



Liquid Crystal Display Television
Service Manual

Chassis: MST6E16JS

Product Type: LCD24V88APAM

Ver 1.0

Hisense Electric Co., Ltd.

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Service Manual

1. Precautions and notices

BEFORE SERVICING THE LCD TV, READ THE SAFETY PRECAUTIONS IN THIS MANUAL.

WHEN REPLACEMENT PARTS ARE REQUIRED, BE SURE TO USE REPLACEMENT PARTS SPECIFIED BY THE MANUFACTURER.

Proper service and repair is important to the safe, reliable operation of all Hisense Electric Co., Ltd Equipment. The service procedures recommended by Hisense and described in this Service Guide are effective methods of performing service operations. Some of these service operations require the use of tools specially designed for the purpose. The special tools should be used when and as recommended.

It is important to note that this manual contains various CAUTIONS and NOTICES which should be carefully read in order to minimize the risk of personal injury to service personnel. The possibility exists that improper service methods may damage the equipment. It is also important to understand that these CAUTIONS and NOTICES ARE NOT EXHAUSTIVE. Hisense could not possibly know, evaluate and advise the service trade of all conceivable ways in which service might be done or of the possible hazardous consequences of each way. Consequently, Hisense has not undertaken any such broad evaluation. Accordingly, a serviceman that uses a service procedure or tools, which are not recommended by Hisense, must first satisfy

himself thoroughly that neither his safety nor the safe of the equipment will be jeopardized by the service method selected.

Hereafter throughout this manual, Hisense Electric Co., Ltd will be referred to as Hisense.

1.1 WARNING

1.1.1

Critical components having special safety characteristics are identified with a ▲ by the Ref. No. in the parts list. Use of substitute replacement parts, which do not have the same specified safety characteristics, may create shock, fire, or other hazards.

Under no circumstances should the original design be modified or altered without written permission from Hisense. Hisense assumes no liability, express or implied, arising out of any unauthorized modification of design. Serviceman assumes all liability.

DANGER CAUTION

TO ENSURE THE CONTINUED RELIABILITY OF THIS PRODUCT, USE ONLY ORIGINAL MANUFACTURER'S REPLACEMENT PARTS, WHICH ARE LISTED WITH THEIR PART NUMBERS IN THE PARTS LIST SECTION OF THIS SERVICE GUIDE.

1.1.2.

All ICs and many other semiconductors are susceptible to electrostatic discharges

(ESD). Careless handling during repair can reduce life drastically. When repairing, make sure that you are connected with the same potential as the mass of the set by a wristband with resistance. Keep components and tools also at this same potential.

1. Never replace modules or other components while the unit is switched on.

2. When making settings, use plastic rather than metal tools. This will prevent any short circuits and the danger of a circuit becoming unstable.

1.1.3

To prevent electrical shock, do not use this polarized ac plug with an extension cord, receptacle, or the outlet unless the blades can be fully inserted to prevent blade exposure.

To prevent electrical shock, match wide blade or plug to wide slot, fully insert.

1.1.4

When replacement parts are required, be sure to use replacement parts specified by the manufacturer or have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock, or other hazards.

1.1.5

Safety regulations require that after a repair the set must be returned in its original condition. In particular attention should be paid to the following points.

- Note: The wire trees should be routed correctly and fixed with the mounted cable clamps.

- The insulation of the mains lead should be checked for external damage.

1.1.6

- (1) Do not touch Signal and Power Connector while this product operates. Do not touch EMI ground part and Heat Sink of Film Filter.
- (2) Do not supply a voltage higher than that specified to this product. This may damage the product and may cause a fire.
- (3) Do not use this product in locations where the humidity is extremely high, where it may be splashed with water, or where flammable materials surround it. Do not install or use the product in a location that does not satisfy the specified environmental conditions. This may damage the product and may cause a fire.
- (4) If a foreign substance (such as water, metal, or liquid) gets inside the panel module, immediately turn off the power. Continuing to use the product may cause fire or electric shock.
- (5) If the product emits smoke, and abnormal smell, or makes an abnormal sound, immediately turn off the power. Continuing to use the product, it may cause fire or electric shock.
- (6) Do not disconnect or connect the connector while power to the product is on. It takes some time for the voltage to drop to a sufficiently low level after the power has been turned off. Confirm that the voltage has dropped to a safe level before disconnecting or connecting the connector.
- (7) Do not pull out or insert the power cable from/to an outlet with wet hands. It may cause electric shock.

-
- (8) Do not damage or modify the power cable. It may cause fire or electric shock.
- (9) If the power cable is damaged, or if the connector is loose, do not use the product: otherwise, this can lead to fire or electric shock.
- (10) If the power connector or the connector of the power cable becomes dirty or dusty, wipe it with a dry cloth. Otherwise, this can lead to fire.
- (11) Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.

1.2 NOTES

Notes on Safe Handling of the LCD panel and during service

The work procedures shown with the Note indication are important for ensuring the safety of the product and the servicing work. Be sure to follow these instructions.

- Before starting the work, secure a sufficient working space.
 - At all times other than when adjusting and checking the product, be sure to turn OFF the POWER Button and disconnect the power cable from the power source of the TV during servicing.
 - To prevent electric shock and breakage of PC board, start the servicing work at least 30 seconds after the main power has been turned off. Especially when installing and removing the power board, start servicing at least 2 minutes after the main power has been turned off.
 - While the main power is on, do not touch any parts or circuits other than the ones
-

specified. If any connection other than the one specified is made between the measuring equipment and the high voltage power supply block, it can result in electric shock or activation of the leakage-detection circuit breaker.

