Doc. Number:

■ Tentative Specification
☐ Preliminary Specification
☐ Approval Specification

MODEL NO.: F040A16-603

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
Jessie Chu	**Jacky Wu**	**Johnny Chiang**

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REVISION HISTORY

Version	Date	Page (New)	Section	Description
Ver. 0.0	2014/03/31	All	All	Product spec was first issued for LCD cut.

1.PURPOSE

The specification F040A16-603 is a 4.0” 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

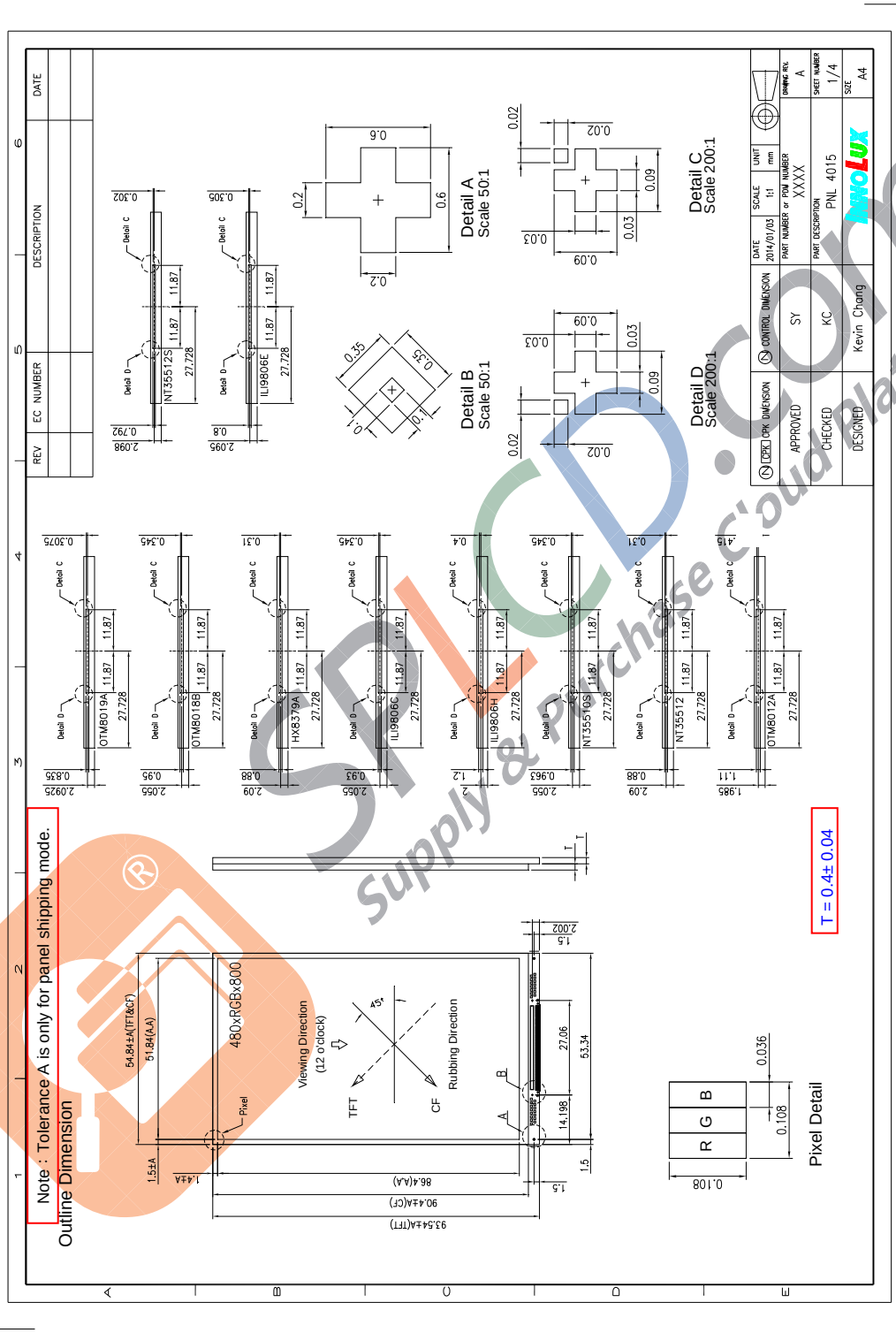
No.	Item		Specification	unit
1	Glass thickness	TFT	0.4	mm
		CF	0.4	
2	Shipping mode		ODF cut	-
3	Shipping size		359.5 (H) x 618 (V) x 0.8(D)	mm
4	Panel outline dimension		54.84 (H) x 93.54 (V) x 0.8 (D)	mm
5	Active screen size		4” diagonal	-
6	Resolution		480RGBx 800	pixel
7	Pixel driving element		a-Si TFT	-
8	Sub pixel size		36 x 108	um
9	Pixel arrangement		RGB-stripe	-
10	View direction (Gray inversion)		TN (12 o’clock)	-
11	Cell gap		3.85 ± 0.3	um
12	Driver IC		HX8379A *<Note>	-
13	Weight without POL		437±10%	g
14	Scanning Method		Dual Direction	-

<Note> 1. Compatible IC : OTM8009A , OTM8018B , OTM8012A , HX8379B , ILI9806 , NT35510S ,NT35512
The other compatible IC are also considered for the design of pad locations.

2. Those compatible IC should be verified for panel performance. Please refer to the IC datasheet (AP note) respectively.

