Chunghwa Picture Tubes, Ltd.
Product Specification

To :

Date : 2017/11/1

TFT LCD

CLAG053LA11 AXN
CLAG053LA11 AXP

ACCEPTED BY : (V0.0)

Tentative

APPROVED BY	CHECKED BY	PREPARED BY

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REVISION STATUS

Revision Notice	Description	Page	Rev. Date
0.0	First revision (Tentative)	--	2017.10.31

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1. OVERVIEW

CPT CLAG053LA11 AXN/AXP is a cell product after LC ODF. This is 18:9 aspect ratio panels for the mobile phone application.

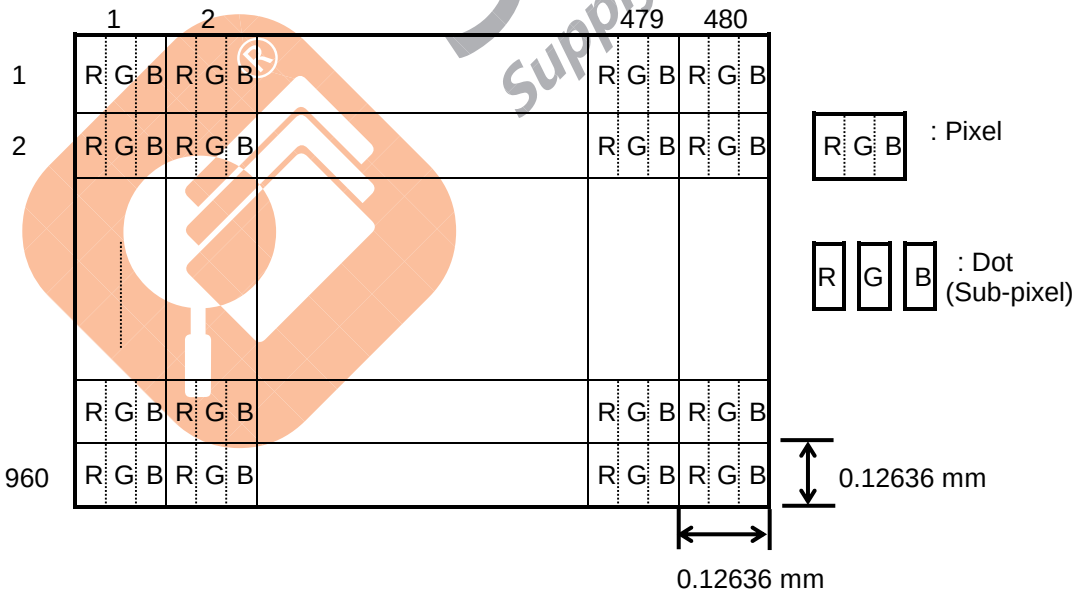
The 5.34” screen produces a high resolution image that is composed of 460,800 (480×960) pixel elements in a stripe arrangement.

General specifications are summarized in the following table:

ITEM	SPECIFICATION
Panel Size	5.34 Inch
Display Area (mm)	60.6528 (W) x 121.3056 (H)
CF glass dimension (mm)	63.1568 (W) x 124.9056 (H) x 0.4 (Thickness)
TFT glass dimension (mm)	63.1568 (W) x 127.6426 (H) x 0.4 (Thickness)
Number of Pixels	480 (W) x 3 x 960 (H)
Pixel Pitch (mm)	0.12636 (W) x 0.12636 (H)
Color Pixel Arrangement	RGB Stripe
NTSC	60 % (Typ.)
Display Mode	Normally White TN
Driving Method	TFT active matrix
Viewing Direction	12 O’Clock
Suggesting IC	ILI9806E
Compatible IC	HX8379C、JD9161、NV3049、OTM8019、FL10802

Note: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.

LCD Cell Drawing



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.	Typ.	Unit	Remark
Electrical Phase						
Power Supply Voltage for Analog	*VDD*	-0.3	4.4	---	V	
Power Supply Voltage for I/O	*VDDI*	-0.3	4.4	---	V	
TFT Gate High Voltage	*VGH*	10.5	18	15	V	ILI9806E-2C
TFT Gate Low Voltage	*VGL*	-15.5	-7	-10	V	
Common Voltage	*VCOM*	-4	-0.2	-0.68	V	
Feed-Through Voltage	*△Vp (black)*	---	---	0.68	V	
Enviromental Phase						
Operating Ambient Temperature	T_{OP}	-20	+60	°C		
Operating Ambient Humidity	H_{OP}	10	90	%（RH）		
Storage Temperature	T_{STG}	-30	+80	°C		
Storage Humidity	H_{STG}	10	90	%（RH）		

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 designing 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.

