

## 23.6“ Lcd Panel With Display Kits

### ■ Preliminary Specification

### □ Approval Specification

<b>Module</b>	<b>23.6” LCD Panel with Display Kits</b>
<b>Module Name</b>	<b>K236LHW-V01 Rev.0</b>

Customer

Approved by

Date

Notice: This Specification is subject to change without notice.

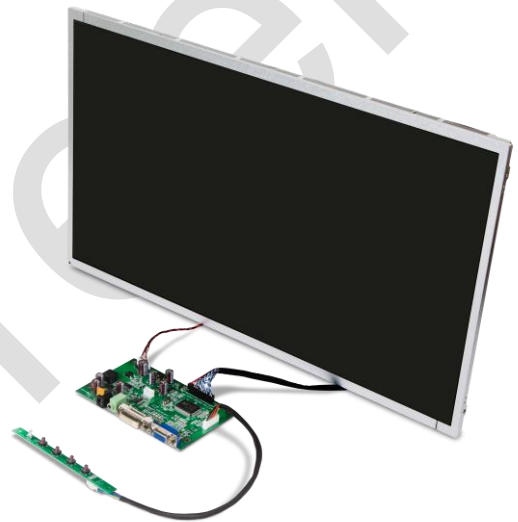
Approved By	Prepared By
Tony Chiu 2017/12/26	Ray Lin 2017/12/6

## 23.6“ Lcd Panel With Display Kits

### K236LHW-V01

#### Overview

- 23.6“ a-si TFT LCD panel with resolution 1920 x 1080
- Suitable for Military, Kiosk, Advertising, POS, Marine, Transportation....etc.
- 15 Pin D-SUB VGA connector input
- DVI-D (Digital Video Input) connector input
- OSD(On-Screen-Display) control menu
- Audio input and Audio output
- Include following parts =
  1. 23.6“ Panel
  2. ADBoard
  3. LVDS Cable
  4. B/L Cable
  5. OSD 4 key Board
  6. OSD 4 Key Cable



23.6” LCD Panel with Display Kits	
PANEL ITEM	SPECIFICATION
Module	23.6” Color TFT-LCD with LED Backlight (LVDS Interface)
Resolution (Pixels)	1920 x 1080 (FHD)
White Luminance	250 cd/m2
Display Mode	VA Mode, Normally Black
Contrast Ratio	3000:1
Response Time	25ms ( MAX 35ms)
View Angle	89/89/89/89 deg
Outline Dimension	544.8mm(H) x 320.5mm(V) x 11.5mm(T)
Weight	2270 g
Power Consumption	16.61Watt
LED Life Time	40,000 Hrs

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**Product Specification**

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**K236LHW-V01****K236LHW-V01 Panel General Description****General Specifications**

Item	Specification	Unit
Screen Size	23.6" diagonal	-
Driver Element	a-si TFT active matrix	-
Pixel Number	1920 x R.G.B. x 1080	pixel
Pixel Pitch	0.2715(H) x 0.2715(V)	mm
Pixel Arrangement	RGB vertical stripe	-
Display Colors	16.7m Colors	color

**Mechanical Specifications**

Item		Type	Unit
Module Size	Horizontal(H)	544.8	mm
	Vertical(V)	320.5	mm
	Thickness(T)	11 (MAX 11.5)	mm
Bezel Area	Horizontal	525.22	mm
	Vertical	297.22	mm
Active Area	Horizontal	521.28	mm
	Vertical	293.22	mm
Weight		2270	g

