4K Monitor Motherboard Product Specification Version: 1.0

Board ID:TDSCS9ES3

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Please send the original back to us after you have approved and signed

Approved by Customer		
Comments	Approved by	Customer Signature(s)
Customer's name：		

Revision History

Version	Date	Board ID	Page	Description	Author
V1.0	2019-7-3	TDSCS9ES3 ver:03	All	First edition	JK

Catalogue

1、Product Description

1.1 Product Introduction

TDSCS9ES3 is a cost-effective 4K monitor driver board that uses MSTAR's MST9U13Q1 high-performance display chip solution with 2 independent graphics processors.Each graphics processor supports 0/90/180/270 degree image and OSD rotation.Also it supports 2 window arbitrary PIP/PBP display, and each window can be arbitrarily configured as any input source signal.It can drive 8-lanes V-by-One/eDP (HBR) 4K/60Hz LCD screen,and support 4K point-to-point display and strip screen.It supports 1 channel HDMI2.0, 1 channel HDMI1.4 and 1 channel DP1.2a video input.It is compatible with OPS control signals and touch inputs and outputs, and can be connected to a built-in computer for touch function.The external ports of the motherboard are compatible with vertical and horizontal seats, and both side and back can be used. The public board is shipped in the horizontal position by default.If you need a vertical seat, you can remark when ordering.

1.2 Features

Main chip	TDSMST9U13Q1	
Target	4K monitor、4K advertising machine、4K strip screen,etc.	
Panel	Interface	8-lanes V-by-One/eDP(HBR) 10-bit
	Resolution	Max. 3840x2160/60Hz
Video Input	1*HDMI1.4	Max. 3840x2160/30Hz

	1*HDMI2.0	Max. 3840x2160/60Hz
	1*DP1.2a	Max. 3840x2160/60Hz
Audio Output	Speaker	2*8W@8ohms, THDN<10%@1KHz
USB	1*USB2.0	Only software upgrades
	1*USB2.0	Touch function output
Power	Power Input	DC 12V/19V (optional), default 12V input
	Screen drive voltage	5V/12V (optional), default 12V
	Standby power consumption	< 0.5W
Key Function	MENU，PLUS，MINUS，EXIT，POWER	
OSD Language	Simplified Chinese, English, Japanese, Korean, Spanish, etc.	

1.3 Appearance and Port

2、Function Description

2.1 DP interface

It supports 1 channel DP1.2a input,with the resolution up to 3840x2160/60Hz.

2.2 HDMI1.4

It supports 1 channel HDMI1.4 input, with the resolution up to 3840x2160/30Hz.

2.3 HDMI

It supports 1 channel HDMI 2.0 input, with the resolution up to 3840x2160/60Hz.

2.4 USB

USB 2.0-2 is used for motherboard software upgrades and cannot be used for other purposes. USB 2.0-1 is a touch output and is connected to internal USB 2.0.

2.5 headphone

It supports 1 channel 3.5MM port headphone output, after the headphone is connected, the amplifier is muted. There is no sound output at the same time.

2.6 AMP output

It supports 2.0 amplifier output, 4-PIN 2.0 socket, maximum output power up to 2*8 ohms/8W.

2.7 Remote control, button function

It supports remote control and button functions. The remote control uses 3PIN 2.0 socket, and the button uses 10PIN 2.0 socket, default 5 button. (6 and 7 buttons are optional)

2.8 UART

It supports 1 TTL serial port with 4-PIN 2.0 socket.

2.9 V-by-One/eDP output

It supports 1-channel 8-lanes V-by-One/eDP (HBR) output. It uses patch 51-PIN FPC seat, which can directly point to 4K screen. The maximum resolution is up to 3840*2160/60Hz, which can realize 90 degree/180 degree/270 degree rotation.

2.10 motherboard power supply

It supports 12V or 19V power supply wIth 2.0mm DC plug and 4-PIN 2.0 socket. The public board defaults to 12V power input.If you need 19V .please mark when ordering because the hardware needs to be changed.

2.11 B/L control

It has 1 backlight control interface, adopts standard 6-PIN 2.0 socket, supports PWM dimming and DC dimming, and the public board defaults to DC dimming. It needs to be changed when PWM dimming is required.

2.12 Upgrade

It supports USB local upgrade.

2.13 Touch function

It supports USB touch input and supports two USB touch output switching.

2.14 Panel VCC

It supports 5V, 12V screen power supply, through selecting resistor.

2.15 OPS control

It can connect OPS through HDMI, and supports OPS switch control and switch indicator light control.It share the port with the light effect function, only one choice.

