

TV CONTROL BOARD SPECIFICATION

MODEL: T.VST29.03

(Asia-V59)

Part Number: MST-12110542

REV: A3

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1. GENERAL DESCRIPTION

T.VST29.03 is analog TV control board, which is suitable for Asia-Pacific and Middle-East market. It can support less than 26 inch LCD panels which resolution is up to 1920×1080.

T.VST29.03 support six kinds of main chip: TSUMV29LU, TSUMV29LE, TSUMV39LU, TSUMV39LE, TSUMV59XU, TSUMV59XE, differences are in the following table.

This specification is only for T.VST29.03 with main chip TSUMV59XU or TSUMV59XE.

| Main Chip | TSUMV29LU | TSUMV29LE | TSUMV39LU | TSUMV39LE | TSUMV59XU | TSUMV59XE |
|-------------------|-------------------|-----------|---|-----------|---------------------------------------|-----------|
| TELETEXT or NICAM | No | Yes | No | Yes | No | Yes |
| USB slot function | updating software | | updating software, playing MP3 and JPEG | | updating software, playing multimedia | |

Note: Chipset TSUMV29LU/LE, TSUMV39LU/LE and TSUMV59XU/XE are pin to pin.

2. DIFFERENCE OF FOUR CONFIGURATIONS

| No. | 03_A4 | 03_A3 | 03_A2 | 03_A1 |
|---------------|---------------|---------------|--------------|--------------|
| No.3 terminal | S-video | HDMI | S-video | HDMI |
| USB | USB connector | USB connector | USB terminal | USB terminal |

Note: Detail can be found in part4 and appendix.

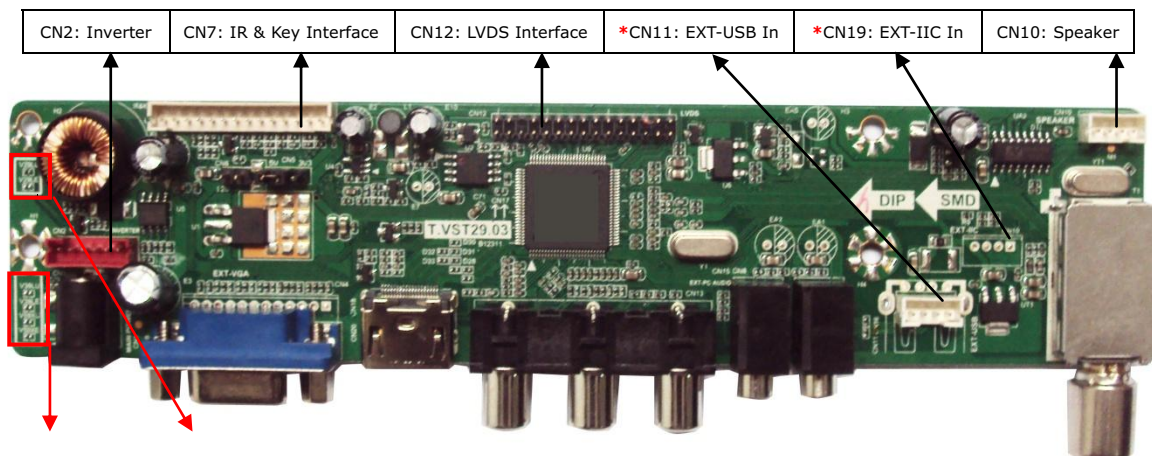
3. FUNCTION LAYOUT

This is the standard. There is three kind of structure, details can be found in appendix.

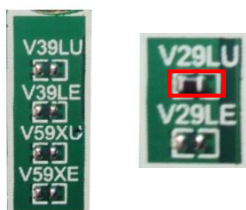
Pictures are for reference only, specific to prevail in kind.

