

Doc. Number:

- ☐ Tentative Specification
☐ Preliminary Specification
☒ Approval Specification

MODEL NO.: AT043TN24

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
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REVISION HISTORY

Version	Date	Page (New)	Section	Description
Ver. 0.0	2017/02/08	All	All	Product spec was first issued for LCD cut.
Ver. 2.0	2018/09/06	All	All	Product spec was changed to Ver. 2.0

1.PURPOSE

The specification AT043TN24 is a 4.3" 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 white mode a-Si TFT-LCD product.

2.GENERAL RULES OF SINGLE PANEL

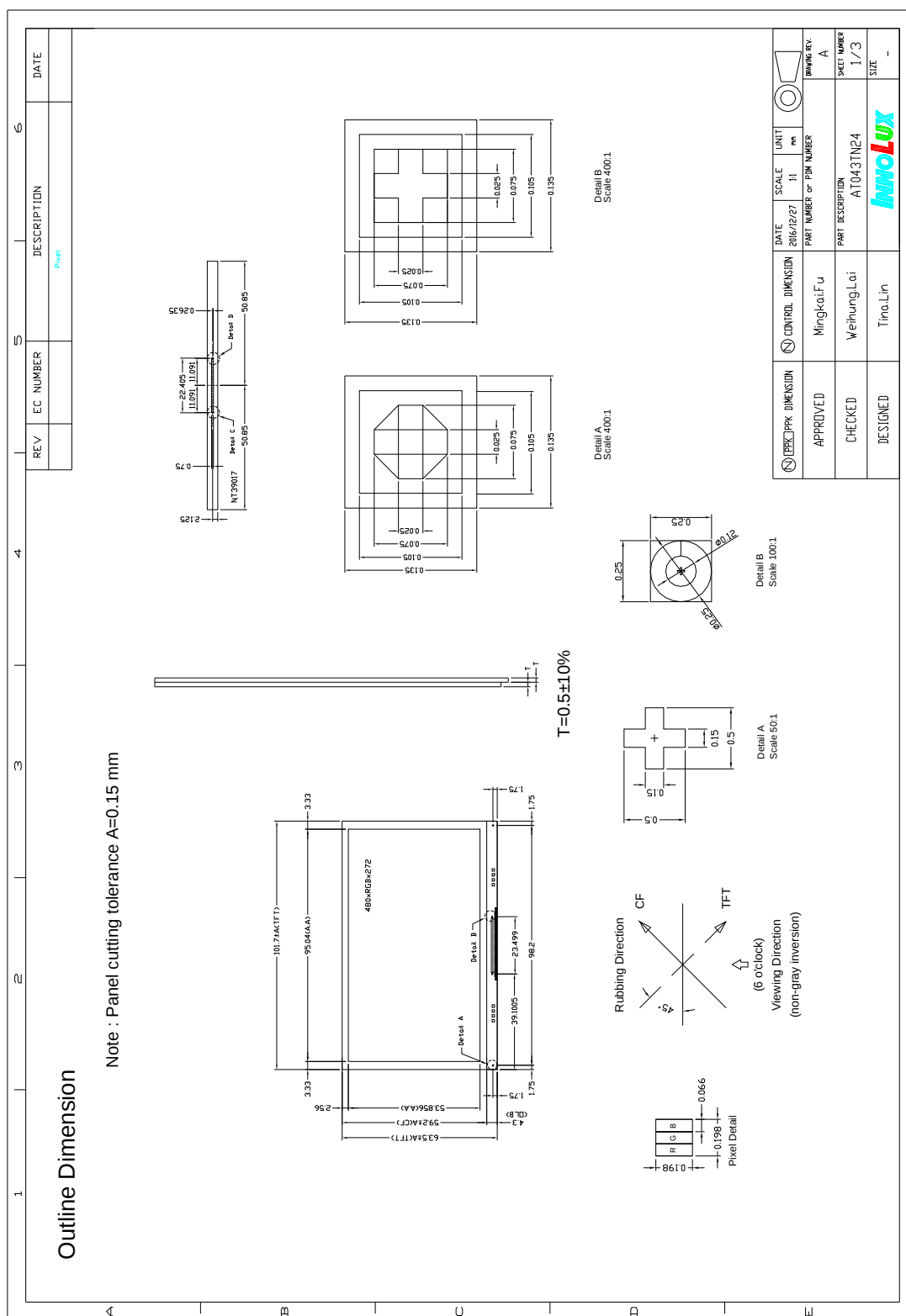
2.1 GENERAL SPECIFICATION

No.	Item		Specification	unit
1	Glass thickness	TFT	0.5	mm
		CF	0.5	
2	Shipping mode		Cut	-
3	Shipping size		535(H) x 320.3(V)x 1.0(D)	mm
4	Panel outline dimension		101.7(H) x 63.5(V) x 1.0(D)	mm
5	Active screen size		4.3 inch(Diagonal)	-
6	Resolution		a-Si TFT active matrix	pixel
7	Pixel driving element		480 x (RGB) x 272	-
8	Sub pixel size		66(H) x 198(V)	um
9	Pixel arrangement		RGB-stripe	-
10	View direction (Gray inversion)		TN (6 o'clock)	-
11	Cell gap		4.0 ± 0.2	um
12	Driver IC		NT39017 (TTL)	-
13	Weight without POL		1200 ± 10%	g

