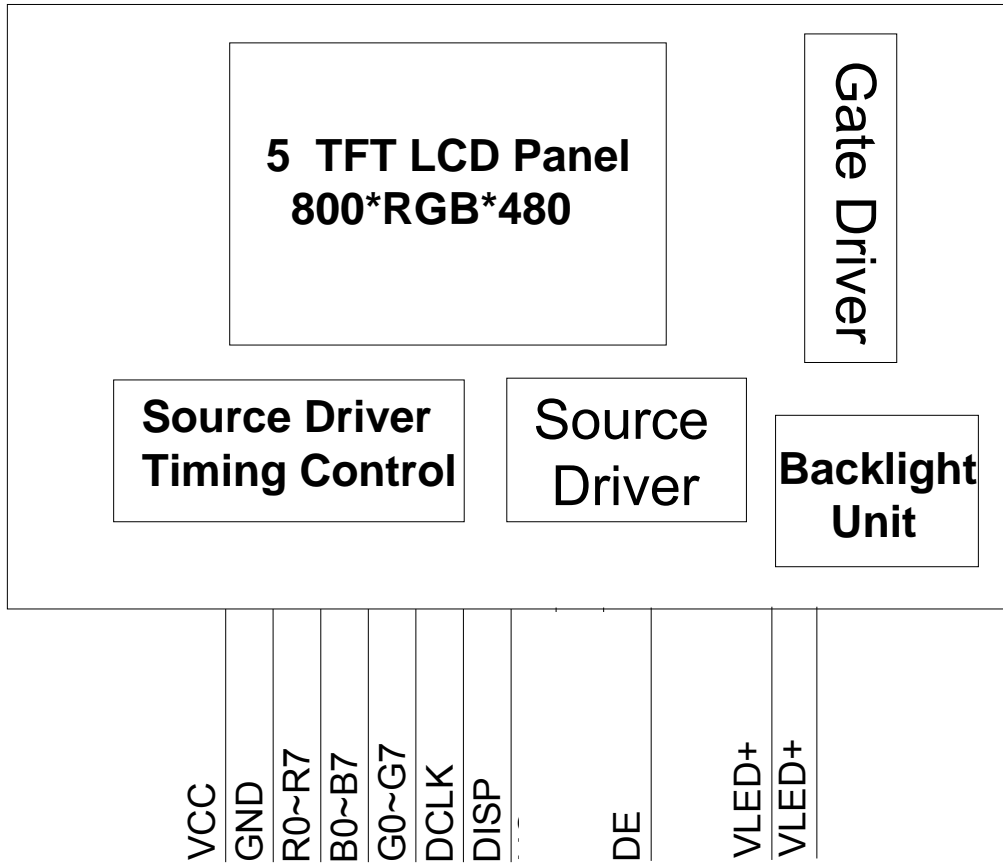
FPC PITCH=0.5mm,40PIN

PIN NO.	SIGNAL	FUNCTION
1	VLED-	Power for LED backlight cathode
2	VLED+	Power for LED backlight anode
3	GND	Ground
3	VCC	Digital Power
5	R0	Red Data(LSB)
6	R1	Red Data
7	R2	Red Data
8	R3	Red Data
9	R4	Red Data
10	R5	Red Data
11	R6	Red Data
12	R7	Red Data(MSB)
13	G0	Green Data(LSB)
14	G1	Green Data
15	G2	Green Data
16	G3	Green Data
17	G4	Green Data
18	G5	Green Data
19	G6	Green Data
20	G7	Green Data(MSB)
21	B0	Blue Data(LSB)
22	B1	Blue Data
23	B2	Blue Data
24	B3	Blue Data
25	B4	Blue Data
26	B5	Blue Data
27	B6	Blue Data
28	B7	Blue Data(MSB)
29	GND	Ground
30	DCLK	Clock Input

PIN NO.	SIGNAL	FUNCTION
31	DISP	Display on/off
32	NC	No Connection
33	NC	No Connection
34	DE	Data Input Enable
35	NC	No Connection
36	GND	Ground
37	NC	No Connection
38	NC	No Connection
39	NC	No Connection
40	NC	No Connection



## 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	GND=0V
Input Signal Voltage	Logic input	-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	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 :  $T_a \leq 60^\circ\text{C}$ : 90%RH max , without condensation.

