



TFT LCD Product Specification

MODEL NO.: F02804-02U

Customer :

Approved by : _____

Note :

APPL Dept.	
Approval	Prepare
	

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REVISION HISTORY

Version	Date	Page (New)	Section	Description
Ver 0.0	2007/07/13	All	All	Product Specification was first issued.
Ver 0.1	2007/07/27	7	2.2.3	Exchange the test pad position of R with B.

1. Purpose

The specification F02804-02U is a 2.8" TFT Liquid Crystal Display cell cut. The cell cut has been designed by CMO, and is to be manufactured by CMO under the agreement of Customer. The TFT-LCD cell cut will be applied to a high transmittance mode_TFT-LCD product.

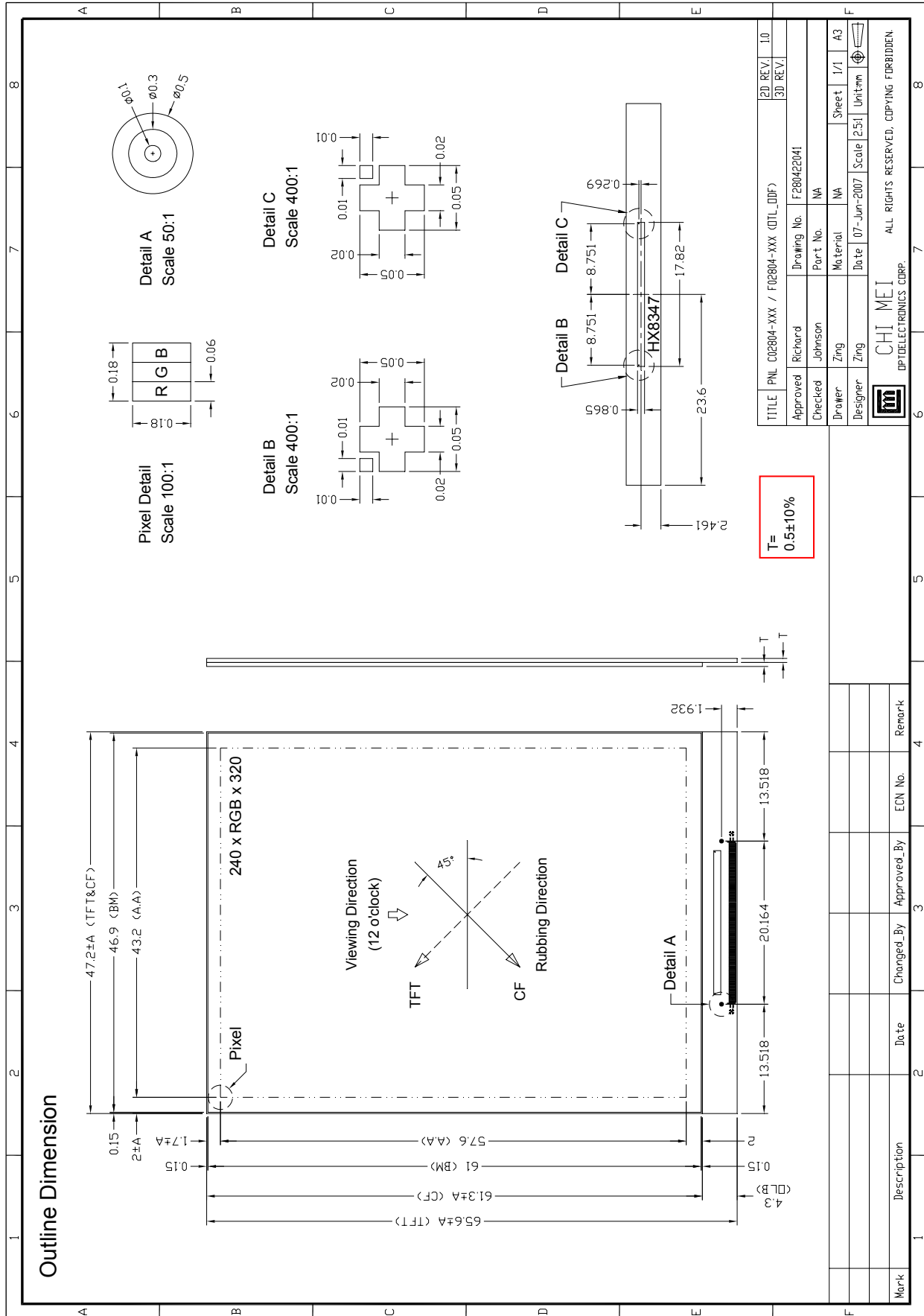
2. General Specification

2.1 General Spec.

Item		Specification	unit
Substrate thickness	t	0.5	mm
Mother glass size	cut	340 (H) x 440 (V) x 1.0 (D)	mm
Panel outline dimension		47.2 (H) x 65.6 (V) x 1.0 (D)	mm
Active screen size		2.8" Diagonal	inch
Resolution		240RGB X 320	pixel
Pixel size		60x180	um
Pixel arrangement		Stripe	--
Pixel driving element		a-Si TFT	-
Viewing Direction		12 o'clock	--
Driver IC		HX8347	--
Pre-tilt angle	α	3 ~ 5	degree
Cell gap		4.7 ± 0.3	um
Assembly precision		± 5	um
Weight (cut)		$355 \pm 10\%$	g

