Chunghwa Picture Tubes, Ltd.
Product Specification

TFT LCD

CLAG050WH41 AXXN

APPROVED BY	CHECKED BY	PREPARED BY

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REVISION STATUS

Revision Notice	Description	Page	Rev. Date
0.0	First revision (Tentative)	--	2015.01.21

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1. OVERVIEW

CPT CLAG050WH41 AXXN is a cell product after LC ODF. This is a 16:9 aspect ratio panel for the mobile application.

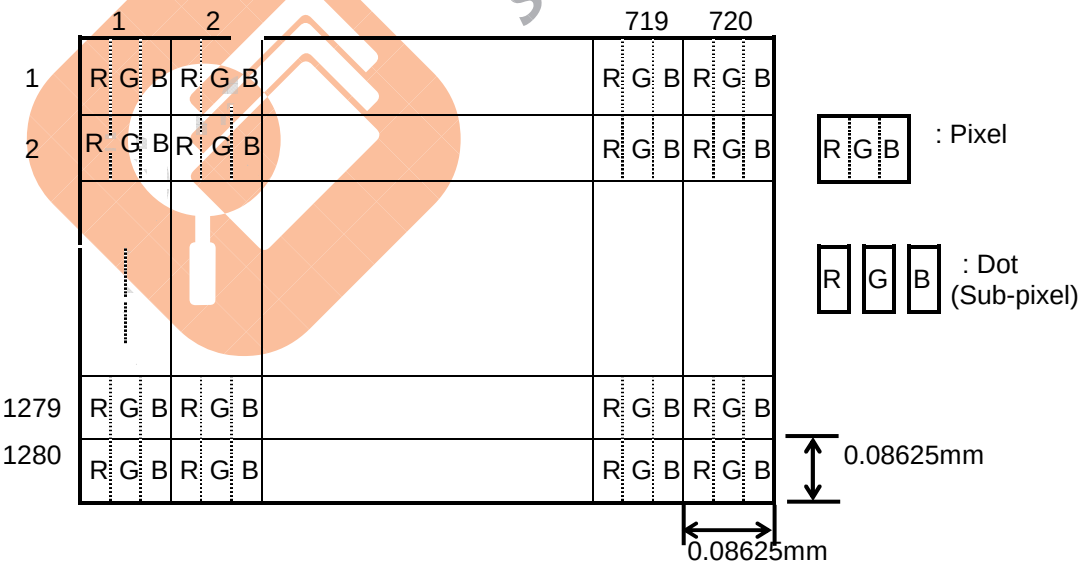
The 5” screen produces a high resolution image that is composed of 2,764,800 pixel elements in a stripe arrangement.

General specifications are summarized in the following table:

ITEM	SPECIFICATION
Panel Size	4.99 inch
Display Area (mm)	62.1(H)x110.4(V)
CF glass dimension	64.5×114.235 x 0.20 (Thickness)
TFT glass dimension	64.5×117.435 (H) x 0.20 (Thickness)
Number of Pixels	720X(RGB)x1280
Pixel Pitch (mm)	86.25um X 86.25um
Color Pixel Arrangement	RGB Stripe
NTSC 1931	70% (CF)
Display Mode	FFS
Driving Method	TFT active matrix
Viewing Angle	85/85/85/85 typ@ CR>10
Suggesting IC	OTM1284A -C16 / R61350
Compatible IC	ILI9881-C/ HX8394D / HX8394F / NT35521S

Note:
1.The FPC circuit design is possibly different according to the individual suggesting IC internal circuit definition and application. Please refer to the IC datasheet respectively.
2.Suggesting means verified by CPT .Compatible IC means IC pad compatible without verified by CPT. Compatible IC couldn’t support same function & FPC as suggest IC, please check with IC vendor in detail.

LCD Cell Drawing
(Note 1)



The LCD Products listed on this document are not suitable for use of aerospace equipment, submarine cables, nuclear reactor control system and life support systems. If customers intend to use these LCD products for above application or not listed in "Standard" as follows, please contact our sales people in advance.

2. ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Min.	Max.	Unit	Remark
Enviromental Phase					
Operating Ambient Temperature	T_{OP}	-20	+70	˚C	
Operating Ambient Humidity	H_{OP}	10	90	% (RH)	
Storage Temperature	T_{STG}	-30	+80	˚C	
Storage Humidity	H_{STG}	10	90	% (RH)	
Electrical Phase					
TFT Gate High Voltage	*VGH*	15	18	V	
TFT Gate Low Voltage	*VGL*	-12	-10	V	
TFT Common Electrode Voltage	*VCOM DC*	-3.5	0	V	NOTE3
TFT Feed-Through Voltage	*ΔVp*	0.6	1.2	V	

Note 1. The absolute maximum ratings are the values that must not be exceeded at any time for this product. It is not allowed for any of these ratings to be exceeded. Should a product be used with any of the absolute maximum ratings exceeded, the characteristics of the product may not be recovered, or in an extreme case, the product may be permanently destroyed.

Therefore, when desigining a system incorporating the product, make sure that adequate attentions be paid to the variations in the supply voltages, the characteristics of parts that are connected, surges in the input and output lines, and the ambient temperatures.

Note 2. This specification applys after the driver IC mounting and the FPC mounting. (This specification isn't applicable at time of driver IC un-mounting and FPC un-mounting.)

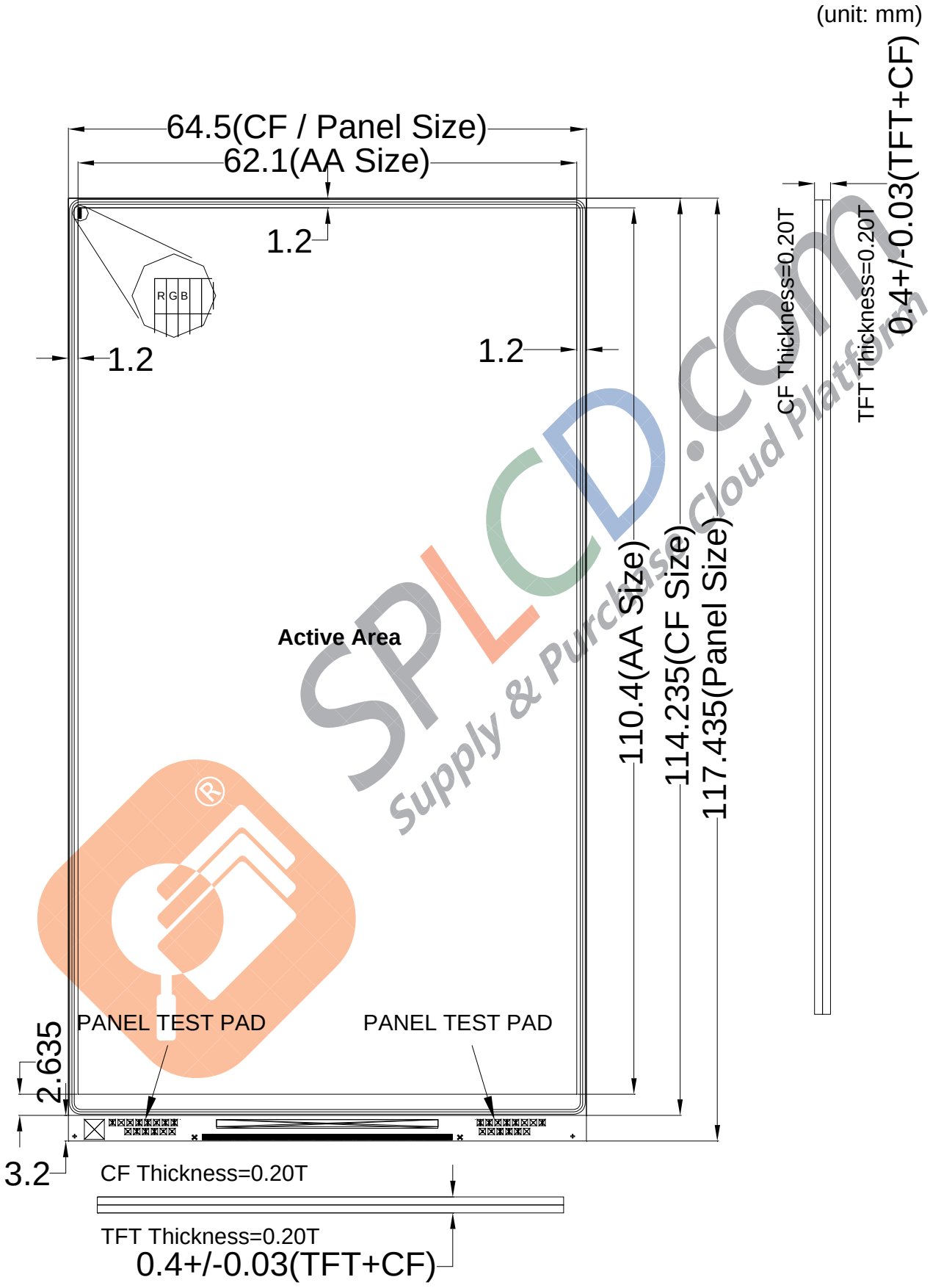
LCD should keep the condition that dew dosen't storage in case of driver IC un-mounting and FPC un-mounting. Dew may break the LCD. Especially part is very weak for dew.

Note 3. Vcom must be adjusted to optimize display quality： Image Sticking, Cross-talk, Contrast Ratio and etc.

We just kindly recommend the setting-voltage as the reference value.
In order to get the optimized display quality, the setting-voltage should be changed as based on customer's developing condition through LCD Driver IC's OTP process.
(The display quality could be changed by customer's setting-voltage.)

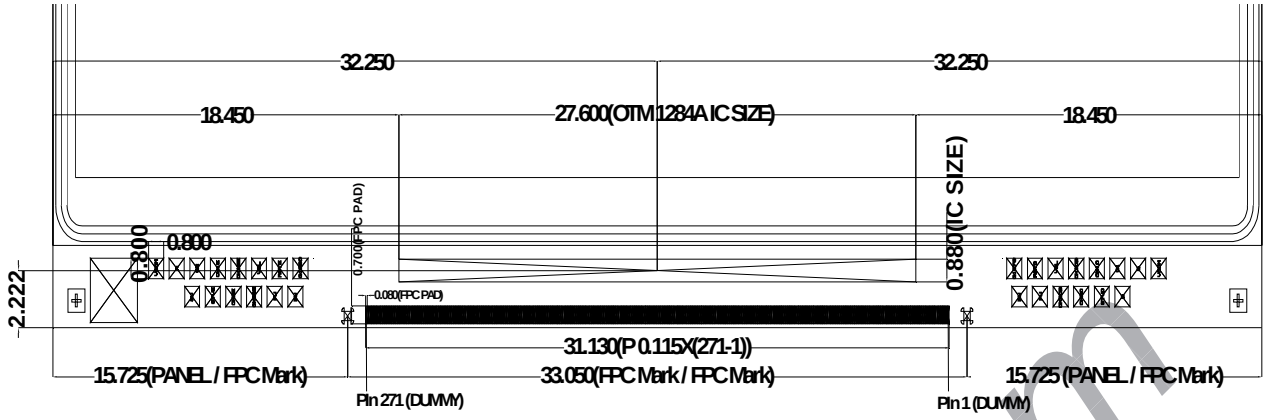
3. MECHANICAL SPECIFICATIONS

3.1 Outline Dimension



3.2.1 IC & FPC Pad

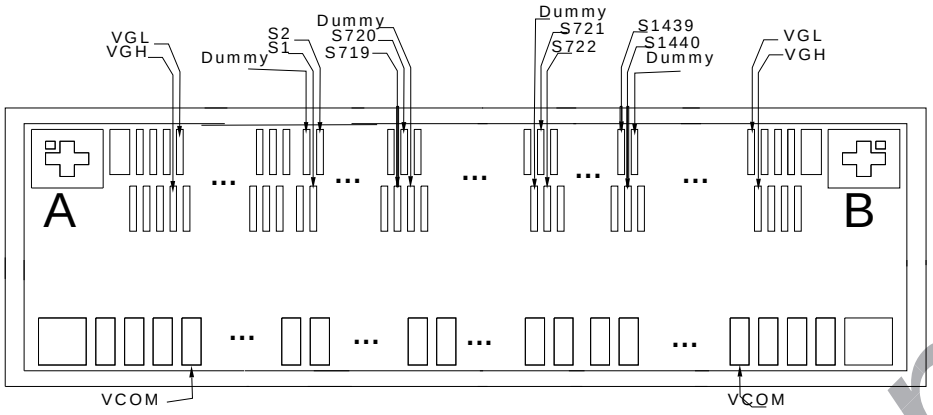
(unit = mm)



