

CUSTOMER' S APPROVAL SPECIFICATIONS**MODEL: CH070OLFL-006****(Complied with RoHS)****ISSUE:APR.11.2013****Spec Condition: preliminary**

No.	ITEM	PAGE
1	COVER	--
2	RECORD OF REVISION	0-1
3	MECHANICAL SPECIFICATIONS	1
4	OUTLINE DIMENSIONS	2
5	INTERFACE PIN CONNECTION	3
6	BLOCK DIAGRAM	4
7	ABSOLUTE MAXIMUM RATINGS	4
8	ELECTRICAL CHARACTERISTICS	5~7
9	OPTICAL CHARACTERISTICS	8~10
10	TIMING SPECIFICATIONS	11~14
11	RELIABILITY TEST	15
12	PACKAGE METHOD	16

CUSTOMER	CHEFREE		
APPROVAL	APPROVAL	CHECKER	PREPARE
	ch lee	ch lee	kevin

2.RECORD OF REVISION

[illegible]

3.MECHANICAL SPECIFICATIONS

(1)	Number Of Dots (Dots)	1024(R.G.B) X 600
(2)	Module Size(mm)	165.75(W) X 105.39(H) X 5.0(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	Glare
(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)	TBD

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

文件題目

圖號

頁

次頁

發行日

舊版日

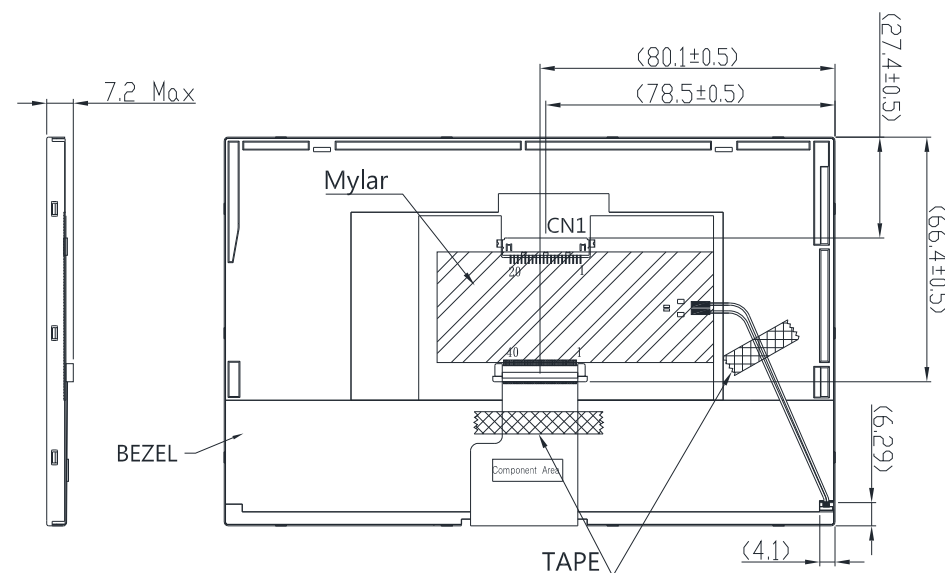
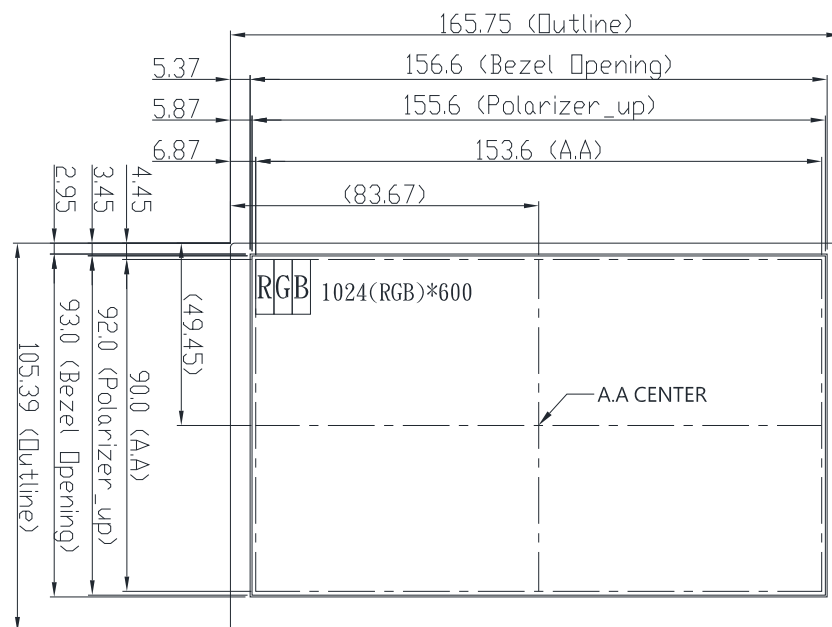
登入號碼

機密等級

8 樣式 QT2-RD02-008

No.	修定區塊	修 訂 內 容	作 成	修訂日期
		新版	Swallow	2013.04.02

4. OUTLINE DIMENSIONS

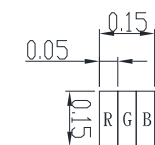


NOTE:

