

深圳市友创光显有限公司

ShenZhen You Chuang Technology Co., LTD.

PRODUCT SPECIFICATIONS

MODULE NO.: YCCLAA080NA12CW

For Customer:	_____
Approved by:	_____
Signature:	_____
Date:	_____

Please sign the cover page of the spec for your approval and return it to our local sales **within a month** after your receipt of the spec from Fair. In the case Fair does not receive the signed spec even after one month later, in general we will consider that the spec was already accepted by your company.

Prepared	Checked	Approved

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1. OVERVIEW

CLAA080NA12 CW is 8" color TFT-LCD (Thin Film Transistor Liquid Crystal Display) module composed of LCD panel, driver ICs ,control circuit and LED backlight. By applying 1024×600 images are displayed on the 8" diagonal screen. Display 16.7M colors by R.G.B signal input.

General specification are summarized in the following table:

ITEM	SPECIFICATION			
Display Area (mm)	176.64(W) x 99.36(H)			
Number of Pixels	1024(H) × 3 (RGB) × 600(V)			
Pixel Pitch (mm)	0.1725(W) x 0.1656(H)			
Color Pixel Arrangement	RGB vertical stripe			
Display Mode	Normally white			
Number of Colors	16.7M			
Brightness (cd/m ²)	600nit(Typ)			
Response Time (ms)	25ms(Typ.)			
Optimum Viewing Direction	6 O'clock(Max contrast ratio,Gray level inversion)			
Contrast Ratio	800:1(Typ.)/ 600:1(min)			
Viewing Angle (CR ≥ 10)	150degree (Horizontal.)			
	130degree (Vertical)			
Power Consumption (W)	2.87W(Typ)			
Interface connection	LVDS			
Module Size (mm)		Min.	Typ.	Max.
	Horizontal(H)	192.5	192.8	193.1
	Vertical(V)	116.6	116.9	117.2
	Depth(D)	6.1	6.4	6.7
Module Weight (g)	220(Typ)			
Backlight Unit	LED			
Surface Treatment	Anti-Glare			

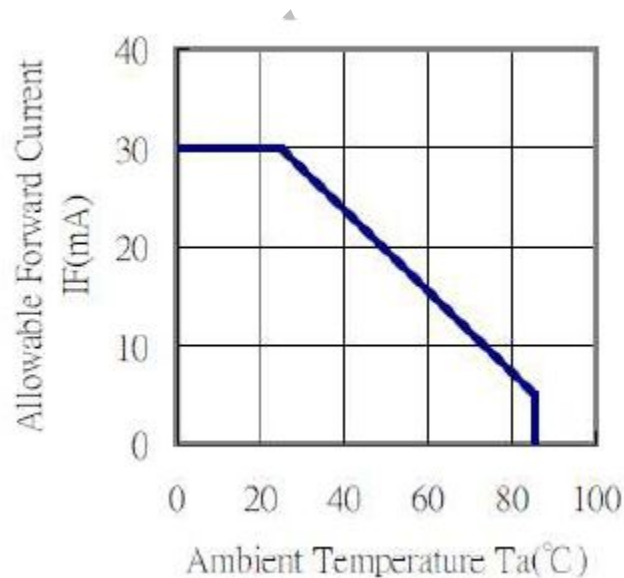
2. ABSOLUTE MAXIMUM RATINGS

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	3.96	V	
Analog Supply Voltage	AVDD	-0.5	14.85	V	
Gate On Voltage	VGH	-0.3	40	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 ≤ 10msec, Duty ≤ 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 of the environmental operation range (temperature and humidity), it will have visual quality concerns.

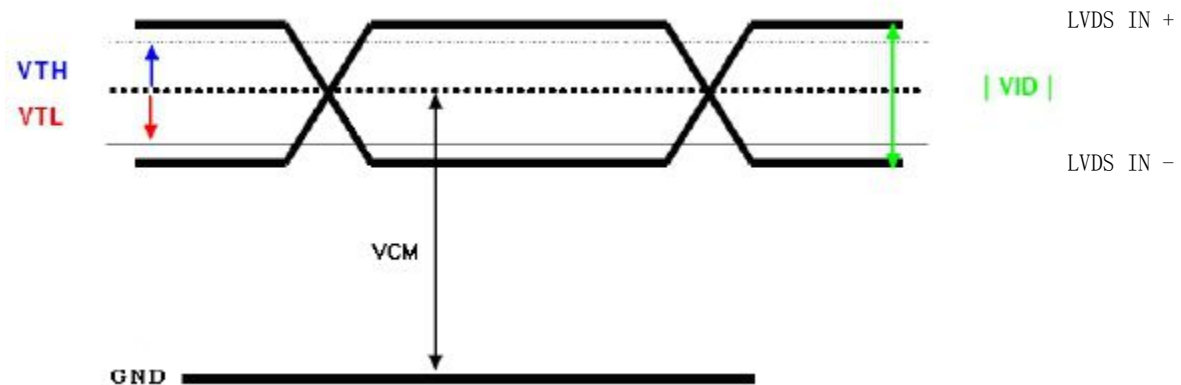
3. ELECTRICAL CHARACTERISTICS

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	
Analog Power Supply Voltage	AVDD	9.4	9.6	9.8	V	
Gate On Power Supply Voltage	VGH	20	21	22	V	
Gate Off Power Supply Voltage	VGL	-6.6	-6	-5.4	V	
Common Power Supply Voltage	VCOM	3.53	3.73	3.93	V	Note2
Logic Input Voltage	VIH	0.7*DVDD	-	DVDD	V	
	VIL	GND	-	0.3*DVDD	V	

【Note1】 LVDS signal



【Note2】 Vcom is the reference voltage for customer, it should be adjust VCOM to make the flicker level be minimum.