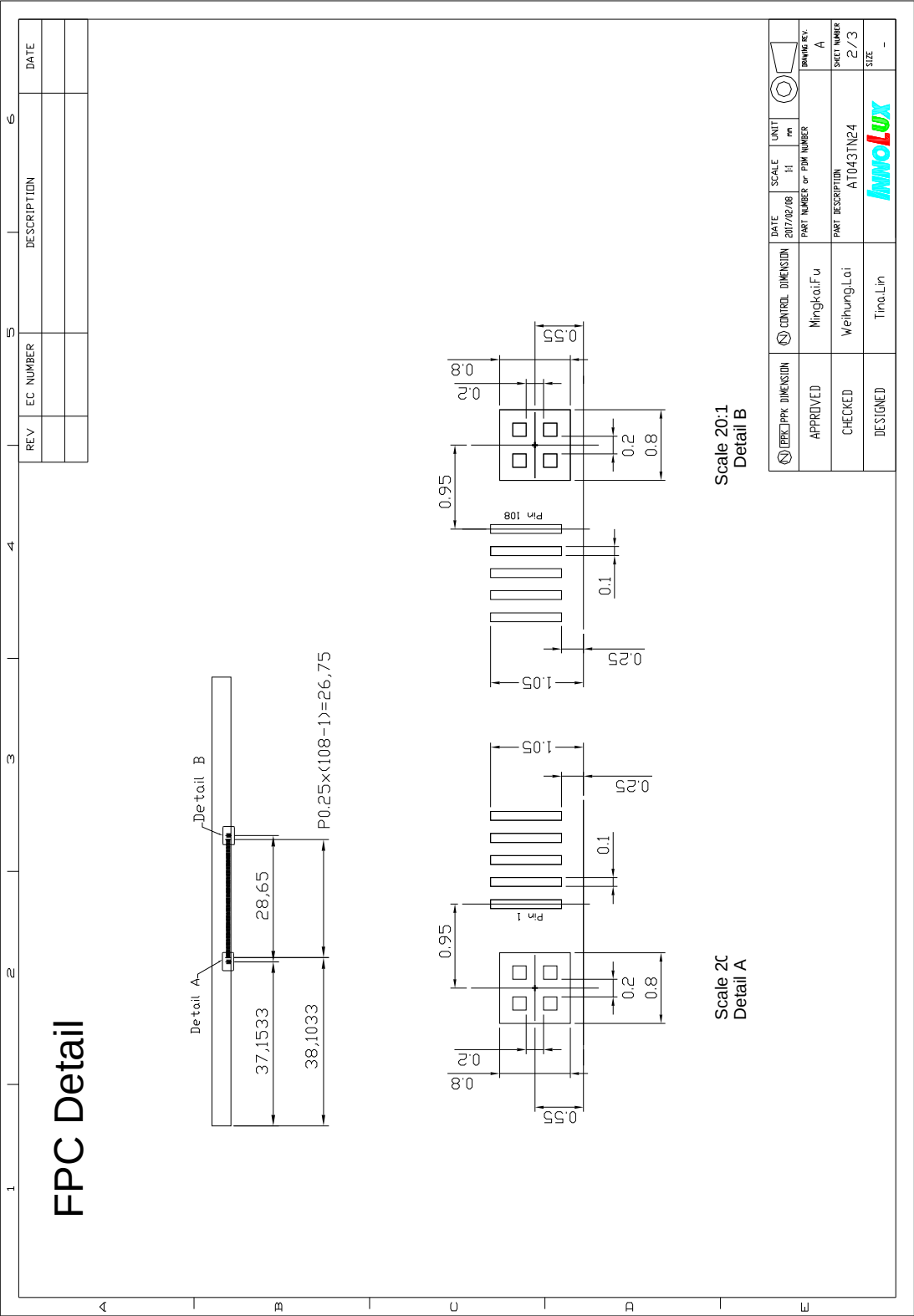
<Note> 1. This model is designed by the driver IC with bumping compensation.

