HY-LINE®
COMPUTER COMPONENTS

TFT-Display Datasheet

ONation
Model: OT070GGDDDV-00

Brief spec.:

Main Feature	LandscapeType
	Transmissive

Active Screen Area	154..4 x 91.44 (mm)
Diagonal | Format	7 " | 15:9
Resolution	800 X 480
Colors	(6 Bit)
Backlight	LED
Brightness	500 cd/m²
LED Life Time	30K (h)
Interface	TTL
Viewing Angle	70/70 L/R 50/60 up/down
Touchscreen	no
Power Supply	3.3 V (Typ.)
Module Outline	165.0 x 106.4 x 5.65 (mm)
Operation Temperature	-20... +70 °C
Storage Temperature	-30... +80 °C
Surface Treatment	Anti—glare

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ONation Corporation

TFT COLOR LCD MODULE

MODEL: OT070GGDDDV-00

(Complied with RoHS)

WVGA
TTL interface

Version: P0.3

Customer : _____

Approved By : _____

Date: _____

ONATION		
APPROVAL	**CHECKER**	**PREPARE**
Jun	Josh	Jun

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

1.RECORD OF REVISION

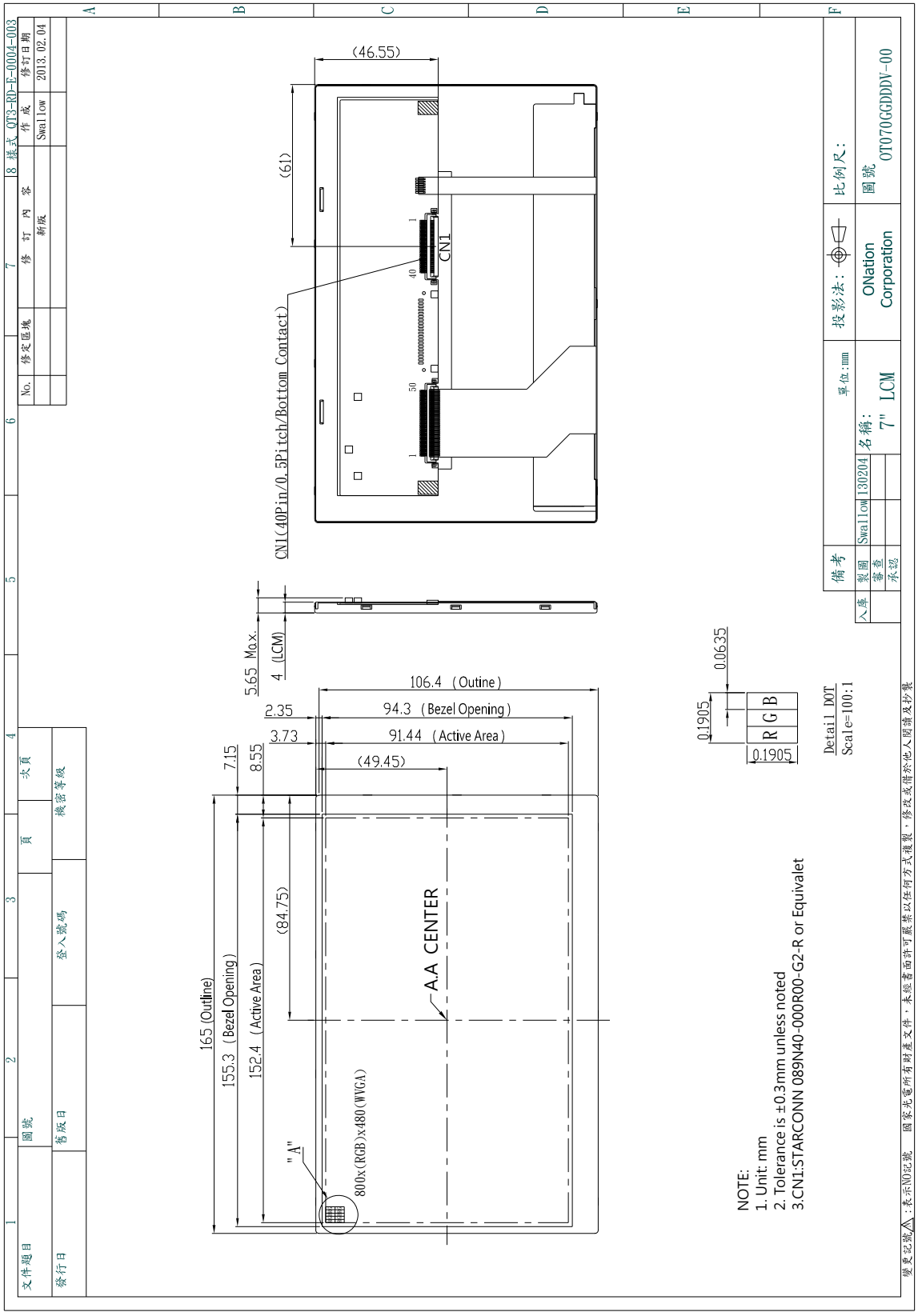
Rev	DATE	PAGE	SUMMARY
0.1	2012.06.14	ALL	Preliminary specification was first issued.
0.2	2013.02.25	1	Module Size: 165.0(W) X 106.4(H) X 6.3(D)→ 165.0(W) X 106.4(H) X 5.65(D)
		2	Modify: 4. OUTLINE DIMENSIONS
0.3	2016.02.01	5	ADD LED Life Time 30,000(Typ.)