$T_a > 60^\circ\text{C}$ : Absolute humidity shall be less than the value of 90%RH at  $60^\circ\text{C}$  without conlensation

## 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	Note1
	ICC	-	114	-	mA	
Input Signal Voltage	VIH	0.7*VCC	-	VCC		
	VIL	GND	-	0.3*VCC		

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

### 7.2 BACKLIGHT UNITS

Ta=25°C

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
LED Voltage	VLED	18.9	21	23.8	V	Note 1
LED Current	ILED	-	40	-	mA	
Power Consumption	PWF	-	840	-	mW	
LED Life Time	-	20000	30000	-	Hrs	Note 2

Note 1: The LED Supply Voltage is defined by the number of LED at Ta=25°C and ILED=40mA.

Note 2: The "LED life time" is defined as the module brightness decrease to 50% original brightness at Ta=25°C and ILED=40mA. The LED lifetime could be decreased if operating ILED is larger than 40 mA.

### 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	-	-	Note 1
Response Time	TR		-	2	-	ms	Note 2
	RF		-	6	-	ms	
Chromaticity	White	x	0.26	0.31	0.36	-	Note 4
		y	0.27	0.32	0.37	-	
Viewing Angle	Hor.	$\theta_{x+}$		70	-	Deg.	Note 3
		$\theta_{x-}$		70	-		
	Ver.	$\theta_{y+}$		50	-		
		$\theta_{y-}$		70	-		
Luminance	L	ILED=40mA	300	380	-	cd/m <sup>2</sup>	Note 5
Luminance Uniformity	YU		70	75	-	%	

Note 1 : Definition of Contrast Ratio (CR) :

The contrast ratio can be calculated by the following expression.

