

# LCD Controller Board

**TEP75 Board ( HDMIx1 +VGA+DP with eDP interface )**

**TEP76 Board**

**CUSTOMER:** \_\_\_\_\_

**PART NO.:** \_\_\_\_\_

**DATE:** \_\_\_\_\_

<b>Revision: V 0.1</b>		
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## 1. SCOPE

The TEP75 or TEP76 series is LCD Controller board with compact size and high performance which can support HDMI/ VGA/Display Input up to 1920x1200 with Audio function( option ) for eDP interface

### Available Model List :

TEP75 : HDMIX1, DPx1, VGAX1 ( 12- 24V IN , Backlight power = DC IN )

TEP75S: HDMIX1, DPx1,VGAX1 with Audio ( 12- 24V IN , Backlight power = DC IN )

TEP76 : HDMIX1,DPx1, VGA x1 ( 12-24V IN , Backlight Power=12V )

TEP76S : HDMIX1, DPx1,VGAX1 with Audio (12V to 24V ,Backlight Power=12V )

## 1.1 PRODUCT FEATURES

### VIDEO

- Horizontal Synchronization 30 KHz to 83 KHz.
- Vertical Synchronization 45 Hz to 75 Hz.. (custom version can support 25Hz in Vertical)
- Support HDMI /Display Port/VGA input
- Support one or two Lanes eDP interface

### AUDIO (optional)

- Support HDMI/DP I Analog Audio input source selection
- Digital Volume Control
- Support 8W Class D audio amplifier.

### POWER

- DC Power In from: 12V to 24V  
(please make sure the Backlight of LCD can work on 24V when 24V DC IN ,otherwise backlight will Be damaged)  
Jack 5.5×2.1Φ  
(a) Wafer 4P 2.0mm
- Output for LCD panel : 3.3V / 5V / 12V.
- VESA DPMS compliant.
- Power consumption :TBD



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## 2. ELICTRICAL PERFORMANCE

All tests must be performed under “standard testing conditions”  
(item 2.1) unless otherwise specified.

### 2.1 OPERTION TEMPERATURE

- Warm up time :  $\geq 30$ min.
- Operation Temperature :  $-20^{\circ}\text{C} \sim 70^{\circ}\text{C}$
- Storage Temperature :  $-30^{\circ}\text{C} \sim 80^{\circ}\text{C}$
- Operation Humidity : 10%  $\sim$  80%
- Storage T Humidity : 5%  $\sim$  90%

### 2.2 PRESET TIMING CHART

#### 2.2.2 FACTORY PRESETTED AND PREDEFINED TIMINGS

VESA MODES			
Mode	Resolution	Horizontal Frequency	Vertical Frequency
1	640 × 480@60Hz	31.469 KHz	59.940 Hz
2	640 × 480@72Hz	37.861 KHz	72.809 Hz
3	640 × 480@75Hz	37.500 KHz	75.00 Hz
4	800 × 600@56Hz	35.156 KHz	56.250 Hz
5	800 × 600@60Hz	37.879 KHz	60.317 Hz
6	800 × 600@72Hz	48.077 KHz	72.188 Hz
7	800 × 600@75Hz	46.875 KHz	75.000 Hz
8	1024 × 768@60Hz	48.363 KHz	60.004 Hz
9	1024 × 768@70Hz	56.476 KHz	70.609 Hz
10	1024 × 768@75Hz	60.023 KHz	75.029 Hz
11	1280 × 1024@60Hz	63.981 KHz	60.020 Hz
12	1280 × 1024@75Hz	79.976 KHz	75.025 Hz
13	1360 × 768@60Hz	47.712 KHz	60.015 Hz

14	1440 × 900@60Hz	55.935 KHz	59.887 Hz
15	1440 × 900@75Hz	70.635 KHz	74.984 Hz
16	1680 × 1050@60Hz	65.290 KHz	59.954 Hz
17	1680 × 1050@75Hz	82.306 KHz	74.892 Hz
18	1920 × 1080@60Hz	67.158 KHz	59.963 Hz