2.MECHANICAL SPECIFICATIONS

(1)	Number Of Dots (Dots)	800(R.G.B) X 480
(2)	Module Size(mm)	165.0(W) X 106.4(H) X 5.65(D)
(3)	Active Area(mm)	152.4(H) X 91.44(V)
(4)	Pixel Size(mm)	0.0635(H) X 0.1905(V)
(5)	Pixel Pitch(mm)	0.1905(H) X 0.1905(V)
(6)	LCD / Polarizer Model	TFT , Transmissive, Normally/White, Anti-glare
(7)	Backlight Color	LED ,White
(8)	Viewing Direction	12 O'clock Horizontal：Right side 70°(typ.), Left side 70°(typ.) Vertical：Up side 50°(typ.), Down side 60°(typ.)
(9)	Gray Scale Inversion Direction	6 O'clock
(10)	Color Configuration	R.G.B Stripe
(11)	Module Weight(g)	115±5%

**Viewing direction for best image quality is different from TFT definition, there is the 180 degrees shift.

3. OUTLINE DIMENSIONS



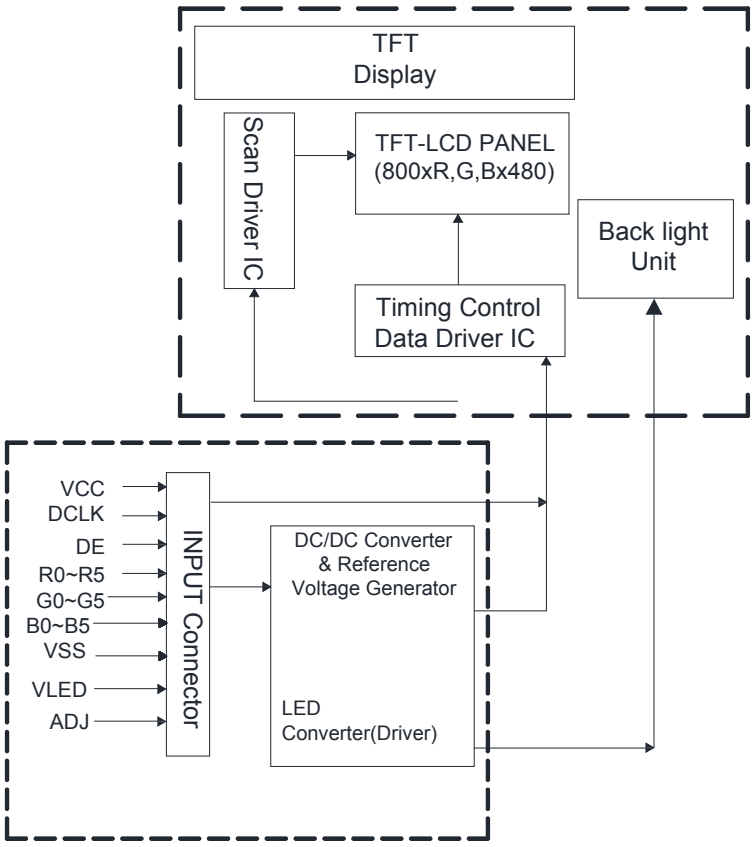
4. INTERFACE PIN CONNECTION

4.1 LCM PANEL DRIVING SECTION

(CN1 Connector: Starconn 089N40-000R00-G2)