Note. Color Filter is in the upper side , TFT is in the bottom side

3.2.2 COG Design (DOM)

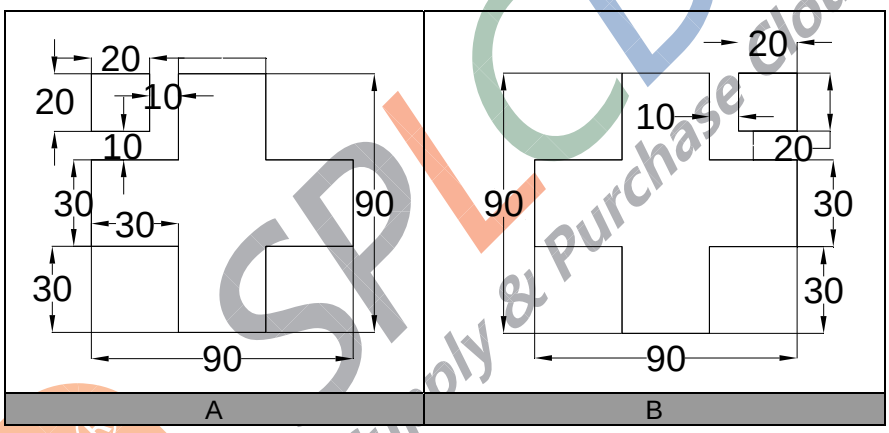
- IC：



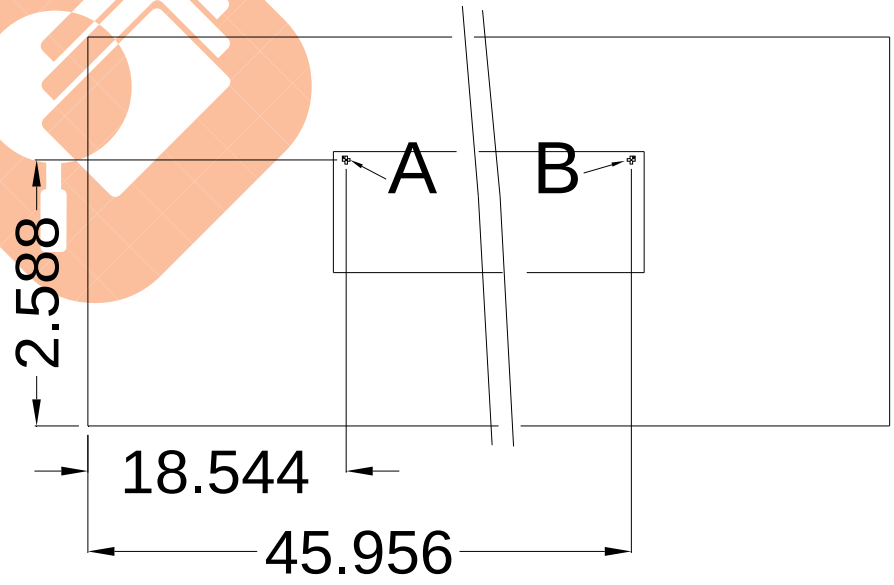
1. Chip Size

IC	Chip Size
OTM1284A-C16	27.6mm x 0.88mm

2. Alignment Mark Size & Position ：

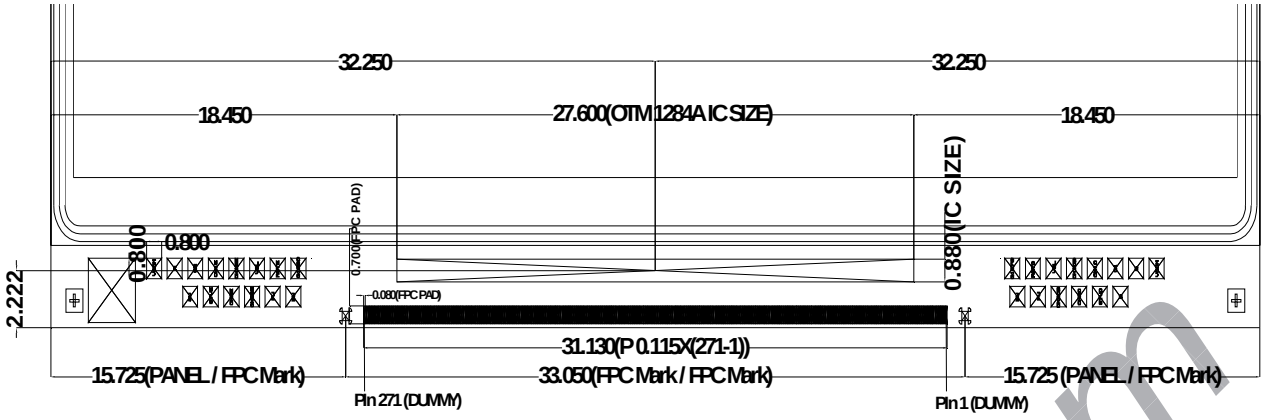


Unit： mm

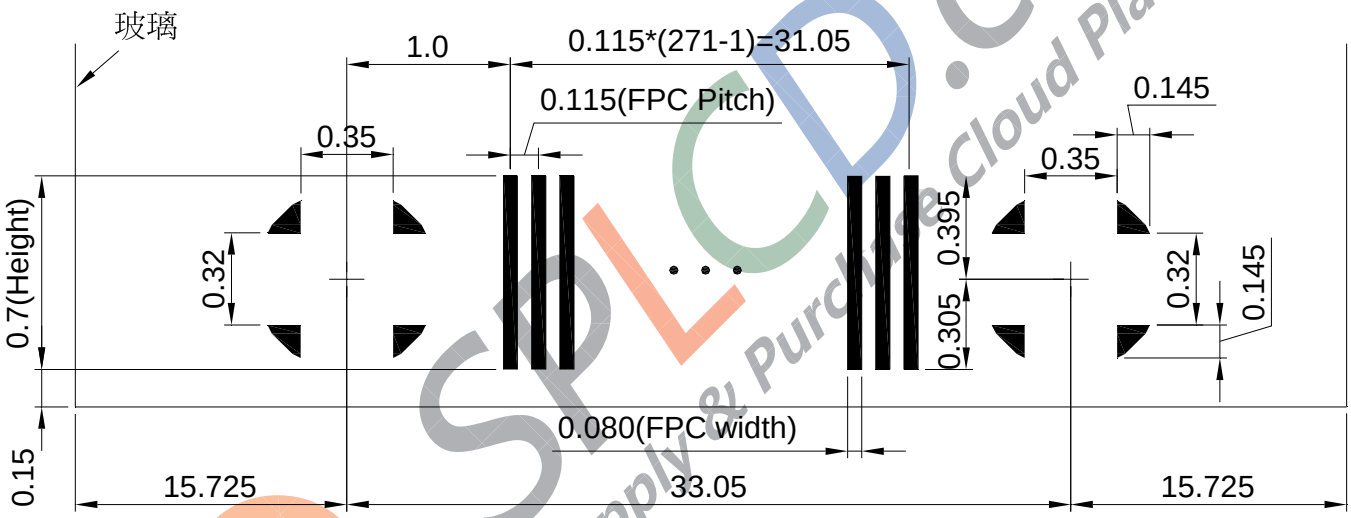


3.2.3 FPC Pad

(unit = mm)



Detail FPC：



3.2.4 FPC Pin Assignment

FPC Pin Assignment (OTM1284A-C16)

Pin No.	Symbol	Pin No.	Symbol	Pin No.	Symbol	Pin No.	Symbol
1	DUMMY	71	VCC	141	VSS	211	C21N
2	DUMMY	72	VCC	142	IM0	212	C21N
3	GND	73	VCC	143	VDDI	213	C22P
4	GND	74	VDD_18	144	IM1	214	C22P
5	VCOM	75	VDD_18	145	VSS	215	C22N
6	VCOM	76	VDD_18	146	RS0	216	C22N
7	DUMMY	77	VDD_18	147	VDDI	217	VGH
8	DUMMY	78	VDD_18	148	RS1	218	VGH
9	DUMMY	79	VDD_18	149	VSS	219	VCI
10	DUMMY	80	VDD_18	150	LANSEL	220	VCI
11	DUMMY	81	VDD_18	151	VDDI	221	DUMMY
12	DUMMY	82	VSS	152	BOOSTM0	222	VSS
13	DUMMY	83	VSS	153	VSS	223	VSS
14	DUMMY	84	VSS	154	BOOSTM1	224	VSS
15	DUMMY	85	VSS	155	VCC	225	C23P
16	DUMMY	86	TOUT0	156	VCC	226	C23P
17	DUMMY	87	VDDA	157	VCC	227	C23N
18	DUMMY	88	VDDA	158	VCC	228	C23N
19	DUMMY	89	VDDA	159	VDD_18V	229	C24P
20	DUMMY	90	VDDA	160	VDD_18V	230	C24P
21	DUMMY	91	VDDA	161	VDD_18V	231	DUMMY
22	VCOM	92	VDDA	162	VDD_18V	232	C24N
23	VSSA	93	VDDA	163	VSS	233	C24N
24	VSSA	94	VSS	164	VSS	234	C24N
25	VSSA	95	VSS	165	VSS	235	C24N
26	VSSA	96	VSS	166	VSS	236	VGL
27	LVDSVSS	97	VSS	167	EXTN	237	VGL
28	LVDSVSS	98	VSS	168	EXTN	238	VGL
29	D0N	99	VSS	169	EXTN	239	VGL
30	D0N	100	C51P	170	EXTP	240	DUMMY
31	D0P	101	DUMMY	171	EXTP	241	DUMMY
32	D0P	102	C51P	172	EXTP	242	DUMMY
33	LVDSVSS	103	C51P	173	MTP_PWR	243	DUMMY
34	LVDSVSS	104	C51N	174	MTP_PWR	244	DUMMY
35	D1N	105	C51N	175	VCI	245	DUMMY
36	D1N	106	C51N	176	VCI	246	VCOMR
37	D1P	107	VSS	177	DUMMY	247	VCOMR
38	D1P	108	C52P	178	DUMMY	248	DUMMYR1
39	LVDSVSS	109	C52P	179	VSSA	249	VCOM
40	LVDSVSS	110	C52P	180	VSSA	250	DUMMY
41	CLKN	111	C52N	181	DUMMY	251	DUMMY
42	CLKN	112	C52N	182	VSSA	252	DUMMY
43	CLKP	113	C52N	183	VSSA	253	DUMMY

