

InfoVision Optoelectronics (Kunshan) Co.,LTD.

Document Title	C078SWW2 R0 Customer Approved Specification			Page No.	1/23
Document No.		Issue date	2016/03/29	Revision	00

Customer Approved Specification

To:

Product Name: C078SWW2 R0

Document Issue Date: 2016/03/29

	InfoVision Optoelectronics
<p><u>SIGNATURE</u></p> <p>_____</p> <p>_____</p> <p>_____</p> <p>Please return 1 copy for your confirmation with your signature and comments.</p>	<p><u>SIGNATURE</u></p> <p>REVIEWED BY QA</p> <p>_____</p> <p>PREPARED BY FAE</p> <p>_____</p>

- Note: 1. Please contact InfoVision Company before designing your product based on this product.
2. The information contained herein is presented merely to indicate the characteristics and performance of our products. No responsibility is assumed by IVO for any intellectual property claims or other problems that may result from application based on the module described herein.

FQ-7-30-0-009-03D

InfoVision Optoelectronics (Kunshan) Co.,LTD.

Document Title	C078SWW2 R0 Customer Approved Specification			Page No.	3/23
Document No.		Issue date	2016/03/29	Revision	00

CONTENTS

1	GENERAL DESCRIPTIONS.....	4
2	ABSOLUTE MAXIMUM RATINGS.....	4
3	ELECTRICAL SPECIFACATIONS.....	6
4	OPTICAL CHARACTERISTICS.....	7
5	PIXEL FORMAT.....	11
6	OUTLINE SIZE.....	12
7	CELL LIGHT-ON INFORMATION.....	16
8	RELIABILITY CONDITION.....	19
9	IVO RECOMMENDED CELL PACKAGING.....	21
10	GENERAL PRECAUTION.....	22

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InfoVision Optoelectronics (Kunshan) Co.,LTD.

Document Title	C078SWW2 R0 Customer Approved Specification			Page No.	4/23
Document No.		Issue date	2016/03/29	Revision	00

1 General Descriptions

1.1 Introduction

The C078SWW2 R0 is a color active matrix thin film transistor (TFT) liquid crystal display (LCD) that uses amorphous silicon TFT as a switching device. This TFT LCD panel has a 7.8 inch diagonally measured active display area with WXGA- resolution (400 horizontal by 1280 vertical pixels array).

1.2 Features

- 7.84" TFT-LCD Panel
- Supported WXGA Resolution
- Compatible with RoHS Standard

1.3 General Characteristics

Table 1 General Characteristics

Item	Specification	Unit	Note
Outline Dimension (H x V x D)	64.80 x 199.88 x 1.0	mm	Single Chip
Active Area (H x V)	59.40 x 190.08	mm	Single Chip
Number of Pixels (H x V)	400 x (RGB) x1280	-	Single Chip
Pixel Size (H x V)	0.0495 x0.1485	mm	Single Chip
Pixel Arrangement	RGB Stripe	mm	Single Chip
Display Type	Transmissive	-	-
Display Mode	Normally Black	-	-
Cell Thickness	CF: 0.50±0.05	mm	-
	TFT: 0.50±0.05		
Driver IC	OTA7290B	-	Customer designation
Weight	(35) (Typ.)TBD(max.)	g	Single Chip
	(813)(Typ.) TBD(max.)	g	Sub A Chips

2 Absolute Maximum Ratings

InfoVision Optoelectronics (Kunshan) Co.,LTD.

Document Title	C078SWW2 R0 Customer Approved Specification	Page No.	5/23
Document No.	Issue date	2016/03/29	Revision 00

Table 2 Absolute Ratings of Environment

Item	Symbol	Min.	Max.	Unit	Conditions
LC Operating Voltage (Ta = 25°C)	V _{OP}	-4.5	4.5	V	(1),(2), (3)
Operating Temperature	T _{OP}	-20	70	°C	
Operating Humidity	H _{OP}	10	80	%RH	
Storage Temperature	T _{ST}	-30	80	°C	
Storage Humidity	H _{ST}	10	90	%RH	

Note (1) Liquid Crystal driving voltage due to the characteristics of LC Material, this voltage varies with environmental temperature.

Note (2) Maximum Wet-Bulb should be 39 °C. No condensation of water

Note (3) When the LCD Panel is working Please make sure to keep the temperature of LCD panel is less than 70°C

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InfoVision Optoelectronics (Kunshan) Co.,LTD.

Document Title	C078SWW2 R0 Customer Approved Specification			Page No.	6/23
Document No.		Issue date	2016/03/29	Revision	00

3 Electrical Specifications

Table 3 Electrical Specifications

No.	Item	Min.	Typ.	Max.	Unit
1	Vcom voltage	TBD	(3.9)	TBD	V
2	Frame Rate	TBD	60	TBD	Hz
3	VGH voltage	TBD	(19)	TBD	V
4	VGL voltage	TBD	(-8)	TBD	V

Note (1) VGH is TFT gate operating voltage

Note (2) VGL is TFT gate operating voltage

Note (3) Vcom must be adjusted to optimize display quality: Crosstalk, Contrast Ratio etc.

Note (4) Environmental condition: 25±5 °C

Note (5) We just kindly recommend the setting-voltage as the reference value. In order to get the optimized display quality, the setting-voltage should be changed as based on customer's developing condition.

InfoVision Optoelectronics (Kunshan) Co.,LTD.

Document Title	C078SWW2 R0 Customer Approved Specification	Page No.	7/23
Document No.	Issue date	2016/03/29	Revision 00

4 Optical Characteristics

The optical characteristics are measured under stable conditions as following notes.

Table 4 Optical Characteristics

Item	Conditions		Min.	Typ.	Max.	Unit	Note
Transmittance	Center		TBD	(4.3)	-	%	(1),(5),(6),(8),(9)
Contrast Ratio	Center		TBD	(900)	-	-	(1),(3),(7),(8),(9)
Response Time	Rising + Falling		-	35	TBD	ms	(1),(4),(7),(8),(9)
CF Color Chromaticity (CIE1931)	Red	x	Typ. -0.03	(0.648)	Typ. +0.03	-	Under C-light
	Red	y		(0.328)		-	
	Green	x		(0.277)		-	
	Green	y		(0.556)		-	
	Blue	x		(0.138)		-	
	Blue	y		(0.128)		-	
	White	x		(0.295)		-	
	White	y		(0.323)		-	
NTSC	CIE1931		TBD	(60)	-	%	(1),(6),(8),(9)
Viewing Angle (CR>10)	Horizontal	θ_{x+}	80	85	-	degree	(1),(2),(7),(8),(9) Viewing Angle base on using EWV Polarizer Reference only
		θ_{x-}	80	85	-		
	Vertical	θ_{y+}	80	85	-		
		θ_{y-}	80	85	-		

InfoVision Optoelectronics (Kunshan) Co.,LTD.

