PRODUCT SPECIFICATION

MODEL:H101NWWB-206

< ◇ > PRELIMINARY SPECIFICAION

< ◆ > APPROVAL SPECIFICATION

CUSTOMER
APPROVED BY
DATE:

DESIGNED	CHECKED	APPROVED
IKEHE		

REVISION STATUS

Version	Revise Date	Page	Content	Modified by
V1.0	2021.04.18	-	First Issued.	Jason

CONTENTS

1. GENERAL DESCRIPTION

1.1 DESCRIPTION

AINFULL Display model-XNW101R1040H01 is a transmissive type color active matrix liquid crystal display (LCD) which uses amorphous thin film transistor (TFT) as switching devices. This product is composed of a TFT LCD panel, driver ICs and a backlight unit. The following table describes the features of this LCM.

1.2 FEATURES

No.	Item	Specification	Unit
1	Panel Size	10.1	inch
2	Number of Pixels	1280 × 3(RGB) ×800	pixels
3	Active Area	216.96(H) ×135.6(V)	mm
4	Pixel Pitch	0.1695(H) ×0.1695(V)	mm
5	Outline Dimension	228.91 (H) × 148.57 (V) × 2.75(D)	mm
6	Pixel arrangement	RGB Vertical stripe	-
7	Display Mode	IPS with Normally Black	-
8	Viewing Direction	ALL Viewing Direction	-
9	Display Color	16.7M	-
10	Surface Treatment	Anti-Glare and Hard-coating 3H	-
11	Interface	LVDS	-
12	Backlight	White LED	-
13	Drive IC	-	-
14	Operation Temperature	-20~70	ºC
15	Storage Temperature	-25~75	ºC
16	Weight	--	g

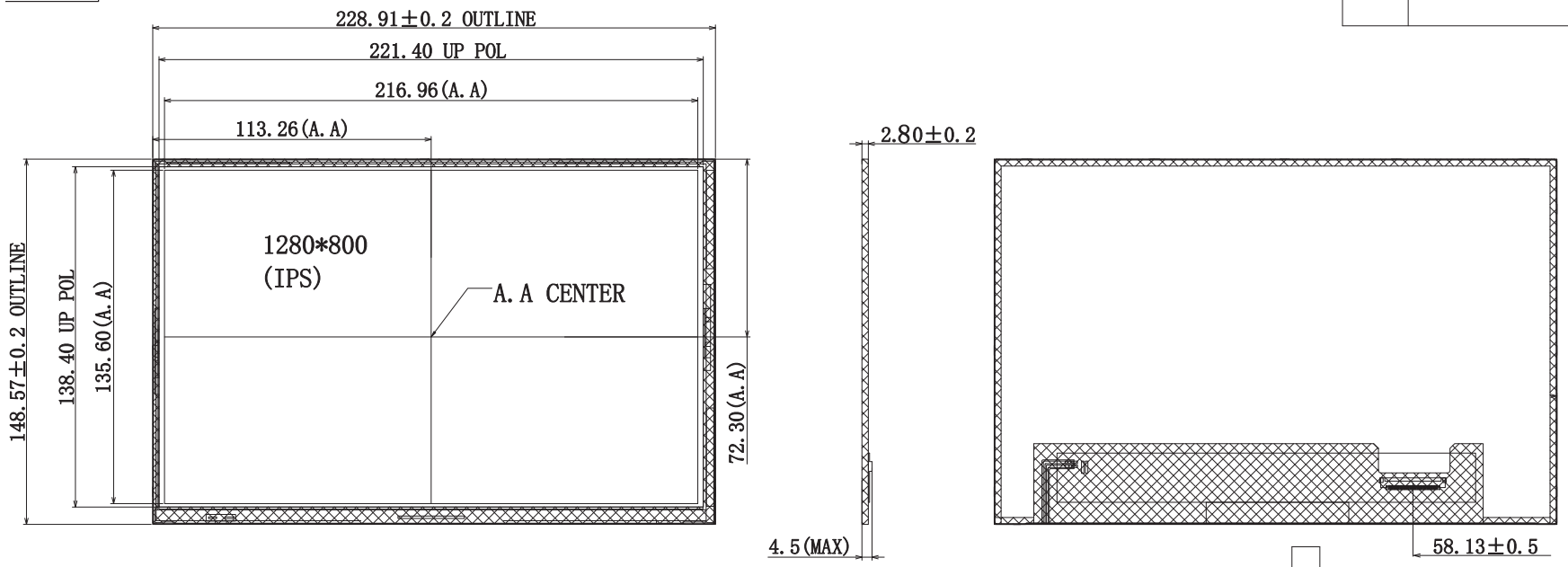
2. MECHANICAL

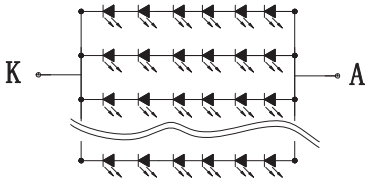
深圳市心诺微电子有限公司

XINUO

ISSUE	AMENDMENT	DATE

ROHS





LED电路图

6*6=36LED

es:

HS must be complied.

