

思诺泰科创电子（苏州）有限公司

SINOTELECTRONICS INC.

样品承认书 APPOVAL SHEET

产品型号(Product Type): SG95MW-RTD2795UT

客户名称 (Customer) : RU-SMT

客户料号 (Part No) :

发布日期(Date Issued): 2020-11-19

Confirmed/确认	Approved/批准	Signature/签章

客户确认

Confirmed/确认	Approved/批准	Signature/签章

Driver Board's Specification and Data sheet

Board Type: SG95MW_2UBTPH_U001

Board Card Function: HDMI+DP+TYPE-C+USB-B+2*USB

Panel Supported:3840*2160@60Hz and below

Security Level: Confidential

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Modified Records of Specification Versions

No	Version	Description	Date	Remark
1	R0.1	The first released version	20191119	

Contents

1. Function Introduction
2. Main Characteristics
3. Outline view of A/D driver board
4. Supporting Mode Table
5. Table of Devices Supporting TYPE-C
6. Descriptions of input/output ports and requirements for electricity
7. Structure and dimension of the board (unit: mm)
8. Transportation, storage and using requirements

1. Function Introduction

SG95MW_2UBTPH_U001 is a new integrated LCD board that integrates LED backlight driver and the most popular Type-C port function. The constant current backlight driver chip adopts high-performance OB3365C scheme. This chip has perfect over-voltage and over-current protection functions and high-precision control of constant current output current. The maximum output current of the hardware is 900mA(DC24V input). The output current of LED backlight below 900mA can also be adjusted through the software. The drive voltage can also be automatically adjusted according to the load of the LED lamp. In addition, this board supports MPRT2(dynamic screen response time)when the backlight is produced by built-in constant current. For that, it solves the problem of picture dragging and provides better display picture details. The DC input voltage can be chosen as 12v or 24v, at the same time, the screen voltage is 5v/10v/12v with a headphone within 10 watts of power amplifier output(8Ω speakers).

SG95MW_2UBTPH_U001 board transforms DP, HDMI or Type-C signal from PC to the LCD module. And the design is mainly used for matching TFT LCD PANEL to achieve the highest resolution up to 4096x2160@60Hz with a color reproduction of 12bit. It also possesses color enhancement, color engine and other special functions which make color appearing more realistic, vivid and bright. Meanwhile, the board supports HDCP (2.2) with exquisite OSD interface and a variety of optional OSD languages.

It supports HDR(High Dynamic Range)rendering image output that provides more dynamic ranges and image details.

It supports Free sync/G-Sync/Adaptive sync.

Type-C port can support data transmission, external charging and image display functions. Please refer to the table below for the specific devices that can be supported. System operation of the signal source of Type-C device can be controlled through connection of the lower port of USB-A, mouse, keyboard and touch screen. The USB-B port can also be used as the upper port of USB and can control the signal source on the upper port through two USB-A interfaces. The Type-C port also supports external quick charging under the PD (only for devices that support quick charging), with a maximum of 20V/3A (DC input must be 24V,

5A adapter is required for the adapter), or a fixed 5V/3A is optional. When the Type-C device is on standby or off, it can be set to charge in the OSD menu. The Type-C protocol also supports online update to better provide compatibility.

