Customer Approval Specification

To:

Product Name: C061SWR3-0

Document Issue Date: 2020/06/16

	InfoVision Optoelectronics
SIGNATURE _____ _____ _____	**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.

CONTENTS

1 General Descriptions

1.1 Introduction

The C061SWR3-0 is a color active matrix thin film transistor (TFT) liquid crystal display (LCD) Sub Sheet that uses amorphous silicon TFT as a switching device. This TFT LCD panel (Single Chip) has a 6.088 inch diagonally measured active display area with HD+ resolution (720 horizontal by 1,560 vertical pixels array).

1.2 Features

- 6.088 Inch TFT-LCD Panel
- Supported HD+ Resolution
- Compatible with RoHS Standard

1.3 General Characteristics

Table 1 General Characteristics

Item	Specification		Unit	Note
Outline Dimension (H x V x D)	66.8x145.4x0.80		mm	Single Chip
Active Area (H x V)	64.8x140.4		mm	Single Chip
Number of Pixels (H x V)	720 x 1,560		-	Single Chip
Pixel Size (H x V)	0.09x0.09		mm	Single Chip
Pixel Arrangement	RGB Stripe		-	-
Display Type	Transmissive		-	-
Display Mode	Normally Black		-	-
Cell Thickness	CF: 0.40±0.04		mm	Single Chip
	TFT: 0.40±0.04			
Driver IC(Recommendation)	ILI9881C-04/ST7703		-	-
Weight	523.02(Typ.)	575.78(Max.)	g	Sub A
	393.95(Typ.)	433.73(Max.)		Sub B
	19.41(Typ.)	21.44(Max.)		Single Chip

2 Absolute Maximum Ratings

Table 2 Absolute Maximum Ratings

Item	Symbol	Min.	Max.	Unit	Conditions
LC Operating Voltage	V_{op}	0.2	5	V	(1),(2),(3),(4)
Operating Temperature	T_{gs}	-20	70	℃	
Storage Temperature	T_a	-30	80	℃	
Operating Humidity	H_{op}	10	90	%RH	
Storage Humidity	H_{st}	10	90	%RH	

Note(1) All the parameters specified in the table are absolute maximum rating values that may cause faulty operation or unrecoverable damage, if exceeded. It is recommended to follow the typical value.

Note(2) All the contents of electro-optical specifications and display fineness are guaranteed under Normal Conditions. Normal conditions are defined as: Temperature: 25℃, Humidity: 55± 10%RH.

Note(3) Unpredictable results may occur when it was used in extreme conditions. T_a= Ambient Temperature, T_{gs}= Glass Surface Temperature. All the display fineness should be inspected under normal conditions.

Note(4) Wet bulb temperature should be lower than 57.8℃, and no condensation of water. Besides, protect the module from static electricity.

3 Electrical Specifications

Table 3 Electrical Specifications

No.	Item	Min.	Typ.	Max.	Unit
1	Vcom voltage	-1.1	-0.6	-0.1	V
2	Frame Rate	55	60	65	Hz
3	VGH voltage	14	15	16	V
4	VGL voltage	-12	-11	-10	V

Note(1) Both VGH and VGL are TFT gate operation voltage.

Note(2) The setting of electrical parameters should follow the initial code specified by IVO. Vcom must be adjusted to optimize display quality.

Note(3) All the contents of electrical specifications and display fineness are guaranteed under Normal Conditions. Normal conditions are defined as follow: Temperature: 25℃, Humidity: 55± 10%RH.

4 Optical Characteristics

The optical characteristics are measured under stable conditions as following notes.

Table 4 Optical Characteristics

Item	Conditions		Min.	Typ.	Max.	Unit	Note
Transmittance	Center		3.4	3.8	-	%	Under C-light (1),(5),(7),(8) θx=θy=0°
Contrast Ratio	Center		1000	1200	-	-	(1),(3),(6),(7),(8) θx=θy=0°
Response Time	Rising + Falling		-	35	40	ms	(1),(4),(6),(7),(8) θx=θy=0°
CF Color Chromaticity (CIE1931)	Red x		Typ. -0.02	0.659	Typ. +0.02	-	Under C-light (1),(5),(8) θx=θy=0°
	Red y			0.319		-	
	Green x			0.276		-	
	Green y			0.599		-	
	Blue x			0.137		-	
	Blue y			0.101		-	
	White x			0.298		-	
	White y			0.334		-	
NTSC	CIE1931		65	70	-	%	
Viewing Angle (CR≥10)	Horizontal	θ_{x+}	80	85	-	degree	(1),(2),(6),(7),(8)
		θ_{x-}	80	85	-		
	Vertical	θ_{y+}	80	85	-		
		θ_{y-}	80	85	-		

Note(1) Measurement Setup:

The LCD module should be stabilized at given ambient temperature (25°C) for 30 minutes to avoid abrupt temperature changing during measuring. In order to stabilize the luminance, the measurement should be executed after lighting backlight for 30 minutes in the windless room.

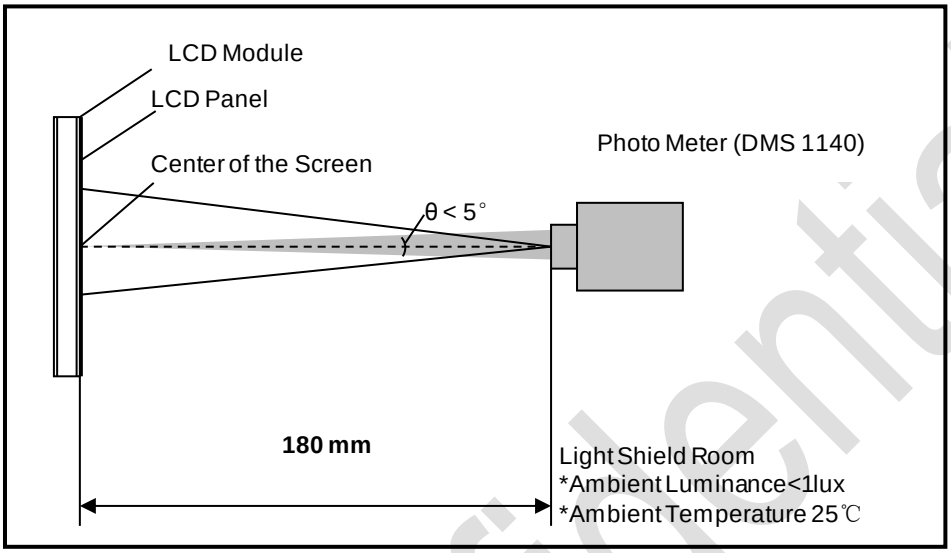


Figure 1 Optical Characteristic Measurement Equipment and Method

Note(2) Definition of Viewing Angle.

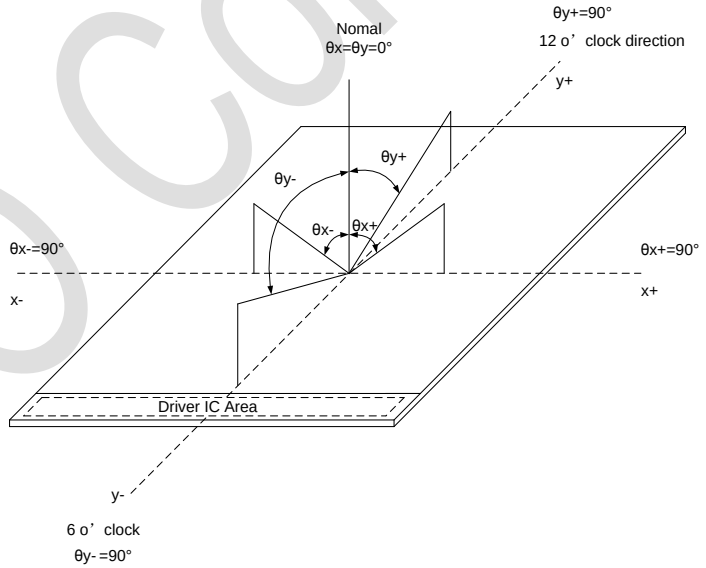


Figure 2 Definition of Viewing Angle

Note(3) Definition of Contrast Ratio (CR)

The contrast ratio can be calculated by the following expression:

Contrast Ratio (CR) = the luminance of White pattern/ the luminance of Black pattern

