Shenzhen Starbillions Electronics Co.,Ltd.

PRODUCT SPECIFICATIONS

For Customer:_____

Customer Model No._____

Module No.: XBY101MBC000-4200AA3

Date : 2021.12.13

Version :V0

■Preliminary Product SPEC

□ Final Product SPEC

For Customer's Acceptance:

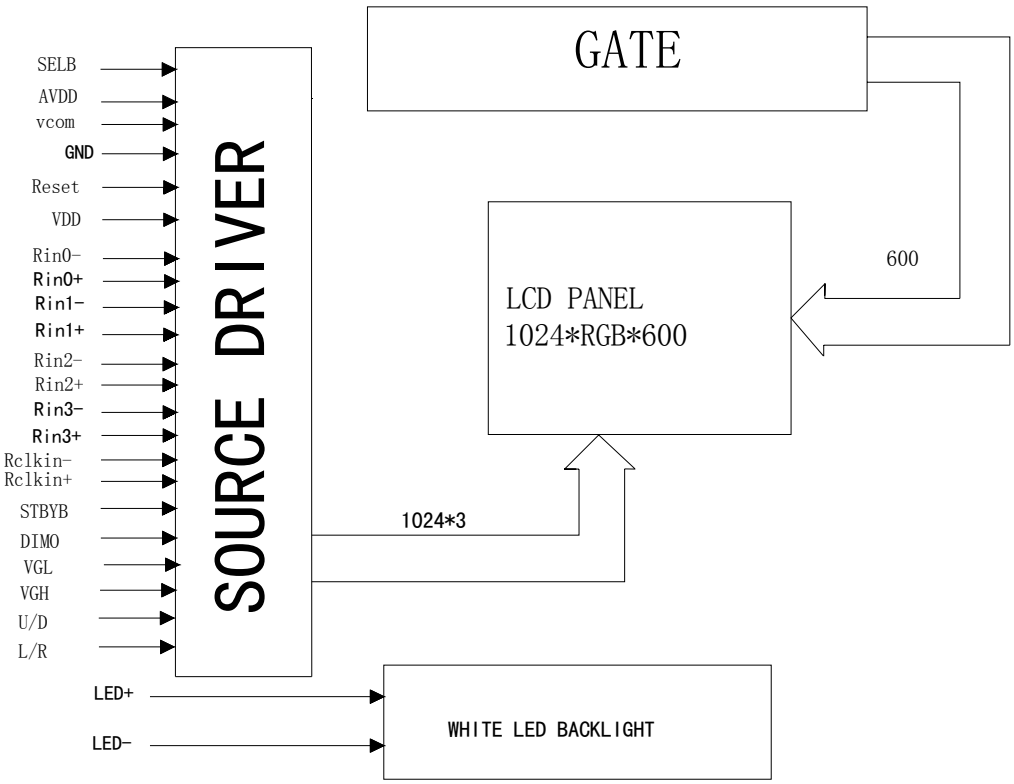
Approved By	Comment

Approved by DIV	Reviewed by QA	Reviewed by RD

