TFT LCD Product Specification

MODEL NO.: F02411-02U

Customer :

Approved by : _____

Note : 2.4''QVGA,12 O'CLOCK,

With NTSC 60% CF, 0.5mm

IC HX8325/R61505U/HX8346

AVPD Dept.	
Approval	Prepare
	

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REVISION HISTORY

Version	Date	Page (New)	Section	Description
Ver 1.0	2007/2/14	All	All	Product Specification was first issued.
Ver 1.1	2007/4/13	5	2.2.1	Revise BM edge to panel edge distance from 0.15 to 0.5mm

1. Purpose

The specification F02411-02U is a 2.4" QVGA TFT Liquid Crystal Display empty cell. The empty cell has been designed by CMO, and is to be manufactured by CMO under the agreement of Customer. The TFT-LCD empty cell will be applied to a high transmittance mode TFT-LCD Product.

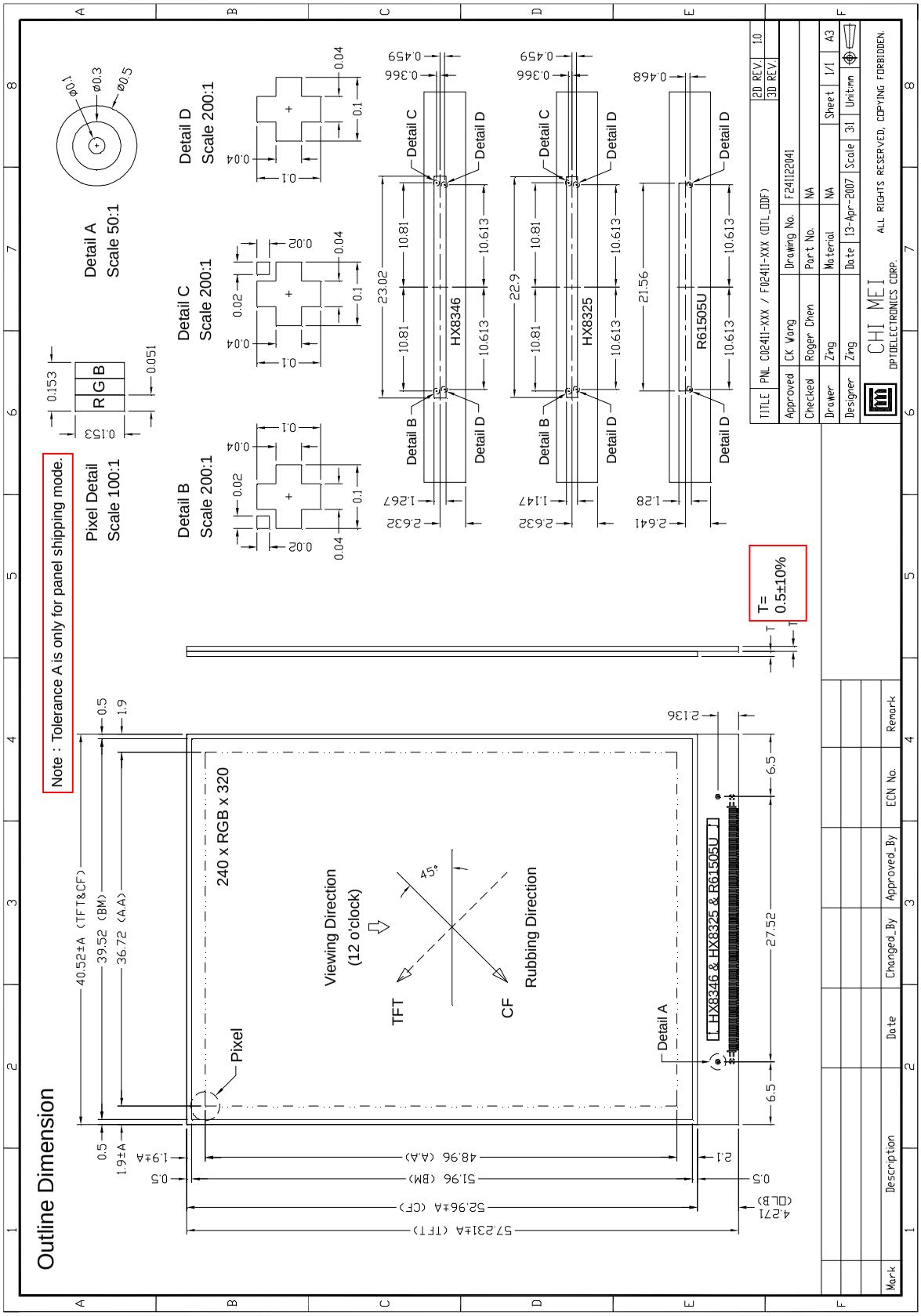
2. General specification