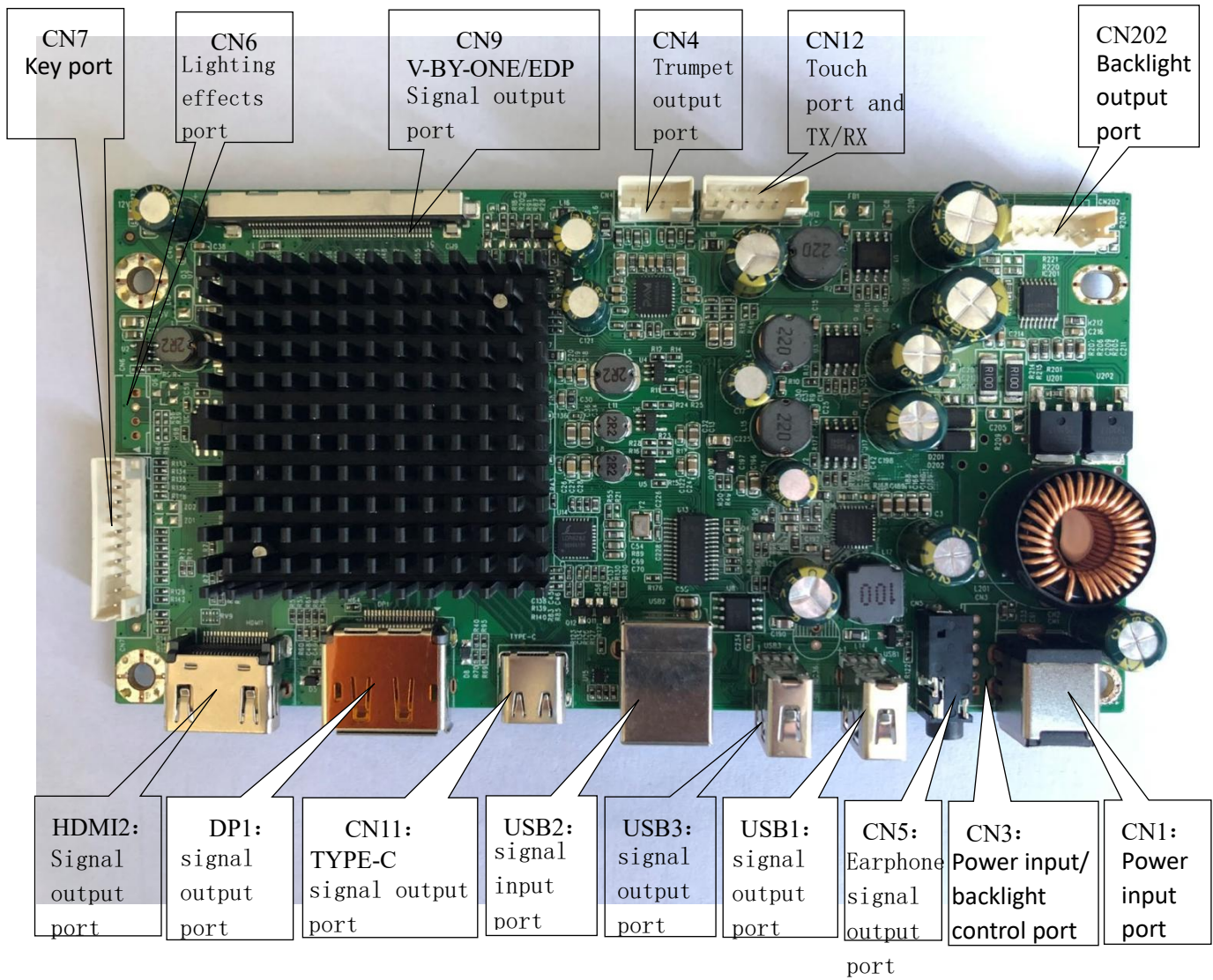
The software on the board can be updated online. Unless otherwise stated, the specifications of the products are described in this document.

2. Main Characteristics

Chip	RTD2795UT		
port	input	DP	DP1.2
		HDMI	HDMI2.0
		USB-A(quantity:2)	USB2.0
		USB-B	USB2.0
		Type-C	Support data transmission, intelligent charging and image display functions
	output	PANEL port	8LANE EDP/8LANE VB1
		power amplifier output	10W*2 (8Ω)
		earphone	JACK-3.5φPHONE
power	Input power	12V/24V DC 电压 (optional)	
	Screen-driven voltage	5V/10V/12V (optional)	
	constant current	MAX:900mA(DC24input)	
	stand-by power consumption	<0.5W	

OSD Menu	Brightness, Contrast, Scene Mode, HDR, Color Temperature, Signal Source, Reset, etc
Key	POWER、LEFT、RIGHT、AUTO、MENU、UP、DOWN 7 keys(it can be replaced by 5 or 6 keys according to customer's demands.)

3.Outline view of A/D driver board



(The picture is for reference only, the specific production is subject to the actual object)

4.Support Mode Table

Support Mode Table			
Mode	Resolution	horizontal frequency (KHz)	field frequency (Hz)
UHD	3840*2160	135	60
QHD	2560*1440	213	144
QHD	2560*1080	180	144
FHD	1920*1080	162	144
WQXGA	2560*1600	98.7	60
WQXGA	2560*1440	88.8	60
WUXGA	1920*1080	137.8	120
WUXGA	1920*1080	67.5	60
UXGA	1680*1050	133.4	120
UXGA	1680*1050	59.8	60
WXGA+	1440*900	55.5	60
SXGA	1280*1024	63.5	60
		80.0	75
XGA	1024*768	48.4 56.5	60
		60.0	70
			75
SVGA	800*600	37.9 47.2	60
		46.9	72
			75

