



Chunghwa Picture Tubes, Ltd.

Product Specification

To : 榮譽

Date : 180717

TFT LCD

CLAP080WH01 XG

ACCEPTED BY :

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		 2018.7.17.

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REVISION STATUS

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1. OVERVIEW

CLAP080WH01 XG is 8" color TFT-LCD (Thin Film Transistor Liquid Crystal Display) OLB module (finish outer lead bonding) composed of LCD panel and driver ICs (the backlight is not included in this OLB module).

The 8" screen produces 1280(RGB)X720 resolution image. By applying R.G.B. input signal, full color images are displayed.

General specifications are summarized in the following table:

ITEM	SPECIFICATION
Display Area (mm)	176.64(H) x 99.36(V)
Number of Pixels	1280(H) x 3(RGB) x 720(V)
Pixel Pitch (mm)	0.138(H) x 0.138(V)
Color Pixel Arrangement	RGB vertical stripe
Display Mode	Normally Black (HFFS)
Number of Colors	16.7M (real 8bit)
Viewing Direction	Full Direction
Response Time (Tr+Tf)	Tr :10ms + Tf :15ms
Panel Transmittance (%)	3.25%(Typ) / 2.92%(Min)
Power Consumption (W)	LCD:0.594 (Typ)
Surface Treatment	HC
Panel Dimension (mm)	185.3x112.7
Interface Connection	LVDS

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	-0.3	5	V	
Signal Input Voltage	NIND0 ~ NIND3 PIND0 ~ PIND3 NINC,PINC	-0.3	DVDD+0.3	V	
Operating temperature	Topa	-30	85	°C	1
Storage temperature	Tstg	-40	95	°C	1

Note1 : If the product were used out of the operation and storage range, it will have quality issue.

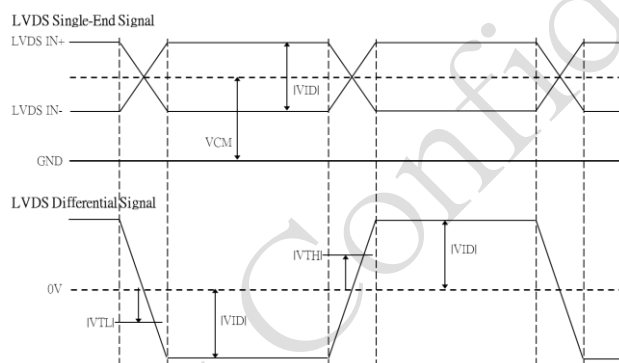
3. ELECTRICAL CHARACTERISTICS

3.1 TFT LCD

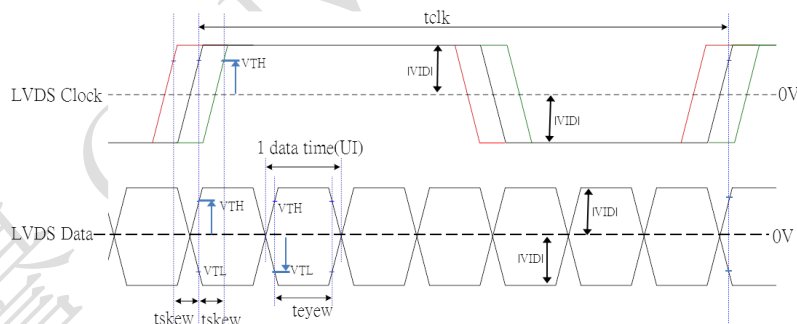
Ta=25°C

ITEM	SYMBOL	MIN	TYP	MAX	UNIT	NOTE
Digital Power Supply Voltage For LCD	DVDD	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	Note1
1 Data time	UI	-	tclk*1/7	-	tclk	Note2
LVDS clock to data skew	tskew	-	-	0.2	UI	Note2
input data eye width	teyew	0.6	-	-	UI	Note2
Logic Input Voltage	VIH	0.7*DVDD	-	DVDD	V	
	VIL	GND	-	0.3*DVDD	V	

Note1 : LVDS DC electrical characteristics



Note2 : The following condition is base on operation frequency at 75.87MHz



3.2 TFT-LCD current consumption

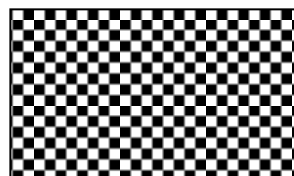
ITEM	SYMBOL	CONDITION	MIN	TYP	MAX	UNIT	NOTE
Digital Current	IDVDD	DVDD = 3.3V	-	180	460	mA rms	【Note2】
Total Power Consumption	PC		-	594	1518	mW rms	【Note1】

Note1 : Typical: Under 256 Gray Scale pattern

Maximum: Under 1x1 Pixel or heavy loading pattern.