.Modification rev.number

raft angle 1.5° :

) reference dimension, ☆:critical dimension

l radii without dimension R0.3 , Unspecified Tolerances is±0.20mm

ctrical-Optical Characteristics(Ta=25° C):

Item	Symbol	min.	typ.	max.	Unit	Condition
LCM Luminance	Lv		300	——	cd/m²	If=120 mA
Uniformity	YU				%	
BL Colour Coordinate	Wx	0.266	0.296	0.326		
	Wy	0.292	0.322	0.352		
orward Voltage	Vf	18	18.6		V	

erating Temperature: -10~+50° C ◦ Storage Temperature: -20~+60° C

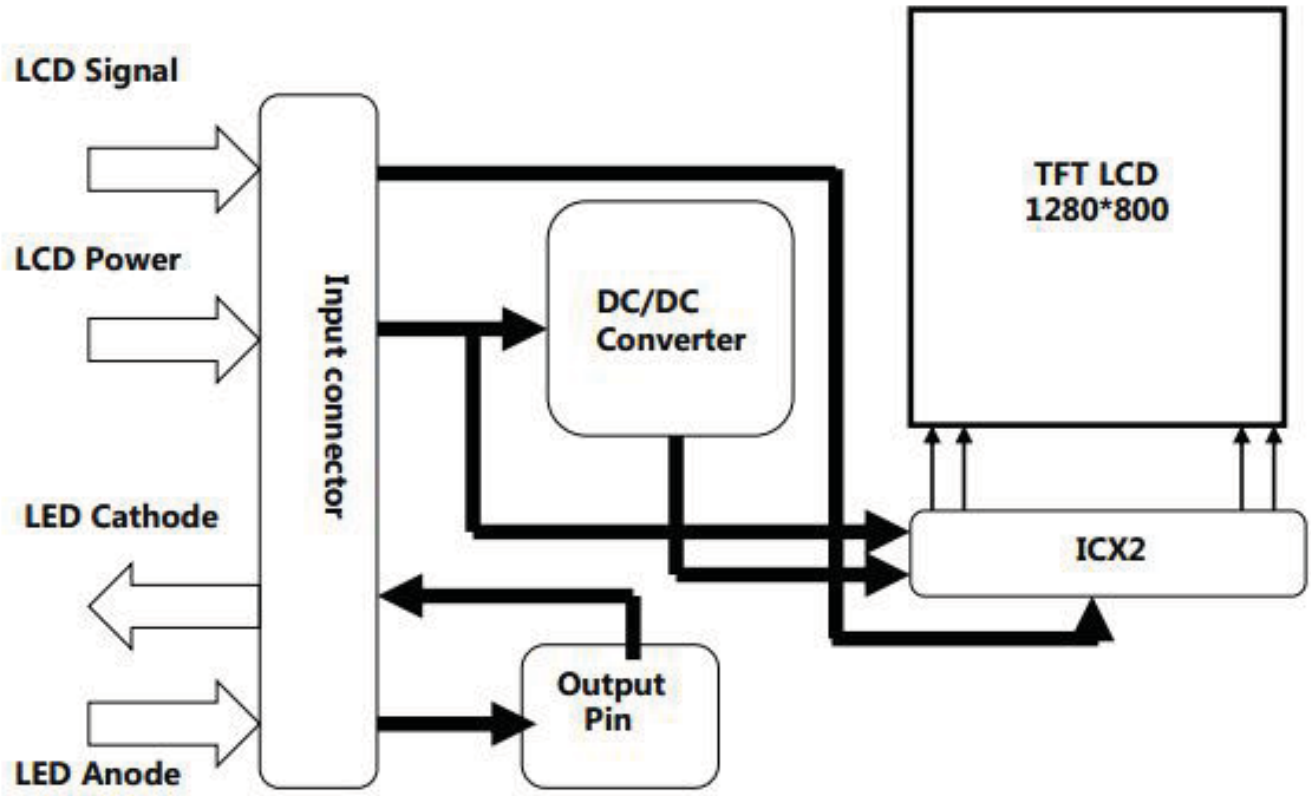
LCD Module:		
SHEET 1 of 1	FIRST ANGLE PROJECTION	UNIT mm
DESIGN:		
CHECKED:		
COUNTERSIGN:	--	
APPROVED:	--	
DRAWING No:		REV A0

3. PIN DESCRIPTION

Pin No.	Symbol	I/O	Function	Remark
1	NC	-	No connection	
2	VDDIN	P	Power supply VDDIN=3.3V	
3	VDDIN	P	Power supply VDDIN=3.3V	
4	CSI			
5	SCL			
6	SDA			
7	GND	P	Ground	
8	RIN0-	I	0-LVDS differential data	
9	RIN0+	I	0+LVDS differential data	
10	GND	P	Ground	
11	RIN1-	I	1-LVDS differential data	
12	RIN1+	I	1+LVDS differential data	
13	GND	P	Ground	
14	RIN2-	I	2-LVDS differential data	
15	RIN2+	I	2+LVDS differential data	
16	GND	P	Ground	
17	LVDS_CLK-	I	-LVDS differential clock input	
18	LVDS_CLK+	I	+LVDS differential clock input	
19	GND	P	Ground	
20	RIN3-	I	3-LVDS differential data	
21	RIN3+	I	3+LVDS differential data	
22	GND	P	Ground	
23	NC	-	No connection	
24	NC	-	No connection	
25	GND	P	Ground	
26	NC	-	No connection	
27	NC	-	No connection	
28	GND	P	Ground	
29	NC	-	No connection	
30	NC	-	No connection	
31	LED-	P	LED GROUND	
32	LED-	P	LED GROUND	
33	LED-	P	LED GROUND	
34	NC	-	No connection	
35	LED_PWM	-	Backlight PWM	
36	LED_EN	-	Backlight EN/ON/OFF	
37	NC	-	No connection	
38	LED+	P	Power supply for Backlight	5-12V
39	LED+	P	Power supply for Backlight	5-12V
40	LED+	P	Power supply for Backlight	5-12V