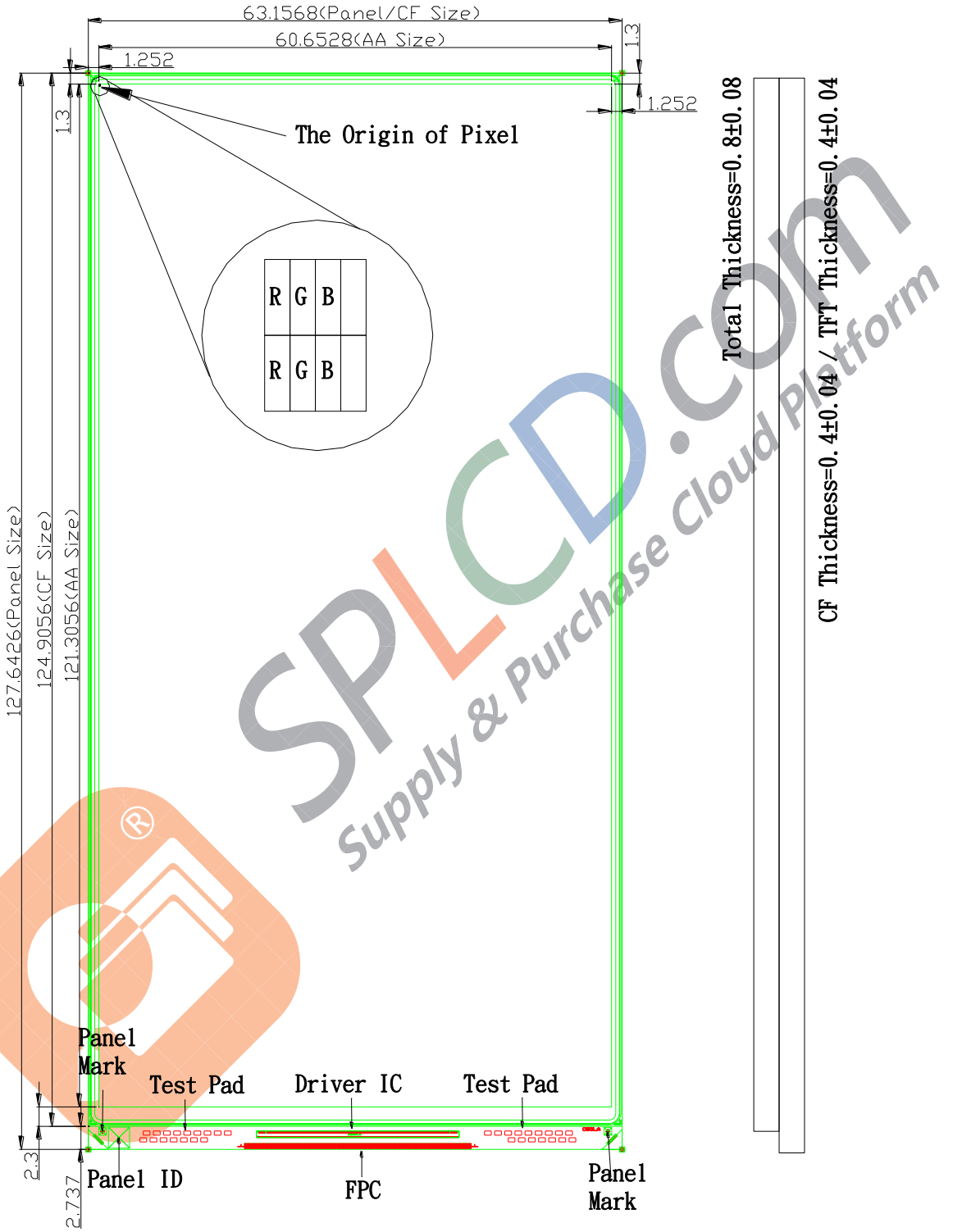
Note 3. Vcom must be adjusted to optimize display quality：Image Sticking, Cross-talk, Contrast Ratio and etc.

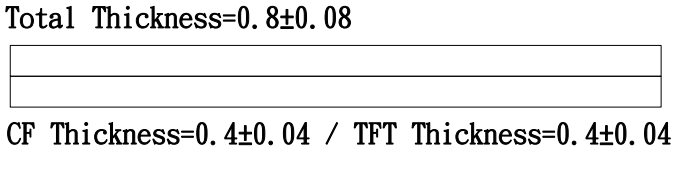
CPT just kindly recommend the setting-voltage as the reference value. In order to get the optimized display quality, the setting-voltage should be changed as based on customer's developing condition through LCD Driver IC's OTP process. The display quality could be changed by customer's setting-voltage.)

3. MECHANICAL SPECIFICATIONS

3.1 Outline Dimension

(unit: mm)





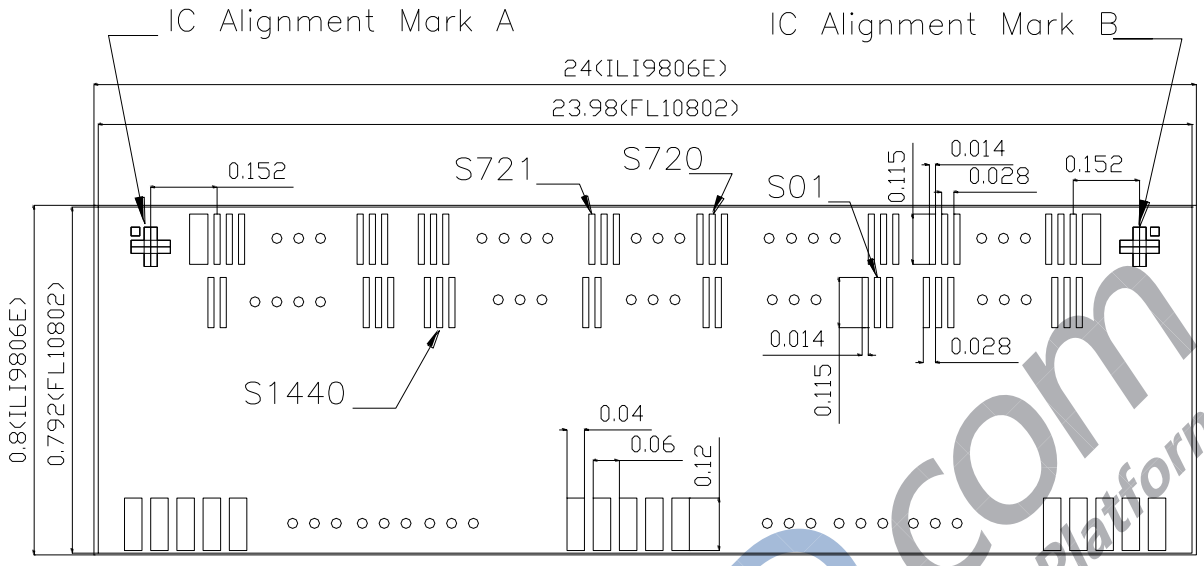
3.2 IC & FPC Pad

(unit = mm)

Note1. Color Filter is upper side , TFT is bottom side
Note2. This IC size is of ILI9806E.
Note3. The glass of IC and FPC bonding area are without temperature compensation.

