

**Doc. Number:**

- ☐ Tentative Specification  
☐ Preliminary Specification  
☒ Approval Specification

**MODEL NO : F050A04-601**

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
<b>JAY.HSU</b>	<b>SOPHIE.CHANG</b>	<b>PANNY.CHANG</b>

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## REVISION HISTORY

Version	Date	Page (New)	Section	Description
Ver. 0.0	2019/11/08	All	All	Product spec was first issued for LCD cut.
Ver. 1.0	2019/12/02	All	All	Version update.
Ver. 2.0	2020/02/27	All	All	Version update.
Ver. 2.1	2020/09/08	All	All	Version update

## 1. PURPOSE

The specification F050A04-601 is a 4.96" a-Si TFT Liquid Crystal Display ODF cell. The ODF 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

	Item		Specification	unit
1	Glass thickness	TFT	0.5	mm
		CF	0.5	
2	Shipping mode		Cut	-
3	Shipping size		453.72mm (H) x 358.8 (V) x 1.0 (D)	mm
4	Panel outline dimension		115.6 (H) x 74.38 (V) x 1.0(D)	mm
5	Active screen size		108.0(H) x 64.8(V)	mm
6	Resolution		800RGB x 480	pixel
7	Pixel driving element		a-Si TFT	-
8	Sub pixel size		45.0 x 135.0	um
9	Pixel arrangement		RGB-Stripe	-
10	View direction (Gray inversion)		6 o'clock	-
11	Cell gap		4.0 ± 0.3	um
12	Driver IC		Source IC: ILI6137 <Note2> Gate IC: ILI5960 <Note3>	-
13	Weight without POL		232.9 ± 10%	g

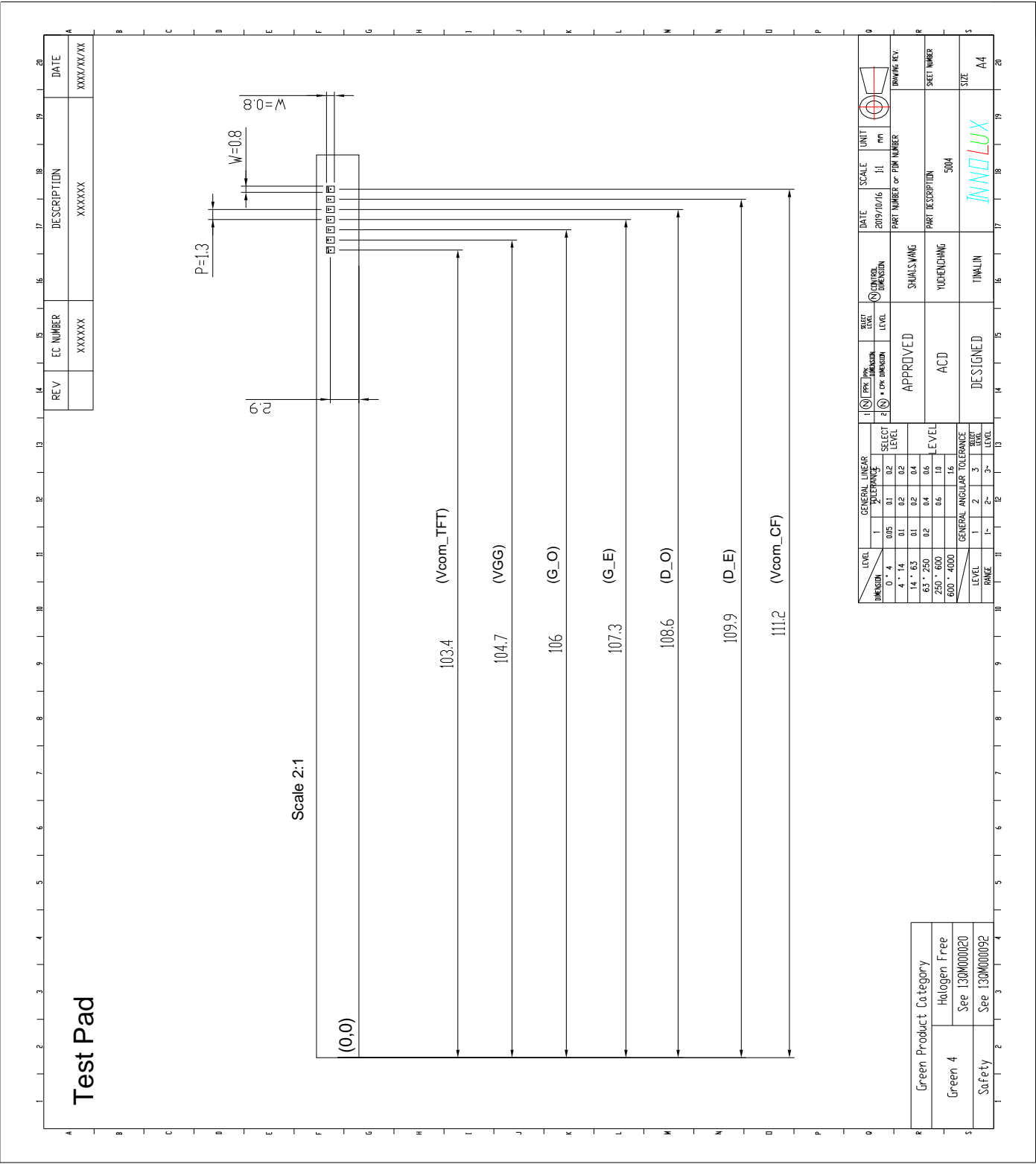
<<Note> 1. This model is designed by the driver IC with bumping compensation.