3.2 TFT-LCD Current Consumption

Item	Symbol	Condition	Min.	Typ.	Max.	Unit.	Note.
Gate on Current	IVGH	VGH =21V	-	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	IAVDD	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



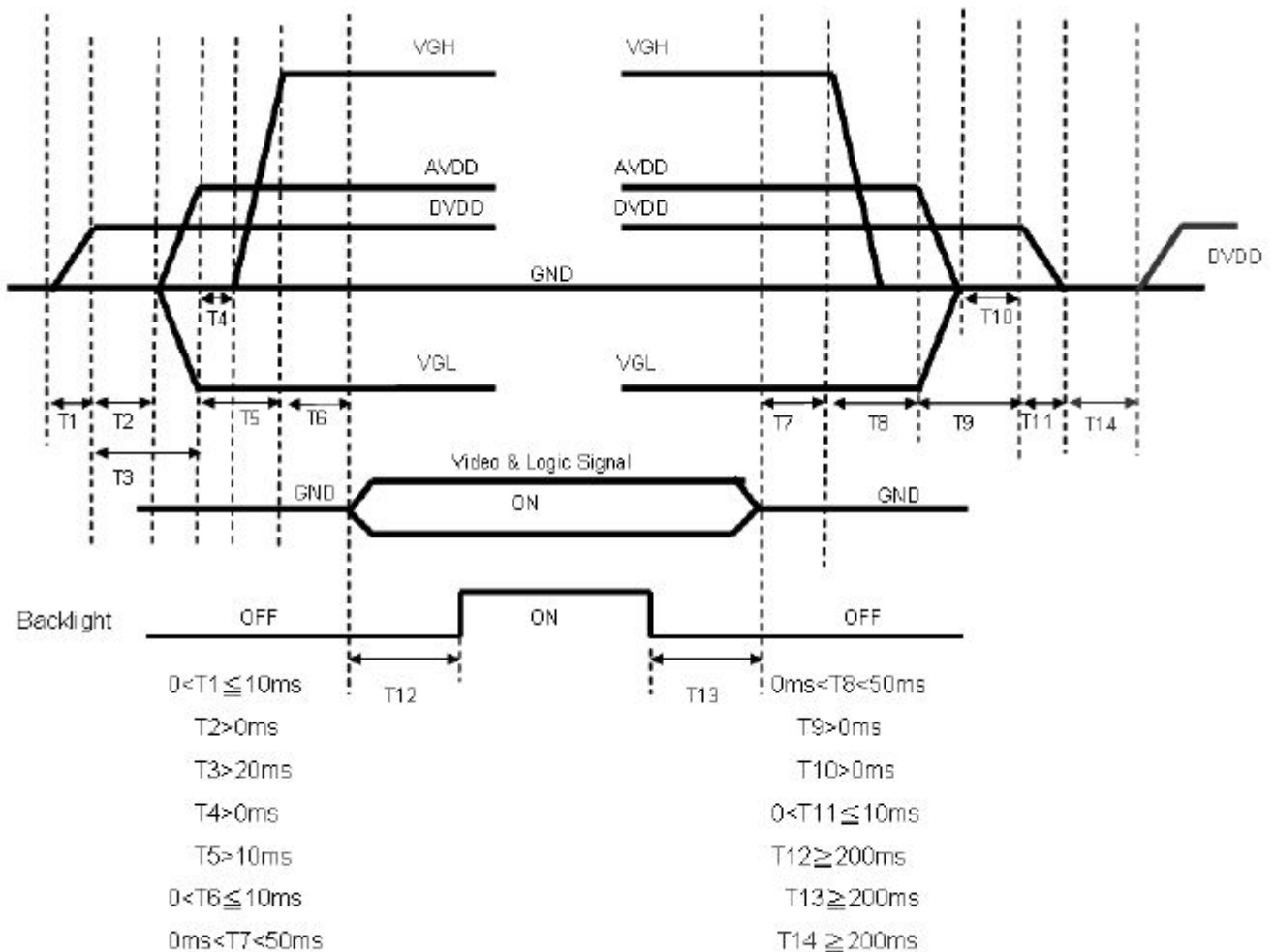
256 gray pattern



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



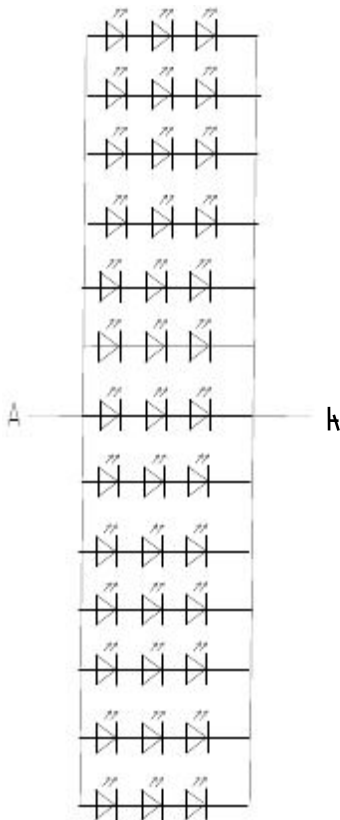
3.4 Backlight

Ta=25°C

ITEM	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT	NOTE
LED current	IL	Ta=25°C (20mA/serise)	--	260	--	mA	
LED voltage	VL	Ta=25°C (20mA/serise)	8.55	9.75	10.65	V	