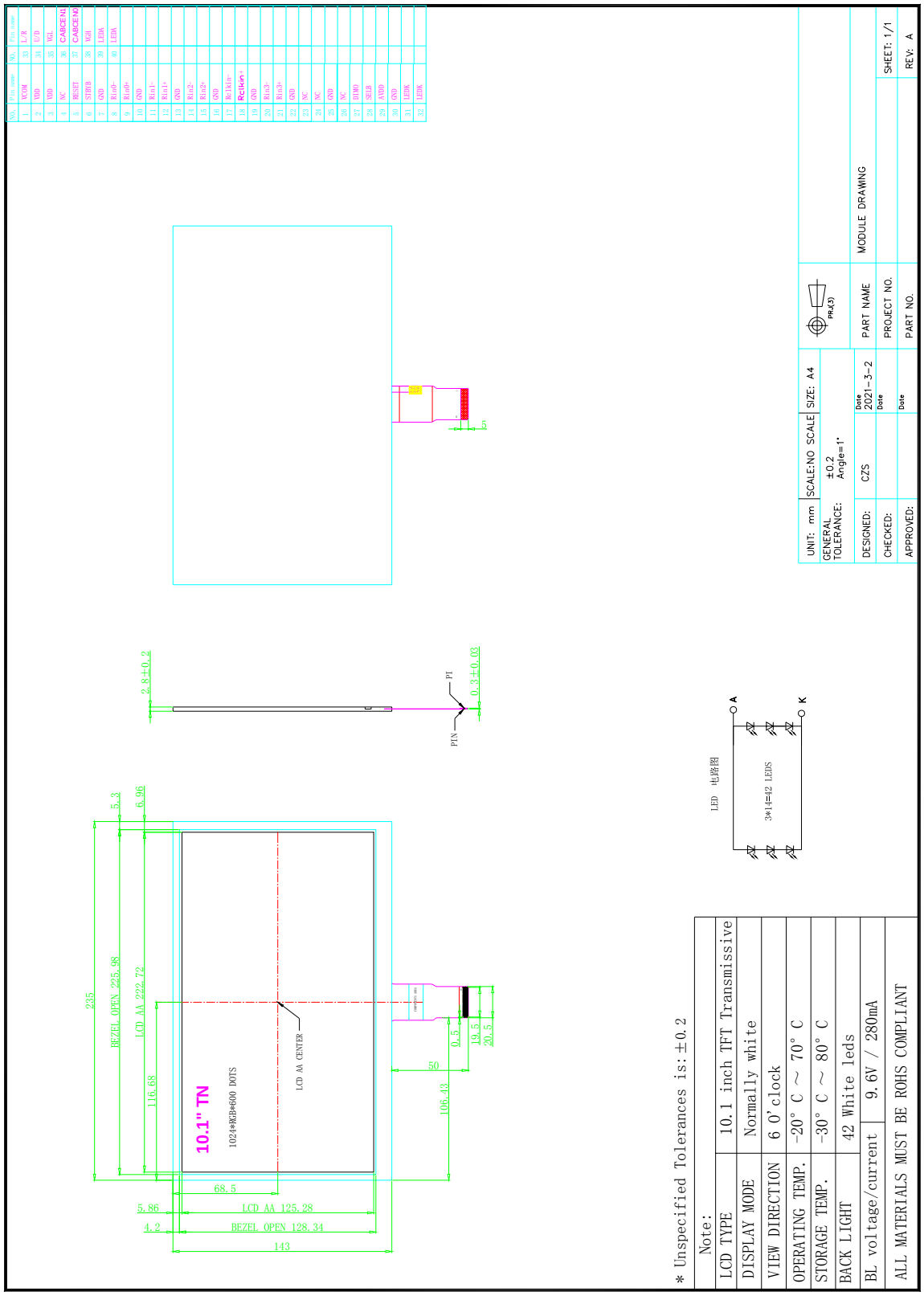
1. PHYSICAL DATA

Item	Contents	Unit
LCD type	TFT TRANSMISSIVE	---
Viewing direction	6	o'clock
Module size (W×H×T)	235 × 143 × 2.8	mm^3
Active area(W×H)	222.72×125.28	mm^2
Number of dots(W×H)	1024(RGB) × 600	dots
Pixel Pitch(H×V)	0.2175×0.2088	mm
Driver IC	EK79001HJ3	---
Colors	16.7M	---
Backlight Type	42 white leds 9.6V 280mA	---
Interface Type	LVDS	---

