

LCD TELEVISION

SERVICE MANUAL

LC-42/47FY36S

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4Attention: This service manual is only for service personnel to take reference with. Before servicing please read the following points carefully.

Safety precautions

1. Instructions

Be sure to switch off the power supply before replacing or welding any components or inserting/plugging in connection wire. Anti static measures to be taken (throughout the entire production process!):

- a) Do not touch here and there by hand at will;
- b) Be sure to use anti static electric iron;
- c) It's a must for the welder to wear anti static gloves.

Please refer to the detailed list before replacing components that have special safety requirements. Do not change the specs and type at will.

2. Points for attention in servicing of LCD

2.1 Screens are different from one model to another and therefore not interchangeable. Be sure to use the screen of the original model for replacement.

2.2 The operation voltage of LCD screen is 700-825V. Be sure to take proper measures in protecting yourself and the machine when testing the system in the course of normal operation or right after the power is switched off. Please do not touch the circuit or the metal part of the module that is in operation mode. Relevant operation is possible only one minute after the power is switched off.

2.3 Do not use any adapter that is not identical with the TV set. Otherwise it will cause fire or damage to the set.

2.4 Never operate the set or do any installation work in bad environment such as wet bathroom, laundry, kitchen, or nearby fire source, heating equipment and devices or exposure to sunlight etc. Otherwise bad effect will result.

2.5 If any foreign substance such as water, liquid, metal slices or other matters happens to fall into the module, be sure to cut the power off immediately and do not move anything on the module lest it should cause fire or electric shock due to contact with the high voltage or short circuit.

2.6 Should there be smoke, abnormal smell or sound from the module, please shut the power off at once. Likewise, if the screen is not working after the power is on or in the course of operation, the power must be cut off immediately and no more operation is allowed under the same condition.

2.7 Do not pull out or plug in the connection wire when the module is in operation or just after the power is off because in this case relatively high voltage still remains in the capacitor of the driving circuit. Please wait at least one minute before the pulling out or plugging in the connection wire.

2.8 When operating or installing LCD please don't subject the LCD components to bending, twisting or extrusion, collision lest mishap should result.

2.9 As most of the circuitry in LCD TV set is composed of CMOS integrated circuits, it's necessary to pay attention to anti statics. Before servicing LCD TV make sure to take anti static measure and ensure full grounding for all the parts that have to be grounded.

2.10 There are lots of connection wires between parts behind the LCD screen. When servicing or moving the set please take care not to touch or scratch them. Once they are damaged the screen

would be unable to work and no way to get it repaired.

If the connection wires, connectors or components fixed by the thermotropic glue need to disengage when service, please soak the thermotropic glue into the alcohol and then pull them out in case of damage.

2.11 Special care must be taken in transporting or handling it. Exquisite shock vibration may lead to breakage of screen glass or damage to driving circuit. Therefore it must be packed in a strong case before the transportation or handling.

2.12 For the storage make sure to put it in a place where the environment can be controlled so as to prevent the temperature and humidity from exceeding the limits as specified in the manual. For prolonged storage, it is necessary to house it in an anti-moisture bag and put them altogether in one place. The ambient conditions are tabulated as follows:

Temperature	Scope for operation	0 ~ +50 °C
	Scope for storage	-20 ~ +60 °C
Humidity	Scope for operation	20% ~ 85%
	Scope for storage	10% ~ 90%

2.13 Display of a fixed picture for a long time may result in appearance of picture residue on the screen, as commonly called "ghost shadow". The extent of the residual picture varies with the maker of LCD screen. This phenomenon doesn't represent failure. This "ghost shadow" may remain in the picture for a period of time (several minutes). But when operating it please avoid displaying still picture in high brightness for a long time.

3. Points for attention during installation

3.1 The front panel of LCD screen is of glass. When installing it please make sure to put it in place.

3.2 For service or installation it's necessary to use specified screw lest it should damage the screen.

3.3 Be sure to take anti dust measures. Any foreign substance that happens to fall down between the screen and the glass will affect the receiving and viewing effect

3.4 When dismantling or mounting the protective partition plate that is used for anti vibration and insulation please take care to keep it in intactness so as to avoid hidden trouble.

3.5 Be sure to protect the cabinet from damage or scratch during service, dismantling or mounting.

Alignment instructions

1. Test equipment

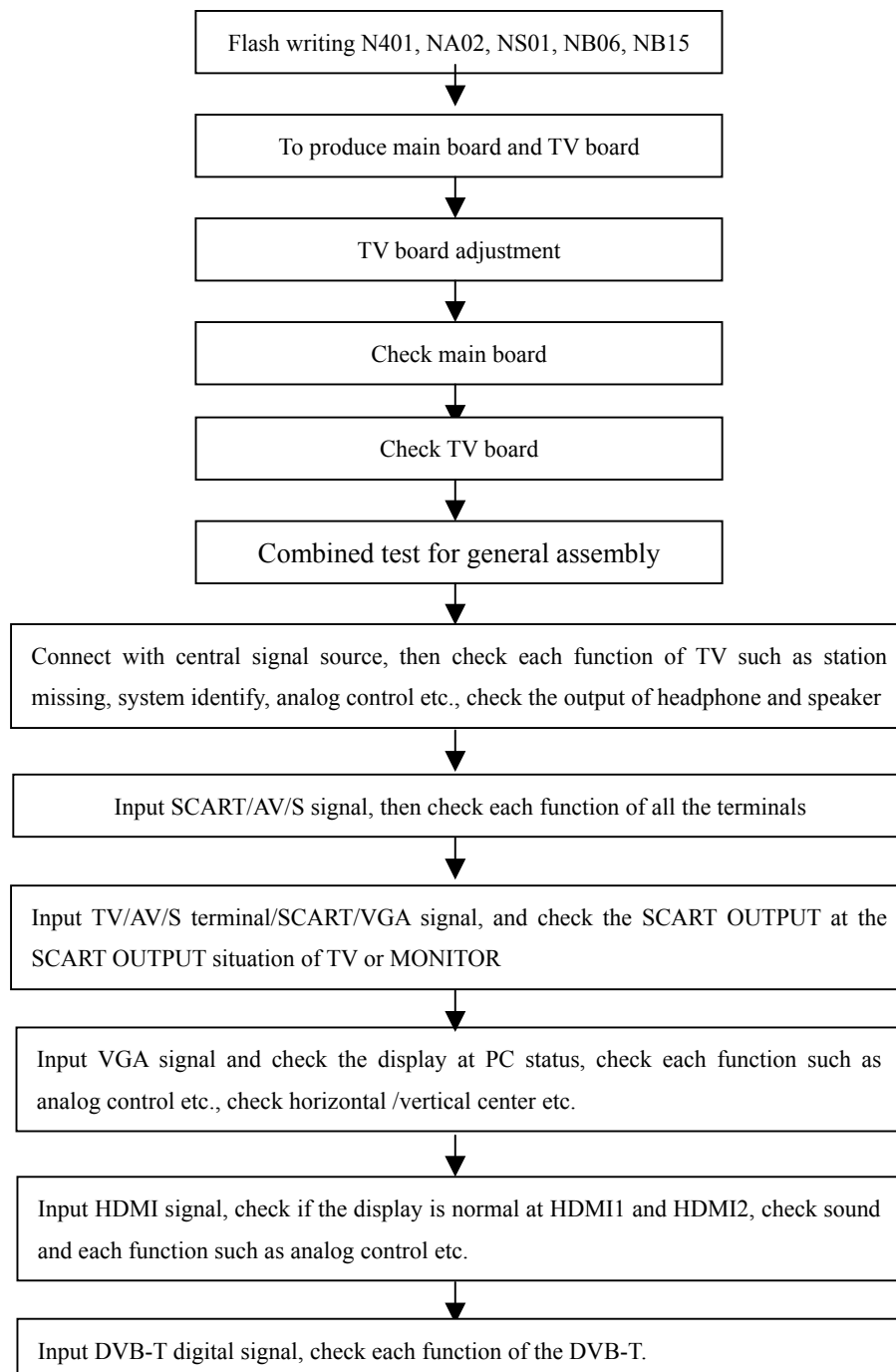
Digital Multimeter, SCART signal generator FLUKE54200, Oscilloscope

PC(FLASH writing program has to be installed firstly), VG848(VGA,YPBPR signal generator)

CA210 (white balancer), DVD player with HDMI output, TV set with SCART terminal

IF signal generator

2. The alignment flow chart (see below figure)



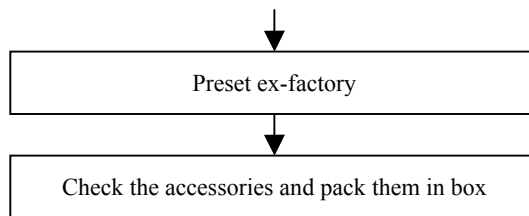


Fig-1 adjustment flow-chart

3. Instruction on adjusting

3.1 Method of entering the factory menu

The method of entering the factory menu is SOURCE, 2, 5, 8, 0.

Press 1 to enter page1, the function is Cotez Feature Setting, to set LOGO, frequency ect,.

Press 2 to enter page2, the function is Color Temperature Setting. The color temperature now is 12000.

Press 3 to enter page3, the function is Auto Color setting, to set AUTO COLOR of each channel.

3.2 Writing program

Write EEPROM N401, NA02, NS01, NB06, NB15.

3.3 Main board adjustment

- Connect X401 of main board and IR board, insert 11-pin wire of power board to XB7, then the indicator light of IR board should be red.
- Press POWER on the remote control, now the indicator light of IR board turns blue, test XB7 PIN1 to be 9V, PIN3 5V, PIN5/PIN6 12V, PIN9 3.3V, LB04 3.3V, NS03 PIN2 1.8V, N404 PIN2 2.5V.
- Connect PC and serial terminal, flash write HDCP KEY.

3.4 TV board adjustment

3.4.1 IF amplify adjustment

- Base on 3.3 a), connect 6-pin wire of power board and X04 of TV board, press POWER on the remote control, now the indicator light of IR board turns blue, TEST PIN2 of X04 to be 5V, PIN4 9V, L07 3.3V.
- Input +5V to TP1 and 0V to TP2, input 38.9m IF signal to J1(use IF signal generator), adjust L10 to let X08 be 1.6V.
- Input 0V to TP1 and +5V to TP2, input 33.5m IF signal to J1(use IF signal generator), adjust RP01 to let X08 be 1.6V.
- Joint the tuner J1.

3.4.2 Unit connect adjustment

Connect the main board, TV board, IR board, SCART connect board and key board according to the wiring diagram. Press POWER button on the remote control, the indicator light on IR board turns blue, test X12 PIN1 of TV board to be +24V.

3.4.3 AGC adjustment

- Receive 60dB signal of D-8 and test X07 with DC voltmeter.
- Adjust RP201 to let the data of voltmeter just below 4.0V.
- Input 100dB signal of antenna, the picture should not no-synchronous or distortion; the color should not disappear when input 30dB-40dB low signal and the picture should synchronous and the sound normal.

3.5 VGA adjustment

3.5.1 mode preset

Input VG-848 of VGA signal(PATTERN 980:1 dot ON/OFF), select TIME877(720*400/70Hz), the TV will auto adjust to full screen, or enter display menu to do auto correction. Adjust TIME885(640*480/60Hz, TIME854(800*600/60Hz) by using the same method.

3.5.2 VGA channel Auto color

Input VG848 of VISA mode signal to VGA channel, enter factory menu of Auto Color Setting item, select VGA and press enter to do Auto Color.

3.6 YPbPr Auto Color

Input a high definition signal of VG-848, enter factory menu of Auto Color Setting item, select YPbPr and press enter to do Auto Color.

3.7 AV Auto Color

Input FLUKE VIDEO signal of PAL, select PATTERN of 100% Color bar, enter factory menu of Auto Color Setting item, select VIDEO1 and press enter to do Auto Color.

3.8 SCART Auto Color

Connect SCART1 RGB signal, input FLUKE signal of PAL system, PATTERN of 100% Color bar, enter factory menu of Auto Color Setting item, select SCART1 and press enter to do Auto Color.

4 Performance check

4.1 TV function

Connect RF-TV terminal to the central signal source, enter the search menu→ auto search, check if there is station skipping, manual search, fine tuning, the output of earphone and speaker, the picture are normal.

4.2 SCART/AV/S terminal

Input SCART1(RGB+CVBS)/SCART2(CVBS+YC)/AV/S signal, check if the picture and sound are normal.

4.3 AUDIO OUT/VIDEO OUT terminal

Separate input signal at the status of TV/SCART/AV/S, connect AUDIO/VIDEO OUT to the monitor and check if the sound and the picture of the AUDIO OUT are normal.

4.4 SCART terminal

4.4.1 check the content of SCART OUTPUT

Separate input signal at the status of TV/SCART/AV/S, connect AUDIO/VIDEO OUT to the monitor, check if the picture and sound of SCART1 OUTPUT are the picture and sound of TV when input SCART1(RGB+CVBS) and check if they are normal; check if the picture and sound of SCART2 OUTPUT are the picture and sound of the present signal when input SCART2(CVBS+YC) and check if they are normal.

4.4.2 check the function of SCART INPUT

- Connect SCART1 and the signal generator after turn on, the TV should auto switch to SCART1 RGB or SCART1 CVBS. Connect SCART2 and the signal generator after turn on, the TV should auto switch to SCART2 CVBS or SCART2 YC.
- SCART signal generator sends CVBS signal (color bar and multi-burst) to SCART1, check if the picture is normal, the OSD should be SCART1 VIDEO; the OSD should be SCART1 RGB when SCART1 signal switches to RGB format.
- SCART signal generator sends CVBS signal (color bar and multi-burst) to SCART2, check if the picture is normal, the OSD should be SCART2 VIDEO; the OSD should be SCART2 S-VIDEO

when SCART2 signal switches to YC format.

d) Disconnect SCART signal, the unit should return to the present TV situation.

Note: the function is act except VGA, YPBPR, HDMI.

4.5 VGA terminal

Input VGA signal (VG-848 signal generator), separate input VGA format signal of table 1 and check if the picture and sound are normal after auto correction. If the image is interfered, press the auto adjust button on the remote control again and check if it is normal.

Table 1 VGA signal format

No	Resolution	Picture element clock (MHz)	H-SYNC(kHz)	V-SYNC(Hz)	Remark
1	640X480 @ 60 885	25.175	31.47	59.94	
2	640X480 @ 72 851	31.500	37.86	85.08	
3	640X480 @ 75 852	31.500	37.50	75.00	
4	640X480 @ 85 334	43.500	43.269	85.00	7253
5	720X400 @ 70 877	28.320	31.47	70.08	
6	720X400 @ 85 960	35.500	37.93	85.04	
7	800X600 @ 56 853	36.000	35.16	56.25	
8	800X600 @ 60 854	40.000	37.88	60.32	
9	800X600 @ 72 887	50.000	48.08	59.80	
10	800X600 @ 75 945	49.500	49.88	75.00	
11	1024X768 @ 60 856	65.000	48.36	60.00	
12	1024X768 @ 70 857	75.000	56.48	70.07	
13	1024X768 @ 75 858	78.750	60.02	75.03	
14	1280X1024 @ 60 963	108.000	63.98	60.02	
15	1280X1024 @ 75 859	135.000	79.98	75.02	
16	1600X1200 @ 60 859	162.000	75.00	60.00	

4.6 YPBPR terminal

Input YPBPR signal (VG848 signal generator), separate input YPBPR format signal of table2 and check if the picture and sound are normal.

Table 2 YPBPR signal format

No	Resolution	Mode	VG848 timing	Remark
1	712X484 @60Hz	480i	968	
2	720X484@60Hz	480P	978	
3	702X574 @50Hz	576i	969	
4	756X557 @50Hz	576P	979	
5	1280X720@50Hz	720P 50	5 SET	
6	1280X720@60Hz	720P 60	976	
7	1920X1080@50Hz	1080i 50	1 SET	
8	1920X1080@60Hz	1080i 60	972	
9	1920X1080@50Hz	1080P 50		
10	1920X1080@60Hz	1080P 60	970	

4.7 HDMI terminal

Input HDMI signal (VG848 signal generator), separate input YPBPR format signal of table1 and table2 and check if the picture and sound are normal.

Check the picture and sound by using VG849 with HDMI terminal.

4.8 DVT-T function check

Connect DVB-T RF terminal to the central signal source, enter the search menu→ auto search, check if it can search the program or there is station skipping, check the output of earphone and speaker, if the picture are normal. Attenuate the signal to 25dBuV(16QAM program) and check the picture and sound.

4.9 Ex-factory preset

Perform “factory reset” of MENU to do ex-factory preset.

5.10 Packing

Check the accessories and pack them in box.

Method of software upgrading

The FY# series models enable you to update software through the serial interface.

Hardware requirements: 1. One serial cable with female end and female end;
2. One PC set;

Steps of software updating are as follows:

1. Install Gprobe 5.0:

The first: Double click the GProbe5[1].0.0.15_S0006-EXE-09A to install it:



According to the prompt of Windows and follow the steps one by one to finish the installation.

The second: Double click the GProbe5[1].0.0.15Update1_S0006-EXE-10A to install it:



According to the prompt of Windows and follow the steps one by one to finish the installation.

2. Copy the full directory of lsp_fastflash to anywhere

E.g. take the root directory of C:\ as an example for the following explanation:

Copy the updating file *.hex to the directory of C:\ lsp_fastflash\

E.g. C:\ lsp_fastflash\20Y25.hex.

3. Open C:\ lsp_fastflash\lsp_parallel\ bat.txt as follows:

```
bat.txt - 记事本
文件(F) 编辑(E) 格式(O) 帮助(H)

debugon

SetBuffer 0x2000 0x800
delay 200
Reset 0

RAMWrite "C:\isp_fastflash\Isp_parallel\TEMP_OBJECT\isptemp_parallel.hex"

Run 0x500
delay 100
FlashErase
delay 100

FastFlashWrite "C:\isp_fastflash\20y25.hex"
```

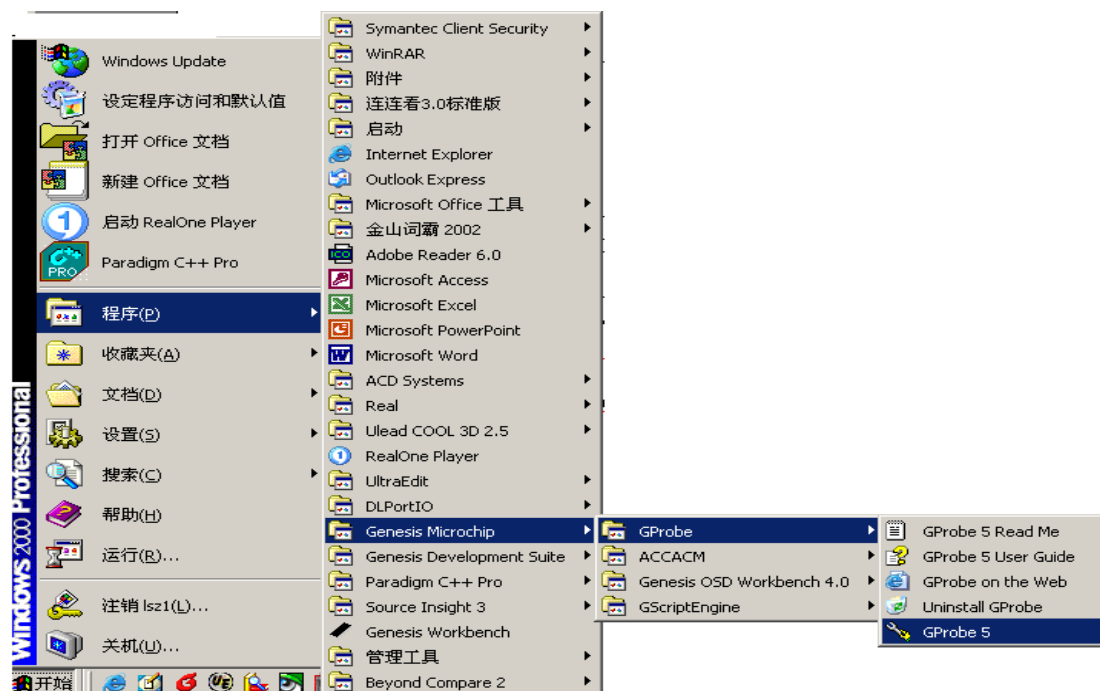
Properly set the path of RAMWrite "C:\isp_fastflash\Isp_parallel\TEMP_OBJECT\isptemp_parallel.hex" and FastFlashWrite "C:\isp_fastflash\20y25.hex", save them and close.

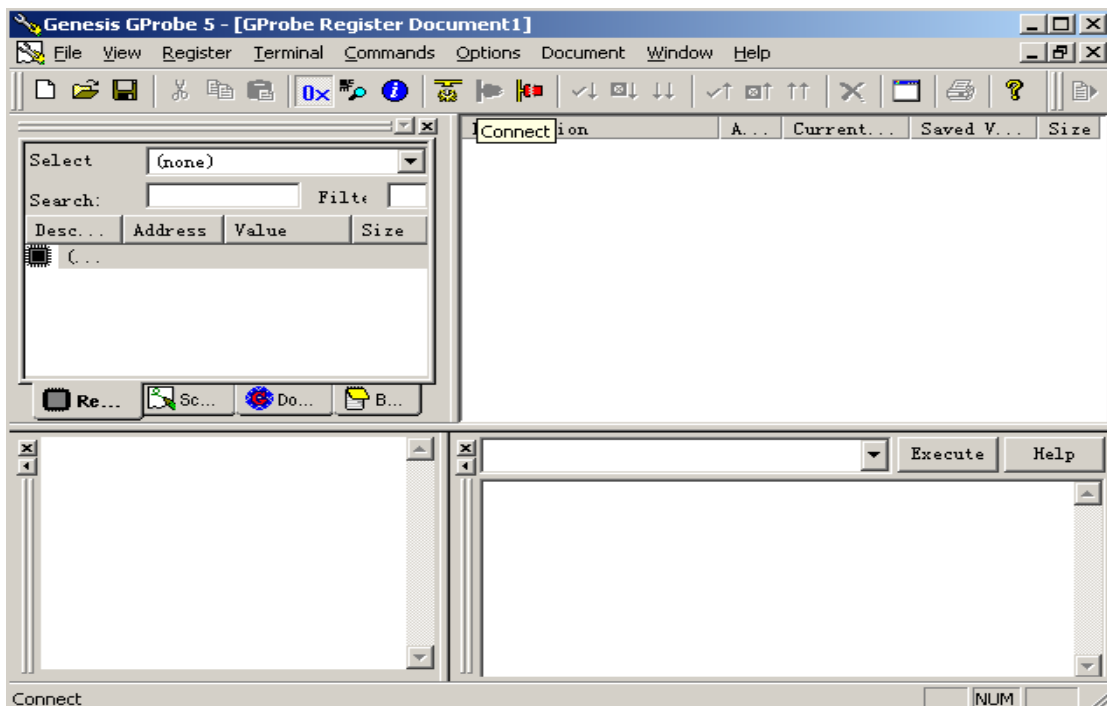
4. Set the LCD to off. Connect the Y# updating board and PC with parallel cable.