Power consumption	WL	Ta=25°C (20mA/serise)	--	2.496	--	W	
LED Lifetime	-	Ta=25°C IF=20mA	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%.

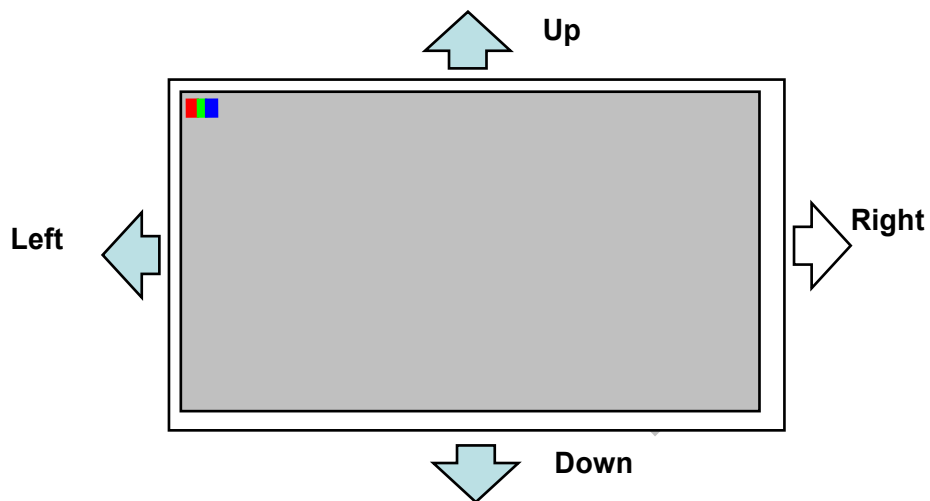
4. INTERFACE CONNECTION

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/8bit mode select if LVDS input data is 6bits,SELB set to High if LVDS input data is 8bits,SELB set to Low	
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	

【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



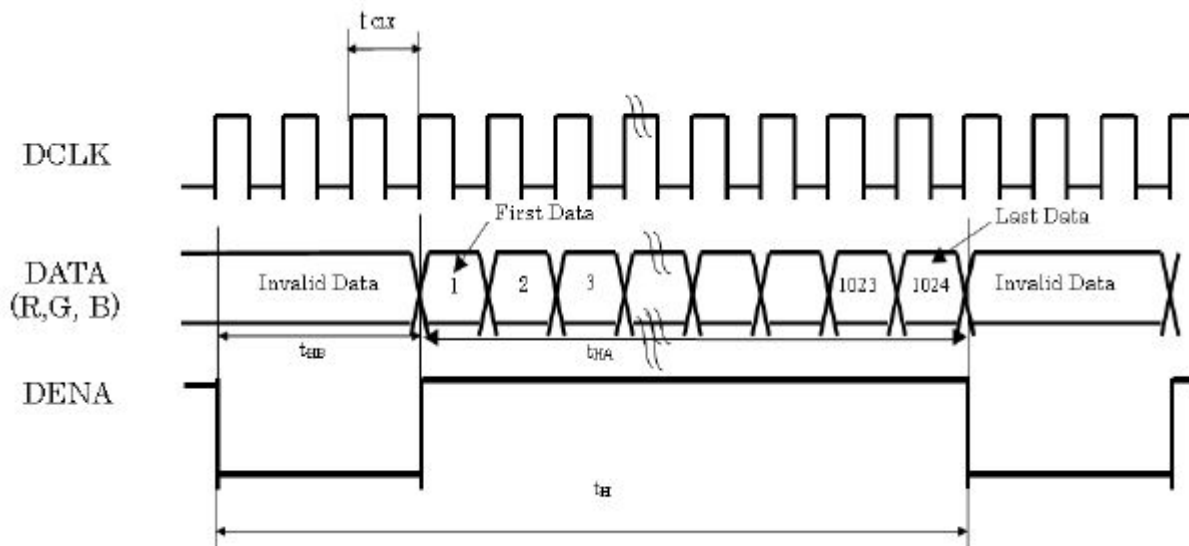
5. INPUT SIGNAL(DE ONLY MODE)

