

深圳市博合数码科技有限公司

Shenzhen Bohoo Digi-Tech Co.,Ltd

SPECIFICATION

MODEL: BH-4K01-A

Rev: 1.1

Part Number:

Published Date:

Approved by		
Prepared by 编写	Checked by 审核	Approved by 批准

Please return us one original approved by you with your signatures.

客户承认签章后敬请寄回正本一份

Approved by customer		
Comments 确认意见	Approved by 批准签字	Company's seal 盖章
Customer's Name:		

Content 目录

1.General Description(概述)	2
2.Function Layout(产品外观图)	2
3.Features(特性说明).....	4
4.Interface Definition(接口定义)	6
5.Mechanical Dimension(结构尺寸图)	10
6.Configuration & General Precautions(使用环境和注意事项)	11
7.Packing,Shipping & Storing (组装注意事项)	11

REVISION HISTORY

Rev	DATE	PAGE	DESCRIPTION	AUTHOR
1.0	17.10.24	All	First issued	Danny Xu
1.1	17.11.20	8,9	修正OPS电脑控制定义及按键默认顺序	徐洪亮

All right reserved. Please refer to the last sample if the specification has change

1. GENERAL DESCRIPTION （概述）

BH-4K01-A is a multi-function 4K driver board, with 8 lane v-by-one output for Large Size 4K@60Hz panel, it supports VGA and 4 HDMI2.0 input;

是一款多功能4K显示板卡，可直接驱动8 lane V-by-one 4K 60Hz大尺寸面板，支持4路HDMI2.0输入（支持4K点对点显示），VGA输入；

BH-4K01-A supports touch UI and IR touch panel intelligent switching for different input source, it used in Commercial display application, such as education white board, medical display, 4K advisement player etc..

支持端口智能切换，红外触摸框智能切换，以及触控手势菜单操作，支持OPS电脑一键开关机等自动控制。常用于教育白板，4K监视器，医疗显示器等商用显示；

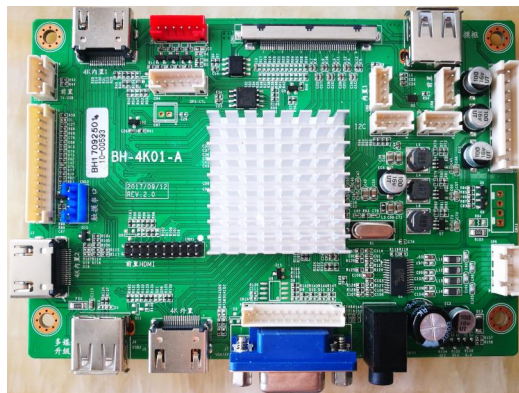
BH-4K01-A The USB port of the program can be used for software upgrades and multimedia playback.

该款方案的USB 接口可用于软件升级和多媒体播放。

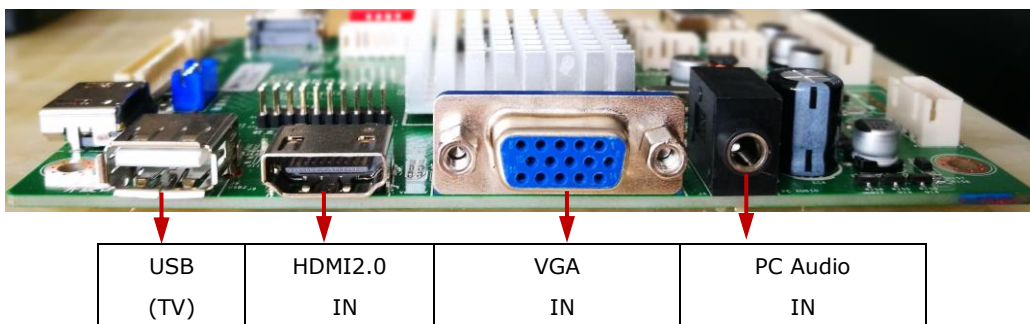
2. FUNCTION LAYOUT （产品外观）

NOTE: The optional connectors and terminals are marked with “*”.