PIN NO	SYMBOL	FUNCTION	REMARK
1	GND	GROUND	
2	GND	GROUND	
3	ADJ	BRIGHTNESS CONTROL FOR LED B/L	
4	VLED	POWER SUPPLY FOR LED DRIVER CIRCUIT	
5	VLED	POWER SUPPLY FOR LED DRIVER CIRCUIT	
6	VLED	POWER SUPPLY FOR LED DRIVER CIRCUIT	
7	VCC	POWER SUPPLY FOR DIGITAL CIRCUIT	
8	VCC	POWER SUPPLY FOR DIGITAL CIRCUIT	
9	DE	DATA ENABLE	
10	GND	GROUND	
11	GND	GROUND	
12	GND	GROUND	
13	B5	BLUE DATA SIGNAL(MSB)	
14	B4	BLUE DATA SIGNAL	
15	B3	BLUE DATA SIGNAL	
16	GND	GROUND	
17	B2	BLUE DATA SIGNAL	
18	B1	BLUE DATA SIGNAL	
19	B0	BLUE DATA SIGNAL(LSB)	
20	GND	GROUND	
21	G5	GREEN DATA SIGNAL(MSB)	
22	G4	GREEN DATA SIGNAL	
23	G3	GREEN DATA SIGNAL	
24	GND	GROUND	
25	G2	GREEN DATA SIGNAL	
26	G1	GREEN DATA SIGNAL	
27	G0	GREEN DATA SIGNAL(LSB)	
28	GND	GROUND	
29	R5	RED DATA SIGNA(MSB)	
30	R4	RED DATA SIGNA	
31	R3	RED DATA SIGNA	
32	GND	GROUND	
33	R2	RED DATA SIGNA	
34	R1	RED DATA SIGNA	
35	R0	RED DATA SIGNA(LSB)	
36	GND	GROUND	
37	GND	GROUND	
38	DCLK	CLOCK SIGNALS	
39	GND	GROUND	
40	GND	GROUND	

5. BLOCK DIAGRAM



6.ABSOLUTE MAXIMUM RATINGS

6.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	MIN.	MAX.	UNIT	COMMENT
Power Supply Voltage	VCC	-0.3	+7.0	V	
Logic Output Voltage	V_I	-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		COMMENT
	MIN	MAX	MIN	MAX	
Ambient Temperature(℃)	-20	70	-30	80	Note 1,2,3
Humidity(% RH)	-	90	-	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℃ & -20℃ ≦ 240Hrs.
Note 4: Storage Ta=60℃ & RH=90% ≦ 240Hrs.

7.ELECTRICAL CHARACTERISTICS

7.1 ELECTRICAL CHARACTERISTICS OF LCD

Ta=25℃

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT
Power Voltage for LCD	VCC	3.0	3.3	3.6	V
	ICC	-	225	337.5	mA
Input High Voltage	VIH	0.7*VCC	-	VCC	V
Input Low Voltage	VIL	GND	-	0.3*VCC	V
Output High Voltage	VOH	0.8VCC	-	VCC	V
Output Low Voltage	VOL	GND	-	0.2VCC	V

