

深圳市友创光显有限公司

产品规格书

Product Type: 10" TFT LCD Module

LCD Number: YC100IPS

MODULE NO. : _____

CUSTOMER	PREPARE BY	CHECK BY	APPROVED BY
APPROVED			
SUPPLIER	PREPARE BY	CHECK BY	APPROVED BY
APPROVED			

Preliminary Specification

Final Specification

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1. OVERVIEW

YC100IPS is 10" color TFT-LCD (Thin Film Transistor Liquid Crystal Display) module composed of LCD panel, driver ICs, control circuit and LED backlight. By applying 1024×768 images are displayed on the 9.7" diagonal screen. Display 16.7M colors by R.G.B signal input.

General specification are summarized in the following table:

Item	Specification	Unit
Screen Diagonal	9.676	Inch
Active area	196.608 x 147.456	mm
Pixels (HxV)	1024x3(RGB)X768	-
Pixel Pitch	0.192 (H) x 0.192 (V)	mm
Pixel Arrangement	R.G.B. Vertical Stripe	-
Display Mode	Normally Black	-
Contrast Ratio	(900) (Typ.)	-
Response Time	(20) (Typ.)	ms
Input Voltage	3.3V	V
Interface	LVDS	
Module size	210.20x164.20x5.00mm	mm
Support Color	262,144	
Weight	TBD	g
Surface treatment	Hard Coating	

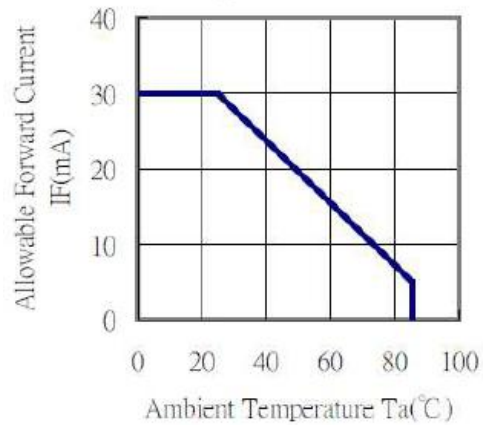
2. ABSOLUTE MAXIMUM RATINGS

The following are maximum values which, if exceeded, may cause faulty operation or damage to the unit.

Item	Symbol	Min.	Max.	Unit	Note
Digital Supply Voltage	DVDD DVDD_LVDS	-0.3	7	V	
Analog Supply Voltage	AVDD	-0.5	14.85	V	
Gate On Voltage	VGH	-0.3	42	V	
Gate Off Voltage	VGL	-20	0.3	V	
Gate On-Gate Off Voltage	VGH-VGL	12	40	V	
Signal Input Voltage	NIND0 ~ NIND3 PIND0 ~ PIND3 NINC,PINC	-0.5	5	V	
Forward Current (per LED)	If	-	30	mA	
Reverse Voltage (per LED)	VR	-	5	V	
Pulse forward current (per LED)	I _{fp}	-	100	mA	1、2、3
Operating temperature	Topa	-20	70	°C	4
Storage temperature	Tstg	-30	80	°C	4

Note:

- *1) If the product were used out of the operation and storage range, it will have quality issue.
- *2) I_{fp} Conditions : Pulse Width \leq 10msec, Duty \leq 1/10.
- *3) Each one of LED operation must be follow diagram of Ambient Temperature and Allowable Forward Current.



- *4) If users use the product out off the environmental operation range (temperature and humidity), it will have visual quality concerns.

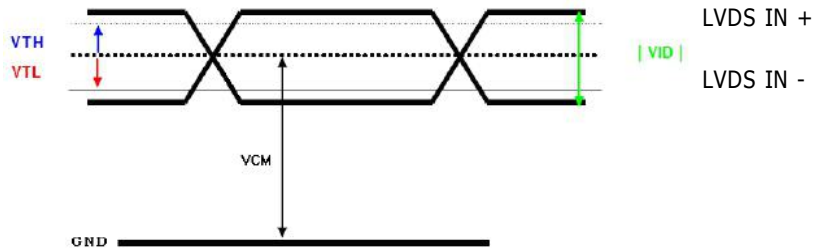
3. ELECTRICAL CHARACTERISTICS

3.1 TFT LCD

Ta=25℃

ITEM	SYMBOL	MIN	TYP	MAX	UNIT	NOTE
Digital Power Supply Voltage For LCD	DVDD	2.3	3.3	3.6	V	
Logic Input Voltage (LVDS:IN+,IN-)	VCM	$\frac{VID}{2}$	-	$2.4 - \frac{VID}{2}$	V	Note1
	VID	200	-	600	mV	Note1
	VTH	-	-	100	mV	VCM=1.2V Note1
	VTL	-100	-	-	mV	
Analog Power Supply Voltage	AVDD	8.4	9.0	9.6	V	
Gate On Power Supply Voltage	VGH	17	18	19	V	
Gate Off Power Supply Voltage	VGL	-9	-8	-7	V	
Common Power Supply Voltage	VCOM		(3.4)		V	Note2
Logic Input Voltage	VIH	0.7*DVDD	-	DVDD	V	
	VIL	GND	-	0.3*DVDD	V	

【Note1】 LVDS signal



【Note2】 Please adjust VCOM to make the flicker level be minimum.