- When installing the LCD module in, and removing it from the packing carton, be sure to have at least two persons perform the work.
- When the surface of the panel comes into contact with the cushioning materials, be sure to confirm that there is no foreign matter on top of the cushioning materials before the surface of the panel comes into contact with the cushioning materials. Failure to observe this precaution may result in, the surface of the panel being scratched by foreign matter.
- When handling the circuit board, be sure to remove static electricity from your body before handling the circuit board.
- Be sure to handle the circuit board by holding the large parts as the heat sink or transformer. Failure to observe this precaution may result in the occurrence of an abnormality in the soldered areas.
- Do not stack the circuit boards. Failure to observe this precaution may result in problems resulting from scratches on the parts, the deformation of parts, and short-circuits due to residual electric charge.
- Routing of the wires and fixing them in position must be done in accordance with the original routing and fixing configuration when servicing is completed. All the wires are routed far away from the areas that become hot (such as the heat sink).

These wires are fixed in position with the wire clamps so that the wires do not move, thereby ensuring that they are not damaged and their materials do not deteriorate over long periods of time. Therefore, route the cables and fix the cables to the original position and states using the wire clamps.

- Perform a safety check when servicing is completed. Verify that the peripherals of the serviced points have not undergone any deterioration during servicing. Also verify that the screws, parts and cables removed for servicing purposes have all been returned to their proper locations in accordance with the original setup.



The lightning flash with arrowhead symbol, within an equilateral triangle is intended to alert the user to the presence of uninsulated dangerous voltage within the products enclosure that may be of sufficient magnitude to constitute a risk of electric shock.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the set.

2. Factory/Service OSD Menu and Adjustment

2.1 To enter the Factory OSD Menu

a. With factory RC (remote control)

1. Press “M” button and enter factory mode.
2. Press “Menu” button and enter factory OSD menu.
3. Press “CH+”/“CH-” button select the function menu, press “VOL+”/“VOL-” enter the selected function menu. Press “VOL+”/“VOL-” button adjust values in the menu.
4. Press “M” button exit factory mode in the factory OSD menu.

When TV outgoing factory, user can not enter factory OSD menu with Factory Remote

b. With user’s RC

1. Power TV On
2. Press Menu button and call up User OSD Menu
3. Select Sound-> Balance
4. When Balance value is “0”, Enter 0->5->3 ->2 in sequence.
Note: If necessary, re-do number keys.
5. Factory OSD appears.
6. Press the standby button then AC turn off and restart the TV, which can exit factory OSD menu.

2.2 Factory OSD Menu

The Factory OSD Menu comprises Factory Menu and Design Menu .

2.2.1、 Factory Menu

FACTORY MENU
WHITE BALANCE
ADC ADJUST
LOGO
OSD LANGUAGE
COUNTRY
OPTIONS
FACTORY INIT
TEST PATTERN
VERSION
NON STANDARD

WHITE BALANCE
COL TEMP STANDARD
R CUT 128
G CUT 128
B CUT 128
R DRV 128
G DRV 128
B DRV 128

ADC ADJUST

Only in component and VGA
SOURCE ,The “ADC Adjust”
Can be chosen.

LOGO

NULL
HISENSE
WELCOME

OPTION

SOURCE **TV**
TOFAC **M**
ATS **1**
STARTUP MENU **1**
Search Sensitive **1**
RF NTSC **0**
HDCP OUT OR IN **1**

FACTORY INIT

QINGDAO
HUANGDAO
HUNGARY
FRANCE
AUSTRALIA
CLEAR PROTECTLY
CLEAR UNPROTECTLY

TEST PATTERN

TEST PATTERN NULL

VERSION

VERSION:
PANEL TYPE:
FLASH :

2.2.2、Design Menu

DESIGN MENU

PICTURE MODE
SOUND MODE
PICTURE CURVE
AUDIO CURVE
SSC SETTING
SAVING MODE

PICTURE MODE

MODE	STANDARD
BRIGHTNESS	50
CONTRAST	50
COLOUR	50

SOUND MODE

MODE	USER
120HZ	10
500HZ	10
1.5KHZ	10
5KHZ	10
10KHZ	10

PICTURE MODE	CURVE BRIGHTNESS
CURVE 0	97
CURVE 25	105
CURVE 50	120
CURVE 75	130
CURVE 100	141

AUDIO MODE	CURVE VOLUME
CURVE 0	0
CURVE 25	18
CURVE 50	22
CURVE 75	28
CURVE 100	36

SSC SETTING

DDR	SSC	2
DDR	MCM	60
LVDS	SSC	2
LVDS	PCM	60

SAVING MODE

255

Note:

The above “Factory/Service OSD Menu” are reference only, please refer to the actual units to determine the appearances.

3. Software Upgrading

Before upgrading, read the following.

- 1、Before upgrading, Write down the ADC Calibration values of the channel of VGA and component.
- 2、Upgrade the software.
- 3、To clear the EEPROM .
 - A Select the item “Clear Unprotected”.
 - B Press VOL+ button to clear the EEPROM data.
 - C Close the OSD menu after 5 seconds.
 - D Restart the TV.
- 4 Write the ADC Calibration values copied just now into the the channels of VGA and component.
- 5、After the operation above all, necessarily, Renew search the channels for the users.

3.1 Get ready for upgrading

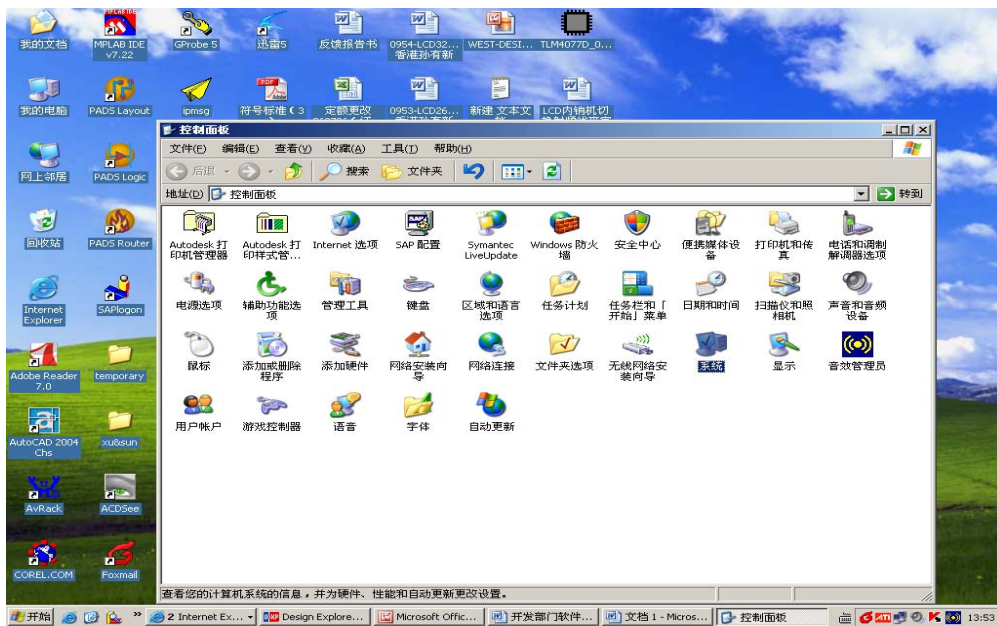
The software is upgraded by a burning tool- ISP_TOOL4.0.9, which can burn the program file “*. bin” to the main board of the unit