1. Unit: mm

2. Tolerance is ± 0.3 mm unless noted .

3. CN1: MSB24013P20HA or Equivalent .

Detail DOT
Scale 100:1

備考	單位:	投影法:	比例尺:
入庫	製圖 Swallow 130402	名稱: mm	圖號
審查		7" LCM	
承認			

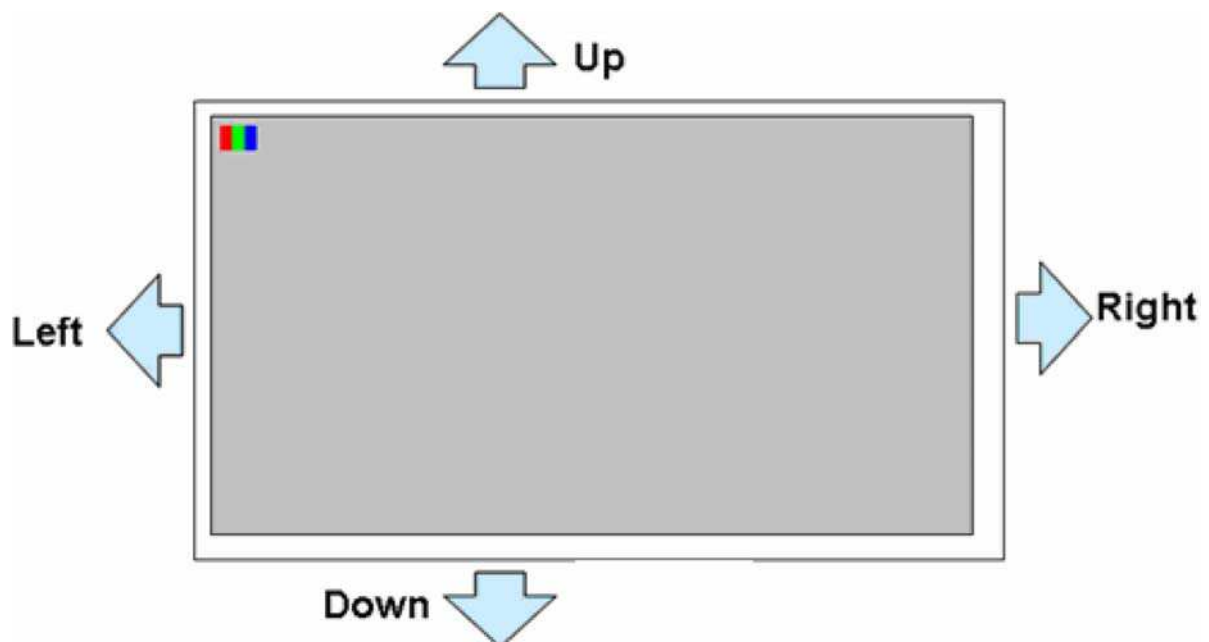
5. INTERFACE PIN CONNECTION

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

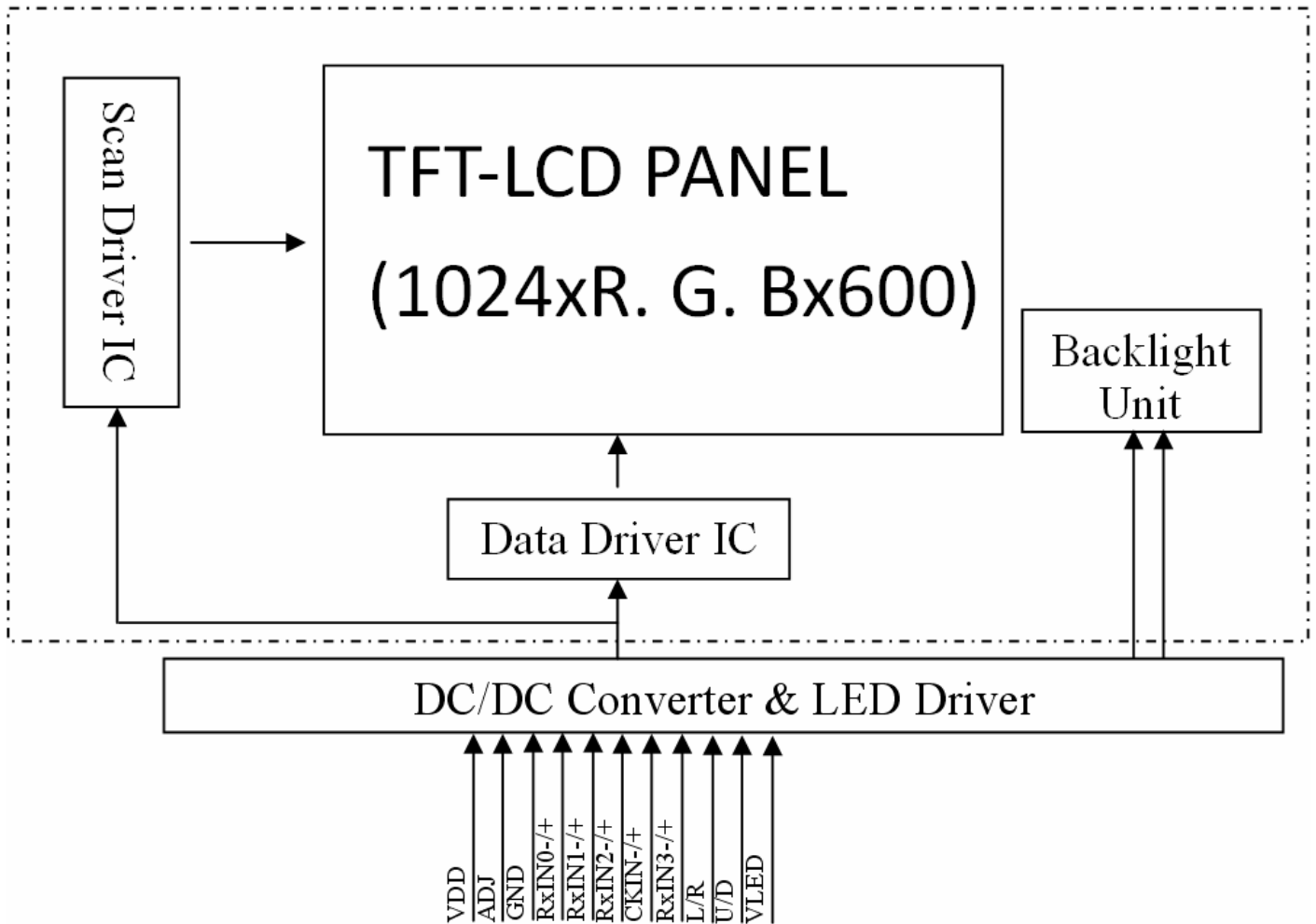
PIN NO.	SIGNAL	FUNCTION	REMARK
1	VDD	Power Voltage for digital circuit	
2	VDD	Power Voltage for digital circuit	
3	U/D	Up/Down Scan	Note 1
4	L/R	Left/Right Scan	Note 1
5	RXIN0-	Differential data Input,CH0(G0,R0~R5)	
6	RXIN0+	Differential data Input,CH0(G0,R0~R5)	
7	GND	Ground	
8	RXIN1-	Differential data 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