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3.2 TFT-LCD Current Consumption

Item	Symbol	Condition	Min.	Typ.	Max.	Unit.	Note.
Gate on Current	IVGH	VGH = 18V	-	0.5	1	mA	【Note1】
Gate off Current	IVGL	VGL = -6V	-	0.5	1	mA	【Note1】
Digital Current	IDVDD	DVDD = 3.3V	-	25	35	mA	【Note1】
Analog Current	I AVDD	AVDD = 9.6V	-	25	35	mA	【Note1】
Total Power Consumption	PC		-	336	478.5	mW	【Note1】

【Note1】 Typical: Under 256 gray pattern
Maximum: Under Black pattern



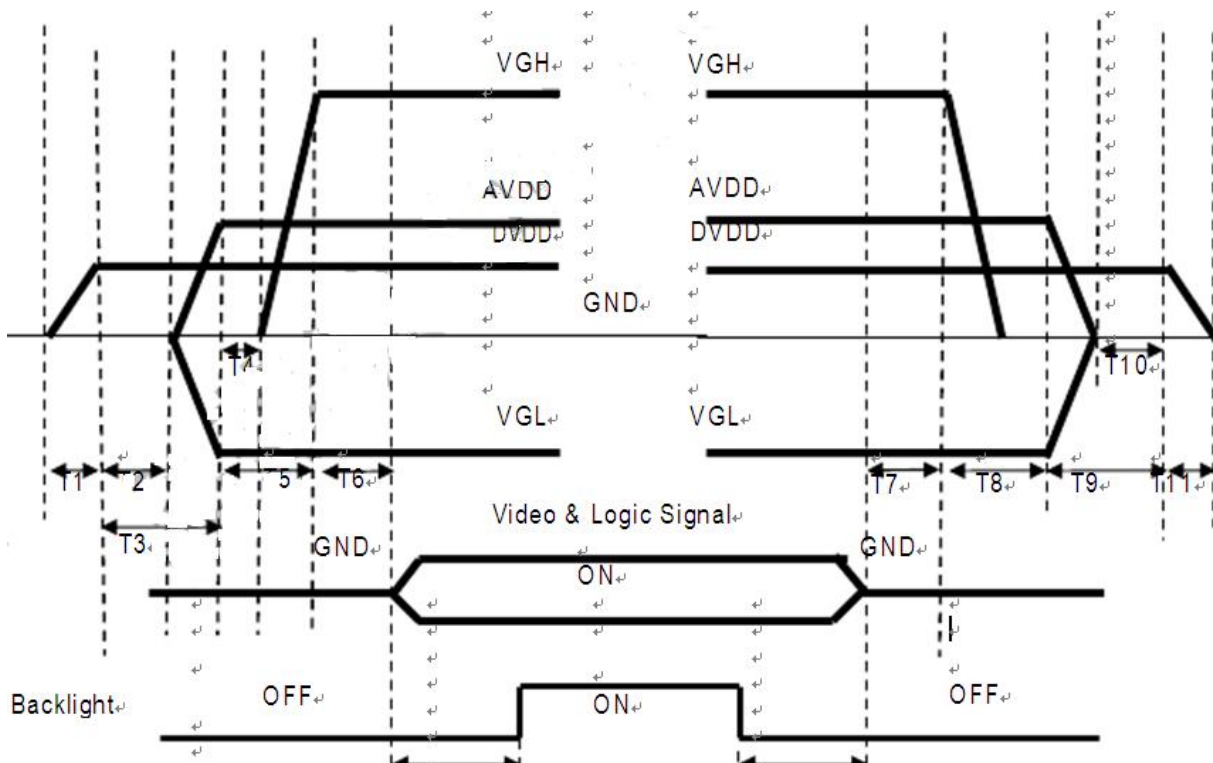
256 gray pattern



Black Pattern

3.3 Power and Signal sequence

Power On: DVDD → AVDD/VGL → VGH → Video & Logic Signal → Backlight
Power Off: Backlight → Video & Logic Signal → VGH → AVDD/VGL → DVDD



0 < T1 ≤ 10ms T2 > 0ms T3 > 20ms T4 > 0ms T5 > 10ms 0 < T6 ≤ 10ms T7 > 0ms
T8 > 0ms T9 > 0ms T10 > 0ms 0 < T6 ≤ 10ms 0 < T11 ≤ 10ms T12 ≥ 200ms T13 ≥ 200ms

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3.4 Backlight

ITEM	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT	NOTE
LED current	IL	Ta=25℃ (25mA/serise)	270	300	330	mA	
LED voltage	VL	Ta=25℃ (25mA/serise)	9	9.6	10.5	V	
Power consumption	WL	Ta=25℃ (25mA/serise)	--	2.88	--	W	
LED Lifetime	-	Ta=25℃ IF=25mA	30000			Hr	

Remarks:

*1)LED Circuit Diagram



*2) A: Anode(+), K: Cathode(-)

*3) Suggestion: Using the constant current control to avoid the leakage light and brightness quality issue.