TOP VIEW OF BH-4K01-A （正视图）



FRONT VIEW OF BH-4K01-A （外部接口视图）



SIDE VIEW OF BH-4K01-A (内部接口视图1)



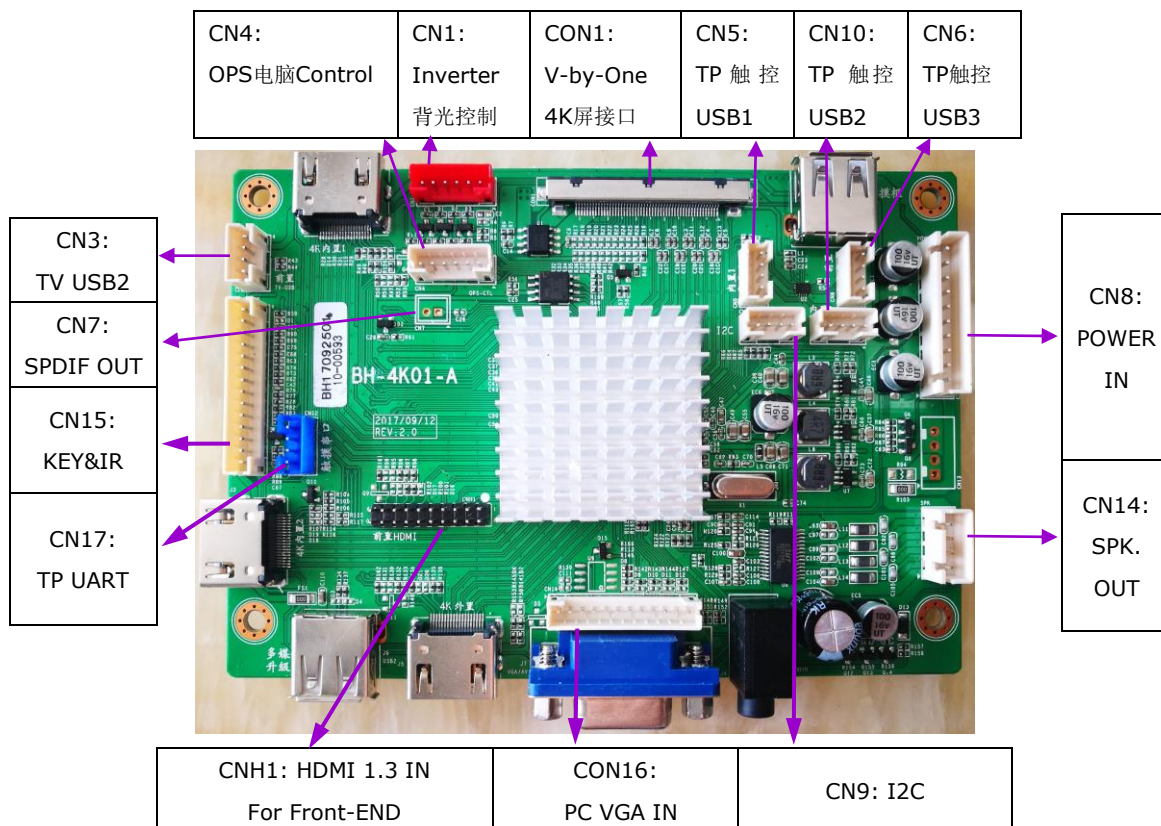
HDMI2.0
IN (默认接前置HDMI
高清端口)

SIDE VIEW OF BH-4K01-A (内部接口视图2)



Touch Panel 触摸框USB IN		HDMI2.0 IN(内置1-默认接OPS电脑)
--------------------------	--	-----------------------------

INTERFACE VIEW OF BH-4K01-A (内部接口示意图)



