Doc. Number:

☐ Tentative Specification
☐ Preliminary Specification
■ Approval Specification

MODEL NO.: F043A11-601

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**	**Liz KAO**

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REVISION HISTORY

Version	Date	Page (New)	Section	Description
Ver. 2.0	2017/05/02	All	All	Approval product spec was first issued for LCD substrate.
Ver. 2.1	2017/05/22	5	2.2.1	Revise POLA Absorption
		19	4	Revise CUT size

1. PURPOSE

The specification F043A11-601 is a 4.3” a-Si TFT Liquid Crystal Display cell. The cell has been designed by Innolux, and manufactured by Innolux under the agreement of customer. The a-Si TFT-LCD cell will be applied to a high transmittance operating in the normally white mode a-Si TFT-LCD product.

2. GENERAL RULES OF SINGLE PANEL

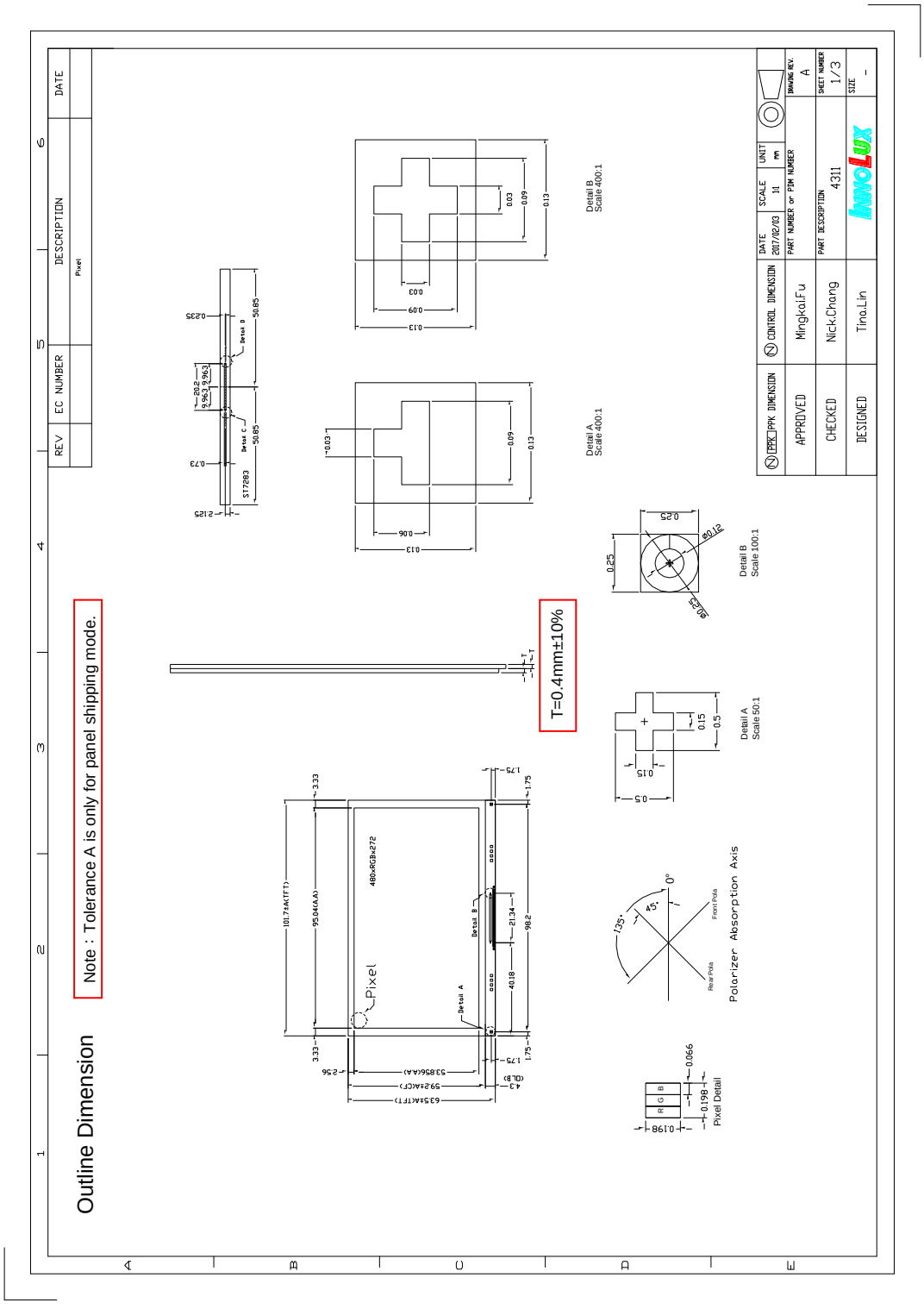
2.1 GENERAL SPECIFICATION

No.	Item		Specification	unit
1	Glass thickness	TFT	0.4	mm
		CF	0.4	
2	Shipping mode		cut	-
3	Shipping size		540 (H) x 426 (V) x 0.8 (D)	mm
4	Panel outline dimension		63.5 (H) x 101.7 (V) x 0.8 (D)	mm
5	Active screen size		95.04 (H) x 53.856 (V)	mm
6	Resolution		480RGB x 272	pixel
7	Pixel driving element		a-Si TFT	-
8	Sub pixel size		66 x 198	um
9	Pixel arrangement		RGB-stripe	-
10	View direction (Gray inversion)		TN (6 o'clock)	-
11	Cell gap		4 ± 0.2	um
12	Driver IC		ST7282 *<Note>	-
13	Weight without POL		442 ± 10%	g