44	CLKP	114	NVDDA	184	DUMMY	254	DUMMY
45	LVDSVSS	115	NVDDA	185	GVDD	255	DUMMY
46	LVDSVSS	116	VSS	186	NGVDD	256	DUMMY
47	D2N	117	D7	187	VREF	257	DUMMY
48	D2N	118	D6	188	VSS	258	DUMMY
49	D2P	119	D5	189	VSS	259	DUMMY
50	D2P	120	D4	190	VCI	260	DUMMY
51	LVDSVSS	121	D3	191	VCI	261	DUMMY
52	LVDSVSS	122	D2	192	VCL	262	DUMMY
53	LVDSVSS	123	D1	193	C41P	263	DUMMY
54	D3N	124	D0	194	C41P	264	DUMMY
55	D3N	125	HS	195	C41N	265	VGL
56	D3P	126	VS	196	C41N	266	VCOM
57	D3P	127	GOUT_SEL	197	C42P	267	VCOM
58	LVDSVSS	128	PCLK	198	C42P	268	GND
59	LVDSVSS	129	DCX	199	C42N	269	GND
60	LVDSVSS	130	CSX	200	C42N	270	DUMMY
61	LVDSVSS	131	SCL	201	C42N	271	DUMMY
62	LVDSVDD	132	SDI	202	C42N		
63	LVDSVDD	133	SDO	203	CSP		
64	LVDSVDD	134	LEDPWM	204	VSP		
65	LVDSVDD	135	TE	205	VSP		
66	VDDAM	136	TE1	206	DUMMY		
67	VDDAM	137	RESX	207	VSN		
68	VDDAM	138	TEST2	208	CSN		
69	VDDAM	139	TEST1	209	C21P		
70	VCC	140	TEST0	210	C21P		

Note : DUMMY don’t connect

FPC Pin Assignment (ILI9881-C)

No.	Signal	No.	Signal	No.	Signal	No.	Signal	No.	Signal
1	DUMMY	56	D3P	111	C52N	166	VSS	221	DUMMY
2	DUMMY	57	D3P	112	C52N	167	EXTN	222	VSS
3	GND	58	LVDSVSS	113	C52N	168	EXTN	223	VSS
4	GND	59	LVDSVSS	114	NVDDA	169	EXTN	224	VSS
5	VCOM	60	LVDSVSS	115	NVDDA	170	EXTP	225	C23P
6	VCOM	61	LVDSVSS	116	VSS	171	EXTP	226	C23P
7	DUMMY	62	LVDSVDD	117	D7	172	EXTP	227	C23N
8	DUMMY	63	LVDSVDD	118	D6	173	MTP_PWR	228	C23N
9	DUMMY	64	LVDSVDD	119	D5	174	MTP_PWR	229	C24P
10	DUMMY	65	LVDSVDD	120	D4	175	VCIREF	230	C24P
11	DUMMY	66	VDDAM	121	D3	176	VCIREF	231	DUMMY
12	DUMMY	67	VDDAM	122	D2	177	DUMMYN	232	C24N
13	DUMMY	68	VDDAM	123	D1	178	DUMMYN	233	C24N
14	DUMMY	69	VDDAM	124	D0	179	VSSA	234	C24N
15	DUMMY	70	VCC1	125	HS	180	VSSA	235	C24N
16	DUMMY	71	VCC1	126	VS	181	DUMMY	236	VGL
17	DUMMY	72	VCC1	127	GOUT_SEL	182	VSSA	237	VGL
18	DUMMY	73	VCC1	128	PCLK	183	VSSA	238	VGL
19	DUMMY	74	VCORE	129	DCX	184	DUMMY	239	VGL
20	DUMMY	75	VCORE	130	CSX	185	VREG1OUT	240	VGLODUMMY
21	DUMMY	76	VCORE	131	SCL	186	VREG2OUT	241	VGLODUMMY
22	VCOM	77	VCORE	132	SDI	187	VREF	242	VGLODUMMY
23	VSSA	78	VCORE	133	SDO	188	VSS	243	VGLODUMMY
24	VSSA	79	VCORE	134	LEDPWM	189	VSS	244	VGLODUMMY
25	VSSA	80	VCORE	135	TE	190	VCI	245	VGLODUMMY
26	VTESTOUTP	81	VCORE	136	TE1	191	VCI	246	VCOMR
27	LVDSVSS	82	VSS	137	RESX	192	VCL	247	VCOMR
28	LVDSVSS	83	VSS	138	TEST2	193	C41P	248	DUMMYR1
29	D0N	84	VSS	139	TEST1	194	C41P	249	VCOM
30	D0N	85	VSS	140	TEST0	195	C41N	250	DUMMY
31	D0P	86	TOUT0	141	VSSDUMMY	196	C41N	251	DUMMY
32	D0P	87	VDDA	142	IM0	197	C42P	252	DUMMY
33	LVDSVSS	88	VDDA	143	VDDI	198	C42P	253	DUMMY
34	LVDSVSS	89	VDDA	144	IM1	199	C42N	254	DUMMY
35	D1N	90	VDDA	145	IM2	200	C42N	255	DUMMY
36	D1N	91	VDDA	146	RS0	201	C42N	256	DUMMY
37	D1P	92	VDDA	147	VDDI	202	C42N	257	DUMMY
38	D1P	93	VDDA	148	RS1	203	VSP	258	DUMMY
39	LVDSVSS	94	VSS	149	VSS	204	VSP	259	DUMMY
40	LVDSVSS	95	VSS	150	LANSEL	205	VSP	201	DUMMY
41	CLKN	96	VSS	151	VDDI	206	DUMMY	261	DUMMY
42	CLKN	97	VSS	152	BOOSTM0	207	VSN	262	DUMMY
43	CLKP	98	VSS	153	BOOSTM2	208	VSN	263	DUMMY
44	CLKP	99	VSS	154	BOOSTM1	209	C21N	264	DUMMY
45	LVDSVSS	100	DUMMY	155	VCC2	210	C21N	265	VGL
46	LVDSVSS	101	C51P	156	VCC2	211	C21P	266	VCOM
47	D2N		C51P	157	VCC2	212	C21P	267	VCOM
48	D2N	103	C51P	158	VCC2	213	C22N	268	GND
49	D2P	104	C51N	159	VCORE	214	C22N	269	GND
50	D2P	105	C51N	160	VCORE	215	C22P	270	DUMMY
51	LVDSVSS	106	C51N	161	VCORE	216	C22P	271	DUMMY
52	LVDSVSS	107	VSS	162	VCORE	217	VGH		
53	LVDSVSS	108	C52P	163	VSS	218	VGH		
54	D3N	109	C52P	164	VSS	219	VCI		
55	D3N	110	C52P	165	VSS	220	VCI		

Note : DUMMY don't connect

FPC Pin Assignment (HX8394-D)

Pin No.	Symbol	Pin No.	Symbol	Pin No.	Symbol	Pin No.	Symbol
1	DUMMY	71	VDD1	141	VSSD	211	C21N
2	DUMMY	72	VDD1	142	BS[0]	212	C21N
3	GND	73	VDD1	143	VDD1	213	C22P
4	GND	74	VDDD	144	BS[1]	214	C22P
5	VCOM	75	VDDD	145	VSSD	215	C22N
6	VCOM	76	VDDD	146	DUMMY	216	C22N
7	G1	77	VDDD	147	VDD1	217	VGH
8	DUMMY	78	VDDD	148	DUMMY	218	VGH
9	DUMMY	79	VDDD	149	VSSD	219	VDD3
10	DUMMY	80	VDDD	150	BS[2]	220	VDD3
11	DUMMY	81	VDDD	151	VDD1	221	DUMMY
12	DUMMY	82	VSSD	152	PCCS[0]	222	VSSD
13	DUMMY	83	VSSD	153	VSSD	223	VSSD
14	DUMMY	84	VSSD	154	PCCS[1]	224	VSSD
15	DUMMY	85	VSSD	155	VDD1	225	C31P
16	DUMMY	86	TS[0]	156	VDD1	226	C31P
17	DUMMY	87	DUMMY	157	VDD1	227	C31N
18	DUMMY	88	DUMMY	158	VDD1	228	C31N
19	DUMMY	89	DUMMY	159	VDDD	229	DUMMY
20	DUMMY	90	DUMMY	160	VDDD	230	DUMMY
21	DUMMY	91	DUMMY	161	VDDD	231	DUMMY
22	VCOM	92	DUMMY	162	VDDD	232	DUMMY
23	VSSA	93	DUMMY	163	VSSD	233	DUMMY
24	VSSA	94	DUMMY	164	VSSD	234	DUMMY
25	VSSA	95	OSC	165	VSSD	235	DUMMY
26	DUMMY	96	OSC	166	VSSD	236	VGL
27	LVDSVSS	97	DUMMY	167	VCSW[2]	237	VGL
28	LVDSVSS	98	DUMMY	168	VCSW[2]	238	VGL
29	HS_DN[0]	99	DUMMY	169	VCSW[2]	239	VGL
30	HS_DN[0]	100	DUMMY	170	VCSW[1]	240	DUMMY
31	HS_DP[0]	101	DUMMY	171	VCSW[1]	241	DUMMY
32	HS_DP[0]	102	DUMMY	172	VCSW[1]	242	DUMMY
33	HS_VSS	103	DUMMY	173	VPP	243	DUMMY
34	HS_VSS	104	DUMMY	174	VPP	244	VGL
35	HS_DN[1]	105	DUMMY	175	DUMMY	245	VGL
36	HS_DN[1]	106	DUMMY	176	VDD3	246	DUMMY
37	HS_DP[1]	107	DUMMY	177	DUMMY	247	DUMMY
38	HS_DP[1]	108	DUMMY	178	DUMMY	248	DUMMY
39	HS_VSS	109	DUMMY	179	VSSAC	249	VCOM
40	HS_VSS	110	DUMMY	180	VSSAC	250	DUMMY
41	HS_CN	111	DUMMY	181	DUMMY	251	DUMMY
42	HS_CN	112	DUMMY	182	VSSA	252	DUMMY

43	HS_CP	113	DUMMY	183	VSSA	253	DUMMY
44	HS_CP	114	DUMMY	184	DUMMY	254	DUMMY
45	HS_VSS	115	DUMMY	185	VSPR	255	DUMMY
46	HS_VSS	116	FRM	186	VSNR	256	DUMMY
47	HS_DN[2]	117	DUMMY	187	VREF	257	DUMMY
48	HS_DN[2]	118	DUMMY	188	VSSD	258	DUMMY
49	HS_DP[2]	119	DUMMY	189	VSSD	259	DUMMY
50	HS_DP[2]	120	DUMMY	190	VDD3	260	DUMMY
51	HS_VSS	121	DUMMY	191	VDD3	261	DUMMY
52	HS_VSS	122	DUMMY	192	VCL	262	DUMMY
53	HS_VSS	123	DUMMY	193	C41P	263	DUMMY
54	HS_DN[3]	124	DUMMY	194	C41P	264	DUMMY
55	HS_DN[3]	125	HSYNC	195	C41N	265	VGL
56	HS_DP[3]	126	VSYNC	196	C41N	266	VCOM
57	HS_DP[3]	127	DE	197	DUMMY	267	VCOM
58	HS_VSS	128	PCLK	198	DUMMY	268	GND
59	HS_VSS	129	DCX	199	DUMMY	269	GND
60	HS_VSS	130	CSX	200	DUMMY	270	DUMMY
61	HS_VSS	131	SCL	201	DUMMY	271	DUMMY
62	HS_LDO	132	SDI	202	DUMMY		
63	HS_LDO	133	SDO	203	VSP		
64	HS_LDO	134	CABC_PWM_OUT	204	VSP		
65	HS_LDO	135	TE	205	VSP		
66	HS_VCC	136	TE1	206	DUMMY		
67	HS_VCC	137	RESX	207	VSN		
68	HS_VCC	138	TEST2	208	VSN		
69	HS_VCC	139	TEST1	209	C21P		
70	VDD1	140	TEST0	210	C21P		

Note : DUMMY don’t connect

FPC Pin Assignment (HX8394-F)