2.2 DIMENSION

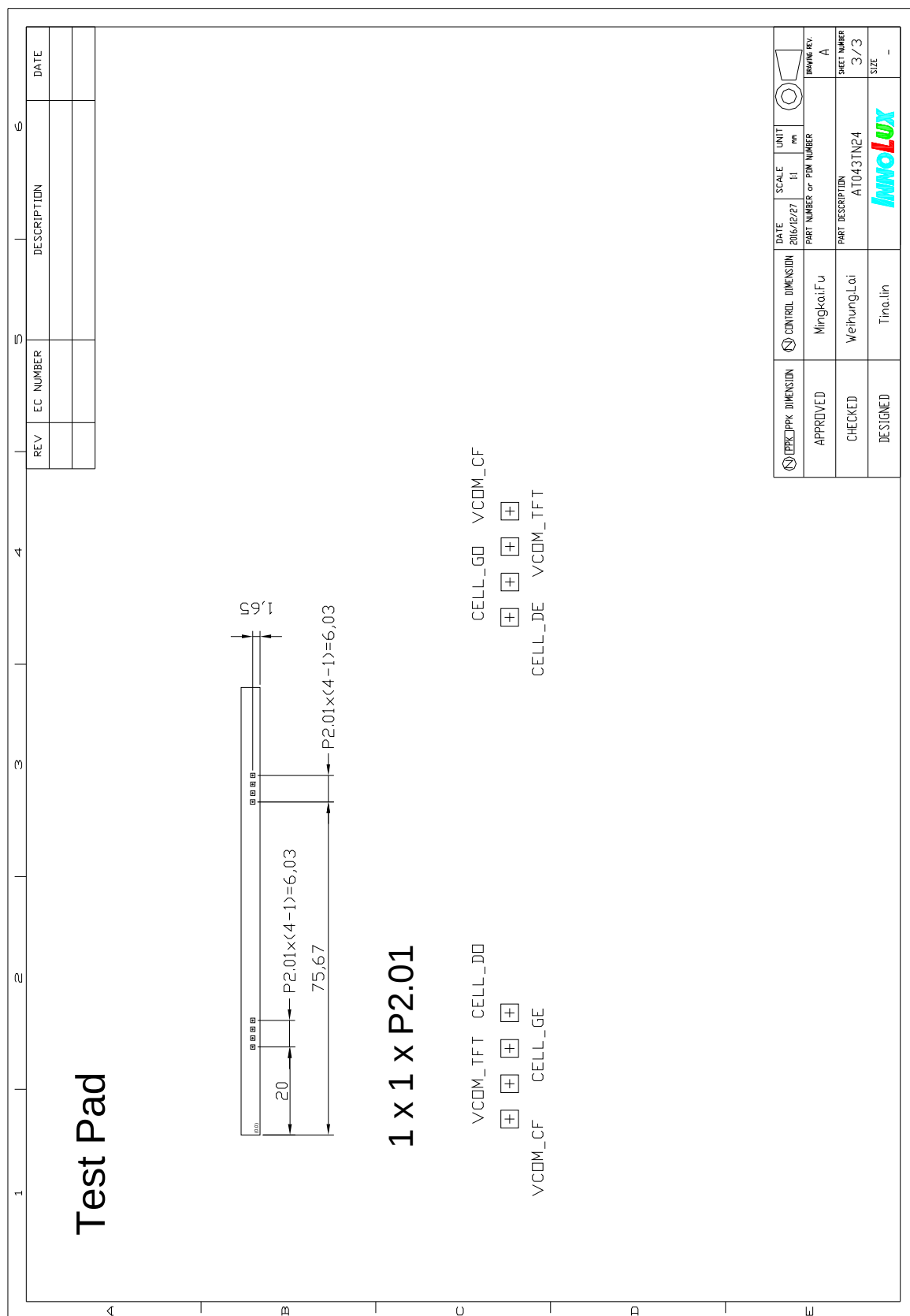
2.2.1 OUTLINE DIMENSION



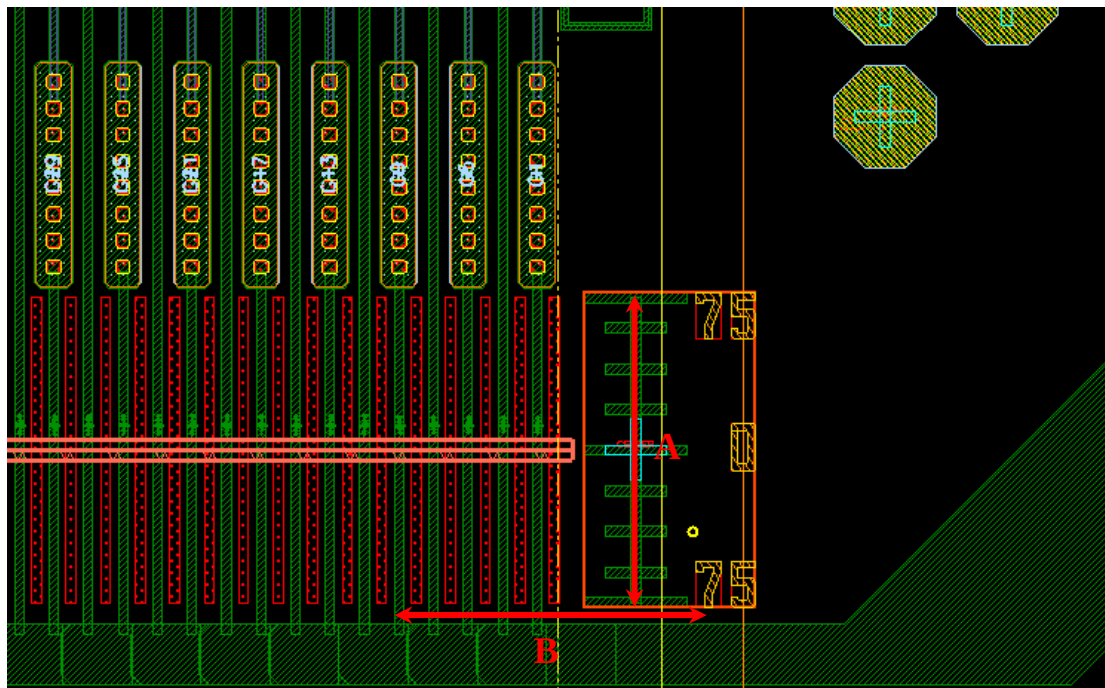
2.2.2 FPC DETAIL



2.2.3 TEST PAD



2.2.4 LASER CUT



Item	Spec (um)
<u>Laser cut 高度(A)</u>	± 75
<u>Laser cut 最外圍 pin 到訊號線距離 (B)</u>	$\underline{150}$

3. PIN ASSIGNMENT

3.1 FPC/IC PIN ASSIGNMENT TABLE

Pad No.	Pad Name	Connect to	FPC Pin Name	FPC Pin No.
	NT39017			
x	x	Panel_VCOM	CF_VCOM_84	1
x	x	Panel_VCOM	CF_VCOM_83	2
x	x	Panel_VCOM	TFT_VCOM_82	3
x	x	Panel_VCOM	TFT_VCOM_81	4
1	DUM2_175	x	x	x
2	SHIELDING11_174	x	x	x
3	VGL_173	FPC	VGL_80	5
4	VGL_172	FPC		
5	VGL_171	FPC		
6	C4M_170	FPC	C4M_79	6
7	C4M_169	FPC		
8	C4P_168	FPC	C4P_78	7
9	C4P_167	FPC		
10	VGH_166	FPC	VGH_77	8
11	VGH_165	FPC		
12	VGH_164	FPC		
13	C3M_163	FPC	C3M_76	9
14	C3M_162	FPC		
15	C3P_161	FPC	C3P_75	10
16	C3P_160	FPC		
17	SHIELDING10_159	x	x	x
18	VINT2_158	FPC	VINT2_74	11
19	VINT2_157	FPC		
20	VINT2_156	FPC		
21	C2M_155	FPC	C2M_73	12
22	C2M_154	FPC		
23	C2P_153	FPC	C2P_72	13
24	C2P_152	FPC		
25	PVDD_151	FPC	PVDD_71 PVDD_70	14 15
26	PVDD_150	FPC		
27	PVDD_149	FPC		
28	PVDD_148	FPC		
29	PVDD_147	FPC		
30	PVDD_146	FPC		