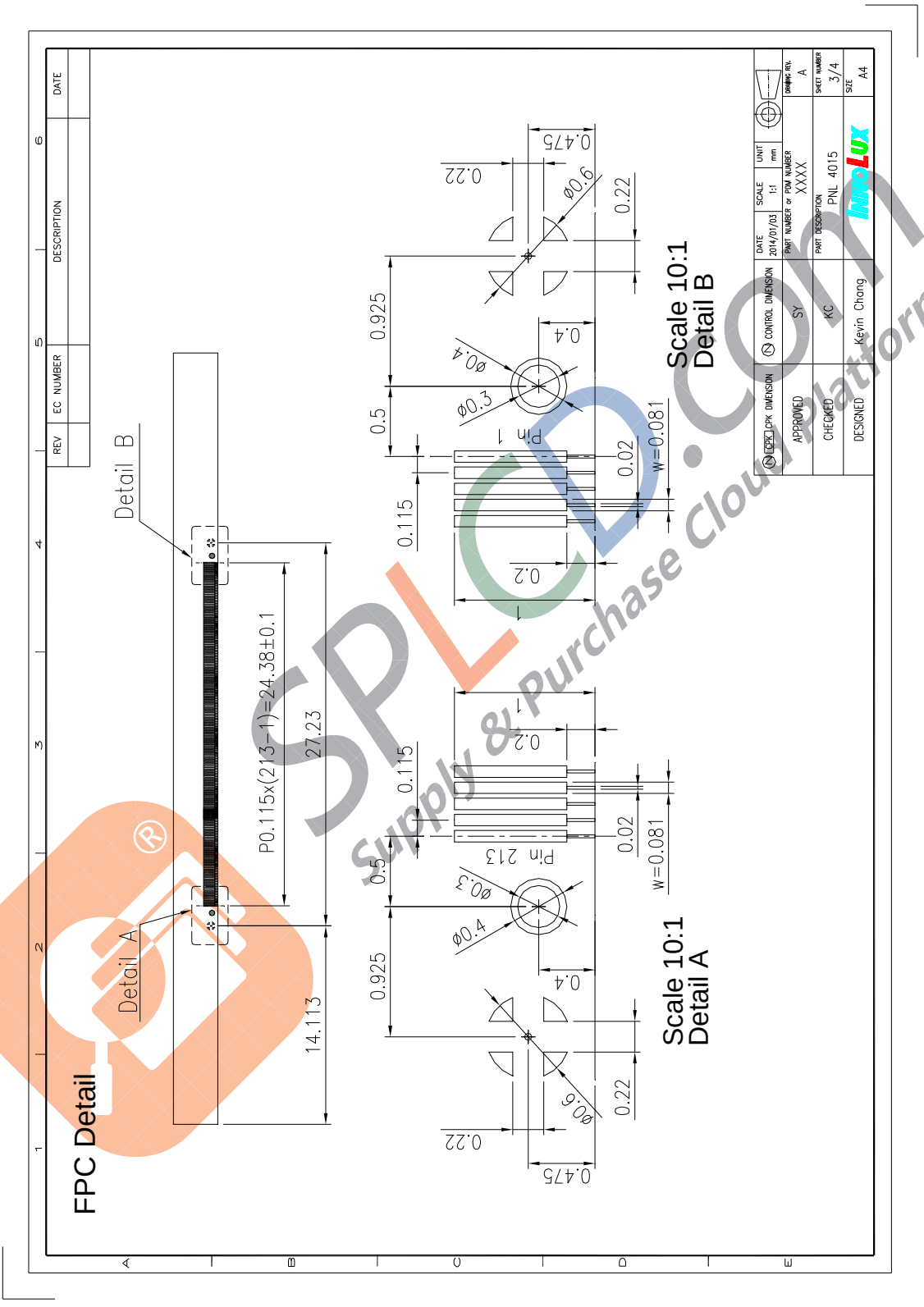
2.2 DIMENSION

2.2.1 OUTLINE DIMENSION

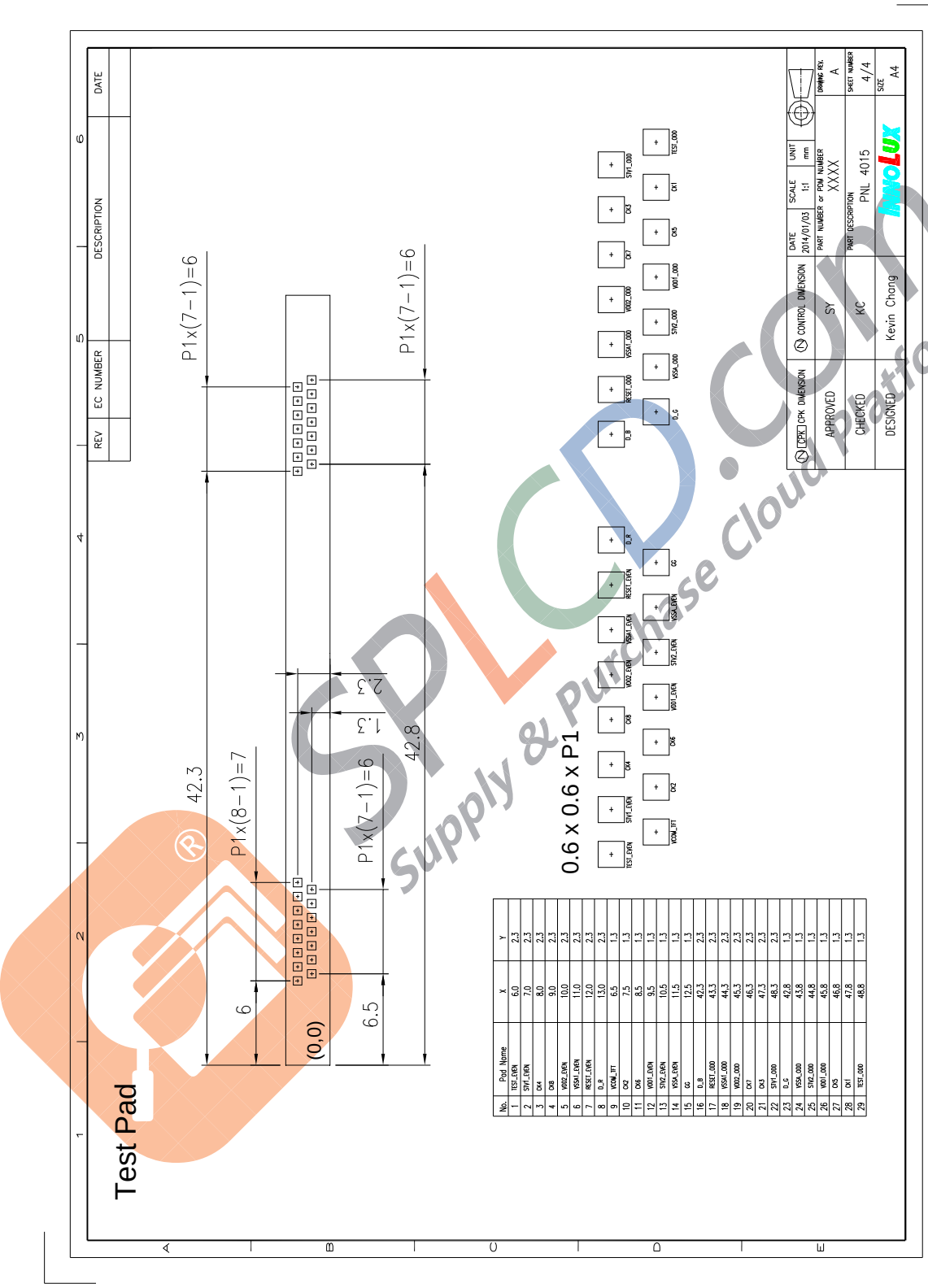


Note: (1) panel outline dimension tolerance ±0.2 mm.
(2) View direction for normal TN is the same as direction of gray inversion.

