InfoVision Optoelectronics (Kunshan) Co.,LTD.

Document Title	C090SWT3-0 Customer Approved Specification			Page No.	1/23
Document No.		Issue date	2019/08/22	Revision	00

Customer Approved Specification

To:

Product Name: C090SWT3-0

Document Issue Date: 2019/08/22

Customer	InfoVision Optoelectronics
SIGNATURE _____ _____ _____ Please return 1 copy for your confirmation with your signature and comments.	**SIGNATURE** **REVIEWED BY QA** _____ **PREPARED BY FAE** _____

Note: 1. Please contact InfoVision Company before designing your product based on this product.
2. The information contained herein is presented merely to indicate the characteristics and performance of our products. No responsibility is assumed by IVO for any intellectual property claims or other problems that may result from application based on the module described herein.

FQ-7-30-0-009-03C

Revision	Date	Page	Old Description	New Description	Remark
00	2019/08/22	--	--	First issued.	

Contents

1 General Description

C090SWT3-0 is a Color Active Matrix Liquid Crystal Display composed of Single chip TN TFT LCD Cell. The format of screen is intended to support the resolution 1024 horizontal by 600 vertical pixel arrays.

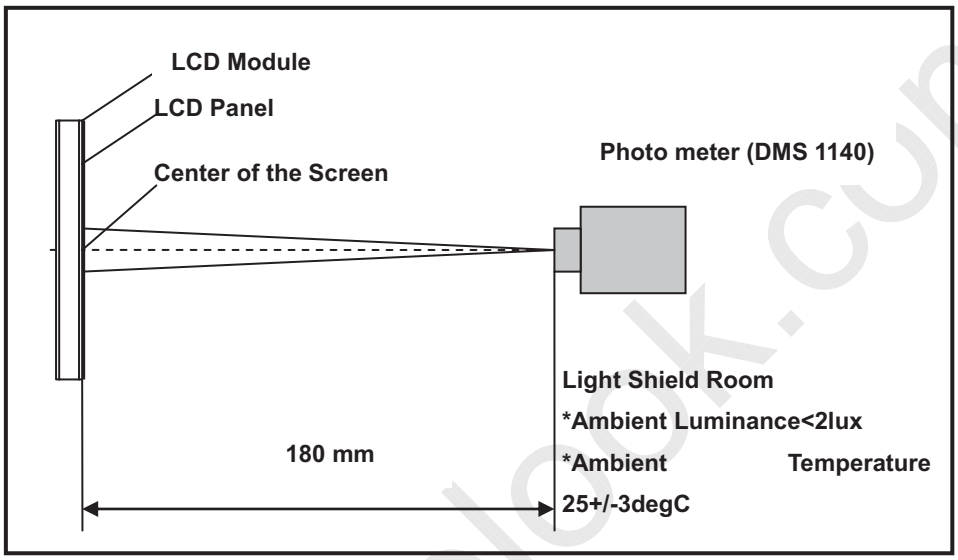
2 General Characteristics

Item			Specification	Unit	Note
Screen Diagonal			8.95	Inch	
Active Area (H x V)			196.608 x 114.15	mm	Single Chip
Number of Dots (H x V)			1024 (RGB) x600	dot	Single Chip
Pixel Size (H x V)			0.192x0.19025	mm	Single Chip
Dimension (H x V x D)			203.7 x 123.9x1.0	mm	Without polarizer
Display Type			Transmissive	-	-
Display Mode			TN Mode, Normally White	-	-
View Direction			4:30 o'clock	-	-
Temperature Range	Storage		-30 ~ 80	℃	-
	Operating		-20 ~ 70	℃	
Response Time			25 (Typ.)	ms	(1) (4)
Contrast Ratio			500 (Typ.)	-	(1) (3)
Viewing Angle （L/R/U/D）CR>10			70/70/70/70 (Typ.).	deg.	(1) (2) Viewing Angle With EWV polarizer
CF only Chromaticity (CIE 1931)	NTSC		50(Typ.)	%	(1) (6)
	Red	Rx	0.602(Typ.)	-	Viewing angle ΘX = ΘY=0° Under C light
		Ry	0.327(Typ.)		
	Green	Gx	0.301(Typ.)		
		Gy	0.552(Typ.)		
	Blue	Bx	0.139(Typ.)		
		By	0.138(Typ.)		
	White	Wx	0.310(Typ.)		
		Wy	0.337(Typ.)		
Panel Transmittance			4.95(Min) /5.5(Typ.)	%	(1) (5)(6)
Color Filter Structure			Stripe RGB	-	-
Weight			60.34	g	Single chip

Note (1) Measurement Setup:

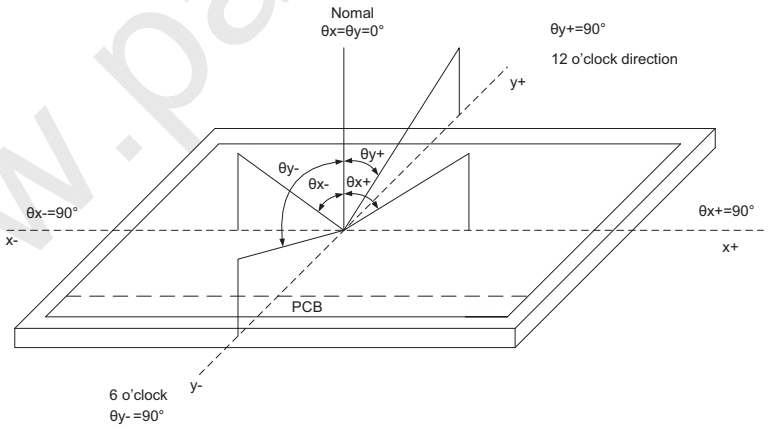
The LCD module should be stabilized at given temperature(25℃) for 15 minutes to Avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting backlight for 15 minutes in a windless room.

Figure 2 Measurement Setup



Note (2) Definition of Viewing Angle

Figure 3 Definition of Viewing Angle



Note (3) Definition Of Contrast Ratio (CR)

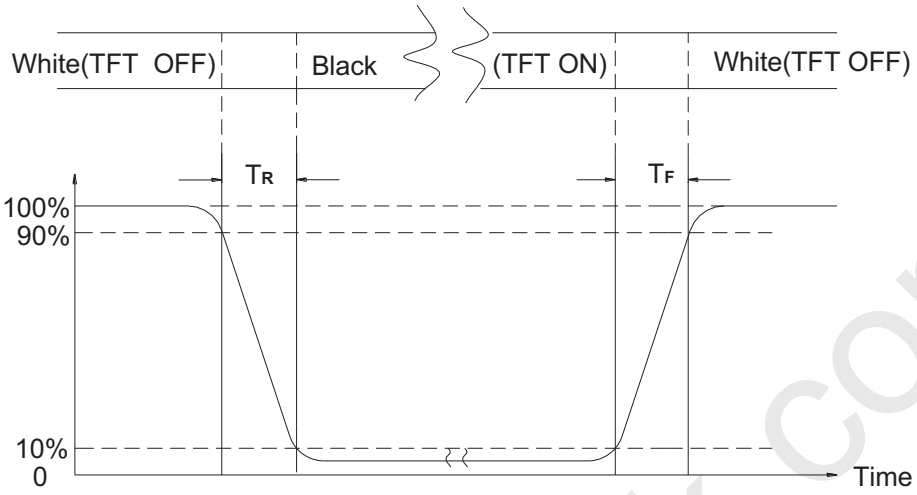
The contrast ratio can be calculated by the following expression

Contrast Ratio (CR) = L63 / L0

L63: Luminance of gray level 63, L0: Luminance of gray level 0

Note (4) Definition Of Response Time (TR, TF)

