

TFT-DISPLAY DATASHEET

ONation
Model: OT101ZFWDEN-01

BRIEF SPEC.:

Main Feature	Landscape Type White LED Backlight Wide Viewing Angle
Active Screen Area	216.57 x 135.36 (mm)
Diagonal Format	10,1" 16:10
Resolution	1920 x 1200
Colors	R.G.B Vertical Stripe
Backlight	LED, White
Brightness	700 cd/m ²
LED Life Time	15,000h (Typ.)
Interface	LVDS
Viewing Angle	-80~85(H), -80~85(V)
Touchscreen	no
Power Supply	3,3V (Typ.)
Module Outline	229. x 153 x 2,5 (mm)
Operation Temperature	-0... +50 °C
Storage Temperature	-25... +65 °C
Surface Treatment	N/A



ONation Corporation

TFT COLOR LCD MODULE

MODEL: OT101ZFWDEN-01
(Complied with RoHS)

FULL HD
LVDS interface(1 Port)

Version: P0.1

Customer : _____
Approved By : _____
Date: _____

ONATION		
APPROVAL	CHECKER	PREPARE
<i>Ian</i>	<i>Josh</i>	<i>Roger</i>

All information is subject to change without notice.
Please confirm the sales representative before starting to design your system

CONTENTS

NO.	ITEM	PAGE
1	RECORD OF REVISION	0-1
2	MECHANICAL SPECIFICATIONS	1
3	OUTLINE DIMENSIONS	2
4	INTERFACE PIN CONNECTION	3 ~ 4
5	BLOCK DIAGRAM	5
6	ABSOLUTE MAXIMUM RATINGS	6
7	ELECTRICAL CHARACTERISTICS	7 ~ 8
8	OPTICAL CHARACTERISTICS	9 ~ 11
9	TIMING SPECIFICATIONS	12~14
10	RELIABILITY TEST	15
11	LCM INSPECTION STANDARD	16
12	PACKAGE INFORMATION	16
13	PRECAUTIONS FOR USE	17

2.MECHANICAL SPECIFICATIONS

(1)	Number Of Dots (Dots)	1920 X RGB (3) X 1200
(2)	Module Size(mm)	229(W) X153(H) X 2.5 (D)
(3)	Active Area(mm)	216.576(W) X135.36(H)
(4)	Pixel Pitch(mm)	0.1128(W) X0.1128(H)
(5)	LCD Model	TFT , Transmissive Normally Black
(6)	LED Backlight Color	White
(7)	Viewing Direction	Wide viewing angle Horizontal :Right side 85°(Typ),Left side85°(Typ) Vertical: Up side 85°(Typ),Down side 85°(Typ)
(8)	Gray Scale Inversion Direction	NO GSI
(9)	Color Configuration	R.G.B Vertical Stripe
(10)	Module Weight(g)	150 g
(11)	Interface	LVDS