256 Gray Scale



1x1 Pixel

Note2 : The current is root mean square value (RMS)

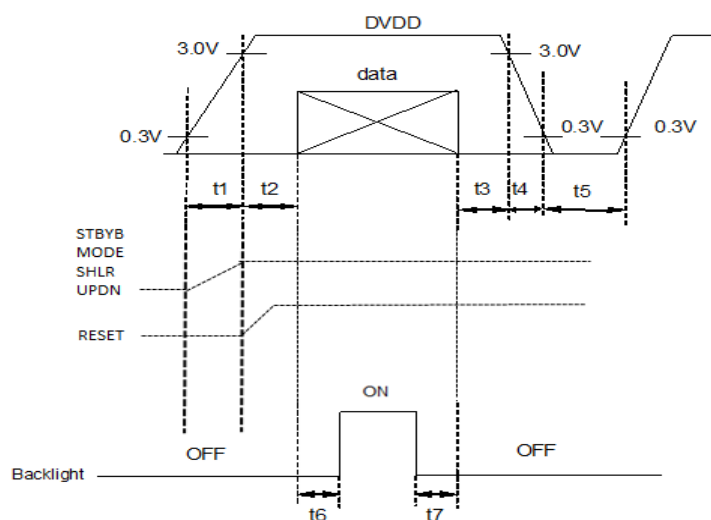
3.3 Power 、Signal sequence

$0.5 < t_1 \leq 10\text{ms}$ $200\text{ms} \leq t_5$

$0 < t_2 \leq 50\text{ms}$ $200\text{ms} \leq t_6$

$0 < t_3 \leq 50\text{ms}$ $200\text{ms} \leq t_7$

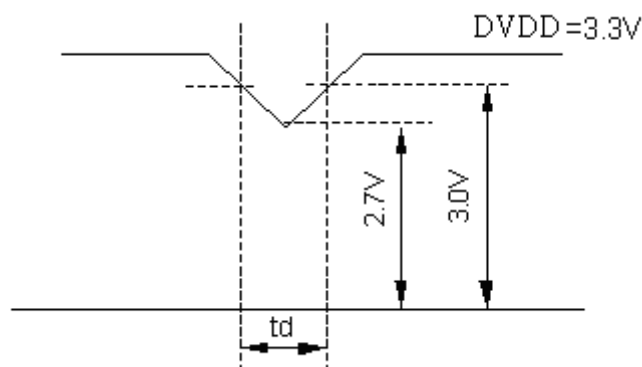
$0 < t_4 \leq 10\text{ms}$



DVDD-dip state

(1) when $3.0\text{V} > \text{DVDD} \geq 2.7\text{V}$, $t_d \leq 10\text{ms}$.

(2) when $\text{DVDD} < 2.7\text{V}$, DVDD-dip condition should as the DVDD-turn-off condition.



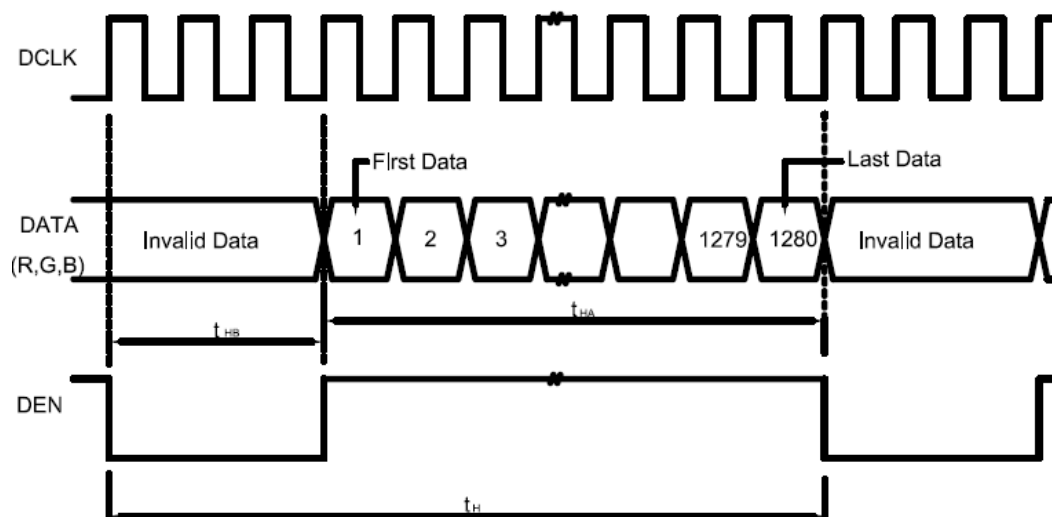
3.4 input signal(DE only mode)