3.1.1 Install the ISP_TOOL4.0.9-----only for the first time update.

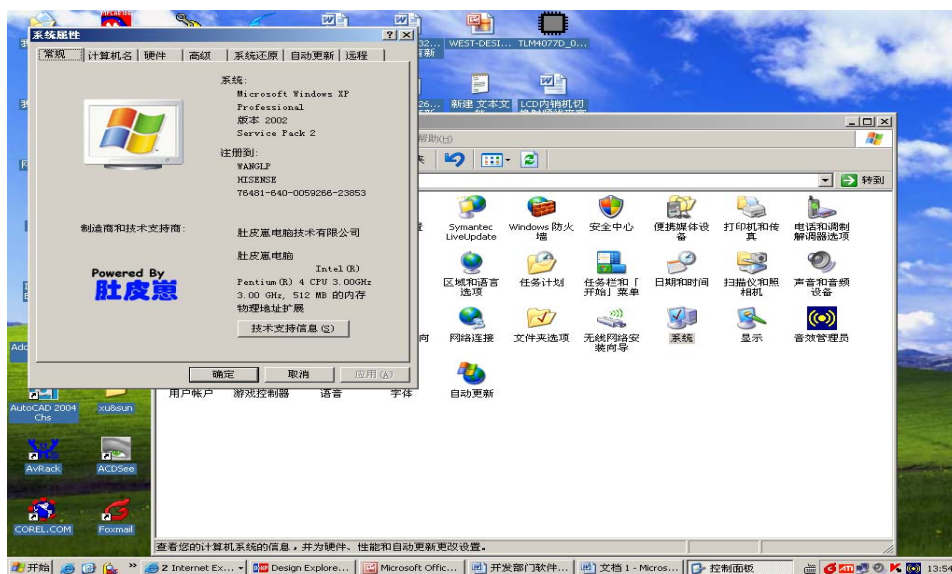
1、 Port Setting:



Choose “system” option from the “control panel”



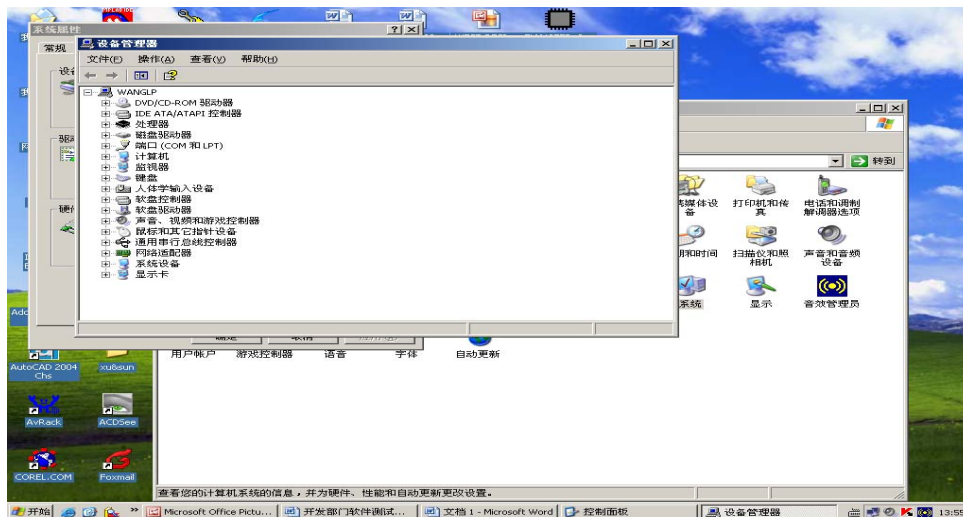
Click the “system” icon as the following



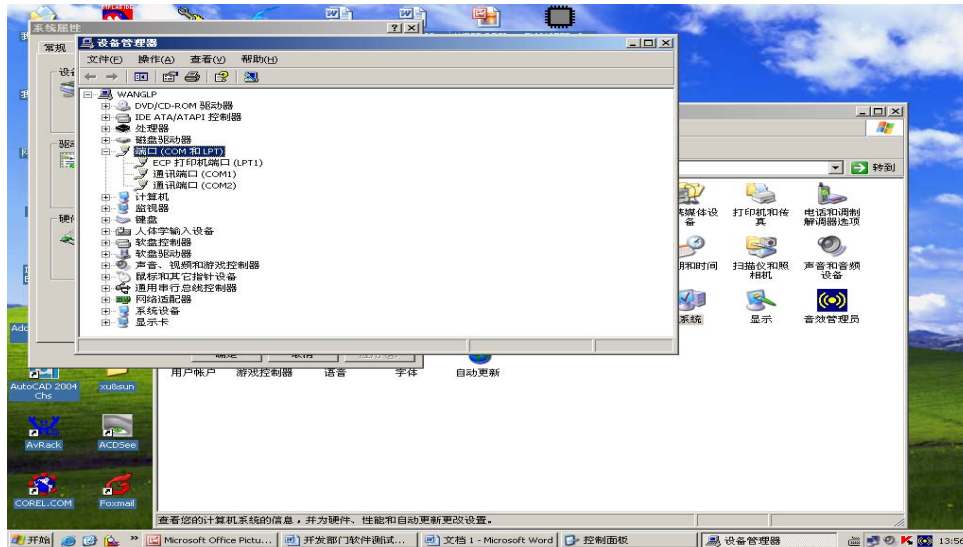
Choose the “hardware” option from the dialog window