2.16 Lighting effect

It supports R, G, B three-channel lighting effect control function, and the LED power supply can be selected 3.3V, 5V, 12V.

3、Interface definition

Build-in Power Supply Interface

NO	SYMBOL	DESCRIPTION
1	GND	Ground
2	GND	Ground
3	12V/19V	DC 12V/19V Input
4	12V/19V	

5V Output Interface

NO	SYMBOL	DESCRIPTION
1	GND	Ground
2	GND	Ground
3	5V	5V Output
4	5V	

Touch Input

NO	SYMBOL	DESCRIPTION
1	5V	5V power supply output
2	DM	Touch screen USB - input
3	DP	Touch screen USB + input
4	GND	Ground

B/L control interface

NO	SYMBOL	DESCRIPTION
1	GND	Ground
2	GND	
3	ADJ	Brightness Adjustment for Panel
4	B-ON	Back-Light ON/OFF Control for Panel
5	12V	12V power supply
6	12V	

IR&KEY

NO	SYMBOL	DESCRIPTION
1	K6	Key-in
2	K5	Key-in
3	K4	Key-in
4	K3	Key-in
5	K2	Key-in
6	K1	Key-in
7	GND	Ground

8	G_LED	On status indicator control signal
9	R_LED	Off status indicator control signal
10	K0	Key-in

Speaker Interface

NO	SYMBOL	DESCRIPTION
1	L+	Audio Right Channel Output+
2	L-	Audio Right Channel Output-
3	R-	Audio Left Channel Output-
4	R+	Audio Left Channel Output+

TTL UART

NO	SYMBOL	DESCRIPTION
1	3V3	3.3V power supply
2	RX	TTL receive signal
3	TX	TTL send signal
4	GND	Ground

DEBUG interface

NO	SYMBOL	DESCRIPTION
1	NC	No Connection
2	RX	UART-RX
3	TX	UART-TX
4	GND	Ground

Light/OPS control interface

NO	SYMBOL	DESCRIPTION
1	P/GND	LED power output/Ground
2	B/PS-ON	LED control signal/OPS switching control signal
3	G/DET	LED control signal/OPS test signal
4	R/OPS-STATE	LED control signal/OPS status signal

OPS Indicator interface

NO	SYMBOL	DESCRIPTION
1	GND	Ground
2	OFF	OPS off indication
3	ON	OPS on indication