*4) Definition of Led lifetime: Luminance < Initial luminance 50%.

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4. INTERFACE CONNECTION

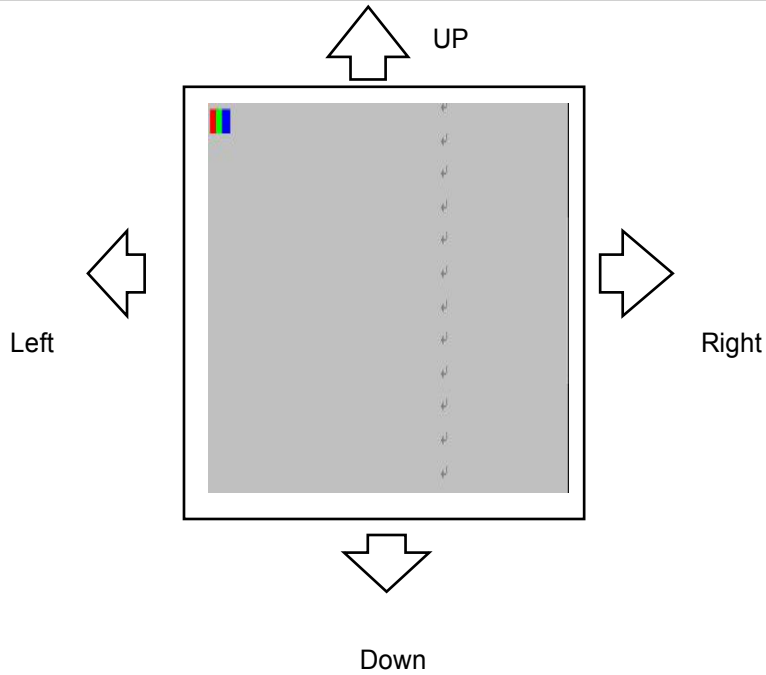
4.1 CN1 (Input Signal)

Pin No.	SYMBOL	FUNCTION	Note
1	VCOM	Common voltage	
2	DVDD	Digital power	
3	DVDD	Digital power	
4	NC	Not connect	
5	RESET	Global reset pin. Active low to enter reset state. Suggest to connecting with an RC reset circuit for stability. Normally pull high. (R=10K , C=1 μ F)	
6	UPDN	Vertical inversion	Note 1
7	SHLR	Horizontal inversion	Note 1
8	STBYB	Standby mode, normally pull high STBYB="1", normal operation STBYB="0", timing control, source driver will turn off, all output are high-Z	
9	GND	Ground	
10	NINC	Negative LVDS differential clock input	
11	PINC	Positive LVDS differential clock input	
12	GND	Ground	
13	NIND0	Negative LVDS differential data input	
14	PIND0	Positive LVDS differential data input	
15	GND	Ground	
16	NIND1	Negative LVDS differential data input	
17	PIND1	Positive LVDS differential data input	
18	GND	Ground	
19	NIND2	Negative LVDS differential data input	
20	PIND2	Positive LVDS differential data input	
21	GND	Ground	
22	NIND3	Negative LVDS differential data input	
23	PIND3	Positive LVDS differential data input	
24	GND	Ground	
25	SELB	6bit mode select LVDS input data is 6bits	
26	GND	Ground	
27	AVDD	Power for Analog Circuit	
28	GND	Ground	
29	VGH	Positive power for TFT	
30	NC	Not connect	
31	NC	Not connect	
32	VGL	Negative power for TFT	
33	GND	Ground	
34	NC	Not connect	
35	NC	Not connect	
36	NC	Not connect	
37	NC	Not connect	
38	NC	Not connect	
39	NC	Not connect	
40	NC	Not connect	

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【Note1】UPDN and SHLR control function

SHLR	UPDN	Data shifting
DVDD	GND	Left→Right, Up→Down(default)
GND	GND	Right→Left, Up→Down
DVDD	DVDD	Left→Right, Down→Up
GND	DVDD	Right→Left, Down→Up



