

Haier SERVICE MANUAL

Order No.: TV0906S013V1

COLOR TV

Customer Model: LC22KW1

Service Model:HLC22KW1b

CHASSIS: MTK5380LC



WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product dealt with in this service information by anyone else could result in serious injury or death.

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1. General Information

1-1 General Guidelines

When servicing, observe the original lead dress. If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.

After servicing, see to it that all the protective devices such as insulation barriers, insulation papers shields are properly installed.

After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.

- 1) Leakage Current Cold Check
- 2) Leakage Current Hot Check
- 3) Prevention of Electro Static Discharge(ESD)to Electrostatically Sensitive

1-2 Important notice

1-2-1. Follow the regulations and warnings

Most important thing is to list up the potential hazard or risk for the service personnel to open the units and disassemble the units. For example, we need to describe properly how to avoid the possibility to get electrical shock from the live power supply or charged electrical parts (even the power is off).

This symbol indicates that high voltage is present inside. It is dangerous to make any kind of contact with any inside part of this product.



This symbol indicates that there are important operating and maintenance instructions in the literature accompanying the appliance

1-2-2. Be careful to the electrical shock

To prevent damage which might result in electric shock or fire, do not expose this TV set to rain or excessive moisture. This TV must not be exposed to dripping or splashing water, and objects

Filled with liquid, such as vases, must not be place on top of or above the TV

1-2-3. Electro static discharge (ESD)

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such Components commonly are called Electrostatically Sensitive (ES) Devices. The following tech-niquesshouldbeusedtohelpreducetheincidenceofcomponentdamagecausedbyelectro Static discharge (ESD).

1-2-4. About lead free solder (PbF)


This product is manufactured using lead-free solder as a part of a movement within the consumer products industry at large to be environmentally responsible. Lead-free solder must be used in the servicing and repair of this product.

1-2-5. Use the genewing parts (specified parts)

Special parts which have purposes of fire retardant (resistors),high-quality sound (capacitors), low noise(resistors), etc. are used.

When replacing any of components, be sure to use only manufacture's specified parts shown in the parts list.

Safety Component

- Components identified by  mark have special characteristics important for safety.

1-2-6. Take Care to Deal With The Cathode-Ray Tube

In the condition that an explosion-proof cathode-ray tube is set in this equipment, safety is secured against implosion. However, when removing it or serving from backward, it is dangerous to give a shock. Take enough care to deal with it.

1-2-7. Safety Check after Repairment

Confirm that the screws, parts and wiring which were removed in order to service are put in the original positions, or whether there are the portions which are deteriorated around the serviced places serviced or not. Check the insulation between the antenna terminal or external metal and the AC cord plug blades. And be sure the safety of that.

Insulation Test

1. Unplug the plug from the AC outlet.
2. Remove the antenna terminal on TV and turn on the TV.
3. Insulation resistance between the cord plug terminals and the external exposure metal should be more than M ohm by using the 500V insulation resistance meter
4. If the insulation resistance is less than M ohm, the inspection repair should be required. If you have not the 500V insulation resistance meter, use a Tester.
External exposure metal: Antenna terminal Headphone jack

1-2-8. Ordering Spare Parts

Please include the following informations when you order parts. (Particularly the Version letter)

1. Model number and Version letter

The model number can be found on the back of each product and the Version letter can be found at the end of the serial number.

2. Part No. and Description

You can find them in your service manual.

1-2-9. Photo used in this manual

The illustration and photos used in this Manual may not base on the final design of products, which may differ from your products in some way.

1-3. How to read this Service Manual

1-4-1. Using Icons

Icons are used to attract the attention of the reader to specific information. The meaning of each icon is described in the table below:



A "note" provides information that is not indispensable, but may nevertheless be valuable to the reader, such as tips and tricks.

Caution:

A "caution" is used when there is danger that the reader, through incorrect manipulation,



may damage equipment, loose data, get an unexpected result or has to restart(part of) a procedure.

Warning:



A “warning” is used when there is danger of personal injury.

Reference:

A “reference” guides the reader to other places in this binder or in this manual, where he/she will find additional information on a specific topic.

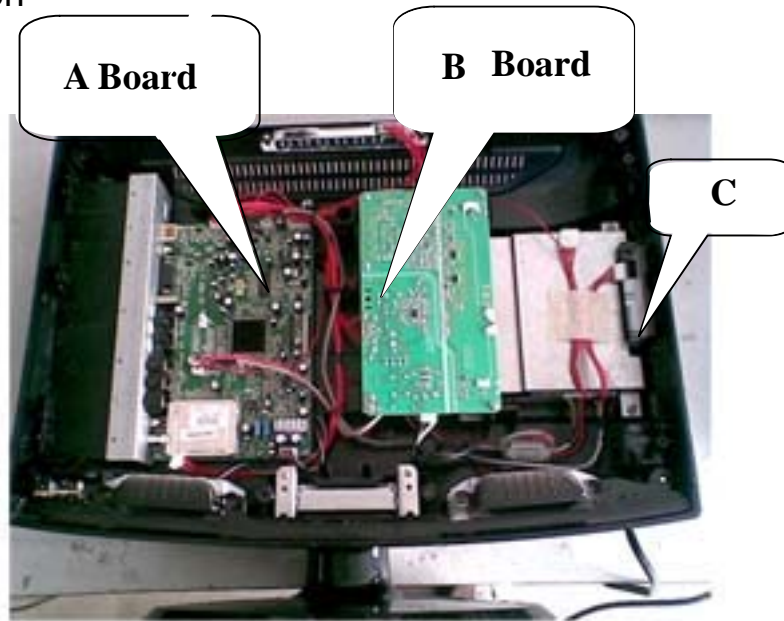


2. Specification

| | |
|---------------------------------|--------------------|
| Model | HLC22K1/HLC22KW1 |
| Screen size | 21.6inch |
| Aspect ratio | 16:9 |
| Resolution | 1366 x 768 |
| Contrast Ratio | 1000:1 |
| Angel of view | H:170/V:160 |
| Color display | 16.7M |
| OSD language | English |
| Color system | ATSC/NTSC |
| Color Temperature | Cold/Standard/Warm |
| Audio output power(Built-in)(W) | 3Wx2 |
| Power Consmption(in Standby) | 1W |
| Total power input (W) | 60W |
| Voltage range (V) | 120V±10% V |
| Power frequency (Hz) | 60HZ |
| Time of sleep timer(MINS) | 240Min |
| Net weight(KG) | 7 |
| Gross weight(KG) | 9.25 |
| Net dimension(MM) | 600/216/485 |
| Packaged dimension(MM) | 605/240/530 |

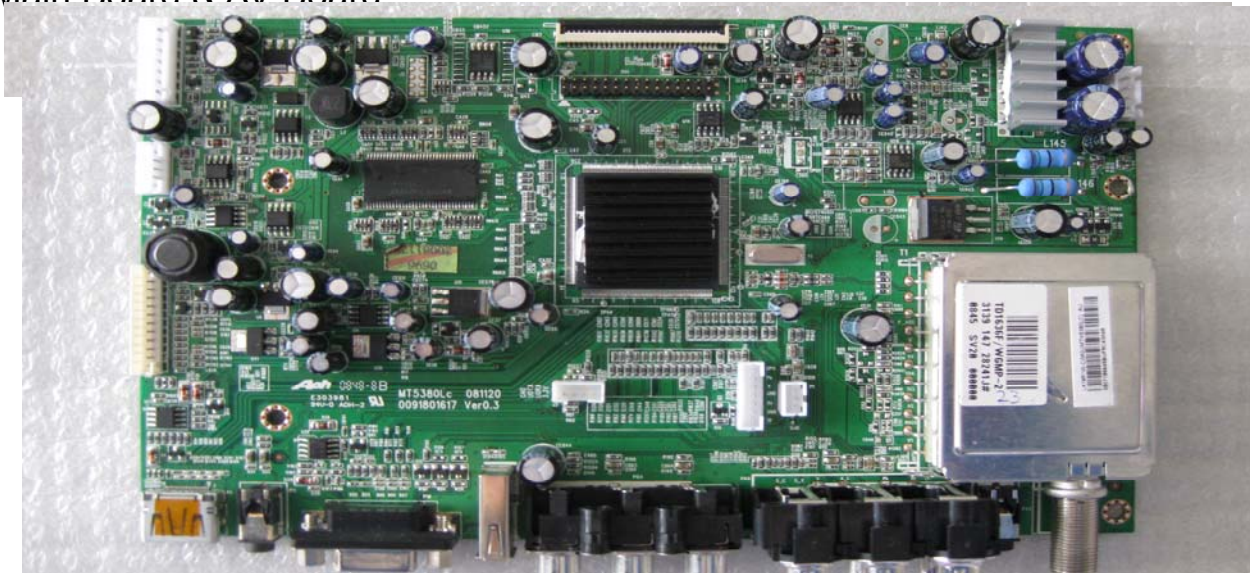
3. LOCATION OF CONTROLS AND COMPONENTS

3-1 Board Location



| No. | Parts number | Description |
|---------|--------------|-------------|
| A Board | DC1490E0200M | Main Board |
| B Board | 0094001224B | Power Board |
| C | DC1490E0200D | DVD player |

3-2 Main Board & AV Board



3-2-1 Function Description:

Main Board

Process signal which incept from exterior equipment display.

3-2-2 Connector definition

Main board connector

Power connectors (CN3, CN5)

| | |
|-----|-----|
| CN3 | CN5 |
|-----|-----|

| Pin number | Signal name | Pin number | Signal name |
|------------|-------------|------------|-------------|
| 1 | +12V | 1 | +12V |
| 2 | +12V | 2 | GND |
| 3 | BL | 3 | GND |
| 4 | DIM | 4 | +5V |
| 5 | GND | 5 | STB |
| 6 | GND | | |
| 7 | SW | | |

Notes:

CN3-Pin 3: Backlight on/off:

The system can turn on or turn off the backlight of TFT LCD Panel through the power supply unit path.

CN3-Pin 7: System power on / standby

System board will use this pin to control system power.

CN3-Pin 4: Control the luminance of backlight

The system can generate the PWN signal to control the strength of TFT LCD Panel's backlight through this connector.

Keypad and remote connector (CN2)

| Pin number | Signal name | Description |
|------------|-------------|-------------|
| 1 | IR_IN | IR |
| 2 | CPU5V | 5V |
| 3 | LED_G | LAMP GREEN |
| 4 | GND | GND |
| 5 | LED_R | LAMPRED |
| 6 | K7 | POWER |
| 7 | K6 | MENU |
| 8 | K5 | P_ |
| 9 | K4 | P+ |
| 10 | K3 | V_ |
| 11 | K2 | V+ |
| 12 | K1 | SOURCE |

Speaker connector (CN1)

| Pin number | Signal name | Description |
|------------|-------------|-------------|
| 1 | LSPK | LSPK |
| 2 | GND | GND |
| 3 | GND | GND |
| 4 | RSPK | RSPK |

DVD VIDEO Connector: CN6

| Pin number | Signal name | Description |
|------------|-------------|-------------|
|------------|-------------|-------------|

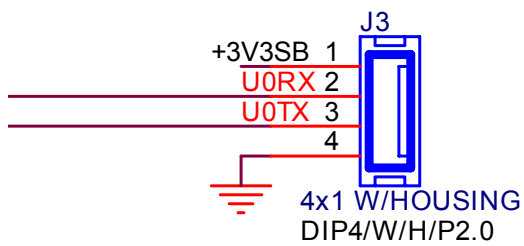
| | | |
|---|-------|--------|
| 1 | GPIO | GPIO |
| 2 | PB_IN | PB1 IN |
| 3 | Y_IN | Y1_IN |
| 4 | GND | GND |
| 5 | PR_IN | PR1 IN |
| 6 | GND | GND |
| 7 | IR | DVD IR |

DVD AUDIO Connector: P1

| Pin number | Signal name | Description |
|------------|-------------|-------------|
| 1 | LI | YPBPR1L_IN |
| 2 | RI | YPBPR1R_IN |
| 3 | GND | GND |

Other connectors:

CN19 to Upgrade the program of MTK5380LC (U13) AND FLASH (U17)



3-3. Power Board



3-3-1 Function Description:

Supply power for Main board, Panel.

3-3-2 Connector definition

11 INPUT CONNECTOR (CN10)

| CN10 | Signal name |
|------|-------------|
|------|-------------|

| | |
|---|------|
| 1 | N |
| 2 | GND |
| 3 | GND |
| 4 | DIM |
| 5 | EN |
| 6 | +12V |
| 7 | +12V |

3-4. LCD Panel



CMQ V2 1 6 BI- L01 KAWA01

3-4-1 Function Description: Display the signal.

3-4-2 Connector definition

| Pin number | Signal name | Description |
|------------|-------------|--------------------------|
| 1-3 | LVDSVDD | Power for panel |
| 4-6 | GND | Ground |
| 7 | A0N | LVDS EVEN 0 - Signal |
| 8 | A0P | LVDS EVEN 0 + Signal |
| 9 | A1N | LVDS EVEN 1 - Signal |
| 10 | A1P | LVDS EVEN 1 + Signal |
| 11 | A2N | LVDS EVEN 2 - Signal |
| 12 | A2P | LVDS EVEN 2 + Signal |
| 13,14 | GND | Ground |
| 15 | CK1N | LVDS EVEN Clock - Signal |
| 16 | CK1P | LVDS EVEN Clock + Signal |
| 17 | A3N | LVDS EVEN 3 - Signal |
| 18 | A3P | LVDS EVEN 3 + Signal |
| 19 | A4N | LVDS ODD 0 - Signal |
| 20 | A4P | LVDS ODD 0 + Signal |
| 21 | A5N | LVDS ODD 1 - Signal |

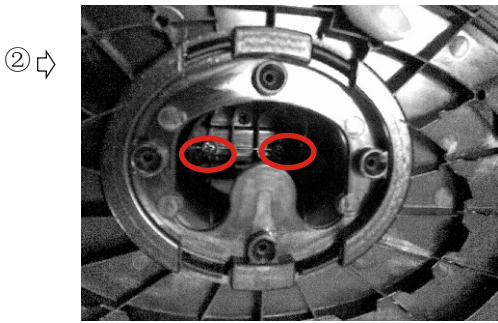
| | | |
|-------|------|-------------------------|
| 22 | A5P | LVDS ODD 1 + Signal |
| 23 | A6N | LVDS ODD 2 - Signal |
| 24 | A6P | LVDS ODD 2 + Signal |
| 25,26 | GND | Ground |
| 27 | CK2N | LVDS ODD Clock - Signal |
| 28 | CK2P | LVDS ODD Clock + Signal |
| 29 | A7N | LVDS ODD 3 - Signal |
| 30 | A7P | LVDS ODD 3+ Signal |

CN1 (Header):S14B-PH-SM4-TB (D)(LF)(JST) or equivalent.

| Pin No. | Symnbol | Description |
|---------|-----------|-------------------|
| 1 | VBL | +5.0V Power input |
| 2 | | |
| 3 | | |
| 4 | GND | Ground |
| 5 | | |
| 6 | | |
| 13 | | |
| 14 | | |
| 25 | | |
| 26 | LVDS EVEN | LVDS EVEN Signal |
| 7-12 | | |
| 15 | | |
| 16 | | |
| 17 | LVDS ODD | LVDS ODD Signal |
| 18 | | |
| 19-24 | | |
| 27 | | |
| 28 | | |
| 29 | | |
| 30 | | |

4. Disassemble and assemble

4. 1 Remove_the_Pedestal



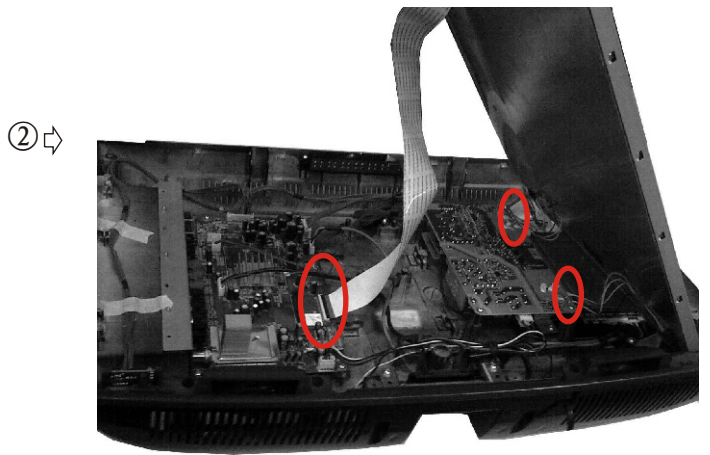
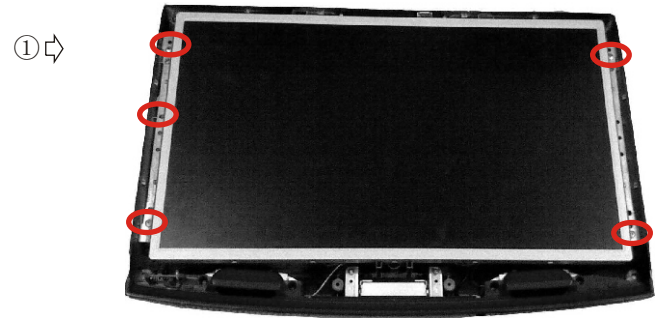
- ① Lay down the unit so that rear cover downward.
- ② Remove the two screw from the pedestal indicated with ○.
- ③ Then remove the pedestal .

4. 2 Remove the Front Cover



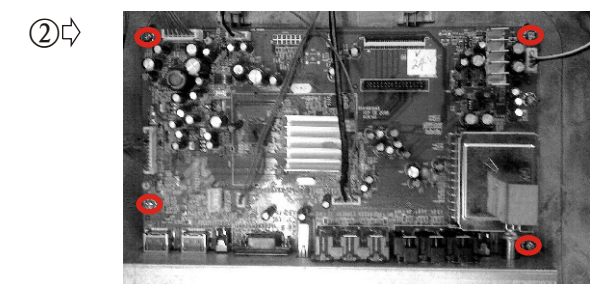
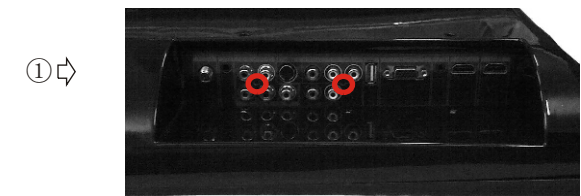
- ① Remove the eight screw indicated with ○.
- ② Turn to front cover upwards.
- ③ Then remove the front cover from the unit.

4. 3 Remove the LCD panel



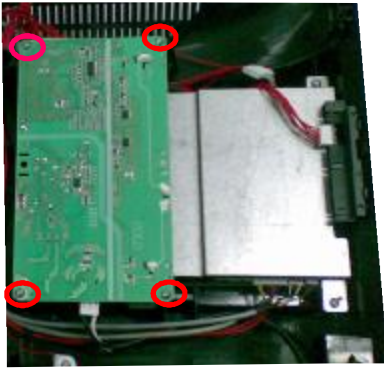
- ① Remove the five screw indicated with ○.
- ② Remove the pin indicated with ○.
- ③ Then remove the panel.

4. 4 Remove the Main Board



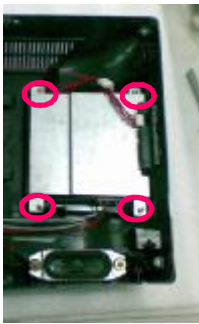
- ① Remove the two screw indicated with ○.
- ② Remove the four screw indicated with ○.
- ③ Then remove the Main Board.

4.5 Remove the Power Board



- ① Remove the four screws indicated with ○.
- ② Then remove the Power Board.

4.6 Remove the DVD Keypad Assembly and DVD



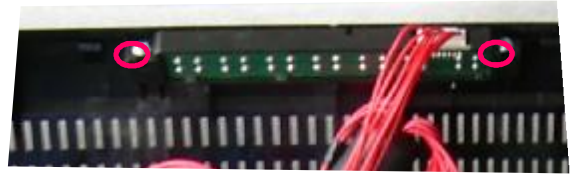
- ① Remove the four screws indicated with ○.
- ② Then remove the Shield Shelf.
- ③ Then remove the DVD Keypad Assembly.
- ④ Then remove the DVD.

