

TFT-DISPLAY DATASHEET

ONation
Model: OT070MADDLV-00

BRIEF SPEC.:

Main Feature	LandscapeType Transmissive
Active Screen Area	153.6x 90.0 (mm)
Diagonal Format	7 " 16:9
Resolution	1024 X 600
Colors	(6 und 8 Bit)
Backlight	LED
Brightness	1000 cd/m ²
LED Life Time	50K (h)
Interface	LVDS
Viewing Angle	75/75 L/R 70/75 up/down
Touchscreen	no
Power Supply	3.3 V (Typ.)
Module Outline	165.5 x 104.4 x 7.05 (mm)
Operation Temperature	-20... +70 °C
Storage Temperature	-30... +80 °C
Surface Treatment	Clear



ONation Corporation

CUSTOMER' S APPROVAL SPECIFICATIONS

MODEL: OT070MADDLV-00
(Complied with RoHS)

CUSTOMER: _____

Version: P0.6

C O N T E N T S

ISSUE: OCT.21.2013

Spec Condition: preliminary

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CUSTOMER	ONATION		
APPROVAL	APPROVAL	CHECKER	PREPARE
	<i>Zinc</i>	<i>Zinc</i>	<i>Josh</i>

2.RECORD OF REVISION

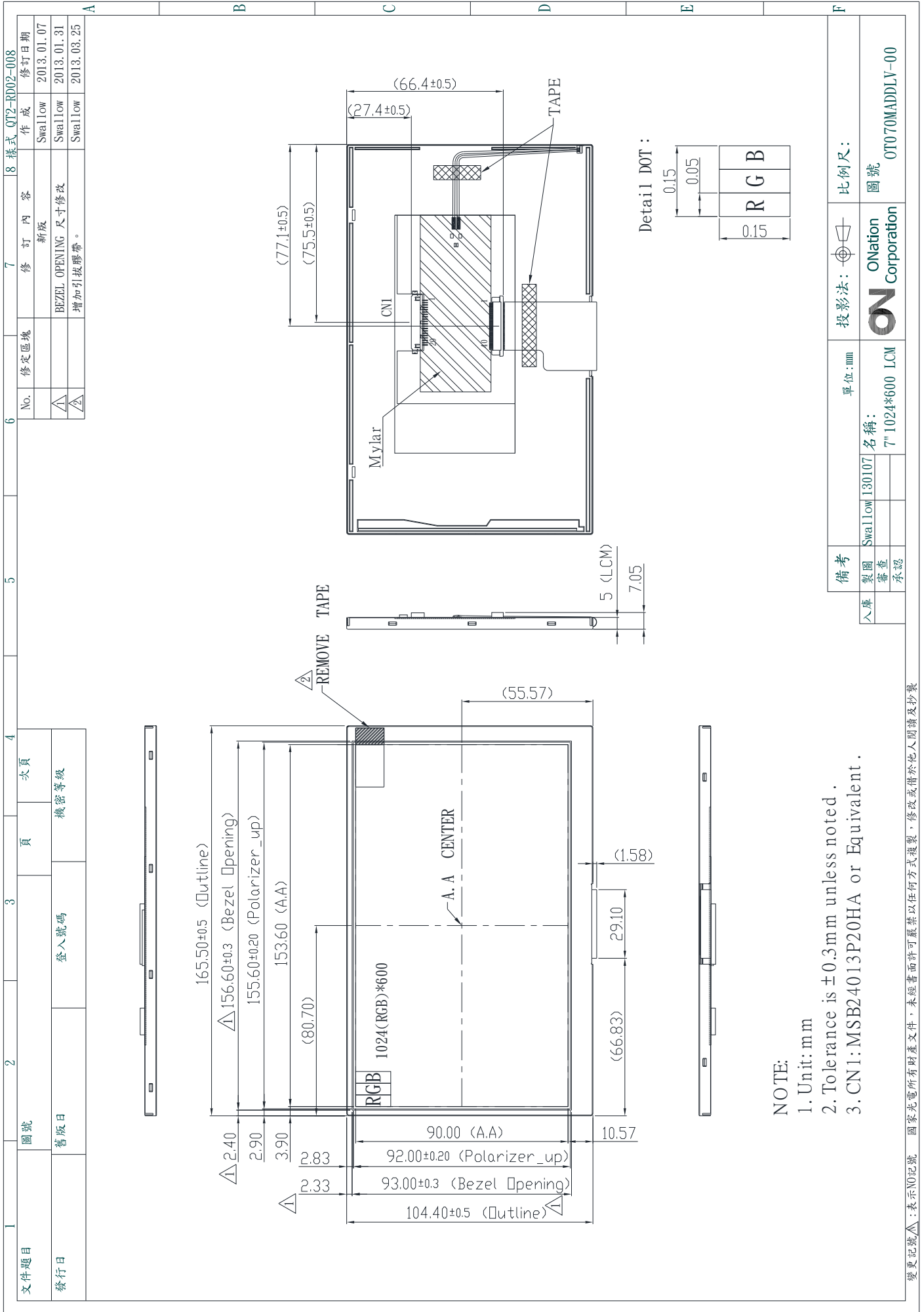
Rev	DATE	PAGE	SUMMARY
0.1	2013.01.07	ALL	Preliminary specification was first issued.
0.2	2013.02.05	5	Modify: 8.1 ELECTRICAL CHARACTERISTICS OF LCD Power Voltage For Digital IDD*: (150)(TYP.)→150(TYP.),180(MAX.)
		6	Modify: 8.2 BACKLIGHT UNITS LED Driving Current ILED: TBD(TYP.),TBD(MAX.)→ 220(TYP.), 300(MAX.)
		8	Modify: 9. OPTICAL CHARACTERISTICS Chromaticity White x: (0.249)(MIN.), (0.299)(TYP.), (0.349)(MAX.) →0.249(MIN.), 0.299(TYP.), 0.349(MAX.) Chromaticity White y: (0.273)(MIN.), (0.323)(TYP.), (0.373)(MAX.) →0.273(MIN.), 0.323(TYP.), 0.373(MAX.) Luminance L: (500)(MIN.), (550)(TYP.)→500(MIN.), 550(TYP.)
0.3	2013.03.13	2	Modify: 4.OUTLINE DIMENSIONS change Connector seat.
0.4	2013.03.25	2	Modify: 4.OUTLINE DIMENSIONS add remove tape.
0.5	2013.07.24	1	Modify: 3.MECHANICAL SPECIFICATIONS (6) Polarizer Model : Anti-glare→Clear
0.6	2013.10.21	6	Modify: 8.2 BACKLIGHT UNITS LED Driving Current ILED: 220(TYP.),300(MAX.)→ 350(TYP.), 380(MAX.)
		8	Modify: 9 OPTICAL CHARACTERISTICS Chromaticity:X: (0.249)MIN,(0.299)TYP,(0.349)MAX Y: (0.273)MIN,(0.323)TYP,(0.373)MAX → X: 0.27 MIN, 0.32 TYP, 0.37 MAX Y: 0.3 MIN, 0.35 TYP, 0.4 MAX Luminance L : (500)MIN, (550)TYP, → L : 900 MIN, 1000 TYP