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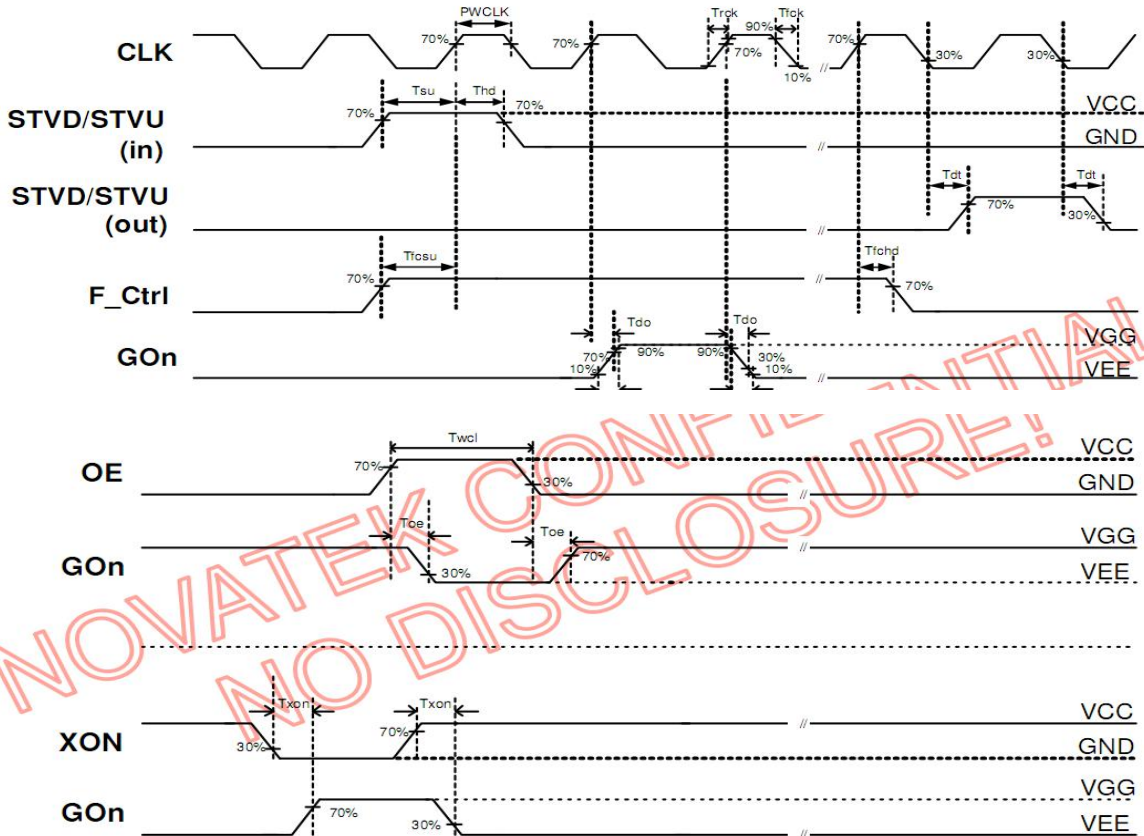
5. INPUT SIGNAL(DE ONLY MODE)

5.1 Timing Specification

(VGG=25V, VEE=-15V, VCC=2.3 to 3.6V, GND=0V, TA=-20 to +85 °C)