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

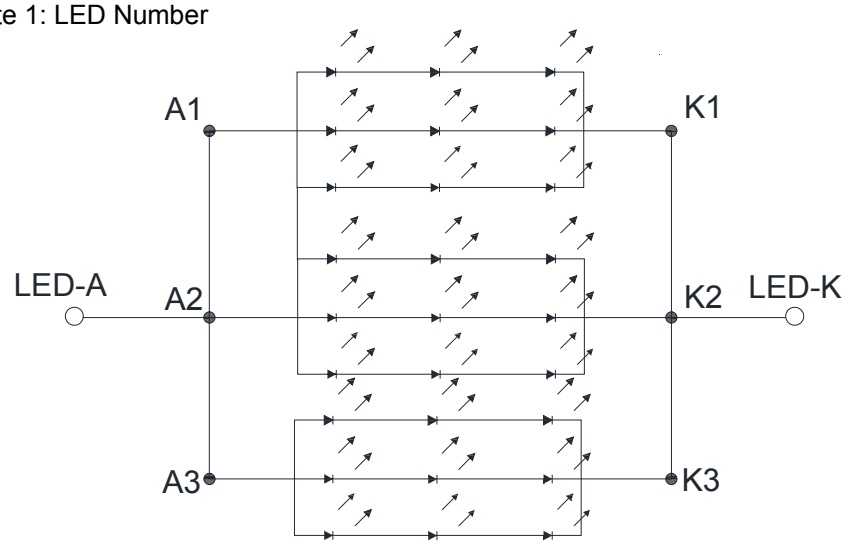
7.2 BACKLIGHT UNITS

Ta=25℃

ITEM	SYMBOL	MIN	TYP	MAX	UNIT
LED Driving Voltage	VLED	3	5	5.5	V
LED Driving Current	ILED(VLED=3.3V)	-	650	850	mA
	ILED(VLED=5V)	-	400	550	mA
ADJ Input Voltage	-	3	-	3.3	V
ADJ Frequency	-	19	20	21	KHz
LED Life Time (For Reference Only)	Ta=25℃ 60-70%RH (Note 1)	-	30,000	-	Hr

※ USE NICHIA LED.

Note 1: LED Number



Note 2: 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).20K hours is only an estimate for reference.

8.OPTICAL CHARACTERISTICS

Ta=25℃

ITEM		SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT	REMARK
Contrast Ratio		CR	At optimized Viewing angle	300	400	-	-	Note (1)
Response Time		TR	T=0	-	5	10	ms	Note (2)
		TF		-	15	20	ms	
Chromaticity	White	x	Viewing Angle Θx= Θy =0°	0.28	0.33	0.38	-	Note (4)
		y		0.33	0.38	0.43	-	
Viewing Angle		Θx+	CR≧10	60	70	-	Deg.	Note (3)
		Θx-		60	70	-		
		ΘY+		40	50	-		
		ΘY-		50	60	-		
Luminance		L	PWM=100%	400	500	-	cd/m2	
Luminance uniformity		YU		70	-	-	%	Note (5)

*Note (1) Definition of Contrast Ratio (CR):

The contrast ratio can be calculated by the following expression.