Document Title	C078SWW2 R0 Customer Approved Specification		Page No.	8/23	
Document No.		Issue date	2016/03/29	Revision	00

Note (1) Measurement Setup:

The LCD module should be stabilized at given temperature(25°C) for 15 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting backlight for 15 minutes in a windless room.

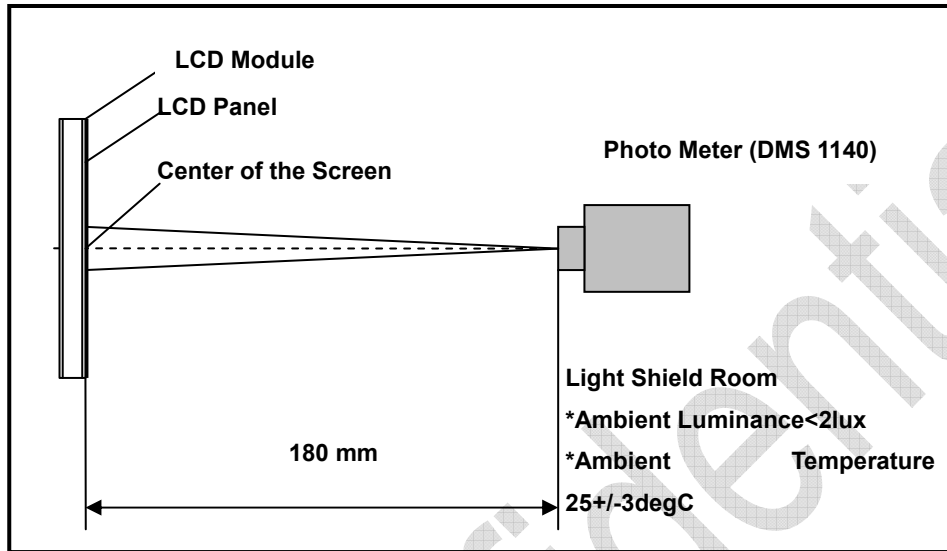


Figure 1 Measurement Setup

Note (2) Definition of Viewing Angle

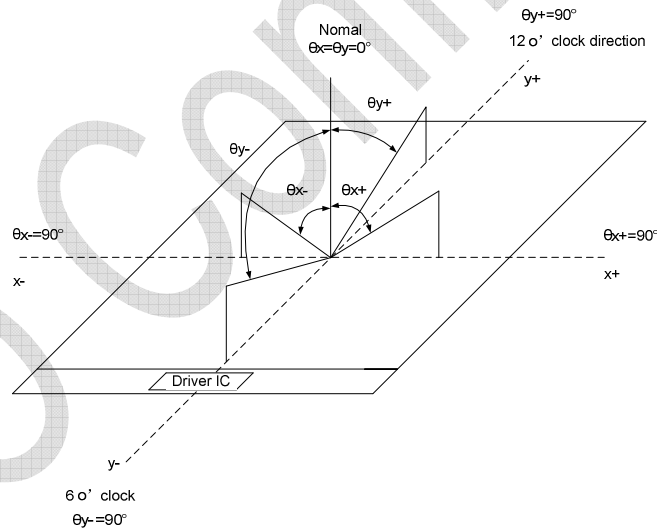


Figure 2 Definition of Viewing Angle

Note (3) Definition Of Contrast Ratio (CR)

The contrast ratio can be calculated by the following expression

$$\text{Contrast Ratio (CR)} = L255 / L0$$

L255: Luminance of gray level 255, L0: Luminance of gray level

Note (4) Definition Of Response Time

InfoVision Optoelectronics (Kunshan) Co.,LTD.

Document Title	C078SWW2 R0 Customer Approved Specification			Page No.	9/23
Document No.		Issue date	2016/03/29	Revision	00

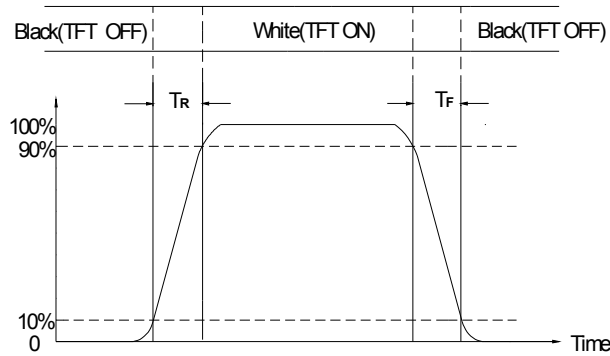


Figure 3 Definition of Response Time

Note (5) C-light Spectrum Based on VESA-1931

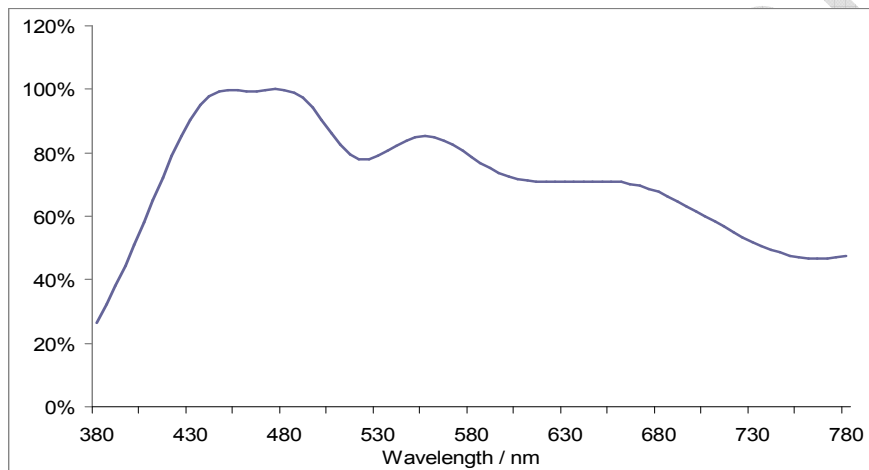


Figure 4 C-Light Spectrum

Note (6) BL Spectrum which is given by IVO .

TBD

Figure 5 BL Spectrum

InfoVision Optoelectronics (Kunshan) Co.,LTD.

Document Title	C078SWW2 R0 Customer Approved Specification			Page No.	10/23
Document No.		Issue date	2016/03/29	Revision	00

Note (7) The EWV polarizer type: AG/TFT, HC/CF

Note (8) All optical data is based on IVO given polarizer & light Source & testing machine in this document.