4.7 Remove the Speaker



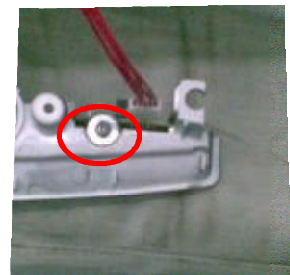
- ① Remove the four screws indicated with ○.
- ② Remove the sponge piece.
- ③ Then remove the speaker.

4.8 Remove the Keypad Assembly



- ① Remove the two screws indicated with ○.
- ② Then remove the Keypad Assembly.

4.9 Remove the Remote Control Board



- ① Remove the one screw indicated with ○.
- ② Then remove the Remote Control Board.

5. Installation Instructions

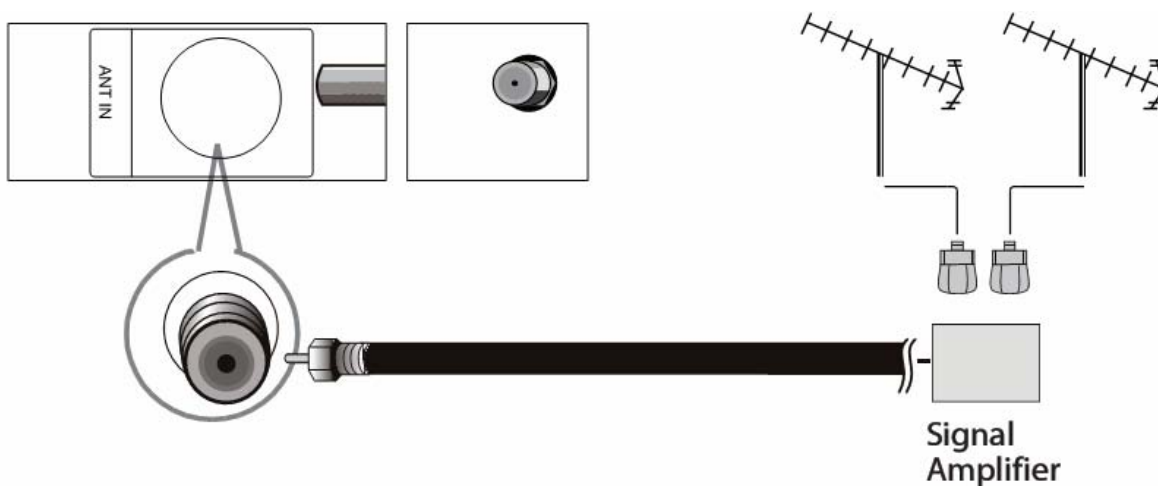
5-1 External Equipment Connections

Antenna Connection

Connect one end of a coaxial cable (not included) to the ANT IN jack on the back of your TV/DVD combo, then connect the other end of the cable into the antenna or cable TV wall outlet.



To improve picture quality from an antenna in a poor signal area, install a signal amplifier.



If you need to split the antenna signal to connect two TVs, install a two-way splitter.

Choose Your Connection

There are several ways to connect your television, depending on the components you want to connect

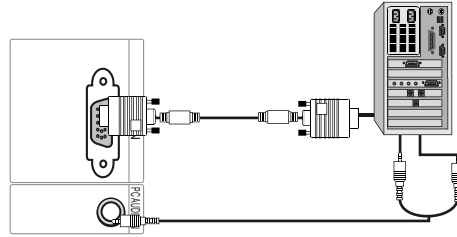
and the quality of the signal you want to achieve. The following are examples of some different ways to connect your TV with different input sources. Choose the connection which is best for you.

VGA Setup

You can use your LCD-TV as a monitor for your personal computer using a VGA cable (not supplied).

Connection and use steps:

1. Read the user guide supplied with your computer and ensure that it has a VGA connector;
2. Make sure that the power of the LCD-TV and the PC are off;
3. Connect a D type 15-pin PC interface cable (not supplied) to the PC video interface connector on the PC. Then connect the other end to the PC video interface connector on the back of the LCD-TV. Tighten the screws on the PC connectors once they are firmly connected;
4. Turn on the power of the LCD-TV first, and then turn on the power of the PC;
5. Press **INPUT** button to set the video input mode of the LCD-TV to PC; Once the input for PC is selected and if you see no image press function F8 on your pc.
6. Check the image on your TV. There may be noise associated with the resolution, vertical pattern, contrast or brightness in PC mode. If noise is present, change the PC mode to another resolution, change the refresh rate to another rate or adjust the brightness and contrast on the menu until the picture is clear. If the refresh rate of the PC graphic card can not be changed, change the PC graphic card or consult the manufacturer of the PC graphic card.



Resolution

| Mode | Resolution | Line frequency(KHz) | Frame frequency(Hz) |
|------|------------|---------------------|---------------------|
| VGA | 640x480 | 31.5 | 60 |
| SVGA | 800x600 | 37.9 | 60 |
| XGA | 1024x768 | 48.4 | 60 |

Note: All above listed are subject to VESA criteria.

Component Setup

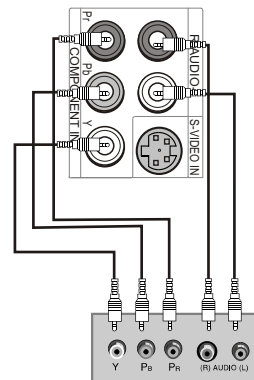
How to connect

Connect the DVD video outputs (Y, PB, PR) to the Component (Y, Pb, Pr) IN jacks on the TV and connect the DVD audio outputs to the AUDIO IN jacks on the TV, as shown in the figure.

NOTE: If your DVD player does not have component video output, use S-Video.

How to use

1. Turn on the DVD player, insert a DVD.
2. Use **INPUT** button on the remote control to select the proper input.



Cable TV Setup

After subscribing to a cable TV service from a local provider you can watch cable TV programming unless a TV tuner device or cable TV converter box is connected to the TV.

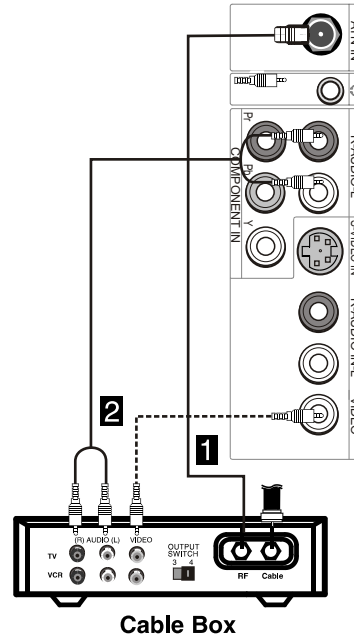
For further information regarding cable TV service, contact your local cable TV service provider(s).

Connection Option 1

1. Select 3 or 4 with channel switch on cable box.
2. Tune the TV channel to the same selected output channel on cable box.
3. Select channels at the cable box or with the cable box remote control.

Connection Option 2

1. Connect the audio and video cables from the Cable Box's output jacks to the TV input jacks, as shown in the figure. When connecting the TV to a Cable Box, match the jack colors (Video = yellow, Audio Left = white, and Audio Right = red).
2. Select the input source by using the **INPUT** button on the remote control.
3. Select your desired channel with the remote control for cable box.



External Component Source Setup

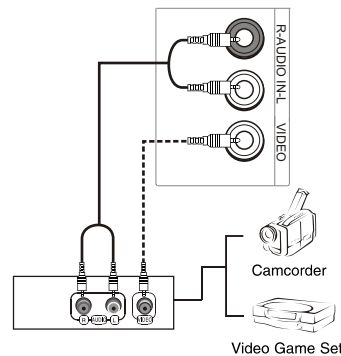
How to connect

Connect the audio and video cables from the external equipment's output jacks to the TV input jacks, as shown in the figure.

When connecting the TV to external equipment, match the jack colors (Video = yellow, Audio Left = white, and Audio Right = red).

How to use

1. Select the input source by using the **INPUT** button on the remote control.
2. Operate the corresponding external equipment. Refer to external equipment operating guide.



5-2 HDMI Connections

When the source device(DVD player or Set Top Box) supports HDM

How To Connect

1. Connect the source device to HDMI port of this TV with an HDMI cable(not supplied with this product).
2. No separated audio connection is necessary.

How To Use

If the source device supports Auto HDMI function, the output resolution of the source device will be automatically set to 1280x720p.

If the source device does not support Auto HDMI, you need to set the output resolution appropriately.

To get the best picture quality, adjust the output resolution of the source device to 1280x720p. Select HDMI input source in input source option of Select Main source menu.

When the source device(DVD player or Set Top Box) supports DVI

How To Connect

1. Connect the source device to HDMI port of this TV with a HDMI-to-DVI cable(not supplied with this product).
2. A separated audio connection is necessary.
3. If the source device has an analog audio output connector, connect the source device audio output to DVI Audio

In port located on the left side of HDMI port.

How To Use

If the source device supports Auto DVI function, the output resolution of the source device will be automatically set to 1280x720p.

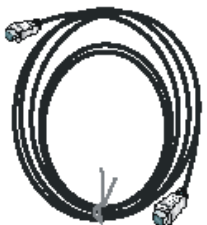
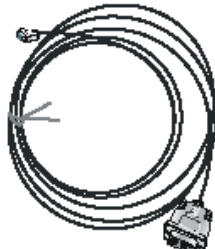
If the source device does not support Auto DVI, you need to set the output resolution appropriately.

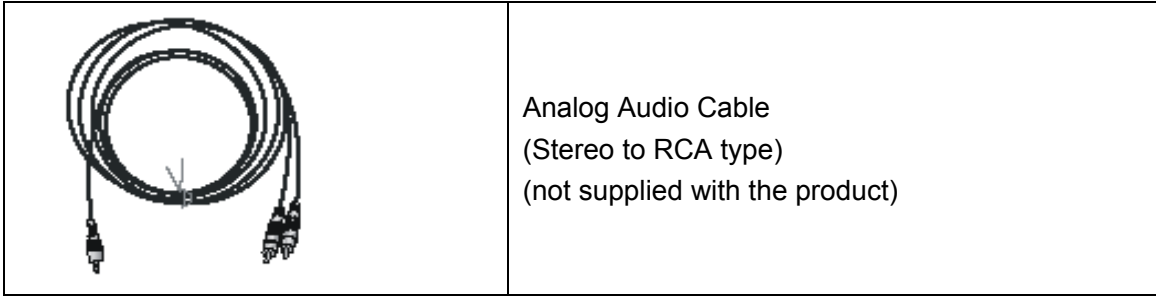
To get the best picture quality, adjust the output resolution of the source device to 1280x720p.

Press the INPUT button to select HDMI input source in input source option of Select Main source menu.

Installation

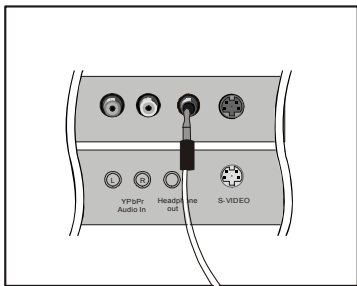
Cable sample

| | |
|---|---|
|  | <p>HDMI Cable (not supplied with the product)</p> |
|  | <p>HDMI to DVI Cable (not supplied with the product)</p> |



Connecting Headphones

You can connect a set of headphones to your set if you wish to watch a TV programmer without disturbing the other people in the room.

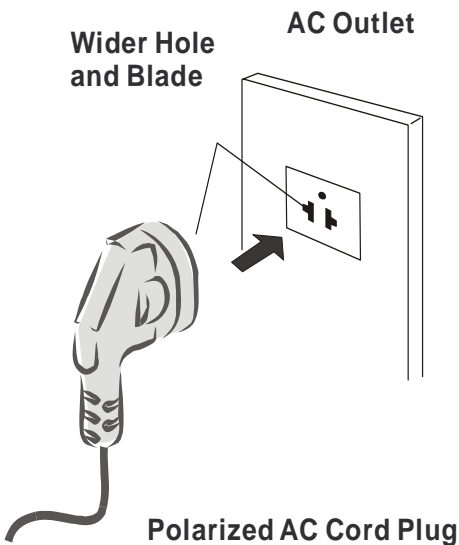


Plug a set of headphones into the 3.5mm mini-jack socket on the rear panel of the set.

Note:

- Prolonged use of headphones at a high volume may damage your hearing.
- You will not receive sound from the speakers when you connect headphones to the system.

Power source



TO USE AC POWER SOURCE

Use the AC polarized line cord provided for operation on AC. Insert the AC cord plug into a standard polarized AC outlet.

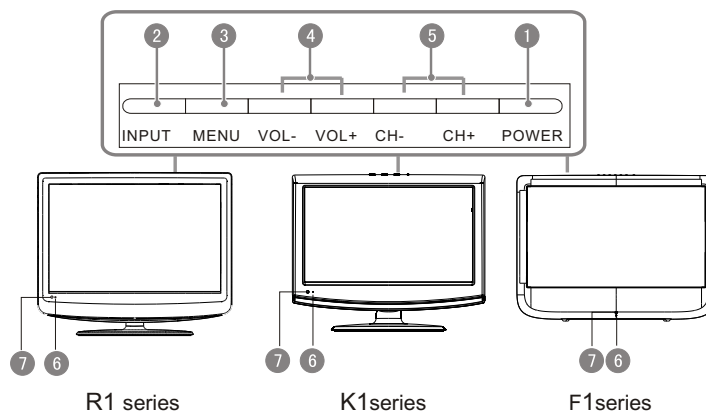
NOTES:

- Never connect the AC line cord plug to other than the specified voltage. Use the attached power cord only.
- If the polarized AC cord does not fit into a non-polarized AC outlet, do not attempt to file or cut the blade. It is the user's responsibility to have an electrician replace the obsolete outlet.
- If you cause a static discharge when touching the unit and the unit fails to function, simply unplug the unit from the AC outlet and plug it back in. The unit should return to normal operation.

6. Operation Instructions

Basal information

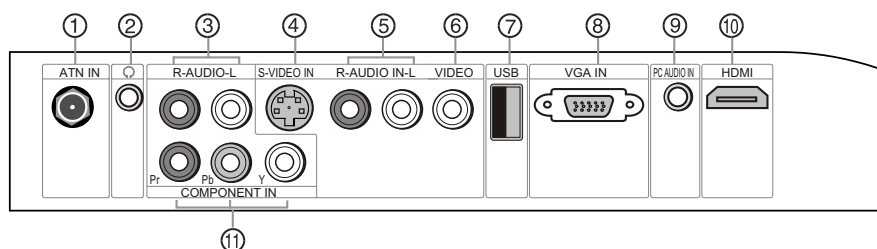
6-1 Front panel controls



Control Panel Function

- 1. POWER** Press to turn on and off the TV.
- 2. INPUT** Selects the input signals.
- 3. MENU** Menu display. Press to access the on-screen menu display.
- 4. VOL-** Volume down / Left button to adjust the item in the OSD.
VOL+ Volume up/ Right button to adjust the item in the OSD /Press to enter.
- 5. CH-** TV channel down / to select the item in the menu.
CH+ TV channel up / to select the item in the menu.
- 6. Power indicator**
- 7. Remote Sensor** Receivers IR signals from the remote control. Do not put anything near the sensor ,which may block the remote control signal.

6-2 Back panel controls



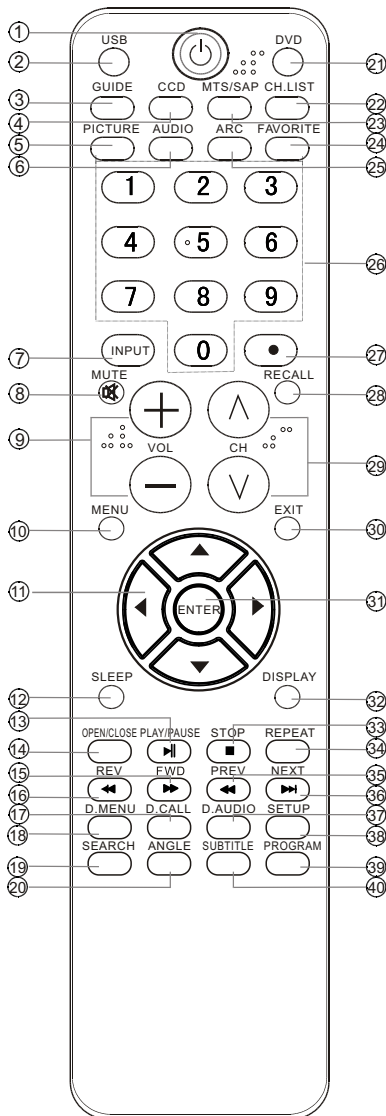
- 1. ANT IN(Antenna Input)** Connect cable or antenna signals to the TV, either directly or through your cable box.
- 2. Headphone jack :** Headphone audio output terminal.
- 3. Audio in** Connect audio output from an external device to these jacks.
- 4. S-VIDEO** Connect S-Video out from an S-Video device to the jacks.
- 5. Audio in** Connect audio output from an external device to these jacks.
- 6. Video in** Connect video output from an external device to this jack.
- 7. USB input** Connect a USB flash drive to view JPEG images or listen to MP3 songs.
- 8. VGA** Connect to the VGA 15PIN analog output connector of a PC graphics card to use set as a PC display.
- 9. PC audio in** Connect the audio output from the pc to the PC audio input port.
- 10. HDMI:** Connect a HDMI device to receive digital audio and uncompressed digital video.
- 11. Component Input** Connect a component video device to these jacks.