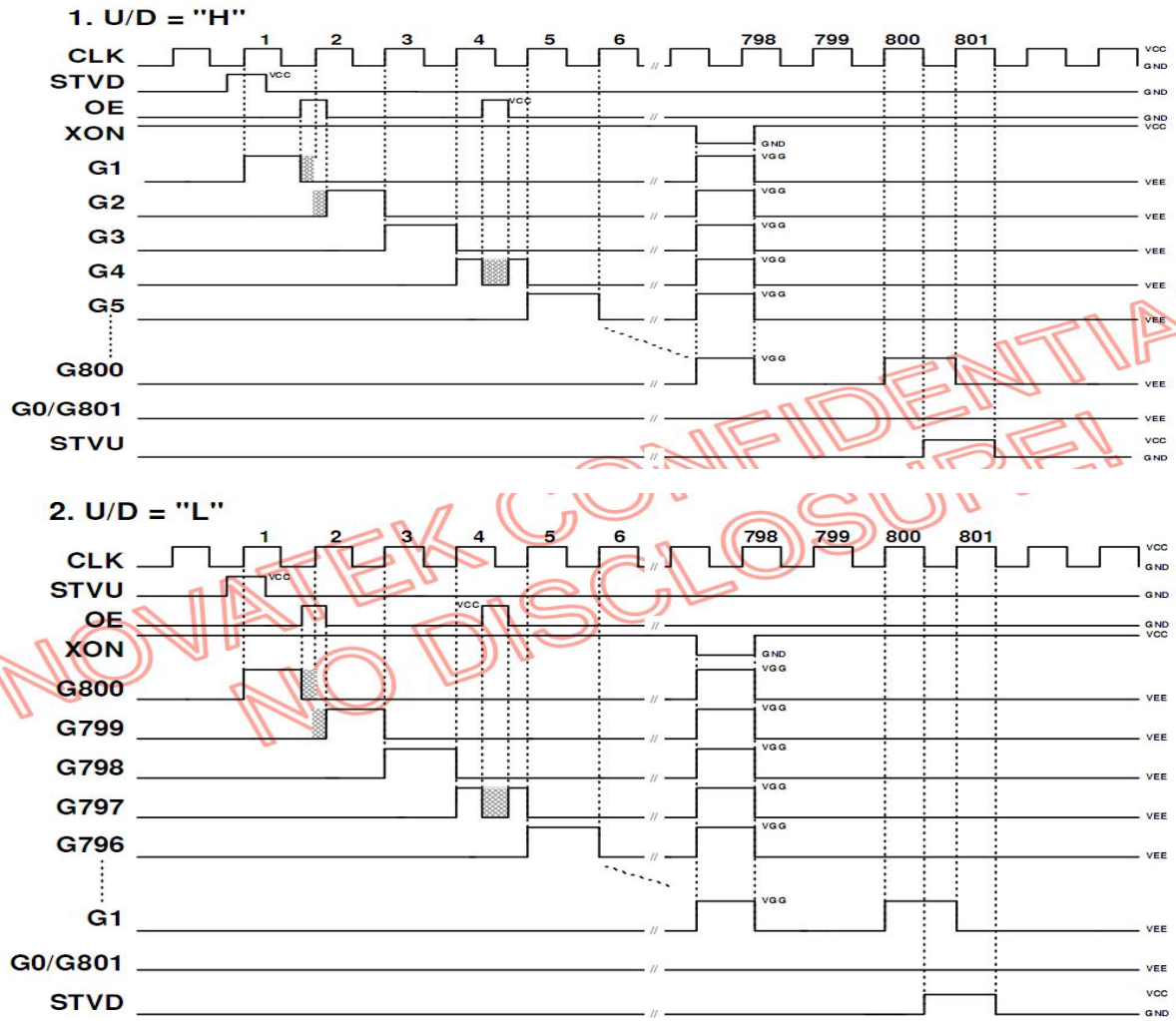
Symbol	Parameters	Min.	Typ.	Max.	Unit	Conditions
Tdt	STVD/STVU Delay Time	-	-	500	ns	CL = 20pF
Tdo	Driver Output Delay Time	-	-	900	ns	CL = 200pF
Tthl	Output Falling Time	-	400	800	ns	CL = 200pF, 90% to 10%
Ttlh	Output Rising Time	-	500	1000	ns	CL = 200pF, 10% to 90%
Txon	XON to Driver Output Delay Time	-	-	50	us	CL = 200pF
Toe	OE to Driver Output Delay Time	-	-	900	ns	CL = 200pF
Fclk	Clock Frequency	-	-	200	KHz	In cascade connection
Trck	Clock Rising Time	-	-	100	ns	CL = 20pF
Tfck	Clock Falling Time	-	-	100	ns	CL = 20pF
PWCLK	Clock Pulse Width (High & Low)	500	-	-	ns	
Tsu	STVD/STVU Set-Up Time	200	-	-	ns	
Thd	STVD/STVU Hold Time	300	-	-	ns	
Tfcsu	F_Ctrl Set-Up Time	200	-	-	ns	
Tfchd	F_Ctrl Hold Time	200	-	-	ns	
Twcl	Output Enabled Pulse Width	1	-	-	us	
Tpor	Power-On Reset Slew Time	-	-	20	ms	From 10% to 90% VCC