2.1 General Spec

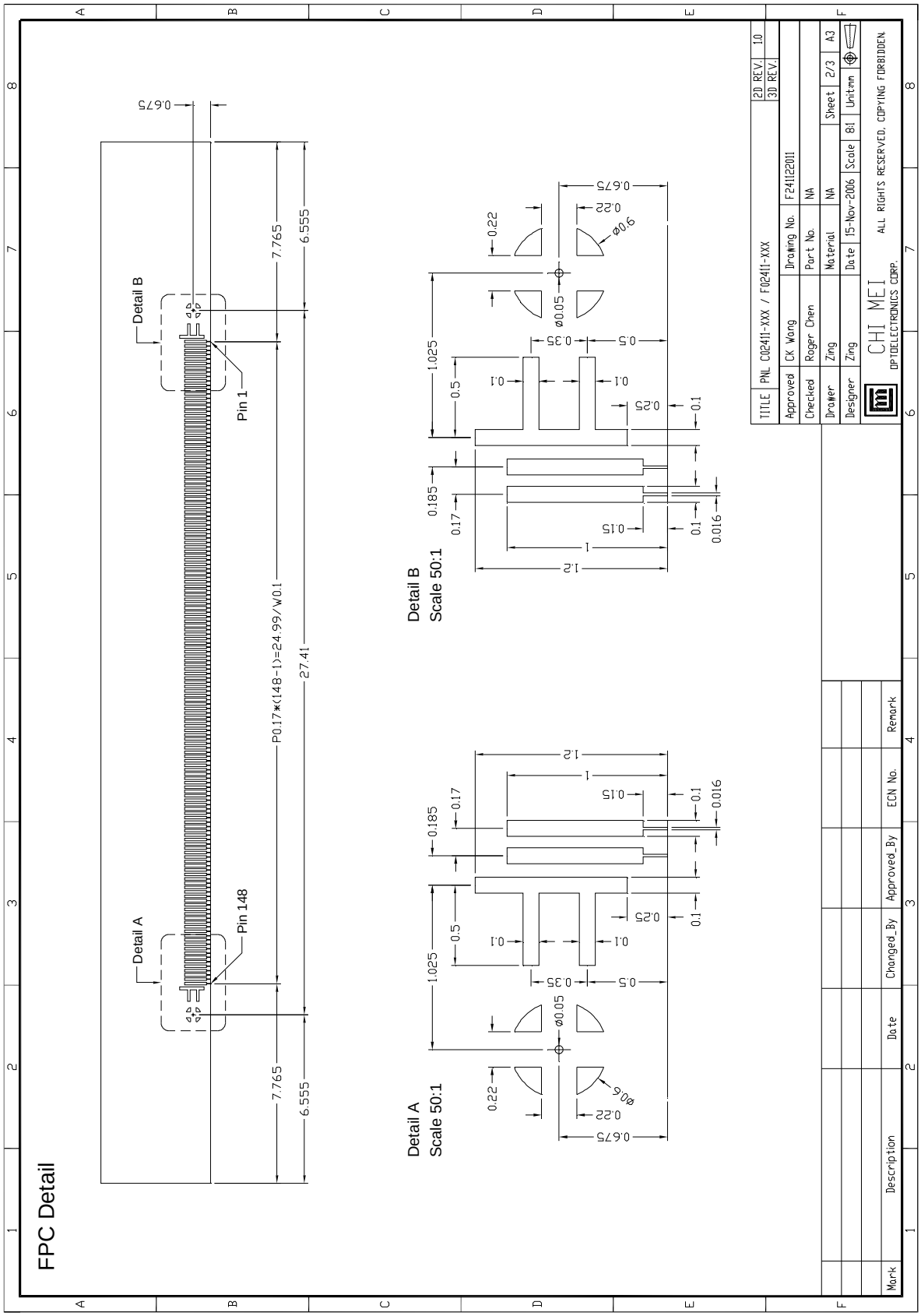
Item		Specification	unit
Substrate thickness	t	0.5	mm
Mother glass size	cut	305(H)x375(V)x1.0(D)	mm
Panel outline dimension		40.52 (H)x 57.231(V)x1.0(D)	mm
Active Screen size		2.4" diagonal	
Resolution		240 RGBx 320	pixel
Pixel driving element		a-Si TFT	-
Pixel size		51 x 153	um
Pixel arrangement		RGB-stripe	-
View direction (Gray inversion)		12 o'clock	-
Driver IC		HX8325 / HX8346 / R61505U	-
Pretilt angle		3 ~ 5	degree
Cell gap		3.85 ± 0.3	um
Assembly precision		±5	um
Weight (cut)		280 ±10%	g

2.2 Dimension

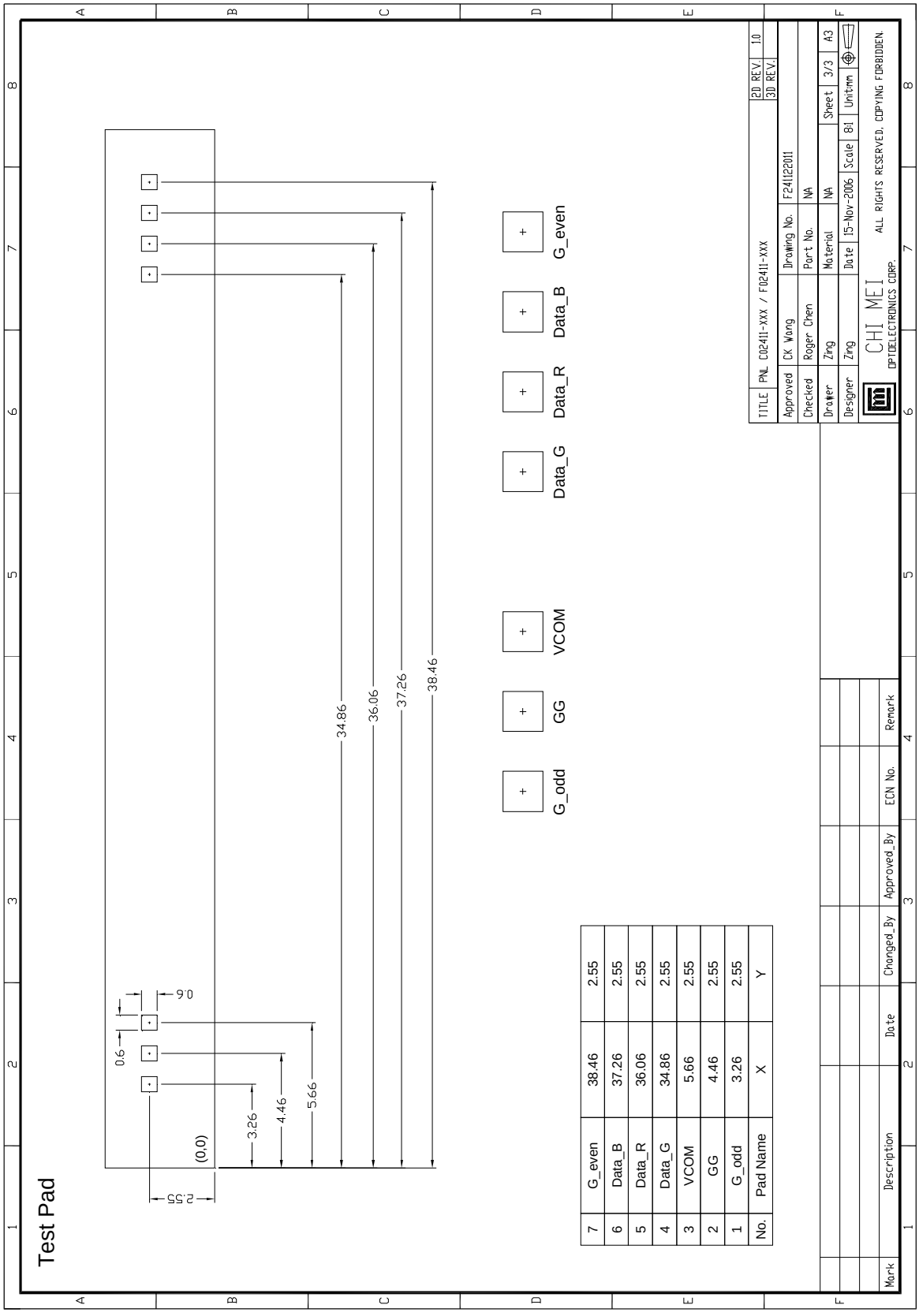
2.2.1 Outline Dimension



2.2.2 FPC detail



2.2.3 TEST PAD



No.	Pad Name	X	Y
7	G_even	38.46	2.55
6	Data_B	37.26	2.55
5	Data_R	36.06	2.55
4	Data_G	34.86	2.55
3	VCOM	5.66	2.55
2	GG	4.46	2.55
1	G_odd	3.26	2.55