Note(4) Definition of Response Time

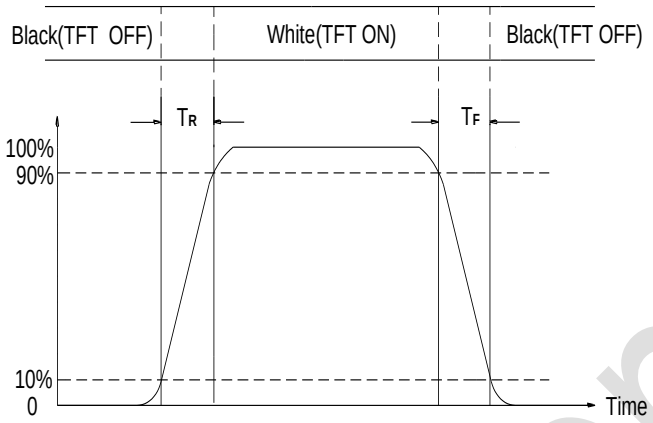


Figure 3 Definition of Response Time

Note(5) C-light Spectrum

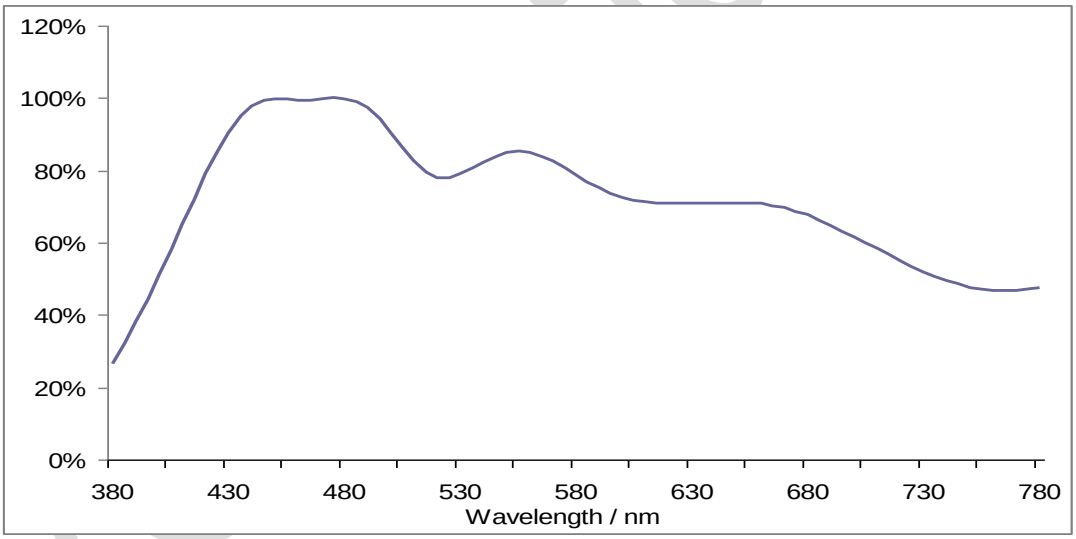
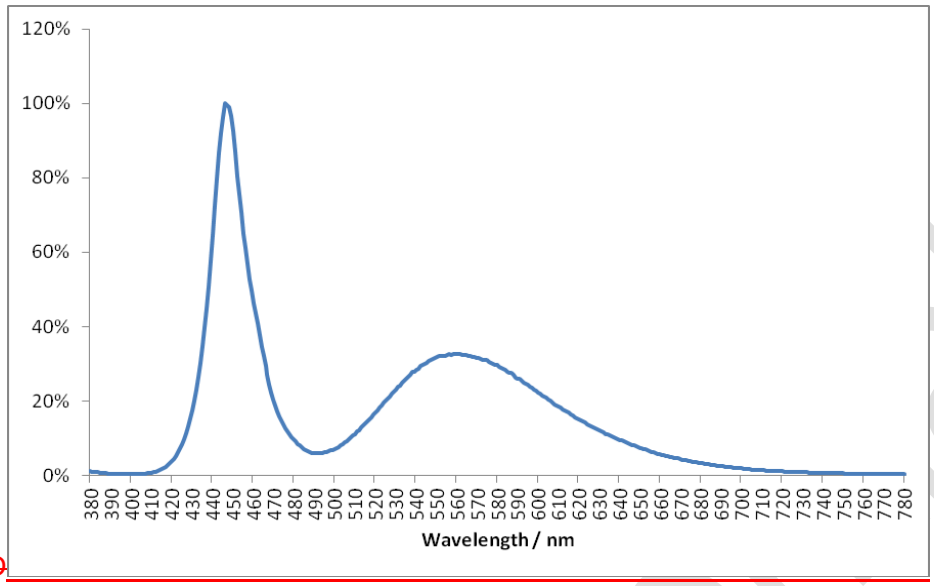


Figure 4 C-Light Spectrum

Note(6) The Back Light Spectrum



~~TBD~~

Figure 5 Back Light Spectrum

Note(7) The polarizer type: SLP-5115-08-T/CF;SLP-5115-08-T/TFT.

Note(8) All optical data are based on IVO given system & nominal parameter & testing machine in this document.

Note(9) The direction of polarizer. It is recommended that customer should choose O Mode or E Mode according to the actual situation.

Note(10) Considering each custom's spectrum of BL is different,we define transmittance spec based on C-light source（standard light source）.The differences may exist,when measure transmittance with unlike BL spectrum.if you have any questions,please contact IVO FAE

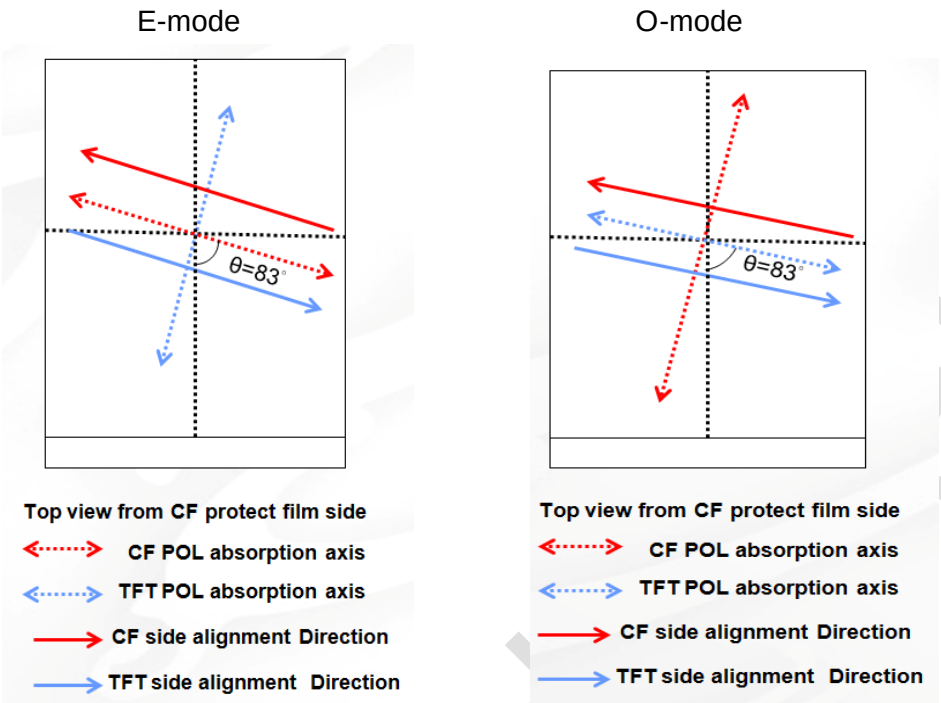


Figure 6 Polarizer Direction

5 Pixel Format

The figure shows the relation of the input signals and LCD panel pixel format.

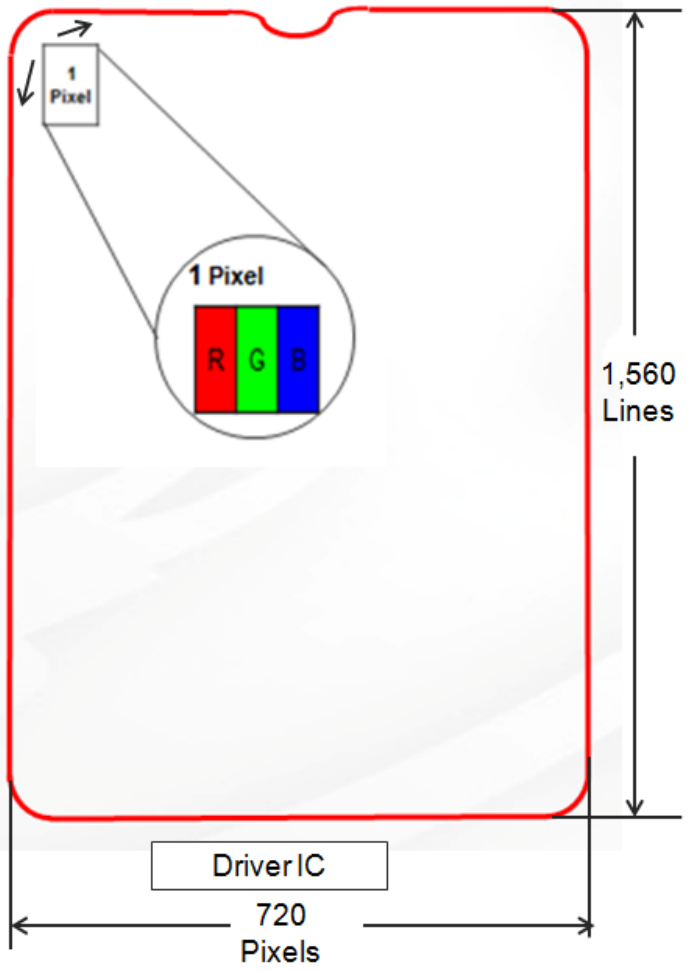


Figure 7 Pixel Format

Table 5 Gate&Source Opposite Relationship

Gate	Source														
	S1，S2，S3，S4……S21577,S2158,S2159,S2160														
	Blank			Display			Blank			Display			Blank		
	S1	……	Sn	Sn+1	……	Sn+n	S2n+1	……	S2n+n	S3n+1	……	S3n+n	S4n+1	……	S4n+n
G1	1	……	189	190	……	870	871	……	1290	1291	……	1971	1972	……	2160
G2	1	……	168	169	……	879	880	……	1281	1282	……	1992	1993	……	2160
G3	1	……	156	157	……	885	886	……	1275	1276	……	2004	2005	……	2160
G4	1	……	144	145	……	891	892	……	1269	1270	……	2016	2017	……	2160
G5	1	……	135	136	……	897	898	……	1263	1264	……	2025	2026	……	2160
G6	1	……	126	127	……	900	901	……	1260	1261	……	2034	2035	……	2160
G7	1	……	120	121	……	903	904	……	1257	1258	……	2040	2041	……	2160
G8	1	……	114	115	……	906	907	……	1254	1255	……	2046	2047	……	2160

