Doc. Number:

■ Tentative Specification
☐ Preliminary Specification
☐ Approval Specification

MODEL NO.: F035A16-601

Customer:

APPROVED BY **SIGNATURE**

Name / Title _____ _____

Note :

Please return 1 copy for your confirmation with your signature and comments.

Approved By	Checked By	Prepared By
Yulin Chang	**TK Lin**	**Jerry Huang**

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REVISION HISTORY

Version	Date	Page (New)	Section	Description
Ver 0.0	2016/7/6	All	All	Product spec was first issued for LCD cut.

1.PURPOSE

The specification F035A16-601 is a 3.47” a-Si TFT Liquid Crystal Display ODF cell. The ODF cell has been designed by INX, and manufactured by INX under the agreement of customer. The a-Si TFT-LCD cell will be applied to a high transmittance operating in the normally black mode a-Si TFT-LCD product.

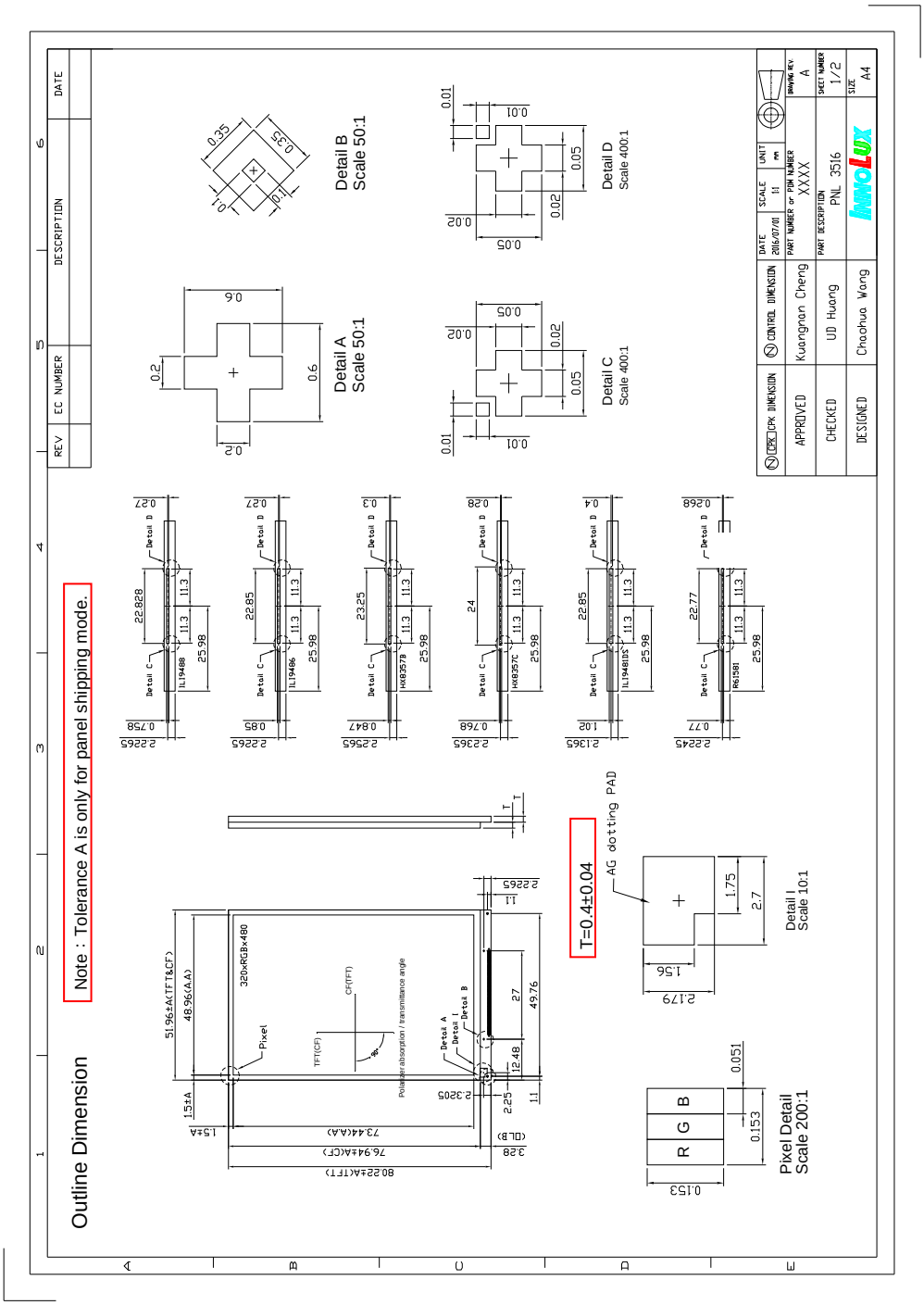
2.GENERAL RULES OF SINGLE PANEL

2.1 GENERAL SPECIFICATION

No.	Item		Specification	unit
1	Glass thickness	TFT	0.4	mm
		CF	0.4	
2	Shipping mode		ODF Cut	-
3	Shipping size		540 (H) x 426 (V) x 0.8(D)	mm
4	Panel outline dimension		51.96 (H) x 80.22 (V) x 0.8 (D)	mm
5	Active screen size		3.47 ” diagonal	
6	Resolution		320RGB x 480	pixel
7	Pixel driving element		a-Si TFT	-
8	Sub pixel size		51 x 153	um
9	Pixel arrangement		RGB stripe	-
10	View direction (Gray inversion)		NA (AAS)	-
11	Cell gap		3.2±0.3	um
12	Driver IC		R61581/ ILI9481 / ILI9486 / ILI9488 / HX8357B / HX8357C	-
13	Weight without POL		453 ± 10%	g
14	Scanning Method		Single Direction	-