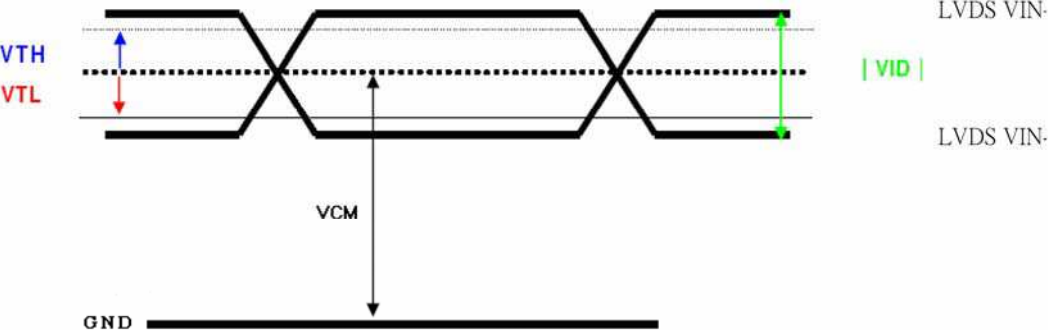
8.1 ELECTRICAL CHARACTERISTICS OF LCD

Ta=25℃

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}	V _{ID} /2	-	2.4- V _{ID} /2	V	Note1
	V _{ID}	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

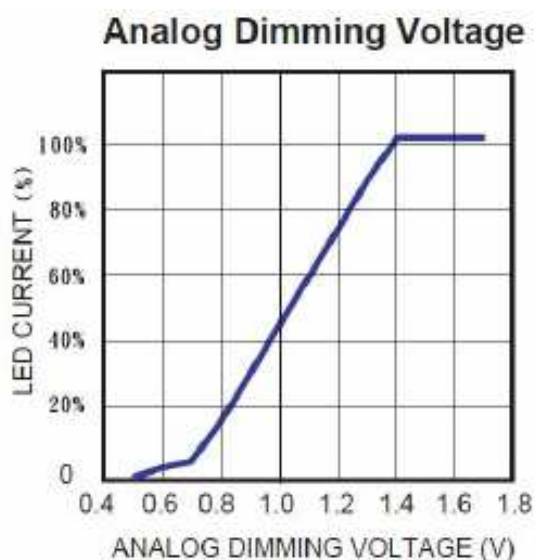
Ta=25°C

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

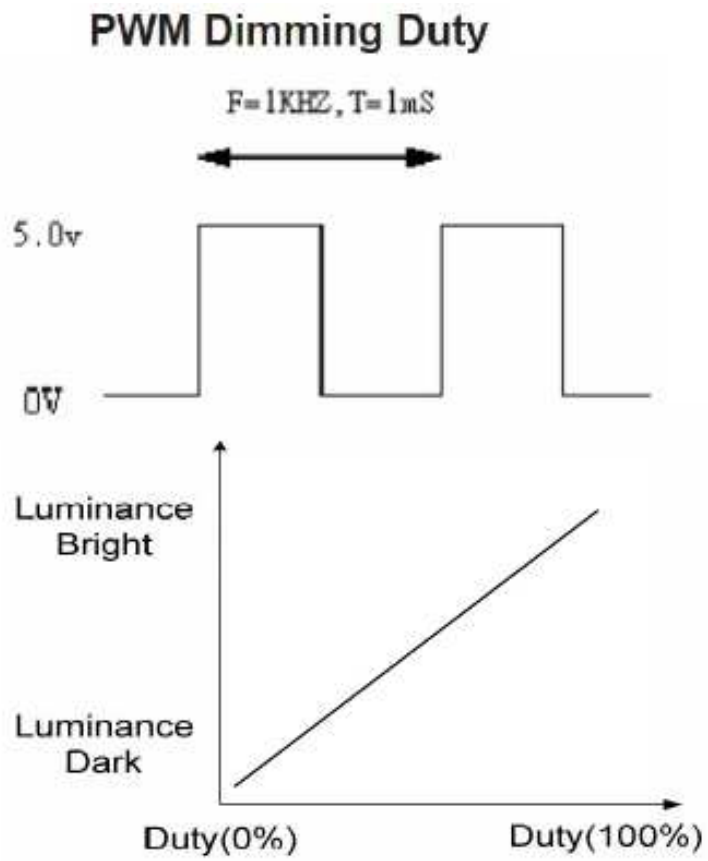
Note 1: If the module is driven at high ambient temperature & humidity condition. The operating life will be reduced.