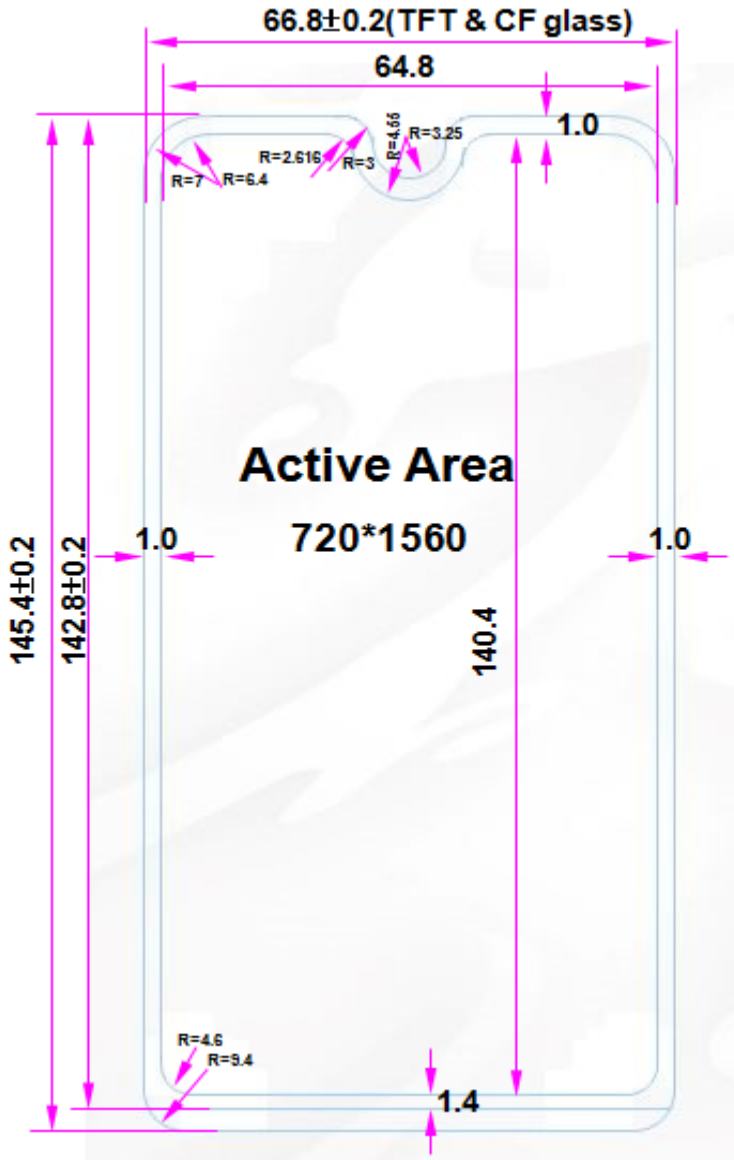
G9	1	……	108	109	……	909	910	……	1251	1252	……	2052	2053	……	2160
G10	1	……	102	103	……	912	913	……	1248	1249	……	2058	2059	……	2160
G11	1	……	96	97	……	915	916	……	1245	1246	……	2064	2065	……	2160
G12	1	……	93	94	……	915	916	……	1245	1246	……	2067	2068	……	2160
G13	1	……	87	88	……	918	919	……	1242	1243	……	2073	2074	……	2160
G14	1	……	84	85	……	921	922	……	1239	1240	……	2076	2077	……	2160
G15	1	……	81	82	……	921	922	……	1239	1240	……	2079	2080	……	2160
G16	1	……	75	76	……	924	925	……	1236	1237	……	2085	2086	……	2160
G17	1	……	72	73	……	927	928	……	1233	1234	……	2088	2089	……	2160
G18	1	……	69	70	……	927	928	……	1233	1234	……	2091	2092	……	2160
G19	1	……	66	67	……	930	931	……	1230	1231	……	2094	2095	……	2160
G20	1	……	63	64	……	930	931	……	1230	1231	……	2097	2098	……	2160
G21	1	……	60	61	……	933	934	……	1227	1228	……	2100	2101	……	2160
G22	1	……	57	58	……	933	934	……	1227	1228	……	2103	2104	……	2160
G23	1	……	54	55	……	936	937	……	1224	1225	……	2106	2107	……	2160
G24	1	……	51	52	……	936	937	……	1224	1225	……	2109	2110	……	2160
G25	1	……	48	49	……	939	940	……	1221	1222	……	2112	2113	……	2160
G26	1	……	45	46	……	939	940	……	1221	1222	……	2115	2116	……	2160
G27	1	……	45	46	……	942	943	……	1218	1219	……	2115	2116	……	2160
G28	1	……	42	43	……	945	946	……	1215	1216	……	2118	2119	……	2160
G29	1	……	39	40	……	945	946	……	1215	1216	……	2121	2122	……	2160
G30	1	……	36	37	……	948	949	……	1212	1213	……	2124	2125	……	2160
G31	1	……	36	37	……	948	949	……	1212	1213	……	2124	2125	……	2160
G32	1	……	33	34	……	951	952	……	1209	1210	……	2127	2128	……	2160
G33	1	……	30	31	……	951	952	……	1209	1210	……	2130	2131	……	2160
G34	1	……	30	31	……	954	955	……	1206	1207	……	2130	2131	……	2160
G35	1	……	27	28	……	957	958	……	1203	1204	……	2133	2134		2160
G36	1	……	27	28	……	960	961	……	1200	1201	……	2133	2134	……	2160
G37	1	……	24	25	……	960	961	……	1200	1201	……	2136	2137	……	2160
G38	1	……	24	25	……	963	964	……	1197	1198	……	2136	2137	……	2160
G39	1	……	21	22	……	966	967	……	1194	1195	……	2139	2140	……	2160
G40	1	……	21	22	……	969	970	……	1191	1192	……	2139	2140	……	2160
G41	1	……	18	19	……	972	973	……	1188	1189	……	2142	2143	……	2160
G42	1	……	18	19	……	975	976	……	1185	1186	……	2142	2143	……	2160
G43	1	……	15	16	……	978	979	……	1182	1183	……	2145	2146	……	2160
G44	1	……	15	16	……	981	982	……	1179	1180	……	2145	2146	……	2160
G45	1	……	15	16	……	984	985	……	1176	1177	……	2145	2146	……	2160
G46	1	……	12	13	……	987	988	……	1173	1174	……	2148	2149	……	2160
G47	1	……	12	13	……	990	991	……	1170	1171	……	2148	2149	……	2160
G48	1	……	12	13	……	996	997	……	1164	1165	……	2148	2149	……	2160
G49	1	……	9	10	……	999	1000	……	1161	1162	……	2151	2152	……	2160

G50	1	……	9	10	……	1005	1006	……	1155	1156	……	2151	2152	……	2160
G51	1	……	9	10	……	1011	1012	……	1149	1150	……	2151	2152	……	2160
G52	1	……	6	7	……	1017	1018	……	1143	1144	……	2154	2155	……	2160
G53	1	……	6	7	……	1023	1024	……	1137	1138	……	2154	2155	……	2160
G54	1	……	6	7	……	1032	1033	……	1128	1129	……	2154	2155	……	2160
G55	1	……	6	7	……	1041	1042	……	1119	1120	……	2154	2155	……	2160
G56	1	……	6	7	……	1053	1054	……	1107	1108	……	2154	2155	……	2160
G57	1	……	3	4	……	……	……	……	……	……	……	2157	2158	……	2160
G58	1	……	3	4	……	……	……	……	……	……	……	2157	2158	……	2160
G59	1	……	3	4	……	……	……	……	……	……	……	2157	2158	……	2160
G60	1	……	3	4	……	……	……	……	……	……	……	2157	2158	……	2160
G61	1	……	3	4	……	……	……	……	……	……	……	2157	2158	……	2160
G62	1	……	3	4	……	……	……	……	……	……	……	2157	2158	……	2160
G63	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…
G64	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…
…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…
G1516	…	…	…	…	……	……	……	……	……	……	……	……	……	……	……
G1517	…	…	…	…	……	……	……	……	……	……	……	……	……	……	……
G1518	1	…	3	4	…	…	…	…	…	…	…	2157	2158	…	2160
G1519	1	…	3	4	…	…	…	…	…	…	…	2157	2158	…	2160
G1520	1	…	3	4	…	…	…	…	…	…	…	2157	2158	…	2160
G1521	1	…	3	4	…	…	…	…	…	…	…	2157	2158	…	2160
G1522	1	…	3	4	…	…	…	…	…	…	…	2157	2158	…	2160
G1523	1	…	6	7	…	…	…	…	…	…	…	2154	2155	…	2160
G1524	1	…	6	7	…	…	…	…	…	…	…	2154	2155	…	2160
G1525	1	…	6	7	…	…	…	…	…	…	…	2154	2155	…	2160
G1526	1	…	6	7	…	…	…	…	…	…	…	2151	2152	…	2160
G1527	1	…	9	10	…	…	…	…	…	…	…	2151	2152	…	2160
G1528	1	…	9	10	…	…	…	…	…	…	…	2151	2152	…	2160
G1529	1	…	12	13	…	…	…	…	…	…	…	2148	2149	…	2160
G1530	1	…	12	13	…	…	…	…	…	…	…	2148	2149	…	2160
G1531	1	…	12	13	…	…	…	…	…	…	…	2148	2149	…	2160
G1532	1	…	15	16	…	…	…	…	…	…	…	2145	2146	…	2160
G1533	1	…	15	16	…	…	…	…	…	…	…	2145	2146	…	2160
G1534	1	…	18	19	…	…	…	…	…	…	…	2142	2143	…	2160
G1535	1	…	18	19	…	…	…	…	…	…	…	2142	2143	…	2160
G1536	1	…	21	22	…	…	…	…	…	…	…	2139	2140	…	2160
G1537	1	…	21	22	…	…	…	…	…	…	…	2139	2140	…	2160
G1538	1	…	24	25	…	…	…	…	…	…	…	2136	2137	…	2160
G1539	1	…	27	28	…	…	…	…	…	…	…	2133	2134	…	2160
G1540	1	…	27	28	…	…	…	…	…	…	…	2133	2134	…	2160