3.4.1 Timing Specification

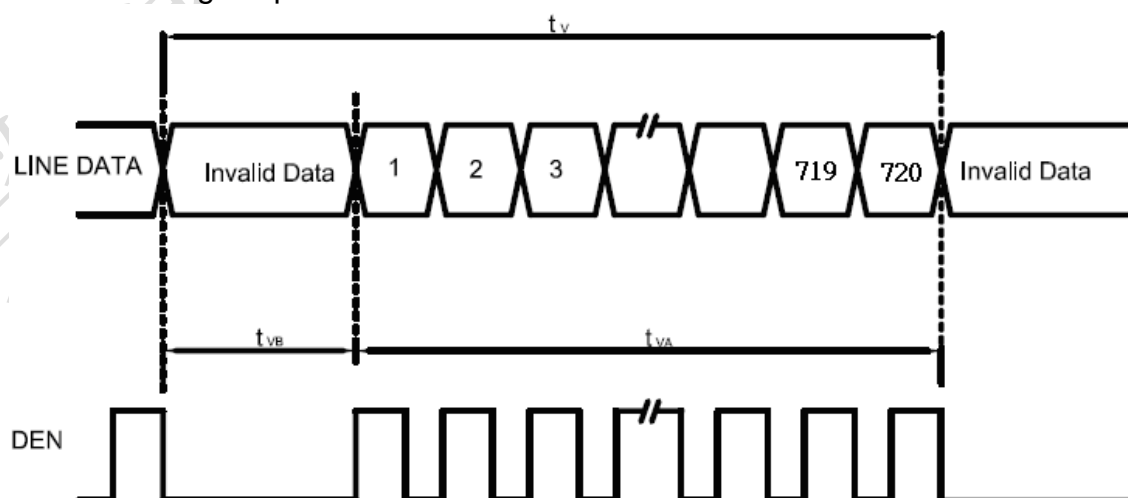
ITEM				SYMBOL	MIN	TYP	MAX	UNIT
LVDS input signal sequence	CLK Frequency			tclk	63	68	75.87	MHz
LCD input signal sequence (Input LVDS Transmitter)	DENA	Horizontal	Horizontal total Time	t _H	1404	1488	1567	tCLK
			Horizontal effective Time	t _{HA}	1280			tCLK
			Horizontal Blank Time	t _{HB}	124	208	287	tCLK
		Vertical	Vertical total Time	t _V	757	758	807	t _H
			Vertical effective Time	t _{VA}	720			t _H
			Vertical Blank Time	t _{VB}	37	38	87	t _H