Note (9) Polarizer Attachment Direction and Size

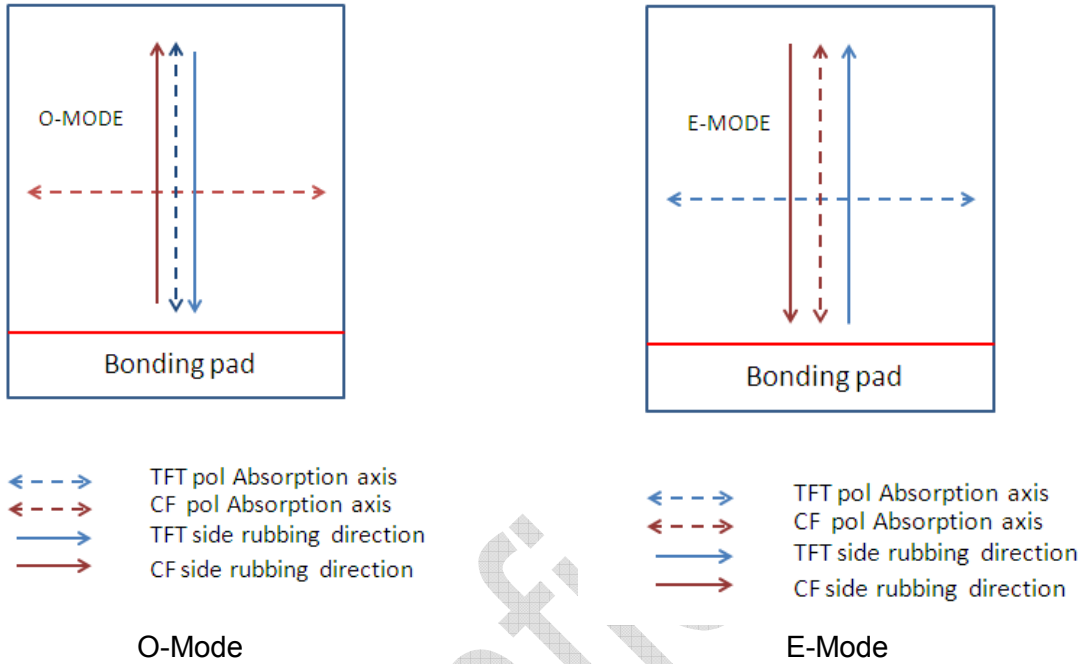


Figure 6 Polarizer Direction

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Document Title	C078SWW2 R0 Customer Approved Specification	Page No.	11/23
Document No.	Issue date	2016/03/29	Revision 00

5 Pixel Format

The figure shows the relationship of the input signals and LCD panel pixel format.

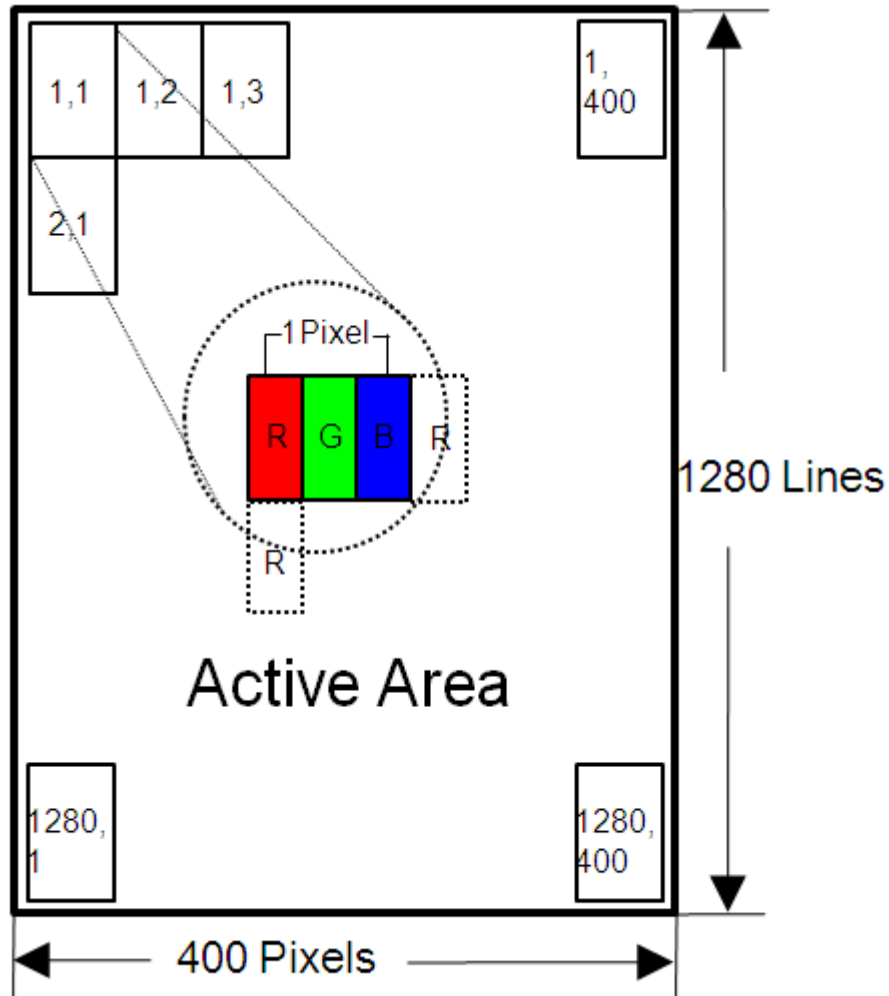


Figure 7 Pixel Format

Document Title	C078SWW2 R0 Customer Approved Specification	Page No.	12/23
Document No.	Issue date	2016/03/29	Revision 00