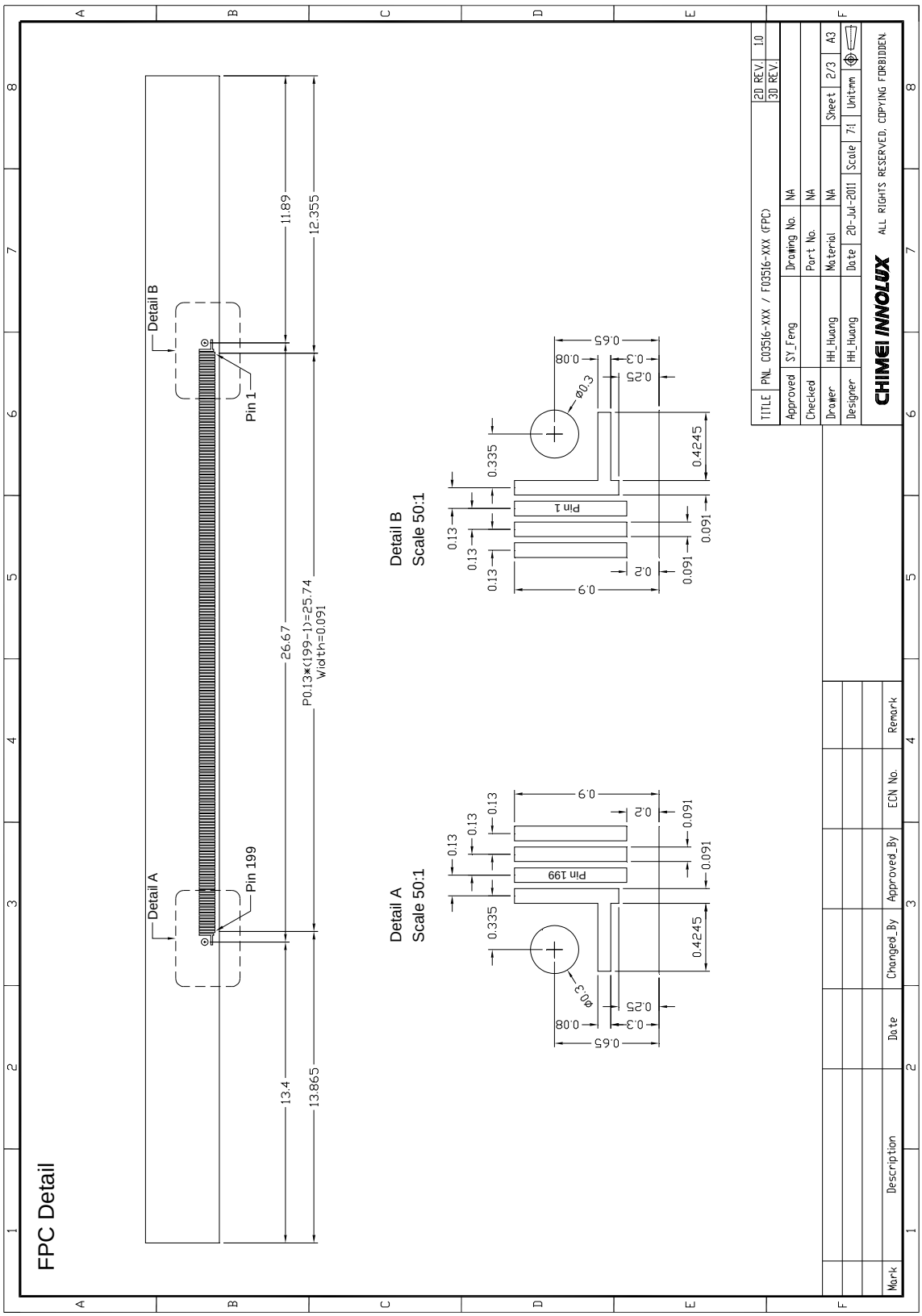
2.2 DIMENSION

2.2.1 OUTLINE DIMENSION

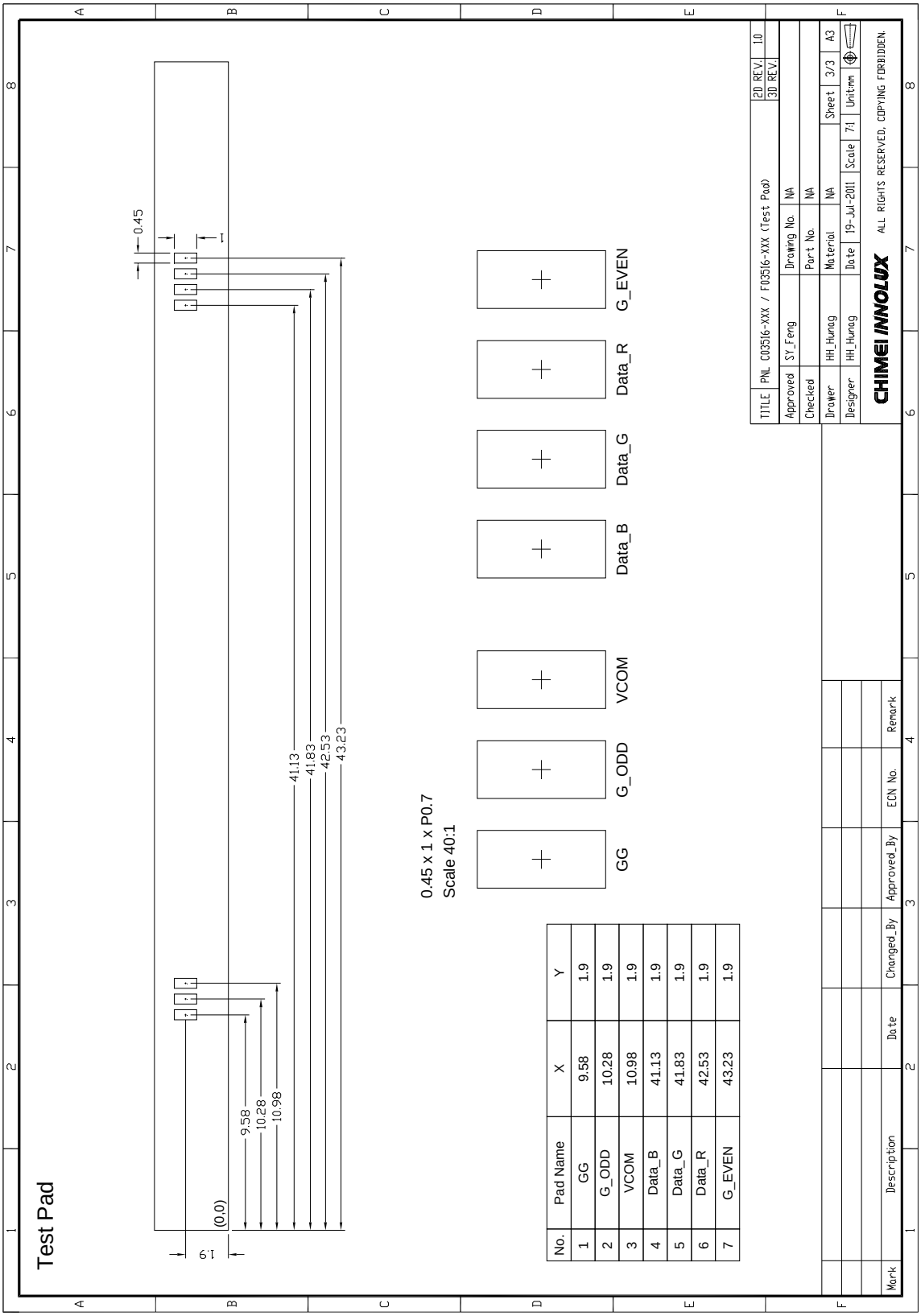


Note: (1) panel outline dimension tolerance ±0.2 mm

2.2.2 FPC DETAIL



2.2.3 TEST PAD



No.	Pad Name	X	Y
1	GG	9.58	1.9
2	G_ODD	10.28	1.9
3	VCOM	10.98	1.9
4	Data_B	41.13	1.9
5	Data_G	41.83	1.9
6	Data_R	42.53	1.9
7	G_EVEN	43.23	1.9

3. PIN ASSIGNMENT

3.1 FPC/IC PIN ASSIGNMENT TABLE

ILI9488(22.828x0.758mm)		Connect to	ILI9488	PinOut NumBer
Pad No	Pad Name		PinOut Name	
			DUMMY	1
			Resist monitor pad	2
		FPC	DUMMY(IPS-GND)	3
		Panel VCOM FPC	VCOM	4
				5
				6
1	DGND	FPC	DGND	7
2	DGND			
3	AGND	FPC	AGND	8
4	AGND			
5	DUMMY	—		
6	DUMMY	—		
7	DUMMY	—		
8	DUMMY	FPC	DUMMY	9
9	DUMMY	FPC	DUMMY	10
10	DUMMY	FPC	DUMMY	11
11	DUMMY	FPC	DUMMY	12
12	DUMMY	FPC	DUMMY	13
13	MIPI_LDO	FPC	MIPI LDO	14
14	MIPI_LDO			
15	DUMMY	FPC	DUMMY	15
16	MIPI_DATA_N	FPC	MIPI_DATA_N	16
17	MIPI_DATA_N			
18	MIPI_DATA_P	FPC	MIPI_DATA_P	17
19	MIPI_DATA_P			

20	MIPI_CLOCK_N	FPC	MIPI_CLOCK_N	18
21	MIPI_CLOCK_N			
22	MIPI_CLOCK_P	FPC	MIPI_CLOCK_P	19
23	MIPI_CLOCK_P			
24	TS0	—		
25	TS1	—		
26	TS2	—		
27	DUMMY	FPC	TEST0	20
28	DB23	FPC	TEST1	21
29	DB22	FPC	TEST2	22
30	DB21	FPC	TEST3	23
31	DB20	FPC	TEST4	24
32	DB19	FPC	TEST5	25
33	DB18	FPC	DB18	26
34	CABC_PWM	FPC	CABC_PWM	27
35	IM0	FPC	IM0/ID	28
36	IM1	FPC	IM1	29
37	IM2	FPC	IM2	30
38	RESX	FPC	RESX	31
39	VSYNC	FPC	VSYNC	32
			DUMMY	33
40	HSYNC	FPC	HSYNC	34
41	PCLK	FPC	PCLK	35
			DUMMY	36
42	ENABLE	FPC	ENABLE	37
43	DB17	FPC	DB17	38
			DUMMY	39
44	DB16	FPC	DB16	40
45	DB15	FPC	DB15	41
46	DB14	FPC	DB14	42
			DUMMY	43
47	DB13	FPC	DB13	44
48	DB12	FPC	DB12	45
			DUMMY	46
49	DB11	FPC	DB11	47
50	DB10	FPC	DB10	48