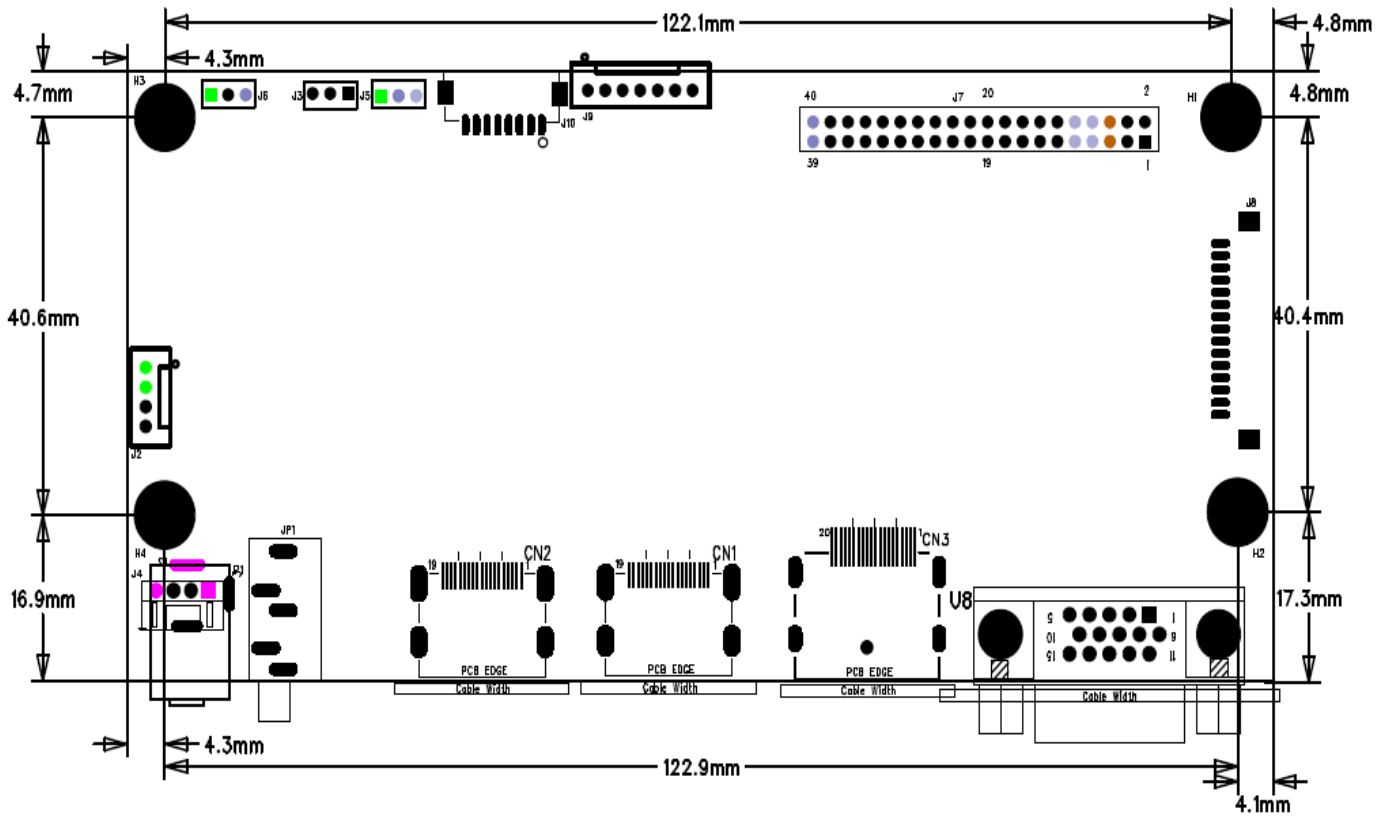
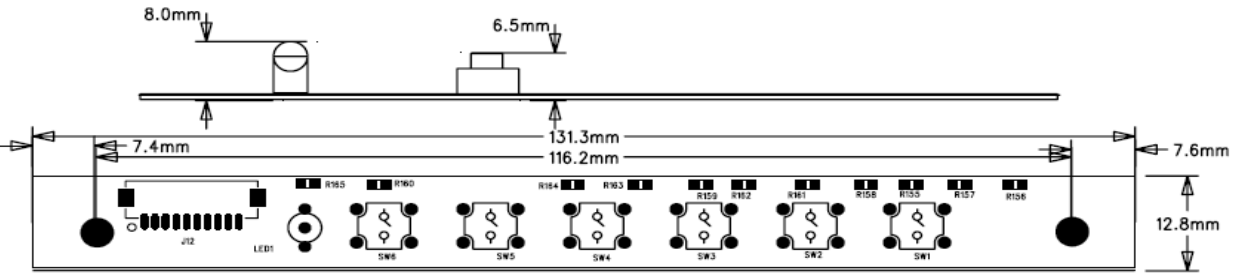
### 3. DIMENSIONS