6 Outline Size

6.1 Outline Size of Single Chip

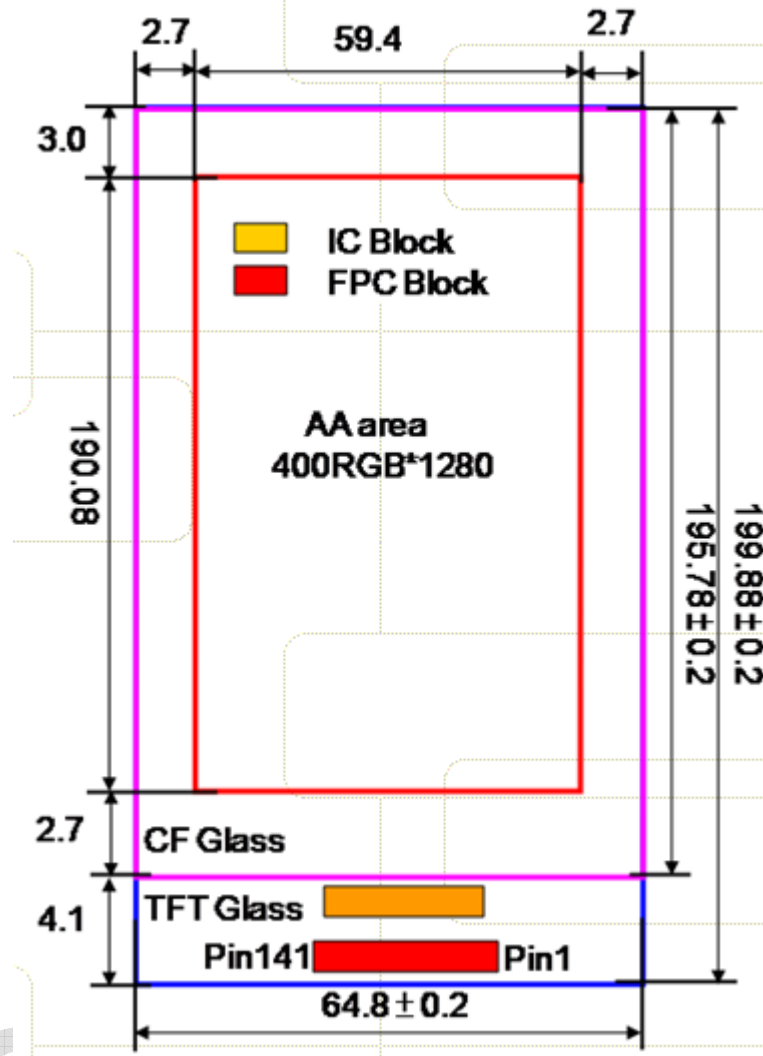
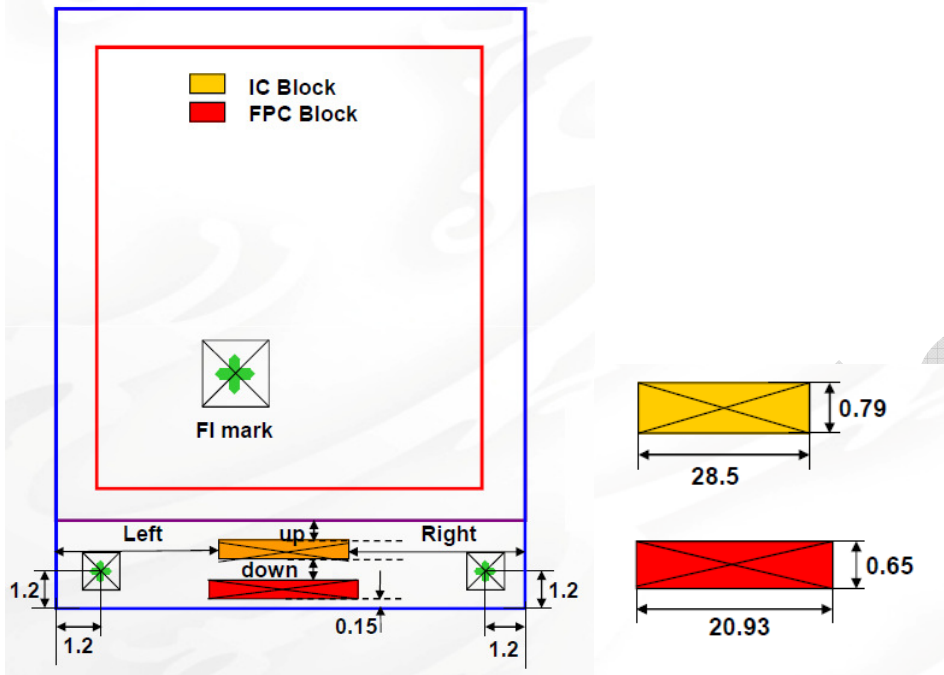


Figure 8 Outline Size of Single Chip

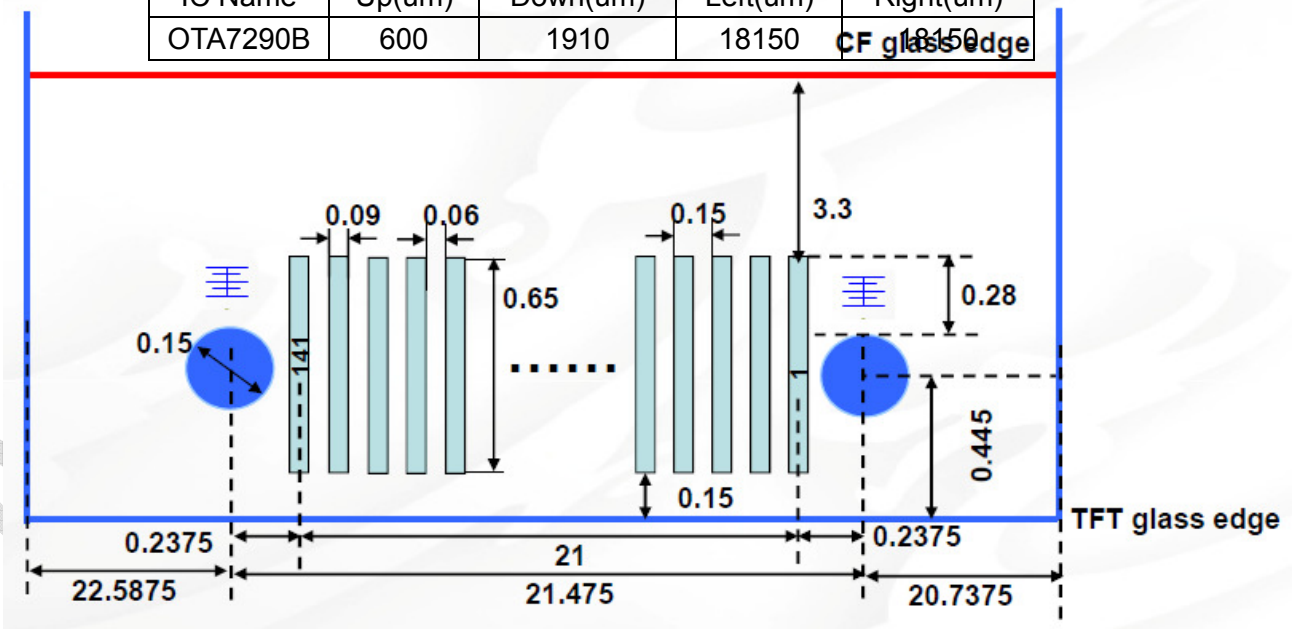
6.2 IC / FPC Position Size On Cell

Document Title	C078SWW2 R0 Customer Approved Specification	Page No.	13/23
Document No.	Issue date	2016/03/29	Revision 00