51	DB9	FPC	DB9	49

52	DB8	FPC	DB8	50
53	DB7	FPC	DB7	51
54	DB6	FPC	DB6	52
55	DB5	FPC	DB5	53
56	DB4	FPC	DB4	54
57	DB3	FPC	DB3	55
58	DB2	FPC	DB2	56
59	DB1	FPC	DB1	57
60	DB0	FPC	DB0	58
61	DOUT	FPC	DOUT	59
62	DIN/SDA	FPC	DIN/SDA	60
63	RDX	FPC	RDX	61
64	WRX/SCL	FPC	WRX_SCL	62
65	D/CX	FPC	D_CX	63
66	CSX	FPC	CSX	64
67	TE	FPC	TE	65
68	IOVCC	FPC	IOVCC	66
69	IOVCC			
70	IOVCC			
71	IOVCC			
72	IOVCC			67
73	IOVCC			
74	IOVCC			
75	VDD	—		
76	VDD	—		
77	VDD	FPC	VDD	68
78	VDD			
79	VDD			
80	VDD			69
81	VDD			
82	VDD			
83	VDD			70
84	VDD			
85	VDD			
86	DGND	FPC	DGND	71
87	DGND			
88	DGND			
89	DGND			

90	DGND			72
91	DGND			
92	DGND			
93	DGND			
94	VGS	FPC	VGS	73
95	VGS			
96	DUMMY	—		
97	AGND	FPC	AGND	74
98	AGND			
99	AGND			
100	AGND			75
101	AGND			
102	AGND			
103	AGND			
104	AGND			76
105	AGND			
106	AGND			
			DUMMY	77
107	VCOM	FPC	VCOM	78
108	VCOM			
109	VCOM			
110	VCOM			79
111	VCOM			
112	VCOM			
113	VCOM			80
114	VCOM			
115	VCOM			
116	VCOM			81
117	VCOM			
118	VCOM			82
119	VCOM			
120	VCOM	FPC	VCOM	83
121	VCOM	FPC	VCOM	84
122	VCOM	FPC	VCOM	85
			DUMMY	86
123	C14A	FPC	C14A	87
124	C14A			
125	C14A			

126	C14A			
127	C14A	FPC	C14A	88
128	C14A			
129	C14A			
130	C14A			89
131	C14A			
132	C14A			
			DUMMY	90
			DUMMY	91
133	C14B	FPC	C14B	92
134	C14B			
135	C14B			
136	C14B			93
137	C14B			
138	C14B			
139	C14B	—		
			DUMMY	94
140	VREG1_TEST	FPC	VREG1_TEST	95
141	VREG1_TEST			
142	VREG1_TEST			96
143	VREG1_TEST			
144	VREG2_TEST	—		
			DUMMY	97
			DUMMY	98
145	VCL	FPC	VCL	99
146	VCL			
147	VCL			
148	VCL			
149	VCL			
150	VCL			100
151	VCL			
152	VCL			
153	VCL			
			DUMMY	101
			DUMMY	102
			DUMMY	103
154	DDVDH	FPC	DDVDH	104
155	DDVDH			