I: input, O: output, P: Power, -:No Connection

4. BLOCK DIAGRAM



5. ELECTRICAL CHARACTERISTICS

5.1 ABSOLUTE MAXIMUM RATINGS

AGND= GND=0V, Ta = 25 ℃

Item	Symbol	Values		Unit	Remark
		Min.	Max.		
Power voltage	VDD-VSS	-0.3	3.3	V	

5.2 RECOMMENDED OPERATING CONDITION

AGND=GND=0V, Ta = 25℃

Item		Symbol	Values			Unit	Remark
			Min.	Typ.	Max.		
Power Supply Voltage		VDD	3.0	3.3	3.6	V	-
		VRP	-	-	300	mV	-
Power Supply Current		IDD	-	212	364	mA	-
Power Consumption		PLCD	-	0.7	1.2	W	-
Rush current		IRUSH	-	-	3.0	A	-
Input Signal Voltage	Low Level	VIL	0	-	0.5	V	-
	High Level	VIH	2.7	-	3.3	V	

5.3 TFT LCD Module Electrical Specifications

Parameter	Symbol	Values			Unit	Notes
		Min	Typ.	Max		
Power Supply Input Voltage	V_{DD}	3.0	3.3	3.6	V	Note 1
Power Supply Current	I_{DD}	-	303	-	mA	
LED Driver Power Supply Voltage	H_{VDD}	4.5	5		13V	Note 2
LED Driver Power Supply Current	I_{HVDD}	-	120	-	mA	
LED Driver Efficiency	η	-	85	-	%	
Positive-going Input Threshold Voltage	V_{IT+}	-	-	+100	mV	Vcom = 1.2V typ.
Negative-going Input Threshold Voltage	V_{IT-}	-100	-	-	mV	
Differential input common mode voltage	V_{com}	-	1.2	-	V	V_{IH}=100mV, V_{IL}=-100mV
Power Consumption	P_D	-	1.0		W	
	P_{BL}	-	2.4		W	Have Driver
	P_{Total}	-	3.4		W	

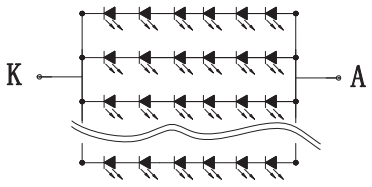
Notes : 1. The supply voltage is measured and specified at the interface connector of LCM.
The current draw and power consumption specified is for 3.7V at 25 ℃
Max value at White Pattern

2. Calculated value for reference (VLED X ILED)

3. CTF of Power Supply Current: PD /PBL

5.4 BACKLIGHT UNIT

Parameter			Min.	Typ.	Max.	Unit	Remarks
LED Forward Voltage		V_F	-	2.8	3.0	V	-
LED Forward Current		I_F	-	20	21	mA	-
LED Power Consumption		P_{LED}	-	2	2.3	W	Note 1
LED Life-Time		N/A	15,000	-	-	Hour	IF = 20mA Note 2
Power supply voltage for Back light		V_{LED}	-	16.8	-	V	
Power supply Current for Back light		I_{LED}	-	120	-	mA	
EN Control Level	Backlight on	V_{ENH}	1.2	-	-	V	EN logic high voltage
	Backlight off	V_{ENL}	-	-	0.4	V	EN logic low voltage
PWM Control Level	PWM High Level	V_{PML}	1.2	-	-	V	
	PWM Low Level	V_{PML}	-	-	0.4	V	
PWM Control Frequency		F_{PWM}	5	-	20	KHz	
PWM duty Ratio			10%	-	-	%	