6-3 Setting Up Your Remote Control

After it has been set up properly, your remote control can operate in six different modes: TV, VCR, CABLE, DVD, SETBOX or AUDIO. Pressing the corresponding button on the remote control

Remote Control Key Functions

When using the remote control, aim it towards the remote sensor on the TV

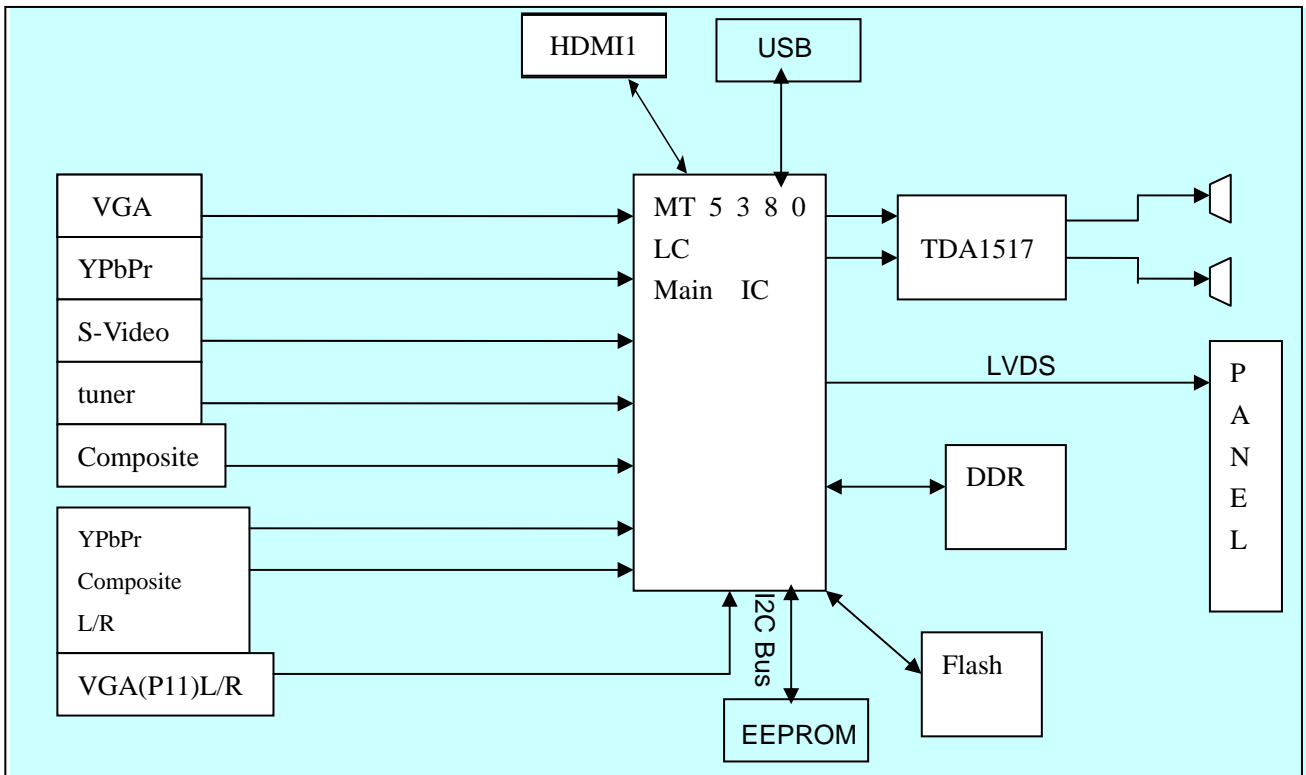


(For TV with DVD)

1. Press to turn on and off the TV
2. Press to switch input source to USB in
3. Display the guide when you are watching analog or digital channels
4. Select a closed caption
5. Press repeatedly to cycle through the available picture modes
6. Press to cycle through different sound settings
7. Show the input source
8. Switches the video sound on or off
9. Press to adjust the volume
10. Press to open the on-screen menu
11. Thumbstick (Up/Down/Left/Right)
Allows you to navigate the on-screen menus and adjust the system settings to your preference.
12. Press to display the sleep timer option
13. DVD PLAY/PAUSE
14. DVD Open/close
15. DVD FAST FORWARD
16. DVD FAST REVERSE
17. DVD CALL
18. DVD MENU
19. DVD SEARCH
20. DVD ANGLE
21. Press to switch input source to DVD in
22. Open the channel list in TV
23. Select MONO, STEREO, SAP in NTSC system
24. Open the favourite channel list in TV
25. Press to change the aspect ratio
26. Press to change a channel
27. Press to select digital channels. For example, to enter "54-3", press "54", " " and "3"
28. Press to jump back and forth between two channels
29. Press to scan through channels. To scan quickly between the last two channels, press and hold down either +/- .
30. Exit On Screen Display
31. Accesses the highlighted item in the on-screen menu
32. Press to display the TV status information on the top of the TV screen
33. DVD STOP
34. DVD REPEAT
35. DVD Previous Chapter
36. DVD Next Chapter
37. DVD AUDIO Mode
38. DVD SETUP
39. DVD PROGRAM
40. DVD SUBTITLE

7. Electrical parts

7-1. Block diagram



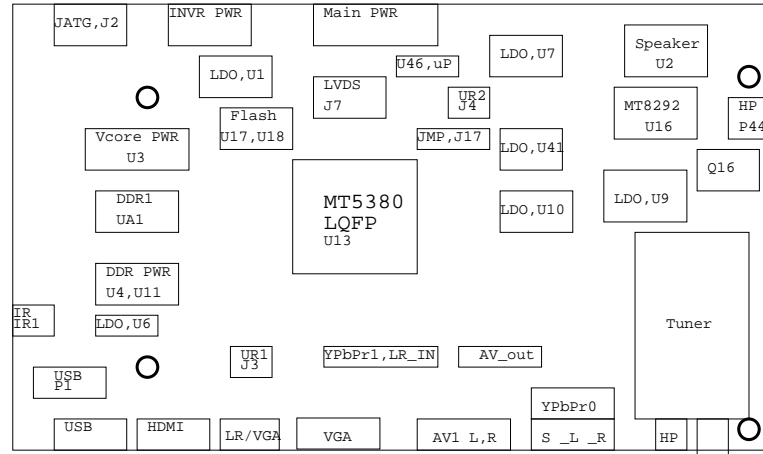
7-2. Circuit Diagram

MT5380 (DDR1) MODEL NAME: MT5380P1-V2

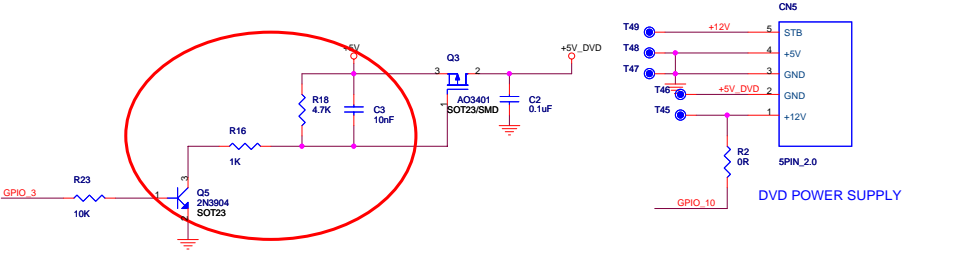
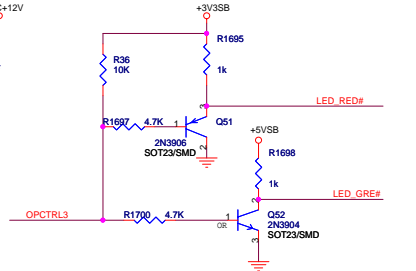
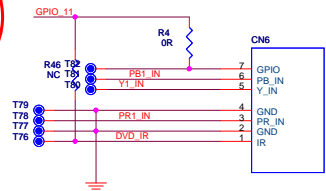
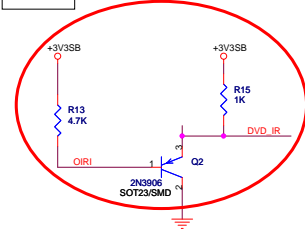
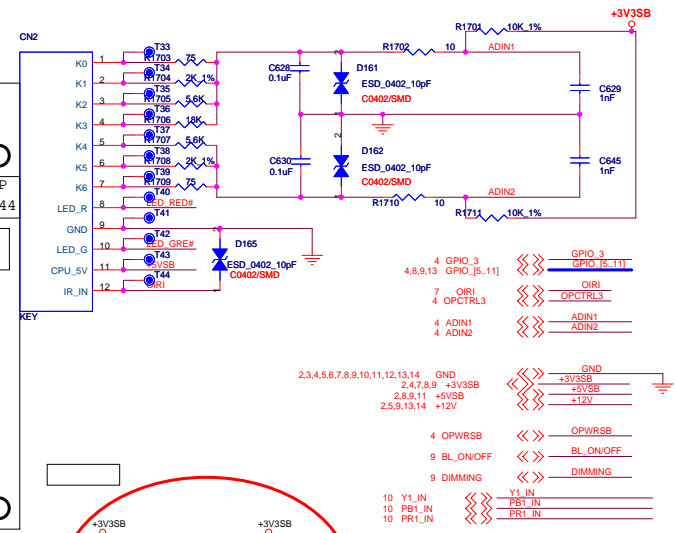
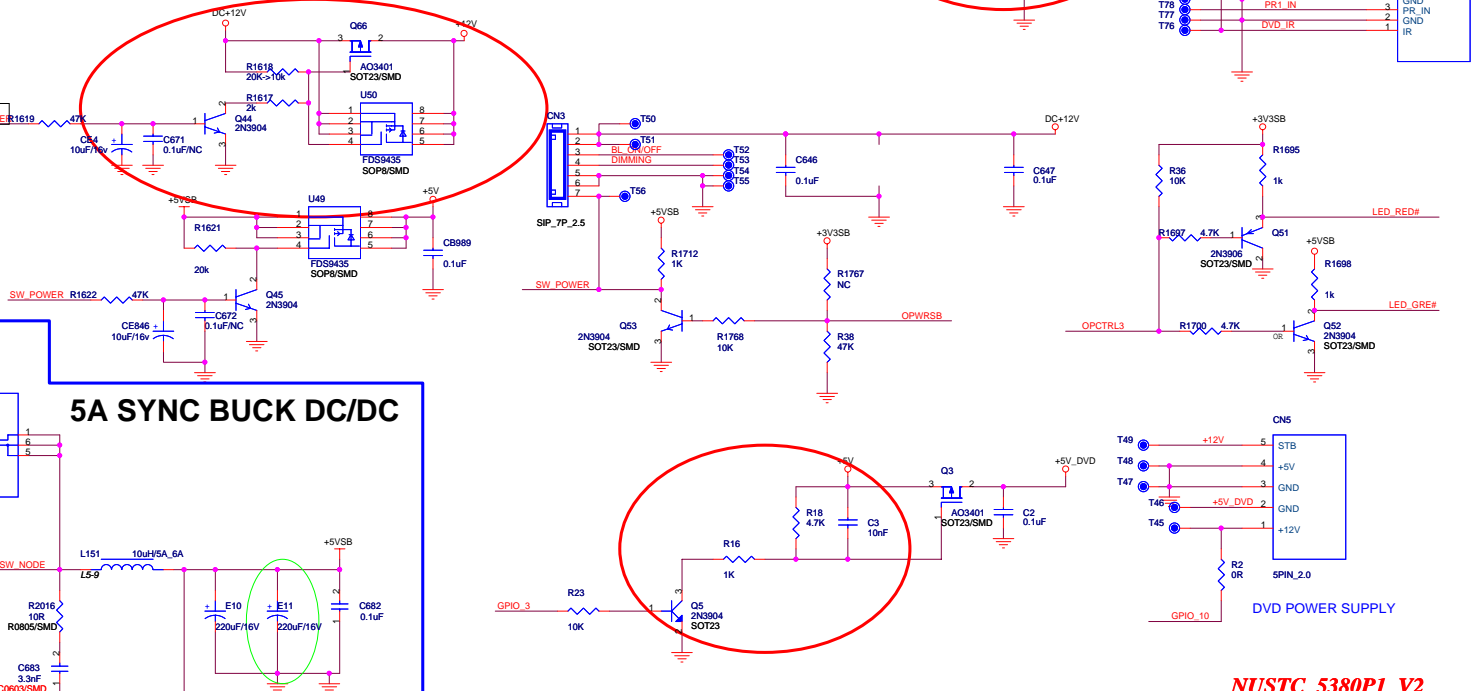
01. INDEX
02. DIGITAL POWER
03. ANALOG POWER
04. PERIPHERAL
05. ANALOG PLL/USB2.0/TUNER
06. DDR1 MEMORY
07. FLASH/JTAG/UART/IR/TRAP
08. HDMI/SPEAKER
09. LVDS/MUTE
10. YPBPR/L/R
11. VGA IN/LR
12. AV IN/LR/CVBSO
13. LINE OUT/HP
14. BACK LIGHT /MAIN POWER

| GPIO Definition | |
|-----------------|-----------------------------|
| GPIO_0 | System EEPROM Write Protect |
| GPIO_1 | Unused |
| GPIO_3 | Unused |
| GPIO_4 | Headphone Detect |
| GPIO_5 | Audio Mute Control |
| GPIO_6 | HDMI EEPROM Write Protect |
| GPIO_7 | HDMI HDP |
| GPIO_8 | Speaker Mute |
| GPIO_9 | LVDS Power Control |
| GPIO_10 | LVDS Panel Control(Reserve) |
| GPIO_11 | LVDS Panel Control(Reserve) |
| GPIO_12 | U2RX |
| GPIO_13 | U2TX |
| OPCTRL0 | CEC Function |
| OPCTRL1 | VGA EEPROM Write Protect |
| OPCTRL2 | Back Light Control |
| OPCTRL3 | Unused |
| OPCTRL4 | Trap |
| OPCTRL5 | Trap |
| AIN1,2,4 | Unused |
| OPWM0(GPIO 40) | Unused |
| VCXO(GPIO 67) | Unused |

| GPIO Definition | |
|-----------------|--------|
| RF_AGC(GPIO 62) | Unused |
| AIN3_L(GPIO 74) | Unused |
| AIN3_R(GPIO 75) | Unused |

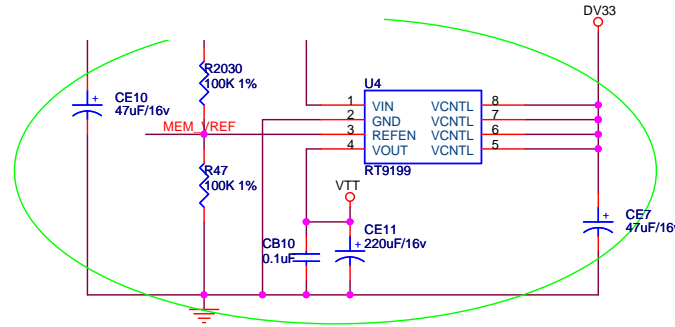
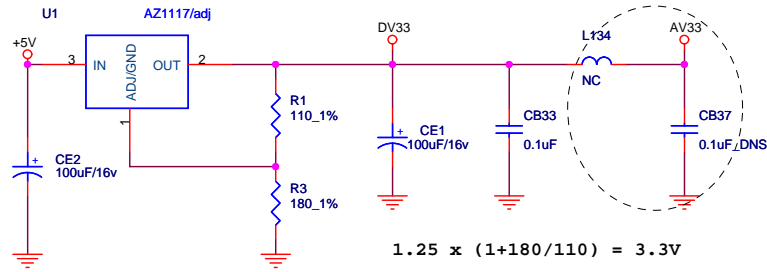


| Rev | History | Note | DATE |
|-----|--|------|------------|
| V1 | INITIAL VERSION | | 2007/04/09 |
| V2 | 1. Change Vcore Voltage. 2. Add FB for DV33 and AV33 Reserve | | 2007/06/11 |
| | 3. Add R49, R50 for a version IC. 4. Change C20, C21 for crystal capacitors. | | 2007/06/11 |
| | 5. Add DRAM Serial resistors. 6. Add CEC uP. 7. Add U16 MT8292 | | 2007/06/11 |

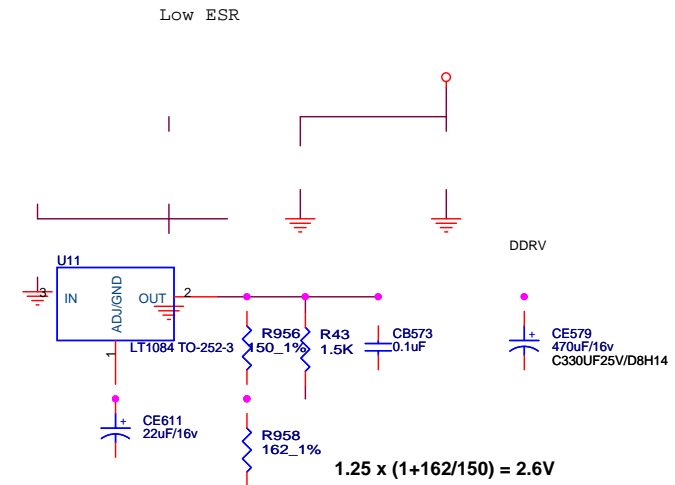
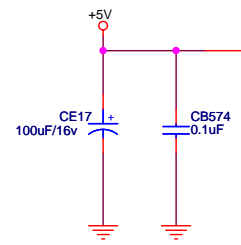
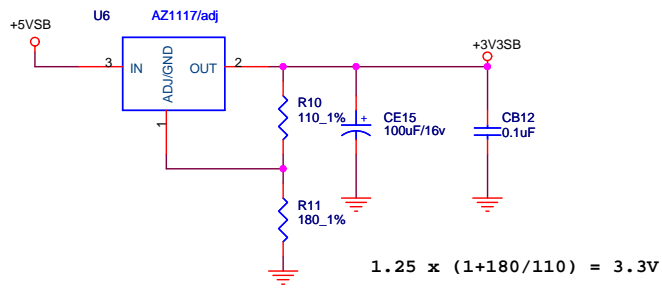
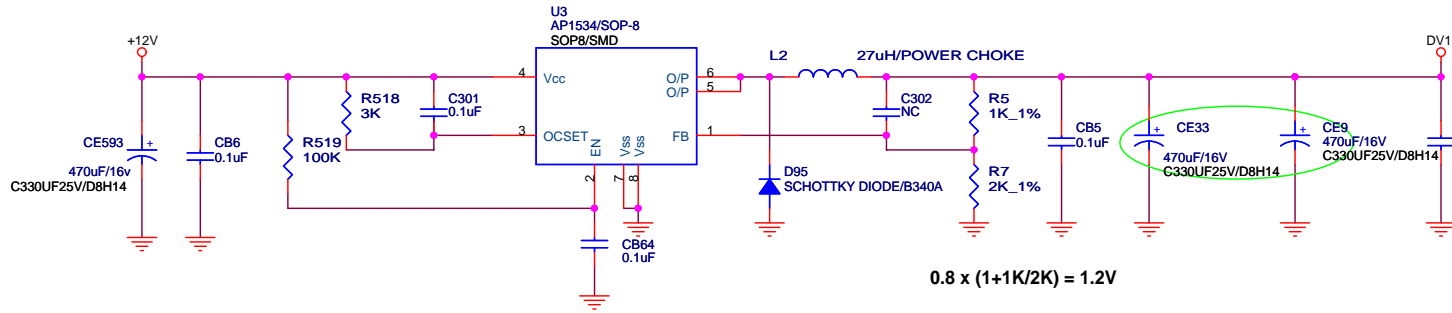


NUSTC_5380P1_V2

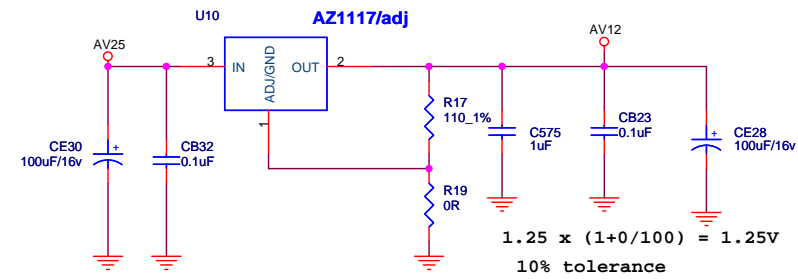
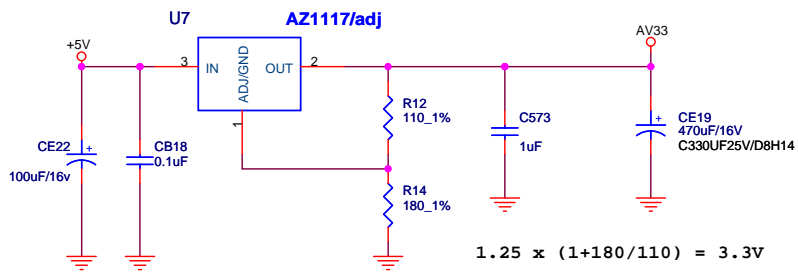
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|---|---------------------------|-------|---------|
| MediaTek Inc. | | | |
| No. 1-2, Innovation Rd 1, GSP, Hsin-Chu City 300 Tel: (886) 92-0726 Fax: (886) 92-7610 | | | |
| INDEX/MAIN POWER | | | |
| File | Document Number | Drawn | Rev |
| | MT5380P1-V2 | | V1 |
| Size | Document Number | Drawn | Rev |
| C | MT5380P1-V2 | | V1 |
| Date: | Friday, December 05, 2008 | Sheet | 1 of 15 |



