# CHIMEI INNOLUX DISPLAY CORPORATION LCD MODULE SPECIFICATION

Customer:	
Model Name:	EJ101IA-01F
Date:	2012/01/03
Version:	01
■Preliminary :	Specification
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For Customer's Acceptance

Approved by	Comment
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Approved by	Reviewed by	Prepared by		
Stanley.CW.Leung	Green Fu	David Lee		
2012/01/04	2012/01/04	2012/01/03		

## Record of Revision



#### CHIMEI INNOLUX

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## 1. General Specifications

No.	Item	Specification	Remark
1	LCD size	10.1 inch(Diagonal)	
2	Driver element	a-Si TFT active matrix	
3	Resolution	1280 × 3(RGB) × 800	
4	Display mode	Normally Black, Transmissive	
5	Dot pitch	0.0565(W) × 0.1695(H) mm	
6	Active area	216.96(W) × 135.60(H) mm	
7	Module size	229.46(W) ×149.1(H) ×2.40(D) mm	Note 1
8	Surface treatment	НС	
9	Color arrangement	RGB-stripe	
10	Interface	Digital	
11	Backlight power consumption	TBD (Typ.)	Note 1
12	Panel power consumption	TBD (Typ.)	Note 1
13	Weight	TBD(Max)	

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Note 1: Refer to Mechanical Drawing.

Note 2: Including LED Driver power consumption. Note 3: Including T-con Board power consumption

## CHIMEI INNOLUX 2. Pin Assignment

A 40pin connector is used for the module electronics interface. The recommended model is F62240-H1210A manufactured by Vigorconn.

Pin No. Symbol		I/O	Function	Remark
1	NC		No connection	
2	VDD	Р	Power Supply	
3	VDD	Р	Power Supply	
4	NC		No connection	See.
5	NC		No connection	
6	NC		No connection	
7	NC		No connection	
8	Rxin0-	I	-LVDS Differential Data Input	DO D5 C0
9	Rxin0+		+LVDS Differential Data Input	- R0-R5, G0
10	VSS	Р	Ground	
11	Rxin1-		-LVDS Differential Data Input	- G1~G5, B0,B1
12	Rxin1+	I	+LVDS Differential Data Input	- U1~U3, D0,D1
13	VSS	Р	Ground	
14	Rxin2-	I	-LVDS Differential Data Input	B2-B5,HS,VS,
15	Rxin2+	1 (	+LVDS Differential Data Input	DE
16	VSS	Р	Ground	
17	RxCLK-	I	-LVDS Differential Clock Input	- LVDS CLK
18	RxCLK+	I	+LVDS Differential Clock Input	LVDSCLK
19	VSS	Р	Ground	
20	Rxin3-	I	-LVDS Differential Data Input	R6, R7, G6, G7,
21	Rxin3+	I	+LVDS Differential Data Input	B6, B7
22	VSS	Р	Ground	
23	LED_GND	Р	LED Ground	
24	LED_GND	Р	LED Ground	
25	LED_GND	Р	LED Ground	
26	NC		No connection	

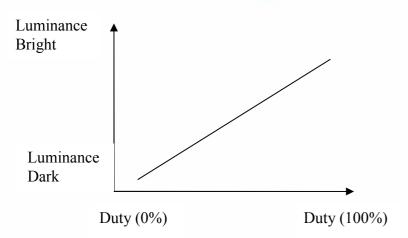
			<u> </u>
LED_PWM	1	PWM Control Signal of LED Converter	Note2
NC		No connection	
CABC_EN	I	CABC Enable Input	Note1
NC		No connection	
LED_VCCS	Р	LED Power	
LED_VCCS	Р	LED Power	
LED_VCCS	Р	LED Power	M.
NC		No connection	
NC	1	No connection	
	NC CABC_EN NC LED_VCCS LED_VCCS NC	NC          CABC_EN       I         NC          LED_VCCS       P         LED_VCCS       P         NC          NC	NC No connection  CABC_EN I CABC Enable Input  NC No connection  LED_VCCS P LED Power  LED_VCCS P LED Power  LED_VCCS P LED Power  NC No connection  NC No connection

I: input, O: output, P: Power

Note1: The setting of CABC function are as follows.

Pin	Enable	Disable
CABC_EN	High Voltage	Low Voltage or open

Note2: LED\_PWM is used to adjust backlight brightness.