G1541	1	…	30	31	…	…	…	…	…	…	…	2130	2131	…	2160
G1542	1	…	33	34	…	…	…	…	…	…	…	2127	2128	…	2160
G1543	1	…	36	37	…	…	…	…	…	…	…	2124	2125	…	2160
G1544	1	…	39	40	…	…	…	…	…	…	…	2121	2122	…	2160
G1545	1	…	42	43	…	…	…	…	…	…	…	2118	2119	…	2160
G1546	1	…	45	46	…	…	…	…	…	…	…	2115	2116	…	2160
G1547	1	…	48	49	…	…	…	…	…	…	…	2112	2113	…	2160
G1548	1	…	51	52	…	…	…	…	…	…	…	2109	2110	…	2160
G1549	1	…	54	55	…	…	…	…	…	…	…	2106	2107	…	2160
G1550	1	…	57	58	…	…	…	…	…	…	…	2103	2104	…	2160
G1551	1	…	60	61	…	…	…	…	…	…	…	2100	2101	…	2160
G1552	1	…	66	67	…	…	…	…	…	…	…	2094	2095	…	2160
G1553	1	…	69	70	…	…	…	…	…	…	…	2088	2089	…	2160
G1554	1	…	75	76	…	…	…	…	…	…	…	2085	2086	…	2160
G1555	1	…	81	82	…	…	…	…	…	…	…	2079	2080	…	2160
G1556	1	…	87	88	…	…	…	…	…	…	…	2073	2074	…	2160
G1557	1	…	96	97	…	…	…	…	…	…	…	2064	2065	…	2160
G1558	1	…	105	106	…	…	…	…	…	…	…	2055	2056	…	2160
G1559	1	…	114	115	…	…	…	…	…	…	…	2046	2047	…	2160
G1560	1	…	132	133	…	…	…	…	…	…	…	2028	2029	…	2160

