



ONation Corporation

TFT COLOR LCD MODULE

MODEL: OT057IVWDLV-00
(Complied with RoHS)

VGA
LVDS interface (1port)

Version: P0.1

Customer : _____

Approved By : _____

Date: _____

ONATION		
APPROVAL	CHECKER	PREPARE
<i>Jun</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

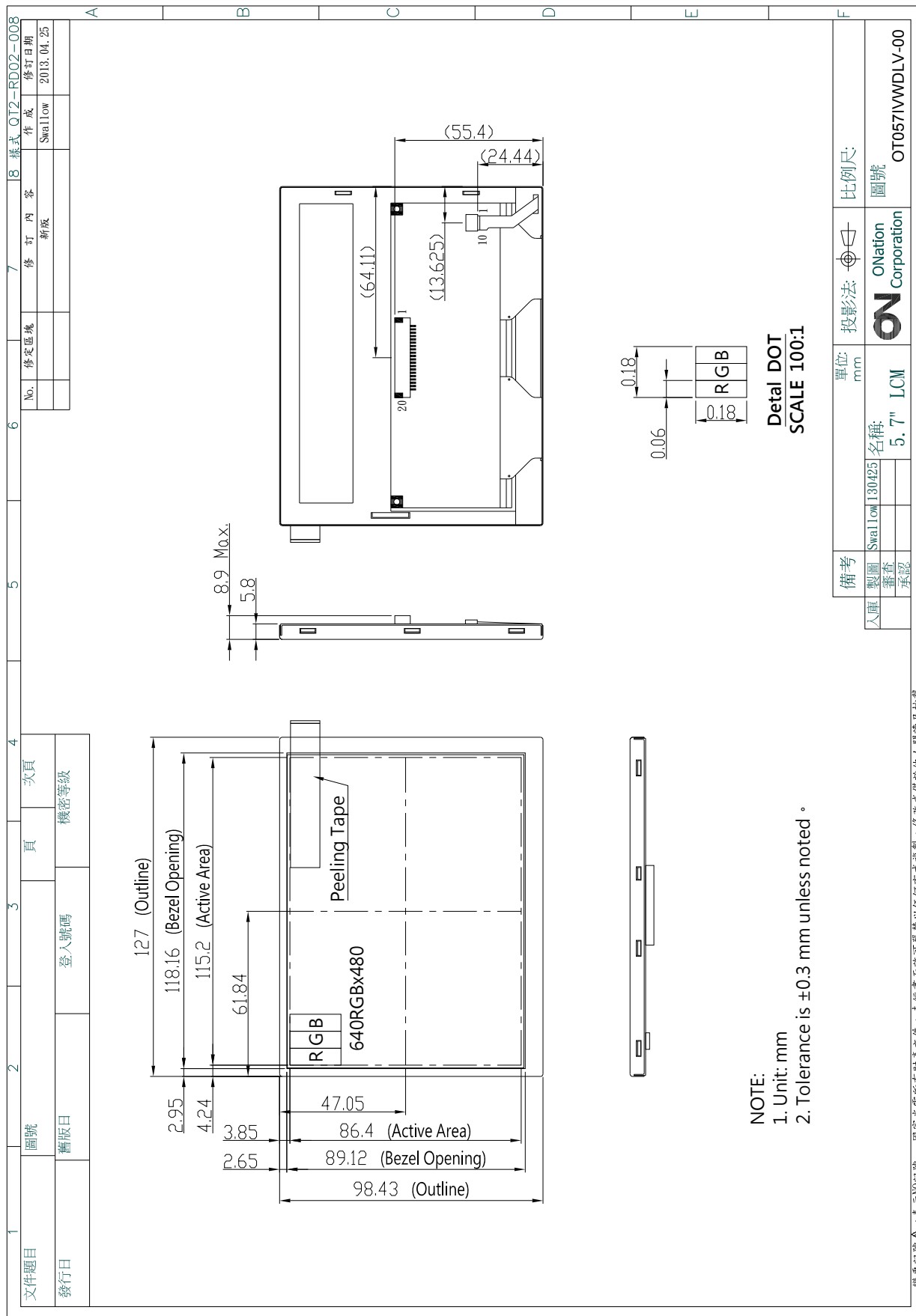
REV	DATE	PAGE	SUMMARY
0.1	2016.11.10	ALL	Preliminary specification was first issued.