156	DDVDH			
157	DDVDH			
158	DDVDH			
159	DDVDH			105
160	DDVDH			
161	DDVDH			
162	DDVDH			
			DUMMY	106
			DUMMY	107
			DUMMY	108
163	DDVDL	FPC	DDVDL	109
164	DDVDL			
165	DDVDL			
166	DDVDL			
167	DDVDL			
168	DDVDL			110
169	DDVDL			
170	DDVDL			
171	DDVDL			
172	DDVDL	—		
173	DDVDL	—		
			DUMMY	111
			DUMMY	112
			DUMMY	113
			DUMMY	114
			DUMMY	115
			DUMMY	116
174	VCI	FPC	VCI	117
175	VCI			
176	VCI			
177	VCI			
178	VCI			
179	VCI			
180	VCI			
181	VCI			118
182	VCI			
183	VCI			
184	VCI			

185	VCI			
186	VCI			
187	VCI			119
188	VCI			
189	VCI			
190	VCI			
191	VCI			
192	VCI			
193	DUMMY	—		
			DUMMY	120
			DUMMY	121
			DUMMY	122
			DUMMY	123
			DUMMY	124
194	C11B	FPC	C11B	125
195	C11B			
196	C11B			
197	C11B			126
198	C11B			
199	C11B			
200	C11B	FPC	C11B	127
201	C11B			
202	C11B			
203	C11B			128
204	C11B			
			DUMMY	129
			DUMMY	130
205	C11A	FPC	C11A	131
206	C11A			
207	C11A			
208	C11A			132
209	C11A			
210	C11A	FPC	C11A	133
211	C11A			
212	C11A			
213	C11A			134
214	C11A			
215	C11A			

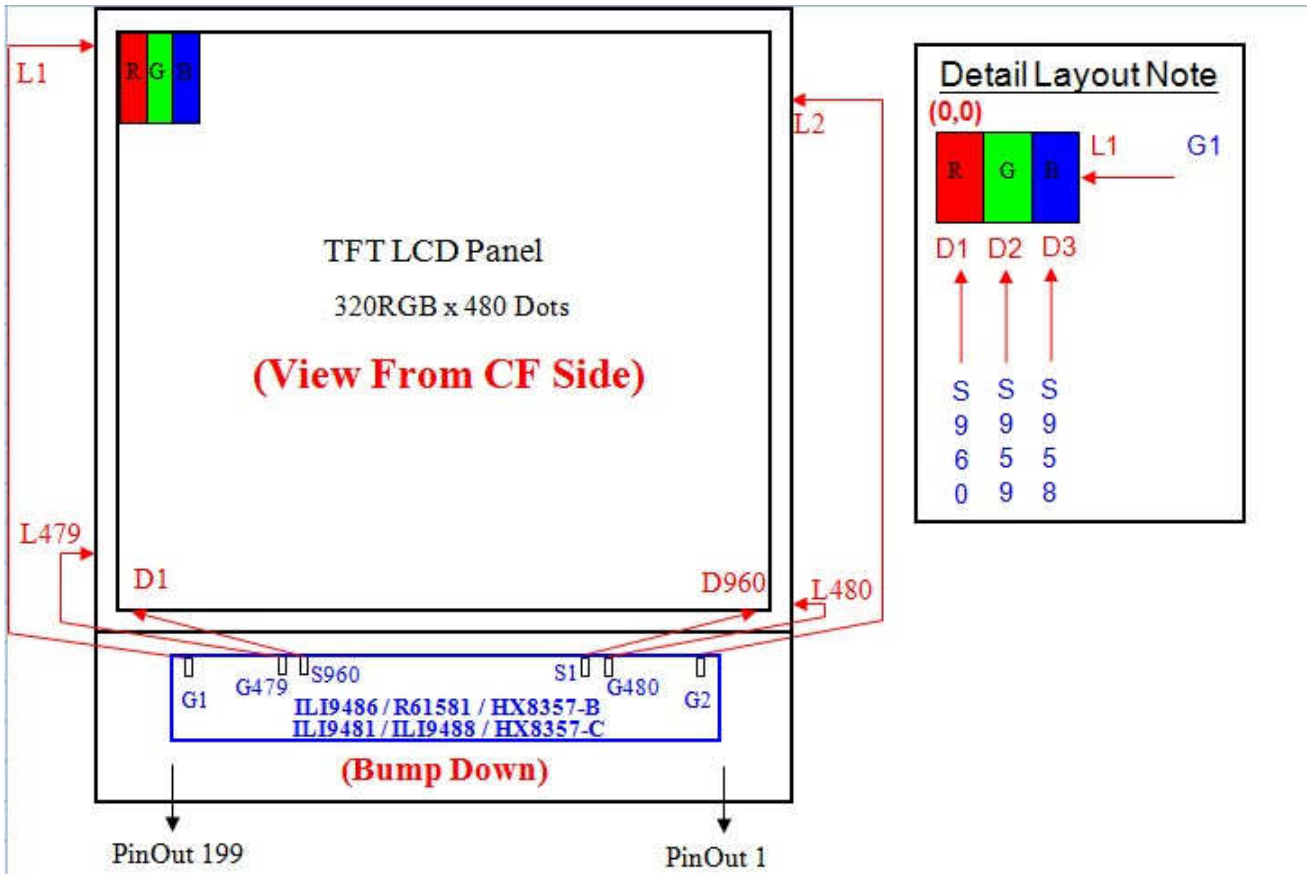
			DUMMY	135
			DUMMY	136
216	C12B	FPC	C12B	137
217	C12B			
218	C12B			
219	C12B			138
220	C12B			
221	C12B	FPC	C12B	139
222	C12B			
223	C12B			
224	C12B			140
225	C12B			
			DUMMY	141
			DUMMY	142
226	C12A	FPC	C12A	143
227	C12A			
228	C12A			144
229	C12A			
230	C12A	FPC	C12A	145
231	C12A			
232	C12A			
233	C12A			146
234	C12A			
235	C12A			
			DUMMY	147
236	VGL	FPC	VGL	148
237	VGL			
238	VGL			
239	VGL			
240	VGL			149
241	VGL			
242	VGL			
243	VGL			150
244	VGL			
245	VGL			
			DUMMY	151
246	AGND	FPC	AGND	152
247	AGND			