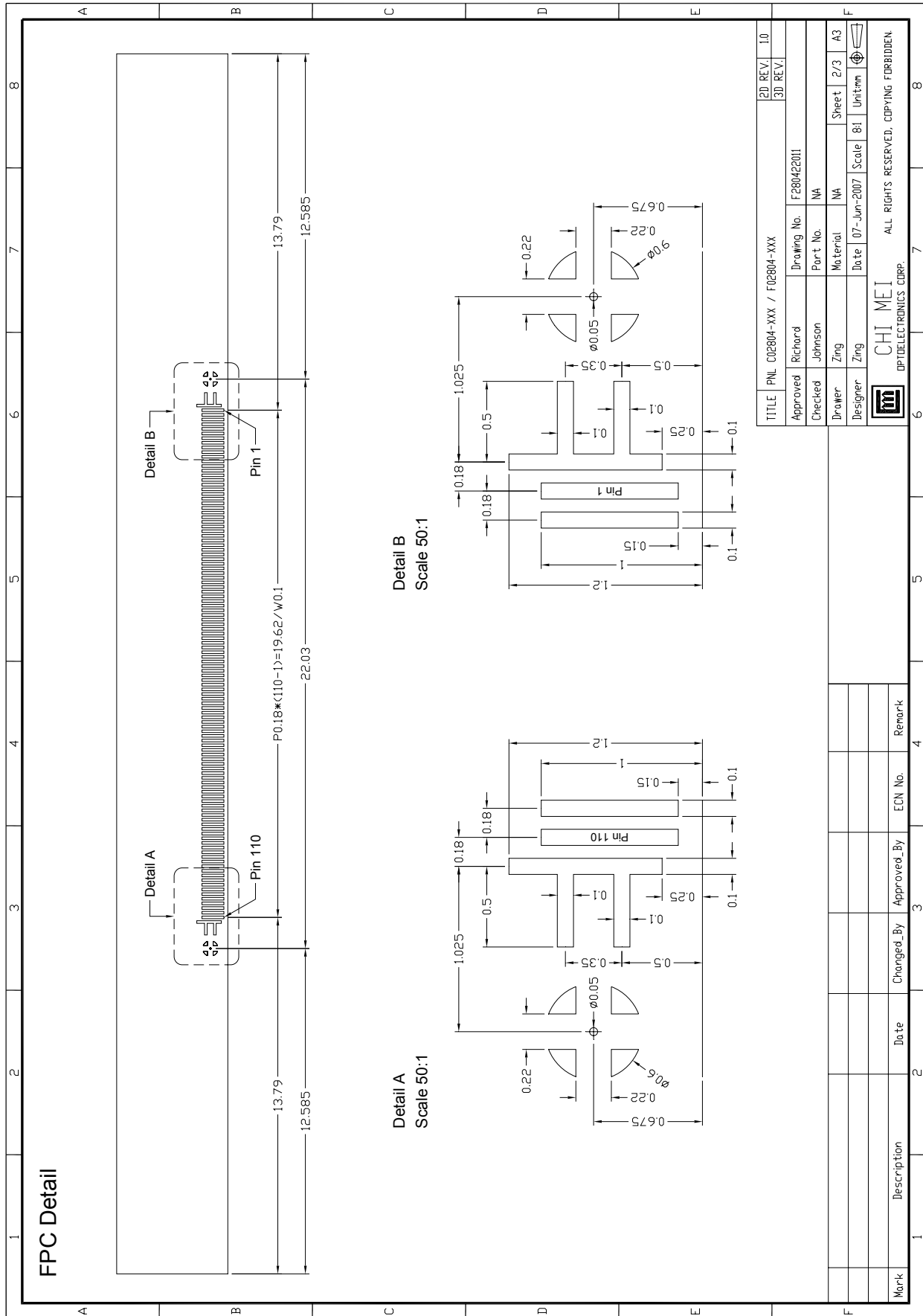
2.2 Dimension

2.2.1 Outline Dimension

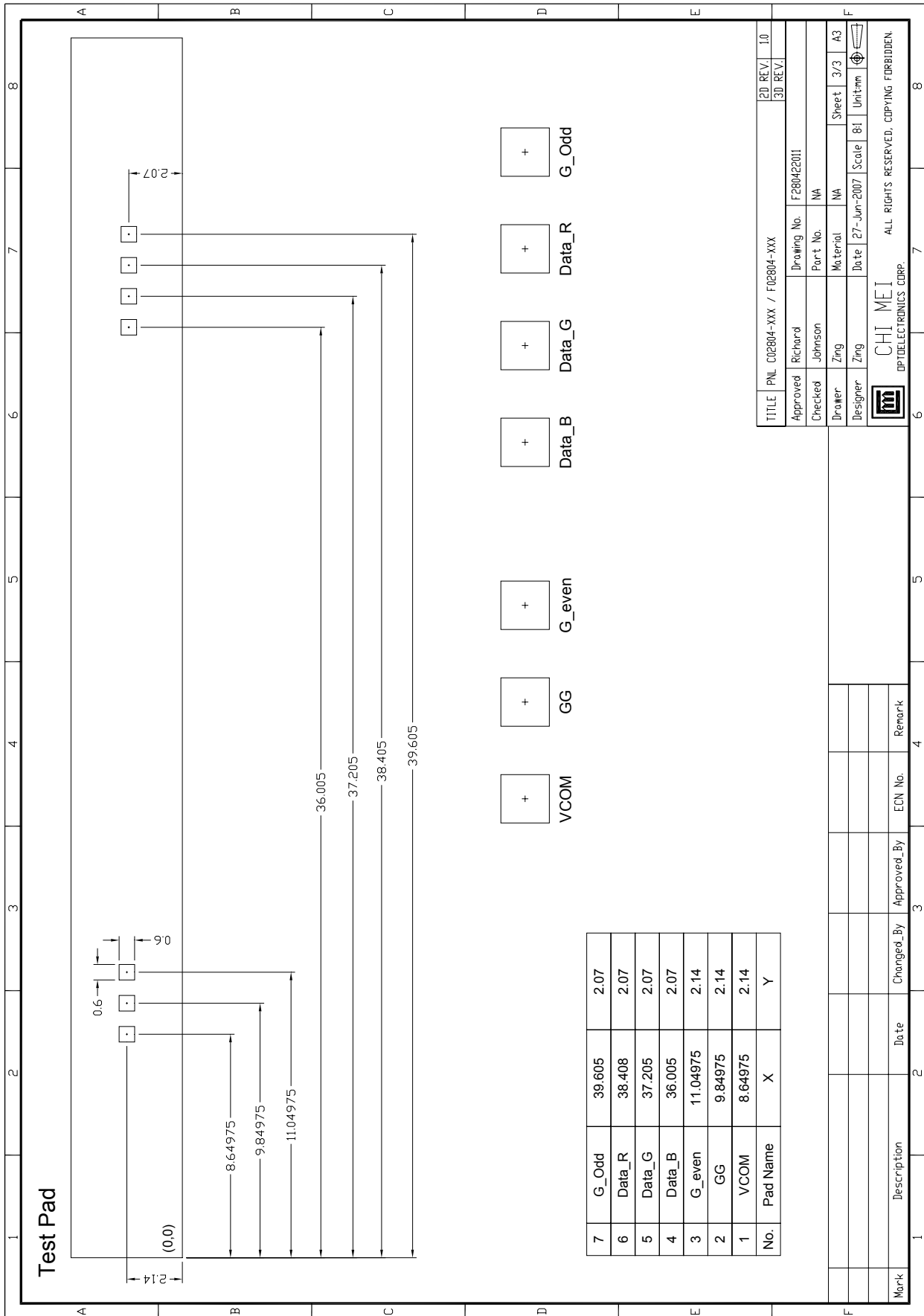



T = 0.5±10%

2.2.2 FPC Detail



2.2.3 TEST PAD



TITLE	PNL C02804-XXX / F02804-XXX		2D REV.	1.0	
Approved	Richard	Drawing No.	F280422011	3D REV.	
Checked	Johnson	Part No.	NA		
Drawer	Zing	Material	NA	Sheet	3/3
Designer	Zing	Date	27-Jun-2007	Scale	8:1
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3. Pin Assignment

3.1 FPC / IC Pin Assignment Table

HX8347		FPC		
Pad No	Pad Name	Connect to	PinOut Name	FPC PinOut NumBer
		FPC Panel VCOM	VCOM	1
				2
1	DUMMY1	—		
2	TEST1	—		
3	IOGNDDUM	—		
4	OSC	FPC	OSC	3
5	P68	FPC	P68	4
6	EXTC	FPC	EXTC	5
7	BS0	FPC	BS0	6
8	BS1	FPC	BS1	7
9	BS2	FPC	BS2	8
10	IFSEL0	FPC	IFSEL0	9
11	TEST2	—		
12	DUMMY2	—		
13	DUMMY3	—		
14	DUMMY4	—		
15	DUMMY5	—		
16	DUMMY6	—		
17	DUMMY7	—		
18	DUMMY8	—		
19	NRESET	FPC	NRESET	10
20	NRESET			
21	VSYNC	FPC	VSYNC	11
22	HSYNC	FPC	HSYNC	12
23	DOTCLK	FPC	DOTCLK	13
24	ENABLE	FPC	ENABLE	14
25	D17	FPC	D17	15
26	D16	FPC	D16	16
27	D15	FPC	D15	17
28	D14	FPC	D14	18
29	D13	FPC	D13	19
30	DUMMY9	—		
31	D12	FPC	D12	20
32	D11	FPC	D11	21
33	D10	FPC	D10	22
34	D9	FPC	D9	23
35	D8	FPC	D8	24
36	TEST3	—		
37	DUMMY10	—		
38	D7	FPC	D7	25
39	D6	FPC	D6	26
40	D5	FPC	D5	27
41	D4	FPC	D4	28
42	D3	FPC	D3	29
43	D2	FPC	D2	30
44	D1	FPC	D1	31
45	D0	FPC	D0	32
46	DUMMY11	—		
47	SDO	FPC	SDO	33
48	SDI	FPC	SDI	34
49	NRD E	FPC	NRD E	35
50	NWR RNW	FPC	NWR RNW	36
51	DNC_SCL	FPC	DNC_SCL	37
52	NCS	FPC	NCS	38
53	NISD	FPC	NISD	39
54	BURN	FPC	BURN	40
55	TE	FPC	TE	41
56	DUMMY12	—		
57	TS8	—		
58	TS7	—		
59	TS6	—		
60	TS5	—		
61	TS4	—		
62	TS3	—		
63	TS2	—		
64	TS1	—		
65	TS0	—		
66	REGVDD	FPC	REGVDD	42
67	IOVCC	FPC	IOVCC	43
68	IOVCC			
69	IOVCC			
70	IOVCC			
71	IOVCC			
72	IOVCC			45
73	VCI	FPC	VCI	46
74	VCI			
75	VCI			
76	VCI			
77	VCI			
78	VCI			
79	VCI			
80	VCI			
81	VCI			
82	VCI			
83	VCI			49

