☐ **Preliminary Specifications**

■ **Final Specifications**

Module	LCD Controller Board (AD Board) Built In Backlight Driver For LCD Display
Model Name	AD-0040
Document Version	Rev.V0

Customer

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Approved by   Date

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Notice : This Specification is subject to change without notice.

Approved By	Prepared By
Tony Chiu	Frank Kuo
2020/04/09	2020/04/09

Contents

Revision History

Version	Date	Revised Content/Summary	Page	Remark
0	2020/04/09	First Edition	All	

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1. General Function

A. TFT-LCD MODULE CONTROLLER BOARD

B. RESOLUTION UP TO 1920 x 1200 @ 60Hz

C. 15 PIN D-SUB VGA CONNECTOR INPUT

D. DVI-D (Digital Video Input) CONNECTOR INPUT

E. DUAL PORT 8 Bit LVDS INTERFACE OUTPUT TO PANEL

F. OSD (On Screen Display) CONTROL MENU

G. SUPPORTING HDCP PROTOCOL (OPTIONAL)

H. SUPPORTING DDC/CI PROTOCOL.

I. AUDIO INPUT AND AUDIO OUTPUT 1.6W x 2 at 8ohm SPEAKER

J. Built In Backlight Driver 4 Channel of LED String

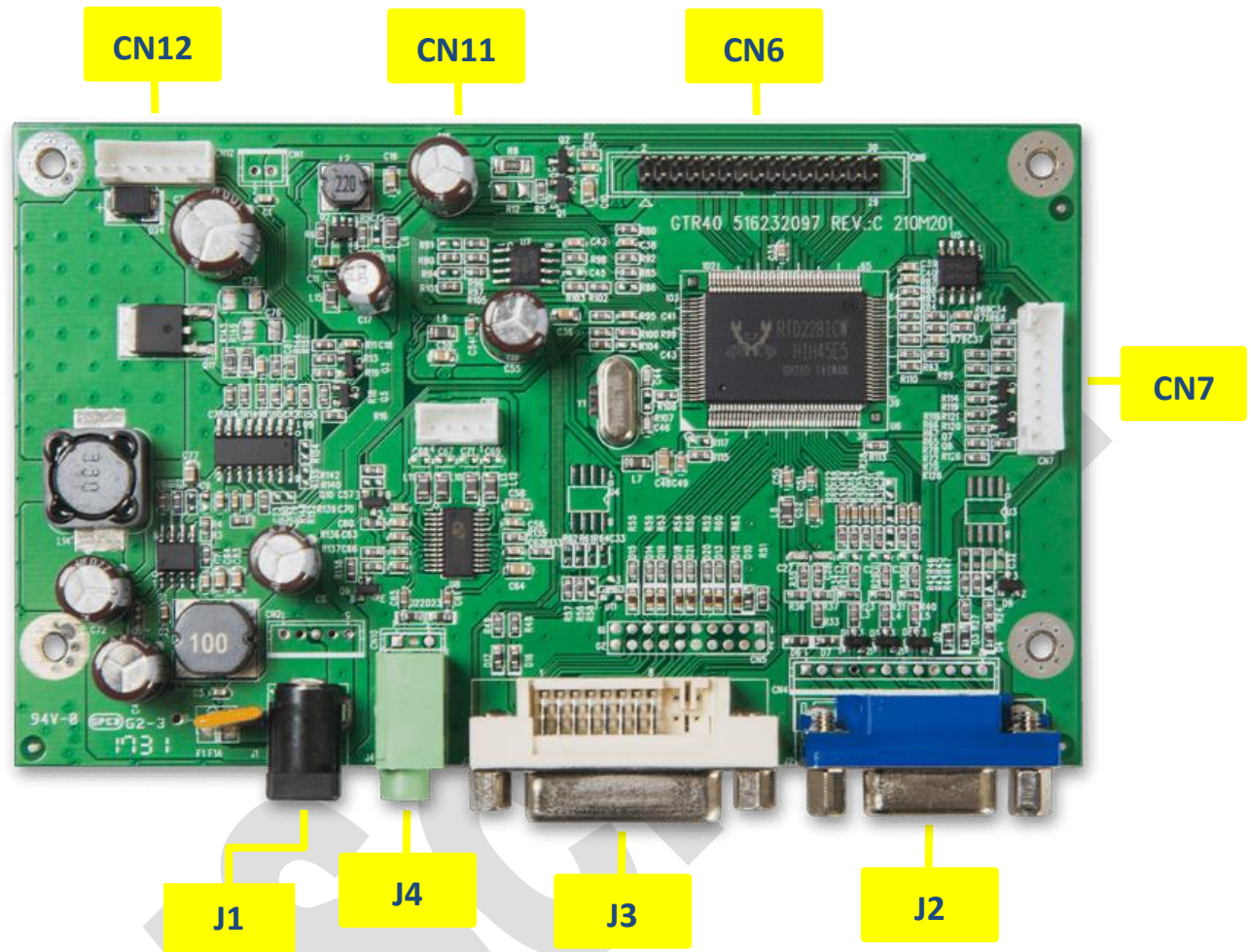**Note：No FRC Function**

2. Specification

2-1 AD Board

Model	AD-0040
Panel Interface	Single/Dual (10" to 27" Panel)
Maximum Resolution	Up to WUXGA 1920x1200 8 bits per color , total 16.7M colors
Vertical Refresh Rate	VGA，SVGA，XGA，UXGA VESA Standard up to 75Hz WUXGA up to 60Hz
Input Source	VGA Analog (15pin D-Sub)，DVI-D，Audio in
Audio Output	1.6W+1.6W at 8 Ohm speaker
Dot Clock Maximum (Pixel clock)	165 MHz
User Controls	Power On/Off Menu Adjust － Adjust ＋ Exit
Board Dimension	133 x 80 x 14.5 mm
Voltage for LCD Panel	5V，12V DC
Storage Temperature Limits	Temperature –40C~70C