248	AGND			
249	VGH	—		
250	VGH	—		
			DUMMY	153
			DUMMY	154
251	VGH	FPC	VGH	155
252	VGH			
253	VGH			
254	VGH			156
255	VGH			
256	VGH			
			DUMMY	157
			DUMMY	158
257	C51B	FPC	C51B	159
258	C51B			
259	C51B			
260	C51B			160
261	C51B			
262	C51B			
			DUMMY	161
263	C51A	FPC	C51A	162
264	C51A			
265	C51A			
266	C51A			163
267	C51A			
268	C51A			
			DUMMY	164
			DUMMY	165
269	C52B	FPC	C52B	166
270	C52B			
271	C52B			
272	C52B			167
273	C52B			
274	C52B			
275	C52B	FPC	C52B	168
276	C52B			
277	C52B			
278	C52B			

279	C52B			169
280	C52B			
281	C52B			
282	C52B			
			DUMMY	170
			DUMMY	171
			DUMMY	172
283	C52A	FPC	C52A	173
284	C52A			
285	C52A			
286	C52A			
287	C52A			174
288	C52A			
289	C52A			
290	C52A	FPC	C52A	175
291	C52A			
292	C52A			
293	C52A	FPC	C52A	176
294	C52A			
295	C52A			
			DUMMY	177
			DUMMY	178
			DUMMY	179
296	C21B	FPC	C21B	180
297	C21B			
298	C21B			
299	C21B	FPC	C21B	181
300	C21B			
301	C21B			
302	C21B	FPC	C21B	182
303	C21B			
304	C21B			
305	C21B	FPC	C21B	183
306	C21B			
307	C21B			
			DUMMY	184
			DUMMY	185
			DUMMY	186

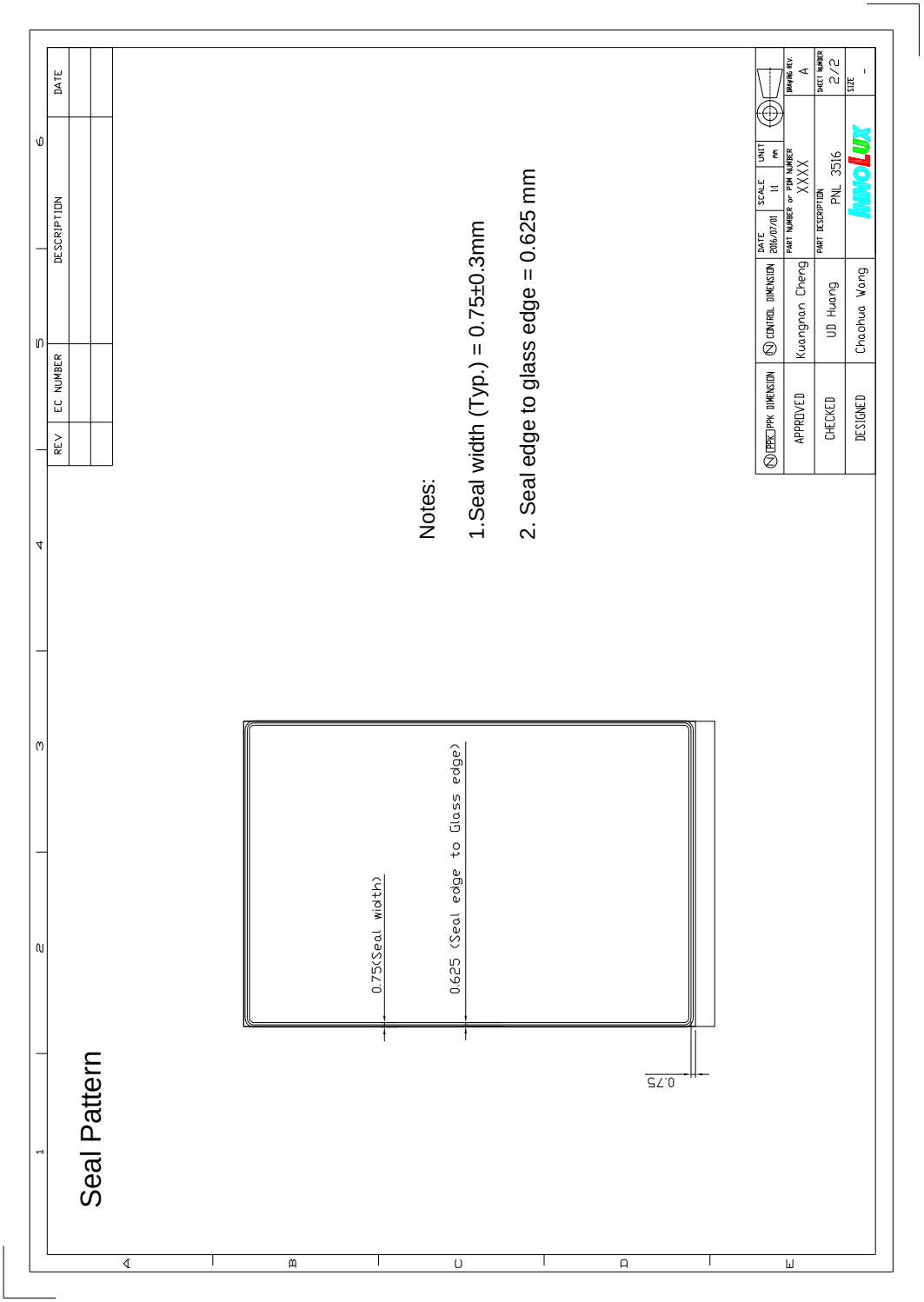
308	C21A	FPC	C21A	187
309	C21A			
310	C21A			
311	C21A			
312	C21A	FPC	C21A	188
313	C21A			
314	C21A			
315	C21A			
316	C21A			189
317	C21A			
318	C21A			
319	C21A	FPC	C21A	190
320	C21A			
		Panel_VCOM Quick_VCOM FPC	VCOM	191
				192
				193
		FPC	GND	194
		FPC, PANEL_GG	GG TEST	195
		FPC	GND	196
		FPC	DUMMY(IPS-GND)	197
		FPC	Resist monitor pad	198
		FPC	DUMMY	199