2.MECHANICAL SPECIFICATIONS

(1)	Number Of Dots (Dots)	640(R.G.B) X 480
(2)	Module Size(mm)	127.0(W) X 98.43(H) X 8.9(D)
(3)	Active Area(mm)	115.2(H) X 86.4(V)
(4)	Pixel Pitch(mm)	0.18(H) X 0.18(V)
(5)	LCD / Polarizer Model	TFT , Transmissive, Normally/White, Clear
(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)	Electrical Interface	LVDS Interface
(9)	Color Configuration	R.G.B Stripe
(10)	Module Weight(g)	110±5%

Note:Viewing direction for best image quality is different from TFT definition, ther is the 180 degree shift.

3. OUTLINE DIMENSIONS



變更記錄: 表示V0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

CN1 Connector: MS240420 G or Equivalent

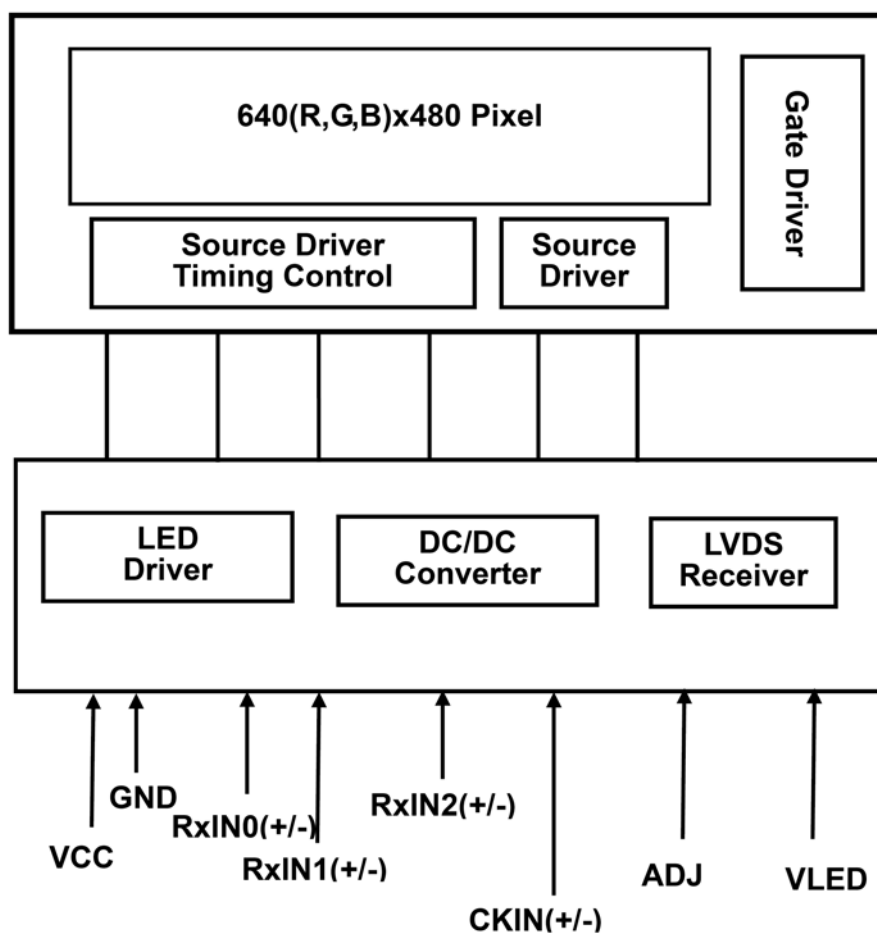
PIN NO.	SIGNAL	FUNCTION	REMARK
1	VCC	Power Supply For Digital Circuit	
2	VCC	Power Supply For Digital Circuit	
3	GND	Ground	
4	GND	Ground	
5	RxIN0-	Differential Data Input, CH0(G0,R5~R0)	
6	RxIN0+	Differential Data Input, CH0(G0,R5~R0)	
7	GND	Ground	
8	RxIN1-	Differential Data Input, CH1(B1,B0,G5~G1)	
9	RxIN1+	Differential Data Input, CH1(B1,B0,G5~G1)	
10	GND	Ground	
11	RxIN2-	Differential Data Input, CH2(DE,B5~B2)	
12	RxIN2+	Differential Data Input, CH2(DE,B5~B2)	
13	GND	Ground	
14	CKIN-	Differential Clock Input	
15	CKIN+	Differential Clock Input	
16	GND	Ground	
17	VLED	Power Supply For LED Driver Circuit	
18	VLED	Power Supply For LED Driver Circuit	
19	GND	Ground	
20	ADJ	Brightness Control For LED B/L	