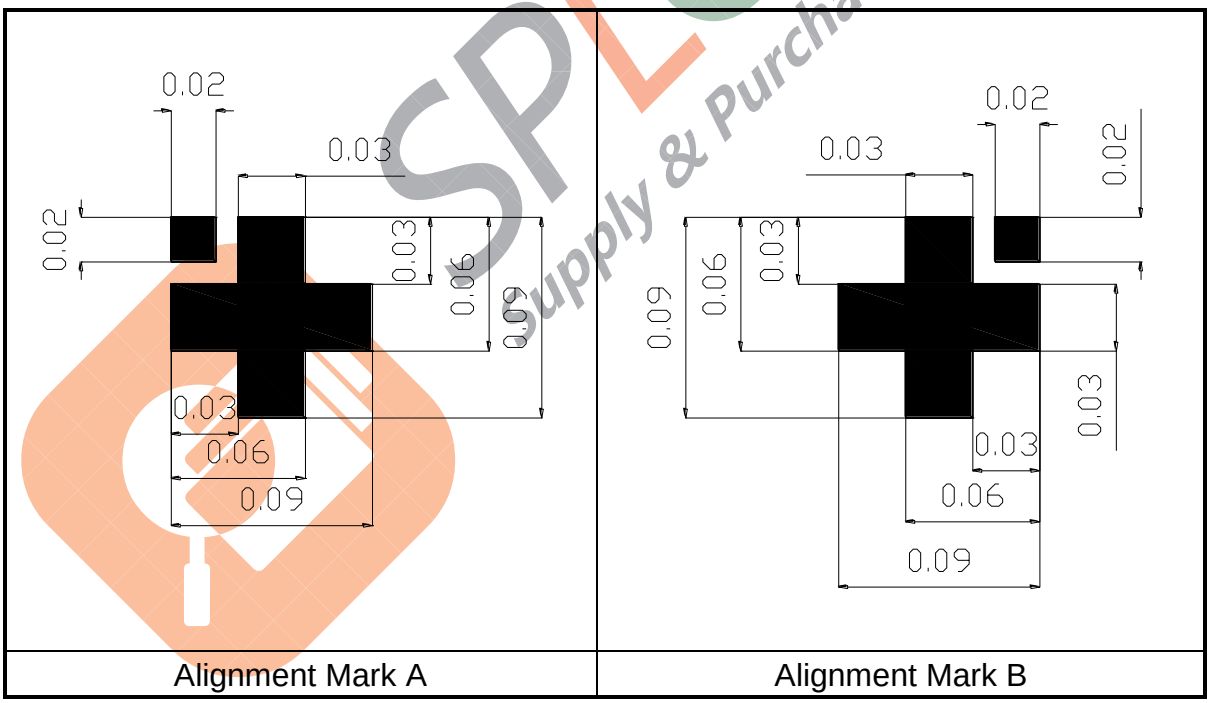
3.2.1 IC Pad

(unit = mm)



IC Dimension Detail for ILI9806E/FL10802

IC	Chip Size
ILI9806E	**24.0 x 0.8 mm**

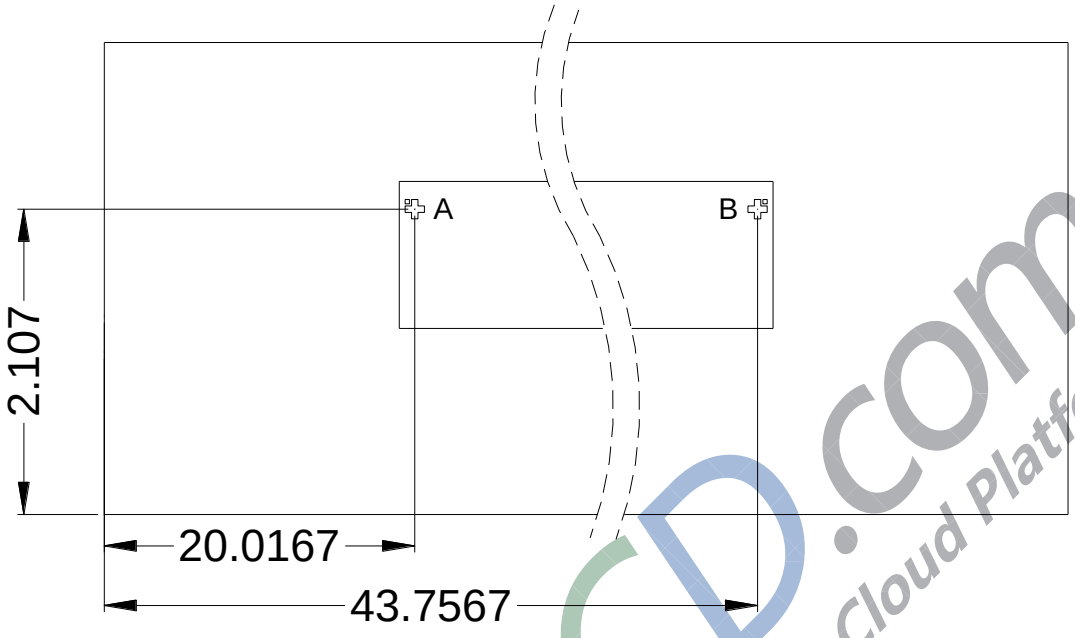


Alignment Mark A	Alignment Mark B

Alignment Mark Detail

3.2.2 Driver IC Block Position on the Glass

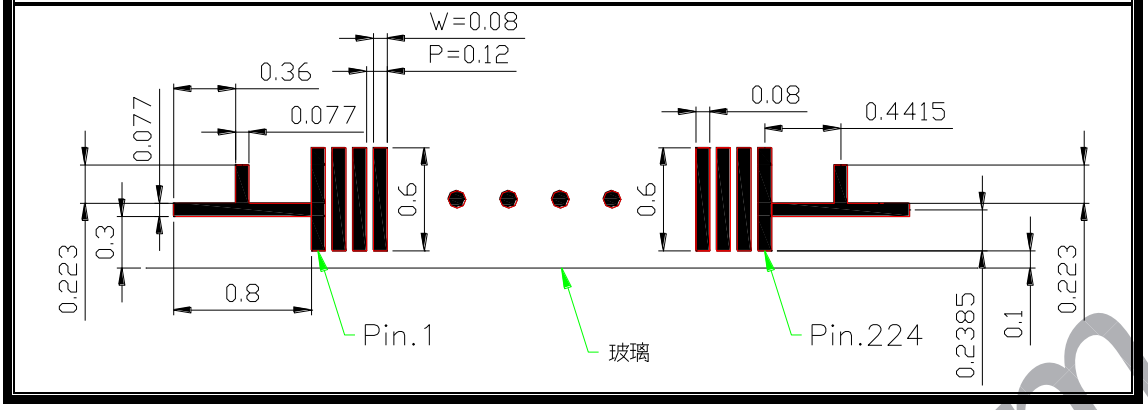
(unit = mm)



3.2.3 FPC Pad

(unit = mm)

Detail FPC Pad (unit = mm)