3. FEATURES

3.1 Main Features Overview (主要特性)

CHIPSET (主芯片)	Mstar		
MARKET (目标应用)	Education whiteboard; Medical Monitor;		
OSD LANGUAGE (OSD语言)	English, Chinese, Multi-Language, 英文，中文，多国语言		
PANEL (面板)	Panel Type(类型)	8 lane V-By-One 4K UHD@60Hz	
	Resolution (分辨率)	Up to 3840x2160	
VIDEO INPUT (视频信号输入)	PC-RGB	Format (格式)	Up to 1920x1080@60Hz
	HDMI	480i, 480p, 576i, 576p, 720p, 1080i, 1080p, 4Kx2K@60Hz	
AUDIO INPUT (音频信号输入)	Audio	Earphone Input	0.2 ~ 2.0Vrms
AUDIO OUTPUT (音频输出)	Speaker	Frequency response(频率响应)	120Hz-15KHz @±3dB (1KHz 0dB reference signal 参考信号为1KHz 0dB)
		Max Output Power (最大输出功率)	2x8W (8Ω) THD+N<10%@1KHz (Audio input:0.5Vrms)
POWER REQUIREMENT	12V,5V,5VSB(5V standby)		
POWER CONSUMPTION		Standby(待机)	≤ 0.5W
POWER TO TCON (屏TCON供电)		To Panel (驱屏电压)	12V
COMB FILTER (梳状滤波器)		3D	
DE-INTERLACE (隔逐行转换)		3D	
KEY FUNCTION (按键功能)		MENU, CH+, CH-, VOL+, VOL-, INPUT, POWER, ECO 菜单, 频道+, 频道-, 音量+, 音量-, 信号源, 电源, 节能	
Note: Licenses involved in specifications above are supposed to be obtained by customers themselves. 注意： 以上规格涉及License部分需要客户自己根据需要获取。			

3.2 USB Multi-Media Playback Format (USB 多媒体播放支持格式列表)

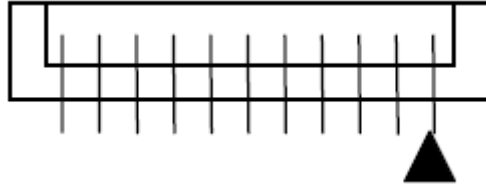
Media 媒体	File Ext. 扩展名	Codec 编解码		Remarks 备注
		Video 视频	Audio 音频	
Movie	*.avi	MJPEG	AA3,AC3, PCM, MP2,MP3, WMA	Max Resolution & Frame Rate: 640×480@30 fps, Max Data Rate: 10 Mbps
		Xvid,MPEG-2, MPEG-4,H.264,Dv iX		Max Resolution & Frame Rate: 1920×1080@30 fps, Max Data Rate: 20 Mbps
	*.mp4	MPEG-2,MPEG-4, H.264,Dvix		
	.ts /.*trp	MPEG-2,H.264		
	*.mkv *.mov	MPEG-1/2/4, H.264		
	*.mpg	MPEG-1,MPEG-2		
	*.dat	MPEG-1	MP2	Max Resolution: 352x288 Max Data Rate: 20 Mbps
	*.vob	MPEG-2		Max Resolution: 720x576 Max Data Rate: 20 Mbps
	*.rm	RV8,RV9,RV10	COOK	Max Resolution & Frame Rate: 1280×720@30 fps, Max Data Rate: 10 Mbps
	*.rmvb			
Music	*.mp3	-	MP3	Sample Rate(KHz): 32~48 Bit Rate(Kbps): 32~320 Channel: Mono/Stereo
	*.wma	-	WMA	Sample Rate(KHz): 8~48 Bit Rate(Kbps): 128~320 Channel: Mono/Stereo
	*.AAC	-	MPEG2 AAC	Sample Rate(KHz): 8~48
	*.M4A	-	MPEG-4 AAC	Bit Rate(Kbps): 128~442 Channel: Mono/Stereo
Photo	*.jpg	Baseline JPEG		Max Resolution: 15360×8640
	*.jpeg	Progressive JPEG		Max Resolution: 1024×768
	.bmp	--		Max Resolution: 9600×6400
	.png	Non-interlaced		Max Resolution: 9600×6400
		Interlaced		Max Resolution: 1200×800
TEXT	.txt	ANSI/UNICODE GB/UTF8		Max File Size: 1MB
Notes:				
1. USB Supports file system: Hi Speed FS, FAT32, FAT16, NTFS(compressed NTFS file is not supported). USB支持文件格式: Hi Speed FS, FAT32,FAT16,NTFS (不支持压缩NTFS文件)				
2. Please don't pull out the USB device under operating.请不要在播放时拔USB.				
3. Licenses are required for MPEG, MP3, WMA, especially AC3 and DivX. Licenses需要客户自行获取。				