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

TOP VIEW OF T.VST29.03 (03_A3)

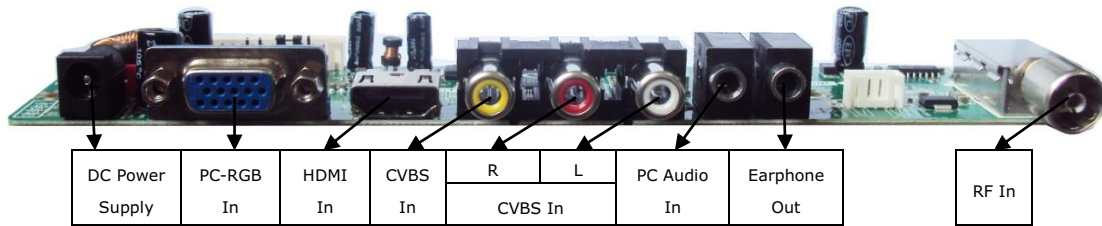


ENLARGED VIEW OF CHIPSET



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

FRONT VIEW OF T.VST29.03B (03_A3)



4. FEATURES

| | | | |
|---|--|--|---|
| CHIPSET | TSUMV59XU / TSUMV59XE | | |
| MARKET AREA | Asia-Pacific, Middle-East | | |
| OSD LANGUAGE | English, French, German, Italian, Spanish, Portuguese, Russian(optional) | | |
| PANEL | Panel Type | LCD | |
| | Interface | Single/Dual LVDS | |
| | Max Resolution | 1920×1080 | |
| VIDEO INPUT | TV | Receiving Range | 48.25MHz ~ 863.25MHz |
| | | Input impedance | 75Ω |
| | | Video System | PAL, SECAM |
| | | Sound System | BG, DK, I NICAM/A2(only for TSUMV59XE) |
| | | TELETEXT (only for TSUMV59XE) | 1000Pages |
| | | Max Storage Channels | 199CH |
| | PC-RGB | Format | Up to 1920×1080@60Hz |
| CVBS | Video System | PAL/NTSC/SECAM | |
| | Video level | 1.0 V _{p-p} ±5% | |
| AUDIO INPUT | PC Audio | Earphone Input | 0.2 ~ 2.0 V _{RMS} |
| | CVBS | L/R RCA Input | 0.2 ~ 2.0 V _{RMS} |
| AUDIO OUTPUT | Frequency Response | 100Hz~15KHz @±3dB (1KHz reference signal) | |
| | Max Output power | 2x2.5W(4Ω)THD+N<10%@1KHz (Power Supply: 12V, Audio Input: 0.5V _{RMS}) | |
| POWER | Requirement | 12V DC/12V(built in) | |
| | To Panel | 3.3V, 5V,12V | |
| | Management | Standby Power Consumption < 0.3W(Board Only) | |
| COMB FILTER | 3D | | |
| DEINTERLACE | 3D | | |
| KEY FUNCTION | MENU, CH+, CH-, VOL+, VOL-, INPUT, POWER | | |
| EXPANDABLE FUNCTION | EXT-USB In, EXT-IIC In | | |
| Note: Licenses involved in specifications above are supposed to be obtained by customers themselves. | | | |

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 | GD25Q32BSIG (32M bits) | GIGA | W25Q32BVSSIG | Winbond |
| AMPLIFIER | NS4263 | NXW | -- | -- |

ELECTRICAL CHARACTERISTICS & REQUIREMENTS

| Power Supply Mode | Symbol | Voltage Range | Max Current | Ripple Voltage@25 °C | Startup Time | Rise Time |
|--|---------------|----------------------|--------------------|-----------------------------|---------------------|------------------|
| 12V(Ext. Adaptor) | 12V | 12V±0.6V | 2000mA | 120mV _{p-p} | -- | ≤50ms |
| 12V(Built-In) | 12V | 12V±0.6V | 2000mA | 120mV _{p-p} | -- | ≤50ms |
| Note: The current of panel, USB,inverter and extension modules are not included in max current. | | | | | | |