4. INTERFACE PIN CONNECTION

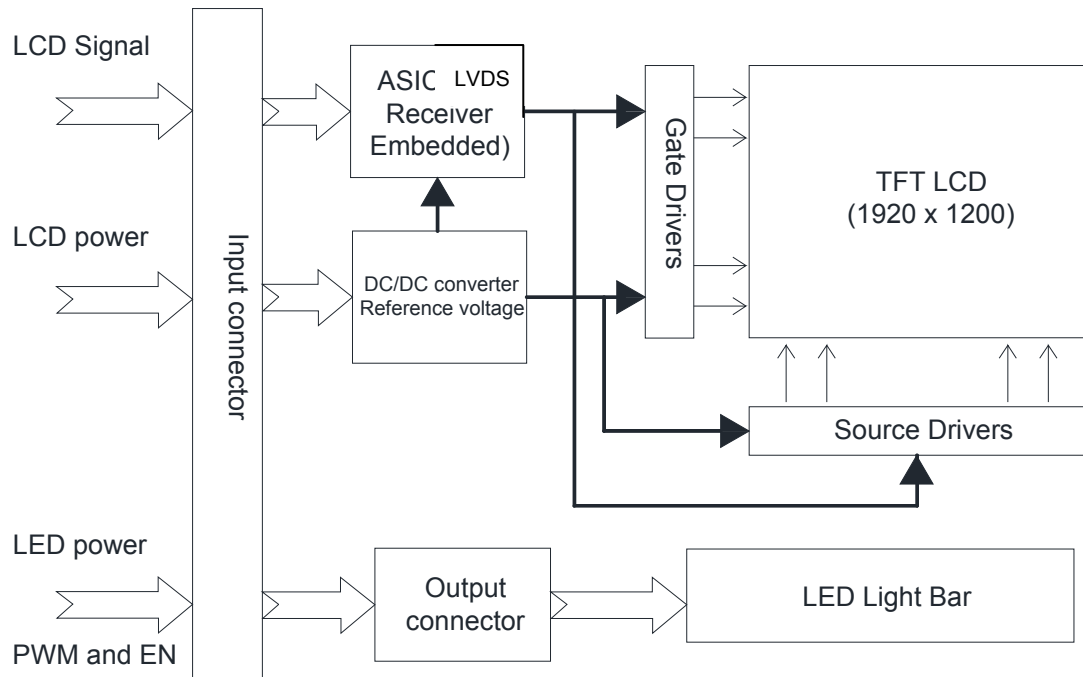
4.1 LCM PANEL DRIVING SECTION

Connector: AYF334535 (PANASONIC)

PIN NO.	SIGNAL	FUNCTION	REMARK
1	VCC	Power Supply, 3.3V(Typical)	
2	VCC	Power Supply, 3.3V(Typical)	
3	VCC	Power Supply, 3.3V(Typical)	
4	VCC	Power Supply, 3.3V(Typical)	
5	NC(BIST)	BIST testing	
6	NC	No connection	
7	GND	Ground	
8	NC	No connection	
9	GND	Ground	
10	GND	Ground	
11	RxIN3-	LVDS Input Data Pair	
12	NC	No connection	
13	RxIN3+	LVDS Input Data Pair	
14	NC	No connection	
15	GND	Ground	
16	GND	Ground	
17	RxIN0-	LVDS Input Data Pair	
18	NC	No connection	
19	RxIN0+	LVDS Input Data Pair	
20	NC	No connection	
21	GND	Ground	
22	GND	Ground	
23	RxCLK-	LVDS Input Data Pair	
24	NC	No connection	
25	RxCLK+	LVDS Input Data Pair	
26	NC	No connection	
27	GND	Ground	
28	GND	Ground	
29	RxIN1-	LVDS Input Data Pair	
30	NC	No connection	
31	RxIN1+	LVDS Input Data Pair	
32	NC	No connection	
33	GND	Ground	
34	GND	Ground	

PIN NO.	SIGNAL	FUNCTION	REMARK
35	RxIN2-	LVDS Input Data Pair	
36	NC	No connection	
37	RxIN2+	LVDS Input Data Pair	
38	LED_EN	LED Enable Pin. (ON : 2.5V / OFF: 0V)	
39	NC	No connection	
40	CABC_EN	CABC Function Enable Pin.	
41	LED_PWM	PWM Signal for LED Dimming Control. (+2.5V Swing)	
42	VLED	LED Power Supply, 12V(Typical)	
43	VLED	LED Power Supply, 12V(Typical)	
44	VLED	LED Power Supply, 12V(Typical)	
45	VLED	LED Power Supply, 12V(Typical)	

5. BLOCK DIAGRAM



6.ABSOLUTE MAXIMUM RATINGS

6.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	MIN.	MAX.	UNIT	REMARK
LCD Voltage	VCC	0	4.0	V	
LED Voltage	VLED	0	25	V	

Note1: 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)	0	50	-25	65	Note 1 , 2
Humidity(% RH)	Note3		Note3		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=40°C & 90°C ≤ 240Hrs.

Note 4 : Storage Ta=40°C & RH=90% ≤ 240Hrs.