Contrast Ratio (CR) = L63 / L0

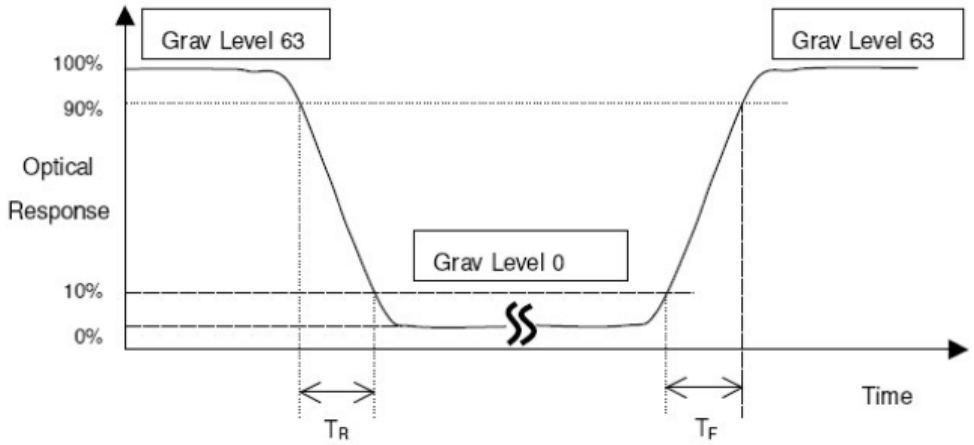
L63: Luminance of gray level 63

L 0: Luminance of gray level 0

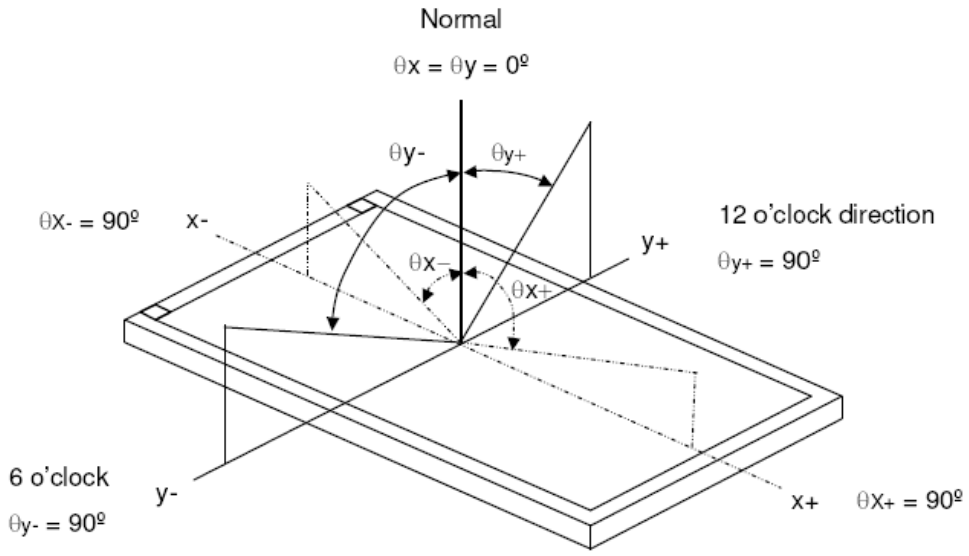
CR = CR (5)

CR (X) is corresponding to the Contrast Ratio of the point X at Figure in Note (5).

*Note (2) Definition of Response Time (T_R, T_F):