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

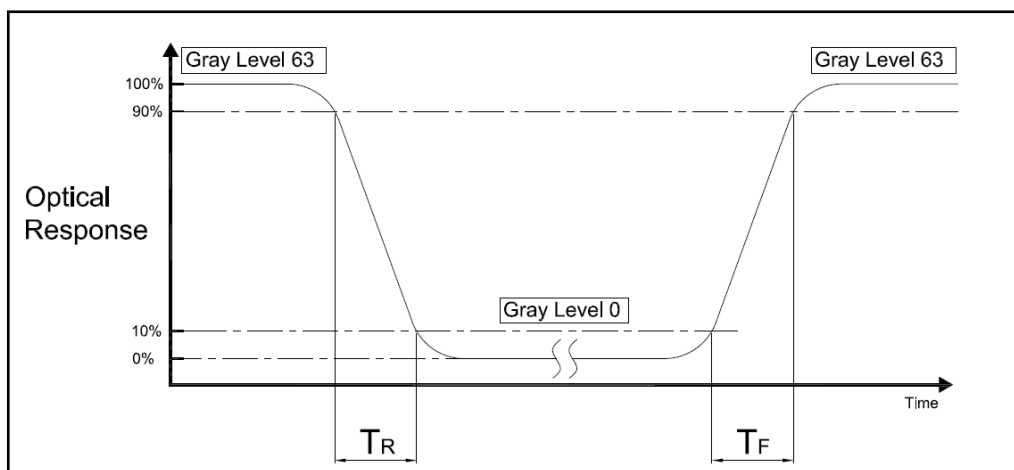
L63 : Luminance of gray level 63

L0 : Luminance of gray level 0

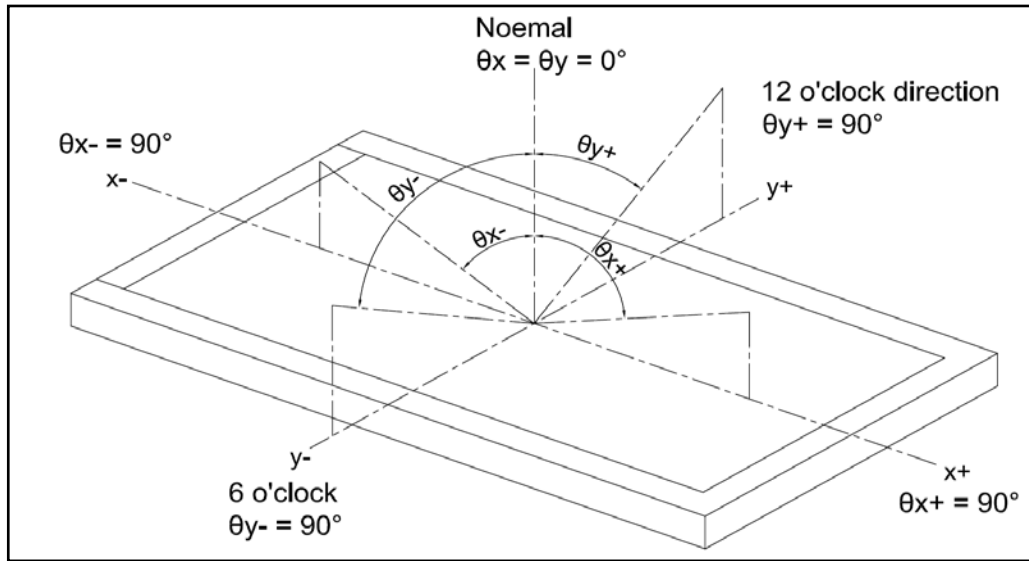
$$CR = CR(5)$$

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)