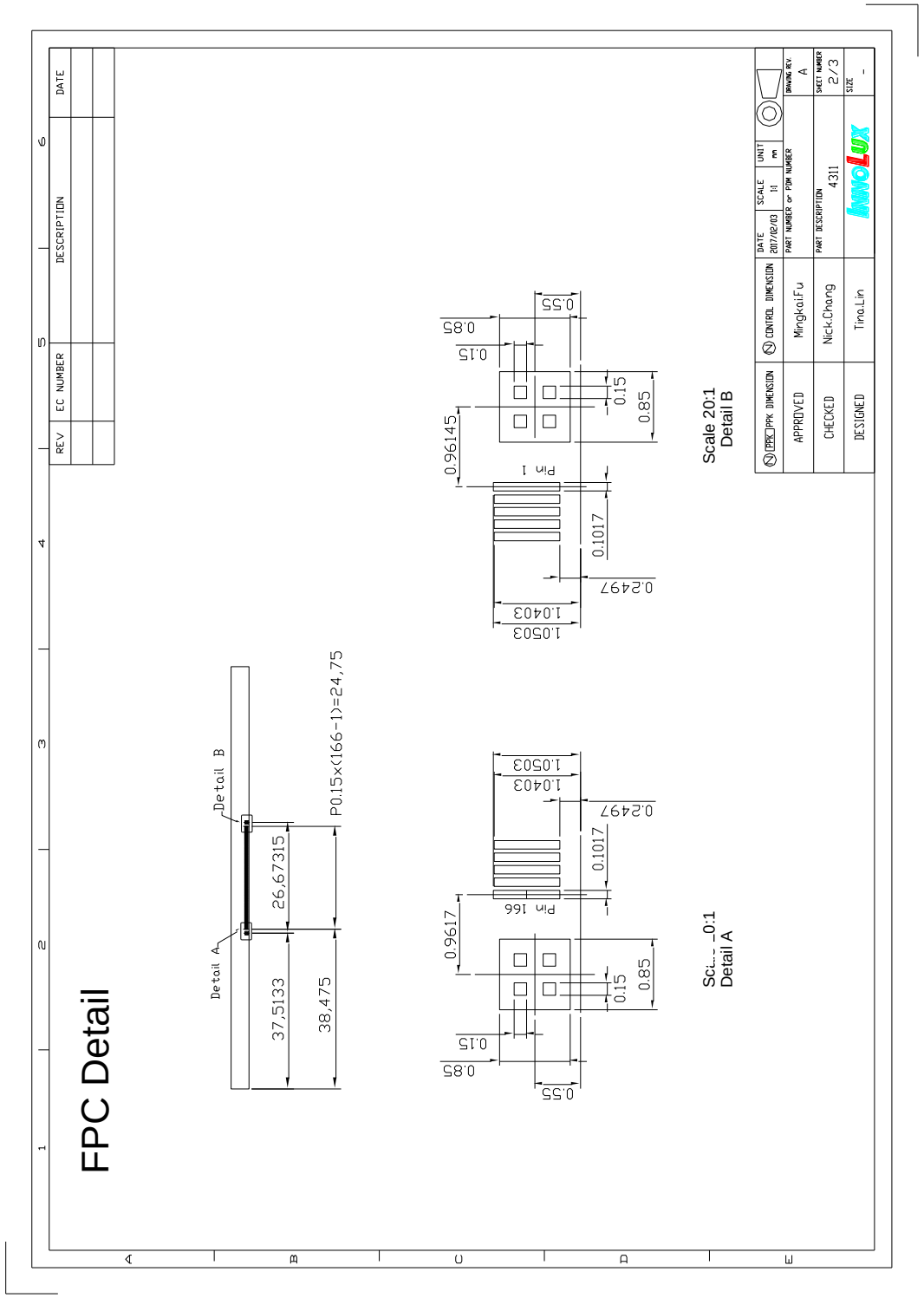
<Note> 1. This model is designed by the driver IC without bumping compensation.