3.2 SCHEMATIC PANEL LAYOUT

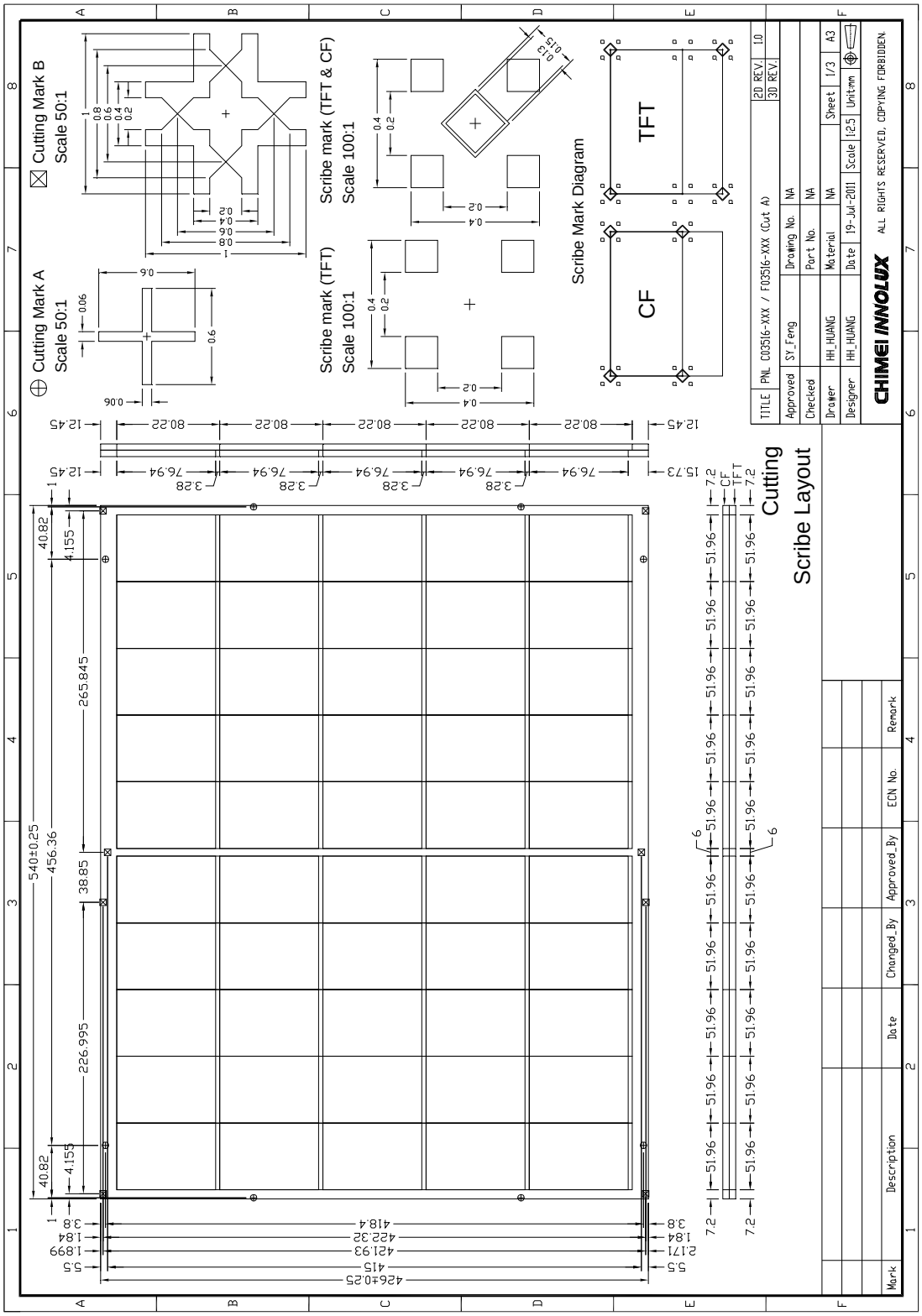


4. CELL PROCESS RULES

4.1 SEAL / AU PATTERN



5. CELL SCRIBE LAYOUT



6. ELECTRICAL SPECIFICATION

Item	Symbol	Specification			Unit
		Min.	Typ	Max.	
TFT gate on voltage	VGH	14.5	15	15.5	V
TFT gate off voltage	VGL	-10.5	-10	-9.5	V
TFT common electrode voltage	Vcom(dc)		-1.18		V

Note: (1) Vcom must be adjusted to optimize display quality :cross-talk, contrast ratio and etc.

(2) VGH is TFT gate operating voltage

(3) VGL is TFT gate operating voltage

(4) Environmental condition: 25±5℃

(5) Reference waveform for panel light on is as below:

7. OPTICAL SPECIFICATION

Item		Symbol	Conditions	Specifications (typ)	Unit	Note
Transmittance		T%	Viewing normal angle $q_X = q_Y = 0°$	4.3	%	All left side data are based on INX's following condition – 1.CG : NTSC 69% 2.AR : 67.5% 3.Light Source : INX LED BLU 4.Machine : DMS 803 5. Vwhite > 5.0 V, Vdark < 0.3V 6. Polarizer : NPF-TEGQ1465DUHC
Contrast Ratio		CR		700	--	
Response Time		Ton+ Toff		30	ms	
Viewing Angle	Hor.	q_{X+}	Center CR>10	80	deg.	
		q_{X-}		80		
	Ver.	q_{Y+}		80		
		q_{Y-}		80		
CF only Chromaticity	Red	X_R	Viewing normal angle $q_X = q_Y = 0°$	0.660	--	Under C light Simulation
		Y_R		0.325	--	
	Green	X_G		0.277	--	
		Y_G		0.568	--	
	Blue	X_B		0.145	--	
		Y_B		0.072	--	
	White	X_W		0.309	--	
		Y_W		0.332	--	

*Note (1) Definition of Contrast Ratio (CR):

The contrast ratio can be calculated by the following expression.