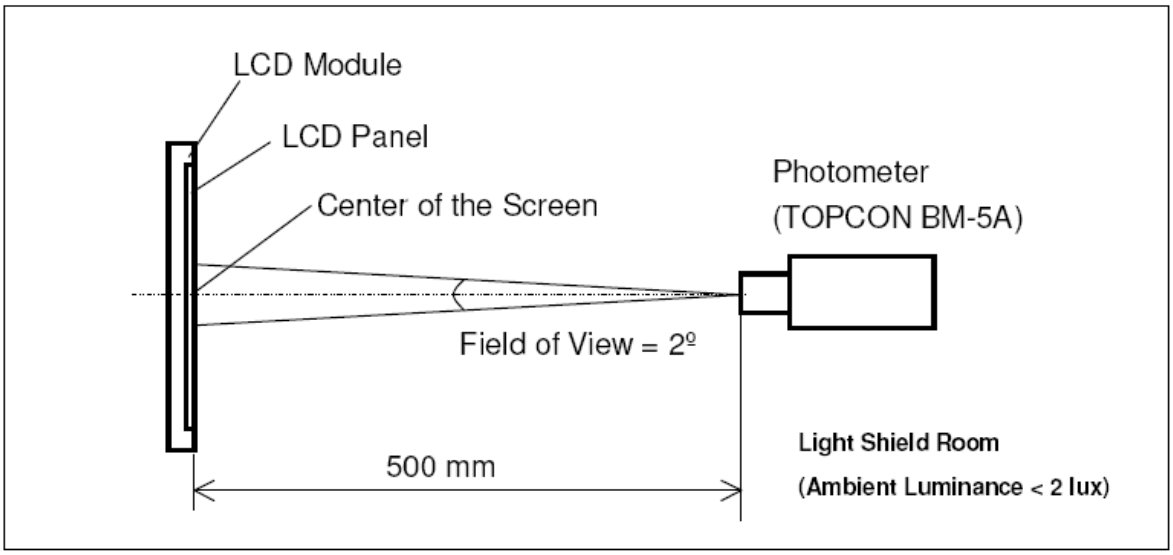


*Note(3) Definition of Viewing Angle

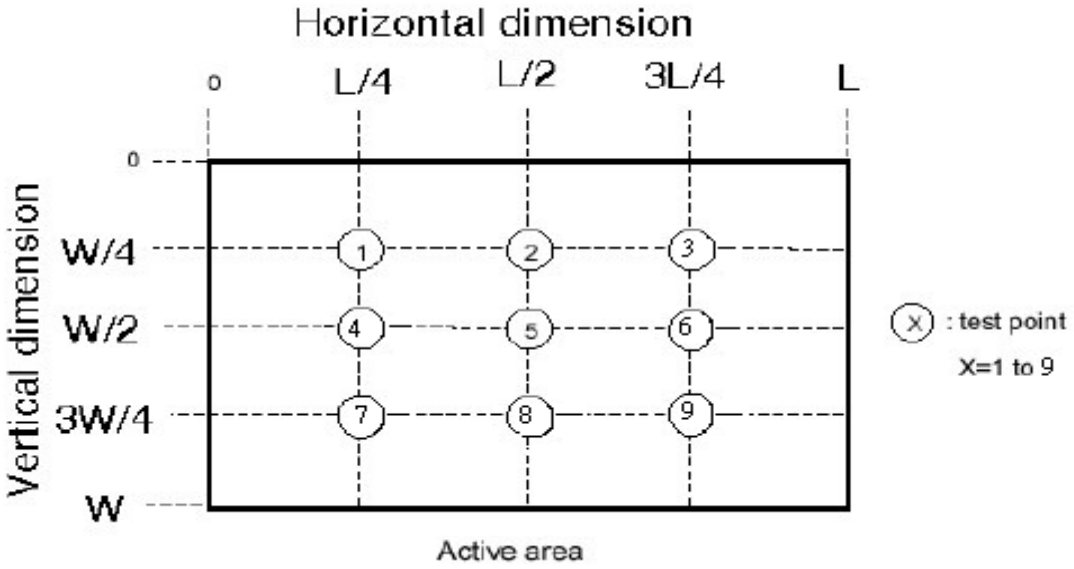


*Note (4) Measurement Set-Up:

The LCD module should be stabilized at a given temperature for 20 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 20 minutes in a windless room.



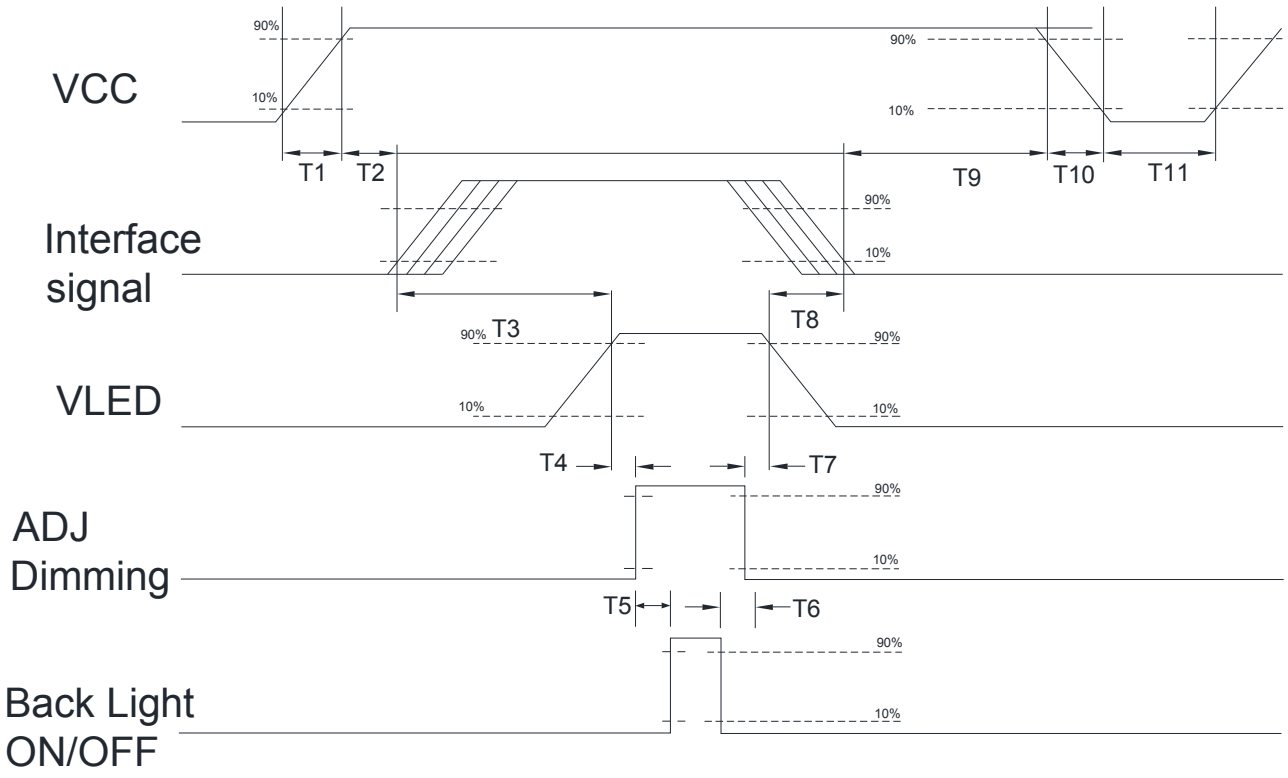
*Note (5)