5.2 Timing Waveforms

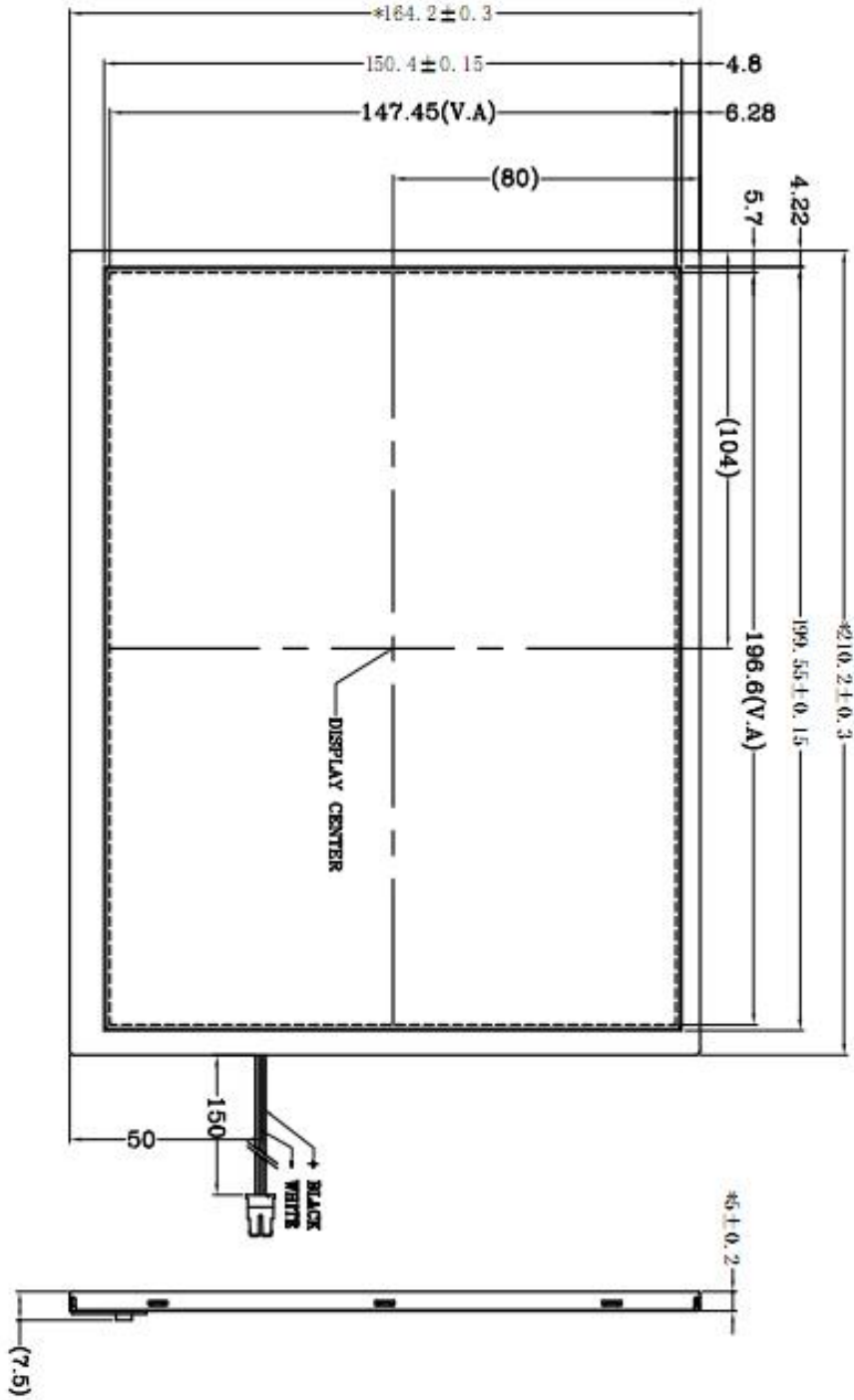


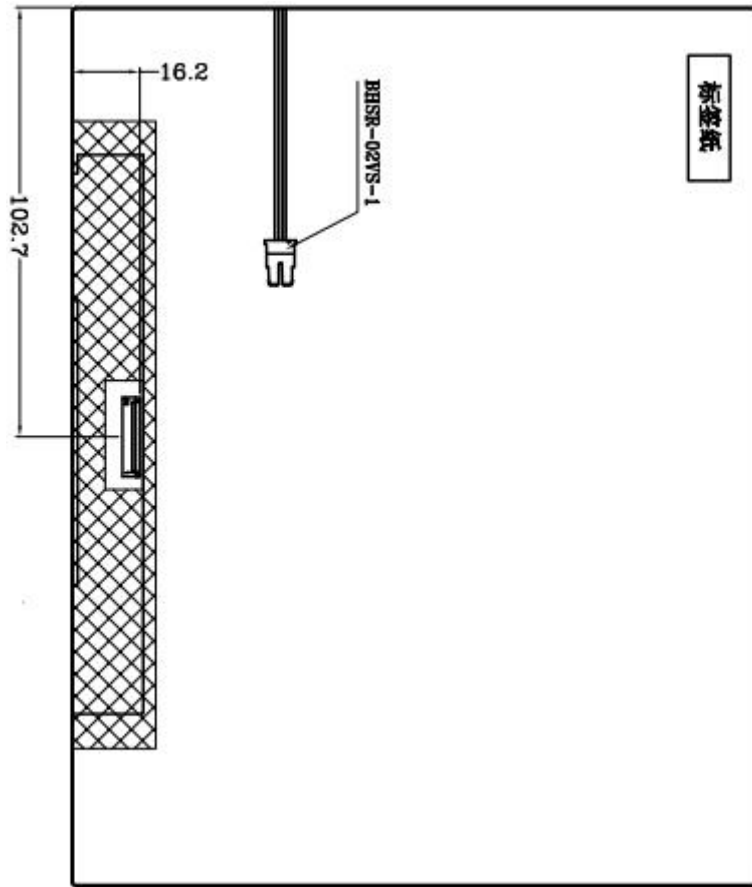
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5.3 Output Timing