Contrast Ratio (CR) = L63 / L0

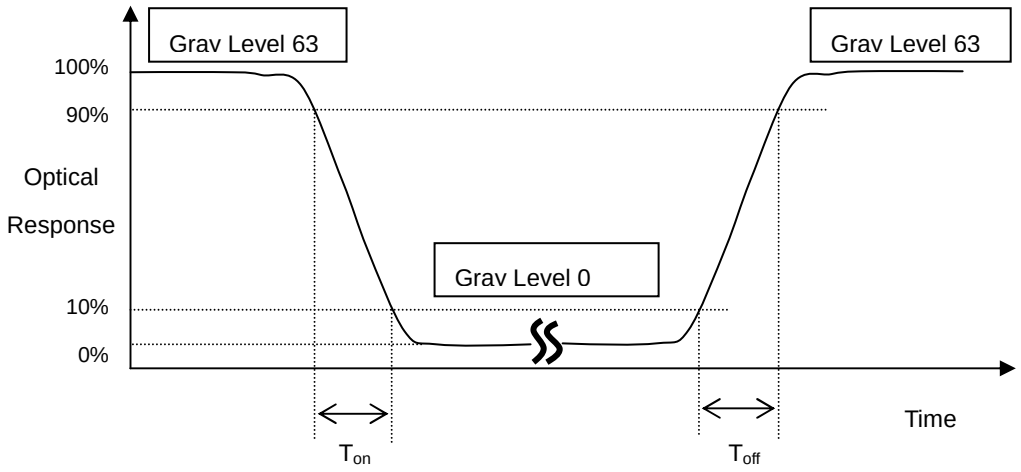
L63: Luminance of gray level 63

L 0: Luminance of gray level 0

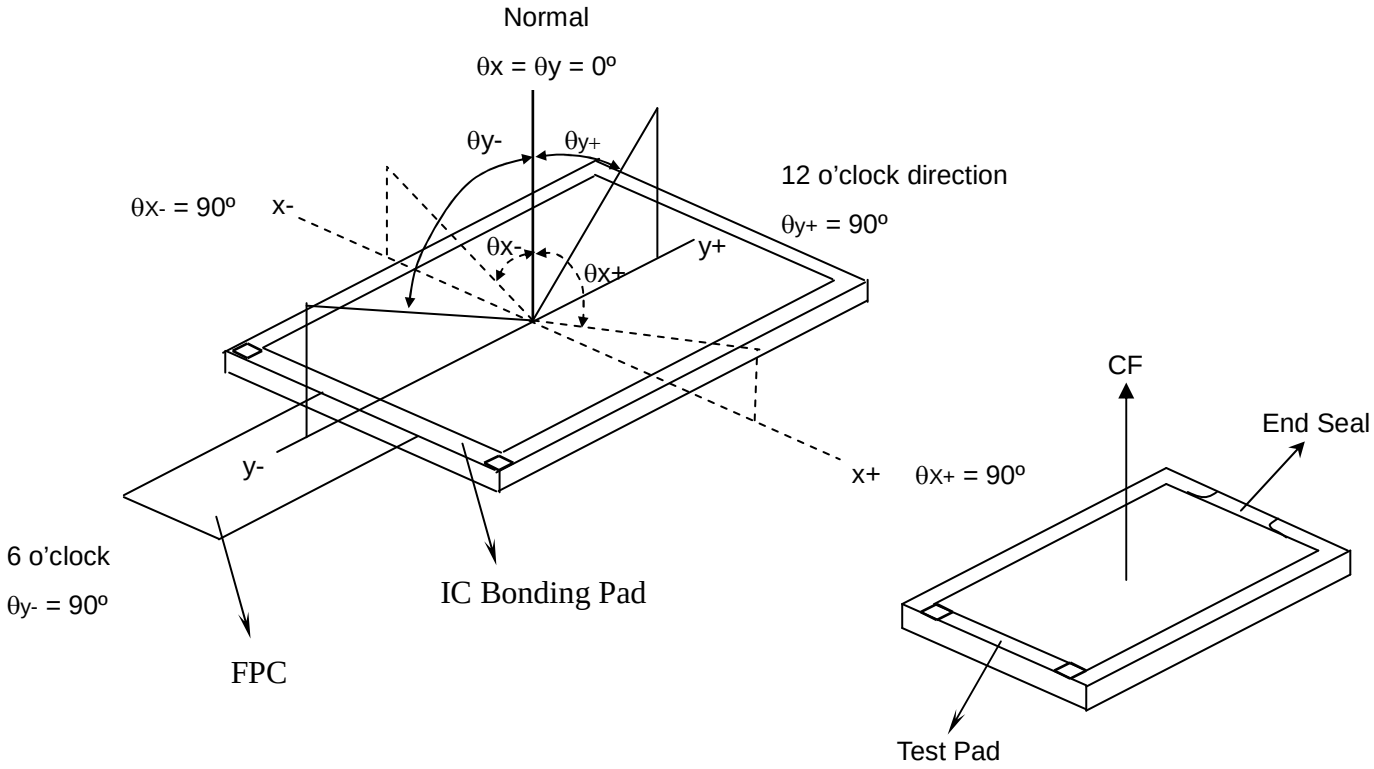
CR = CR (5)

CR (X) is corresponding to the Contrast Ratio of the point X at Figure in Note (5).

*Note (2) Definition of Response Time (T_{on}, T_{off}):