Note 1: ADJ is brightness control Pin. The larger of the pulse duty is, the higher of the brightness.

Note 2: ADJ signal is 0~3.3V.Operation frequency is 20KHz.

Note 3: GND PIN must be grounding, can not be floating.

5. BLOCK DIAGRAM



6. ABSOLUTE MAXIMUM RATINGS

6.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	MIN.	MAX.	UNIT	REMARK
Power Supply Voltage	VCC	-0.3	+5.0	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 extremec ase 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)	5~90		5~90		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 : Operation Ta=60°C & RH=90% ≤ 240Hrs.

7. ELECTRICAL CHARACTERISTICS

7.1 LCM ELECTRICAL CHARACTERISTICS

Ta=25°C

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
Power Voltage For LCD	VCC	3.0	3.3	3.6	V	
	ICC	-	(123)	(150)	mA	Note1
Input High Voltage	VIH	0.7*VCC	-	VCC	V	
Input Low Voltage	VIL	GND	-	0.3*VCC	V	
Ripple Voltage	V _{RF}	-	-	100	mV _{P-P}	

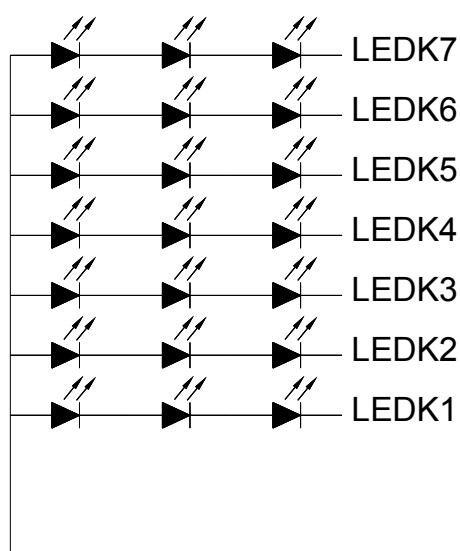
Note 1 : Test Condition: VCC=3.3V ; Test Pattern: Black.

7.2 BACKLIGHT UNITS

Ta=25°C

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
LED Driving Voltage	VLED	4.5	5	5.5	V	
LED Driving Current	ILED	-	333	400	mA	VLED=5V
DJ Input Voltage	VIH	3.0	-	3.3		
	VIL	0	-	0.3		
ADJ Frequency	-	19	20	21	KHz	
LED Life Time (For Reference only)	-	-	50,000	-	Hr	Note2

Note 1:LED number



LEDA

Note2:The "LED dice life time" is defined as the brightness decrease to 50% original brightness that the ambient temperature is 22°C and LED dice current=20mA.

8. OPTICAL CHARACTERISTICS

Ta=25°C

ITEM		SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT	REMARK
Contrast Ratio		CR	Viewing Normal Angle Θx=Θy=0°	(200)	(300)	-	-	Note 1
Response Time		TR		-	15	-	ms	Note 2
		TF		-	35	-	ms	
Uniformity		YU		70	80	-	%	Note 5
Chromaticity	Red	x		(0.565)	(0.615)	(0.665)	-	Note 4
		y		(0.310)	(0.360)	(0.410)	-	
	Green	x		(0.295)	(0.345)	(0.395)	-	
		y		(0.490)	(0.540)	(0.590)	-	
	Blue	x		(0.098)	(0.148)	(0.198)	-	
		y		(0.056)	(0.106)	(0.156)	-	
	White	x	(0.259)	(0.309)	(0.359)	-		
		y	(0.270)	(0.320)	(0.370)	-		
Viewing Angle	Hor.	θx+	Viewing Angle Θx=Θy=0° CR≥10	-	80	-	Deg.	Note 3
		θx -		-	80	-		
	Ver.	θy+		-	80	-		
		θy -		-	80	-		
Brightness		L	PWM=100%	(280)	(320)	-	cd/m2	