2.2.2 FPC DETAIL



2.2.3 TEST PAD



No.	Pad Name	X	Y
1	TEST_LVDS	6.0	2.3
2	SVI1_LVDS	7.0	2.3
3	CK4	8.0	2.3
4	CK8	9.0	2.3
5	VDD2_DVDS	10.0	2.3
6	VSS41_LVDS	11.0	2.3
7	RESET_LVDS	12.0	2.3
8	D_L4	13.0	2.3
9	VCOM_EFT	6.5	1.3
10	CK2	7.5	1.3
11	CK6	8.5	1.3
12	VDD1_DVDS	9.5	1.3
13	SVI2_DVDS	10.5	1.3
14	VSS4_DVDS	11.5	1.3
15	CK	12.5	1.3
16	D_8	42.3	2.3
17	RESET_ODD	43.3	2.3
18	VSS41_ODD	44.3	2.3
19	VDD2_ODD	45.3	2.3
20	CK7	46.3	2.3
21	CK3	47.3	2.3
22	SVI1_ODD	48.3	2.3
23	D_L6	42.8	1.3
24	VSS4_ODD	43.8	1.3
25	SVI2_ODD	44.8	1.3
26	VDD1_ODD	45.8	1.3
27	CK5	46.8	1.3
28	CK1	47.8	1.3
29	TEST_ODD	48.8	1.3

3. PIN ASSIGNMENT

3.1 FPC/IC PIN ASSIGNMENT TABLE

HX8379A (MIPI)

IC Pad No	IC Pad Name	Connect to	FPC PinOut Name	FPC PinOut NumBer
No.1	VSSA	SHORT		
No.2	VSSA			
No.3	VSSA			
No.4	VSSA	SHORT		
No.5	VSSA			
X	X	FPC	DUMMY	1
X	X	FPC	DUMMY	2
X	X	FPC	DUMMY	3
No.6	VCOM	FPC TEST PAD Panel VCOM	VCOM	4
No.7	VCOM			
No.8	VCOM			5
No.9	VCOM			6
No.10	VCOM			
No.11	DUMMYR1_A			
No.12	DUMMYR1_B			
No.13	OTP_PWR	FPC	OTP_PWR	7
No.14	OTP_PWR			
No.15	OTP_PWR			8
No.16	OTP_PWR			
No.17	OTP_PWR			
No.18	VGL	FPC	VGL	9
No.19	VGL			
No.20	VGLO_L	FPC	VGL	10
No.21	VGLO_L			
No.22	VGL_REG	FPC	VGL_REG	11
No.23	VGL_REG			
No.24	VRGH	FPC	VRGH	12
No.25	VRGH			
No.26	VCL	FPC	VCL	13
No.27	VCL			
No.28	VCL			
No.29	VCL			
No.30	VREF	FPC	VREF	14
No.31	VREF			
No.32	VREF			15
No.33	VREF			
No.34	VSSAC	FPC	VSSAC	16
No.35	VSSAC			
No.36	VSSAC			17
No.37	VSSAC			

No.38	VDD2	FPC OTM8009A & OTM8018B =>Link to Pad No. 68 ~ 70 HX8379A & HX8379B =>Link ti Pad No. 69 ~71	VDD	18
No.39	VDD2			
No.40	VDD2			19
No.41	VDD2			
No.42	VDD3			20
No.43	VDD3			
No.44	VDD3			21
No.45	VDD3			
No.46	VSSA	FPC	VSSA	22
No.47	VSSA			
No.48	VSSA			23
No.49	VSSA			
No.50	TEST0			
No.51	TEST1			
No.52	TEST2			
No.53	TEST3			
No.54	VDD3	FPC	VDD	24
				25
No.55	Dummy_DIOPWR	FPC	Dummy_DIOPWR	26
No.56	Dummy_DIOPWR			
No.57	VGSN	FPC	VGSN	27
No.58	VGSN			
No.59	VGSP	FPC	VGSP	28
No.60	VSNR	FPC	VGMN	29
No.61	VSNR			
No.62	VSPR	FPC	VGMP	30
No.63	VSSD	FPC	VSS	31
No.64	VSSD			
No.65	VSSD			
No.66	VDDD	FPC	VDDD	32
No.67	VDDD			
No.68	VDDD			
No.69	VDD3	OTM8009A & OTM8018B =>Link to Pad No. 37 ~ 44 HX8379A & HX8379B =>Link to Pad No. 38 ~ 45		
No.70	VDD3			
No.71	VDD3			
No.72	VCL	FPC	VCL	33
No.73	VCL			
No.74	VCL			
No.75	VCL			34
No.76	VCL			
No.77	VCL			

No.78	VSSA	FPC	VSSA	35
No.79	VSSA			
No.80	VSSA			
No.81	VDD1			
No.82	LANSEL	FPC	LANSEL	36
No.83	DSWAP	FPC	DSWAP	37
No.84	PSWAP	FPC	PSWAP	38
No.85	VSSD	OTM8009A & TOM8018B =>Link to Pad No. 88 ~ 89 HX8379A & HX8379B =>Link to Pad No. 89 ~ 90		
No.86	DUMMY_DSTB_SEL	FPC	DSTB_SEL	39
No.87	NBWSEL	OTM8009A & TOM8018B =>Link to Pad No. 84 HX8379A & HX8379B =>Link to Pad No. 85 NB or NW panel type selection		
No.88	VGSW3	OTM8009A & TOM8018B =>Link to Pad No. 90 ~ 91 HX8379A & HX8379B =>Link to Pad No. 91 ~ 92		
No.89	VGSW2	OTM8009A & TOM8018B =>Link to Pad No. 84 HX8379A & HX8379B =>Link to Pad No. 85		
No.90	VGSW1			
No.91	VGSW0	OTM8009A & TOM8018B =>Link to Pad No. 87 HX8379A & HX8379B =>Link to Pad No. 88		
No.92	VDD1			
No.93	DUMMY_RGBBP	FPC	DUMMY_RGBBP	40
No.94	I2C_SA0	FPC	I2C_SA0	41
No.95	IM3	FPC	IM3	42
No.96	IM2	FPC	IM2	43
No.97	IM1	FPC	IM1	44
No.98	IM0	FPC	IM0	45
No.99	GPO3	FPC	GPO3	46
No.100	GPO2	FPC	GPO2	47
No.101	GPO1	FPC	GPO1	48
No.102	GPO0	FPC	GPO0	49

No.103	IDLE_ON	FPC	IDLE_ON	50
No.104	TE_L	FPC	TE	51
No.105	LED_BOOST	FPC	LED_BOOST	52
No.106	SDO	FPC	SDO	53
No.107	SDI_I2C_SDA	FPC	SDI_I2C_SDA	54
No.108	DCX	FPC	DCX	55
No.109	SCL_I2C_SCL	FPC	SCL_I2C_SCL	56
No.110	DUMMY_RDX	FPC	RDX	57
No.111	CSX	FPC	CSX	58
No.112	RESX	FPC	RESX	59
No.113	VSSD	FPC	VSS	60
No.114	VSSD			
No.115	VSSD			
No.116	VDD1	FPC	VDDIO	61
No.117	VDD1			
No.118	VDD1			
No.119	DB23	FPC	D23	62
No.120	DB22	FPC	D22	63
No.121	DB21	FPC	D21	64
No.122	DB20	FPC	D20	65
No.123	DB19	FPC	D19	66
No.124	DB18	FPC	D18	67
No.125	DB17	FPC	D17	68
No.126	DB16	FPC	D16	69
No.127	DB15	FPC	D15	70
No.128	DB14	FPC	D14	71
No.129	DB13	FPC	D13	72
No.130	DB12	FPC	D12	73
No.131	DB11	FPC	D11	74
No.132	DB10	FPC	D10	75
No.133	DB9	FPC	D9	76
No.134	DB8	FPC	D8	77
No.135	DB7	FPC	D7	78
No.136	DB6	FPC	D6	79
No.137	DB5	FPC	D5	80
No.138	DB4	FPC	D4	81
No.139	DB3	FPC	D3	82
No.140	DB2	FPC	D2	83
No.141	DB1	FPC	D1	84
No.142	DB0	FPC	D0	85
No.143	DE	FPC	DE	86
No.144	PCLK	FPC	PCLK	87
No.145	HS	FPC	HS	88
No.146	VS	FPC	VS	89