← should connect to FPC PinOut 58,59

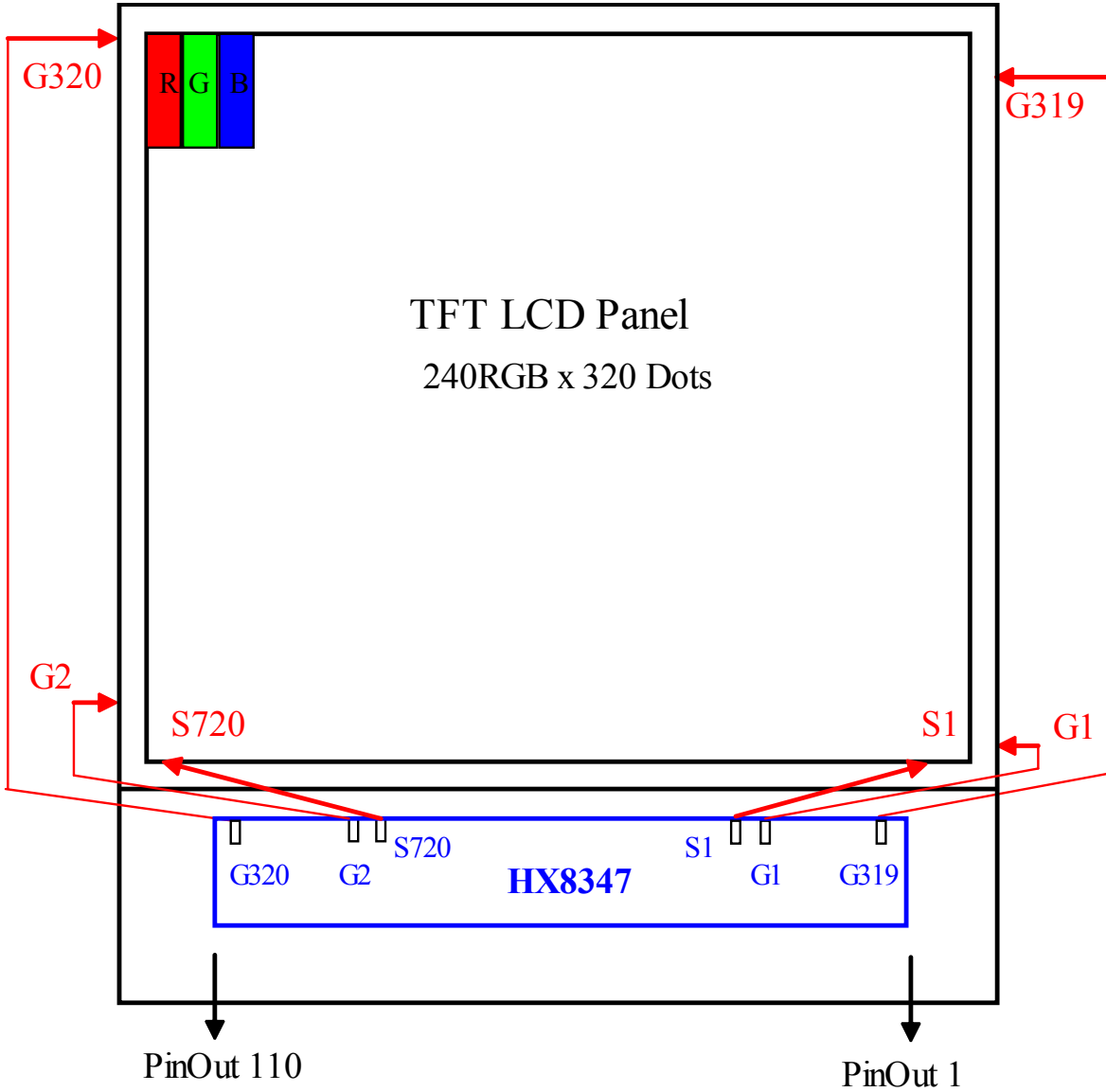
HX8347		FPC			
Pad No	Pad Name	Connect to	PinOut Name	FPC PinOut NumBer	
84	VBGP	FPC	VBGP	50	
85	VSSA	FPC	VSSA	51	
86	VSSA				
87	VSSA				
88	VSSA			52	
89	VSSA				
90	VSSA				
91	VSSA				
92	VSSA	53			
93	VGS				
94	VGS	FPC	VGS	54	
95	VSSD	FPC	VSSD	55	
96	VSSD				
97	VSSD				
98	VSSD			56	
99	VSSD				
100	VSSD				
101	VSSD				
102	VSSD				
103	VSSD	57			
104	VSSD				
105	VMONI	—			
106	VTEST	—			
107	DUMMY13	—			
108	VCOM	FPC	VCOM	58	
109	VCOM				
110	VCOM				
111	VCOM			59	
112	VCOM				
113	VCOM				
114	VCOM				
115	VCOMH	FPC	VCOMH	60	
116	VCOMH				
117	VCOMH				
118	VCOMH			61	
119	VCOMH				
120	VCOMH				
121	VCOML	FPC	VCOML	62	
122	VCOML				
123	VCOML			63	
124	VCOML				
125	VREG1	FPC	VREG1	64	
126	VREG1				
127	VREG1			65	
128	TVCOMHI	—			
129	VCOMR	FPC	VCOMR	66	
130	TMAG	—			
131	VCL	FPC	VCL	67	
132	VCL				
133	VCL			68	
134	VCL				
135	VCL				
136	DDVDH	FPC	DDVDH	69	
137	DDVDH				
138	DDVDH				70
139	DDVDH				
140	DDVDH				
141	DDVDH			71	
142	VREG3	FPC	VREG3		72
143	VREG3				
144	VREG3			FPC	VDDD
145	VDDD				
146	VDDD				
147	VDDD				
148	VDDD				
149	VDDD				
150	VDDD				
151	VDDD				
152	VDDD	75			
153	VDDD				
154	VDDD				
155	VDDD				
156	VDDD				
157	VDDD				
158	VDDD				
159	VDDD	76			
160	VDDD				
161	VDDD				
162	VDDD				
163	DUMMYR14	FPC	DUMMYR14	77	
164	DUMMYR15	FPC	DUMMYR15	78	

← measure the COG bonding resistance

HX8347		FPC				
Pad No	Pad Name	Connect to	PinOut Name	FPC PinOut NumBer		
165	CX11B	FPC	CX11B	79		
166	CX11B					
167	CX11B					
168	CX11B					
169	CX11B					
170	CX11A	FPC	CX11A	81		
171	CX11A					
172	CX11A					
173	CX11A					
174	CX11A					
175	C11B	FPC	C11B	83		
176	C11B					
177	C11B					
178	C11B					
179	C11B					
180	C11A	FPC	C11A	85		
181	C11A					
182	C11A					
183	C11A					
184	C11A					
185	VGL	FPC Quick_GG	VGL	87		
186	VGL					
187	VGL					
188	VGL					
189	VGL					
190	VGL	—	—	88		
191	VGL					
192	VGL					
193	VGL					
194	VGL					
195	VSSA	—	—	90		
196	VSSA					
197	VSSA					
198	VGH			FPC	VGH	91
199	VGH					
200	VGH					
201	VGH					
202	VGH					
203	VGH					
204	DUMMY16	—	—	92		
205	DUMMY17					
206	C12B	FPC	C12B	93		
207	C12B					
208	C12B					
209	C12B					
210	C12A			FPC	C12A	94
211	C12A					
212	C12A					
213	C12A					
214	C21B	FPC	C21B			95
215	C21B					
216	C21B					
217	C21B					
218	C21B					
219	C21B	FPC	C21A	97		
220	C21B					
221	C21A					
222	C21A					
223	C21A					
224	C21A	FPC	C22B	98		
225	C21A					
226	C21A					
227	C21A					
228	C22B			FPC	C22A	99
229	C22B					
230	C22B					
231	C22B					
232	C22B					
233	C22B	FPC	C22A	100		
234	C22B					
235	C22A					
236	C22A					
237	C22A					
238	C22A	—	—	101		
239	C22A					
240	C22A					
241	C22A					
242	DUMMY18			—	—	102
243	DUMMY19					
		FPC Panel_VCOM	VCOM	109		
				110		

