

# **TV CONTROL BOARD SPECIFICATION**

**MODEL: T.VST59S.21B (Asia)**

Part Number: MST-12082541

REV: A1

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CHECKED BY:

RECHECKED BY:

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## REVISION HISTORY

VERSION	DATE	BOARD ID	PAGE	DESCRIPTION	AUTHOR
A1	2012.08.25	T.VST59S.21B 12276	2	Modify the board picture in part 2;	Lily
A0	2012.06.29	T.VST59S.21A 12246	All	First issued.	Linda

## 1. GENERAL DESCRIPTION

T.VST59S.21B is an analog TV control board, which is suitable for Asia-Pacific and Middle-East market. It can support more than 26 inch LCD panels which resolution is up to 1920×1080.

USB2.0 support multimedia playback and Software upgrade.

The HDMI support 1.4, the HDCP support1.1.

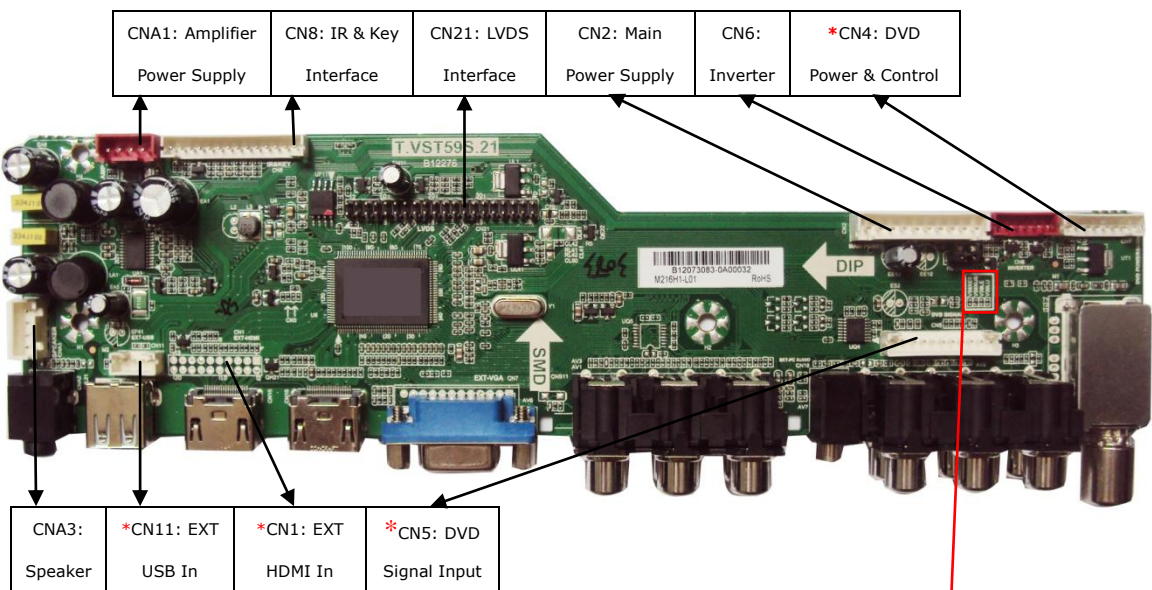
## 2. FUNCTION LAYOUT

### Note:

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

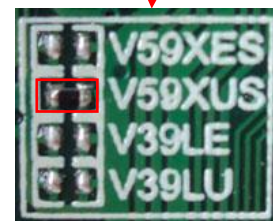
The optional connectors and terminals are marked with "\*".