3.4.2 Timing sequence(Timing chart)

3.4.2.1 Horizontal Timing Sequence



3.4.2.2 Vertical Timing Sequence

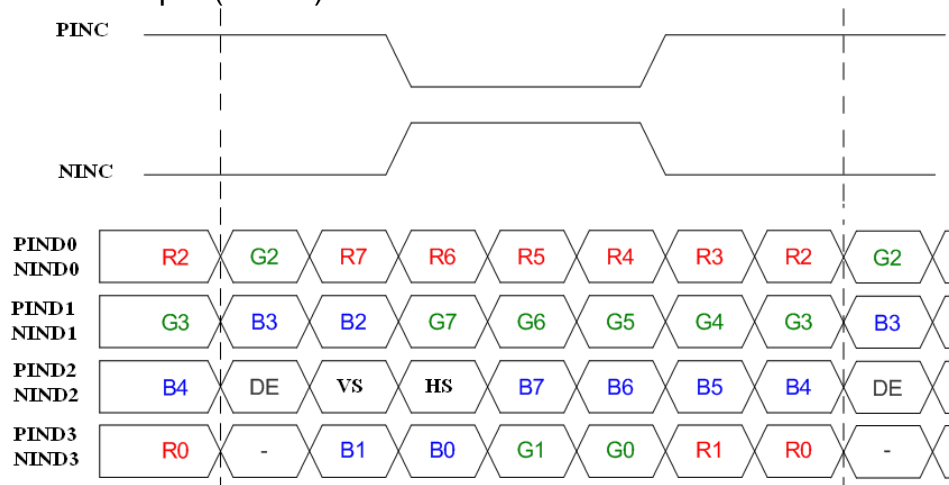


No.	Symbol	Function	Remarks
1	VCOM	Common voltage	
2	VDD	Power supply	
3	VDD	Power supply	
4	NC	No connection	
5	RESET	Global reset pin	
6	U/D	Vertical inversion	
7	L/R	Horizontal inversion	
8	STBYB	Standby mode, normally pull high STBYB="1", Normal Operation STBYB="0", Timing control, source driver will turn off, all output are high-Z	
9	GND	Power Ground	
10	RxCLK-	Negative LVDS differential clock inputs	
11	RxCLK+	Positive LVDS differential clock inputs	
12	GND	Power Ground	
13	Rxin0-	Negative LVDS differential data inputs	
14	Rxin0+	Positive LVDS differential data inputs	
15	GND	Power Ground	
16	Rxin1-	Negative LVDS differential data inputs	
17	Rxin1+	Positive LVDS differential data inputs	
18	GND	Power Ground	
19	Rxin2-	Negative LVDS differential data inputs	
20	Rxin2+	Positive LVDS differential data inputs	
21	GND	Power Ground	
22	Rxin3-	Negative LVDS differential data inputs	
23	Rxin3+	Positive LVDS differential data inputs	
24	GND	Power Ground	
25	HSD	In LVDS mode, input select.	
26	GND	Power Ground	
27	AVDD	Power for Analog Circuit	

No.	Symbol	Function	Remarks
28	GND	Power Ground	
29	VGH		
30	NC	No connection	
31	NC	No connection	
32	VGL		
33	GND	Power Ground	
34	NC	No connection	
35	LEDK	Power for LED backlight(Cathode)	
36	LEDK	Power for LED backlight(Cathode)	
37	NC	No connection	
38	NC	No connection	
39	LEDA	Power for LED backlight(anode)	
40	LEDA	Power for LED backlight(anode)	

3.4.2.3 LVDS Input Data mapping

8 Bit LVDS input (JEIDA)



3.4.2.4 Color Data Reference

COLOR	INPUT DATA	R DATA								G DATA								B DATA							
		R7	R6	R5	R4	R3	R2	R1	R0	G7	G6	G5	G4	G3	G2	G1	G0	B7	B6	B5	B4	B3	B2	B1	B0
		MSB							LSB	MSB							LSB	MSB							LSB
BASIC COLOR	BLACK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RED(255)	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	GREEN(255)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	BLUE(255)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	CYAN	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	MAGENTA	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	YELLOW	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	WHITE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
RED	RED(0)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RED(1)	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RED(2)	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RED(254)	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RED(255)	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GREEN	GREEN(0)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	GREEN(1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
	GREEN(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
	GREEN(254)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
	GREEN(255)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
BLUE	BLUE(0)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	BLUE(1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	BLUE(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
	BLUE(254)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0
	BLUE(255)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1

Note1 : Gray level:

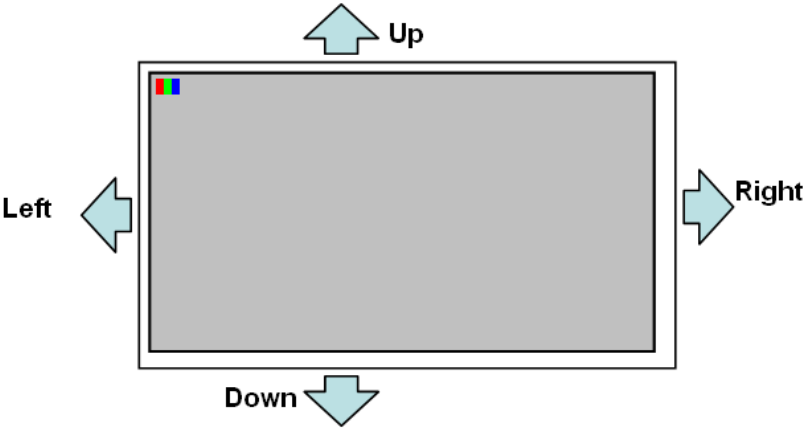
Color(n) : n is level order; higher n means brighter level.