Note 1 : Definition of Contrast Ratio (CR) :

The contrast ratio can be calculated by the following expression.

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

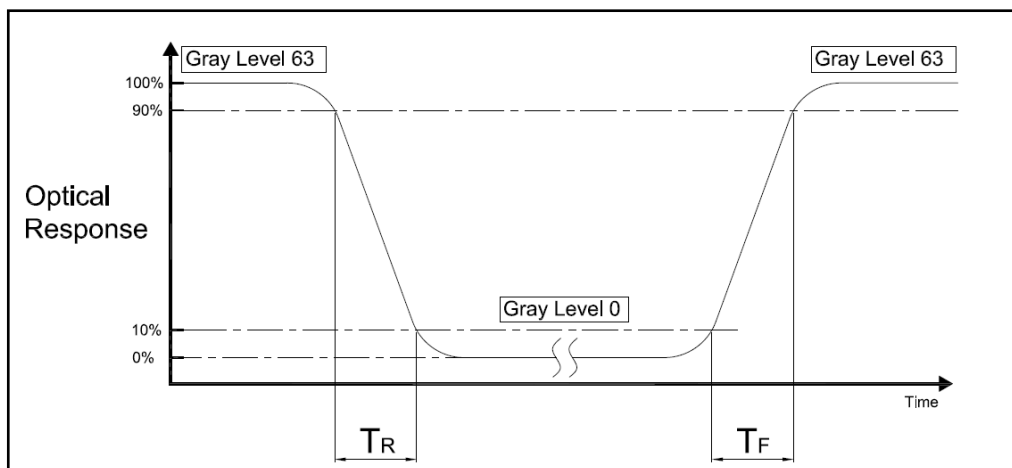
L63 : Luminance of gray level 63

L0 : Luminance of gray level 0

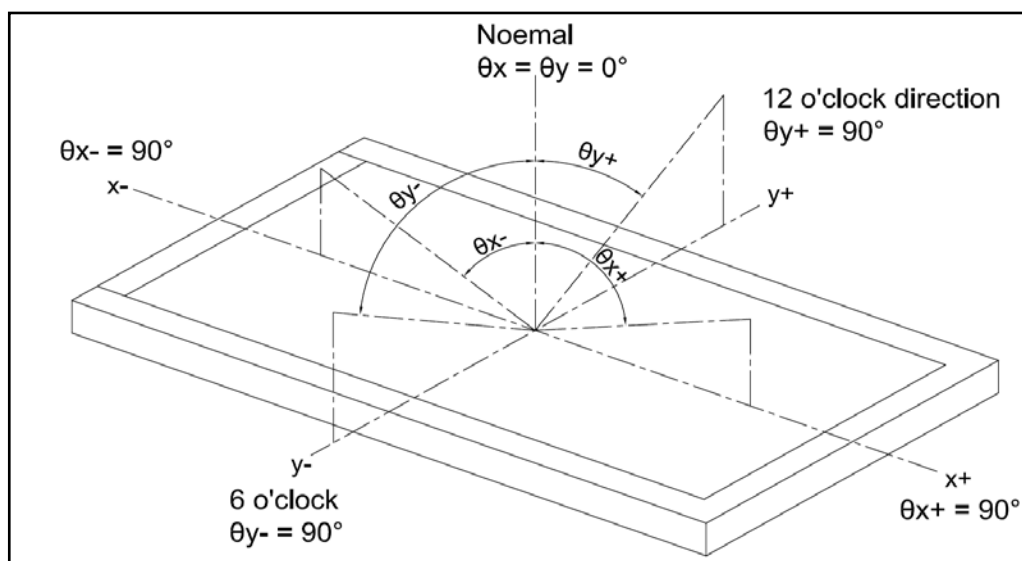
$$CR = CR(5)$$

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)