## 3. Operation Specifications

## 3.1. Absolute Maximum Ratings

(Note 1)

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Item	Symbol	Va	lues	Unit	Remark	
item	Symbol	Min.	Max.	Oilit	Remark	
Power voltage	VDD	-0.3	5.0	V	VSS=0V, TA=25°C	
1 ower voltage	LED_VCCS	-0.3	6.5	V		
Operation Temperature	$T_OP$	0	50	$^{\circ}\!\mathbb{C}$		
Storage Temperature	T <sub>ST</sub>	-20	60	$^{\circ}\!\mathbb{C}$		

Note 1: The absolute maximum rating values of this product are not allowed to be exceeded at any times. Should a module be used with any of the absolute maximum ratings exceeded, the characteristics of the module may not be recovered, or in an extreme case, the module may be permanently destroyed.

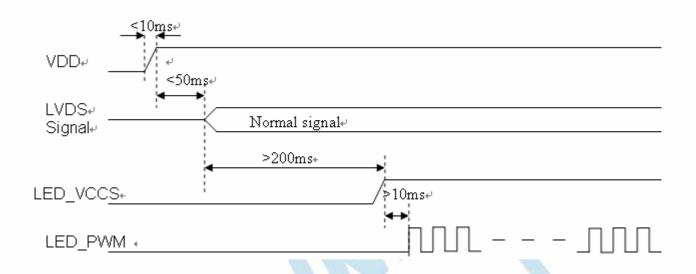
## 3.2. Typical Operation Conditions

(GND=0V, TA=25 °C)

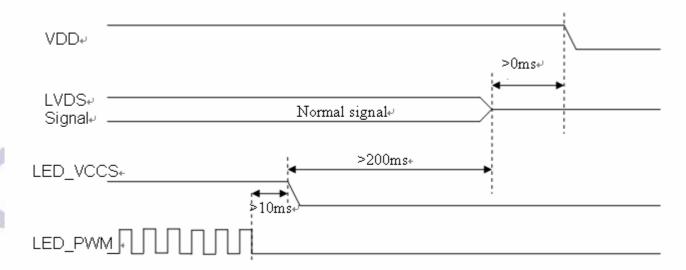
	- N. A			CITE CV,		/
ltem	Symbol		Values		Unit	Remark
item	Syllibol	Min.	Тур.	Max.	Oilit	Nemark
Dower voltage	VDD	3.0	3.3	3.6	V	
Power voltage	LED_VCC S	4.8	5.0	6.2		
Input logic high	V <sub>IH</sub>	3.0	3.3	3.6	V	
Input logic low	$V_{IL}$	0	ı	0.5	V	
Current for Driver	IVDD	-	TBD	TBD	mA	VDD=3.3V
Current for Driver	ILED_VCC S	-	TBD	TBD	mA	LED_VCCS =5V,Duty=100%
PWM Control Level	PWM High Level	3.0	ı	3.6	>	
	PWM Low Level	0	ı	0.4	>	
PWM Control	fрwм	1K	ı	20K	Hz	
Frequency						

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#### a. Power on:



#### b. Power off:

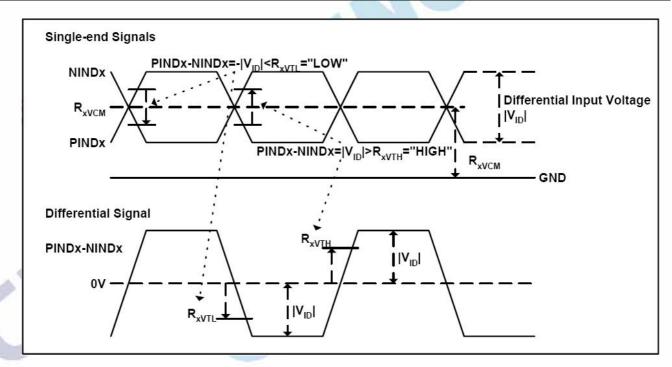


## 3.4. LVDS Signal Timing Characteristics

#### 3.4.1. AC Electrical Characteristics

Parameter	Symbol		Values	Unit	Remark	
	- J	Min.	Typ.	Max.		1 1011101111
LVDS Differential input high Threshold voltage	R <sub>xVTH</sub>	-	-	+100	mV	R <sub>XVCM</sub> =1.2V
LVDS Differential input low Threshold voltage	R <sub>xVTL</sub>	-100	-	4-	mV	1.2 V
LVDS Differential input common mode voltage	R <sub>xVCM</sub>	0.7	-6	1.6	>	
LVDS Differential voltage	V <sub>ID</sub>	250	0-1	600	mV	