2.2 DIMENSION

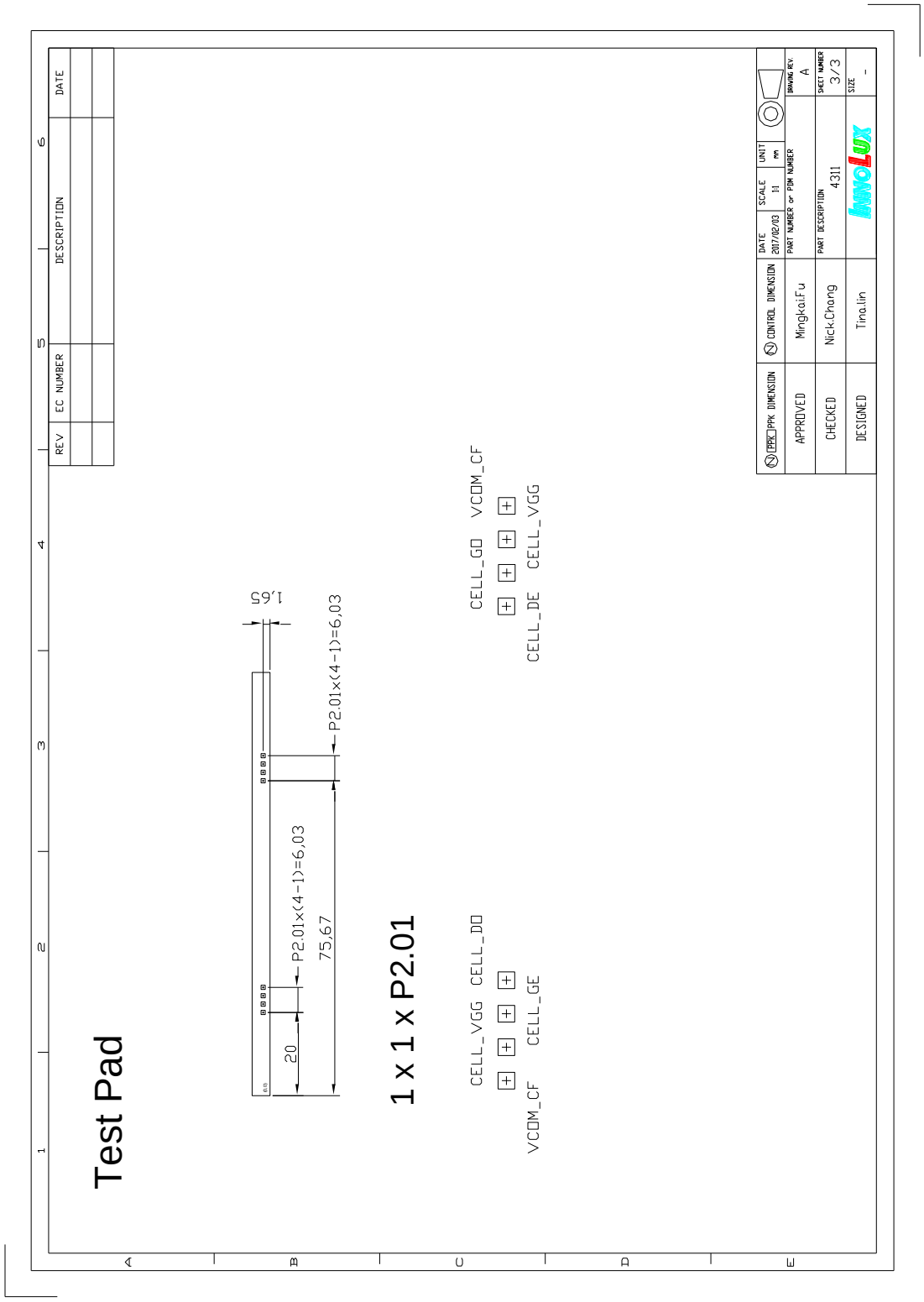
2.2.1 OUTLINE DIMENSION



2.2.2 LCD FPC DETAIL



2.2.3 TEST PAD



3. PIN ASSIGNMENT

3.1 LCD FPC/IC PIN ASSIGNMENT TABLE

ST7282

ST7282			ST7282	
IC Pad No.	IC Pad name	connect to	FPC Pinout name	FPC Pinout No.
x		FPC	DUMMY	1
x		FPC	DUMMY	2
x		FPC	VCOM_R	3
x		FPC	VCOM_R	4
x		FPC	VCOM_R	5
1	DUMMY			
2	DGND	FPC	DGND	6
3	DUMMY	FPC	DUMMY	7
4	DUMMY			
5	DGND	FPC	DGND	8
6	VPP			9
7	VPP			
8	VPP			10
9	VPP	FPC	VPP	
10	VPP			11
11	VPP			
12	DGND	FPC	DGND	12
13	DUMMY			13
14	DUMMY			
15	DUMMY	FPC	VCOM_TFT1	14
16	DUMMY			15
17	DGND	FPC	DGND	16
18	GVDD			17
19	GVDD			
20	GVDD			18
21	GVDD	FPC	GVDD	
22	GVDD			19

23	GVDD			
24	GVCL	FPC	GVCL	20
25	GVCL			
26	GVCL			21
27	GVCL			
28	GVCL			22
29	GVCL			
30	VCOM			23
31	VCOM			
32	VCOM			24
33	VCOM	FPC	VCOM	
34	VCOM			25
35	VCOM			
36	VDIR	FPC	DGND	26
37	DUMMY	FPC	DUMMY	27
38	DUMMY			
39	HDIR	FPC	DGND	28
40	DUMMY			29
41	DUMMY			
42	DUMMY	FPC	DUMMY	30
43	DUMMY			
44	DUMMY	FPC		
45	DUMMY	FPC		
46	DGND			31
47	DGND			
48	DGND			32
49	DGND			
50	DGND	FPC	DGND	33
51	DGND			
52	DGND			34
53	DGND			
54	VCC			35
55	VCC			
56	VCC			36
57	VCC	FPC	VCC	
58	VCC			37

59	VCC			
60	VDDI			38
61	VDDI			
62	VDDI			39
63	VDDI	FPC	VDDI	
64	VDDI			40
65	VDDI			
66	VDD	FPC	VDD	41
67	VDD			
68	VDD			42
69	VDD			
70	VDD			43
71	VDD			
72	VDD			44
73	VDD			
74	DUMMY	FPC	DUMMY	45
75	DCLKN(RX3P)	FPC	VSYNC	46
76	DCLKN(RX3P)			
77	DCLKP(RX3N)	FPC	HSYNC	47
78	DCLKP(RX3N)			
79	DGND	FPC	DCLK	48
80	DGND			
81	DB0(RX2P)	FPC	VDPOL	49
82	DB0(RX2P)			
83	DB1(RX2N)	FPC	HDPOL	50
84	DB1(RX2N)			
85	DGND	FPC	DCLKPOL	51
86	DGND			
87	DB2(RX1P)	FPC	SBGR	52
88	DB2(RX1P)			
89	DB3(RX1N)	FPC	DE	53
90	DB3(RX1N)			
91	DGND	FPC	DUMMY1	54
92	DGND			
93	DB4(RX0P)	FPC	DUMMY2	55
94	DB4(RX0P)			
95	DB5(RX0N)	FPC	PARA_SERI	56

96	DB5(RX0N)			
97	DGND	FPC	EXTC	57
98	DGND			
99	DB6(RXCLKP)	FPC	HDIR	58
100	DB6(RXCLKP)			
101	DB7(RXCLKN)	FPC	VDIR	59
102	DB7(RXCLKN)			
103	DGND	FPC	TEST_IN3	60
104	DGND			
105	HSYNC	FPC	TEST_IN4	61
106	HSYNC			
107	DG0	FPC	CS	62
108	DG0			
109	DG1	FPC	SDA	63
110	DG1			
111	DG2	FPC	SCL	64
112	DG2			
113	DG3	FPC	DISP	65
114	DG3			
115	VSYNC	FPC	TEST_IN5	66
116	VSYNC			
117	DG4	FPC	GRB	67
118	DG4			
119	DG5	FPC	SYNC	68
120	DG5			
121	DGND	FPC	DUMMY	69
122	DGND			
123	DG6	FPC	DUMMY	70
124	DG6			
125	AUTODL	FPC	DGND	71
126	DE	FPC	DR7	72
127	DE	FPC	DR7	
128	DG7	FPC	DR6	73
129	DG7	FPC	DR6	
130	DR0	FPC	DR5	74
131	DR0	FPC	DR5	
132	DR1	FPC	DR4	75

133	DR1	FPC	DR4	
134	DR2	FPC	DR3	76
135	DR2	FPC	DR3	
136	DR3	FPC	DR2	77
137	DR3	FPC	DR2	
138	DR4	FPC	DR1	78
139	DR4	FPC	DR1	
140	DR5	FPC	DR0	79
141	DR5	FPC	DR0	
142	DR6	FPC	DG7	80
143	DR6	FPC	DG7	
144	DR7	FPC	DG6	81
145	DR7	FPC	DG6	
146	HDPOL/ LVSEL[0]	FPC	DG5	82
147	HDPOL/ LVSEL[0]	FPC	DG5	
148	VDPOL/ LVSEL[1]	FPC	DG4	83
149	VDPOL/ LVSEL[1]	FPC	DG4	
150	DCLKPOL/ LVFMT	FPC	DG3	84
151	DCLKPOL/ LVFMT	FPC	DG3	
152	PARA_SERI/ LVSW	FPC	DG2	85
153	PARA_SERI/ LVSW	FPC	DG2	
154	INTF	FPC	DG1	86
155	INTF	FPC	DG1	
156	GRB	FPC	DG0	87
157	GRB	FPC	DG0	
158	DISP	FPC	DB7	88
159	DISP	FPC	DB7	
160	SCL	FPC	DB6	89
161	SCL	FPC	DB6	
162	SDA	FPC	DB5	90
163	SDA	FPC	DB5	
164	CS	FPC	DB4	91