31	PVDD_145	FPC		
32	PVDD_144	FPC		
33	C1CM_143	FPC	C1CM_69	16
34	C1CM_142	FPC		
35	C1CM_141	FPC		
36	C1CP_140	FPC	C1CP_68	17
37	C1CP_139	FPC		
38	C1CP_138	FPC		
39	C1BM_137	FPC	C1BM_67	18
40	C1BM_136	FPC		
41	C1BM_135	FPC		
42	C1BP_134	FPC	C1AP_66	19
43	C1BP_133	FPC		
44	C1BP_132	FPC		
45	C1AM_131	FPC	C1AM_65	20
46	C1AM_130	FPC		
47	C1AM_129	FPC		
48	C1AP_128	FPC	C1AP_64	21
49	C1AP_127	FPC		
50	C1AP_126	FPC		
51	COM2_L_125	FPC	TFT_VCOM_63 TFT_VCOM_62	22
52	COM2_L_124	FPC		23
53	PGND_123	FPC	PGND_61 PGND_60	24 25
54	PGND_122	FPC		
55	PGND_121	FPC		
56	PGND_120	FPC		
57	PGND_119	FPC		
58	PGND_118	FPC		
59	PGND_117	FPC		
60	PGND_116	FPC		
61	VINT1_115	FPC	VINT1_59 VINT1_58	26 27
62	VINT1_114	FPC		
63	VINT1_113	FPC		
64	VINT1_112	FPC		
65	VINT1_111	FPC		
66	VINT1_110	FPC		
67	C5P_109	FPC	C5P_57	28
68	C5P_108	FPC		

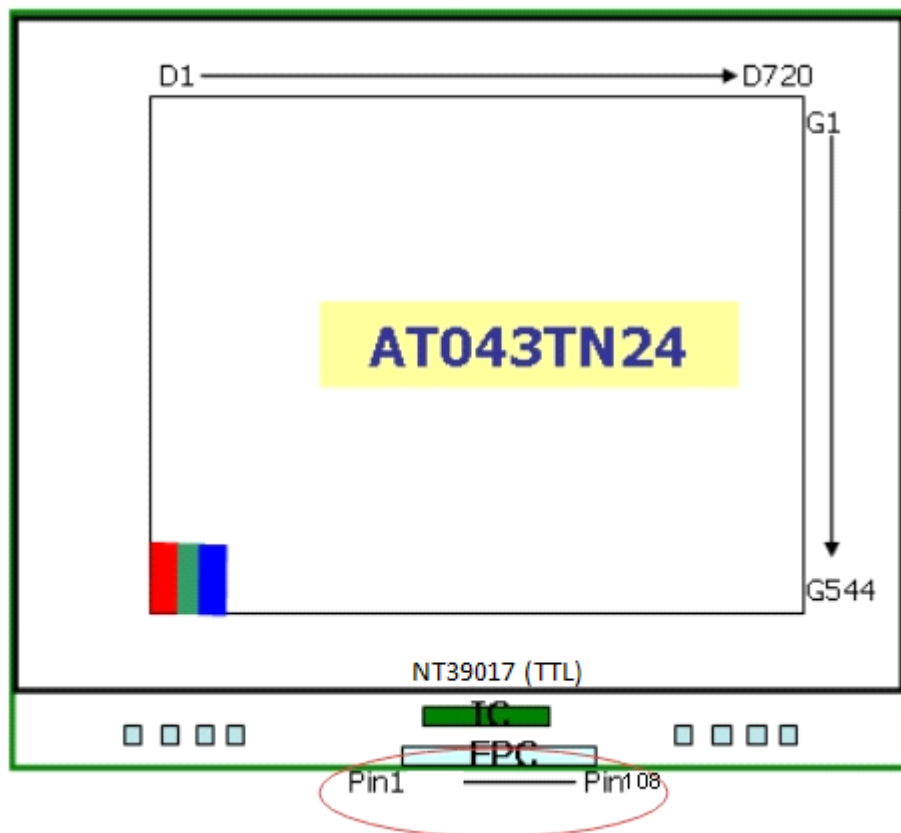
69	C5P_107	FPC		
70	C5M_106	FPC	C5M_56	29
71	C5M_105	FPC		
72	C5M_104	FPC		
73	VINT3_103	FPC	VINT3_55	30
74	VINT3_102	FPC		
75	VINT3_101	FPC		
76	VINT3_100	FPC		
77	SHIELDING9_99	x	x	x
78	AGND_98	FPC	AGND_54 AGND_53	31 32
79	AGND_97	FPC		
80	AGND_96	FPC		
81	AGND_95	FPC		
82	AGND_94	FPC		
83	AGND_93	FPC		
84	AVDD_92	FPC	AVDD_52 AVDD_51	33 34
85	AVDD_91	FPC		
86	AVDD_90	FPC		
87	AVDD_89	FPC		
88	AVDD_88	FPC		
89	AVDD_87	FPC		
90	SHIELDING8_86	x	x	x
91	DB7	FPC	DB7	35
92	DB6	FPC	DB6	36
93	DB5	FPC	DB5	37
94	DB4	FPC	DB4	38
95	DB3	FPC	DB3	39
96	DB2	FPC	DB2	40
97	DB1	FPC	DB1	41
98	DB0	FPC	DB0	42
99	DG7	FPC	DG7	43
100	DG6	FPC	DG6	44
101	DG5	FPC	DG5	45
102	DG4	FPC	DG4	46
103	DG3	FPC	DG3	47
104	DG2	FPC	DG2	48
105	DG1	FPC	DG1	49
106	DG0	FPC	DG0	50

107	DR7	FPC	DR7	51
108	DR6	FPC	DR6	52
109	DR5	FPC	DR5	53
110	DR4	FPC	DR4	54
111	DR3	FPC	DR3	55
112	DR2	FPC	DR2	56
113	DR1	FPC	DR1	57
114	DR0	FPC	DR0	58
115	SHIELDING7_85	x	x	x
116	CPSEL_84	FPC	CPSEL_50	59
117	PINCTL_83	FPC	PINCTL_49	60
118	SHLR_82	FPC	SHLT_48	61
119	UPDN_81	FPC	UPDN_47	62
120	HVDSL_80	FPC	HVDSL_46	63
121	GRB_79	FPC	CRB_45	64
122	STB_78	FPC	STB_44	65
123	SCL_77	FPC	SCL_43	66
124	SDA_76	FPC	SDA_42	67
125	CSB_75	FPC	CSB_41	68
126	PSEL_74	FPC	PSEL_40	69
127	DEN_73	FPC	DEN_39	70
128	DCLK_72	FPC	DCLK_38	71
129	HSD_71	FPC	HSD_37	72
130	VSD_70	FPC	VSD_36	73
131	VDD_69	FPC	VDD_35	74
132	VDD_68	FPC		
133	VDD_67	FPC		
134	VDDIO_66	FPC	VDDIO_34	75
135	VDDIO_65	FPC		
136	VDDIO_64	FPC		
137	VCC_63	FPC	VCC_33	76
138	VCC_62	FPC		
139	VCC_61	FPC		
140	GND_60	FPC	GND_32	77
141	GND_59	FPC		
142	GND_58	FPC		
143	DRV_57	FPC	DRV_31	78
144	DRV_56	FPC		

