

保密等级：机密

SPECIFICATION

产品规格书

产品型号: **SKR.03**

销售区域: 亚太

产品形态: TV

产品类型: 基本型|ATV

文档编码: 17041120

Approved by Shiyuan		
Checked by HW	Rechecked by DC	Approved by SW

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

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:		

REVISION HISTORY

VERSION	DATE	BOARD ID	PAGE	DESCRIPTION	AUTHOR
V0	2017.04.11	SKR.03 V2.1	All	First Issued.	Candy

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1. STANDARD CONFIGURATION（标准配置）

下表为我们主推的标准配置：

标准配置一	亚太，1 路 HDMI，1 路 AV IN，1 路 USB
FUNCTIONS	【03_A1】VGA,HDMI,CVBS/AUDIO IN,PC AUDIO IN,EARPHONE OUT,USB,ATV
Notes	--
FRONT VIEW	
OPTIONAL FUNCTION	--

备注：如以上表格不包含您需要的配置，请单独向我司销售人员进行申请。

Note: If the configurations above can't meet your demand, please apply to our sales stuff.

2. BOARD PICTURE（板卡外观图）

Pictures are for reference only, specific to prevail in kind.

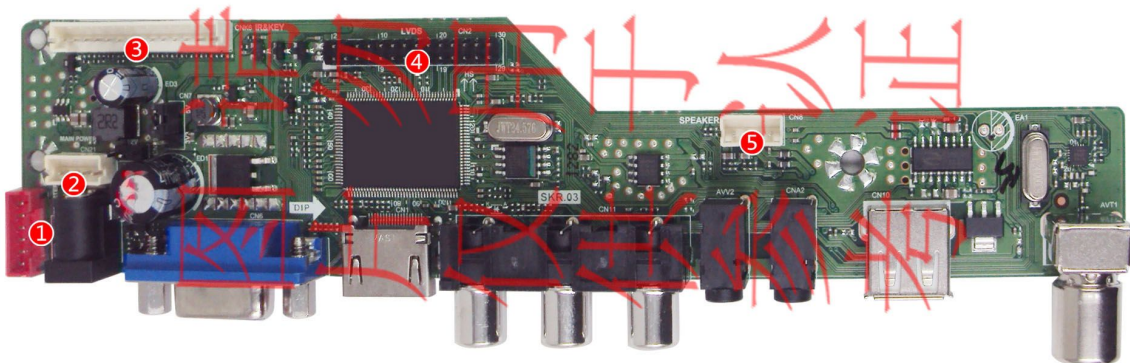
The optional connectors and functions are marked with “*”.

以下图片仅供参考，请以【结构图】或【实物】为准。

可选的接口或者功能都以“*”标示。

尺寸：187.9mm(L)*42mm(W)*1.2mm(H)（H 为 PCB 厚度）

No.	Position	Description
1	CN9	INVERTER
2	CN21	MAIN POWER
3	CNK6	IR&KEY
4	CN2	LVDS
5	CN8	SPEAKER