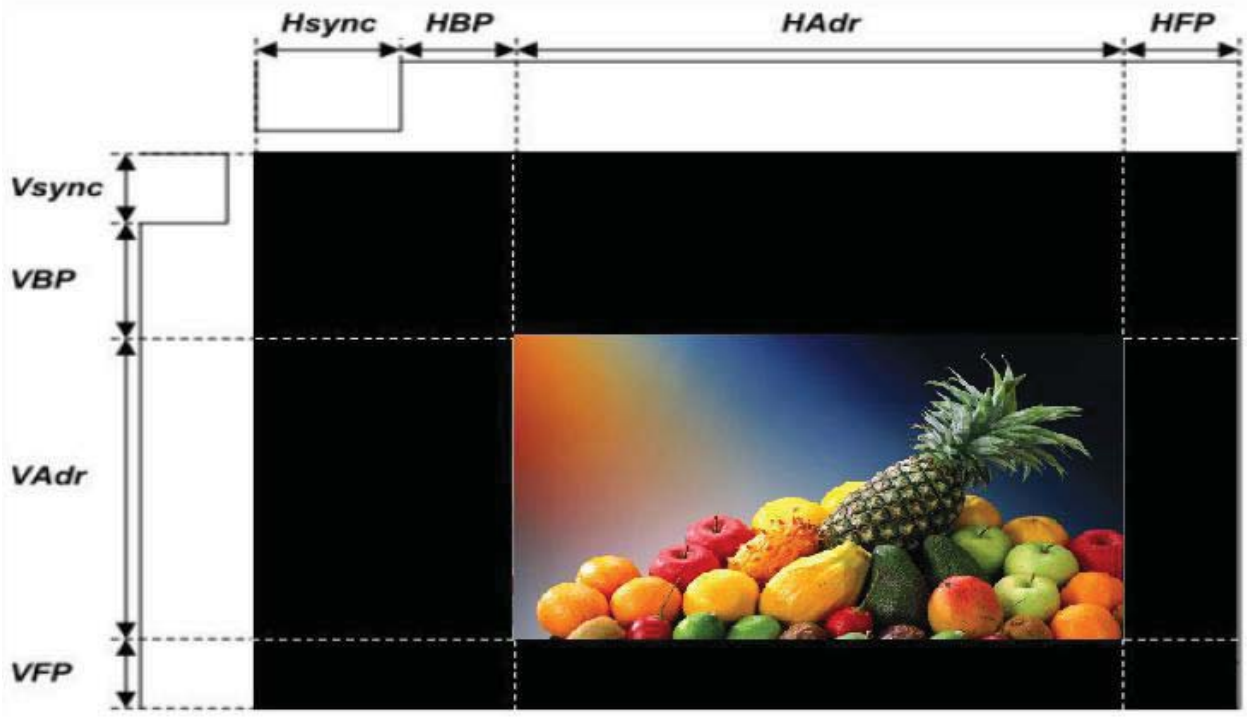
LED电路图

6*6=36LED

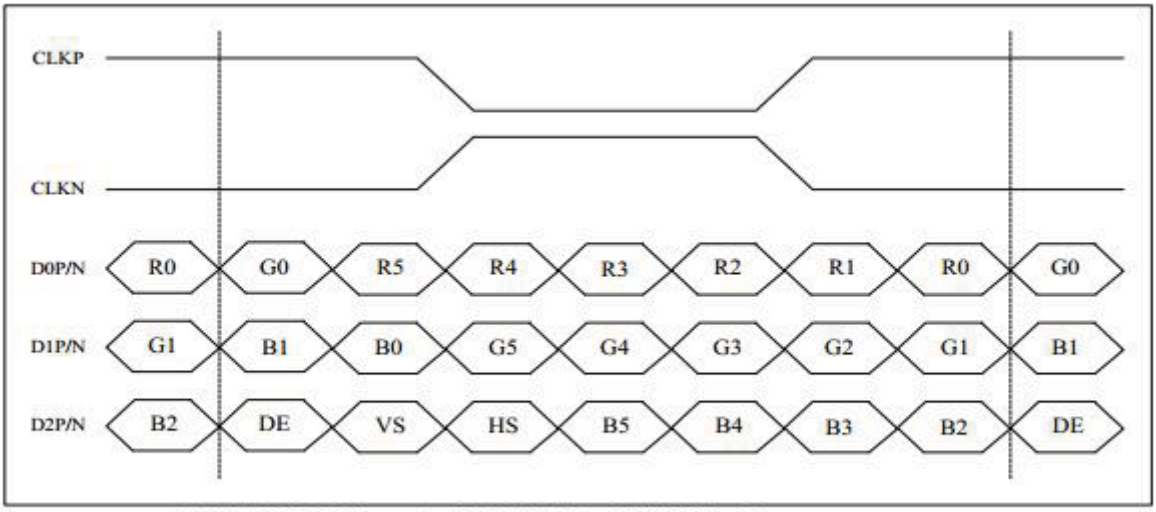
6. INPUT SIGNAL CHARACTERISTICS

6.1. LVDS Input Timing Table

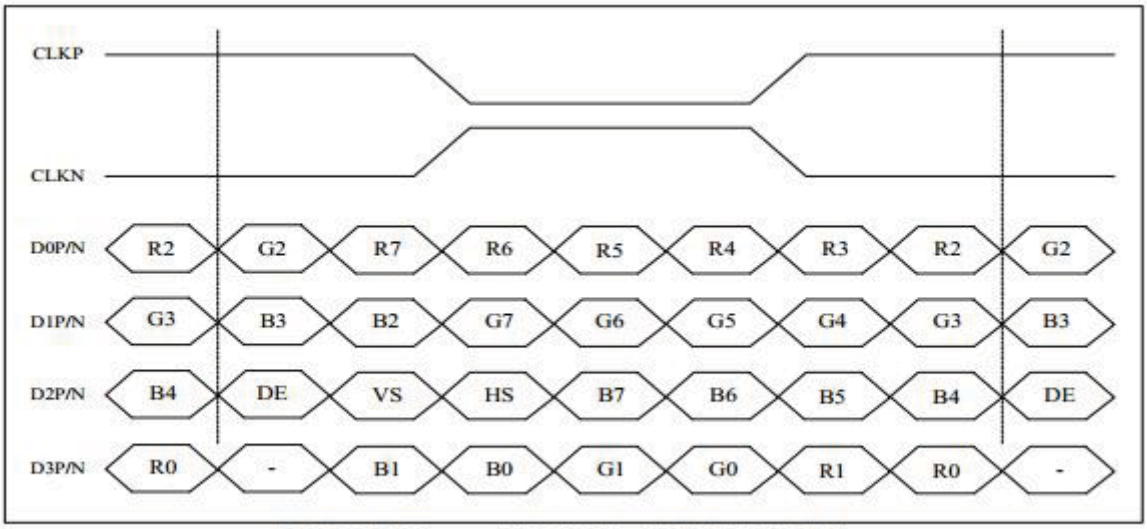
Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
DCLK frequency@Frame rate=60Hz	F_{dclk}	66.3	72.4	78.9	MHz	-
HSYNC period time	T_h	1380	1440	1500	pixel	-
Horizontal display area	T_{hd}	-	1280	-	pixel	-
HSYNC blanking	T_{hbp}+ T_{hfp}	100	160	220	pixel	-
VSYNC period time	T_V	824	838	872	H	-
Vertical display area	T_{VD}	-	800	-	H	-
VSYNC blanking	T_{vbp}+ T_{vfp}	24	38	72	H	-
Frequency	fV	55	60	65	Hz	-