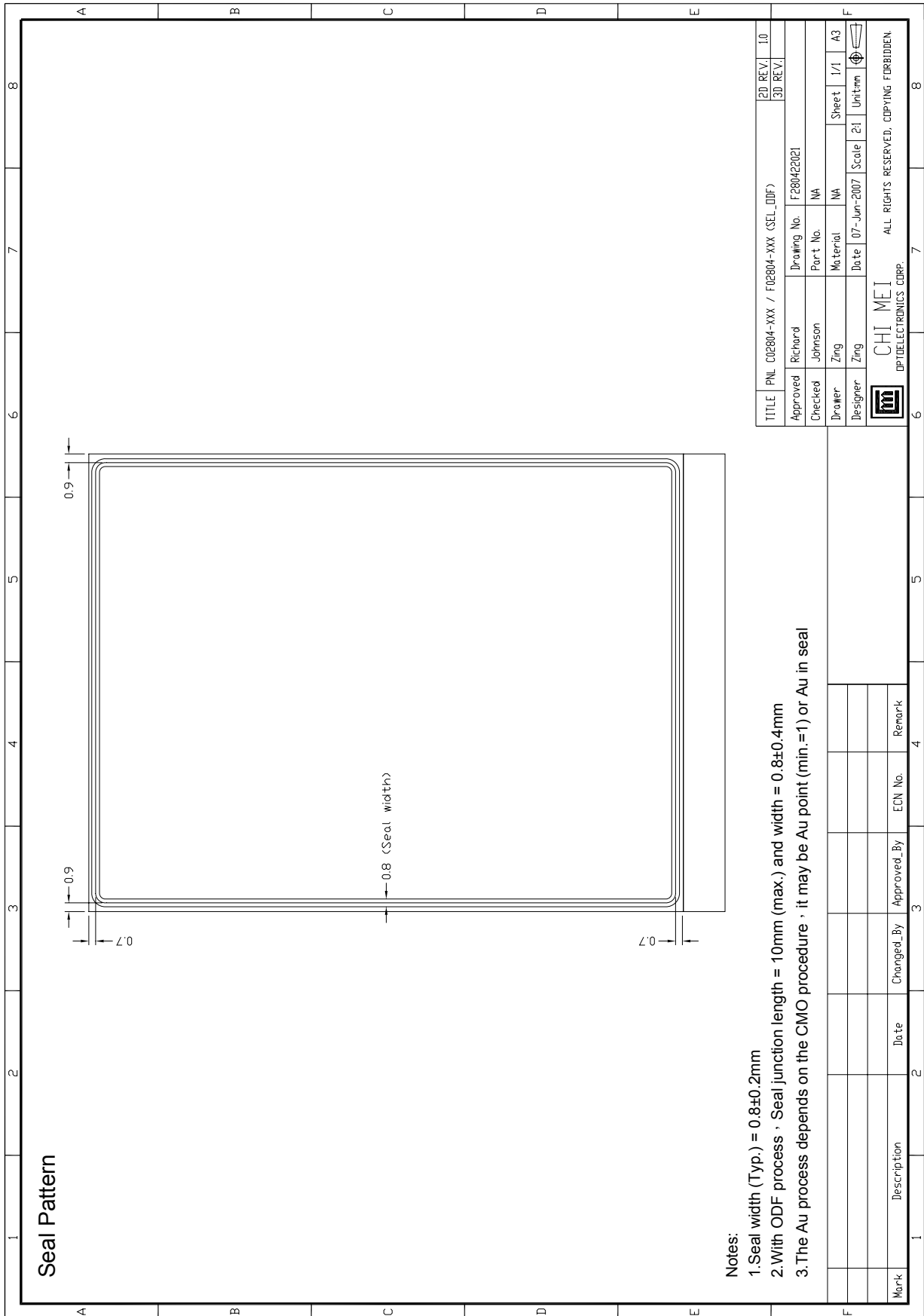
← should connect to FPC PinOut 58,59

3.2 Schematic Panel Layout



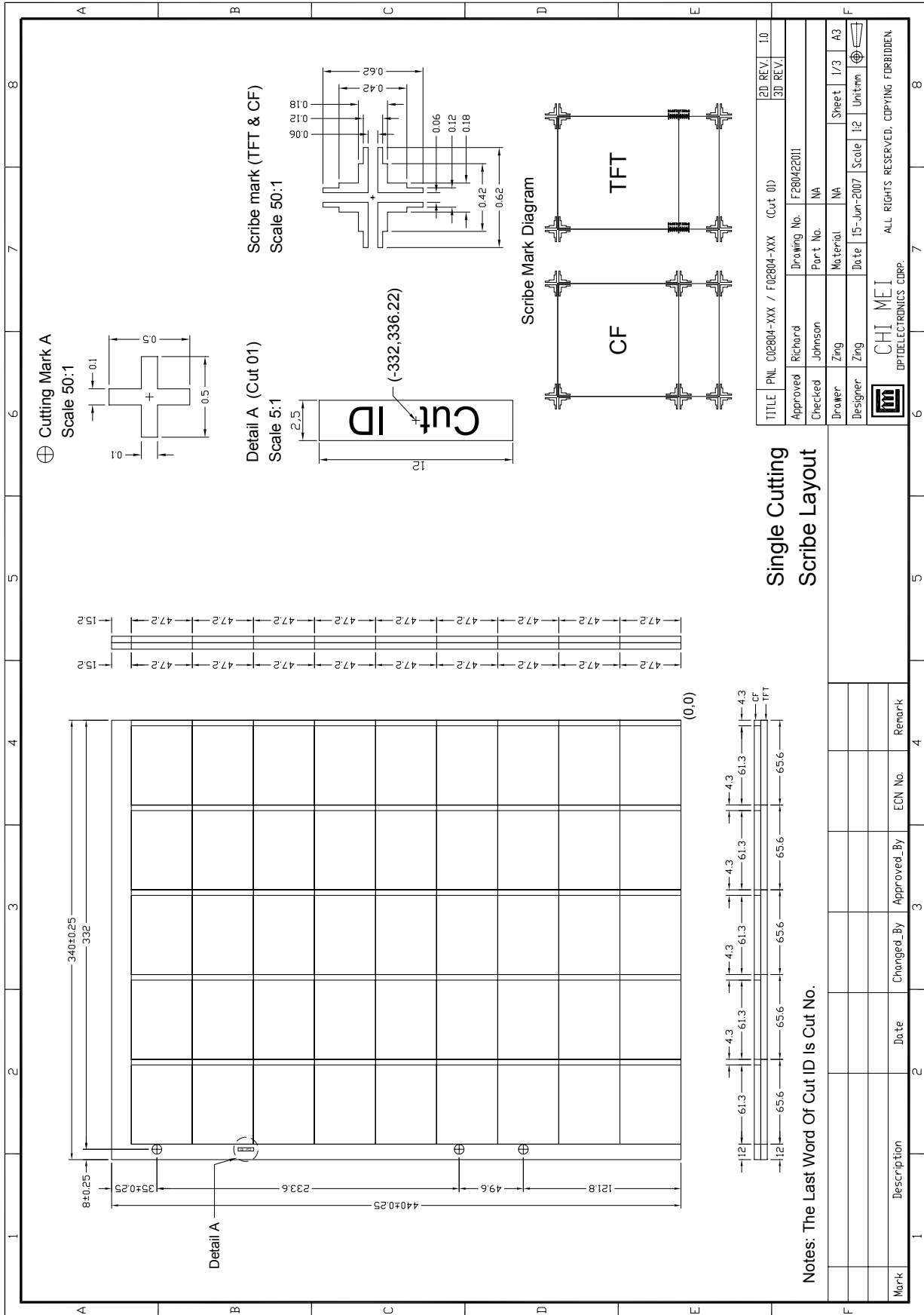
4. CELL PROCESS RULES

4.1 SEAL PATTERN (ODF)

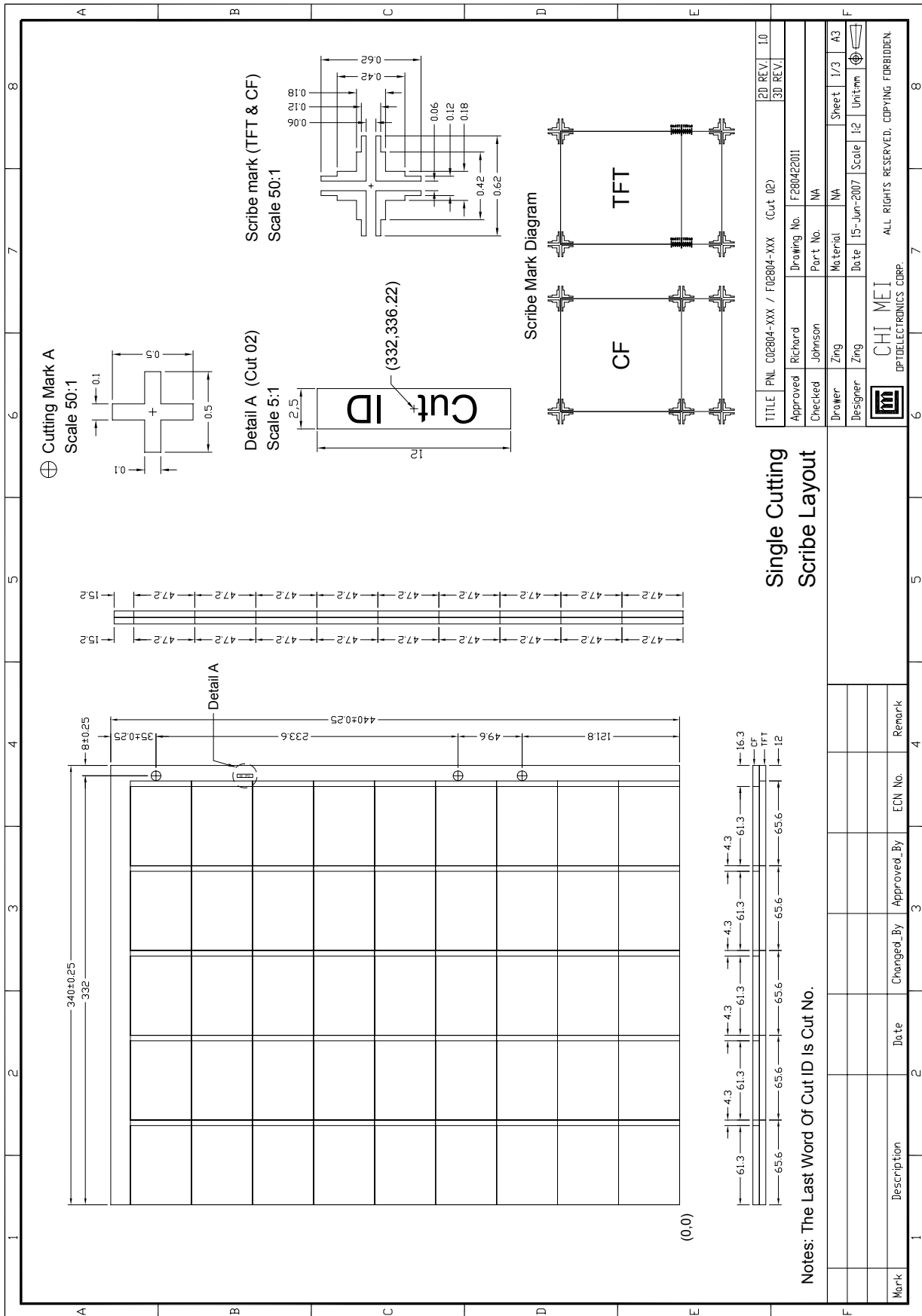


4.2 CELL SCRIBE LAYOUT

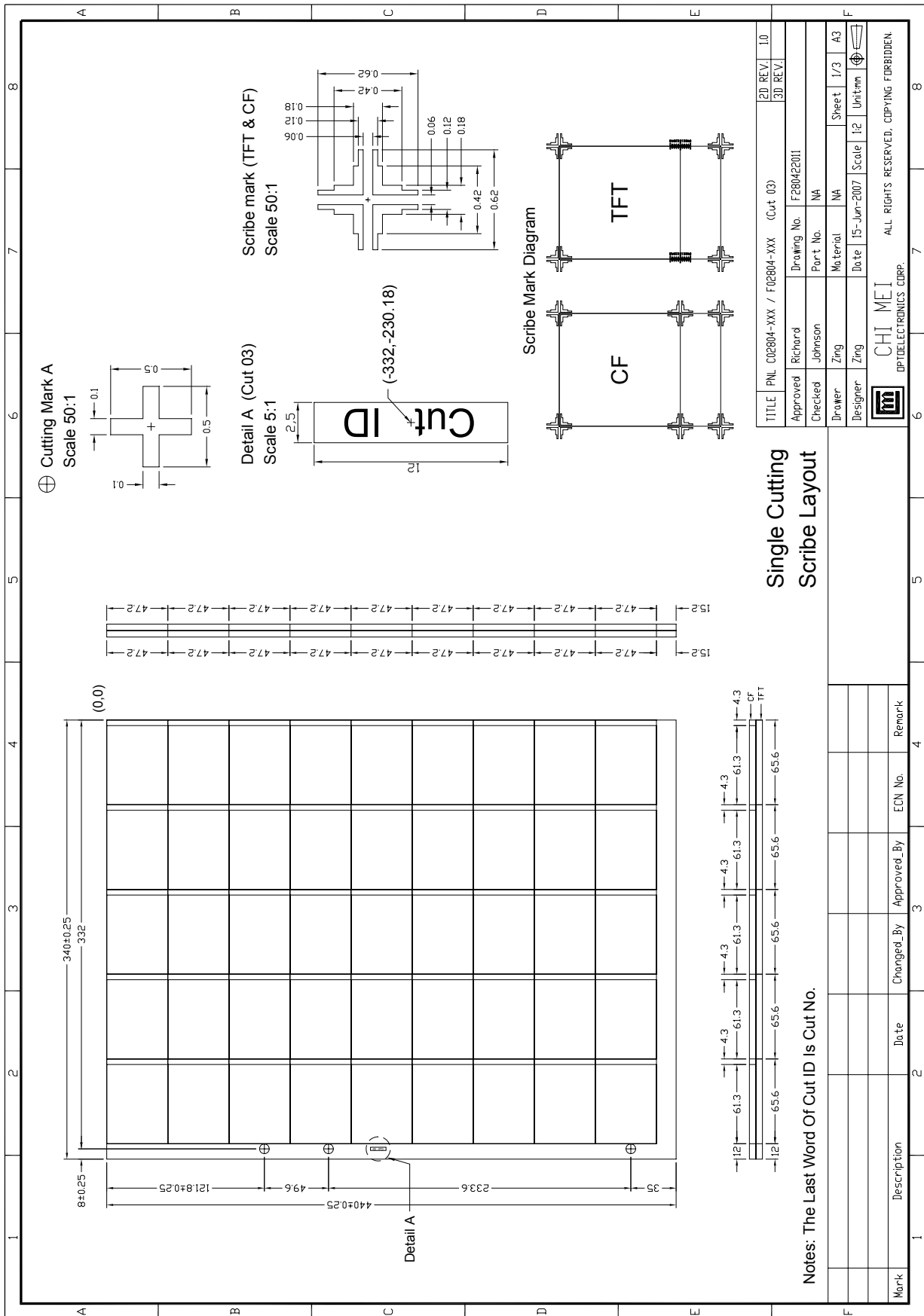
Cut01



Cut02



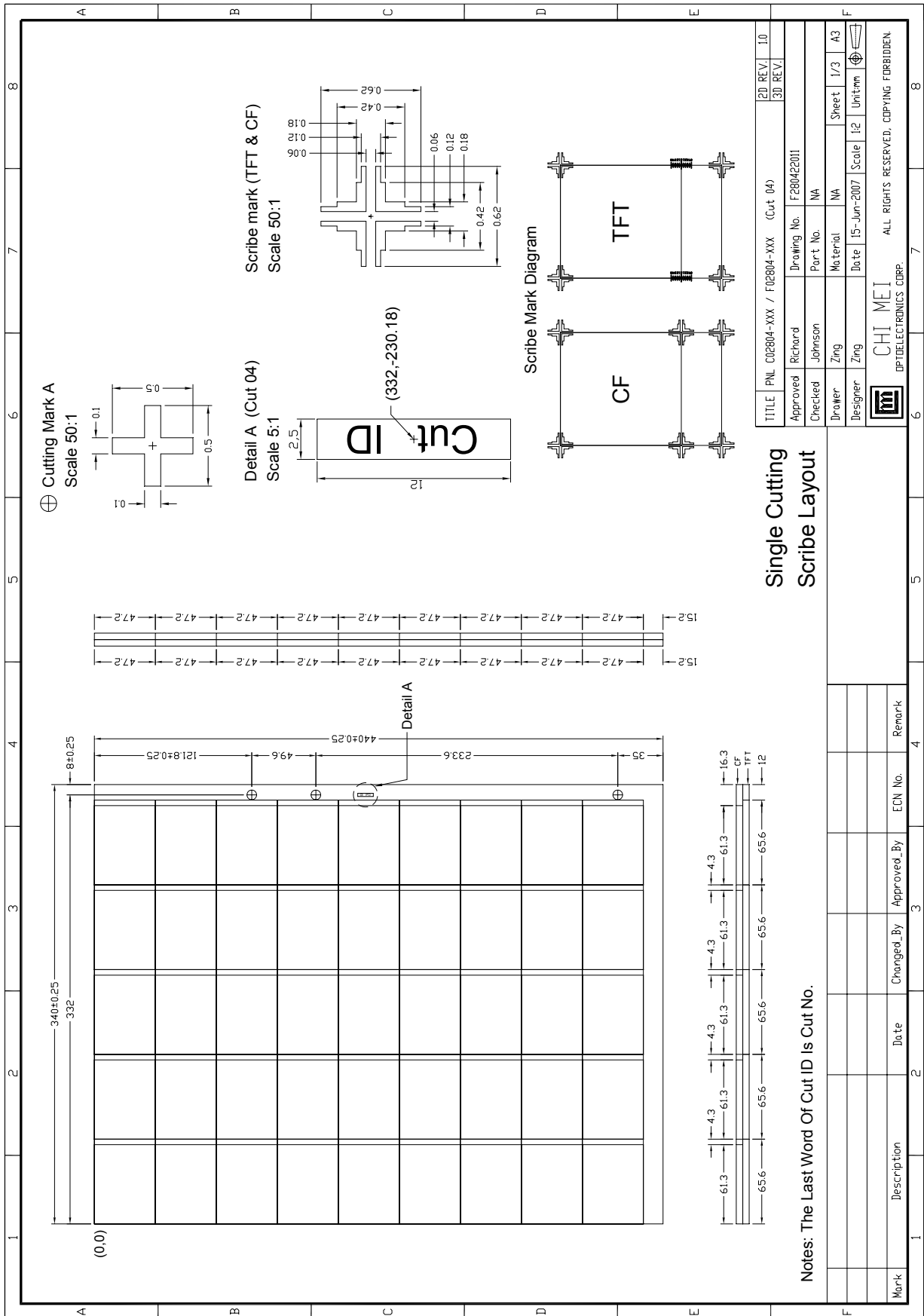
Cut03



Single Cutting
Scribe Layout

Notes: The Last Word Of Cut ID Is Cut No.

Cut04



5. ELECTRICAL SPECIFICATION

Item	Symbol	Specification			Unit
		Min.	Typ	Max.	
TFT gate on voltage	VGH	-	15	-	V