5. Connect the VGA MONITOR interface on the Y# updating board with the VGA cable, connect the other end to the VGA interface of the LCD.

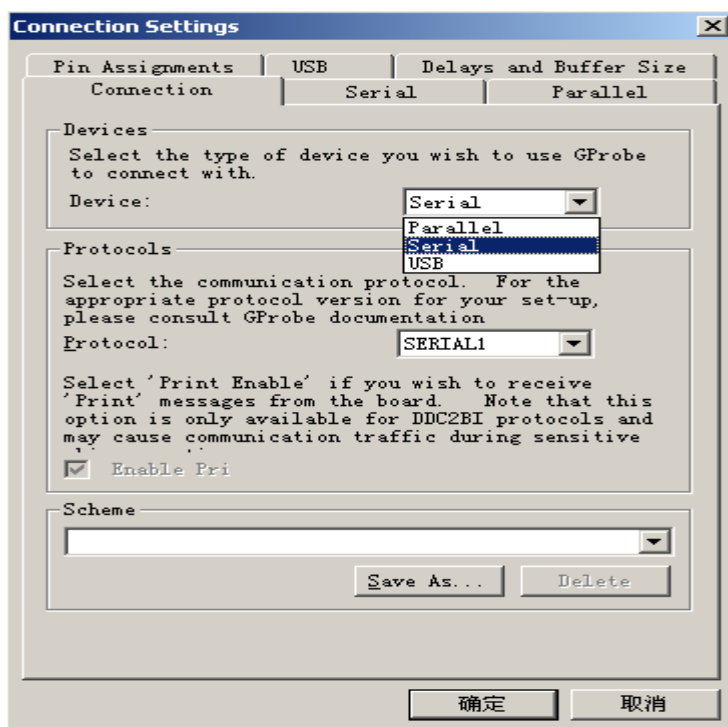
6. Turn on the LCD

Double click to run Gprobe5:



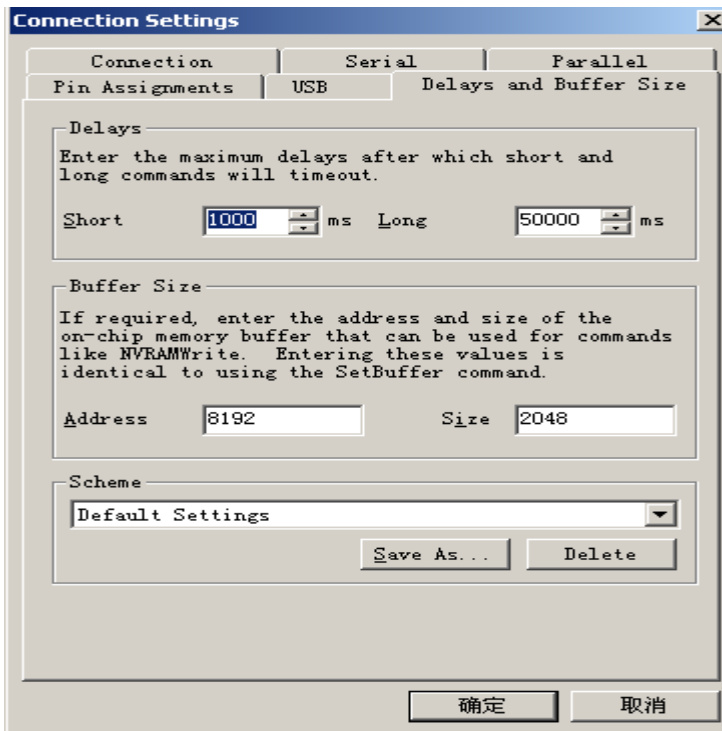


Click the icon of :



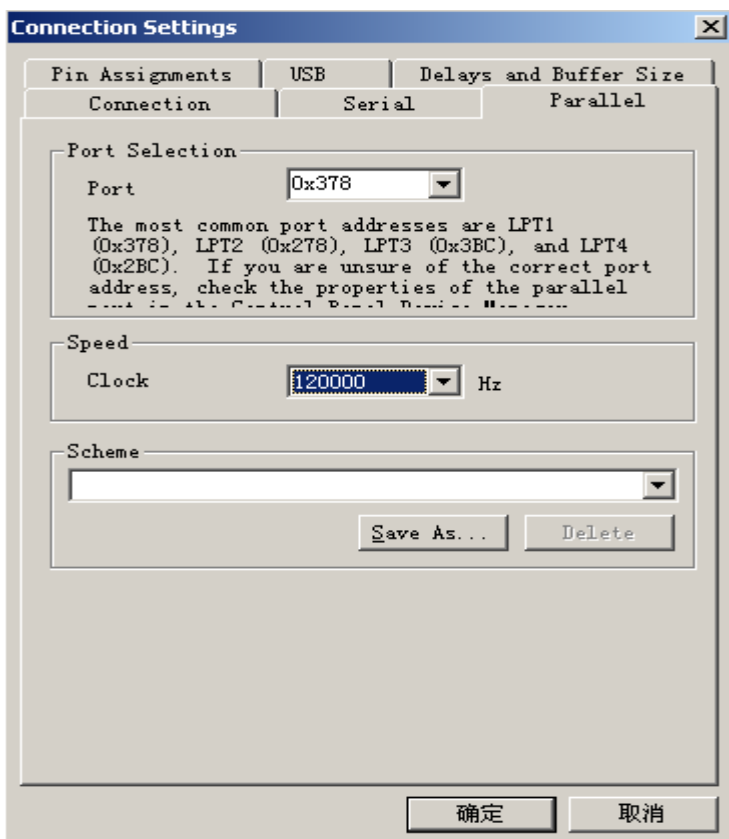
Set the Device to Parallel.

Then click the item of Delays and Buffer Size:



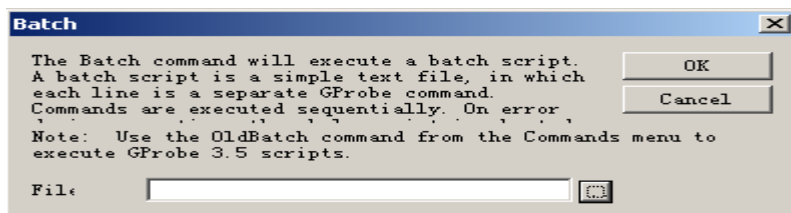
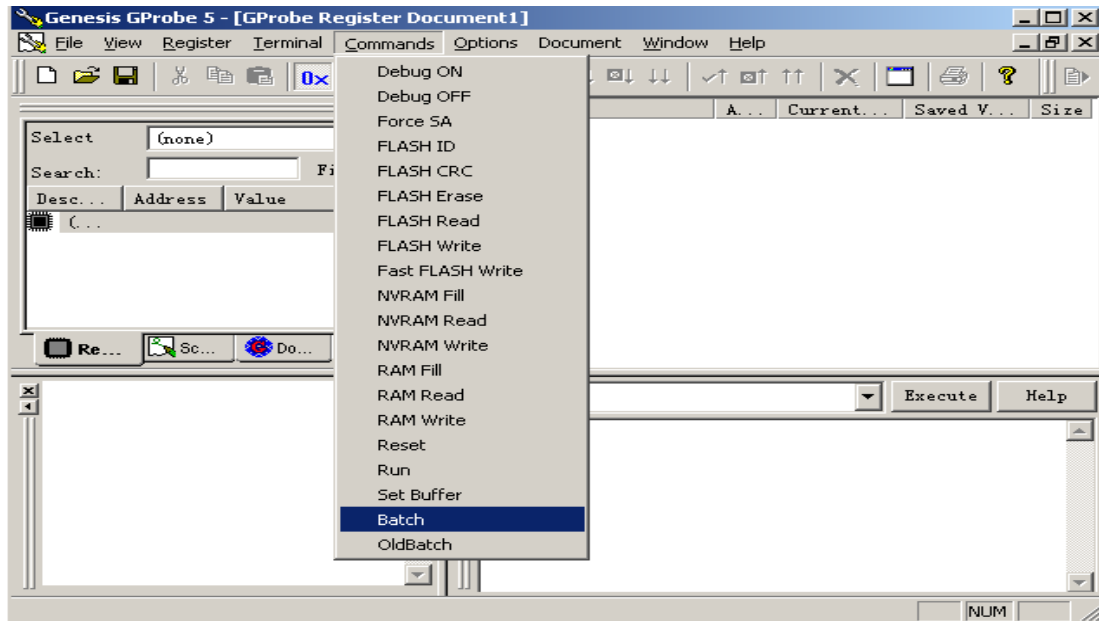
Set Long to 50000 ms.

Click the item of Parallel:

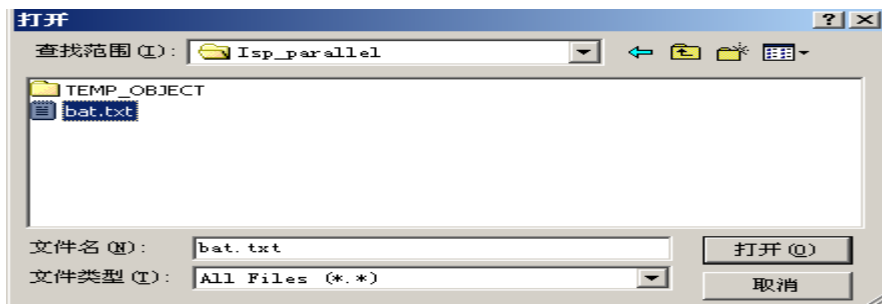


Set Clock to 120000 Hz

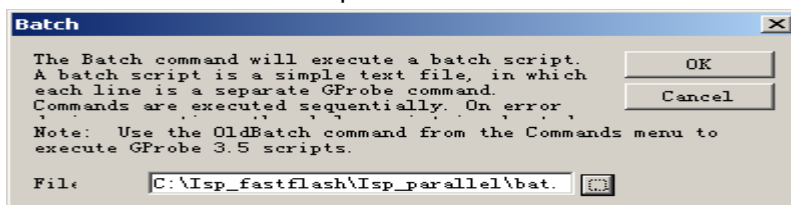
7. Click Batch,



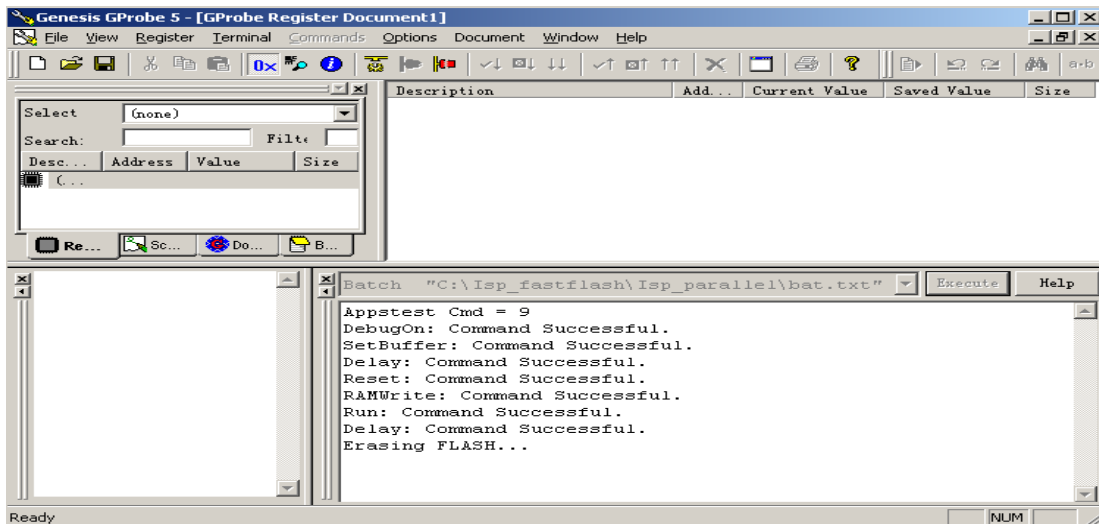
Select the path of the File: bat.txt



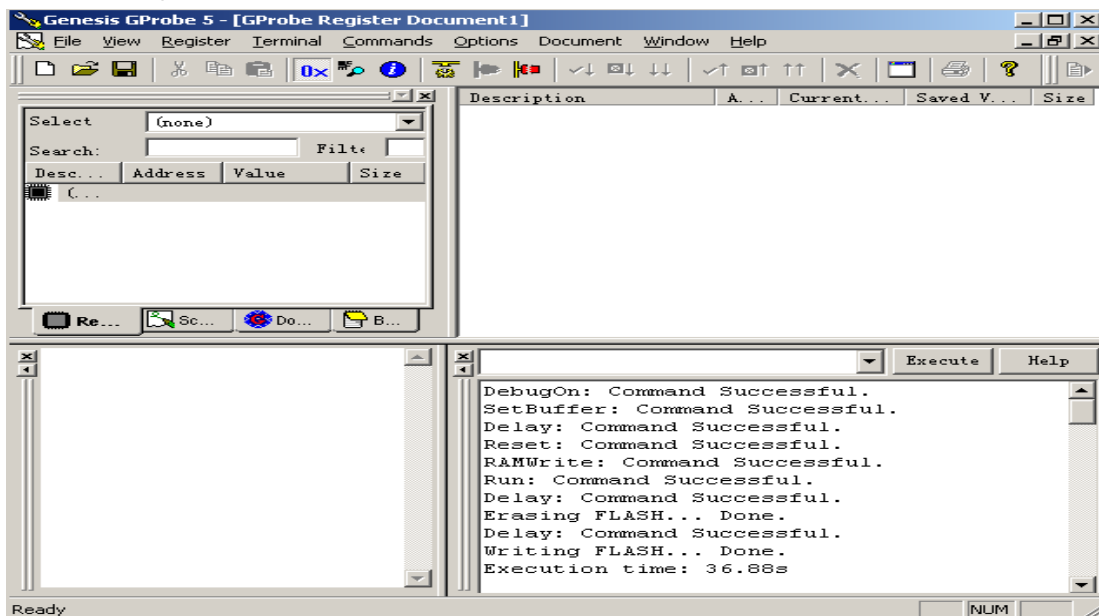
Select bat.txt and click to open it:



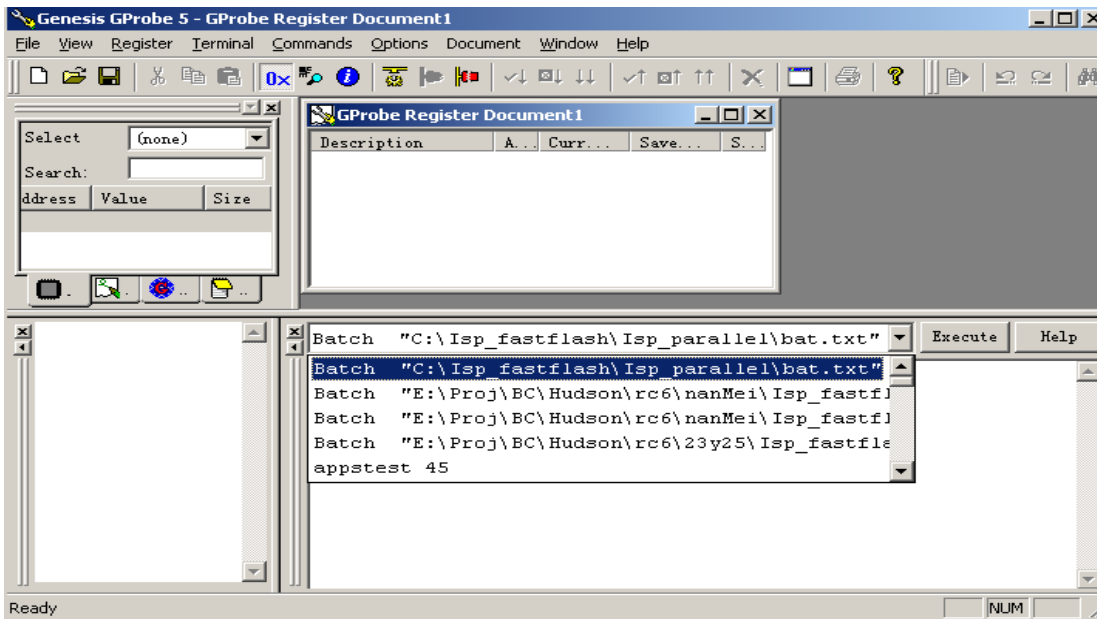
Click "OK" to start the process of burning the program.



The following screen appears when the process is finished.



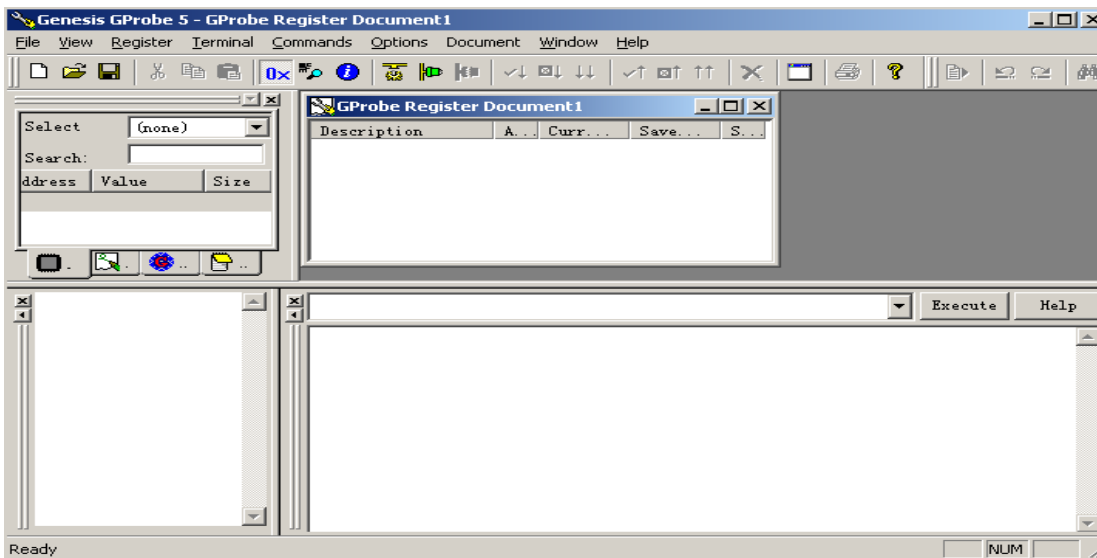
If you want to update the software next time, you just need to click the pull-down menu to select the desired Batch file and execute it in the following screen.



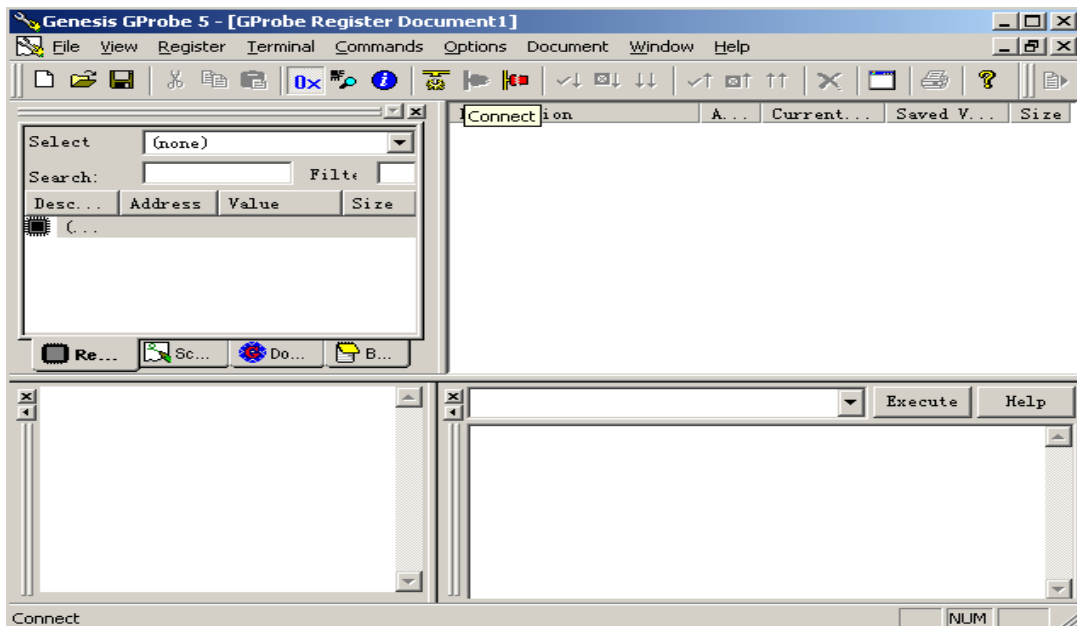
Note: Do not cut off the power or turn off the unit during the burning process, or the flash may be damaged.