Operation Temperature Limits	Temperature -20C~70C Humidity：Less than 85%

2-2 Backlight Driver

Parameter		Min.	Typ.	Max.	Unit	
Output Voltage	Vout	---	68	---	V	***
Efficiency	Eff.	---	80	---	%	
Sub Current	Iout	---	60	---	mA	***
Total Current	Iout	---	240	---	mA	***
LED ON/OFF	Von	2.5	---	5.0	V	
	Voff	0	---	0.5		
Dimming	PWM Level	2.5	---	5.0	V	
	Duty Ratio	0	---	100	%	
	Frequency	0.1	---	20	KHz	

*** Depend on panel type

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3. Interface

3-1.   J1 : Power Input (DC 12V)

3-2.   J2 : VGA Connect (VGA Signal Input)

3-3.   J3 : DVI-D Connect (DVI Signal Input)

3-4.   J4 : Audio Input (Phone Jack)

3-5.   CN6 : LVDS Output

3-6.   CN7 : OSD Key Output

3-7.   CN11 : Speaker Output

3-8.   CN12 : 4 Channel of LED String Output

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4. Support PC Timing

NO.	Description	H-Freq. (KHz)	V-Freq. (Hz)	
1.	VGA640×400	31.480	70	
2.	VGA640×480	31.649	60	
3.	VGA720×400	37.469	70	
4.	VESA 640×480	37.862	72.809	
5.	VESA 640×480	37.5	75	
6.	VESA 800×600	35.156	56.25	
7.	VESA 800×600	37.9	60	
8.	VESA 800×600	48.077	72.188	
9.	VESA 800×600	46.875	75	
10.	VESA 1024×768	48.363	60	
11.	VESA 1024×768	56.476	70	
12.	VESA 1024×768	60.023	75	
13.	VESA 1152×864	67.5	75	
14.	VESA 1280 x 768	47.8	60	
15.	VESA 1280 x 768	60.3	75	
16.	VESA 1280×960	60	60	
17.	VESA 1280×1024	63.981	60	
18.	VESA 1280×1024	79.977	75	
19.	VESA 1440x900	59.9	60	
20.	VESA 1440x900	75	75	
21.	VESA 1600x1200	75	60	
22.	VESA 1600x1200	81.3	65	Note
23.	VESA 1600x1200	87.5	70	Note
24.	VESA 1600x1200	93.8	75	Note
25.	VESA 1680x1050	65.3	60	
26.	VESA 1680x1050	74.9	75	Note
27.	VESA 1920x1080	56.25	50	
28.	VESA 1920x1080	67.5	60	
29	VESA 1920x1200	74.6	60	