Pin No.	Symbol	Pin No.	Symbol	Pin No.	Symbol	Pin No.	Symbol
1	DUMMY	71	VDD1	141	VSSD	211	C21N
2	DUMMY	72	VDD1	142	BS[0]	212	C21N
3	GND	73	VDD1	143	VDD1	213	C22P
4	GND	74	VDDD	144	BS[1]	214	C22P
5	VCOM	75	VDDD	145	VSSD	215	C22N
6	VCOM	76	VDDD	146	DUMMY	216	C22N
7	G1	77	VDDD	147	VDD1	217	VGH
8	DUMMY	78	VDDD	148	DUMMY	218	VGH
9	DUMMY	79	VDDD	149	VSSD	219	VDD3
10	DUMMY	80	VDDD	150	BS[2]	220	VDD3
11	DUMMY	81	VDDD	151	VDD1	221	DUMMY
12	DUMMY	82	VSSD	152	PCCS[0]	222	VSSD
13	DUMMY	83	VSSD	153	VSSD	223	VSSD
14	DUMMY	84	VSSD	154	PCCS[1]	224	VSSD
15	DUMMY	85	VSSD	155	VDD1	225	C31P
16	DUMMY	86	TS[0]	156	VDD1	226	C31P
17	DUMMY	87	DUMMY	157	VDD1	227	C31N
18	DUMMY	88	DUMMY	158	VDD1	228	C31N
19	DUMMY	89	DUMMY	159	VDDD	229	DUMMY
20	DUMMY	90	DUMMY	160	VDDD	230	DUMMY
21	DUMMY	91	DUMMY	161	VDDD	231	DUMMY
22	VCOM	92	DUMMY	162	VDDD	232	DUMMY
23	VSSA	93	DUMMY	163	VSSD	233	DUMMY
24	VSSA	94	DUMMY	164	VSSD	234	DUMMY
25	VSSA	95	OSC	165	VSSD	235	DUMMY
26	DUMMY	96	OSC	166	VSSD	236	VGL
27	LVDSVSS	97	DUMMY	167	VCSW[2]	237	VGL
28	LVDSVSS	98	DUMMY	168	VCSW[2]	238	VGL
29	HS_DN[0]	99	DUMMY	169	VCSW[2]	239	VGL
30	HS_DN[0]	100	DUMMY	170	VCSW[1]	240	DUMMY
31	HS_DP[0]	101	DUMMY	171	VCSW[1]	241	DUMMY
32	HS_DP[0]	102	DUMMY	172	VCSW[1]	242	DUMMY
33	HS_VSS	103	DUMMY	173	VPP	243	DUMMY
34	HS_VSS	104	DUMMY	174	VPP	244	VGL
35	HS_DN[1]	105	DUMMY	175	DUMMY	245	VGL
36	HS_DN[1]	106	DUMMY	176	VDD3	246	DUMMY
37	HS_DP[1]	107	DUMMY	177	DUMMY	247	DUMMY
38	HS_DP[1]	108	DUMMY	178	DUMMY	248	DUMMY
39	HS_VSS	109	DUMMY	179	VSSAC	249	VCOM
40	HS_VSS	110	DUMMY	180	VSSAC	250	DUMMY
41	HS_CN	111	DUMMY	181	DUMMY	251	DUMMY
42	HS_CN	112	DUMMY	182	VSSA	252	DUMMY

43	HS_CP	113	DUMMY	183	VSSA	253	DUMMY
44	HS_CP	114	DUMMY	184	DUMMY	254	DUMMY
45	HS_VSS	115	DUMMY	185	VSPR	255	DUMMY
46	HS_VSS	116	FRM	186	VSNR	256	DUMMY
47	HS_DN[2]	117	DUMMY	187	VREF	257	DUMMY
48	HS_DN[2]	118	DUMMY	188	VSSD	258	DUMMY
49	HS_DP[2]	119	DUMMY	189	VSSD	259	DUMMY
50	HS_DP[2]	120	DUMMY	190	VDD3	260	DUMMY
51	HS_VSS	121	DUMMY	191	VDD3	261	DUMMY
52	HS_VSS	122	DUMMY	192	VCL	262	DUMMY
53	HS_VSS	123	DUMMY	193	C41P	263	DUMMY
54	HS_DN[3]	124	DUMMY	194	C41P	264	DUMMY
55	HS_DN[3]	125	HSYNC	195	C41N	265	VGL
56	HS_DP[3]	126	VSYNC	196	C41N	266	VCOM
57	HS_DP[3]	127	DE	197	DUMMY	267	VCOM
58	HS_VSS	128	PCLK	198	DUMMY	268	GND
59	HS_VSS	129	DCX	199	DUMMY	269	GND
60	HS_VSS	130	CSX	200	DUMMY	270	DUMMY
61	HS_VSS	131	SCL	201	DUMMY	271	DUMMY
62	HS_LDO	132	SDI	202	DUMMY		
63	HS_LDO	133	SDO	203	VSP		
64	HS_LDO	134	CABC_PWM_OUT	204	VSP		
65	HS_LDO	135	TE	205	VSP		
66	HS_VCC	136	TE1	206	DUMMY		
67	HS_VCC	137	RESX	207	VSN		
68	HS_VCC	138	TEST2	208	VSN		
69	HS_VCC	139	TEST1	209	C21P		
70	VDD1	140	TEST0	210	C21P		

Note : DUMMY don’t connect

FPC Pin Assignment (NT35521-S)

Pin No.	Symbol	Pin No.	Symbol	Pin No.	Symbol	Pin No.	Symbol
1	DUMMY	71	VDDI	141	VDDI	211	C41N
2	DUMMY	72	VDDI	142	IM0	212	C41N
3	GND	73	VDDI	143	IM1	213	C42P
4	GND	74	DVDD	144	LANSEL0	214	C42P
5	VCOM	75	DVDD	145	LANSEL1	215	C42N
6	VCOM	76	DVDD	146	VGSW0	216	C42N
7	DUMMY	77	DVDD	147	VGSW1	217	VGH
8	DUMMY	78	DVDD	148	VSSI	218	VGH
9	DUMMY	79	DVDD	149	VSSI	219	VRGH
10	DUMMY	80	DVDD	150	VGSW2	220	VRGH
11	DUMMY	81	DVDD	151	VGSW3	221	DUMMY
12	DUMMY	82	DVSS	152	BTM0	222	AVEE
13	DUMMY	83	DVSS	153	BTM1	223	AVEE
14	DUMMY	84	DVSS	154	BTM2	224	AVEE
15	VGL	85	DVSS	155	DVDD	225	C51P
16	LVGL	86	VSSB	156	DVDD	226	C51P
17	DUMMY	87	VSSB	157	DVDD	227	C51N
18	VGH_G_L	88	VSSB	158	DVDD	228	C51N
19	DUMMY	89	AVSS	159	DVSS	229	VGLX
20	DUMMY	90	AVSS	160	DVSS	230	VGLX
21	DUMMY	91	AVSS	161	DVSS	231	DUMMY
22	VCOM	92	AVSS	162	DVSS	232	AVDD
23	AVSS	93	AVSS	163	AVDD	233	AVDD
24	AVSS	94	AVSS	164	AVDD	234	AVDD
25	AVSS	95	AVSS	165	AVDD	235	AVDD
26	MVDDL	96	AVSS	166	AVDD	236	VDDA
27	VSSAM	97	AVDD	167	EXTP	237	VDDA
28	VSSAM	98	AVDD	168	EXTP	238	VDDA
29	HSSI_D0_N	99	AVDD	169	EXTP	239	VDDA
30	HSSI_D0_N	100	AVDD	170	EXTN	240	VSSB
31	HSSI_D0_P	101	DUMMY	171	EXTN	241	VSSB
32	HSSI_D0_P	102	AVEE	172	EXTN	242	C11P
33	VSSAM	103	AVEE	173	CSPN	243	C11P
34	VSSAM	104	AVEE	174	CSPN	244	C11N
35	HSSI_D1_N	105	C21P	175	VGL_REG2	245	C11N
36	HSSI_D1_N	106	C21P	176	VGL_REG	246	MTP_PWR
37	HSSI_D1_P	107	C21P	177	VSSA	247	MTP_PWR
38	HSSI_D1_P	108	C21N	178	VSSR	248	MTP_PWR
39	VSSAM	109	C21N	179	VDDR	249	VCOM
40	VSSAM	110	C21N	180	VDDR	250	DUMMY
41	HSSI_CLK_N	111	C22P	181	DUMMY	251	DUMMY
42	HSSI_CLK_N	112	C22P	182	AVEE	252	DUMMY
43	HSSI_CLK_P	113	C22P	183	AVEE	253	VGH_G_R

44	HSSI_CLK_P	114	C22N	184	DUMMY	254	DUMMY
45	VSSAM	115	C22N	185	VGMP	255	LVGL
46	VSSAM	116	C22N	186	VGMN	256	VGL
47	HSSI_D2_N	117	T_D6	187	VREF	257	DUMMY
48	HSSI_D2_N	118	T_D4	188	VEQP_SD	258	DUMMY
49	HSSI_D2_P	119	T_D2	189	VEQP_SD	259	DUMMY
50	HSSI_D2_P	120	T_D0	190	VCL	260	DUMMY
51	VSSAM	121	T_VS	191	VCL	261	DUMMY
52	VSSAM	122	T_PK	192	VEQN_SD	262	DUMMY
53	VSSAM	123	T_IM	193	C31P	263	DUMMY
54	HSSI_D3_N	124	TEST6	194	C31P	264	DUMMY
55	HSSI_D3_N	125	PSWAP	195	C31N	265	VGL
56	HSSI_D3_P	126	DSWAP0	196	C31N	266	VCOM
57	HSSI_D3_P	127	DSWAP1	197	C32P	267	VCOM
58	VSSAM	128	DSWAP2	198	C32P	268	GND
59	VSSAM	129	D/CX	199	C32N	269	GND
60	VSSAM	130	CSX	200	C32N	270	DUMMY
61	VSSAM	131	SCL	201	C32N	271	DUMMY
62	MVDDA	132	SDI	202	C32N		
63	MVDDA	133	SDO	203	VDDB		
64	MVDDA	134	LEDPWM	204	VDDB		
65	MVDDA	135	TE	205	VDDB		
66	VDDA	136	TE1	206	DUMMY		
67	VDDA	137	RESX	207	VSSB		
68	VDDA	138	VDDI	208	VSSB		
69	VDDA	139	VDDI	209	C41P		
70	VDDI	140	VDDI	210	C41P		

FPC Pin Assignment (R61350)