Check the following if you fail to update:

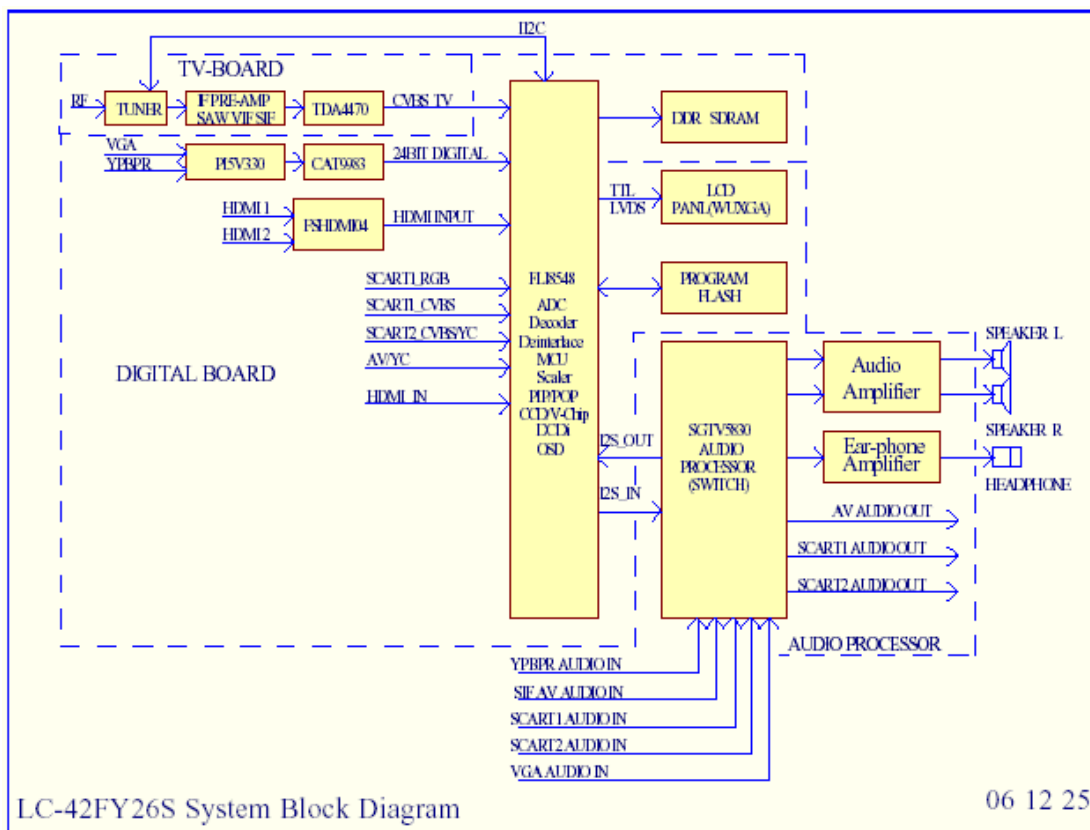
1. Check whether all cables are properly connected. If LCD is turn on.
2. Check the settings of Gprobe.
3. It is wrong if the Gprobe shows as the following icon.



Now just click the icon of  to show below icon.



Block diagram



Working principle analysis of the unit

The unit has two modules: video module and sound module. The diagram is show as fig 1 and fig 2:

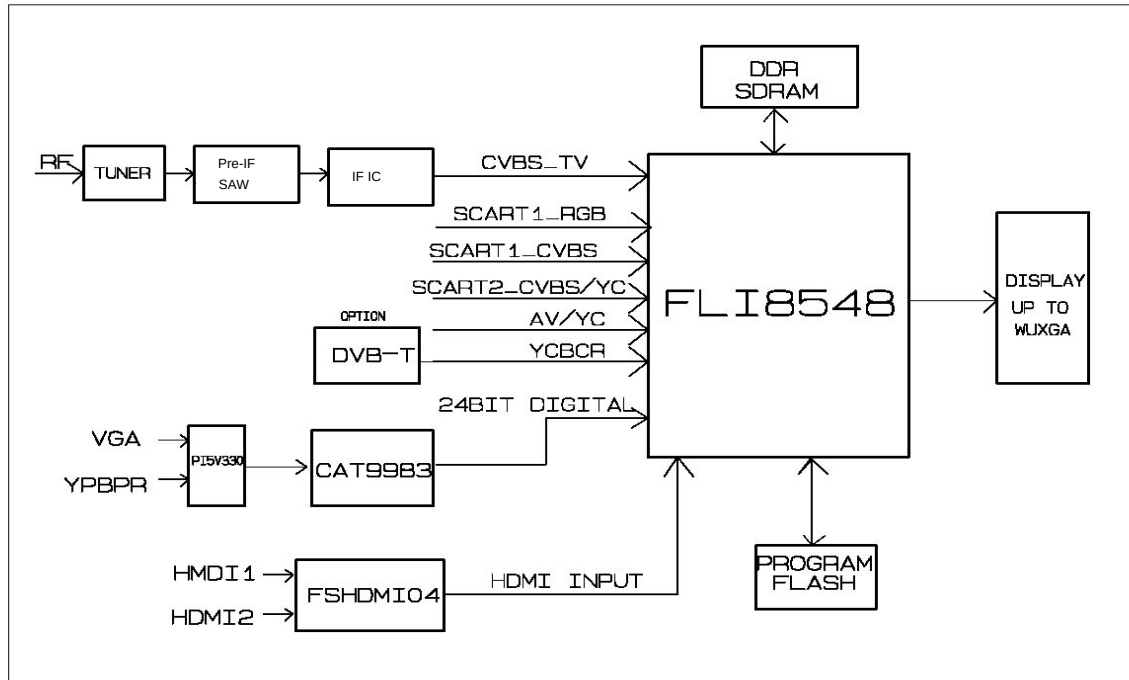


Fig1 diagram of video module

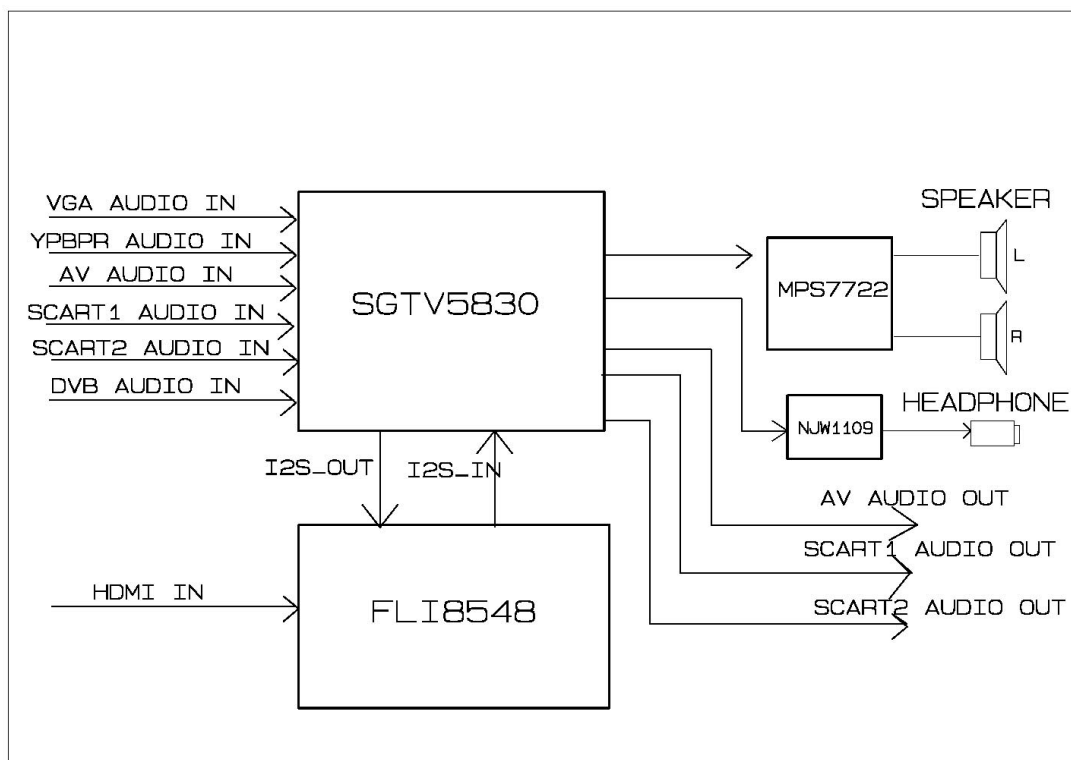


Fig2 diagram of sound module

1. Video module

There are three kinds of terminal of SCALER FLI8548:

A: 16 channel analog signal input

B: one group 24BIT digital signal input

C: one group HDMI digital signal input

SCART1, SCART2, AV, DVB-T, TV input from terminal A;

VGA, YPBPR via switch PI5V330 to ADC CAT9983, after CAT9983 processing output 24BIT DIGITAL DATA to terminal B;

HDMI1 and HDMI2 via FSHDMI04 switch directly to terminal C.

SCALER FLI8548 has only three ADC of 10BIT(16-rout analog signal via internal MUX switch to three ADC), so the signals(SCART1, SCART2, AV, DVB-T, TV) input to terminal A can't cooperate to perform PIP each other. The function of PIP can only realize by the signals input from the three terminals(A, B and C).

All the signals via FLI8548 processing to the panel directly, the output interface is configurable for single wide TTL, LVDS(18,24 or 30-bit RGB) or dual wide TTL(18, 24-bit RGB), LVDS(18. 24 or 30-bit RGB). FY# use the dual wide LVDS(30-bit RGB) to support the 1080P panel.

2. TV module

RF signal via the tuner to output 38.9MHz(L) or 33.5MHz(L') IF signal, via pre-IF circuit and two SAW to amplify and separate VIF and SIF, then it sent to IF decode IC TDA4470. VIDEO-OUT from TDA4470 via switch HEF4052T select and four filters, output CVBS to FLI8548 image processing. SIF from TDA4471 sent to sound processing IC N03SGTV5830.

Diagram of TDA4470 is below:

Block Diagram

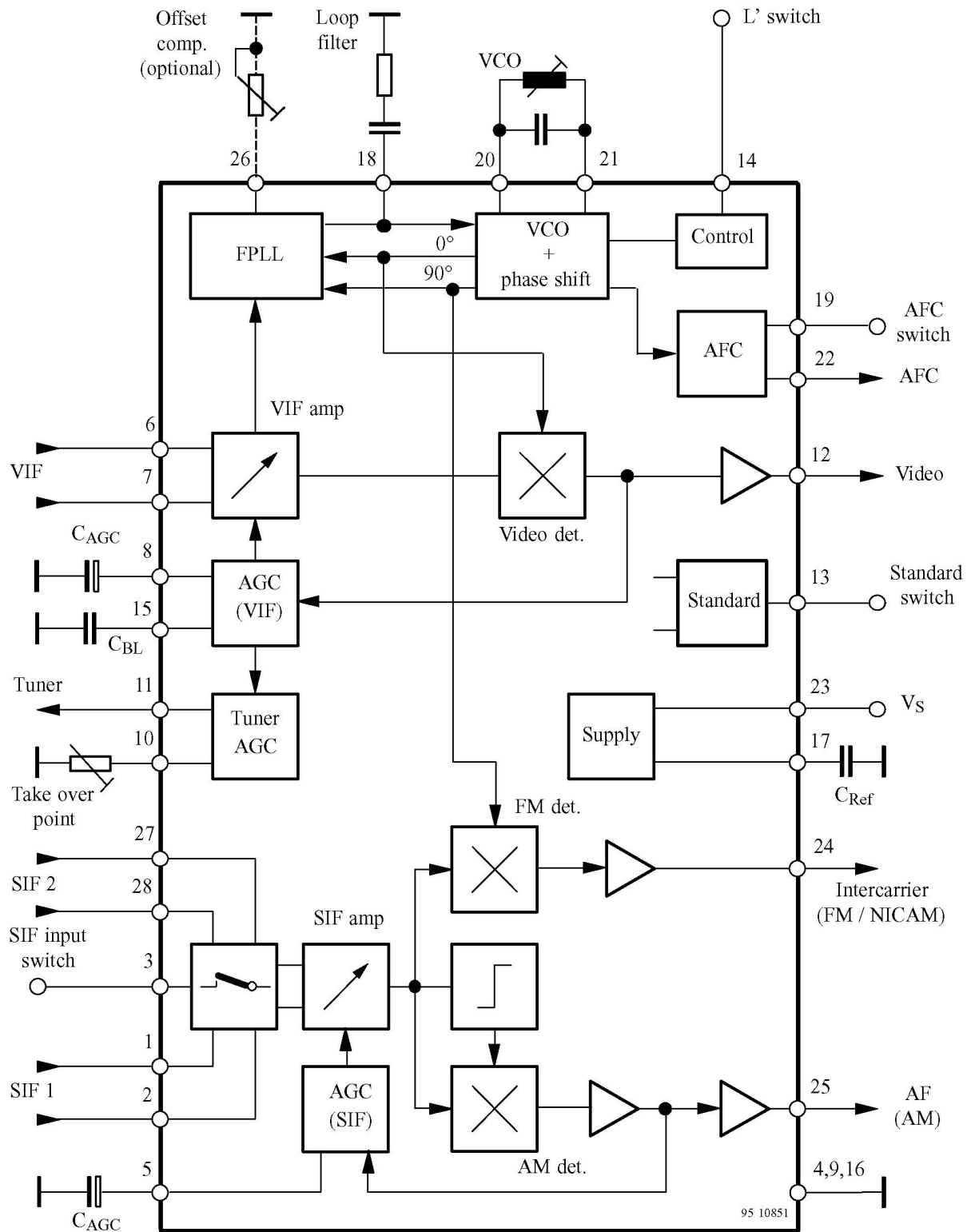


Figure 1. Block diagram

Pin Description

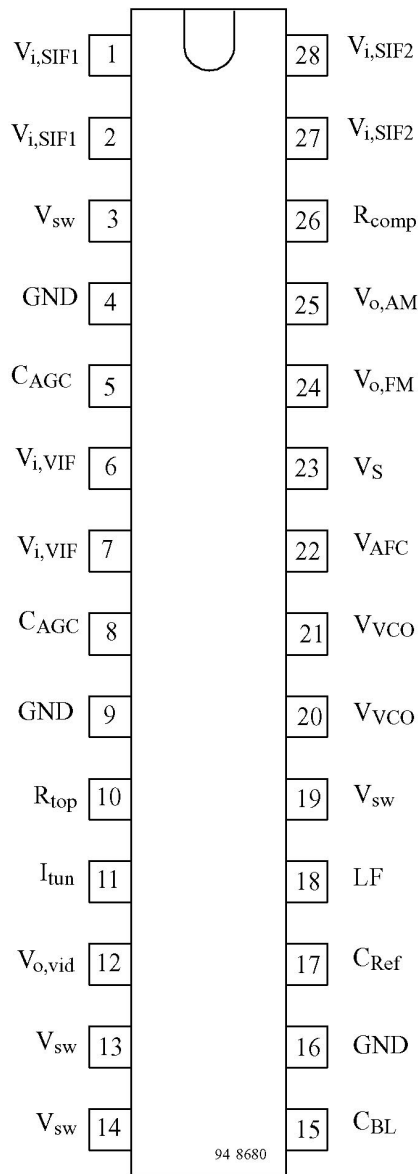


Figure 2. Pinning

Pin	Symbol	Function
1, 2	$V_{i, SIF1}$	SIF1 input (symmetrical)
3	V_{sw}	Input selector switch
4, 9, 16	GND	Ground
5	C_{AGC}	SIF-AGC (time constant)
6, 7	$V_{i, VIF}$	VIF input (symmetrical)
8	C_{AGC}	VIF-AGC (time constant)
10	R_{top}	Take over point, tuner AGC
11	I_{tun}	Tuner AGC output current
12	$V_{o, vid}$	Video output
13	V_{SW}	Standard switch
14	V_{SW}	L' switch
15	C_{bl}	Black level capacitor
17	C_{ref}	Internal reference voltage
18	LF	Loop filter
19	V_{sw}	AFC switch
20, 21	V_{VCO}	VCO circuit
22	V_{AFC}	AFC output
23	V_S	Supply voltage
24	$V_{O, FM}$	Intercarrier output
25	$V_{O, AM}$	AF output – AM sound
26	R_{comp}	Offset compensation
27, 28	$V_{i, SIF2}$	SIF 2 input (symmetrical)

3. Sound module SGTV5830 Multistandard TV Audio Processor

The diagram is below:

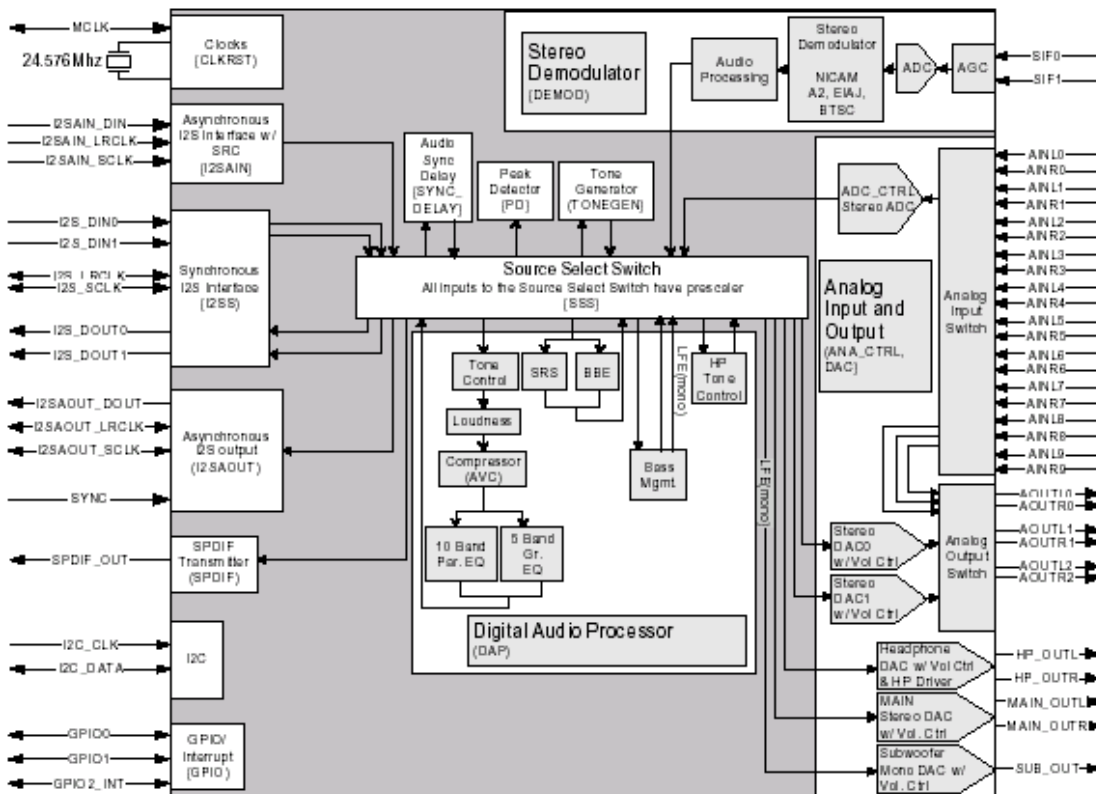


Figure 4. SGT58xx Block Diagram

Input pins:

AIN3: AV L/R input	AIN4: SCART2 L/R input
AIN5: SCART1 L/R input	AIN6: DVB L/R input
AIN8: YPBPR L/R input	AIN9: VGA L/R input
I2SAIN: I2S input	SIF1: SIF input

SIF is directly sent to SGT5830 ADC and sound demodulate module (stereo identify), then output to SSS(SOURCE SELECT SWITCH) to output selection.

L/R of VGA, YPBPR, AV, DVB-T, SCART1 and SCART2 will be sent to SGT5830 analog input switcher to output to ADC, then to SSS(SOURCE SELECT SWITCH) to output selection.

Output pins:

MAIN-OUT: MAIN-OUT
 HP-OUT: TV-OUT
 AOUT0: HP
 AOUT1: AV-OUT
 AOUT2: SCART1-MONITOR OUT
 I2SA-OUT: I2S OUTPUT

All of the sound signal via front-processor to SSS switch, the sound of main channel will output I2S-OUT to FLI8548 as a signal of SYNC DELAY, then sent back to SSS switch to SGT5830 digital processing module(DAP), after processing back to SSS switch output.

