



# Chunghwa Picture Tubes, Ltd.

## Product Specification

To : HAOSHENG  
Date : 2009/02/23

**TFT LCD**  
**CLAA102NA0ACG**

ACCEPTED BY :

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Doc.No:	CLAA102NA0ACG-HAOSHENG-V1-20090223	Issue Date:	20090223
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## 1. OVERVIEW

CLAA102NA0ACG is 25.8cm(10.2") color TFT-LCD (Thin Film Transistor Liquid Crystal Display) module composed of LCD panel, driver ICs, control circuit and LED backlight. By applying 1024×600 images are displayed on the 10.2" diagonal screen. Display 262K colors by 6 Bit R.G.B signal input. Use 3.3 voltage to drive the power of LCD system. Use 5.0 voltage to drive the power of LED backlight.

General specification are summarized in the following table:

ITEM	SPECIFICATION
Display Area (mm)	222.72(H) x 130.5(V) (10.2-inch diagonal)
Number of Pixels	1024(H) × 3(RGB) × 600(V)
Pixel Pitch (mm)	0.2175 (H) × 0.2175 (V)
Color Pixel Arrangement	RGB vertical stripe
Display Mode	Normally white, TN
Number of Colors	262,144
Optimum Viewing Angle	6 o'clock
Brightness (cd/m <sup>2</sup> )	220nit(typ)
Response Time (Tr+Tf)	20ms (typ)
Viewing Angle(BL on,CR ≥ 10)	140 degree (Horizontal.)
	120 degree (Vertical)
Power Consumption	3.6(w) (Typ)
Electrical Interface(data)	LVDS
Module Size (mm)	235.2(W) × 145.9(H) × 5.9(D)
Module Weight (g)	257(Typ)
Backlight Unit	LED
Surface Treatment	Glare ,Hardness:3H

## 2. ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	MIN	MAX	UNIT	NOTE
Power Supply Voltage	V <sub>cc</sub>	-0.3	4.0	V	
LED Supply Voltage	V <sub>LED</sub>	-0.3	6.0	V	
Signal Input Voltage	RxIN0+ ~ RxIN2+ RxIN0- ~ RxIN2- Rx CLK IN +/-	-0.3	V <sub>cc</sub> + 0.3	V	
Static Electricity	VESD <sub>c</sub>	-200	+200	V	【Note2】
	VESD <sub>m</sub>	-15K	+15K	V	
I <sub>CC</sub> Rush Current	IRUSH	-	1	A	【Note3】
Operation temperature	T <sub>op</sub>	-30	70	°C	【Note1】
Storage temperature	T <sub>stg</sub>	-40	80	°C	【Note1】

【Note】

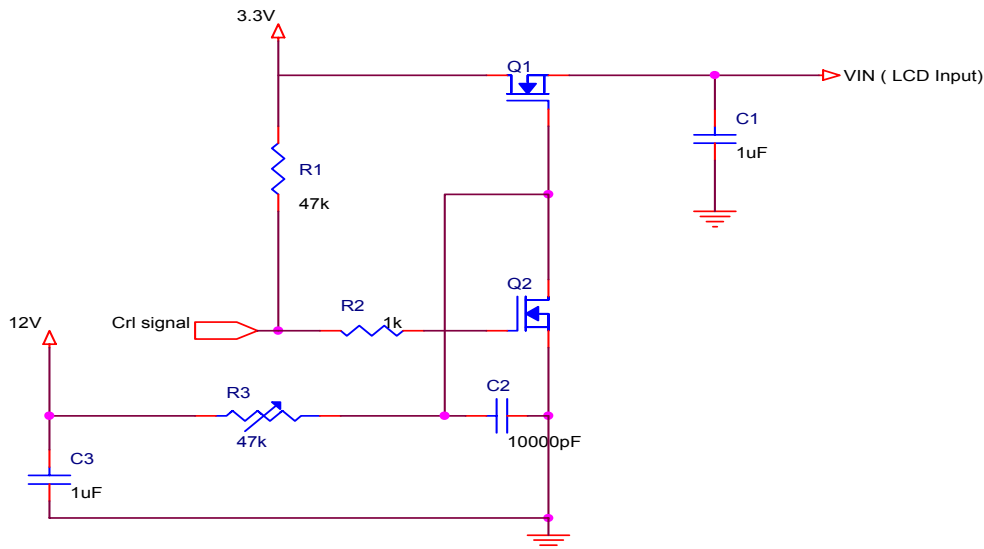
【Note1】 If users use the product out off the environment operation range ( temperature and humidity ) ,it will concern for visual quality.