6 Outline Size

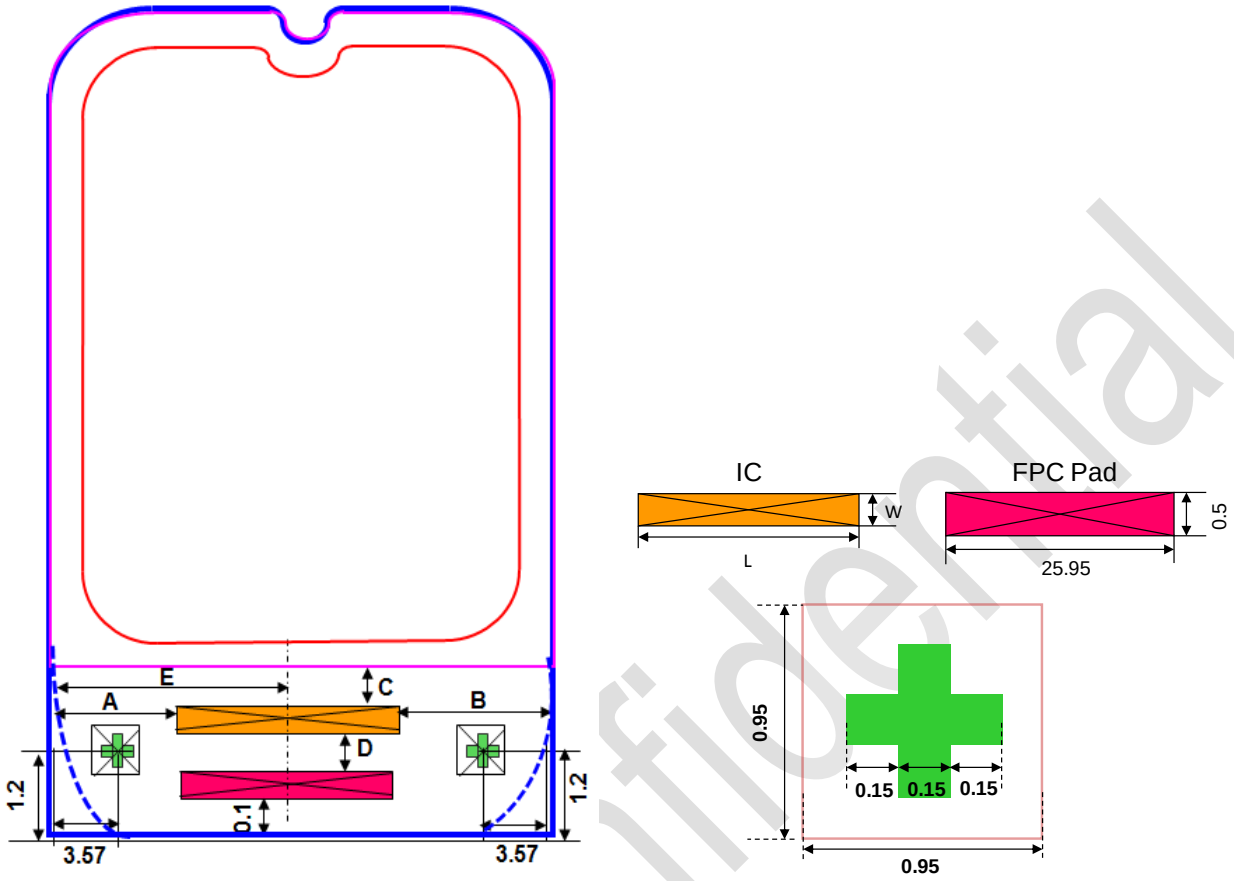
6.1 Outline Size of Single Chip



Unit: mm

Figure 8 Outline Size of Single Chip

6.2 IC & FPC Position on Cell

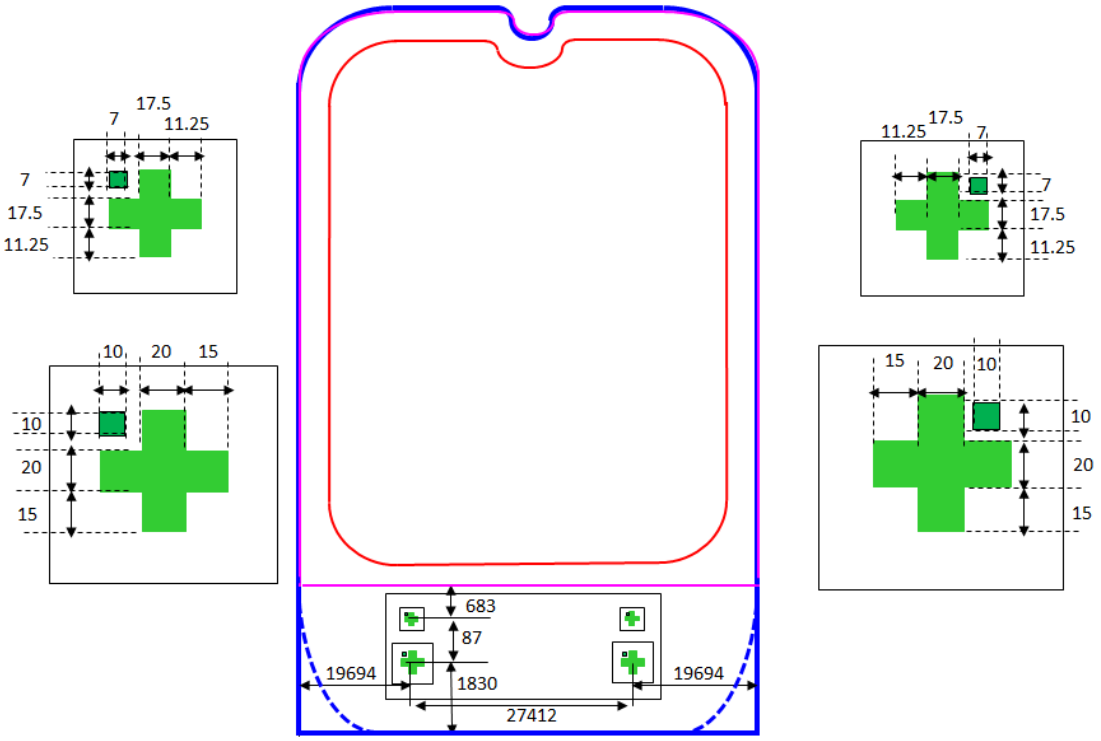


Unit: mm

Figure 9 IC and FPC Position Information

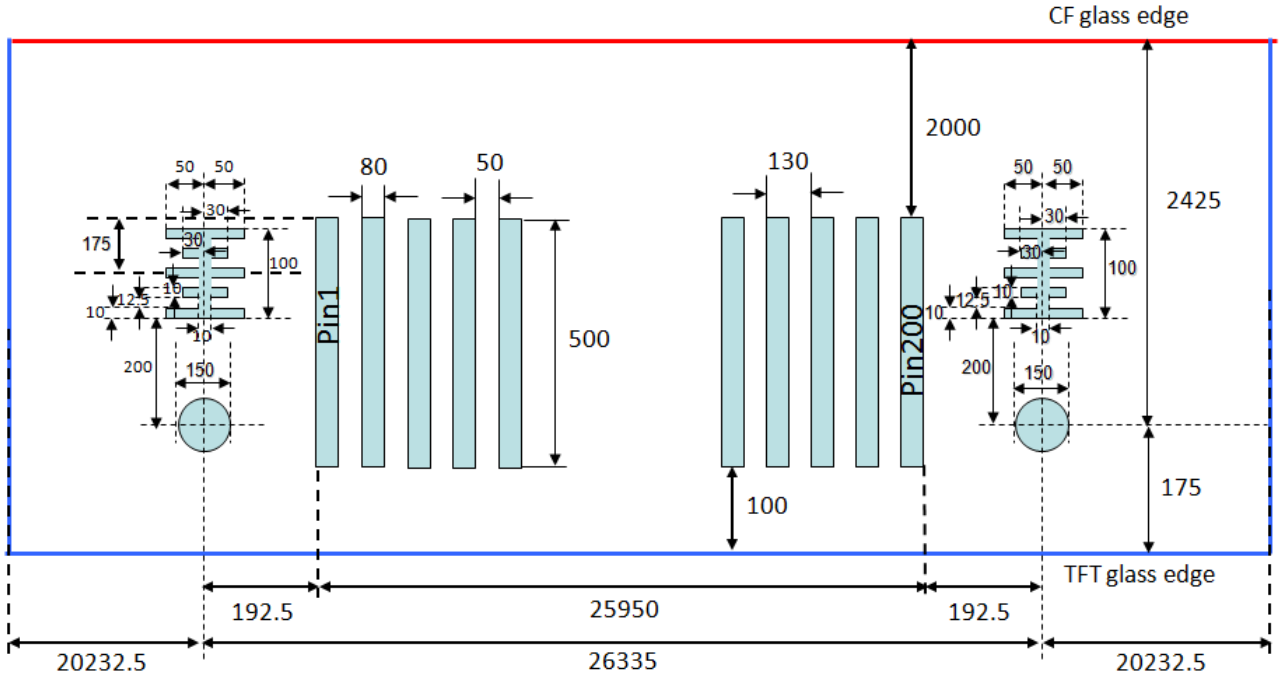
Table 6 IC Position Information

IC Name	L(mm)	W(mm)	A(mm)	B(mm)	C(mm)	D(mm)	E(mm)
(ILI9881C-04)	(27.84)	(0.875)	(19.48)	(19.48)	(0.618)	(0.507)	(33.4)
(ST7703)	(27.72)	(0.82)	(19.54)	(19.54)	(0.649)	(0.531)	(33.4)