3.MECHANICAL SPECIFICATIONS

(1)	Number Of Dots (Dots)	1024(R.G.B) X 600
(2)	Module Size(mm)	165.5(W) X 104.4(H) X 7.05(D)
(3)	Active Area(mm)	153.6(H) X 90.0(V)
(4)	Pixel Pitch(mm)	0.15 (H) X 0.15(V)
(5)	LCD Model	TFT , Transmissive, Normally/White
(6)	Polarizer Model	Clear
(7)	LED Backlight Color	White
(8)	Viewing Direction	12 O'clock
(9)	Gray Scale Inversion Direction	6 O'clock
(10)	Color Configuration	R.G.B Stripe
(11)	Module Weight(g)	135

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

4. OUTLINE DIMENSIONS



備考	單位:mm	投影法:	比例尺:
入庫	製圖 Swallow I30107	ON	ONation Corporation
簽查	名稱: 7" 1024*600 LCM	圖號	OT070MADDLV-00
承認			

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。

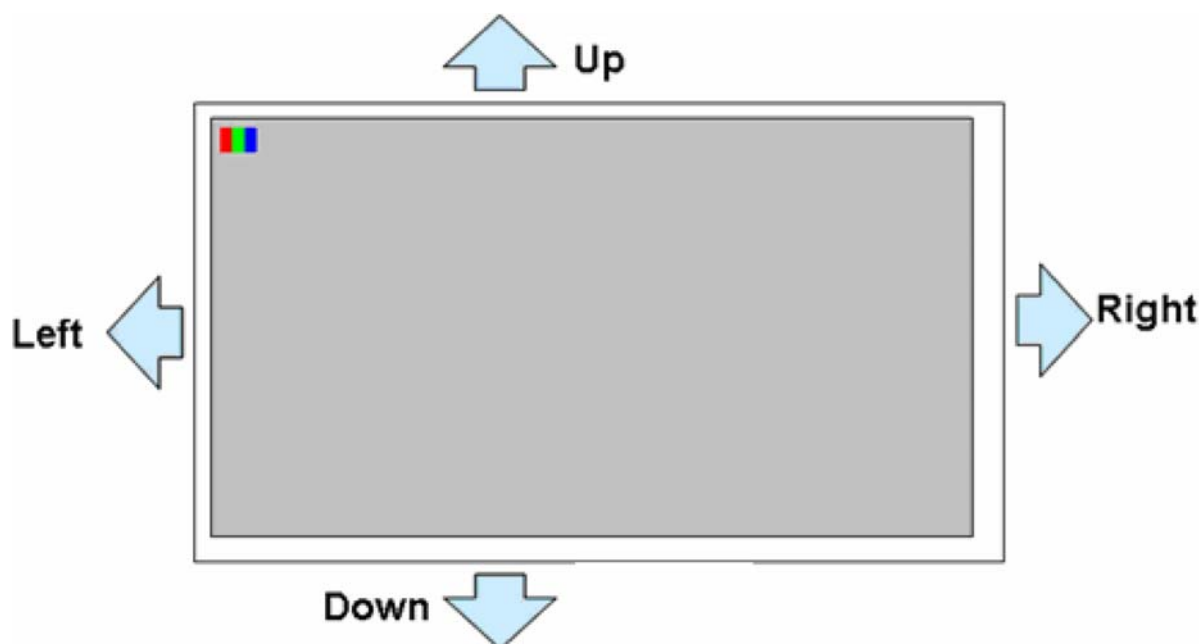
5. INTERFACE PIN CONNECTION

5.1 LCM PANEL DRIVING SECTION (CN1: MSB24013P20HA or Equivalent)

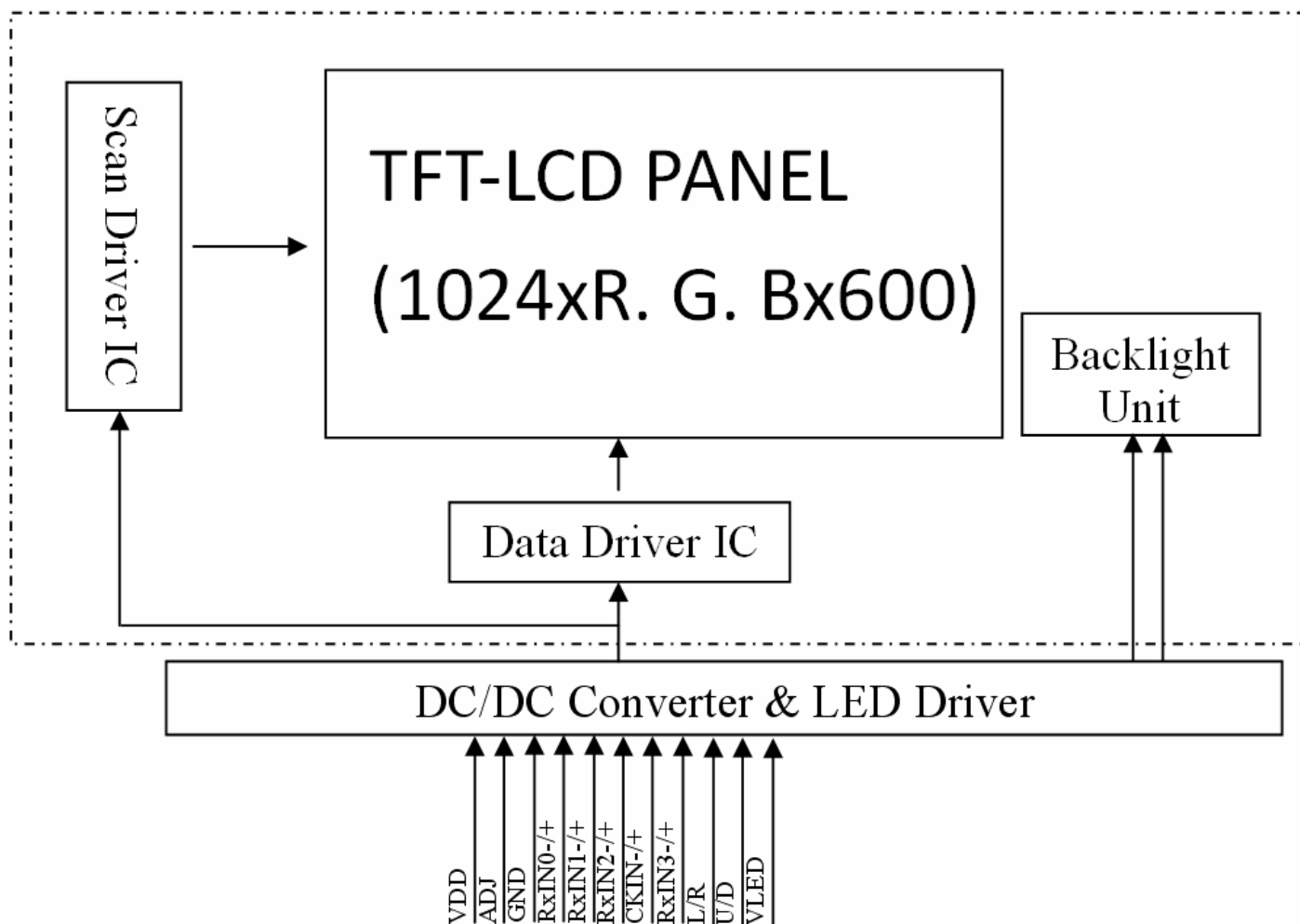
PIN NO.	SIGNAL	FUNCTION	REMARK
1	VDD	Power Voltage for digital circuit	
2	VDD	Power Voltage for digital circuit	
3	U/D	Up/Down Scan	Note 1
4	L/R	Left/Right Scan	Note 1
5	RXIN0-	Differential data Input,CH0(G0,R0~R5)	
6	RXIN0+	Differential data Input,CH0(G0,R0~R5)	