Figure 4 Definition of Response Time

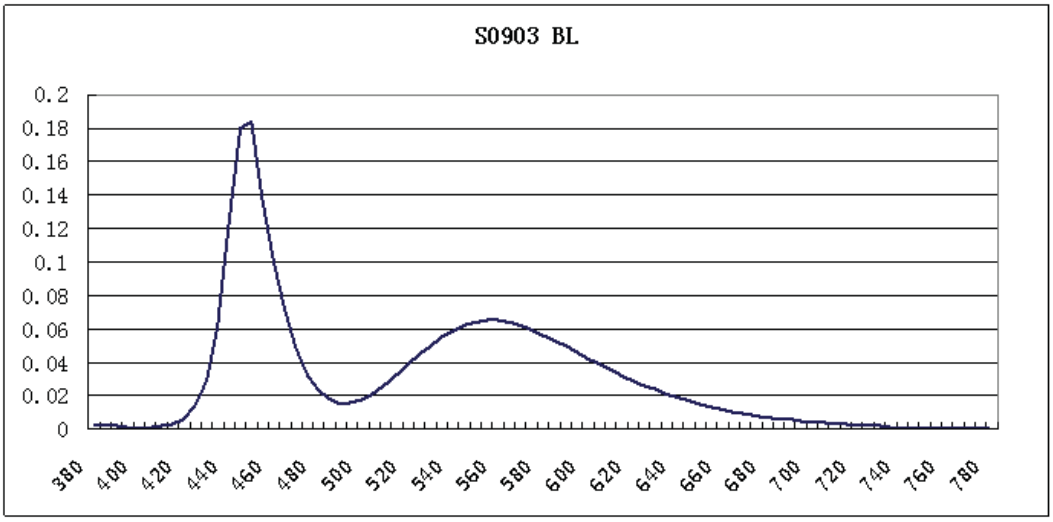


Note (5) Definition of Transmittance (Module is without signal input and IVO reference backlight).

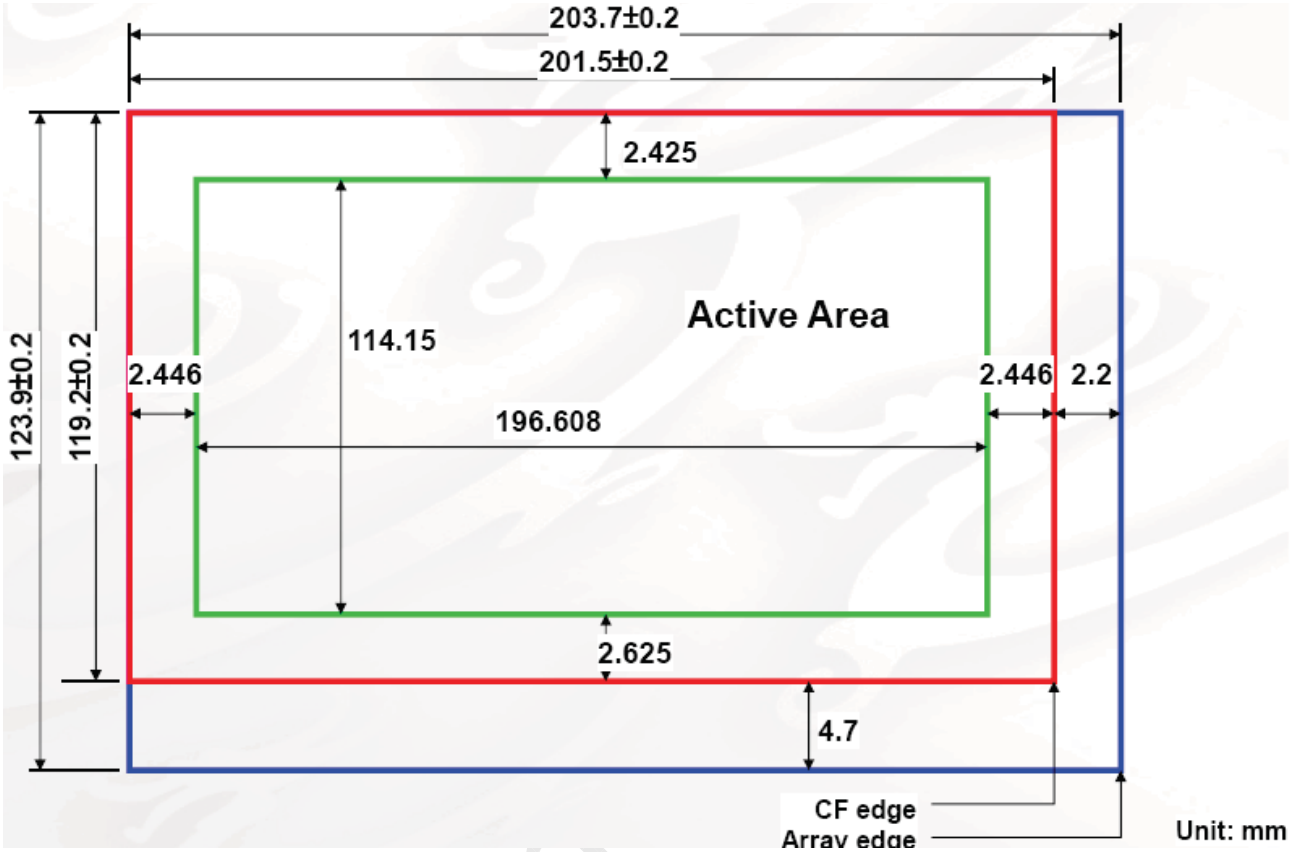
$$\text{Transmittance} = \frac{\text{Luminance of LCD Module}}{\text{Luminance of Back light}} \text{X100\%}$$