Unit:mm

IC Name	Up(um)	Down(um)	Left(um)	Right(um)
OTA7290B	600	1910	18150	18150



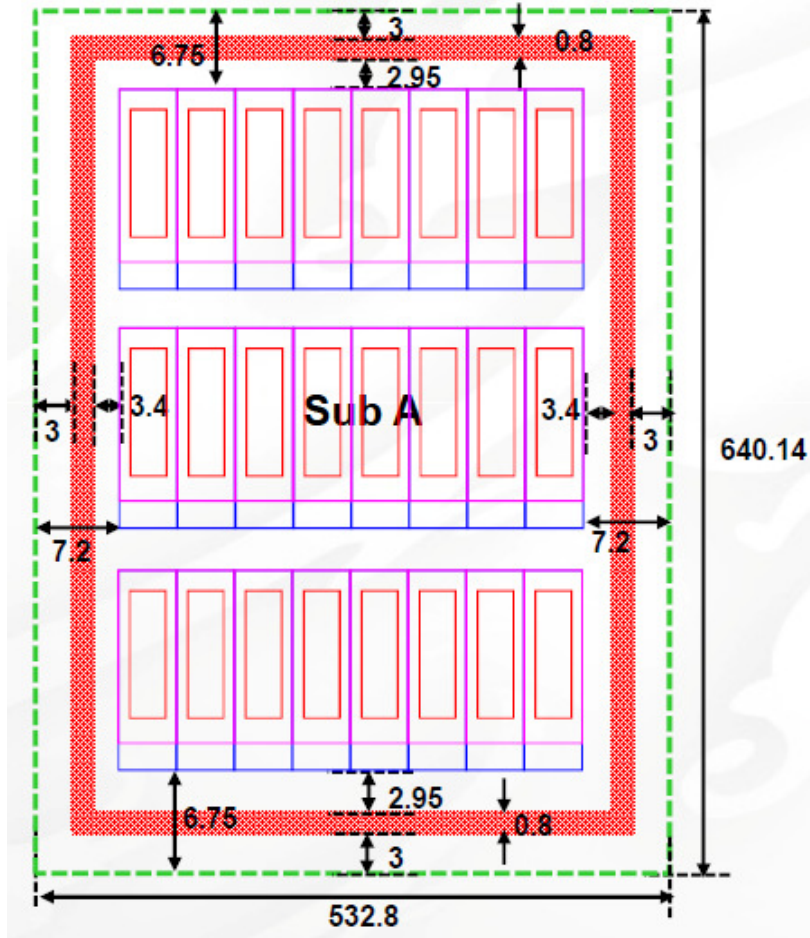
Unit:mm

Figure 10 FPC Position Information

6.3 Outline Size of Sub Sheet and Cut Mark

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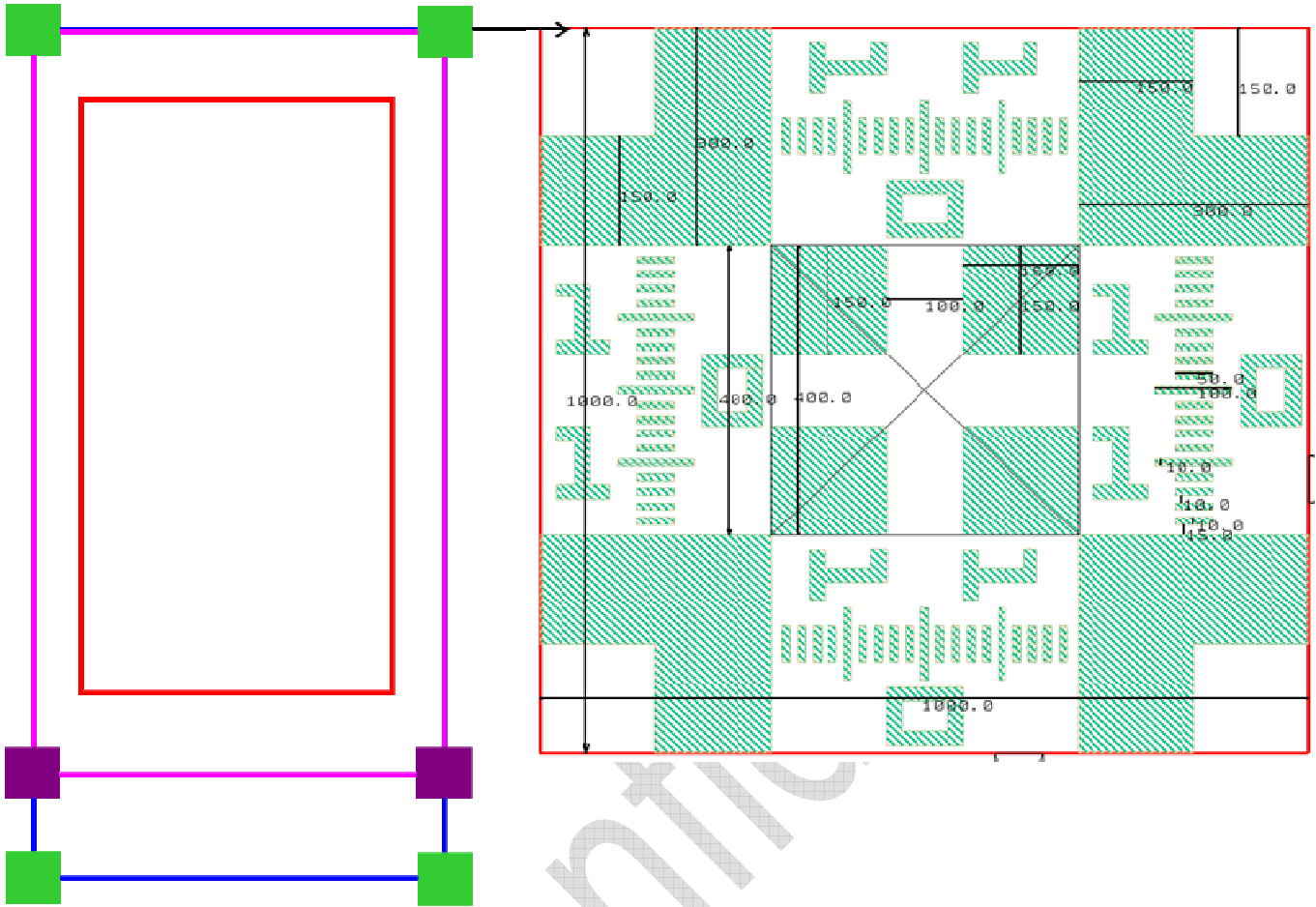
Document Title	C078SWW2 R0 Customer Approved Specification	Page No.	14/23
Document No.	Issue date	2016/03/29	Revision 00



Unit: mm

Figure 11 Outline Size of SubA

Document Title	C078SWW2 R0 Customer Approved Specification	Page No.	15/23
Document No.	Issue date	2016/03/29	Revision
			00