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	(0.249)	(0.299)	(0.349)	-	Note (4)
		y	(0.273)	(0.323)	(0.373)	-	
Viewing Angle	Hor.	Θ_{X+}	65	75	-	Deg.	Note (3)
		Θ_{X-}	65	75	-		
	Ver.	Θ_{Y+}	60	70	-		
		Θ_{Y-}	65	75	-		
Luminance	L	PWM=100%	(900)	(1000)	-	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.

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

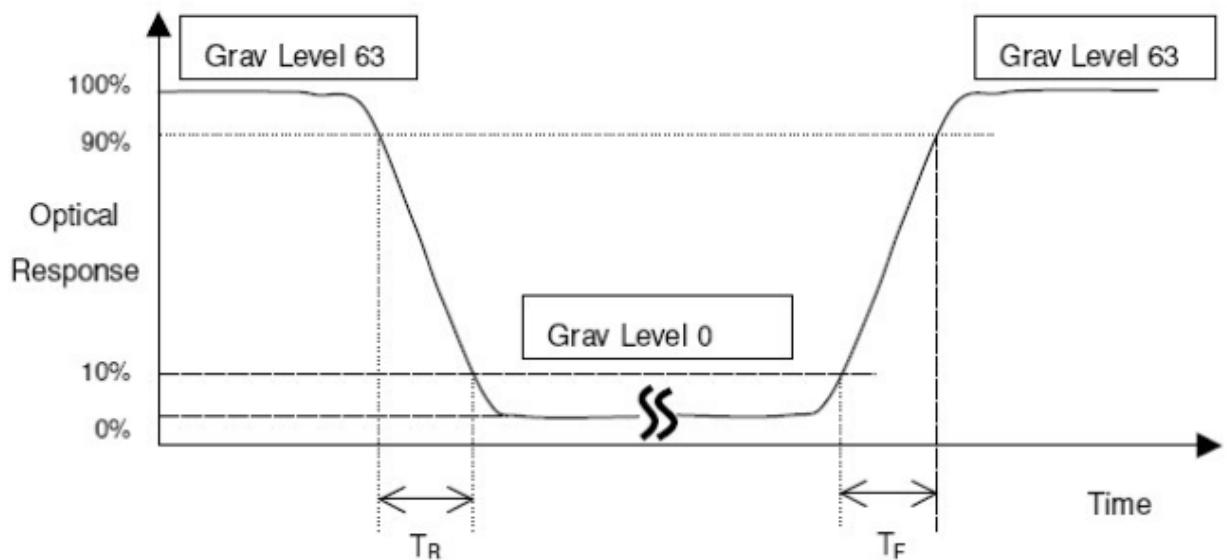
L63: Luminance of gray level 63

L 0: Luminance of gray level 0

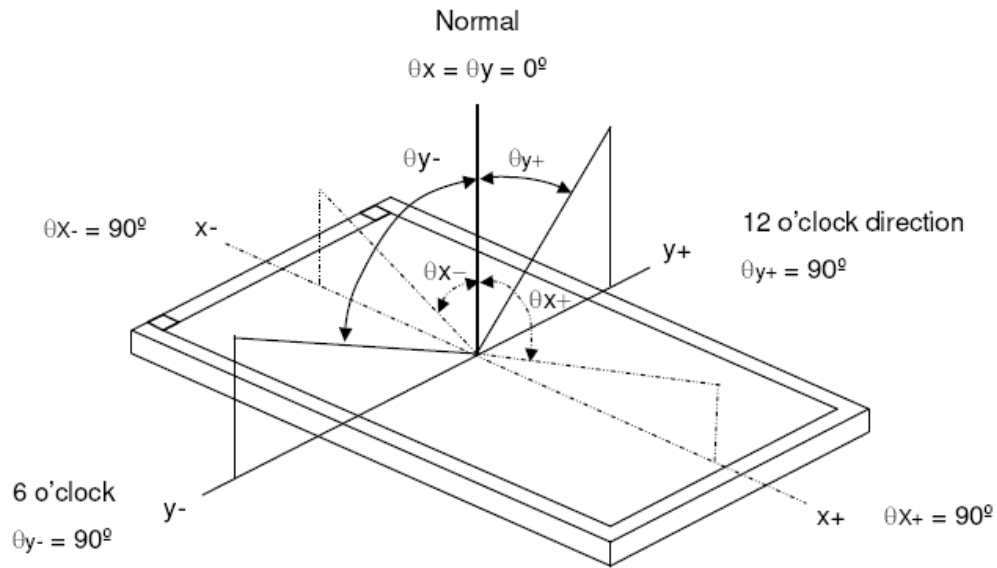
$$CR = CR (5)$$

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):