Note (6) Back light Spectrum

Figure 5 Back Light Spectrum



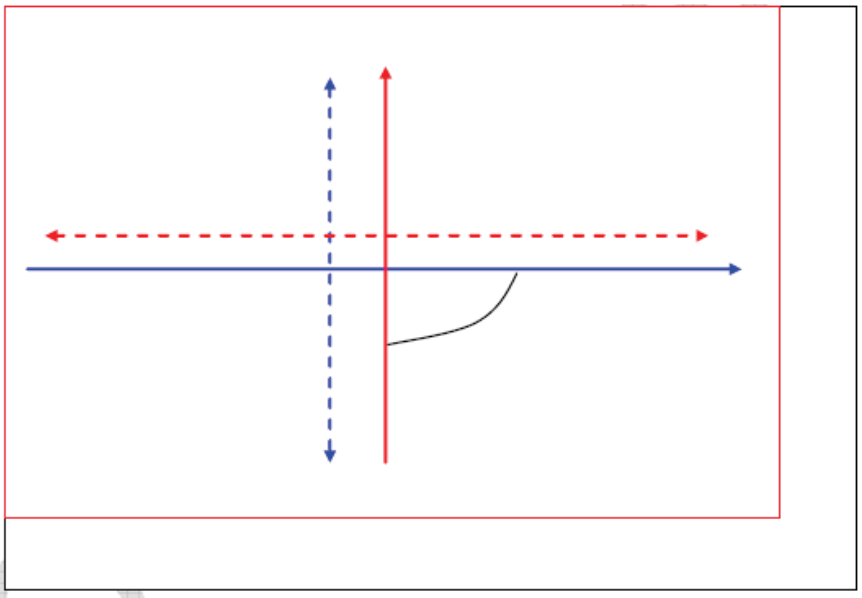
3 Outline Size of Cell



4 Cell Thickness (Single Chip)

Side	Thickness
a	0.5±0.05mm
b	0.5±0.05mm

5 CF/TFT Side Rubbing Direction



Top view from CF protective film side

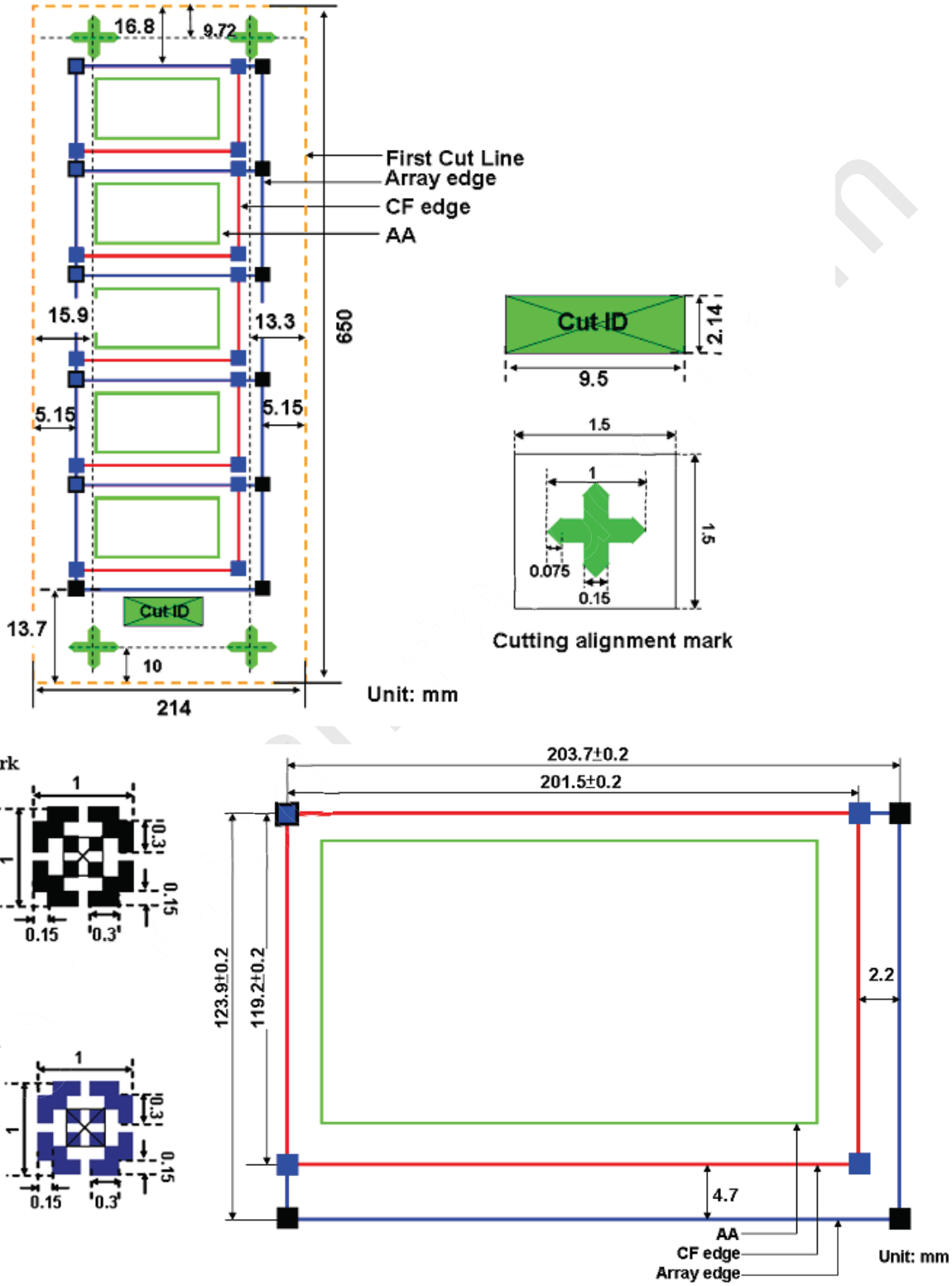
CF Absorption axis

TFT Absorption axis

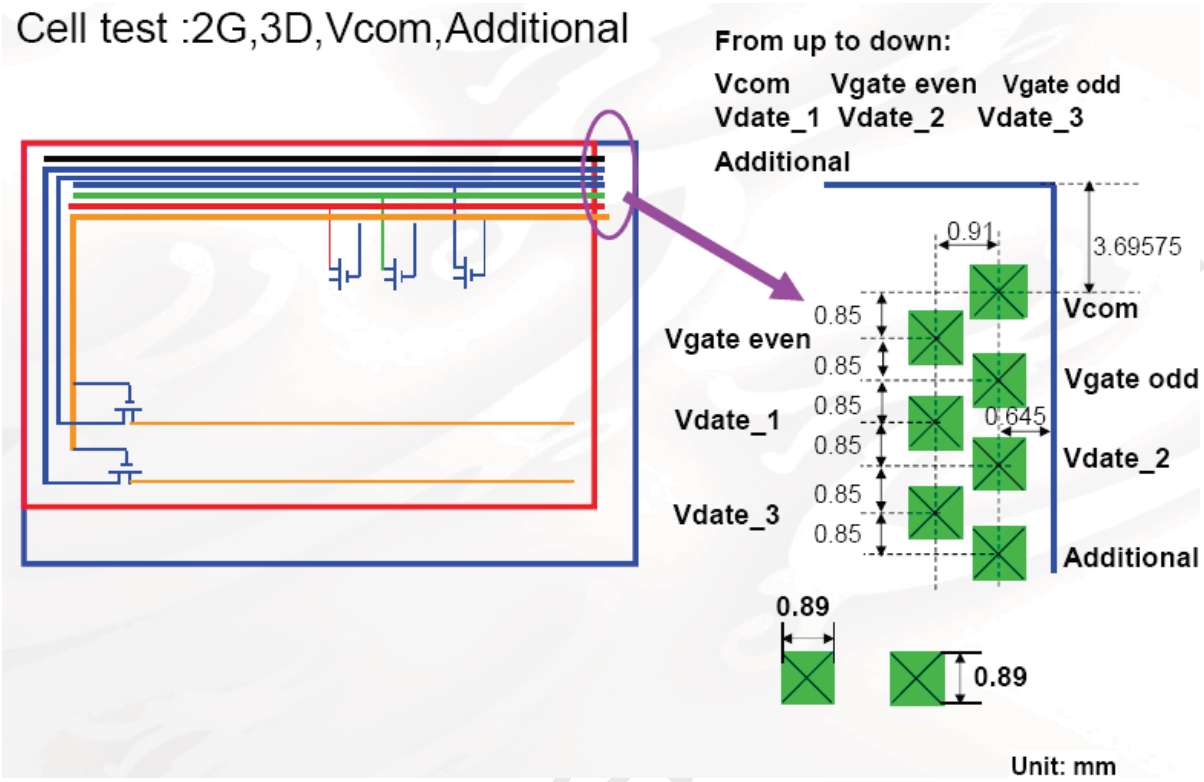
TFT side rubbing direction

CF side rubbing direction

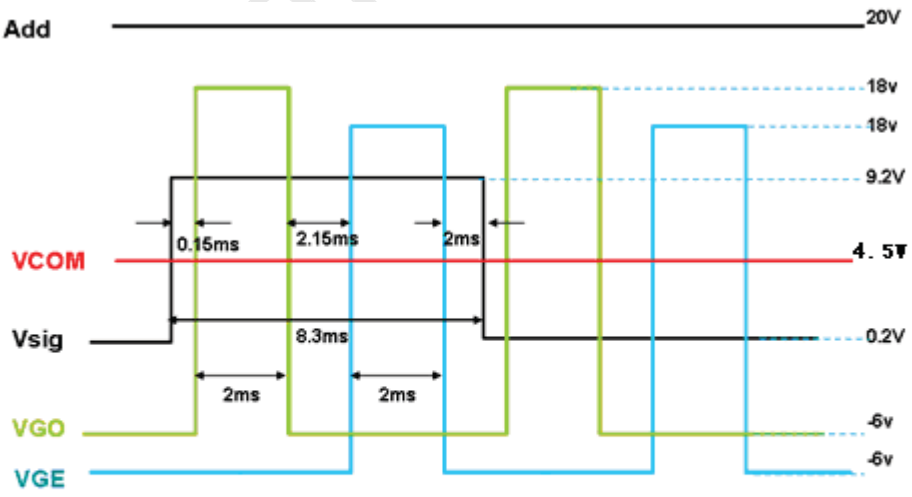
6 Sub sheet 5 chips: Size and cut mark.