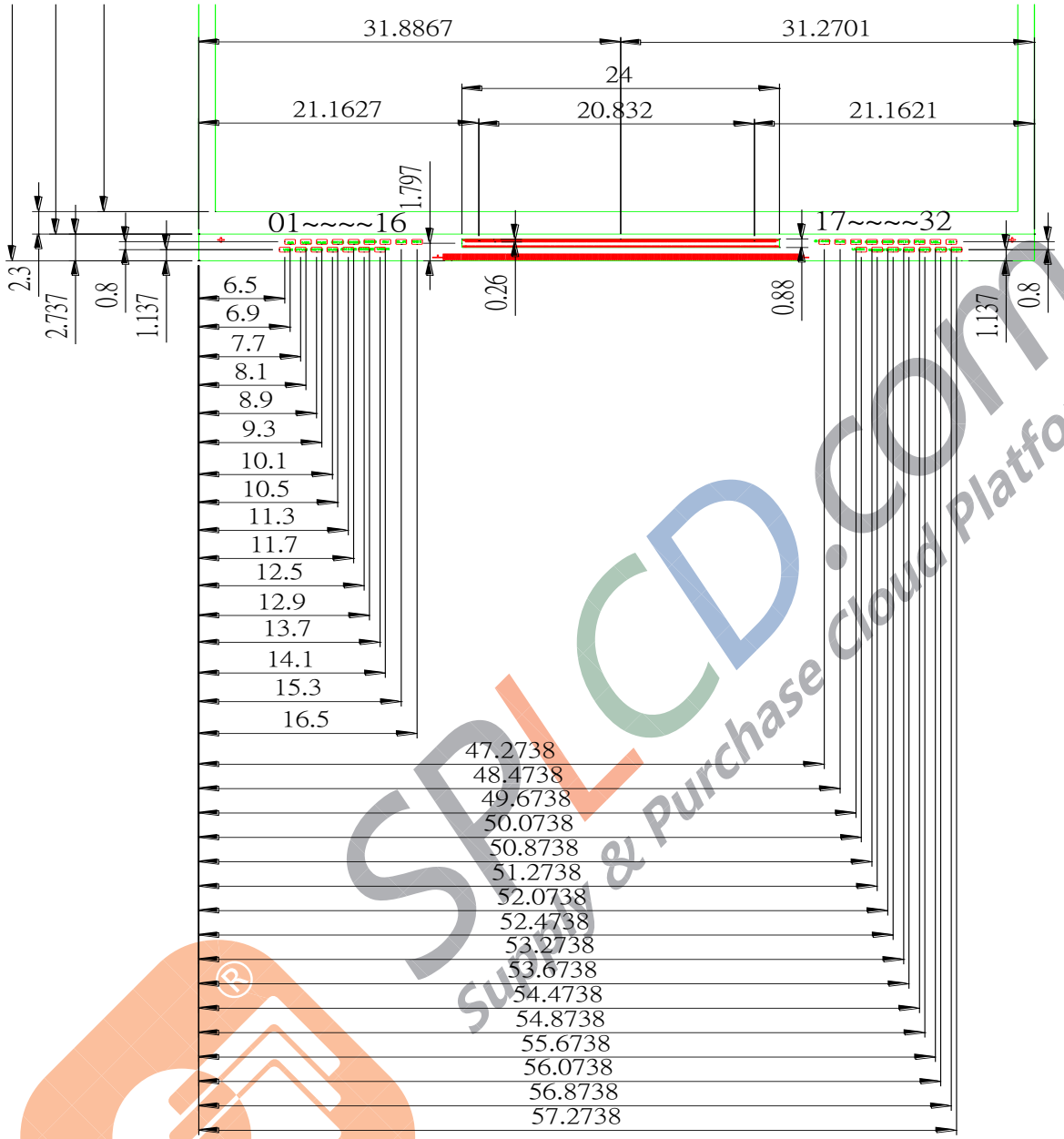
3.2.4 FPC Pin Assignment (ILI9806E-2C)

PIN NO.	NAME	PIN NO.	NAME	PIN NO.	NAME	PIN NO.	NAME
1	DUMMY	57	C21N	113	HS_D1N	169	TE_L
2	DUMMY	58	C21P	114	HS_D1N	170	EXB1T
3	VCOM	59	C21P	115	HS_D1P	171	GPO0
4	VGL	60	DDVDL	116	HS_D1P	172	GPO1
5	DMY_VSS	61	DDVDL	117	DGND	173	GPO2
6	VCOM	62	CGND	118	VDD	174	GPO3
7	VCOM	63	CGND	119	GND	175	IM0
8	CONTACT2B	64	DDVDH	120	VDDA	176	IM1
9	CONTACT2A	65	DDVDH	121	AVEE	177	IM2
10	VGL	66	C14N	122	AVEE	178	IM3
11	VGL	67	C14N	123	AVSS	179	I2C_SA0
12	VGLO	68	C14P	124	AVDD	180	RGBBP
13	VGLO	69	C14P	125	AVDD	181	VGSW0
14	VGL_REG	70	C13N	126	GND	182	VGSW1
15	VGL_REG	71	C13N	127	VDDI	183	VGSW2
16	C51N	72	C13P	128	ERR	184	VGSW3
17	C51N	73	C13P	129	LEDON	185	NBWSEL
18	C51P	74	C12N	130	LEDPWM	186	DSTB_SEL
19	C51P	75	C12N	131	VS	187	GND
20	VGH_REG	76	C12P	132	HS	188	PSWAP
21	VGHO	77	C12P	133	PCLK	189	DSWAP
22	VGH	78	C11N	134	DE	190	LANSEL
23	C41N	79	C11N	135	DB[0]	191	VDDI
24	C41N	80	C11P	136	DB[1]	192	AVSS
25	C41P	81	C11P	137	DB[2]	193	VCL
26	C41P	82	CGND	138	DB[3]	194	VCIP
27	AGND	83	CGND	139	DB[4]	195	VCIP
28	VCORE	84	VCIP	140	DB[5]	196	VDD
29	C32N	85	VCIP	141	DB[6]	197	DVSS
30	C32N	86	DMY	142	DB[7]	198	VGMP_PAD