【Note2】 Test Condition: IEC 61000-4-2 ,

VESD<sub>c</sub> : Contact discharge to input connector

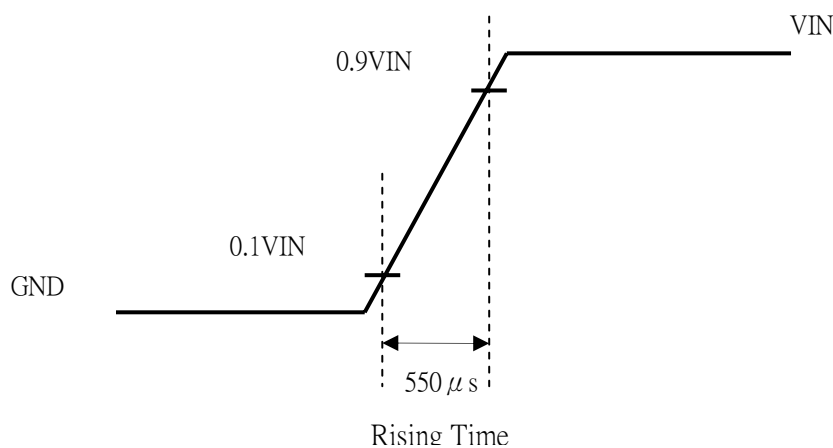
VESD<sub>m</sub> : Discontact discharge to module

【Note3】 The input pulse-current measurement system as below :



Control signal:High(+3.3V)→Low(GND)

Supply Voltage of rising time should be from R3 and C2 tune to 550 us.