6.1 Cell Light-On Test Pad Drawing (Shorting bar)

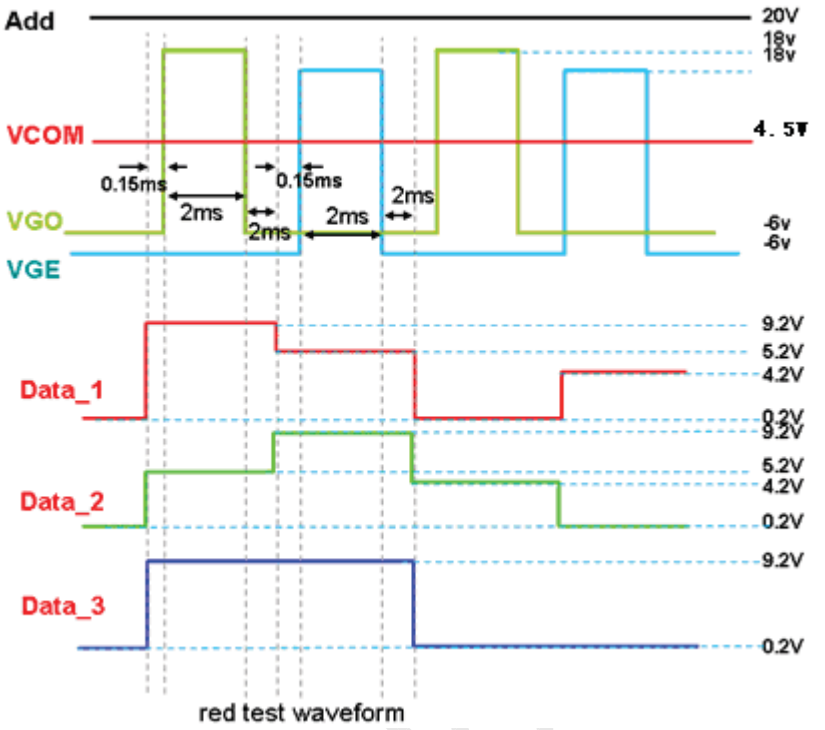


6.2 Cell Light-On Test Waveform

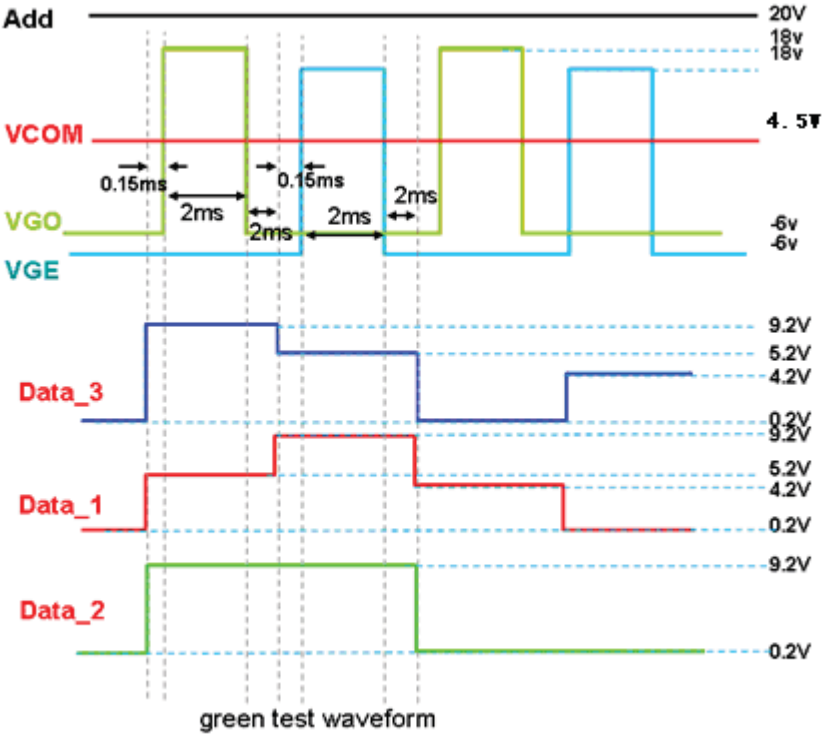


Black：Vdata 输入均为 Vsig：9.2V/0.2V，Vcom 输入为3.41V；
Gary： Vdata 输入均为 Vsig：7.2V/2.2V，Vcom 输入为3.41V；
White：Vdata 输入均为 Vsig：5.2V/4.2V，Vcom 输入为3.41V；