3. FEATURES（特性说明）

MAIN CHIPSET 主芯片	RDA8501-XBN		
OSD LANGUAGE OSD 语言	Asia	English, Hindi, Simplified Chinese, Khmer, Myanmar, French, German, Italian, Spanish	
PANEL 面板	Panel Type	TFT LCD	
	Interface	Single/Dual LVDS	
	Max Resolution	1920*1080	
VIDEO INPUT 视频输入	TV(Details in 3.1)	ATV(PAL/NTSC/SECAM)	
	PC-RGB	Format	Up to 1920×1080@60Hz
	CVBS	Video System	PAL/NTSC
		Video level	1.0 Vp-p±10%
	HDMI	480i, 480p, 720p, 1080i, 1080p	
		*CEC, *ARC	
		HDCP Version	1.4
	AUDIO INPUT 音频输入	PC Audio	Earphone Input
CVBS		L/R RCA input	0.2 – 2.0V _{RMS}
AUDIO OUTPUT 音频输出	Frequency response	100Hz-15KHz @±3dB(1KHz 0dB reference signal)	
	Max Output power	2×3W(4Ω) THD+N<10%@1KHz (Power Supply:12V,Audio Input: 0.5V _{RMS})	
POWER TO PANEL 驱屏电压	3.3V、5V、12V 保留(驱屏电压跳帽跳至 5V)		
Management 电源管理	Standby Power Consumption < 0.2W(Board Only) 待机功耗< 0.2W（仅主板）		
USB FUNCTION USB 功能	software upgrade, multimedia play 软件升级，多媒体播放		
Button Types 按键类型	Ground Key Interface 对地按键接口		
Note: 1. Licenses involved in specifications above are supposed to be obtained by customers themselves. 2. When 3.3V panel Irush≥2000mA, Inormal≥600mA,please contact CVTE engineers to confirm 3.3V panel power supply component selection. 3. Max current of USB2.0: 500mA. Large impact current of USB device(exceeds 500mA) may lead to board abnormal work; 4. The normal operating current of 5V panel ≤ 1500mA.			
注意: 1. 以上规格涉及 License 部分需要客户自己获取; 2. 当 3.3V 屏冲击电流大于 2000mA, 正常电流大于 600mA, 请联系 CVTE 工程师确认 3.3V 屏供电器件选型; 3. USB2.0 最大电流: 500mA, 如果 USB 设备冲击电流过大（超过 500mA）将可能导致板卡工作异常; 4. 5V 屏正常工作电流小于 1200mA。			

3.1 TV SYSTEM (TV 制式)

ATV (亚太)	Reception Range (接收范围)	48.25MHz ~ 863.25MHz
	Input impedance (输入抗阻)	75Ω
	Video System (视频制式)	PAL,NTSC,SECAM
	Sound System (声音制式)	BG, DK, I, M
	Max Storage Channels (最大存台数)	199CH

3.2 CRITICAL MATERIALS of TV Part (TV 部分关键物料清单)

The table is for reference only, specific to prevail in kind. 此表仅供参考，请以实物为准。

NAME 物料名称	TYPE 型号	BRAND 品牌	BACKUP 备用型号	BACKUP 备用品牌
TUNER	RDA5160-HZ	RDA	--	--
AMPLIFIER	CS8563S	CHIPSTAR	--	--
FLASH	KH25L3296FM2I-08G	KH	--	--
SPXO	MAIN CHIP	SPXO,24.576MHz,±30PPM, 20pF,HC-49SMD,SMD, HC-49SMD 24.576MHz	JWT	--
	TUNER	SPXO,24MHz,20ppm, 9pF,HC-49S,SMD	JWT	--

3.3 MULTIMEDIA PLAYBACK FORMAT (USB 多媒体格式播放列表)

Media	File Ext.	Codec		Remark
Movie	*.avi	Video Codec	MJPEG	MPGE1/MPEG2/MPEG4 Max Solution: 1920X1080P@30fps H.264 Max Solution: 1920X1080P@25fps
			MPEG-1	
			MPEG-2 MP	
			MPEG-4 SP	
			MPEG-4 ASP	
			MPEG-4 XVID	
			WMV9 / VC1	
			DivX	
			H.264(AVC)MP@Level 4.1	
			H.264(AVC)HP@Level 4.1	
		Audio Codec	MPEG-1 Layer 2	AAC : AAC-LC (type 2) HE-AAC v1 (type 5,SBR) HE-AAC v2 (type 29,SBR+PS) AC3/EAC3/AAC need the license support.
			MPEG-1 Layer 3	
			MPEG-2 Layer 3	
			AC3	
			AAC-LC	