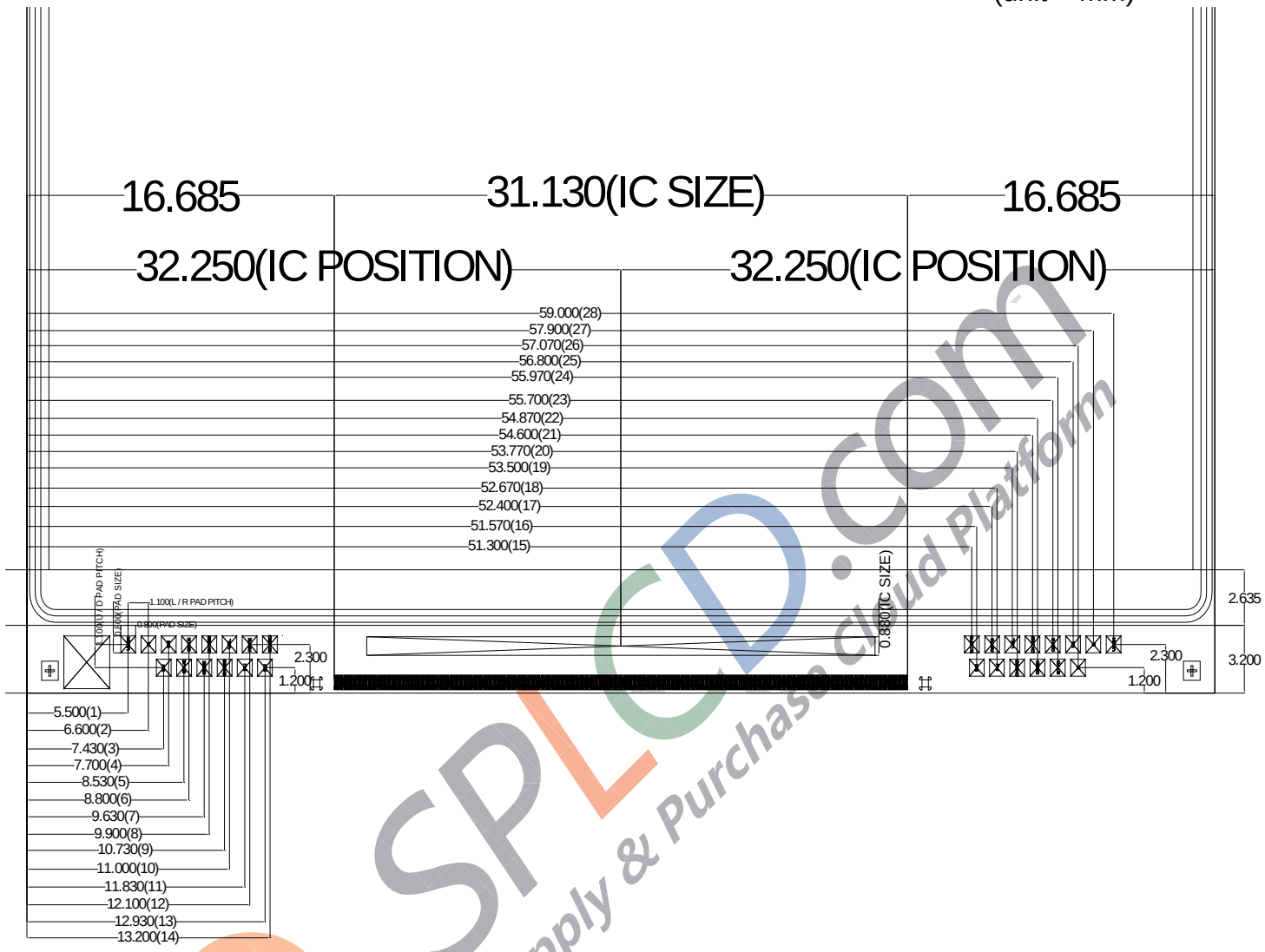
Pin No.	Symbol	Pin No.	Symbol	Pin No.	Symbol	Pin No.	Symbol
1	DUMMY	71	IOVCC	141	GND	211	C21M
2	DUMMY	72	IOVCC	142	IM0	212	C21M
3	GND	73	IOVCC	143	IOVCC	213	C22P
4	GND	74	VDD	144	IM1	214	C22P
5	VCOMDC	75	VDD	145	GND	215	C22M
6	VCOMDC	76	VDD	146	RS0	216	C22M
7	DUMMY	77	VDD	147	IOVCC	217	VGH
8	DUMMY	78	VDD	148	RS1	218	VGH
9	DUMMY	79	VDD	149	GND	219	VCI
10	DUMMY	80	VDD	150	IM2	220	VCI
11	DUMMY	81	VDD	151	IOVCC	221	DUMMY
12	DUMMY	82	GND	152	DUMMYIN4	222	GND
13	DUMMY	83	GND	153	GND	223	GND
14	DUMMY	84	GND	154	PCCS	224	GND
15	VGLO_L	85	GND	155	IOVCC	225	C31P
16	LVGL	86	VREF	156	IOVCC	226	C31P
17	DUMMY	87	VREFD	157	IOVCC	227	C31M
18	VGHO_L	88	VREFD	158	IOVCC	228	C31M
19	DUMMY	89	VREFD	159	VDD	229	C32P
20	DUMMY	90	VREFD	160	VDD	230	C32P
21	DUMMY	91	TEST_IOUT	161	VDD	231	DUMMY
22	VCOMDC	92	TEST_IOUT	162	VDD	232	C32M
23	AGND	93	VREFD	163	GND	233	C32M
24	AGND	94	VREFD	164	GND	234	C32M
25	AGND	95	EXCK	165	GND	235	C32M
26	AGND	96	EXCK	166	GND	236	VGL
27	DPHYGNDDUM<1>	97	GND	167	VCSW2	237	VGL
28	DPHYGNDDUM<1>	98	DUMMYIN1	168	VCSW2	238	VGL
29	DSID0N	99	DUMMYIN2	169	VCSW2	239	VGL
30	DSID0N	100	DUMMYIN3	170	VCSW1	240	DUMMY
31	DSID0P	101	DUMMY	171	VCSW1	241	DUMMY
32	DSID0P	102	TESTMD4	172	VCSW1	242	DUMMY
33	DPHYGNDDUM<2>	103	TESTMD3	173	MTP_PWR	243	DUMMY
34	DPHYGNDDUM<2>	104	DBIST	174	MTP_PWR	244	DUMMYVGL
35	DSID1N	105	HSOUT	175	DUMMYVCI	245	DUMMYVGL

36	DSID1N	106	VSOUT	176	VCI	246	DUMMY
37	DSID1P	107	GND	177	VREFM	247	DUMMY
38	DSID1P	108	DB15	178	VREFM	248	DUMMYR1
39	DPHYGNDDUM<3>	109	DB14	179	VGS	249	VCOMDC
40	DPHYGNDDUM<3>	110	DB13	180	VGS	250	DUMMY
41	DSICLKN	111	DB12	181	DUMMY	251	DUMMY
42	DSICLKN	112	DB11	182	AGND	252	DUMMY
43	DSICLKP	113	DB10	183	AGND	253	VGHO_R
44	DSICLKP	114	DB9	184	DUMMY	254	DUMMY
45	DPHYGNDDUM<4>	115	DB8	185	VPLVL	255	DUMMYVGL
46	DPHYGNDDUM<4>	116	GND	186	VNLVL	256	VGLO_R
47	DSID2N	117	DB7	187	DUMMY	257	DUMMY
48	DSID2N	118	DB6	188	GND	258	DUMMY
49	DSID2P	119	DB5	189	GND	259	DUMMY
50	DSID2P	120	DB4	190	VCI	260	DUMMY
51	DPHYGNDDUM<5>	121	DB3	191	VCI	261	DUMMY
52	DPHYGNDDUM<5>	122	DB2	192	VCL	262	DUMMY
53	DPHYGNDDUM<5>	123	DB1		DUMMY	263	DUMMY
54	DSID3N	124	DB0	194	DUMMY	264	DUMMY
55	DSID3N	125	HSYNC	195	DUMMY	265	VGL
56	DSID3P	126	VSYNC	196	DUMMY	266	VCOMDC
57	DSID3P	127	DE	197	DUMMY	267	VCOMDC
58	DPHYGND	128	PCLK	198	DUMMY	268	GND
59	DPHYGND	129	DCX	199	DUMMY	269	GND
60	DPHYGND	130	CSX	200	DUMMY	270	DUMMY
61	DPHYGND	131	SCL	201	DUMMY	271	DUMMY
62	DPHYVCC	132	DIN	202	DUMMY		
63	DPHYVCC	133	DOUT	203	VSPC		
64	DPHYVCC	134	LEDPWM	204	VSP		
65	DPHYVCC	135	TE	205	VSP		
66	DPHYVCC	136	TE1	206	DUMMY		
67	DPHYVCC	137	RESX	207	VSN		
68	DPHYVCC	138	TESTMD1	208	VSNC		
69	DPHYVCC	139	TESTMD2	209	C21P		
70	IOVCC	140	TESTMD2	210	C21P		

Note : DUMMY don't connect

3.3.1 Panel Check Pad in Panel

(unit = mm)

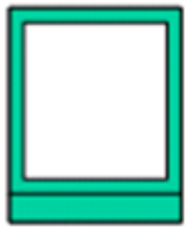


Panel Check Pad				
Pad Size	800 μm x 800 μm			
Pad Pitch	1100 μm			
Pad Name	01	VCOM	15	G1279
	02	R	16	BW
	03	SW	17	RSTO
	04	G2	18	FW
	05	STVE	19	VGL
	06	CK1E	20	CK2BO
	07	CK2E	21	CK1BO
	08	CK1BE	22	CK2O
	09	CK2BE	23	CK1O
	10	VGL	24	STVO
	11	FW	25	G1
	12	RSTE	26	B
	13	BW	27	G
	14	G1280	28	VCOM

3.3.2 CELL Test Light Wavefrmo

Frame	R	G	B	SW	Vcom
White(W)	H	H	H	H	DC/GND
Black(BK)	L	L	L	H	DC/GND
Gray(GY)	Gray	Gray	Gray	H	DC/GND
Zebra Stripe(Z)	H	H	H	H	DC/GND

Display Mode：FFS, Normally Black
Every Frame stay > 2sec.
Ex. LC = 5V, Vcom = 0V
Data H = ±5V, Data L = 0V, Data Gray = ±2.5V
SW_H = 10V above (on duty), SW_L = -6V (not on duty)
VGL, CK1~CK8, STV1, STV2, RST1, RST2...etc, please follow the timing char below.

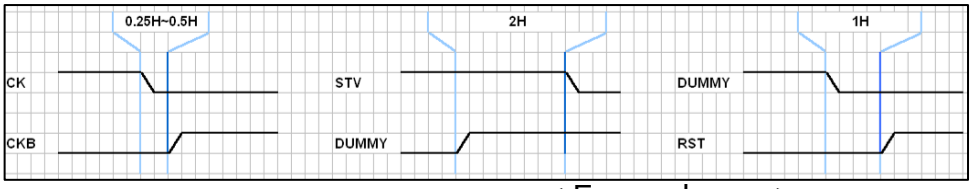


3.3.3 GIP Timing Chart

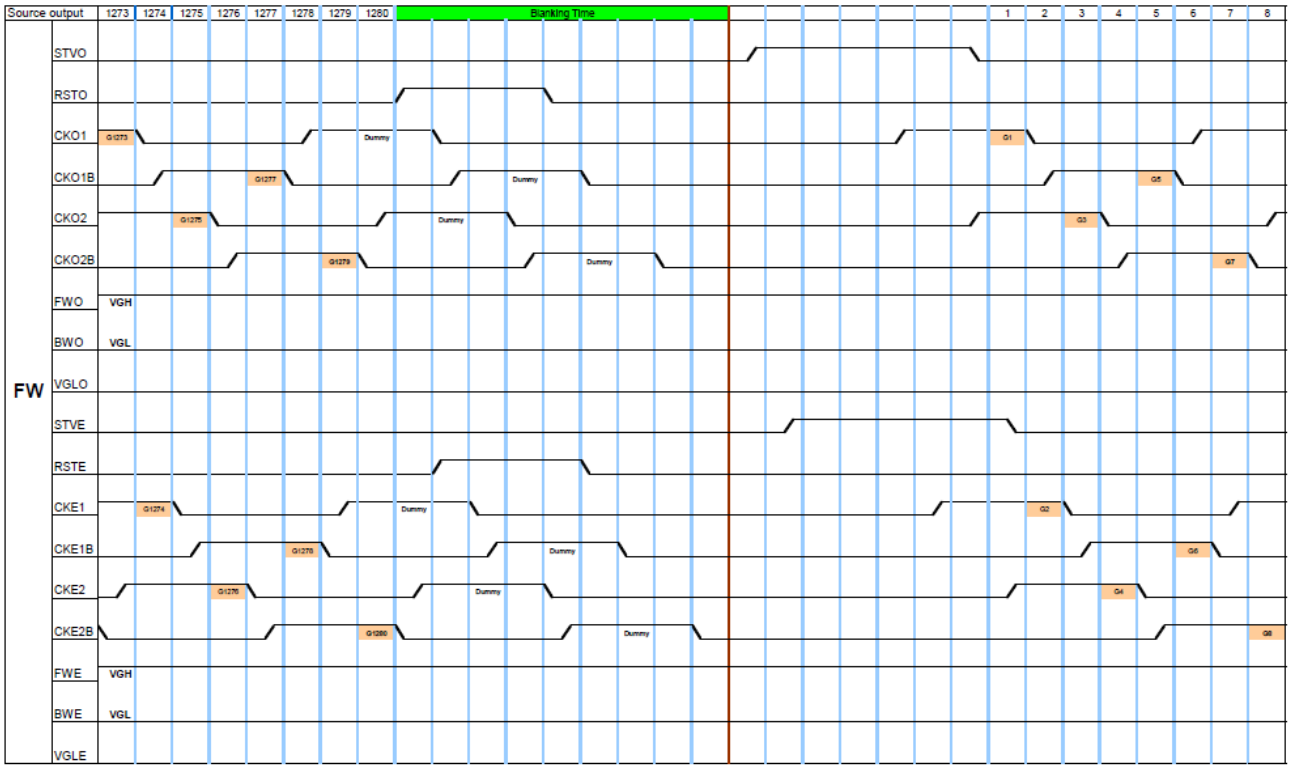
Resolution **720qHD** **Scanning Frequency** **60Hz**