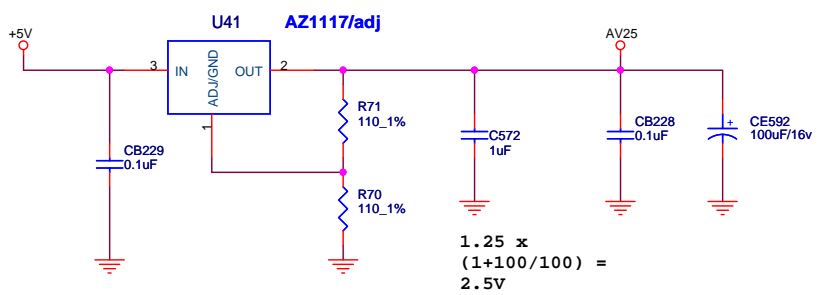
| | | | |
|--------------------------------|----------|------|----------|
| 1,3,4,5,6,7,8,9,10,11,12,13,14 | GND | <<>> | GND |
| 1,8,9,11 | +5VSB | <<>> | +5VSB |
| 1,4,7,8,9 | +3V3SB | <<>> | +3V3SB |
| 7 | DV10 | <<>> | DV10 |
| 6 | MEM_VREF | <<>> | MEM_VREF |
| 6 | VTT | <<>> | VTT |
| 6 | DDRV | <<>> | DDRV |
| 3,5,8,9,13 | AV33 | <<>> | AV33 |
| 1,5,9,13,14 | +12V | <<>> | +12V |



| | | |
|---|-----------------|-----------|
| + | CE579 | 470uF/16v |
| + | C330UF25V/D8H14 | |

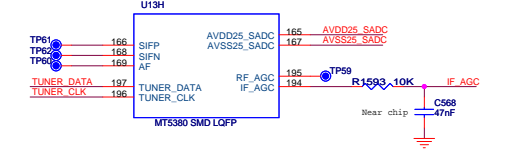
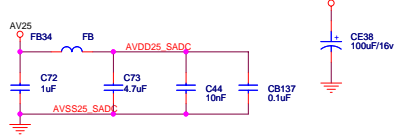
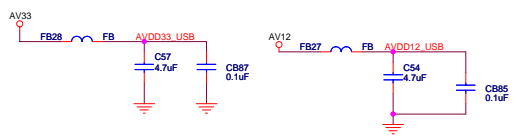
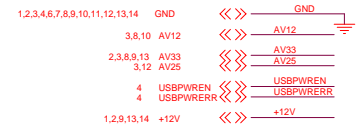
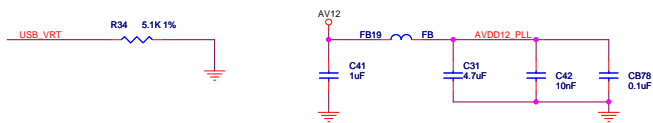
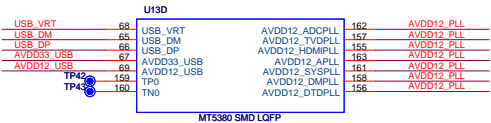


- 1,2,4,5,6,7,8,9,10,11,12,13,14 GND
- 2,5,8,9,13 AV33
- 5,8,10 AV12
- 5,12 AV25
- 1,2,5,9,13,14 +12V

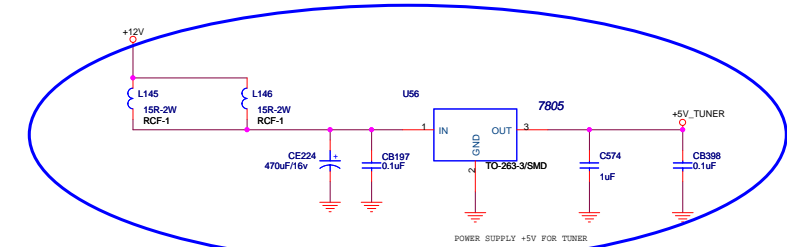
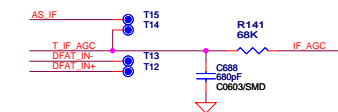
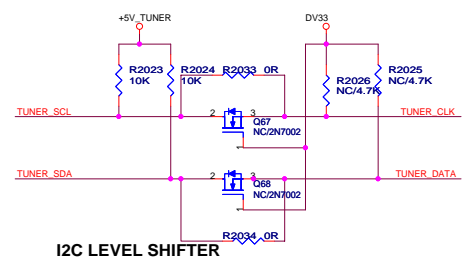
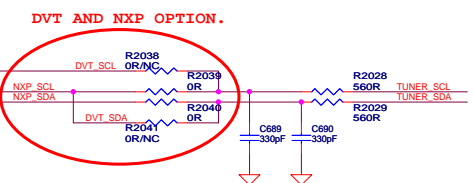
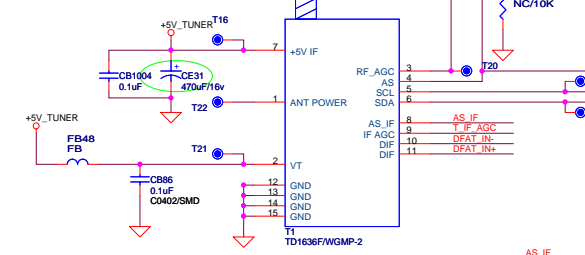
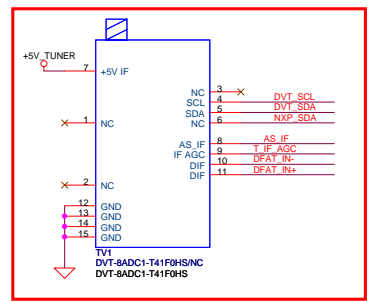
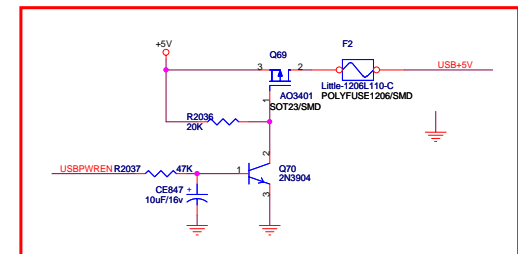
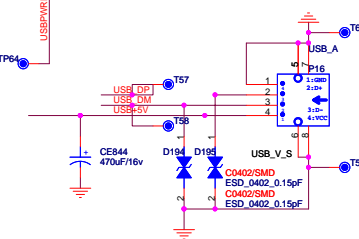
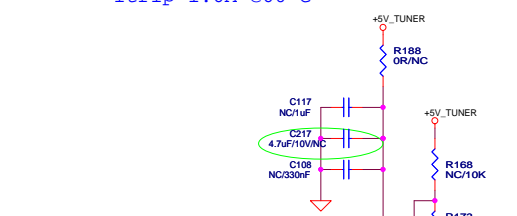
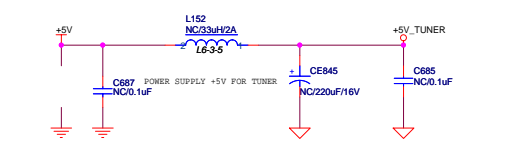


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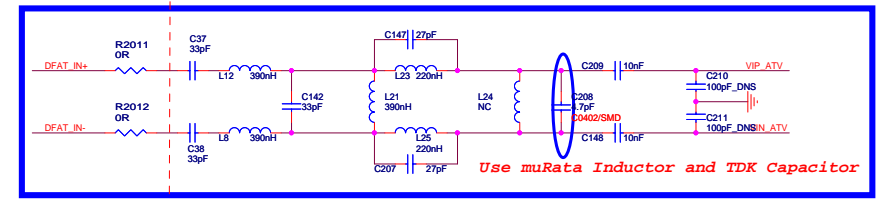
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| MediaTek Inc. | | | |
| No.1-2, Innovation Rd 1, SBIP, Hsin-Chu City 300 TEL:(03)567-0766 FAX:(03)578-7610 | | | |
| Title ANALOG POWER | | | |
| Size B | Document Number MT5380P1-V2 | Drawn | Rev V1 |
| Date: | Thursday, December 04, 2008 | Sheet 3 of 15 | |



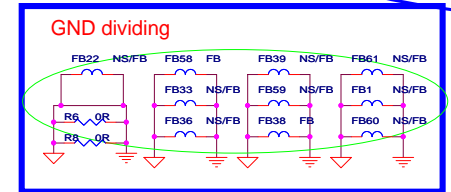
use this POLYSWITCH PTC to avoid over current.
 tyco nanoSMDC110F :
 Ihold=0.8A
 Itrip=1.6A @60°C



Near Tuner Near MT538X



muRata: LQM18NNR22K00 和 LQM18NNR39K00

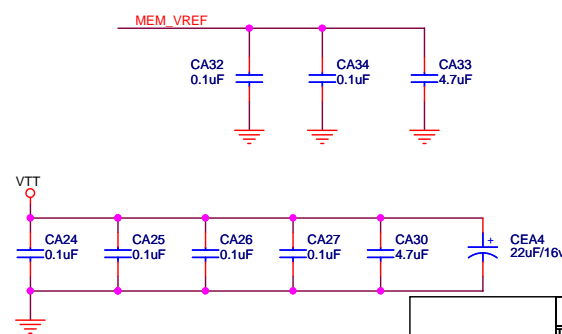
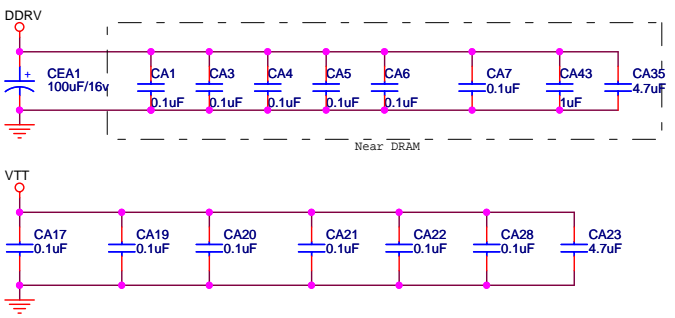
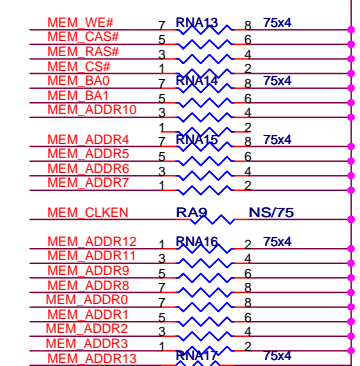
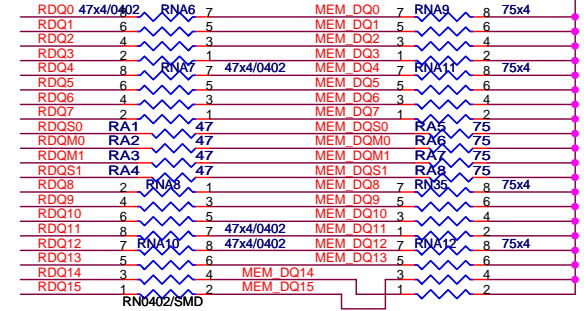
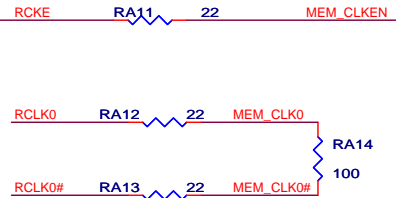
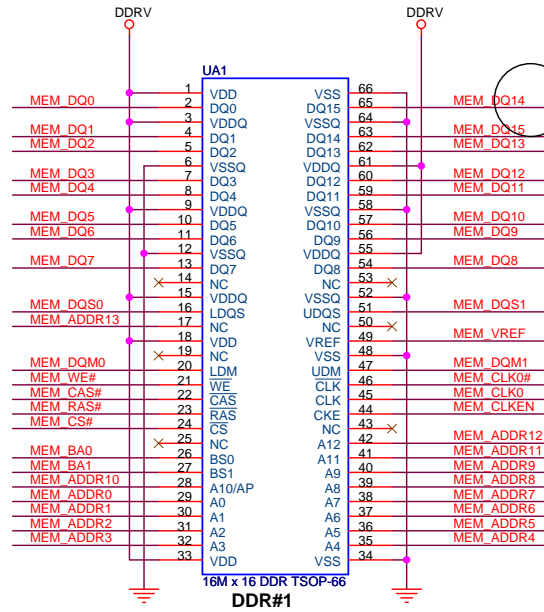
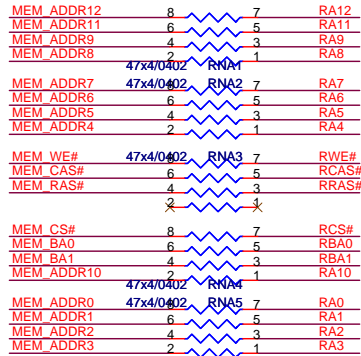
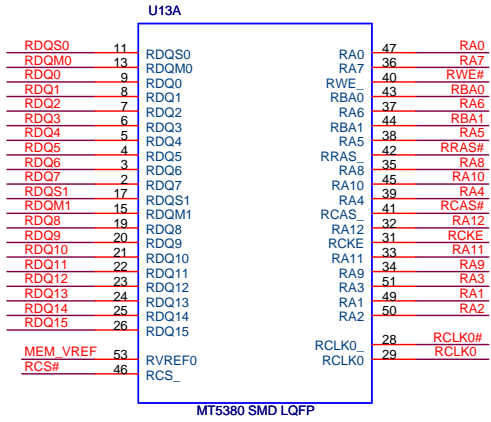


NUSTC_5380P1_V2

MediaTek Inc. No.1-2, Innovation Rd 1, S&IP, Hsin-Chu City 300
 TEL: (86)887-6788 FAX: (86)887-6810

Analog PLL / USB2.0/TUNER

| | | | |
|-------|-----------------------------|-------|---------|
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| C | MTS380P1-V2 | | V1 |
| Date: | Thursday, December 04, 2008 | Sheet | 5 of 15 |

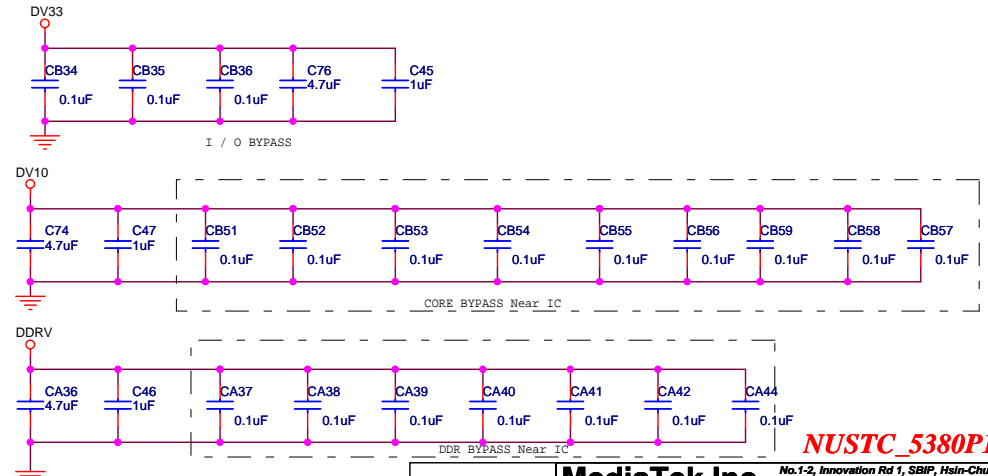
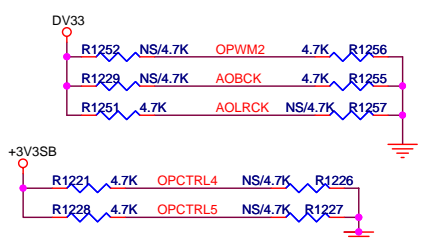
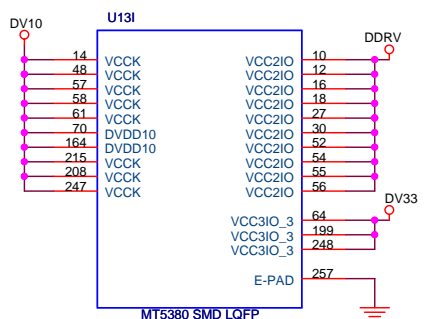
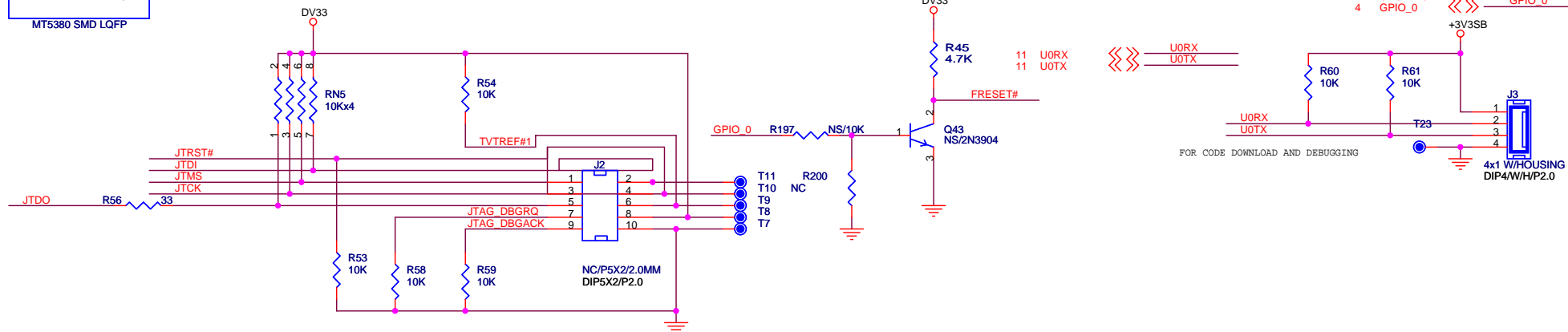
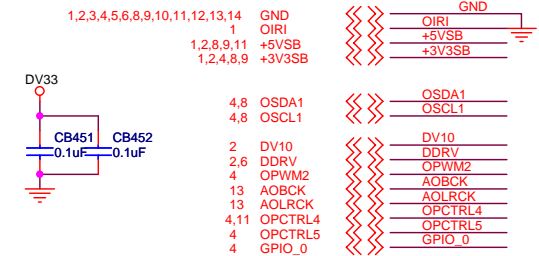
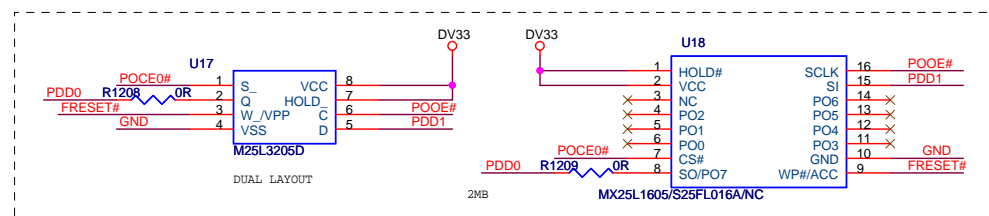
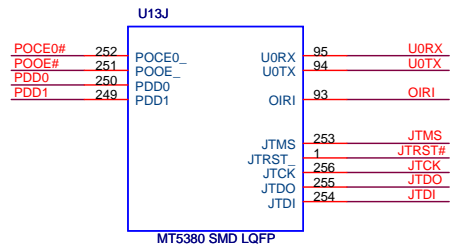


NUSTC_5380P1_V2

MediaTek Inc. No.1-2, Innovation Rd 1, SBIP, Hsin-Chu City 300
TEL:(03)567-0766 FAX:(03)578-7610

Title: **DDR1 MEMORY**

| | | | |
|--------|---------------------------------------|---------------|-----------|
| Size B | Document Number MT5380P1-V2 | Drawn | Rev V1 |
| Date: | Thursday, December 04, 2008 | Sheet 6 of 15 | |