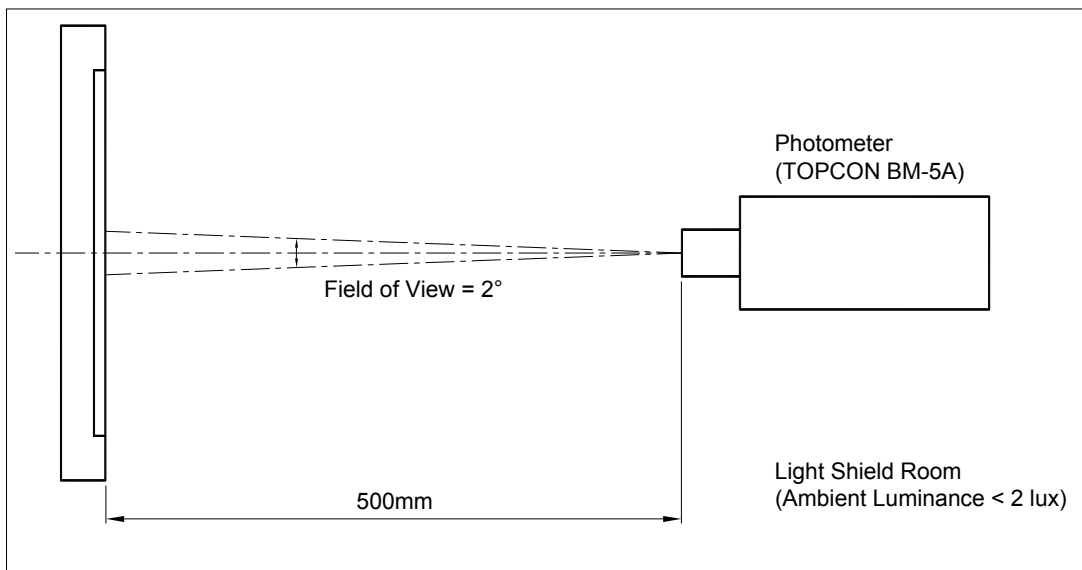


Note 3 : Definition of Viewing Angle

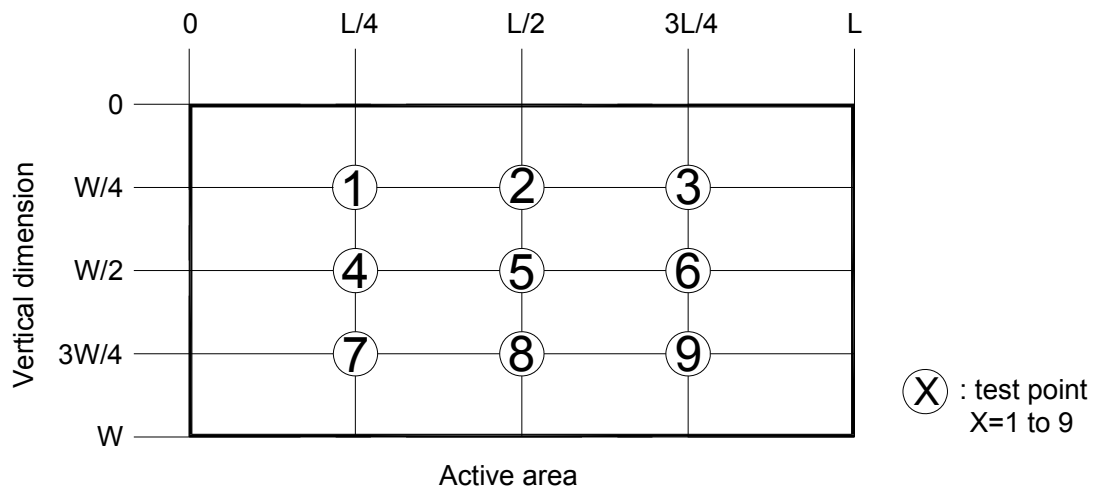


Note 4 : Measurement Set-Up:

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 :



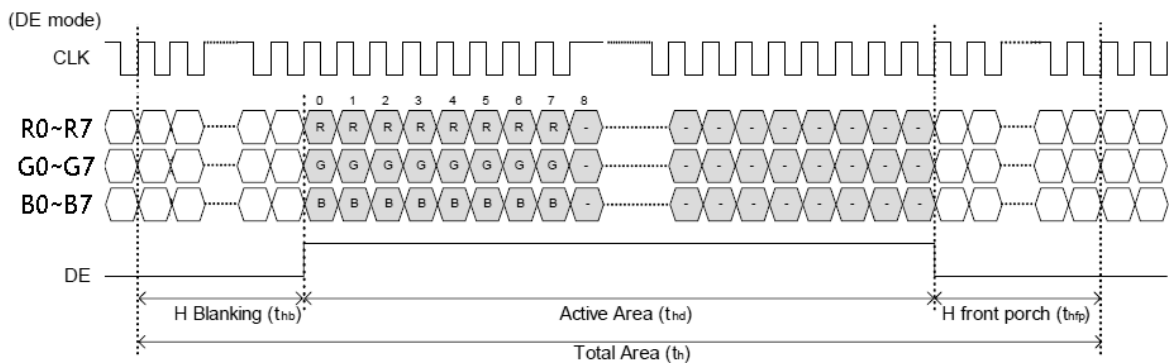
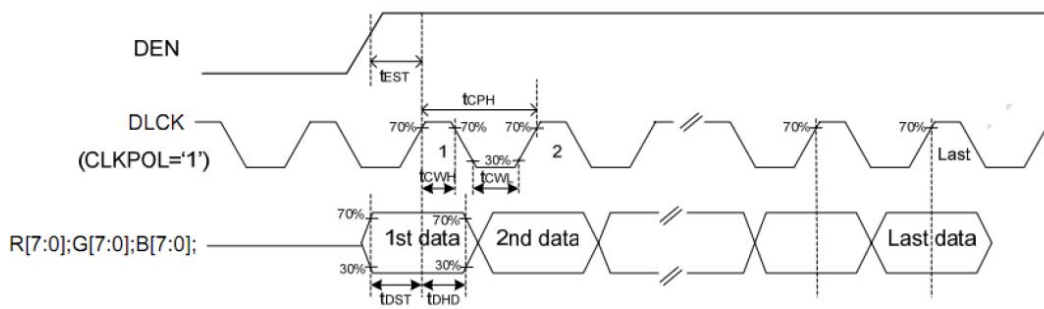
$$\left[ 1 - \frac{\text{MAX Luminance} - \text{Average Luminance}}{\text{Average Luminance}} \right] \times 100\% = YU$$