			HE-AAC V1	
			HE-AAC V2	
			WMA Standard	
			PCM	
	*.mpeg *.mpg *.dat *.vob	Video Codec	MPEG-1 MP	MPGE1/MPEG2 Max Solution: 1920X1080P@30fps
			MPEG-2 MP	
		Audio Codec	MPEG-1 Layer 2	AAC : AAC-LC (type 2) HE-AAC v1 (type 5,SBR) HE-AAC v2 (type 29,SBR+PS) AC3/EAC3/AAC need the license support.
			MPEG-1 Layer 3	
			MPEG-2 Layer 3	
			AC3	
			AAC-LC	
			HE-AAC V1	
			HE-AAC V2	
			WMA Standard	
			PCM	
		*.mp4	MPEG-4 SP	MPGE1/MPEG2/MPEG4 Max Solution: 1920X1080P@30fps H.264 Max Solution: 1920X1080P@25fps
			MPEG-4 ASP	
			MPEG-4 XVID	
			H.264(AVC)MP@Level 4.1	
			H.264(AVC)HP@Level 4.1	
		Audio Codec	MPEG-1 Layer 2	AAC : AAC-LC (type 2) HE-AAC v1 (type 5,SBR) HE-AAC v2 (type 29,SBR+PS) AC3/EAC3/AAC need the license support.
			MPEG-1 Layer 3	
			MPEG-2 Layer 3	
			AC3	
			AAC-LC	
			HE-AAC V1	
			HE-AAC V2	
			WMA Standard	
			PCM	
	*.ts *.trp *tp	Video Codec	MPEG-1	MPGE1/MPEG2 Max Solution: 1920X1080P@30fps H.264 Max Solution: 1920X1080P@25fps
			MPEG-2 MP	
			H.264(AVC)MP@Level 4.1	
			H.264(AVC)HP@Level 4.1	
		Audio Codec	MPEG-1 Layer 2	AAC : AAC-LC (type 2) HE-AAC v1 (type 5,SBR) HE-AAC v2 (type 29,SBR+PS) AC3/EAC3/AAC need the license support.
			MPEG-1 Layer 3	
			MPEG-2 Layer 3	
			AC3	
			AAC-LC	
			HE-AAC V1	
			HE-AAC V2	
			WMA Standard	
			PCM	

	*.mkv	Video Codec	MPEG-1	MPGE1/MPEG2/MPEG4 Max Solution: 1920X1080P@30fps H.264 Max Solution: 1920X1080P@25fps
			MPEG-2 MP	
			MPEG-4 SP	
			MPEG-4 ASP	
			MPEG-4 XVID	
			H.264(AVC)MP@Level 4.1	
			H.264(AVC)HP@Level 4.1	
		Audio Codec	MPEG-1 Layer 2	AAC : AAC-LC (type 2) HE-AAC v1 (type 5,SBR) HE-AAC v2 (type 29,SBR+PS) AC3/EAC3/AAC need the license support.
			MPEG-1 Layer 3	
			MPEG-2 Layer 3	
			AC3	
			AAC-LC	
			HE-AAC V1	
			HE-AAC V2	
	*.flv	Video Codec	Sorenson H.263	H.264 Max Solution: 1920X1080P@25fps
			H.264(AVC)MP@Level 4.1	
			H.264(AVC)HP@Level 4.1	
		Audio Codec	MPEG-1 Layer 2	AAC : AAC-LC (type 2) HE-AAC v1 (type 5,SBR) HE-AAC v2 (type 29,SBR+PS) AC3/EAC3/AAC need the license support.
			MPEG-1 Layer 3	
			MPEG-2 Layer 3	
			AC3	
			AAC-LC	
			HE-AAC V1	
			HE-AAC V2	
			WMA Standard	
			PCM	
	*.wmv	Video Codec	WMV9	Max Solution: 1920X1080P@25fps
			VC-1 MP	
			VC-1 SP	
			VC-1 AP	
		Audio Codec	WMA Standard	
	*.asf	Video Codec	WMV9	Max Solution: 1920X1080P@25fps
			VC-1 MP	
			VC-1 SP	
			VC-1 AP	
		Audio Codec	WMA Standard	
	*.rm *.rmvb	Video Codec	RV8	RV8 Max Solution:800x600@30 fps RPR is not supported
			RV9 720P@30	
			RV10 720P@30	
		Audio Codec	AAC-LC	AAC : AAC-LC (type 2)