31	C32P	87	EXTN	143	DB[8]	199	VGMN_PAD
32	C32P	88	DMY	144	DB[9]	200	VGSP_PAD
33	C31N	89	EXTP	145	DB[10]	201	VGSN_PAD
34	C31N	90	VGH_REG	146	DB[11]	202	DIOPWR
35	C31P	91	DMY	147	DB[12]	203	VCI
36	C31P	92	DMY	148	DB[13]	204	VSSR
37	CGND	93	VSSR[2]	149	DB[14]	205	VCI
38	CGND	94	TE_R	150	DB[15]	206	VDDA
39	VSSR[3]	95	VCI	151	DB[16]	207	VSSA
40	VCL	96	VCI	152	DB[17]	208	VREF_PWR
41	VCL	97	VCI	153	DB[18]	209	VCL
42	VCIP	98	VCORE_MIPI	154	DB[19]	210	VCL
43	VCIP	99	VCORE_MIPI	155	DB[20]	211	VRGH
44	C24N	100	V12_MIPI	156	DB[21]	212	VGL_REG
45	C24N	101	V12_MIPI	157	DB[22]	213	VGLO
46	C24P	102	DGND	158	DB[23]	214	VGL
47	C24P	103	HS_D0N	159	VDDI	215	VPP
48	C23N	104	HS_D0N	160	GND	216	VPP
49	C23N	105	HS_D0P	161	RESX	217	CONTACT1B
50	C23P	106	HS_D0P	162	CSX	218	CONTACT1A
51	C23P	107	DGND	163	RDX	219	VCOM_L
52	C22N	108	HS_CN	164	WRX	220	VCOM_L
53	C22N	109	HS_CN	165	DCX	221	VSSIDUM0
54	C22P	110	HS_CP	166	SDI	222	VCOM
55	C22P	111	HS_CP	167	SDO	223	DUMMY
56	C21N	112	DGND	168	VSEL	224	DUMMY

3.3 Panel Check Pad in Panel

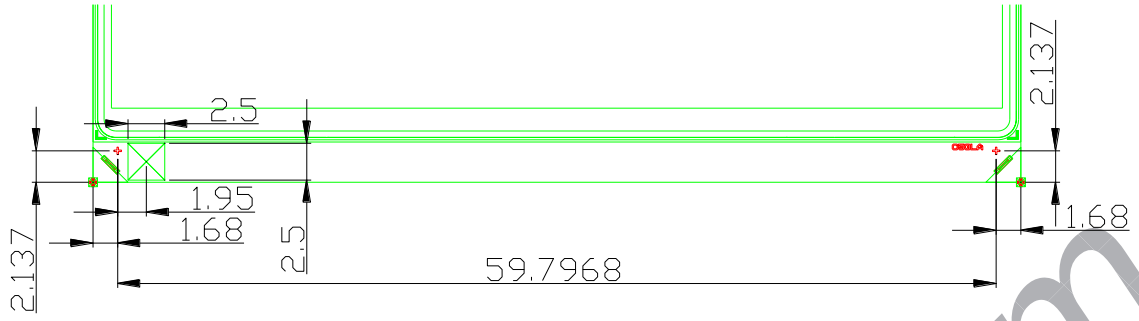
(unit = mm)

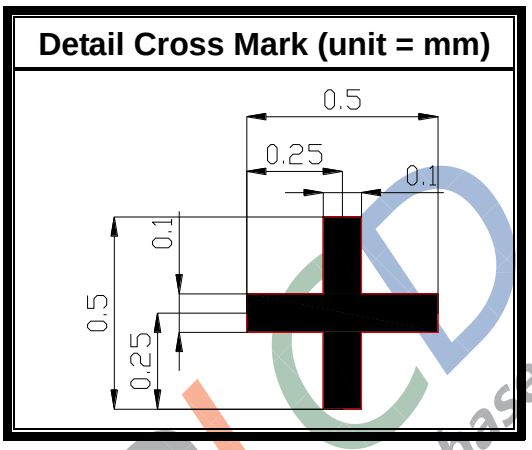


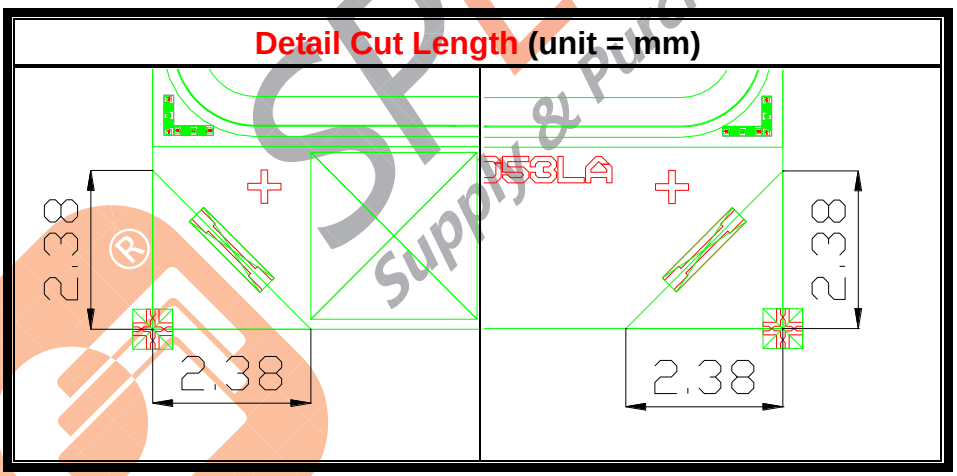
Panel Check Pad								
Test Pad Size	0.8 x 0.5 mm							
Test Pad Pitch	1.2 mm							
Test Pad Name	1	VCOM	9	CK1BE	17	S1140	25	CK1O
	2	G02	10	CK2E	18	D_G	26	BWO
	3	STVE	11	CK2BE	19	D_B	27	FWO
	4	VGL	12	G960	20	VCOM	28	RSTO
	5	RSTE	13	VCOM	21	G959	29	VGL
	6	FWE	14	SW	22	CK2BO	30	STVO
	7	BWE	15	D_R	23	CK2O	31	G01
	8	CK1E	16	S01	24	CK1BO	32	VCOM

3.4 Panel ID Pad

(unit = mm)