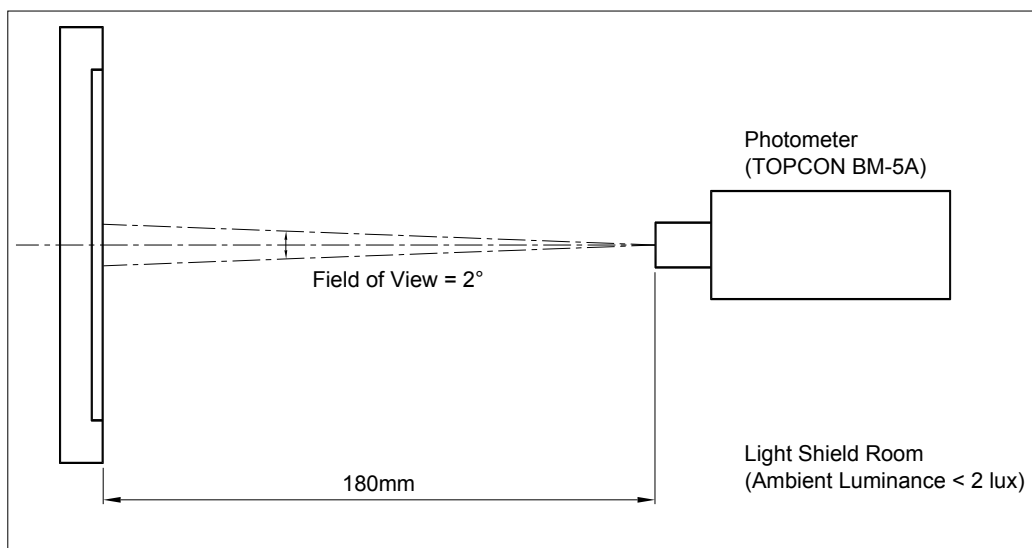


Note 3 : Definition of Viewing Angle

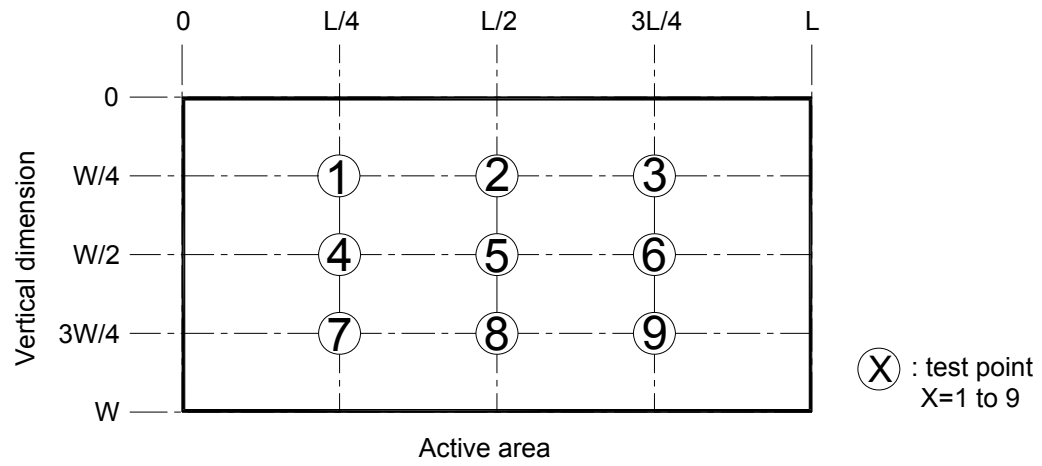


Note 4 : Measurement Set-Up:

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.