5.1 Timing Specification

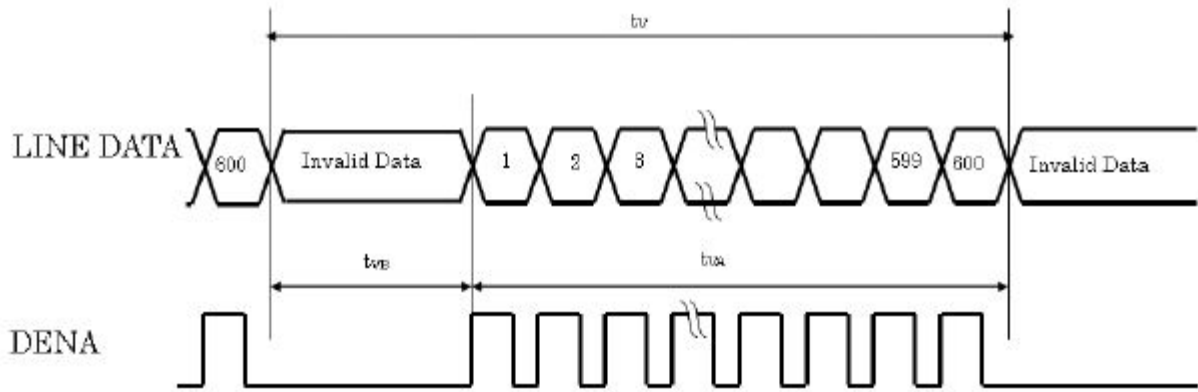
Item		Symbol	Min.	Typ.	Max.	Unit	
LVDS input signal sequence	CLK Frequency	tclk	45	51.2	57	MHz	
LCD input signal sequence (Input LVDS Transmitter)	Horizontal	Horizontal total Time	t _H	1324	1344	1364	tCLK
		Horizontal effective Time	t _{HA}	1024			tCLK
		Horizontal Blank Time	t _{HB}	300	320	340	tCLK
	Vertical	Vertical total Time	t _V	625	635	645	t _H
		Vertical effective Time	t _{VA}	600			t _H
		Vertical Blank Time	t _{VB}	25	35	45	t _H