## 9. TIMING SPECIFICATIONS

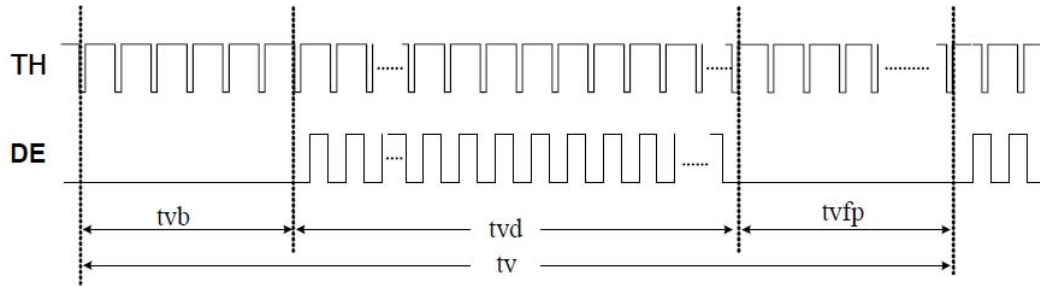
### 9.1 AC ELECTRICAL CHARACTERISTICS

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
DCLK Cycle Time	$T_{cph}$	20	-	-	ns	
Power On Slew rate	$T_{POR}$	-	-	20	ms	From 0 to 90%
DCLK Pulse Duty	$T_{cwh}$	40	50	60	%	
Data Setup Time	$T_{dasu}$	8	-	-	ns	
Data Hold Time	$T_{dhd}$	8	-	-	ns	
DE Setup Time	$T_{esu}$	8	-	-	ns	
DE Hold Time	$T_{ehd}$	8	-	-	ns	

### 9.2 INPUT CLOCK AND DATA TIMING DIAGRAM



Horizontal display timing range



Vertical timing

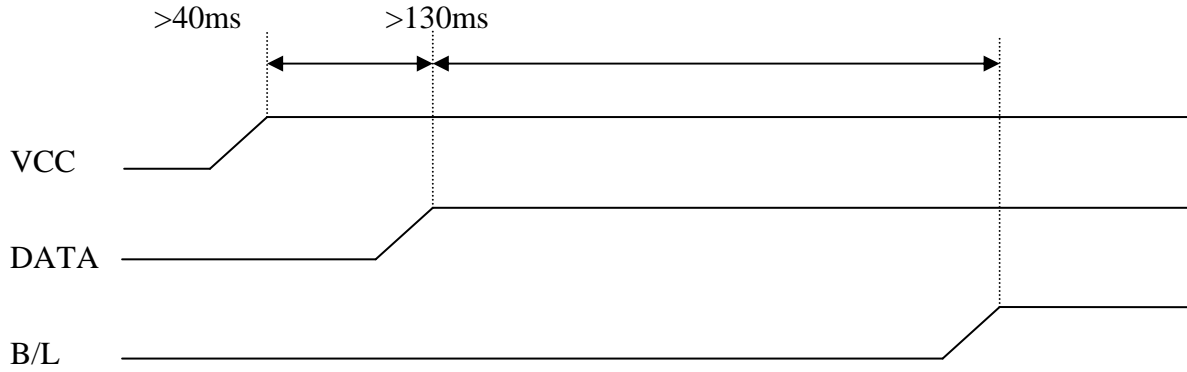
ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
Horizontal Display Area	thd	-	800	-	CLK	
CLK Frequency	fclk	26.4	33.3	46.8	MHz	
One Horizontal Line	th	862	1056	1200	CLK	
HS Blanking	thb	46	46	46	CLK	
HS Front Porch	thfp	16	210	354	CLK	