4. Mp4 cannot support GMC. Mp4不支持GMC
5. Max storage capacity is **400G**. The greatest depth of folders is 30.
最大可接硬盘容量400G，文件夹最多30层。

4. INTERFACE DIFINITION(接口定义)

All connecting plug-ins recognize tacitly the square pin as No.1 pin. The pin definition also refers to PCBA bottom silkscreen. No.1 pin of 2.0/2.54mm pitch sockets show as below picture:

Pin脚顺序，PCB封装方脚均表示第1脚。2.0/2.54mm间距插座缺口朝上时，最左边为第1脚，如下图所示：



◆ CON1 (51PIN/0.5): V-By-One TO PANEL CONNECTOR

NO.	SYMBOL	DESCRIPTION	NO.	SYMBOL	DESCRIPTION
51	12V	Power Supply +12.0V	25	GND	Ground
50	12V	Power Supply +12.0V	24	Rx0n	V-by-One HS DATA LANE0
49	12V	Power Supply +12.0V	23	Rx0p	
48	12V	Power Supply +12.0V	22	GND	Ground
47	12V	Power Supply +12.0V	21	Rx1n	V-by-One HS DATA LANE1
46	12V	Power Supply +12.0V	20	Rx1p	
45	12V	Power Supply +12.0V	19	GND	Ground
44	12V	Power Supply +12.0V	18	Rx2n	V-by-One HS DATA LANE2
43	NC	No Connection	17	Rx2p	
42	GND	Ground	16	GND	Ground
41	GND	Ground	15	Rx3n	V-by-One HS DATA LANE3
40	GND	Ground	14	Rx3p	
39	GND	Ground	13	GND	Ground
38	NC	No Connection	12	Rx4n	V-by-One HS DATA LANE4
37	D_Format0	[1:0]: 01 Default For LG panel Mode2:2 Division	11	Rx4p	
36	D_Format1		10	GND	Ground
35	NC	No Connection	9	Rx5n	V-by-One HS DATA LANE5
34	PNL_SDA	PANEL I2C Data Signal	8	Rx5p	
33	PNL_SCL	PANEL I2C Clock Signal	7	GND	Ground
32	NC	No Connection	6	Rx6n	V-by-One HS DATA LANE6
31	BIT_SEL	'H' or NC = 10bit (Default);	5	Rx6p	
30	D_Format	Set LG PANEL to 2Division	4	GND	Ground
29	NC	No Connection(L_DIM ENABLE)	3	Rx7n	V-by-One HS DATA LANE7
28	GND	Ground	2	Rx7p	
27	HTPDN	Hot Plug Detect	1	GND	Ground
26	LOCKN	Lock Detect	-	-	-

◆ CN1 (6PIN/2.0): INVERTER CONNECTOR

NO.	SYMBOL	DESCRIPTION
1	GND	Ground
2	GND	Ground
3	ADJ	Backlight brightness adjust(0V-3V, 默认3.3V最亮)
4	ON/OFF	Backlight Control(H:ON, L:OFF)
5	12V	+12V Power Supply
6	12V	+12V Power Supply

◆ CN2 (4PIN/2.0): TV USB IN (前置TV-USB输入)

NO.	SYMBOL	DESCRIPTION
1	5VD	+5V Power Supply for Touch panel
2	DM	USB D-
3	DP	USB D+
4	GND	Ground

◆ CN5 (4PIN/2.0): TOUCH USB FOR OPS(触摸框USB内置电脑1)

NO.	SYMBOL	DESCRIPTION
1	NC	NC
2	DM	USB D-
3	DP	USB D+
4	GND	Ground

◆ CN10 (4PIN/2.0): TOUCH USB FOR PC2(触摸框USB内置电脑2)

NO.	SYMBOL	DESCRIPTION
1	NC	NC
2	DM	USB D-
3	DP	USB D+
4	GND	Ground

◆ CN6 (4PIN/2.0): TOUCH USB FOR EXT-PC(触摸框USB外部或前置端口)

NO.	SYMBOL	DESCRIPTION
1	NC	NC
2	DM	USB D-
3	DP	USB D+
4	GND	Ground

◆ CN4 (6PIN/2.0): OPS CONTROL CONNECTOR(OPS控制接口)