165	CS	FPC	DB4	
166	ENPROG	FPC	DB3	92
167	ENPROG	FPC	DB3	
168	SPI_I2C_SEL	FPC	DB2	93
169	SPI_I2C_SEL	FPC	DB2	
170	BIST_EN	FPC	DB1	94
171	BIST_EN	FPC	DB1	
172	ERR_OUT	FPC	DB0	95
173	ERR_OUT	FPC	DB0	
174	DUMMY	FPC	DUMMY	96
175	DUMMY	FPC	DUMMY	97
176	DUMMY	FPC	DUMMY	98
177	DUMMY			
178	DUMMY			
179	TESTOUT0			
180	TESTOUT1			
181	TESTOUT2			
182	TESTOUT3			
183	TESTOUT4			
184	TESTOUT5			
185	TESTOUT6			
186	TESTOUT7			
187	TEST_IN0			
188	TEST_IN1			
189	TEST_IN2			
190	TEST_IN3			
191	TEST_IN4			
192	TEST_IN5			
193	TEST_IN6			
194	TEST_IN7			
195	TEST_IN8			
196	TEST_IN9			
197	TEST_IN10			
198	TEST_IN11			
199	TEST_IN12			
200	TEST_IN13			
201	TEST_IN14			

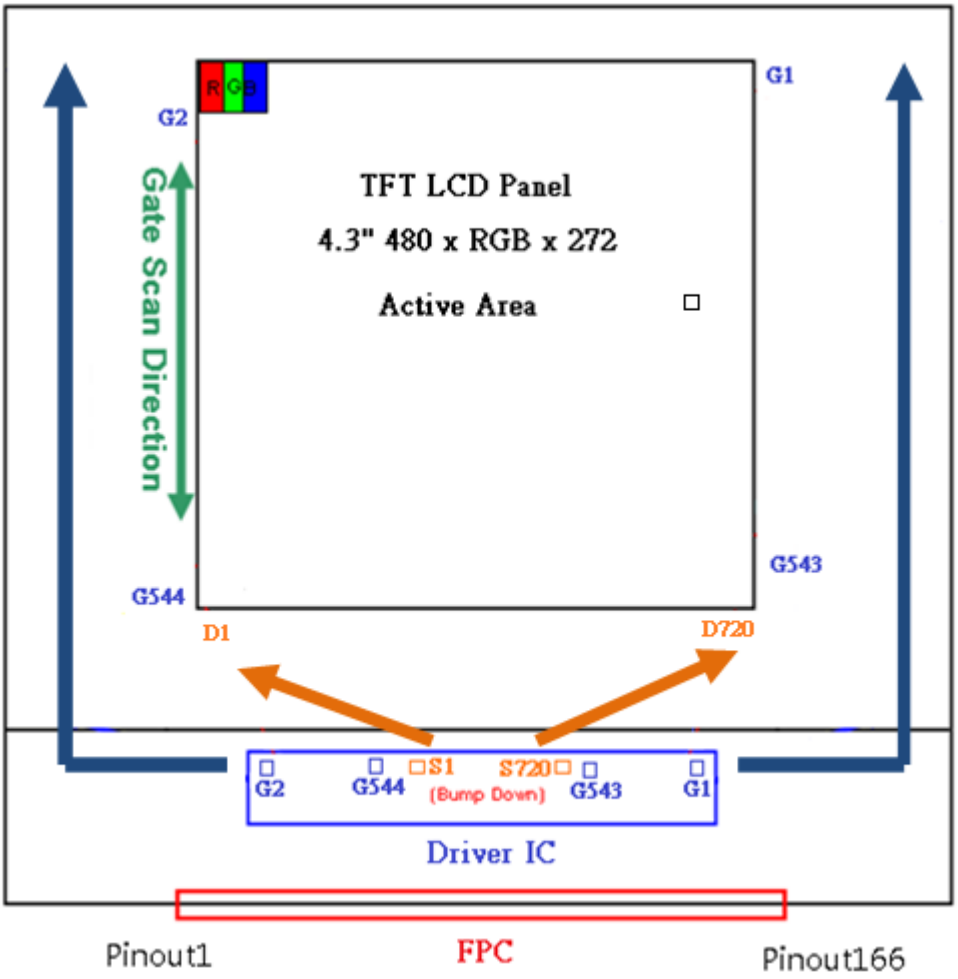
202	DUMMY			
203	DUMMY			
204	DUMMY			
205	DUMMY			
206	DUMMY			
207	DUMMY			
208	DUMMY			
209	DUMMY			
210	DUMMY	FPC	DUMMY	99
211	DUMMY			100
212	DUMMY			
213	DUMMY			101
214	DUMMY	FPC	DUMMY	
215	DUMMY			102
216	DUMMY			
217	AGND	FPC	AGND	103
218	AGND			
219	AGND			104
220	AGND			
221	AGND			105
222	AGND			
223	AGND	FPC	AGND	106
224	AVCL			107
225	AVCL			
226	AVCL			108
227	AVCL	FPC	AVCL	
228	AVCL			109
229	AVCL			
230	DUMMY			110
231	DUMMY			
232	DUMMY			111
233	DUMMY	FPC	DUMMY	
234	DUMMY			112
235	DUMMY			
236	DUMMY			113
237	DUMMY			

238	DUMMY			114
239	DUMMY	FPC	DUMMY	
240	DUMMY			115
241	DUMMY			
242	AVDD			116
243	AVDD			
244	AVDD			117
245	AVDD			
246	AVDD	FPC	AVDD	118
247	AVDD			
248	AVDD			119
249	AVDD			
250	PGND	FPC	PGND	120
251	PGND			
252	PGND			121
253	PGND			
254	PGND			122
255	PGND			
256	PGND			123
257	PGND			
258	DUMMY			124
259	DUMMY			
260	DUMMY	FPC	VCOM_TFT2	125
261	DUMMY			126
262	AVDD1			
263	AVDD1			127
264	AVDD1			
265	AVDD1	FPC	AVDD1	128
266	AVDD1			
267	AVDD1			129
268	DUMMY			
269	DUMMY			130
270	DUMMY			
271	DUMMY	FPC	TESTOUT9	131
272	DUMMY			