2. Compatible IC : EK9173 / HX8264 / ILI6122 / ST5623

3. Compatible IC : EK73002 / HX8664 / ST5091

### 2.2.1 OUTLINE DIMENSION





## 3. PIN ASSIGNMENT

### 3.1 FPC/IC PIN ASSIGNMENT TABLE

Pad No.	Pad Name	Connect to	FPC Pin Name	FPC Pin No.
	ILI6137			
X	X	X	DUMMY	108
X	X	Panel_VCOM	VCOM_CF_107	107
X	X	Panel_VCOM	VCOM_CF_106	106
X	X	FPC	VGL	105
X	X	Panel_VCOM	VCOM_TFT_104	104
1	SHIELDING	X	X	X
2	SHIELDING	X	X	X
3	SHIELDING	X	X	X
4	SHIELDING	X	X	X
5	COM1_B	X	X	X
6	COM1_B	X	X	X
7	SHIELDING	X	X	X
8	SHIELDING	X	X	X
9	AGND	FPC	AGND_103	103
10	AGND	FPC		
11	AGND	FPC	AGND_102	102
12	AGND	FPC		
13	SHIELDING	X	X	X
14	FB (Reserved)	X	X	X
15	FB (Reserved)	X	X	X
16	SHIELDING	X	X	X
17	DRV (Reserved)	X	X	X
18	DRV (Reserved)	X	X	X
19	TP0	X	X	X
20	TP0	X	X	X
21	TP1	X	X	X
22	TP1	X	X	X
23	TP2	X	X	X
24	TP2	X	X	X
25	TP3	X	X	X
26	TP3	X	X	X
27	TP4	X	X	X
28	TP4	X	X	X
29	Dummy	X	X	X



30	REV	X	X	X
31	SHIELDING	X	X	X
32	INVSEL	X	X	X
33	INVSEL	X	X	X
34	SHIELDING	X	X	X
35	CABC_EN	FPC	TB1_101	101
36	CABC_EN	FPC		
37	SHIELDING	X	X	X
38	PWM_EN (Reserved)	X	X	X
39	PWM_EN (Reserved)	X	X	X
40	SHIELDING	X	X	X
41	CSX	FPC	TB2_100	100
42	CSX	FPC		
43	SHIELDING	X	X	X
44	SCL/DBC[0]	FPC	TB3_99	99
45	SCL/DBC[0]	FPC		
46	SHIELDING	X	X	X
47	SDA/DBC[1]	FPC	TB4_98	98
48	SDA/DBC[1]	FPC		
49	SHIELDING	X	X	X
50	SHIELDING	X	X	X
51	GOSEQ	FPC	GOSEQ_97	97
52	GOSEQ	FPC		
53	SHIELDING	X	X	X
54	BIST	FPC	BIST_96	96
55	BIST	FPC		
56	SHIELDING	X	X	X
57	RES0	FPC	RES0_95	95
58	RES0	FPC		
59	SHIELDING	X	X	X
60	DBC/3	FPC	CFSEL_94	94
61	DBC/3	FPC		
62	SHIELDING	X	X	X
63	CLKPOL	FPC	CLKPOL_93	93
64	CLKPOL	FPC		
65	SHIELDING	X	X	X
66	DITHB	FPC	DITHB_92	92
67	DITHB	FPC		
68	SHIELDING	X	X	X

69	MODE	FPC	MODE_91	91
70	MODE	FPC		
71	SHIELDING	X	X	X
72	SHLR	FPC	SHLR_90	90
73	SHLR	FPC		
74	SHIELDING	X	X	X
75	UPDN	FPC	UPDN_89	89
76	UPDN	FPC		
77	SHIELDING	X	X	X
78	STBYB	FPC	STBYB_88	88
79	STBYB	FPC		
80	SHIELDING	X	X	X
81	RSTB	FPC	RSTB_87	87
82	RSTB	FPC		
83	SHIELDING	X	X	X
84	BLKEN	FPC	BLKEN_86	86
85	BLKEN	FPC		
86	SHIELDING	X	X	X
87	VSET	FPC	VSET_85	85
88	VSET	FPC		
89	TP6	X	X	X
90	TP6	X	X	X
91	TP7	X	X	X
92	TP7	X	X	X
93	TP8	X	X	X
94	TP8	X	X	X
95	TP9	X	X	X
96	TP9	X	X	X
97	TP10	X	X	X
98	Dummy	FPC	GND_84	84
99	DCMP_EN	FPC	DCMP_EN_83	83
100	DUMMY	FPC	VCC_82	82
101	SHIELDING	X	X	X
102	AVDD	FPC	AVDD_81	81
103	AVDD	FPC		
104	AVDD	FPC		
105	AVDD	FPC		
106	AVDD	FPC	AVDD_80	80
107	AVDD	FPC		