NO.	SYMBOL	DESCRIPTION
1	GND	Ground

2	NC	No Connection
3	IO4	No Connection
4	IO3	OPS Power Good (OPS电脑硬盘检测, 辅助作用)
5	IO2	OPS Reset(OPS电脑开关)
6	IO1	OPS Detect(OPS电脑电压检测)

◆ **CN9 (4PIN/2.0): I2C CONNECTOR** I2C接口(可用于数字光感)

NO.	SYMBOL	DESCRIPTION
1	5V	+5V Power Supply
2	GND	Ground
3	SDA	IIC Data Signal
4	SCL	IIC Clock Signal

◆ **CN8 (10PIN/2.5): POWER IN CONNECTOR**

NO.	SYMBOL	DESCRIPTION
1	STB	Power Standby Control(H:work, L:Standby)
2	GND	Ground
3	GND	Ground
4	5VS	+5V Standby Power Supply
5	5V	+5V Normal Power Supply
6	5V	+5V Normal Power Supply
7	GND	Ground
8	GND	Ground
9	12V	+12V Normal Power Supply
10	12V	+12V Normal Power Supply

◆ **CON11 (14PIN/2.0): IR&KEY BOARD CONNECTOR** 遥控按键接口

NO.	SYMBOL	DESCRIPTION
1	GND	Ground
2	K7/ECO	ADC KEY7 (ECO Key) 节能键 (控制背光开关)
3	K6/P	ADC KEY6 (Power Key default) 默认电源键
4	K5/V+	ADC KEY5 (Volume+ Key default) 默认音量加/右键
5	K4/V-	ADC KEY4 (Volume- Key default) 默认音量减/左键
6	K3/S	ADC KEY3 (Source Key default) 默认输入源键
7	K2/CH+	ADC KEY2 (CH- Key default) 默认向上键
8	K1/CH-	ADC KEY1 (CH- Key default) 默认向下键
9	K0/M	ADC KEY0 (Menu Key default) 默认菜单键
10	GND	Ground
11	IR	Remote control 红外遥控接收
12	GRN	Green indicator 绿色指示灯

13	RED	Red indicator 红色指示灯
14	5V	+5V power supply for IR 遥控接收头5V供电

***Note1:** Default key function is strongly recommended, please don't change it, especially for Power key.

If you want use ADC key board, you need connect pin3:K6/P and pin5: VOL-, and leave other open, please contact our HW engineer first for reference key board application circuit.

推荐不改变默认的按键定义顺序，特别是电源和频道加减键。如果希望使用3P线连接按键板，请连接第3脚(Power)，第5脚(VOL-)用于按键电压采样，并请联系敝公司工程师提供参考的按键板电路图。

◆ CN14 (4PIN/2.5): SPEAKER CONNECTOR 喇叭接口

NO.	SYMBOL	DESCRIPTION
1	R+	Audio Right Channel Output+ 右声道正输出
2	R-	Audio Right Channel Output- 右声道负输出
3	L-	Audio Left Channel Output- 左声道负输出
4	L+	Audio Left Channel Output+ 左声道正输出

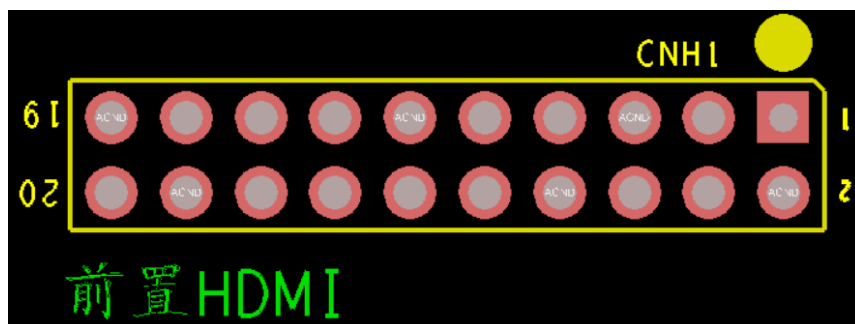
◆ CN7 (2PIN/2.0): SPDIF OUT CONNECTOR

NO.	SYMBOL	DESCRIPTION
1	SPDIF	SPDIF OUT (同轴数字音频输出)
2	GND	GND

◆ CN12 (4PIN/2.0): UART CONNECTOR 触摸串口

NO.	SYMBOL	DESCRIPTION
1	5VD	+5V Power Supply
2	GND	Ground
3	TX	UART Transmitter Signal
4	RX	UART Receiver Signal