7	GND	Ground	
8	RXIN1-	Differential data Input,CH1(B0,B1,G1~G5)	
9	RXIN1+	Differential data Input,CH1(B0,B1,G1~G5)	
10	GND	Ground	
11	RXIN2-	Differential data Input,CH2(DE,B2~B5)	
12	RXIN2+	Differential data Input,CH2(DE,B2~B5)	
13	GND	Ground	
14	RXCLKIN-	Differential Clock Input	
15	RXCLKIN+	Differential Clock Input	
16	GND	Ground	
17	RXIN3-	Differential data Input,CH3(B6,B7,G6,G7,R6,R7)	
18	RXIN3+	Differential data Input,CH3(B6,B7,G6,G7,R6,R7)	
19	VLED	LED Driving Voltage	
20	ADJ	LED ADJ dimming	

Note1:

U/D	L/R	FUNCTION
0	1	Normal display
0	0	Inverse Left and Right
1	1	Inverse Up and Down
1	0	Inverse Left and Right Inverse Up and Down



6. BLOCK DIAGRAM



7. ABSOLUTE MAXIMUM RATINGS

7.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	MIN.	MAX.	UNIT	COMMENT
Power Supply Voltage For Digital	VDD	-0.3	5.0	V	
Logic Output Voltage	V _I	-0.5	5.0	V	

7.2 ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS

ITEM	OPERATING		STORAGE		COMMENT
	MIN	MAX	MIN	MAX	
Ambient Temperature(°C)	-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°C & -20°C ≤ 240Hrs.

Note 4 : Storage Ta=60°C & H=90% ≤ 240Hrs.