3. Pin Assignment

3.1 FPC/IC Pin Assignment table

R61505U	HX8325 / HX8346	FPC PinOut NumBer
PinOut Name	PinOut Name	
VCCDUM1	BGR_PANEL	1
VPP1	REV_PANEL	2
VPP1	TB	3
VPP1	RL	4
VPP2	SHUT	5
VPP2	TEST1	6
VPP2	D23	7
VPP2	D22	8
VPP2	D21	9
VPP3	D20	10
VPP3	D19	11
VPP3	D18	12
TESTO2	SM_PANEL	13
TESTO3	OSC	14
TEST1	CM	15
TEST2	SS_PANEL	16
TEST4	GS_PANEL	17
TEST5	P68	18
TEST3	EXTC	19
IM0/ID	BS0	20
IM1	BS1	21
IM2	BS2	22
IM3	IFSEL0	23
TESTO4	IFSEL1	24
RESET*	NRESET	25
VSYNC	VSYNC	26
HSYNC	HSYNC	27
DOTCLK	DOTCLK	28
ENABLE	ENABLE	29
DB17	D17	30
DB16	D16	31
DB15	D15	32
DB14	D14	33
DB13	D13	34
DB12	D12	35

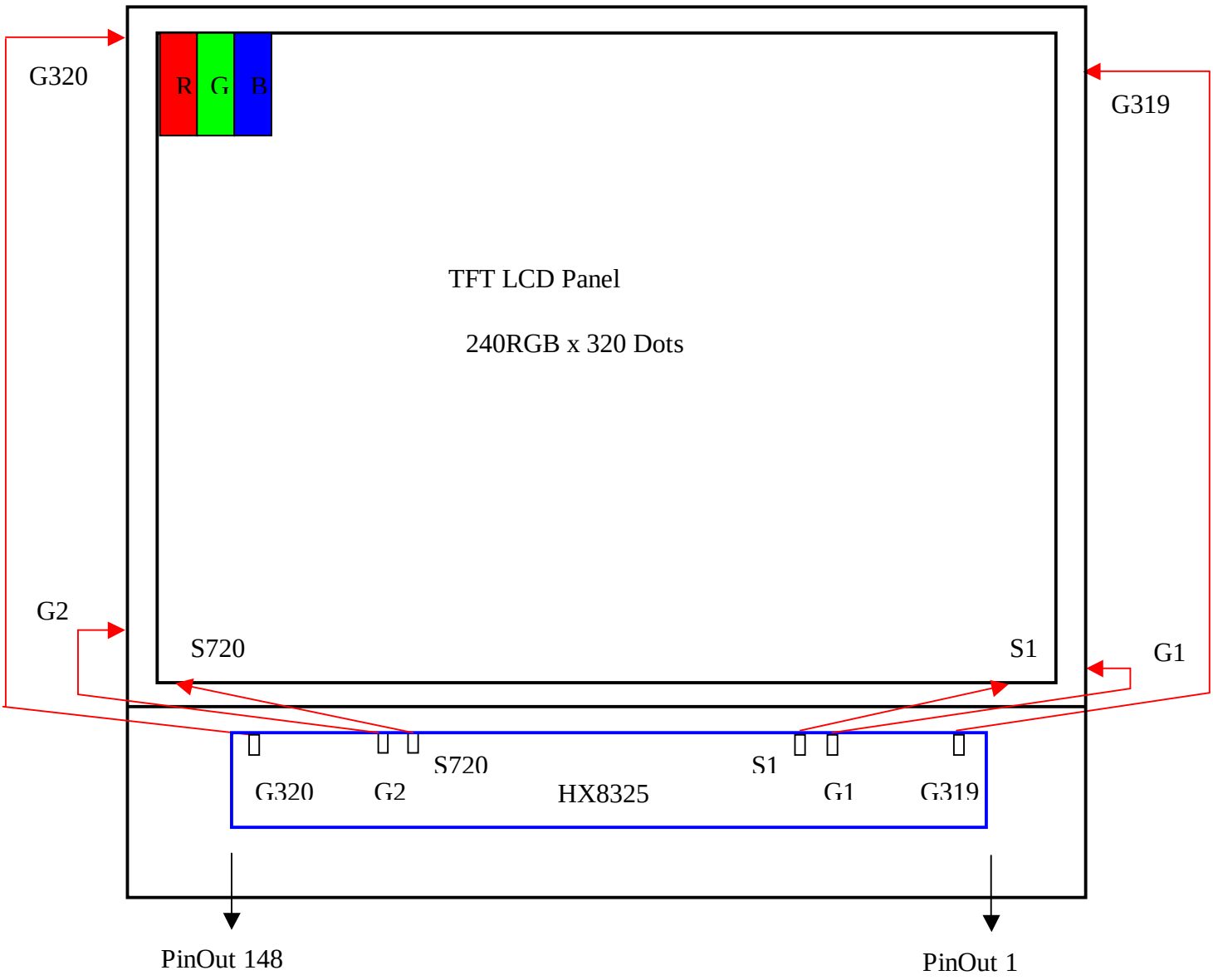
DB11	D11	36
DB10	D10	37
DB9	D9	38
DB8	D8	39
TESTO7	HSSP_EN	40
DB7	D7	41
DB6	D6	42
DB5	D5	43
DB4	D4	44
DB3	D3	45
DB2	D2	46
DB1	D1	47
DB0	D0	48
SDO	SDO	49
SDI	SDI	50
RD*	NRD_E	51
WR*/SCL	NWR_RNW	52
RS	DNC_SCL	53
CS*	NCS	54
TESTO9	BURN	55
FMARK	TE	56
TSC	REGVDD	57
TESTO10	FLM	58
OSC1DUM1	HS_DA_P	59
OSC1DUM2	HS_DA_P	60
OSC1	HS_DA_P	61
OSC1DUM3	HS_DA_P	62
OSC2	Dummy	63
IOGND	VSSD	64
IOGND	HS_DA_N	65
IOVCC	IOVCC	66
VCC	HS_CLK_N	67
		68
VCC	HS_CLK_P	69
		70
VDD	VCI	71
		72
VDD	VCC	73
TESTO13	VCI1	74