$$\left(1 - \frac{\text{MAX Luminance} - \text{Average Luminance}}{\text{Average Luminance}}\right) \times 100\% > 70\%$$

9. TIMING SPECIFICATIONS

9.1 POWER SIGNAL SEQUENCE



Power ON/OFF sequence timing

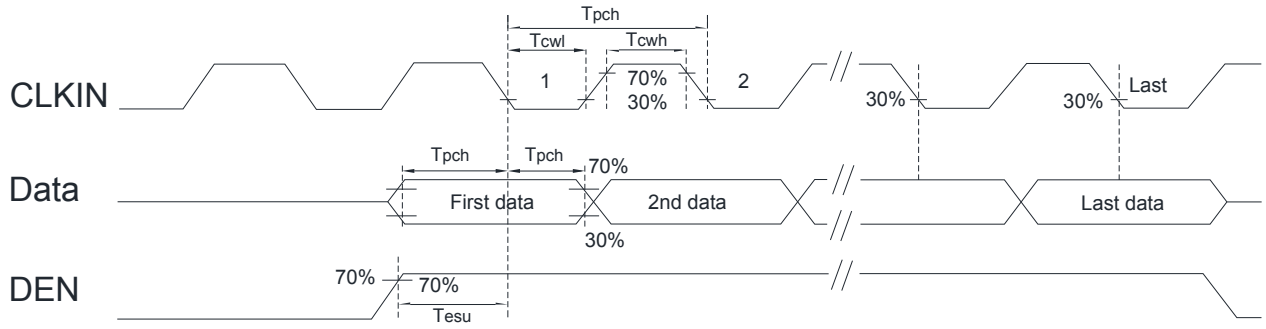
PARAMETER	MIN.	TYP.	MAX.	UNIT
T1	0.5	-	10	ms
T2	0	-	50	ms
T3	200	-	-	ms
T4	10	-	-	ms
T5	10	-	-	ms
T6	0	-	-	ms
T7	10	-	-	ms
T8	100	-	-	ms
T9	0	16	50	ms
T10	-	-	10	ms
T11	1000	-	-	ms

The above on/off sequence should be applied to avoid abnormal function in the display. Please make sure to turn off the power when you plug the cable into the input connector or pull the cable out of the connector.