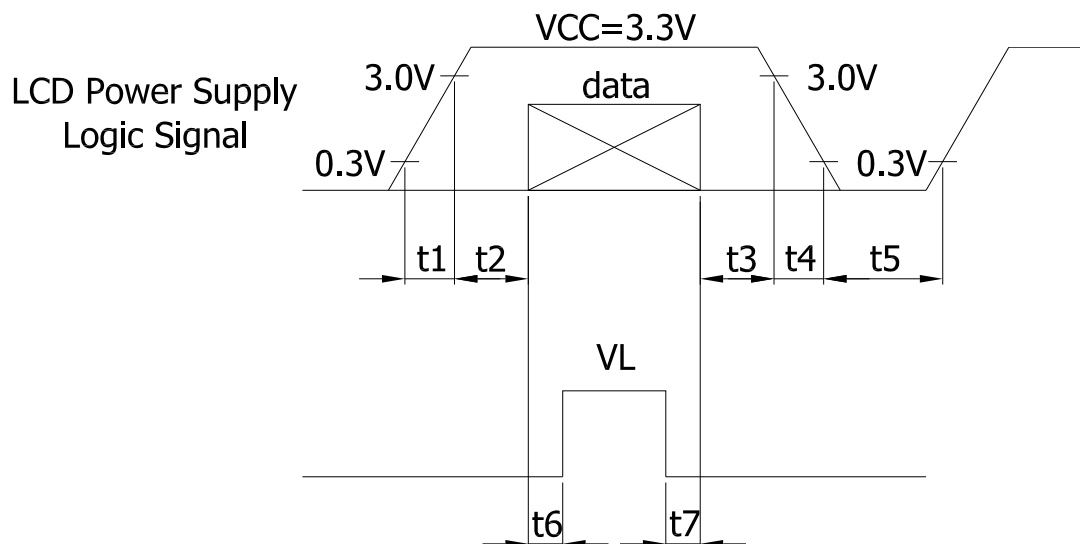
Note 5 :



$$\left[1 - \frac{\text{MAX Luminance} - \text{Average Luminance}}{\text{Average Luminance}} \right] \times 100\% \geq 70\%$$

9. TIMING SPECIFICATIONS

9.1 POWER SIGNAL SEQUENCE

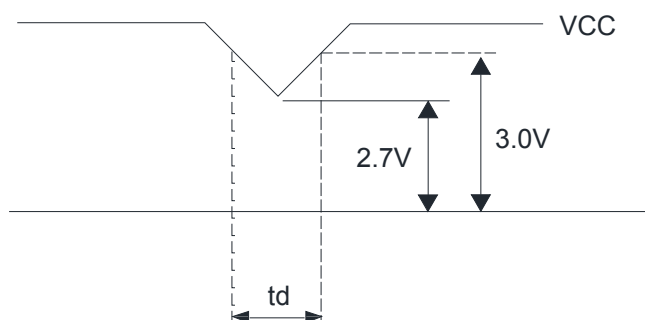


ITEM	MIN.	TYP.	MAX.	UNIT
T1	-	-	10	ms
T2	50	-	-	ms
T3	0	-	50	ms
T4	0	-	10	ms
T5	60	-	-	ms
T6	200	-	-	ms
T7	200	-	-	ms

9.2 VCC-dip condition:

(1) $2.7\text{ V} \leq V_{CC} < 3.0\text{ V}$, $t_d \leq 10\text{ ms}$

(2) $V_{CC} > 3.0\text{ V}$, VCC-dip condition should be the same with VCC-turn-on condition.