USB MULTIMEDIA PLAYBACK FORMAT

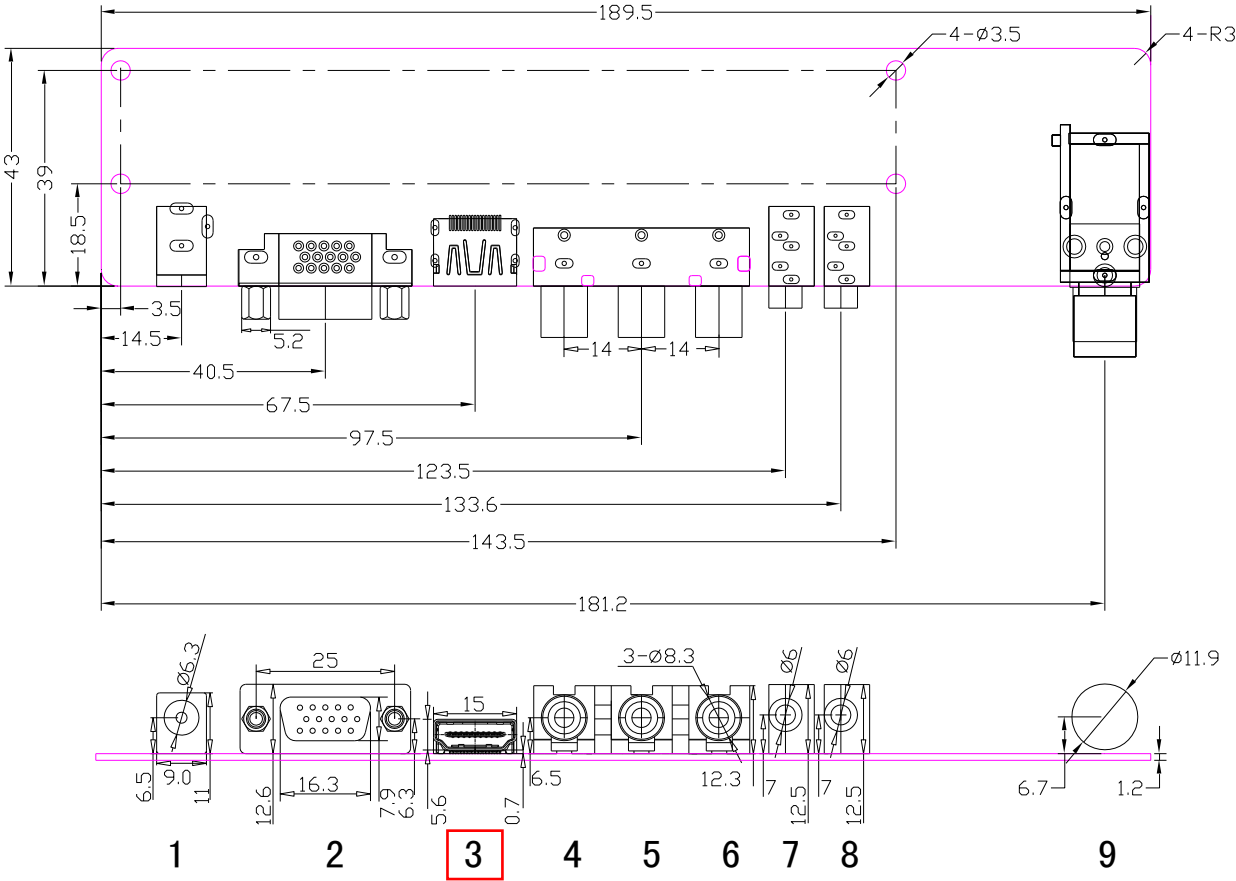
| Media | File Ext. | Codec | | Remark | | |
|--|----------------|-----------------------------------|--|--|-----|---|
| | | Video | Audio | | | |
| Movie | .avi | MJPEG | MP3, WMA, AAC, MP2, PCM, AC3 | Max Resolution And Frame Rate: 640×480@30fps Max Data Rate: 10 Mbps | | |
| | | Xvid, MPEG-2, MPEG-4, DivX, H.264 | | | | |
| | .mp4 | MPEG-2, MPEG-4, DivX, H.264 | | Max Resolution And Frame Rate: 1920×1080@30fps Max Data Rate: 20 Mbps | | |
| | .ts/ .trp | MPEG-2, H.264 | | | | |
| | .mkv/ .mov | MPEG-4, H.264 | | | | |
| | .mpg | MPEG-1, MPEG-2 | | | | |
| | .dat | MPEG-1 | | | MP2 | Max Resolution: 352×288 Max Data Rate: 20 Mbps |
| | .vob | MPEG-2 | | | | Max Resolution: 720×576 Max Data Rate: 20 Mbps |
| .rm/ .rmvb | RV8, RV9, RV10 | COOK | Max Resolution And Frame Rate: 1280×720@30fps Max Data Rate: 10 Mbps | | | |
| Music | .mp3 | -- | MP3 | Sample Rate: 32K~48KHz Bit Rate: 32K~320Kbps Channel: Mono/Stereo | | |
| | .wma | -- | WMA | Sample Rate: 8K~48KHz Bit Rate: 128K~320Kbps Channel: Mono/Stereo | | |
| | .m4a/ .aac | -- | AAC | Sample Rate: 8K~48KHz Bit Rate: 128K~442Kbps Channel: Mono/Stereo | | |
| Photo | .jpg/ .jpeg | Progressive JPEG | | Max Resolution: 1024×768 | | |
| | | Baseline JPEG | | Max Resolution: 15360×8640 | | |
| | .bmp | -- | | Max Resolution: 9600×6400 | | |
| | .png | Non-Interlaced | | Max Resolution: 9600×6400 | | |
| Interlaced | | Max Resolution: 1200×800 | | | | |
| Text | .txt | ANSI/UNICODE GB/UTF8 | | File Size: Max 1MB | | |
| <p>File system: Hi Speed FS, FAT32, FAT16, NTFS(NTFS compressed file is not supported).</p> <p>Note:</p> <p>1.Licenses involved in specifications above are supposed to be obtained by customers themselves, eg:AC3 and DivX.</p> <p>2.MP4 cannot support GMC.</p> | | | | | | |

