

LCD Controller Board

CUSTOMER:

MODEL NO.: TUD4K

DESCRIPTION:

DATE: 2018/04/01

Revision: V 0.2

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Contact	
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Approval by :		
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Review by : K.C

Design by : Tony

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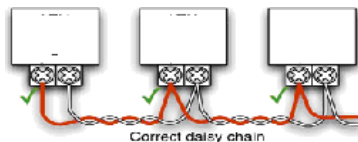
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1. SCOPE

TUD4K board is high performance LCD controller board which can support up to Max. 4096x2160(4K2K) panel at 60Hz.

1.1 PRODUCT FEATURES

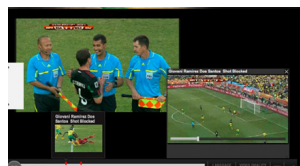
- DP x1 , VGA x1, HDMIx5, DP(output) x1
- Support HDMI 2.0(6Ghz), Display port V1.2(5.4GHz,HBR2/2.7GHz/1.62GHz)
- Display Port V1.1 and V1.2
- Support Display port 1.2 MST daisy-chain



- V-BY-One, eDP, 8 Ch LVDS is supported
- Display port with Daisy Chain Capability
- Display image rotation with 90/180/270/360 degree



- Max support 4 PIP/POP (Picture in Picture/ Picture Over Picture)



- DDC/CI Command is support
- 5 HDMI +One Display Port input, One Display Port Output
- External Open frame power module support
- UART is supported

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POWER

- Two input for control board : 12V to 24V +-15% DC
(a) Jack 5.5×2.5Φ
- Output for LCD panel : 3.3V / 5V / 12V./24V
-