Note: depends on panel

5. Signal input connections

5-1 Power Input

Location – J1 : DC JACK D=2.0mm 12V DC Input

5-2 VGA Connect (VGA Signal Input)

Location – J2 : 15pin Hi-Density Female D-SUB

Pin Assign and Definition

Pin No.	SYMBOL	Pin No.	SYMBOL	Pin No.	SYMBOL
1	RED IN	6	R-GND	11	GND
2	GREEN IN	7	G-GND	12	SDA_DDC
3	BLUE IN	8	B-GND	13	SYNC_ H
4	GND	9	PC 5V	14	SYNC _V
5	GND	19	VGA_CABLE_DET	15	SCL_DDC

5-3 DVI-D Connect (DVI Signal Input)

Location – J3 : 30pin DVI-D Connector

Pin Assign and Definition

Pin No.	SYMBOL	Pin No.	SYMBOL	Pin No.	SYMBOL
1	DATA2-	11	GND	21	NC
2	DATA2+	12	NC	22	GND
3	GND	13	NC	23	CLK+
4	NC	14	DVI_DDC_5V	24	CLK-
5	NC	15	DVI_CABLE_DET	25	NC
6	DVI_DDC_SCL	16	DVI_HPD	26	NC
7	DVI_DDC_SDA	17	DATA0-	27	NC
8	NC	18	DATA0+	28	NC
9	DATA1-	19	GND	29	GND
10	DATA1+	20	NC	30	NC

5-4 Audio Input (Phone Jack)

Location – J4 : SCJ368R0NXS0G04G 3P Green or equiv

Audio Input 1Vp-p Max.

5-6 LVDS Output

Location – CN6 : 2x15pin DuPont pin pitch 2.0mm

Pin Assign and Definition

Pin No.	SYMBOL	Pin No.	SYMBOL	Pin No.	SYMBOL
1	VLCD for panel	11	LVDS RXE 2-	21	LVDS RXO 1-
2	VLCD for panel	12	LVDS RXE 2+	22	LVDS RXO 1+
3	VLCD for panel	13	GND	23	LVDS RXO 2-
4	NC	14	GND	24	LVDS RXO 2+
5	GND	15	LVDS RXE CLK-	25	GND
6	GND	16	LVDS RXE CLK+	26	GND
7	LVDS RXE 0-	17	LVDS RXE 3-	27	LVDS RXO CLK-
8	LVDS RXE 0+	18	LVDS RXE 3+	28	LVDS RXO CLK+
9	LVDS RXE 1-	19	LVDS RXO 0-	29	LVDS RXO 3-
10	LVDS RXE 1+	20	LVDS RXO 0+	30	LVDS RXO3+

5-7 OSD Key Output Connector

Location – CN7 : 8pin wafer pitch 2.0mm STM M24268 or equivalent

All Key Active Low Level , All LED Active HI Level , Output Current 10mA MAX

Pin assign and definition

Pin No.	SYMBOL	Pin No.	SYMBOL	Pin No.	SYMBOL
1	MENU KEY	4	UP KEY	7	LED_O
2	AUTO KEY	5	GND	8	POWER KEY
3	DOWN KEY	6	LED_G	---	----------------