## Product Specification

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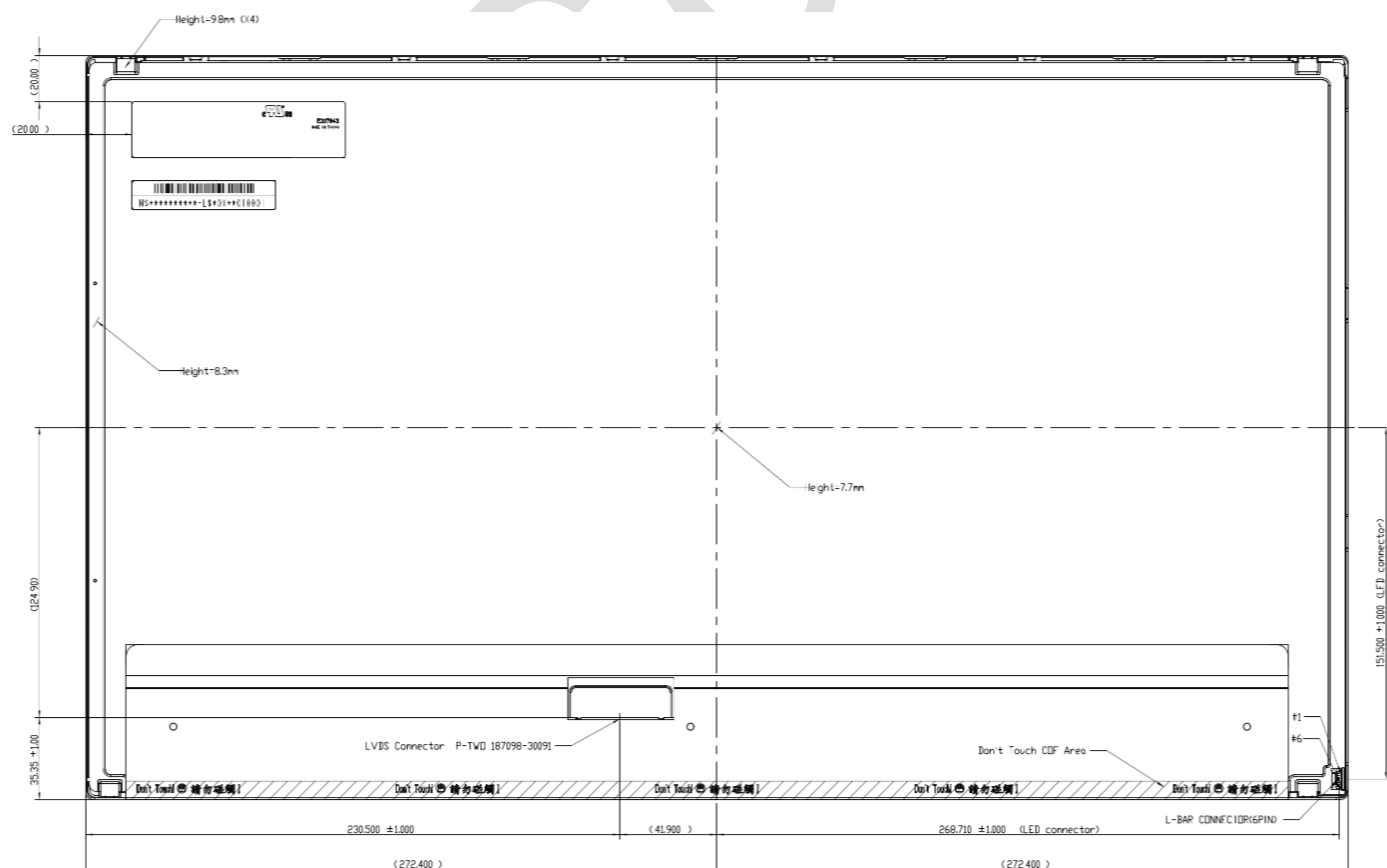
### Absolute Rating of Environment

Item	Symbol	Value		Unit
		Min.	Max.	
Storage Temperature	T <sub>ST</sub>	-20	+60	°C
Operating Temperature	T <sub>OP</sub>	0	+50	°C

### Optical Specifications

Item	Symbol		Condition	Min.	Type	Max.	Unit
Color Chromaticity	Red	Rx	$\theta_x=0^\circ, \theta_Y=0^\circ$ Viewing Normal Angle	-	-	0.646	-
		Ry				0.336	-
	Green	Gx				0.322	-
		Gy				0.622	-
	Blue	Bx				0.154	-
		By				0.052	-
	White	Wx				0.313	-
		Wy				0.329	-
	Viewing Angle	Horizontal				$\theta_{x+}$	80
$\theta_{x-}$			80	89	-		
Vertical		$\theta_{Y+}$	80	89	-		
		$\theta_{Y-}$	80	89	-		

**K236LHW-V01**

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## ADBoard & OSD Key General Function