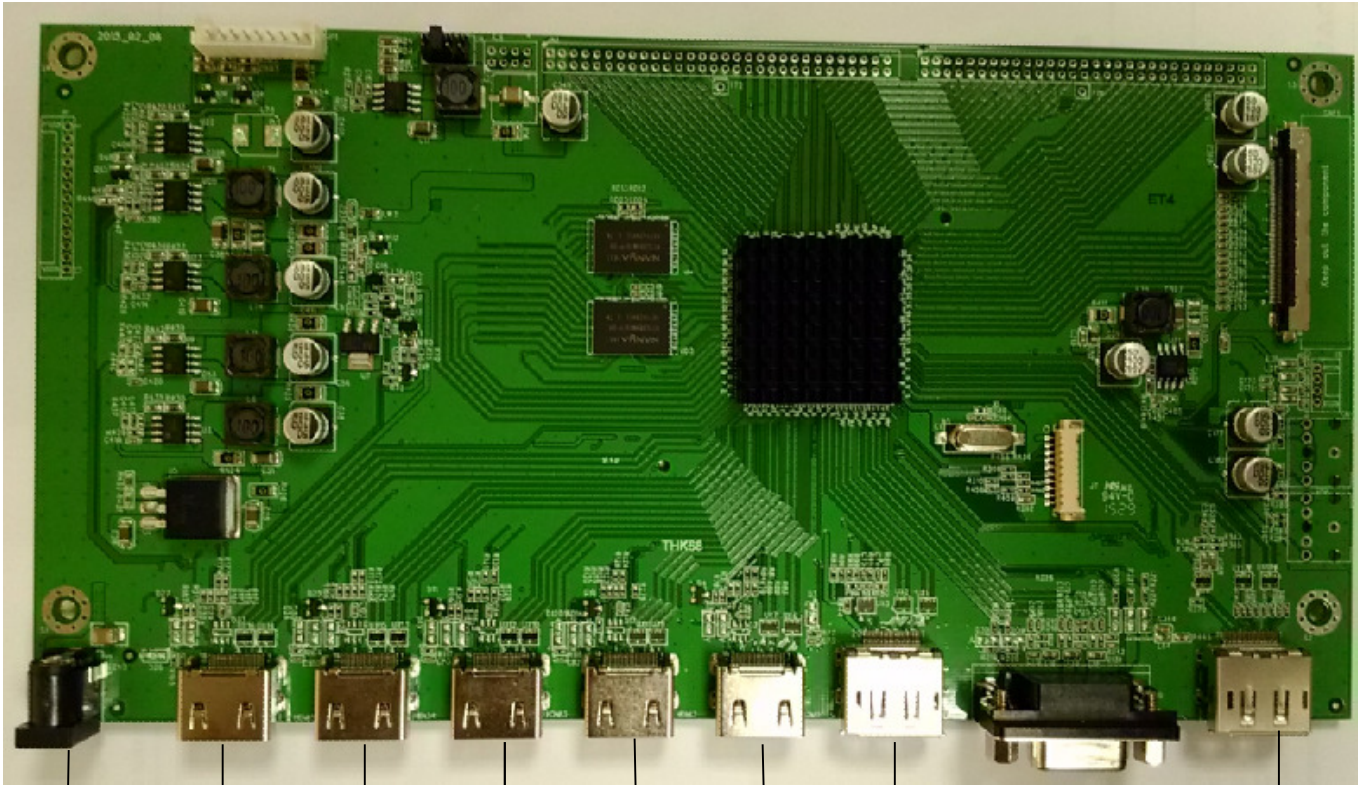
2. ELICTRICAL POWER CONSUMPTION

Working condition	Consuming current	Watt
Board only @running mode	TBD	
Board only @No sync mode	TBD	
Board only @sleep mode	TBD	
Panel Power Consumption	Depend on LCD Power Consumption	check

ITEM	Symbol	MIn	Typical	Max	Unit
DC_POWER	DC_PWR	--	24V	26	V
LCD VCC	VCC_FP				V
DigitalPWM	PWM	2.5	3 to 5V	5.5	V
Analog_Bright	Anag_bright	0	NA	5	V
Panel_OFF	On-off	0	NA	NA	

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2.