			HE-AAC V1	HE-AAC v1 (type 5,SBR)
			HE-AAC V2	HE-AAC v2 (type 29,SBR+PS)
			Cook Codec	AC3/EAC3/AAC need the license support.
	*.divx *.div	Video Codec	DivX 3,4,5,6	support 3-point GMC
		Audio Codec	MPEG-1 Layer 2	AAC : AAC-LC (type 2) HE-AAC v1 (type 5,SBR) HE-AAC v2 (type 29,SBR+PS) AC3/EAC3/AAC need the license support.
			MPEG-1 Layer 3	
			MPEG-2 Layer 3	
			AC3	
			AAC-LC	
			HE-AAC V1	
			HE-AAC V2	
			WMA Standard	
			PCM	
	*.mov	Video Codec	MPEG-4 SP	
			MPEG-4 ASP	
			MPEG-4 XVID	
			H.264(AVC)MP@Level 4.1	
			H.264(AVC)HP@Level 4.1	
			MJPEG	
		Audio Codec	MPEG-1 Layer 2	AAC : AAC-LC (type 2) HE-AAC v1 (type 5,SBR) HE-AAC v2 (type 29,SBR+PS) AC3/EAC3/AAC need the license support.
			MPEG-1 Layer 3	
			MPEG-2 Layer 3	
			AC3	
Music	*.mp3	Audio Codec	MPEG-1 Layer 3	Bit Rate : up to 320Kbps
			MPEG-2 Layer 3	Sample Rate : 32KHz, 44.1KHz, 48KHz
	*.aac	Audio Codec	AAC	AAC : AAC-LC (type 2)
			HE-AAC V1	HE-AAC v1 (type 5,SBR)
			HE-AAC V2	HE-AAC v2 (type 29,SBR+PS) AC3/EAC3/AAC need the license support.
	*.m4a	Audio Codec	AAC	AAC : AAC-LC (type 2)
			HE-AAC V1	HE-AAC v1 (type 5,SBR)
			HE-AAC V2	HE-AAC v2 (type 29,SBR+PS) AC3/EAC3/AAC need the license support.
	*.wav	Audio Codec	LPCM	
			ADPCM	
	*.wma	Audio Codec	WMA Standard	
Photo	*.jpg	Baseline Mode		Baseline Max Resolution: 7680x4320

	*.jpeg	Progressive Mode	Baseline Min Resolution: 72x72 Progressive Max Resolution:1280x1024 File Size <=10MB
	*.bmp		Support 8bit / 24bit / 32bit case. Max Resolution: 1920x1080 File Size <=5MB
	*.png		Max Resolution: 1920x1080 File Size <=5MB
Text	*.txt	UTF-8	File Size <= 10MB Page <= 99999
		UNICODE	
		ASCII	
Subtitle	SRT	Seperated Subtitle file under the same folder	
	SSA	Seperated Subtitle file under the same folder	
	ASS	Seperated Subtitle file under the same folder	
	SMI	Seperated Subtitle file under the same folder	
	SUB	Seperated Subtitle file under the same folder	
	IDX	Seperated Subtitle file under the same folder	
File system	FAT32		Max Partition Num : 8
	NTFS		NTFS device ONLY support read.
Note:			
1. Max Disk / Partition Size : 2 TB			
2. Max Full Path Length : 512 Bytes			
3. Max Support Items (File + Folder) : 250			

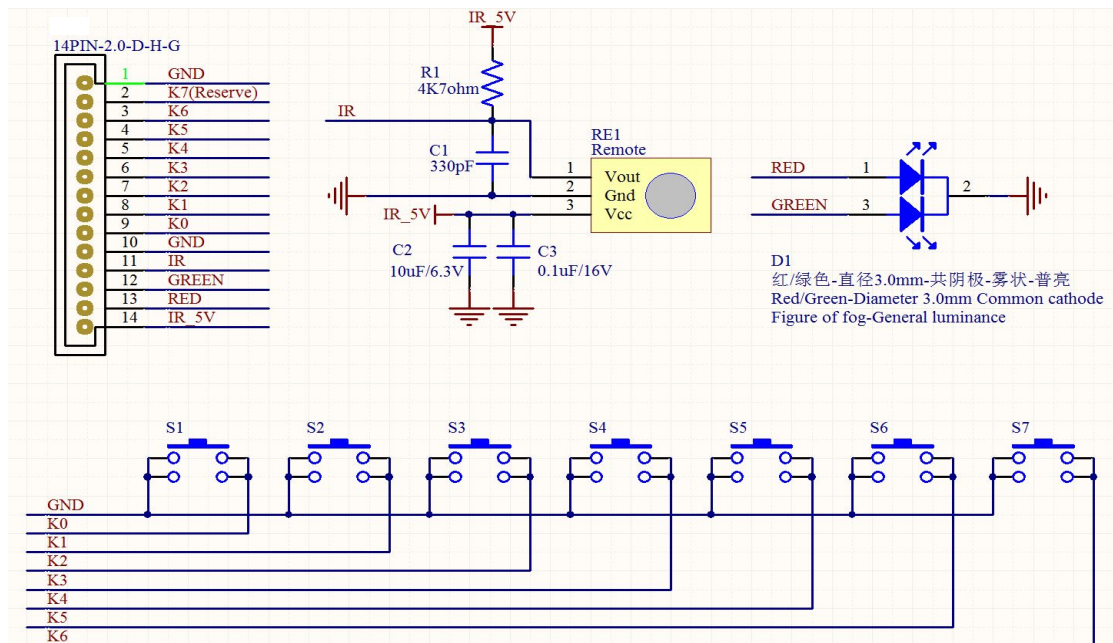
3.4 ELECTRICAL CHARACTERISTICS & REQUIREMENTS