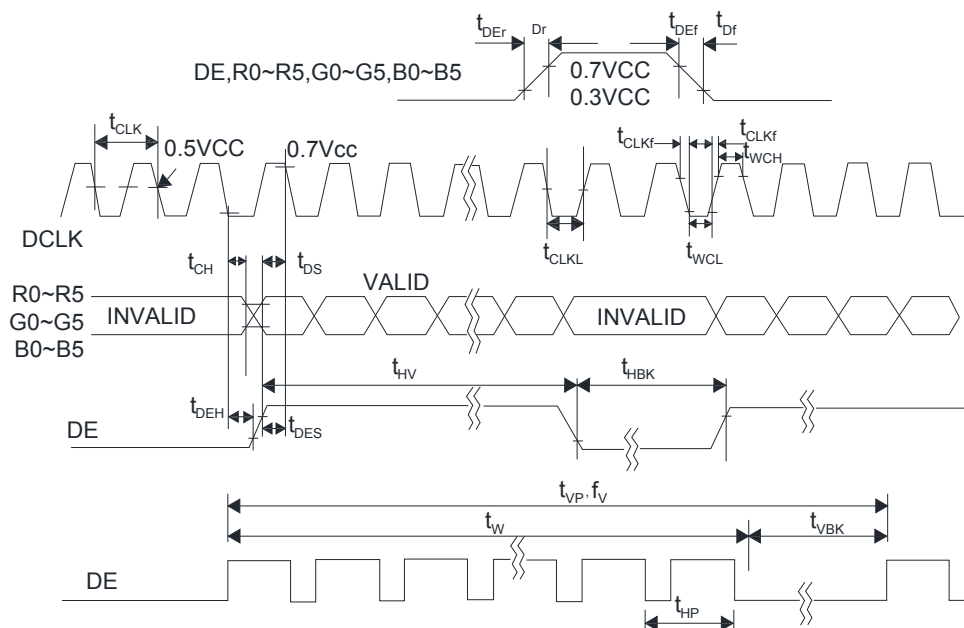


9.3 DE MODE INPUT SIGNAL CHARACTERISTICS

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
DCLK	Period	t_{CLK}	33	40	43	ns
	Frequency	f_{CLK}	23	25	30	MHz
	Low Level width	t_{WCL}	6	-	-	ns
	High Level width	t_{WCH}	6	-	-	ns
	Rise Fall Time	t_{CLKr}, t_{CLKf}	-	-	3	ns
	Duty	-	0.45	0.50	0.55	-
DE(Data Enable)	Setup Time	t_{DES}	5	-	-	ns
	Hold Time	t_{DEH}	10	-	-	ns
	Rise, Fall Time	t_{DEr}, t_{DEf}	-	-	16	ns
	Horizontal Period	t_{HP}	750	800	900	t_{CLK}
	Horizontal Valid	t_{HV}	640	640	640	t_{CLK}
	Horizontal Blank	t_{HBK}	110	160	260	t_{CLK}
	Vertical Period	t_{VP}	515	525	560	t_{HP}
	Vertical Valid	t_W	480	480	480	t_{HP}
	Vertical Blank	t_{VBK}	35	45	80	t_{HP}
	Vertical Frequency	F_v	55	60	65	Hz
Data R,G,B	Setup Time	t_{DS}	5	-	-	ns
	Hold Time	t_{DH}	10	-	-	ns
	Rise, Fall Time	t_{Dr}, t_{Df}	-	-	3	ns

Note1: Clock Duty= t_{CLKL} / t_{CLK} .

9.4 DE mode timing waveform



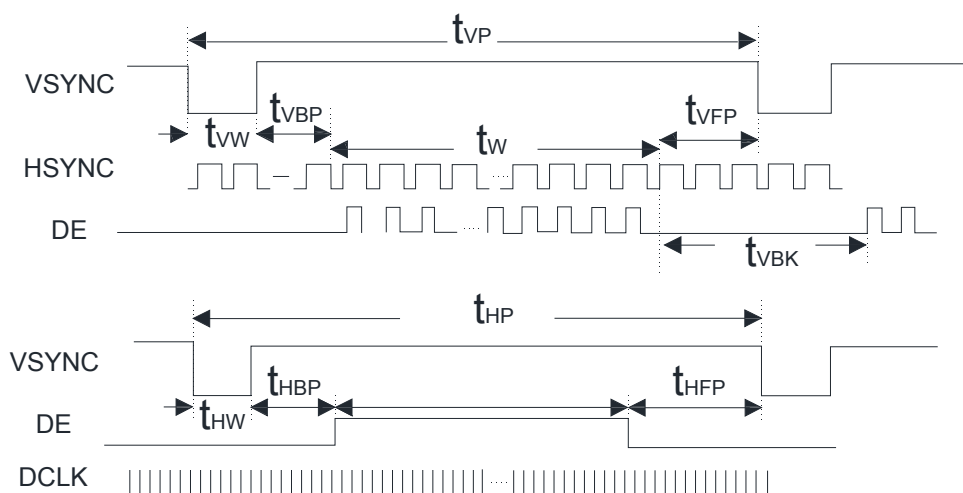
9. 5 SYNC MODE INPUT SIGNAL CHARACTERISTICS