◆ CNH1 (2*10PIN/2.0): BUILT-IN HDMI CONNECTOR 内部HDMI接口

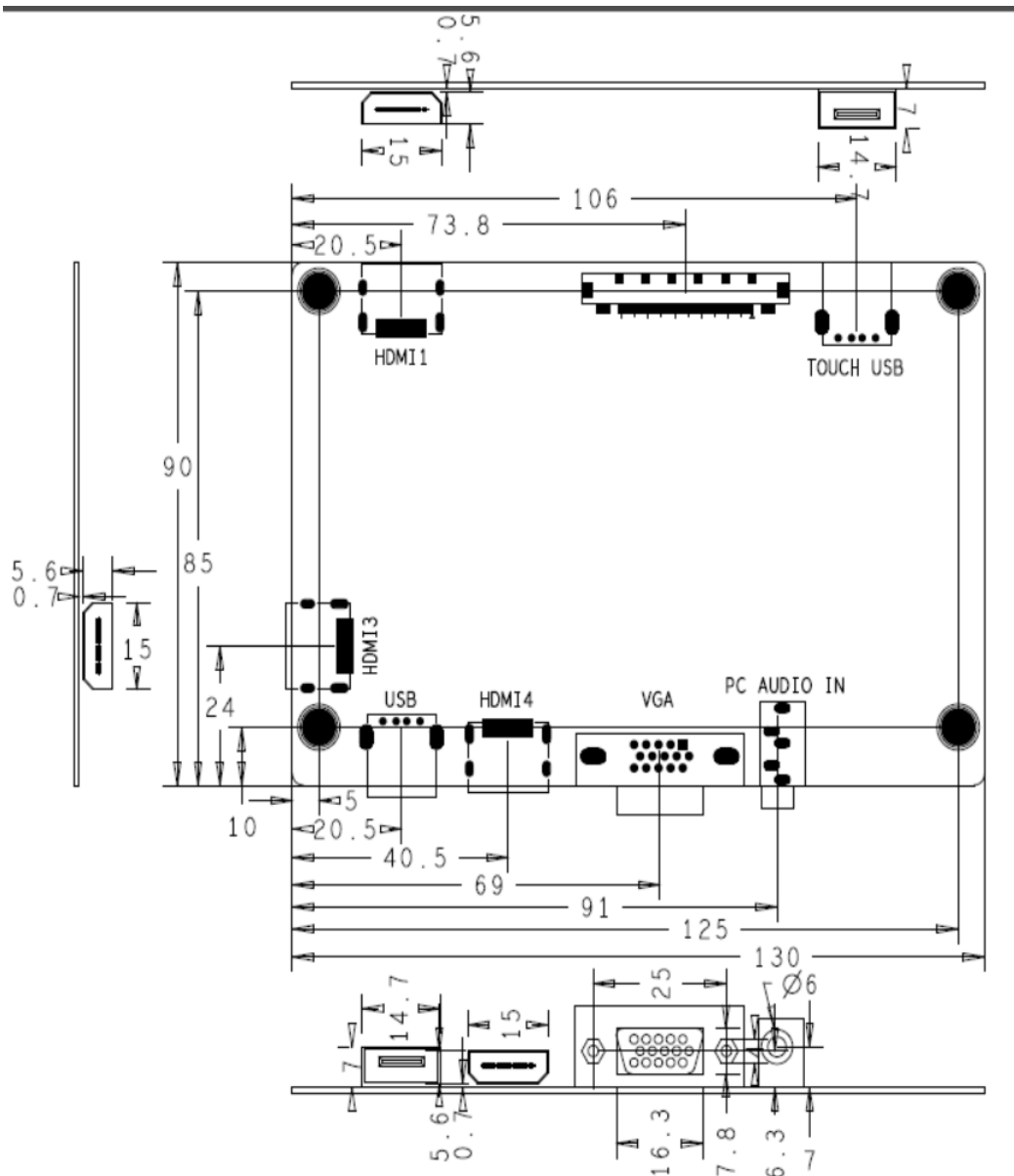


NO.	SYMBOL	DESCRIPTION	NO.	SYMBOL	DESCRIPTION
1	Rx2P	HDMI TMDS Data2+	2	GND	Ground
3	Rx2n	HDMI TMDS Data2-	4	Rx1p	HDMI TMDS Data1+
5	GND	Ground	6	Rx1n	HDMI TMDS Data1-
7	Rx0P	HDMI TMDS Data0+	8	GND	Ground
9	Rx0N	HDMI TMDS Data0-	10	CLKP	HDMI TMDS Clock+

11	GND	Ground	12	CLKN	HDMI TMDS Clock-
13	NC	No Connection	14	NC	No Connection
15	HDMI-SDA	HDMI I2C Data Signal	16	HDMI-SCL	HDMI I2C Clock Signal
17	H5V	HDMI 5V	18	GND	Ground
19	GND	Ground	20	HPD	HDMI Hot Plug Detect

5. PCB Dimension 尺寸图

The overall height of BH-4K01-A is 18 mm.



6. CONFIGURATION & GENERAL PRECAUTIONS

使用环境和注意事项

- Storage temperature: -10~60°C.
- 存储温度: -10~60°C。
- Operation temperature: 0~40°C.
- 工作温度: 0~40°C。
- Operating: 10% to 90% (Non-condensing, 无冷凝)
- 工作湿度: 10% ~ 90%
- Store: 5% to 95%
- 储存湿度: 5%~95%
- Operating: 10,000ft (max)
- 工作高度: 10,000ft (最大)
- Store: 20,000ft (max)
- 储存高度: 20,000ft (最大)
- Vibration (振动) 5-55Hz, 19.6m/s²(2G), 20minutes each along X, Y and Z axis.
- Protect the board from static electricity in case of damage to the IC.
- 请使板卡远离静电。
- Keep the board away from conductor when it is working.
- 请确保板卡工作时远离导体。
- Don't push or pull the connectors when the board is working.
- 板卡工作时请勿按压和扭曲。
- Don't press, distort or disassemble the board.
- 请勿拆解板卡。
- Clean the board with soft dry cloth when it's dirty.
- 如果板卡脏了, 请用干布擦拭。
- Don't wire in the board to power supply before panel is correctly connected.