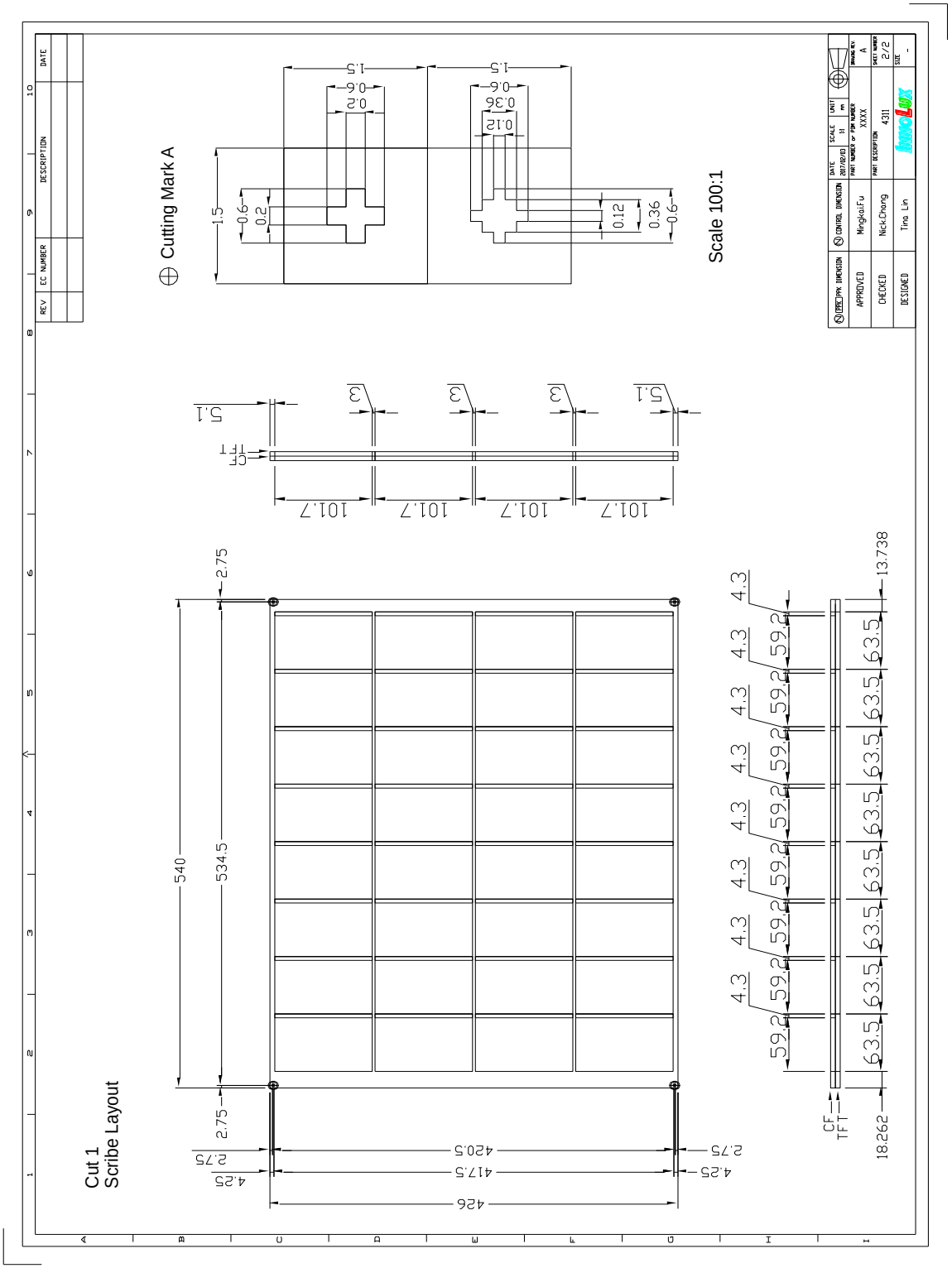
273	DUMMY			132
274	AVCL1			
275	AVCL1			133
276	AVCL1			
277	AVCL1	FPC	AVCL1	134
278	AVCL1			
279	AVCL1			135
280	TESTO			
281	TESTO			136
282	TESTO			
283	TESTO	FPC	TESTOUT11	137
284	TESTO			
285	TESTO			138
286	PVDD			
287	PVDD			139
288	PVDD			
289	PVDD			140
290	PVDD	FPC	PVDD	
291	PVDD			141
292	PVDD			
293	PVDD			142
294	VGSP	FPC	VGSP	143
295	VGSP			
296	VGSP			
297	VGSP			144
298	VGSP			
299	VGSP			145
300	VCCA			
301	VCCA			146
302	VCCA			
303	VCCA	FPC	TESTOUT13	147
304	VCCA			

305	VCCA			148
306	VGH			
307	VGH			149
308	VGH			
309	VGH	FPC	VGH	150
310	VGH			
311	VGH			151
312	DUMMY			
313	DUMMY			152
314	DUMMY			
315	DUMMY	FPC	TESTOUT14	153
316	DUMMY			
317	DUMMY			154
318	DUMMY			
319	DUMMY			155
320	DUMMY			
321	DUMMY	FPC	TESTOUT15	156
322	DUMMY			
323	DUMMY			157
324	VGL			
325	VGL			158
326	VGL			
327	VGL	FPC	VGL	159
328	VGL			
329	VGL			160
330	PGND	FPC	DUMMY	161
331	DUMMY			
		FPC	VCOM_R	162
		FPC	VCOM_R	163
		FPC	VCOM_R	164
		FPC	DUMMY	165
		FPC	DUMMY	166

3.2 SCHEMATIC PANEL LAYOUT



4. CELL SCRIBE



5. ELECTRICAL SPECIFICATION

Item	Symbol	Specification			Unit
		Min.	Typ.	Max.	
TFT gate on voltage	VGH	--	15	--	V
TFT gate off voltage	VGL	--	-10	--	V
TFT common electrode voltage	Vcom(DC)	--	OTP. (1)	--	V
Control signal Logic 'H'	STVs, CKVs,RESET, BGAS, CKHs		VGH		V
Control signal Logic 'L'	STVs, CKVs, RESET, BGAS, CKHs		VGL		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: (release after sample output)