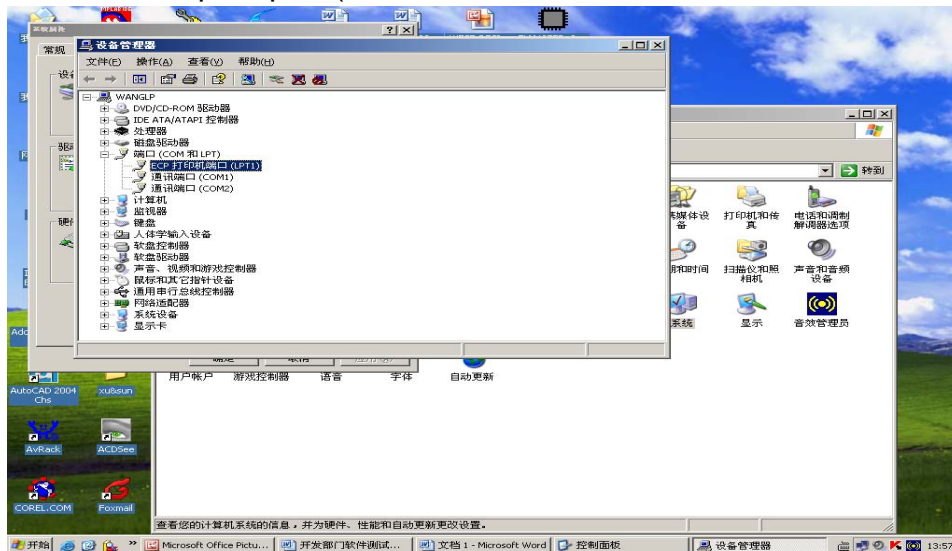
Click“device management” icon as the following



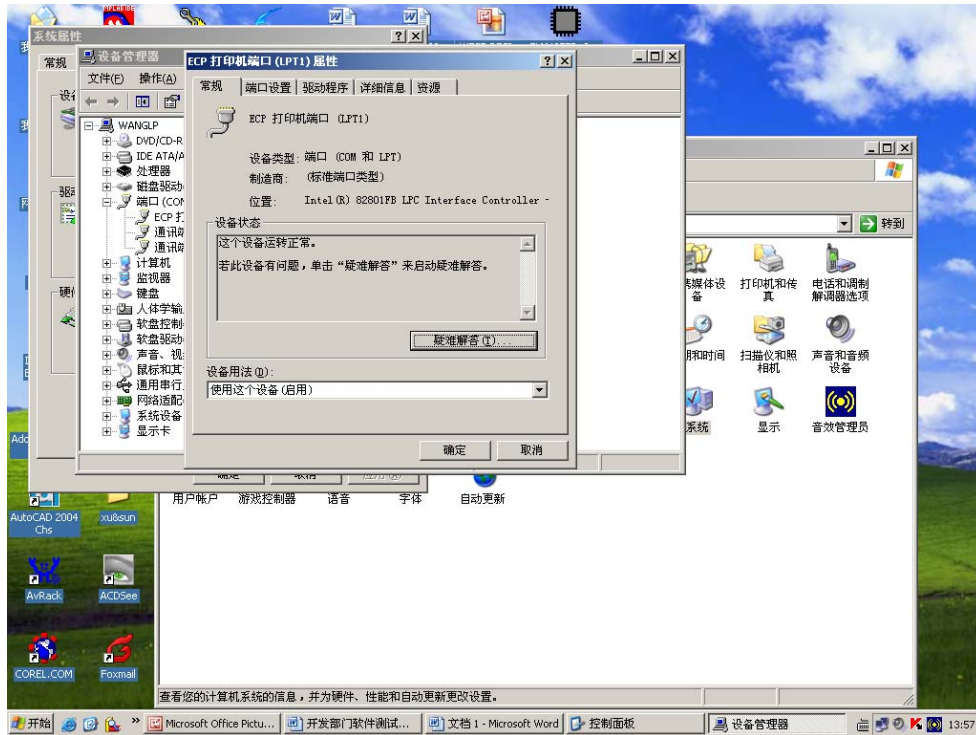
Choose the port (COM and LPT1)



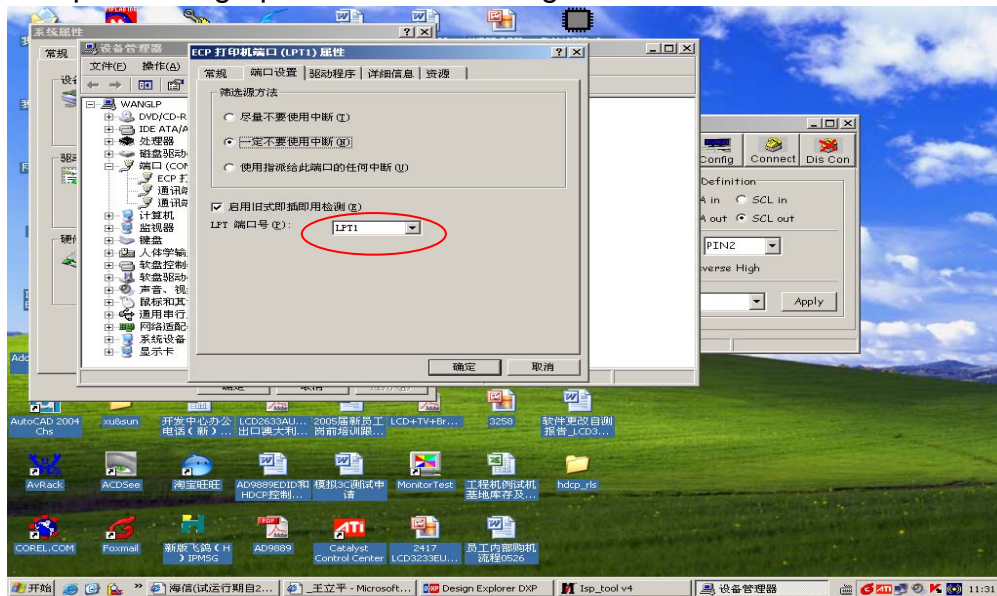
Choose the ECP print port (LPT1)