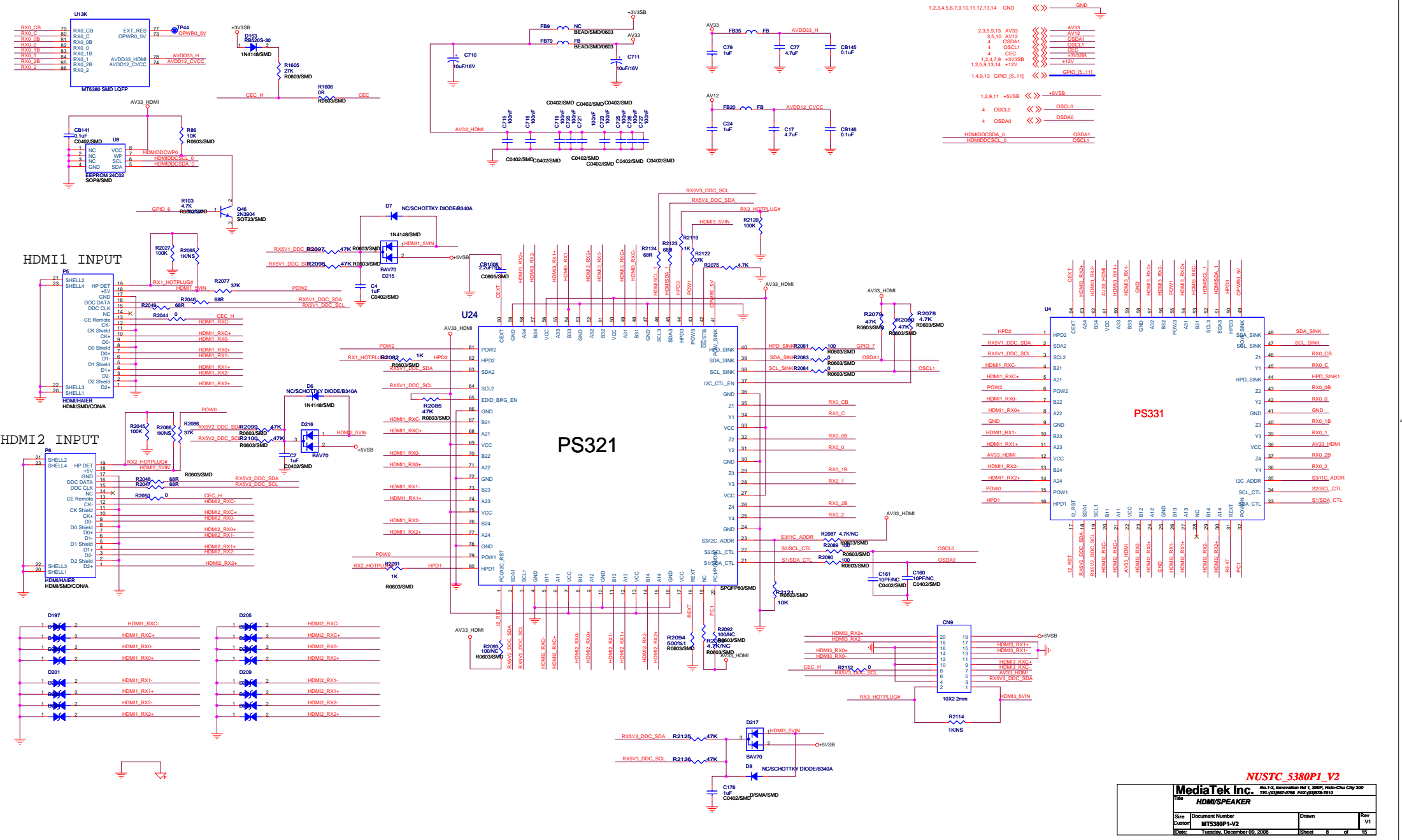
| | | | |
|-----------------|----------|----------|----------|
| Trap Mode | OPWM2 | AOBCK | AOLRCK |
| Normal mode | 0 | 0 | 0 |
| ICE mode | 0 | 0 | 1 |
| Trap Mode | OPCTRL5 | OPCTRL4 | |
| Core Reset 1 us | 1 | 1 | |

NUSTC_5380P1_V2

MediaTek Inc. No.1-2, Innovation Rd 1, SBIP, Hsin-Chu City 300
TEL:(03)561-0766 FAX:(03)578-7610

Title: **FLASH/JTAG/UART/IR/TRAP**

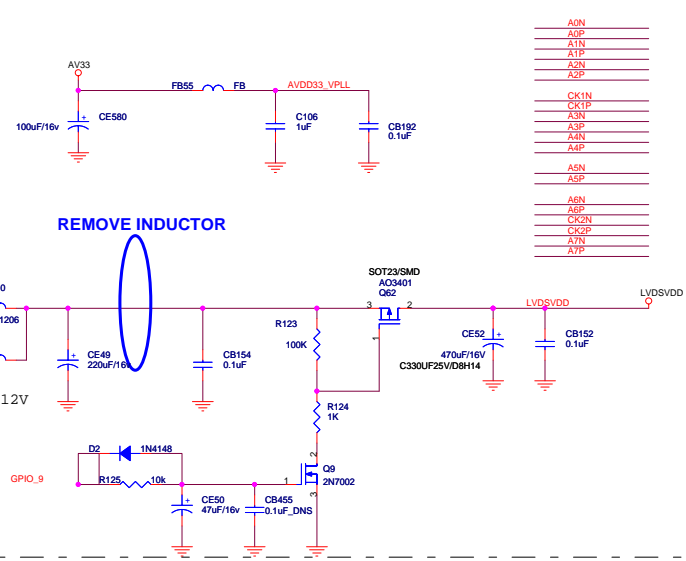
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| Date: | Thursday, December 04, 2008 | Sheet | 7 of 15 |



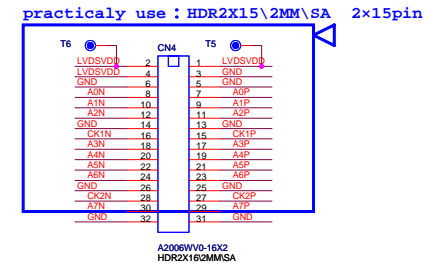
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|---------------|----------------------------|--|---------|
| MediaTek Inc. | | No. 1-2, Innovation Rd 1, SEP, Hsin-Chu City 300 | |
| HDMISPEAKER | | TEL: (86)887-0768 FAX: (86)887-7810 | |
| Size | Document Number | Drawn | Rev |
| Custom | MTS380P1-V2 | | V1 |
| Date | Tuesday, December 06, 2006 | Sheet | 8 of 16 |

| U13C | | |
|------|-----|--------------|
| A0N | 244 | AVDD33_LVDS4 |
| A0P | 243 | AVDD33_LVDS4 |
| A1N | 242 | AVDD33_LVDS4 |
| A1P | 241 | AVDD33_LVDS4 |
| A2N | 238 | AVDD33_VPLL |
| A2P | 238 | AVDD33_VPLL |
| CK1N | 237 | AVDD33_VPLL |
| CK1P | 236 | AVDD33_VPLL |
| A3N | 235 | AVDD33_VPLL |
| A3P | 234 | AVDD33_VPLL |
| A4N | 233 | AVDD33_VPLL |
| A4P | 232 | AVDD33_VPLL |
| A5N | 230 | AVDD33_VPLL |
| A5P | 229 | AVDD33_VPLL |
| A6N | 228 | AVDD33_VPLL |
| A6P | 227 | AVDD33_VPLL |
| CK2N | 226 | AVDD33_VPLL |
| CK2P | 225 | AVDD33_VPLL |
| A7N | 224 | AVDD33_VPLL |
| A7P | 223 | AVDD33_VPLL |

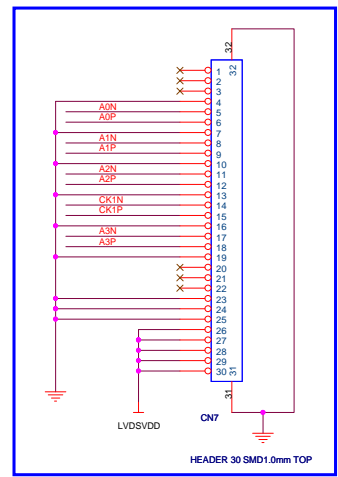


| | | | |
|--------------------------------|--------------|------|--------------|
| 1,2,3,4,5,6,7,8,10,11,12,13,14 | GND | <<>> | GND |
| 1,2,5,13,14 | +12V | <<>> | +12V |
| 2,3,5,8,13 | AV33 | <<>> | AV33 |
| 1,4,8,13 | GPIO_[5..11] | <<>> | GPIO [5..11] |

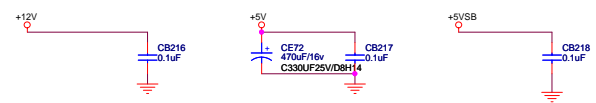
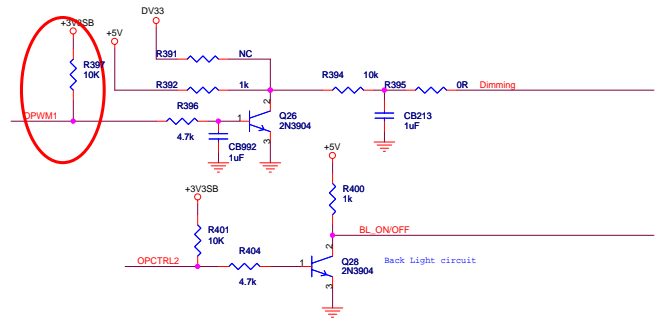


| | | | |
|--------------------------------|------------|------|------------|
| 1,2,3,4,5,6,7,8,10,11,12,13,14 | GND | <<>> | GND |
| 1,2,5,13,14 | +12V | <<>> | +12V |
| 1,2,8,11 | +5VSB | <<>> | +5VSB |
| 1,2,5,13,14 | +12V | <<>> | +12V |
| 4 | OPCTRL2 | <<>> | OPCTRL2 |
| 1,2,4,7,8 | +3V3SB | <<>> | +3V3SB |
| 4,7 | OPWM[1..2] | <<>> | OPWM[1..2] |
| 1 | BL_ON/OFF | <<>> | BL_ON/OFF |
| 1 | DIMMING | <<>> | DIMMING |

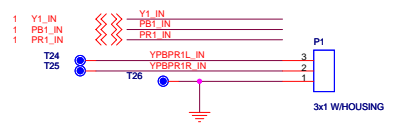
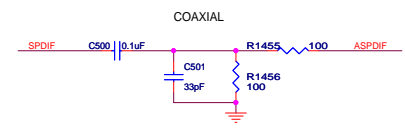
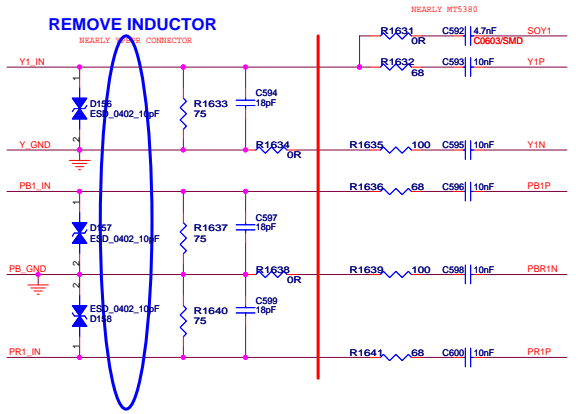
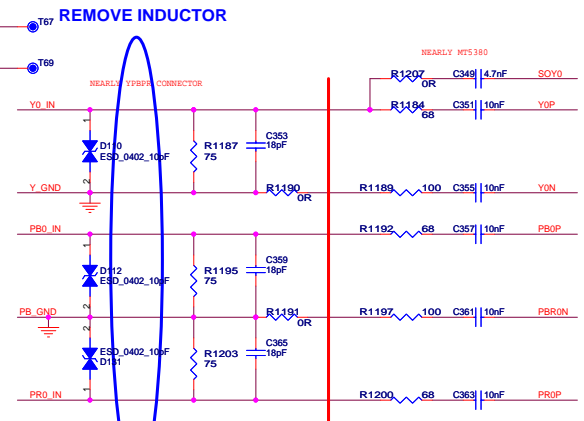
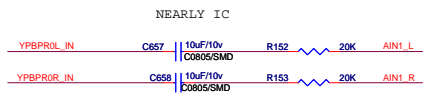
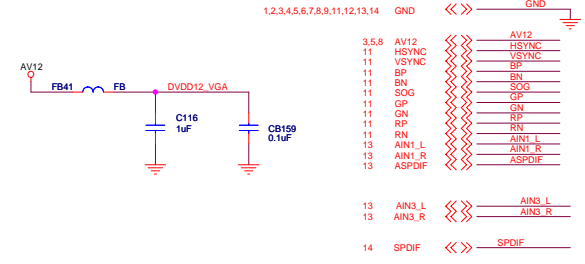
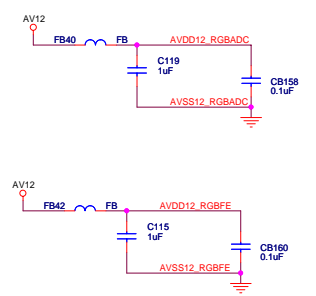
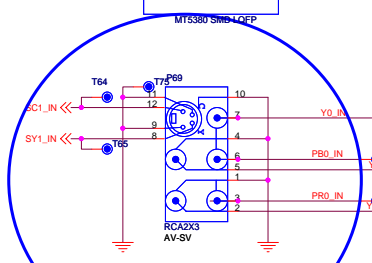
HI => LVDS POWER ON
LO => LVDS POWER OFF



use for 21.6 inch panel with TCON CMO



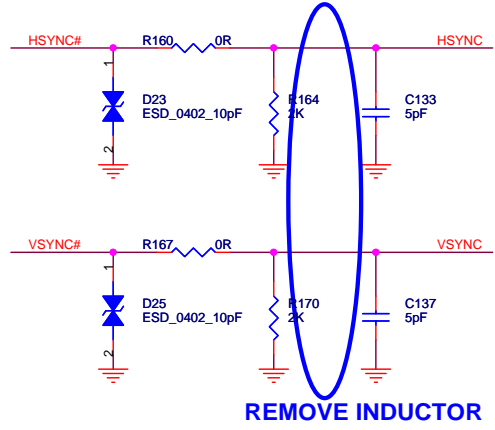
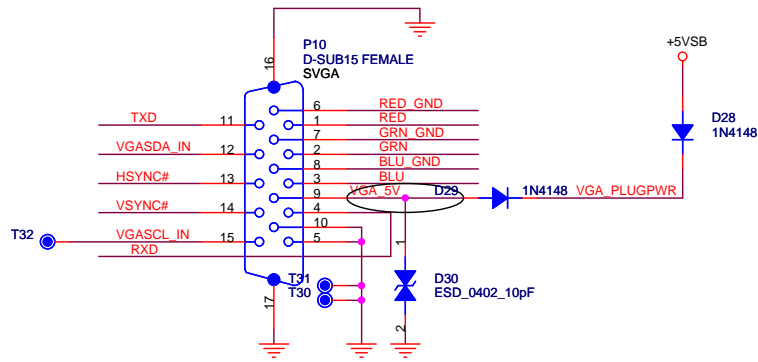
| U13E | | | | | |
|------|-----|------|---------------|-----|---------------|
| SOY0 | 107 | SOY0 | DVDD12_VGA | 117 | DVDD12_VGA |
| Y0P | 108 | Y0P | AVSS12_RGBADC | 113 | AVSS12_RGBADC |
| Y0N | 109 | Y0N | AVDD12_RGBADC | 110 | AVDD12_RGBADC |
| PB0P | 114 | PB0P | AVSS12_RGBPFE | 105 | AVSS12_RGBPFE |
| PB0N | 115 | PB0N | AVDD12_RGBPFE | 101 | AVDD12_RGBPFE |
| PR0P | 116 | PR0P | | | |
| SOY1 | 118 | PR0P | RP | 104 | RP |
| Y1P | 119 | SOY1 | RN | 106 | RN |
| Y1N | 120 | Y1P | BP | 98 | BP |
| PB1P | 121 | Y1N | BN | 99 | BN |
| PB1N | 122 | PB1P | GP | 102 | GP |
| PR1P | 123 | PR1N | GN | 103 | GN |
| | | PR1P | VSYNC | 96 | VSYNC |
| | | TP47 | HSYNC | 97 | HSYNC |
| | | TP48 | SOG | 100 | SOG |
| | | TN1 | | | |
| | | TP1 | | | |



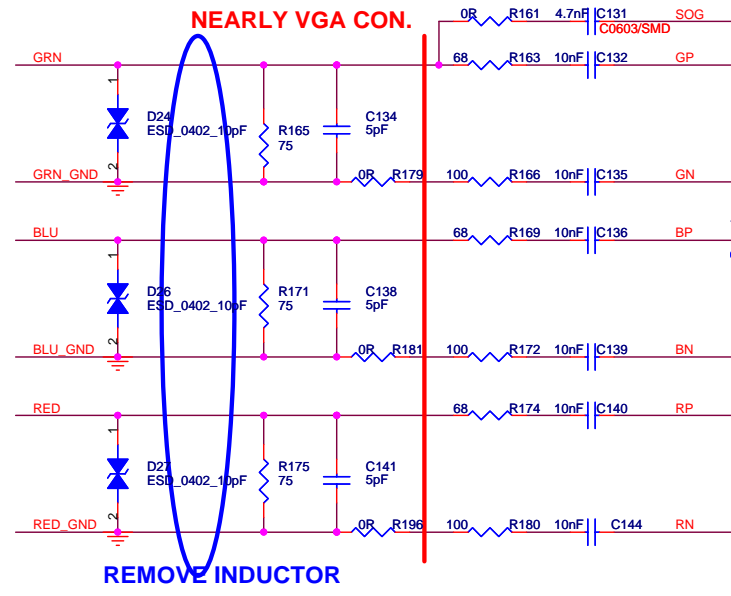
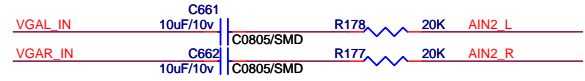
NUSTC_5380P1_V2

MediaTek Inc. No.1-2, Innovation Rd 1, S&IP, Hsin-Chu City 300
TEL: (86)887-6788 FAX: (86)887-6810

| | | | |
|-----------------------------------|-------------------------------------|--------|---------|
| File: YPbPr/LR | | | |
| Size: C | Document Number: MT5380P1-V2 | Drawn: | Rev: V1 |
| Date: Thursday, December 04, 2008 | Sheet: 10 | of 15 | |

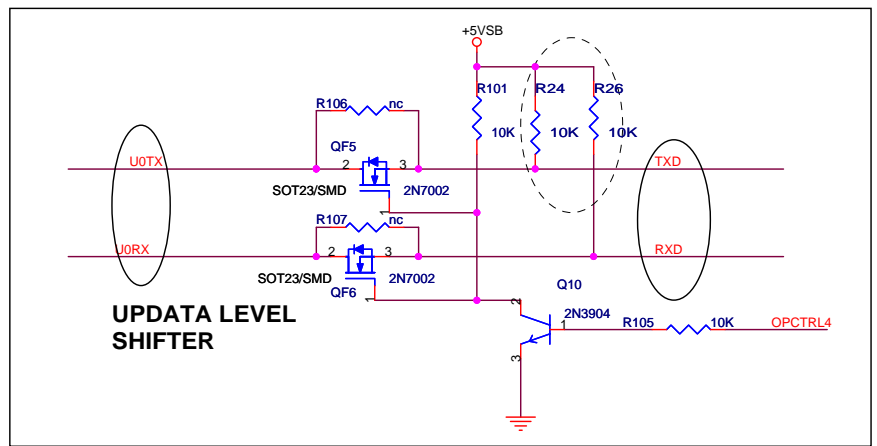
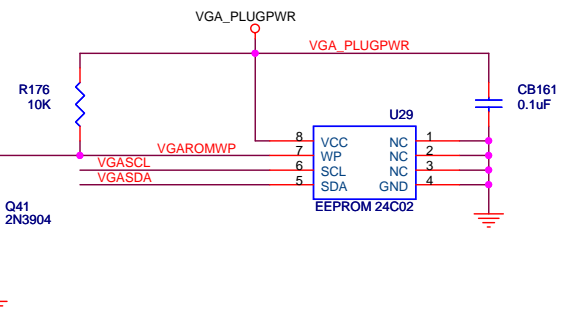
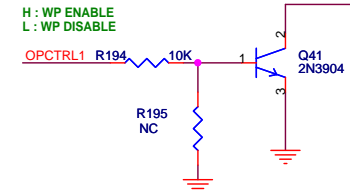
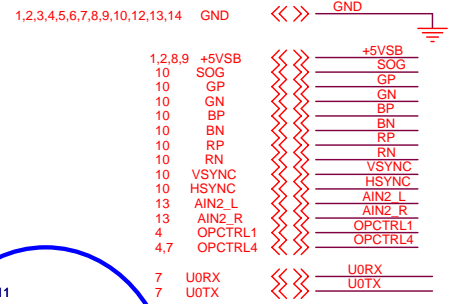
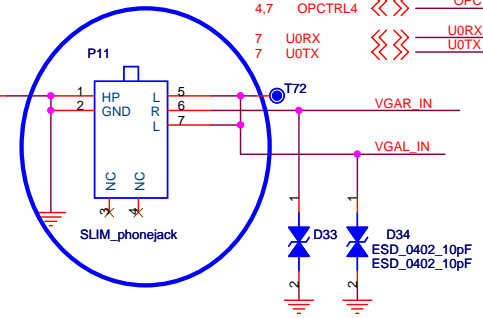


