ALL SHORE INDUSTRIES

ASI-T-430FA2BN/D

Item	Contents	Unit
Size	4.30	inch
Resolution	480(RGB)x272	/
Interface	CPU 16-bit	/
Technology type	a-Si TFT	/
Pixel pitch	0.161x0.161	mm
Pixel Configuration	RGB stripe	
Outline Dimension (W x H x D)	105.50x67.10x8.5	mm
Active Area	95.04x53.86	mm
Display Mode	Transmissive,Normally white	/
Backlight Type	LED	/
Driver IC	SSD1963	/

Record of Revision

Date	Revision No.	Summary
2012-02-22	1.0	Rev 1.0 was issued
2012-08-31	1.1	Modify the outline drawing

1. Scope

This data sheet is to introduce the specification of ASI-T-430FA2BN/D active matrix TFT module. It is composed of a color TFT-LCD panel, driver ICs, FPC and a backlight unit. The 4.30'' display area contains 480(RGB) x272pixels.
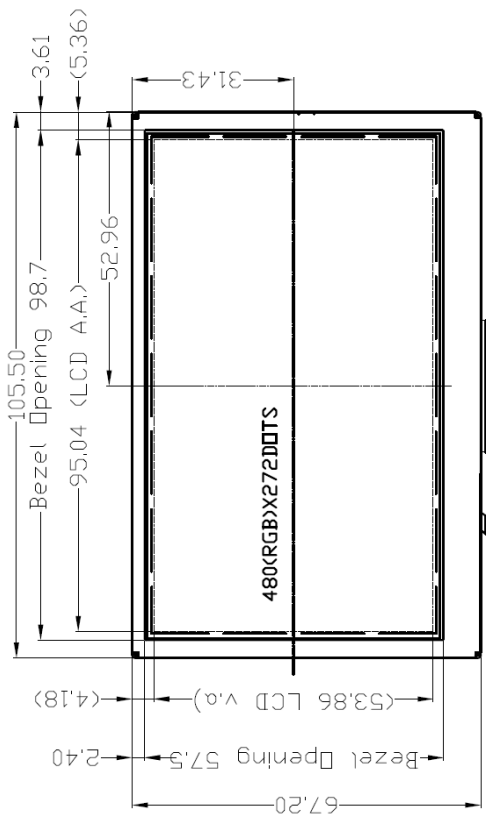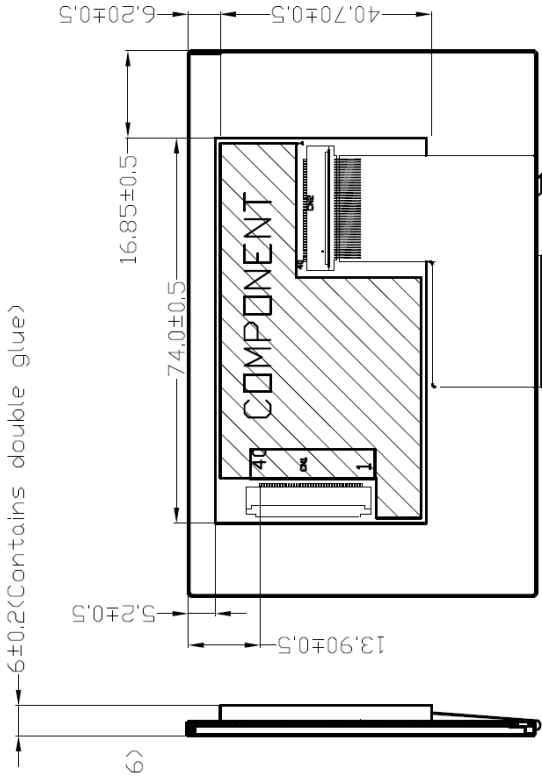
2. Application

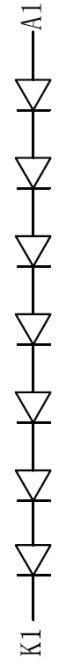Digital equipments which need color display, mobile navigator/video systems.

