

☐ Preliminary Specifications

☒ Final Specifications

Module	LCD Controller Board (AD Board) For LCD Display
Model Name	AD-0037
Document Version	Rev.V0

Customer

Approved by

Date

Notice : This Specification is subject to change without notice.

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Revision History

Version	Date	Revised Content/Summary	Page	Remark
0	2020/03/10	First Edition	All	

1. General Function

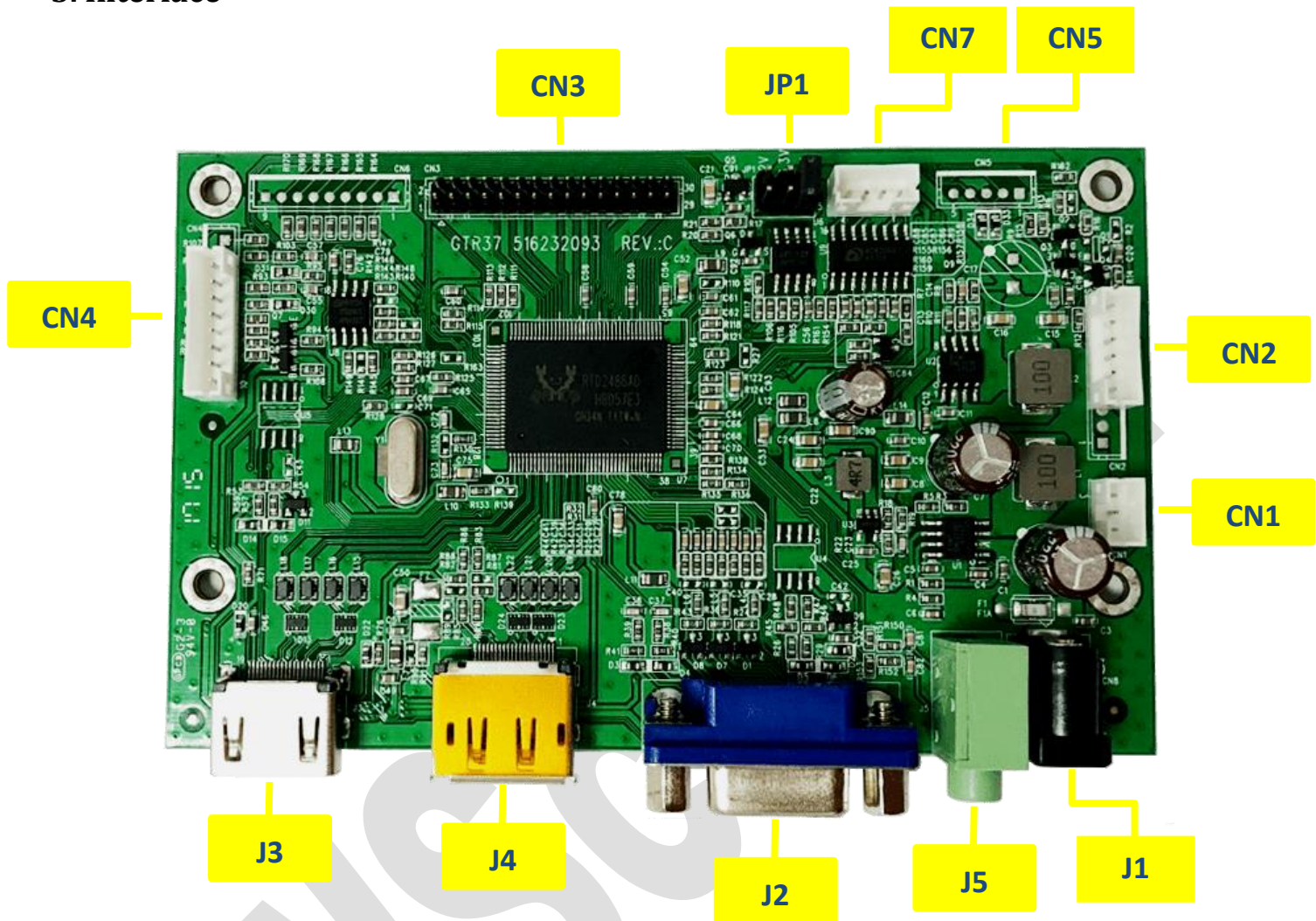
- A. TFT-LCD Module Driver Board
- B. Resolution UP TO 1920 x 1200 @ 60Hz (Note)
- C. 15 PIN D-SUB VGA Connector Input
- D. HDMI Connector Input
- E. Display Port Connector Input
- F. LVDS Interface Output to Panel
- G. OSD (On Screen Display) Control Menu
- H. Supporting HDCP Protocol (Optional)
- I. Supporting DDC/CI Protocol
- J. Audio Input And Audio Output 1.6W x 2 at 8ohm Speaker