TFT gate off voltage	VGL	-	-8	-	V
TFT common electrode voltage	VcomH	2.5	-	4.5	V
	VcomL	-2.0	-	0	

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

6.OPTICAL SPECIFICATIONS

Light source: C light, using CMO TN LC + Polarizer reference only

Item	Symbol	Conditions	Specifications			Unit	Note	
			Min.	Typ.	Max.			
Transmittance	T%	Viewing normal angle $\theta_x = \theta_y = 0^\circ$	NA	6.3	NA	%	All left side data are based on CMO's following condition -- NTSC: 60% LC: 5091 Light : C Light (Machine:BM5A) Polarizer without DBEF Reference Only	
Contrast Ratio	CR		150	250	NA	--		
Response Time	T_R		NA	15	20	ms		
	T_F		NA	35	50	ms		
Chromaticity	Red		X_R	0.603	0.633	0.663		
			Y_R	0.296	0.326	0.356		
	Green		X_G	0.267	0.297	0.327		
			Y_G	0.547	0.577	0.607		
	Blue		X_B	0.103	0.133	0.163		
			Y_B	0.099	0.129	0.159		
	White	X_W	0.264	0.294	0.324			
		Y_W	0.304	0.334	0.364			
Viewing Angle	Hor.	θ_{x+}	-	45	-	deg.		
		θ_{x-}	-	45	-			
	Ver.	θ_{y+}	-	35	-			
		θ_{y-}	-	15	-			

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

The contrast ratio can be calculated by the following expression.