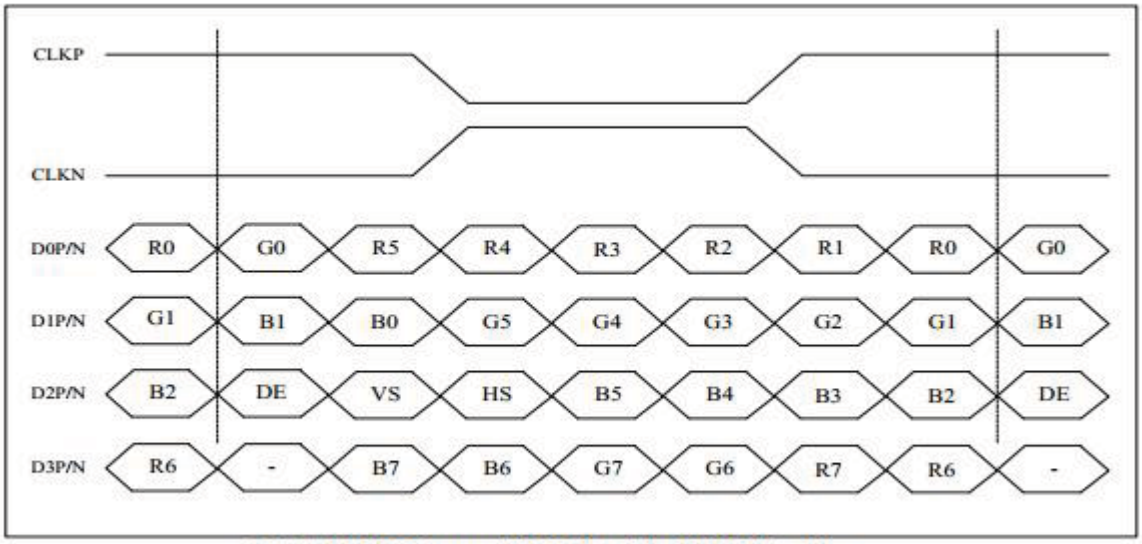
6.2. LVDS Input Signal



6-bit LVDS input (LVBIT=L, LVFMT=Don

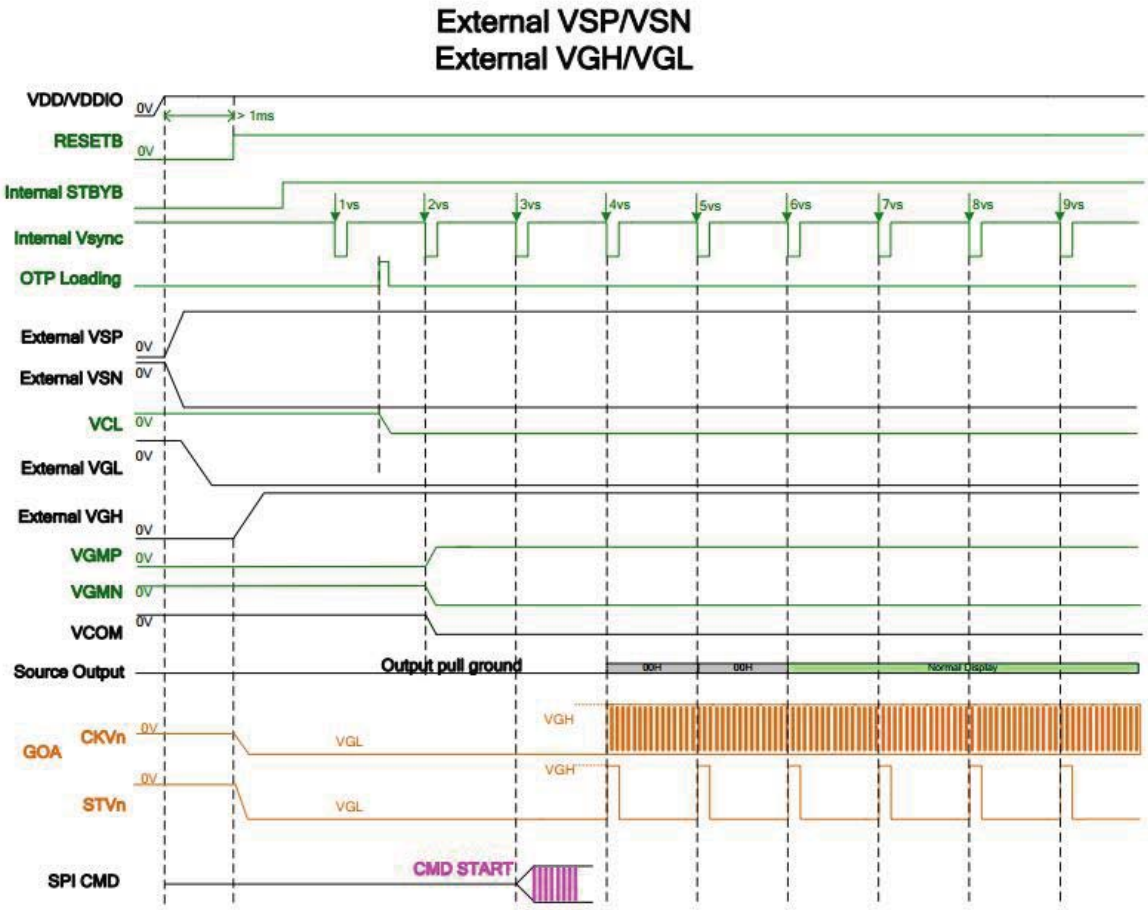


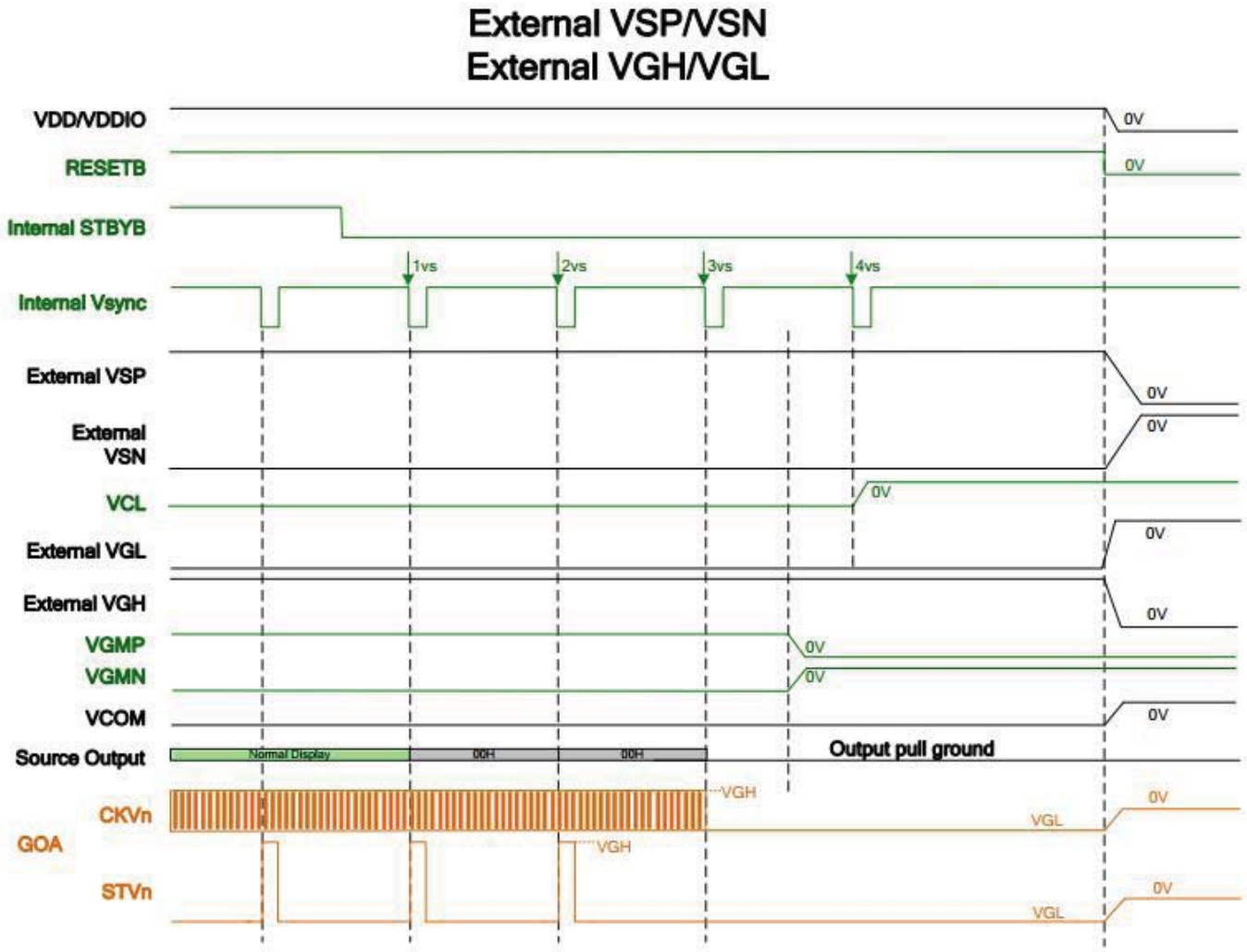
bit LVDS input (LVBIT=H, LVFMT=L)