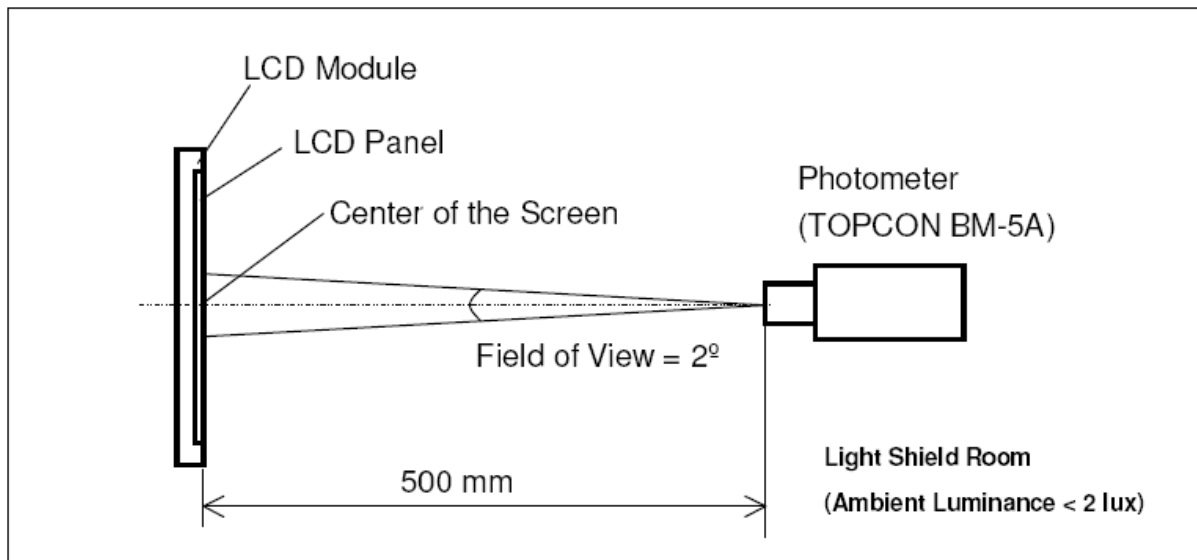


*Note(3) Definition of Viewing Angle

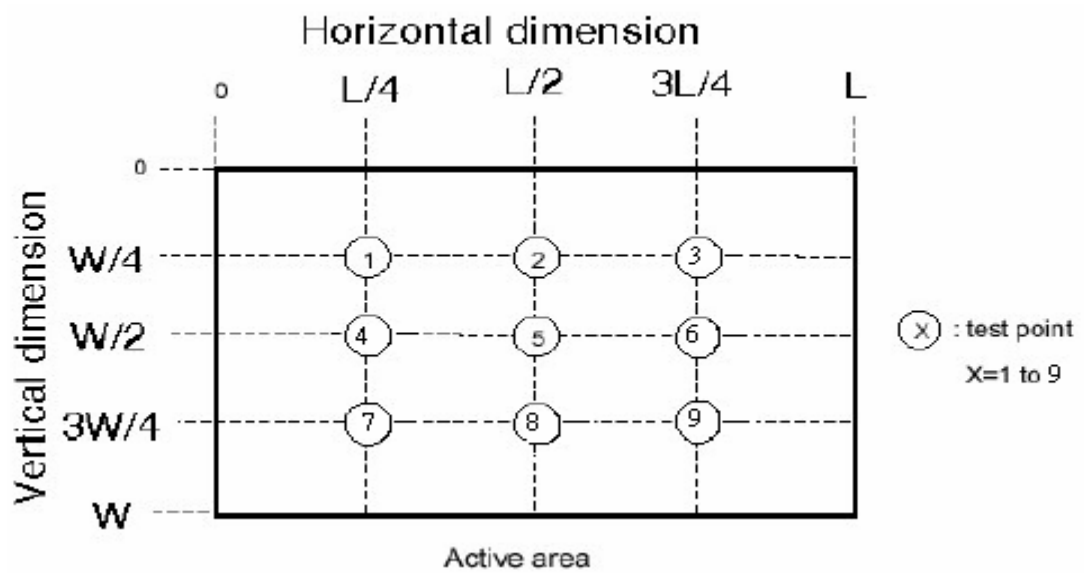


*Note (4) Measurement Set-Up:

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)