VGA	640*480	31.5 37.9 37.5	60 72 75
DOS	720*400	31.5	70

5. Table of Devices Supporting TYPE-C (Including but not limited to)

Brand	Notebook/video card	Phone
Huawei	MateBook D、MateBook X、MateBook Xp Pro、MateBook E、MateBook 13	Mate 10、Mate 10 pro、P20、P20 pro、Mate RS、Mate 20、Mate 20 Pro、Mate 20X、HUAWEI Mate 20 X (5G)、Mate 20 RS、P30、P30 Pro、HUAWEI Mate 30、HUAWEI Mate 30 Pro
Honor	MagicBook	Note 10、Magic 2、V20
MIUI	Air12.5/13.3inch、Pro15.6inch、MIUI game computer、MIUI notebook Pro	/
Asus	Lingyao 3、Lingyao 3 pro、Lingyao x series、U4100UN、U5100UQ	ROG game phone、ROG game phone 2
HP	Shadow elf 4 Pro、EliteBook 1050 G1、EliteBook Folio G1	/
Dell	G3/G5/G7 series、Lingyue 5000/7000、XPS13、XPS15	/
谷歌 宏碁 acer	Chromebook 11	/
Razer	Blade Stealth Lingren/Lingren Stealth version	Razer Phone
Microsoft	Surface Book 2	/
Samsung	/	S8、Note 8、S9、S9+、Note 9、S10、S10e、S10、S10+、Galaxy Note10、Galaxy Note10+
OPPO	/	R17 Pro
Nut	/	Nut Pro 2s、Nut R1、Nut Pro 3
LG	/	G5
HTC	/	U Ultra
Nintendo	Switch	/
NVIDIA	Geforce RTX 2080Ti、Geforce RTX 2080、Geforce RTX 2070	/
Apple	MacBook 12inch、MacBookPro2016/2017/2018、MacBook Air2018、ipad Pro 2018	/
Sony	/	Sony XPERIA1(J9110)、Xperia 5、Xperia XZ3

Zhongxing	/	Zhongxing Axon 9 Pro
Yijia	/	OnePlus 7pro、OnePlus 7
Nokia	/	Nokia 9 PureView

6. Descriptions of input/output ports and requirements for electricity

◆ DP1(DP pedestal, horizontal type):DP input port

Remark:this port supports DP 1.2 standard(the maximum input resolution is 3840X2160@60Hz)

Foot serial number	Definition	Description
1	Lane3-	DP Differential Signal Input
2	GND	GROUP
3	Lane3+	DP Differential Signal Input
4	Lane2-	DP Differential Signal Input
5	GND	GROUP
6	Lane2+	DP Differential Signal Input
7	Lane1-	DP Differential Signal Input
8	GND	GROUP
9	Lane1+	DP Differential Signal Input
10	Lane0-	DP Differential Signal Input
11	GND	GROUP
12	Lane0+	DP Differential Signal Input
13	GND	GROUP
14	GND	GROUP
15	AUX+	DPRX AUX-CH / MCU GPIO
16	DP_DET	Input Detect
17	AUX-	DPRX AUX-CH / MCU GPIO
18	DP_HPDP_1	Hot Plug Detect
19	DP_RETURN	The pull-down resistor is grounded
20	DP_VCC	POWER

◆ CN6(PH2.0mm-4AL Vertical socket):light effect port
(from up to down is 1PIN-4PIN)

Foot serial number	Definition	Description
1	IIC_5V	light effect power
2	IIC_SCL	clock signal
3	IIC_SDA	data signal
4	GND	ground

◆ CN9 (FI-RE51S-HF port 0.5mm space between, 51PIN): VByOne/eDP signal output port
(from left to right is 1PIN-51PIN).