#### 3.1 COMPONENT SIZE

**( TEP 75/TEP76 board)**

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### 3.2 PCB DIMENSIONS



## 4. CONNECTOR

### 4.1 POWER CONNECTOR ( P1 ) 5.5×2.1Φ

PIN	Symbol	Description
1	+12V	POWER SUPPLY +12V
3	GND	POWER SUPPLY GROUND

### 4.2 POWER CONNECTOR (J4 ) Wafer 4P 2.0mm

PIN	Symbol	Description
1	DC_IN	POWER SUPPLY +12V
2	GND	POWER SUPPLY GND
3	GND	POWER SUPPLY GND
4	DC_IN	POWER SUPPLY +12V

### 4.3 VGA INPUT CONNECTOR ( U8 )—D-Sub 15P

PIN	Symbol	Description	PIN	Symbol	Description
1	VGA IN R	Red analog signal	9	DDC_VDD	DDC power supply
2	VGA IN G	Green analog signal	10	GND	Digital ground
3	VGA IN B	Blue analog signal	11	N.C	N.C
4	N.C	N.C	12	DDC SDA	DDC Serial Data
5	GND	Digital ground	13	Hor. SYNC	Horizontal synchronous
6	GND-R	Analog ground of Red	14	Ver. SYNC	Vertical synchronous
7	GND-G	Analog ground of Green	15	DDC SCL	DDC Serial Clock
8	GND-B	Analog ground of Blue			



#### 4.5 Display port ( CN3 ) Connector

Pin	Function	Note
1	LANE 3N	
2	GND	
3	LANE 3P	
4	LANE 2N	
5	GND	
6	LANE 2P	
7	LANE 1N	
8	GND	
9	LANE 1P	
10	LANE 0N	
11	GND	
12	LANE 0P	
13	GND	
14	GND	
15	AUX_P	
16	GND	
17	AUX_N	
18	HOT_PLUG	
19	NC	
20	DP_POWER	

#### 4.6 CONNECTOR (CN1 )— 19 PIN

##### 4.6 HDMI CONNECTOR ( CN1/CN2 )—D-19P

PIN	Symbol	Description	PIN	Symbol	Description
1	HDMI_0+	HDMI_0+	11	GND	Ground
2	GND	Ground	12	HDMI_CLK-	HDMI_CLK-
3	HDMI_0-	HDMI_0-	13	CEC	CEC
4	HDMI_1+	HDMI_1+	14	N.C	NO Connection
5	GND	Ground	15	HDMI_SCL	HDMI_SCL
6	HDMI_1-	HDMI_1-	16	HDMI_SDA	HDMI_SDA
7	HDMI_2+	HDMI_2+	17	GND	Ground
8	GND	Ground	18	HD_5V	+5V input
9	HDMI_2-	HDMI_2-	19	HDMI_PLGDET1	HDMI_PLGDET
10	HDMI_CLK+	HDMI_CLK+			