VREFD	VCI1	75
TESTO14	VCI1	76
VREF	VCI2	77
TESTO15	VCI2	78
VREFC	VCI2	79
VDDTEST	VBGP	80
AGND	VSSA	81
		82
GND	VGS	83
GND	VSSD	84
		85
RGND	VSSD	86
		87
TESTO18	SO_TEST1	88
VGS	SO_TEST2	89
TESTO19	SO_TEST3	90
V0T	LED_FB	91
TESTO20	LED_FB	92
VMON	LED_FB	93
TESTO21	LED_FB	94
V31T	LED_FB	95
VCOM	VCOM	96
		97
VCOMH	VCOMH	98
		99
VCOML	VCOML	100
		101
TESTO22	VREG1	102
TESTO23	VREG1	103
VREG1OUT	VREG1	104
TESTO24	VREG1	105
VCOMR	VCOMR	106
VCL	VCL	107
VLOUT1	PWM_OUT	108
		109
DDVDH	DDVDH	110
		111
VCIOUT	VREG3	112
		113

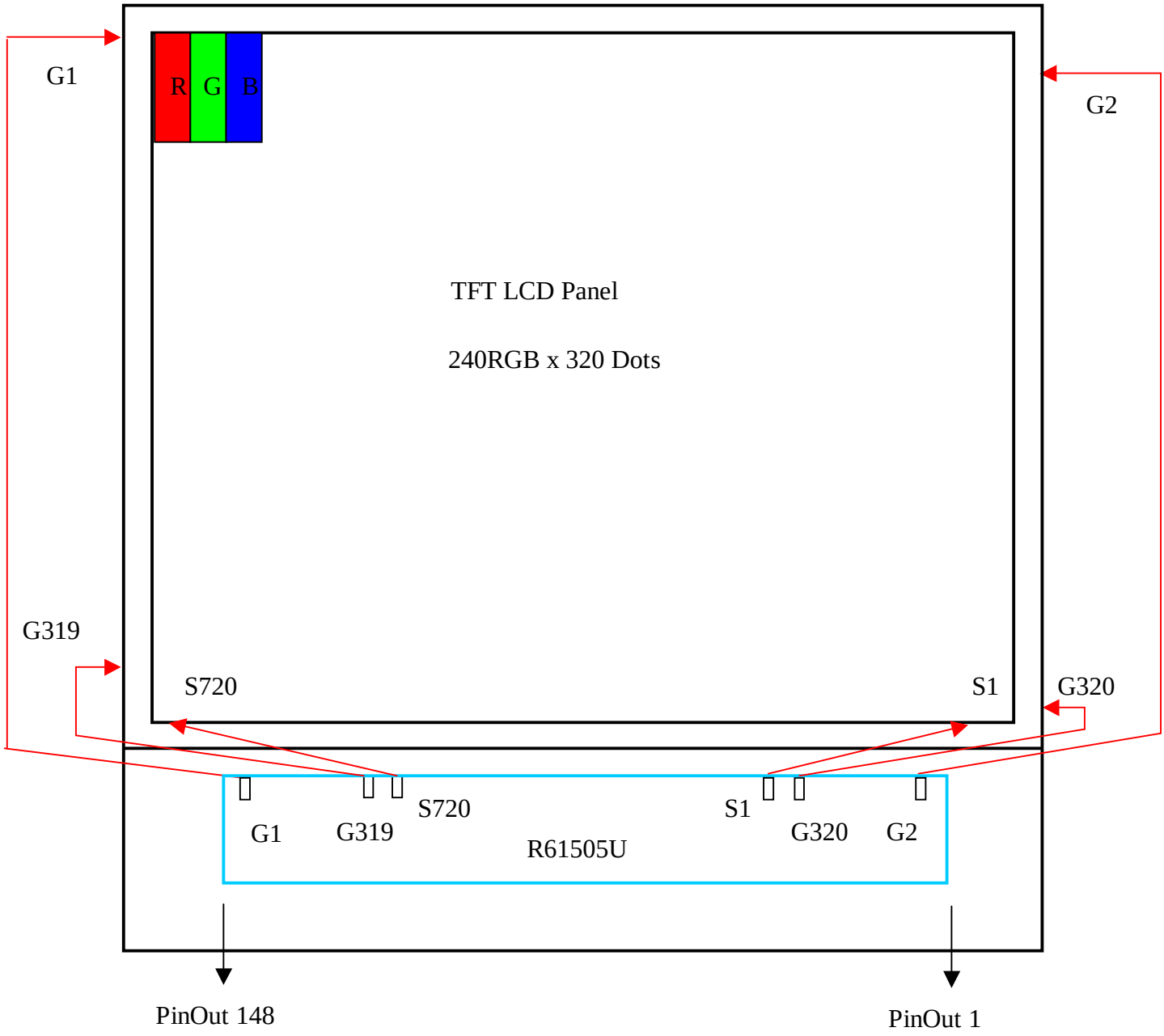
VCI1	LED_SW	114
		115
VCILVL	VDDD	116
VCI	VDDD	117
		118
C12-	C11BX	119
		120
C12+	C11AX	121
		122
C11-	C11B	123
		124
C11+	C11A	125
		126
VGL	VGL	127
		128
VGH	VGH	129
		130
C13-	C12B	131
TESTO28	C12B	132
C13+	C12A	133
TESTO29	C12A	134
C21-	C21B	135
		136
C21+	C21A	137
		138
C22-	C22B	139
		140
C22+	C22A	141
		142
C23-	C23B	143
		144
C23+	C23A	145
		146
TESTO30	PADB0	147
TESTO1	PADA0	148