CPT 720qHD Timing 8 phase :

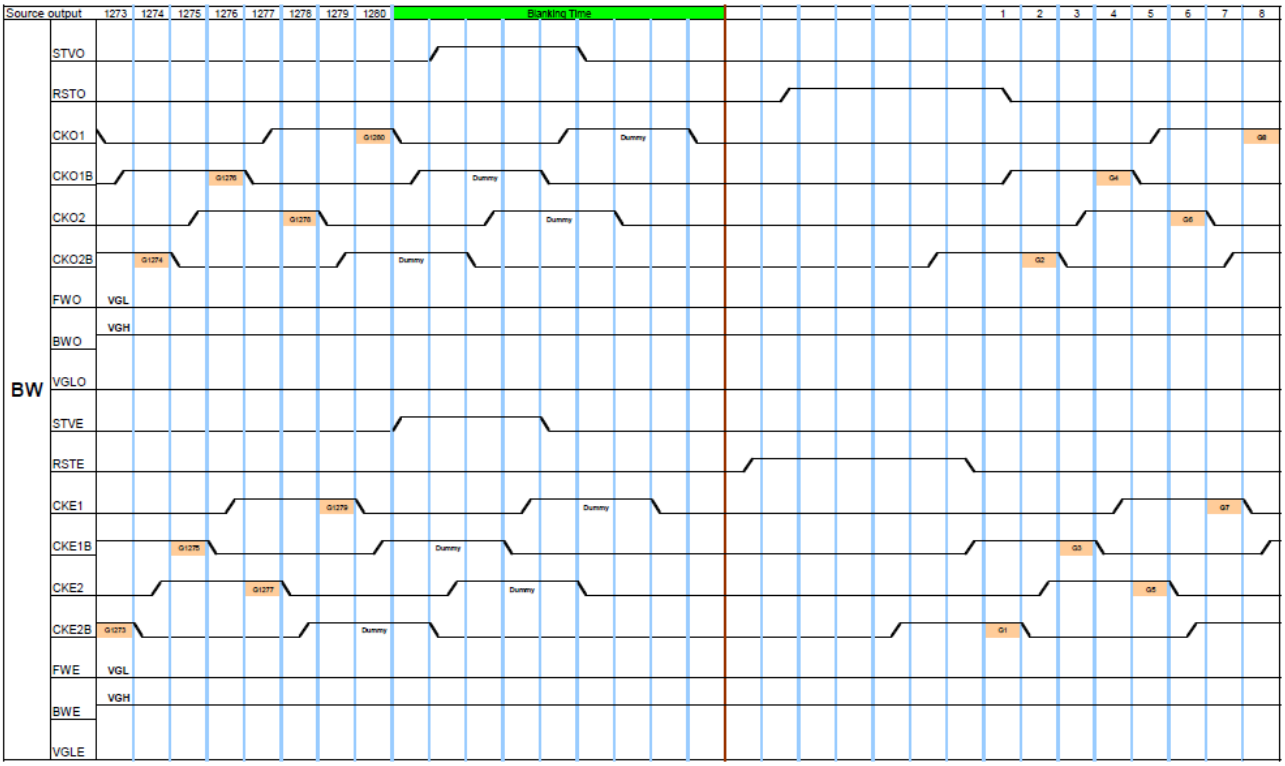
Interval between RST and last line is 1H	**CK keep toggle in blanking**
Duty time = 3.5~3.75H	**1H = 12us**



< Forward scan >



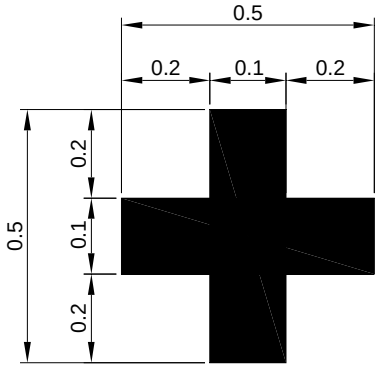
< Backward scan >



3.4 Cross Mark

(unit = mm)

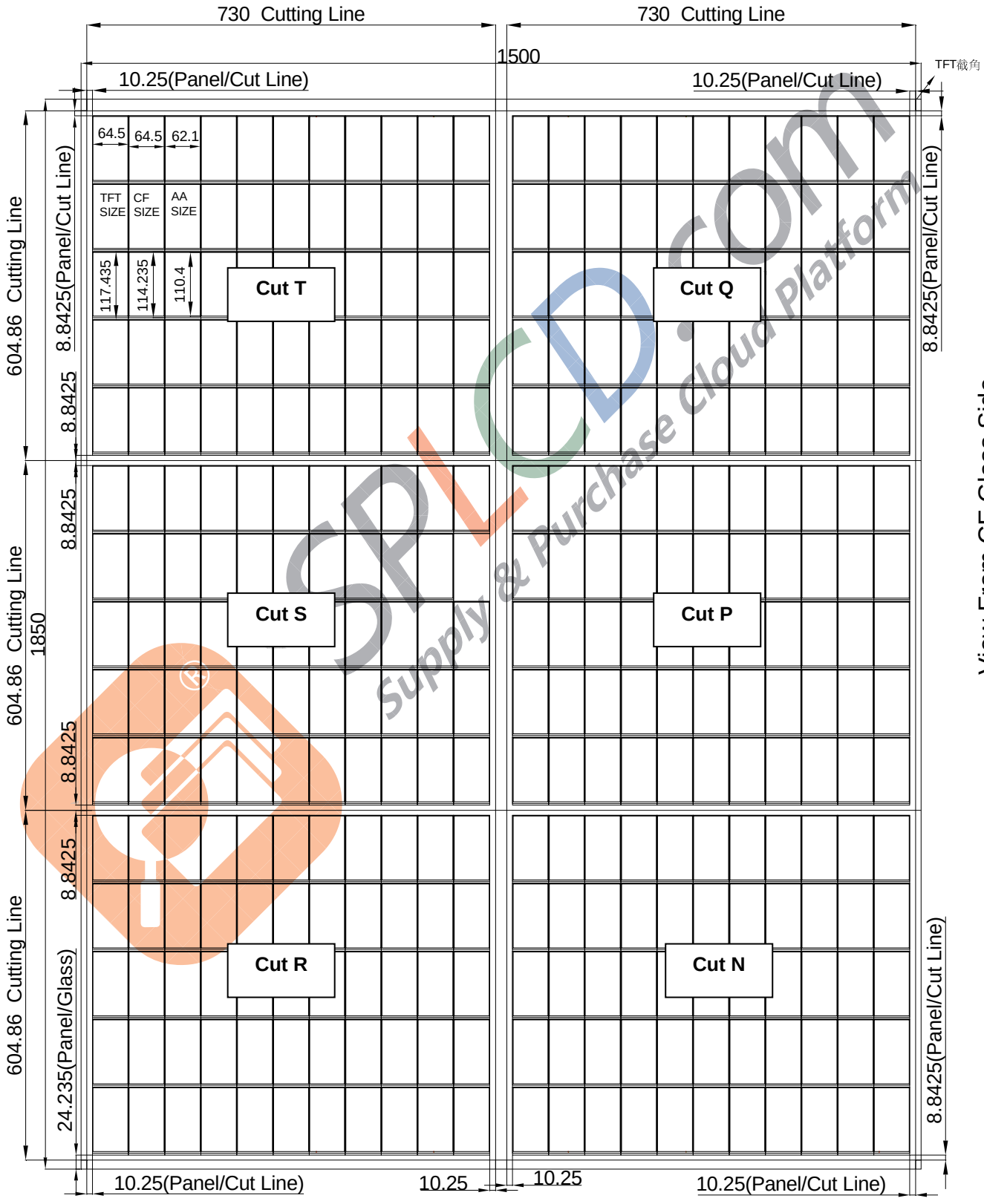
Detail Cross Mark:



4. CELL PROCESS RULES

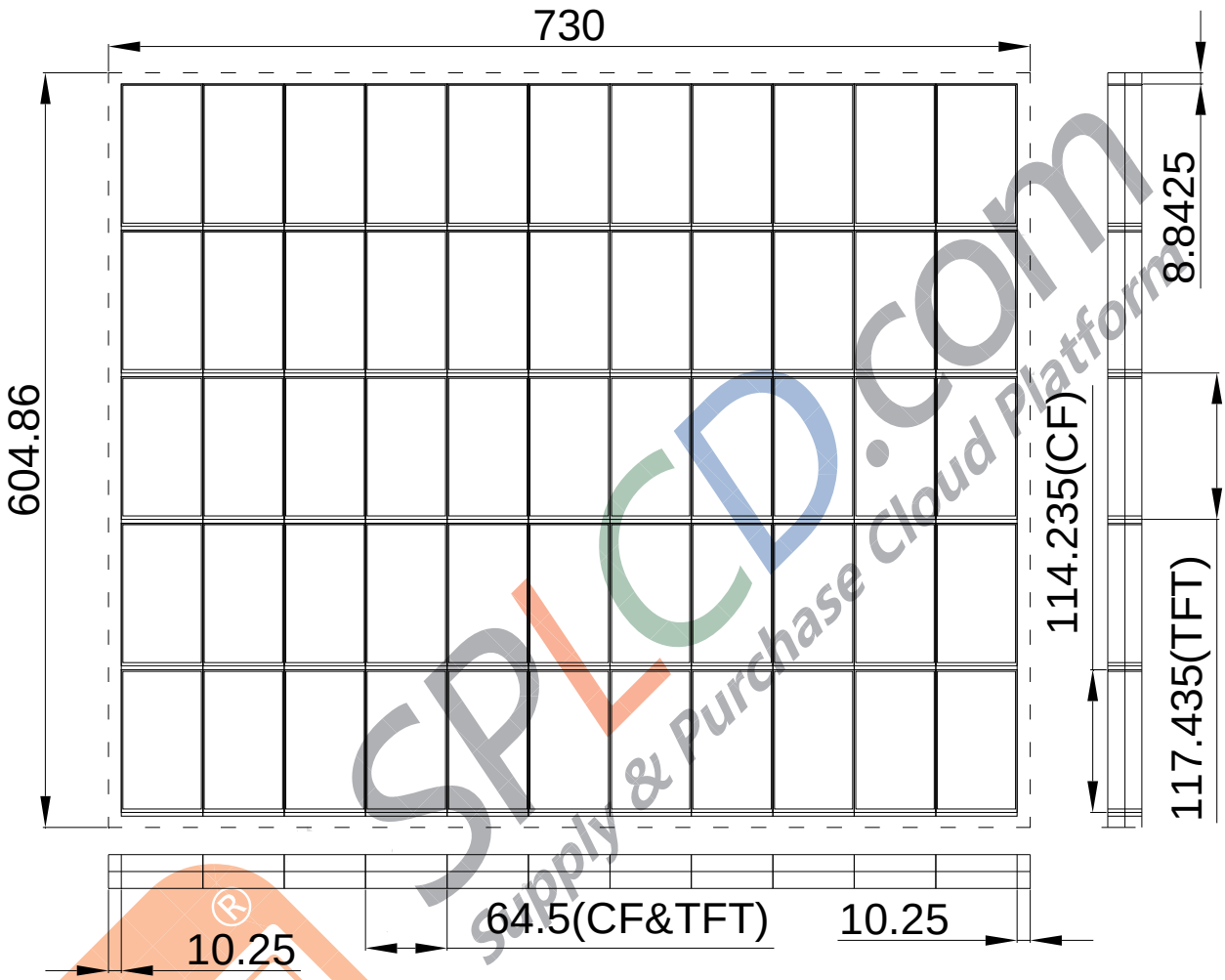
Item	Specification
Cell gap	3.6±0.2um
Assembly precision	±3.5um