5.2 Timing sequence(Timing chart)

5.2.1 Horizontal Timing Sequence

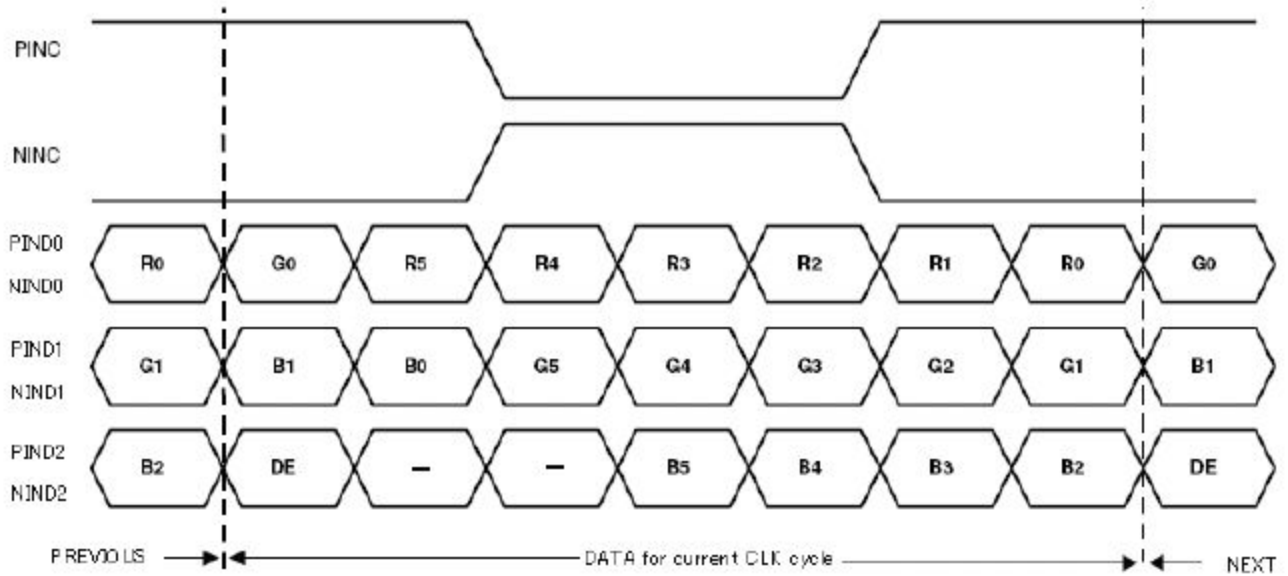


5.2.2 Vertical Timing Sequence

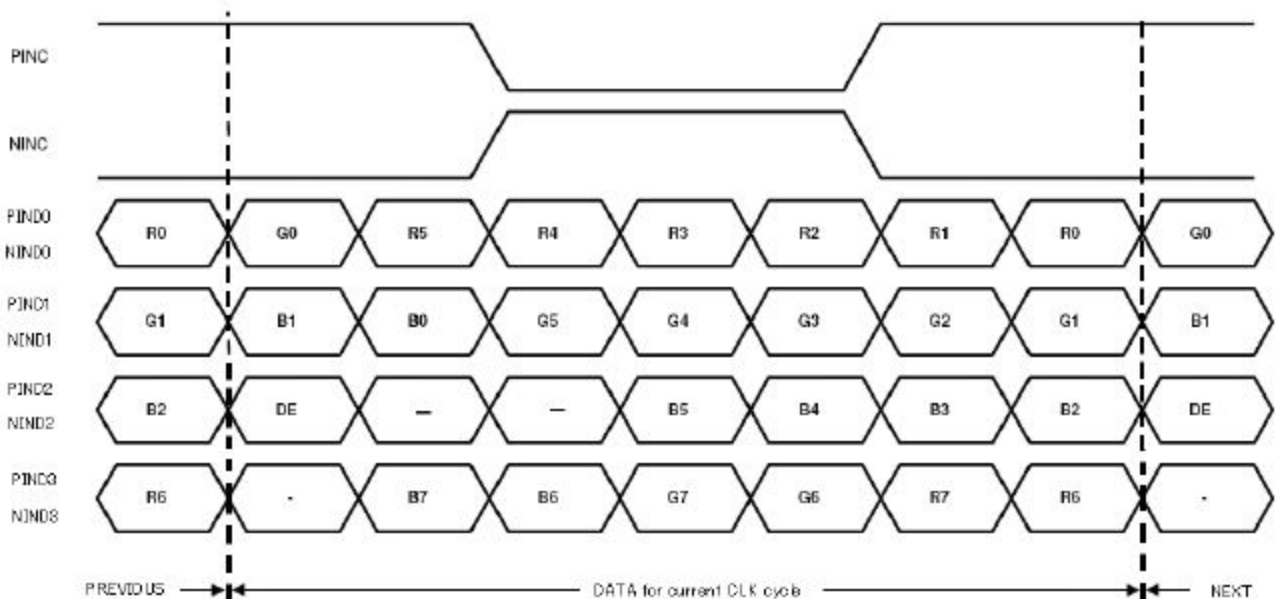


5.2.3 LVDS Input Data mapping

6 Bit LVDS input



8 Bit LVDS input



5.2.4 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						
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	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	GREEN(255)	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	BLUE(255)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
	CYAN	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	MAGENTA	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1
	YELLOW	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	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	
	RED(1)	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	RED(2)	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	RED(254)	1	1	1	1	1	1	1	1	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	1	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	
	GREEN(1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	
	GREEN(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
	GREEN(254)	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	
	GREEN(255)	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	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	
	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	
	BLUE(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
	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	
	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	

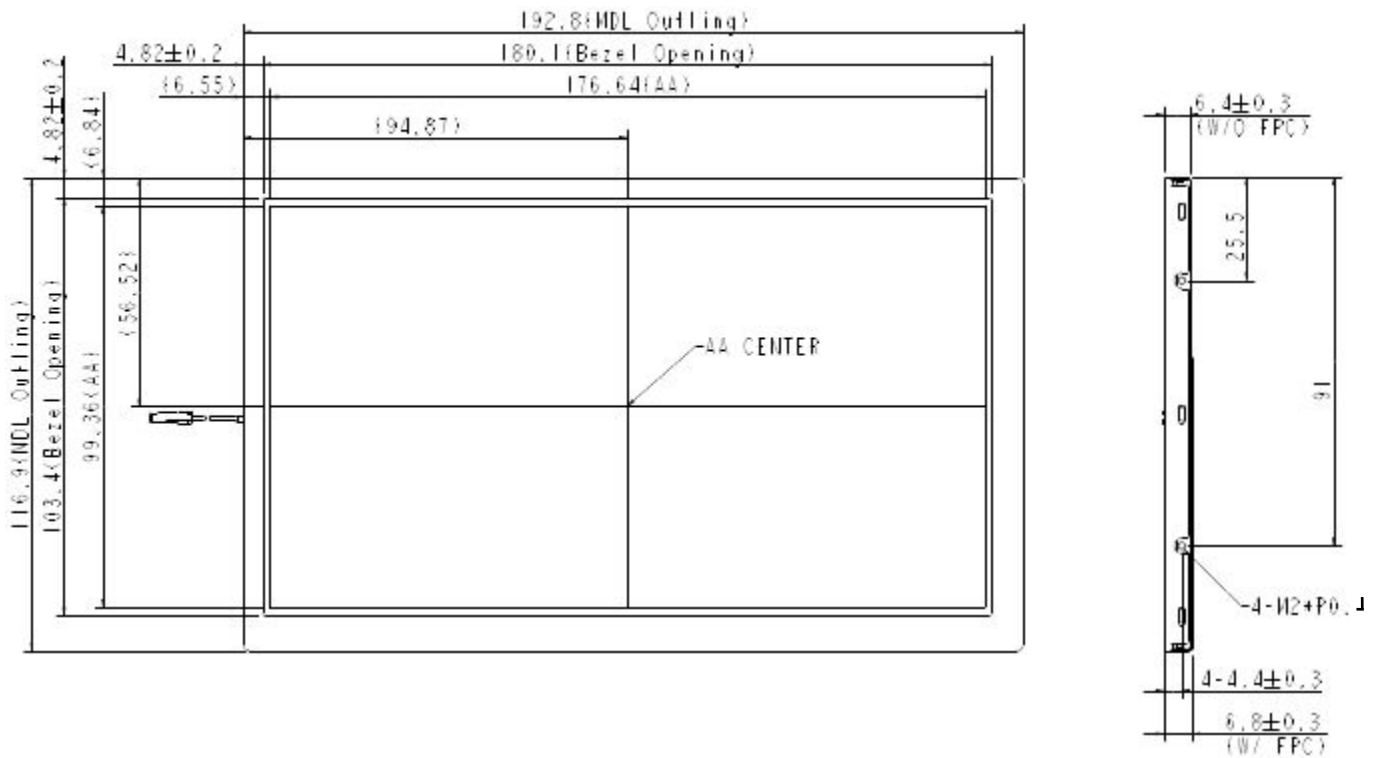
Note :