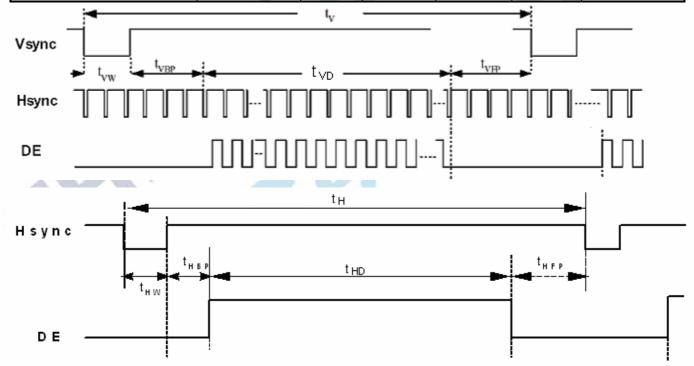
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3.4.2. Timing Table

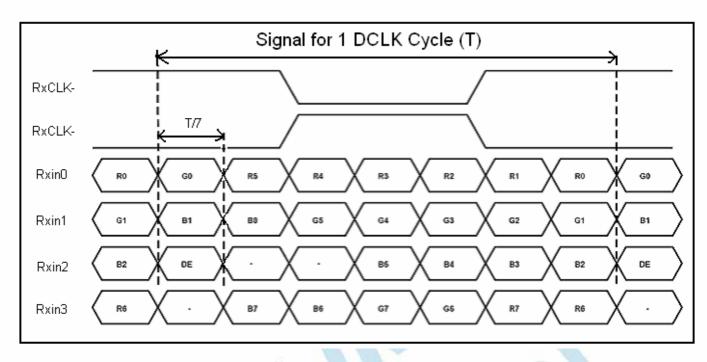
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Item	Symbol		Values	Unit	Remark	
nem	Symbol	Min.	Тур. Мах.			Offic
Clock Frequency	1/Tc	(68.9)	71.1	(73.4)	MHz	Frame rate =60Hz
Horizontal display area	tHD		1280	4	Tc	
HS period time	tн	(1410)	1440	(1470)	Тс	
HS Width +Back Porch +Front Porch	thw+ thbp +thfp	(60)	160	(190)	Tc	
Vertical display area	tvD		800		tн	
VS period time	tv	(815)	823	(833)	tн	
VS Width +Back Porch +Front Porch	tvw+ tv <sub>BP</sub> +tv <sub>FP</sub>	(15)	23	(33)	tн	



3.4.3. LVDS Data Input Format





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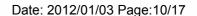
## 4. Optical Specifications

Item	Symbol	Condition	Values			Unit	Remark
item			Min.	Тур.	Max.	Onit	Remark
Viewing angle (CR≥ 10)	θι	Ф=180°(9 o'clock)	75	85	. 1	domes	Note 1
	$\theta_{R}$	Ф=0°(3 o'clock)	75	85	A- V		
	θτ	Φ=90°(12 o'clock)	75	85	Pro-	degree	
	$\theta_{B}$	Ф=270°(6 o'clock)	75	85	-		
Response time	T <sub>ON</sub>		1-1	10	20	msec	Note 3
	T <sub>OFF</sub>		<b>)</b> -	15	30	msec	Note 3
Contrast ratio	CR		600	800		<u></u>	Note 4
Color chromaticity	W <sub>X</sub>	Normal θ=Φ=0°	0.26	0.31	0.36	-	Note 2 Note 5 Note 6
	W <sub>Y</sub>		0.28	0.33	0.38	-	
Luminance	L		300	350	-	cd/m²	Note 6
Luminance uniformity	Yu		70	75	-	%	Note 7

#### **Test Conditions:**

- 1. V<sub>DD</sub>=3.3V, I<sub>L</sub>=240mA (Backlight current), the ambient temperature is 25℃.
- 2. The test systems refer to Note 2.

Note 1: Definition of viewing angle range



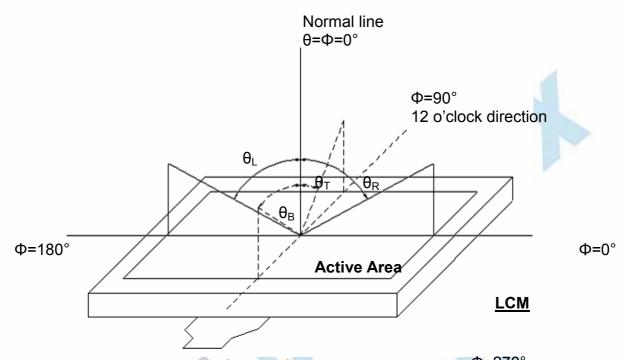


Fig. 4-1 Definition of viewing angle

Ф=270°

Note 2: Definition of optical measurement system.