3.2 Schematic Panel layout

3.2.1 HX8325 IC

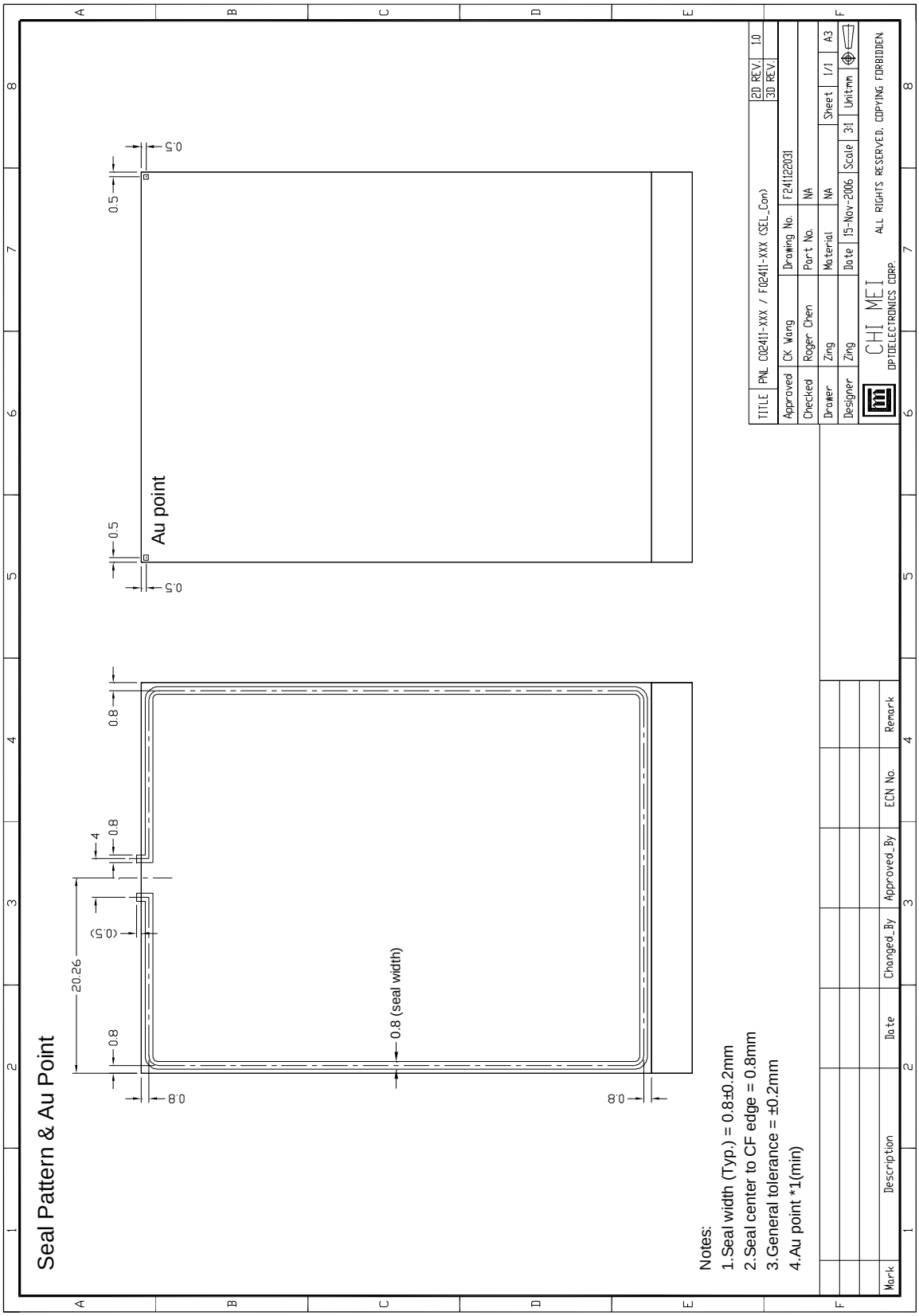


3.2.2 R61505U IC

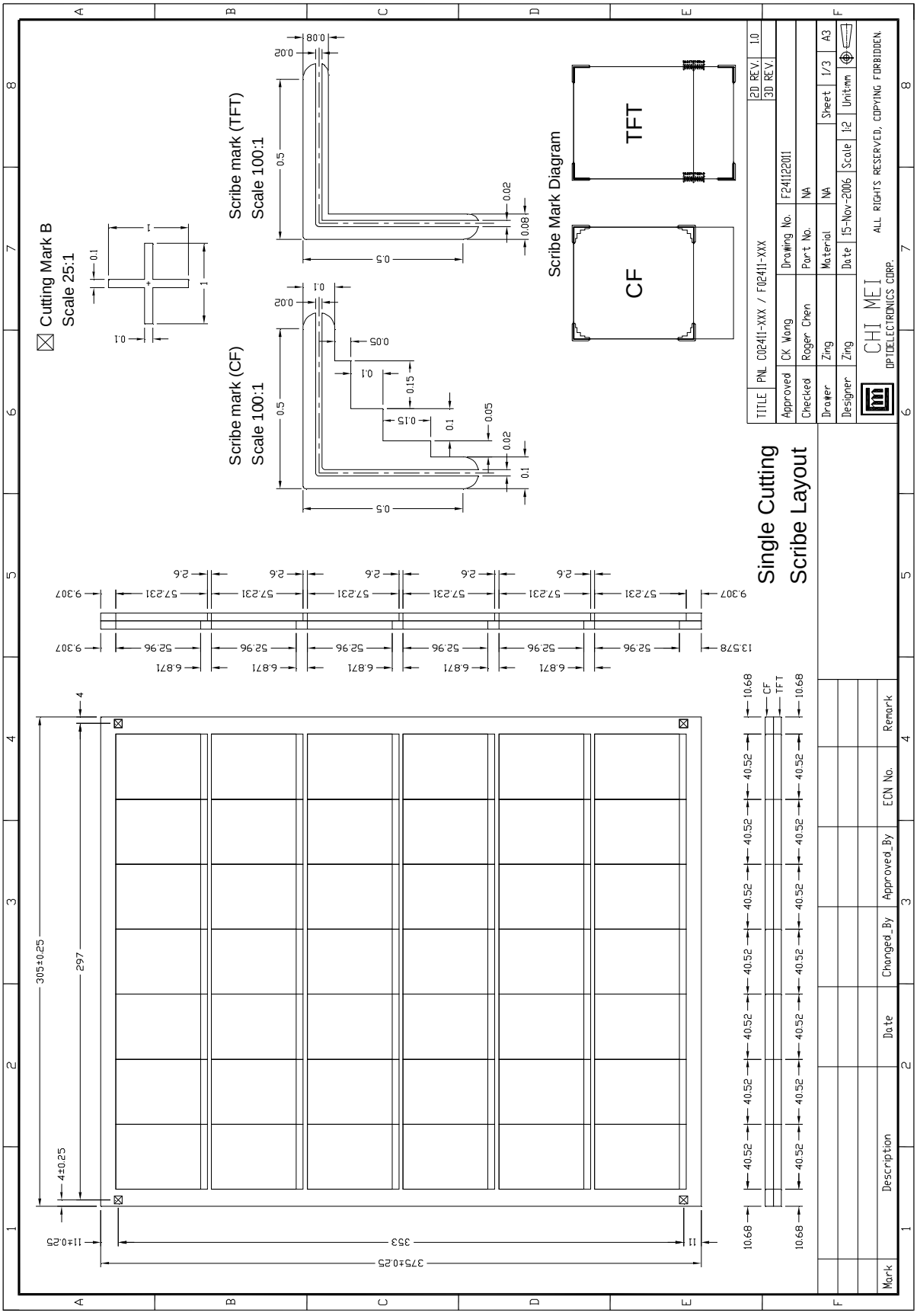


4.CELL PROCESS RULES

4.1 SEAL/AU PATTERN



4.2 CELL SCRIBE LAYOUT



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

The storage capacitance structure of this product is Cst(Storage on Common).