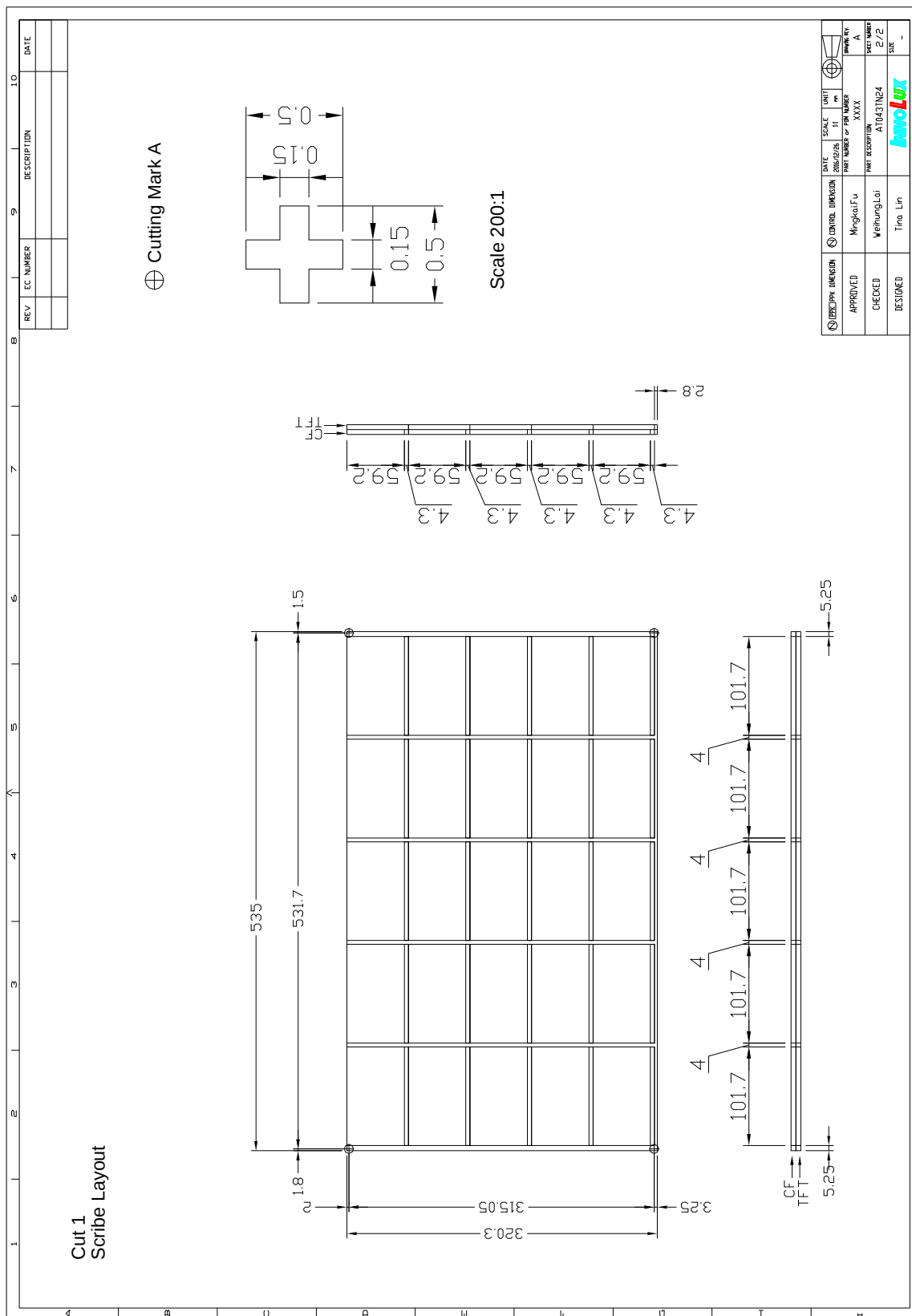
145	SHIELDING6_55	FPC	SHIDLEING_30	79
146	FB_54	FPC	FB_29	80
147	SHIELDING5_53	FPC	SHIDLEING_28	81
148	VCC25_52	FPC	VCC25_27	82
149	VCC25_51	FPC		
150	VCC25_50	FPC		
151	VCOM_49	FPC	VCOM_26 VCOM_25	83 84
152	VCOM_48	FPC		
153	VCOM_47	FPC		
154	VCOM_46	FPC		
155	VCOM_45	FPC		
156	VCOM_44	FPC		
157	VCOML_43	FPC	VCOML_24	85
158	VCOML_42	FPC		
159	VCOML_41	FPC		
160	VCOMH_40	FPC	VCOMH_23	86
161	VCOMH_39	FPC		
162	VCOMH_38	FPC		
163	SHIELDING4_37	FPC	SHIDLEING_22	87
164	COM1_L_36	FPC	TFT_VCOM_21 TFT_VCOM_20	88
165	COM1_L_35	FPC		89
166	SHIELDING3_34	FPC	SHIDLEING_19	90
167	VDD_OTP_33	FPC	VDD_OTP_18	91
168	VDD_OTP_32	FPC		
169	VDD_OTP_31	FPC		
170	TCSW1	FPC	TCSW1_17	92
171	TCSW0	FPC	TCSW0_16	93
172	TB1	FPC	TB1_15	94
173	TB0	FPC	TB0_14	95
174	CLKPOL_30	FPC	CLKPOL_13	96
175	HSDPOL_29	FPC	HSDPOL_12	97
176	VSDPOL_28	FPC	VSDPOL_11	98
177	DITHB_27	FPC	DITHB_10	99
178	FPOL_26	FPC	FPOL_9	100
179	SHDB_25	FPC	SHDB_8	101
180	EXT_PWR_24	FPC	EXT_PWR_7	102
181	LHL_23	FPC	LHL_6	103