4. PCB DIMENSIONS

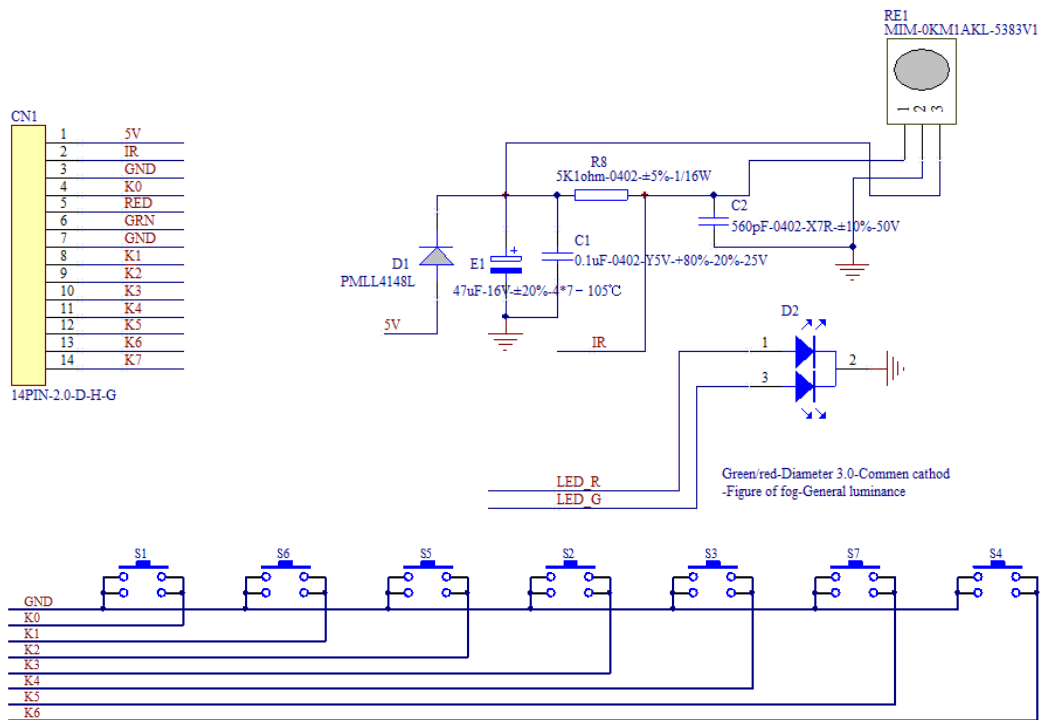
The size of T.VST29.03A is 181.2mm(L)*43mm(W)*17mm(H).