Unit：um

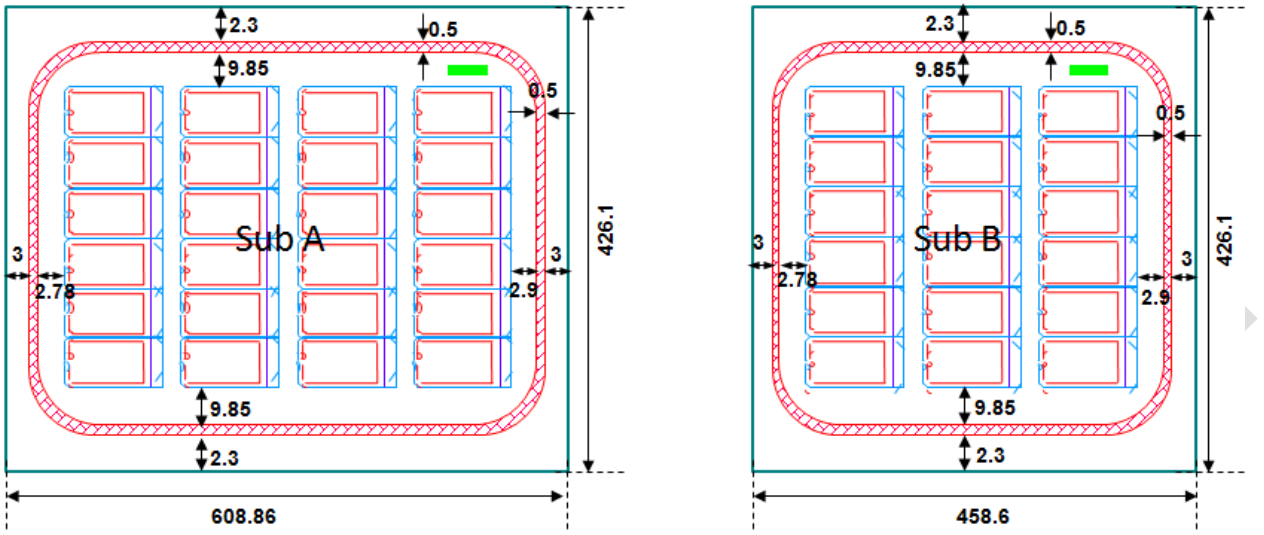
Figure 10 IC Position Information



Unit: um

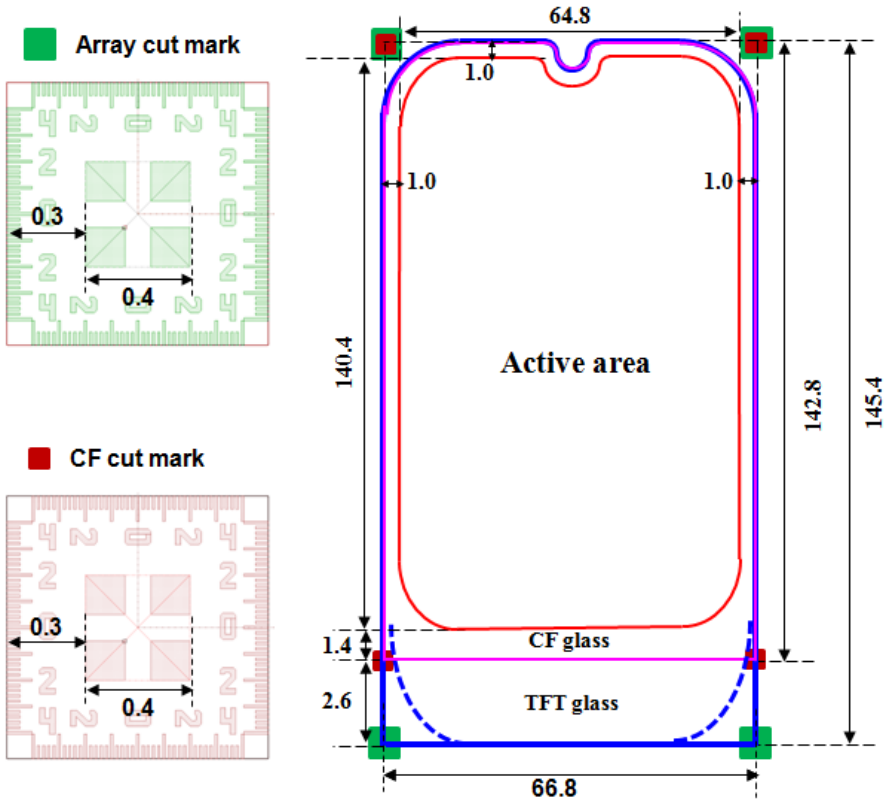
Figure 11 FPC Position Information

6.3 Outline Size of Sub Sheet and Cut Mark



Unit: mm

Figure 12 Outline Size of Sub A & B



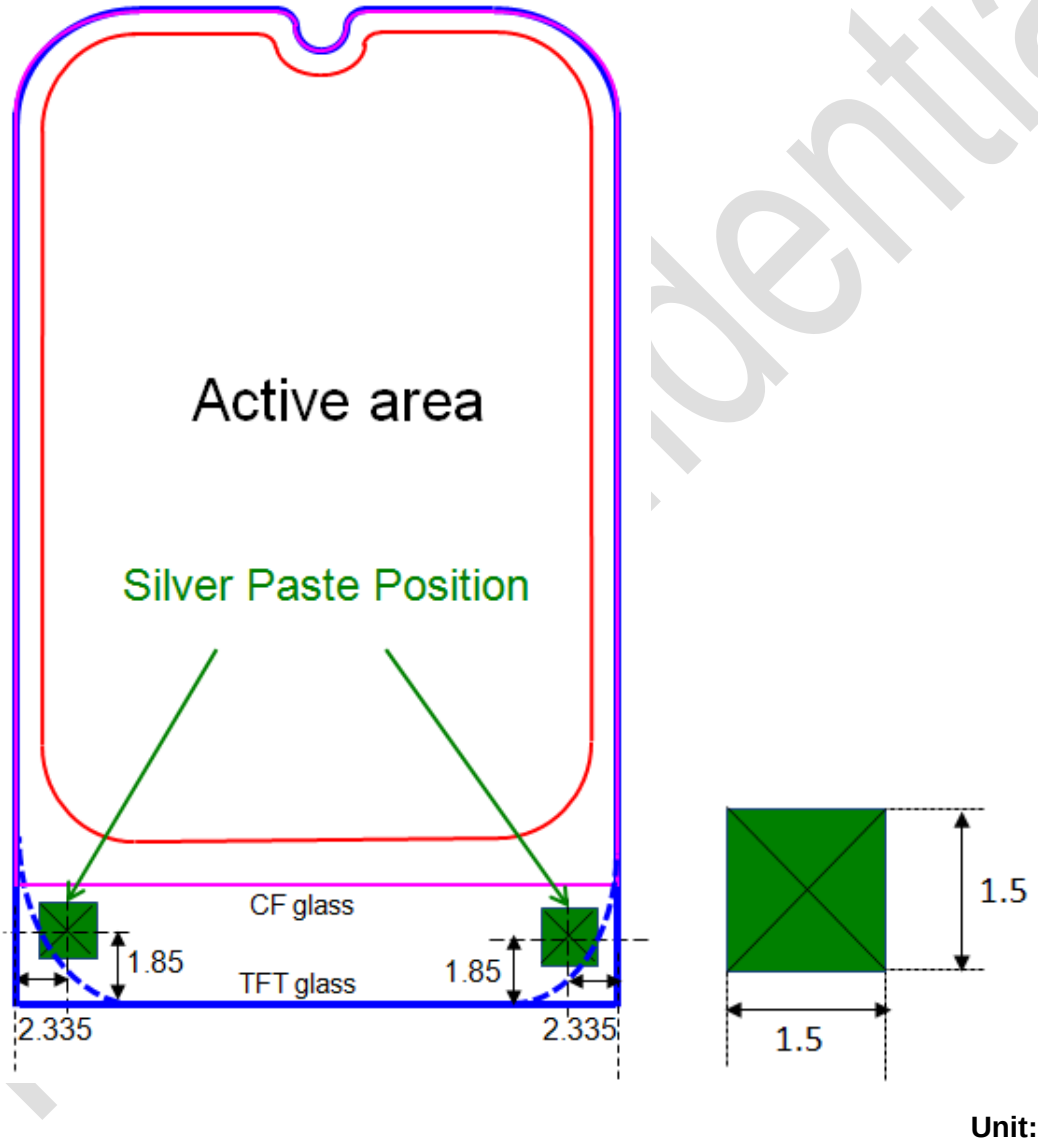
Unit: mm

Figure 13 Outline Size of Cut Mark

6.4 Cell Thickness

Figure 14 Cell Thickness

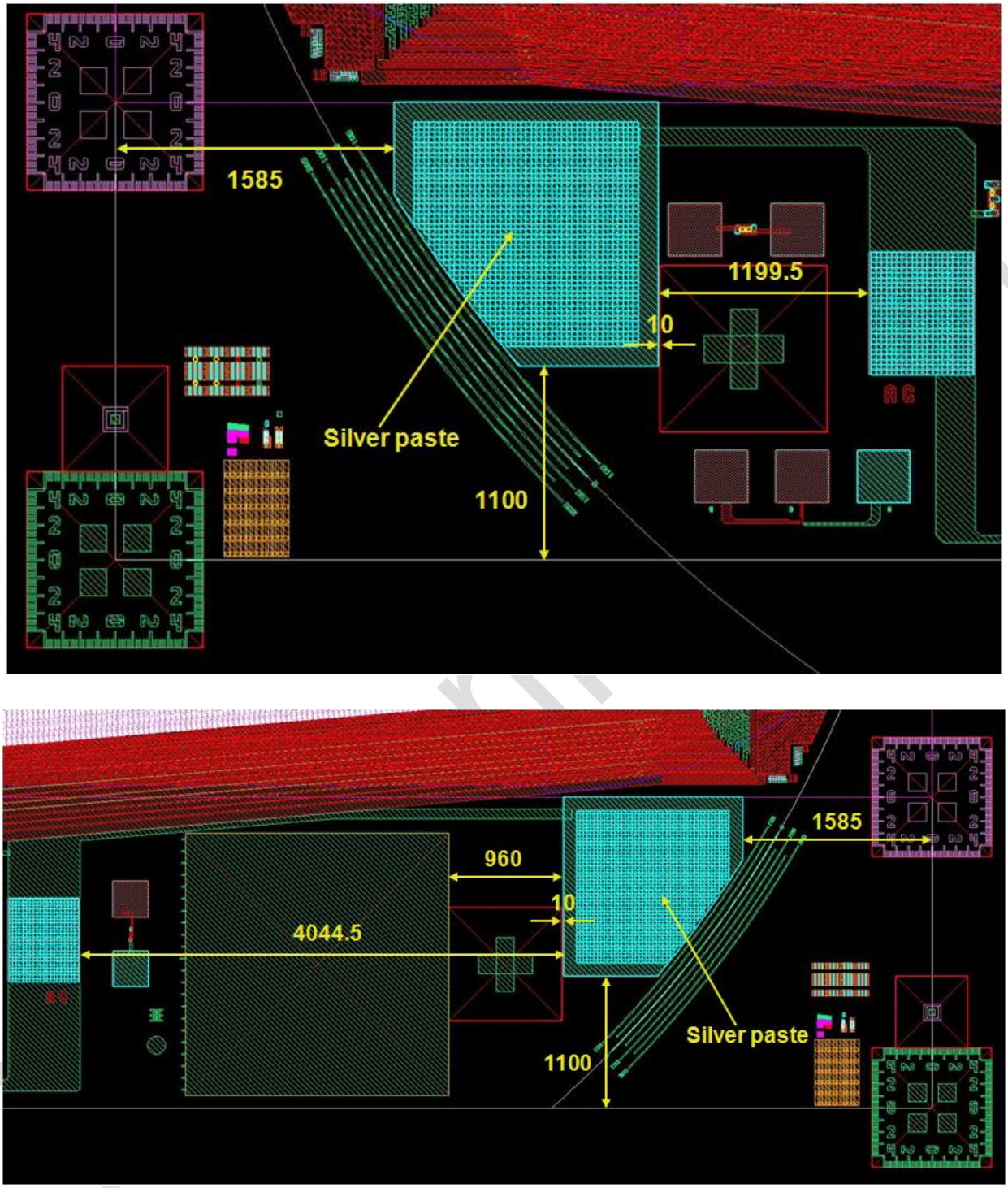
6.5 Silver Paste Position



Unit: mm

Figure 15 Silver Paste Position

6.6 Silver Paste on The Pad



Unit: um

Figure 16 Silver Paste on The Pad

7 Cell Light-On Information

7.1 Cell Light-On Test Pad Drawing

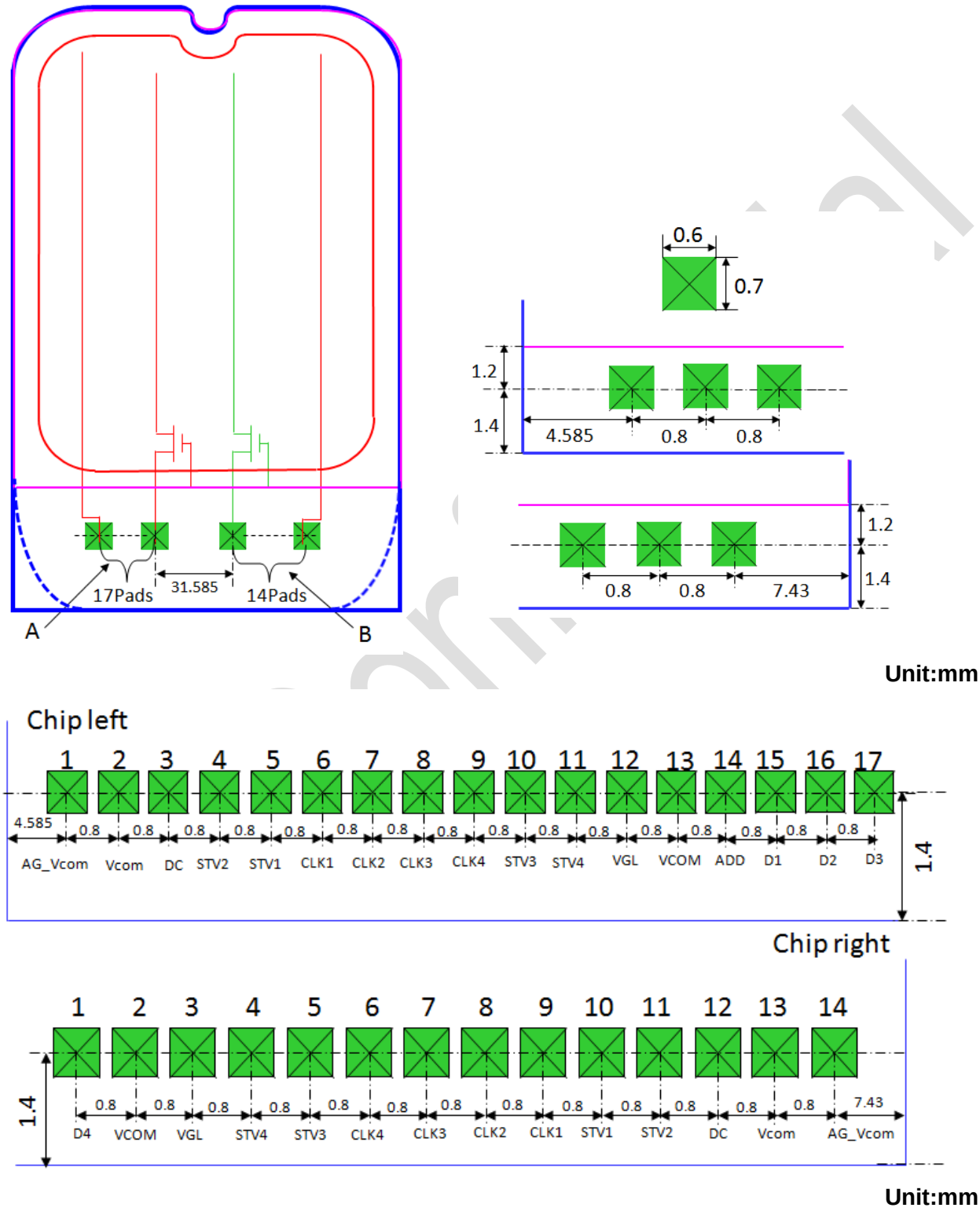


Figure 17 Cell Light-On Test Pad Drawing

7.2 Cell Light-On Test Waveform

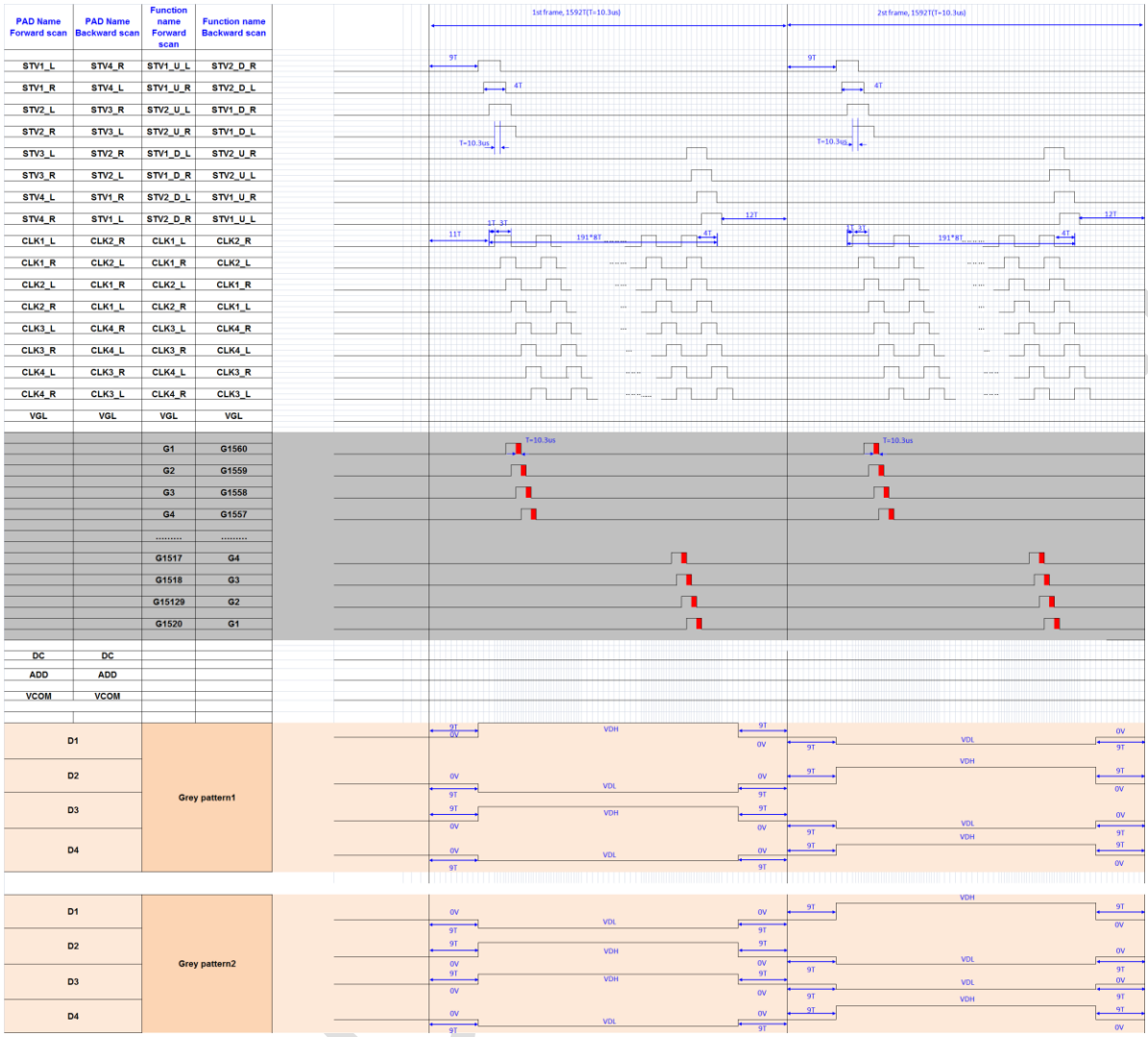


Figure 18 Cell Light-On Test Waveform

Table 7 Voltage for Cell Test

Item	Black	Gray(50%)	White
VGH	15V		
VGL	-11V		
VCOM	-0.6V		
DC	5V		
ADD	15~25V		
S1_VDH	0.2V	2.8V	5V
S1_VDL	-0.2V	-2.8V	-5V
S2_VDH	0.2V	2.8V	5V
S2_VDL	-0.2V	-2.8V	-5V
S3_VDH	0.2V	2.8V	5V
S3_VDL	-0.2V	-2.8V	-5V
S4_VDH	0.2V	2.8V	5V
S4_VDL	-0.2V	-2.8V	-5V

7.3 LCD FPC Input Pin Assignment

Table 8 LCD FPC Input Pin Assignment

NO.	Pin Definition	NO.	Pin Definition	NO.	Pin Definition	NO.	Pin Definition
1	AG	51	C41N/DUMMY	101	VDDI/IOVCC	151	VCORE/VDDD
2	AG	52	C41N/DUMMY	102	IM[0]	152	VCC1/IOVCC
3	VCOM	53	C41P/DUMMY	103	VSSDUMMY/VSSD	153	VCC1/IOVCC
4	DC	54	C41P/DUMMY	104	RESX	154	VCC1/IOVCC
5	VCOM	55	VCL/DUMMY	105	RESX	155	VCC1/IOVCC
6	VGLO1/DUMMY	56	VCL/DUMMY	106	TE1	156	VCC1/IOVCC
7	VGLO1/DUMMY	57	VCI	107	TE1	157	VDDAM/DUMMY
8	DUMMY	58	VCI	108	TE1	158	VDDAM/DUMMY
9	DUMMY	59	VCI	109	TE	159	VDDAM/DUMMY
10	C31P/DUMMY	60	VSS/VSSA	110	TE	160	VDDAM/DUMMY
11	C31P/DUMMY	61	VSS/VSSA	111	LEDPWM	161	LVDSVDD/DSI_LDO
12	C31P/DUMMY	62	VREF/VTRIMOUT	112	SCL	162	LVDSVDD/DSI_LDO
13	VGL	63	VREG2OUT/VSNROUT	113	CSX	163	LVDSVDD/DSI_LDO
14	VGL	64	VREG1OUT/VSPROUT	114	DCX	164	LVDSVDD/DSI_LDO