### TOP VIEW OF T.VST59S.21B (21\_A2)

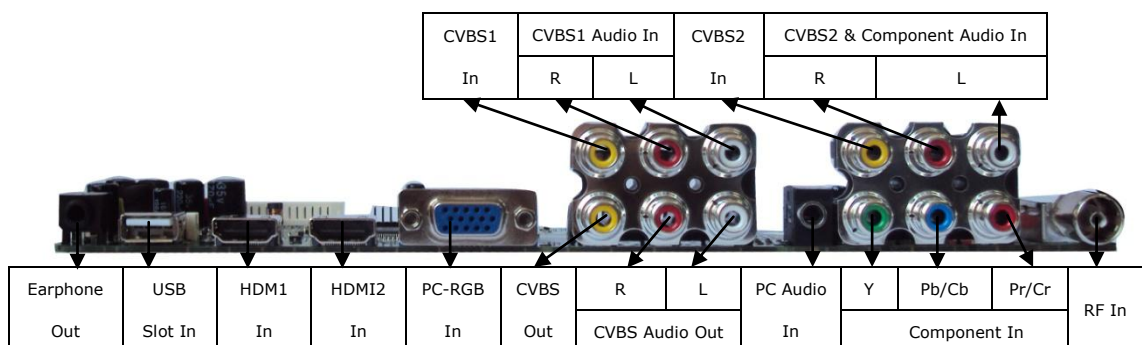


### ENLARGED VIEW OF CHIPSET

As the picture shows in left, difference the board and chipset by resistance and mark.



### FRONT VIEW OF T.VST59S.21B (21\_A2)



### 3. FEATURES

<b>CHIPSET</b>	TSUMV59X <b>US</b> -Z1(without TELETEXT and NICAM) TSUMV59X <b>ES</b> -Z1 (with TELETEXT and NICAM)			
<b>MARKET AREA</b>	Asia-Pacific, Middle-East			
<b>OSD LANGUAGE</b>	Chinese, English (optional)			
<b>PANEL</b>	Panel Type	LCD		
	Interface	Dual/Single LVDS Interface		
	Max Resolution	1920×1080		
<b>VIDEO INPUT</b>	TV	Receiving Range	48.25MHz ~ 863.25MHz	
		Input impedance	75Ω	
		Video System	PAL, SECAM	
		Sound System	BG, DK, I	
			NICAM/A2(only for TSUMV59X <b>ES</b> -Z1)	
		TELETEXT (only for TSUMV59X <b>ES</b> -Z1)	1000Pages	
	Max Storage Channels	199CH		
	PC-RGB	Format	Up to 1920×1080@60Hz	
	CVBS	Video System	PAL/NTSC/SECAM	
		Video level	1.0 V <sub>p-p</sub> ±5%	
Component	480i, 480p, 576i, 576p, 720p, 1080i, 1080p			
HDMI	480i, 480p, 576i, 576p, 720p, 1080i, 1080p			
<b>AUDIO INPUT</b>	PC Audio	Earphone Input	0.2 ~ 2.0 V <sub>RMS</sub>	
	CVBS Audio Component Audio	L/R RCA Input	0.2 ~ 2.0 V <sub>RMS</sub>	
<b>VIDEO OUTPUT</b>	CVBS	Video System	PAL/NTSC/SECAM	
		Video level	1.0 V <sub>p-p</sub> ±5%	
<b>AUDIO OUTPUT</b>	CVBS Audio	L/R RCA Input	0.2 ~ 2.0 V <sub>RMS</sub>	
	Frequency Response	100Hz~15KHz @±3dB (500mV reference signal)		
	Max Output power	2×9W(8Ω) THD+N<10%@1KHz (Power Supply: 24V, Audio Input: 0.5V <sub>RMS</sub> )		
<b>POWER</b>	Requirement	24V/12V/5V/5VSB		
	To Panel	5V, 12V		
	Management	Standby Power Consumption < 0.5W(Board Only)		
<b>COMB FILTER</b>	3D			
<b>DEINTERLACE</b>	3D			
<b>KEY FUNCTION</b>	INPUT, CH+, CH-, VOL+, VOL-,MENU, POWER Details can be found in part 5.			
<b>EXPANDABLE FUNCTION</b>	DVD, External USB In, External HDMI In			
<b>Note:</b> Licenses involved in specifications above are supposed to be obtained by customers themselves.				