3. General Information

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PIN	SYMBOL
1	GND
2	VDD
3	AVDD
4	RESET
5	CS
6	RS
7	WR
8	RD
9	DB0
10	DB1
11	DB2
12	DB3
13	DB4
14	DB5
15	DB6
16	DB7
17	DB8
18	DB9
19	DB10
20	DB11
21	BD12
22	DB13
23	DB14
24	DB15
25	NC
26	GND
27	NC
28	NC
29	NC
30	GND
31	AGND
32	AGND
33	AVDD
34	AVDD
35	LED A
36	LED K
37	NC
38	NC
39	NC
40	NC

COMPONENT

6.20±0.5
40.70±0.5
16.85±0.5
74.0±0.5
5.2±0.5
13.90±0.5
6±0.2(Contains double glue)

A–A

3.61
(5.36)
31.43
105.50
Bezel Opening 98.7
95.04 (LCD A.A.)
52.96
480(RGB)x272DOTS
(53.86 LCD v.a.)
(4.18)
Bezel Opening 57.5
2.40
67.20

1. LED CIRCUIT DIAGRAM:

K1 —▷|—▷|—▷|—▷|—▷|—▷|—▷|—▷|—▷|—▷|— A1

DRAWN BY:
CHECKED BY:
APPROVED BY:
CONFIRMED BY:
TITLE:
DWG NO:
DWG NAME:
SCALE:
UNIT: mm
SHEET NO: OF

NOTES:
1.DISPLAY TYPE: α-si TFT
2.DISPLAY MODULE :Transmissive,Normally White
3.OPERATING TEMP: -20°C ~ 70°C
4.STORAGE TEMP: -30°C ~ 80°C
5.BACKLIGHT: LED
6.RoHS Compliancy

5. Interface signals

Pin No.	Symbol	Description
1	GND	Ground for digital circuit
2	VDD	Power supply for digital circuit (VDD = 3.3V).
3	AVDD	Leave it OPEN.
4	RESET	External reset, active low.
5	CS	Chip select, active low.
6	RS	Command/data select.
7	WR	Write control.
8	RD	Read control.
9-24	[DB0-DB15]	16bit data bus
25	NC	NO CONNECT
26	GND	Ground for digital circuit
27-29	NC	NO CONNECT
30	GND	Ground for digital circuit
31-32	AGND	Connect to GND.
33-34	AVDD	Leave it OPEN.
35	LED-A	Anode of LED backlight (13.2V @ 40mA).
36	LED-K	Cathode of LED backlight.
37	NC	No connection
38	NC	
39	NC	
40	NC	

6. Absolute maximum Ratings

6.1. Electrical Absolute max. ratings

Parameter	Symbol	MIN	MAX	Unit	Remark
Supply Voltage	VDD	-0.3	5.0	V	

6.2. Environment Conditions

Item	Symbol	MIN	MAX	Unit	Remark
Operating Temperature	TOPR	-20	70	℃	
Storage Temperature	TSTG	-30	80	℃	

6.3. LED Backlight Absolute max. ratings

Item	Symbol	MIN	MAX	Unit	Remark
LED Forward Current	ILED	--	25	mA	For each LED

7. Electrical Specifications

7.1 Electrical characteristics

GND=0V, Ta=25℃

Item	Symbol	MIN	TYP	MAX	Unit	Remark
Logic Supply Voltage	VDD-GND	3	3.3	3.6	V	
Input Signal Voltage	VIH	0.8VDD	-	VDD	V	
	VIL	0	-	0.2VDD	V	
Supply Current	IDD	-	-	15	mA	VDD=3.3V

7.2 LED Backlight

Ta=25℃

Item	Symbol	MIN	TYP	MAX	Unit	Remark
Forward Current	IF	--	20	--	mA	
Forward Voltage	VF	--	22.4	--	V	

Backlight Circuit:

LED-AJ ○─ ▷│ ▷│ ▷│ ▷│ ▷│ ▷│ ▷│ ─○ LED-D

CIRCUIT DIAGRAM

8. Command/AC Timing

Details can be seen in the specification of IC -- SSD1963.