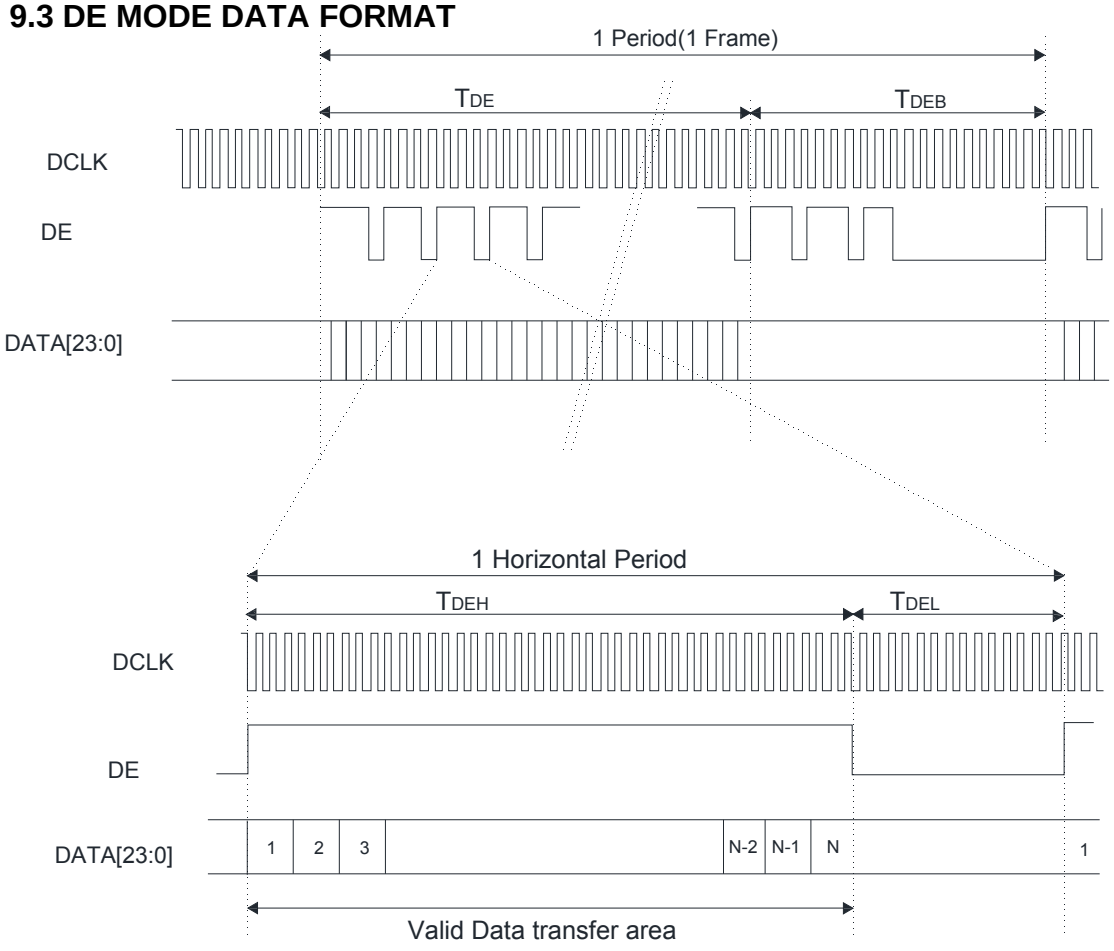
9.2 AC TIMING CHARATERISTICS

PARAMETER		SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITION
Clock	Frequency	1/Tc	-	33.26	-	MHz	Note1
	Clk pulse duty	Tcwh	40	50	60	%	Note1
	Clk cycle time	Tcph	25	-	-	ns	Note1
Data	Setup time	Tdsu	6	-	-	ns	Note1
	Hold time	Tdhd	6	-	-	ns	Note1
ENAB signal	Setup time	Tesu	6	-	-	ns	Note1

Note 1: Frame rate is 60 Hz at 3.3V VCC Clock and Data Timing Diagram



9.3 DE MODE DATA FORMAT



10. RELIABILITY TEST

Environmental Test				
NO.	ITEM	CONDITIONS	TIME PERIOD	REMARK
1	High Temperature Storage	80℃	240HRS	
2	Low Temperature Storage	-30℃	240HRS	
3	High Temperature Humidity Storage	60℃ 90%RH	240HRS	NOTE(2)
4	High Temperature Operation	70℃	240HRS	NOTE(2)
5	Low Temperature Operation	-20℃	240HRS	NOTE(2)
6	Temperature Cycle	-20℃←25℃→70℃ (30min) (5min) (30min)	30CYCLE	NOTE(2)

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) : BEFORE COSMETIC AND FUNCTION TEST, THE PRODUCT MUST HAVE ENOUGH RECOVERY TIME, AT LEAST 2 HOURS AT ROOM TEMPERATURE.

11. LCM INSPECTION STANDARD

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

12. PACKAGE INFORMATION

LCM Model	LCM Qty. in the box	Inner Box Size (mm)	Weight	REMARK
OT070GGDDDV-00	TBD	TBD	TBD	

13.PRECAUTIONS FOR USE

13.1 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.

13.2 STORAGE CONDITIONS

(1) Store the panel or module in a dark place where the temperature is 23±5°C and the humidity is below 50±20%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.

13.3 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.

13.4 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.