## USB MULTIMEDIA PLAYBACK FORMAT

Media	File Ext.	Codec		Remark
		Video	Audio	
Movie	.avi	MJPEG	MP3, WMA, AAC, MP2, PCM, AC3	<b>Max Resolution And Frame Rate:</b> 640×480@30fps <b>Max Data Rate:</b> 10 Mbps
		Xvid, MPEG-2, MPEG-4, DivX, H.264		<b>Max Resolution And Frame Rate:</b> 1920×1080@30fps <b>Max Data Rate:</b> 20 Mbps
	.mp4	MPEG-2, MPEG-4, DivX, H.264		
	.ts/ .trp	MPEG-2, H.264		
	.mkv/ .mov	MPEG-4, H.264		
	.mpg	MPEG-1, MPEG-2		
	.dat	MPEG-1		MP2
.vob	MPEG-2	<b>Max Resolution:</b> 720×576 <b>Max Data Rate:</b> 20 Mbps		
.rm/ .rmvb	RV8, RV9, RV10	COOK	<b>Max Resolution And Frame Rate:</b> 1280×720@30fps <b>Max Data Rate:</b> 10 Mbps	
Music	.mp3	--	MP3	<b>Sample Rate:</b> 32K~48KHz <b>Bit Rate:</b> 32K~320Kbps <b>Channel:</b> Mono/Stereo
	.wma	--	WMA	<b>Sample Rate:</b> 8K~48KHz <b>Bit Rate:</b> 128K~320Kbps <b>Channel:</b> Mono/Stereo
	.m4a/ .aac	--	AAC	<b>Sample Rate:</b> 8K~48KHz <b>Bit Rate:</b> 128K~442Kbps <b>Channel:</b> Mono/Stereo
Photo	.jpg/ .jpeg	Progressive JPEG		<b>Max Resolution:</b> 1024×768
		Baseline JPEG		<b>Max Resolution:</b> 15360×8640
	.bmp	--		<b>Max Resolution:</b> 9600×6400
	.png	Non-Interlaced		<b>Max Resolution:</b> 9600×6400
Interlaced		<b>Max Resolution:</b> 1200×800		
Text	.txt	ANSI/UNICODE GB/UTF8		<b>File Size:</b> Max 1MB
<p><b>File system:</b> Hi Speed FS, FAT32, FAT16, NTFS(NTFS compressed file is not supported).</p> <p><b>Note:</b></p> <p>1.Licenses involved in specifications above are supposed to be obtained by customers themselves.</p> <p>2.MP4 cannot support GMC.</p>				

## USB DEVICE PARAMETERS

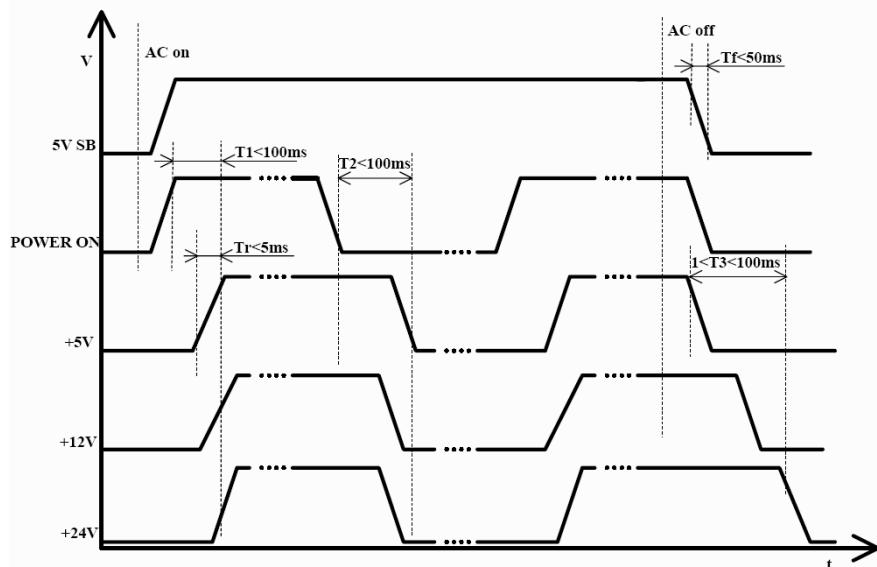
	Maximum USB size	Maximum single file size
NTFS	2T	2T
FAT 32	192G	4G
FAT 16	2G	2G