6 o'clock

The optical characteristics should be measured in dark room. After 30 minutes operation, the optical properties are measured at the center point of the LCD screen. (Viewing angle is measured by ELDIM-EZ contrast/Height :1.2mm, Response time is measured by Photo detector TOPCON BM-7, other items are measured by BM-5A/ Field of view: 1° /Height: 500mm.)

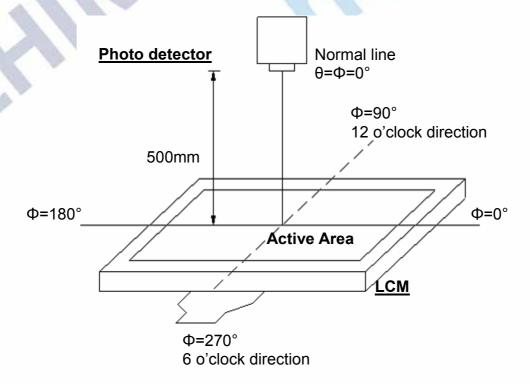


Fig. 4-2 Optical measurement system setup

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#### Note 3: Definition of Response time

The response time is defined as the LCD optical switching time interval between "White" state and "Black" state. Rise time  $(T_{ON})$  is the time between photo detector output intensity changed from 90% to 10%. And fall time  $(T_{OFF})$  is the time between photo detector output intensity changed from 10% to 90%.

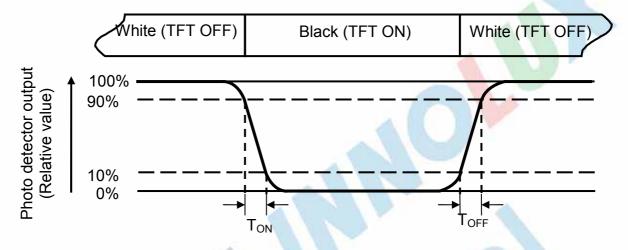


Fig. 4-3 Definition of response time

#### Note 4: Definition of contrast ratio

Contrast ratio (CR) =  $\frac{\text{Luminance measured when LCD on the "White" state}}{\text{Luminance measured when LCD on the "Black" state}}$ 

## Note 5: Definition of color chromaticity (CIE1931) Color coordinates measured at center point of LCD.

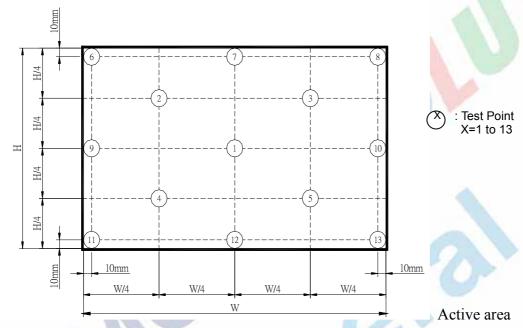
Note 6: All input terminals LCD panel must be ground while measuring the center area of the panel. The LED driving condition is I<sub>I</sub> =240mA.

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Note 7: Definition of Luminance Uniformity

Measure the luminance of gray level 63 at 9 points

 $\delta W_{9p} = \{ Minimum [L (1)+L (6)+L (7)+L (8)+L (9)+L (10)+L (11)+L (12)+L (13)] / Maximum [L (1)+L (6)+L (7)+L (8)+L (9)+L (10)+L (11)+L (12)+L (13)] \}^* 100\%$ 



## **5. Reliability Test Items**

(Note3)

Item	Test Co	Remark	
High Temperature Storage	Ta = 60°C	240hrs	Note 1, Note 4
Low Temperature Storage	Ta = -20°C 240hrs		Note 1, Note 4
High Temperature Operation	Ts = 50°C	240hrs	Note 2, Note 4
Low Temperature Operation	Ta = 0°C	240hrs	Note 1, Note 4
Operate at High Temperature and Humidity	+40℃, 90%RH 240hrs		Note 4
Thermal Shock	-20°C/30 min ~ +60°C/3 cycles, Start with cold twith high temperature.	Note 4	
Vibration Test	Frequency range:10~5 Stroke:1.5mm Sweep:10Hz~55Hz~10 2 hours for each direct (6 hours for total)		
Mechanical Shock	100G 6ms,±X, ±Y, ±Z 3 direction		
Package Vibration Test	Random Vibration: 0.015G*G/Hz from 5-2 from 200-500HZ 2 hours for each direct (6 hours for total)		
Package Drop Test	Height:60 cm 1 corner, 3 edges, 6 su		
Electro Static Discharge	± 2KV, Human Body		

- Note 1: Ta is the ambient temperature of samples.
- Note 2: Ts is the temperature of panel's surface.
- Note 3: In the standard condition, there shall be no practical problem that may affect the display function. After the reliability test, the product only guarantees operation, but don't guarantee all of the cosmetic specification.
- Note 4: Before cosmetic and function test, the product must have enough recovery time, at least 2 hours at room temperature.