No.147	CABC_PWM_OUT	FPC	CABC_PWM_OUT	90
No.148	CABC_LED_EN	FPC	CABC_LED_EN	91
No.149	DUMMY_KBBC			
No.150	ERR	FPC	ERR	92
No.151	VDD1	FPC	VDDIO	93
No.152	VDD1			
No.153	VDD1			
No.154	VSSD	FPC	VSSD	94
No.155	VSSD			
No.156	VSSD			
No.157	VSP	FPC	VSP	95
No.158	VSP			
No.159	VSP			96
No.160	VSP			
No.161	VSSA	FPC	VSSA	97
No.162	VSSA			
No.163	VSSA			98
No.164	VSSA			
No.165	VSN	FPC	VSN	99
No.166	VSN			
No.167	VSN			
No.168	VSN			
No.169	VSN			
No.170	VDD3	FPC	VDD	100
No.171	VDD3			
No.172	VDD3			101
No.173	VDD3			
No.174	VSSD	FPC	VSSD	102
No.175	VSSD			
No.176	VSSD			103
No.177	VSSD			
No.178	VDDD	FPC	VDDD	104
No.179	VDDD			
No.180	VDDD			105
No.181	VDDD			
No.182	HS_VSS	FPC	LVDSVSS	106
No.183	HS_VSS			
No.184	HS_VSS			
No.185	HS_VSS			107
No.186	HS_VSS			

No.187	HS_D1_P	FPC	D1_P	108
No.188	HS_D1_P			
No.189	HS_D1_P			109
No.190	HS_D1_P			
No.191	HS_D1_N	FPC	D1_N	110
No.192	HS_D1_N			
No.193	HS_D1_N			111
No.194	HS_D1_N			
No.195	HS_VSS	FPC	LVDSVSS	112
No.196	HS_VSS			113
No.197	HS_CLK_P	FPC	CLK_P	114
No.198	HS_CLK_P			
No.199	HS_CLK_P			115
No.200	HS_CLK_P			
No.201	HS_CLK_N	FPC	CLK_N	116
No.202	HS_CLK_N			
No.203	HS_CLK_N			117
No.204	HS_CLK_N			
No.205	HS_VSS	FPC	LVDSVSS	118
No.206	HS_VSS			119
No.207	HS_D0_P	FPC	D0_P	120
No.208	HS_D0_P			
No.209	HS_D0_P			121
No.210	HS_D0_P			
No.211	HS_D0_N	FPC	D0_N	122
No.212	HS_D0_N			
No.213	HS_D0_N			123
No.214	HS_D0_N			
No.215	HS_VSS	FPC	LVDSVSS	124
No.216	HS_VSS			125
No.217	HS_LDOL	FPC	LDOL	126
No.218	HS_LDOL			
No.219	HS_LDOL			127
No.220	HS_LDO	FPC	LDO	128
No.221	HS_LDO			
No.222	HS_LDO			129
No.223	HS_VCC	FPC	HS_VCC	130
No.224	HS_VCC			
No.225	HS_VCC			
No.226	HS_VCC			
No.227	HS_VCC			

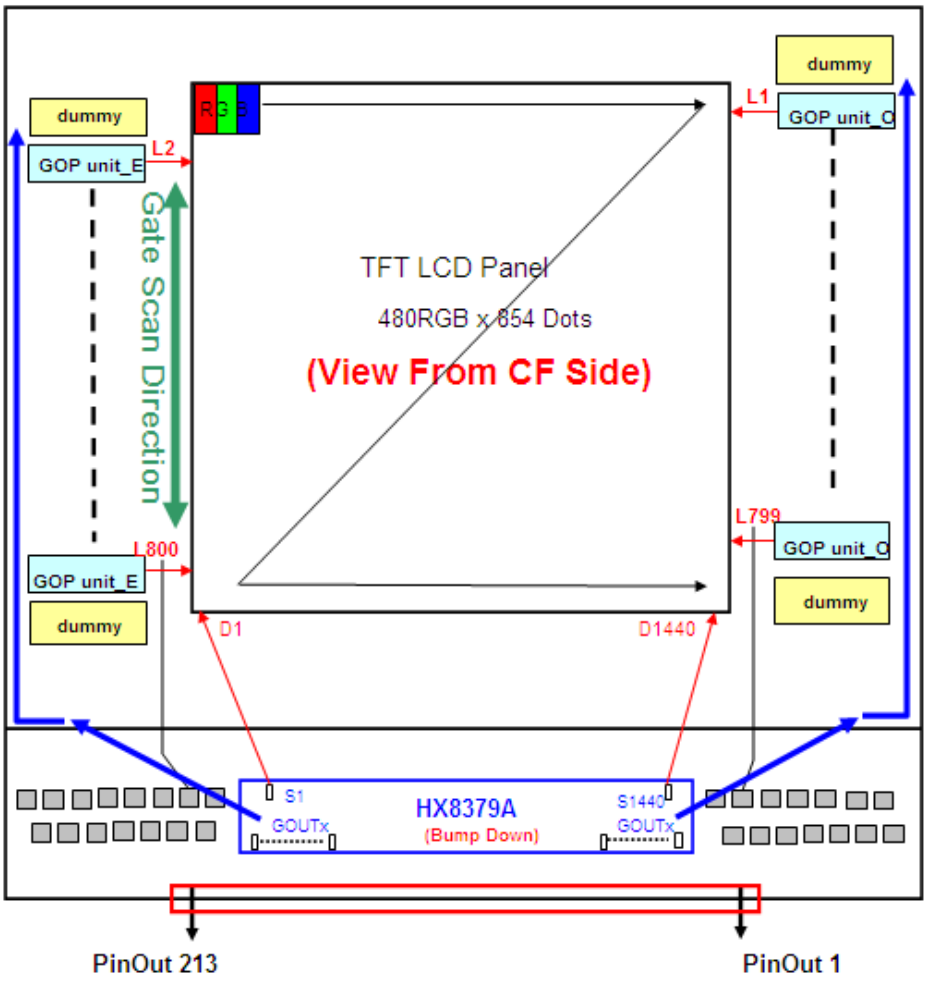
No.228	VDD3	OTM8009A & TOM8018B =>Link to Pad No. 248 ~ 253 HX8379A & HX8379B =>Link to Pad No. 249 ~ 254		
No.229	VDD3			
No.230	VDD3			
No.231	OSC			
No.232	TE_R			
No.233	VSSA	FPC	VSSA	131
No.234	VSSA			
No.235	VSSA			132
No.236	VSSA			
No.237	VTESTOUTP	FPC	VTESTOUTPN	133
No.238	VTESTOUTN			
No.239	VRGH	FPC	VRGH	134
No.240	VRGH			
No.241	VCSW2	FPC	VCSW2	135
No.242	VCSW2			
No.243	CSP	FPC	CSP	136
No.244	CSP			
No.245	VCSW1	FPC	VCSW1	137
No.246	VCSW1			
No.247	CSN	FPC	CSN	138
No.248	CSN			
No.249	VDD3_P	FPC OTM8009A & TOM8018B =>Link to Pad No. 227 ~ 229 HX8379A & HX8379B =>Link to Pad No. 228 ~ 230	VDD	139
No.250	VDD3_P			
No.251	VDD3_P			
No.252	VDD3_P			140
No.253	VDD3_P			
No.254	VDD3_P			
No.255	VSSD_P	FPC	VSSD	141
No.256	VSSD_P			
No.257	VSSD_P			
No.258	VSSD_P			
No.259	VSSD_P			
No.260	VSSD_P			
No.261	C11P	FPC	C11P	142
No.262	C11P			
No.263	C11P			143
No.264	C11N	FPC	C11N	144
No.265	C11N			
No.266	C11N			145
No.267	C12P	FPC	C12P	146
No.268	C12P			
No.269	C12P			147