4.1.1. Full Size

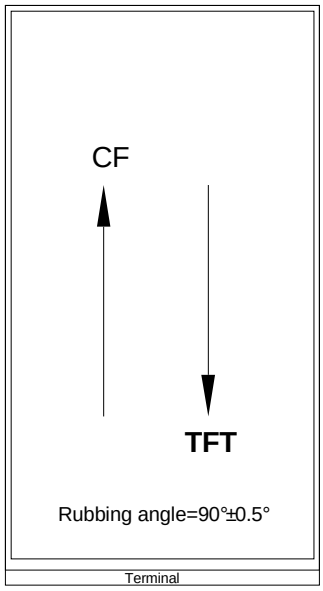


4.1.2 1/6 Cut

Cut T= Cut S= Cut R= Cut Q= Cut P= Cut N



4.2 Rubbing Direction



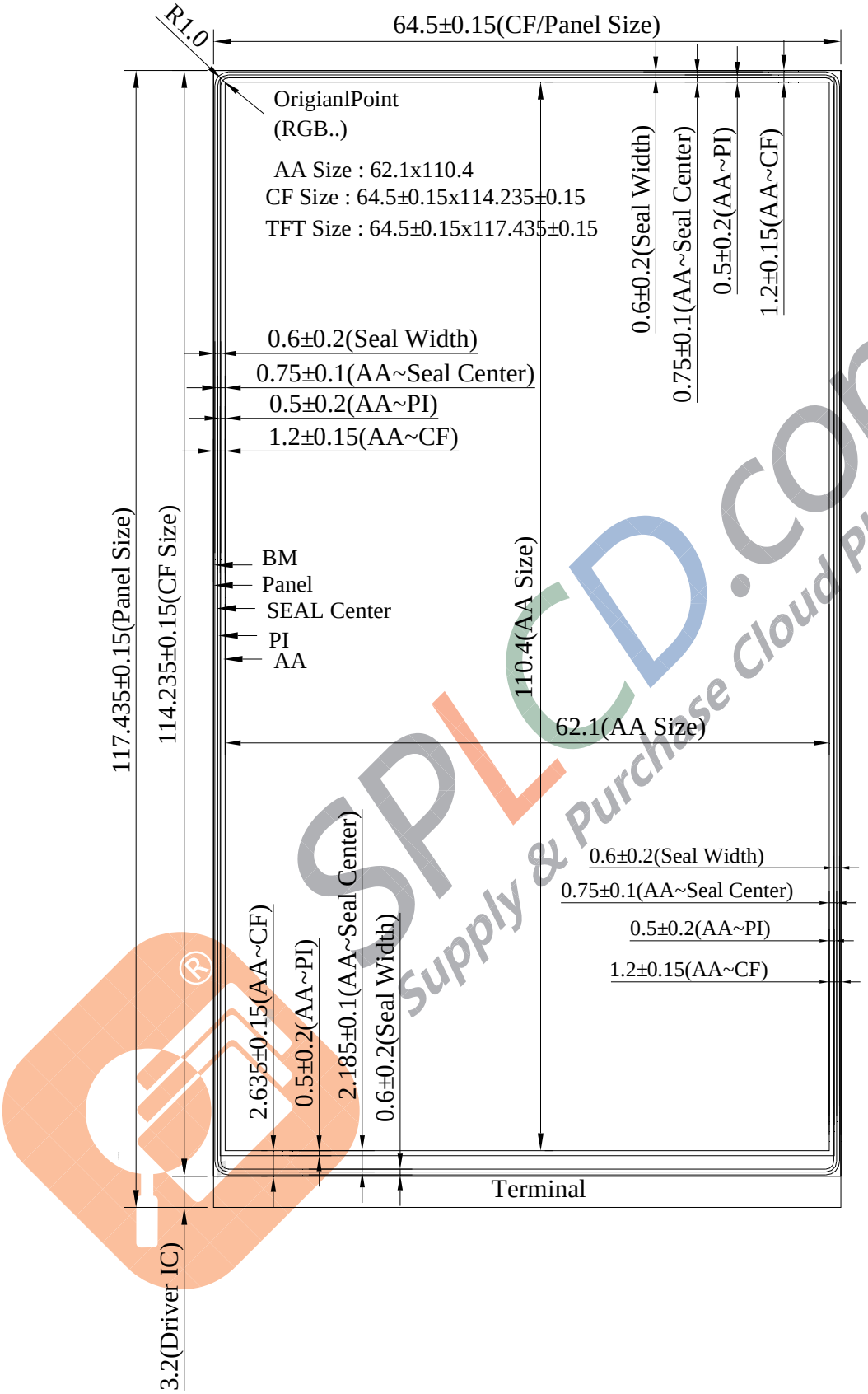
View From CF Glass Side

4.3 PI Pattern

(unit = mm)

4.4 Seal Pattern

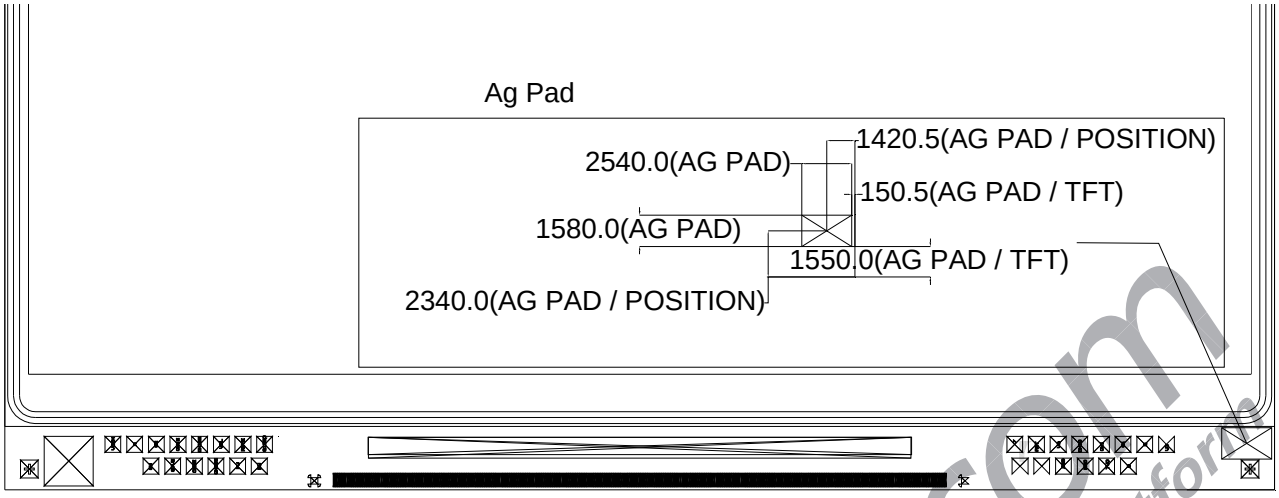
(unit = mm)



Notes:
1.Seal width (Typ.) = 0.6±0.2 mm
2.With ODF process，Seal junction length = 15 mm (max.) and width = (0.6+0.4) mm
3. Seal Center to CF Edge = 0.45±0.2mm

4.5 Ag Pad Size & Position

(unit = um)



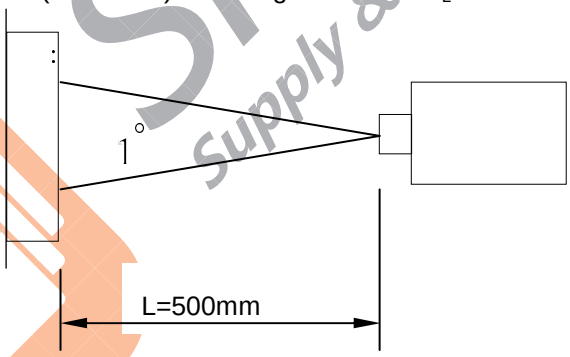
5. OPTICAL SPECIFICATION

(Taransmittance, contrast ratio, response time, viewing angle results are using CPT LC(Vlc=5V) + CPT Polarizer + Corresponding Backlight, reference only)

Ambient condition：25 ± 2℃ ，60 ± 10% RH，under 10 Lunx in the darkroom

ITEM		SYMBOL		CONDITION	MIN.	TYP.	MAX.	UNIT	REMARK
Transmittance (Without Polarizer)	--	T		$\theta = \phi = 0°$	10	11.5		%	Note 5
Transmittance (With Polarizer)	HC/APCF	T_{PL}		$\theta = \phi = 0°$	4.0	4.6	--	%	Note 1
Contrast Ratio		CR			700	900	---		Note 2
Response Time		Tr+Tf		$\theta = \phi = 0°$	---	30	40	ms	Note 3
Viewing angle	Vertical	U	--	CR≧10	75	85	--	degree	Note 4
		D	--		75	85	--	degree	
	Horizontal	L	--		75	85	--	degree	
		R	--		75	85	--	degree	
Color Filter Chromacicity	W	x		$\theta = \phi = 0°$	0.275	0.295	0.315		Note 5
		y			0.303	0.323	0.343		
	R	x			0.640	0.660	0.680		
		y			0.303	0.323	0.343		
	G	x			0.238	0.258	0.278		
		y			0.570	0.590	0.610		
	B	x			0.117	0.137	0.157		
		y			0.069	0.089	0.109		
	NTSC				67%	70%	--	%	
Flicker							<-25	dB	Note6
Crosstalk							3	%	

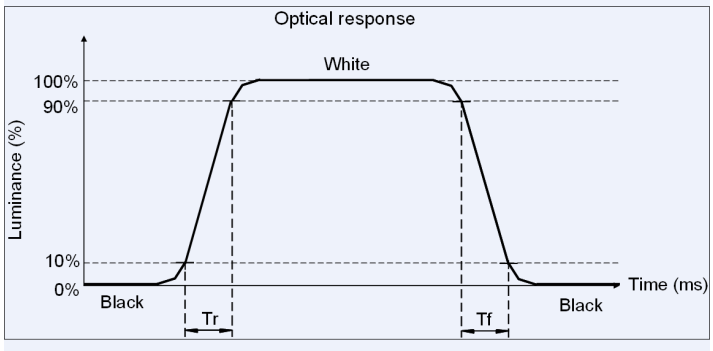
Note 1. Measure device BM-5A (TOPCON)，viewing cone = 1°，I_L= 20mA。



Note 2. Definition of Contrast Ratio：

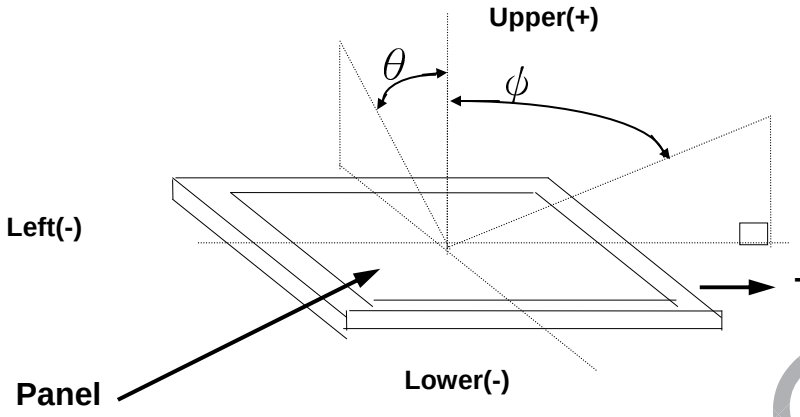
CR = White Luminance (ON) / Black Luminance (OFF)

Note 3. Definition of response time：The response time is defined as the time interval between the 10% and 90% amplitudes.