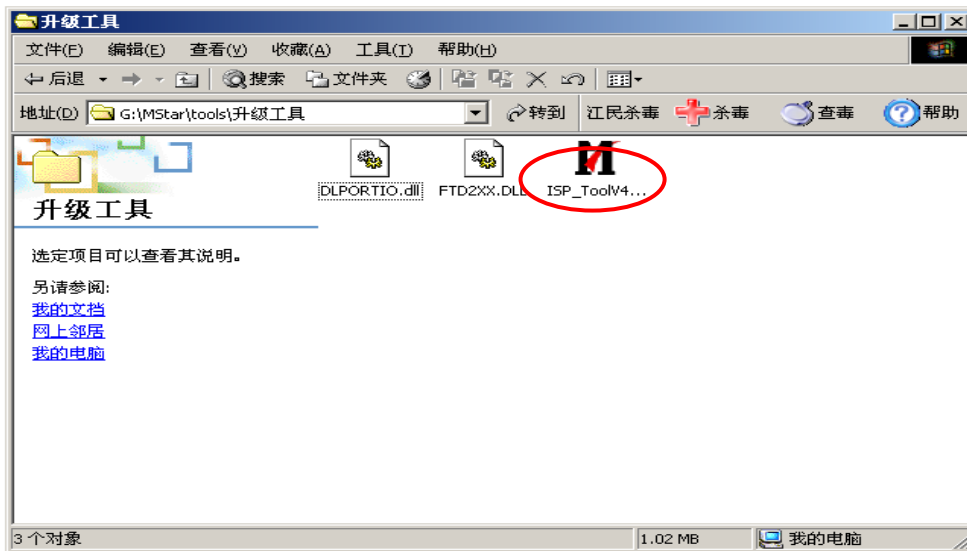
Click the port of print (LPT1) as the following



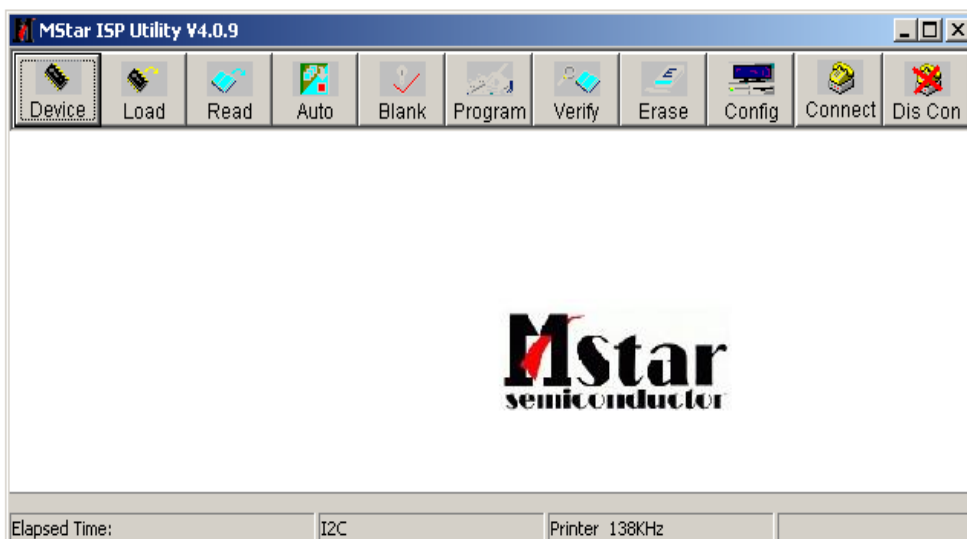
Choose “port setting” option as the following



-
- 2、 Find the folder where the ISP_TOOL4.0.9 lies in.
There are three folders/files in this folder together.
DLPORTIO.dll and FTD2XX.DLL must be in the same folder



Double click the ISP_TOOL4.0.9 icon, and then a dialog window will show as below.



Click the **Config** button. And then a dialog window will show as below.

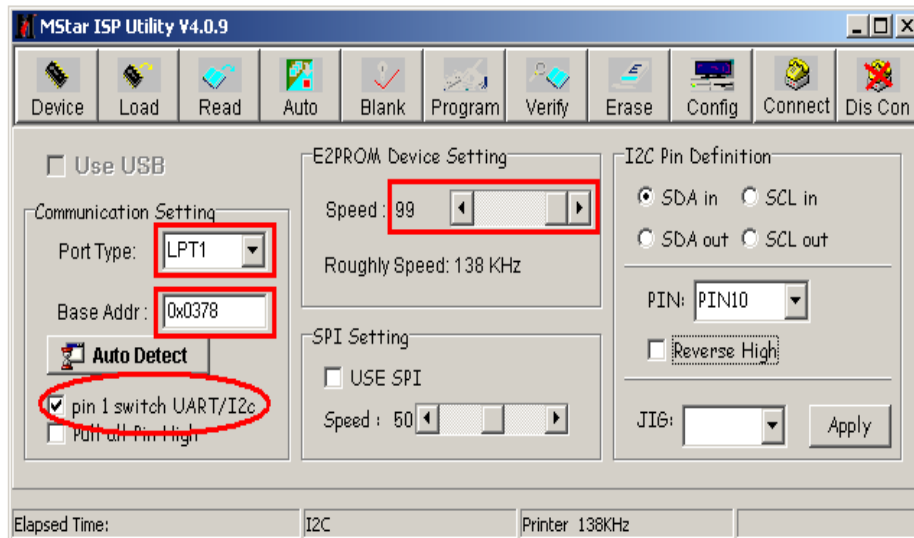
Port Type setting is LPT1

Base Addr setting is 0x378

Draw ☒ on the front of “pin 1 switch UART/I2c”