Note2 : DATA:

1: high , 0: low

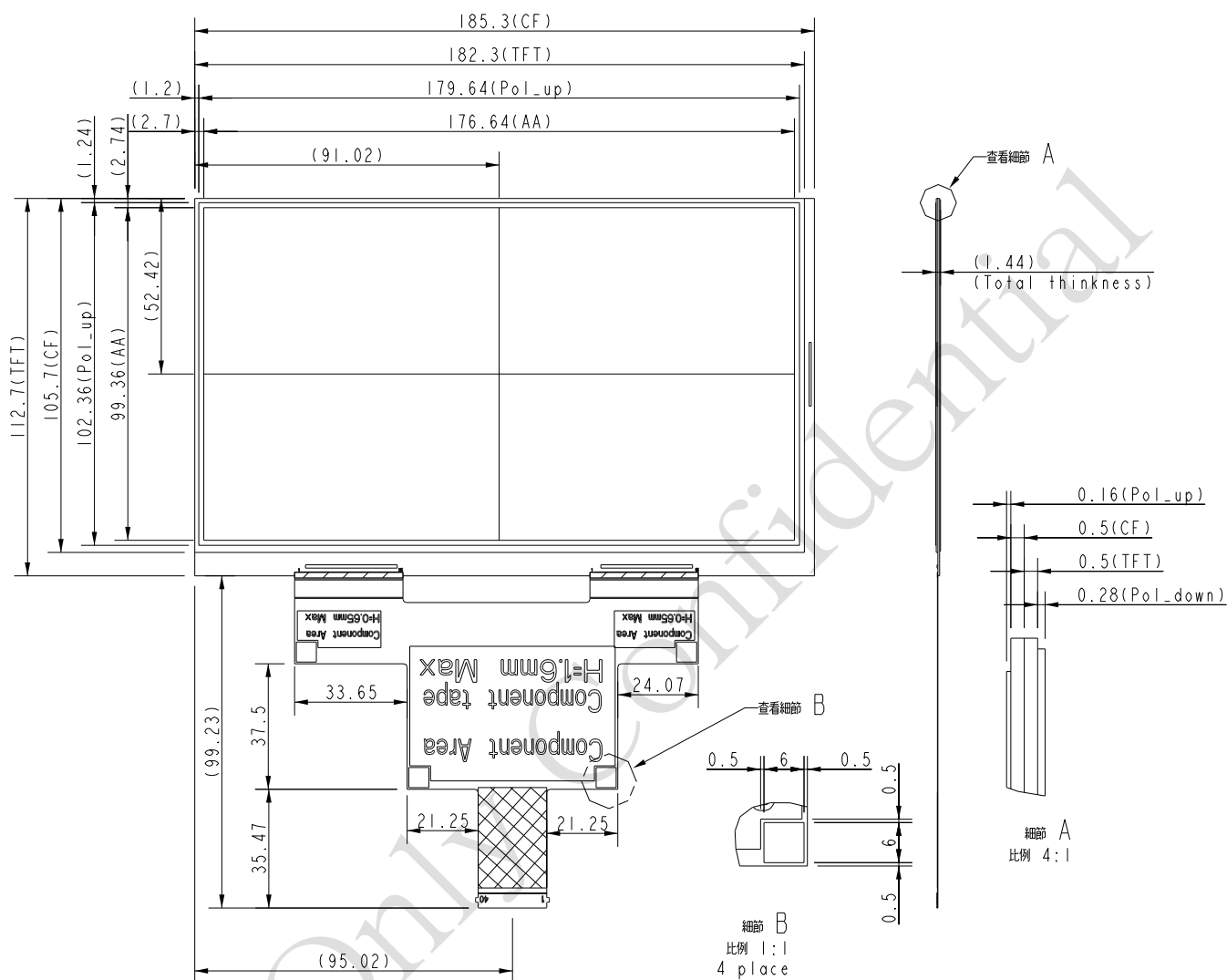
Note : UPDN and SHLR control function

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



5.1 Front Side

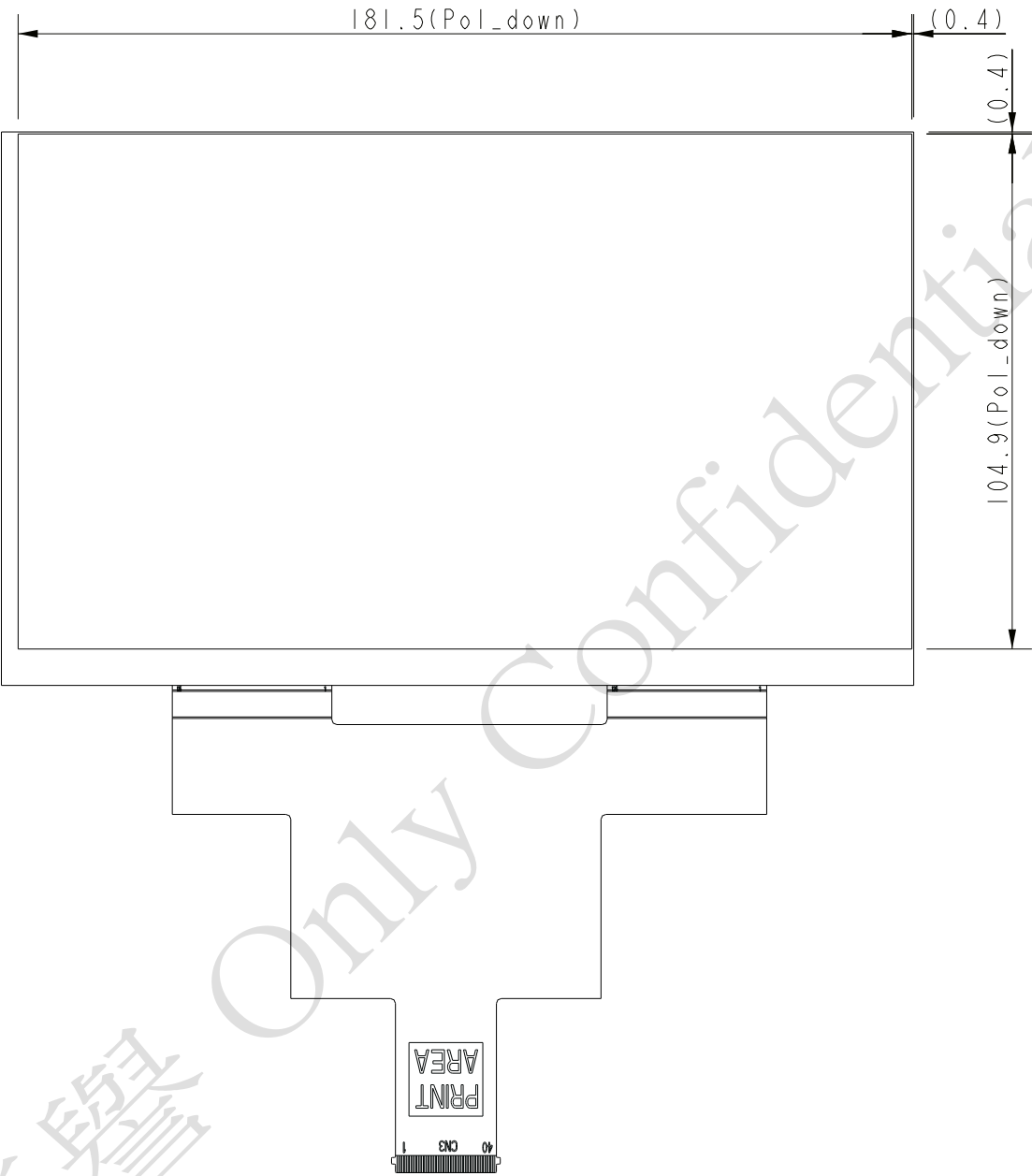
(Limit: none)



*1) General tolerance : $\pm 0.3\text{mm}$

5.2 Rear Side

(Unit : mm)



Note
*1) General tolerance : $\pm 0.3\text{mm}$



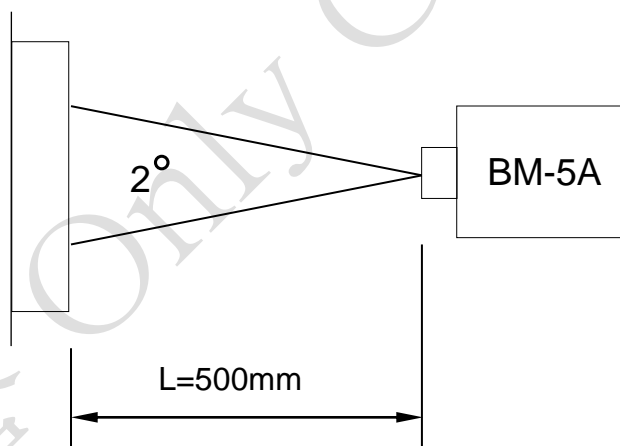
*1) General tolerance : $\pm 0.3\text{mm}$