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

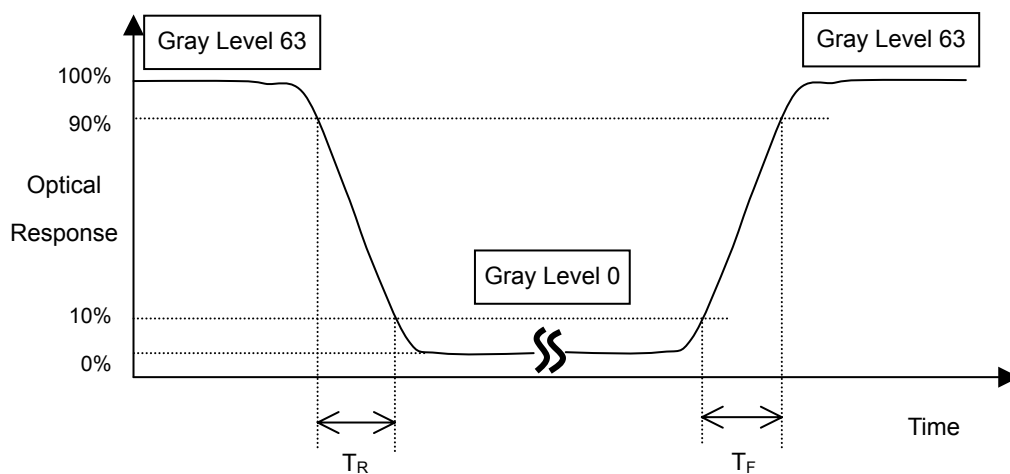
L63: Luminance of gray level 63

L 0: Luminance of gray level 0

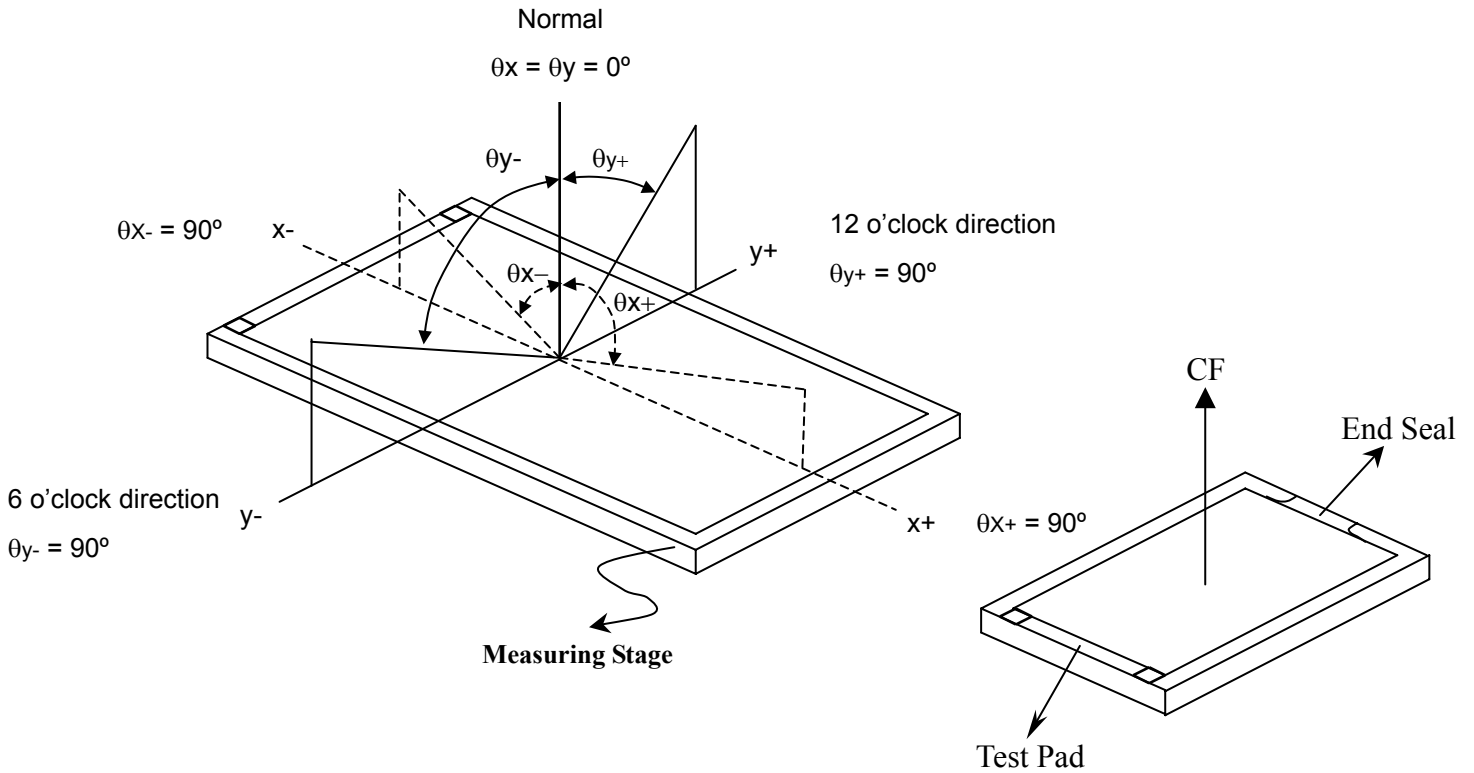
$$\text{CR} = \text{CR} (10)$$

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

*Note (2) Definition of Response Time (T_R , T_F):

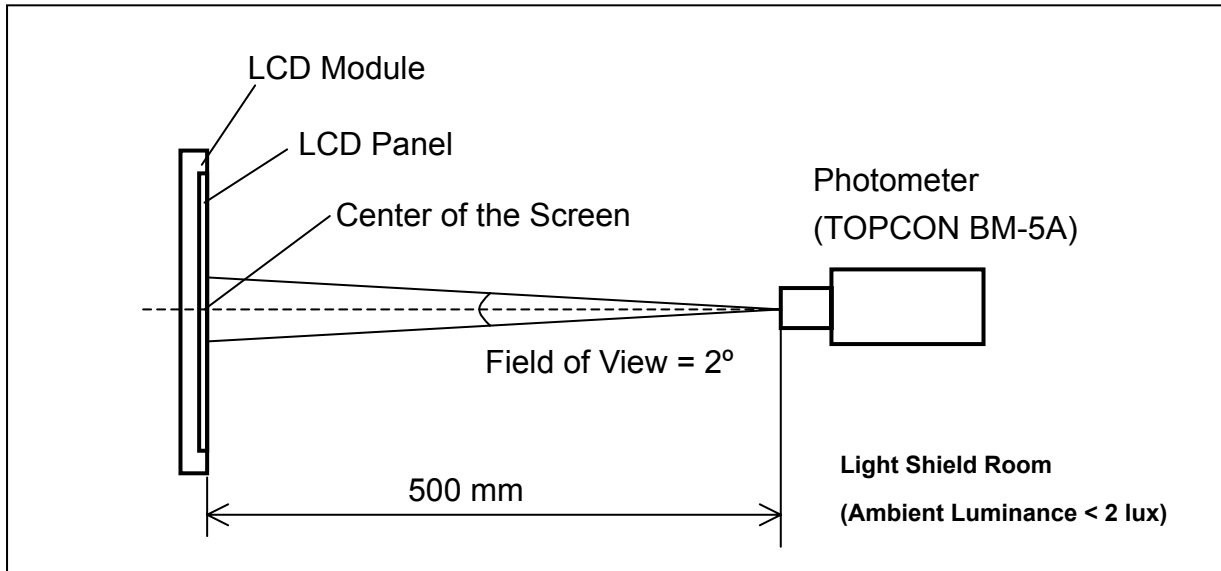


*Note(3) Definition of Viewing Angle

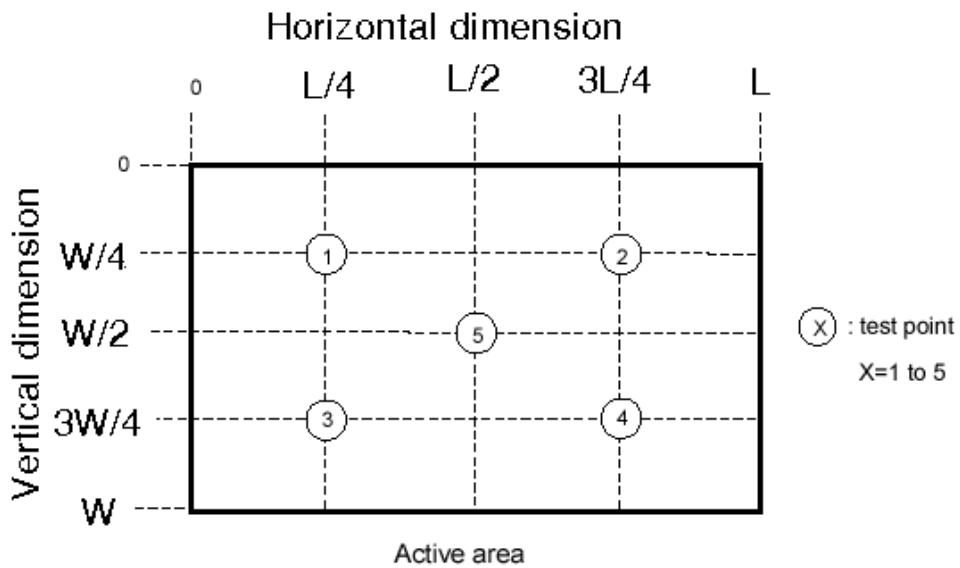


*Note (4) Measurement Set-Up:

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)