8.1 Parallel 8080-series Interface Timing

Parallel 8080-series Interface Timing Characteristics

| Symbol	Parameter		Min	Typ	Max	Unit
f_{MCLK}	System Clock Frequency*		1	-	110	MHz
t_{MCLK}	System Clock Period*		$1/ f_{MCLK}$	-	-	ns
t_{PWCSL}	Control Pulse High Width	Write	13	$1.5* t_{MCLK}$	-	ns
		Read	30	$3.5* t_{MCLK}$		
t_{PWCSH}	Control Pulse Low Width	Write (next write cycle)	13	$1.5* t_{MCLK}$	-	ns
		Write (next read cycle)	80	$9* t_{MCLK}$		
		Read	80	$9* t_{MCLK}$		
t_{AS}	Address Setup Time		1	-	-	ns
t_{AH}	Address Hold Time		2	-	-	ns
t_{DSW}	Write Data Setup Time		4	-	-	ns
t_{DHW}	Write Data Hold Time		1	-	-	ns
t_{PWLW}	Write Low Time		12	-	-	ns
t_{DHR}	Read Data Hold Time		1	-	-	ns
t_{ACC}	Access Time		32	-	-	ns
t_{PWLR}	Read Low Time		36	-	-	ns
t_R	Rise Time		-	-	0.5	ns
t_F	Fall Time		-	-	0.5	ns
t_{CS}	Chip select setup time		2	-	-	ns
t_{CSH}	Chip select hold time to read signal		3	-	-	ns

* System Clock denotes external input clock (PLL-bypass) or internal generated clock (PLL-enabled)