8. ELECTRICAL CHARACTERISTICS

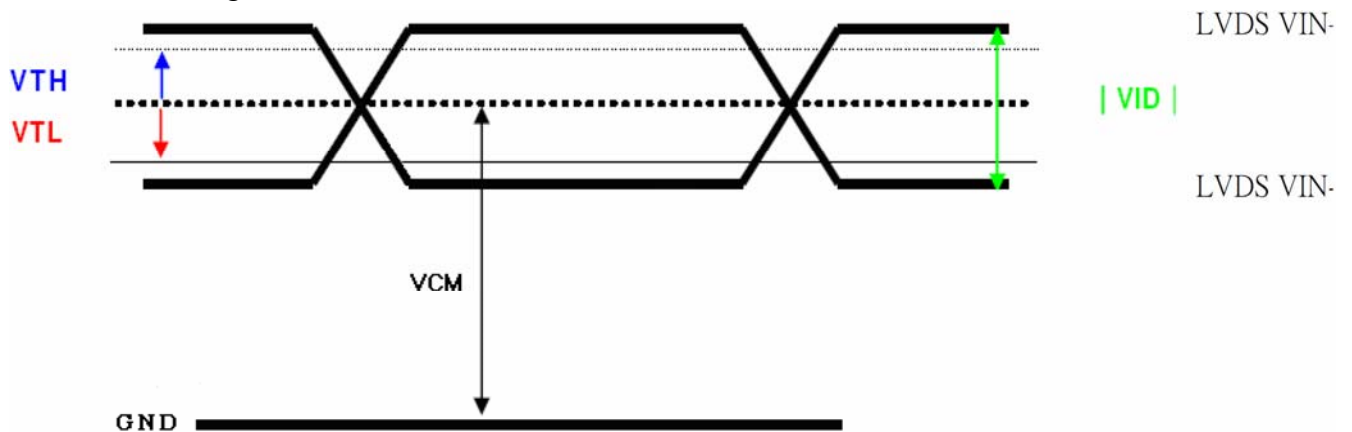
8.1 ELECTRICAL CHARACTERISTICS OF LCD

Ta=25°C

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
Power Voltage For Digital	VDD	3.0	3.3	3.6	V	
	IDD*	-	150	180	mA	VDD=3.3V
Input High Voltage	V _{IH}	0.7 x VDD	-	VDD	V	
Input Low Voltage	V _{IL}	GND	-	0.3 x VDD	V	
Logic Input Voltage (LVDS: IN+, IN-)	V _{CM}	VID /2	-	2.4- VID /2	V	Note1
	VID	200	-	600	mV	Note1
	V _{TH}	-	-	100	mV	V _{CM} =1.2V
	V _{TL}	-100	-	-	mV	

*Test pattern Black.

Note1 : LVDS signal



8.2 BACKLIGHT UNITS

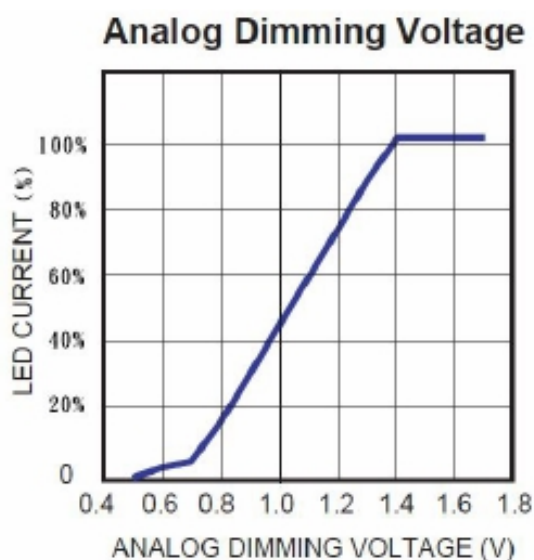
Ta=25°C

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	
LED Driving Voltage	VLED	11.7	12	12.3	V	
LED Driving Current	ILED	-	350	380	mA	
Brightness Control	Analog dimming	ADJ	0.7	-	1.4	V _{DC}
	PWM dimming		1.4	-	5.0	V _{P-P}
ADJ Frequency	-	100	-	1000	Hz	
LED Life Time	-	50000	-	-	Hr	

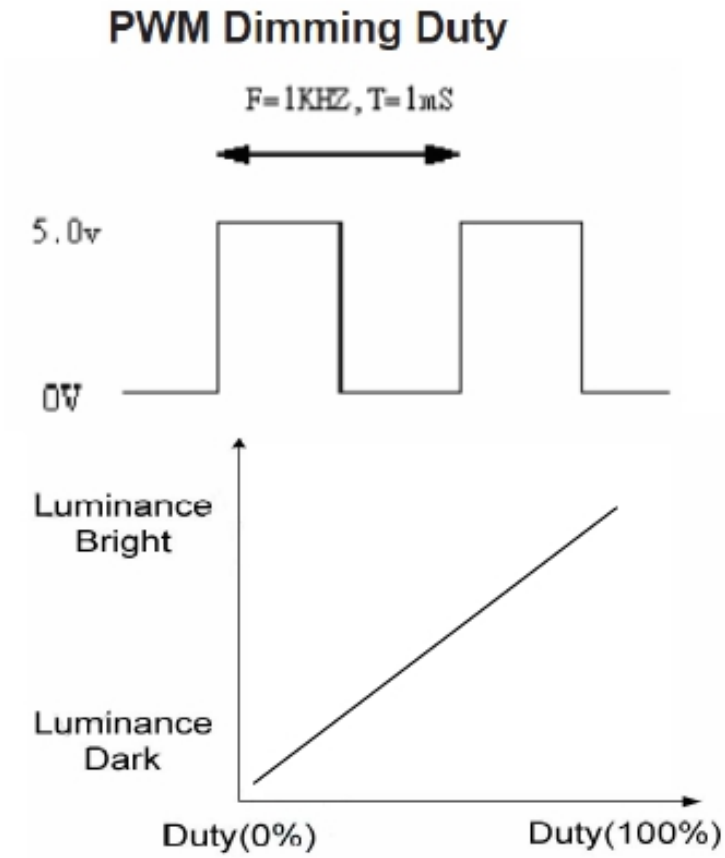
Note 1: If the module is driven at high ambient temperature & humidity condition. The operating life will be reduced.

Note 2: Operating life means brightness goes down to 50% initial brightness. Typical operating life time is estimated data.

Note 3: When the ADJ pin voltage rises from 0.7VDC to 1.4VDC, the LED current will change from 0% to 100% of the maximum LED current.



Note 4: ADJ signal $V_{p-p} = 1.4 \sim 5.0V$, operation frequency: 100Hz ~ 1 kHz



9. OPTICAL CHARACTERISTICS

Ta=25°C

ITEM	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT	REMARK
Contrast Ratio	CR	Viewing	500	700	-	-	Note (1)
Response Time	TR+TF	Normal	-	25	50	ms	Note (2)
Chromaticity	White	x	0.27	0.32	0.37	-	Note (4)
		y	0.30	0.35	0.40	-	
Viewing Angle	Hor.	Θx+	65	75	-	Deg.	Note (3)
		Θx-	65	75	-		
	Ver.	Θy+	60	70	-		
		Θy-	65	75	-		
Luminance	L		900	1000	-	cd/m2	
Luminance uniformity	YU	PWM=100%	70	-	-	%	Note (5)

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

The contrast ratio can be calculated by the following expression.