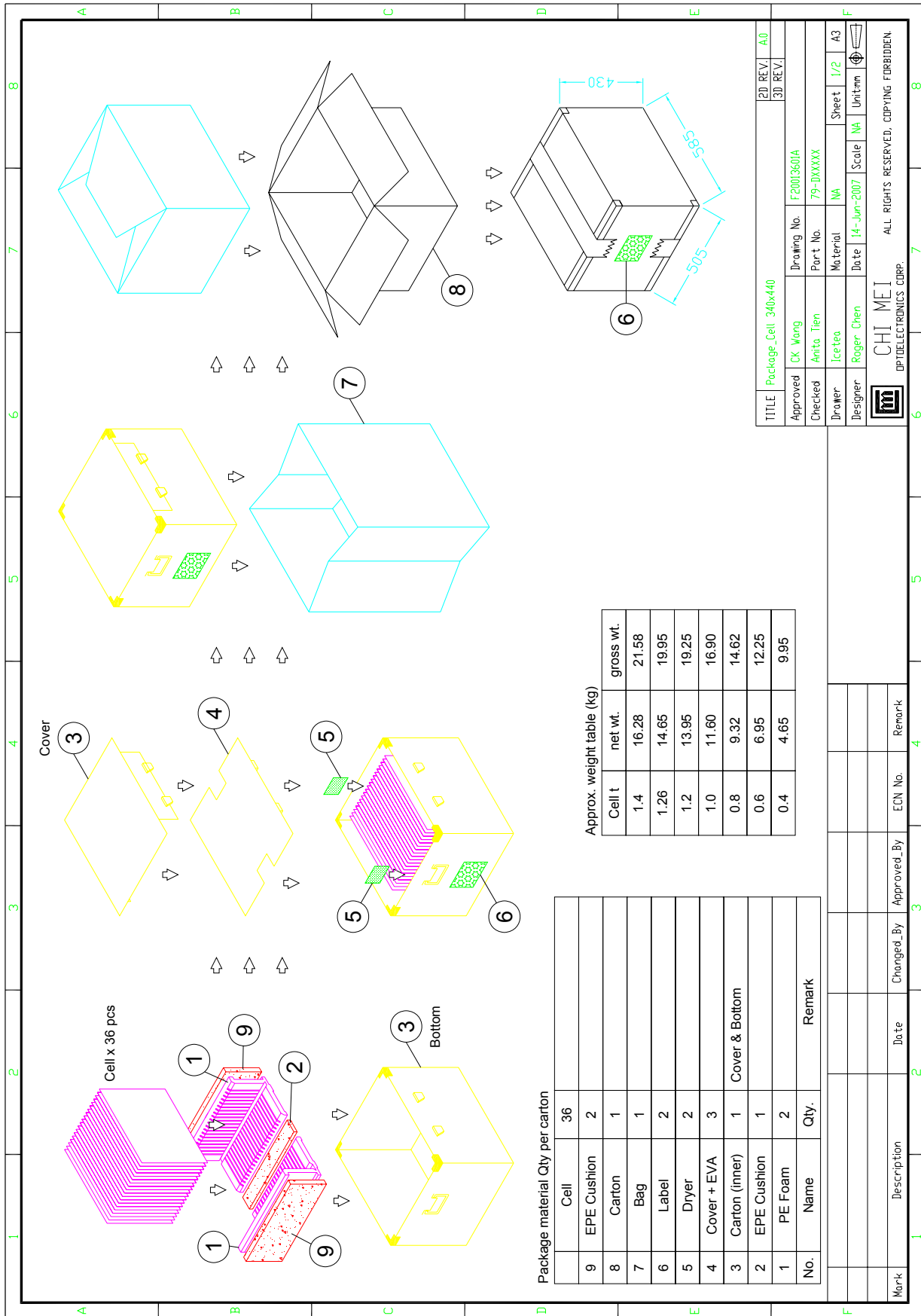
7. RELIABILITY SPECIFICATION

No.	Test Item	Test Condition	Check Time
1	High temp storage	T= 80°C	240 hrs
2	Low temp storage	T= -30°C	240 hrs
3	High temp operation	T= 70°C	240 hrs
4	Low temp operation	T= -20°C	240 hrs
5	High temp & high humidity	T=60°C H=90%	240 hrs

Reliability Test Criteria:

Display function should be no change under normal operating condition.

8. PACKAGE FORM
8.1 CUTS PACKAGE



Approx. weight table (kg)

Cell t	net wt.	gross wt.
1.4	16.28	21.58
1.26	14.65	19.95
1.2	13.95	19.25
1.0	11.60	16.90
0.8	9.32	14.62
0.6	6.95	12.25
0.4	4.65	9.95

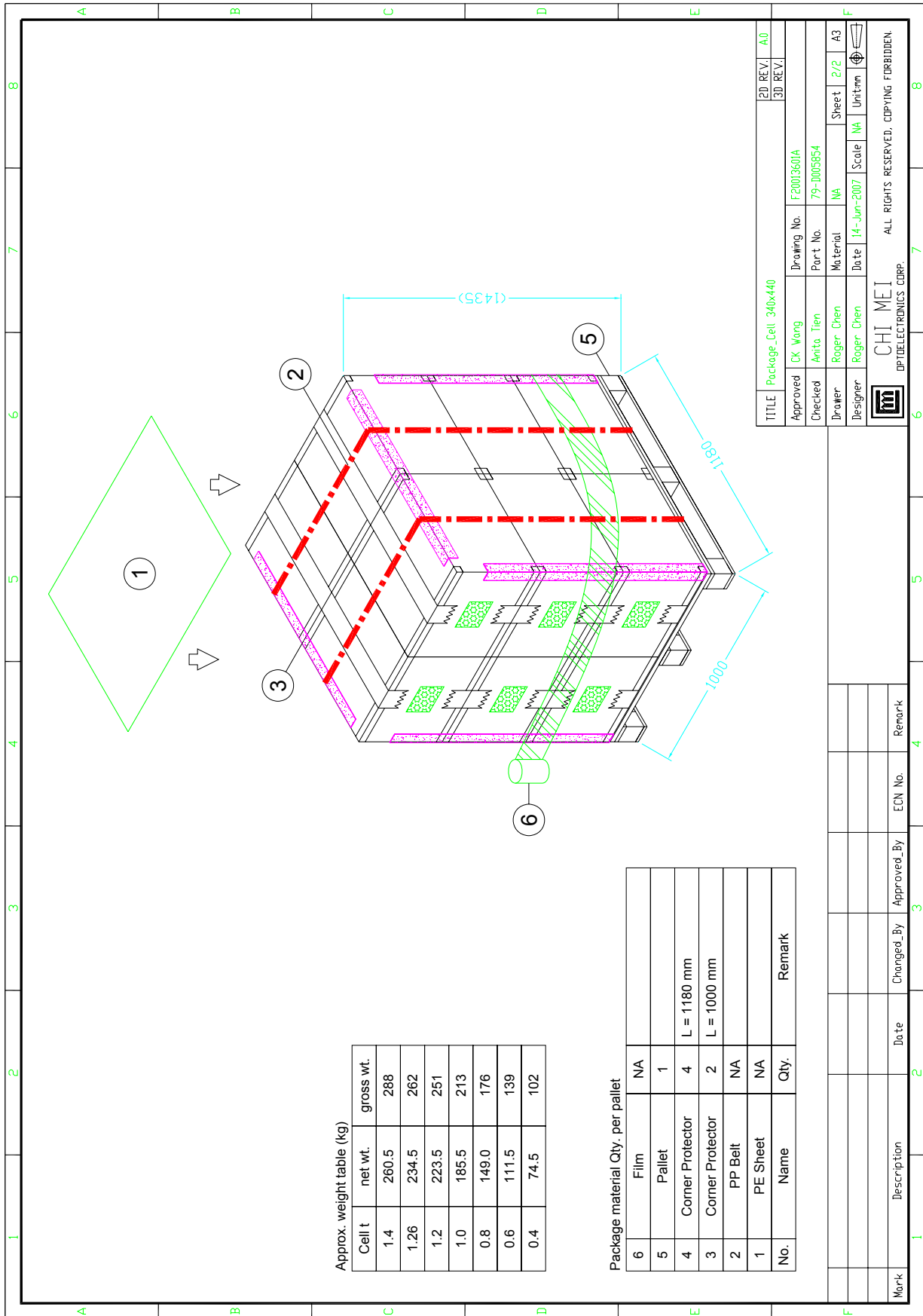
Package material Qty per carton

No.	Name	Qty.	Remark
9	Cell	36	
8	EPE Cushion	2	
7	Carton	1	
6	Bag	1	
5	Label	2	
4	Dyer	2	
3	Cover + EVA	3	
2	Carton (inner)	1	Cover & Bottom
1	EPE Cushion	1	
	PE Foam	2	

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TITLE	Package_Cell 340x440	2D REV.	A0
3D REV.			
Approved	CK Wong	Drawing No.	F20013601A
Checked	Anita Tien	Part No.	79-DXXXXX
Drawer	Icetea	Material	MA
Designer	Roger Chen	Date	14-Jun-2007
		Scale	NA
		Sheet	1/2
		Unit:mm	A3

8.2 PALLET PACKAGE



Cell t	net wt.	gross wt.
1.4	260.5	288
1.26	234.5	262
1.2	223.5	251
1.0	185.5	213
0.8	149.0	176
0.6	111.5	139
0.4	74.5	102

No.	Name	Qty.	Remark
6	Film	NA	
5	Pallet	1	
4	Corner Protector	4	L = 1180 mm
3	Corner Protector	2	L = 1000 mm
2	PP Belt	NA	
1	PE Sheet	NA	

TITLE	Package_Cell 340x440	2D REV.	A.0
Approved	CK Wang	Drawing No.	F2003601A
Checked	Anita Tien	Part No.	79-0005854
Drawer	Roger Chen	Material	NA
Designer	Roger Chen	Date	14-Jun-2007
		Scale	NA
		Sheet	2/2
		Unit:mm	A3

Mark	Description	Date	Changed_By	Approved_By	ECN No.	Remark

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8.3 Label Information

Cut01 Label

PO No. : _____

Part ID : LX2804LLB311 _____

Model Name : F02804-02U
ZX2804XXX1 _____

Carton/ Lot ID : _____ Quantities : _____

Cut02 Label

PO No. : _____

Part ID : LX2804LLB312 _____

Model Name : F02804-02U
ZX2804XXX1 _____

Carton/ Lot ID : _____ Quantities : _____

Cut03 Label

PO No. : _____

Part ID : LX2804LLB313 _____

Model Name : F02804-02U
ZX2804XXX1 _____

Carton/ Lot ID : _____ Quantities : _____

Cut04 Label

PO No. : _____

Part ID : LX2804LLB314 _____

Model Name : F02804-02U
ZX2804XXX1 _____

Carton/ Lot ID : _____ Quantities : _____