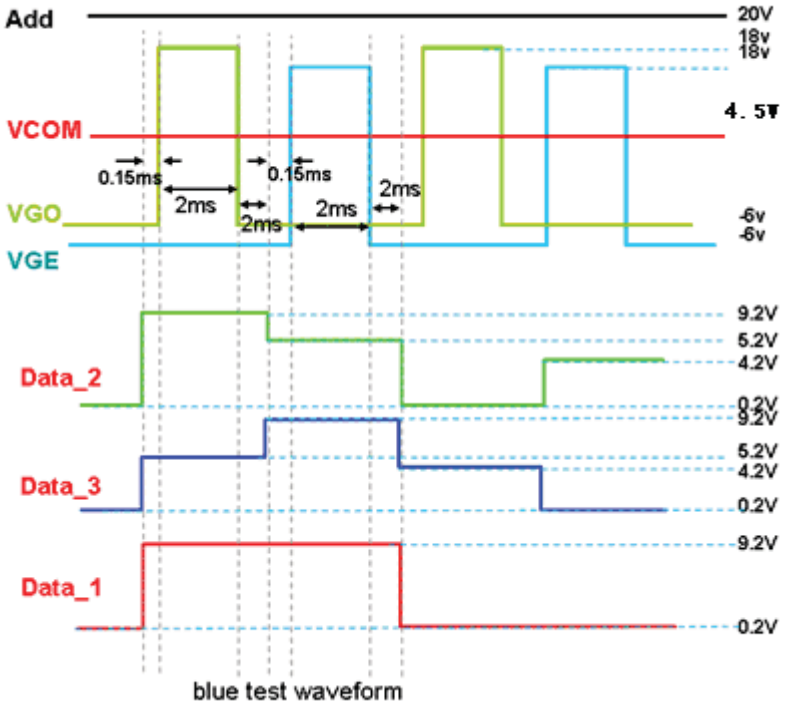
Black/gray/white testing waveform



red test waveform



green test waveform

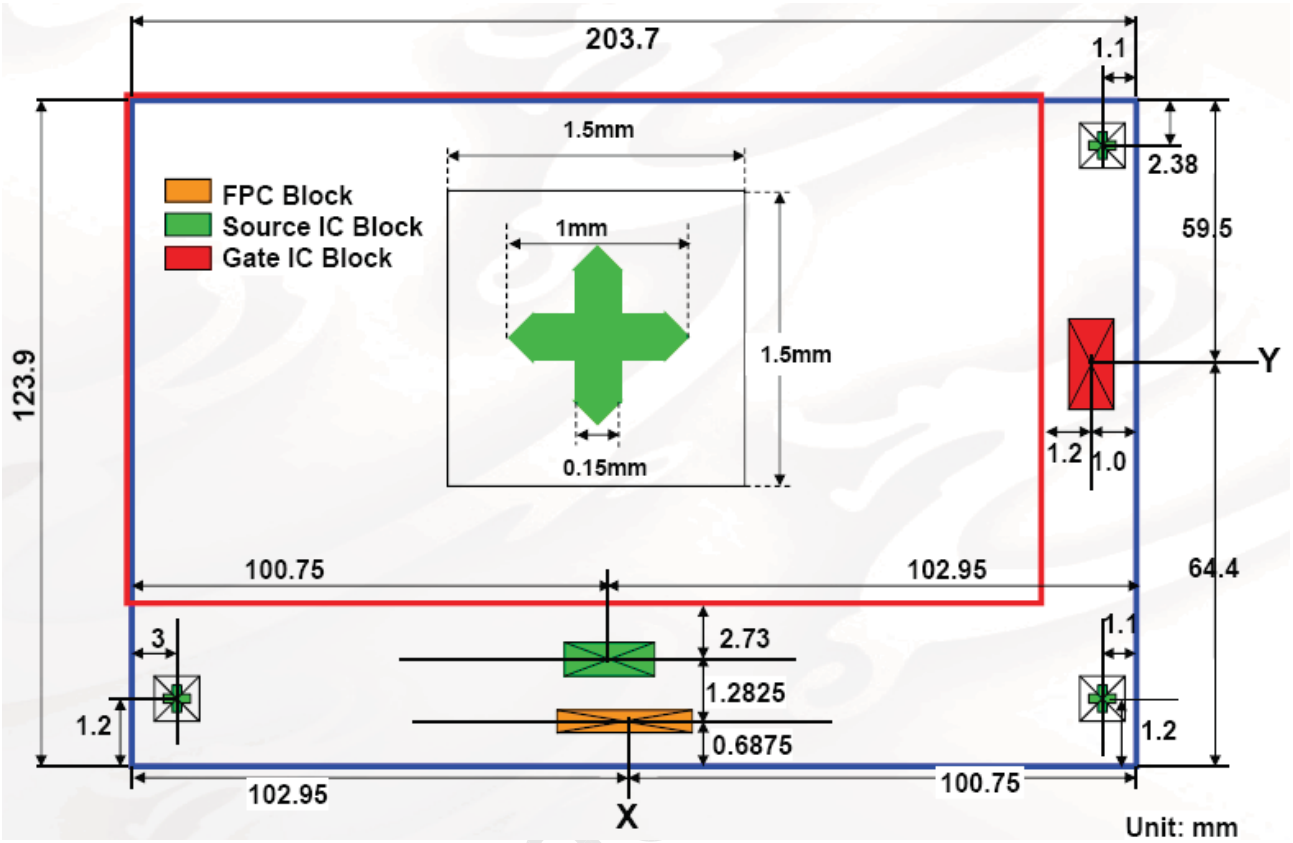


blue test waveform

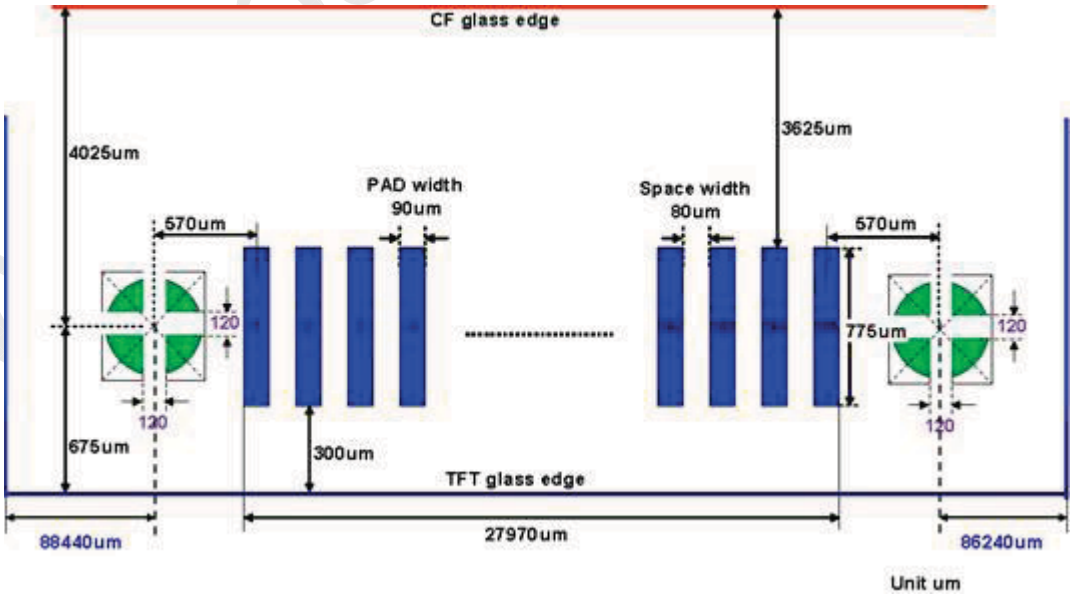
6.3 Shorting Bar Driving Voltage Range

No.	Item	Min.	Typ.	Max.	Unit
1	Vcom voltage	4.3	4.5	4.7	V
2	Vgl voltage	-7	-6	-5	V
3	Vgh voltage	17	18	19	V
4	Vdl voltage	0	0.2	0.4	V
5	Vdh voltage	9	9.2	9.4	V
7	Vadd	19	20	21	V
6	OE time		0.15		us
8	Vgate line charging time	-	2	-	us
9	Vgate line charging time	-	2	-	us

7 X-COG,X-FPC&Y-COG Pitch On TFT Panel

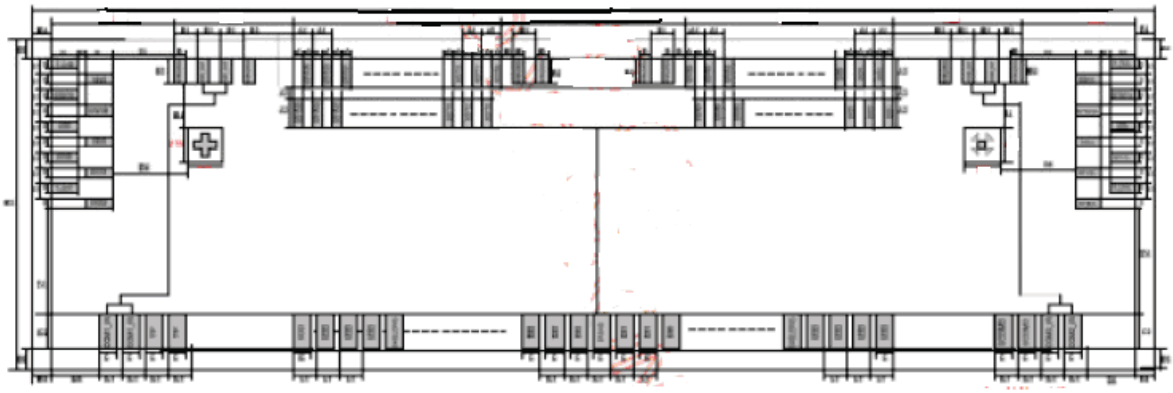


8 X- FPC Pad Information



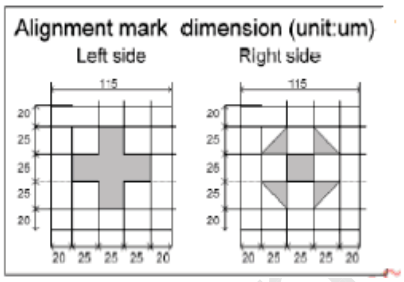
9 Cell Electrode Pin Assignment

9.1 Source Driver IC Dimension and pad function（Bump side）



Pad Information

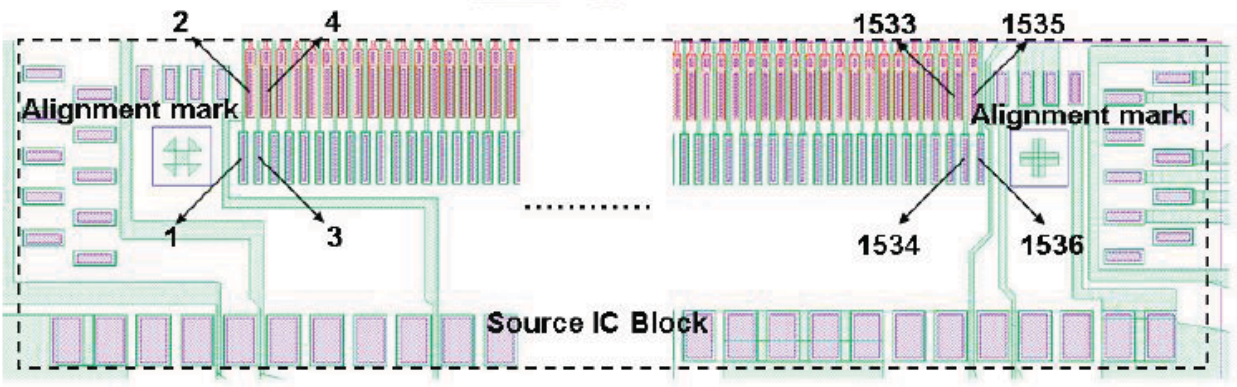
Alignment Mark



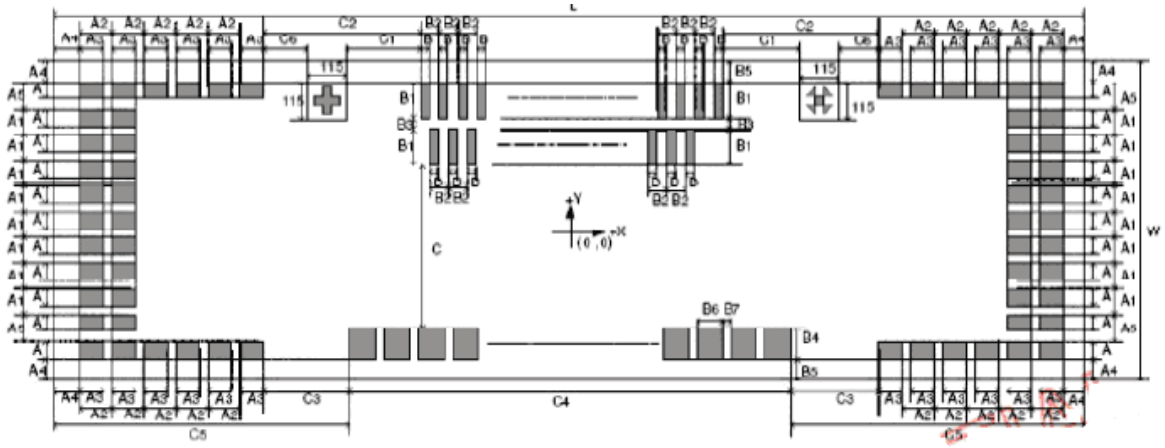
Symbol	Dimension (um)
A	19
A1	30
A2	100
A3	30
B	30
B1	50
B2	70
B3	50
B4	50
C	65
C1	85
C2	100