### 3. ELECTRICAL CHARACTERISTICS

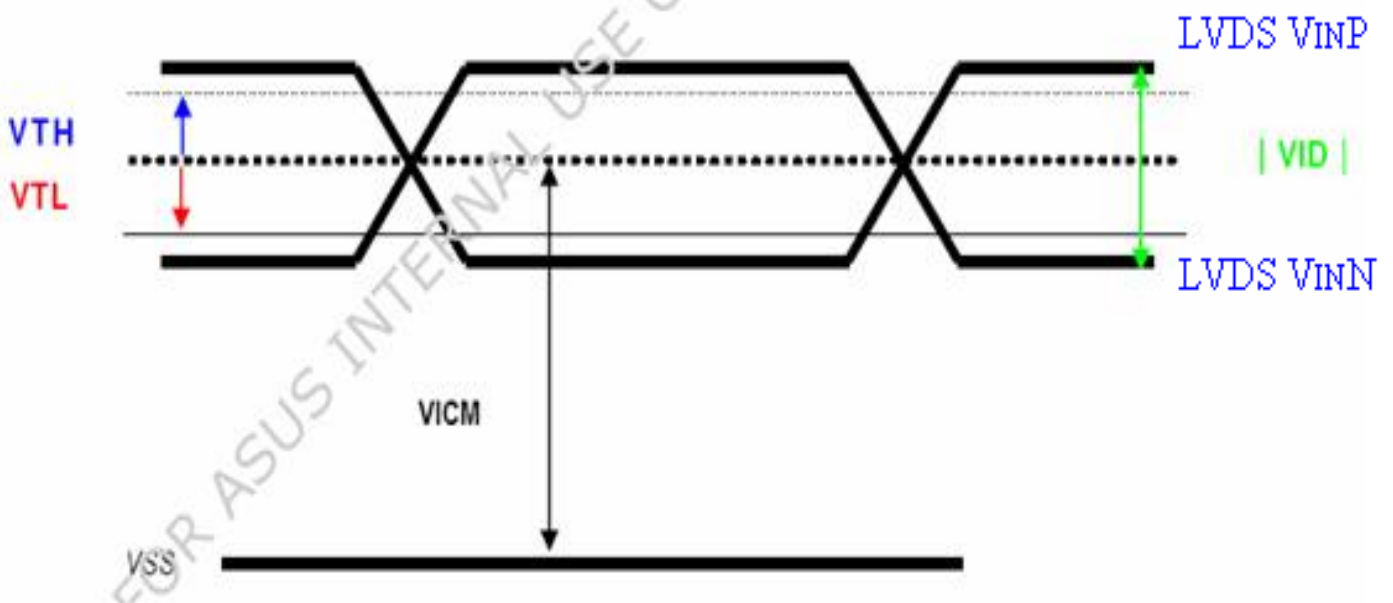
#### 3.1 TFT LCD Power Voltage

Ta=25°C

ITEM	SYMBOL	MIN	TYP	MAX	UNIT	NOTE	
Power Supply Voltage For LCD	$V_{CC}$	3.0	3.3	3.6	V		
Power Supply Voltage For LED	$V_{LED}$	4.5	5	5.5	V		
Logic Input Voltage (LVDS:IN+,IN-)	Input Voltage	$V_{IN}$	0	-	$V_{CC}$	V	【Note 1】
	Common Mode Voltage	$V_{CM}$	1.08	1.2	1.32	V	【Note 1】
	Differential Input Voltage	$ VID $	250	350	450	mV	【Note 1】
	Threshold Voltage(high)	$V_{TH}$	-	-	100	mV	【Note 1】
	Threshold Voltage(low)	$V_{TL}$	-100	-	-	mV	【Note 1】
ADJ Input Voltage	Input Voltage(high)	$V_{IH}$	3.0	-	3.3	V	
	Input Voltage(low)	$V_{IL}$	GND	-	0.3	V	

【Note】

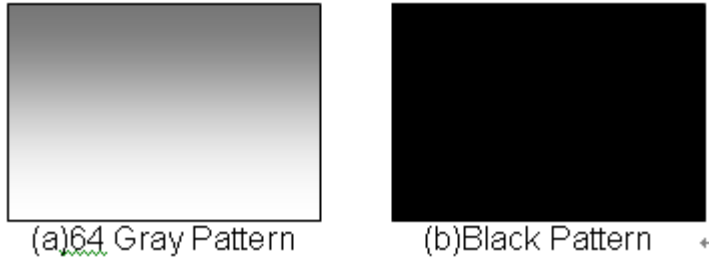
【Note1】 LVDS signal



### 3.2 TFT-LCD Current Consumption

ITEM	SYMBOL	MIN	TYP	MAX.	UNIT	NOTE
LCD Power Current	$I_{CC}$	--	250	350	mA	【Note1】
LED Power Current	$I_{LED}$	--	500	600	mA	【Note2】

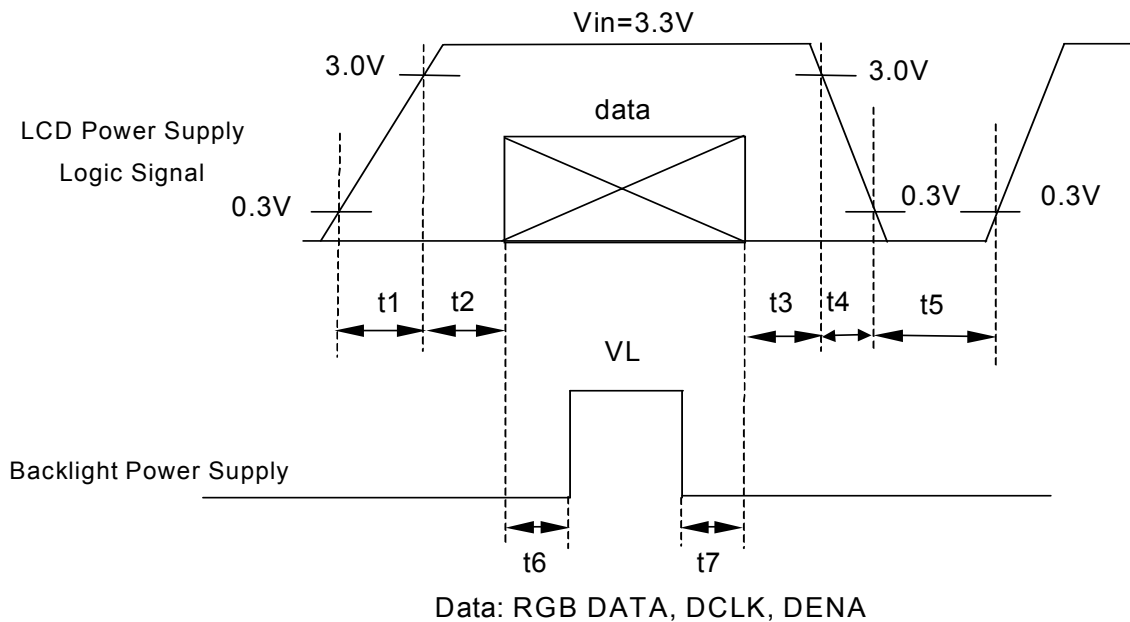
【Note1】 Typical: Under 64 gray pattern @  $V_{CC} = 3.3\text{ V}$   
 Maximum: Under black pattern @  $V_{CC} = 3.0\text{ V}$