#### 4.7 SPEAKER OUTPUT CONNECTOR (J10 )--Wafer 7Pin 2.0mm




PIN	Symbol	Description
1	Audio_R_in	Audio_Input_R
2	Audio_L_in	Audio_Input_L
3	GND	GND
4	R-OUT	To speaker R
5	GND	GROUND
6	L-OUT	To speaker L
7	GND	GROUND

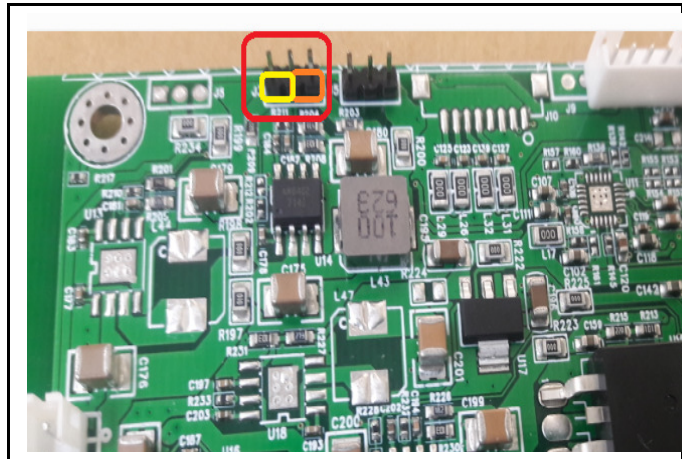
#### 4.8 EDP IPEX CONNECTOR ( J7 ) 30 pin /40 pin

#### 4.9

PIN	Symbol	Description	PIN	Symbol	Description
1	NC		21	Lane2 N	
2	NC		22	Lane2 P	
3	NC		23	GND	
4	NC		24	GND	
5	3.3V	3.3V	25	Lane3 N	
6	3,3V	3.3V	26	Lane3 P	
7	LCD_PWR	LCD_VCC	27	GND	GND
8	LCD_PWR	LCD_VCC	28	GND	GND
9	LCD_PWR	LCD_VCC	29	AUX N	
10	LCD_PWR	LCD_VCC	30	AUX P	
11	GND		31	GND	
12	GND		32	GND	
13	Lane 0 N	Lane0 N	33	HPG	LCD Hot Plug
14	Lane 0 P	Lane0 P	34	GND	GND
15	GND		35	Backlight	backlight Enable
16	GND		36	GPIO1	GPIO
17	Lane1 N		37	GPIO2	GPIO
18	Labe1 P		38	PWM	PWM
19	GND		39	Backlightt PWR	
20	GND		40	Backlight PWR	

### J3 set for LCD Power

	LCD VCC= 12V
	LCD VCC= 5V
	LCD VCC= 3.3V



#### 4.10 INTERVER CONNECTOR (J9)--Wafer 5 Pin 2.0mm

PIN	Symbol	Description
1	+12V	Power Supply +12V
2	GND	GND
3	BK_PWM	Dimming Control by digital PWM mode
4	BK_ADJ	Dimming Control by Analog mode
5	BL_EN	Penal Backlight On/Off control

#### 4.11 Keypad SELECTION ( J8 )--Wafer 15P 1.25mm

Pin	Function	Note
1	SW1	POWER
2	SW2	MENU/ENTER
3	SW3	DOWN/ AUTO ADJUST
4	SW4	UP / AUTO COLOR
5	SW5	DOWN/AUTO ADJUST(Reserve)
6	LED-G	LED GREEN
7	LED-R	LED RED
8	GND	GND
9	SW6	UP / AUTO COLOR
10	LED_POWER	
11	DDC_SCL	DDCCI command port
12	DDC_SDA	DDCCI Command port
13	GPIO_PWM	Reserved for PWM or GPIO
14	Reserved	RX (UART—TTL/CMOS )
15	Reserved	TX(UART---TTL/CMOS )

## 5 CORRESPONDING KEYPAD