- 1) Gray level:
Color(n): n is level order; higher n means brighter level.
- 2) DATA:
1: high, 0: low

6. MECHANICAL DIMENSION

6.1 Front Side

[Unit: mm]



NOTE:

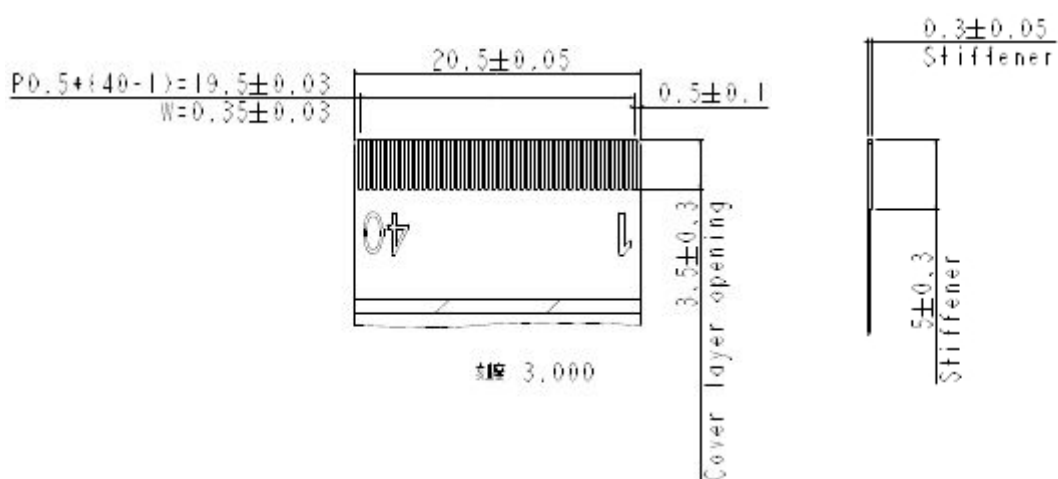
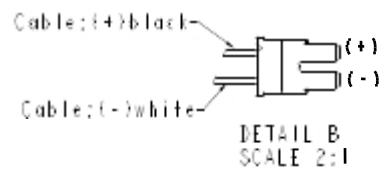
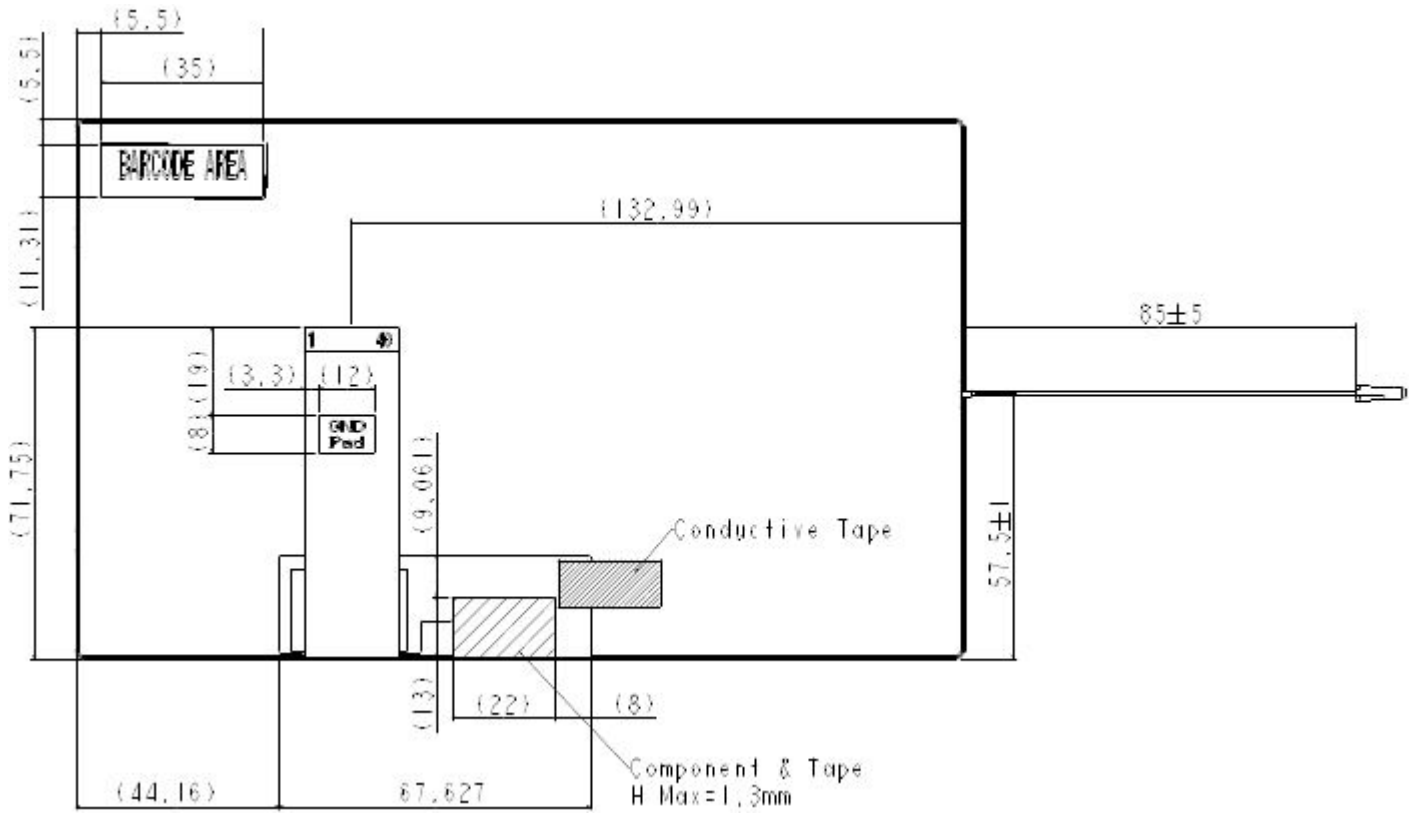
1. GENERAL TOLERANCE = ± 0.3 mm