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
Vertical Display Area	tvd	-	480	-	TH	
VS Period Time	tv	510	525	650	TH	
VS Blanking	tvb	23	23	23	TH	
VS Front Porch	tvfp	7	22	147	TH	

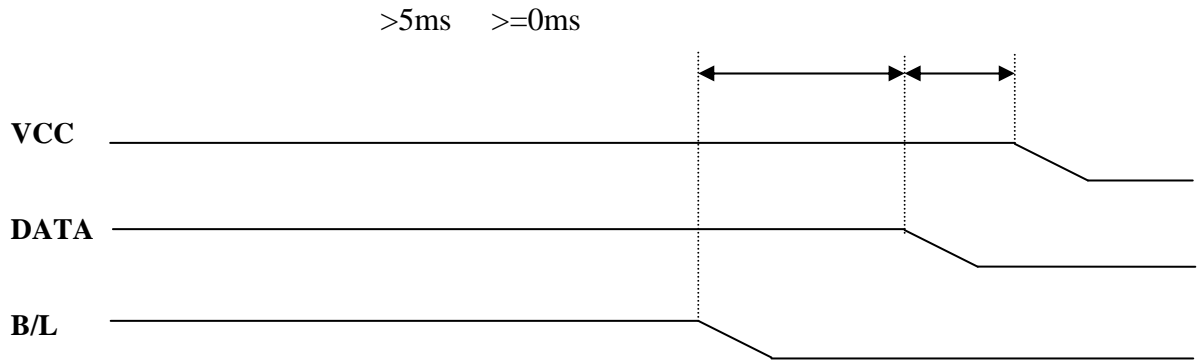


### 9.3 POWER SEQUENCE

#### Power on sequence



#### Power OFF sequence



Note: Data include R2~R7, B2~B7, G2~G7, DCLK,,DEN

## 10. 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	-20°C~25°C~70°C (30min) (5min) (30min)	10CYCLE	
6	High Temperature Humidity Storage	60°C 90%RH	240HRS	

NOTE 1 : a. The module should work properly.

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

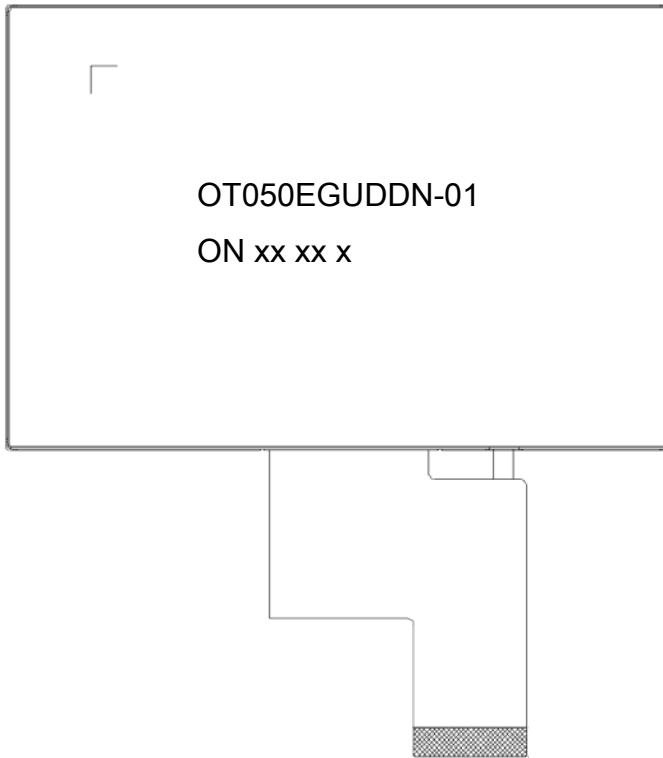
NOTE 2 : a. The module should work properly.

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.