2. BLOCK DIAGRAM



3. Mechanical Dimension



4. Pin Descriptions

Pin No.	Symbol	Functional	Notes
1	VCOM	Common Voltage	
2~3	VDD	Power Supply for digital circuit	
4	NC	No connection	
5	RESET	Global reset pin	
6	STBYB	Standby mode, Normally pulled high	
7	GND	Ground	
8	Rin0-	-LVDS differential data input	
9	Rin0+	+LVDS differential data input	
10	GND	Ground	
11	Rin1-	-LVDS differential data input	
12	Rin1+	+LVDS differential data input	
13	GND	Ground	
14	Rin2-	-LVDS differential data input	
15	Rin2+	+LVDS differential data input	
16	GND	Ground	
17	RclkIN-	-LVDS differential clock input	
18	RclkIN+	+LVDS differential clock input	
19	GND	Ground	
20	Rin3-	-LVDS differential data input	
21	Rin3+	+LVDS differential data input	
22	GND	Ground	
23-24	NC	No connection	
25	GND	Ground	
26	NC	No connection	
27	NC	NC	
28	SELB	6bot/8bit mode select ， L=8 BIT ， H=6BIT	
29	AVDD	Power for Analog Circuit	
30	GND	Ground	
31-32	LED-	LED Cathode	
33	L/R	Horizontal inversion	
34	U/D	Vertical inversion	
35	VGL	Gate OFF Voltage	
36	NC	NC	
37	NC		
38	VGH	Gatr ON Voltage	
39-40	LED+	LED Anode	

5. Operation Specification

5.1 Absolute maximum ratings

Parameter	Symbol	Min	Max	Unit
Power supply1	V_{DD}	-0.5	+3.96	V
Power supply2	Avdd	-0.5	+13.85	V
Operating temperature	T_{OPR}	-20	70	℃
Storage temperature	T_{STG}	-30	80	℃

5.2

Input driver voltage

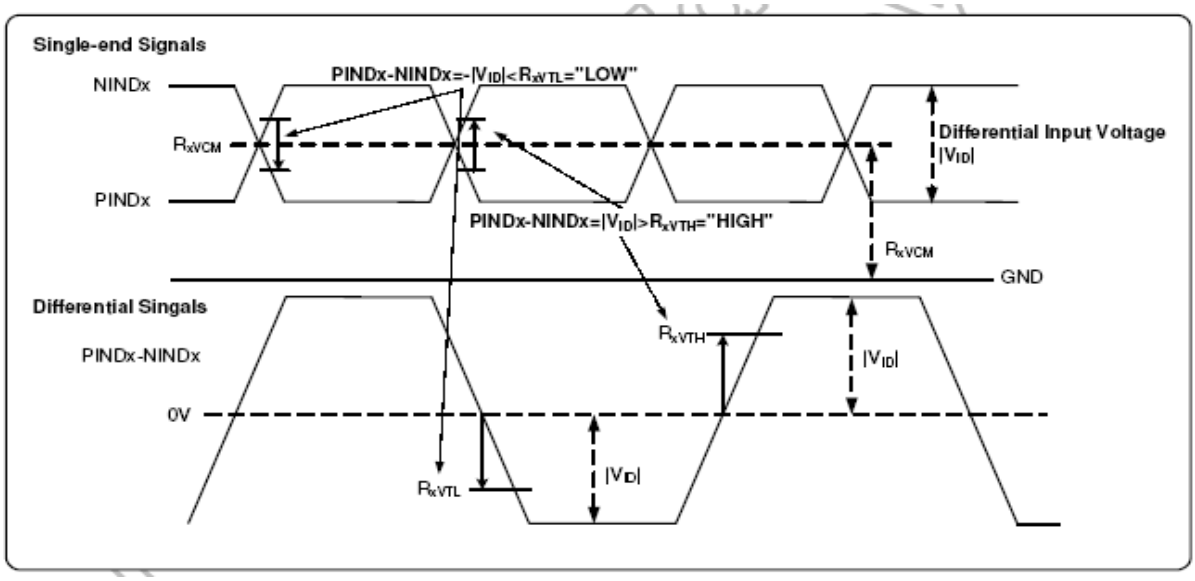
Parameter	Symbol	Value	Unit	Remarks
TFT Gate ON Voltage	VGH	21	V	
TFT Gate Off Voltage	VGL	-8	V	
Analog Power Supply Voltage	AVDD	10.8	V	
TFT Common Electrode Voltage	VCOM	3.8	V	Note