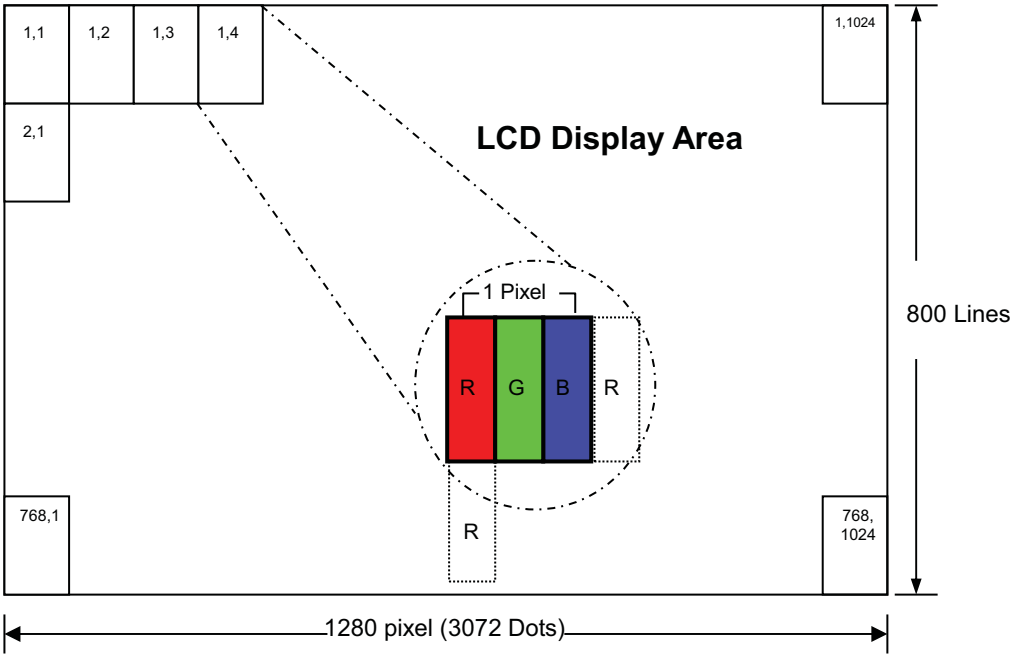
8-bit LVDS input(LVBIT=H, LVFMT=H)

6.3 Power On / Off Sequence





6.3. Data Input Format



7. OPTICAL CHARACTERISTICS

Light source :c-light(with normal polarizer)