## 11.MODEL NUMBER SYSTEM



(a) MODEL NAME : OT050EGUDDN-01

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

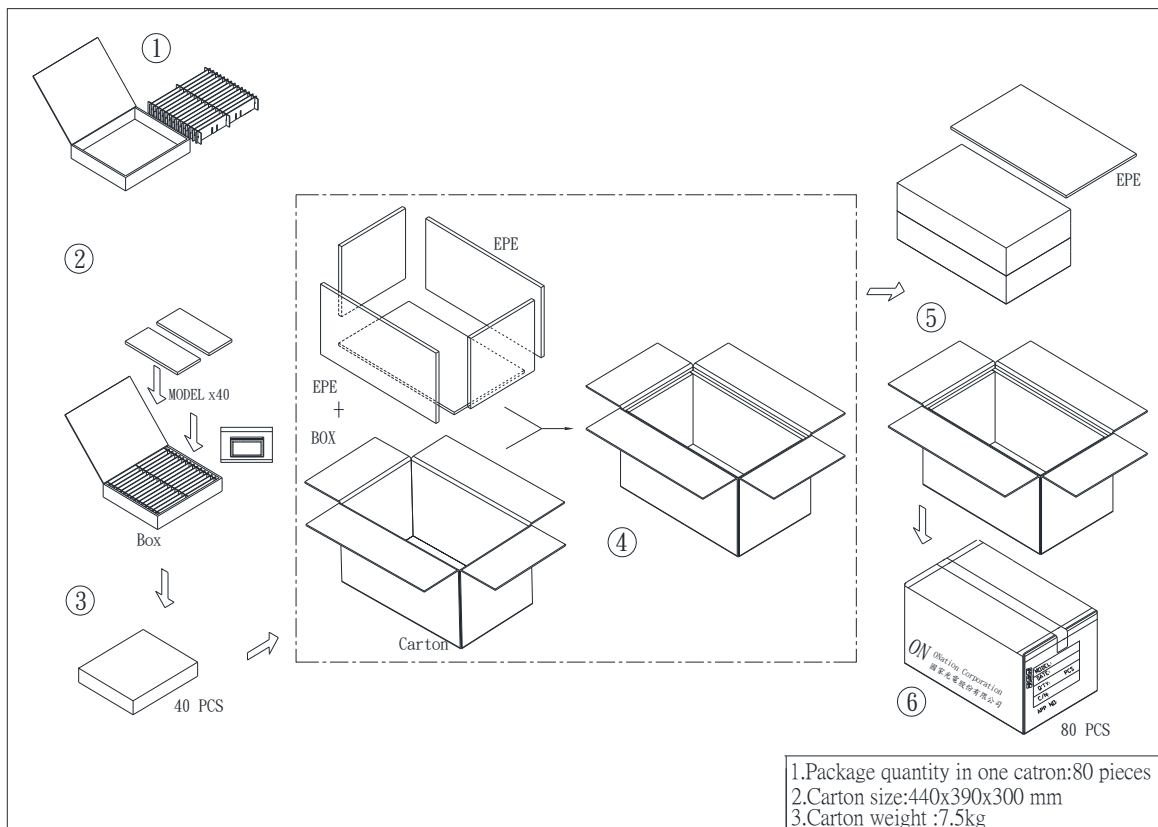
CODE	MEANING	DESCRIPTION
<u>XX</u>	Year	2015=15, 2016=16, 2017=17, ....
<u>XX</u>	Month	01,02,.....11,12
<u>X</u>	Week	1,2,3,4

## 12. LCM INSPECTION STANDARD

Inspection specifications refer ONation Corporation LCM INSPECTION STANDARD Document.  
 Document Number : 5.0-7.9-QT3-QC-A-I002 P0.3

## 13. PACKAGE INFORMATION

LCM Model	LCM Qty. in the box	Inner Box Size (mm)	Weight	REMARK
OT050EGUDDN-01	80 pcs	440*390*300(mm)	7.5 Kg	



## 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.