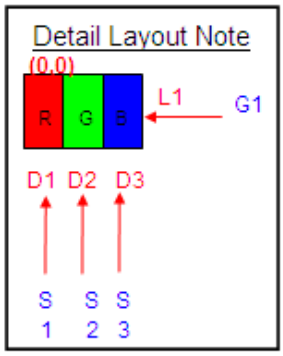
No.270	C12N	FPC	C12N	148
No.271	C12N			
No.272	C12N			149
No.273	C13P	FPC	C13P	150
No.274	C13P			
No.275	C13P			151
No.276	C13N	FPC	C13N	152
No.277	C13N			
No.278	C13N			153
No.279	C14P	FPC	C14P	154
No.280	C14P			
No.281	C14P			155
No.282	C14N	FPC	C14N	156
No.283	C14N			
No.284	C14N			157
No.285	VSP	FPC	VSP	158
No.286	VSP			
No.287	VSP			159
No.288	VSP			
No.289	VSSD_P	FPC	VSSD	160
No.290	VSSD_P			
No.291	VSSD_P			
No.292	VSSD_P			
No.293	VSSD_P			
No.294	VSN	FPC	VSN	161
No.295	VSN			
No.296	VSN			
No.297	VSN			162
No.298	VSN			
No.299	VSN			
No.300	C21P	FPC	C21P	163
No.301	C21P			
No.302	C21P			164
No.303	C21N	FPC	C21N	165
No.304	C21N			
No.305	C21N			166
No.306	C22P	FPC	C22P	167
No.307	C22P			
No.308	C22P			168
No.309	C22N	FPC	C22N	169
No.310	C22N			
No.311	C22N			170

No.311	C22N	FPC	C22N	170
No.312	C23P	FPC	C23P	171
No.313	C23P			
No.314	C23P			172
No.315	C23N	FPC	C23N	173
No.316	C23N			
No.317	C23N			174
No.318	C24P	FPC	C24P	175
No.319	C24P			
No.320	C24P			176
No.321	C24N	FPC	C24N	177
No.322	C24N			
No.323	C24N			178
X	X	FPC	DUMMY	179
No.324	VDD3_P	FPC	VDD	180
No.325	VDD3_P			
No.326	VDD3_P			181
No.327	VDD3_P			
No.328	VDD3_P			
No.329	VCL	FPC	VCL	182
No.330	VCL			
No.331	VCL			
No.332	VCL			
No.333	VCL			183
No.334	VCL			
No.335	VCL			
No.336	VSSD_P	FPC	VSSD	184
No.337	VSSD_P			
No.338	VSSD_P			
No.339	VSSD_P	FPC	VSSD	185
No.340	VSSD_P			
No.341	VSSD_P			186
No.342	VSSD_P			
No.343	C31P	FPC	C31P	187
No.344	C31P			
No.345	C31P			
No.346	C31N	FPC	C31N	188
No.347	C31N			
No.348	C31N			
No.349	C32P	FPC	C32P	189
No.350	C32P			
No.351	C32P			

No.352	C32N	FPC	C32N	190
No.353	C32N			
No.354	C32N			
No.355	VDDD	FPC	VDDD	191
No.356	VDDD			
No.357	VDDD			192
No.358	VSSD	FPC	VSSD	193
No.359	VSSD			
No.360	VSSD			194
No.361	C41P	FPC	C41P	195
No.362	C41P			
No.363	C41N	FPC	C41N	196
No.364	C41N			
No.365	VGH	FPC	VGH	197
No.366	VGH			
No.367	VGHO_R			198
No.368	VGHO_R			
No.369	VRGH	FPC	VRGH	199
No.370	VRGH			
No.371	C51P	FPC	C51P	200
No.372	C51P			201
No.373	C51N	FPC	C51N	202
No.374	C51N			203
No.375	VGL_REG	FPC	VGL_REG	204
No.376	VGL_REG			
No.377	VGLO_R	FPC	VGL	205
No.378	VGLO_R			
No.379	VGL	FPC	VGL	206
No.380	VGL			
No.381	VGL	FPC	VGL	207
No.382	VGL			
No.383	LED1			
No.384	LED2			
No.385	DUMMY1			
No.386	DUMMY2			
No.387	DUMMYR2_A			
No.388	DUMMYR2_B			
No.389	VCOM	FPC TEST PAD Panel VCOM	VCOM	208
No.390	VCOM			
No.391	VCOM			209
No.392	VCOM			210
No.393	VCOM			
X	X	FPC	DUMMY	211
X	X	FPC	DUMMY	212
X	X	FPC	DUMMY	213