Note : No FRC Function

2. Specification

Model	AD-0037
Panel Interface	Single/Dual LVDS
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 (No FRC Function)
Input Source	VGA Analog (15pin D-Sub) HDMI 1.4a (HDCP 1.3) Display Port 1.2 (HDCP1.3)
Audio Output	1.6W+1.6W at 8 Ohm speaker
Dot Clock Maximum (Pixel clock)	VGA : 210 MHz HDMI : 165 MHz
User Controls	Power On/Off Menu Adjust — Adjust + Exit
Board Dimension	120 x 75 x 14.5 mm
Voltage for LCD Panel	3.3V , 5V , 12V DC (Jump Select)
Storage Temperature Limits	Temperature -40°C~70°C
Operation Temperature Limits	Temperature -20°C~70°C Humidity : Less than 85%

3. Interface



- 3-1. JP1 : Panel Voltage Selector
- 3-2. J1 : Power Input (DC 12V)
- 3-3. J2 : VGA Connect (VGA Signal Input)
- 3-4. J3 : HDMI Connect (HDMI Signal Input)
- 3-5. J4 : Display Port Connect (Display Port Signal Input)
- 3-6. J5 : Audio Input (Phone Jack)
- 3-7. CN1 : 5V Output
- 3-8. CN2 : Backlight Control
- 3-9. CN3 : LVDS Output
- 3-10. CN4 : OSD Key Output Connect
- 3-11. CN5 : IR and Light Sensor Input (Optional)
- 3-12. CN7 : Audio Output

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	37.9	60
7.	VESA 800×600	46.875	75
8.	VESA 1024×768	48.363	60
9.	VESA 1024×768	60.023	75
10.	VESA 1152×864	67.5	75
11.	VESA 1280 x 768	47.4	60
12.	VESA 1280 x 768	60	75
13.	VESA 1280×960	60	60
14.	VESA 1280×960	75	75
15.	VESA 1280×1024	63.981	60
16.	VESA 1280×1024	79.977	75
17.	VESA 1440x900	59.9	60
18.	VESA 1440x900	75	75
19.	VESA 1600x1200	75	60
20.	VESA 1600x1200	93.8	75
21.	VESA 1680x1050	65.3	60
22.	VESA 1680x1050	75	75
23.	VESA 1920x1080	67.5	60
24.	VESA 1920x1200	74	60

Note: depends on panel

5. Signal input connections

5-1 Panel Voltage Selector

Location – JP1 : Pin1,Pin2 Short Panel Power 12V

Pin3,Pin4 Short Panel Power 3.3V

Pin5,Pin6 Short Panel Power 5V

5-2 Power Input

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

5-3 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	VGA DET	19	GND	15	SCL DDC

5-4 HDMI Connect (HDMI Signal Input)

Location – J3 : 19pin HDMI Connector

Pin Assign and Definition

Pin No.	SYMBOL	Pin No.	SYMBOL	Pin No.	SYMBOL
1	HDMI_DATA2+	8	GND	15	HDMI_SCL
2	GND	9	HDMI_DATA0-	16	HDMI_SDA
3	HDMI_DATA2-	10	HDMI_CLK+	17	GND
4	HDMI_DATA1+	11	HDMI_DET	18	HDMI_5V
5	GND	12	HDMI_CLK-	19	HDMI_HPD
6	HDMI_DATA1-	13	CEC	-----	-----
7	HDMI_DATA0+	14	NC	-----	-----

5-5 Display Port Connect (Display Port Signal Input)

Location – J4 : 20pin Display Port Connector

Pin Assign and Definition

Pin No.	SYMBOL	Pin No.	SYMBOL	Pin No.	SYMBOL
1	LANE3-	8	GND	15	AUX_CHP
2	GND	9	LANE1+	16	DP DET
3	LANE3+	10	LANE0-	17	AUX_CHN
4	LANE2-	11	GND	18	HPD
5	GND	12	LANE0+	19	RETURN
6	LANE2+	13	GND	20	DP_5V
7	LANE1-	14	GND	-----	-----

5-6 Audio Input (Phone Jack)

Location – J5 : SCJ368R0NXS0G04G 3P Green or equivalent

Audio Input 1Vp-p Max.

5-7 5V Output

Location – CN1 : 3pin wafer pitch 2.0mm STM M24263 or equivalent

Pin Assign and Definition

Pin No.	SYMBOL
1	GND
2	NC
3	+5V Output

Note : 5V 500mA Max

5-8 Backlight Control

Location – CN2 : 6pin wafer pitch 2.0mm STM M24266 or equivalent

Pin Assign and Definition

Pin No.	SYMBOL	Pin No.	SYMBOL
1	GND	4	Backlight Enable
2	GND	5	+12V
3	Dimming control	6	+12V

5-8A Dimming : PWM Ratio 100% (LED Current Max) to PWM Ratio 20% (LED Current Min)

5-8B Backlight Enable : 5V (ON) or 0V (OFF)

5-9 LVDS Output

Location – CN3 : 2x15pin DuPont 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+

5-10 OSD Key Output Connect

Location – CN4 : 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	---	-----

5-11 IR and Light Sensor Input (Optional)

Location – CN5 : 5pin wafer pitch 2.0mm STM M24265 or equivalent

Pin Assign and Definition

Pin No.	SYMBOL	Pin No.	SYMBOL
1	+5V	4	Light Sensor Signal
2	IR Signal	5	GND
3	GND	---	-----

5-12 Audio Output For Speaker

Location – CN7 : 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 +

6. LCD Controller Board Dimension