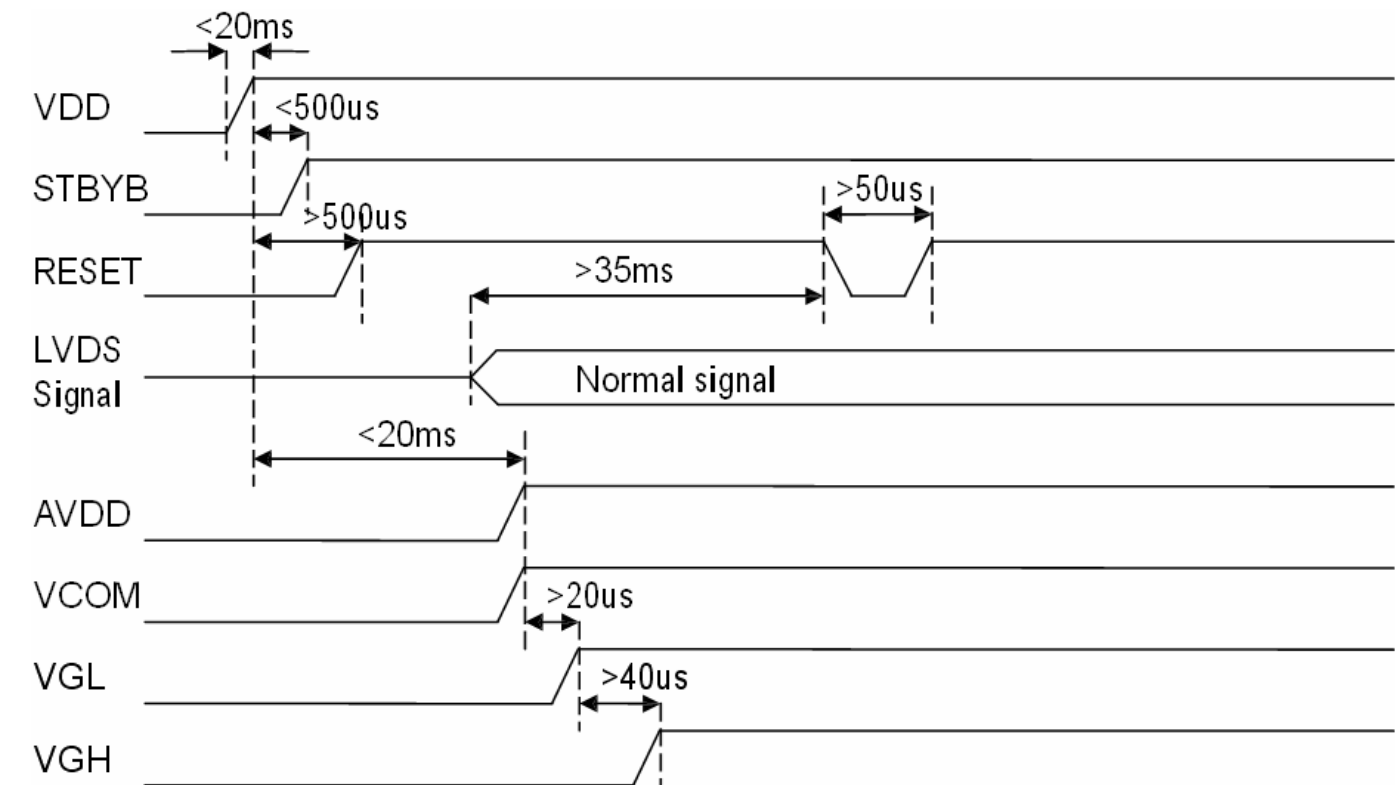


$$\left(1 - \frac{\text{MAX Luminance} - \text{Average Luminance}}{\text{Average Luminance}} \right) \times 100\% > 70\%$$