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
Clock Period	t_{CLK}	33	40	43	ns	
Clock Frequency	f_{CLK}	23	25	30	MHz	
Clock Low Level width	t_{WCL}	6	-	-	ns	
Clock High Level width	t_{WCH}	6	-	-	ns	
Clock Rise, Fall Time	t_{CLKr}, t_{CLKf}	-	-	3	ns	
HSYNC Period	t_{HP}	750	880	900	t_{CLK}	
HSYNC Pulse Width	t_{HW}	5	30	-	t_{CLK}	
HSYNC Front Porch	t_{HFP}	1	16	116	t_{CLK}	
HSYNC Back Porch	t_{HBP}	1	114	139	t_{CLK}	
HSYNC Width + Back Porch	$t_{HW}+t_{HBP}$	144	144	144	t_{CLK}	
Horizontal Blank	t_{HBK}	1	160	260	t_{CLK}	Note1
Horizontal Valid	t_{HV}	640	640	640	t_{CLK}	
VSYNC Period	t_{VP}	515	525	560	t_{HP}	
VSYNC Pulse Width	t_{VW}	1	3	5	t_{HP}	
VSYNC Front Porch	t_{VFP}	1	10	45	t_{HP}	
VSYNC Back Porch	t_{VBP}	30	32	34	t_{HP}	
VSYNC Width+Back Porch	$t_{VW}+t_{VBP}$	35	35	35	t_{CLK}	
Vertical Blank	t_{VBK}	35	45	80	t_{HP}	
Vertical data Width	t_W	480	480	480	t_{HP}	
Data Setup Time	t_{DS}	5	-	-	ns	
Data Hold Time	t_{DH}	10	-	-	ns	

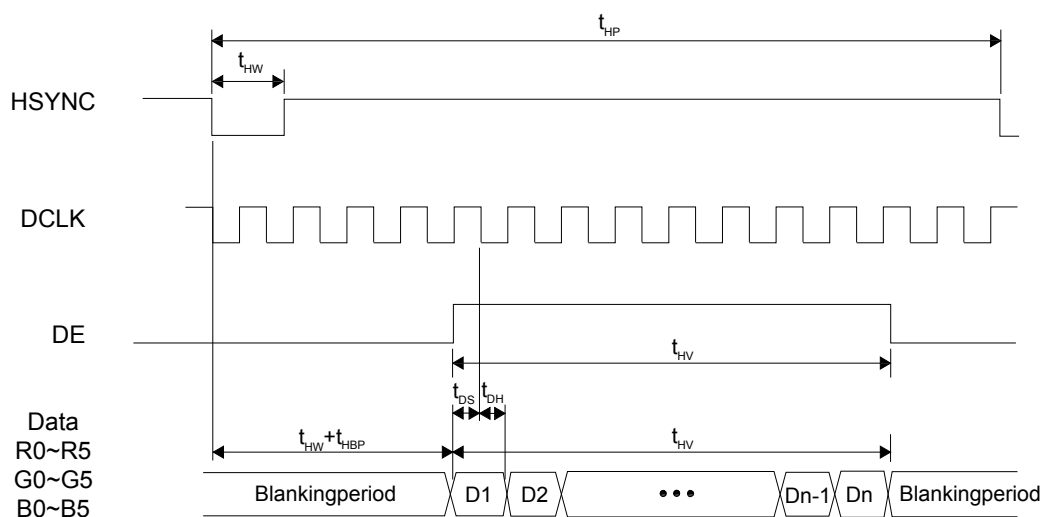
Note1: $t_{HBK} = t_{HFP} + t_{HW} + t_{HBP}$

9.6 SYNC mode timing waveform

Input vertical timing



Input horizontal timing



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	-30°C ← 25°C → 80°C (30min) (5min) (30min)	10CYCLE	
6	High Temperature Humidity Operation	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 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
OT057IVWDLV-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 $23\pm5^{\circ}\text{C}$ 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.

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.