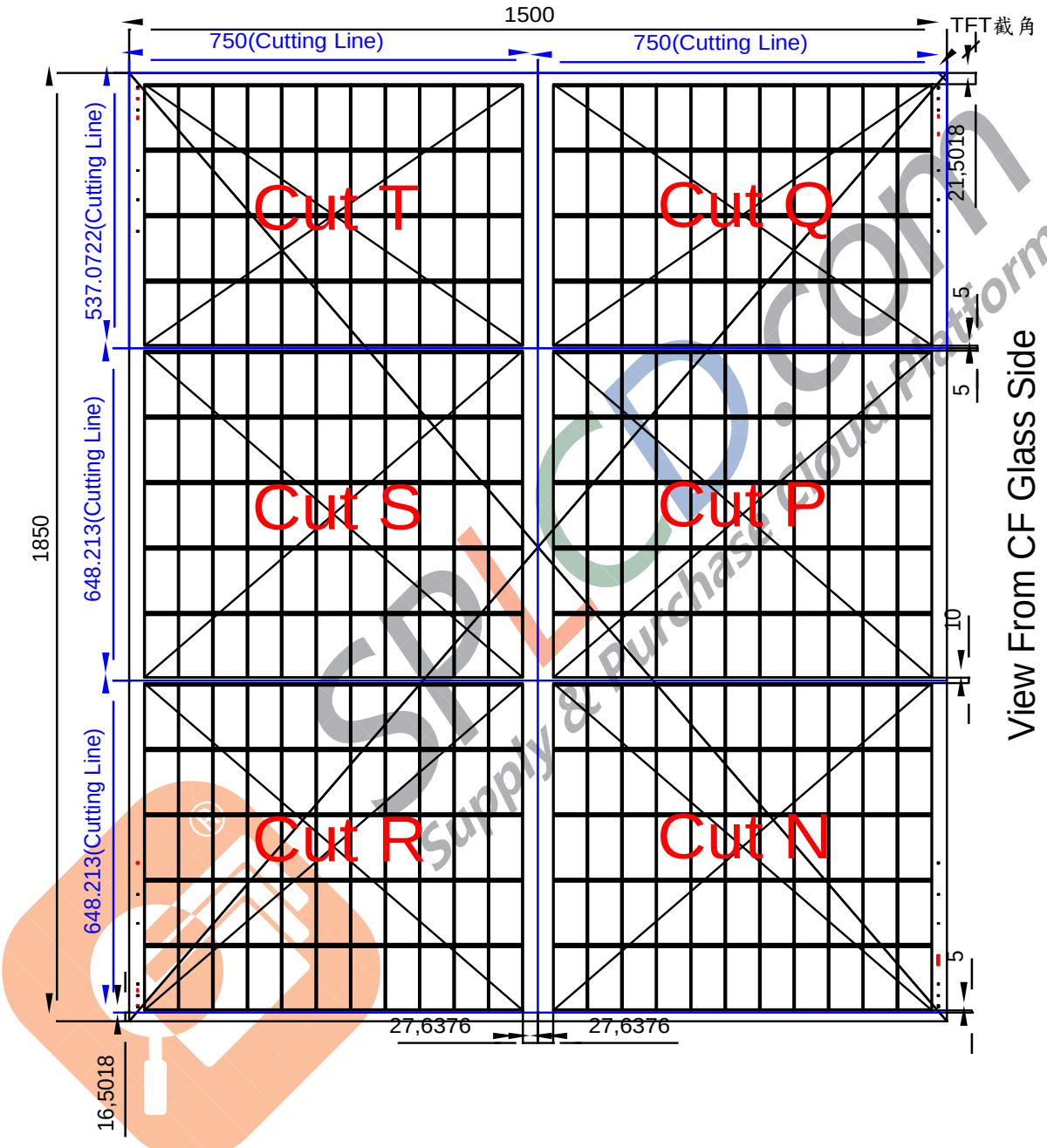


4. CELL PROCESS RULES

4.1 Cell Scribing Layout

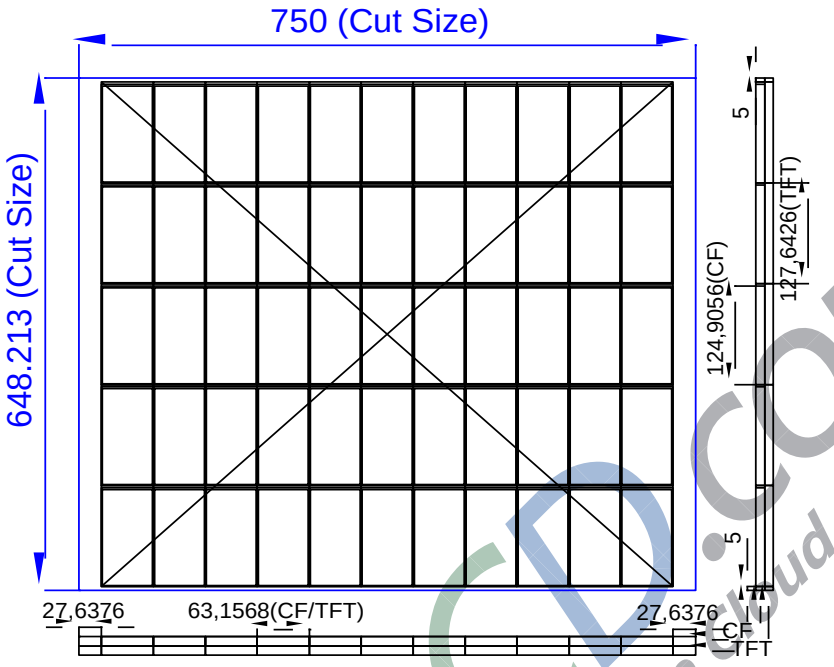
4.1.1 Full Cell (Provides up to 308 pieces)

(unit = mm)