Speed setting is 99

As following

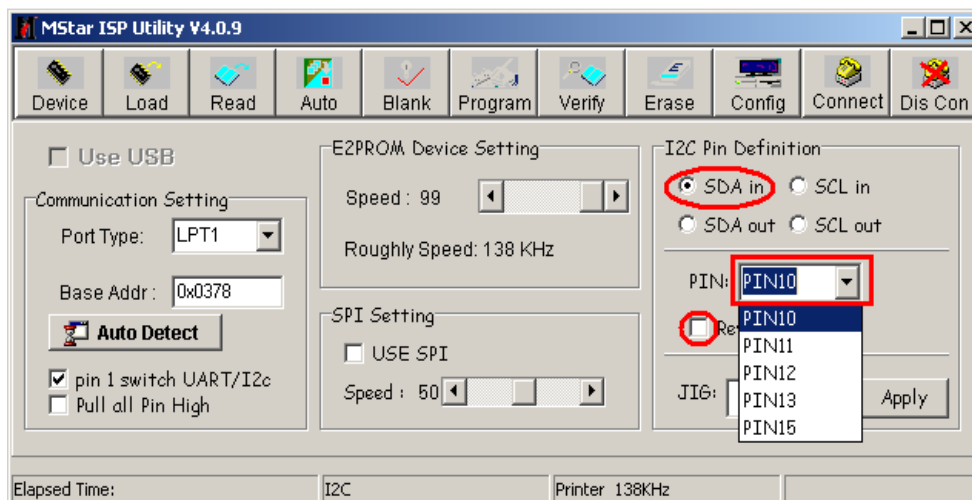


Choose “SDA in” and setting “PIN” is “PIN10”.

Notes:

Do not draw ☒ on the front of “Reverse High”.

As following

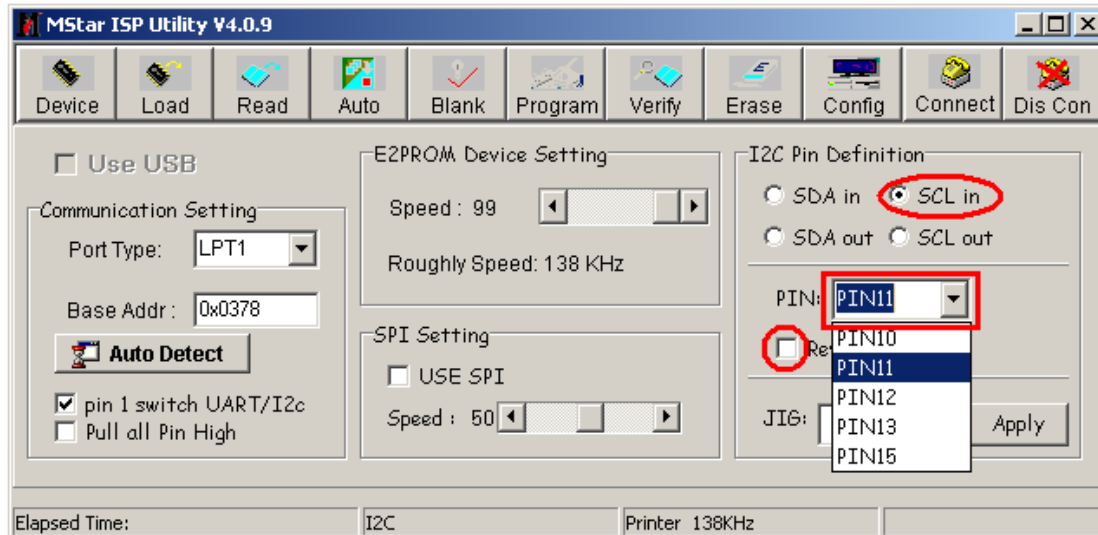


Choose “SCL in” and setting “PIN” is “PIN11”.

Notes:

Do not draw ☒ on the front of “Reverse High”.

As following

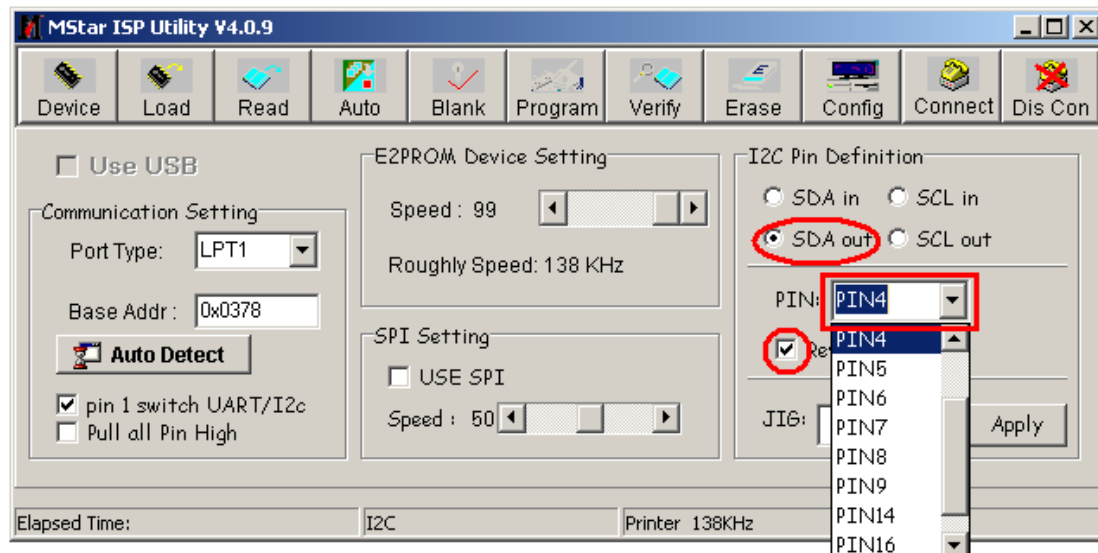


Choose “SDA out” and setting “PIN” is “PIN4”

Notes:

Draw ☒ on the front of “Reverse High”.