2. ALLOWED DEPTH OF USERHOLD SCREW INSERT IS 1.0mm MAX

3. ISHOLD SCREW OF TORQUE = 1.4kgf.cm MAX

6.2 Rear Side

[Unit: mm]



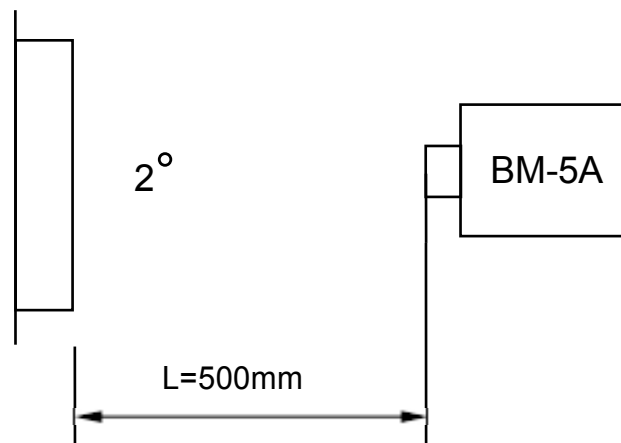
Remark: 1.General tolerance $\pm 0.3\text{mm}$

7. OPTICAL CHARACTERISTICS

Ta = 25°C, Vcc=3.3V

ITEM	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT	NOTE	
Contrast Ratio	CR	Point-5	600	800		--	1, 2, 3	
Luminance(CEN)	Lw	Point-5	40	45		cd/m^2	1, 3	
Luminance Uniformity	ΔL		70	80		%	1, 3	
Response Time (White - Black)	Tr +Tf	Point-5	-	25	35	ms	1, 3, 5	
NTSC		-	Point-5	45	50	-	%	1, 4
Viewing Angle	Vertical	Upper(θ)	CR \geq 10 Point-5	50	60	--	$^{\circ}$	1, 4
		Down(θ)		60	70			1, 4
	Horizontal	Left(ψ)		65	75			1, 4
		Right(ψ)		65	75	--	$^{\circ}$	1, 4
Color Coordinate	White	Wx Wy	Point-5	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		
	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 \pm 2°C, 60 \pm 10%RH, under 1 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:

Contrast Ratio (CR)= (White) Luminance of ON \div (Black) Luminance of OFF

【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
 $\Delta L = [L(\text{MIN})/L(\text{MAX})] \times 100$