Note:

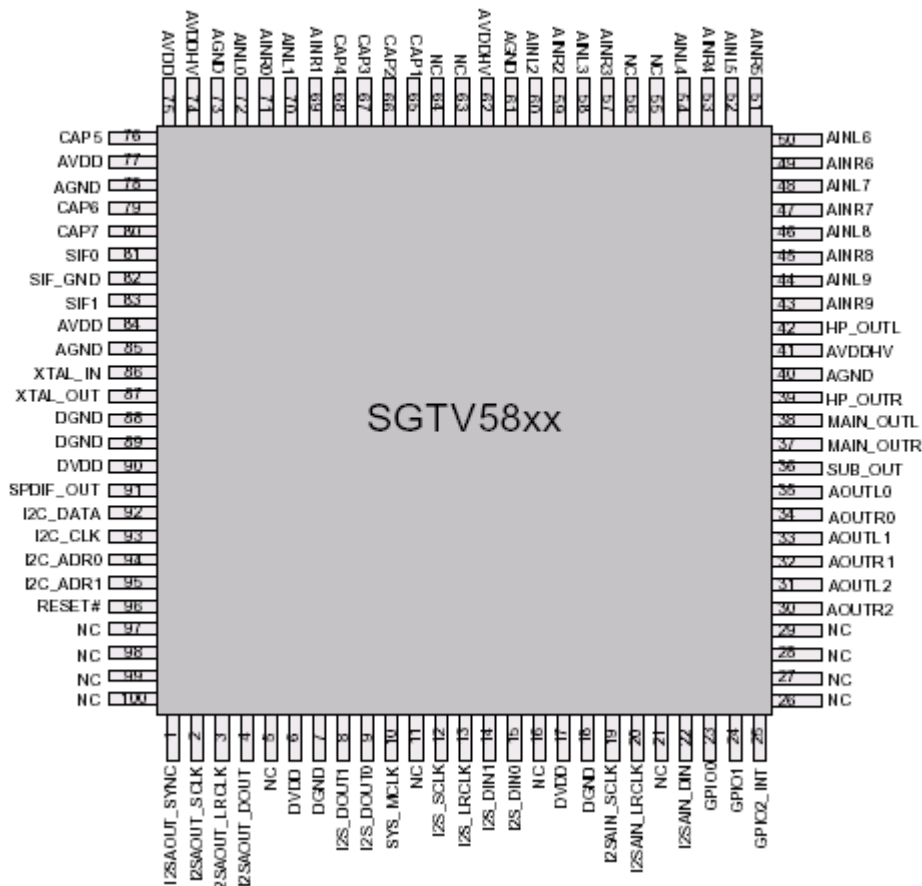
a) The reason why AOUT0 act as HP OUT while HP-OUT act as TV-OUT is that when two channels(two of AV, SCART1, SCART2, DVB, YPBPR and VGA) perform PIP, the main picture

via ADC and SSS switcher output MAIN-OUT. There is only one channel ADC, the signal can't go through another channel HP. When AOUT0 act as HP OUT, it can use "Analog Input Switch" switch the sound of PIP to AOUT0 and use the earphone sound amplifier to control the volume.

- b) The reason why output to FLI8548 a signal of SYNC DELAY is that when process the picture and sound at the same time, the process of image is much more complex and needs more time, so they may no-sync. When HDMI act as the main picture and occupy the I2S terminal, SYNC DELAY is needless.

SGVT5830 output MAIN L/R to sound amplifier MPS7722, then to speaker.

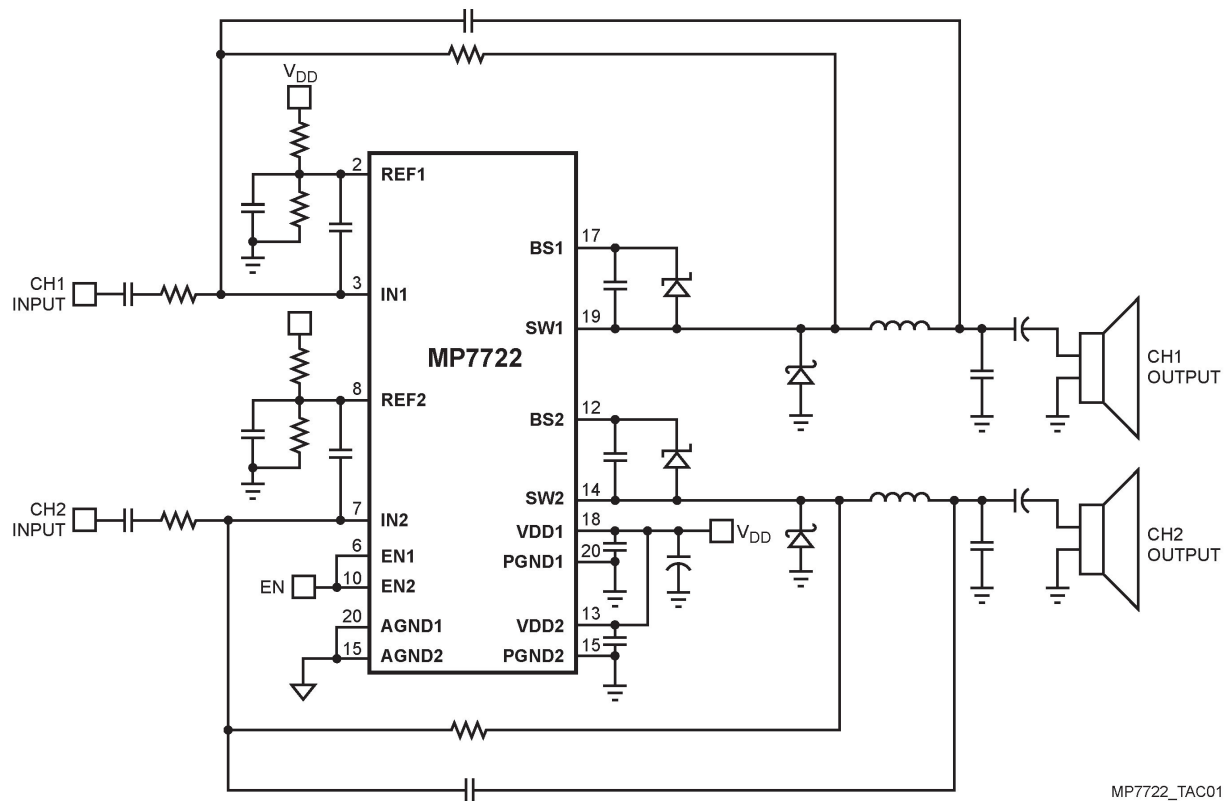
5.1. Pin-Out Diagram 100-Pin TQFP



4. Audio amplifier MPS7722

The MPS7722 is a dual ended 20W Class D Audio Amplifier with +24V power supply. It has the capability of delivering 2X12Ω/20W into 6Ω bass speakers and 1X 6Ω/12W treble speaker.

TYPICAL APPLICATION



MP7722_TAC01

PIN FUNCTIONS

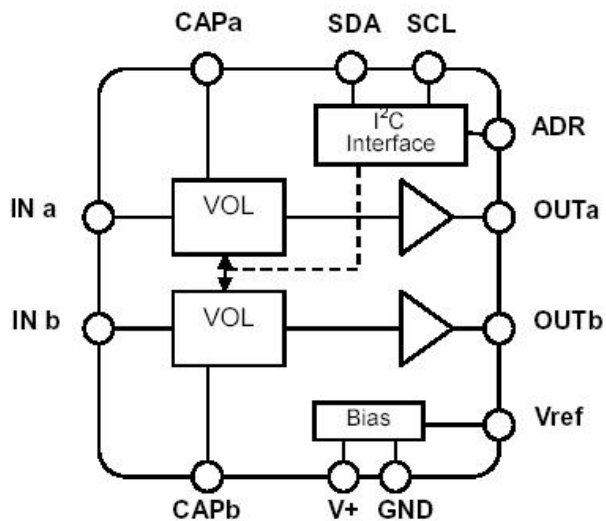
Pin #	Name	Description
1, 5, 11, 16	NC	No Connect. Not internally connected
2	REF1	Amplifier 1 Reference. REF1 is the reference point for amplifier 1. Use a resistive voltage divider to set the voltage at REF1 to $V_{DD}/2$.
3	IN1	Amplifier 1 Input. IN1 is the input for amplifier 1. This is an inverting input.
4	AGND1	Analog Ground 1. Connect AGND1 to AGND2.
6	EN1	Enable Input 1. EN1 must be connected to EN2. Drive high to enable MP7722, drive low to disable.
7	IN2	Amplifier 2 Input. IN2 is the input for amplifier 2. This is an inverting input.
8	REF2	Amplifier 2 Reference. REF2 is the reference point for amplifier 2. Use a resistive voltage divider to set the voltage at REF1 to $V_{DD}/2$.
9	AGND2	Analog Ground 2. Connect AGND2 to AGND1.
10	EN2	Enable Input 2. EN2 must be connected to EN1. Drive high to enable MP7722, drive low to disable.
12	BS2	High-Side MOSFET Bootstrap Input for Amplifier 2. A capacitor from BS2 to SW2 supplies the gate drive current to the internal high-side MOSFET. Connect a 1 μ F capacitor from SW2 to BS2.
13	VDD2	Power Supply Input. Bypass VDD2 to PGND2 with a 1 μ F X7R capacitor (in addition to the main bulk capacitor), placed close to the IC PIN13 and PIN15.
14	SW2	Switched Power Output. SW2 is the output of Amplifier 2. Connect the LC filter to this pin.
15	PGND2	Power Ground for Amplifier 2. Connect PGND2 to PGND1.

PIN FUNCTIONS *(continued)*

Pin #	Name	Description
17	BS1	High-Side MOSFET Bootstrap Input for Amplifier 1. A capacitor from BS1 to SW1 supplies the gate drive current to the internal high-side MOSFET. Connect a 1 μ F capacitor from SW1 to BS1. See Figure 1.
18	VDD1	Power Supply Input. Bypass VDD1 to PGND1 with a 1 μ F X7R capacitor (in addition to the main bulk capacitor), placed close to the IC PIN18 and PIN20.
19	SW1	Switched Power Output. SW1 is the output of Amplifier 1. Connect the LC filter to this pin. See Figure 1.
20	PGND1	Power Ground for Amplifier 1. Connect PGND1 to PGND2. See Figure 1.

Gain (V/V)	Gain (dB)	R _{FB} (K Ω)	R _{IN} (K Ω)	C _{INT}	F _{SW}	V _{DD} (V)	Remark
17.4	24.8	82	4.7	5.6nF	720KHz	24	FY#
3.9	15.0	39	10	6.8nF	660KHz	12	MPS7722
8.2	18.3	82	10	3.3nF	660KHz	12	MPS7722
8.3	21.5	39	4.7	6.8nF	660KHz	12	MPS7722
17.4	24.8	82	4.7	3.3nF	660KHz	12	MPS7722
5.6	15.0	56	10	8.2nF	670KHz	24	MPS7722
8.2	18.3	82	10	5.6nF	720KHz	24	MPS7722
11.9	21.5	56	4.7	8.2nF	670KHz	24	MPS7722
17.4	24.8	82	4.7	5.6nF	720KHz	24	MPS7722
33.0	30.4	330	10	1.8nF	700KHz	24	MPS7722

5. NJW1109



IN a,b: HP L/R

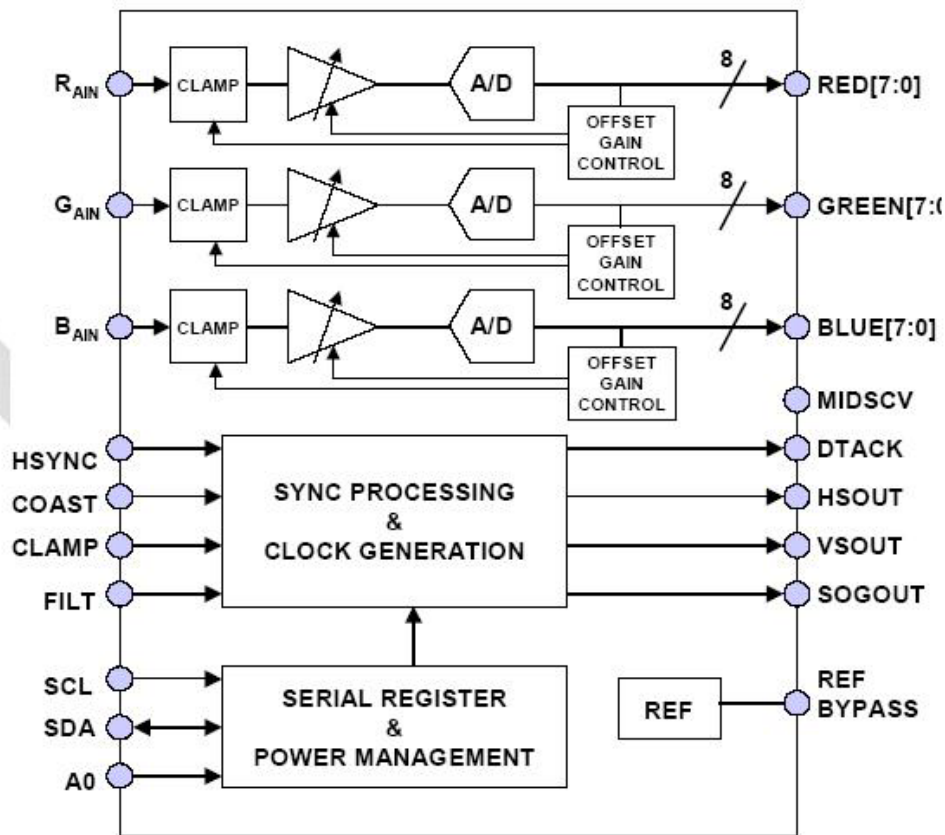
SCL,SDA: SCL_+5V, SDA_+5V

Out A, B: earphone output

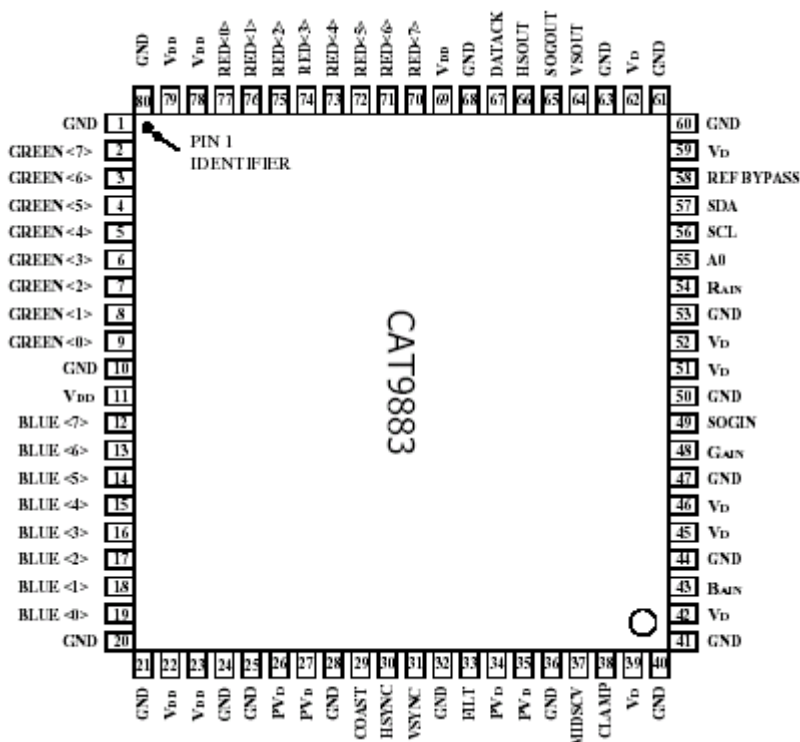
V+:+9V power supply

6. High definition module

VGA and YPBPR via switch PI5V330 to CAT9983 D/A convert. CAT9983 has a 150M band width, three groups ADC with 8-bit MICROVISION, support YPBPR 1080P input. CAT9983



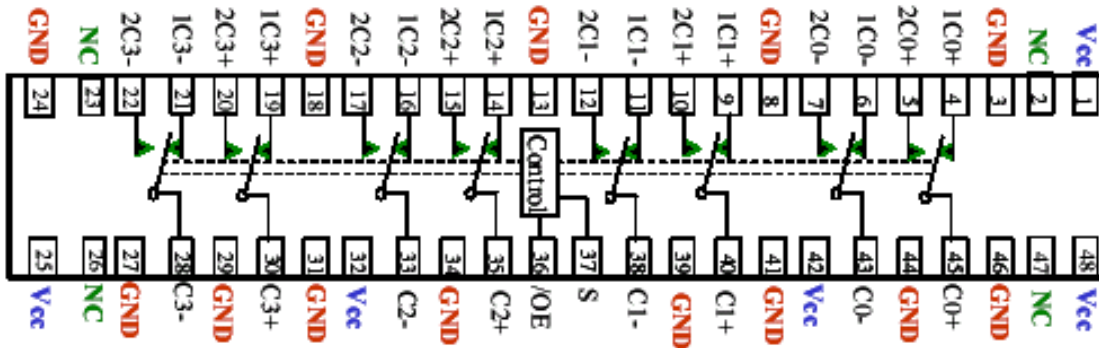
Note: pin COAST and CLAMP connected to ground for auto test.



7. Digital HDMI module

Two groups HDMI via video switch IC FSHDMI04 to HDMI input port of FLI8548, which integrated HDMI reception and support digital 1080P input.

FSHDMI04(with ESD) diagram is below:



8. FLI8545 system module

Feature:

- 3D comb filter, support multi-system TV signal and MICROVISION
- Integrated triple 10-bit ADC.
- HDMI receiver, support 1080P input, I2S output
- Built-in MCU, GPIP control
- ACC(Adaptive Contrast and Color), ACM(Active Color Management), DCDI(Dynamic mode test).

FIGURE 2. FLI8548H PIN OUT DIAGRAM

- DDR MEEORY

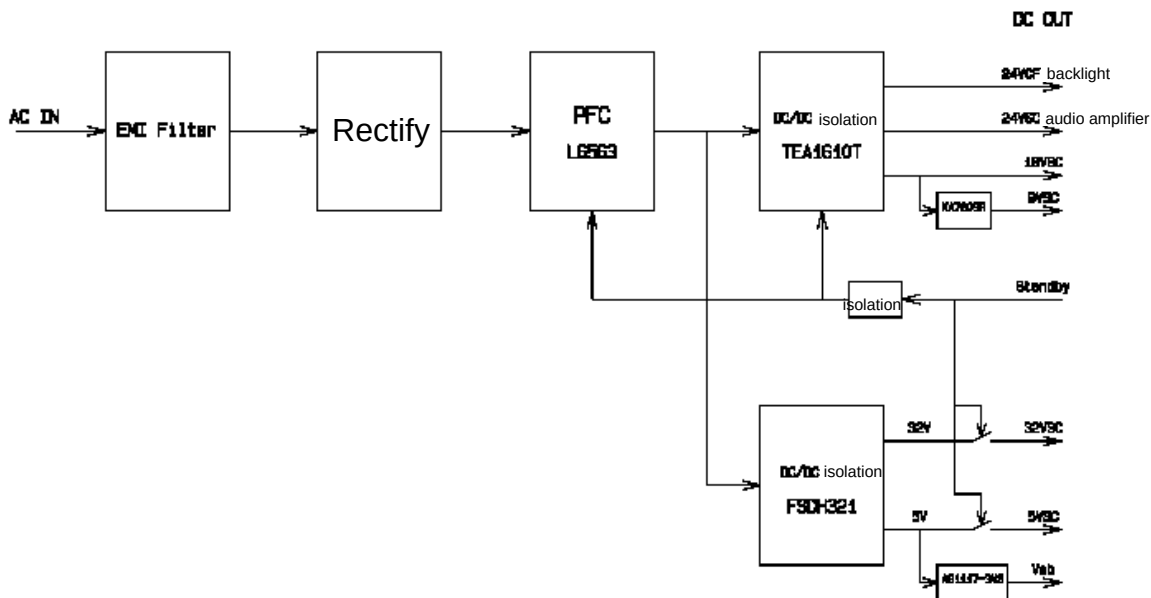
The unit adopts 2 chips 16M*16bit DDR SGRAM of 200M speed, 32-bit of data and 12 bit of address.

- FLASH and EEPROM

1M*16-bit of FLASH and 64K bit of EEPROM

10. DAP module (include AVC, SRS, TONE CONTROL, EQ ect,.)

11. Power part



Working principle of power:

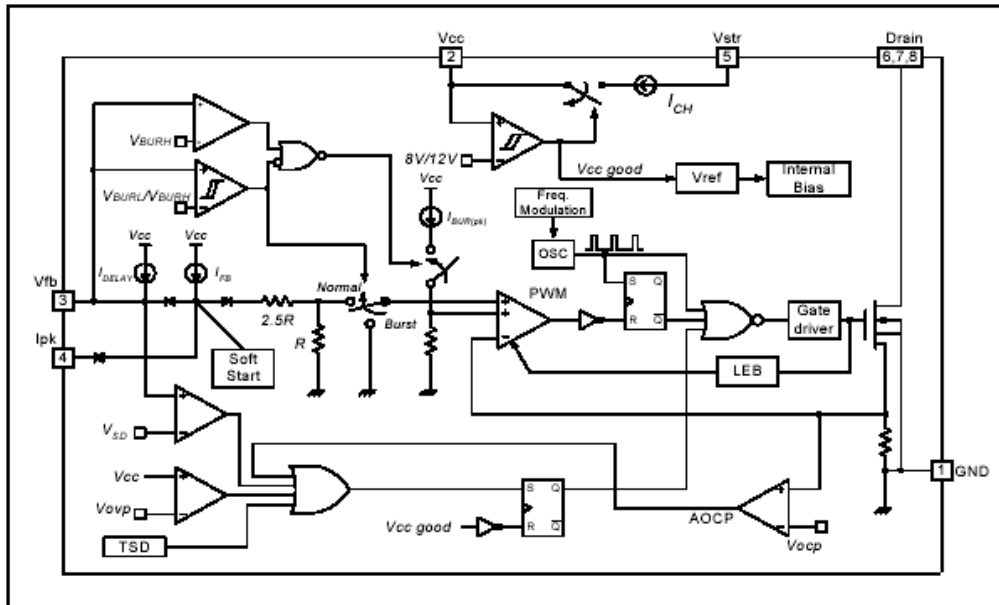
The input AC power via EMC filter and rectification circuit, it sent to PFC(power factor correct L6563) to output DC400V, which will be separated into two ways, one way via standby circuit (isolation D/D convert FSDH321) output 5VAND 32V; another way via semi-bridge circuit(TEA1610T) output 24V, 18V, ect. At standby, power board send out Vsb(3.3V) to cut off 5VSC, 32VSC output by the control of Standby signal and stop working of PFC circuit(L6563) and semi-bridge (TEA1610T). When turn on, it makes all the IC working and output voltage.

L1653:PFC(power factor correct)

TEA1610T: Isolation D/D convert (400VDC converted to DC 24V, 18V, ect.)