(03_A3) HDMI +USB connector

| Ver. | V1.1 |
|------|--------------|
| NO. | Description |
| 1 | DC IN |
| 2 | VGA IN |
| 3 | HDMI IN |
| 4 | CVBS IN |
| 5 | CVBS RIN |
| 6 | CVBS LIN |
| 7 | PC AUDIO IN |
| 8 | EARPHONE OUT |
| 9 | RF 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 "*".

◆ CN2(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 | |

◆ CN7(14PIN/2.0): IR & KEY BOARD CONNECTOR

| NO. | SYMBOL | DESCRIPTION |
|-----|--------|---------------------|
| 1 | 5V | +5V DC Power Supply |
| 2 | IR | IR Receiver |
| 3 | GND | Ground |
| 4 | K0 | Key0 |
| 5 | RED | Red Indicator |
| 6 | GRN | Green Indicator |
| 7 | GND | Ground |

T.VST29.03(Asia-V29V39)-SPECIFICATION

| NO. | SYMBOL | DESCRIPTION |
|-----|--------|-------------|
| 8 | K1 | Key1 |
| 9 | K2 | Key2 |
| 10 | K3 | Key3 |
| 11 | K4 | Key4 |
| 12 | K5 | Key5 |
| 13 | K6 | Key6 |
| 14 | K7 | Key7 |

◆ CN12(2×15PIN/2.0): LVDS INTERFACE CONNECTOR

| NO. | SYMBOL | DESCRIPTION |
|-----|--------|-------------------------|
| 1 | VSEL | Power Supply for Panel |
| 2 | VSEL | |
| 3 | VSEL | |
| 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 | |
| 15 | TXOC- | LVDS ODD Clock- Signal |
| 16 | TXOC+ | LVDS ODD Clock+ Signal |
| 17 | TX03- | LVDS ODD 3- Signal |
| 18 | TX03+ | 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 |

◆ *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 |

◆ *CN19(4PIN/2.0): EXTERNAL I²C CONNECTOR

| NO. | SYMBOL | DESCRIPTION |
|-----|--------|-------------------------------|
| 1 | GND | Ground |
| 2 | SDA | External I ² C SDA |
| 3 | SCL | External I ² C SCL |
| 4 | 5V | +5V DC Power Supply |