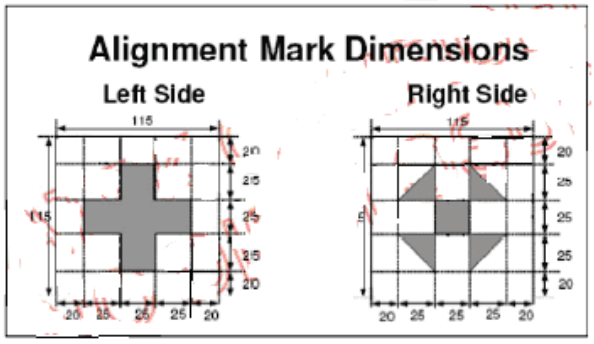
Symbol	Dimension (um)
D	30
D1	40
D2	80
D3	43
D4	33
D5	96
D6	74
D7	20
E1	25000
E2	700
E3	256
E4	57(max)
E5	57(max)

9.2 Source Driver IC Pin Assignment



9.3 Gate Driver IC Dimension and pad fuction（Bump Side）

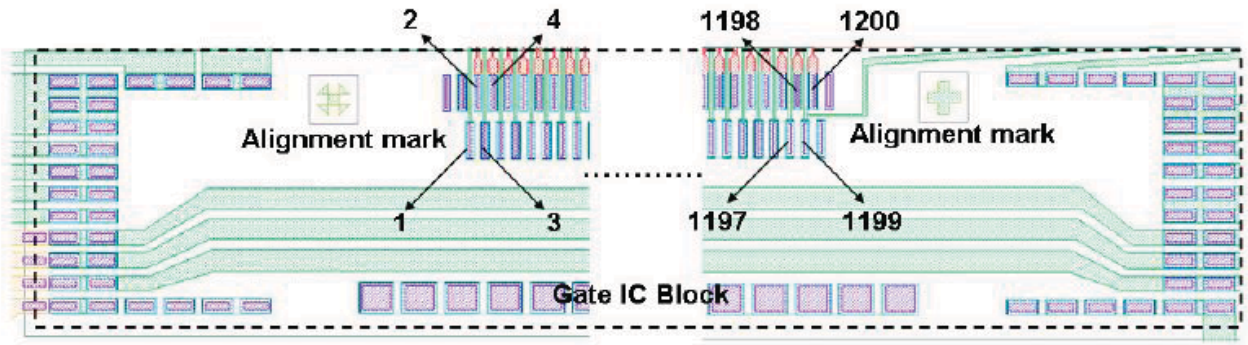




Symbol	Dimensions (um)	Symbol	Dimensions (um)	Symbol	Dimensions (um)
A	32	B2	36	C2	403
A1	52	B3	25	C3	208
A2	90	B4	70	C4	22080
A3	70	B5	57	C5	785
A4	57	B6	80	C6	89
A5	54	B7	20	L	23650(Max)
B	18	C	291	W	670(Max)
B1	85	C1	199		

(scribe-line included)

9.4 Gate Driver IC Pin assignment

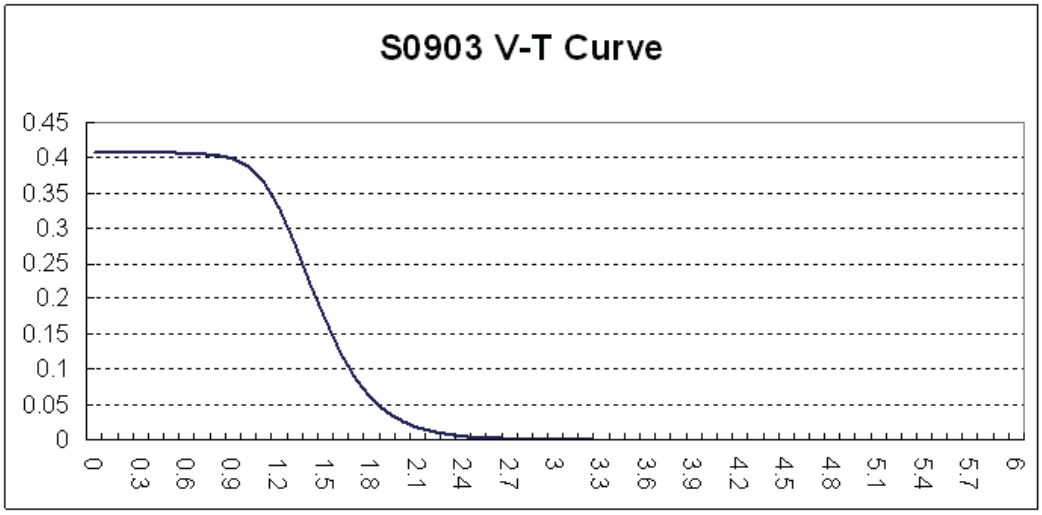


9.5 FPC Pin assignment

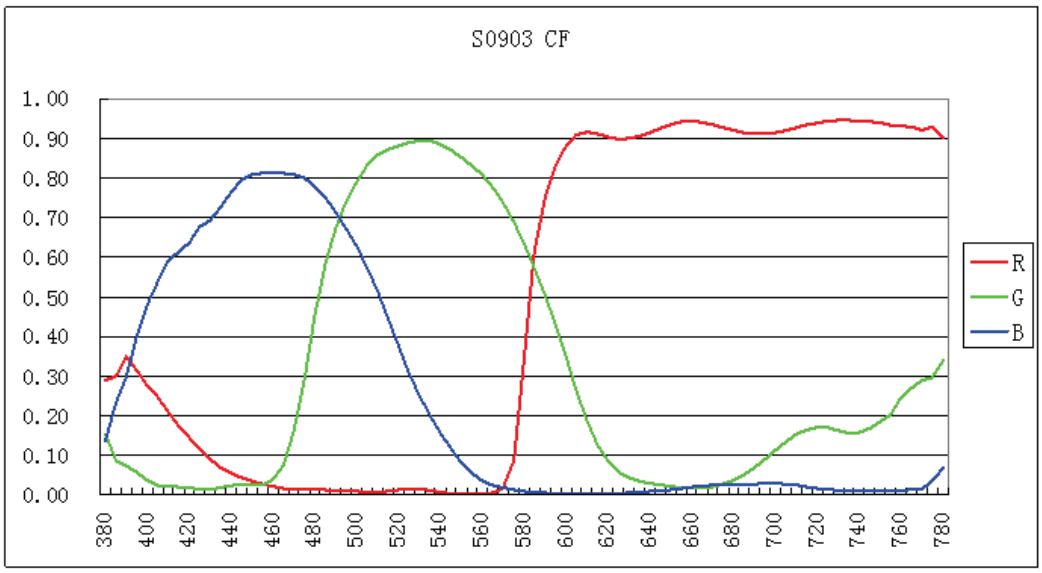
No.	pin	No.	pin	No.	pin	No.	pin	No.	pin
1	VCOM	34	IFSEL	67	G1	100	V5	133	VDD
2	VCOM	35	MODE	68	G2	101	V4	134	VDD
3	VCOM	36	OPDRV	69	G3	102	V3	135	GND
4	NC	37	CABC_EN[1]	70	G4	103	V2	136	GND
5	NC	38	CABC_EN[0]	71	G5	104	V1	137	GND
6	REPO	39	VDD	72	G6	105	AGND	138	GND
7	REPI_2	40	VDD	73	G7	106	AGND	139	AVDD
8	S1	41	GND	74	DASHD	107	AGND	140	AVDD
9	VDDN	42	GND	75	VDD_LVDS	108	AGND	141	AVDD
10	VDDN	43	AVDD	76	VDD_LVDS	109	AVDD	142	AVDD
11	NC	44	AVDD	77	DASHD	110	AVDD	143	AGND
12	NC	45	AVDD	78	NINC	111	AVDD	144	AGND
13	NC	46	AGND	79	PINC	112	AVDD	145	AGND
14	NC	47	AGND	80	DASHD	113	GND	146	AGND
15	NC	48	AGND	81	NIND0	114	GND	147	S1536
16	AGND	49	V14	82	PIND0	115	GND	148	REPI_1
17	AGND	50	V13	83	DASHD	116	GND	149	VCOM
18	AGND	51	V12	84	NIND1	117	VDD	150	VCOM
19	AGND	52	V11	85	PIND1	118	VDD	151	VCOM
20	AVDD	53	V10	86	DASHD	119	VDD	152	XON
21	AVDD	54	V9	87	NIND2	120	VDD	153	XON
22	AVDD	55	V8	88	PIND2	121	SCL	154	VGH
23	AVDD	56	DASHD	89	DASHD	122	SDA	155	VGH
24	GND	57	R0	90	NIND3	123	CSB	156	VEE
25	GND	58	R1	91	PIND3	124	SEL1	157	VEE
26	VDD	59	R2	92	GND_LVDS	125	SEL0	158	VEE
27	VDD	60	R3	93	GND_LVDS	126	FRAME	159	NC
28	UPDN	61	R4	94	GND_LVDS	127	DITHER	160	VCC
29	SHLR	62	R5	95	DEN	128	DIMO	161	VCC
30	GRB	63	R6	96	HSD	129	PINCTL	162	NC
31	STBYB	64	R7	97	VSD	130	DIMI	163	GND
32	DCLKPOL	65	DASHD	98	V7	131	VDD	164	GND
33	BIST	66	G0	99	V6	132	VDD	165	GND