Unit:mm

Figure 12 Outline Size of Single Chip

6.4 Cell Thickness

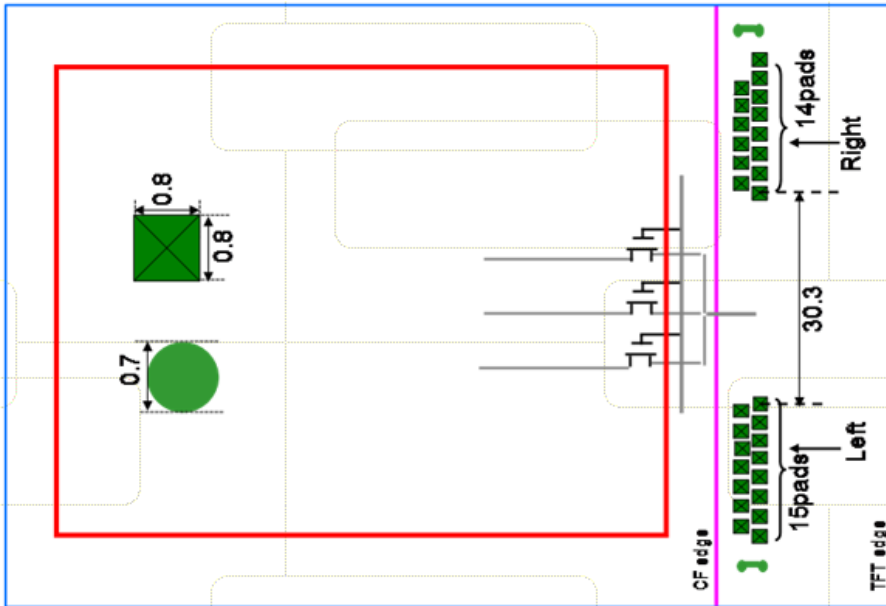


Figure 13 Cell Thickness

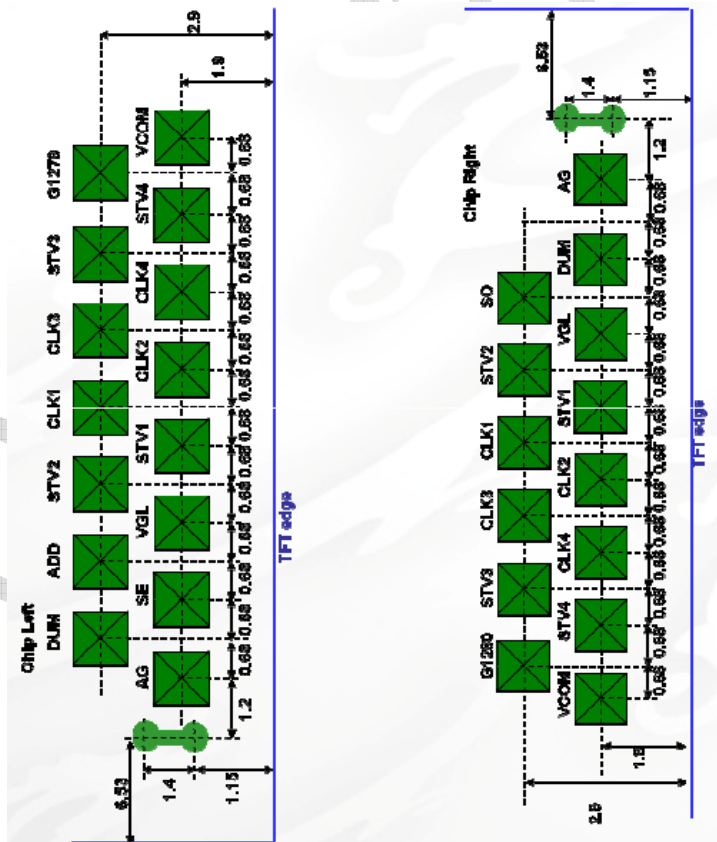
Document Title	C078SWW2 R0 Customer Approved Specification	Page No.	16/23
Document No.		Issue date	2016/03/29
		Revision	00

7 Cell Light-On Information

7.1 Cell Light-On Test Pad Drawing



Unit: mm

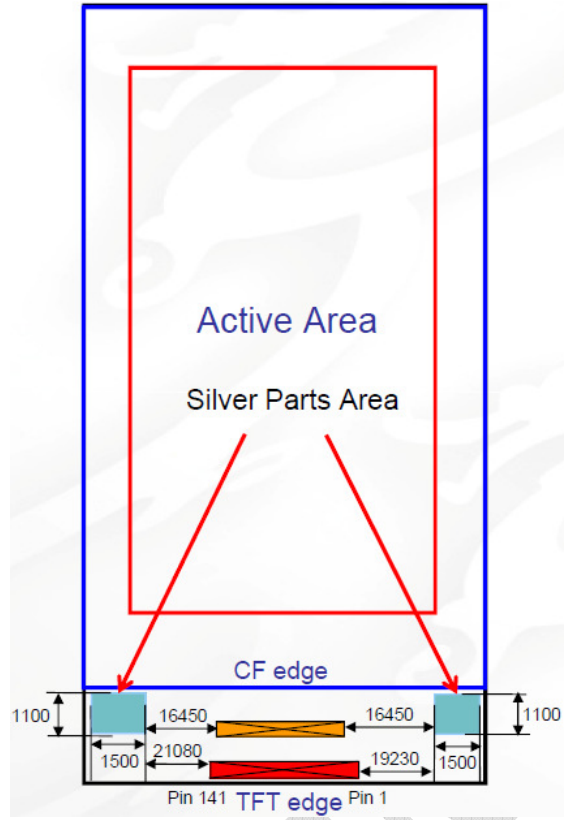


Unit: mm

Figure 14 Cell Light-On Test Pad Drawing

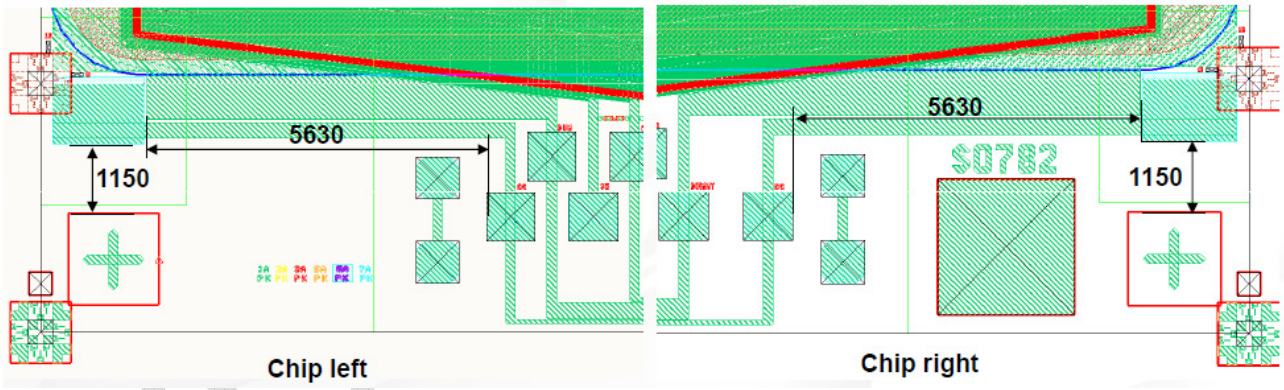
7.2 The Distance Between silver paste and Bonding area