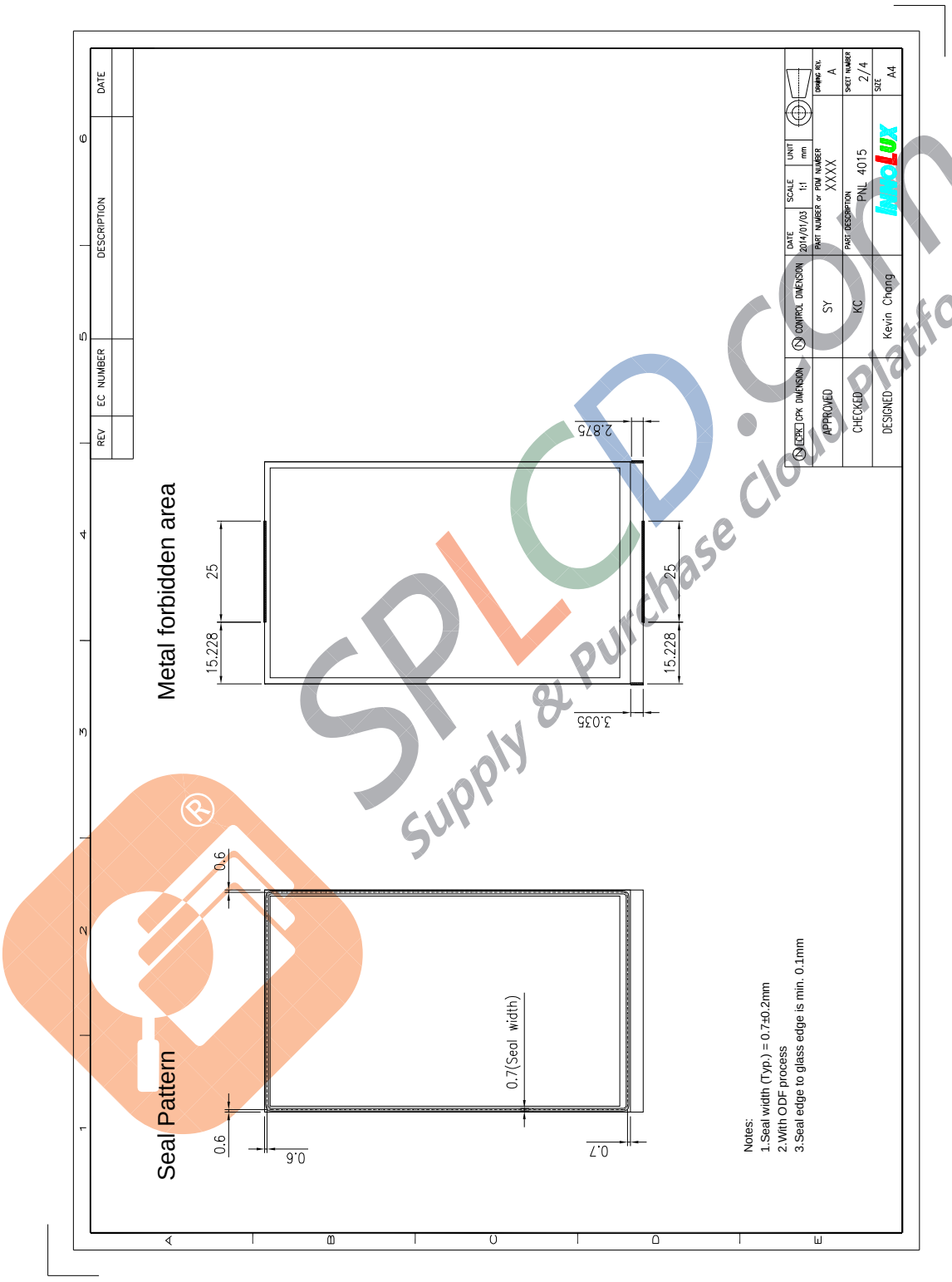
3.2 SCHEMATIC PANEL LAYOUT



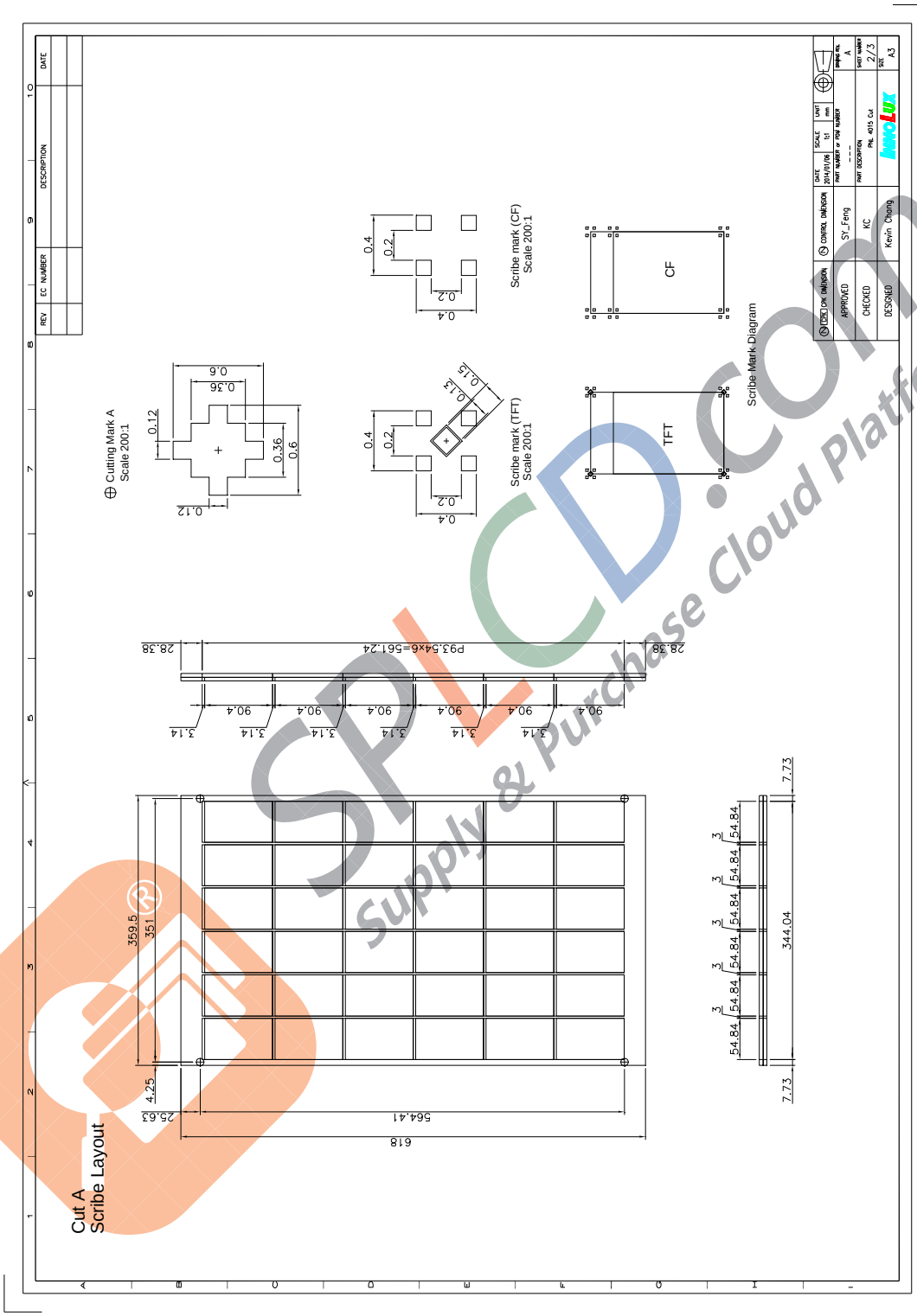


4. CELL PROCESS RULES

4.1 SEAL / AU PATTERN



5. CELL SCRIBE



6. ELECTRICAL SPECIFICATION

Item	Symbol	Specification			Unit
		Min.	Typ	Max.	
TFT gate on voltage	VGH		18		V
TFT gate off voltage	VGL		-10		V
TFT common electrode voltage	Vcom		TBD		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:

7. OPTICAL SPECIFICATION

Item		Symbol	Conditions	Specifications			Unit	Note
				Min.	Typ.	Max.		
Transmittance		T%	Viewing normal angle $\theta_X = \theta_Y = 0°$	3.0	3.6	-	%	All left side data are based on INX's following condition – 1.LC : TN LC 2.Light Source : INX LED BLU 3.Film : CF : SRW062APN1HC5 TFT : SRW062APN1 4.Machine : DMS 803 5.VLC dark > 4.6V VLC white < 0.4V
Contrast Ratio		CR		-	500	-	-	
Response Time (by Quick)		T_{on}		-	5	-	ms	
		T_{off}		-	15	-		
Viewing Angle	Hor.	θ_{X+}	Center CR>10	-	45	-	deg.	
		θ_{X-}		-	45	-		
	Ver.	θ_{Y+}		-	50	-		
		θ_{Y-}		-	25	-		
CF only Color Chromaticity (CIE 1931)	Red	Rx	Viewing normal angle $\theta_X = \theta_Y = 0°$	0.609	0.629	0.649	-	1.Under C light Simulation 2.NTSC 60%
		Ry		0.317	0.337	0.357	-	
	Green	Gx		0.291	0.311	0.331	-	
		Gy		0.544	0.564	0.584	-	
	Blue	Bx		0.132	0.152	0.172	-	
		By		0.045	0.065	0.085	-	
	White	Wx		0.272	0.292	0.312	-	
		Wy		0.286	0.306	0.326	-	

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

The contrast ratio can be calculated by the following expression.

Contrast Ratio (CR) = L63 / L0

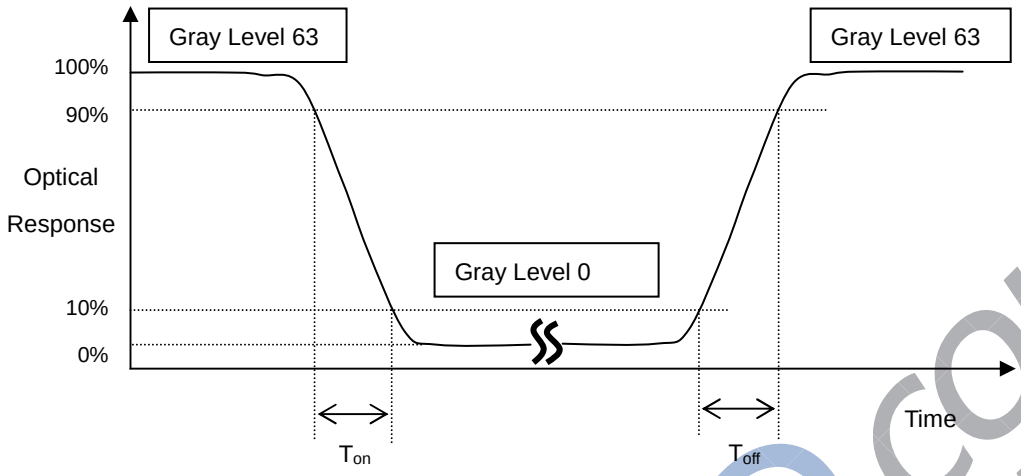
L63: Luminance of gray level 63

L 0: Luminance of gray level 0

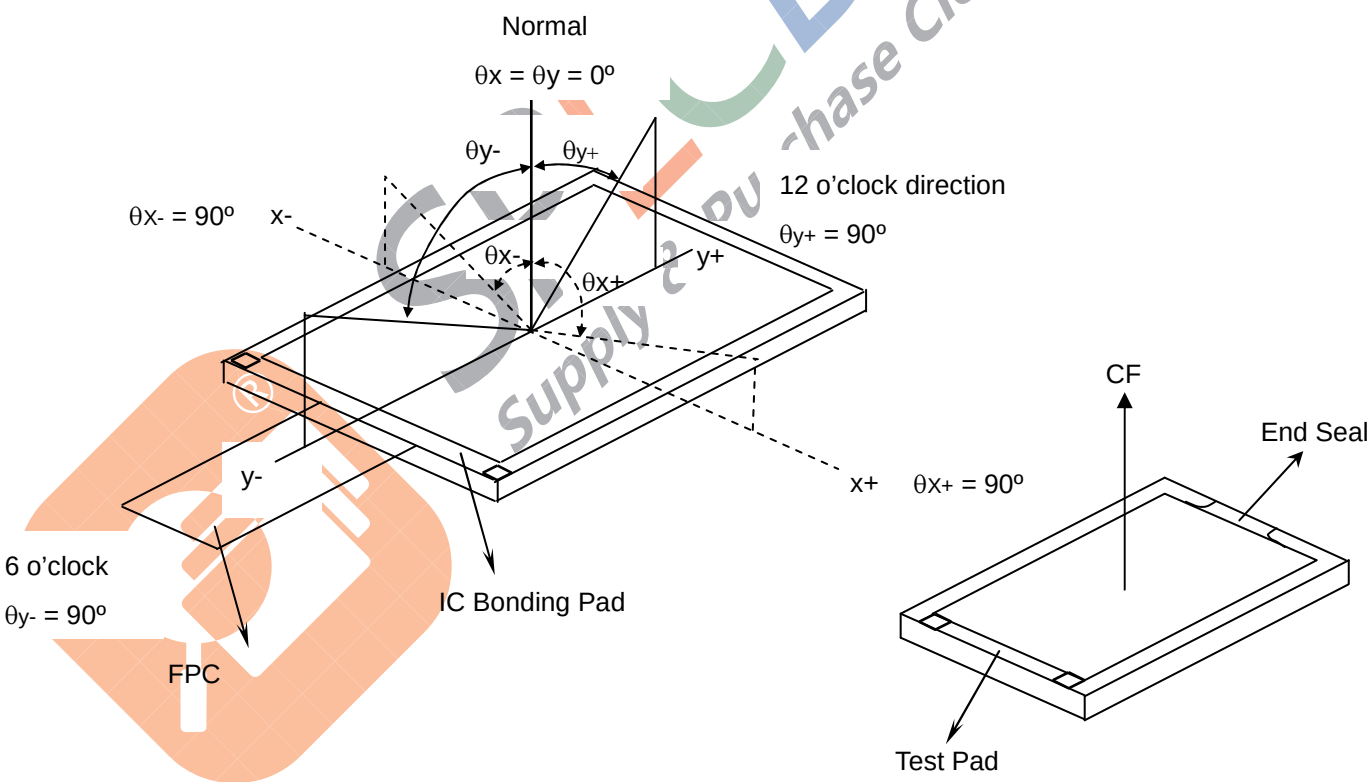
CR = CR (5)

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}):