(电气特性和要求)

Symbol	Voltage Range			Ripple Voltage	Total current	MAX. current(mA) of Individual part					
	MIN	TYP	MAX			Mainboard	AMP	USB	MHL	Panel	DVD
12V	11	12	13	300 mV _{P-P}	Ct1 ^①	2600mA	-	-	-	1000mA	-
Note ^① : CtN = The sum of MAX. current(mA) of individual part.											

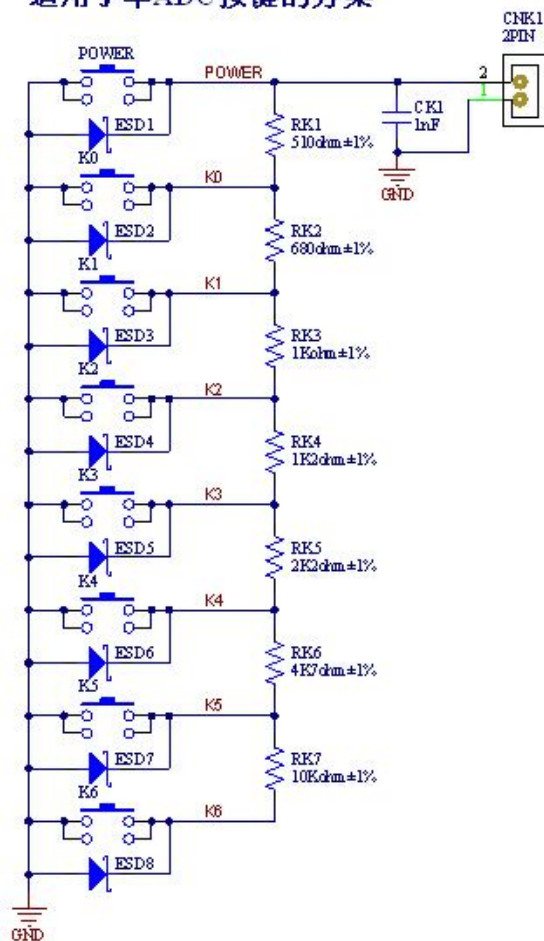
4. SCHEMATICS OF IR & KEY BOARD（遥控按键原理图）

对地按键接口：



模拟按键接口：

适用于单ADC按键的方案



按键功能: 信号源, 菜单, 音量+, 音量-, 频道+, 频道-, 电源

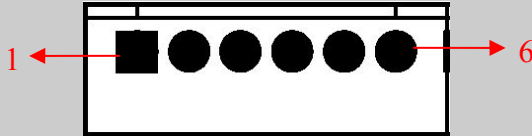
KEY FUNCTION: TV/AV, MENU, VOL+, VOL-, CH+, CH-, POWER

Note: The dividing resistor which is corresponding to the power key must be zero (equivalent to the voltage is zero). Otherwise, the board will not work. K6 is default power.