Item		Symbol	Condition	Values			Unit	Remark
				Min.	Typ.	Max.		
Viewing angle		Θ_u	CR≧10	70	80	-	degree	Note2
		Θ_D		70	80	-		
		Θ_L		70	80	-		
		Θ_R		70	80	-		
Response time		$T_{ON}+T_{OFF}$	θ=Φ =0° Normal viewing angle	-	35	40	ms	Note1 Note3
Contrast ratio		CR		-	1000	-	-	Note1 Note4
Luminance		L		300	320	-	cd/m²	
Luminance uniformity		YU		75	-	-	%	
Color chromaticity (CIE1931)	White	W_X		0.280	0.310	0.340		Note1 Note5
		W_Y		0.321	0.351	0.381		
	Red	R_X		0.575	0.605	0.635		
		R_Y		0.323	0.353	0.383		
	Green	G_X		0.302	0.332	0.362		
		G_Y		0.528	0.558	0.588		
	Blue	B_X		0.112	0.142	0.172		
		B_Y		0.108	0.138	0.168		
NTSC					50%			

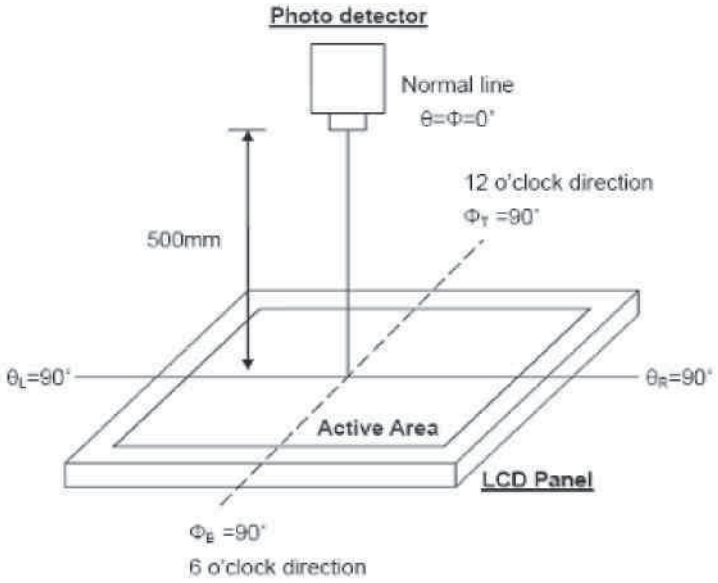
Test Conditions:

1.Measuring surrounding:dark room

2.The ambient temperature is 25±2°C.

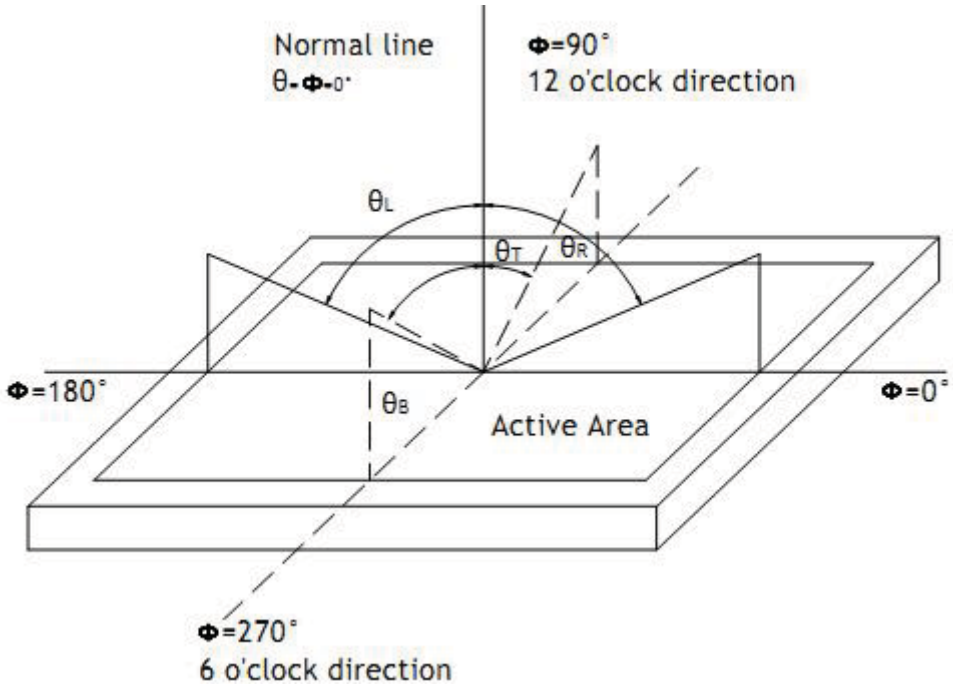
3.The test systems refer to Note1 and Note2.

Note1: Definition of optical measurement system



Note2: Definition of viewing angle range and measurement system

Viewing angle is measured at the center point of the LCD by CONOSCOPE (ergo-80).



Note3: Definition of Response time

The response time is defined as the LCD optical switching time interval between “White” state and “Black” state. Rise time (TON) is the time between photo detector output intensity changed from 90% to 10%. And fall time (TOFF) is the time between photo detector output intensity changed from 10% to 90%.