15	C24N/DUMMY	65	VSSA	115	PCLK	165	LVDSVSS/DSI_VSS
16	C24N/DUMMY	66	VSSA	116	DUMMY	166	LVDSVSS/DSI_VSS
17	C24P/DUMMY	67	VSSA	117	VS/DUMMY	167	LVDSVSS/DSI_VSS
18	C24P/DUMMY	68	VSSREF/VSSA	118	HS/DUMMY	168	LVDSVSS/DSI_VSS
19	C24P/DUMMY	69	DUMMY	119	D[0:1]/T_DB[0:1]	169	DUMMY
20	C23N/DUMMY	70	DUMMY	120	D[2:3]/T_DB[2:3]	170	D3P/DSI_D3P
21	C23N/DUMMY	71	DUMMY	121	D[4:5]/T_DB[4:5]	171	DUMMY
22	C23P/DUMMY	72	VTESTOUTN/DUMMY	122	D[5:6]/T_DB[5:6]	172	D3N/DSI_D3N
23	C23P/DUMMY	73	VCIREF/VCI	123	D[6:7]/T_DB[6:7]	173	LVDSVSS/HS_VSS
24	C23P/DUMMY	74	VCIREF/VCI	124	VSS/OSC	174	D2P/DSI_D2P
25	VSS/VSSD	75	DUMMYN/VCI	125	DUMMY	175	DUMMY
26	VSS/VSSD	76	MTP_PWR/DUMMY	126	DUMMY	176	D2N/DSI_D2N
27	VCI	77	MTP_PWR/DUMMY	127	DUMMY	177	DUMMY
28	VCI	78	EXTP/VCSW1	128	DUMMY	178	LVDSVSS/DSI_VSS
29	VGH	79	EXTP/VCSW1	129	DUMMY	179	CLKP/DSI_CP
30	VGH	80	EXTP/VCSW1	130	DUMMY	180	CLKN/DSI_CN
31	C22P/DUMMY	81	EXTN/VCSW2	131	DUMMY	181	DUMMY
32	C22P/DUMMY	82	EXTN/VCSW2	132	DUMMY	182	LVDSVSS/DSI_VSS
33	C22P/DUMMY	83	EXTN/VCSW2	133	DUMMY	183	DUMMY
34	C22N/DUMMY	84	VSS/VSSD	134	DUMMY	184	D1P/DSI_D1P
35	C22N/DUMMY	85	VSS/VSSD	135	DUMMY	185	D1N/DSI_D1N
36	C21P/DUMMY	86	VSS/VSSD	136	DUMMY	186	DUMMY
37	C21P/DUMMY	87	VCORE/VDDD	137	DUMMY	187	LVDSVSS/DSI_VSS
38	C21P/DUMMY	88	VCORE/VDDD	138	TOUT[0]/DUMMY	188	D0P/DSI_D0P
39	C21N/DUMMY	89	VCC2/IOVCC1	139	TOUT[0]/DUMMY	189	D0N/DSI_D0N
40	C21N/DUMMY	90	BOOSTM[1]/DUMMY	140	TOUT[3]/VSSD	190	DUMMY
41	VSN	91	BOOSTM[2]/VSSD	141	VSS/VSSD	191	LVDSVSS/DSI_VSS
42	VSN	92	BOOSTM[0]/DUMMY	142	VSS/VSSD	192	VTESTOUTP/VSSD
43	VSP	93	VDDI/IOVCC	143	VSS/VSSD	193	VSSA/VSSD
44	VSP	94	LANSEL	144	VSS/VSSD	194	VSSA/VSSD
45	VSP	95	VSS/VSSD	145	VSS/VSSD	195	VSSA/VSSD
46	C42N/DUMMY	96	RS[1]/DUMMY	146	VCORE/VDDD	196	VCOM
47	C42N/DUMMY	97	VDDI/IOVCC	147	VCORE/VDDD	197	DC
48	C42P/DUMMY	98	RS[0]/DUMMY	148	VCORE/VDDD	198	VCOM
49	C42P/DUMMY	99	IM[2]/VSSD	149	VCORE/VDDD	199	AG
50	C42P/DUMMY	100	IM[1]	150	VCORE/VDDD	200	AG