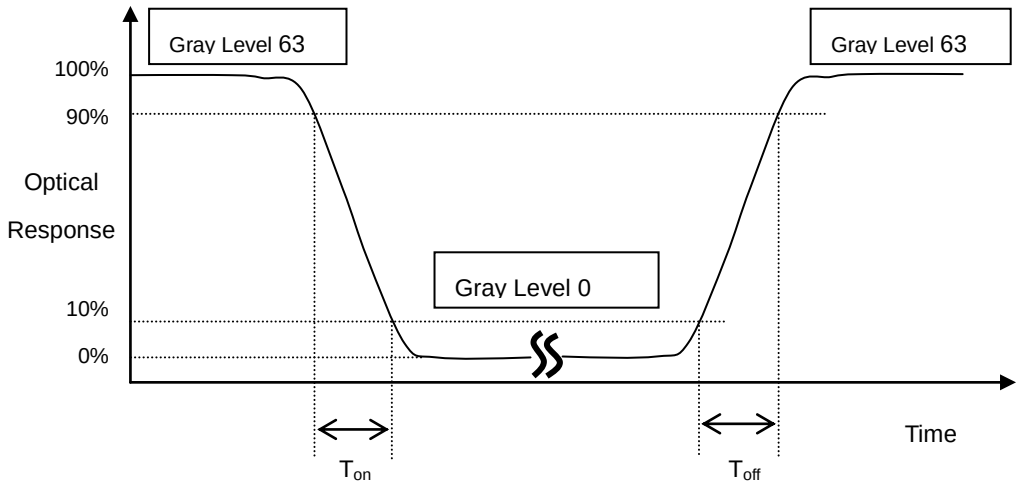
(6) Reference waveform timing for panel light on is as below:

6. OPTOCAL SPECIFICATION

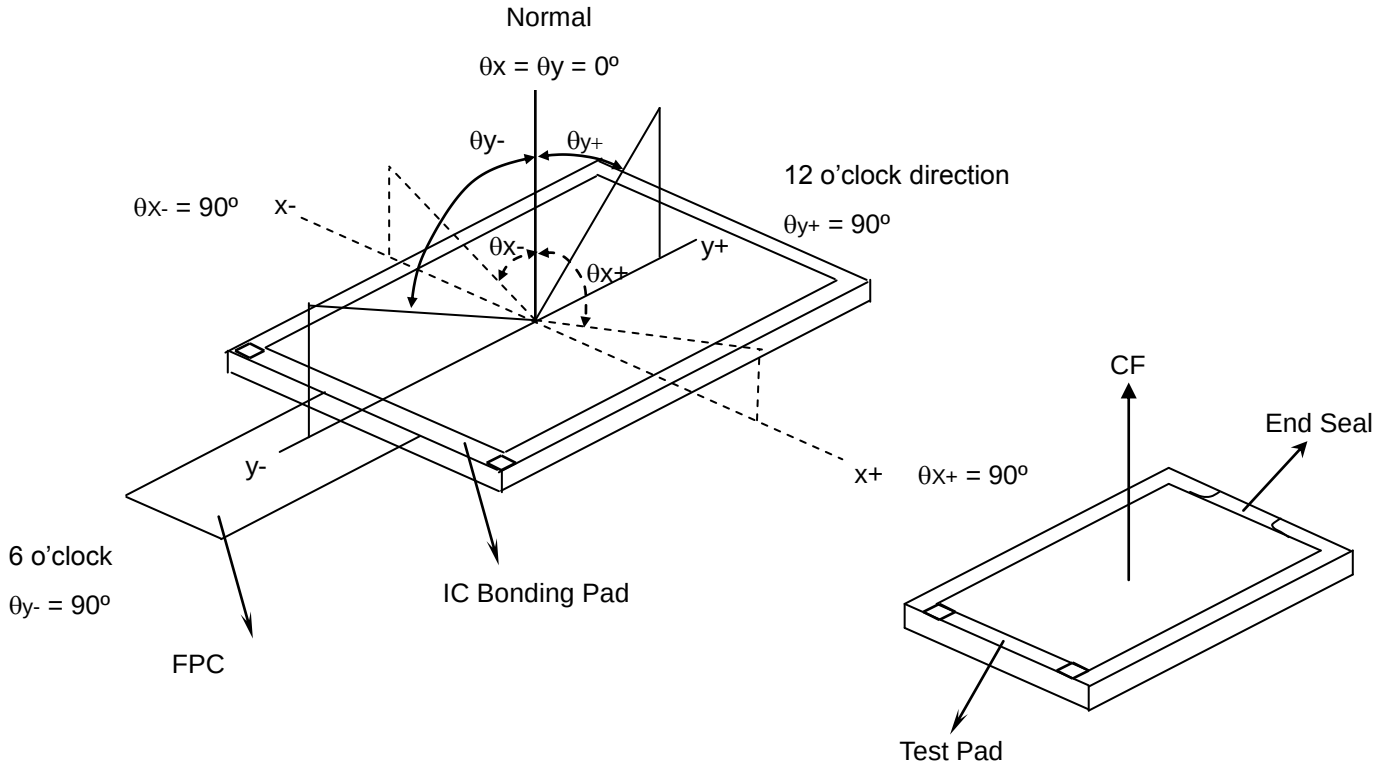
Item		Symbol	Conditions	Specifications			Unit	Note
				Min.	Typ.	Max.		
Transmittance (w/o APCF)		T%	Viewing normal angle $\theta_X = \theta_Y = 0°$	4.60%	5.41%	--	%	C-light
Contrast Ratio		CR		300	500	--	--	The left side data are based on INX's following condition – 1.LC : TN 2.Light Source :C light 3.Polarizer : CF NWF-LR-SEGAGS1(霧面) TFT NWF-LR-SEGAGS1(霧面) 4.Machine : DMS 803 5. VLC dark = 4.6V, VLC white = 0.5V
Response Time		$T_{on} + T_{off}$		--	25	50	ms	
Viewing Angle	Hor.	θ_{X+}	Center CR>10	60	70	--	deg.	
		θ_{X-}		60	70	--		
	Ver.	θ_{Y+}		40	50	--		
		θ_{Y-}		50	60	--		
CF only Color Chromaticity (CIE 1931)	Red	Rx	Viewing normal angle $\theta_X = \theta_Y = 0°$	0.588	0.618	0.648	-	Light Source :C-Light
		Ry		0.313	0.343	0.373	-	
	Green	Gx		0.276	0.306	0.336	-	
		Gy		0.497	0.527	0.557	-	
	Blue	Bx		0.109	0.139	0.169	-	
		By		0.068	0.098	0.128	-	
	White	Wx		0.283	0.313	0.343	-	
		Wy		0.293	0.323	0.353	-	
	Color Gamut			--	52	--	%	