Foot serial number	Definition	Description
1	Vcc	PANEL VCC
2	Vcc	PANEL VCC
3	Vcc	PANEL VCC
4	Vcc	PANEL VCC
5	Vcc	PANEL VCC
6	Vcc	PANEL VCC
7	Vcc	PANEL VCC
8	Vcc	PANEL VCC
9	N.C.	No Connection
10	GND	Ground
11	GND	Ground
12	GND	Ground
13	GND	Ground
14	GND	Ground
15	NC	No Connection
16	NC	No Connection
17	NC	No Connection
18	SCL	VB1 I2C Clock signal

19	SDA	VB1 I2C Data signal
20	NC	No Connection
21	AUX_P_1	eDPTX_AUX / MCU GPIO
22	AUX_N_1	eDPTX_AUX / MCU GPIO
23	AUX_P_2	eDPTX_AUX / MCU GPIO I-
24	AUX_N_2	eDPTX_AUX / MCU GPIO
25	HPD1	eDP_HPDP1
26	HPD2	eDP_HPDP2
27	GND	Ground
28	VTX_TX0N EDDP_LANE0N	eDPTX / VbyOne (HBR/HBR2)
29	VTX_TX0P EDDP_LANE0P	eDPTX / VbyOne (HBR/HBR2)
30	GND	Ground
31	VTX_TX1N EDDP_LANE1N	eDPTX / VbyOne (HBR/HBR2)
32	VTX_TX1P EDDP_LANE1P	eDPTX / VbyOne (HBR/HBR2)
33	GND	Ground
34	VTX_TX2N EDDP_LANE2N	eDPTX / VbyOne (HBR/HBR2)
35	VTX_TX2P EDDP_LANE2P	eDPTX / VbyOne (HBR/HBR2)
36	GND	Ground
37	VTX_TX3N EDDP_LANE3N	eDPTX / VbyOne (HBR/HBR2)
38	VTX_TX3P EDDP_LANE3P	eDPTX / VbyOne (HBR/HBR2)
39	GND	Ground
40	VTX_TX4N EDDP_LANE4N	eDPTX / VbyOne (HBR/HBR2)
41	VTX_TX4P EDDP_LANE4P	eDPTX / VbyOne (HBR/HBR2)

42	GND	Ground
43	VTX_TX5N EDDP_LANE5N	eDPTX / VbyOne (HBR/HBR2)
44	VTX_TX5P EDDP_LANE5P	eDPTX / VbyOne (HBR/HBR2)
45	GND	Ground
46	VTX_TX6N EDDP_LANE6N	eDPTX / VbyOne (HBR/HBR2)
47	VTX_TX6P EDDP_LANE6P	eDPTX / VbyOne (HBR/HBR2)
48	GND	Ground
49	VTX_TX7N EDDP_LANE7N	eDPTX / VbyOne (HBR/HBR2)
50	VTX_TX7P EDDP_LANE7P	V eDPTX / VbyOne (HBR/HBR2)
51	GND	Ground

◆ CN5 earphone output port

CN5 (black 5PIN P=3.6mm H=12mm PJ-3580, quantity: 4, reverse function without screw head)

◆ CN202(PH2.0mm-6AW vertical socket) : LED backlight output port
(from left to right is 1PIN-6PIN)

Foot serial number	Definition	Description
1	LED-	LED backlight output negative
2	LED-	LED backlight output negative
3	LED+	LED backlight output positive
4	LED+	LED backlight output positive
5	LED-	LED backlight output negative
6	LED-	LED backlight output negative

◆ CN7(PH2.0mm vertical socket) : key port

(from up to down is 1PIN-12PIN)

No.	Definition	Description
K1	DOWN	It can be produced according to customer's demands.
K2	UP	It can be produced according to customer's demands.
K3	MENU	It can be produced according to customer's demands.
K4	AUTO	It can be produced according to customer's demands.
K5	RIGHT	It can be produced according to customer's demands.
K6	LEFT	It can be produced according to customer's demands.
K7	GND	GND
K8	LED-G	Green light
K9	LEG-R	Red light
K10	POWER	It can be produced according to customer's demands.
K11	5V	5V (By default no connection)
K12	IR	Red infrared receptive port (By default no connection)

◆HDMI(HDMI pedestal, horizontal type): HDMI input port, remark: it supports HDMI 2.0 standard(the maximum input resolution is 3840X2160@60Hz)

Foot serial number	Definition	Description
1	RX2P_2	TMDS Differential Signal Input
2	GND	Ground

3	RX2N_2	TMDS Differential Signal Input
4	RX1P_2	TMDS Differential Signal Input
5	GND	Ground
6	RX1N_2	TMDS Differential Signal Input
7	RX0P_2	TMDS Differential Signal Input
8	GND	Ground
9	RXON_2	TMDS Differential Signal Input
10	RXCP_2	TMDS Differential Signal Input
11	GND	Ground
12	RXCN_2-	TMDS Differential Signal Input
13	NC	No Connection
14	NC	No Connection
15	HDMI_SCL	DDC 时钟 port
16	HDMI_SDA	DDC 数据 port
17	GND	Ground
18	NC	No Connection
19	HDMI_HPD2	HPD detection port

◆ CN1 insert core diameter is 2.0mm/2.5mm(optional):power input port

CN1 (power input port) The core diameter is 2.0mm (black),horizontal type Note: When the customer requires the input voltage to be 12V, the port uses a DC socket with a core diameter of 2.0mm;When the input voltage is 24V, the port uses a DC socket with a 2.5mm.