$$\text{Contrast Ratio (CR)} = L63 / L0$$

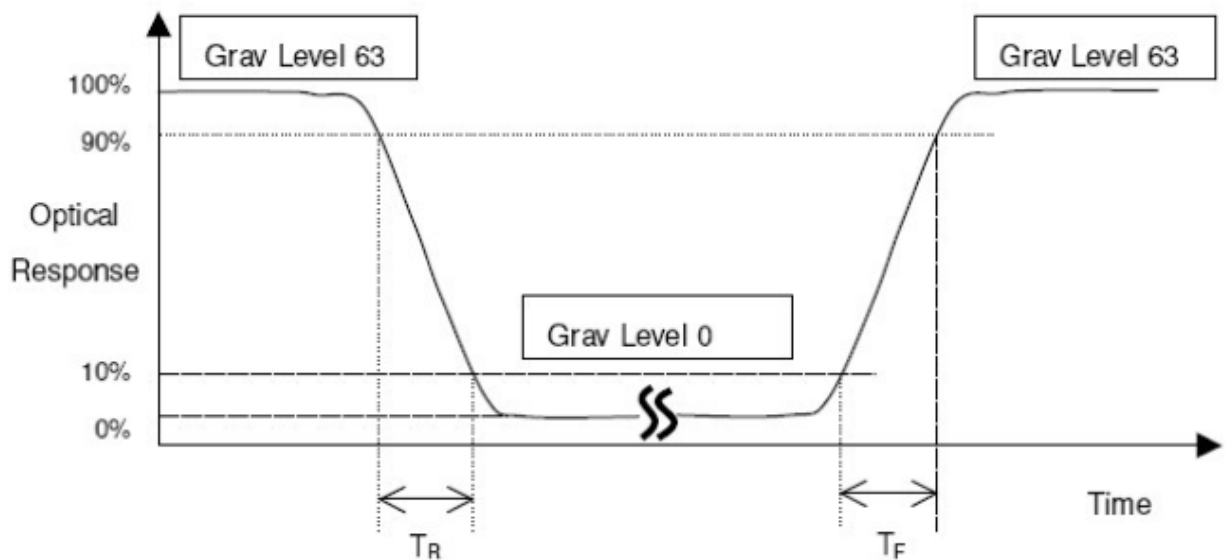
L63: Luminance of gray level 63

L 0: Luminance of gray level 0

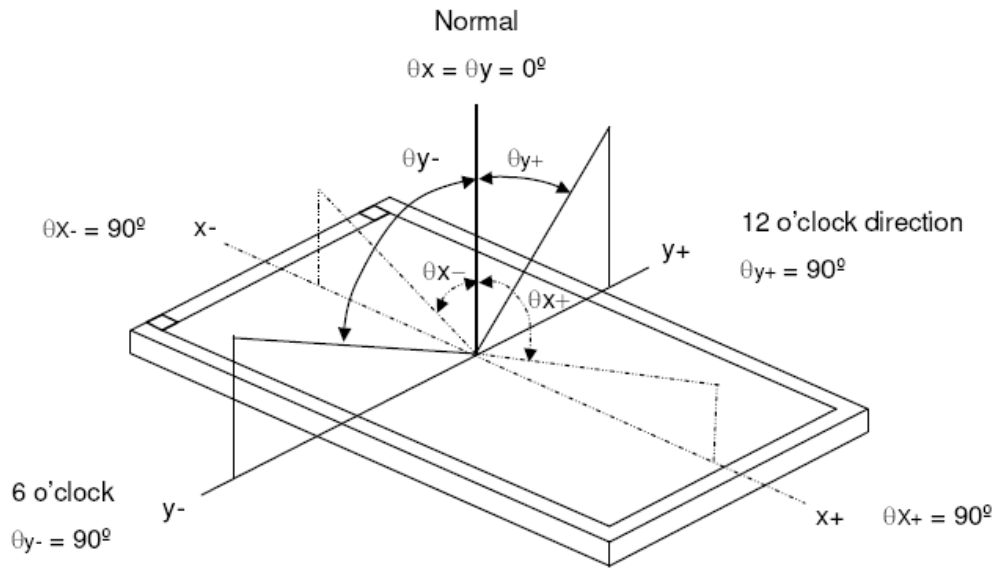
$$CR = CR (5)$$

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

*Note (2) Definition of Response Time (TR, TF):