DC IN

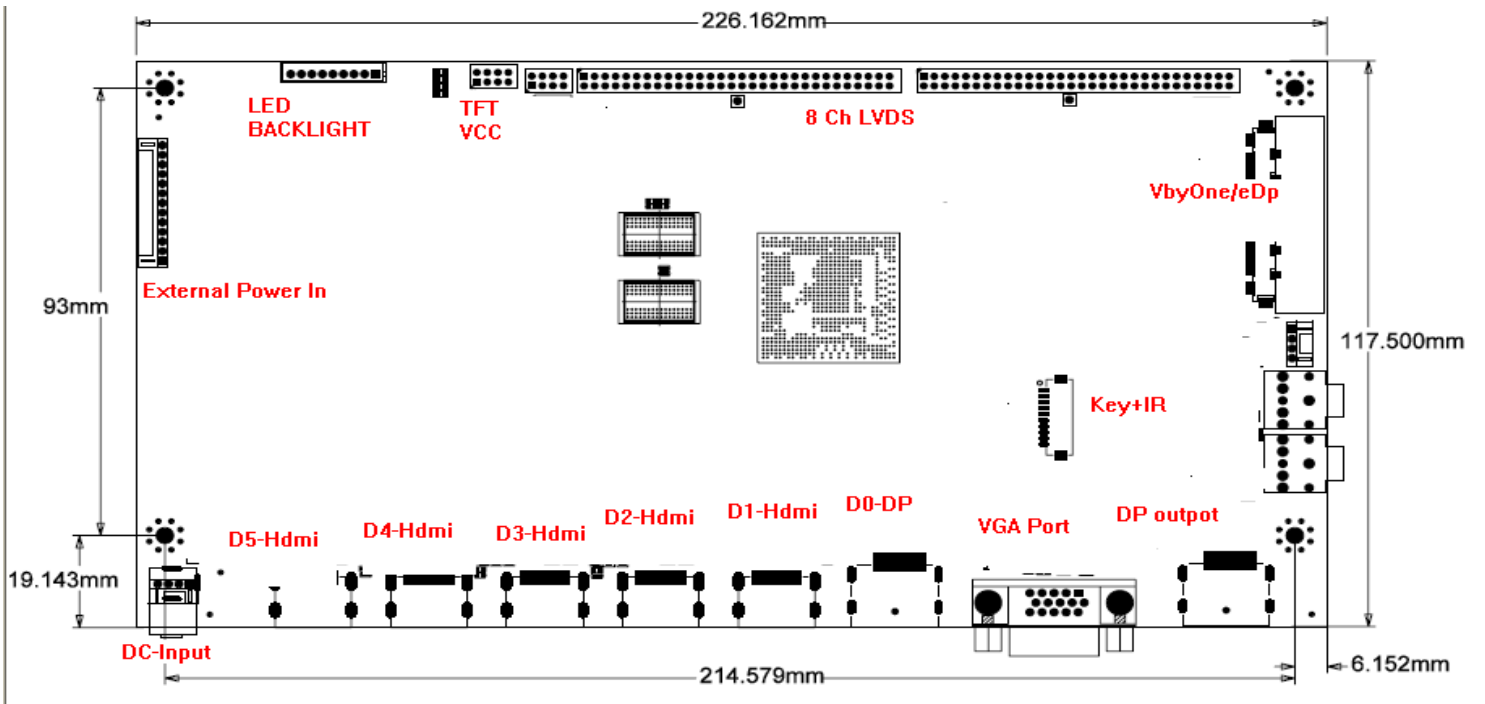
HDMI Input

Display port Input

Display port output

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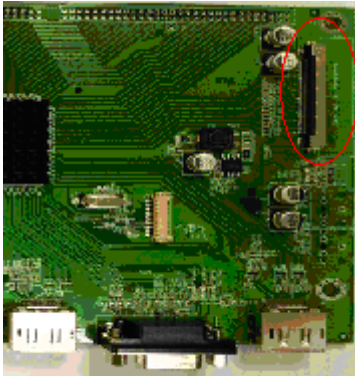
3. DIMENSIONS



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4. LCD Connector

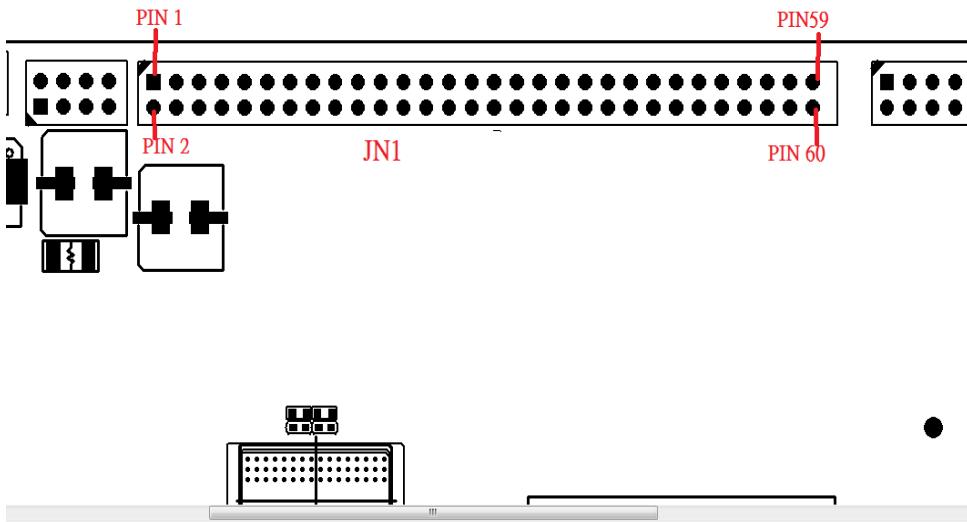
V-BY-One /eDP connector



	V-BY-ONE	eDP	
PIN 1	GND	GND	
2	VBO-7+	eDP-7+	
3	VBO-7-	eDP-7-	
4	GND	GND	
5	VBO-6+	eDP-6+	
6	VBO-6-	eDP-6-	
7	GND	GND	
8	VBO-5+	eDP-5+	
9	VBO-5-	eDP-5-	
10	GND	GND	
11	VBO-4+	eDP-4+	
12	VBO-4-	eDP-4-	
13	GND	GND	
14	VBO-3+	eDP-3+	
15	VBO-3-	eDP-3-	
16	GND	GND	
17	VBO-2+	eDP-2+	
18	VBO-2-	eDP-2-	
19	GND	GND	
20	VBO-1+	eDP-1+	
21	VBO-1-	eDP-1-	
22	GND	GND	
23	VBO-0+	eDP-0+	
24	VBO-0-	eDP-0-	
25	GND	GND	
26	Lock Detect		
27	Hot plug		
28	GND		
29	GND		
30			
31	LD_EN		
32			
33	SCL	Aux-N	
34	SDA	Aux-P	
35	2D/3D enable		
36			
37			
38	GND	GND	
39	GND	GND	
40	GND	GND	
41	GND	GND	
42	GND	GND	
43			
44	LCD POWER	LCD POWER	

	45	LCD POWER	LCD POWER	
	46	LCD POWER	LCD POWER	
	47	LCD POWER	LCD POWER	
	48	LCD POWER	LCD POWER	
	49	LCD POWER		
	50	LCD POWER		
	51	LCD POWER		