## ELECTRICAL CHARACTERISTICS & REQUIREMENTS

Power Supply Mode	Symbol	Voltage Range	Max Current	Ripple Voltage @25°C	Startup Time	Rise Time
24V/12V/ 5V/5VSB (Built-In)	24V	22V~25V	1000mA	240mV <sub>p-p</sub>	≤100ms	≤50ms
	12V	12V±10%	300mA	120mV <sub>p-p</sub>	≤100ms	≤50ms
	5V	5V~5.25V	1000mA	50mV <sub>p-p</sub>	≤100ms	≤50ms
	5VSB	5V~5.25V	600mA	50mV <sub>p-p</sub>	--	≤50ms

**Note:** The current of panel, inverter and extension modules are not included in max current.

## POWER UP TIMING



## SUBSTITUTABLE PRIMARY MATERIALS

The table is for reference only, the actual item is the standard.

NAME	TYPE	BRAND	BACKUP TYPE	BACKUP BRAND
TUNER	R620D	Rafael	--	--
FLASH	GD25Q32SIP (32M bits)	GIGA	W25Q32FVSSIG	Winbond
AMPLIFIER	TPA3124	TI	--	--

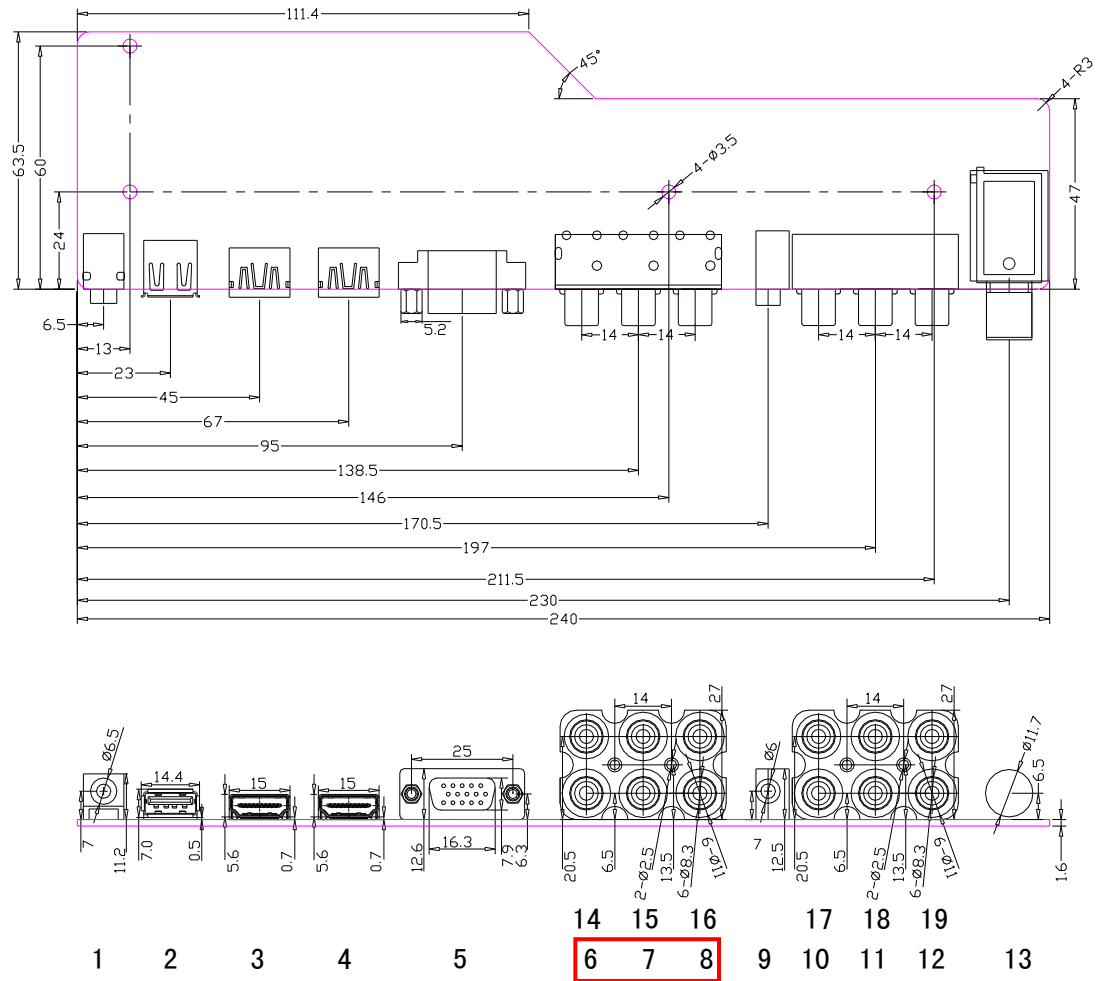
## 4. PCB DIMENSIONS

### CVBS Out+YPbPr In +2CVBS In (21\_A2)

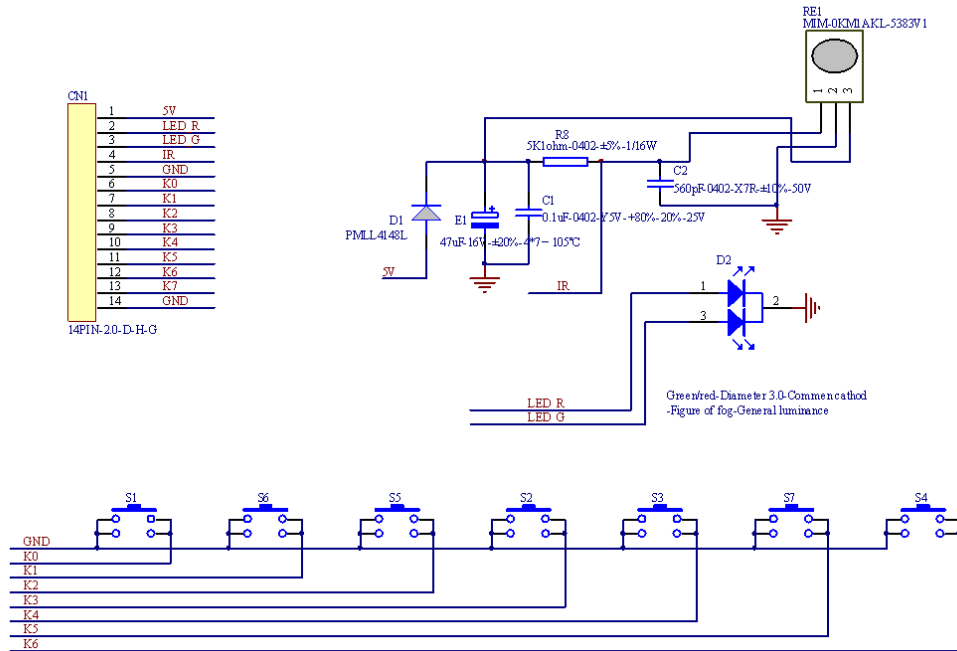
The size of T.VST59S.21B is 240mm(L)\*63.5mm(W)\*32mm(H).

Note: For No.6.7.8, the CVBS Out in terminal can be compatible with YPbPr in terminal.

Ver.	V1.0
NO.	Description
1	EARPHONE OUT
2	USB IN
3	HDMI 1
4	HDMI 2
5	VGA IN
6	CVBS OUT
7	CVBS-R OUT
8	CVBS-L OUT
9	PC AUDIO IN
10	YPbPr-Y IN
11	YPbPr-Pb IN
12	YPbPr-Pr IN
13	RF IN
14	CVBS1 IN
15	CVBS1-R IN
16	CVBS1-L IN
17	CVBS2 IN
18	CVBS2/YPbPr R IN
19	CVBS2/YPbPr L IN



## 5. SCHEMATICS OF IR BOARD & KEY BOARD



**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.

## 6. INTERFACE DEFINITION

The optional connectors are marked with “\*”.