Note (1) Pin4 and Pin197 DC is for GIA, DC voltage is set tentatively between 5V~10V, which needs to be adjusted during validation.

Note (2) Pin1,Pin2,Pin199,Pin200 are connected to Vcom by default, reserved line are connected to GND, don't floating.

8 Reliability Condition

Table 9 Reliability Condition

NO	Item	Condition
1	High temperature Operation	T_{gs}=70℃,240hours
2	Low temperature Operation	T_a=-20℃,240hours
3	High temperature Storage	T_a=80℃,240hours
4	Low temperature Storage	T_a=-30℃,240hours
5	High temperature/High humidity Operation	T_{gs}=60℃, 90%RH,240hours

Note(1) A sample can only have one test. Outward appearance, image quality and optical data can only be checked at normal conditions according to the IVO document before reliable test. Only check the function of the panel after reliability test.

Note(2) The setting of electrical parameters should follow the initial code specified by IVO before reliability test. Besides, in OTP mode, Vcom must be adjusted to optimize display quality. It is recommended to use the backlight that specified by IVO.

Note(3) The sample must be released for 24 hours under normal conditions before judging. Furthermore, all the judgment must be made under normal conditions. Normal conditions are defined as follow: Temperature: 25℃, Humidity: 55± 10%RH. T_a= Ambient Temperature, T_{gs}= Glass Surface Temperature.

Note(4) During the test, it is unaccepted to have condensate water remains. Besides, protect the module from static electricity.

9 IVO Recommended Packaging

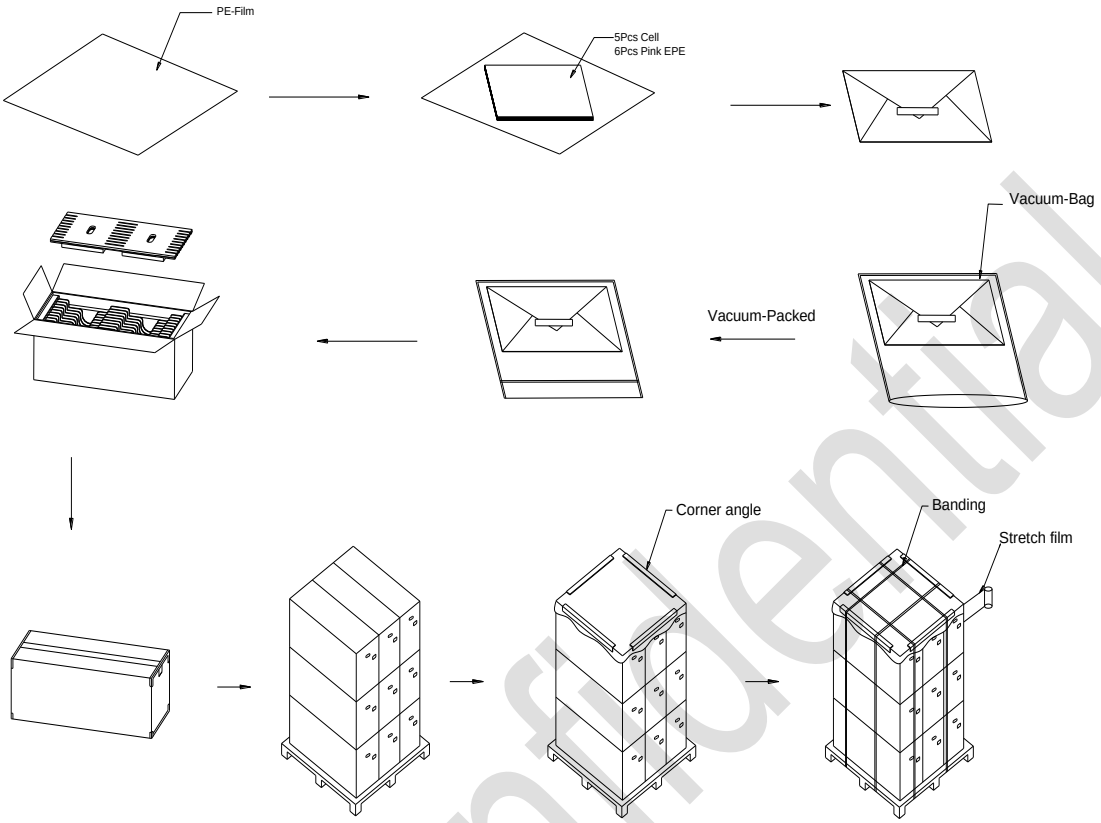


Figure 19 Sub Sheet Packaging

10 General Precaution

10.1 Use Restriction

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

10.2 Operation Precaution

(1) The LCD product should be operated under normal conditions.
Normal conditions are defined as below:
Temperature: 25℃
Humidity: 55±10%
Display pattern: continually changing pattern (Not stationary)
(2) Brightness and response time depend on the temperature. (It needs more time to reach normal brightness in low temperature.)
(3) Image sticking may occur when the module displayed the same pattern for long time.
(4) Do not connect or disconnect the panel in the “power on” condition. Power supply should always be turned on/off by the “power on/off sequence”

10.3 Handling Precaution

(1) All the operators should be electrically grounded through adequate methods such as an anti-static wrist band, and with ionized air blowing to the panel surface when handling.
(2) Dressing finger-stalls out of the gloves is important for keeping the panel clean during the incoming inspection and the process of assembly.
(3) Do not apply strong mechanical impact or static load to the panel, so as to avoid breaking it.
(4) Clean the panel gently with absorbent cotton or soft cloth when it is dirty.
(5) Wipe off saliva or water drops on the polarizer, as soon as possible. Otherwise, it may cause deformation and fading of color.
(6) Desirable cleaners are IPA (Isopropyl Alcohol) or hexane. Do not use Ketone type materials (ex. Acetone), Ethyl alcohol, Toluene, Ethyl acid or Methyl chloride. It might permanent damage to the polarizer due to chemical reaction.
(7) When expose to drastic fluctuation of temperature (hot to cold or cold to hot), the LCD panel may be affected; It is necessary for you to pay attention to condensation when the ambient temperature drops suddenly. Condensate water would damage the polarizer and electrical contacted parts of the panel. Besides, smear or spot will remain after condensate water evaporating.
(8) The TFT-LCD Panel shall be installed flat, without twisting or bending
(9) If the liquid crystal material leaks from the panel, keep it away from the eyes and mouth. In case of contact with hands, legs or clothes, it must be clean with soap thoroughly.

10.4 Storage Precaution

When storing the product as spares for a long time, the following precautions are necessary.

(1) Store them in a dark place. Do not expose to sunlight or fluorescent light. Keep the temperature between 5℃ and 35℃ at normal humidity.
(2) The product's glass surface should not come in contact with any other object. It is recommended that they be stored in the container in which they were shipped.
(3) It is recommended to use it in a short-time period, after it's unpacked. Otherwise, we would not guarantee the quality.

10.5 Reprocessing Precaution

In order to ensure original product status, protective measures must be assessed before any reprocessing, including UV, ESD and high temperature prevention, etc. Product storage and usage condition also must be considered. For glass slimming process, we insist to strictly observe IVO standard operation procedure《Slimming Process Instruction》.

10.6 Disposal

When disposing LCD panel, obey the local environmental regulations.