6. OPTICAL CHARACTERISTICS

Ta=25°C

ITEM		SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT	NOTE
Panel Transmittance		T	---	2.92%	3.25%		%	Base on CPT BL
Constrast Ratio		CR	Point-5	800	1100		--	1, 2, 3
Response Time (White - Black)		Tr +Tf	Point-5		25	35	ms	1, 3, 5
Viewing Angle	Horizontal		CR ≥ 10 Point-5	70	80	70	°	1, 3
	Vertical			70	80	70	°	1, 2, 4
CF Color Coordinate with C-light	White	Wx Wy	Point-5	0.288 0.305	0.308 0.325	0.328 0.345	--	1, 3
	Red	Rx Ry		0.627 0.301	0.647 0.321	0.667 0.341		
	Green	Gx Gy		0.243 0.545	0.263 0.565	0.283 0.585		
	Blue	Bx By		0.122	0.142	0.162		

Note1: Measure condition : 25°C±2°C , 60±10%RH , under 1 Lux in the dark room.BM-5A (TOPCON) , viewing angle2° , measurement after lighting on 10 mins.



Note2: Definition of contrast ratio :

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

Note3: Definition of Viewing Angle(θ, ψ), refer to Fig.6-2 as below :

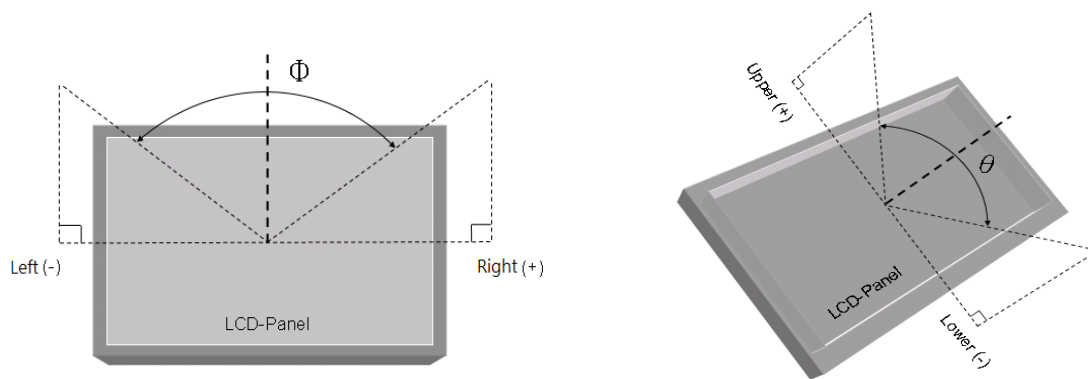


Fig.6-2 Definition of Viewing Angle

Note4: Definition of Response Time.(White-Black)

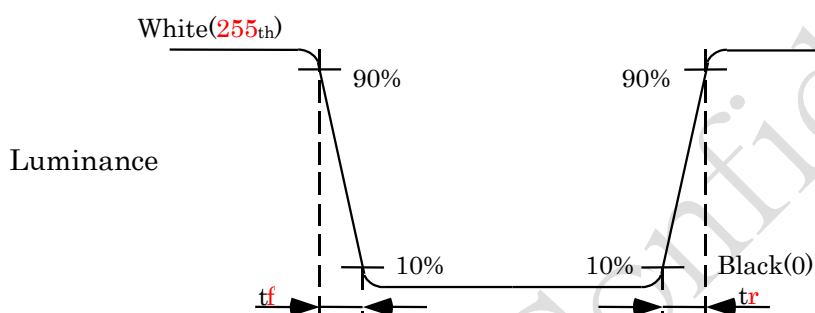


Fig.6-3 Definition of Response Time(White-Black)

Note5: Definition of luminance : Measure white luminance on the point 5 as figure.6-4