REMOVE INDUCTOR

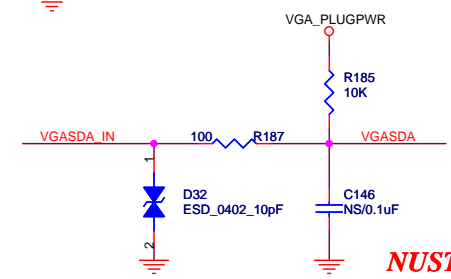
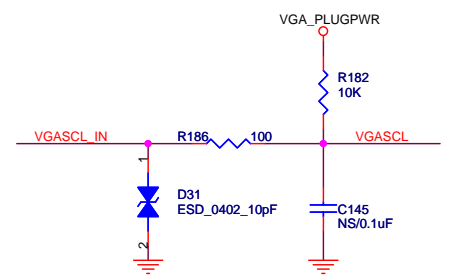


REMOVE INDUCTOR

NEARLY IC

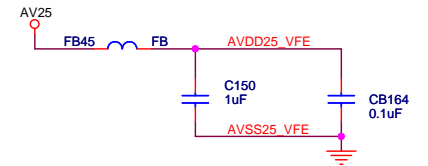
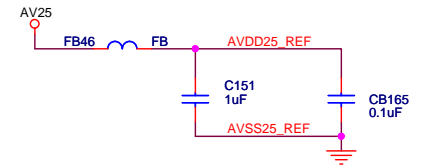
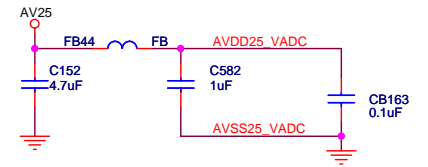
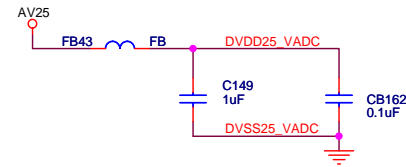
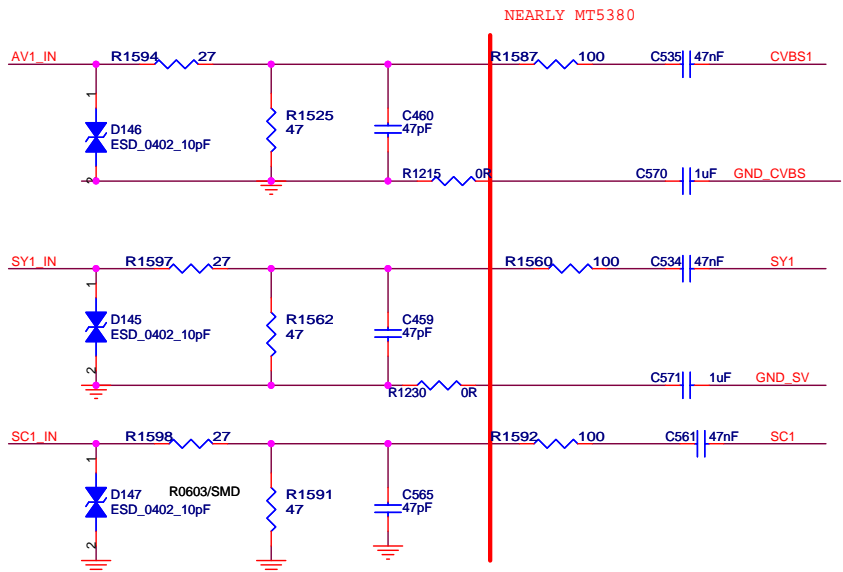
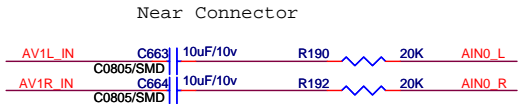
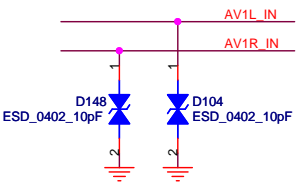
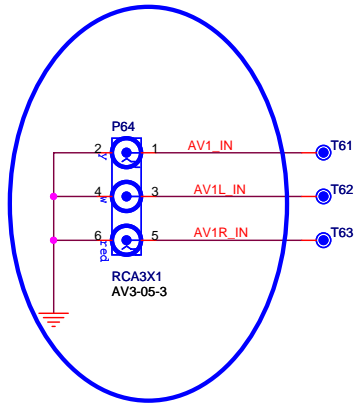
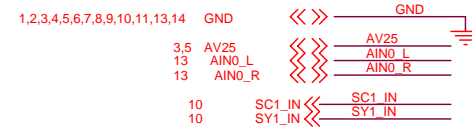
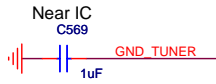
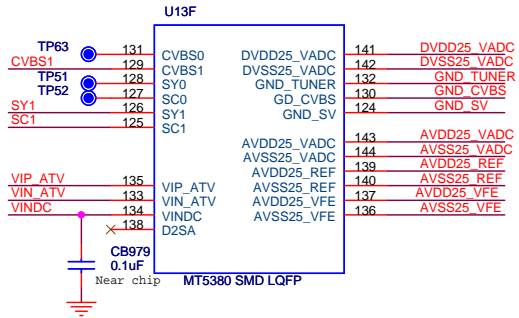


UPDATA LEVEL SHIFTER



NUSTC_5380P1_V2

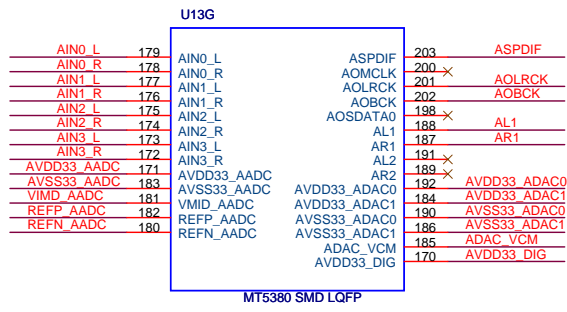
| | | | |
|--|------------------------------------|-------|--------|
| MediaTek Inc. No.1-2, Innovation Rd 1, SBIP, Hsin-Chu City 300 TEL:(03)567-0766 FAX:(03)578-7610 | | | |
| Title VGA IN/LR | | | |
| Size B | Document Number MT5380P1-V2 | Drawn | Rev V1 |
| Date: Thursday, December 04, 2008 | Sheet 11 | of 15 | |



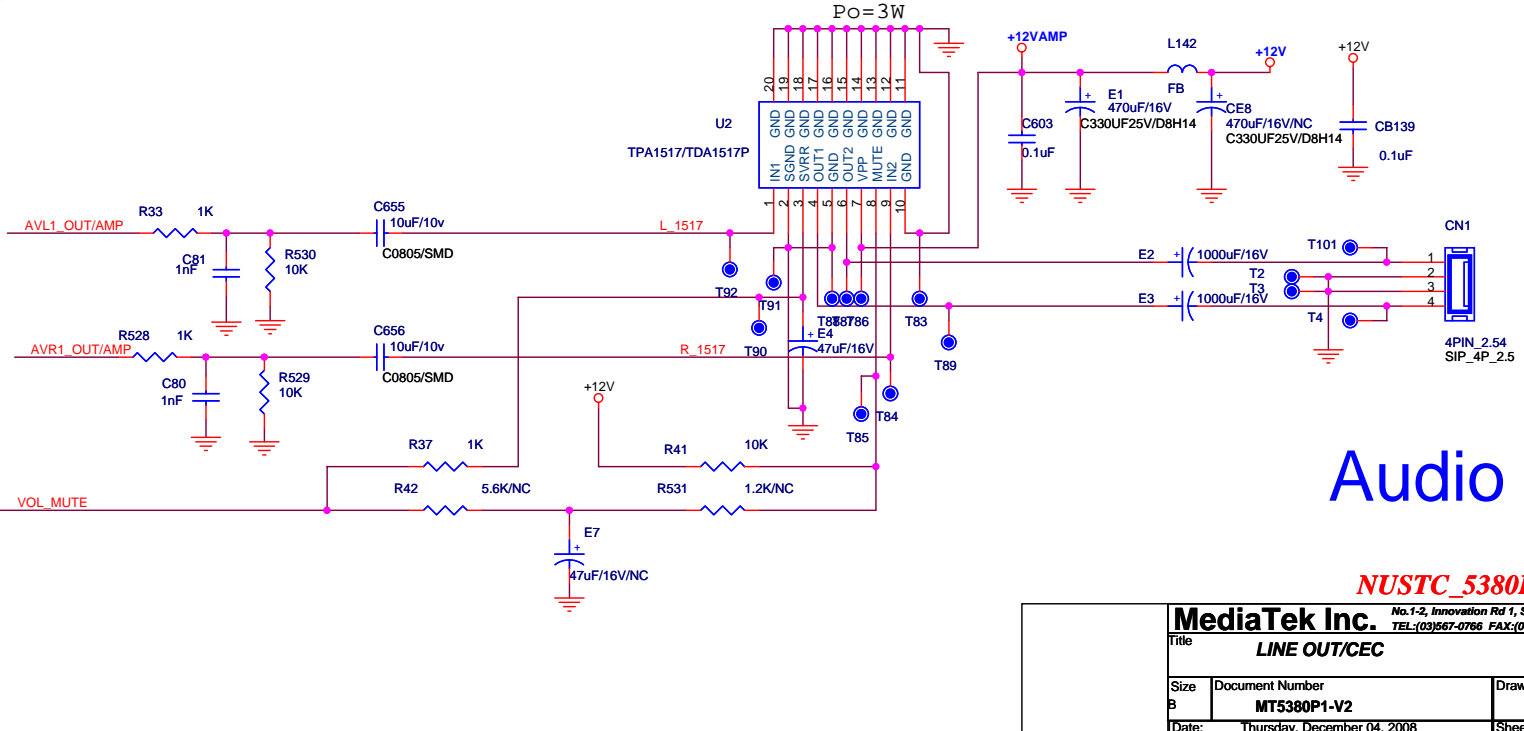
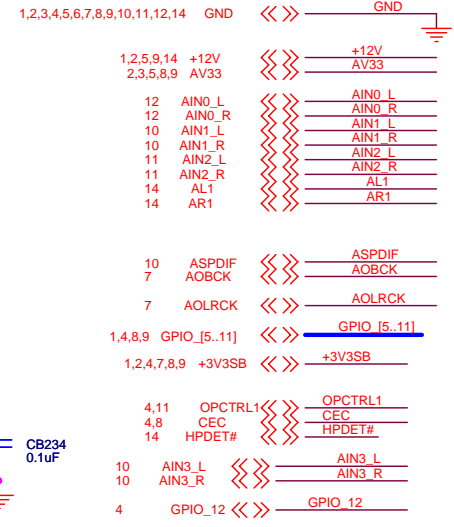
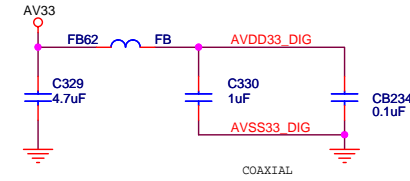
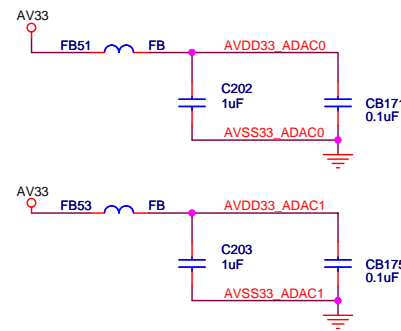
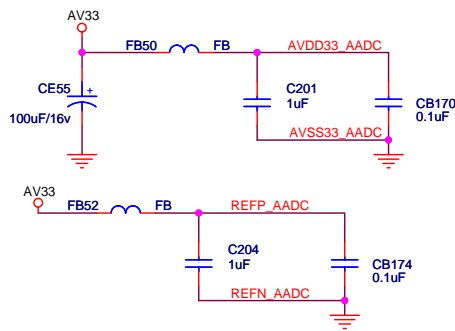
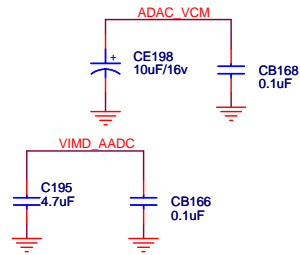
NO VIDEO OUTPUT

NUSTC_5380P1_V2

| | | | |
|---|---------------------------------------|----------|-----------|
| MediaTek Inc. | | | |
| No.1-2, Innovation Rd 1, SBIP, Hsin-Chu City 300 TEL:(03)567-0766 FAX:(03)578-7610 | | | |
| Title AV IN/L/CVBS0 | | | |
| Size B | Document Number MT5380P1-V2 | Drawn | Rev V1 |
| Date: Thursday, December 04, 2008 | Sheet 12 | of 15 | |



Need fine tune timing

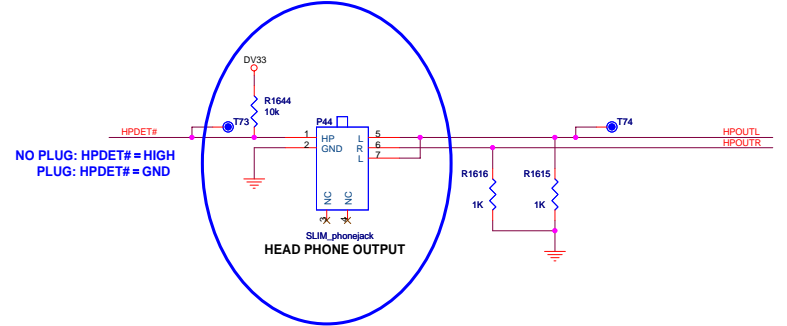
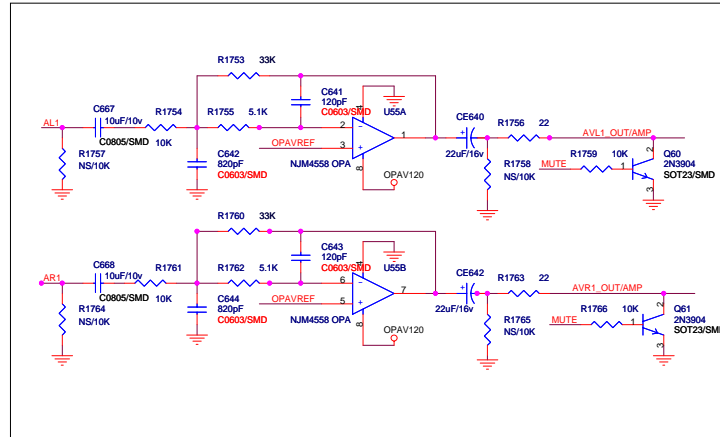
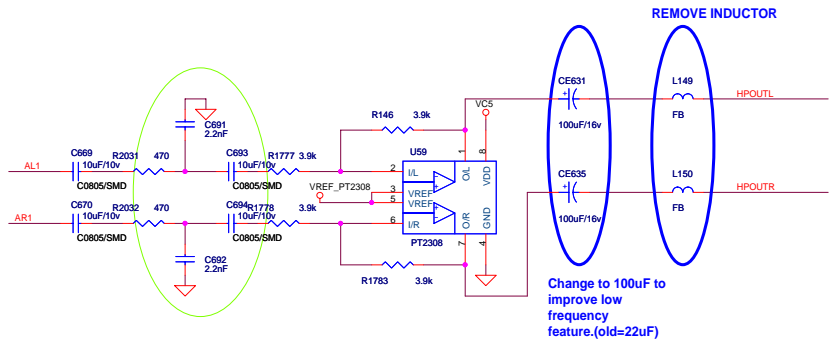
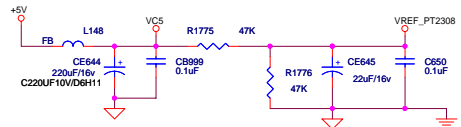
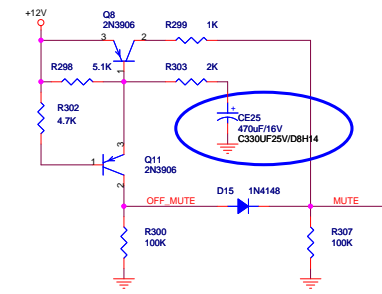
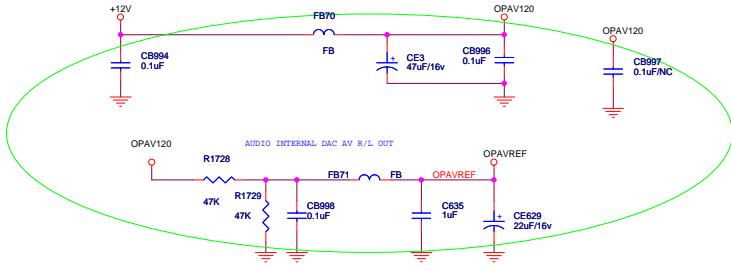
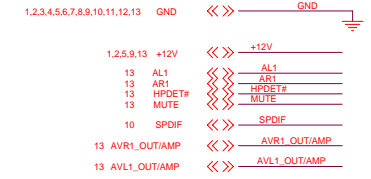


Audio AMP

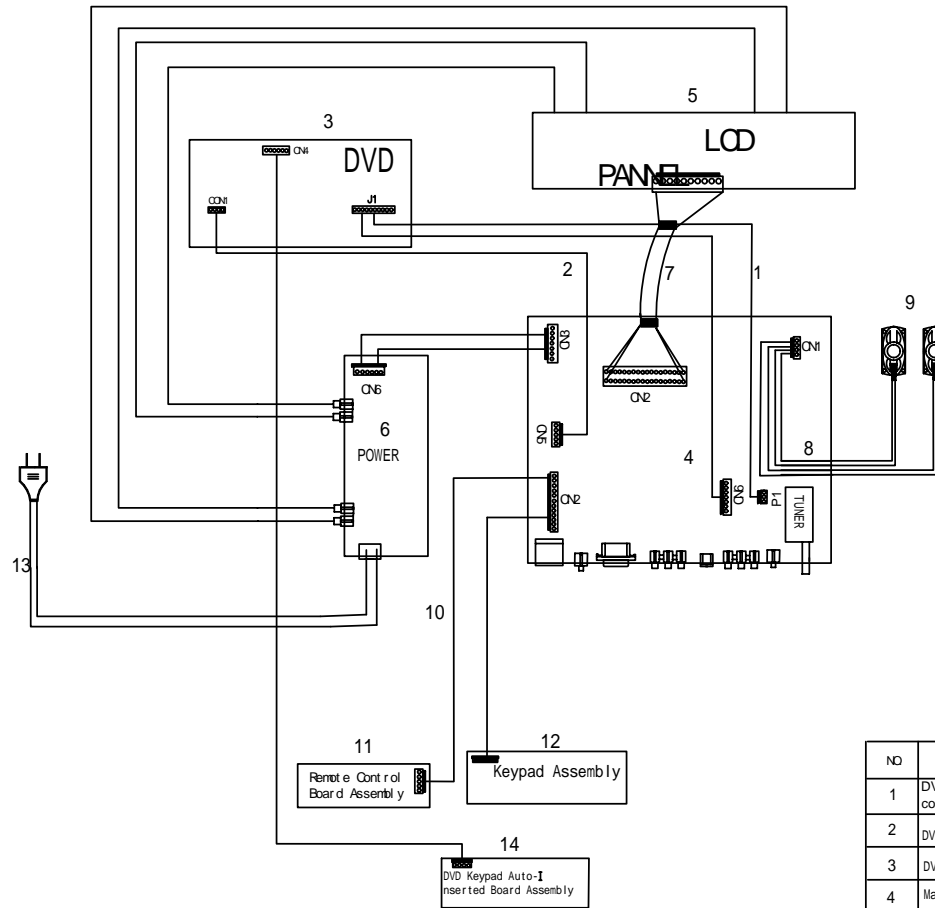
NUSTC_5380P1_V2

| | | | |
|--|-----------------------------|----------------|-----|
| MediaTek Inc. No.1-2, Innovation Rd 1, SBIP, Hsin-Chu City 300 TEL:(03)567-0766 FAX:(03)578-7610 | | | |
| Title LINE OUT/CEC | | | |
| Size | Document Number | Drawn | Rev |
| b | MT5380P1-V2 | | V1 |
| Date: | Thursday, December 04, 2008 | Sheet 13 of 15 | |