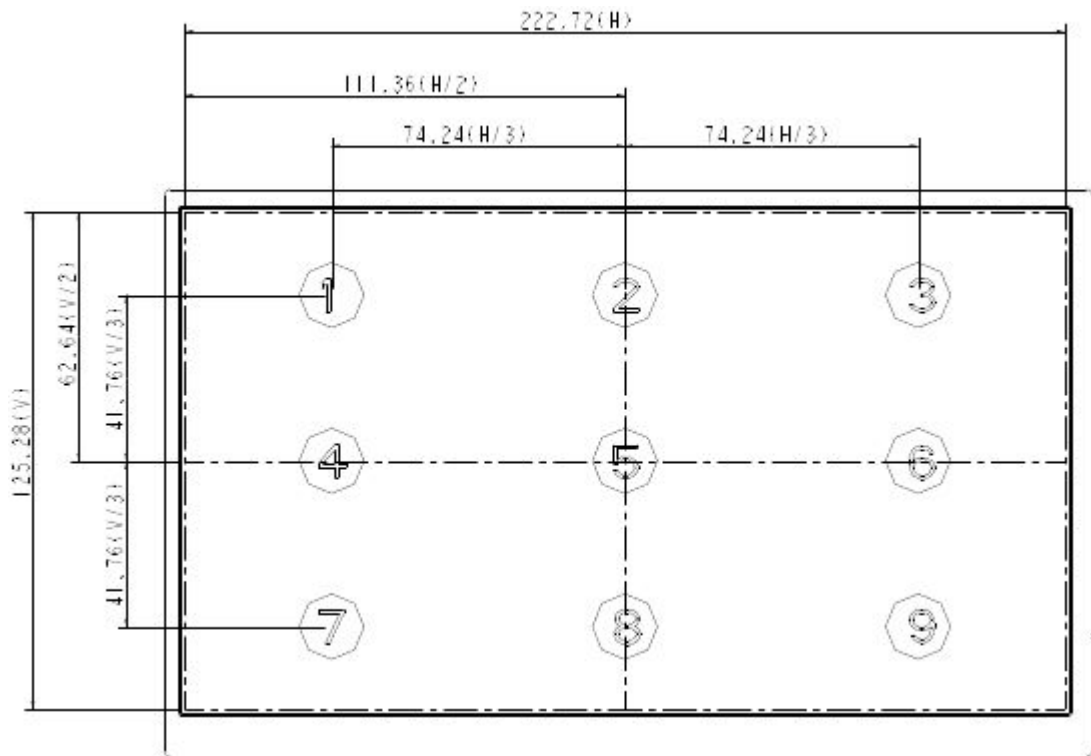


Fig.7-1 Measuring point

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

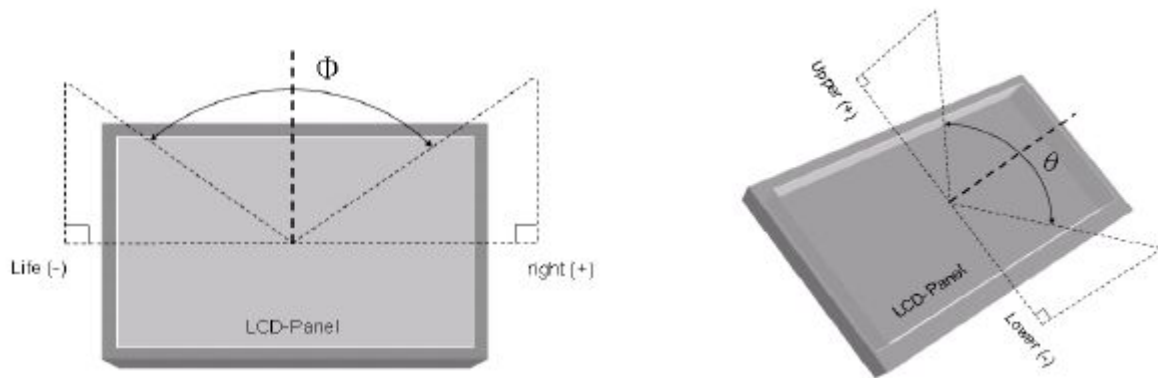


Fig.7-2 Definition of Viewing Angle

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

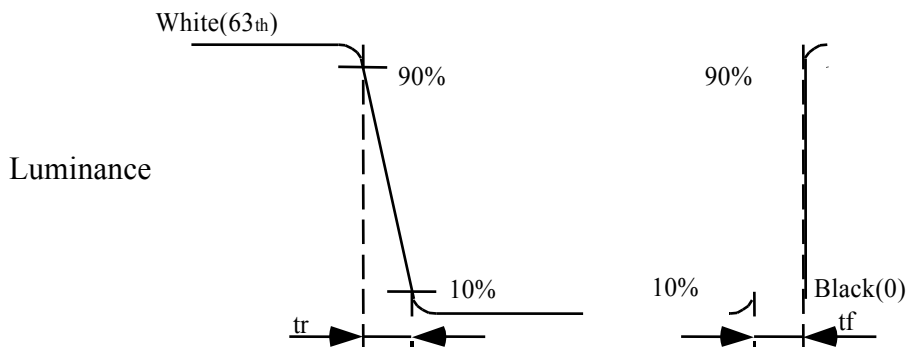


Fig.7-3 Definition of Response Time(White-Black)

8. RELIABILITY TEST

8.1. Temperature and humidity

TEST ITEMS	CONDITIONS	NOTE
High Temperature Operation	70°C ;240hrs	
High Temperature Storage	80°C ; 240hrs	
High Temperature High Humidity Operation	60°C ; 90%RH ;240hrs	No condensation
Low Temperature Operation	-20°C ; 240hrs	
Low Temperature Storage	-30°C ; 240hrs	
Thermal Shock	- 30°C(0.5hr) ~ 80°C(0.5hr) ; 200 Cycles	
Image Sticking	25 °C± 2 °C ; 4hrs	Note 1
MTBF	20,000hrs	

【Note1】 :

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

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

After 5 mins, the mura must be disappeared completely .

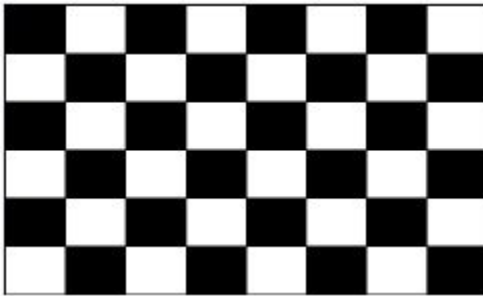


Image Sticking -pattern



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