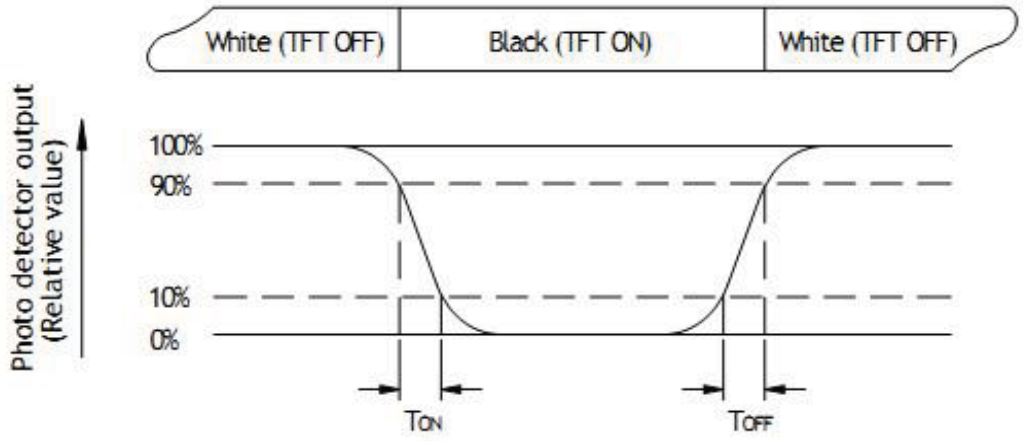


Fig. 6-3 Definition of response time

Note4: Definition of contrast ratio

$$\text{Contrast ratio(CR)} = \frac{\text{Luminance measured when LCD on the Whitestate}}{\text{Luminance measured when LCD on the Blackstate}}$$

"White state ": The state is that the LCD should drive by Vwhite.

"Black state": The state is that the LCD should drive by Vblack.

Vwhite: To be determined Vblack: To be determined.

Note5: Definition of color chromaticity (CIE1931)

Color coordinates measured at center point of LCD.

Note6: All input terminals LCD panel must be ground while measuring the center area of the panel.

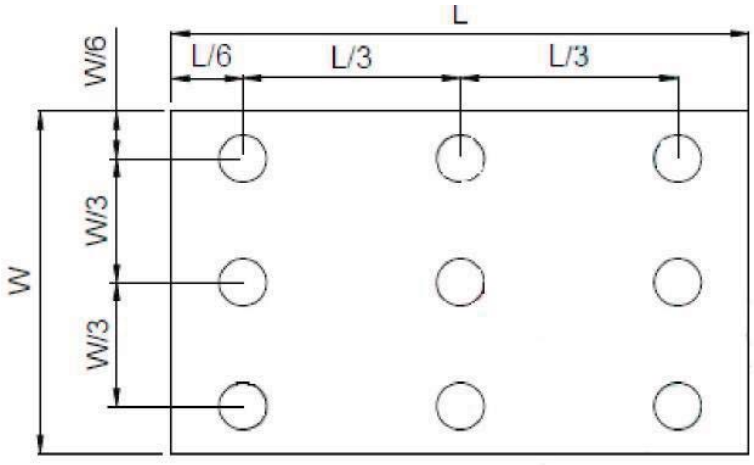
The LED driving condition is IL=20mA of which each LED module is 3 LED serial.

Note7: Definition of Luminance Uniformity

Active area is divided into 9 measuring areas.Every measuring point is placed at the center of each measuring area.

Luminance Uniformity (U) = Lmin/ Lmax

L----Active area length, W---- Active area width



Bmax: The measured maximum luminance of all measurement position.

Bmin: The measured minimum luminance of all measurement position.

Note8: Definition of Luminance

Measure the luminance of white state at center point.

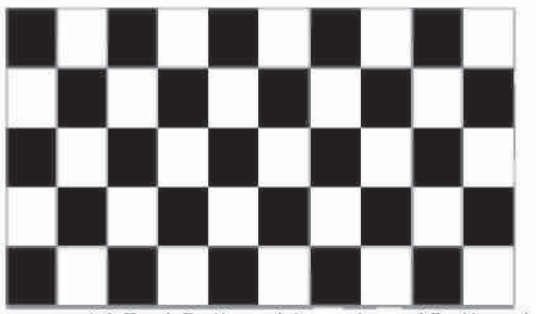
8. RELIABILITY TEST

8.1 TEMPERATURE AND HUMIDITY

Test Item	Test Condition
High Temperature Storage	Ta=80°C; 240hrs
Low Temperature Storage	Ta=-25°C; 240hrs
High Temperature Operation	Ta=70°C ; 240hrs
Low Temperature Operation	Ta=-20°C; 240hrs
High Temperature High Humidity Operation	Ta=60°C ; 90%RH ; 240hrs(no condensation)
Thermal Shock	-20℃(0.5hrs) ~ 60℃(0.5hrs) / 100 cycles
Image Sticking	25℃ ; 2hrs Note1

Note1:Condition of image sticking test :25°C±2°C

Operation with test pattern sustained for 4hrs,then change to gray pattern immediately.after5 mins,the mura must be disappeared completely



(a) Test Pattern (chess board Pattern)

(b) Gray Pattern

8.2 VIBRATION & SHOCK

Test item	Conditions
Packing Shock (non-operation)	Shock level:980m/s^2 Waveform:1/2 Sine wave,6msec ±X, ±Y ±Z,each axis 1 times
Packing Vibration (non-operation)	Frequency range:8 HZ~33.3HZ Stroke:1.0mm,sweep:10 HZ ~50 HZ x,y,z 2 hours for each direction

8.3 ESD

Test item	Conditions
Electro Static Discharge Test (non-operation)	150pF,330Ω， Contact±4KV,Air :±8KV Note 1
	200pF,0Ω， ±200V Contact test.Note 2

Note1:LCD glass and metal bezel
Note2:IF connector pins

9. GENERAL PRECAUTION

9.1 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.

9.2 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.

9.3 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.

9.4 WARRANTY

(1)The period is within twelve months since the date of shipping out under normal using and storage conditions.
(2) Do not repaired or modified the LCM . It may cause function to lose efficacy , Starry does not warrant the LCM.
(3) All process and material comply RoHS.