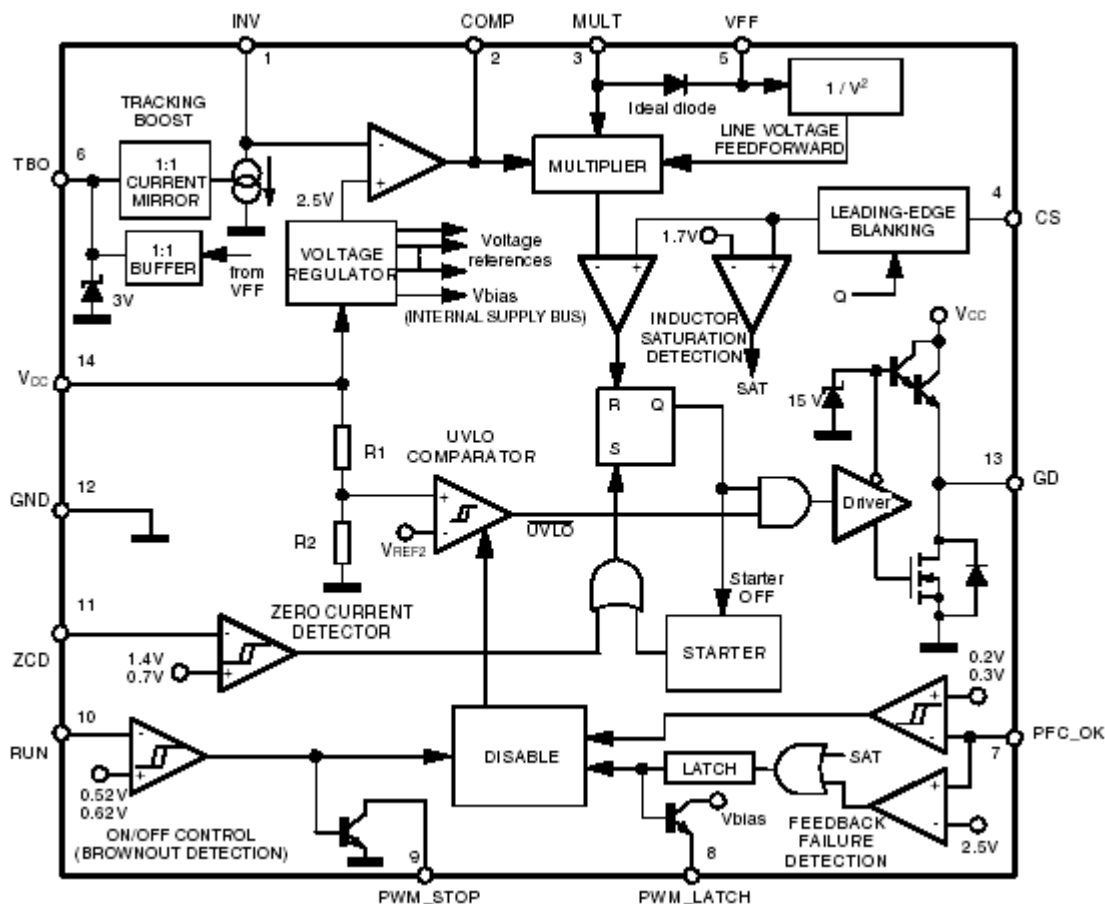
FSDH321: Isolation D/D convert (400VDC converted to DC 5V, 32V, ect.)

FSDH321 block diagram is bellow:



Pin Number	Pin Name	Pin Function Description
1	GND	Sense FET source terminal on primary side and internal control ground.
2	Vcc	Positive supply voltage input. Although connected to an auxiliary transformer winding, current is supplied from pin 5 (Vstr) via an internal switch during startup (see Internal Block Diagram section). It is not until Vcc reaches the UVLO upper threshold (12V) that the internal start-up switch opens and device power is supplied via the auxiliary transformer winding.
3	Vfb	The feedback voltage pin is the non-inverting input to the PWM comparator. It has a 0.9mA current source connected internally while a capacitor and optocoupler are typically connected externally. A feedback voltage of 6V triggers over load protection (OLP). There is a time delay while charging external capacitor Cfb from 3V to 6V using an internal 5uA current source. This time delay prevents false triggering under transient conditions, but still allows the protection mechanism to operate under true overload conditions.
4	Ipk	This pin adjusts the peak current limit of the Sense FET. The feedback 0.9mA current source is diverted to the parallel combination of an internal 2.8kΩ resistor and any external resistor to GND on this pin to determine the peak current limit. If this pin is tied to Vcc or left floating, the typical peak current limit will be 0.7A.
5	Vstr	This pin connects directly to the rectified AC line voltage source. At start up the internal switch supplies internal bias and charges an external storage capacitor placed between the Vcc pin and ground. Once the Vcc reaches 12V, the internal switch is opened.
6, 7, 8	Drain	The drain pins are designed to connect directly to the primary lead of the transformer and are capable of switching a maximum of 650V. Minimizing the length of the trace connecting these pins to the transformer will decrease leakage inductance.

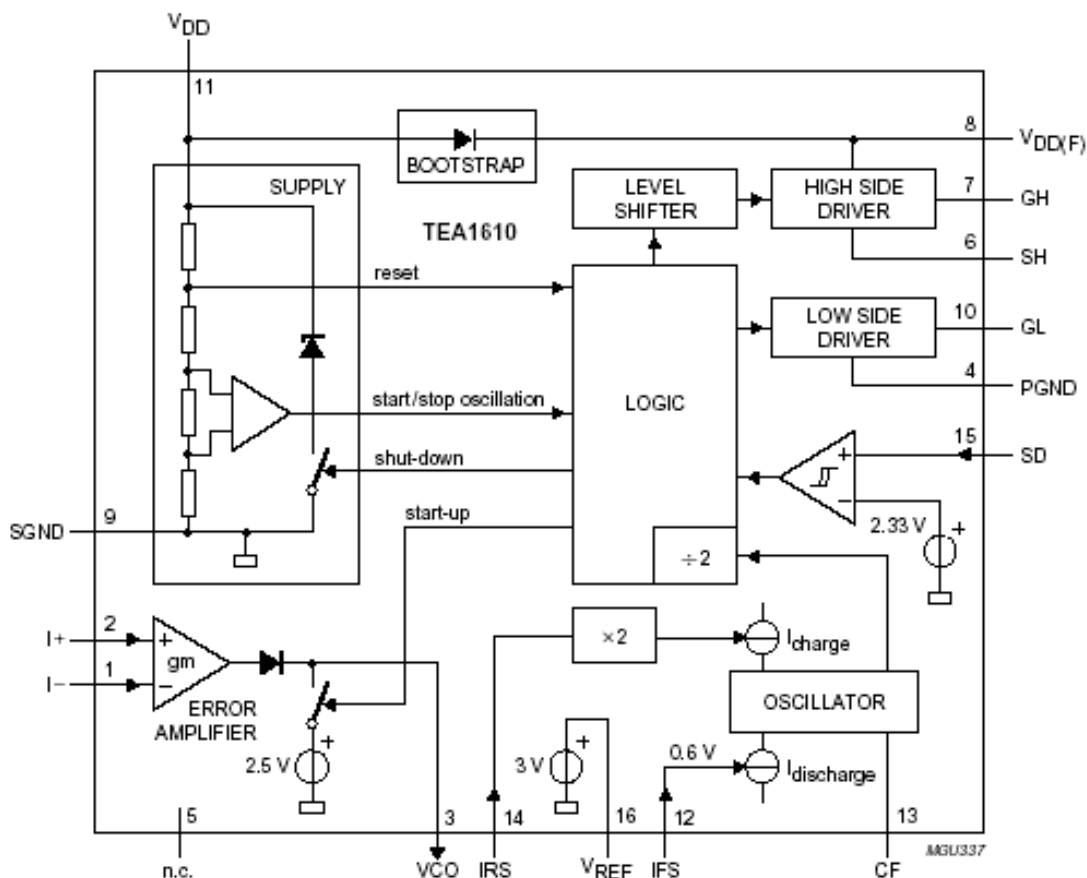
L6563 block diagram is below:



Pin #	Pin Name	Function
1	INV	Inverting input of the error amplifier. The information on the output voltage of the PFC pre-regulator is fed into the pin through a resistor divider. The pin normally features high impedance but, if the tracking boost function is used, an internal current generator programmed by TBO (pin #6) is activated. It sinks current from the pin to change the output voltage so that it tracks the mains voltage.
2	COMP	Output of the error amplifier. A compensation network is placed between this pin and INV (pin #1) to achieve stability of the voltage control loop and ensure high power factor and low THD.
3	MULT	Main input to the multiplier. This pin is connected to the rectified mains voltage via a resistor divider and provides the sinusoidal reference to the current loop. The voltage on this pin is used also to derive the information on the RMS mains voltage.
4	CS	Input to the PWM comparator. The current flowing in the MOSFET is sensed through a resistor, the resulting voltage is applied to this pin and compared with an internal reference to determine MOSFET's turn-off. A second comparison level at 1.7V detects abnormal currents (e.g. due to boost inductor saturation) and, on this occurrence, shuts down the IC, reduces its consumption almost to the start-up level and asserts PWM_LATCH (pin #8) high.
5	VFF	Second input to the multiplier for 1/V ² function. A capacitor and a parallel resistor must be connected from the pin to GND. They complete the internal peak-holding circuit that derives the information on the RMS mains voltage. The voltage at this pin, a DC level equal to the peak voltage at pin MULT (#3), compensates the control loop gain dependence on the mains voltage. Never connect the pin directly to GND.
6	TBO	Tracking Boost function. This pin provides a buffered VFF voltage. A resistor connected between this pin and GND defines a current that is sunk from pin INV (#1). In this way, the output voltage is changed proportionally to the mains voltage (tracking boost). If this function is not used leave this pin open.

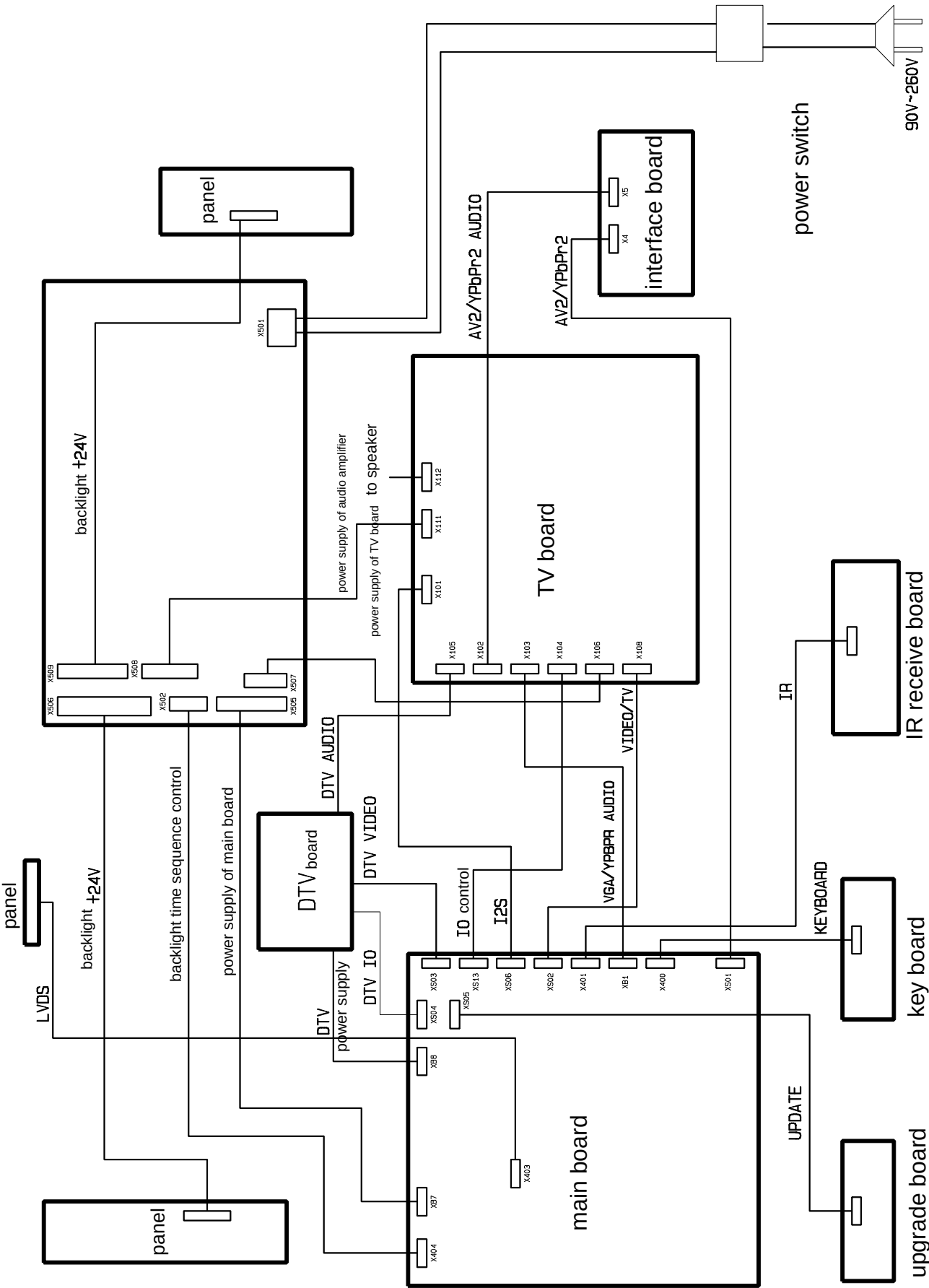
7	PFC_OK	PFC pre-regulator output voltage monitoring/disable function. This pin senses the output voltage of the PFC pre-regulator through a resistor divider and is used for protection purposes. If the voltage at the pin exceeds 2.5V the IC is shut down, its consumption goes almost to the start-up level and this condition is latched. PWM_LATCH pin is asserted high. Normal operation can be resumed only by cycling the Vcc. This function is used for protection in case the feedback loop fails. If the voltage on this pin is brought below 0.2V the IC is shut down and its consumption is considerably reduced. To restart the IC the voltage on the pin must go above 0.26V. If these functions are not needed, tie the pin to a voltage between 0.26 and 2.5 V.
8	PWM_LATCH	Output pin for fault signaling. During normal operation this pin features high impedance. If either a voltage above 2.5V at PFC_OK (pin #7) or a voltage above 1.7V on CS (pin #4) is detected the pin is asserted high. Normally, this pin is used to stop the operation of the DC-DC converter supplied by the PFC pre-regulator by invoking a latched disable of its PWM controller. If not used, the pin will be left floating.
9	PWM_STOP	Output pin for fault signaling. During normal operation this pin features high impedance. If the IC is disabled by a voltage below 0.5V on RUN (pin #10) the voltage at the pin is pulled to ground. Normally, this pin is used to temporarily stop the operation of the DC-DC converter supplied by the PFC pre-regulator by disabling its PWM controller. If not used, the pin will be left floating.
10	RUN	Remote ON/OFF control. A voltage below 0.52V shuts down (not latched) the IC and brings its consumption to a considerably lower level. PWM_STOP is asserted low. The IC restarts as the voltage at the pin goes above 0.6V. Connect this pin to VFF (pin #5) either directly or through a resistor divider to use this function as brownout (AC mains undervoltage) protection, tie to INV (pin #1) if the function is not used.
11	ZCD	Boost inductor's demagnetization sensing input for transition-mode operation. A negative-going edge triggers MOSFET's turn-on.
12	GND	Ground. Current return for both the signal part of the IC and the gate driver.
13	GD	Gate driver output. The totem pole output stage is able to drive power MOSFET's and IGBT's with a peak current of 600 mA source and 800 mA sink. The high-level voltage of this pin is clamped at about 12V to avoid excessive gate voltages.
14	Vcc	Supply Voltage of both the signal part of the IC and the gate driver.

TEA1610T block diagram is below:



SYMBOL	PIN	DESCRIPTION
I ₋	1	error amplifier inverting input
I ₊	2	error amplifier non-inverting input
VCO	3	error amplifier output
PGND	4	power ground
n.c.	5	not connected (high voltage spacer)
SH	6	high side switch source
GH	7	gate of the high side switch
V _{DD(F)}	8	floating supply voltage for the high side driver
SGND	9	signal ground
GL	10	gate of the low side switch
V _{DD}	11	supply voltage
IFS	12	oscillator discharge current input
CF	13	oscillator capacitor
IRS	14	oscillator charge current input
SD	15	shut-down input
V _{REF}	16	reference voltage

Wiring diagram



Trouble shooting

Before servicing please check to find the possible causes of the troubles according to the table below.

1. Antenna(signal):

Picture is out of focus or jumping	● Bad status in signal receiving ● Poor signal ● Check if there are failures with the electrical connector or the antenna. ● Check if the antenna is properly connected.
Fringe in picture	● Check if the antenna is correctly oriented. ● Maybe there is electric wave reflected from hilltop or building.
Picture is interfered by stripe shaped bright spots	● Possibly due to interference from automobile, train, high voltage transmission line, neon lamp etc. ● Maybe there is interference between antenna and power supply line. Please try to separate them in a longer distance. ● Maybe the shielded-layer of signal wire is not connected properly to the connector.
There appear streaks or light color on the screen	● Check if interfered by other equipment and if interfered possibly by the equipment like transmitting antenna, non professional radio station and cellular phone.

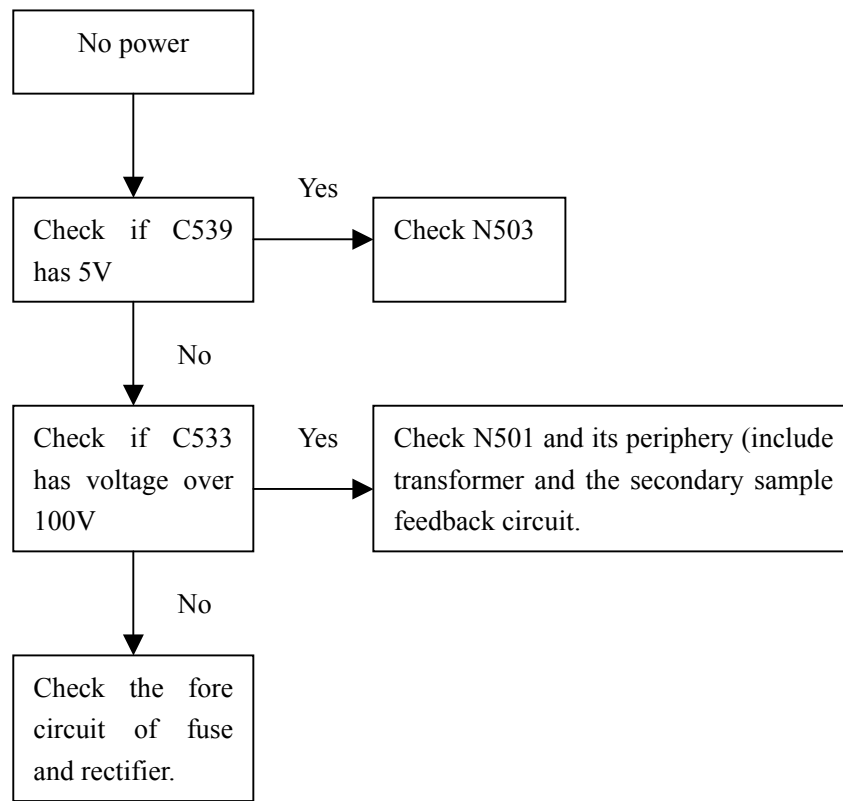
2. TV set:

Symptoms	Possible cause
Unable to switch the power on	● Check to see if the power plug has been inserted properly into the socket.
No picture and sound	● Check to see if the power supply of liquid crystal TV has been switched on. (as can be indicated by the red LED at the front of the TV set) ● See if it's receiving the signal that is transmitted from other source than the station ● Check if it's connected to the wrong terminal or if the input mode is correct. ● Check if the signal cable connection between video frequency source and the liquid crystal TV set is correct.
Deterioration of color phase or color tone	● Check if all the picture setups have been corrected.
Screen position or size is not proper	● Check is the screen position and size is correctly set up.
Picture is twisted and deformed	● Check to see if the picture-frame ratio is properly set up.
Picture color changed or colorless	● Check the "Component" or "RGB" settings of the liquid crystal TV set and make proper adjustment according to