The low voltage level of VGL signal must be fluctuated with same phase as Vcom, in case of Storage on Gate structure.

(4) Environmental condition: 25±5℃

6. OPTICAL SPECIFICATION (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 $\theta_X = \theta_Y = 0°$		4.7		%	All left side data are based on CMO's following condition – Type 767 NTSC: 60% LC:5066 Light : C light (Machine:BM5A) Normal Polarizer Without DBEF
Contrast Ratio		CR		150	250	-	-	
Response Time		T_R		NA	10	20	ms	
		T_F		NA	20	30	ms	
Chromaticity	Red	X_R		0.603	0.633	0.663		
		Y_R		0.299	0.329	0.359		
	Green	X_G		0.264	0.294	0.324		
		Y_G		0.546	0.576	0.606		
	Blue	X_B		0.103	0.133	0.163		
		Y_B		0.092	0.122	0.152		
	White	X_W		0.278	0.308	0.338		
		Y_W		0.316	0.346	0.376		
Viewing Angle	Hor.	θ_{X+}	Center CR≥10		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.

Contrast Ratio (CR) = L63 / L0

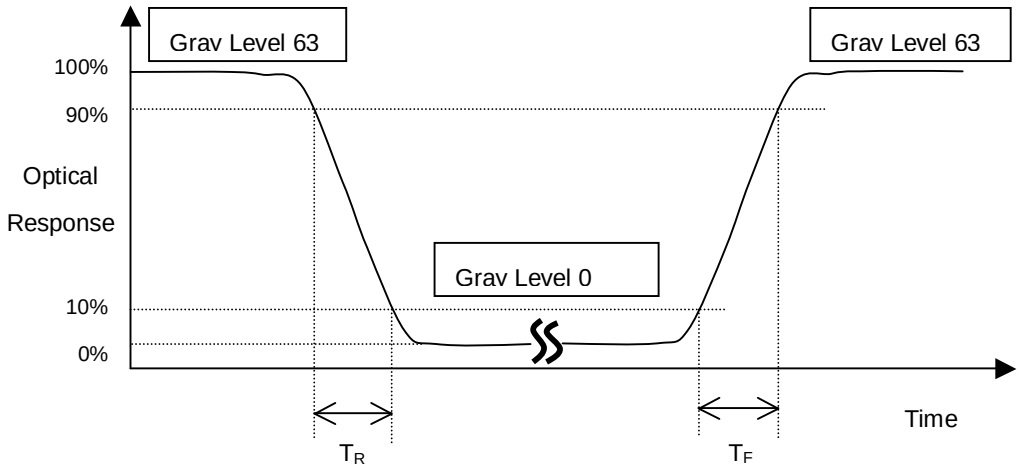
L63: Luminance of gray level 63

L 0: Luminance of gray level 0

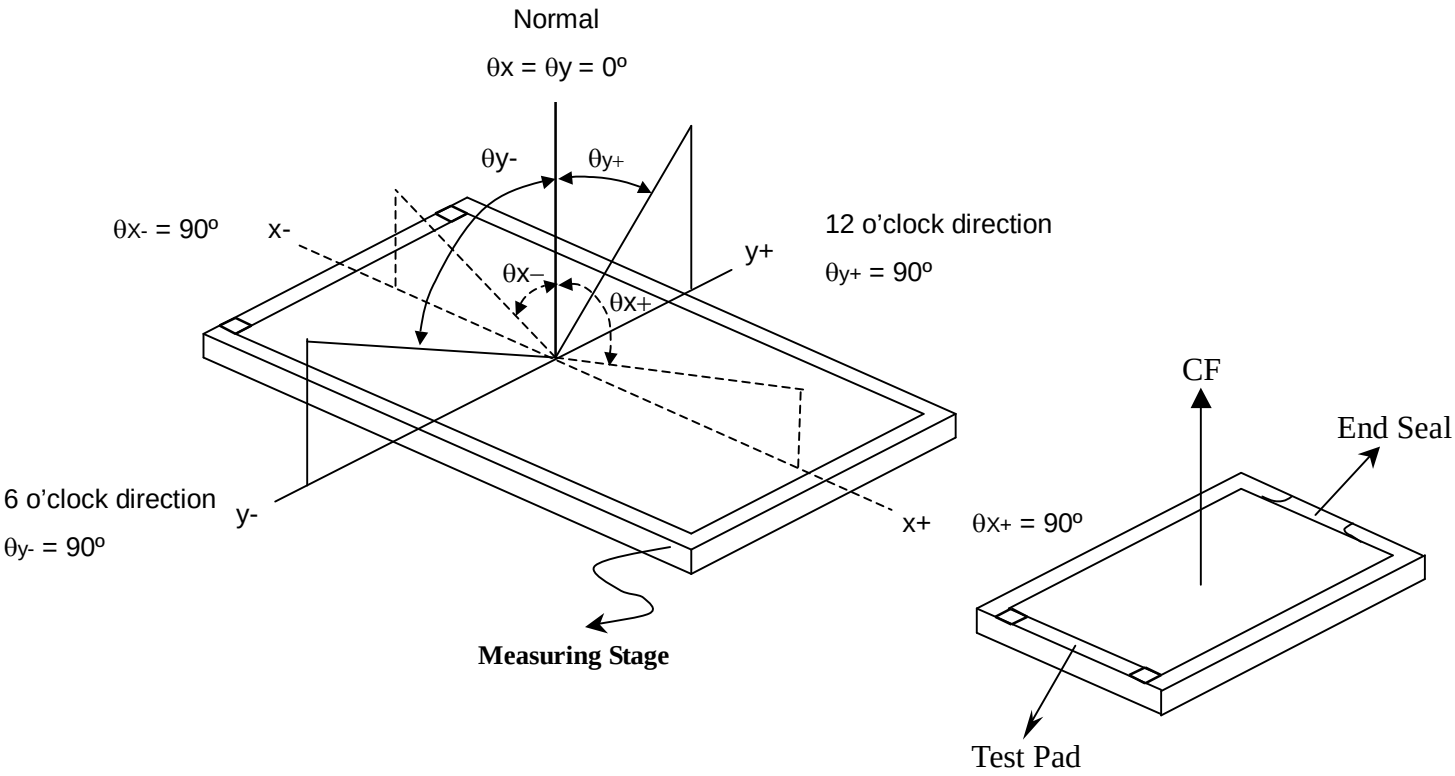
CR = CR (10)