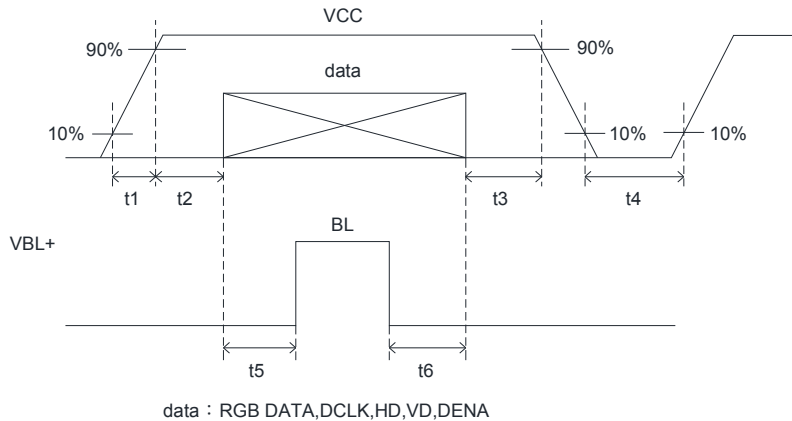
7.ELECTRICAL CHARACTERISTICS

7.1 ELECTRICAL CHARACTERISTICS OF LCD

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
LCD Power Voltage	VCC	3.0	3.3	3.6	V	Note 1
LCD Power Current	ICC	-	400	600	mA	Note 2
Rush Current	Irush	-	-	3	A	Note 3

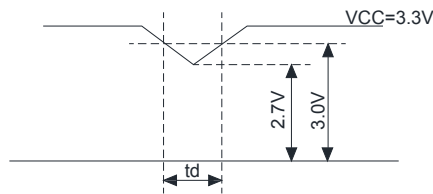
Note 1

Power Sequence :
 $0.01 \text{ ms} < t1 \leq 50 \text{ ms}$ $500 \text{ ms} \leq t4$
 $100 \text{ ms} \leq t2 \leq 150 \text{ ms}$ $200 \text{ ms} \leq t5$
 $0.01 \text{ ms} < t3 \leq 50 \text{ ms}$ $200 \text{ ms} < t6$



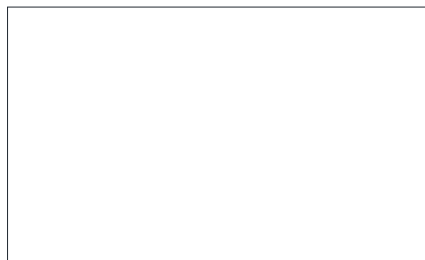
data : RGB DATA,DCLK,HD,VD,DENA

Vin -dip state
 (1)when $3.0V > Vin \geq 2.7V$, $td \leq 10ms$
 (2)when $Vin < 2.7V$, Vin-dip condition should as the Vin-turn-off condition.

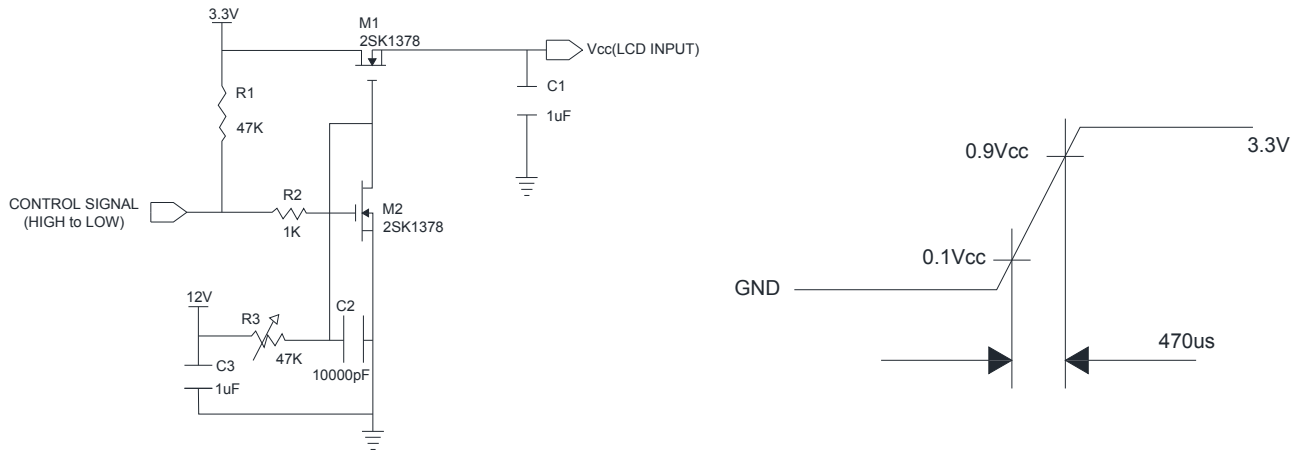


Note 2 Max value is White Pattern : 1200 line mode.

Circuit condition (Max) : VCC=3.3 V , $f_v=60 \text{ Hz}$, $f_H=74.1 \text{ kHz}$, $f_{CLK}=154\text{MHz}$.