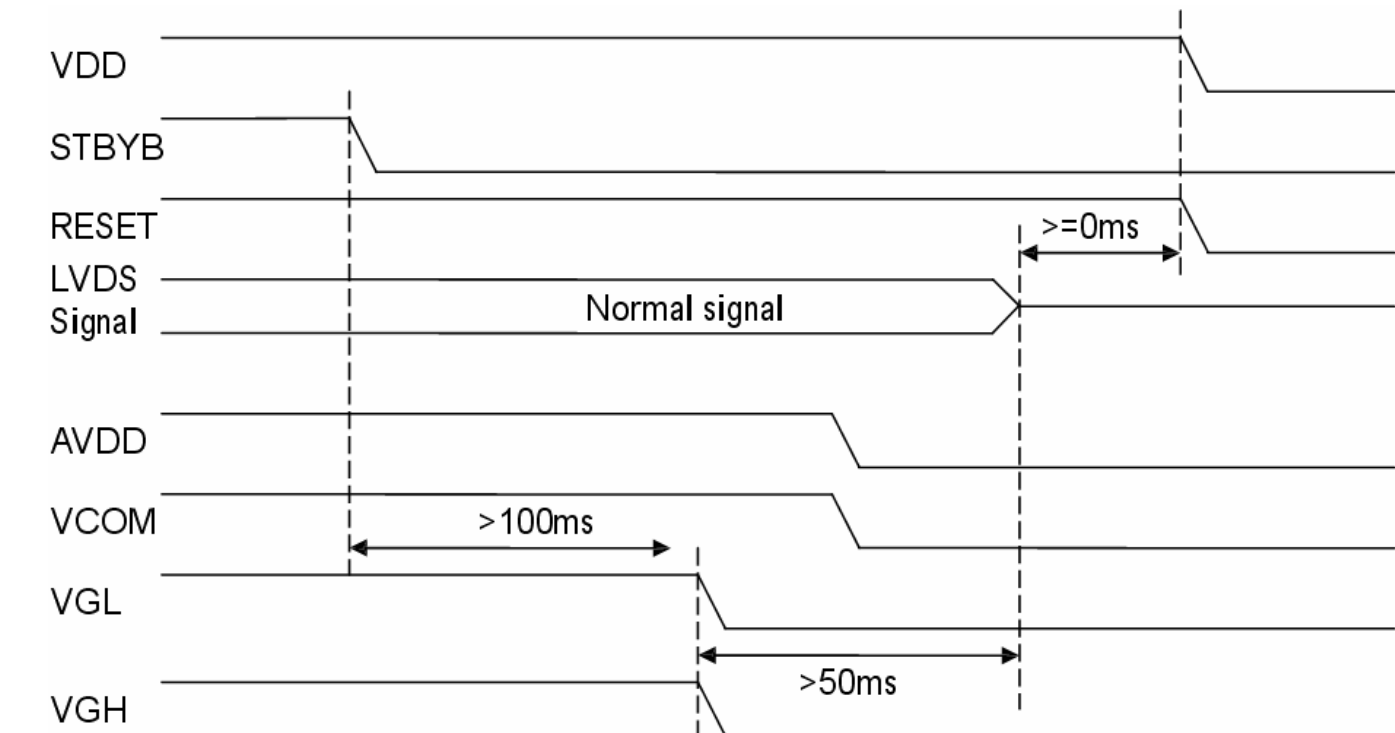
10. TIMING SPECIFICATIONS

10.1 POWER SIGNAL SEQUENCE

10.1.1 Power on:



10.1.2 Power off:

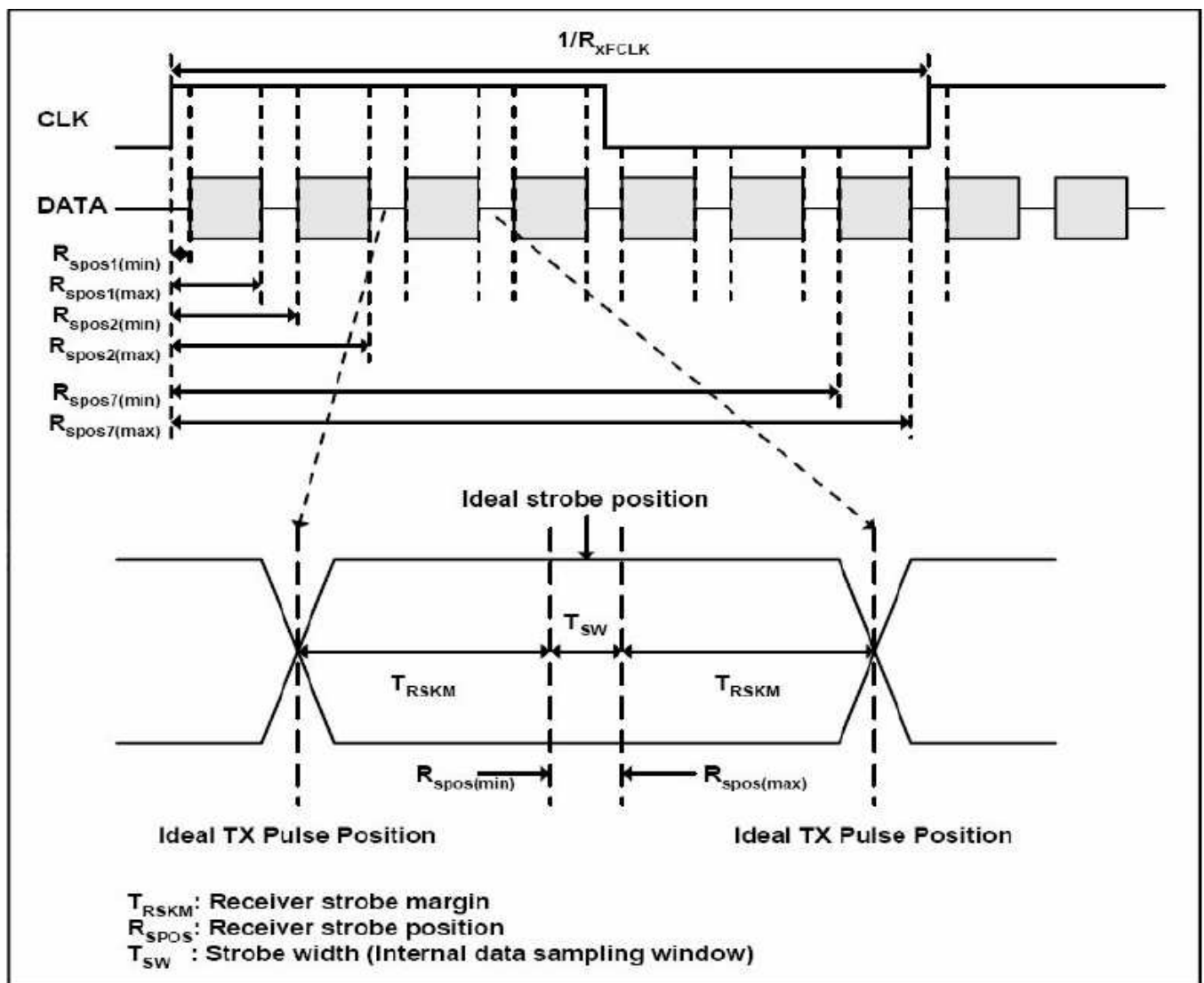
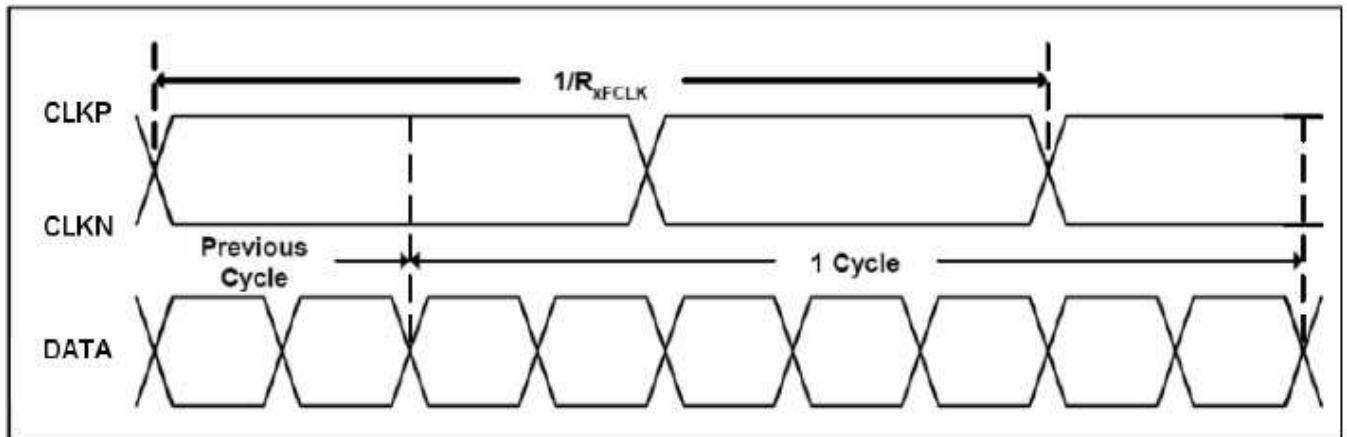