- A. RESOLUTION UP TO 1920 X 1080 @ 60Hz
- B. 15 PIN D-SUB VGA CONNECTOR INPUT
- C. DVI (Digital Video Input) CONNECTOR INPUT (OPTIONAL)
- D. LVDS INTERFACE OUTPUT TOPANEL
- E. OSD ( On Screen Display ) CONTROL MENU
- F. SUPPORTING HDCP PROTOCOL (OPTIONAL)
- G. SUPPORTING DDC/CID PROTOCOL
- H. BUILT IN LED BACKLIGHT DRIVER BOARD

### Specification

#### 1 - AD Board

<b>Model</b>	AD-0040
<b>Panel Compatibility</b>	Compatible with XGA, SVGA, VGA resolution TFT LCD panel from various panel manufactures by changing some jumpers setting and specified BIOS.
<b>Maximum Resolution</b>	Up to 8 bits per color, total 16.7M Colors
<b>Vertical Refresh Rate</b>	VGA、SVGA、XGA AND UXGA VESA standard up to 75Hz
<b>Input Source</b>	VGA analog (15pin D-Sub), DVI (option),
<b>Dot Clock Maximum (pixel clock)</b>	165 MHz
<b>User Controls</b>	Power On/Off, OSD Menu, Adjust -, Adjust +, Auto
<b>Voltage for LCD Panel</b>	5V, 12VDC
<b>Storage Temperature Limits</b>	Temperature -40C~70C
<b>Operation Temperature Limits</b>	Temperature 0C~40C Humidity : Less than 85%

#### 2 - LED DRIVER Board

Parameter		Min.	Max.	Unit
Output Voltage	Vout	-----	68	V
Efficiency	Eff.	80	-----	%
Output Current	Io	-----	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	20	100	%
	Frequency	0.1	20	KHz