【Note2】 Typical: When  $V_{LED}$  is 5V  
 Maximum: When  $V_{LED}$  is 4.5V

### 3.3 Power · Signal sequence

- $0.5 < t_1 \leq 10\text{ms}$
- $0 < t_2 \leq 50\text{ms}$
- $0 < t_3 \leq 50\text{ms}$
- $0 < t_4 \leq 10\text{ms}$
- $200\text{ms} \leq t_5$
- $200\text{ms} \leq t_6$
- $200\text{ms} \leq t_7$



## 4. INTERFACE CONNECTION

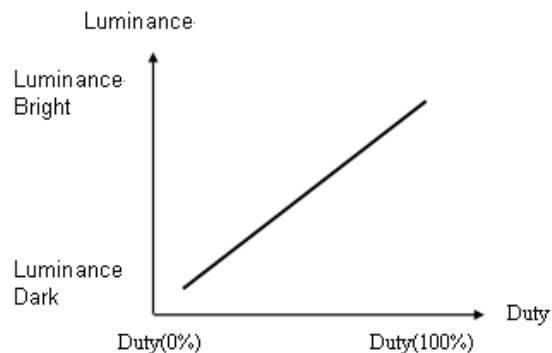
### 4.1 CN1

Connector type : 093F30-B0B01A or compatible

Pin No.	SYMBOL	FUNCTION
1	GND	Ground
2	V <sub>CC</sub>	+3.3V Power
3	V <sub>CC</sub>	+3.3V Power
4	V <sub>EDID</sub>	3.3V Power for NB
5	ADJ	Adjust for LED brightness
6	CLK_EDID	EDID Clock for NB
7	DATA_EDID	EDID Data for NB
8	RXIN0-	LVDS Signal(-)—channel 0
9	RXIN0+	LVDS Signal(+)—channel 0
10	GND	Ground
11	RXIN1-	LVDS Signal(-)—channel 1
12	RXIN1+	LVDS Signal(+)—channel 1
13	GND	Ground
14	RXIN2-	LVDS Signal(-)—channel 2
15	RXIN2+	LVDS Signal(+)—channel 2
16	GND	Ground
17	RXCLKIN-	LVDS Clock Signal(-)
18	RXCLKIN+	LVDS Clock Signal(+)
19	GND	Ground
20	NC	NC
21	NC	NC
22	GND	Ground
23	GND	Ground
24	V <sub>LED</sub>	Power Supply for LED(V <sub>LED</sub> =5.0±0.5)
25	V <sub>LED</sub>	Power Supply for LED(V <sub>LED</sub> =5.0±0.5)
26	V <sub>LED</sub>	Power Supply for LED(V <sub>LED</sub> =5.0±0.5)
27	NC	NC
28	NC	NC
29	NC	NC
30	NC	NC

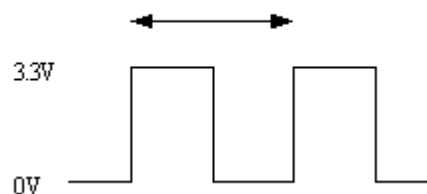
#### 【Note】

1) ADJ adjust brightness to control Pin , Pulse duty the bigger the brighter.



2) ADJ signal=0~3.3V , operation frequency : 25KHZ±5KHZ, ADJ pin should not connect to GND, it should pull-high if not adjust brightness.

$$F = 25\text{KHz} \pm 5\text{KHz}, T = 0.05\text{ms}$$



3) GND Pin must ground contact , can not be floating.