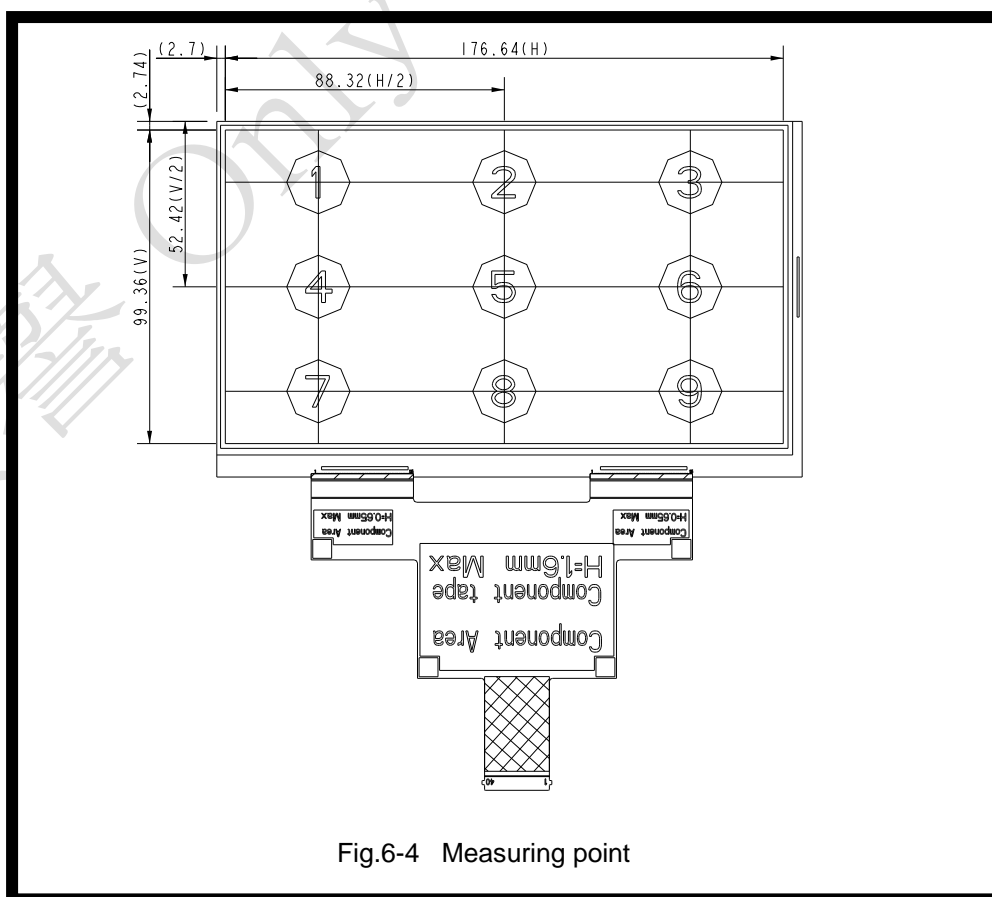


Fig.6-4 Measuring point

7. RELIABILITY TEST

7.1 Temperature and Humidity

Test items	Conditions	NOTE
High Temperature Operation	85°C ; 240hrs	
High Temperature Storage	85°C ; 240hrs	
High Temperature High Humidity Operation	60°C ; 90%RH ;240hrs	No condensation
Low Temperature Operation	-30°C ; 240hrs	
Low Temperature Storage	-40°C ; 240hrs	
Thermal Shock	-40°C(0.5hr) ~ 85°C(0.5hr) ; 300 Cycles	
Image Sticking	25 °C± 2 °C ; 2hrs	Note 1

Note 1 :

Condition of Image Sticking test : 25 °C± 2 °C

Operation with test pattern sustained for 2 hrs, then change to mid-gray pattern immediately.

After 5 mins, the mura must be disappeared.

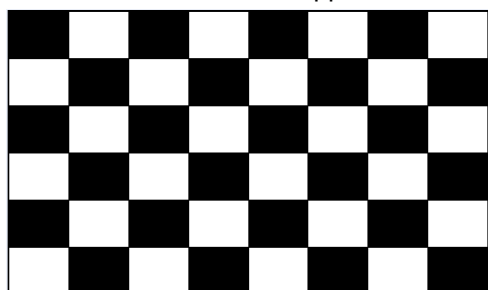


Image Sticking pattern



Mid-Gray pattern

7.2 Judgment Standard

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

Pass: Normal display image and no line defect.

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

7.3 ESD

ITEM	CONDITION	NOTE
ESD (Power off)	200pF , 0Ω , ±200V contact test , TFT-LCD Power off	Note1

Note1 : IF connector pins

8. PACKING

TBD

9. WARRANTY

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

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