5. INTERFACE DEFINITION (接口定义)

The optional connectors and terminals are marked with "*". 标 "*" 的为可选。

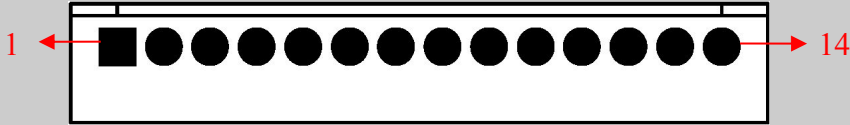
◆ CN9(6PIN/2.0): INVERTER CONNECTOR (INVERTER 接口)

		
NO.	SYMBOL	DESCRIPTION
1	GND	Ground
2	GND	
3	ADJ	Brightness Adjustment for Panel $VOH \geq 4.8V$ (IOHMAX: 1mA), $VOL \leq 0.8V$ (IOLMAX: 1mA)
4	BLON	Back-Light ON/OFF Control for Panel $VOH \geq 4.8V$ (IOHMAX: 1mA), $VOL \leq 0.8V$ (IOLMAX: 1mA)
5	12V	+12V DC Power Supply
6	12V	

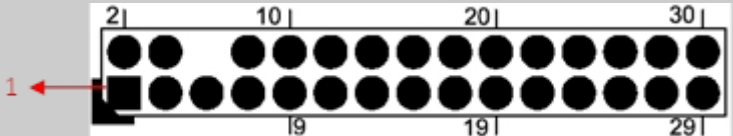
◆ CN21(4PIN/2.0): MAIN POWER CONNECTOR (主供电接口)

		
NO.	SYMBOL	DESCRIPTION
1	12V	+12V Power Supply.
2	12V	+12V Power Supply.
3	GND	Ground
4	GND	Ground

◆ **CNK6(14PIN/2.0): IR & KEY CONNECTOR (遥控和按键控制接口)**


		
NO.	SYMBOL	DESCRIPTION
1	GND	Ground
2	K7	Key7(Reserved)
3	K6	Key6
4	K5	Key5
5	K4	Key4
6	K3	Key3
7	K2	Key2
8	K1	Key1
9	K0	Key0
10	GND	Ground
11	IR	IR Receiver, $V_{IH} \geq 2V$, $V_{IL} \leq 1V$, $I_{ILmin} : 1mA$, $I_{IHmin} : 1mA$
12	GRN	Green Indicator, $V_{OH} \geq 2V$ ($I_{OHMAX} : 2mA$), $V_{OL} \leq 0.8V$ ($I_{OLMAX} : 2mA$)
13	RED	Red Indicator, $V_{OH} \geq 2V$ ($I_{OHMAX} : 1.3mA$), $V_{OL} \leq 0.8V$ ($I_{OLMAX} : 0.5mA$)
14	5V	+5V DC Power Supply

◆ **CN2(2×15PIN/2.0): LVDS INTERFACE CONNECTOR (LVDS 接口)**

		
NO.	SYMBOL	DESCRIPTION
1	VCC_PANEL	Power Supply for Panel
2	VCC_PANEL	
3	VCC_PANEL	
4	GND	Ground
5	GND	
6	NC	No Connection
7	TX00-	LVDS ODD 0- Signal
8	TX00+	LVDS ODD 0+ Signal
9	TX01-	LVDS ODD 1- Signal
10	TX01+	LVDS ODD 1+ Signal
11	TX02-	LVDS ODD 2- Signal
12	TX02+	LVDS ODD 2+ Signal
13	GND	Ground
14	GND	Ground

15	TXEC-	LVDS EVEN Clock- Signal
16	TXEC+	LVDS EVEN Clock+ Signal
17	TXO3-	LVDS ODD 3- Signal
18	TXO3+	LVDS ODD 3+ Signal
19	TXE0-	LVDS EVEN 0- Signal
20	TXE0+	LVDS EVEN 0+ Signal
21	TXE1-	LVDS EVEN 1- Signal
22	TXE1+	LVDS EVEN 1+ Signal
23	TXE2-	LVDS EVEN 2- Signal
24	TXE2+	LVDS EVEN 2+ Signal
25	GND	Ground
26	GND	
27	TXEC-	LVDS EVEN Clock- Signal
28	TXEC+	LVDS EVEN Clock+ Signal
29	TXE3-	LVDS EVEN 3- Signal
30	TXE3+	LVDS EVEN 3+ Signal

◆ **CN8(4PIN/2.0): SPEAKER CONNECTOR (喇叭接口)**

		
NO.	SYMBOL	DESCRIPTION
1	ROUT+	Audio Right Channel Output+
2	ROUT-	Audio Right Channel Output-
3	LOUT-	Audio Left Channel Output-
4	LOUT+	Audio Left Channel Output+