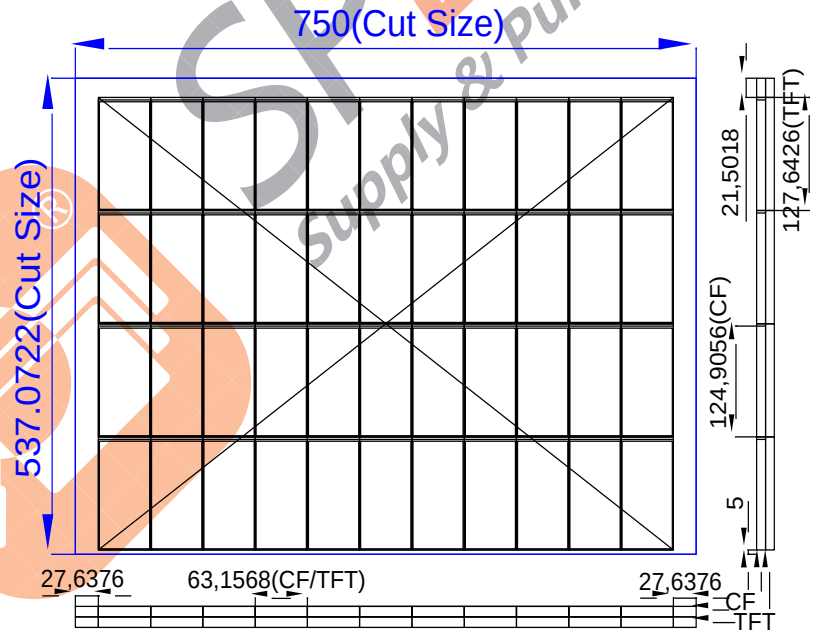


4.1.2 1/6 CuT Cell

Cut S= Cut P= Cut R= Cut N

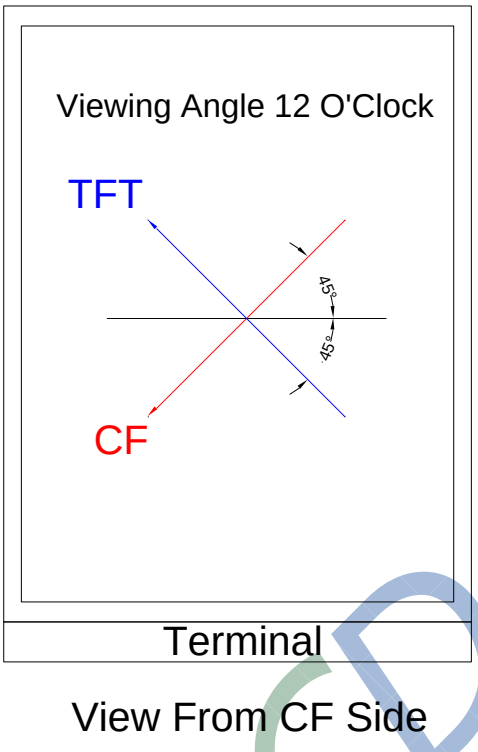


Cut T= Cut Q



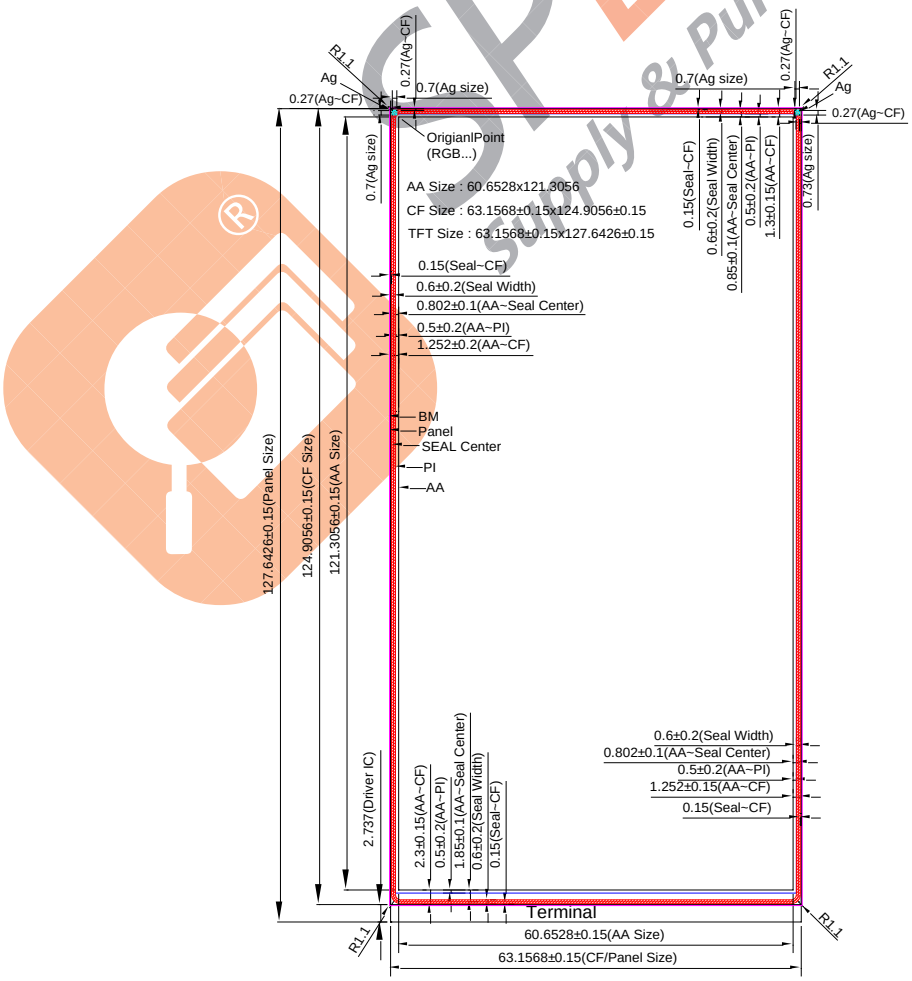
單位：mm

4.2 Rubbing Direction



4.3 Seal and PI Pattern

(unit = mm)

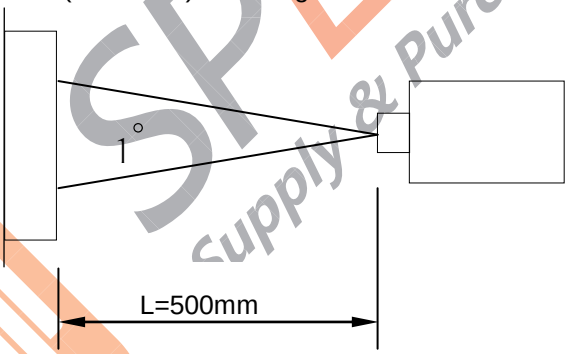


5. OPTICAL SPECIFICATION

(Transmittance, contrast ratio, response time, viewing angle results are using CPT's LC (V_{lc}≧4.5V) + CPT's EWV Polarizer + Corresponding Backlight, reference only)
Ambient condition：25 ± 2°C，60 ± 10% RH，under 10 Lunx in the darkroom.