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### Support PC Timing

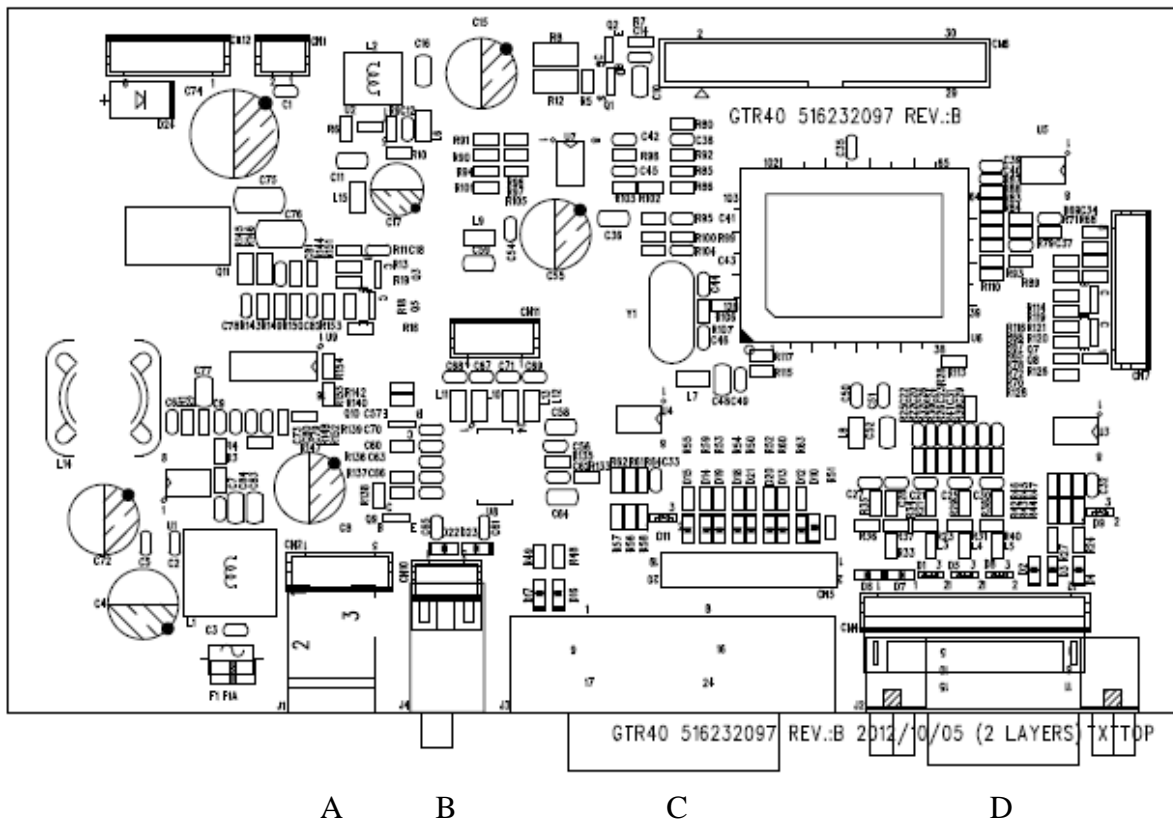
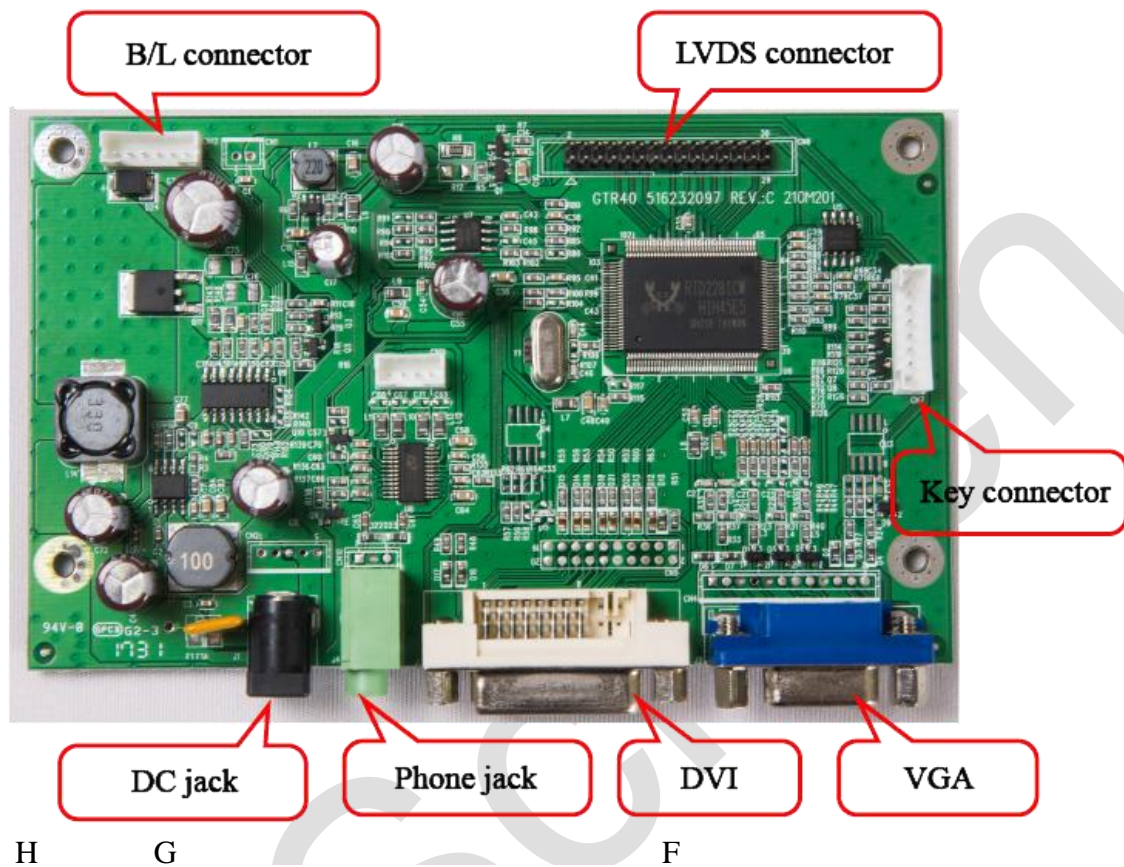
NO.	Description	H-Freq.(KHz)	V-Freq. (Hz)
1.	VGA640×400	31.480	70
2.	VGA640×480	31.649	60
3.	VGA720×400	37.469	70
4.	VESA640×480	37.862	72.809
5.	VESA640×480	37.5	75
6.	VESA800×600	35.156	56.25
7.	VESA800×600	37.9	60
8.	VESA800×600	48.077	72.188
9.	VESA800×600	46.875	75
10.	VESA1024×768	48.363	60
11.	VESA1024×768	56.476	70
12.	VESA1024×768	60.023	75
13.	VESA1152×864	67.5	75
14.	VESA 1280 x768	47.8	60
15.	VESA 1280 x768	60.3	75
16.	VESA1280×960	60	60
17.	VESA1280×1024	63.981	60
18.	VESA1280×1024	79.977	75
19.	VESA1440x900	59.9	60
20.	VESA1440x900	75	75
21.	VESA1600x1200	75	60
22.	VESA1600x1200	81.3	65 Note1
23.	VESA1600x1200	87.5	70 Note1
24.	VESA1600x1200	93.8	75 Note1
25.	VESA1680x1050	65.3	60
26.	VESA1680x1050	74.9	75 Note1
27.	VESA1920x1080	56.25	50
28.	VESA1920x1080	67.5	60
29.	VESA1920x1200	74.6	60