- 正确接好驱屏线前请勿接通电源。
- Inner wires of the whole set should match reasonable, we suggest the LVDS twisted pair wire between the main board and panel must be tied up well and try to use shielding wire. If it's possible, try to put on the magnetic belt ring on the wire which near the board terminal, each connected wire try to not directly cross the PCB board, especially cross over from the main chips, avoid affecting the whole set EMC performance.
- 机内需合理布线, 芯片上方不建议走线, LVDS屏线必须使用双绞线并建议使用屏蔽网, 同时将地环锁死在PCB孔位上。

7. PACKING, SHIPPING & STORING (包装、运输、贮存)

7.1、Packing (包装)

Product name, part number, supplier's logo, QC stamp, Pb-free display and date must be printed on the package case.

包装箱上有产品名称、型号、厂家标识、厂家质量部门的检验合格证、制造日期等。

7.2、Shipping (运输)

This product can be transported through land, sea or air. Measures should be taken for water and

sun proof. Also, it should be handled with care.

适应于车、船、飞机运输，运输中应遮蓬、防晒、文明装卸。

7.3、Storing(贮存)

Please keep staying in the package case before using and keep away from hazardous gas, flammable or explosive substances and erosive chemical material. Avoid dramatic vibration or shock and strong magnetic field. The package cases should be racked 20cm above the ground and 50cm away from the wall, window, heat source or ventilation port. Generally the storage term of this product is 2 years. All the products should be double checked after that time.

产品未使用时应存放在包装箱内，仓库内不允许有有害气体，易燃，易爆的产品及有腐蚀性的化学物品，并且无强烈的机械振动，冲击和强磁场作用，包装箱应垫离地至少20cm高，距离墙壁、热源、窗口或空气入口至少50cm，在本规定条件下的贮存期一般为2年，超过2年后应重新进行检验。