Parallel 8080-series Interface Timing Diagram (Write Cycle)
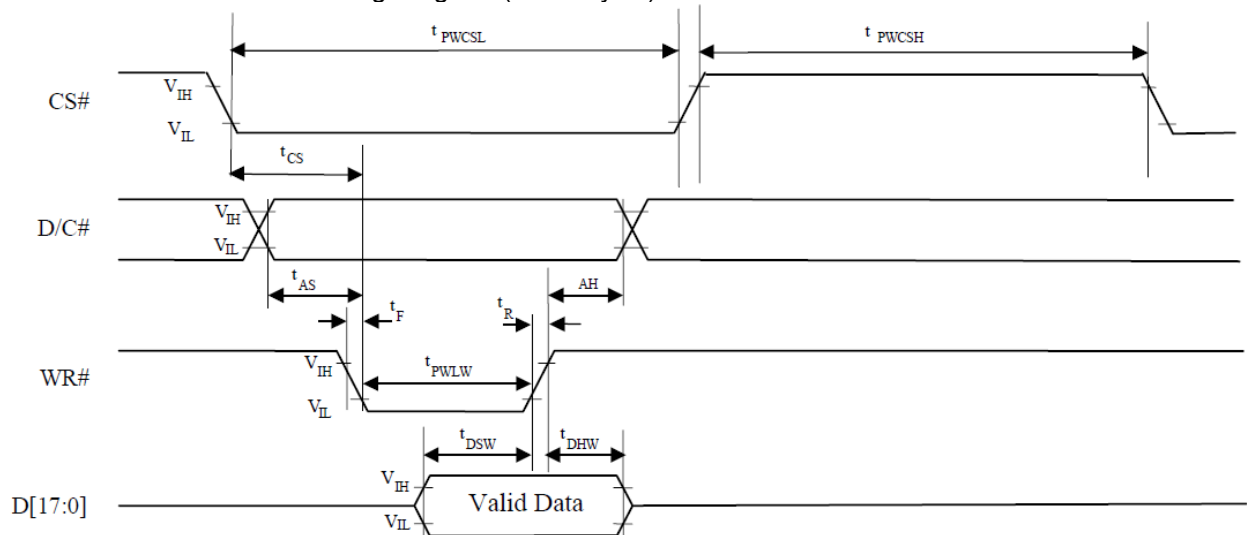
Parallel 8080-series Interface Timing Diagram (Read Cycle)
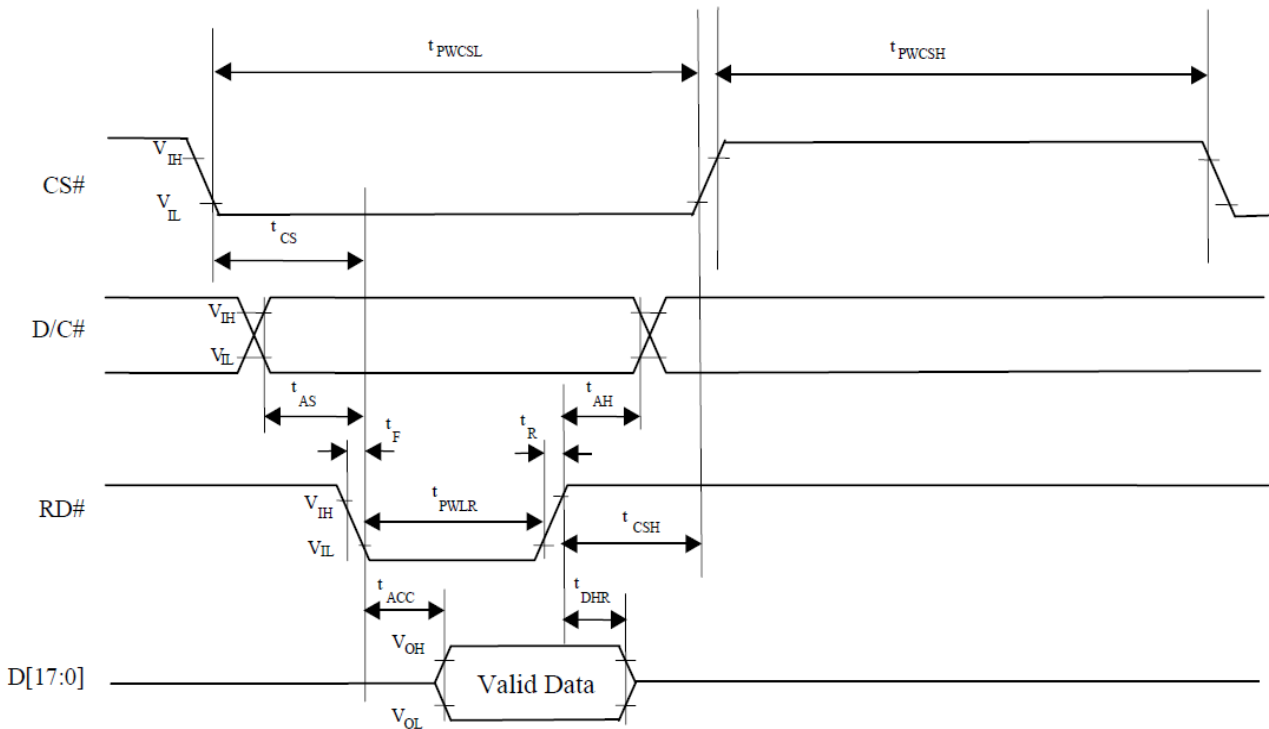
8.2 Pixel Data Format
Both 6800 and 8080 support 8-bit, 9-bit, 16-bit, 18-bit and 24-bit data bus. Depending on the width of the data bus, the display data are packed into the data bus in different ways.