\*\* Note1 : VGA inputonly

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### Signal Input Connections





## Product Specification

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### 1.Power Input

- a. Location – J1 : DC JACK DC=2.5mm ORDC=2.0mm  
b. Location – CN2 : Wafer , 5P , PH  
2.0mm,S/TPin Assign and Definition

PinNo.	Signal
1	InputVoltage
2	InputVoltage
3	NC
4	GND
5	GND

### 2.Audio Input

Location – J4 , SCJ368R0NXS0G04G 3P Green orequiv.

Audio Input 1Vp-pMax

### 3.DVI Input Connector

- a. Location – J3 – 28 pin

DVI Connector Pin Assign and Definition

PinNo.	SYMBOL	PinNo.	SYMBOL	PinNo.	SYMBOL
1	DATA2-	11	GND	21	NC
2	DATA2+	12	NC	22	GND
3	GND	13	NC	23	CLK+
4	NC	14	DVI5V	24	CLK-
5	NC	15	DVI_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	----	-----
10	DATA1+	20	NC	----	-----

- b. Location CN5 – Pin Header , 10x2P,  
PH2.0mm.S/TPin assign anddefinition

PinNo.	SYMBOL	PinNo.	SYMBOL	PinNo.	SYMBOL
1	GND	8	DVI_HPD	15	DATA2+
2	GND	9	GND	16	DATA2-
3	NC	10	GND	17	CLK+
4	NC	11	DATA0+	18	CLK-
5	DVI_DDC_SCL	12	DATA0-	19	GND
6	DVI_DDC_SDA	13	DATA1+	20	GND
7	DVI5V	14	DATA1-	----	-----

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### 4.VGA Signal Input Connector

a. Location J2 - 15 pin Hi-Density Female D-SUB Pin Assign and Definition

PinNo.	SYMBOL	PinNo.	SYMBOL	PinNo.	SYMBOL
1	REDIN	6	R-GND	11	GND
2	GREENIN	7	G-GND	12	SDADDC
3	BLUEIN	8	B-GND	13	SYNC.H
4	GND	9	PC5V	14	SYNC.V
5	GND	10	DET	15	SCLDDC

b. Location CN4 - Wafer , 12P , PH 2.0mm ,S/T Pin Assign and

Definition

PinNo.	SYMBOL	PinNo.	SYMBOL	PinNo.	SYMBOL
1	SCLDDC	5	B-GND	9	R-GND
2	SDADDC	6	GREENIN	10	SYNC.H
3	GND	7	G-GND	11	SYNC.V
4	BLUEIN	8	REDIN	12	GND

### 5.Key Output Connector

Location – CN7 :Wafer 8P, PH 2.0mm ,S/T

All Key Active Low Level.,AI I LED Active HI Level, Output Current 10mA MAX Pin Assign and Definition