108	AVDD	FPC		
109	AVDD	FPC		
110	SHIELDING	X	X	X
111	V1	FPC	V1_79	79
112	V1	FPC		
113	SHIELDING	X	X	X
114	V2	FPC	V2_78	78
115	V2	FPC		
116	SHIELDING	X	X	X
117	V3	FPC	V3_77	77
118	V3	FPC		
119	SHIELDING	X	X	X
120	V4	FPC	V4_76	76
121	V4	FPC		
122	SHIELDING	X	X	X
123	V5	FPC	V5_75	75
124	V5	FPC		
125	SHIELDING	X	X	X
126	V6	FPC	V6_74	74
127	V6	FPC		
128	SHIELDING	X	X	X
129	V7	FPC	V7_73	73
130	V7	FPC		
131	SHIELDING	X	X	X
132	V8	FPC	V8_72	72
133	V8	FPC		
134	SHIELDING	X	X	X
135	V9	FPC	V9_71	71
136	V9	FPC		
137	SHIELDING	X	X	X
138	V10	FPC	V10_70	70
139	V10	FPC		
140	SHIELDING	X	X	X
141	V11	FPC	V11_69	69
142	V11	FPC		
143	SHIELDING	X	X	X
144	V12	FPC	V12_68	68
145	V12	FPC		
146	SHIELDING	X	X	X

147	V13	FPC	V13_67	67
148	V13	FPC		
149	SHIELDING	X	X	X
150	V14	FPC	V14_66	66
151	V14	FPC		
152	SHIELDING	X	X	X
153	AGND	FPC	AGND_65	65
154	AGND	FPC		
155	AGND	FPC		
156	AGND	FPC		
157	AGND	FPC	AGND_64	64
158	AGND	FPC		
159	AGND	FPC		
160	AGND	FPC		
161	SHIELDING	X	X	X
162	SHIELDING	X	X	X
163	GND	FPC	GND_63	63
164	GND	FPC		
165	GND	FPC	GND_62	62
166	GND	FPC		
167	SHIELDING	X	X	X
168	SHIELDING	X	X	X
169	VDD	FPC	VCC_61	61
170	VDD	FPC		
171	VDD	FPC	VCC_60	60
172	VDD	FPC		
173	DASHD	FPC	GND_59	59
174	VSD	FPC	VSD_58	58
175	VSD	FPC		
176	DASHD	FPC	GND_57	57
177	HSD	FPC	HSD_56	56
178	HSD	FPC		
179	DASHD	FPC	GND_55	55
180	DEN	FPC	DEN_54	54
181	DEN	FPC		
182	DASHD	FPC	GND_53	53
183	CLKIN	FPC	CLKIN_52	52
184	CLKIN	FPC		
185	DASHD	FPC	GND_51	51

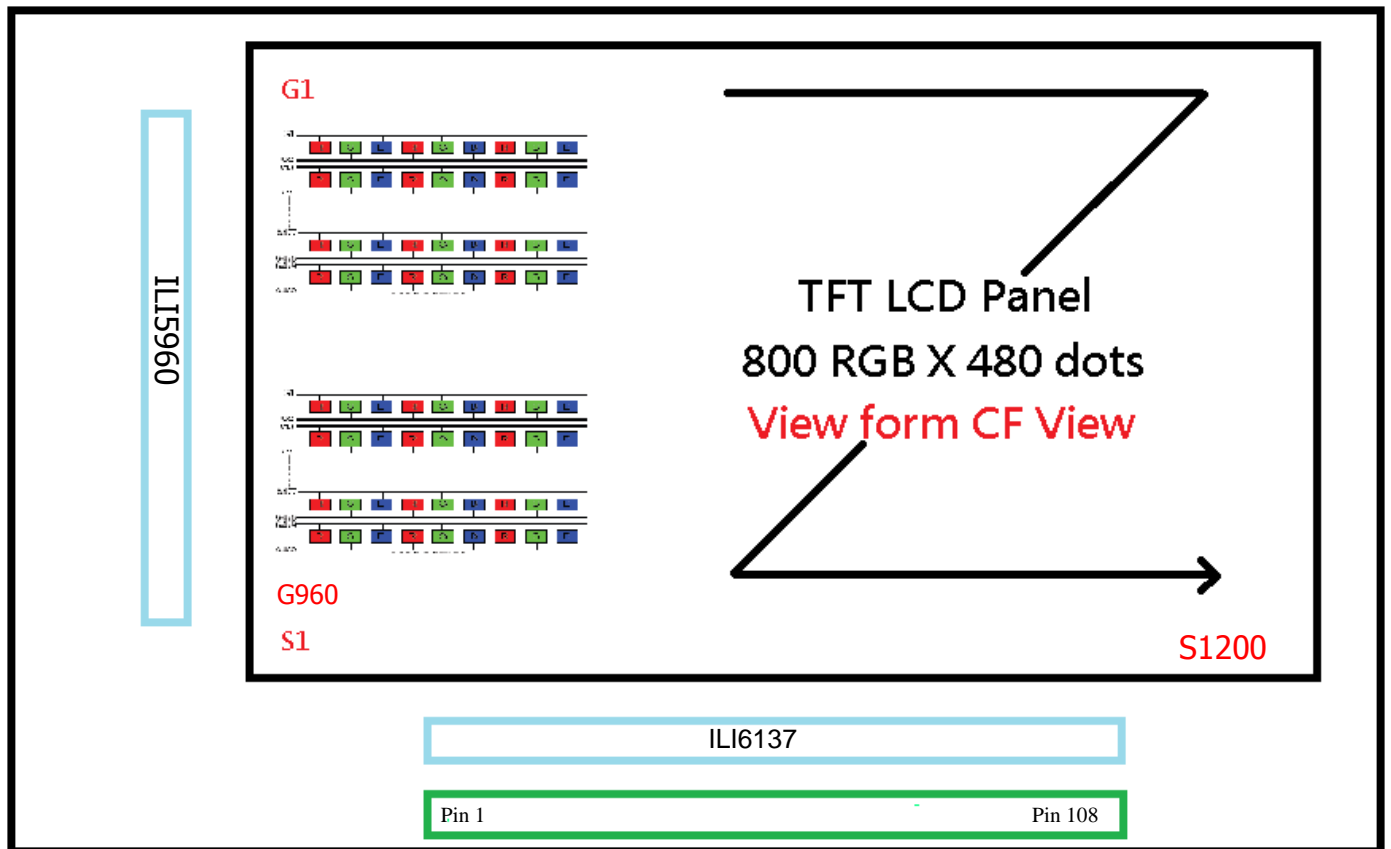
186	D27	FPC	D27_50	50
187	D27	FPC		
188	D26	FPC	D26_49	49
189	D26	FPC		
190	DASHD	FPC	GND_48	48
191	D25	FPC	D25_47	47
192	D25	FPC		
193	D24	FPC	D24_46	46
194	D24	FPC		
195	DASHD	FPC	GND_45	45
196	D23	FPC	D23_44	44
197	D23	FPC		
198	D22	FPC	D22_43	43
199	D22	FPC		
200	DASHD	FPC	GND_42	42
201	D21	FPC	D21_41	41
202	D21	FPC		
203	D20	FPC	D20_40	40
204	D20	FPC		
205	DASHD	FPC	GND_39	39
206	D17	FPC	D17_38	38
207	D17	FPC		
208	D16	FPC	D16_37	37
209	D16	FPC		
210	DASHD	FPC	GND_36	36
211	D15	FPC	D15_35	35
212	D15	FPC		
213	D14	FPC	D14_34	34
214	D14	FPC		
215	DASHD	FPC	GND_33	33
216	D13	FPC	D13_32	32
217	D13	FPC		
218	D12	FPC	D12_31	31
219	D12	FPC		
220	DASHD	FPC	GND_30	30
221	D11	FPC	D11_29	29
222	D11	FPC		
223	D10	FPC	D10_28	28
224	D10	FPC		