As following.

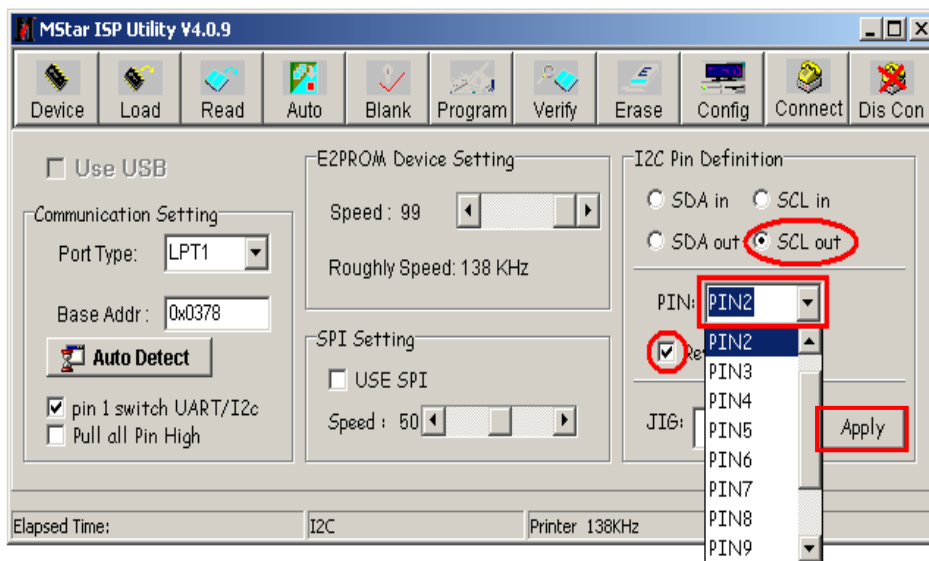


Choose “SCL out” and setting “PIN” is “PIN2”

Notes:

Draw ☒ on the front of “Reverse High”

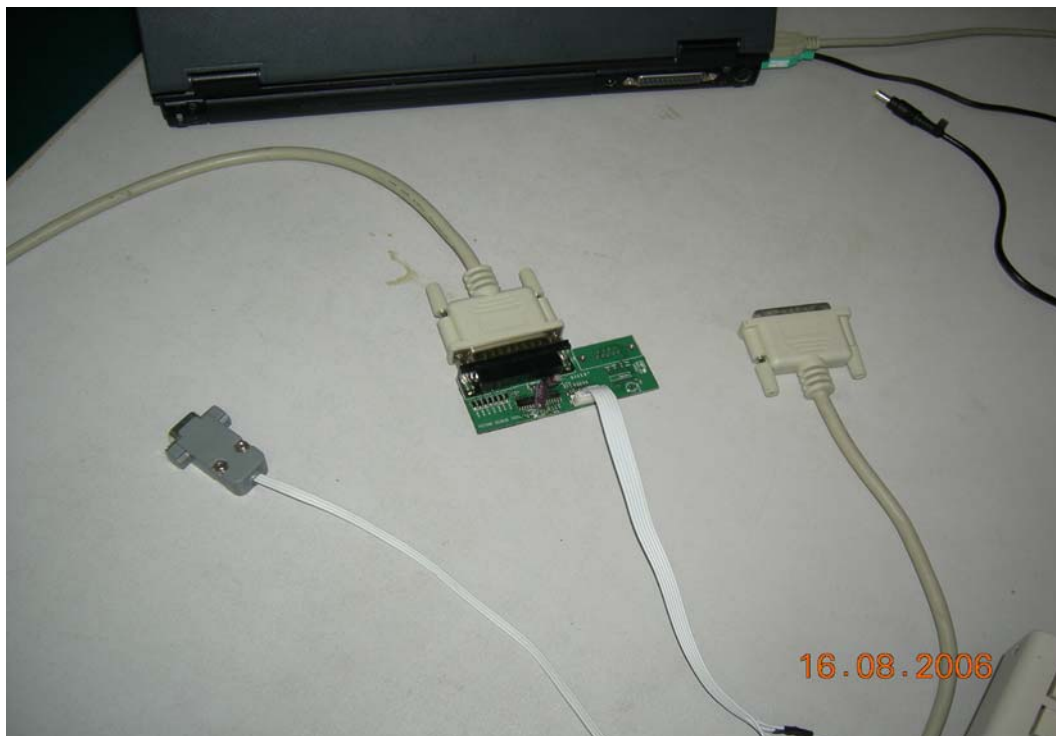
As following



After having finished all above, clicking the “Apply ”button to complete the configuration。

3.1.2 Hardware connecting

You can update the software through a special tool (as following)



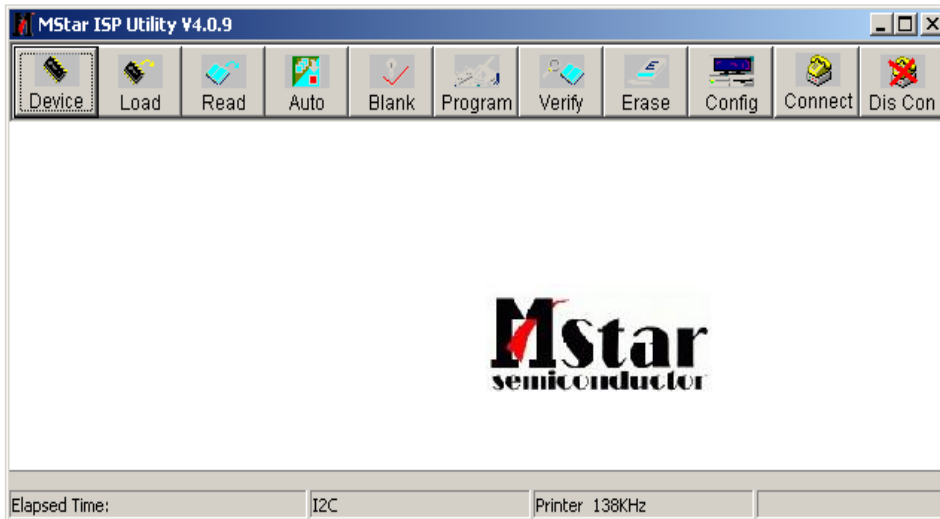
Connect the Debug board to the TV use VGA interface, the other parallel port to the

computer, just as the following.