Pin	SYMBOL	Pin	SYMBOL	Pin	SYMBOL
1	MENUKEY	4	UPKEY	7	LED_O
2	AUTOKEY	5	GND	8	POWERKEY
3	DOWNKEY	6	LED_G	9	

## Product Specification

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### 6.LVDS Output Connector

Location – CN6 : PIN BOX , 2X15 P, PH 2.0mm ,S/T Pin Assign and Definition

PinNo.	SYMBOL	PinNo.	SYMBOL	PinNo.	SYMBOL
1	VLCD forPanel	11	LVDSRXE_2-	21	LVDSRXO_1-
2	VLCD forPanel	12	LVDSRXE_2+	22	LVDSRXO_1+
3	VLCD ForPanel	13	GND	23	LVDSRXO_2-
4	NC	14	GND	24	LVDSRXO_2+
5	GND	15	LVDS RXE_CLK-	25	GND
6	GND	16	LVDS RXE_CLK+	26	GND
7	LVDSRXE_0-	17	LVDSRXE_3-	27	LVDSRXO_CLK-
8	LVDSRXE_0+	18	LVDSRXE_3+	28	LVDSRXO_CLK+
9	LVDSRXE_1-	19	LVDSRXO_0-	29	LVDSRXO_3-
10	LVDSRXE_1+	20	LVDSRXO_0+	30	LVDSRXO_3+

### 7. Voltage Output Connector

Location – CN1 : Wafer, 2P, PH 2.0mm S/T Pin Assign and Definition

PinNo.	SYMBOL
1	+5V
2	GND

### 8. LED Output Connector

Location CN2 – Wafer , 6P,PH 2.0mm,S/T Pin Assign and Definition

PinNo.	Symbol	PinNo.	Symbol
1	IRLED	4	VLED
2	IRLED	5	IRLED
3	VLED	6	IRLED

### 9. Speaker Output Connector

Location – CN11, Wafer, 4P,PH 2.0mm,S/T Audio Output 1.6W + 1.6W at 8Ohm Pin Assign and Definition

Pin	Signal
1	R+
2	R-
3	L+
4	L-

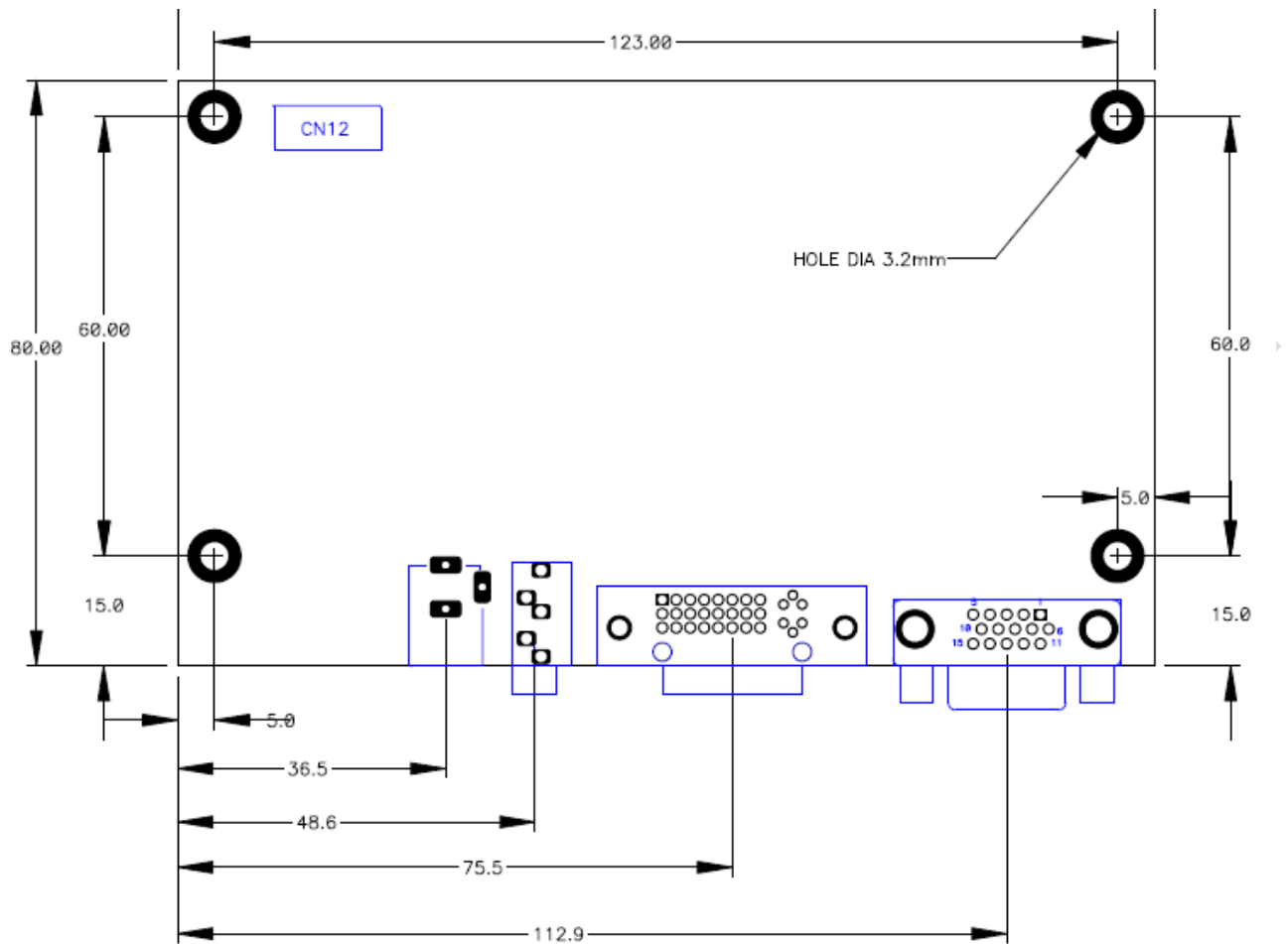
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### PCB Dimension