NOTE:

(1) 参数说明

V_{OH} : 高电平输出电压; I_{OHMAX} : 高电平输出驱动电流; V_{OL} : 低电平输出电压; I_{OLMAX} : 低电平输出驱动电流;

V_{IH} : 高电平输入电压; V_{IL} : 低电平输入电压; I_{ILmin} : 低电平最小输入电流; I_{IHmin} : 高电平最小输入电流;

(2) 在匹配应用时, 各控制和通讯口以及供电须在本规格书中描述的电气特性范围内, 若有特殊需求, 请与我司硬件工程师联系确认。

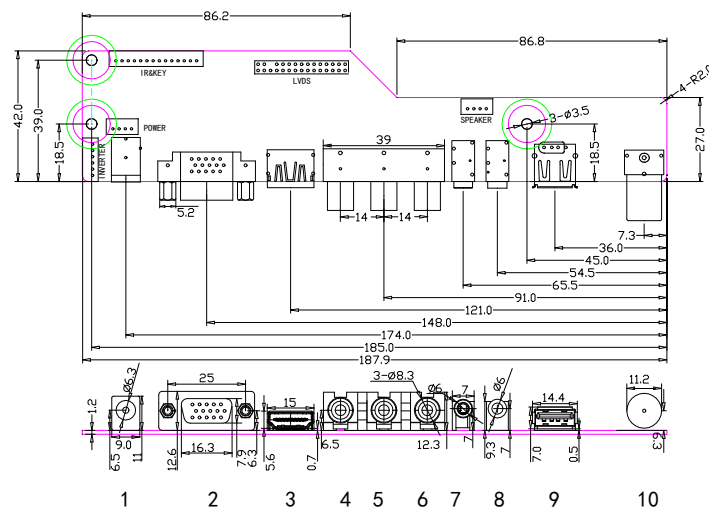
6. CONFIGURATION & GENERAL PRECAUTIONS

（使用注意事项）

- Relative humidity: $\leq 80\%$.
- 相对湿度: $\leq 80\%$ 。
- Storage temperature: $-10\sim 60^{\circ}\text{C}$.
- 存储温度: $-10\sim 60^{\circ}\text{C}$ 。
- Operation temperature: $0\sim 40^{\circ}\text{C}$.
- 使用温度: $0\sim 40^{\circ}\text{C}$ 。
- 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.
- 板卡工作时请勿拆解。
- Don't press, distort or disassemble the board.
- 勿受重压及弯折变形。
- Clean the board with soft dry cloth when it's dirty.
- 如果板卡上有灰尘, 请用干布擦拭。
- Don't power on before panel is correctly connected.
- 正确接好驱屏线前请勿接通电源。
- The whole machine certification performance will be subject to the impact of the whole machine, must use the whole machine to test and confirm.
- 整机认证性能会受整机匹配的影响, 必须使用整机进行测试确认。
- When using the I2C interface to communicate with the outside, please confirm the matching of the pull up resistance and the series resistance with CVTE hardware engineer.
- 使用 I2C 接口跟外部通信时, 需与我司硬件工程师确认上拉电阻以及串接电阻的匹配性
- To ensure communicating properly between the mainboard and external expansion modules, it's recommend that test related control and communication signals and power supply voltage waveform after installing prototype to confirm whether to meet the relevant requirements.
- 为保障 TV 主板与外部扩展模块间能正常通讯控制, 建议装样机后对相关控制和通讯信号以及供电等的电压波形进行测试, 确认是否满足相关要求。

7. MECHANICAL DIMENSION (结构尺寸图)

配置1【03_A1】	
Ver.	A0
NO.	Description
1	DC IN
2	VGA IN
3	HDMI IN
4	CVBS IN
5	CVBS LIN
6	CVBS RIN
7	PC AUDIO IN
8	EARPHONE OUT
9	USB IN
10	RF IN



NOTE: 标志说明

○	底层限高3mm(仅限地脚)
○	底层禁布器件及线(地网络除外)

NOTE:

1. 除特殊说明区域, 顶层器件最高14.5mm、底层最高4mm