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}):

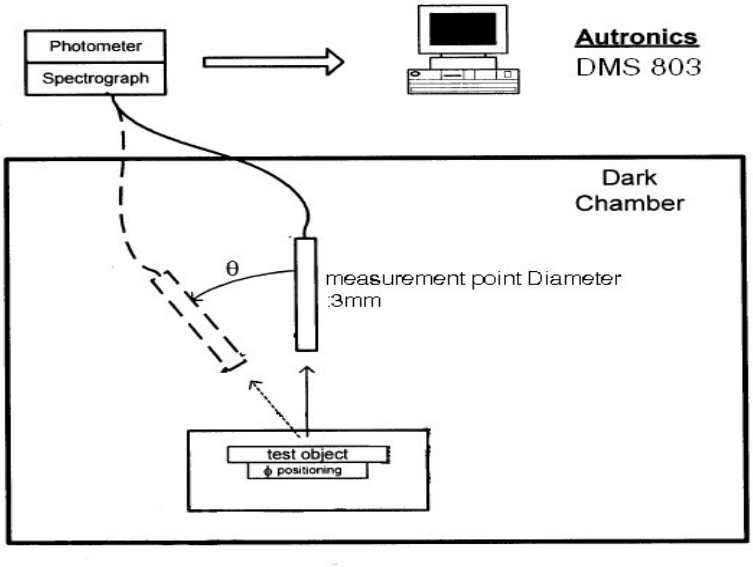


*Note(3) Definition of Viewing Angle

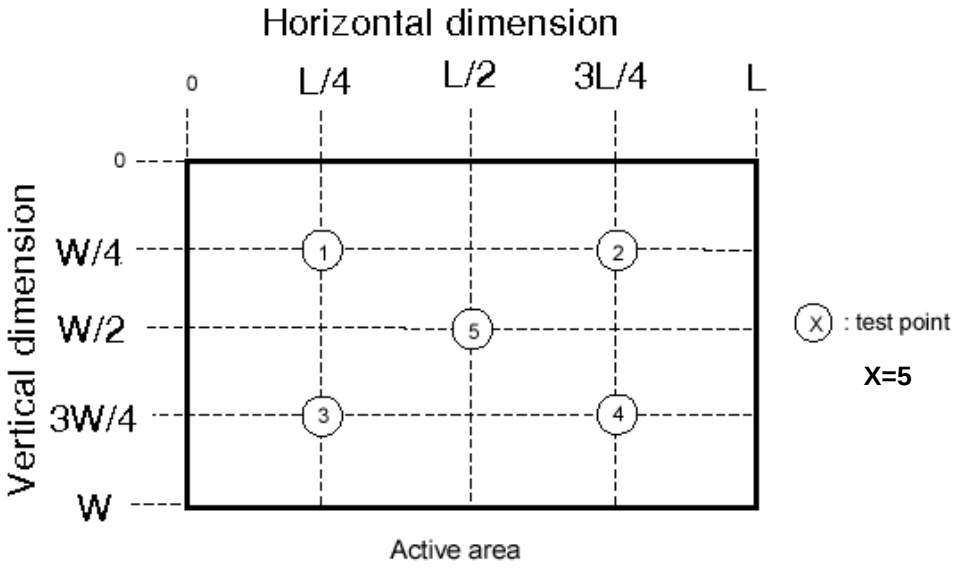


*Note (4) Measurement Set-Up:

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)



7. 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

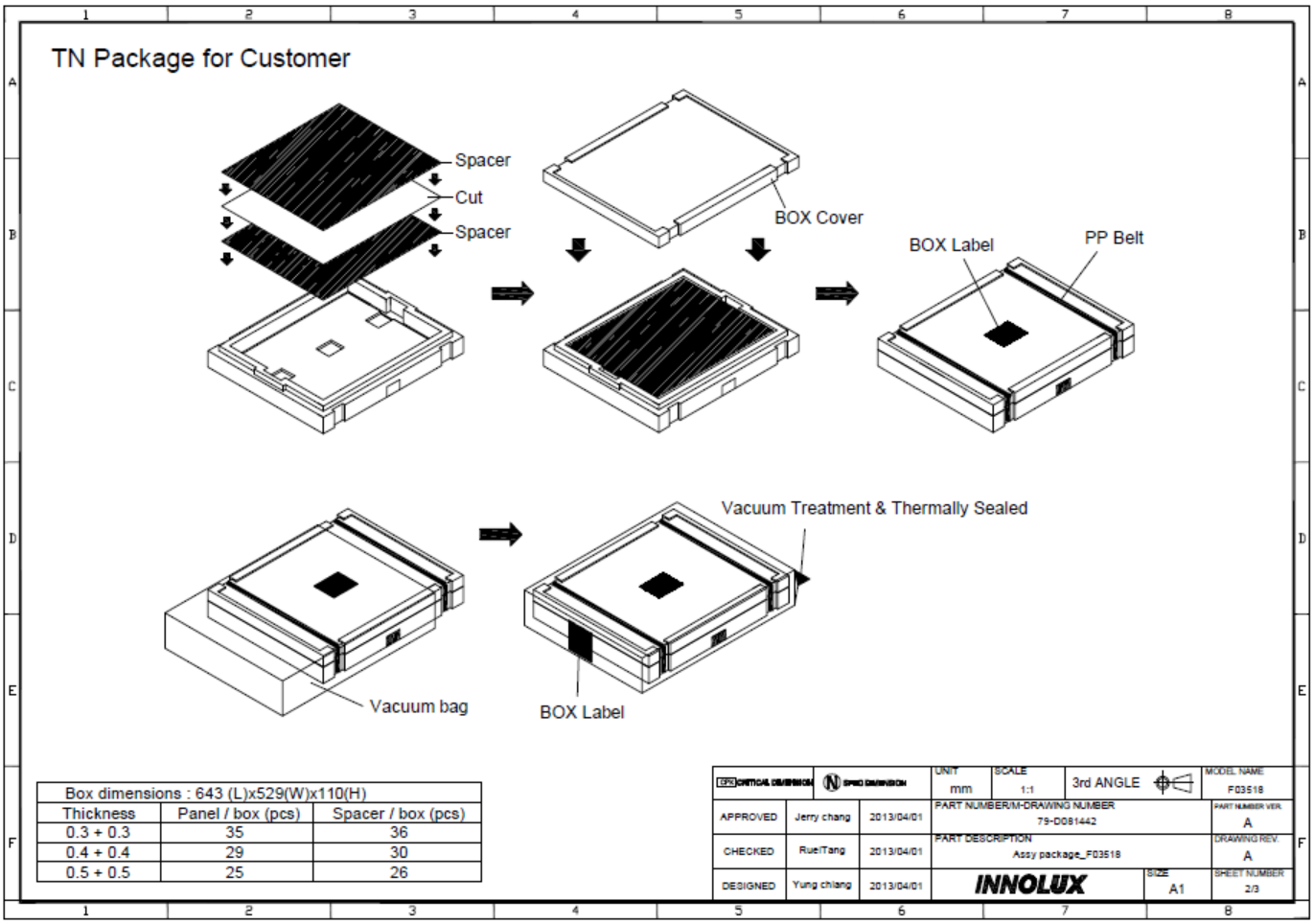
(2) All judgments of display are performed after temp of panel returns to room temperature