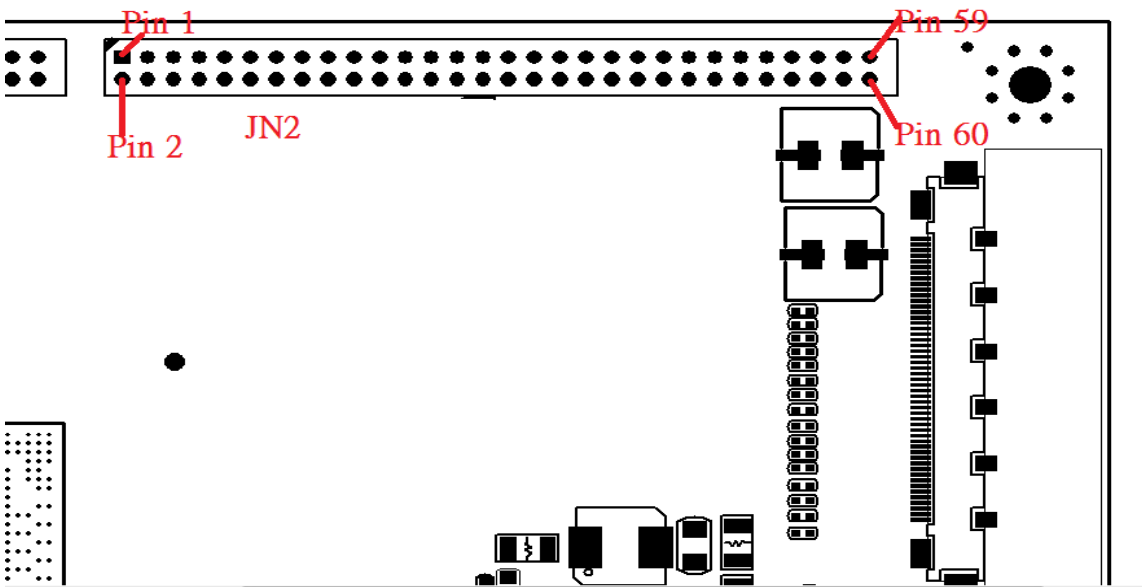
LVDS Connector: Pin Header : JN1 (30 x2).pitch=2.0mm (Dupont)



<p>LVDS JN1 connector</p>	1	LCD power	2	LCD power
	3	GND	4	GND
	5	TXA0N	6	TXA0P
	7	TXA1N	8	TXA1P
	9	TXA2N	10	TXA2P
	11	TXACKN	12	TXACKP
	13	TXA3N	14	TXA3P
	15	TXA4N	16	TXA4P
	17	TXB0N	18	TXB0P
	19	TXB1N	20	TXB1P
	21	TXB2N	22	TXB2P
	23	TXBCKN	24	TXBCKP
	25	TXB3N	26	TXB3P
	27	TXB4N	28	TXB4P
	29	NC	30	LCD_SCL1(PWM)
	31	NC	32	LCD_SDA1
	33		34	
	35	TXC0N	36	TXC0P
	37	TXC1N	38	TXC1P
	39	TXC2N	40	TXC2P
	41	TXCCKN	42	TXCCKP
	43	TXC3N	44	TXC3P
	45	TXC4N	46	TXC4P
	47	TXD0N	48	TXD0P
	49	TXD1N	50	TXD1P
	51	TXD2N	52	TXD2P
	53	TXDCKN	54	TXDCKP
	55	TXD3N	56	TXD3P

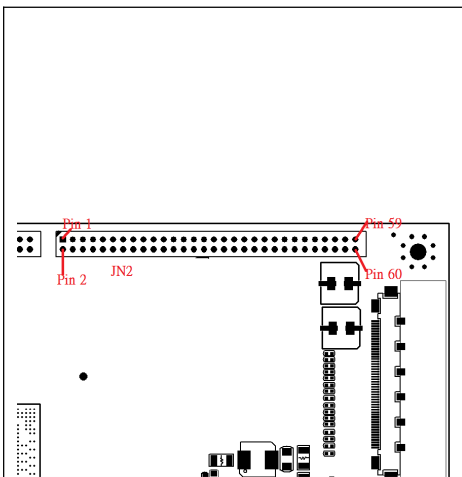
	57	TXD4N	58	TXD4P
	59	GND	60	GND

LVDS Connector : Pin Header : JN2 (30 x2). pitch=2.0mm (Dupont)