10 V-T Curve

10.1 V-T Curve



10.2 CF Spectrum



※ Measured at ambient temperature 25℃, under IVO requirement driving condition (refer to see section 11)

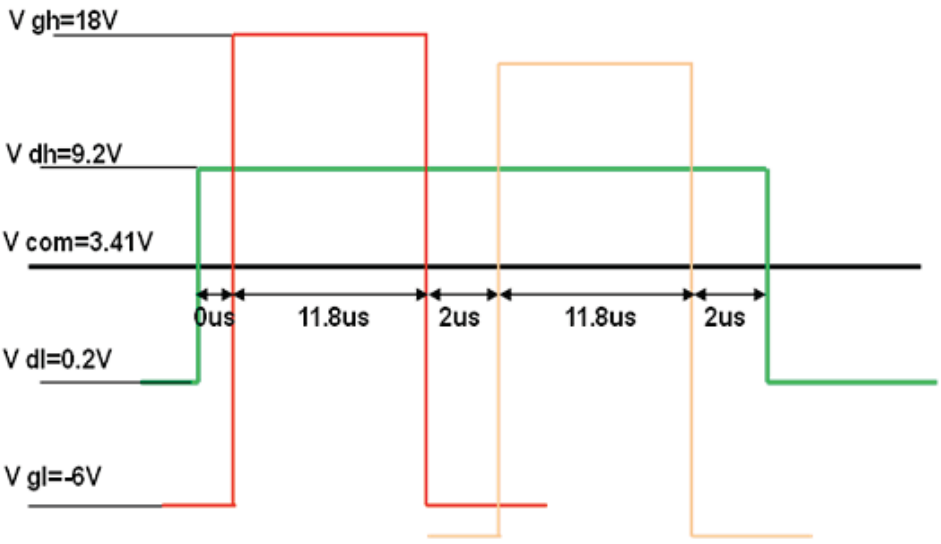
11 IVO Requirement Driving Condition

11.1 Timing Range

Item	Parameter	Unit	Min	Typ	Max
Timings	Frame Rate	Hz	55	60	65
Scanning Method	Gate Scanning Method (single / double)	Double			
Line Impedance	Capacitive Load of a Signal Line	pF	37.96	54.09	71.89
	Capacitive Load of a Gate Line	pF	178.78	190.99	207.43
	Resistance Load of Signal Line	KOhm	3.65	5.07	8.19
	Resistance Load of Gate Line	KOhm	2.87	3.32	3.95

11.2 Power Supply Voltage

No.	Item	MIN	TYP	MAX	Unit
1	Vcom voltage	4.3	4.5	4.7	V
2	Vgl voltage	-7	-6	-5	V
3	Vgh voltage	17	18	19	V
4	Vdl voltage	0	0.2	0.4	V
5	Vdh voltage	9	9.2	9.4	V
6	OE time[T1]		0		us
8	Vgate line charging time[T2]	-	11.8	-	us
9	Vgate line charging time[T3]	-	2	-	us



11.3 Gamma Reference Voltage

No.	Voltage	Unit
V1	9.35	V
V2	9.3	V
V3	7.79	V
V4	7.43	V
V5	7.2	V
V6	6.862	V
V7	6.5	V
V8	5.9	V
V9	5.108	V
V10	3.929	V
V11	3.485	V
V12	2.931	V
V13	1.132	V
V14	0.2	V

※ Vcom must be adjusted to optimize display quality: Crosstalk、Contrast Ratio etc.

11.4 OLB Outline

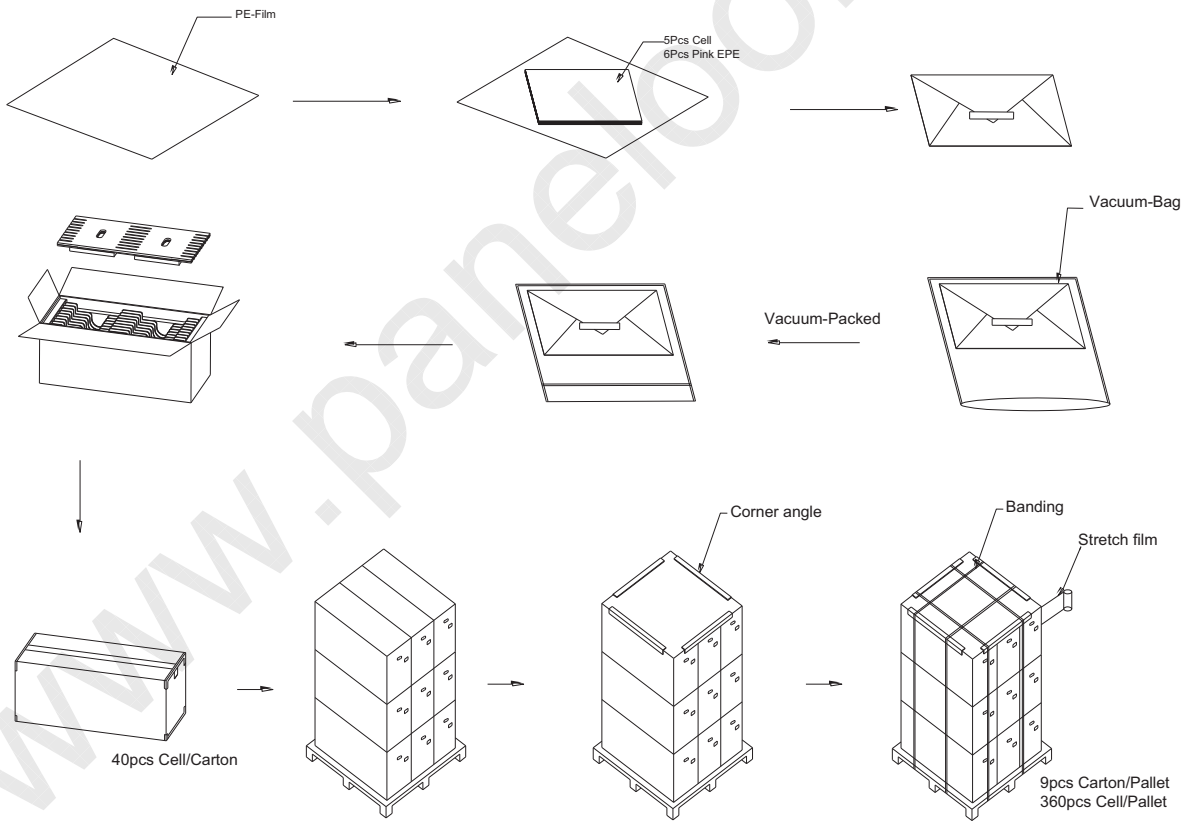
	Source Driver	Gate Driver
Output Channels	1536	1200
Driver Amount	1	1
Component Type	COG	COG
OLB Pad Pitch	15um	18 um