Document Title	C078SWW2 R0 Customer Approved Specification	Page No.	17/23
Document No.	Issue date	2016/03/29	Revision 00



Unit: um

Figure 15 The Distance Between silver paste and Bonding area

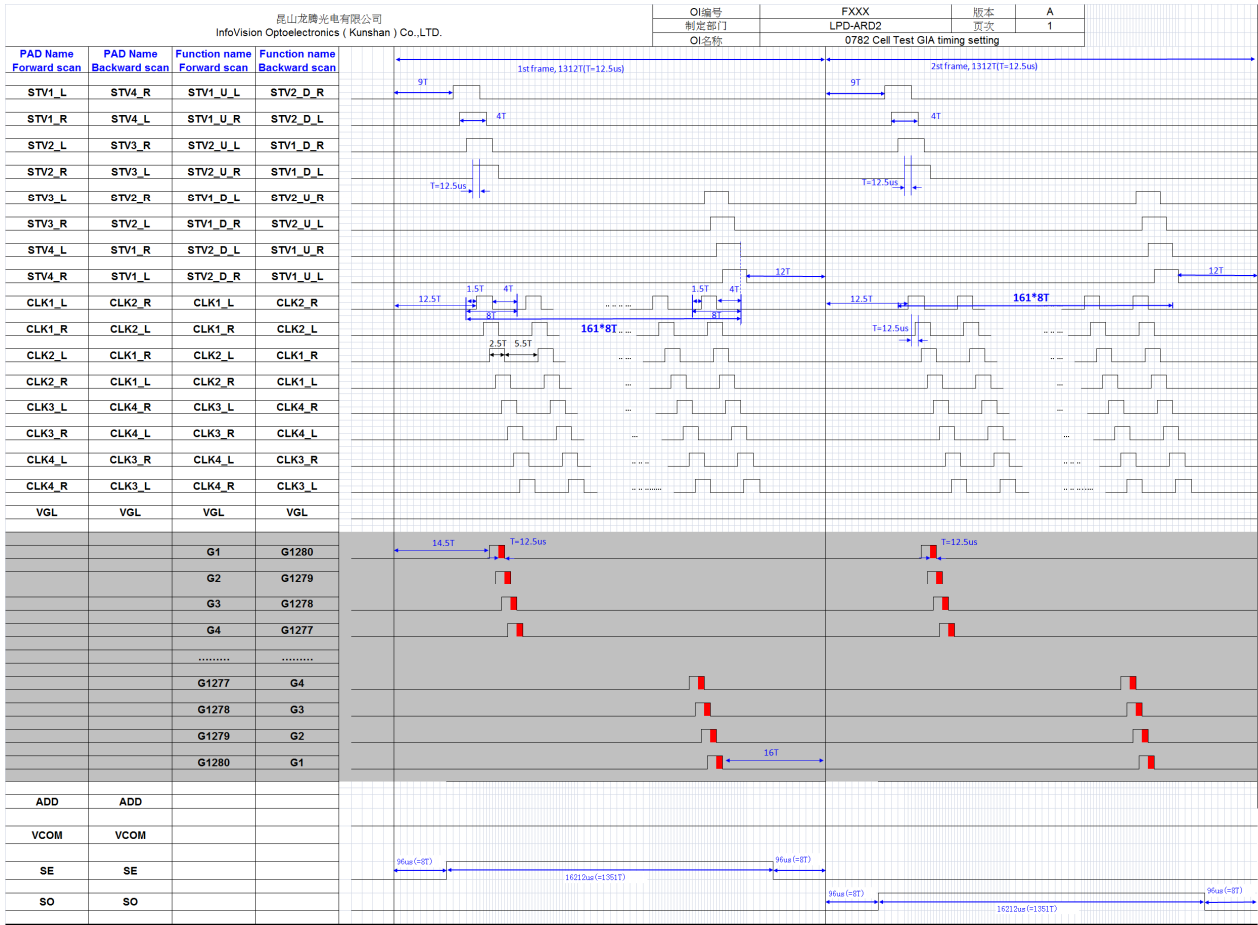


Unit: um

Figure 16 The silver paste to the pad or Bonding Mark

InfoVision Optoelectronics (Kunshan) Co.,LTD.

Document Title	C078SWW2 R0 Customer Approved Specification			Page No.	18/23
Document No.		Issue date	2016/03/29	Revision	00



NOTES:
 (1) For Cell Test, Need to check GIA forward and backward scan function.
 (2) VGH=19V, VGL=-8V, VDHL=9.2V, VDL=0.2V. VCOM=3.9. 要求+/-1V可调.

Figure 17 Cell Light-On Test Waveform

7.2 Cell Light-On Test Waveform

Table 5 Voltage For Cell Test

Item	Black	Gray	White
VGH(V)		(-19)	
VGL(V)		(-8)	
VCOM(V)		(-3.9)	
ADD(V)		17~25	
SE_VDH(V)	(4.9)	(7.85)	(9.2)
SE_VDL(V)	(4.5)	(1.55)	(0.2)
SO_VDH(V)	(4.9)	(7.85)	(9.2)
SO_VDL(V)	(4.5)	(1.55)	(0.2)

7.3 FPC Pin assignment

InfoVision Optoelectronics (Kunshan) Co.,LTD.

Document Title	C078SWW2 R0 Customer Approved Specification	Page No.	19/23
Document No.	Issue date	2016/03/29	Revision 00