10.2 TIMING CHARACTERISTICS OF INPUT SIGNALS

ITEM				SYMBOL	MIN.	TYP.	MAX.	UNIT
LVDS input signal sequence	CLK Frequency**			tc _{lk}	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 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

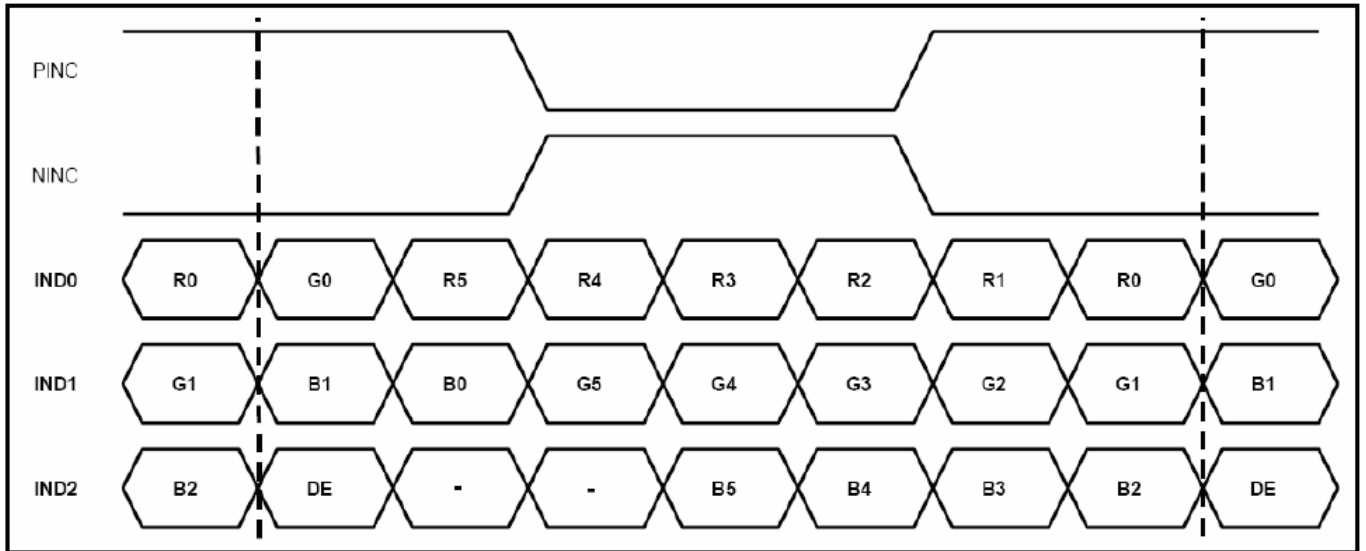
**Frame rate = 60Hz

10.3 TIMING SEQUENCE(TIMING CHART)

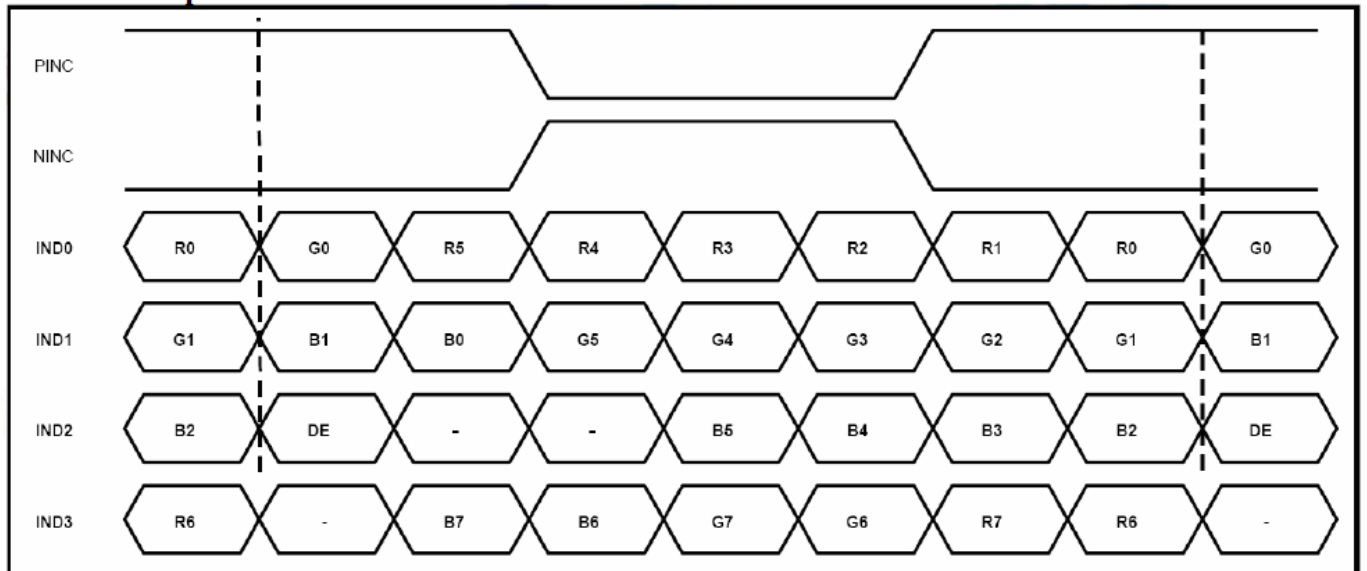


10.4 LVDS INPUT DATA MAPPING

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°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 MODULE 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