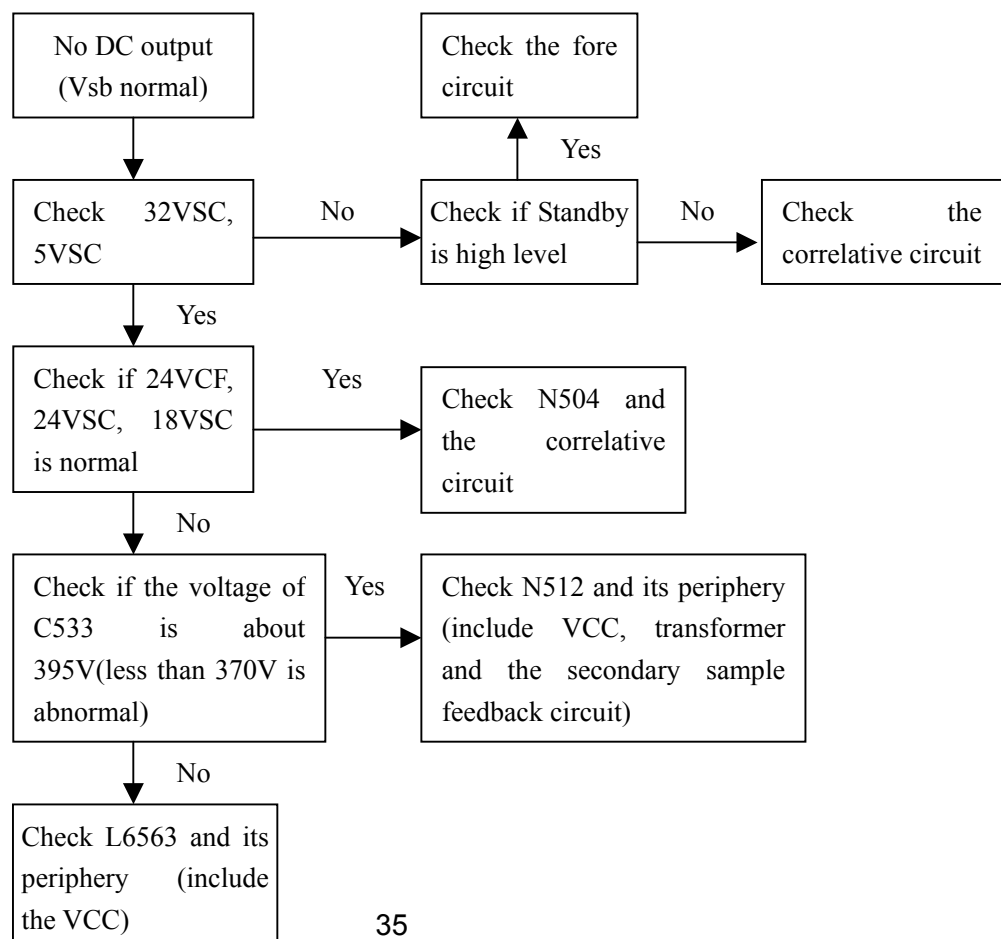
Symptoms	Possible cause
	the signal types.
Picture too bright and there is distortion in the brightest area	● Check if the contrast setting is too high. ● Possibly the output quality of DVD broadcaster is set too high. ● It maybe also due to improper terminal connection of the video frequency signal in a certain position of the system.
Picture is whitish or too bright in the darkest area of the picture	● Check if the setting for the brightness is too high ● Possibly the brightness grade of DVD player (broadcaster) is set too high.
No picture or signal produced from the displayer if “XXX in search” appears.	● Check if the cable is disconnected. ● Check if it's connected to the proper terminal or if the input mode is correct.
There appears an indication - “outside the receivable scope)	● Check if the TV set can receive input signal. The signal is not correctly identified and VGA format is beyond the specified scope.
Remote control cannot work properly	● Check if the batteries are installed in the reverse order. ● Check if the battery is effective. ● Check the distance or angle from the monitor. ● Check if there is any obstruct between the remote control and the TV set. ● Check if the remote control signal- receiving window is exposed to strong fluorescence.
No picture and sound, but only hash.	● Check if the antenna cable is correctly connected, or if it has received the video signal correctly.
Blur picture	● Check if the antenna cable is correctly connected. ● Of if it has received the right video signal.
No sound	● Check if the “mute” audio frequency setting is selected. ● Check if the sound volume is set to minimum. ● Make sure the earphone is not connected. ● Check if the cable connection is loose.
When playing VHS picture search tape, there are lines at the top or bottom of the picture.	● When being played or in pause VHS picture search tape sometimes can't provide stable picture, which may lead to incorrect display of the liquid crystal TV, In this case please press “auto” key on the remote control so as to enable the liquid crystal TV set to recheck the signal and then to display correct picture signal

Troubleshooting guide

1. Trouble diagnosis of power

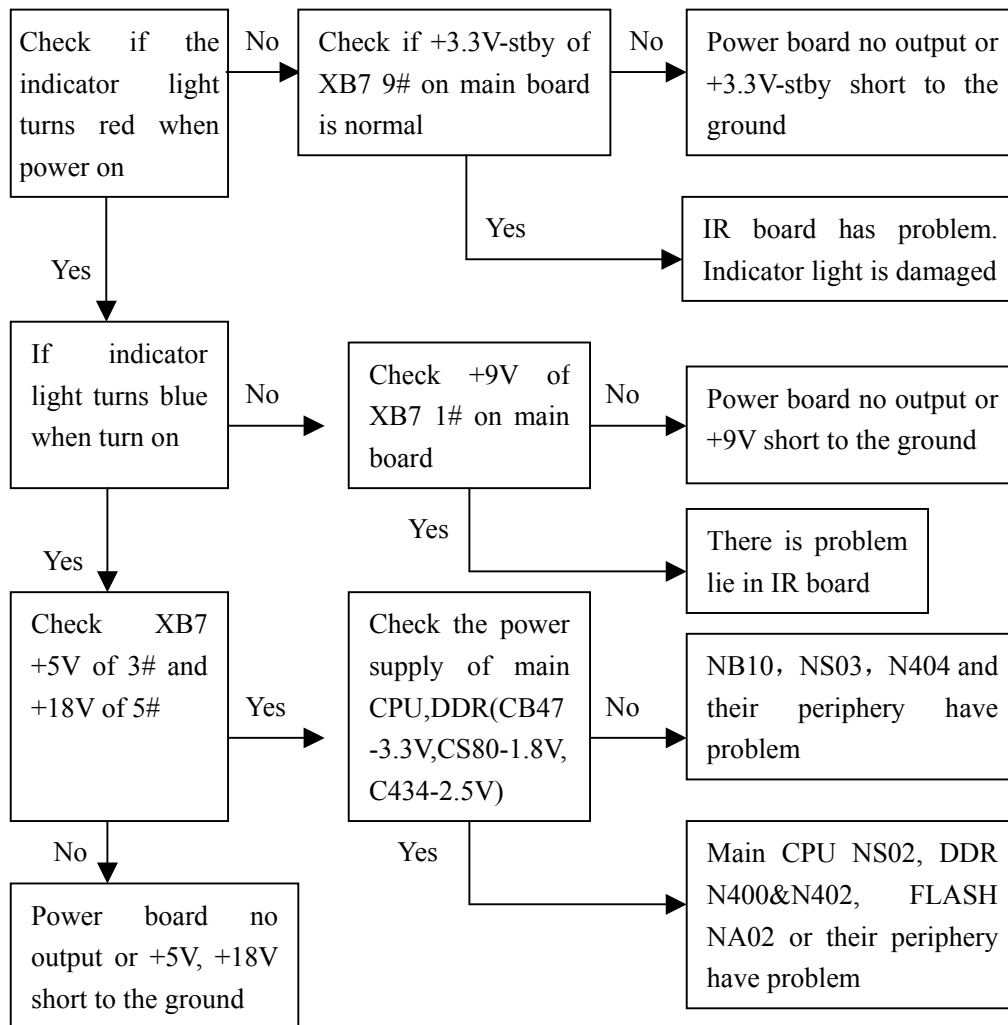


2. No DC output

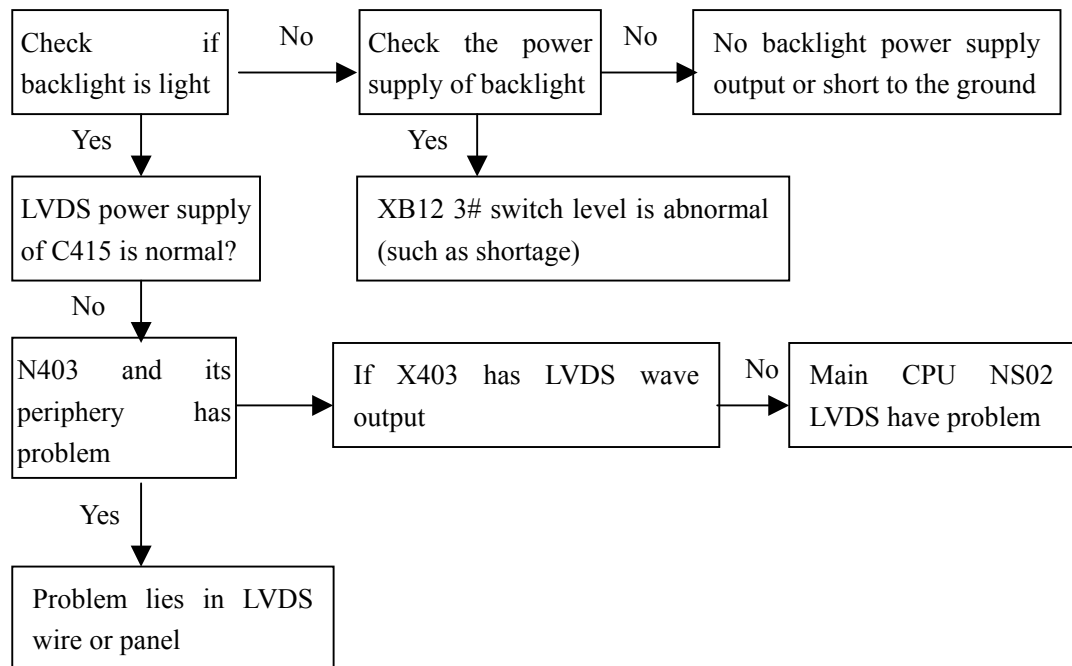


3. Representative symptoms

(1) no picture, no sound, no raster

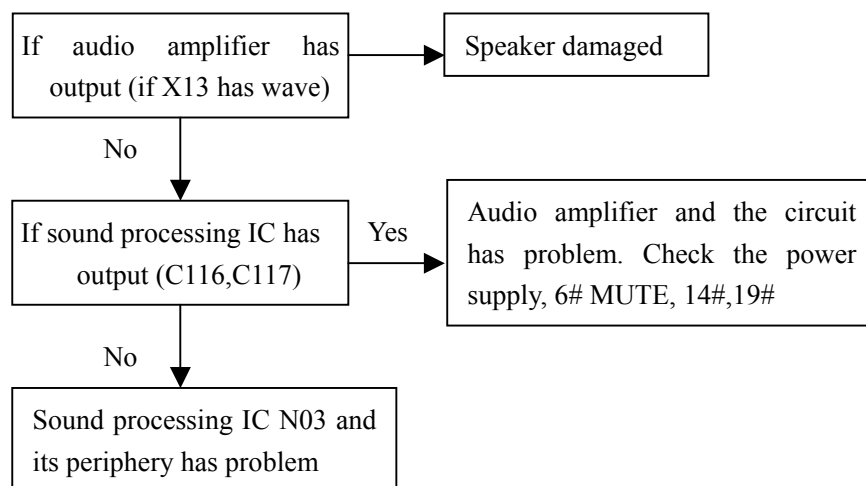


(2) with sound but no picture

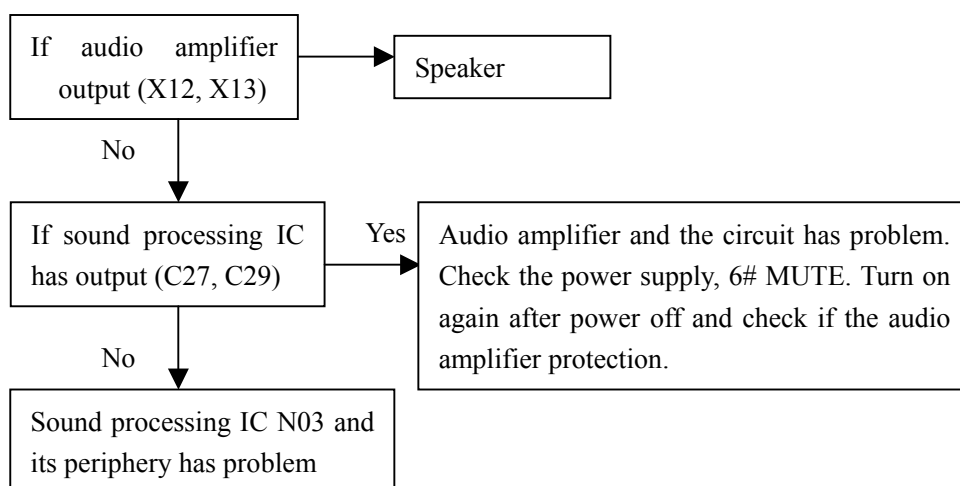


(3) with picture but no sound

a) MP7722



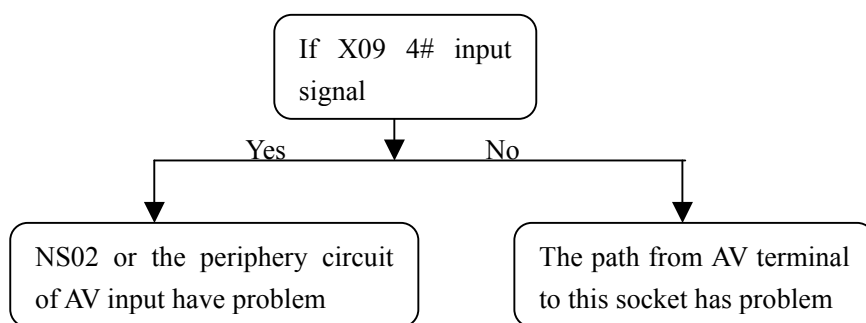
b) TPA3001



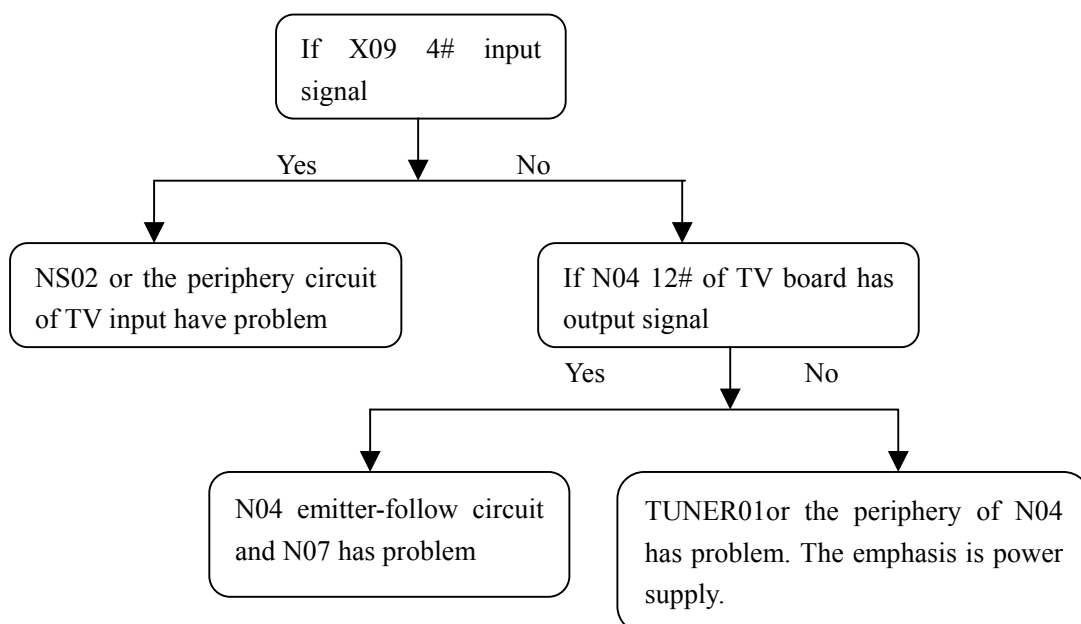
The output of TPA3001 is differential output, so when check X12, X13 output signal with oscilloscope, please use the power cord with two pins, otherwise, it may damage the audio amplifier.