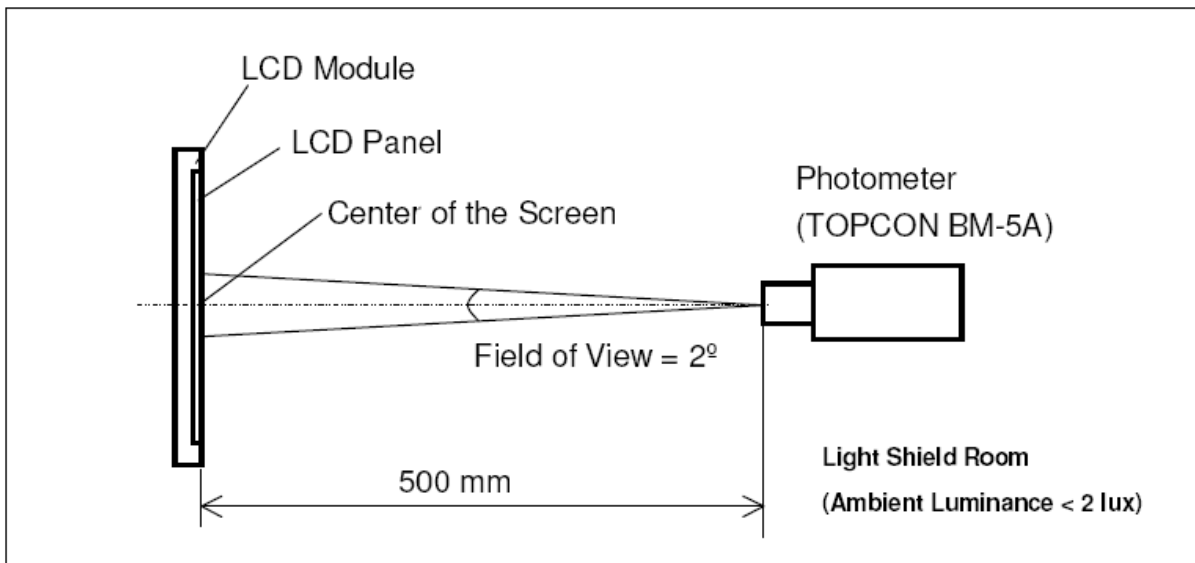


*Note(3) Definition of Viewing Angle

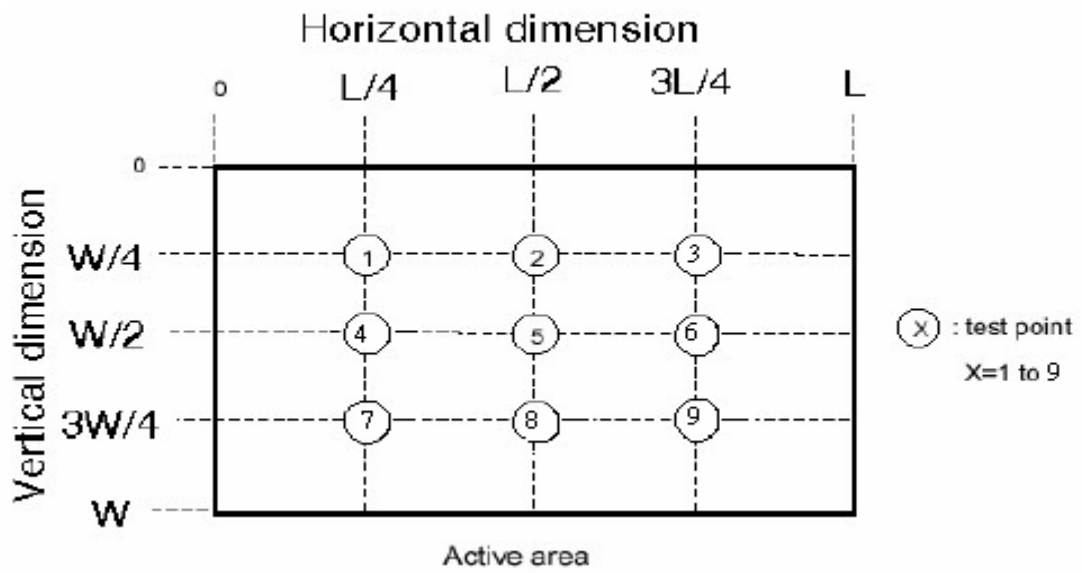


*Note (4) Measurement Set-Up:

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



*Note (5)

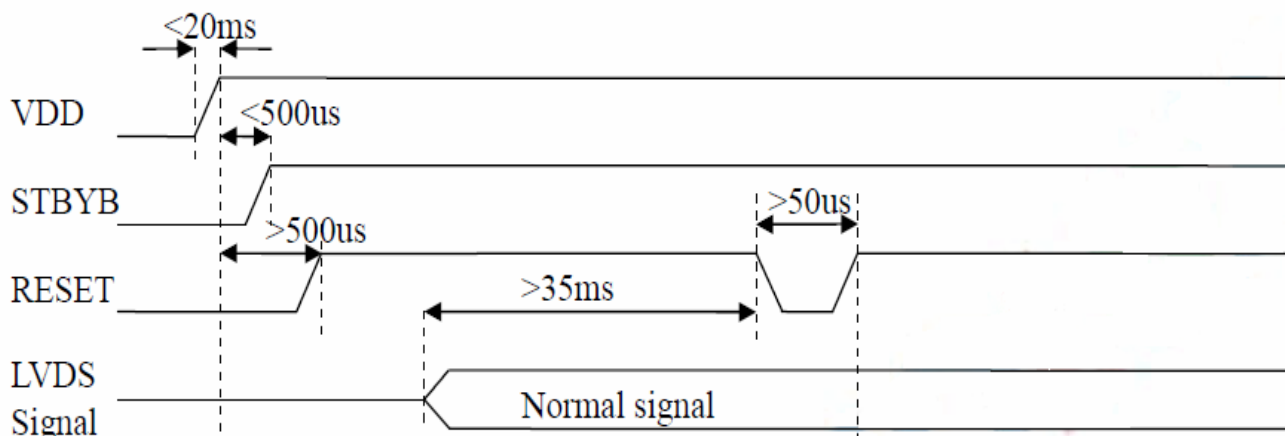


$$\left(1 - \frac{\text{MAX Luminance} - \text{Average Luminance}}{\text{Average Luminance}} \right) \times 100\% > 70\%$$

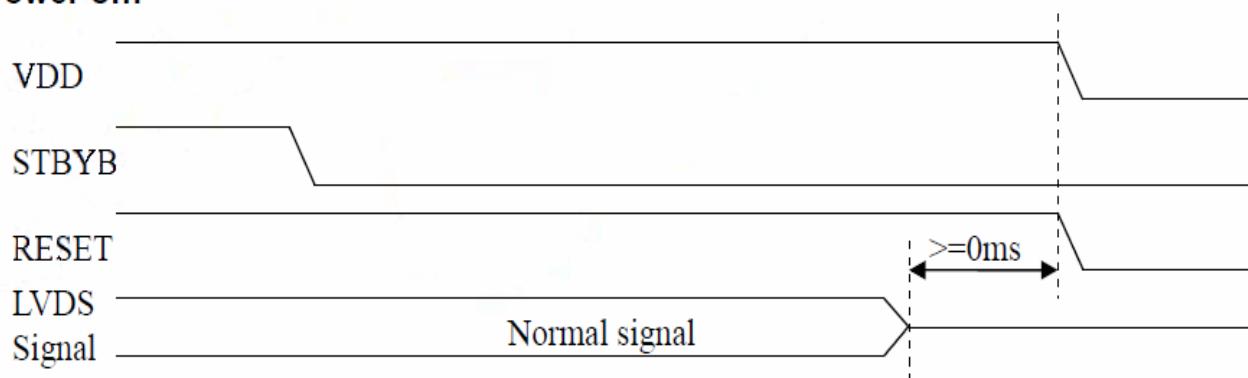
10. TIMING SPECIFICATIONS

10.1 POWER SIGNAL SEQUENCE

a. Power on:



b. Power off:

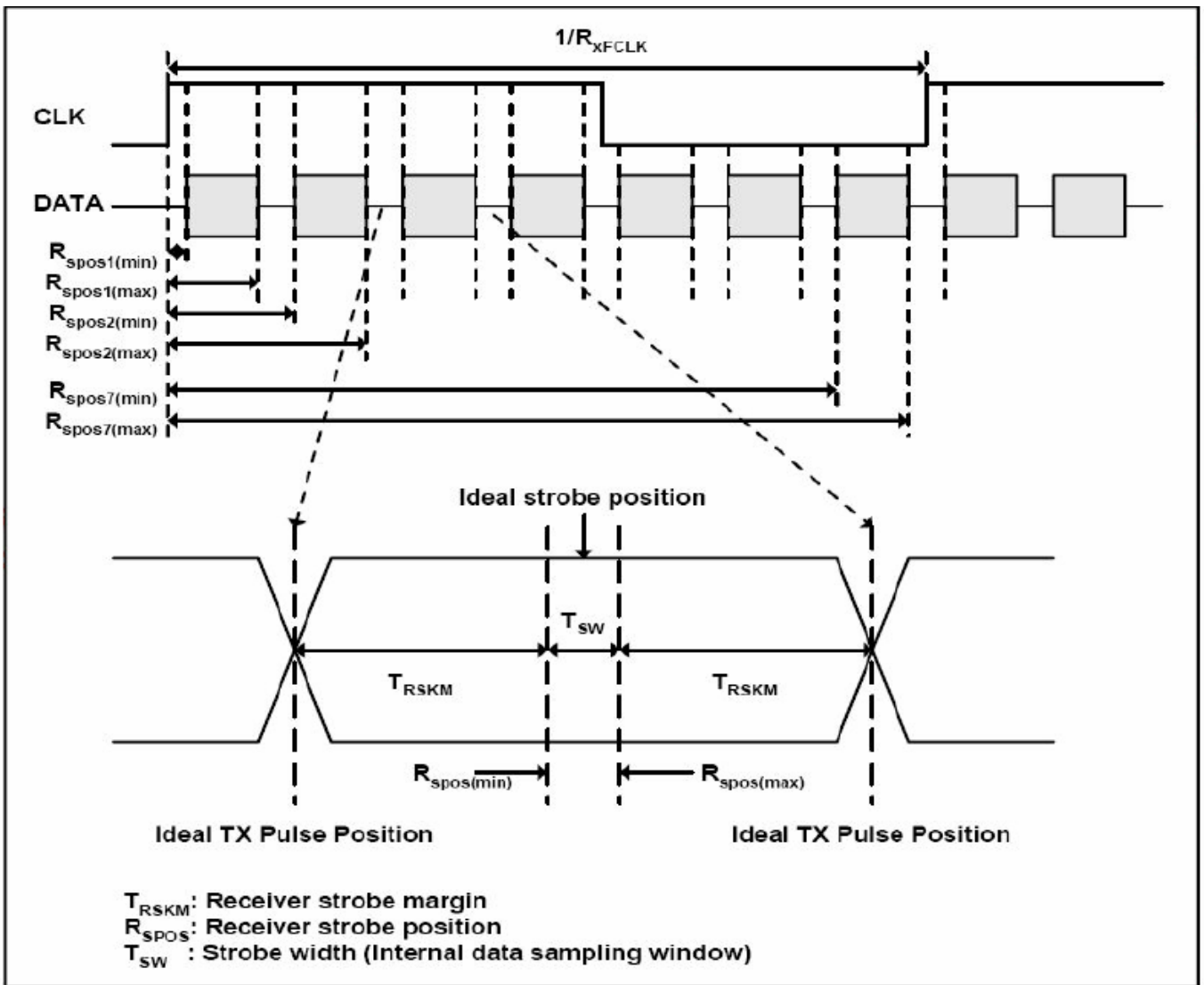
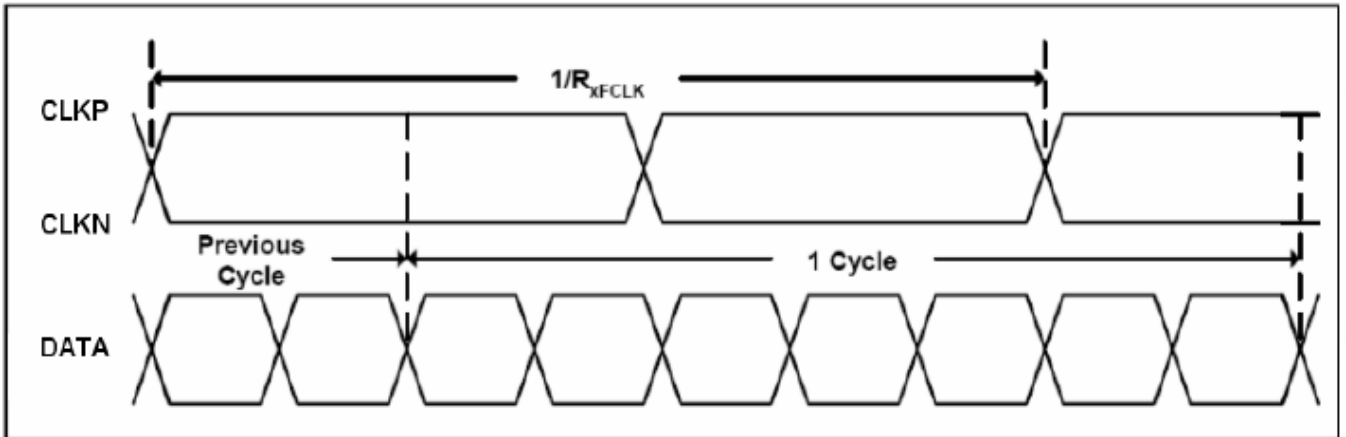


10.2 TIMING CHARACTERISTICS OF INPUT SIGNALS

ITEM			SYMBOL	MIN.	TYP.	MAX.	UNIT	
LVDS input signal sequence	CLK Frequency**		clk	40.8	51.2	67.2	MHz	
LCD input signal sequence(Input LVSD Transmitter)	DENA	Horizontal	Horizontal total Time	t_H	1114	1344	1400	tCLK
			Horizontal effective Time	t_{HA}	1024			tCLK
			Horizontal Blank Time	t_{HB}	90	320	376	tCLK
	Vertical	Vertical	Vertical total Time	t_V	610	635	800	t_H
			Vertical effective Time	t_{VA}	600			t_H
			Vertical Blank Time	t_{VB}	10	35	200	t_H