6. MECHANICAL DIMENSION





Remark: 1.General tolerance $\pm 0.3\text{mm}$

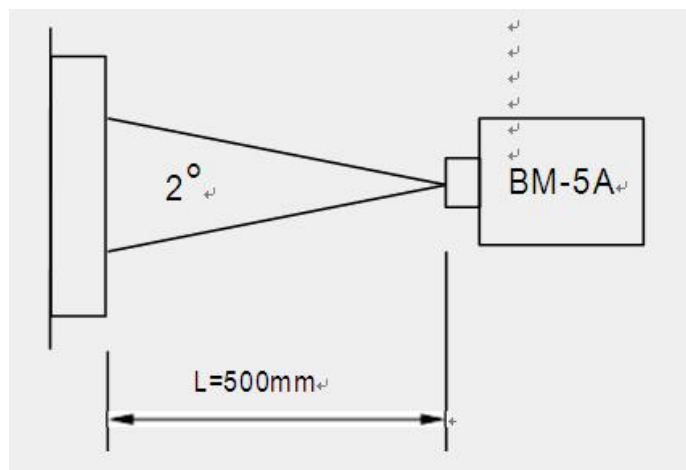
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7. OPTICAL CHARACTERISTICS

Ta = 25°C, Vcc=3.3V

ITEM	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT	NOTE
Constrast Ratio	CR	Point-5	700	900		--	1, 2, 3
Luminance(CEN)	Lw	Point-5	500	550		cd/m ²	1, 3
Luminance Uniformity	ΔL		70	80		%	1, 3
Response Time (White - Black)	Tr +Tf	Point-5	-	20	40	ms	1, 3, 5
NTSC	-	Point-5	45	50	-	%	1, 4
Viewing Angle	Vertical	Upper(θ)		85	--	°	1, 4
		Down(θ)		85			1, 4
	Horizontal	Left(ψ)		85			1, 4
		Right(ψ)		85	--	°	1, 4
Color Coordinate	White	Wx Wy	0.273 0.289	0.313 0.329	0.353 0.369		1, 3
	Red	Rx Ry	(0.522) (0.284)	(0.562) (0.324)	(0.602) (0.364)	--	
	Green	Gx Gy	(0.291) (0.537)	(0.331) (0.577)	(0.371) (0.617)		
	Blue	Bx By	(0.112) (0.061)	(0.152) (0.101)	(0.192) (0.141)		

【Note1】 Measure condition: 25°C±2°C, 60±10%RH, under10 Lux in the dark room.BM-5A (TOPCON), viewing angle2°, IL=260mA (Backlight current) , measurement after lighting on 10 mins.



【Note2】 Definition of contrast ratio:

$$\text{Contrast Ratio (CR)} = (\text{White}) \text{ Luminance of ON} \div (\text{Black}) \text{ Luminance of OFF}$$

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【Note3】 Definition of luminance: Measure white luminance on the point 5 as figure.7-1
 Definition of Luminance Uniformity: Measure white luminance on the point1~9 as figure.7-1
 $\Delta L = [L(\text{MIN})/L(\text{MAX})] \times 100$

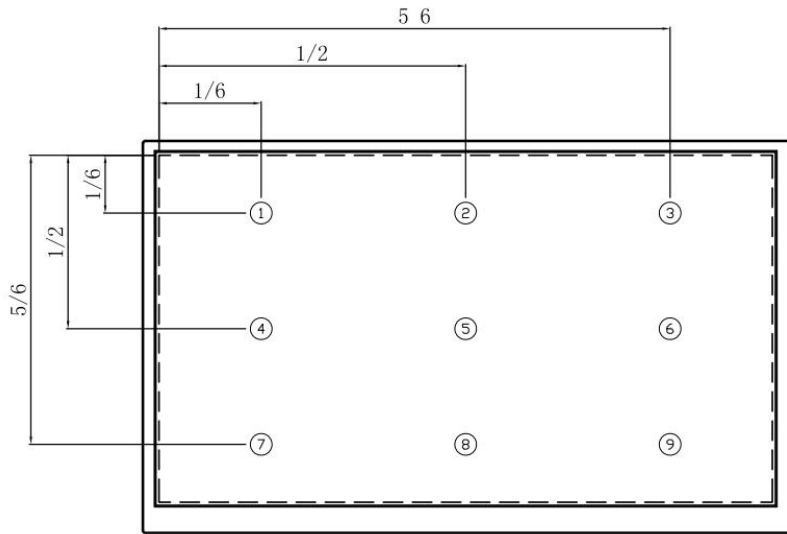
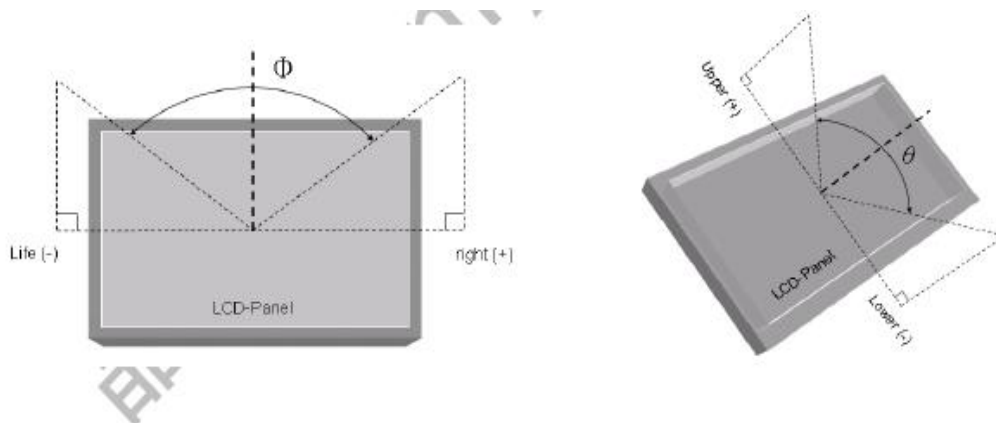