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):

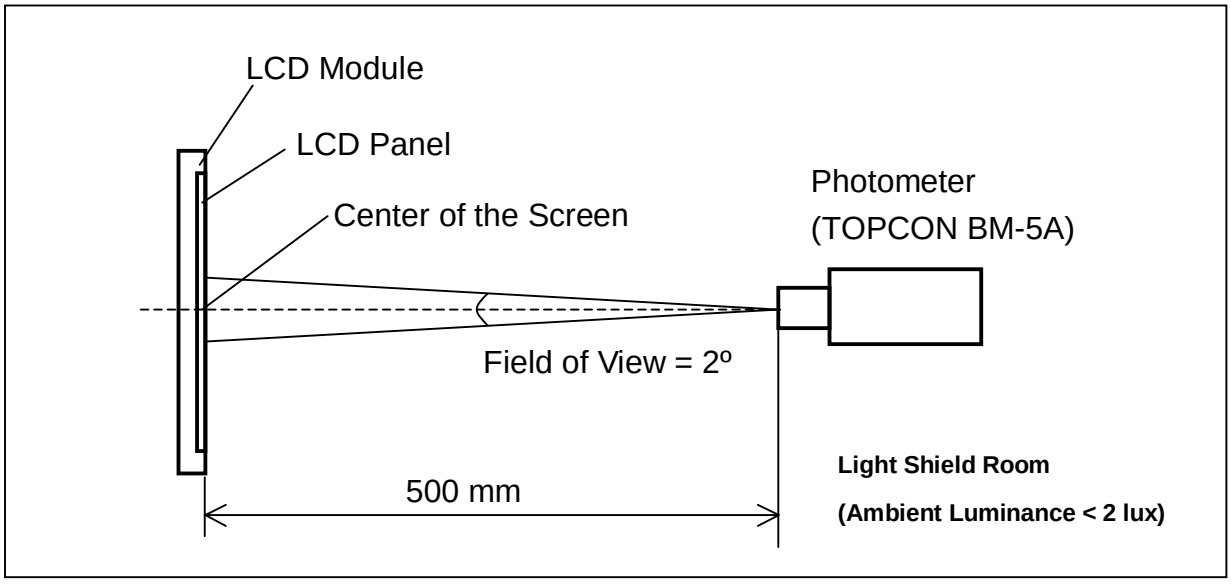


*Note(3) Definition of Viewing Angle

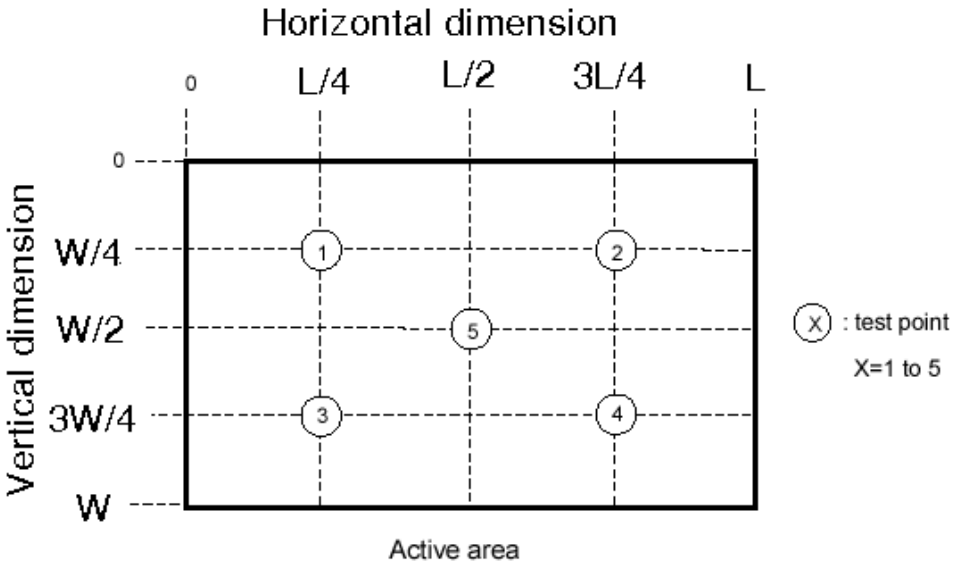


*Note (4) Measurement Set-Up:

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)