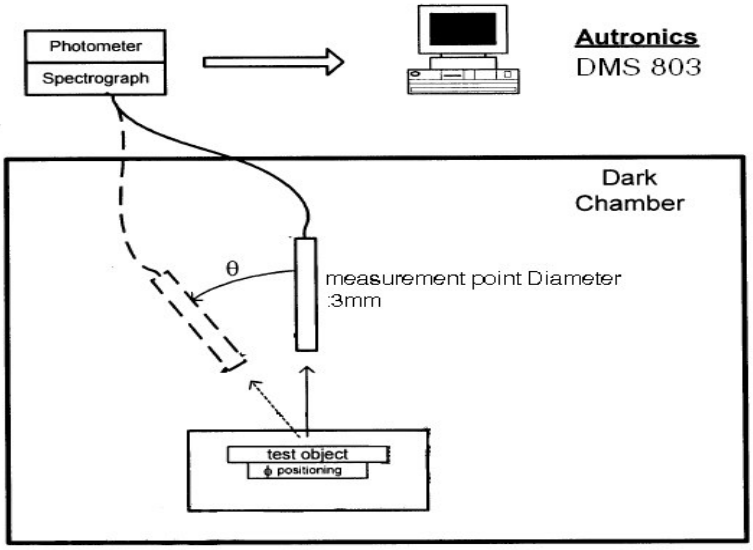


*Note(3) Definition of Viewing Angle

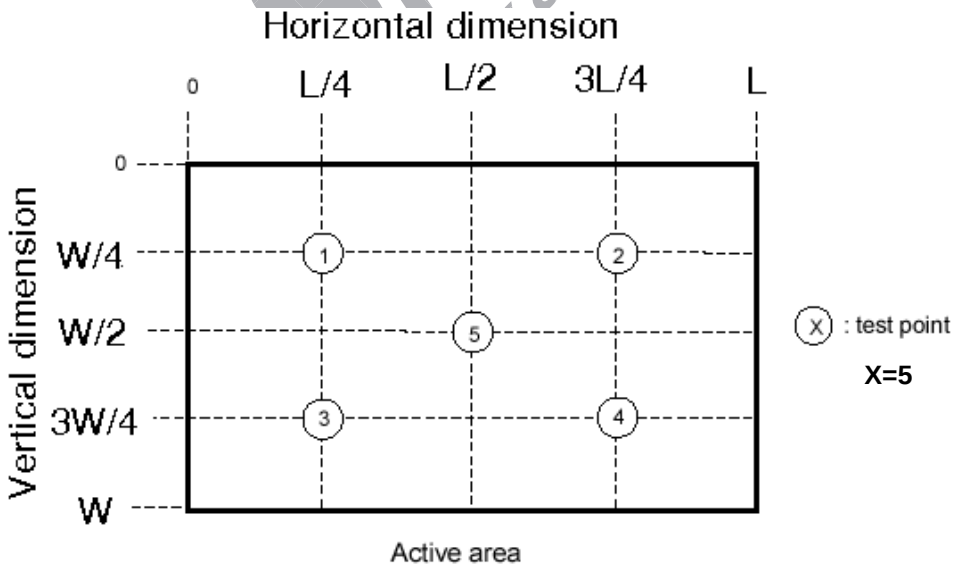


*Note (4) Measurement Set-Up:

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)



8. 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

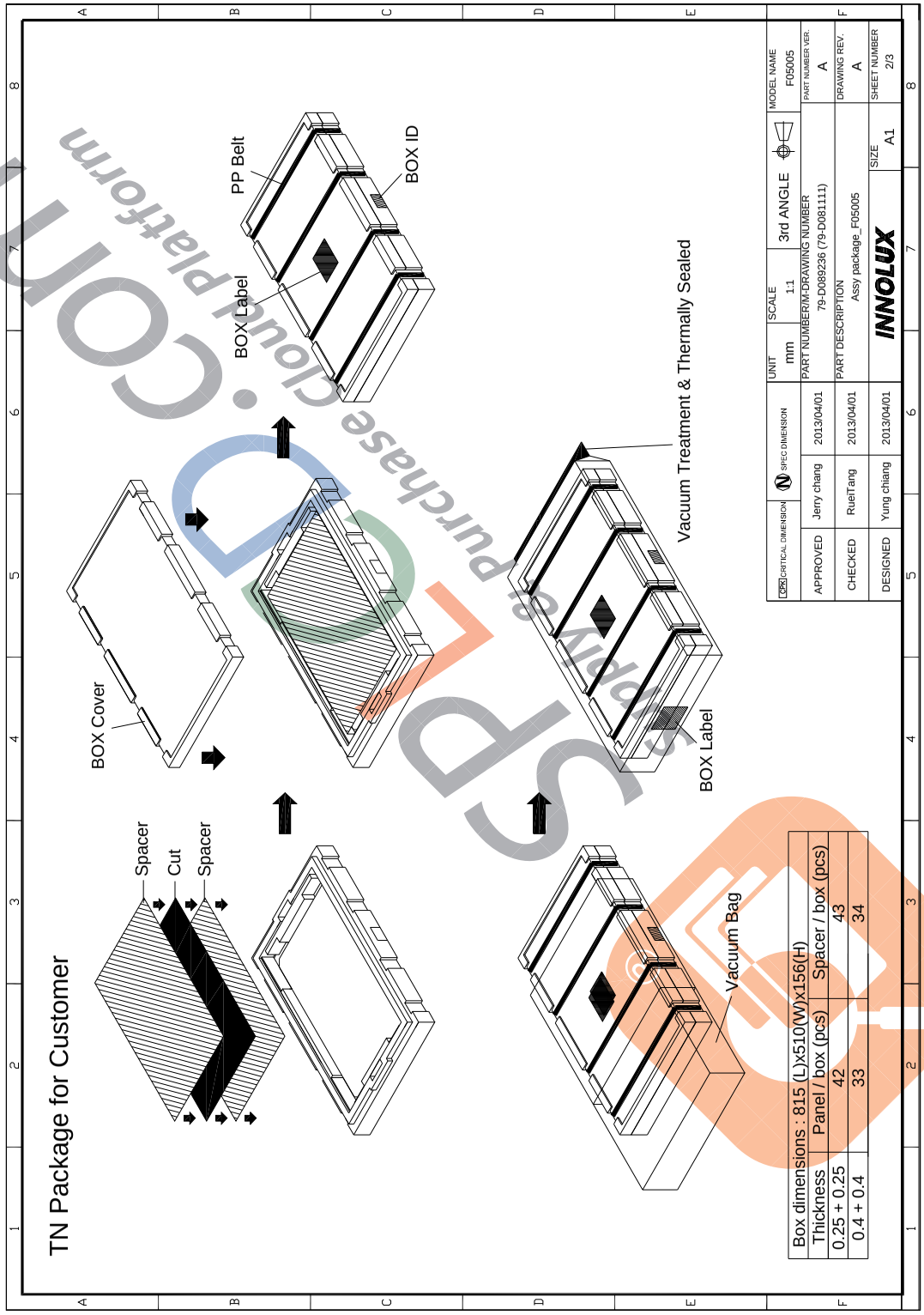
(2) All judgments of display are performed after temp of panel returns to room temperature

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

(4) Under no condensation of dew

9. PACKAGE FORM

9.1 CELL PACKAGE



9.2 PALLET PACKAGE