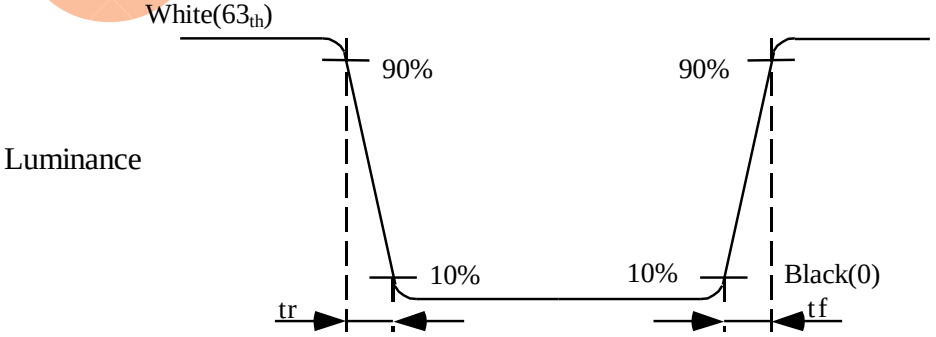
ITEM		SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	REMARK
Transmittance (With AG 42% Polarizer)		T_{PL}	Θ=Φ=0°	3.3	4.0	--	%	Note 1
Contrast Ratio		CR	Θ=Φ=0°	500	700	--	--	Note 2
Response Time		Tr+ Tf	Θ=Φ=0°	-- --	20	25	ms	Note 3
Viewing Angle (CR≧10)	U	θ	Φ=90°	60	70	--	°	Note 4
	D		Φ=270°	50	60	--	°	
	L		Φ=180°	60	70	--	°	
	R		Φ=0°	60	70	--	°	
Color Filter Chromacicity	White	x	Θ=Φ=0°	0.287	0.307	0.327	--	Note 5
		y		0.316	0.336	0.356	--	
	Red	x		0.630	0.650	0.670	--	
		y		0.310	0.330	0.350	--	
	Green	x		0.296	0.316	0.336	--	
		y		0.554	0.574	0.594	--	
	Blue	x		0.124	0.144	0.164	--	
		y		0.111	0.131	0.151	--	
	NTSC	CIE 1931	--	55	60	--	%	
Flicker						-25	dB	Note 6
Crosstalk						3	%	

Note 1. Measure device：SRUL1R (TOPCON)，viewing cone = 1°，IL= 20mA。

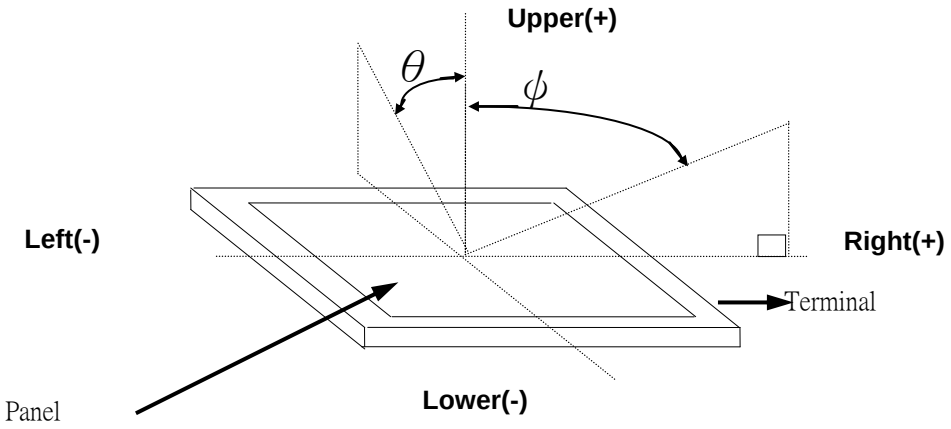


Note 2. Definition of Contrast Ratio：
CR = White Luminance (ON) / Black Luminance (OFF)

Note 3. The output signals of photo detector are measured when the input signals are changed from "white" to "black" (rising time) and from "black" to "white" (falling time), respectively. Definition of response time：The response time is defined as the time interval between the 10% and 90% amplitudes.

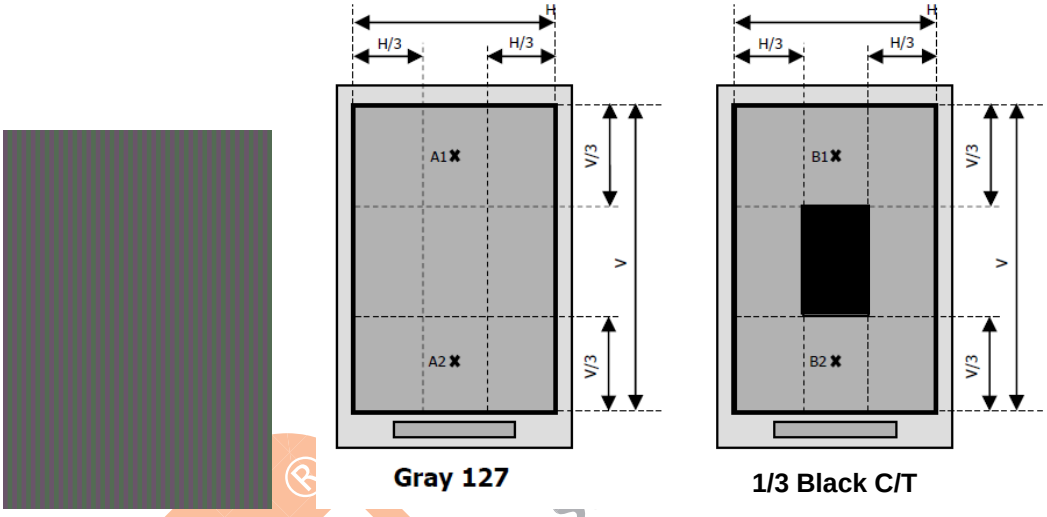


Note 4. Definition of view angle(θ，ϕ):



Note 5. Light source: C light.

Note 6. Based on ILI9806E-2CV 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 Storage	80°C, 240 hrs
2	Low Temperature Storage	-30°C, 240 hrs
3	HighTemperature Operation	70°C, 240 hrs
4	Low Temperature Operation	-20°C, 240 hrs
5	High Temperature and High Humidity Operation	60°C, 90% RH, 240 hrs
6	Thermal Shock	-30℃ <-> 80℃(0.5hr.),100 cycles
7	Image Sticking	25℃, 8x8 pattern, 4hrs → in 5min at 128 gray scale

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 7 test items, and without guarantee the others.

7. PACKAGE FORM

TBD

7.1. 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 (as above) and suggest to input MDL process within 3 months.