◆ CN4(PH2.0mm-4AW horizontal type socket) :trumpet output port
(from right to left is 1PIN-4PIN)(optional)

Foot serial number	Definition	Description
1	R-	Right trumpet track negative
2	R+	Right trumpet track positive
3	L+	Left trumpet track positive
4	L-	Left trumpet track negative

◆ CN11(MINI-Type-Cpedestal, horizontal type): Type-C input port

Foot serial number	Definition	Description
1	DET	Input Detect
2	TX1+	Positive half of Second Super Speed TX differential pair

1

3	TX1-	Negative half of Second Super Speed TX differential pair
4	TYPEC 5V	Bus Power
5	CC1	Configuration Channel
6	TP_DP	
7	TP_DM	
8	SUB1	Reserved for Future Use(RFU)
9	TYPEC 5V	Bus Power
10	RX2-	Negative half of Third Super Speed RX differential pair
11	RX2+	Positive half of Third Super Speed RX differential pair
12	GND	Ground
13	GND	Ground
14	TX2+	Positive half of Third Super Speed TX differential pair
15	TX2-	Negative half of Third Super Speed TX differential pair
16	TYPEC 5V	Bus Power
17	CC2	Configuration Channel
18	TP_DP	Positive half of the USB2.0 differential pair
19	TP_DM	Negative half of the USB2.0 differential pair
20	SBU2	Reserved for Future Use(RFU)

21	TYPEC 5V	Bus Power
22	RX1-	Negative half of Second Super Speed RX differential pair
23	RX1+	Positive half of Second Super Speed RX differential pair
24	GND	Ground

◆ USB3 (USB2.0horizontal type socket):USB output port
(from left to right is 1PIN-4PIN)

Foot serial number	Definition	Description
1	VBUS	USB 5V
2	D-	USB DATA-
1		
3	D+	USB DATA+
4	GND	GND

◆ USB1 (USB2.0horizontal type socket):USB output port
(from left to right is 1PIN-4PIN)

Foot serial number	Definition	Description
1	VBUS	USB 5V
2	D-	USB DATA-
3	D+	USB DATA+
4	GND	GND