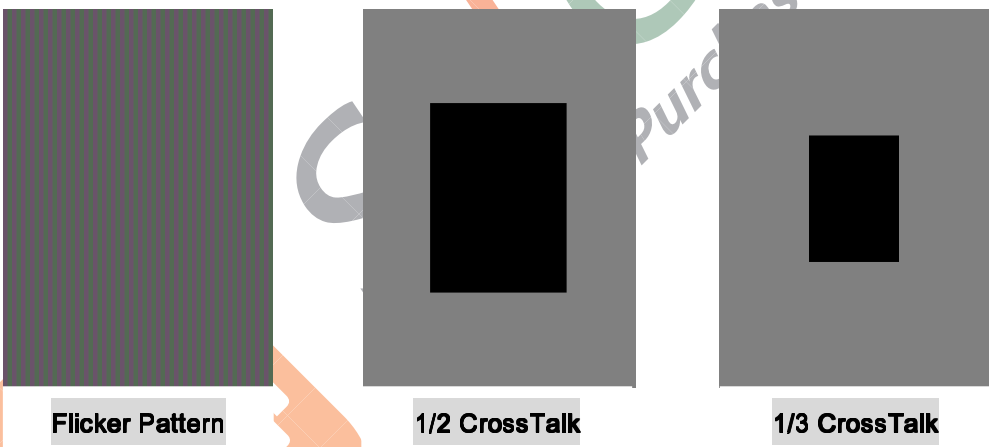
The output signals of photo detector are measured when the input signals are changed from “black” to “white” (rising time) and from “white” to “black” (falling time), respectively.

Note 4. Definition of view angle(θ，ϕ)：



Note 5. Light source: C light.

Note6. Base on OTM1284A under column inversion and apply OTP process with below pattern.[Measure device: BM-5AS (TOPCON)]



6. Reliability test item

N0.	TEST ITEM	CONDITIONS
1	High Temperature and High Humidity Operation	60℃, 90%RH, 240Hrs
2	High temperature operation	70℃, 240Hrs
3	Low temperature operation	-20℃, 240Hrs
4	High temperature storage	80℃, 240Hrs
5	Low temperature storage	-30℃
6	Image Sticking	25 , 5×5 pattern, 1Hr → in 5min at the middle gray scale(Grey128)
7	Thermal Shock(Non-Operating)	- 30 (0.5hr) ; 200 Cycles

NOTE

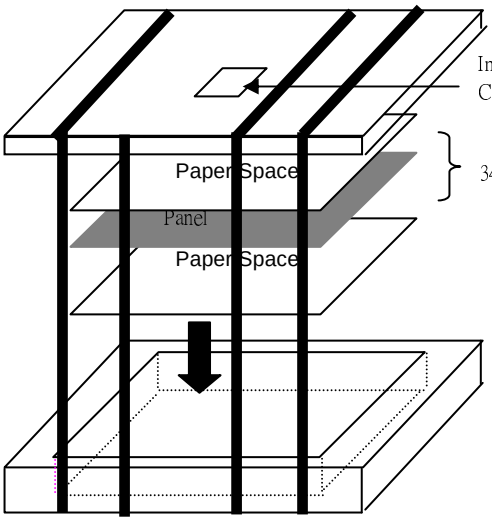
1. All judgement of display are performed after temperature of panel return to room temperature.
2. Display function should be no change under normal operating condition.
3. Under no condensation of dew.
4. CPT only guarantee the above 6 test items, and without guarantee the others.

7. PACKAGE FORM

7.1 Cut Package Form CUT DP Box

Cut A：730*604.86 *0.9 mm

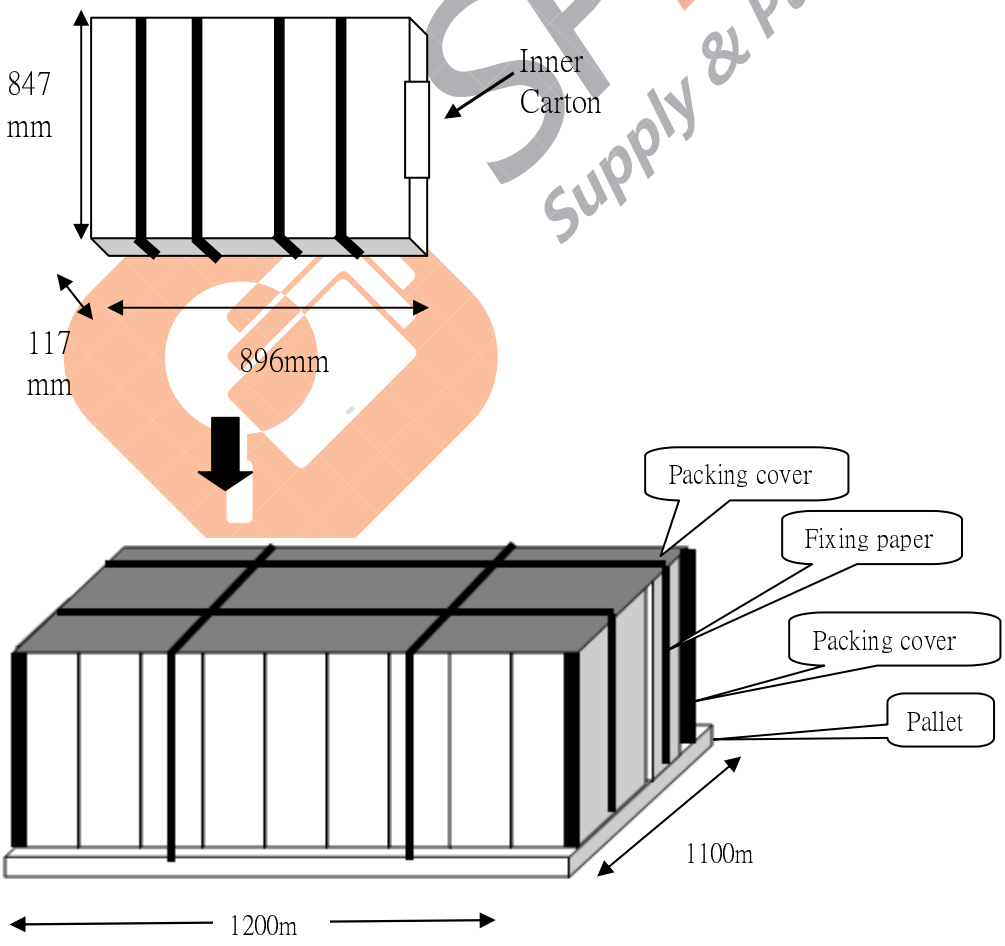
1/6 Cut Package Form G6 750*701 DP Box

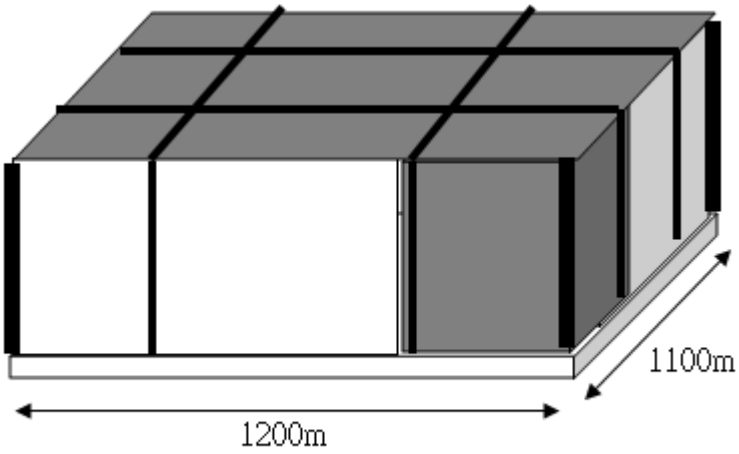


G6 750*701 DP Box

Each DP box has 34cuts.

Paper Spacer：35 pcs





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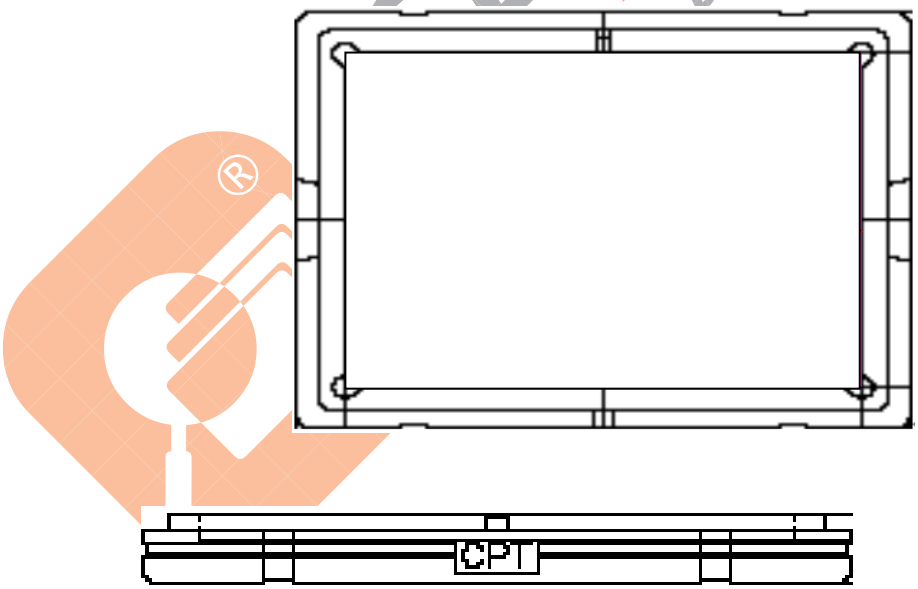
Note1. G6 750*701 DP-Box Dimension(mm) ：896±2 x 847±2 x 117±2(L x W x H)
Note2. Cover and Pallet Dimension(mm)：1,200±5 x 1,100±5 x 130±5
Note3. One pallet contains： G6 750*701 DP-Box➔ 11 cartons.
Note4. A DP-Box contain:
Cut A= Cut B：55 pcs * 34 Cut=1,870 Pcs
Note5.A DP-Box weight (contain panels standard):

7.2 DP BOX

G6 750*701 DP-Box inside diameter(mm) ：756*707*52.5mm
Cut A：730*604.86 *0.9 mm



8.Product Keeping Requirements

Item	Condition	Unit	Remark
Storage Temperature	20±10	˚C	
Storage Humidity	60±20	% (RH)	
Warranty	6	month	Note1

Note1. The period is within 6 months since the date of shipping out under normal using and storage conditions.