Note: Please adjust Vcom to make the flicker level be minimum

6. DC ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Spec.			Unit	Condition
		Min.	Typ.	Max.		
Differential input high Threshold voltage	R_{XVTH}	-	-	+0.1	V	R_{XVCM}=1.2V
Differential input low threshold voltage	R_{XVTL}	-0.1	-	-	V	
Input voltage range (singled-end)	R_{XVIN}	0	-	VDD-1.2+ $\|V_{ID}\|/2$	V	-
Differential input common Mode voltage	R_{XVCM}	$\|V_{ID}\|/2$	-	VDD-1.2	V	-
Differential input voltage	$\|V_{ID}\|$	0.2	-	0.6	V	-
Differential input leakage Current	RV_{Xiz}	-10	-	+10	μA	-
LVDS Digital Operating Current	Iddlvds	-	15	30	mA	Fclk=65MHz, VDD=3.3V
LVDS Digital Stand-by Current	Istlvds	-	10	50	μA	Clock & all Functions are stopped

Preliminal



Parameter	Symbol	Spec. Min.	Spec. Typ.	Spec. Max.	Unit	Condition
Base drive current for PWM	IDRV	-	-	60	mA	R_{XVCM} =1.2V
DRV output voltage for PWM	VDRV	0	-	VDD	V	
Feed back voltage for PWM	VFB	0.55	0.6	0.65	V	-
Duty cycle maximum	Dmax	-	-	85	%	-
VCOM buffer input voltage	VCOMI	1	-	AVDD	V	-
VCOM buffer output voltage	VCOMO	VCOMI-0.2	VCOMI	VCOMI+0.2	V	-
VCOM buffer output current	IVCOM	-	-	10	mA	Fclk=65MHz, VDD=3.3V

7. Parallel RGB input timing table

Resolution:1024x600

DE mode

DE mode

DE mode

Parameter	Symbol	Value Min.	Value Typ.	Value Max.	Unit
DCLK frequency @Frame rate=60hz	fclk	40.8	51.2	67.2	Mhz
Horizontal display area	thd		1024		DCLK
HSYNC period time	th	1114	1344	1400	DCLK
HSYNC blanking	thb+thfp	90	320	376	DCLK
Vertical display area	tvd		600		H
VSYNC period time	tv	610	635	800	H
VSYNC blanking	tvb+tvfp	10	35	200	H

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HV mode :

HV mode(1)

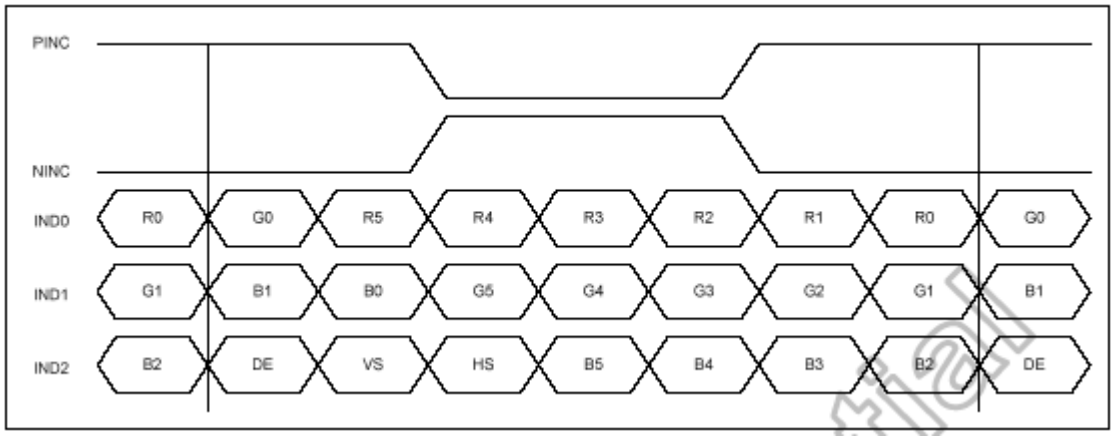
HV mode Horizontal input timing						
Parameter		Symbol	Value			Unit
Horizontal display area		thd	1024			DCLK
DCLK frequency@ Frame rate=60hz		fclk	Min.	Typ.	Max.	
			44.9	51.2	63	Mhz
1 Horizontal Line		th	1200	1344	1400	DCLK
HSYNC pulse width	Min.	thpw	1			
	Typ.		–			
	Max.		140			
HSYNC back porch		thbp	160	160	160	
HSYNC front porch		thfp	16	160	216	