225	DASHD	FPC	GND_27	27
226	D07	FPC	D07_26	26
227	D07	FPC		
228	D06	FPC	D06_25	25
229	D06	FPC		
230	DASHD	FPC	GND_24	24
231	D05	FPC	D05_23	23
232	D05	FPC		
233	D04	FPC	D04_22	22
234	D04	FPC		
235	DASHD	FPC	GND_21	21
236	D03	FPC	D03_20	20
237	D03	FPC		
238	D02	FPC	D02_19	19
239	D02	FPC		
240	DASHD	FPC	GND_18	18
241	D01	FPC	D01_17	17
242	D01	FPC		
243	D00	FPC	D00_16	16
244	D00	FPC		
245	DASHD	FPC	GND_15	15
246	SHIELDING	X	X	X
247	SHIELDING	X	X	X
248	SHIELDING	X	X	X
249	SHIELDING	X	X	X
250	AVDD	FPC	AVDD_14	14
251	AVDD	FPC		
252	AVDD	FPC	AVDD_13	13
253	AVDD	FPC		
254	SHIELDING	X	X	X
255	SHIELDING	X	X	X
256	COM2_B	FPC	VCOM_TFT_12	12
257	COM2_B	FPC	VCOM_TFT_11	11
Pad No.	Pad Name	Connect to	FPC Pin Name	FPC Pin No.
	ILI5960			
X	X	Panel_VCOM	VCOM_CF_10	10
1215	VGH	FPC	VGH_8 VGH_9	8 9
1216	VGH	FPC		
1217	VGH	FPC		