182	TB3	x	x	x
183	TB2	FPC	TB2_5	104
184	TM3	x	x	x
185	TM2	x	x	x
186	TM1	x	x	x
187	TM0	x	x	x
188	TP10	x	x	x
189	TP09	x	x	x
190	TP08	x	x	x
191	TP07	x	x	x
192	TP06	x	x	x
193	TP05	x	x	x
194	TP04	x	x	x
195	TP03	x	x	x
196	TP02	x	x	x
197	TP01	x	x	x
198	TP00	x	x	x
199	SHIELDING1_22	x	x	x
200	DUM1_21	x	x	x
x.		Panel_VCOM	TFT_VCOM_4	105
x.		Panel_VCOM	TFT_VCOM_3	106
x.		Panel_VCOM	CF_VCOM_2	107
x.		Panel_VCOM	CF_VCOM_1	108

3.2 SCHEMATIC PANEL LAYOUT



4. CELL SCRIBE



5. 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	1.25	1.3	1.35	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°C

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

	Black	White	G64	G127	G192
Vdata+	4.9	0.5	2.87	2.35	1.96
Vdata-	-4.9	-0.5	-2.87	-2.35	-1.96

6. OPTICAL SPECIFICATION

Item		Symbol	Conditions	Specifications			Unit	Note
				Min.	Typ.	Max.		
Transmittance		T%	Viewing normal angle $x = y$ $=0$	5.58	6.39	-	%	All left side data are based on INX's following condition – 1.LC : TN LC 2.Light Source : C light 3.Film : CF NWF-LR-SEGAGS1(霧面) TFT NWF-LR-SEGAGS1(霧面) 4.Machine : DMS 803 5.VLC dark = 4.9V VLC white = 0.5V
Contrast Ratio		CR		400	500	-	-	
Response Time (by Quick)		$T_{on} + T_{off}$		-	25	50	ms	
Viewing Angle	Hor.	x+	- Center CR>10	60	70	-	deg.	
		x-		60	70	-		
	Ver.	y+		40	50	-		
		y-		60	70	-		
CF only Color Chromaticity (CIE 1931)	Red	Rx	Viewing normal angle $x = y$ $=0$	0.556	0.586	0.616	-	1.Under C light Simulation 2.NTSC 50%
		Ry		0.283	0.313	0.343	-	
	Green	Gx		0.281	0.311	0.341	-	
		Gy		0.530	0.560	0.590	-	
	Blue	Bx		0.107	0.137	0.167	-	
		By		0.090	0.120	0.150	-	
	White	Wx		0.284	0.314	0.344	-	
		Wy		0.301	0.331	0.361	-	

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

The contrast ratio can be calculated by the following expression.