HV mode(2)

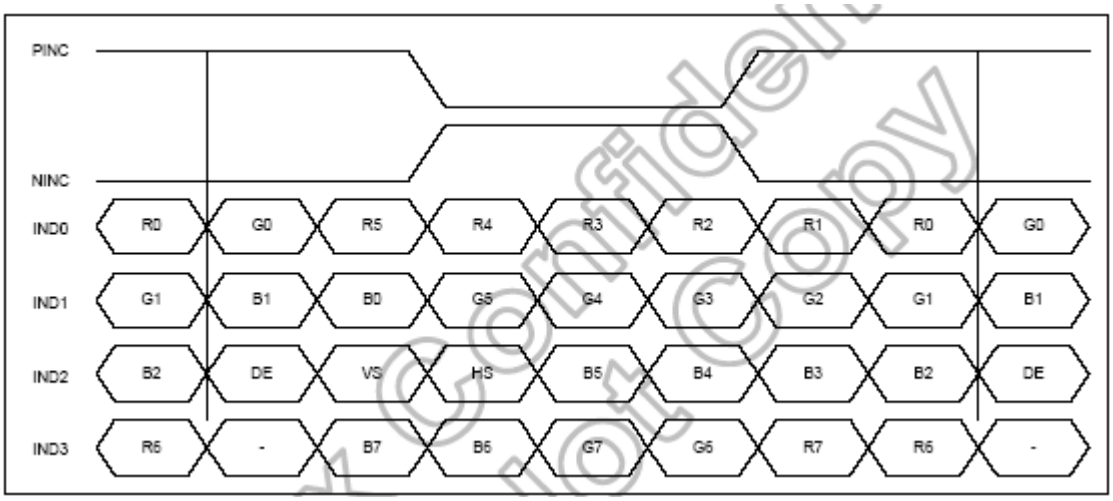
Vertical input timing					
Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
Vertical display area	tvd	600			H
VSYNC period time	tv	624	635	750	H
VSYNC pulse width	tvpw	1	–	20	H
VSYNC back porch	tvb	23	23	23	H
VSYNC front porch	tvfp	1	12	127	H