5-8 Speaker Output

Location – CN11 : 4pin wafer pitch 2.0mm STM M24264 or equivalent

Audio Output 1.6W + 1.6W at 8 Ohm

Pin assign and definition

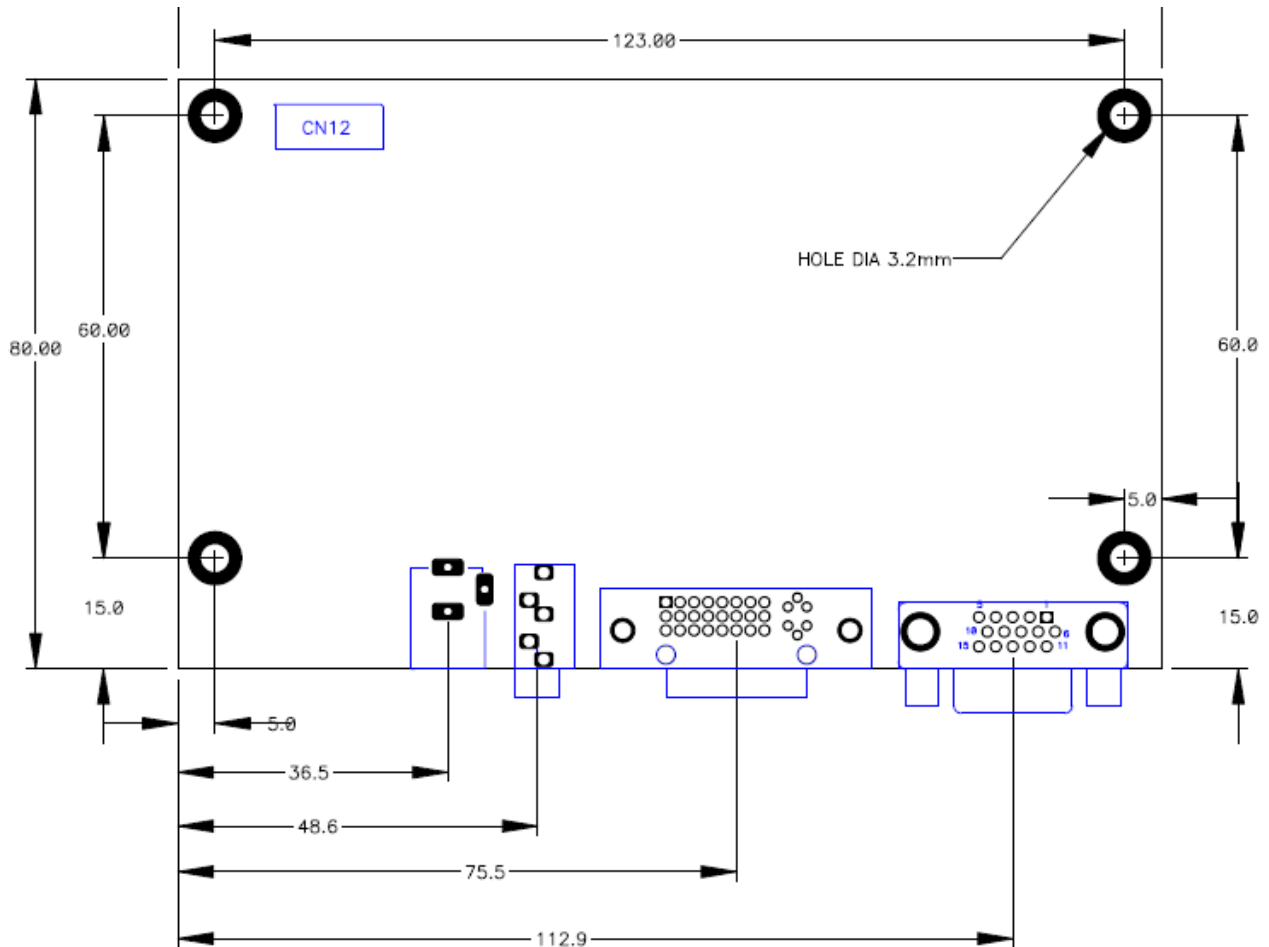| Pin No.	Signal
1	R +
2	R -
3	L -
4	L +

5-9 4 Channel of LED String Output

Location – CN12 : 6pin wafer pitch 2.0mm STM M24266 or equivalent

Pin Assign and Definition

Pin No.	SYMBOL	Pin No.	SYMBOL
1	IRLED_1	4	VLED
2	IRLED_2	5	IRLED_3
3	VLED	6	IRLED_4

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6. LCD Controller Board Dimension

Unit : mm