AUDIO_OUTPUT



| | |
|-----------------------------------|----------------|
| customer type | HLC22K1 |
| Haier type | LX22K3W |
| special number | DC1490E0100 |
| special technique document number | AT08SR1101US07 |
| export country | AMERICA |
| customer | HAC |
| brand | Haier |



| NO | NAME | Serial NO | Spec | Quantity |
|---------|-------------------------------|--------------|-----------------|----------|
| 1 | DVD signal connection wire | 0090402064 | | |
| 2 | DVD Power wire | 0090403161A | | |
| 3 | DVD(0090810121A) | DC1490E0100C | | |
| 4 | Main board (0290719615) | DC1490E0100M | | |
| 5 | LCD Panel | 0094001227CA | | |
| 6 | Power Supply | 0094001224B | | |
| 7 | LVDS wire | 0090402338 | | |
| 8 | Speaker wire | 0090402199A | | |
| 9 | Speaker | 0094001218 | | |
| 10 | Combination Wire | 0090402388A | | |
| 11 | Remote Control Board Assembly | 0090719244 | | |
| 12 | Keypad Assembly | 0090701136 | | |
| 13 | Power cord | 0090403211 | | |
| 14 | DVD Keypad Assembly | 0090719333 | | |
| Workout | Auditing | | Standardization | Approval |

8. Measurements and Adjustments

8-1. Service Mode

8-1-1. How to enter into Service Mode

The way to the factory mode menu:

1st, press menu,

2en, input 8893,

3rd, press "ok"

Finished these operations , system will be into the factory mode menu.

8-1-2. How to exit

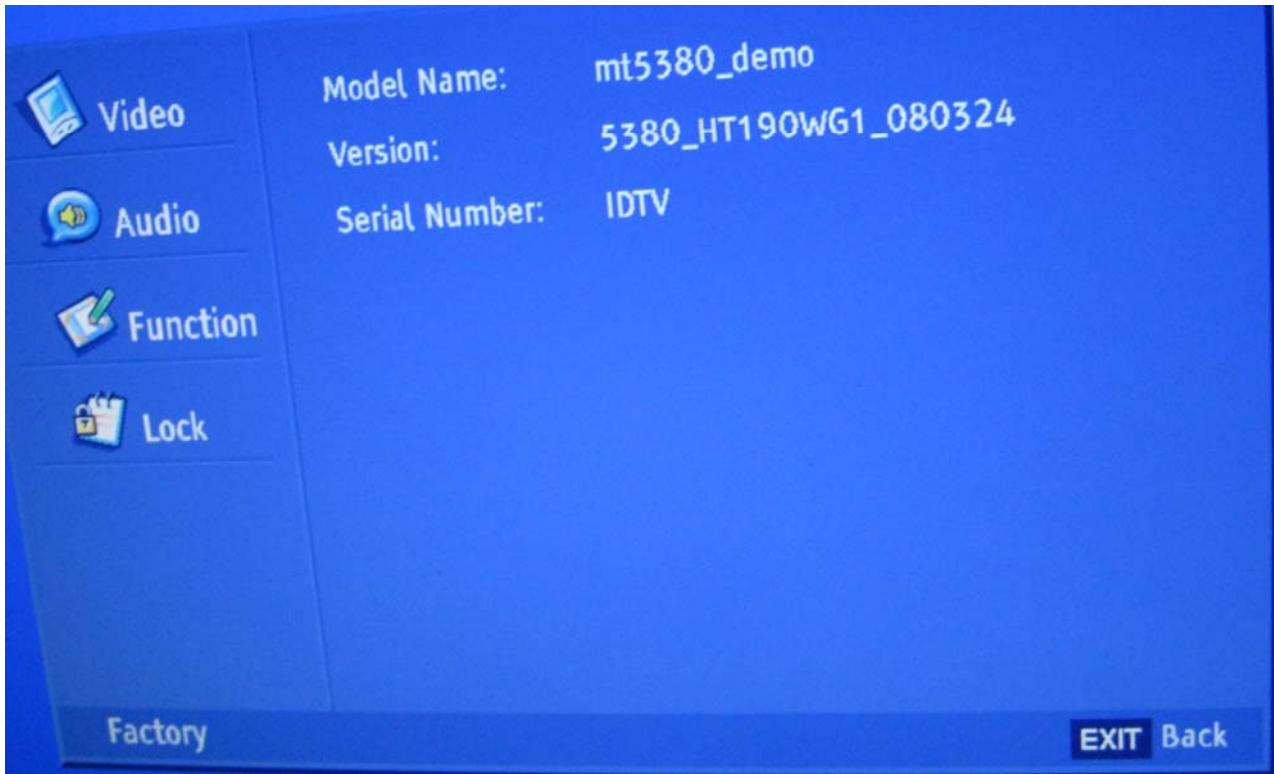
IF want to exit this factory menu, please press the botton "Exit" in the remoter.

8-2 Measurements and Adjustments



8-2-1 Version ,S/N, Panel Resoution

Version: The first line is the model Name and the second line is current software version.



8-2-2 Video

Auto Color

The option could only be used in the VGA and Component model. When we found the color in the two

models was abnormal. Then we can use the function to adjust it automatically.

Color Temperature

The function could adjust the Color Temperature., used when debugging.



8-2-3 Audio

Dolby Banner: When turn it "ON", the model will be in Dolby authentication state.

Compression: Compression style. RF: atv line: AV/S-Video/YPbPr/VGA

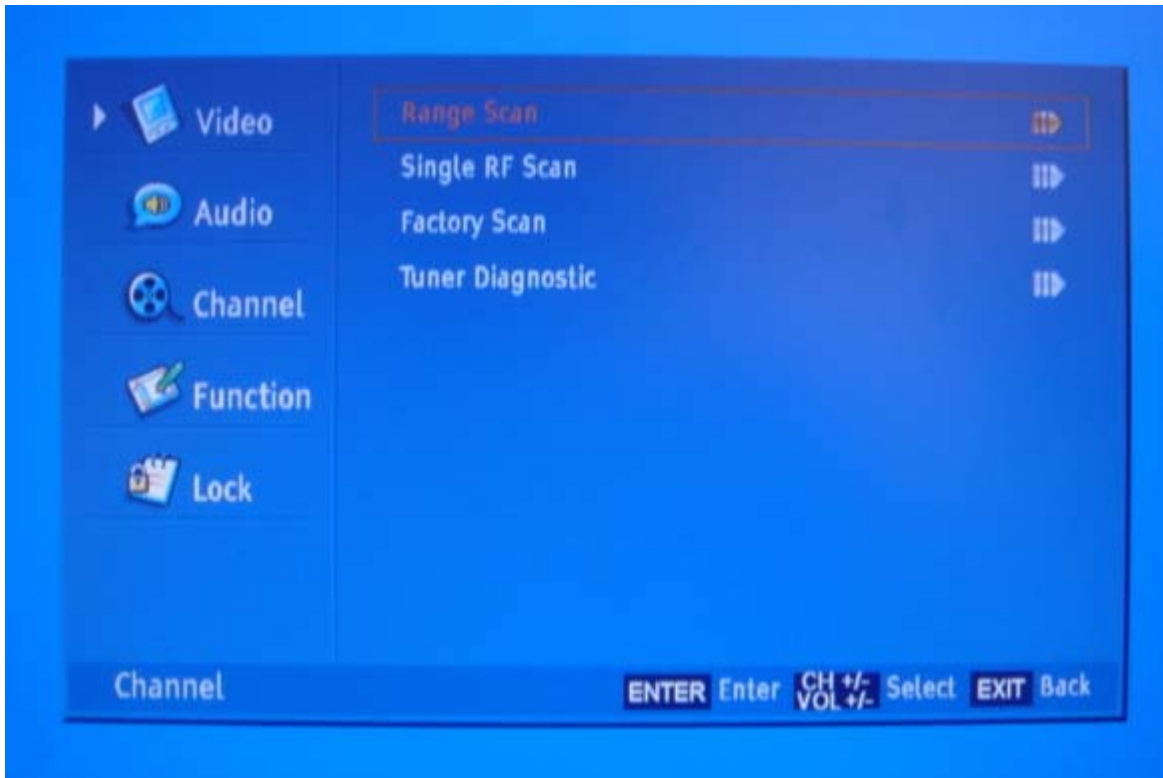
Compression Factor: Compression state.

Downmix: output model. MTS System: used when debugging. The parameters only used when debugging, no need to be modified.

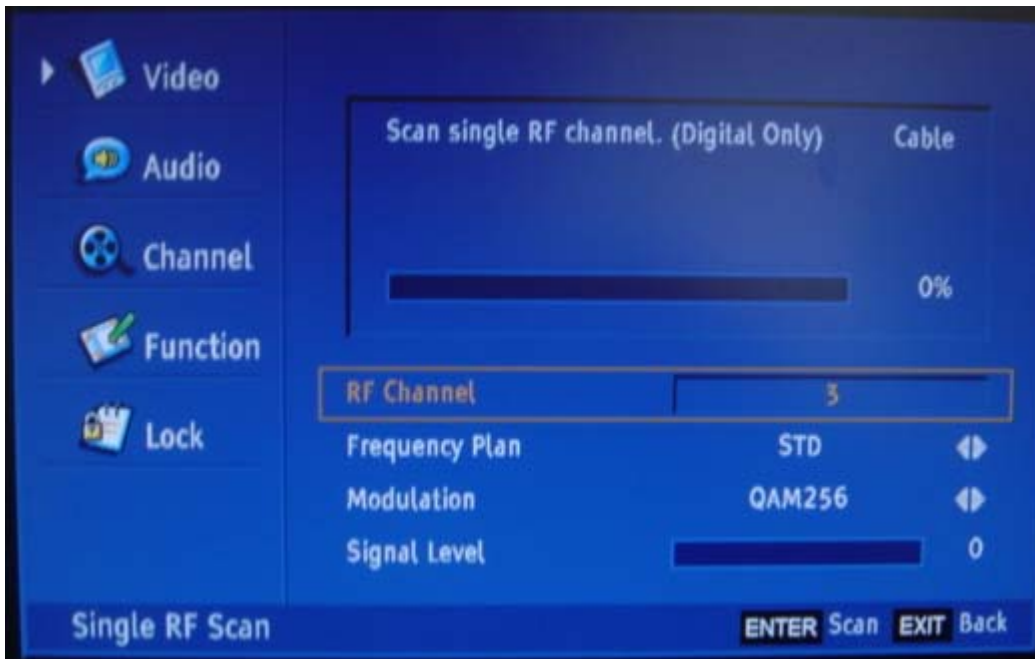


8-2-4 Channel

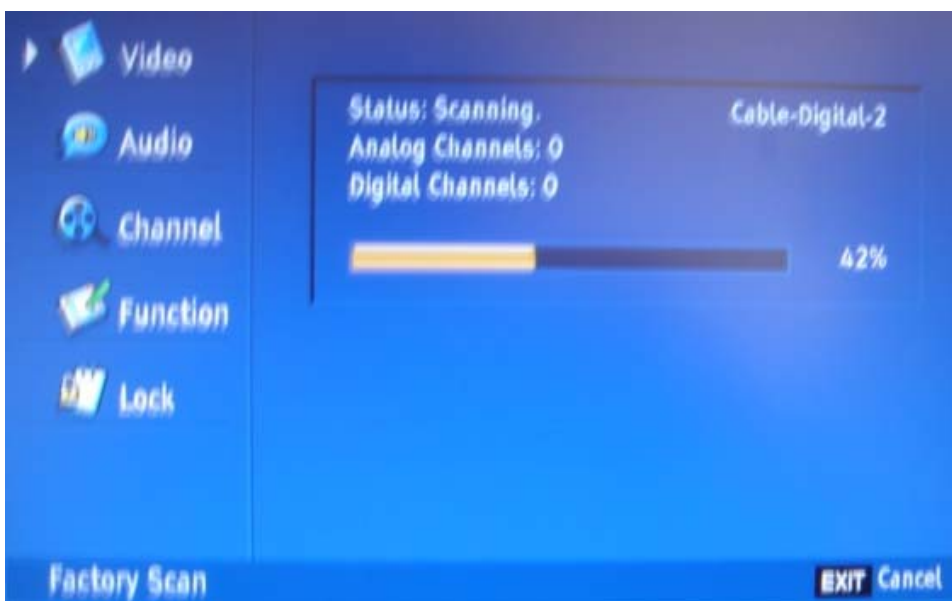
Range Scan: The function could make it to search the channels by differentiation the analog and digital channels.



Single RF Scan: Search channels in the frequency scope set in advance.



Factory Scan: According to ANTENNA-ANALOG---> ANTENNA-DIGITAL---> CABLE-ANALOG---> CABLE- DIGITAL to search channels, used only in project debugging.

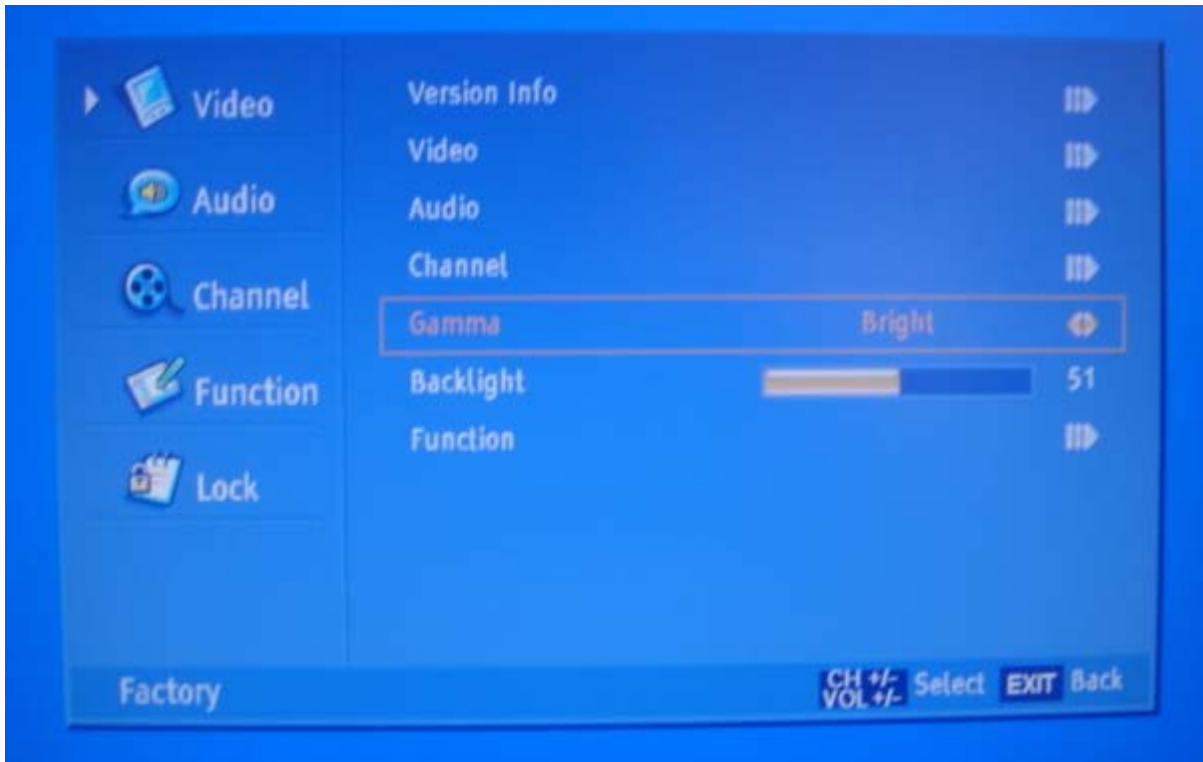


Tuner Diagnostic: Project debugging setting, used to inspect the audio function.

8-2-5Gamma

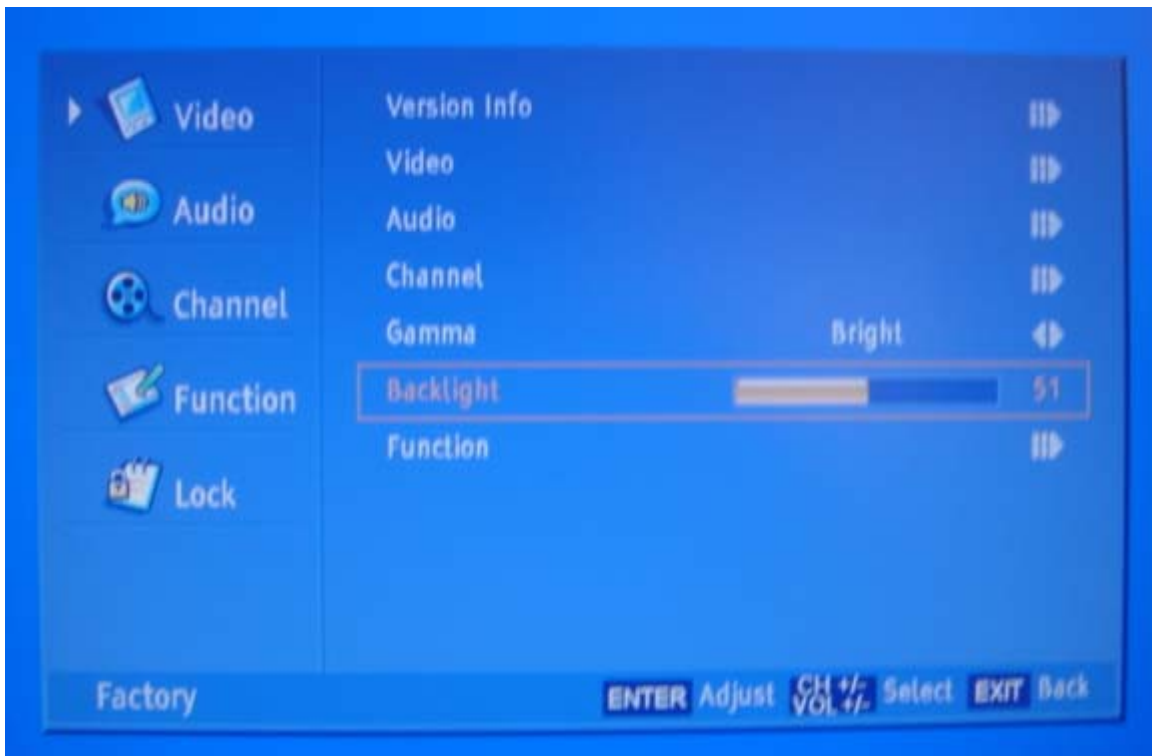
Gamma:

Bright: GAMMA0.8 Middle: default settings in the program Dark: GAMMA1.2



8-2-6 Backlight

Backlight: adjust the backlight.