8. Data input format for LVDS

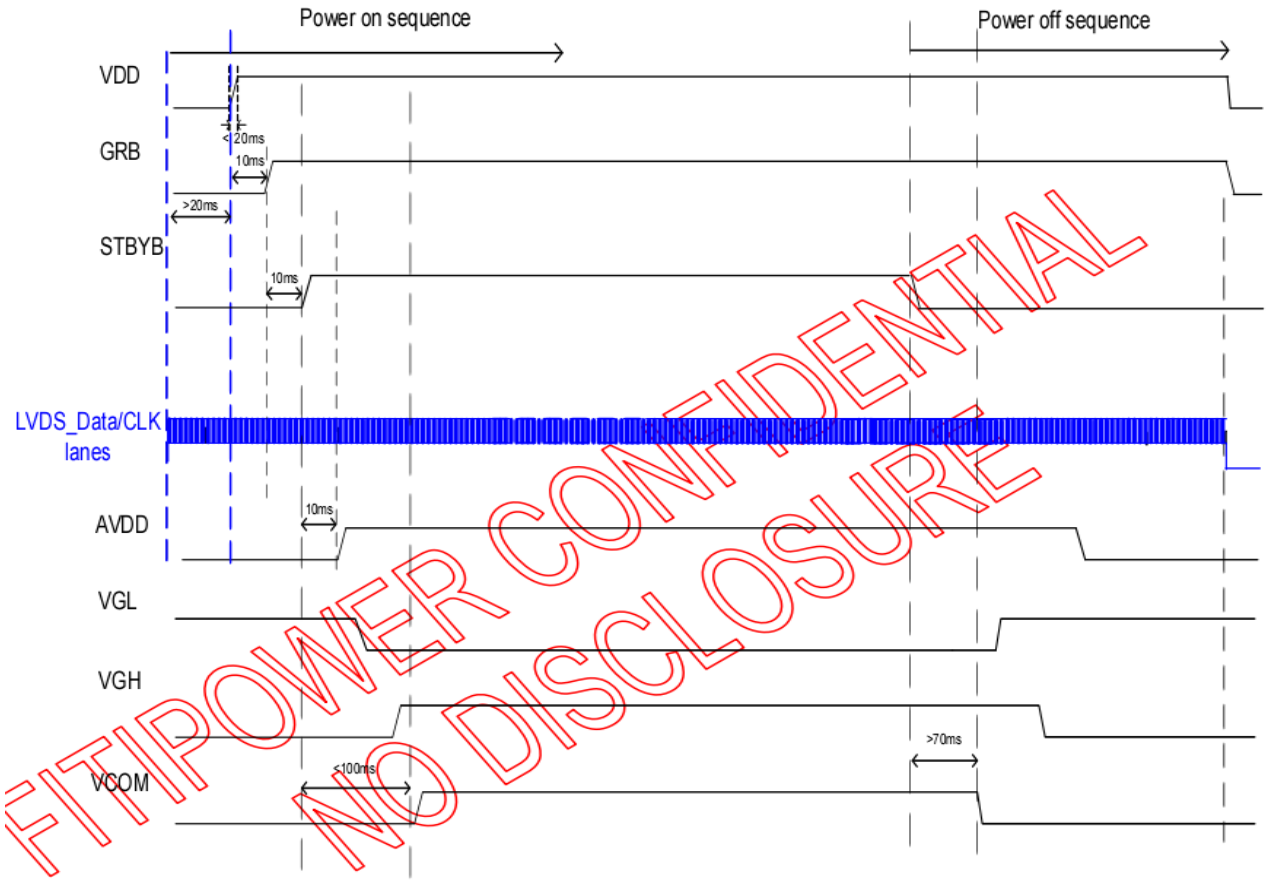
8.1 For 6-Bit LVDS



8.2 For 8-Bit LVDS



8.3 Power on/off timing sequence for LVDS interface



Note LVDS data/CLK more than 20ms before VDD

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9. Backlight Characteristic

Item	Symbol	Min	Typical	Max	Unit
LED module Forward voltage	V_{LED}	--	9.3	9.6	V
LED module current	I_{LED}	--	280	--	mA
LCM Surface Luminance ★1	L_S	--	TBD	--	mcd
LCM Surface brightness uniform ★2	L_D	80	--	--	%

★ 1 Test condition is:

(a) Center point on active area.

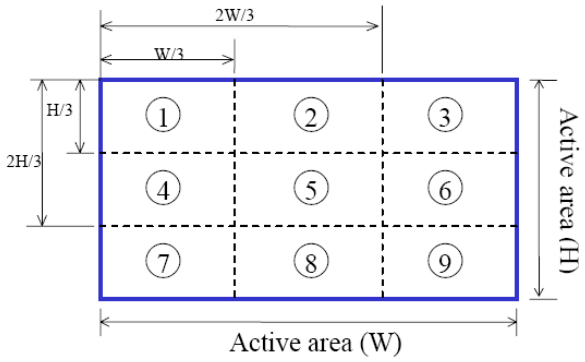
(b)Best Contrast.