11.5 Driver Recommendation

Driver Supplier and Model No.	Source Driver	Gate Driver
	Himax HX8282	Himax HX8696

12 Cell Packaging

S0903 5Sub-sheet Cell



Components Material	5 Sub-Sheet Cell	Pink EPE	Vacuum Bag	PE_Film	Carton	Inside Carton	Pallet
Size(mm)	650*214*1	650*214*1	720*400*0.15	745*745*0.16	766*337*333	744*315*298	1100*830*120
Amount (Pcs/Carton)	40	48	8	8	1	1	1/9

13 General Precaution

13.1 Use Restriction

This product is not authorized for use in life supporting systems, aircraft navigation control systems, military systems and any other application where performance failure could be life-threatening or otherwise catastrophic.

13.2 Handling Precaution

(1) Since the LCD is made of glass, do not apply strong mechanical impact or static load onto it. Handling with care since shock, vibration, and careless handling may seriously affect the product. If it fall a high place or receives a strong shock, the glass maybe broken.
(2) Use fingerstalls of soft gloves in order to keep clean display quality, when persons handle the LCD for incoming inspection or assembly.
(3) When the surface is dusty, please wipe gently with absorbent cotton or other soft material.
(4) Wipe off saliva or water drops as soon as possible. If saliva or water drops contact with polarizer for a long time, they may causes deformation or color fading.
(5) When cleaning the adhesives, please use absorbent cotton wetted with a little petroleum benzine or other adequate solvent.

13.3 Storage Precaution

(1) Please do not leave cell in the environment of high humidity and high temperature for long time.
(2) IVO suggests to assembly the cell to LCD module in one month after cut into single chip.
(3) The Cell should be stored in a dark place .Store in an ambient temperature of 5°C to 45°C,and in a relative humidity of 40% to 60%.Don’t expose to sunlight or fluorescent light.
(4) Storage in a clean environment, free from dust, active gas, and solvent.
(5) Store in anti-static electricity container.
(6) Store without any physical load.

13.4 Caution For operation

(1) The Polarizer on the surface of panel are made from organic substance. Be very careful for chemicals not to touch the polarizer or it leads the polarizer to be deteriorated.
(2) Dot drop water or any chemicals onto the LCD’s surface.
(3) Please do not leave LCD in the environment of high humidity and high temperature for a long time.

(4) Do not connect or disconnect the LCD to or from the system when power is on.
(5) When expose to drastic fluctuation of temperature(hot to cold or cold to hot),the LCD may be affected; specifically, drastic temperature fluctuation from cold to hot, produces dew on the LCD's surface which may affect the operation of the polarizer and the LCD.
(6) Do not display the fixed pattern for a long time because it may develop image sticking due to the LCD structure.

13.5 Static Electricity

(1) Protection film must remove very slowly from the surface of LCD to prevent from electrostatic occurrence if the LCD attaches a polarizer.
(2) Because TFT-LCD panel is very weak to electrostatic discharge, please be careful with electrostatic discharge. Persons who handle the LCD should be grounded through adequate methods.

13.6 Safety

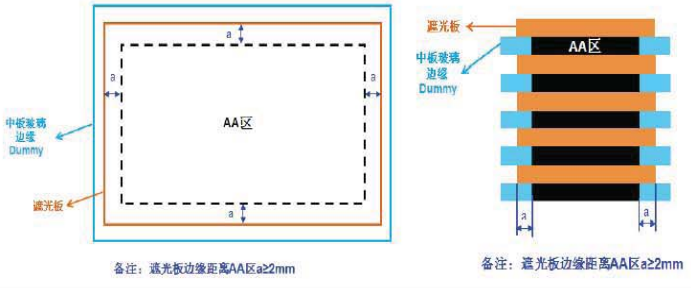
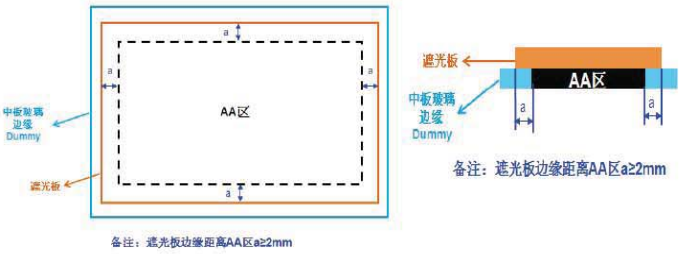
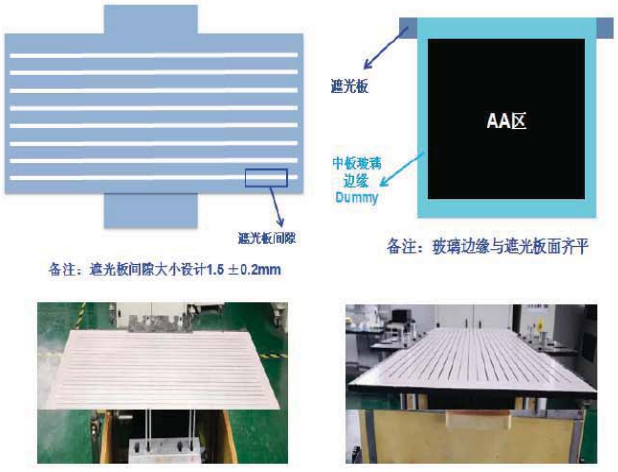
(1) For the crash damaged or unnecessary LCD, it is recommended to wash off liquid crystal by either of solvents such as acetone and ethanol an should be burned up later.
(2) In the case the LCD is broken, watch out whether liquid crystal leaks out or not. If your hands touch the liquid crystal, wash your hands cleanly with water an soap as soon as possible.
(3) If you should swallow the liquid crystal, first, wash your mouth thoroughly with water, then drink a lot of water and induce vomiting, and then, consult a physician.
(4) If the liquid crystal should get in your eyes, flush your eyes with running water for at least fifteen minutes.
(5) If the liquid crystal touches your skin or clothes, remove it and wash the affected part of your skin or clothes with soap and running water.

13.7 Disposal

When disposing LCD module, obey the local environmental regulations.

昆山龙腾光电有限公司
InfoVision Optoelectronics (Kunshan) Co., LTD.

薄化制程生产标准说明表
Slimming Process Instruction

	UV固化方式		遮光板设计	作业标准
UV固化制程	水平固化	箱式固化		1、将中板玻璃进行叠片，叠放层数≤5层 2、遮光板变形不可有，遮光板需紧贴玻璃表面，玻璃有效区需完全遮盖，遮光板边缘距离AA区a≥2mm 3、中板玻璃边缘进行UV封胶，渗胶量≥1mm 4、将产品缓慢推进固化炉固化 5、固化期间玻璃表面温度＜70℃
		传动固化		1、将中板玻璃进行叠片，叠放层数1层 2、遮光板变形不可有，遮光板需紧贴玻璃表面，玻璃有效区需完全遮盖，遮光板边缘距离AA区a≥2mm 3、中板玻璃边缘进行UV封胶，渗胶量≥1mm 4、将产品平稳放入传送带 5、固化期间玻璃表面温度＜70℃
	垂直固化			1、将中板玻璃垂直插入封胶架 2、中板玻璃边缘进行UV封胶，渗胶量≥1mm 3、遮光板变形不可有，将中板玻璃均匀卡入遮光板间隙中(遮光板间隙大小设计1.5 ± 0.2mm)，玻璃边缘与遮光板面齐平 4、中板玻璃有效区需完全遮盖，不可漏光 5、将产品缓慢推进固化炉固化 6、固化期间玻璃表面温度＜70℃

	尺寸	研磨实测压力管控	研磨时间管控
研磨	≤7"	≤60g/cm^2	≤6min/面
	>7"	≤50g/cm^2	≤3min/面