8-2-7 Function

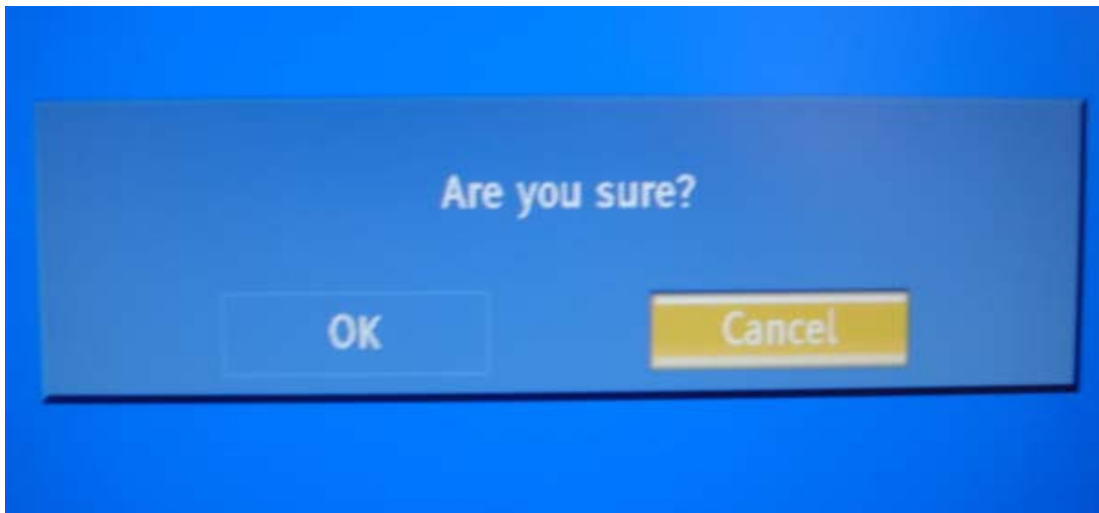
Burning Mode:

Turn it "ON" to enter the aging model, This is for factory run-in testing. The screen would display red, green, blue and black screen repeatedly. Each color screen could be exam at that time.



Clean Storage: The function could make the model turn back to the factory default setting.





Remark:

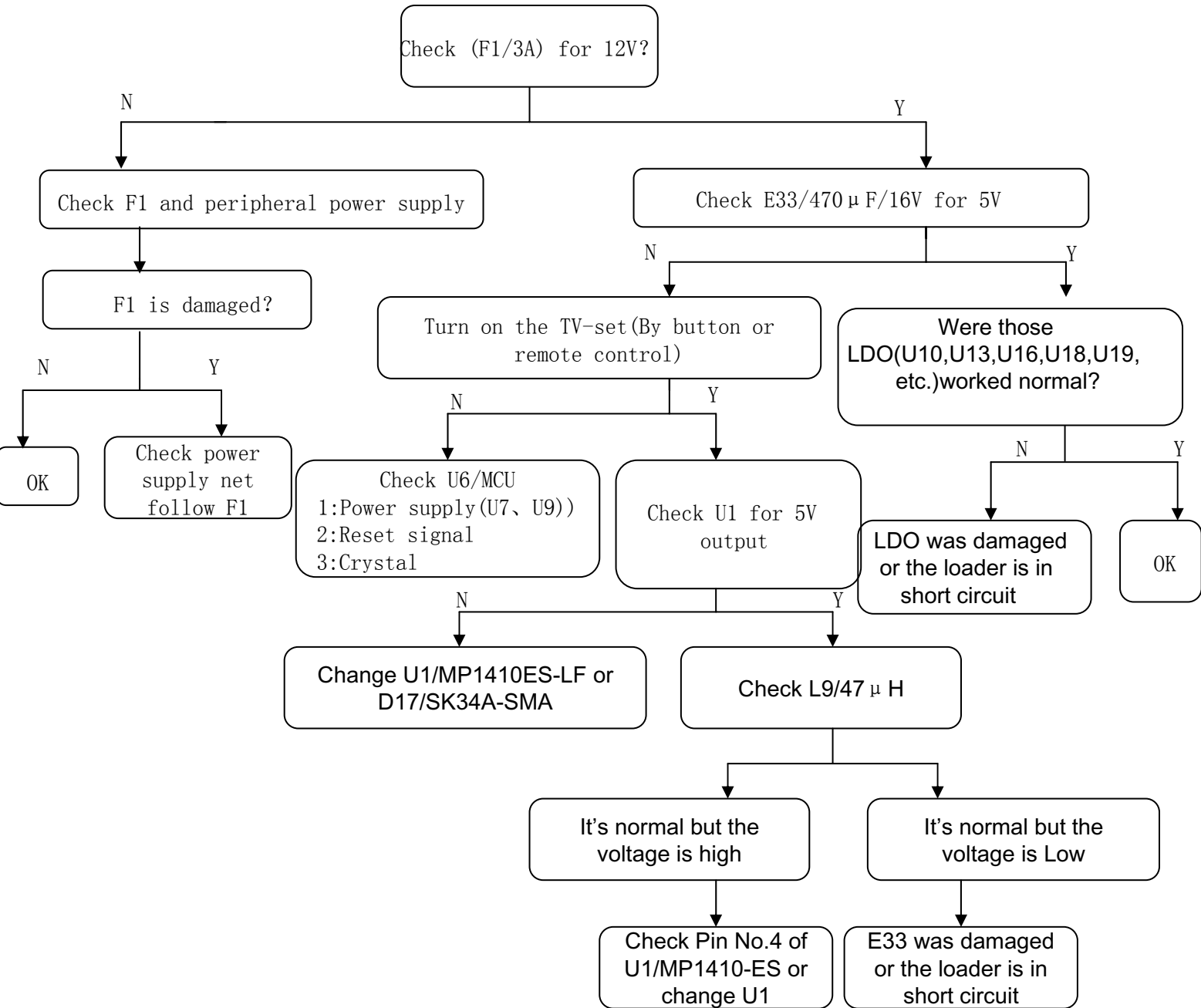
The date of the chart only is a example, please don't adjust the factory mode base on it.

9. Trouble shooting

9-1. Simple check

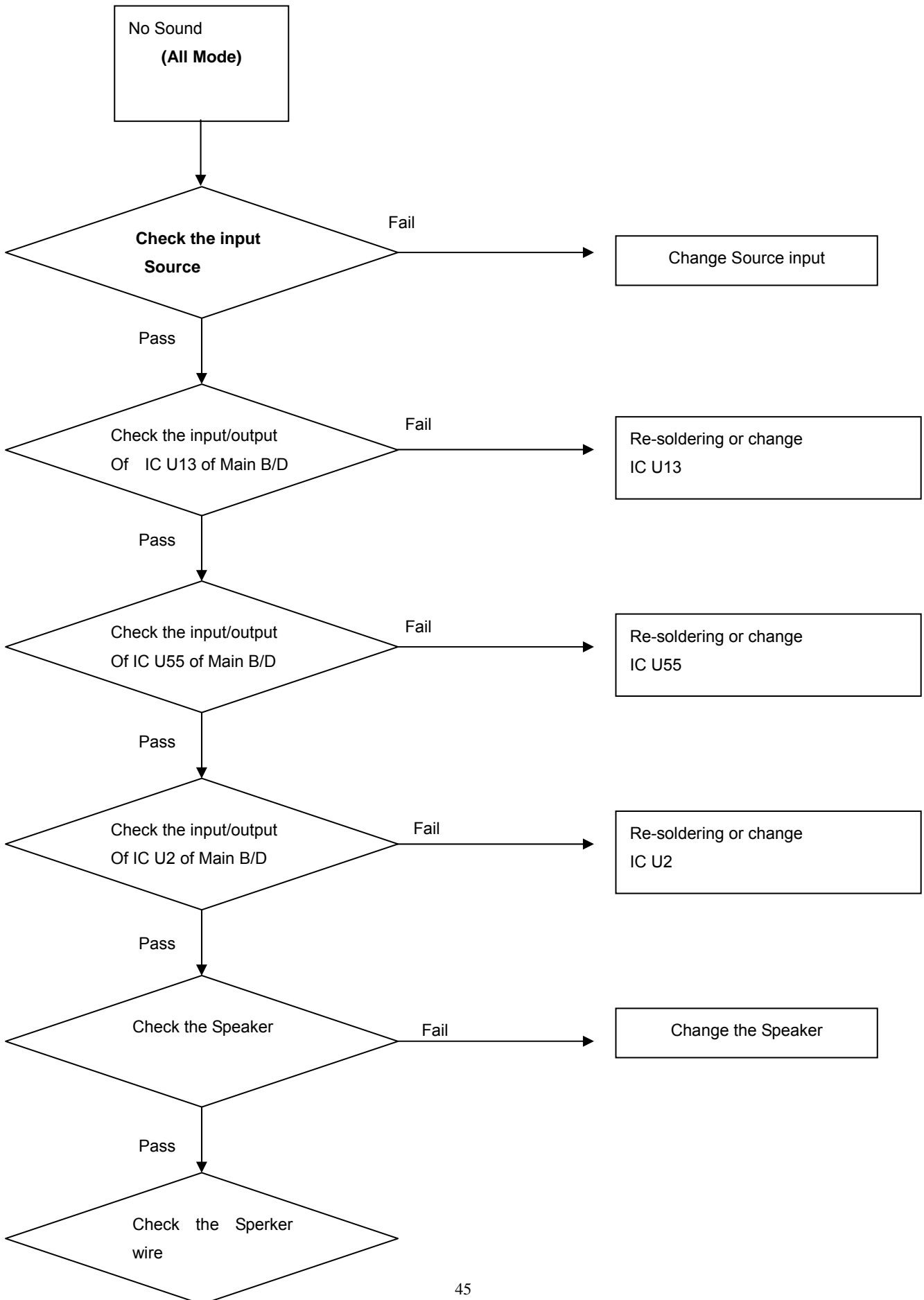
| | |
|--|---|
| No Picture,no sound | Verify if the television is properly plugged Verify if the television is properly supplied power Verify if electricity is available |
| Blank screen | Verify if correct signals are input Press INPUT button to change signal input to TV input Restart the television of power supply is interrupted |
| No sound | Press Mute button and verify if Mute mode is set. Switch to otger channel and verify if the same problem happens. Press VOL+ button to see of he problem can be solved. |
| Poor sound | Verufy if sound system is correct .Refer to some chapter for adjust. |
| No picture in some channel | Verify if correct channel is selected. Adjust the antenna. Make adjustments by Fine Tune and MANUAL Scan. |
| No color for some channel program(black and white) | Verify if the same problem exists in other channels. check out of picture and sound system. Refer to relative instructions in the Manual for color adjust. |
| Spots with some or all pictures | Verify if the antennal is correctly connected. Verify if the antennal is in good condition. Make fine adjustment of channel. |

9-2. Power Supply Board failure check.

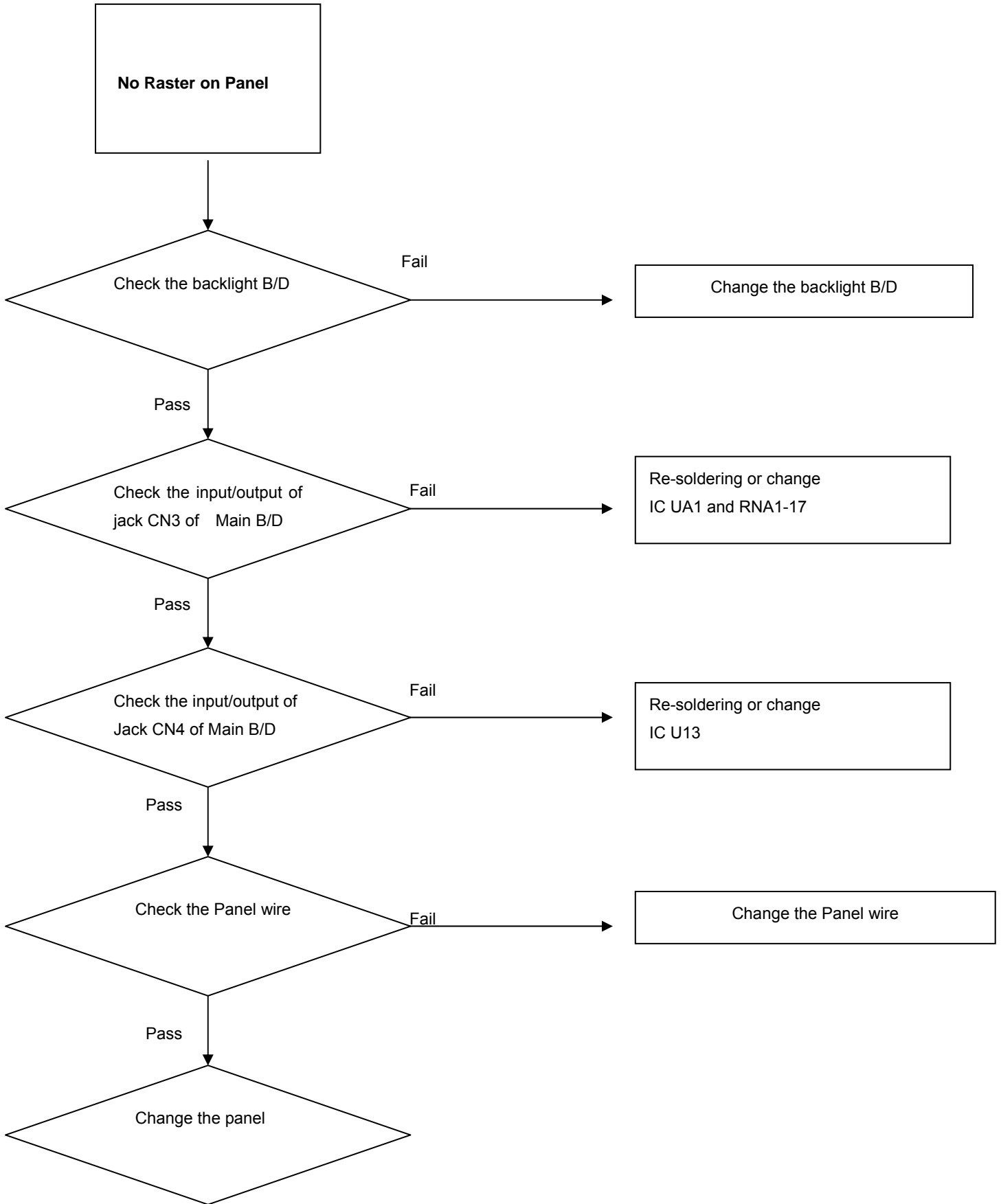


9-3. Main board failure check

State: No Sound

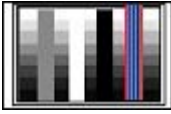
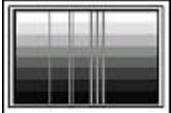
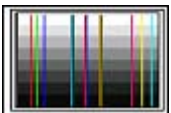

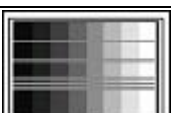
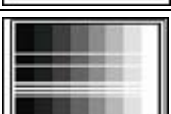
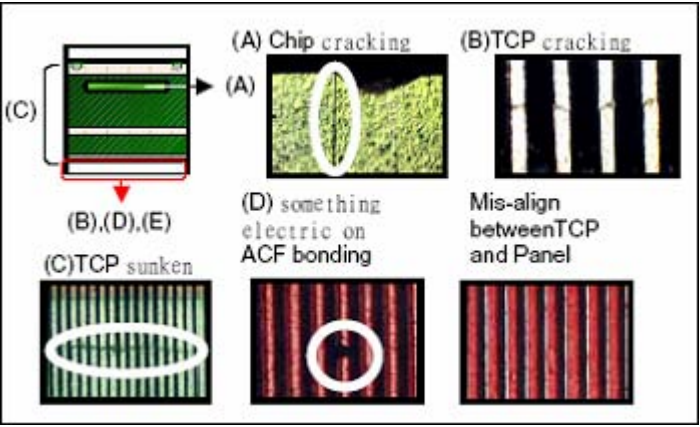


State: No picture








9-4. Pannel failure

Failure Mode



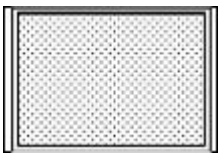
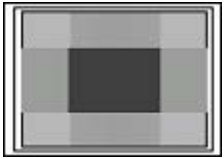
| Part | Name | Description | Phenomena | Failure cause |
|---|-------|--|--|--|
| TCP | V B/D | Vertical bar |  | Block Defect :TCP cracking or cracking Dim or L/D :TCP Sunken :TCP lead cracking :ACF bonding short :Awful environment and something electric enter into LCD :Mis-align between TCP and Panel :Panel failure :TCP failure |
| | V Dim | Vertal gray line |  | |
| | V L/D | Vertical color line(light or dark forever) |  | |
| | H B/D | Horizontal bar |  | |
| | H Dim | Horizontal gary line |  | |
| | H L/D | Horizontal line(light or dark forever) |  | |
|  | | | | |

Failure Mode




| Part | Name | Description | Phenomena | Failure cause |
|--------------------|----------------------|-------------------------------|---|--|
| Panel or Polarizer | Dot Defect | Bright dot dark dot in pannel |  | Incoming Inspection Standard |
| | Polarizer Bubble | Bladder in Polarizer |  | Bladder between Polarizer and top glass |
| | Polarizer Scratch | Polarizer Scratch |  | Tine or rigidity arose |
| | F/M inside Polarizer | Eyewinker inside Polarizer |  | Eyewinker inside Polarizer |
| Circuit | Abnormal Display | Abnormal Display | | 1. Chip lose action 2. IC ahort or jointiog bad |


| | | | | |
|--|----------|-------------------------------------|---|------------------------------|
| | Flashing | Bright and dark display alternately |  | 3. Panel and vsc connect bad |
|--|----------|-------------------------------------|---|------------------------------|

Failure Mode



| Part | Name | Description | Phenomena | Failure cause |
|---------|----------------|---------------------------------------|--|---|
| Circuit | White Screen | B/L normal, only white screen display |  | Maybe caused by surge current and EDS |
| | Black Screen | B/L normal, only Black screen display |  | |
| | Flicker | Crosstalk |  | LCD Vcom imbalance |
| | Abnormal Color | Only abnormal color |  | Capacitance improper bring crosstalk inside LCD panel |
| | Abnormal Color | Only abnormal color | | 1. Chip lose action 2. IC short or joint bad 3. Panel and vsc connect bad |

Failure Mode

| Part | Name | Description | Phenomena | Failure cause |
|------|------------------|-----------------------------------|---|--|
| | Mechanical Noise | When turn panel, appear cacophony | | Caused by Mechanical noise of backlight unit |
| | Ripple | Concentric circle |  | Caused by between mechanism and panel |
| | B/L off | B/L lose action | | *Connect badness between wire and electrode |
| | B/L dark | B/L brightness darker than normal |  | *Connect badness Short between wire and electrode |
| | B/L wire damaged | B/L wire damaged |  | Operation abnormal or systemic noise |

| | | | | |
|--|---------------|--|---|---|
| | B/L wire open | Without backlight | | Operation abnormal or systemic noise |
| | B/L shutdown | B/L shutdown in sometime | | Short between lamp housing and wire, Because consume power too much |
| | F/M | F/M in B/L, white, black Rotundity or wirelike |  | F/M in B/L unit |

Failure Mode

| Part | Name | Description | Phenomena | Failure cause |
|-------------------|---------------|--|---|-----------------------------|
| Mechanical or B/L | Light leakage | Brightness at bottom of LCM brighter than normal |  | B/L unit badness |
| | Uniformity | B/L brightness asymmetric |  | Sheet in B/L unit is uneven |
| | Mount hole | Lack screw or screw damage | | *Lack screw Screw damage |

Sincere Forever