★2 Uniform measure condition:

(1)Measure 9 point. Measure location show below;

(2)Uniform=(Min. brightness /Max. brightness)*100%

(3)Best Contrast.



10.Electro-optical Characteristics

Parameter		Symbol	Condition	Min	Typ	Max	Unit	Remark
Viewing angle range	Hor.	Φ3	CR≥10		70		Deg	
		Φ9			70		Deg	
	Ver.	Φ12			60		Deg	
		Φ6			70		Deg	
Color gamut (C light)					50		%	
Contrast ratio		T(%)	Φ0°		600			
Response Time		TRT	Temp=25° C		8		ms	

11. Reliability

11.1 Mtbf

The LCD module shall be designed to meet a minimum MTBF value of 50000 hours with normal

11.2 Test condition

NO.	ITEM	CONDITION	CRITERION
1	High Temperature Non-Operating Test	80℃*120Hrs	No Defect Of Operational Function In Room Temperature Are Allowable
2	Low Temperature Non-Operating Test	-30℃*120Hrs	
3	High Temperature/Humidity Non Operating Test	60℃*75%RH*120Hrs	
4	High Temperature Operating Test	70℃*120Hrs	
5	Low Temperature Operating Test	-20℃*120Hrs	
6	Thermal Shock Test	-10℃(30Min) -50℃(30Min) *10CYCLES	

Notes:

1. Judgments should be made after exposure in room temperature for two hours.
2. The distill water is used for the high temperature/humidity test.
3. The sample above is individually for every reliability tests condition.

12. Inspection standards

1.AQL(Acceptable Quality Level

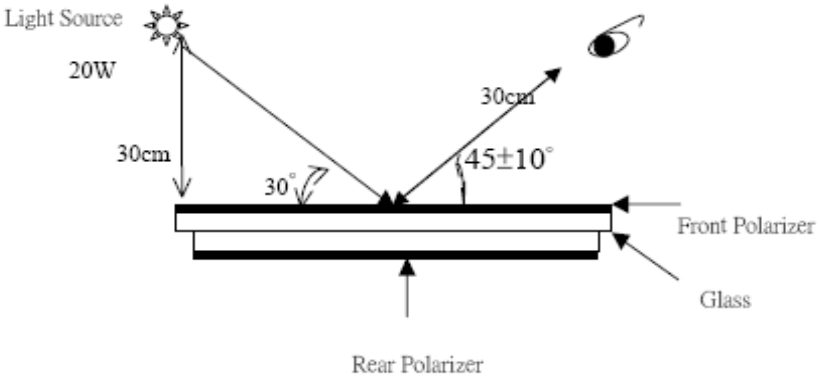
AQL of major and minor defect.

	MAJOR DEFECT	MINOR DEFECT
AQL	0.65	1.5

2. Basic conditions for inspection

The LCM face to us, in normal environment, the lux is 1000±200.(Darkroom's lux: 100±50),About an angle of incidence 30,a distance of 30 cm with an angle of 45 degree to check the products without uncovering the film!

(As shown below)



13.Precautions for using LCD modules.

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

(4)Store the panel or module in a dark place where the temperature is 23±5℃and the humidity is below 45±20%RH.
(5)Store in anti-static electricity container.
(6)Store in clean environment, free from dust, active gas, and solvent.
(7)Do not place the module near organics solvents or corrosive gases.
(8))Do not crush, shake, or jolt the module.

13.3Handling Precautions

(9)Avoid static electricity, which can damage the CMOS LSI.
(10)The polarizing plate of the display is very fragile, please handle if very carefully.
(11)Do not give external shock.
(12)Do not apply excessive force on the surface.
(13)Do not wipe the polarizing plate with a dry cloth, as it may easily scratch the surface of plate.
(14)Do not use ketonics solvent & Aromatic solvent, use with a soft cloth soaked with a cleaning naphtha solvent.
(15)Do not operate it above the absolute maximum rating.
(16)Do not remove the panel or frame from the module.

13.4 Warranty

The period is within twelve months since the date of shipping out under normal using and storage conditions.