(4) a certain channel abnormal

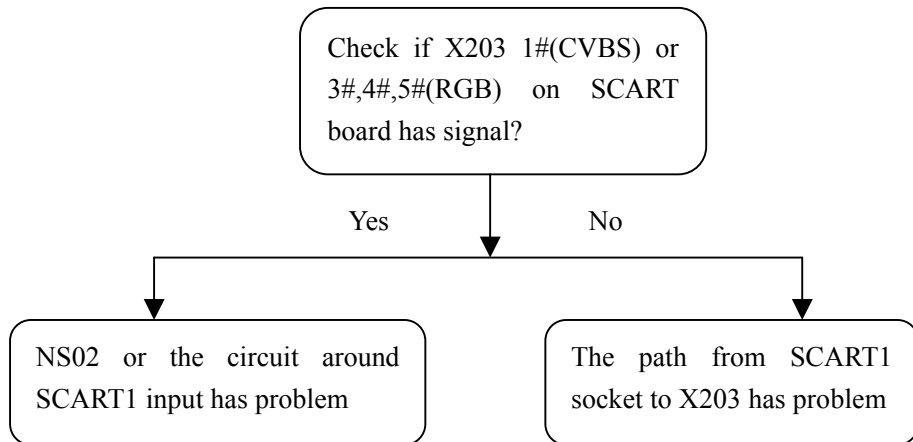
a) AV no picture



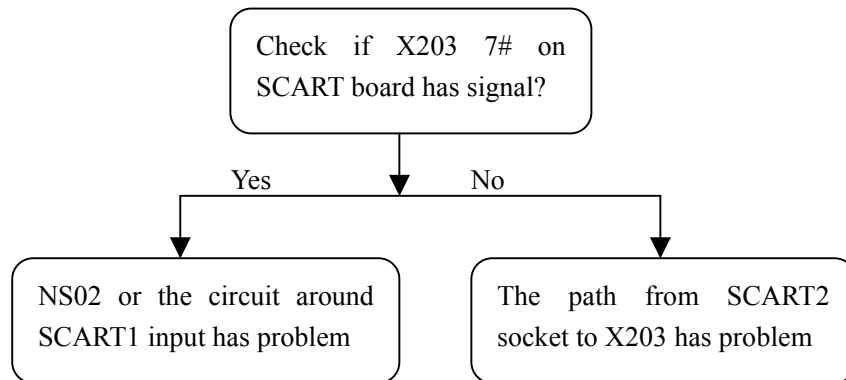
b) TV no picture



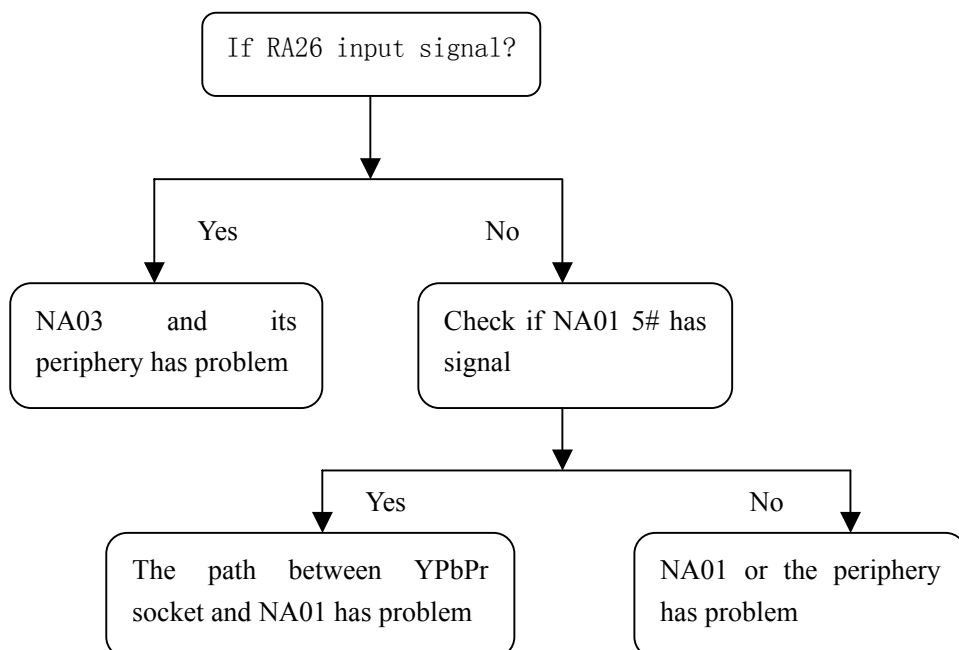
c) SCART1 no picture



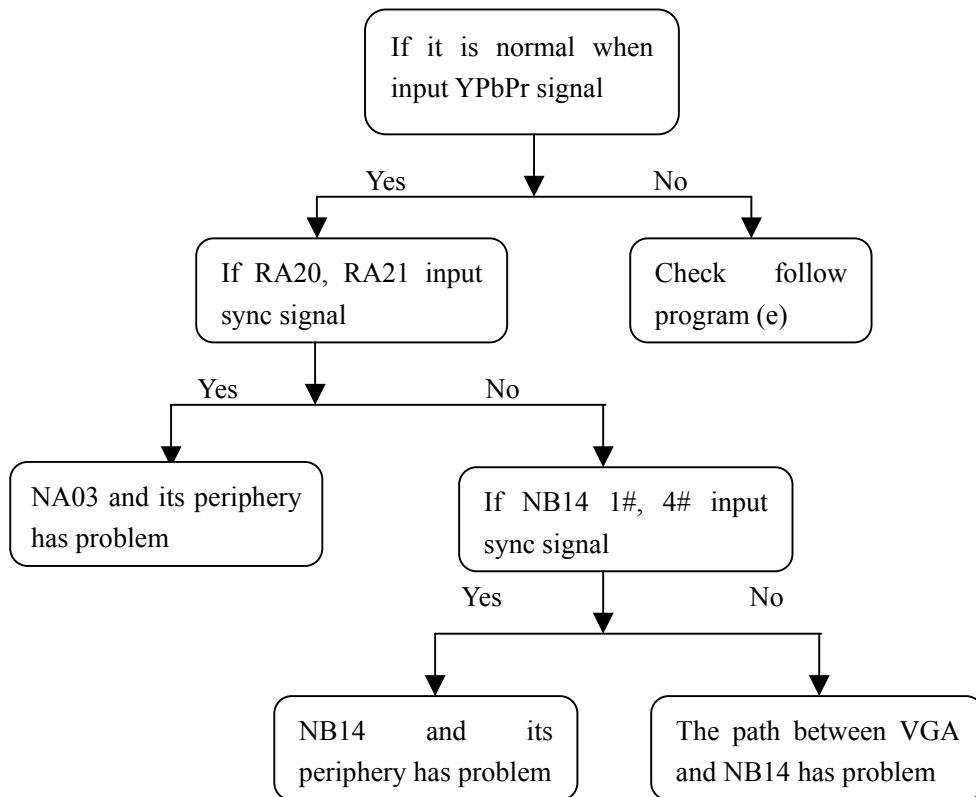
d) SCART2



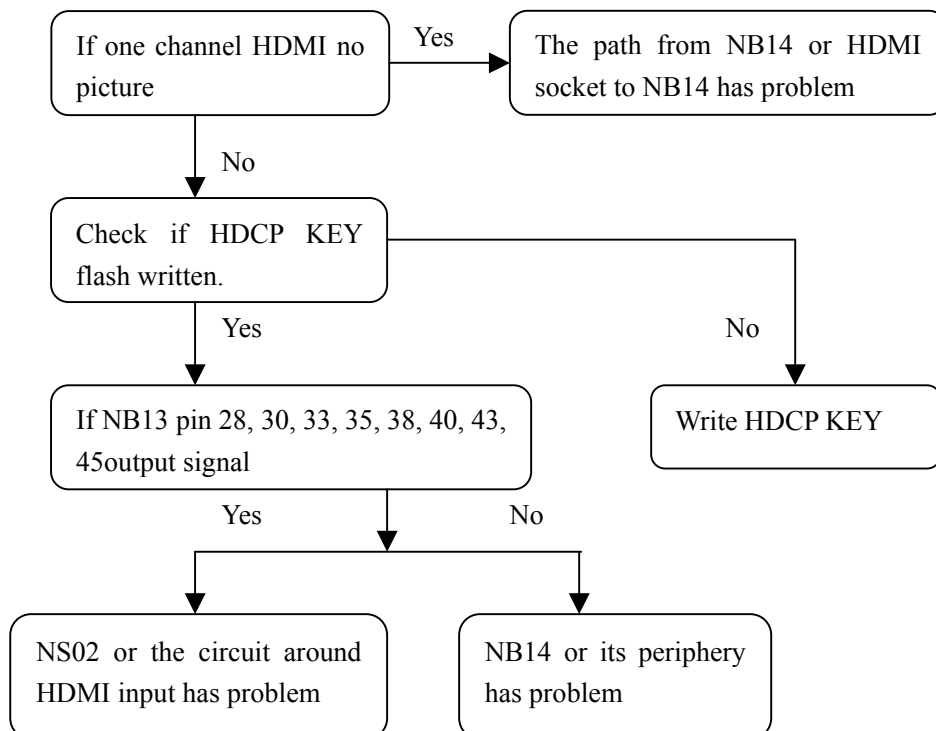
e) YUV no picture

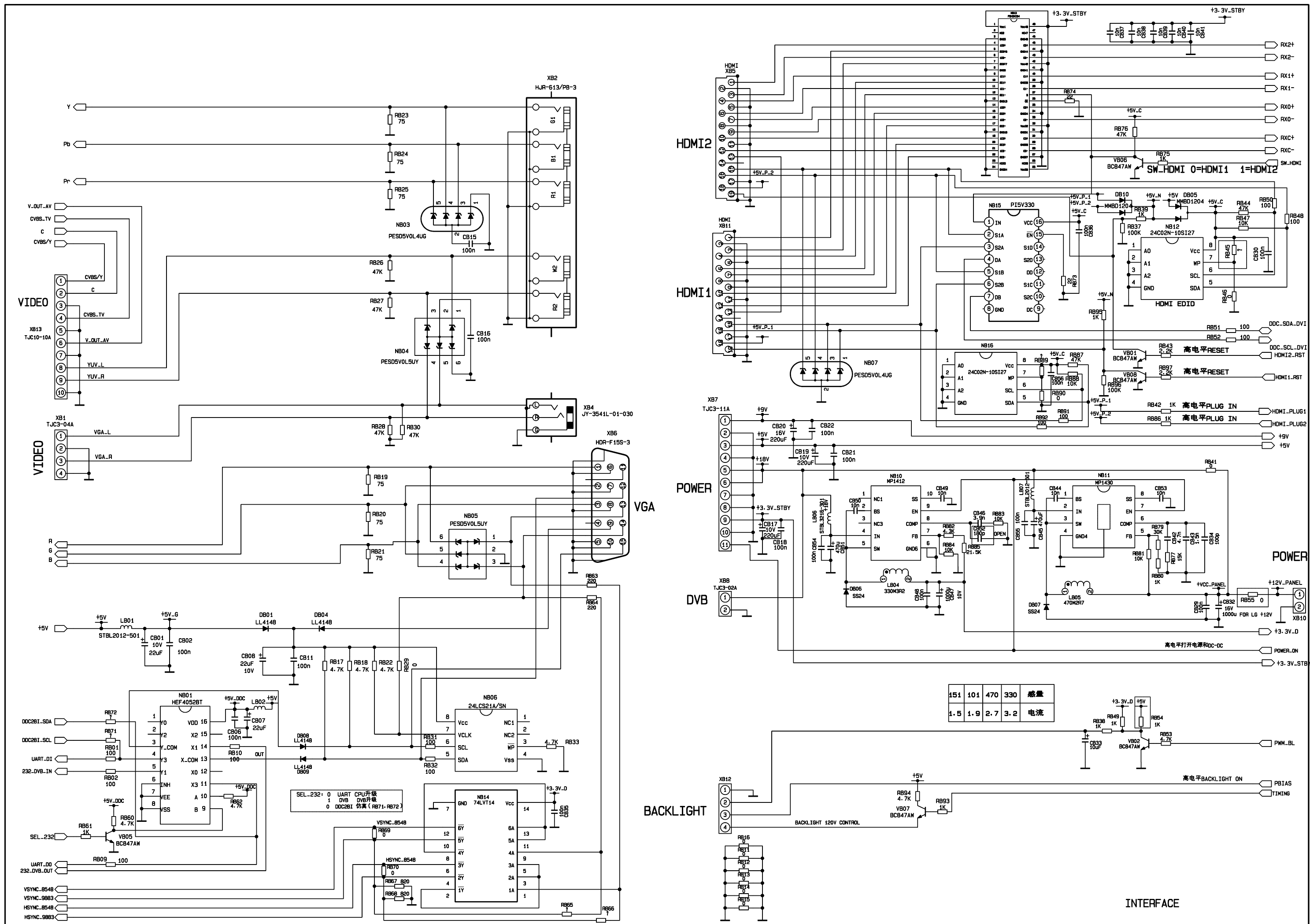


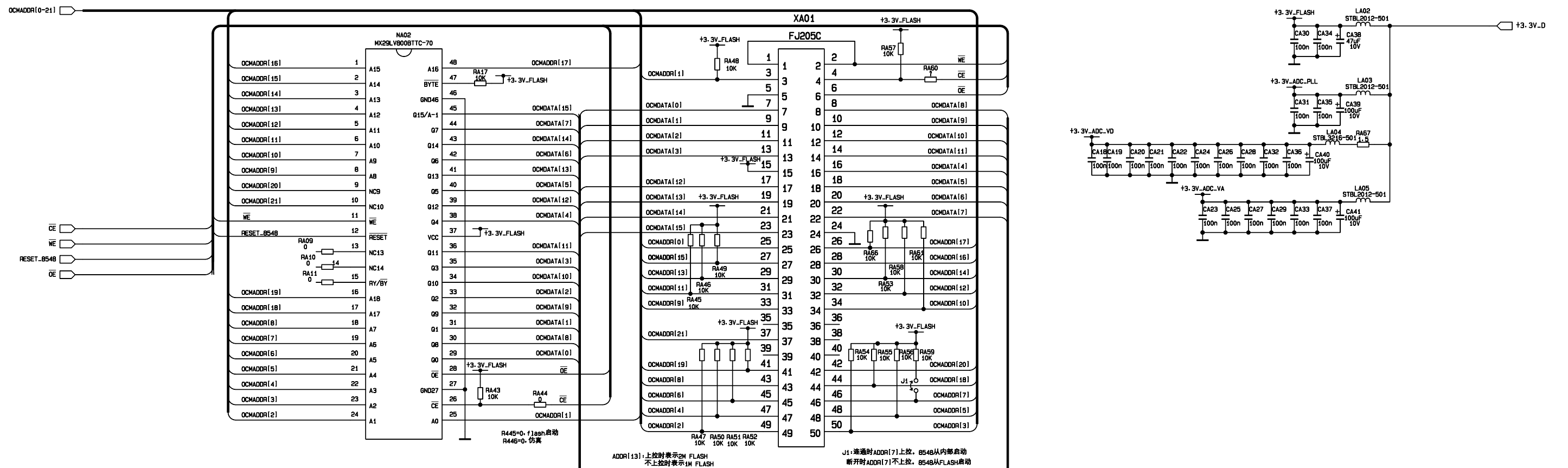
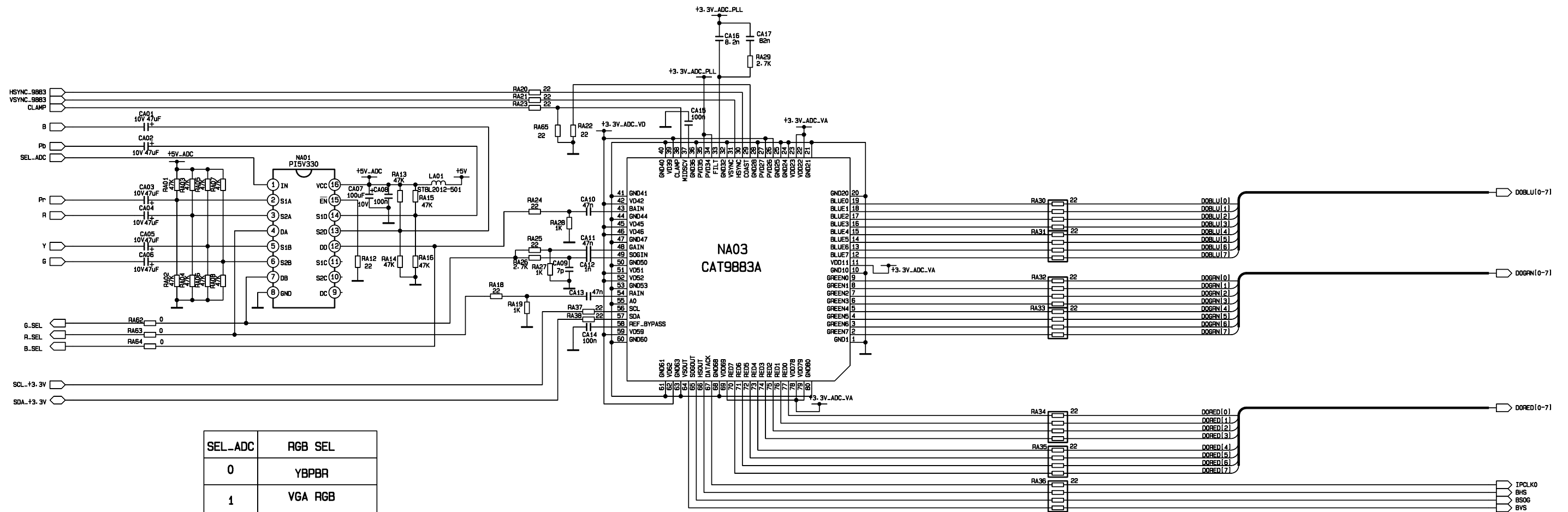
f) D-Sub no picture

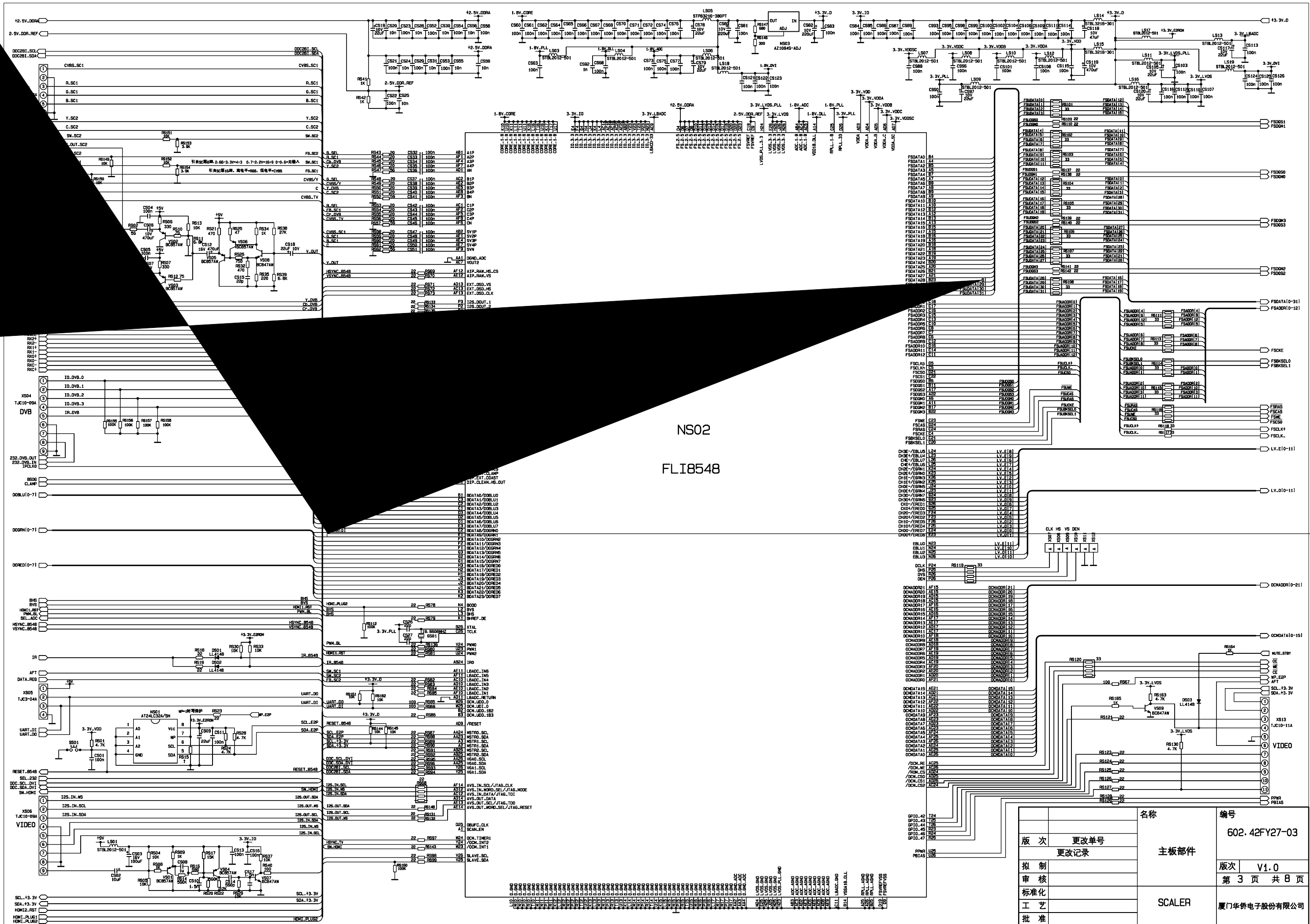


g) HDMI no picture

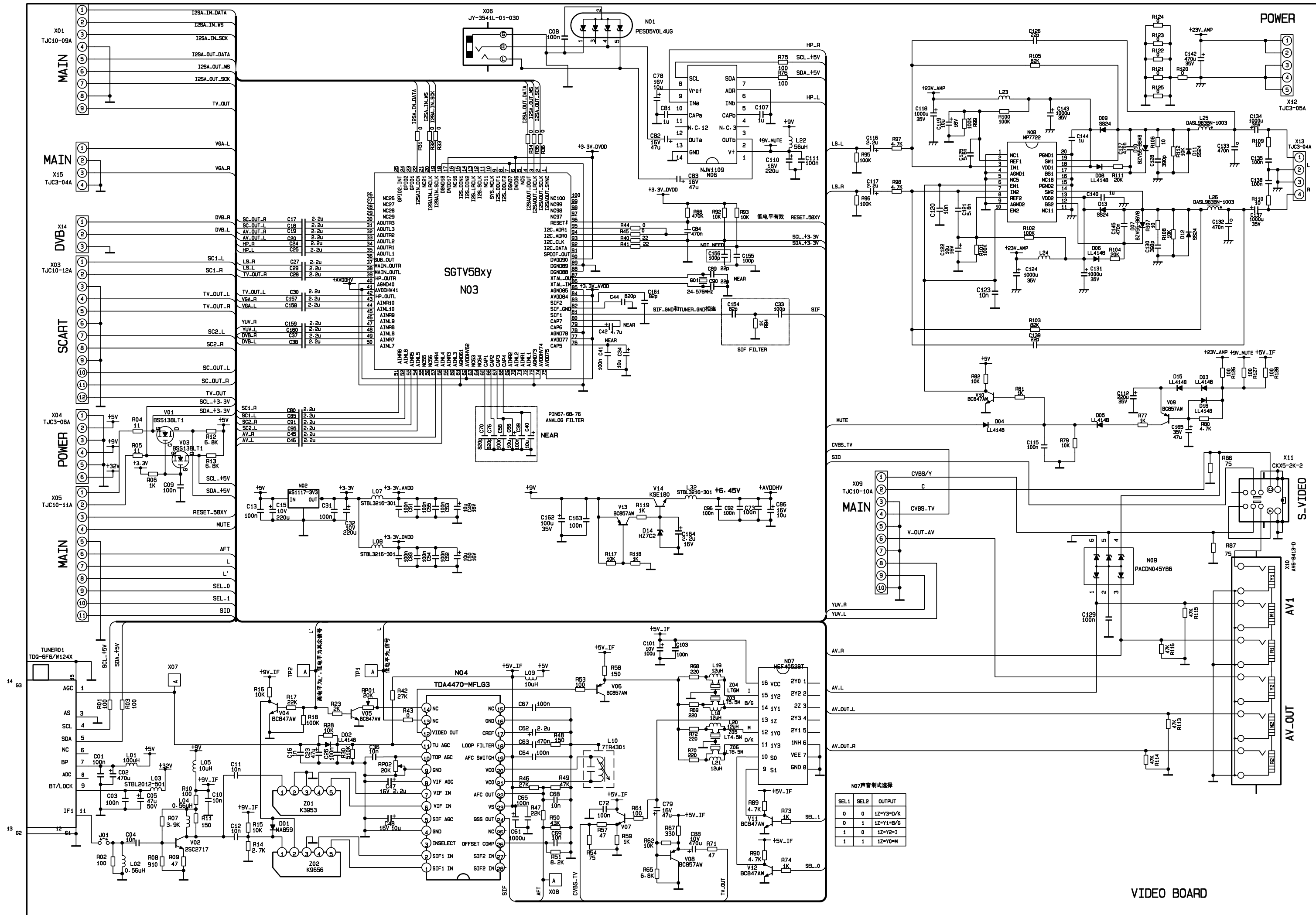








名称		编号
602.42FY27-03		
版次	更改单号	板次
拟制	更改记录	V1.0
审核		第 3 页 共 8 页
标准化		
工艺		
批准		
主板部件		SCALER
		厦门华侨电子股份有限公司