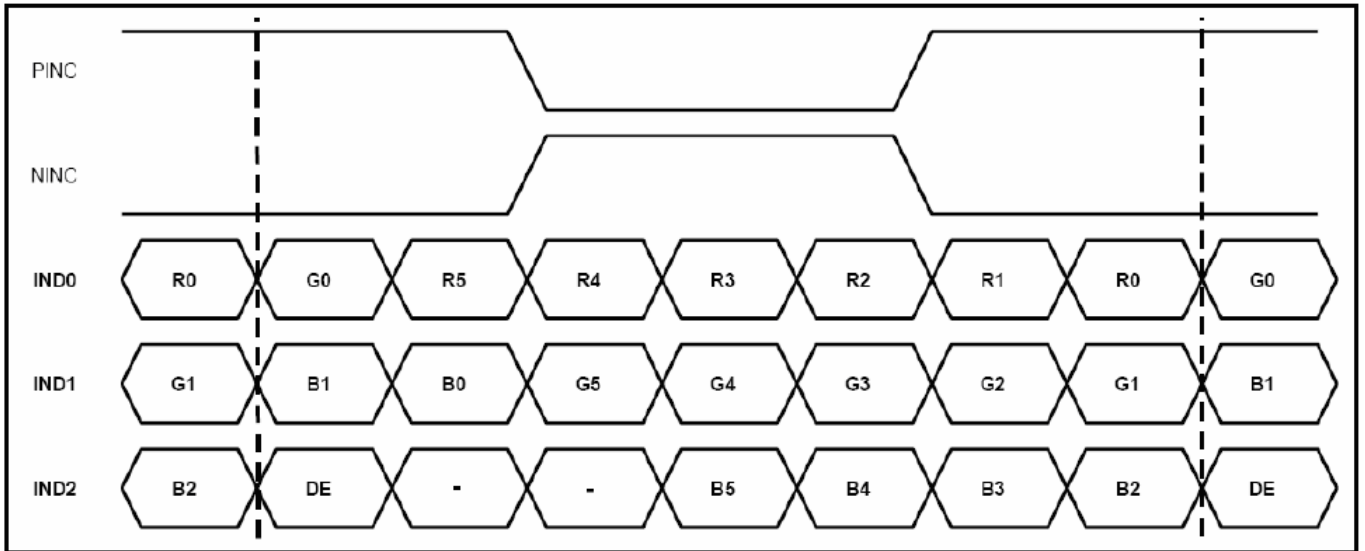
**Frame rate = 60Hz

10.3 TIMING SEQUENCE(TIMING CHART)

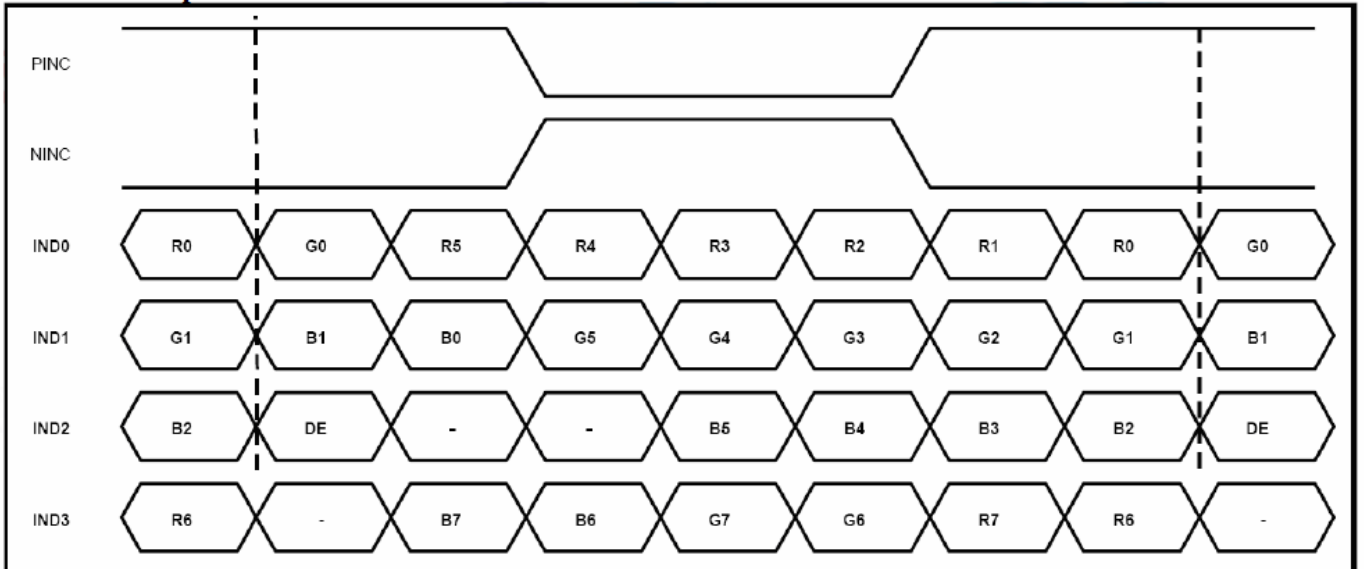


10.4 LVDS INPUT DATA MAPPING

6bit LVDS input



8bit LVDS input



Note: Support DE timing mode only, SYNC mode not supported.

11. RELIABILITY TEST

Ta = 25°C

Environmental Test				
NO.	ITEM	CONDITIONS	TIME PERIOD	REMARK
1	High Temperature Storage	80°C	240HRS	
2	Low Temperature Storage	-30±3°C	240HRS	
3	High Temperature Humidity Storage	60°C 90%RH	240HRS	NOTE(2)
4	High Temperature Operation	70°C	240HRS	NOTE(2)
5	Low Temperature Operation	-20°C	240HRS	NOTE(2)
6	Temperature Cycle	-30°C ← 25°C → 80°C (30min) (5min) (30min)	10CYCLE	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.

12. PACKAGE METHOD

TBD