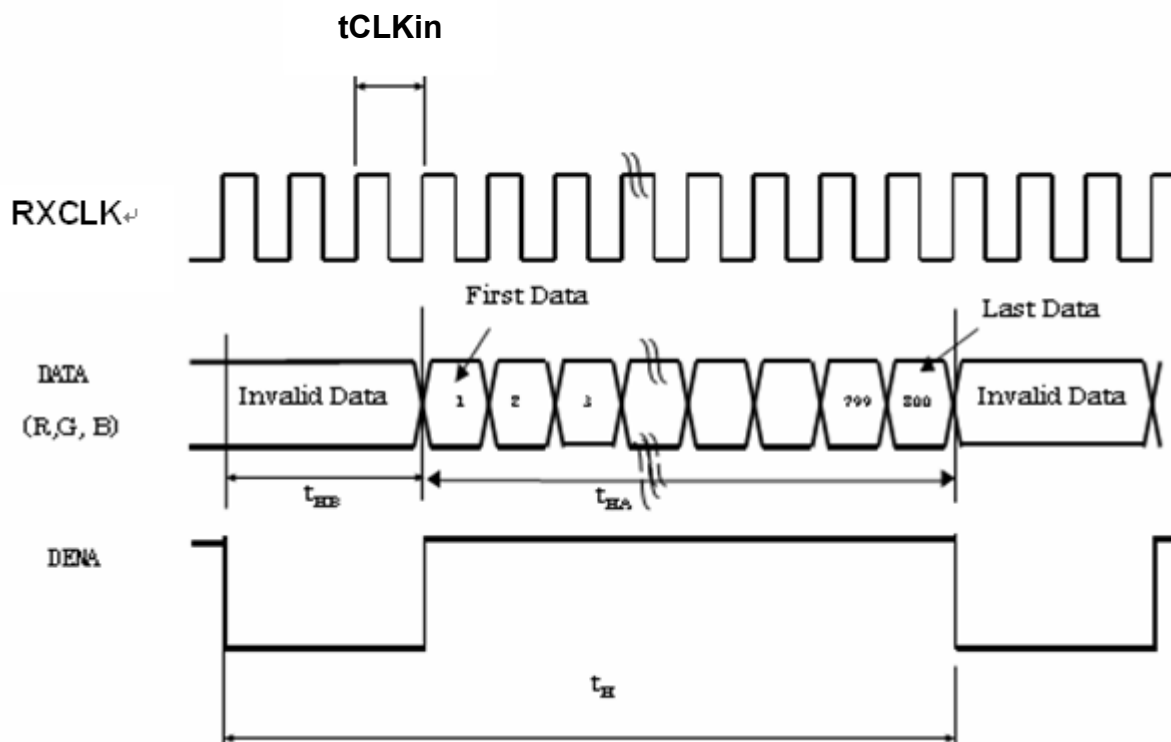
## 5. INPUT SIGNAL

### 5.1 Timing Specification

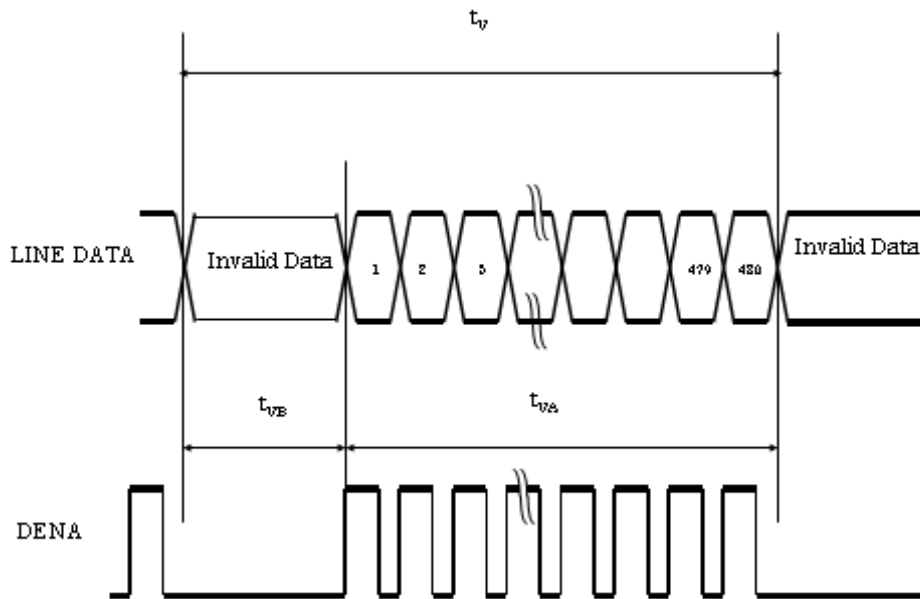
ITEM			SYMBOL	MIN	TYP	MAX	UNIT
LVDS input signal sequence	CLK Frequency		fCLKin	39.05	45	50	MHz
	CLK Period		tCLKin	25.61	22.22	19.45	ns
LCD input timing	Horizontal	Horizontal Total Time	$t_H$	1160	1200	1240	tCLK
		Horizontal Effective Time	$t_{HA}$	1024	1024	1024	tCLK
		Horizontal Blank Time	$t_{HB}$	136	176	216	tCLK
	Vertical	Frame	fV	55	60	65	Hz
		Vertical Total Time	$t_V$	612	625	638	$t_H$
		Vertical Effective Time	$t_{VA}$	600	600	600	$t_H$
		Vertical Blank Time	$t_{VB}$	12	25	38	$t_H$

### 5.2 Timing sequence (Timing chart)

#### 5.2.1 Horizontal Timing Sequence



### 5.2.2 Vertical Timing Sequence



### 5.2.3 LVDS Input Data mapping