VBO&EDP screen interface

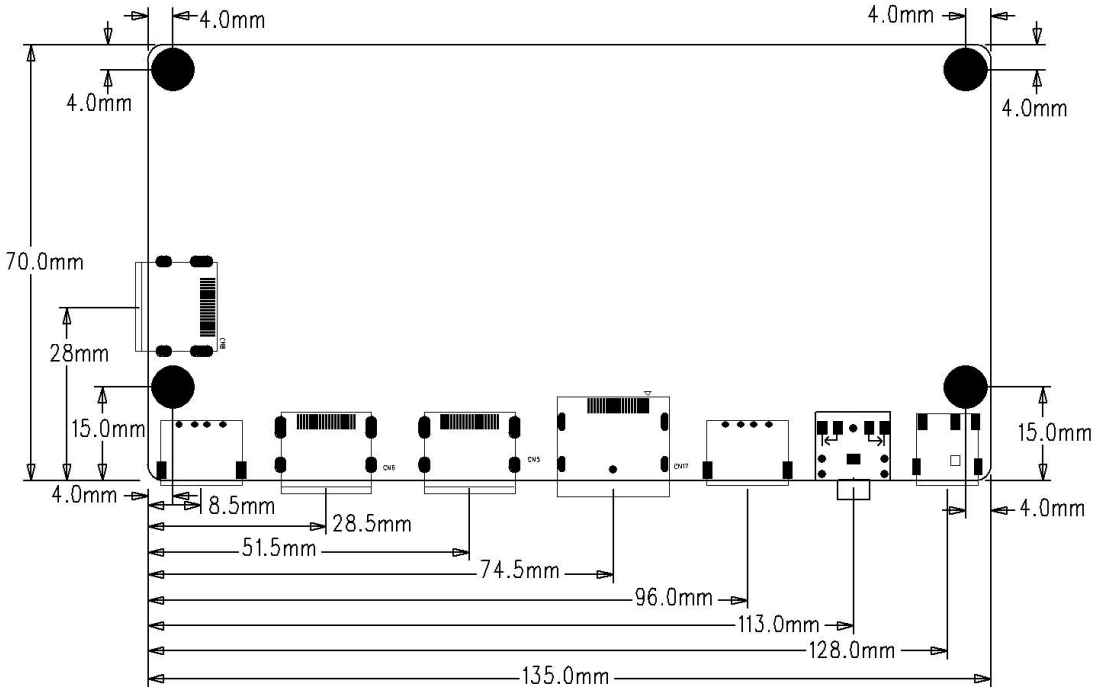
NO	SYMBOL	DESCRIPTION

1	VCC	Screen power supply
2	VCC	
3	VCC	
4	VCC	
5	VCC	
6	VCC	
7	VCC	
8	NC	No Connection
9	NC	No Connection
10	GND	Ground
11	GND	Ground
12	GND	Ground
13	GND	Ground
14	NC	No Connection
15	NC	No Connection
16	NC	No Connection
17	NC	No Connection
18	SDA	I2C data signal
19	SCL	I2C clock signal
20	NC	No Connection
21	NC	No Connection
22	NC	No Connection
23	NC	No Connection
24	NC	No Connection
25	HTPDN	VBO Hot plug output signal
26	LOCKN	VBO signal detect output signal
27	GND	Ground
28	RX0N	VBO RX0-
29	RX0P	VBO RX0+
30	GND	Ground
31	RX1N	VBO RX1-
32	RX1P	VBO RX1+
33	GND	Ground
34	RX2N	VBO RX2-
35	RX2P	VBO RX2+
36	GND	Ground
37	RX3N	VBO RX3-
38	RX3P	VBO RX4+
39	GND	Ground
40	RX4N	VBO RX4-

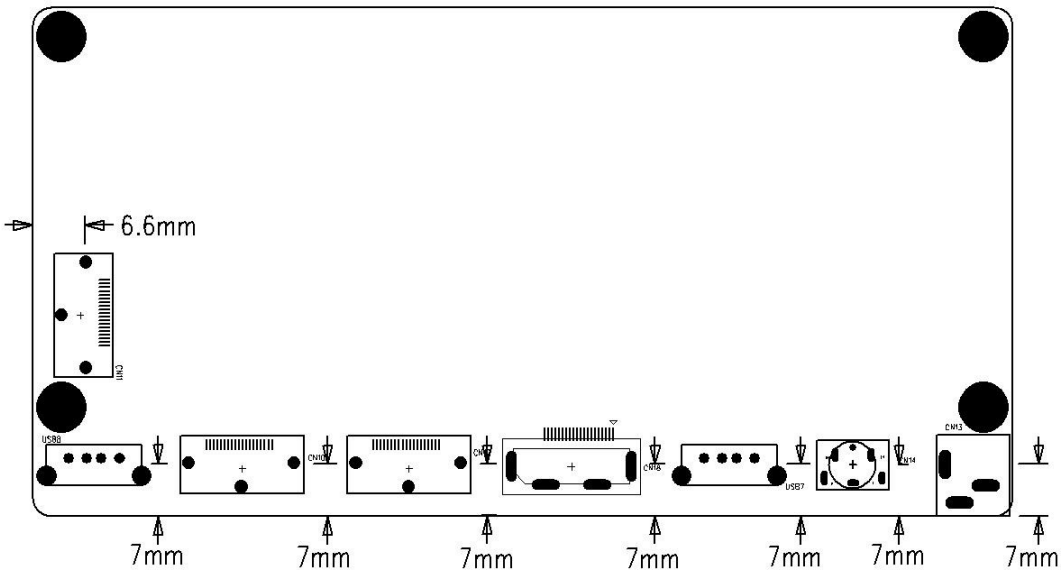
41	RX4P	VBO RX4+
42	GND	Ground
43	RX5N	VBO RX5-
44	RX5P	VBO RX5+
45	GND	Ground
46	RX6N	VBO RX6-
47	RX6P	VBO RX6+
48	GND	Ground
49	RX7N	VBO RX7-
50	RX7P	VBO RX8+
51	GND	Ground

4、Mechanical Dimensions

Horizontal Size



Longitudinal Size



5、Precautions

5.1 The main board is packed in a bubble bag during storage and transportation to prevent damage caused by collision.

5.2 All the wires are connected and then powered on. When the cable is unplugged, the power is turned off first, and the motherboard or peripherals are damaged.

5.3 When you light up the screen,please pay attention to the screen voltage to avoid burning the screen.

5.4 Keep away from the conductor when the motherboard is working, and prevent the short circuit from burning the motherboard

5.5 Do not press or deform the motherboard during installation.