NO	PIN NAME	NO	PIN NAME	NO	PIN NAME
1	AG	48	VCOMPI	95	V7
2	VCOM	49	VCOMNI	96	V8
3	VCOM	50	VCOMO	97	V11
4	DUMMY	51	VCOMO	98	V14
5	DUMMY	52	VCOMO	99	AVDD
6	VGL	53	VCOM_EN	100	AVDD
7	VGL	54	VCOM_UGB	101	AVDD
8	VGL	55	HAOP_EN	102	AGND1
9	VGH_R	56	HAOP	103	AGND
10	VGH_R	57	HAOP	104	AGND
11	COMR2_IN	58	HAOP	105	HAVDD
12	COMR1_IN	59	VQH	106	HAVDD
13	RPO_EVEN	60	VQL	107	HAVDD
14	SCL	61	VCC	108	BISTAUTO
15	SDA	62	VCC	109	BISTB
16	I2C_SCL	63	VCC_IF	110	BIST_CKSL
17	I2C_SDA	64	GND	111	BIST_CLK
18	PMU_EN	65	GND_IF	112	SHLR
19	STATE	66	D3N	113	UPDNB
20	GRB	67	D3P	114	CABC_ENB[0]
21	STBYB	68	DASH	115	CABC_ENB[1]
22	GPMOE	69	D2N	116	CE_ENB
23	LEDON	70	D2P	117	LSTVB
24	LEDPWM	71	DASH	118	INVSEL[0]
25	TP_SYNC	72	CLKN	119	INVSEL[1]
26	XON_IN	73	CLKP	120	OPDRV0
27	ALSIN	74	DASH	121	OPDRV1
28	RPEN_EVEN	75	D1N	122	BLKINSER
29	LED_EN	76	D1P	123	ZTYPE
30	CMD_SEL	77	DASH	124	ZIGZAG
31	RES0	78	D0N	125	RPEN_ODD
32	RES1	79	D0P	126	COM3_IN
33	VCC	80	GND_IF	127	COM3_OUT
34	VCC	81	GND	128	RPO_ODD
35	VDD	82	VCC_IF	129	COML2_IN
36	VDD	83	VCC	130	COML1_IN
37	GND	84	VCC	131	VPP_MTP
38	GND	85	VLPH	132	VGH_L
39	AVDD	86	VDD	133	VGL
40	AVDD	87	VDD	134	VGL
41	AVDD	88	VCC_EN	135	VGL
42	AGND	89	VCC	136	DUMMY
43	AGND	90	VCC	137	DUMMY
44	AGND1	91	GND	138	DUMMY
45	HAVDD	92	GND	139	VCOM
46	HAVDD	93	V1	140	VCOM
47	HAVDD	94	V4	141	AG

Figure 18 FPC Pin Assignment

8 Reliability Condition

Table 6 Reliability Condition

InfoVision Optoelectronics (Kunshan) Co.,LTD.

Document Title	C078SWW2 R0 Customer Approved Specification	Page No.	20/23
Document No.	Issue date	2016/03/29	Revision 00

NO	Item	Condition
1	High temperature Storage	80°C ,240hours
2	Low temperature Storage	-30°C ,240hours
3	High temperature Operate	70°C ,240hours
4	Low temperature Operate	-20°C ,240hours
5	High temperature/High humidity Operate	60°C , 90%RH,240hours

Note (1) All tests above are practiced at module type.

Note (2) There is no display function defect, all the cosmetic specification is judged before the reliability stress.

Note (3) Result Evaluation Criteria:TFT- LCD Panel should be at room temperature for 2 hours when the display quality test is over. There should be no particular change which might affect the practical display function and the display quality test should be conducted under normal operating condition.

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InfoVision Optoelectronics (Kunshan) Co.,LTD.

Document Title	C078SWW2 R0 Customer Approved Specification			Page No.	21/23
Document No.		Issue date	2016/03/29	Revision	00

9 IVO Recommended Cell Packaging

TBD

Figure 19 IVO Recommended Cell Packaging

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InfoVision Optoelectronics (Kunshan) Co.,LTD.

Document Title	C078SWW2 R0 Customer Approved Specification			Page No.	22/23
Document No.		Issue date	2016/03/29	Revision	00

10 General Precaution

10.1 Use Restriction

This product is not authorized for use in life supporting systems, aircraft navigation control systems, military systems and any other application where performance failure could be life-threatening or otherwise catastrophic.

10.2 Handling Precaution

(1) Since the LCD panel is made of glass, do not apply strong mechanical impact or static load onto it. Handling with care since shock, vibration, and careless handling may seriously affect the product. If it fall a high place or receives a strong shock, the glass maybe broken.

(2) Use fingerstalls of soft gloves in order to keep clean display quality, when persons handle the LCD for incoming inspection or assembly.

(3) When the surface is dusty, please wipe gently with absorbent cotton or other soft material.

(4) Wipe off saliva or water drops as soon as possible. If saliva or water drops contact with polarizer for a long time, they may causes deformation or color fading.

(5) When cleaning the adhesives, please use absorbent cotton wetted with a little petroleum benzine or other adequate solvent.

10.3 Storage Precaution

(1) Please do not leave cell in the environment of high humidity and high temperature for long time.

(2) IVO suggests to assembly the panel to LCD module in one month after cut into single chip.

(3) The cell should be stored in a dark place .Store in an ambient temperature of 5°C to 45°C,and in a relative humidity of 40%RH to 60%RH.Don't expose to sunlight or fluorescent light.

(4) Storage in a clean environment, free from dust, active gas, and solvent.

(5) Store in anti-static electricity container.

(6) Store without any physical load.

10.4 Caution For Operation

(1) The polarizer on the surface of panel are made from organic substance. Be very careful for chemicals not to touch the polarizer or it leads the polarizer to be deteriorated.

(2) Dot drop water or any chemicals onto the LCD panel surface.

(3) Please do not leave LCD panel in the environment of high humidity and high temperature for a long time.

(4) Do not connect or disconnect the LCD panel to or from the system when power is on.

(5) When expose to drastic fluctuation of temperature(hot to cold or cold to hot) ,the LCD panel may be affected; specifically, drastic temperature fluctuation from cold to hot, produces dew on the LCD panel surface which may affect the operation of the polarizer and the LCD panel.

(6) Do not display the fixed pattern for a long time because it may develop image sticking due to the LCD panel structure.

(7) The temperature of baking should be under 80°C .

InfoVision Optoelectronics (Kunshan) Co.,LTD.

Document Title	C078SWW2 R0 Customer Approved Specification			Page No.	23/23
Document No.		Issue date	2016/03/29	Revision	00

10.5 Static Electricity

(1) Protection film must remove very slowly from the surface of LCD panel to prevent from electrostatic occurrence if the LCD panel attaches a polarizer.

(2) Because TFT-LCD panel is very weak to electrostatic discharge, please be careful with electrostatic discharge. Persons who handle the LCD panel should be grounded through adequate methods.

10.6 Safety

(1) For the crash damaged or unnecessary LCD panel, it is recommended to wash off liquid crystal by either of solvents such as acetone and ethanol and should be burned up later.

(2) In the case the LCD panel is broken, watch out whether liquid crystal leaks out or not. If your hands touch the liquid crystal, wash your hands cleanly with water and soap as soon as possible.

(3) If you should swallow the liquid crystal, first, wash your mouth thoroughly with water, then drink a lot of water and induce vomiting, and then, consult a physician.

(4) If the liquid crystal should get in your eyes, flush your eyes with running water for at least fifteen minutes.

(5) If the liquid crystal touches your skin or clothes, remove it and wash the affected part of your skin or clothes with soap and running water.

10.7 Disposal

When disposing LCD panel, obey the local environmental regulations.

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