Interface	Cycle	D[23]	D[22]	D[21]	D[20]	D[19]	D[18]	D[17]	D[16]	D[15]	D[14]	D[13]	D[12]	D[11]	D[10]	D[9]	D[8]	D[7]	D[6]	D[5]	D[4]	D[3]	D[2]	D[1]	D[0]
24 bits	1st	R7	R6	R5	R4	R3	R2	R1	R0	G7	G6	G5	G4	G3	G2	G1	G0	B7	B6	B5	B4	B3	B2	B1	B0
18 bits	1st							R5	R4	R3	R2	R1	R0	G5	G4	G3	G2	G1	G0	B5	B4	B3	B2	B1	B0
16 bits (565 format)	1st									R5	R4	R3	R2	R1	G5	G4	G3	G2	G1	G0	B5	B4	B3	B2	B1
16 bits	1st									R7	R6	R5	R4	R3	R2	R1	R0	G7	G6	G5	G4	G3	G2	G1	G0
	2nd									B7	B6	B5	B4	B3	B2	B1	B0	R7	R6	R5	R4	R3	R2	R1	R0
	3rd									G7	G6	G5	G4	G3	G2	G1	G0	B7	B6	B5	B4	B3	B2	B1	B0
12 bits	1st													R7	R6	R5	R4	R3	R2	R1	R0	G7	G6	G5	G4
	2nd													G3	G2	G1	G0	B7	B6	B5	B4	B3	B2	B1	B0
9 bits	1st															R5	R4	R3	R2	R1	R0	G5	G4	G3
	2nd															G2	G1	G0	B5	B4	B3	B2	B1	B0
8 bits	1st																	R7	R6	R5	R4	R3	R2	R1	R0
	2nd																	G7	G6	G5	G4	G3	G2	G1	G0
	3rd																	B7	B6	B5	B4	B3	B2	B1	B0

9. Optical Specification

Item		Symbol	Condition	Min	Typ.	Max.	Unit	Remark
Contrast Ratio		CR	θ=0°	350	500	-		Note1 Note2
Response Time		Ton/ Toff	25℃	-	20	-	ms	Note1 Note3
View Angles		ΘT	CR≧10	60	70	-	Degree	Note 4
		ΘB		40	50	-		
		ΘL		60	70	-		
		θR		60	70	-		
Chromaticity	White	x	Brightness is on	0.265	0.315	0.365		Note5, Note1
		y		0.278	0.328	0.378		
	Red	x		0.540	0.590	0.640		
		y		0.300	0.350	0.400		
	Green	x		0.290	0.340	0.390		
		y		0.500	0.550	0.600		
	Blue	x		0.094	0.144	0.194		
		y		0.050	0.100	0.150.		
NTSC		S			51		%	Note5
Luminance		L			280	-	cd/m^2	Note1 Note6
Uniformity		U		75	80	-	%	Note1 Note7

Note 1: Definition of optical measurement system.