◆ CN10(4PIN/2.0): SPEAKER CONNECTOR

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

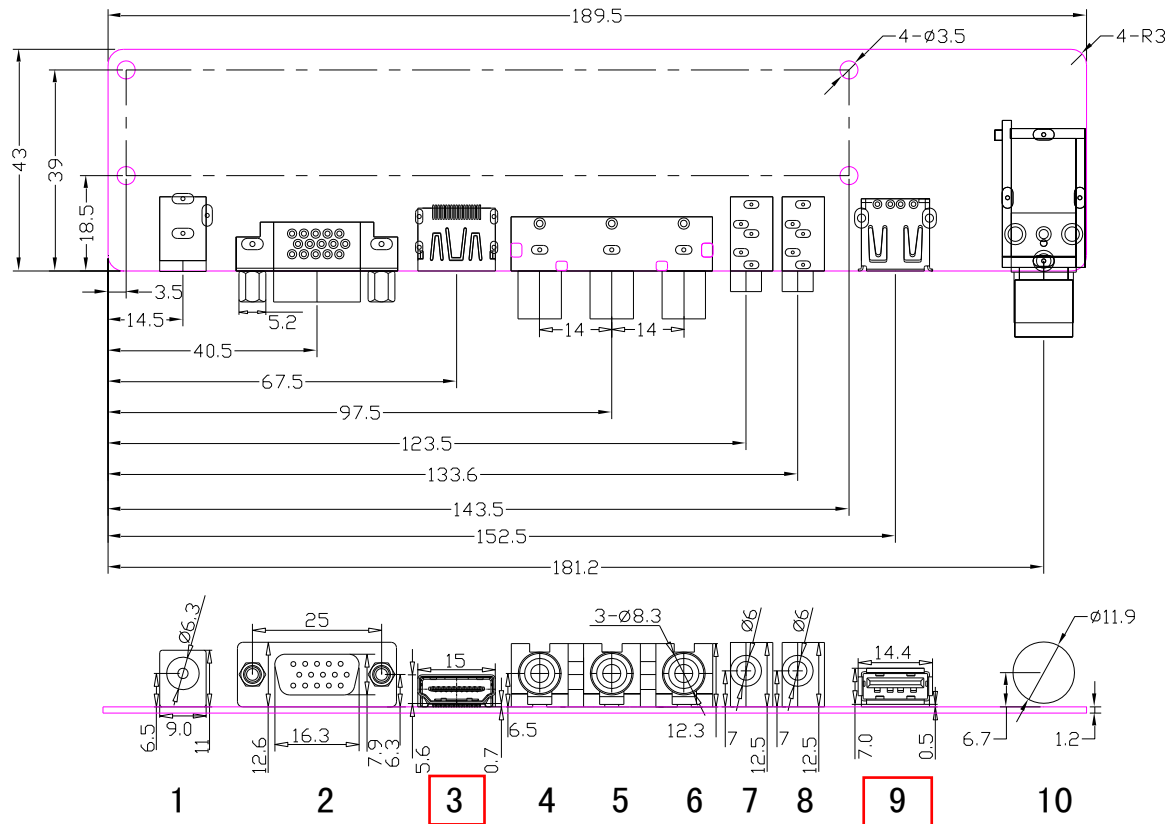
7. CONFIGURATION & GENERAL PRECAUTIONS

- Relative humidity: ≤ 80%.
- Storage temperature: -10~60°C.
- Operation temperature: 0~40°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 THREE STRUCTURE