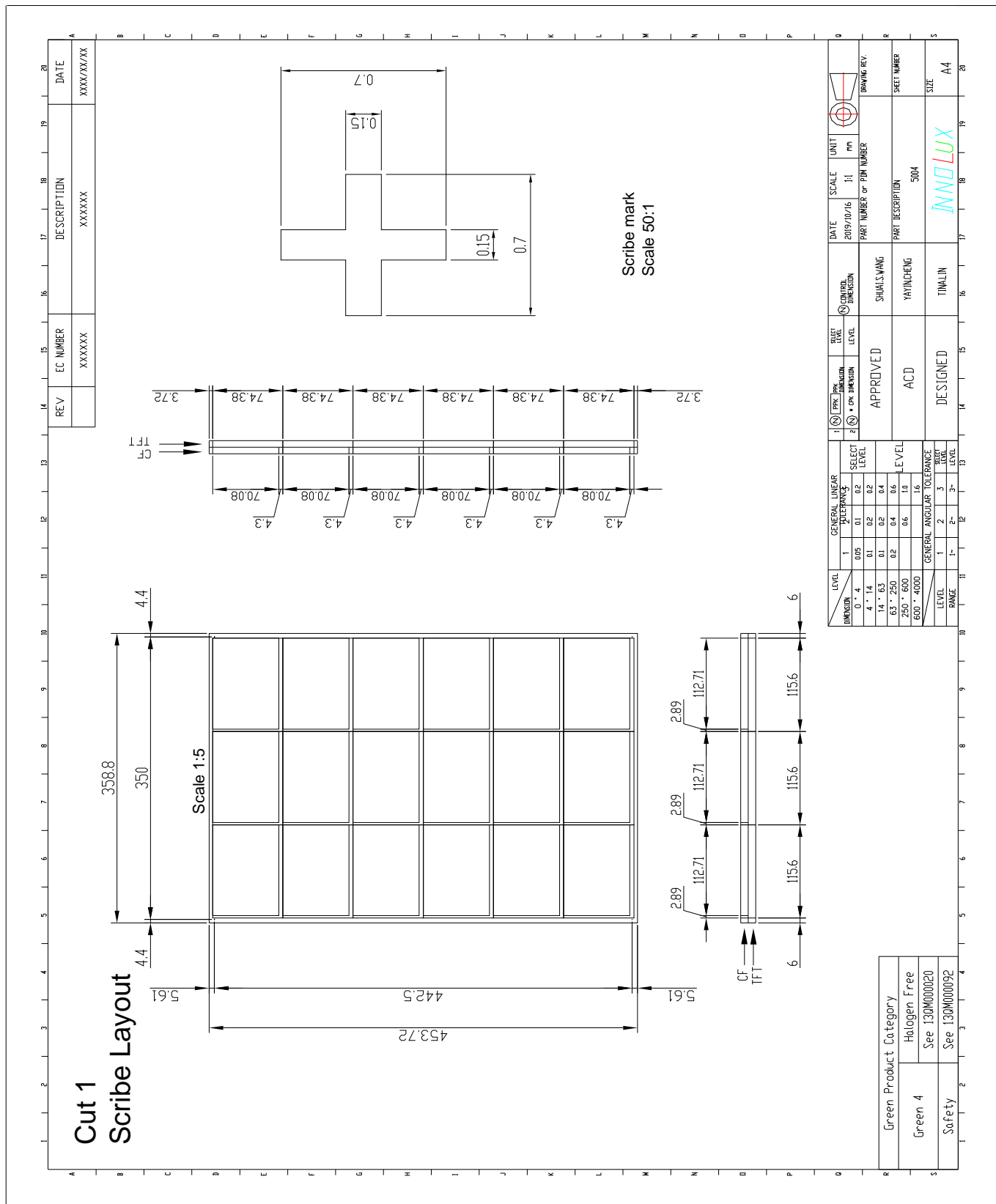
1218	VDD	FPC	VCC_6 VCC_7	6 7
1219	VDD	FPC		
1220	VDD	FPC		
1221	VEE	FPC	VGL_4 VGL_5	4 5
1222	VEE	FPC		
1223	VEE	FPC		
1	VSS	FPC	GND_2 GND_3	2 3
2	VSS	FPC		
3	VSS	FPC		
4	VSS	FPC		
X	X	FPC	DUMMY_1	1

Note: Source Driver IC is ILI6137, Gate Driver IC is ILI5960

## 3.2 SCHEMATIC PANEL LAYOUT







## 5.ELECTRICAL SPECIFICATION

Item	Symbol	Specification			Unit
		Min.	Typ.	Max.	
TFT gate on voltage	VGH	14.5	(15)	15.5	V
TFT gate on voltage	VGL	-8.5	-8	-7.5	V
TFT common electrode voltage	Vcom(DC)	3.7	4.2	4.7	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)

(unit: V)	Black	25% Gray	50% Gray	75% Gray	White
Positive	10.0	8.1	7.5	7.1	5.4
Negative	0.2	2.1	2.7	3.1	4.8

## 6. OPTICAL SPECIFICATION (light source: C light)

Item		Symbol	Conditions	Specifications			Unit	Note
				Min.	Typ.	Max.		
Transmittance (w/o APCF)		T%	Viewing normal angle $\theta_x = \theta_y = 0^\circ$	3.55	4.48	--	%	All left side data are based on Innolux's following condition – 1. LC: TN 2. Light Source: C light 3. Polarizer: Up: NWF-LN-SEG-AGS1 Down: NWF-LN-SEG-AGS1 4. Machine: DMS-803 5. By quick: VLC dark 4.9V VLC white 0.3V
Contrast Ratio		CR		400	500	--	--	
Response Time		T <sub>on</sub> + T <sub>off</sub>		-	25	50	ms	
Viewing Angle	Hor.	$\theta_{x+}$	Center CR>10	60	70	--	deg.	
		$\theta_{x-}$		60	70	--		
	Ver.	$\theta_{y+}$		40	50	--		
		$\theta_{y-}$		60	70	--		
CF only Color Chromaticity (CIE 1931)	Red	R <sub>x</sub>	Viewing normal angle $\theta_x = \theta_y = 0^\circ$	0.559	0.579	0.599	-	Under C light Simulation
		R <sub>y</sub>		0.288	0.308	0.328	-	
	Green	G <sub>x</sub>		0.296	0.316	0.336	-	
		G <sub>y</sub>		0.533	0.553	0.573	-	
	Blue	B <sub>x</sub>		0.118	0.138	0.158	-	
		B <sub>y</sub>		0.109	0.129	0.149	-	
	White	W <sub>x</sub>		0.292	0.312	0.332	-	
		W <sub>y</sub>		0.310	0.330	0.350	-	
	Color Gamut					49	--	