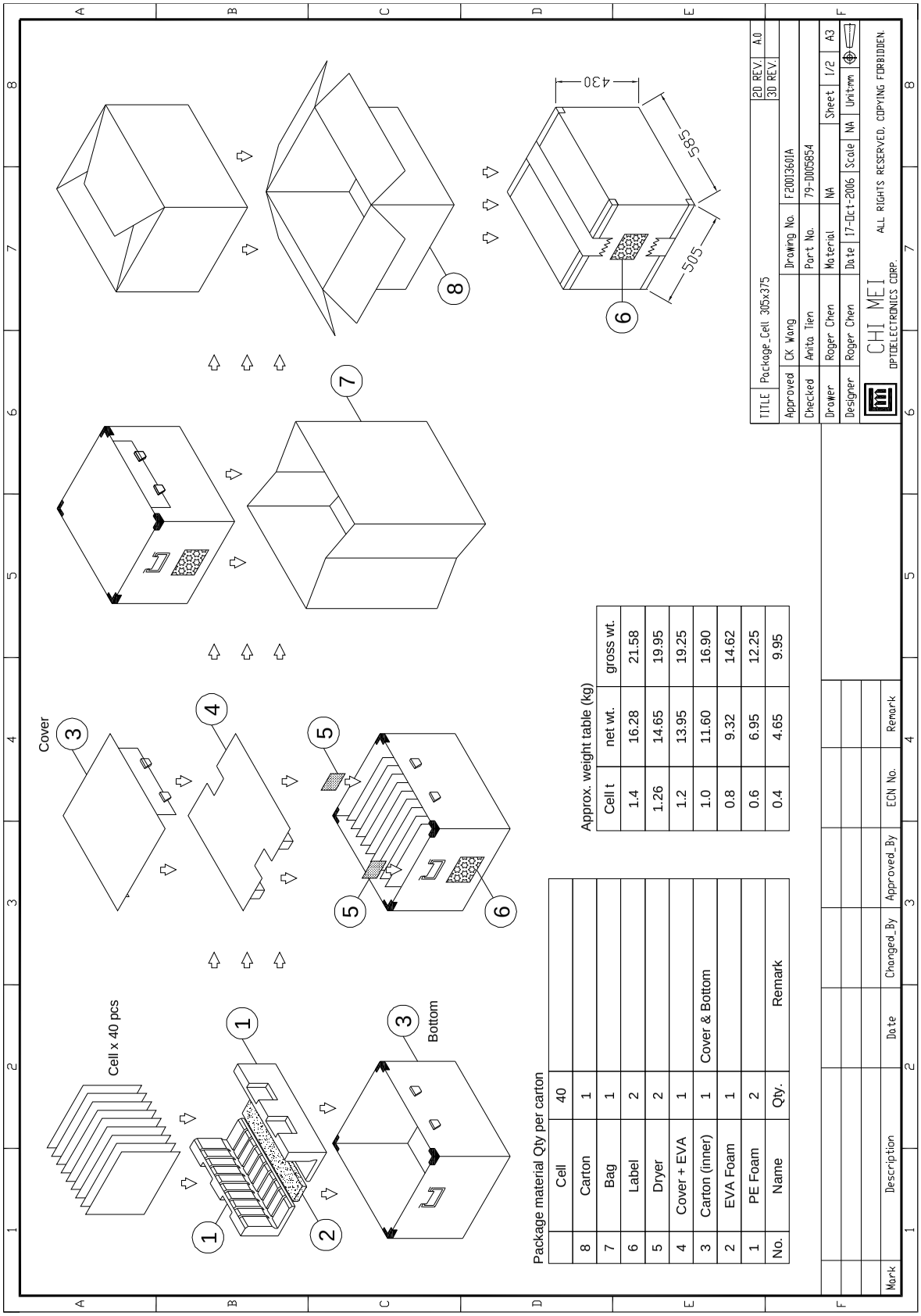
7. RELIABILITY SPECIFICATION

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

Reliability Test Criteria:
Display function should be no change under normal operating condition.

8. PACKAGE FORM

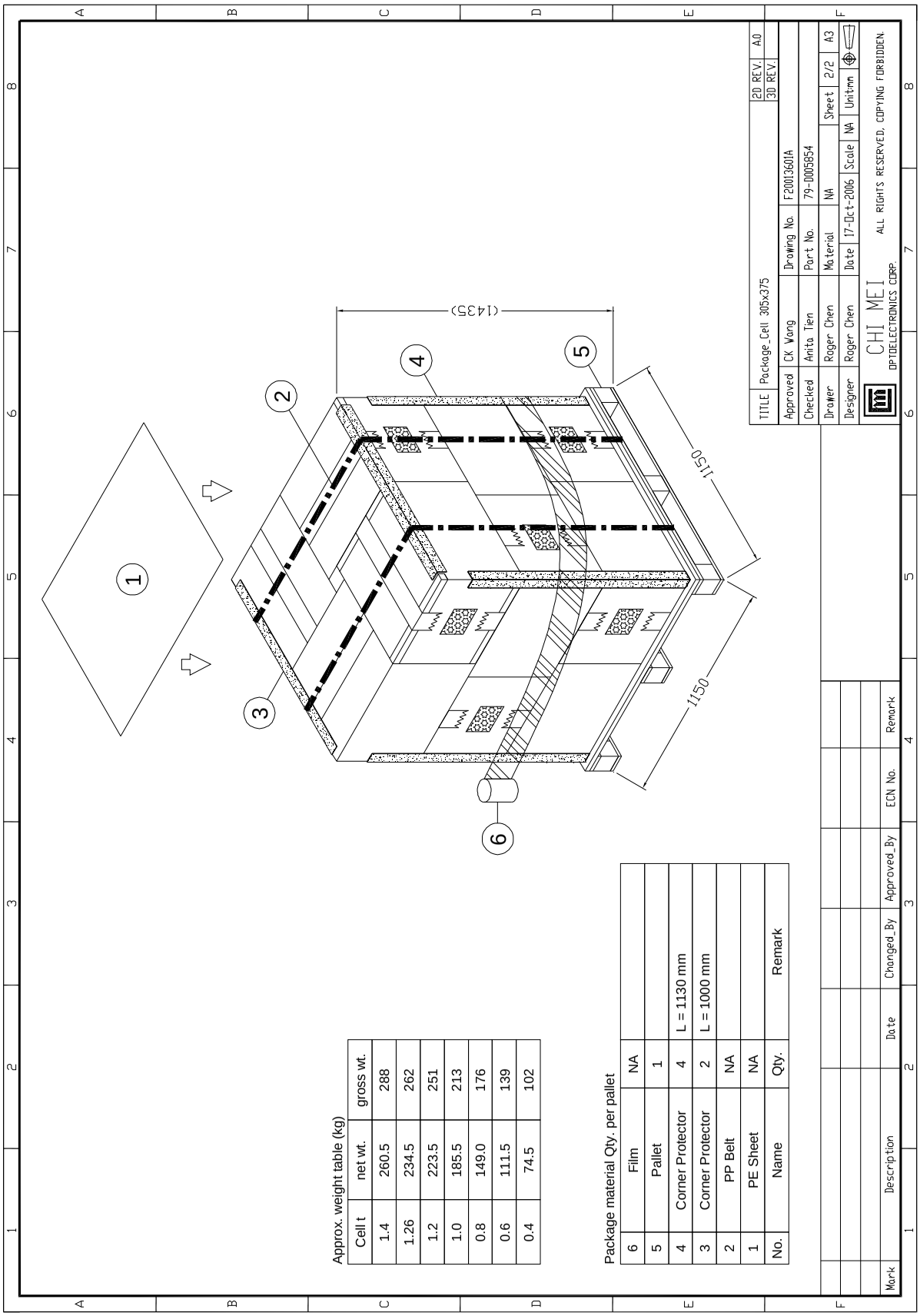
8.1 CUTS PACKAGE



No.	Name	Qty.	Remark
8	Cell	40	
7	Carton	1	
6	Bag	1	
5	Label	2	
4	Dryer	2	
3	Cover + EVA	1	Cover & Bottom
2	Carton (inner)	1	
1	EVA Foam	1	
	PE Foam	2	

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

8.2 PALLET PACKAGE



Approx. weight table (kg)

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

Package material Qty. per pallet

No.	Name	Qty.	Remark
6	Film	NA	
5	Pallet	1	
4	Corner Protector	4	L = 1130 mm
3	Corner Protector	2	L = 1000 mm
2	PP Belt	NA	
1	PE Sheet	NA	