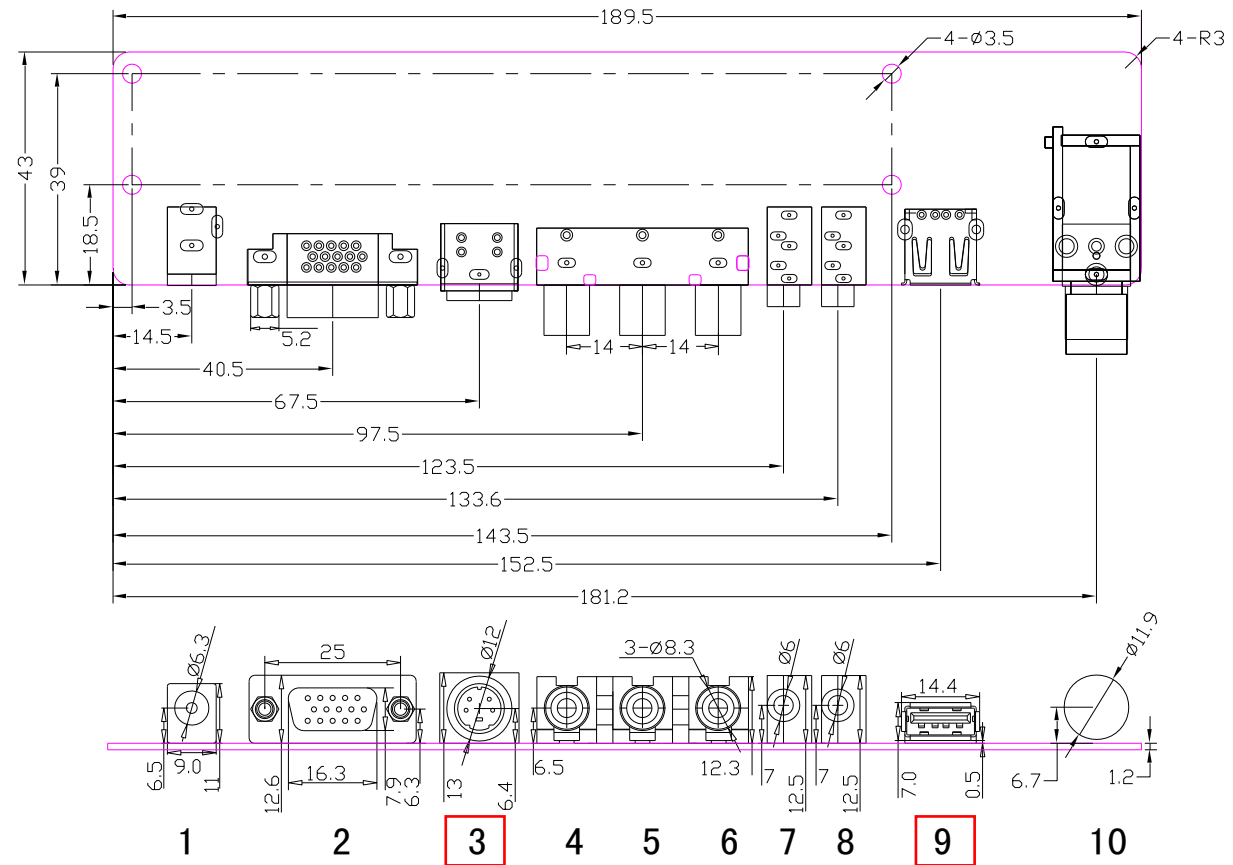
(03_A1) HDMI+USB terminal

| Ver. | V1.1 |
|------|--------------|
| NO. | Description |
| 1 | DC IN |
| 2 | VGA IN |
| 3 | HDMI IN |
| 4 | CVBS IN |
| 5 | CVBS RIN |
| 6 | CVBS LIN |
| 7 | PC AUDIO IN |
| 8 | EARPHONE OUT |
| 9 | USB IN |
| 10 | RF IN |



(03_A2) S-video +USB terminal

| Ver. | V1.1 |
|------|------------------|
| NO. | Description |
| 1 | DC IN |
| 2 | VGA IN |
| 3 | S-VIDEO IN |
| 4 | CVBS IN |
| 5 | S-VIDEO/CVBS RIN |
| 6 | S-VIDEO/CVBS LIN |
| 7 | PC AUDIO IN |
| 8 | EARPHONE OUT |
| 9 | USB IN |
| 10 | RF IN |



(03_A4) S-video+USB connector

| Ver. | V1.1 |
|------|------------------|
| NO. | Description |
| 1 | DC IN |
| 2 | VGA IN |
| 3 | S-VIDEO IN |
| 4 | CVBS IN |
| 5 | S-VIDEO/CVBS RIN |
| 6 | S-VIDEO/CVBS LIN |
| 7 | PC AUDIO IN |
| 8 | EARPHONE OUT |
| 9 | RF IN |