Unit : mm

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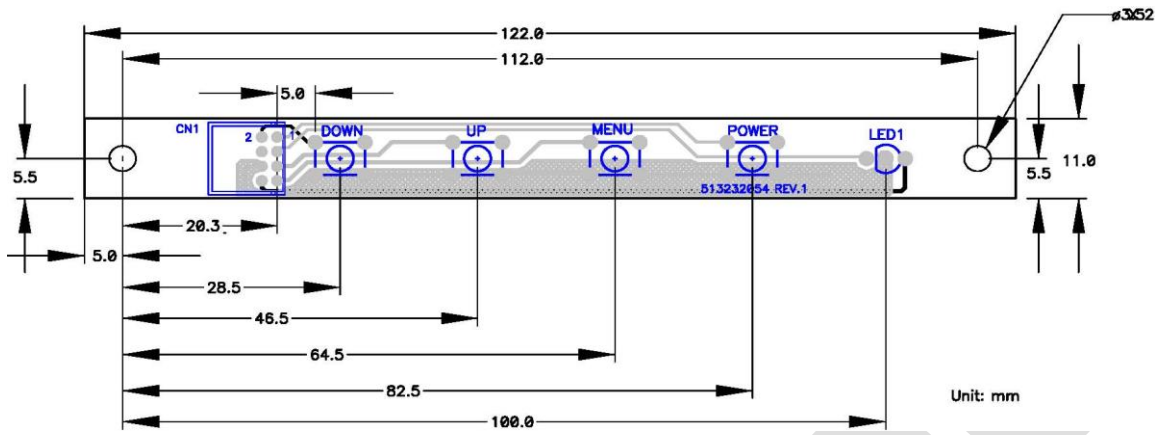
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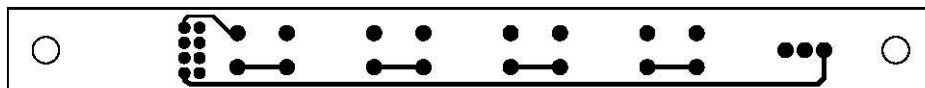
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### OSD Key PCB

#### 1.OSD Key PCB Dimension & Layout Drawings



LAYER : TOPSILK



LAYER : TOP



LAYER : BOTTOM

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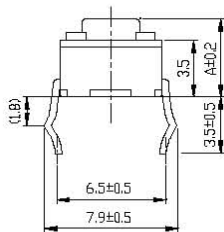
### 2. Output Connector

Location – CN1, Wafer PH 2.0mm 4x2 pin R/A, MD242154R or equiv.

Pin Assign and Definition

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

### 3. Tact Switch Spec



A = 7.0 mm