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

The contrast ratio can be calculated by the following expression.

$$\text{Contrast Ratio (CR)} = L_{255} / L_0$$

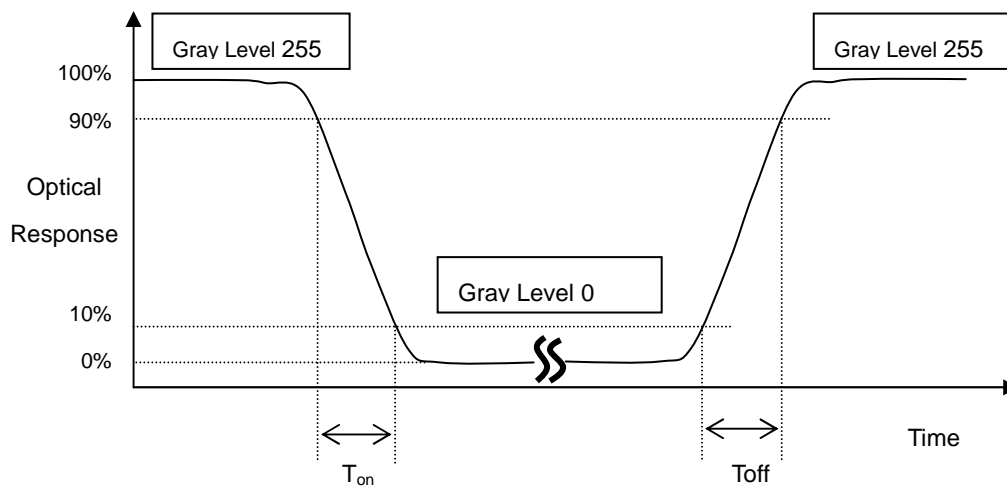
L255 : Luminance of gray level 255

L 0: Luminance of gray level 0

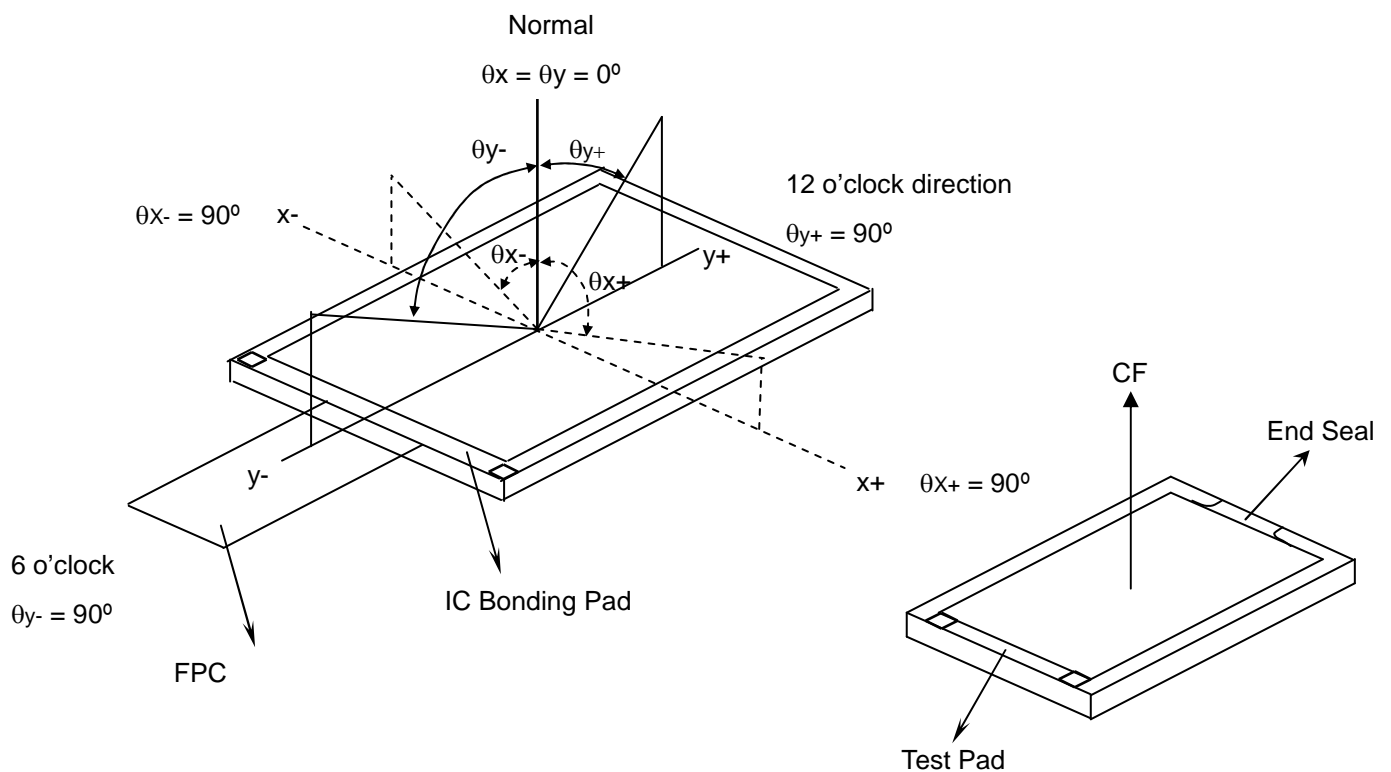
$$CR = CR (5)$$

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

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

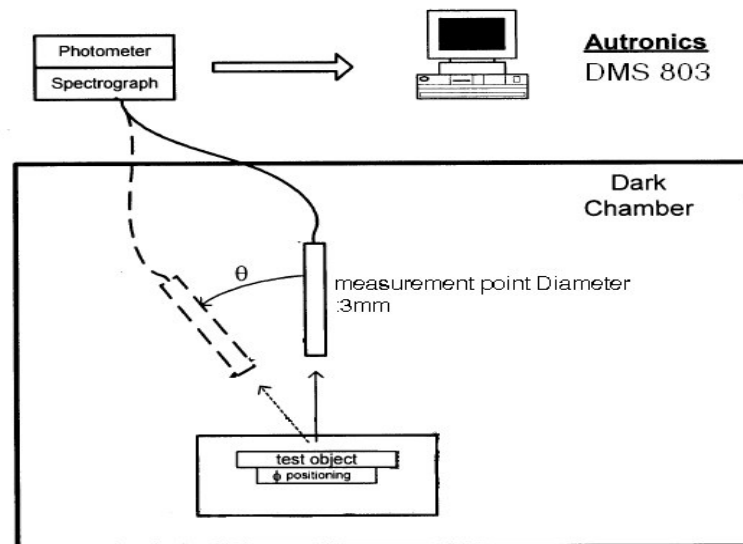


**\*Note(3) Definition of Viewing Angle**

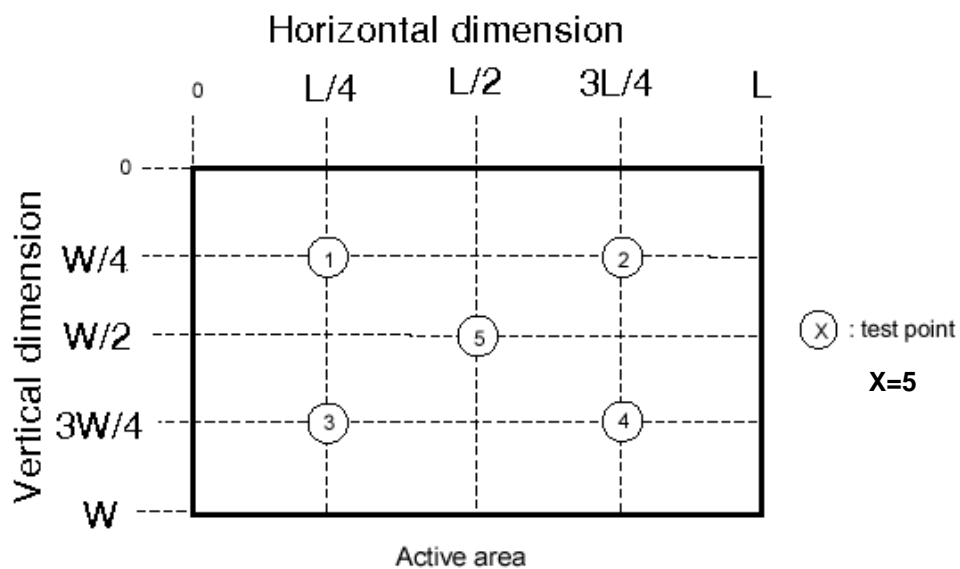


**\*Note (4) Measurement Set-Up:**

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