Temperature = 25℃(±3℃)
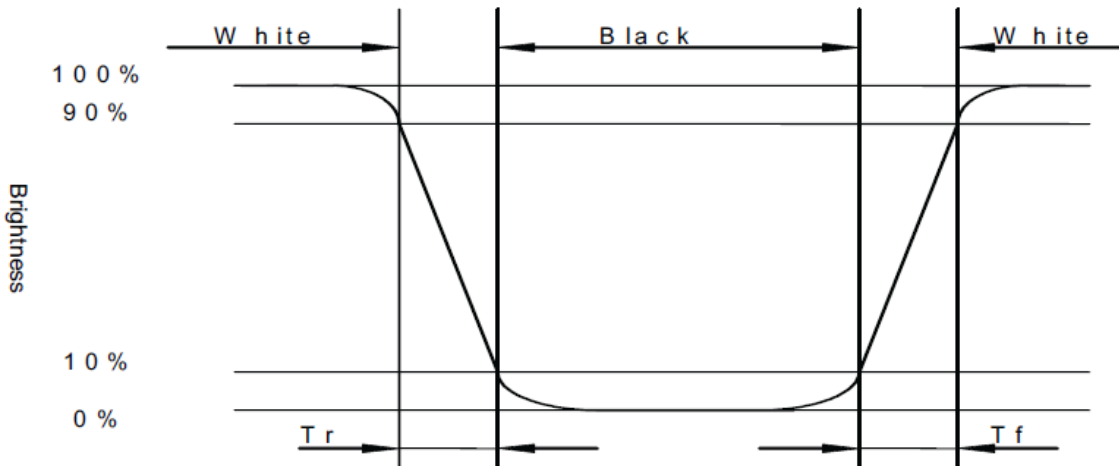
LED back-light: ON, Environment brightness < 150 lx
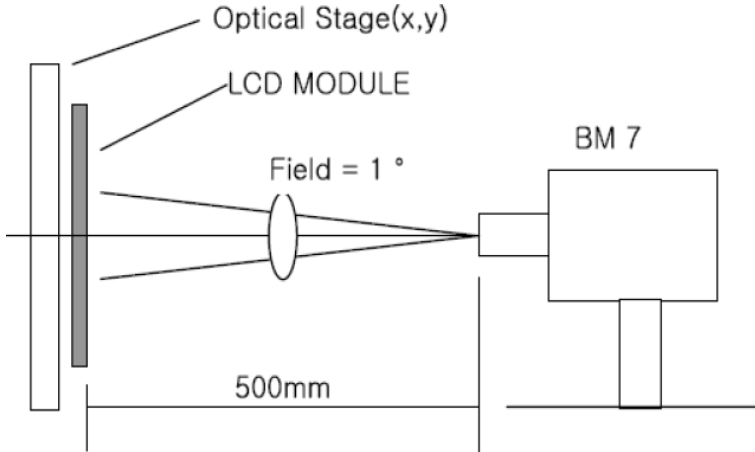
Note 2: Contrast ratio is defined as follow:

$$\text{Contrast Ratio} = \frac{\text{Surface Luminance with all white pixels}}{\text{Surface Luminance with all black pixels}}$$
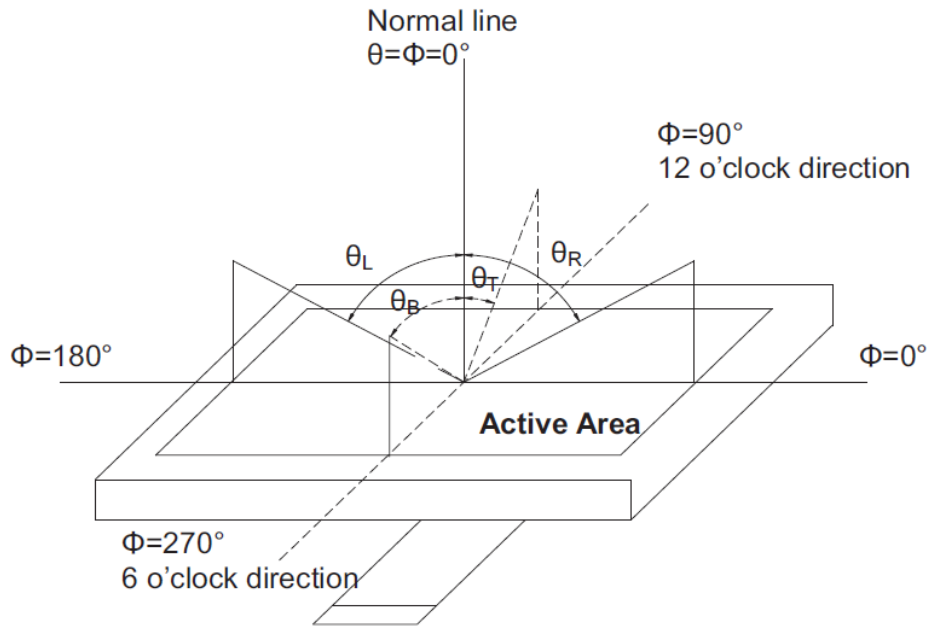
Note 3: Response time is defined as follow:

Response time is the time required for the display to transition from black to white (Rise Time, Tr) and from white to black (Decay Time, Tf).
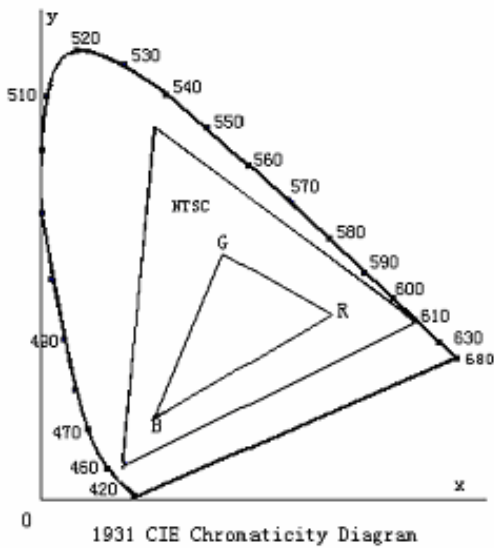
Note 4: Viewing angle range is defined as follow:

Viewing angle is measured at the center point of the LCD.

Normal line
θ=Φ=0°

Φ=90°
12 o'clock direction

θ_L θ_R

θ_T

θ_B

Φ=180°

Φ=0°

Active Area

Φ=270°
6 o'clock direction

Note 5: Color chromaticity is defined as follow: (CIE1931)

Color coordinates measured at center point of LCD.

1931 CIE Chromaticity Diagram

$$S = \frac{\text{area of RGB triangle}}{\text{area of NTSC triangle}} \times 100\%$$

Note 6: Luminance is defined as follow:

Luminance is defined as the brightness of all pixels "White" at the center of display area on optimum contrast.

Note 7: Luminance Uniformity is defined as follow:

Active area is divided into 9 measuring areas (Refer Fig. 2). Every measuring point is placed at the center of each measuring area.

$$\text{Uniformity } (U) = \frac{\text{Minimum Luminance(brightness) in 9 points}}{\text{Maximum Luminance(brightness) in 9 points}}$$
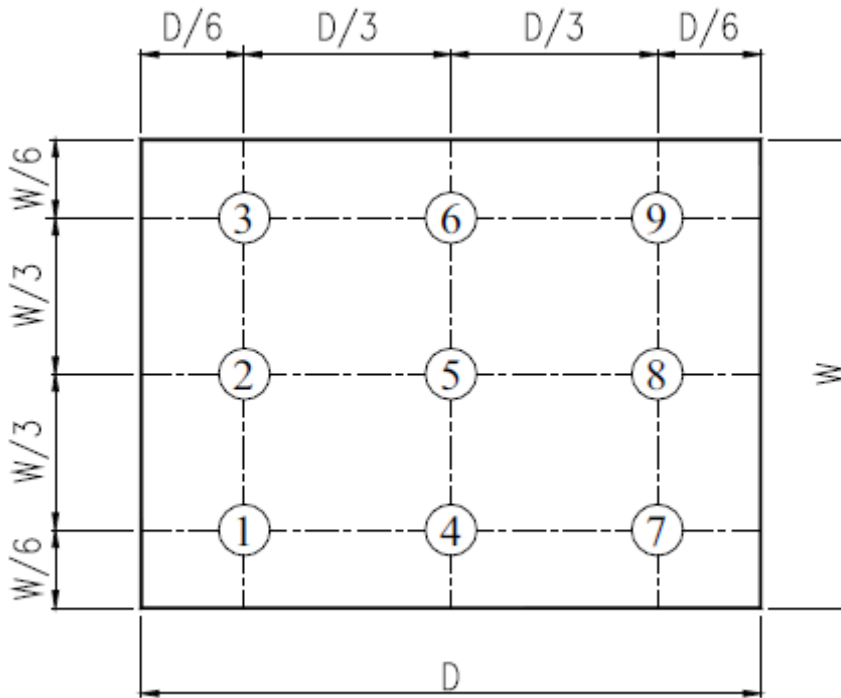