Contrast Ratio (CR) = L_{63} / L_0

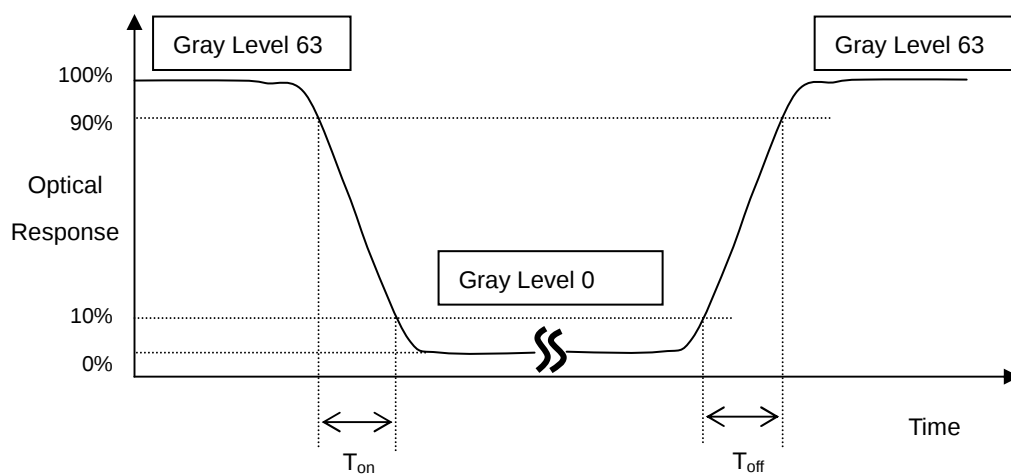
L63: Luminance of gray level 63

L 0: Luminance of gray level 0

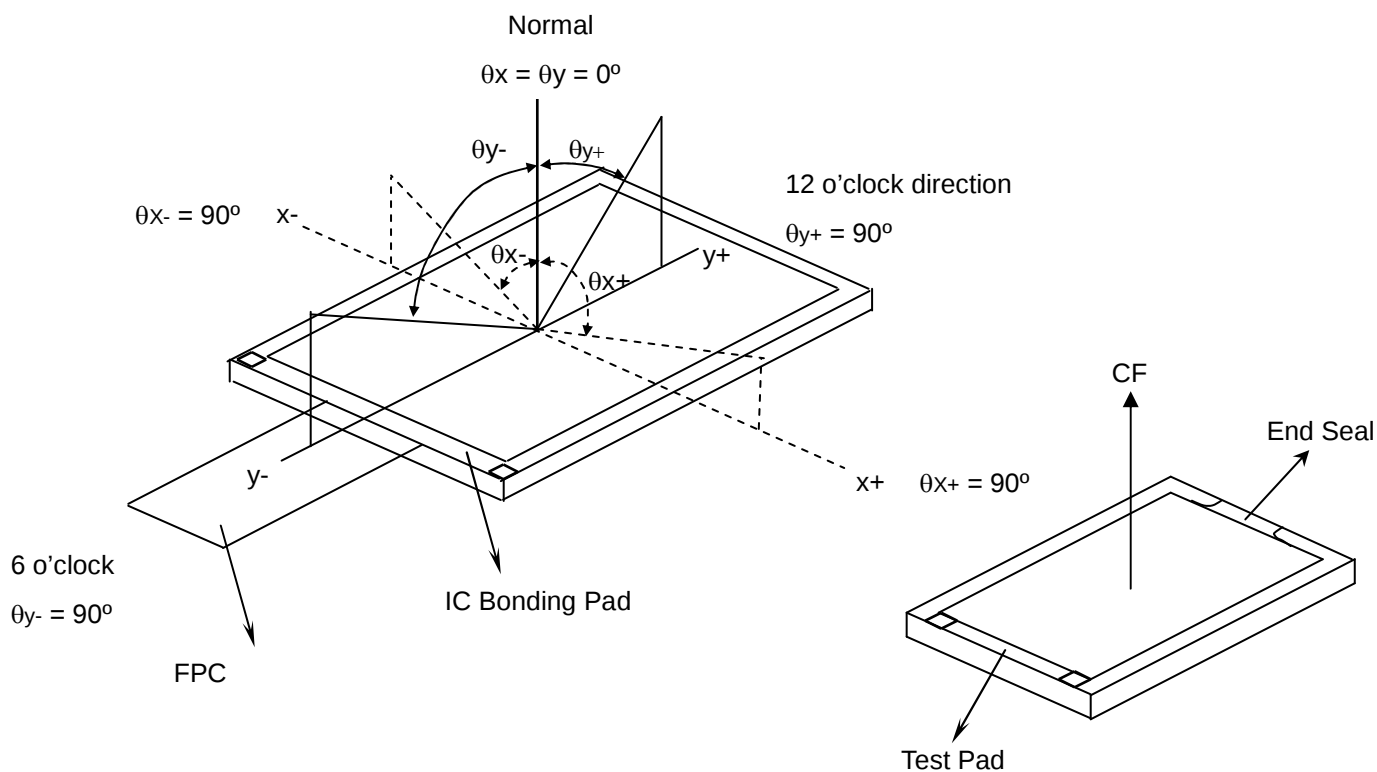
CR = CR (5)

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}):

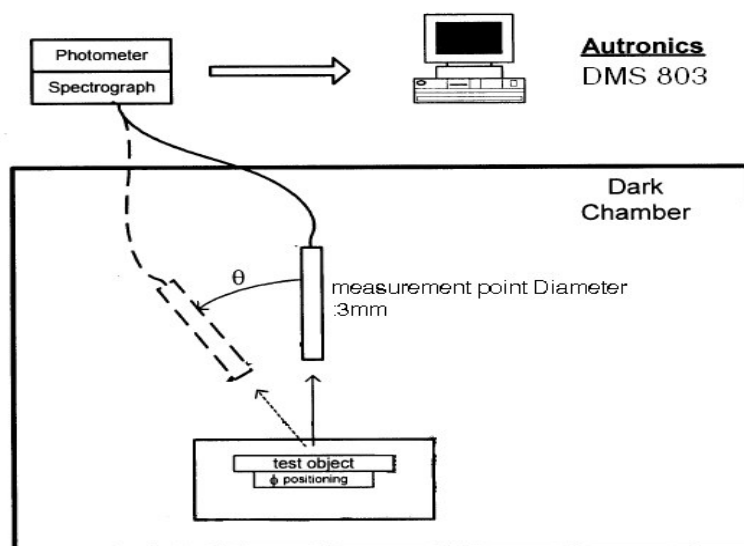


*Note(3) Definition of Viewing Angle

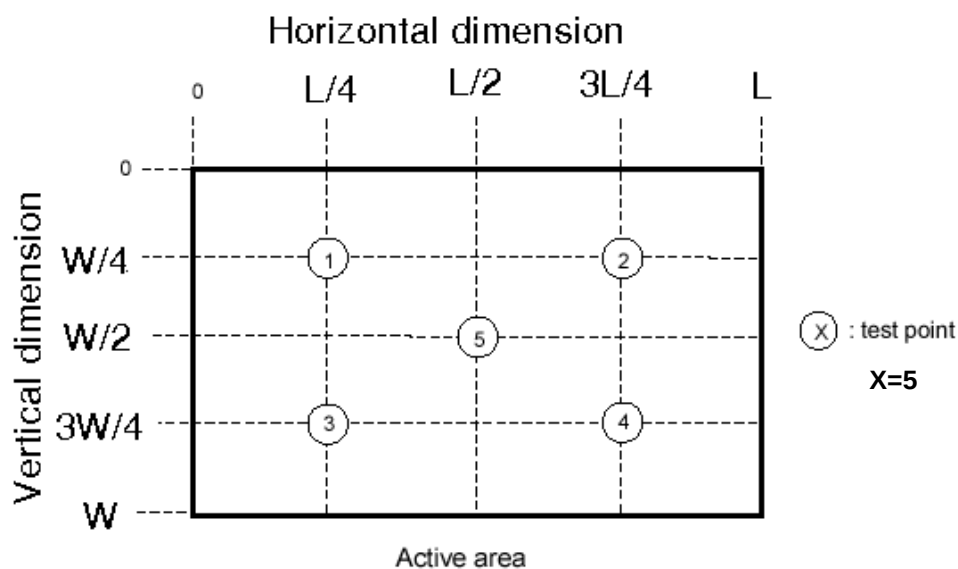


***Note (4) Measurement Set-Up:**

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)**



7. RELIABILITY SPECIFICATION

Test Items	Test Conditions	Check Time
High Temperature Storage	Ta=+70°C	240 hours
Low Temperature Storage	Ta=-20°C	240 hours
High Temperature Operation	Ts=+60°C	240 hours
Low Temperature Operation	Ts=-10°C	240 hours
High Temperature Humidity Operation Test	Ts=+50°C , 80%RH	240 hours