No.	Test Item	Test Condition	Check Time
1	High Temp Storage	90°C	240 hrs
2	Low Temp Storage	-40°C	240 hrs
3	High Temp Operation	85°C	240 hrs
4	Low Temp Operation	-30°C	240 hrs
5	High Temp & High Humidity Operation	60°C, 90%RH	240 hrs

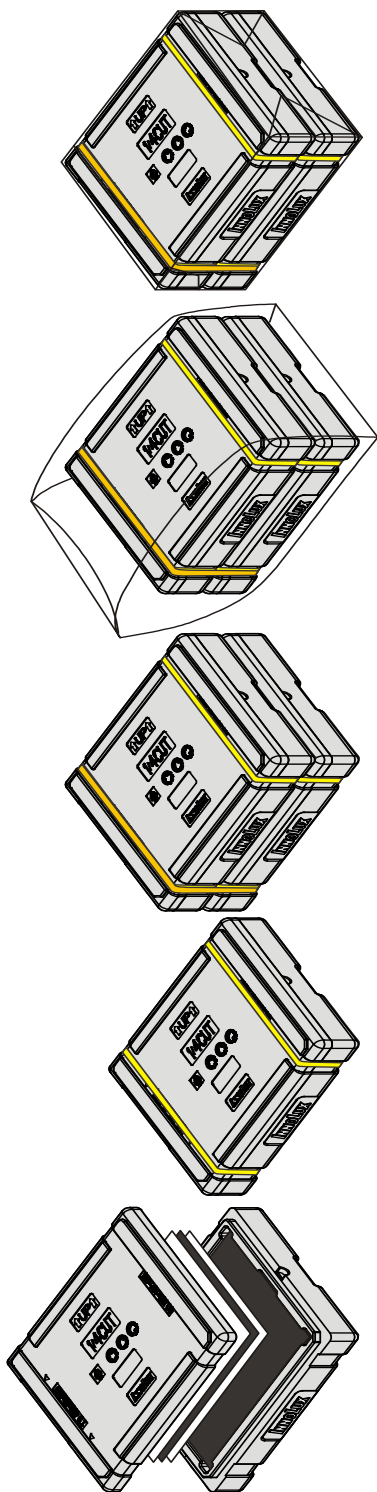
### Note:

- (1)The test samples have recovery time need more than 2 hours at room temperature before the function check. In the standard conditions , there is no abnormal display function occurred .
- (2)After the reliability test , the product only guarantees operational function , but don't guarantee all of the cosmetic specification.
- (3)Under no condensation of dew.