POWER

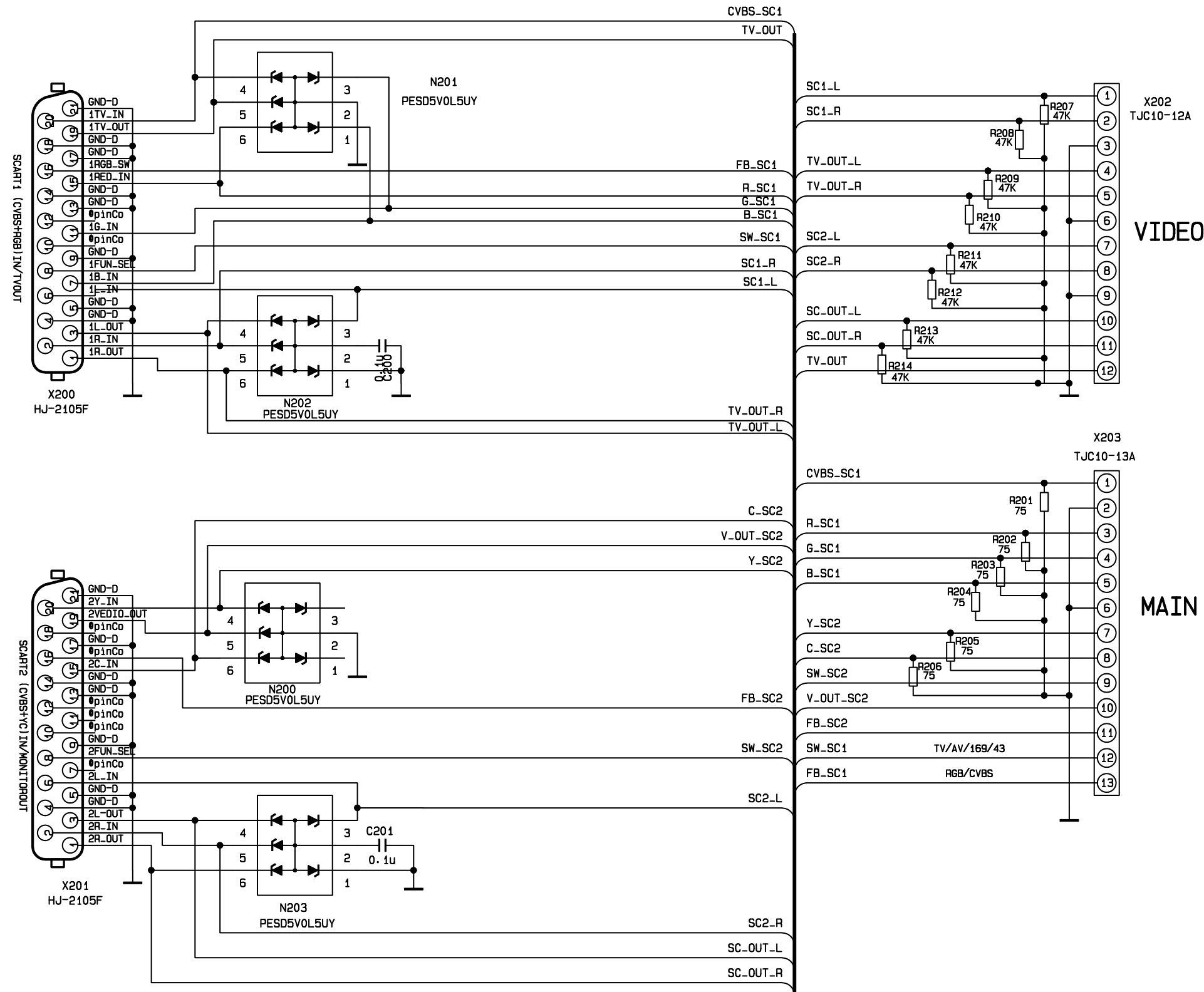
S_VIDEO

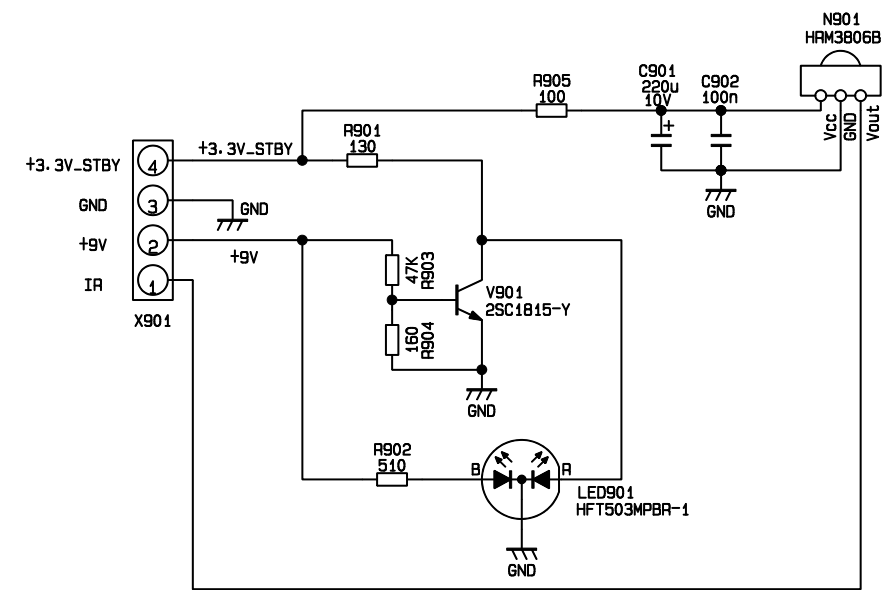
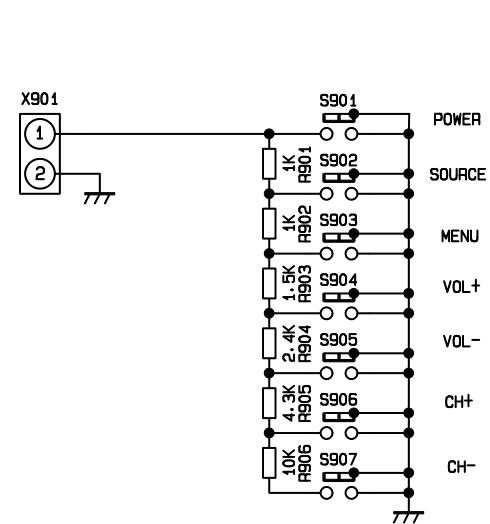
AV1

AV_OUT

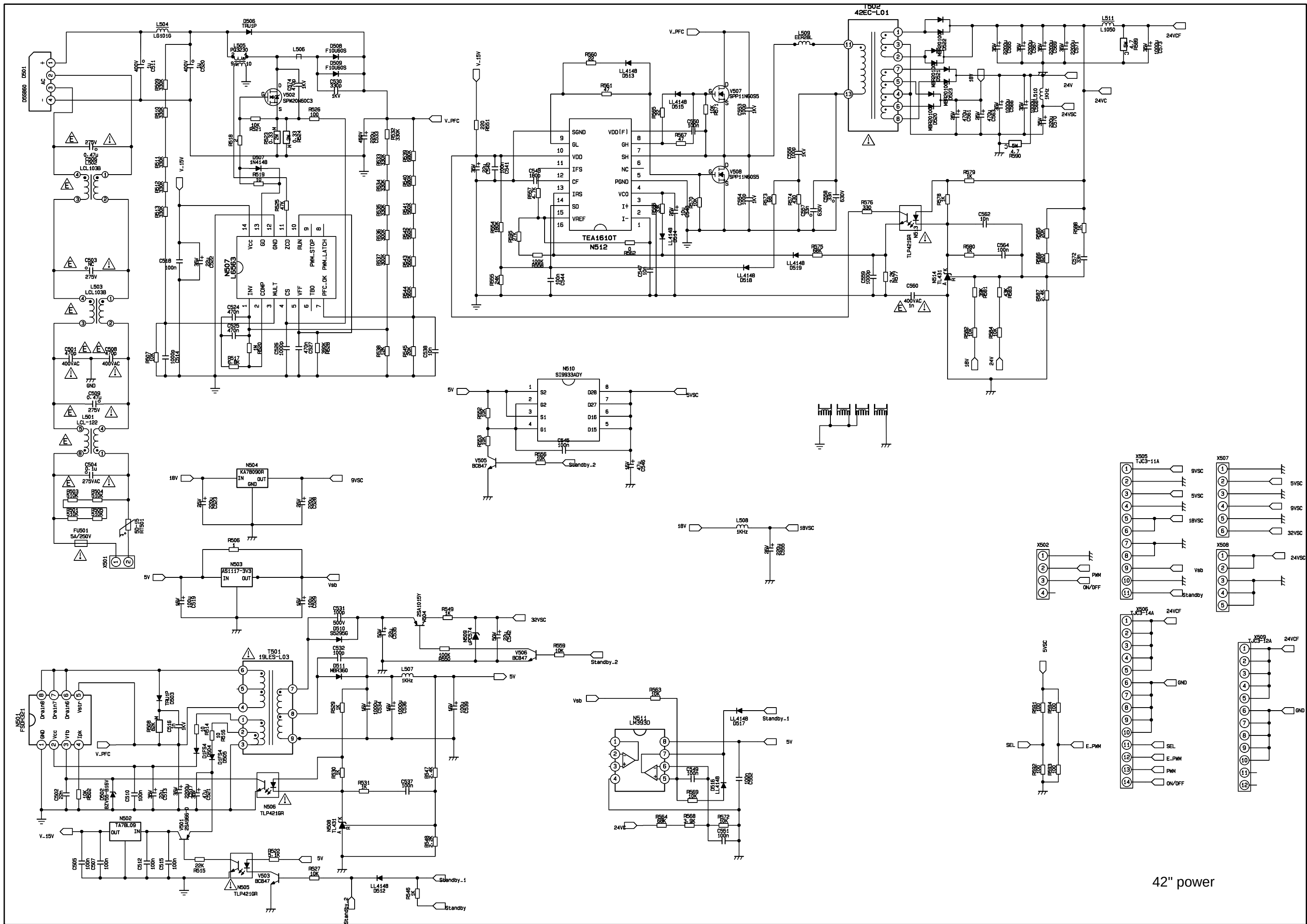
VIDEO BOARD

N07 声音制式选择		
SEL1	SEL2	OUTPUT
0	0	1Z=Y3=D/K
0	1	1Z=Y1=B/G
1	0	1Z=Y2=I
1	1	1Z=Y0=N

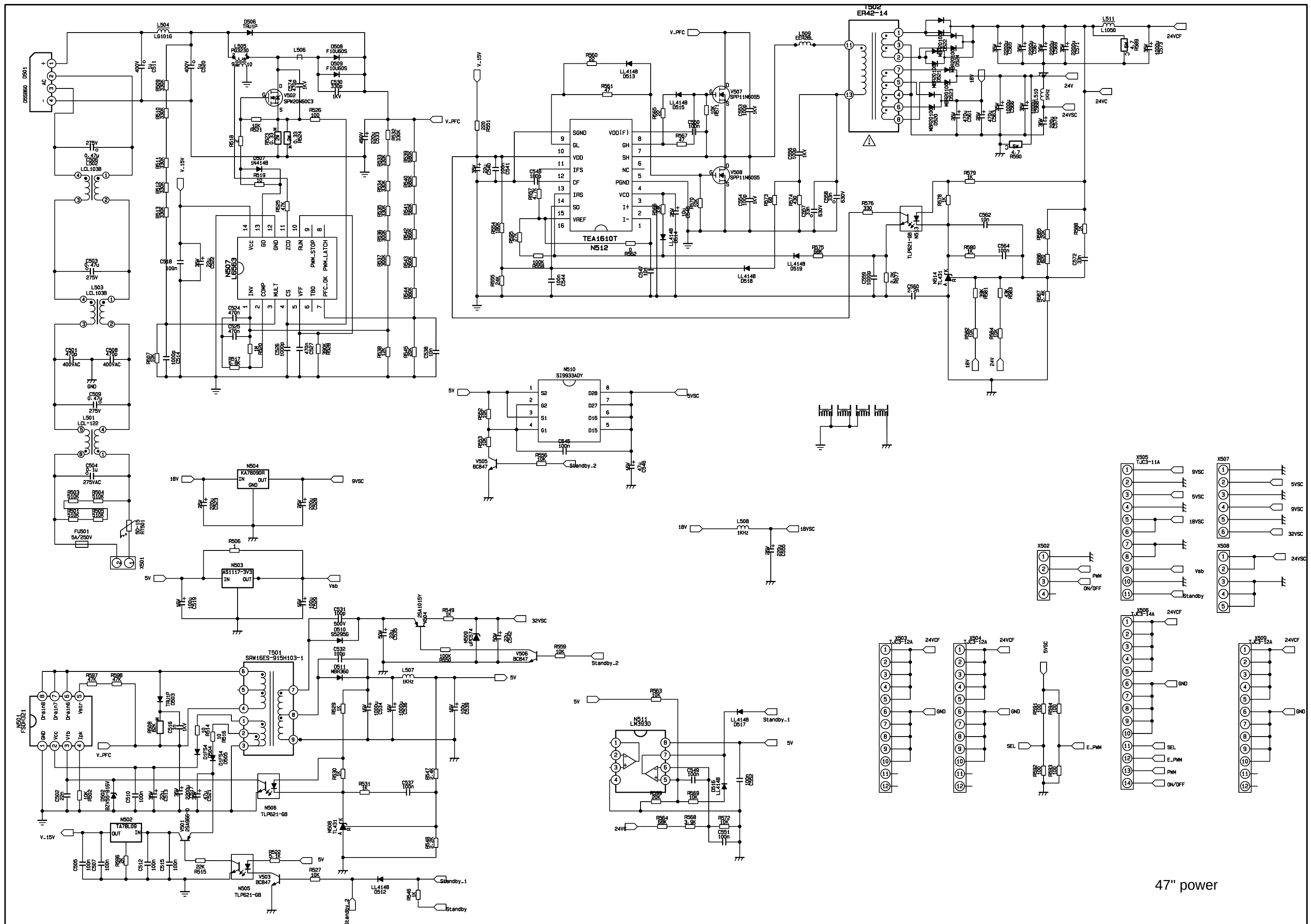




KEY & IR



42" power



47" power

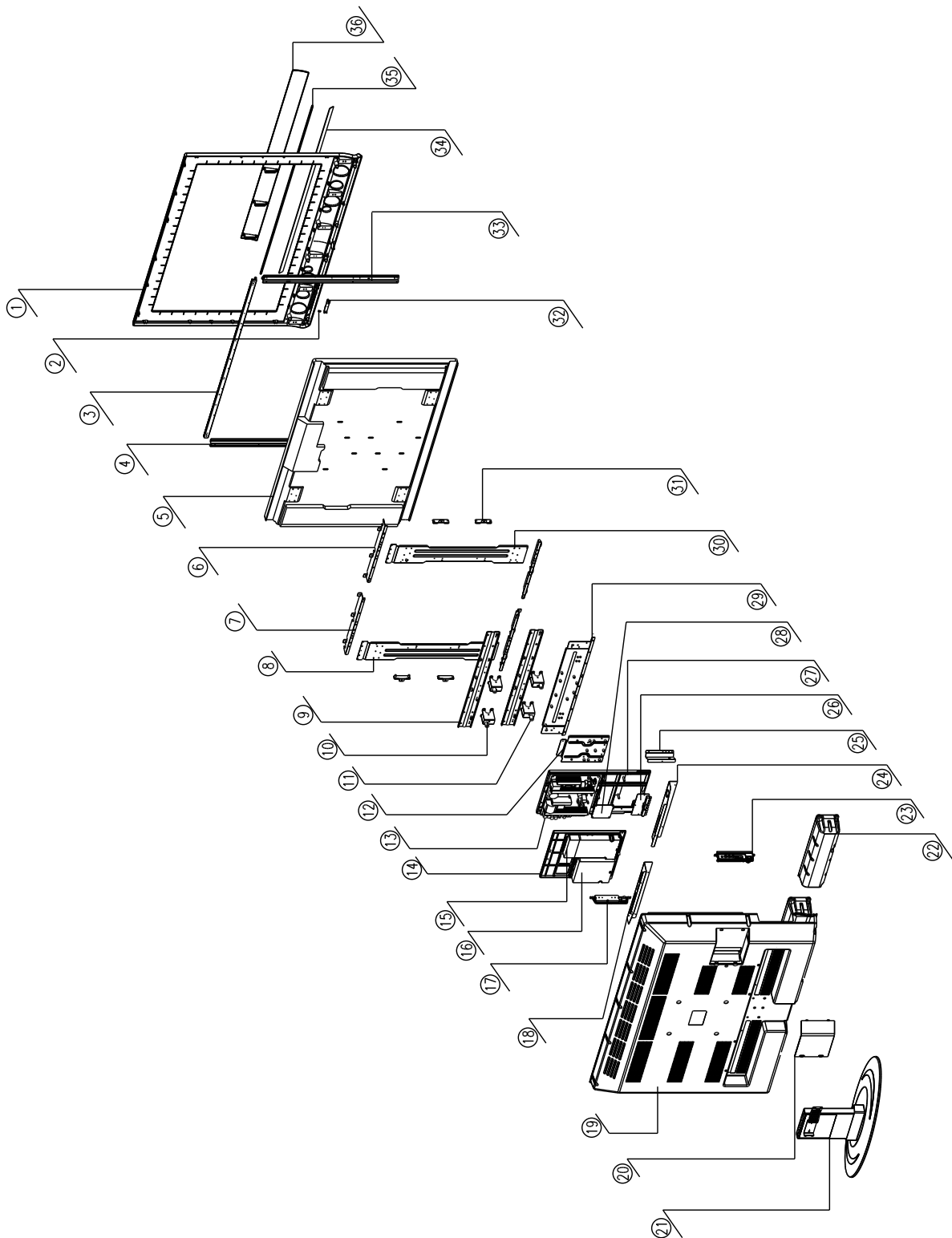
APPENDIX-A: Main assembly 9242FY3615

NAME	NO.	MAIN COMPONENT AND IT'S NO.	
Main board	6FY0050110	NS02 NA03	FLI8548 (5278548001) CAT9983 (5279983001)
Video processing board	6FY0054010	N03 N04 N08	SGTV5830 (5275830002) TDA4470 (5274470001) MPS7722 (5277722001)
AV board	6FY01629A0		
SCART connection board	6FY0064610		
Key board	6FY0060510		
Interface connection board	6FY0052910		
IR board	6FY0160910		
Power board	6FN0052010		
Remote control	6010I01803	RC-I18-0C	
Panel	5203428504	V420H1-L11	

APPENDIX-A: Main assembly 9247FY3613

NAME	NO.	MAIN COMPONENT AND IT'S NO.	
Main board	6FY0050110	NS02 NA03	FLI8548 (5278548001) CAT9983 (5279983001)
Video processing board	6FY0054010	N03 N04 N08	SGTV5830 (5275830002) TDA4470 (5274470001) MPS7722 (5277722001)
AV board	6FY01629A0		
SCART connection board	6FY0144610		
Key board	6FY0240510		
Interface connection board	6FY0052910		
IR board	6FY0160910		
Power board	6FN0052010		
Remote control	6010I01803	RC-I18-0C	
Panel	5203478503	V470H1-L03	

APPENDIX: Exploded view LC-42x36

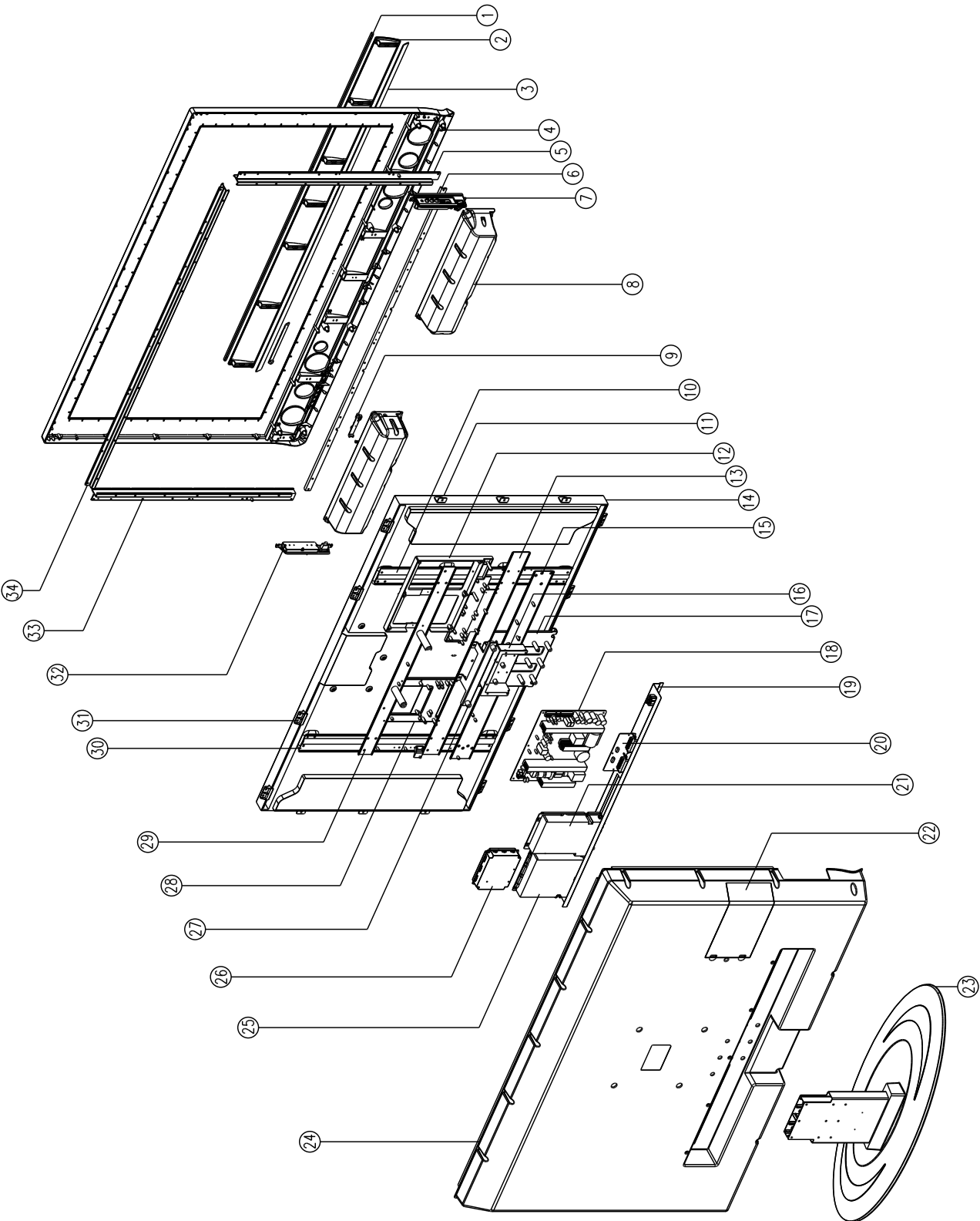


PART LIST OF EXPLODED VIEW

NO.	DESCRIPTION
1	front cabinet
2	light conducting cloumn
3	fixed board (upper)
4	fixed board (left)
5	panel
6	front cabinet connection
7	front cabinet connection
8	panel connection
9	panel fixed bracket
10	wall mounting fixed bracket
11	wall mounting fixed bracket
12	stand connection
13	power board
14	main board frame
15	high frequency board
16	main board
17	key board
18	AV baffle (left)
19	back cabinet
20	back cover
21	stand
22	speaker
23	side AV connction board
24	AV baffle (right)
25	interface baffle
26	interface board
27	power board frame
28	USB board
29	panel fixed bracket
30	panel connection
31	panel connection
32	IR board
33	fixed board (right)
34	decorative bar
35	front cabinet decorative bar
36	speaker net

Note: design and specifications are subject to change without notice.

APPENDIX-B: Exploded view (LC-47X36)



PART LIST OF EXPLODED VIEW

NO.	DESCRIPTION
1	decorative bar
2	speaker
3	decorative bar
4	front cabinet
5	front cabinet fixed bar (right)
6	front cabinet fixed bar (down)
7	side AV board
8	speaker
9	IR board
10	panel fixed bracket (right)
11	fixed bracket
12	power board bracket
13	panel fixed bracket (middle)
14	panel
15	panel fixed bracket (down)
16	column bracket
17	baffle
18	power board
19	terminal baffle
20	SCART connection board
21	video processing board
22	back cover
23	stand
24	back cabinet
25	main board
26	DVB-T digital board
27	wall mounting bracket
28	digital board bracket
29	panel fixed bracket (top)
30	panel fixed bracket (left)
31	panel connection bracket
32	key board
33	front cabinet fixed bar (left)
34	front cabinet fixed bar (top)

Note: design and specifications are subject to change without notice.