### ◆ CNA1(4PIN/2.54): AMPLIFIER POWER SUPPLY CONNECTOR

NO.	SYMBOL	DESCRIPTION
1	24V	24V Power Supply
2	24V	
3	GND	Ground
4	GND	

### ◆ CN8(14PIN/2.0): IR & KEY BOARD CONNECTOR

NO.	SYMBOL	DESCRIPTION
1	5V	+5V DC Power Supply
2	RED	Red Indicator
3	GRN	Green Indicator
4	IR	IR Receiver
5	GND	Ground
6	K0	Key0
7	K1	Key1
8	K2	Key2
9	K3	Key3



NO.	SYMBOL	DESCRIPTION
10	K4	Key4
11	K5	Key5
12	K6	Key6
13	K7	Key7(Reserved)
14	GND	Ground

**◆ CN21(2×20PIN/2.0): LVDS INTERFACE CONNECTOR**

**NOTE:** PIN31~40 are optional. The connector or each PIN can refer to the panel specification.

NO.	SYMBOL	DESCRIPTION
1	VSEL	Power Supply for Panel
2	VSEL	
3	VSEL	
4	GND	Ground
5	GND	
6	GND	
7	RX00-	LVDS ODD 0- Signal
8	RX00+	LVDS ODD 0+ Signal
9	RX01-	LVDS ODD 1- Signal
10	RX01+	LVDS ODD 1+ Signal
11	RX02-	LVDS ODD 2- Signal
12	RX02+	LVDS ODD 2+ Signal
13	GND	Ground
14	GND	
15	RXOC-	LVDS ODD Clock- Signal
16	RXOC+	LVDS ODD Clock+ Signal
17	RX03-	LVDS ODD 3- Signal
18	RX03+	LVDS ODD 3+ Signal
19	RXE0-	LVDS EVEN 0- Signal
20	RXE0+	LVDS EVEN 0+ Signal
21	RXE1-	LVDS EVEN 1- Signal
22	RXE1+	LVDS EVEN 1+ Signal
23	RXE2-	LVDS EVEN 2- Signal
24	RXE2+	LVDS EVEN 2+ Signal
25	GND	Ground
26	GND	
27	RXEC-	LVDS EVEN Clock- Signal
28	RXEC+	LVDS EVEN Clock+ Signal
29	RXE3-	LVDS EVEN 3- Signal
30	RXE3+	LVDS EVEN 3+ Signal
*31	GND	Ground
*32	GND	

*33	CON1	Logic Level Control (Default For High Level)
*34	NC	No Connection
*35	VSEL1	Reserved Power or I <sup>2</sup> C SCL
*36	VSEL2	Reserved Power or I <sup>2</sup> C SDA
*37	RXO4-	LVDS ODD4- Signal
*38	RXO4+	LVDS ODD4+ Signal
*39	RXE4-	LVDS EVEN 4- Signal
*40	RXE4+	LVDS EVEN 4+ Signal

**◆ CN2(10PIN/2.54): MAIN POWER SUPPLY CONNECTOR**

NO.	SYMBOL	DESCRIPTION
1	5VSB	+5V Power Supply when Standby
2	PON	Power On/Off
3	GND	Ground
4	GND	
5	P5V	+5V Power Supply for Panel
6	P5V	
7	5V	+5V DC Power Supply
8	5V	
9	GND	Ground
10	12V	+12V DC Power Supply

**◆ CN6(6PIN/2.0): INVERTER CONNECTOR**

NO.	SYMBOL	DESCRIPTION
1	12V	+12V DC Power Supply
2	12V	
3	BLO	Back-Light ON/OFF Control for Panel
4	ADJ	Brightness Adjustment for Panel
5	GND	Ground
6	GND	

**◆ \*CN4(8PIN/2.0): DVD POWER SUPPLY & CONTROL CONNECTOR**

NO.	SYMBOL	DESCRIPTION
1	D5V	+5V DC Power Supply for DVD
2	D5V	
3	GND	Ground
4	GND	
5	D12	+12V DC Power Supply for DVD
6	DIR	IR Data Transfer to DVD
7	DAT	Data Receiver
8	STB	DVD Standby Control