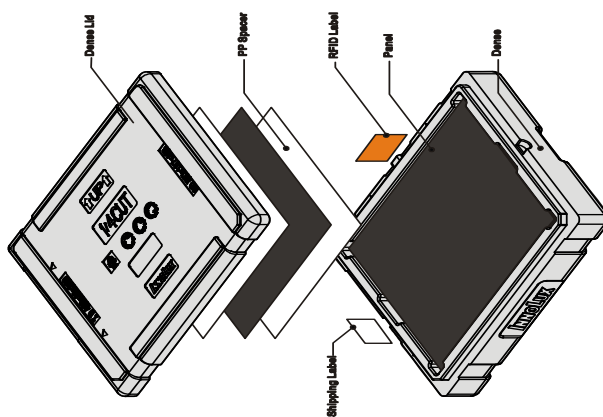
## 8. PACKAGE FORM

## 8.1 CELL ACKAGE

# Packing Drawing





# Dense Packing

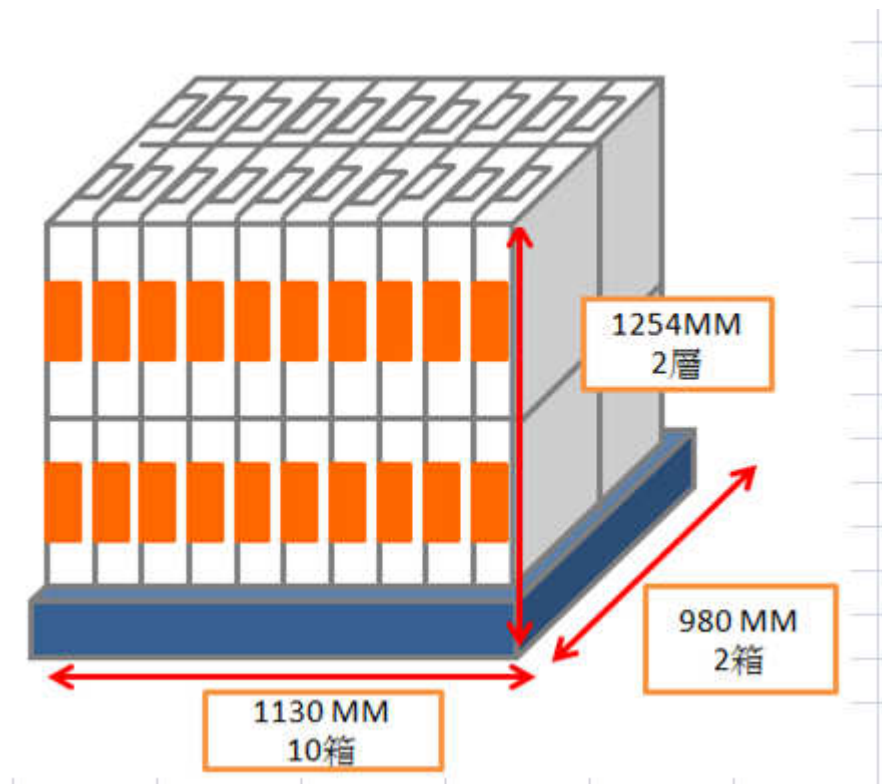


### Packing List:

No.	Item	Model(Material)	Dimensions(mm)	Unit	Weight(kg)	Quantity	Remark
1	T0.5"DH Cut	242050500402F	453.7*358.8*1	Cut	0.283	30	
2	1/4 Cut EPS Dense	8701800013000	552*463*109	EA	0.56	1	Color:White
3	1/4 Cut PP PAD	8301800217000	371*322*0.5	Pcs	0.057	31	Color:White
4	Flat Vacuum Bag	840180001K000	850*850*0.08	Pcs	0.01	0.5	
5	BOX RFID Label	8D01800019000	90*50	Pcs	0.01	1	Color:Orange
6	Shipping Label	R16020101WD0	90*50	Pcs	0.01	1	Color:White

CPK			SPECIFICATION	UNIT	SCALE		MODEL NAME			
APPROVED				CHING-LIU	2018/08/08			PART NUMBER/DRAWING NUMBER	PART NUMBER/REV.	
CHECKED				YICHA-HUANG	2018/08/08			TO_5°DH Cut (0.5t+0.5t)		A
DESIGNED				YICHA-HUANG	2018/08/08			Package_F050A04-601_0.5t INNOLUX		A
						SIZE	A1	SHEET NUMBER	1	
5		6		7		8				

## 8.2 PALLET PACKAGE







箱體料號：8701B000J3000

外箱尺寸 mm	單層堆疊	堆疊層數	總堆疊箱數	棧板材積 mm	堆疊材積 mm
552*463*109	20	2	40	1130*980*150	1130*980*1254