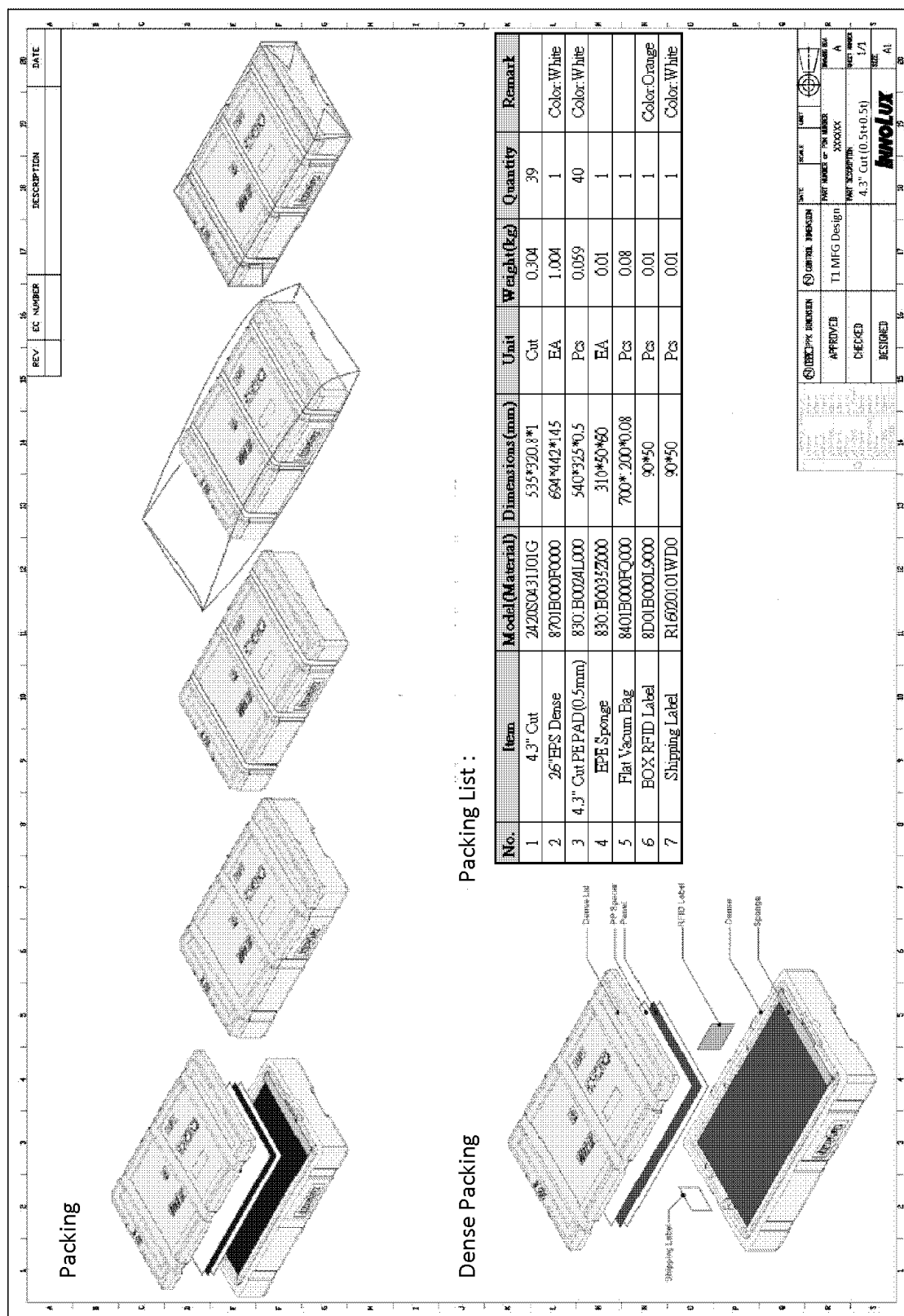
***** Ta= Ambient Temperature , Ts = Surface Temperature

Note:

1. The test samples have recovery time for 2 hours at room temperature before the function check. In the standard conditions, there is no display function NG issue occurred.
2. After the reliability test, the product only guarantees operation, but don't guarantee all of the cosmetic specification.

8. PACKAGE FORM

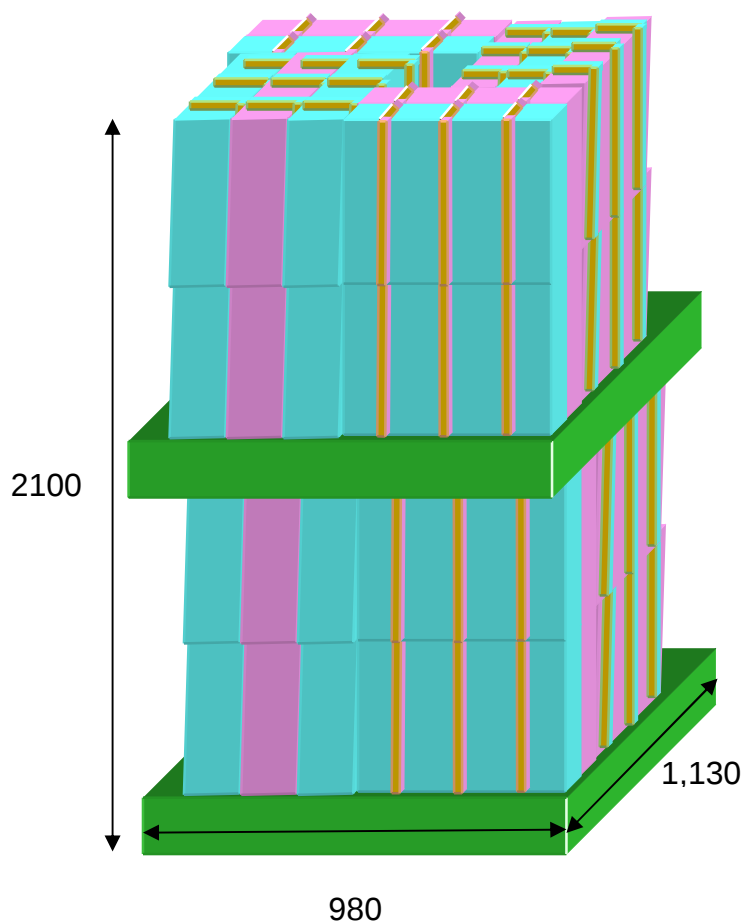
8.1 CELL PACKAGE



8.2 PALLET PACKAGE

4.3"裝載方式

箱型：1MG



外箱尺寸	滿箱Panel數	滿箱PE數	單層堆疊	堆疊層數	總堆疊箱數
694*442*145	25	34	10	2	20