Fig.7-1 Measuring point

【Note4】 Definition of Viewing Angle(θ, ψ), refer to Fig.7-2 as below:



【Note5】 Definition of Response Time.(White-Black)

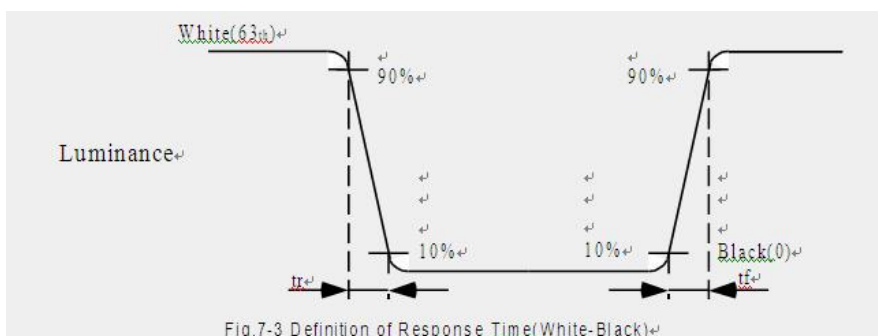


Fig.7-3 Definition of Response Time(White-Black)

8. RELIABILITY TEST

8.1. Temperature and humidity

TEST ITEMS	CONDITIONS	NOTE
High Temperature Operation	70℃ ;240hrs	
High Temperature Storage	80℃ ; 240hrs	
High Temperature High Humidity Operation	60℃ ; 90%RH ;240hrs	No condensation
Low Temperature Operation	-20℃ ; 240hrs	Backlight unit always turn on
Low Temperature Storage	-30℃ ; 240hrs	
Thermal Shock	-20℃(0.5hr) ~ 70℃(0.5hr) ; 100 Cycles	
Image Sticking	25 ℃± 2 ℃ ; 4hrs	Note 1
MTBF	30,000hrs	

【Note1】 :

Condition of Image Sticking test: 25 ℃± 2 ℃

Operation with test pattern sustained for 4 hrs, then change to gray pattern immediately.

After 5 mins, the mura must be disappeared completely .

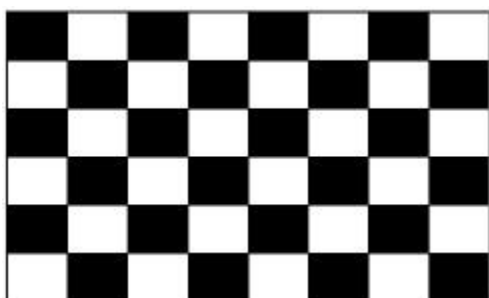


Image Sticking pattern



Mid-Gray pattern

8.2. Shock and Vibration

TEST ITEMS	CONDITIONS
Shock (Non-operation)	Shock level: 980m/s ² (equal to 100G). Waveform: half sinusoidal wave,6ms. Number of shocks: +X,+Y,+Z axes for a total of nine shock inputs.
Vibration (Non-operation)	Frequency range:8~33.3Hz Stoke: 1.3 mm Vibration: sinusoidal wave, perpendicular axis(both x, z axis: 2hrs ,y axis: 4hrs). Sweep: 2.9G,33.3 Hz -400 Hz Cycle time: 15 min

8.3 Electrostatic Discharge

TEST ITEM	CONDITIONS	Note
ESD	150pF, 330 , ±8kV&±15kV air& contact test	1
	200pF, 0 , ±200V contact test	2

【Note】 Measure

1: LCD glass and metal bezel

2: IF connector pins

8.4. Judgment standard

The Judgment of the above test should be made as follow:

Pass: Normal display image with no line defect. Partial transformation of the module parts should be ignored.

Fail: No display image, Function NG, or line defects.

9. PACKING

TBD

10. WARRANTY

10.1 The period is within 12 months since the date of shipping out under normal using and storage conditions.

10.2 The warranty will be avoided in case of defect induced by customer