◆ **CNA3(4PIN/2.54): SPEAKER CONNECTOR**

NO.	SYMBOL	DESCRIPTION
1	LO	Audio Left Channel Output
2	GND	Ground
3	GND	
4	RO	Audio Right Channel Output

◆ **\*CN11(4PIN/2.0): EXTERNAL USB CONNECTOR**

NO.	SYMBOL	DESCRIPTION
1	5V	+5V DC Power Supply for USB
2	DM	USB Data-
3	DP	USB Data+
4	GND	Ground

◆ **\*CN1(2×10PIN/2.0): EXTERNAL HDMI CONNECTOR**

NO.	SYMBOL	DESCRIPTION
1	HDMI_RX2+	HDMI 2+ Signal
2	HDMI_RX2-	HDMI 2- Signal
3	HDMI_RX1+	HDMI 1+ Signal
4	HDMI_RX1-	HDMI 1- Signal
5	HDMI_RX0+	HDMI 0+ Signal
6	HDMI_RX0-	HDMI 0- Signal
7	HDMI_RXC+	HDMI Clock+ Signal
8	HDMI_RXC-	HDMI Clock- Signal
9	HDMI_SCL	HDMI DDC I <sup>2</sup> C SCL
10	HDMI_SDA	HDMI DDC I <sup>2</sup> C SDA
11	GND	Ground
12	GND	
13	POW_SINK	HDMI 5V
14	HPD_CON	Hot Plug Detect
15	GND	Ground
16	GND	
17	CEC	CEC Signal
18	+5V	+5V DC Power Supply
19	M_SCL	Main I <sup>2</sup> C SCL
20	M_SDA	Main I <sup>2</sup> C SDA

◆ **\*CN5(11PIN/2.0): DVD SIGNAL INPUT CONNECTOR**

NO.	SYMBOL	DESCRIPTION
1	CVBS	CVBS
2	GND	Ground
3	DRI	DVD Audio Right Channel Input

NO.	SYMBOL	DESCRIPTION
4	GND	Ground
5	DLI	DVD Audio Left Channel Input
6	DPB	DVD Component-Pb Input
7	GND	Ground
8	DPR	DVD Component-Pr Input
9	GND	Ground
10	DY	DVD Component-Y Input
11	GND	Ground

## 7. CONFIGURATION & GENERAL PRECAUTIONS

- **Relative humidity:  $\leq 80\%$ .**
- **Storage temperature:  $-10\sim 60^{\circ}\text{C}$ .**
- **Operation temperature:  $0\sim 40^{\circ}\text{C}$ .**
- **Protect the board from static electricity in case of damage to the IC.**
- **Keep the board away from conductor when it is working.**
- **Don't push or pull the connectors when the board is working.**
- **Don't press, distort or disassemble the board.**
- **Clean the board with soft dry cloth when it's dirty.**
- **Don't wire in the board to power supply before panel is correctly connected.**

## APPENDIX: ANOTHER STRUCTURE

### 2YPbPr In + 2CVBS In (21\_A1)

The size of T.VST59S.21B is 240mm(L)\*63.5mm(W)\*32mm(H).

Note: For No.6.7.8, the YPbPr in terminal can be compatible with CVBS Out terminal.

Ver.	V1.0
NO.	Description
1	EARPHONE OUT
2	USB IN
3	HDMI1
4	HDMI2
5	VGA IN
6	YPbPr1-Y IN
7	YPbPr1-Pb IN
8	YPbPr1-Pr IN
9	PC AUDIO IN
10	YPbPr2-Y IN
11	YPbPr2-Pb IN
12	YPbPr2-Pr IN
13	RF IN
14	CVBS1 IN
15	CVBS1/YPbPr1 R IN
16	CVBS1/YPbPr1 L IN
17	CVBS2 IN
18	CVBS2/YPbPr2 R IN
19	CVBS2/YPbPr2 L IN