Note 3 Irush measure condition



7.2 BACKLIGHT UNIT

Ta=25°C

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
LED Driver Input Voltage	VLED	7.0	12	19	V	
LED Driver Input Current	ILED	-	-	900	mV	Note1
Forward Voltage	VF	2.6	2.8	3.0	V	Note2 IF=20mA
Forward Current	IF	-	20	-	mA	Note2 IF=20mA
Power Consumption	PLED	-	4.09	-	W	Note2 IF=20mA
PWM Frequency	PWM	100	-	1000	Hz	
Duty ratio	Dim	10	-	100	%	
LED life Time		15000			Hrs	

Note 1: Maximum LED Driver Input Current at 12V Input Voltage/PWM Duty 100%.

Note 2: Measure method: a.LED current is measured by utilizing a current meter as show below.
 b. System power PLED is measured at input voltage 12V.

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	800	-	-	Note 1
Response Time		TR+TF		-	30	40	ms	Note 2
Color chromaticity	White	x	Viewing Angle $\Theta_x=\Theta_y=0^\circ$ CR ≥ 10	(0.261)	(0.311)	(0.361)	-	Note 3
		y		(0.307)	(0.357)	(0.407)	-	
Viewing Angle	Hor.	θ_L		80	85	-	Deg.	
		θ_R		80	85	-		
	Ver.	θ_T	80	85	-			
		θ_B	80	85	-			
Luminance		L	PWM=100%	560	700	-	cd/m2	
Luminance Uniformity		YU		75	-	-	%	Note 5

Note 1 : Definition of Contrast Ratio (CR) :

The contrast ratio can be calculated by the following expression.