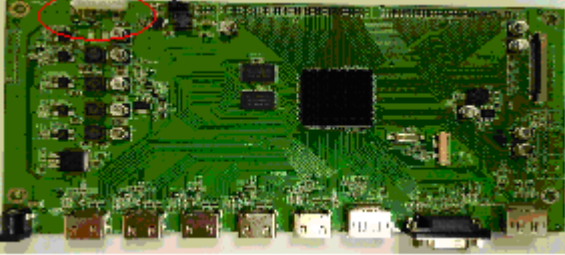


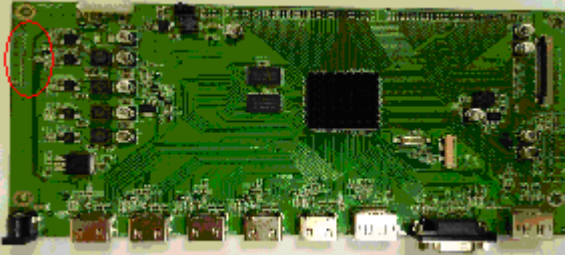
LVDS JN2 Connector 	1	LCD Power	2	LCD Power
	3	GND	4	GND
	5	TXE0N	6	TXE0P
	7	TXE1N	8	TXE1P
	9	TXE2N	10	TXE2P
	11	TXECKN	12	TXECKP
	13	TXE3N	14	TXE3P
	15	TXE4N	16	TXE4P
	17	TXF0N	18	TXF0P
	19	TXF1N	20	TXF1P

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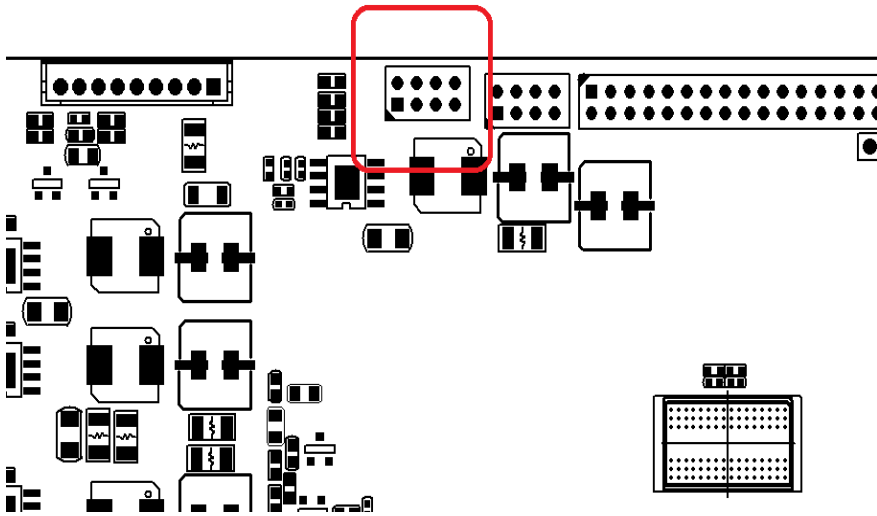


21	TXF2N	22	TXF2P
23	TXFCKN	24	TXFCKP
25	TXF3N	26	TXF3P
27	TXF4N	28	TXF4P
29	NC	30	LCD_SCL2
31	NC	32	LCD_SDA2
33		34	
35	TXG0N	36	TXG0P
37	TXG1N	38	TXG1P
39	TXG2N	40	TXG2P
41	TXGCKN	42	TXGCKP
43	TXG3N	44	TXG3P
45	TXG4N	46	TXG4P
47	TXH0N	48	TXH0P
49	TXH1N	50	TXH1P
51	TXH2N	52	TXH2P
53	TXHCKN	54	TXHCKP
55	TXH3N	56	TXH3P
57	TXH4N	58	TXH4P
59	GND	60	GND

Backlight Input JST PHR 2.0 		JP1		
	PIN 1	Backlight VCC		
	2	Baclight VCC		
	3	GND		
	4	GND		
	5	Backlight VCC		
	6	GND		
	7	Digital PWM		
	8	Analog Brightness		
	9	Backlight Enable		

External Power Input JST-PHR 2.0 		J2	Note	
	PIN 1	DC POWER(24V)		
	2	DC POWER(24V)		
	3	DC POWER(24V)		
	4	Backlight Power		
	5	Backlight Power		
	6	Backlight Power		
	7	LCD Power		
	8	LCD Power		
	9	LCD Power		
	10	GND		
	11	GND		
	12	GND		
	13	GND		
	14	GND		
	15	GND		

J6: LCD power Connector



<p>J6: Pitch 2.0</p>		<p>LCD POWER=12V</p>	
		<p>LCD POWER=5V</p>	
		<p>LCD POWER=24V</p>	
		<p>LCD POWER=3.3V</p>	

Operation Condition

- 1.) **Operating Temperature** : **-20°C ~ +70°C**
- 2.) **Storage Temperature** : **-20~85°C**
- 3.) **Operating Relative Humidity** : **90% MAX.R.H.**
- 4.) **Storage Relative Humidity** : **90% MAX.R.H.**

ENVIRONMENT

Operating Temperature	-20 TO 70 °C
Operating Humidity	90% MAX. R.H.
Storage Temperature	-20 TO 85°C
Storage Humidity	90% MAX. R.H.