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

(4) Under no condensation of dew

8. PACKAGE FORM

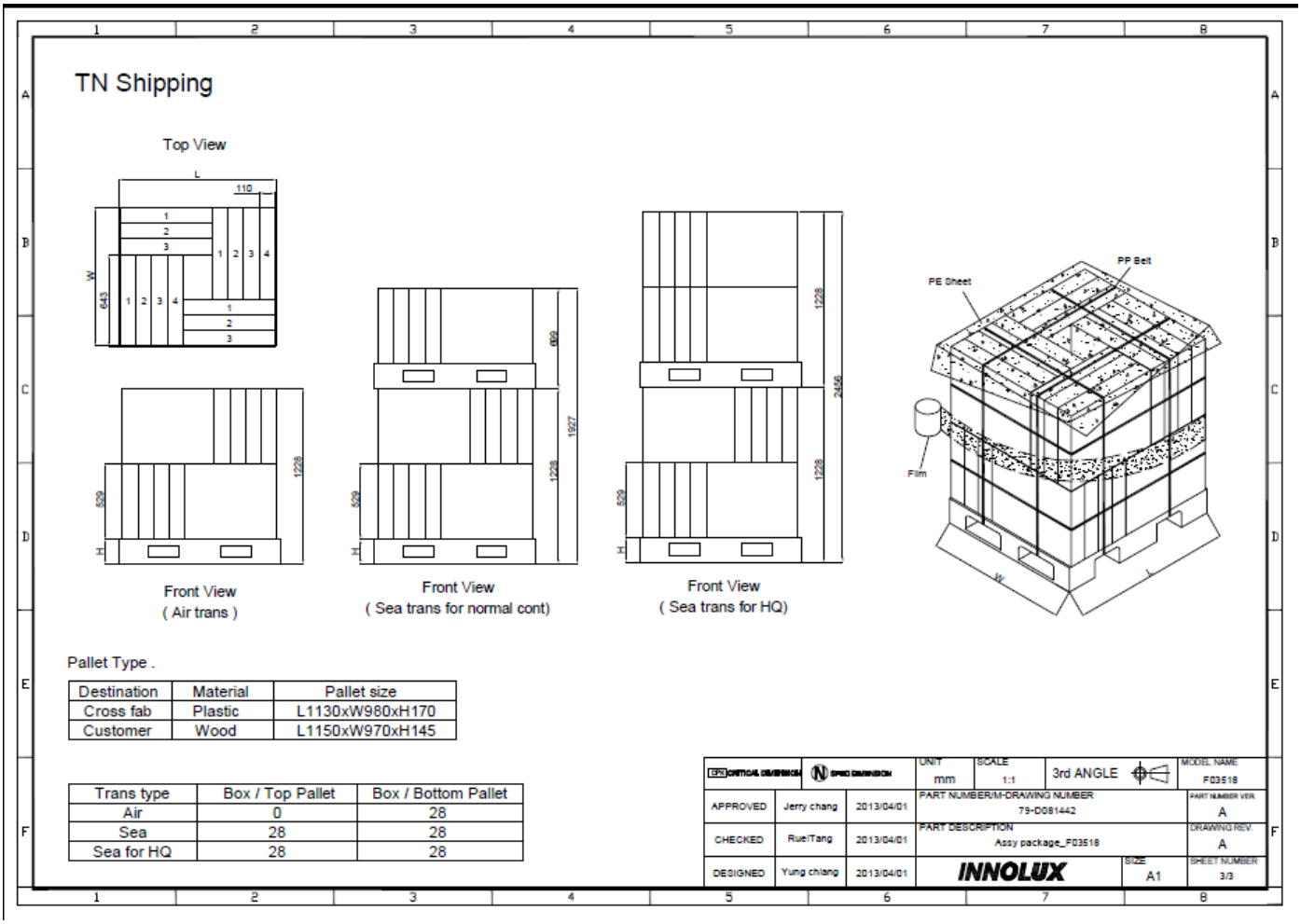
8.1 PACKAGE



Box dimensions : 643 (L)x529(W)x110(H)		
Thickness	Panel / box (pcs)	Spacer / box (pcs)
0.3 + 0.3	35	36
0.4 + 0.4	29	30
0.5 + 0.5	25	26

UNIT: mm	SCALE: 1:1	3rd ANGLE			MODEL NAME: F03518
APPROVED	Jerry chang	2013/04/01	PART NUMBER/M-DRAWING NUMBER: 79-D081442		PART NUMBER VER.: A
CHECKED	RuelTang	2013/04/01	PART DESCRIPTION: Assy package_F03518		DRAWING REV.: A
DESIGNED	Yung chiang	2013/04/01	INNOLUX	SIZE: A1	SHEET NUMBER: 2/3

8.2 PALLET



Pallet Type .

Destination	Material	Pallet size
Cross fab	Plastic	L1130xW980xH170
Customer	Wood	L1150xW970xH145

Trans type	Box / Top Pallet	Box / Bottom Pallet
Air	0	28
Sea	28	28
Sea for HQ	28	28

CRITICAL DIMENSION	SPEC DIMENSION	UNIT: mm	SCALE: 1:1	3rd ANGLE	MODEL NAME: F03518	
APPROVED	Jerry chang	2013/04/01	PART NUMBER/M-DRAWING NUMBER: 79-D081442		PART NUMBER VER.: A	
CHECKED	RuelTang	2013/04/01	PART DESCRIPTION: Assy package_F03518		DRAWING REV.: A	
DESIGNED	Yung chiang	2013/04/01	INNOLUX	SIZE: A1	SHEET NUMBER: 3/3	