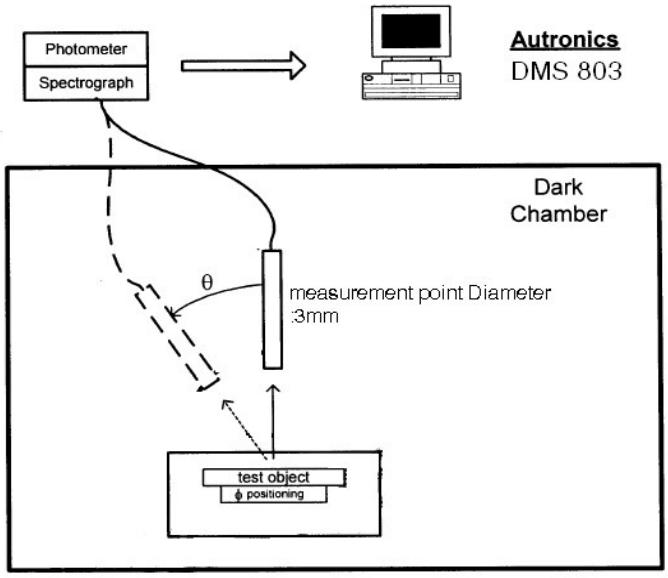


*Note(3) Definition of Viewing Angle

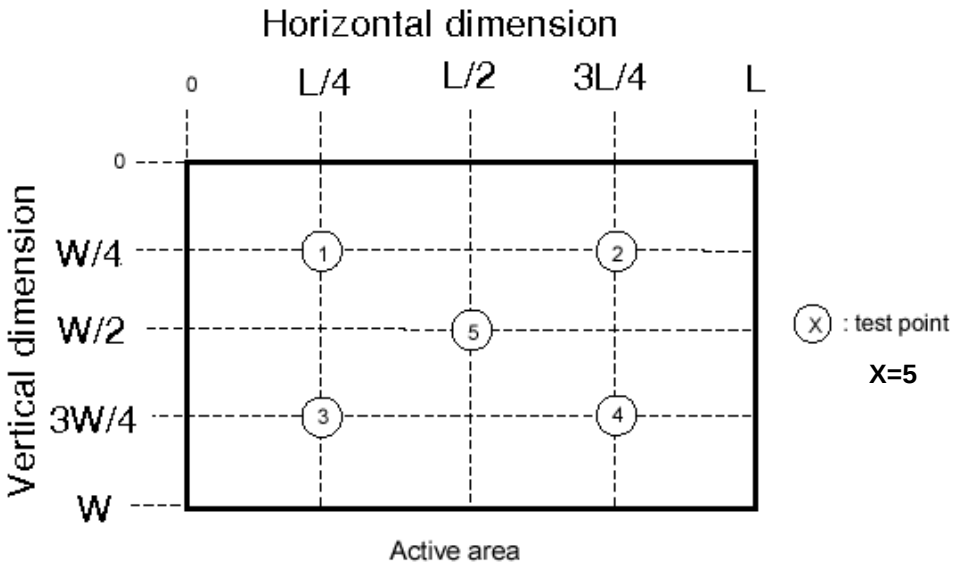


*Note (4) Measurement Set-Up:

The LCD module should be stabilized at a given temperature for 20 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 20 minutes in a windless room.



*Note (5)



8. RELIABILITY SPECIFICATION

No.	Test Item*	Test Condition	Check Time
1	High Temp Storage	Ta= 80℃	240 hrs
2	Low Temp Storage	Ta= -30℃	240 hrs
3	High Temp Operation	Ta= 70℃	240 hrs
4	Low Temp Operation	Ta= -20℃	240 hrs
5	High Temp & High Humidity Operation	Ta=60℃ H=90%RH	240 hrs

Note:(1) Ta : Ambient temperature

(2) All judgments of display are performed after temp of panel returns to room temperature

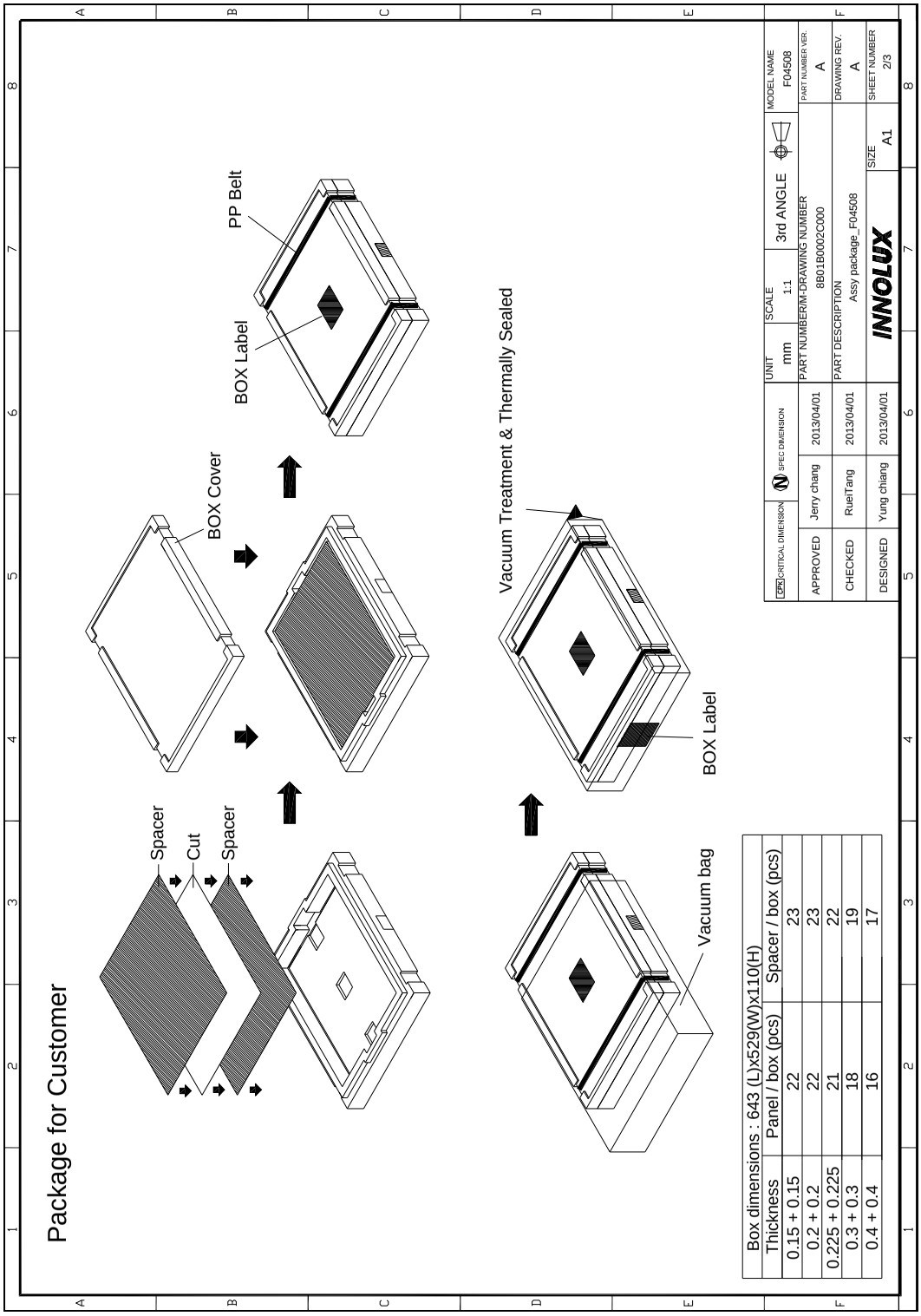
(3) Display function should be no change under normal operating condition.

(4)Under no condensation of dew

(5)*INX only guarantee the above 5 test items. INX wouldn't guarantee the others not shown as the above ones.

9. PACKAGE FORM

9.1 CELL PACKAGE



9.2 PALLET PACKAGE