#### 6. General Precautions

#### 6.1. Safety

Liquid crystal is poisonous. Do not put it in your mouth. If liquid crystal touches your skin or clothes, wash it off immediately by using soap and water.

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#### 6.2. Handling

- 1. The LCD panel is plate glass. Do not subject the panel to mechanical shock or to excessive force on its surface.
- 2. The polarizer attached to the display is easily damaged. Please handle it carefully to avoid scratch or other damages.
- 3. To avoid contamination on the display surface, do not touch the module surface with bare hands.
  - 4. Keep a space so that the LCD panels do not touch other components.
- 5. Put cover board such as acrylic board on the surface of LCD panel to protect panel from damages.
- 6. Transparent electrodes may be disconnected if you use the LCD panel under environmental conditions where the condensation of dew occurs.
  - 7. Do not leave module in direct sunlight to avoid malfunction of the ICs.

#### 6.3. Static Electricity

- 1. Be sure to ground module before turning on power or operating module.
- 2. Do not apply voltage which exceeds the absolute maximum rating value.

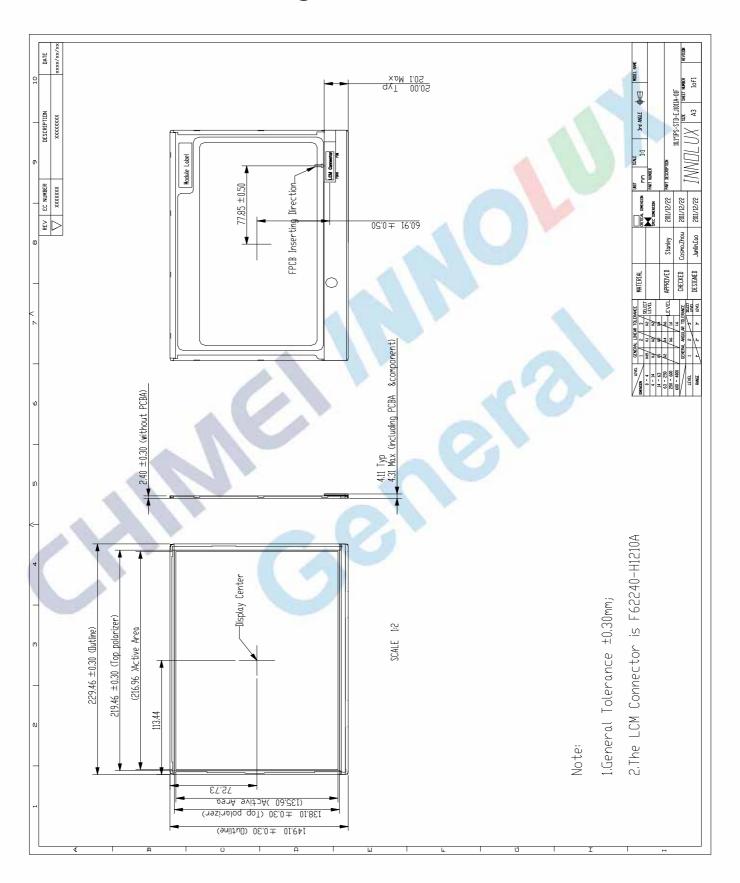
#### 6.4. Storage

- 1. Store the module in a dark room where must keep at 25±10° and 65%RH or less.
- 2. Do not store the module in surroundings containing organic solvent or corrosive gas.
  - 3. Store the module in an anti-electrostatic container or bag.

### 6.5. Cleaning

- 1. Do not wipe the polarizer with dry cloth. It might cause scratch.
- 2. Only use a soft sloth with IPA to wipe the polarizer, other chemicals might permanent damage to the polarizer.

## 7. Mechanical Drawing



## 8. Package Drawing

## 8.1. Packaging Material Table

TBD

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## 8.2. Packaging Quantity

**TBD** 

## 8.3. Packaging Drawing

TBD