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

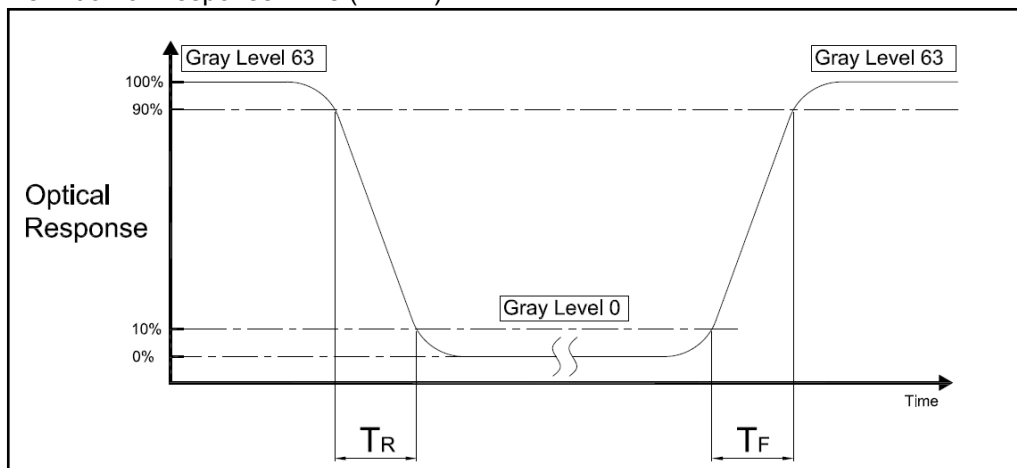
L63 : Luminance of gray level 63

L0 : Luminance of gray level 0

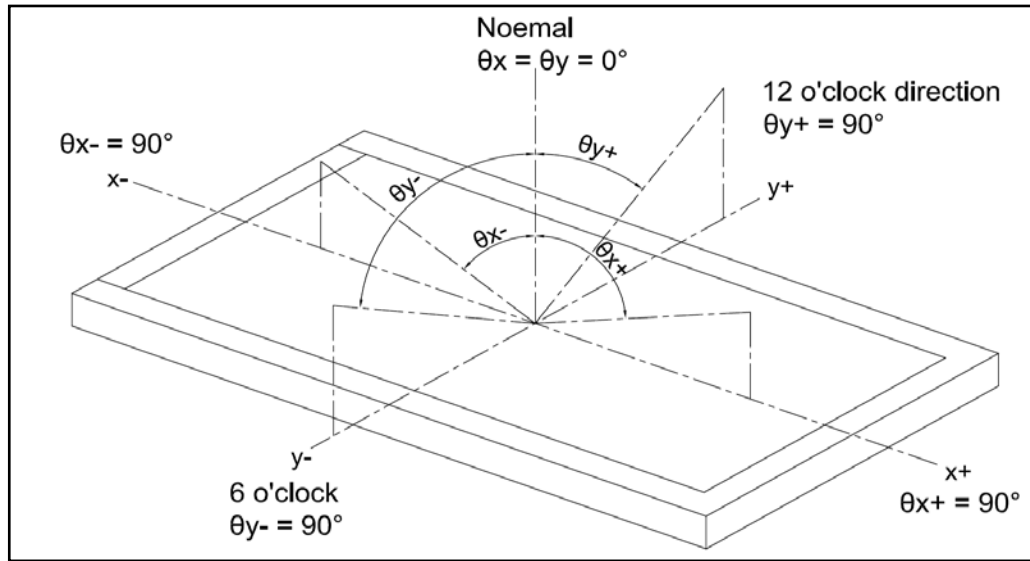
$$CR = CR(5)$$

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)

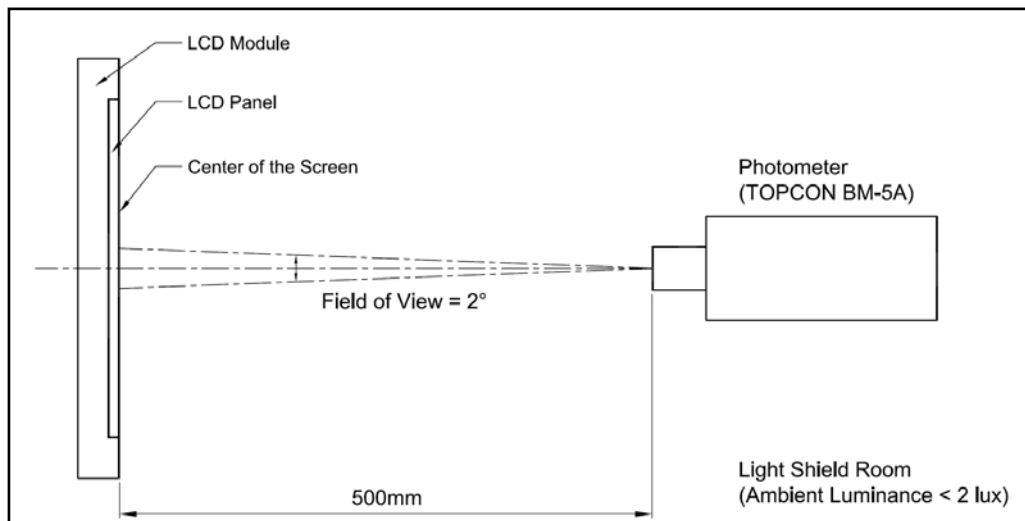


Note 3 : Definition of Viewing Angle



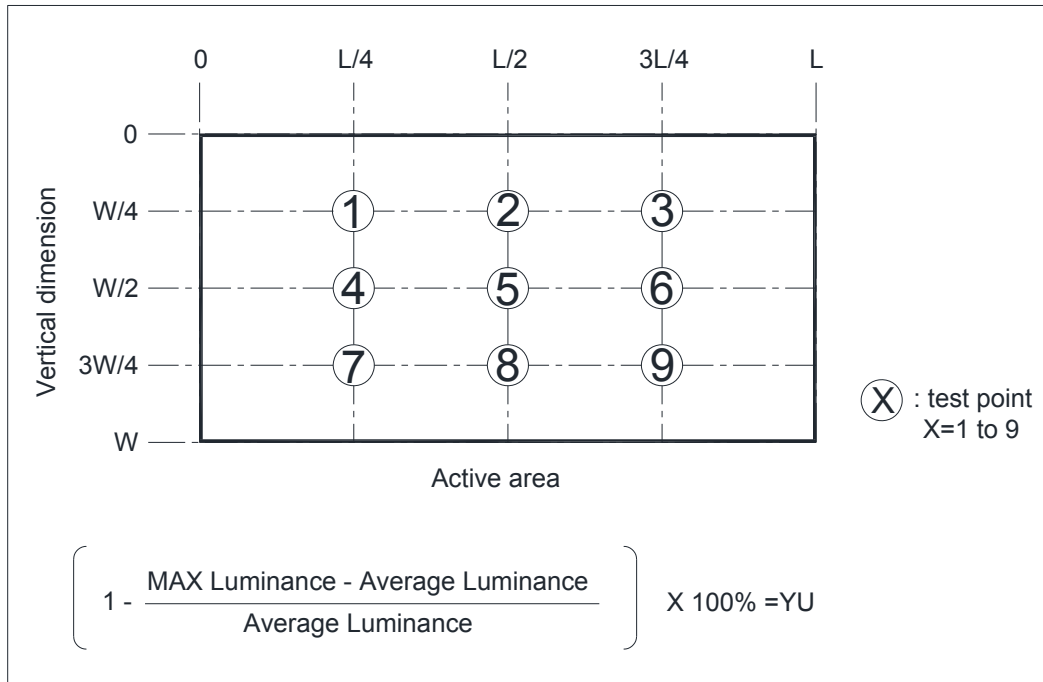
Note 4 : Measurement Set-Up:

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.



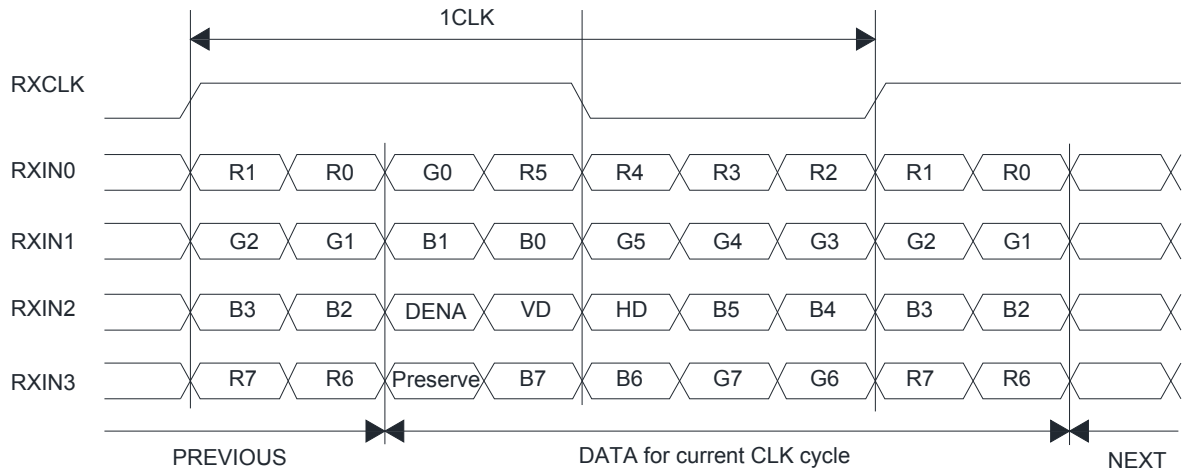
\

Note 5 :



9. TIMING SPECIFICATIONS

9.1LVDS DATA(VESA):Timing Chart



9.2 DATA MAPPING

Color	Input Data	R DATA						G DATA						B DATA					
		R5	R4	R3	R2	R1	R0	G5	G4	G3	G2	G1	G0	B5	B4	B3	B2	B1	B0
		MSB					LSB	MSB					MSB	MSB					MSB
Basic Color	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(63)	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
	Green(63)	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
	Blue(63)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
	Cyan	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1
	Magenta	1	1	1	1	1	1	0	0	0	0	0	0	1	1	1	1	1	1
	Yellow	1	1	1	1	1	1	1	1	1	1	1	1	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
RED	RED(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	1	0	0	0	0	0	0	0	0	0	0	0	0
	RED(2)	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	RED(62)	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	RED(63)	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Green	Green(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	1	0	0	0	0	0	0
	Green(2)	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
	Green(62)	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0
	Green(63)	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
Blue	Blue(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	1
	Blue(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Blue(62)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0
	Blue(63)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1

Note1 : Gray level:

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

Note2 : DATA:

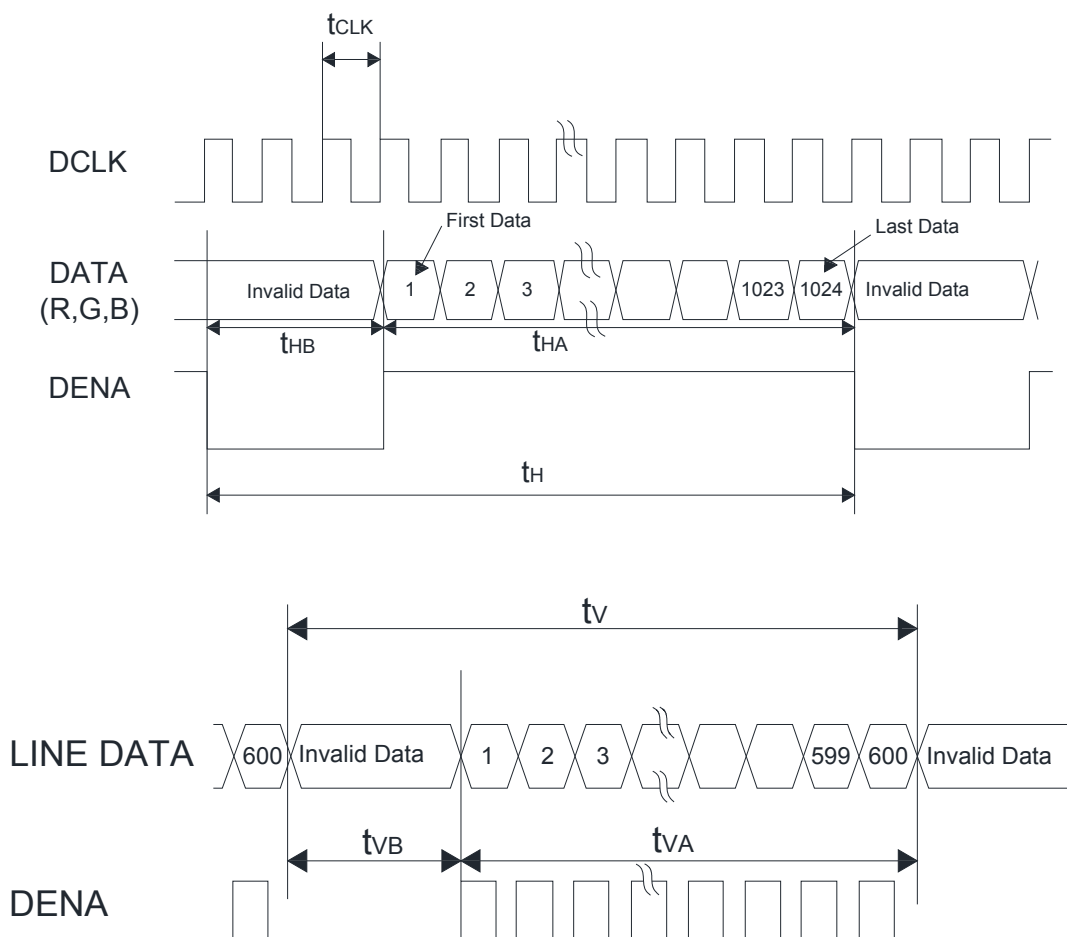
1 : high , 0 : low

9.3 Timing Chart

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT	REMARK
Frame Rate	-	60	60	60	Hz	
Frequency	f_{CLK}	-	154	-	MHz	
Period	t_{CLK}	-	6.5	-	ns	
Horizontal total time	t_H	-	2080	-	t_{CLK}	
Horizontal Active time	t_{HA}	1920	1920	1920	t_{CLK}	
Horizontal Blank time	t_{HB}	-	160	-	t_{CLK}	
Vertical total time	t_V	-	1235	-	t_H	
Vertical Active time	t_{VA}	1200	1200	1200	t_H	
Vertical Blank time	t_{VB}	-	35	-	t_H	

Note1 : DENA (DATA ENABLE) usually is positive.

Note2 : During the whole blank period, DCLK should keep input.



10. RELIABILITY TEST

ENVIRONMENTAL TEST				
NO.	ITEM	CONDITIONS	TIME PERIOD	REMARK
1	High Temperature Storage	60°C	240Hours	Note 1,4
2	Low Temperature Storage	-30°C	240Hours	Note 1,4
3	High Temperature Humidity Operation	40°C,90%RH	240Hours	Note 4
4	High Temperature Operation	50°C	240Hours	Note 2,4
5	Low Temperature Operation	-20°C	240Hours	Note1,4
6	Temperature Cycle	-30°C ~ 60°C (0.5Hr) (0.5Hr)	27CYCLE	Note 4

Note1 : Ta is the ambient temperature of samples.

Note2 : Ts is the temperature of panel's surface.

Note3 : In the standard condition, there shall be no practical problem that may affect the display function. After the reliability test, the product only guarantees operation, but don't guarantee all of the cosmetic specification.

Note4 : 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
OT101ZFWDEN-01	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 $23\pm 5^{\circ}\text{C}$ 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.

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.