◆ USB2 (USB2.0horizontal type socket):USB-B input port

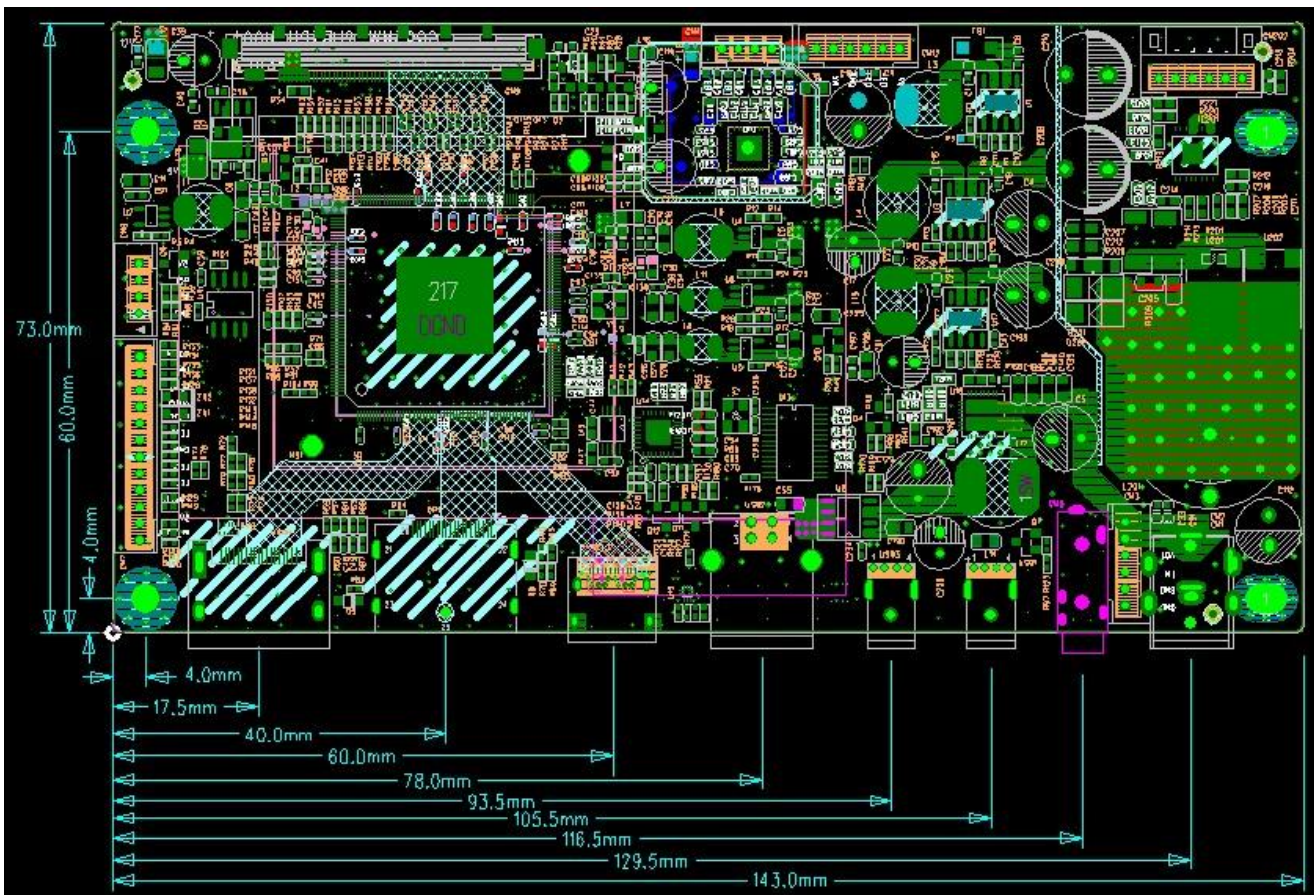
Foot serial number	Definition	Description
2	D-	USB DATA-
3	D+	USB DATA+
4	GND	GND

◆ CN12:TOUCH port
 (from right to left is 1PIN-6PIN)

Foot serial number	Definition	Description
1	VBUS	USB 5V
2	D-	USB DATA-
3	D+	USB DATA+
4	GND	GND
5	RX	RX
6	TX	TX

12

7. Structure and dimension of the board (unit: mm)



◆ Related control board PCB dimensions and specifications

- 1、 thickness + height of the highest part ≤ 16mm

- 2、 PCB length=143.0mm
- 3、 PCB breadth=73.0mm
- 4、 PCB thickness of the board=1.6mm

◆ Specification of screw hole: diameter 3.5mm, screw hole, hole size and coordinates see the structure drawing.

1

8. Transportation, storage and using requirements

In order to ensure the positive use of this product and prevent electric shock, fire and other accidents, please read and understand all the requirements and operating procedures before using this product. And please strictly comply with the following requirements:

1. The DC power supply required by this product is generated by the AC/DC power adapter, and the AC/DC power adapter should be far away from the heat source and placed in the good ventilation.
2. AC power socket and cord should be connected to ground well and can withstand sufficient current demand.
3. This product needs DC power input voltage is +12V, the error is not greater than +/-0.5V, the electric current is based on the selected LED screen and the power of the machine.
4. Pay attention to good ventilation and heat dissipation, can not be placed in a closed shell or box without heat conduction; Do not allow direct sunlight or other heat sources.
5. Be careful to avoid too much moisture and dust, so as not to cause circuit corrosion.

6. During assembly, keep certain N/A interval to provide heat dissipation by N/A air convection on the surface, and prevent short circuit between the conductor and the components on the board.
7. When assembling, pay attention to prevent the drive board from deforming due to extra pressure.
8. During assembly, pay attention to the correct electrical connection of the drive board, LED screen, key board and other parts. Select right working voltage of LED (too low will show abnormally; too high may burn out the LED screen). Power can be turned on after checking.
9. The program on the driver board should be matched with the corresponding LED screen.
10. Attention should be paid to the electrostatic protection during the assembly of the board card to avoid short circuit and electrostatic damage.
11. All I/O ports should be operated under power failure (pull out and plug connector connectors).
12. This product is suitable for general commercial and household use with the ambient temperature from -10°C to 40°C and relative humidity less than or equal to 80%.
13. Please unplug the power when not in use for a long time.