Fig. 2 Definition of uniformity

10. Environmental / Reliability Tests

No	Test Item	Condition	Judgment criteria
1	High Temp Operation	Ts=+70℃, 120hrs	Per table in below
2	Low Temp Operation	Ta=-20℃, 120hrs	Per table in below
3	High Temp Storage	Ta=+80℃, 120hrs	Per table in below
4	Low Temp Storage	Ta=-30℃, 120hrs	Per table in below
5	High Temp & High Humidity Storage	Ta=+60℃, 90% RH, 120hours	Per table in below (polarizer discoloration is excluded)
6	Thermal Shock (Non-operation)	-30℃ 30 min~+80℃ 30 min, Change time:5min, 10 Cycles	Per table in below
7	ESD (Operation)	C=150pF, R=330Ω，5 points/panel Air: ±8KV, 5times; Contact: ±4KV, 5 times.	Per table in below
8	Vibration (Non-operation)	Frequency range:10~55Hz, Stroke:1.5mm Sweep:10Hz~55Hz~10Hz 2 hours for each direction of X.Y.Z. (6 hours for total)(Package condition)	Per table in below
9	Shock (Non-operation)	60G 6ms, ±X,±Y,±Z 3times, for each direction	Per table in below
10	Package Drop Test	Height: 80 cm, 1 corner, 3 edges, 6 surfaces	Per table in below

INSPECTION	CRITERION(after test)
Appearance	No Crack on the FPC, on the LCD Panel
Alignment of LCD Panel	No Bubbles in the LCD Panel No other Defects of Alignment in Active area
Electrical current	Within device specifications
Function / Display	No Broken Circuit, No Short Circuit or No Black line No Other Defects of Display

11. Precautions for Use of LCD Modules

11.1 Safety

The liquid crystal in the LCD is poisonous. Do not put it in your mouth. If the liquid crystal touches your skin or clothes, wash it off immediately using soap and water.

11.2 Handling

A. The LCD and touch panel is made of plate glass. Do not subject the panel to mechanical shock or to excessive force on its surface.

B. Do not handle the product by holding the flexible pattern portion in order to assure the reliability

C. Transparency is an important factor for the touch panel. Please wear clear finger sacks, gloves and mask to protect the touch panel from finger print or stain and also hold the portion outside the view area when handling the touch panel.

D. Provide a space so that the panel does not come into contact with other components.

E. To protect the product from external force, put a covering lens (acrylic board or similar board) and keep an appropriate gap between them.

F. Transparent electrodes may be disconnected if the panel is used under environmental conditions where dew condensation occurs.

G. Property of semiconductor devices may be affected when they are exposed to light, possibly resulting in IC malfunctions.

H. To prevent such IC malfunctions, your design and mounting layout shall be done in the way that the IC is not exposed to light in actual use.

11.3 Static Electricity

A. Ground soldering iron tips, tools and testers when they are in operation.

B. Ground your body when handling the products.

C. Power on the LCD module before applying the voltage to the input terminals.

D. Do not apply voltage which exceeds the absolute maximum rating.

E. Store the products in an anti-electrostatic bag or container.

11.4 Storage

A. Store the products in a dark place at $+25℃ \pm 10℃$ with low humidity (40% RH to 60% RH). Don't expose to sunlight or fluorescent light.

B. Storage in a clean environment, free from dust, active gas, and solvent.

11.5 Cleaning

A. Do not wipe the touch panel with dry cloth, as it may cause scratch.

B. Wipe off the stain on the product by using soft cloth moistened with ethanol. Do not allow ethanol to get in between the upper film and the bottom glass. It may cause peeling issue or defective operation. Do not use any organic solvent or detergent other than ethanol.

11.6 Cautions for installing and assembling

Bezel edge must be positioned in the area between the Active area and View area. The bezel may press the touch screen and cause activation if the edge touches the active area. A gap of approximately 0.5mm is needed between the bezel and the top electrode. It may cause unexpected activation if the gap is too narrow. There is a tolerance of 0.2 to 0.3mm for the outside dimensions of the touch panel and tail. A gap must be made to absorb the tolerance in the case and connector.