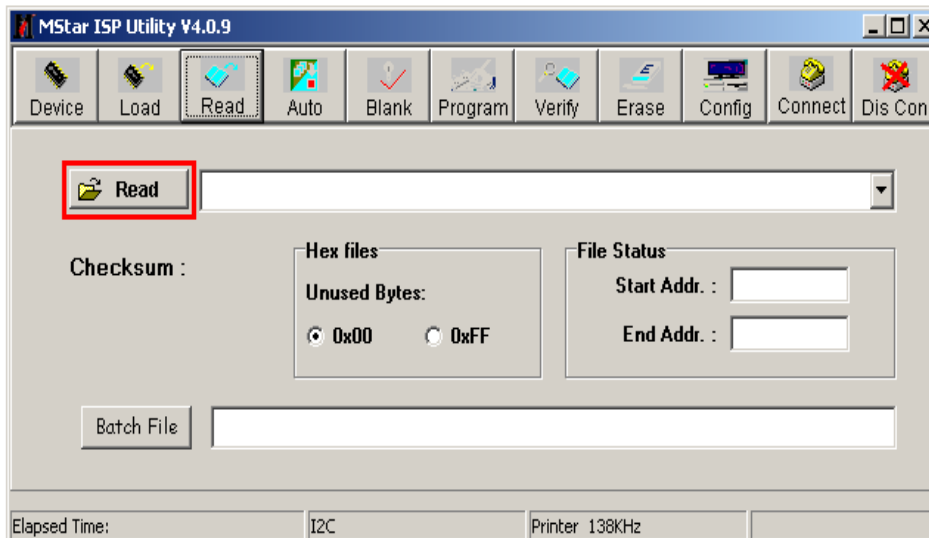


3.2 Upgrading with the ISP_TOOL4.0.9

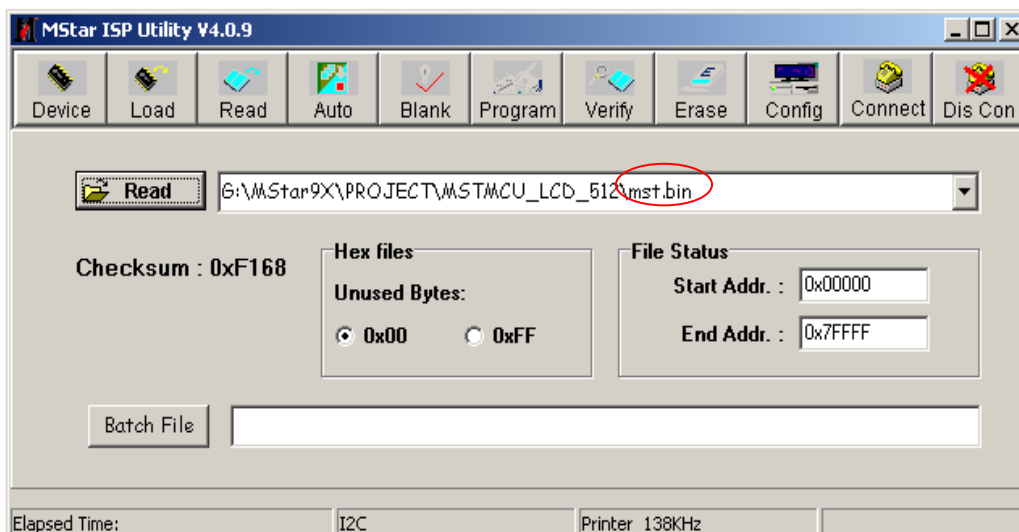
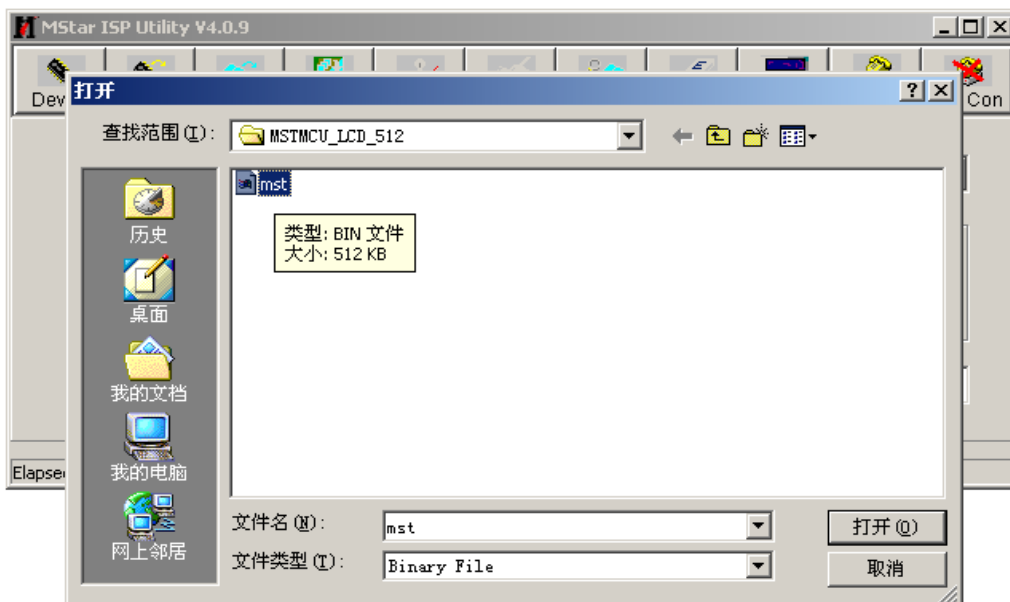
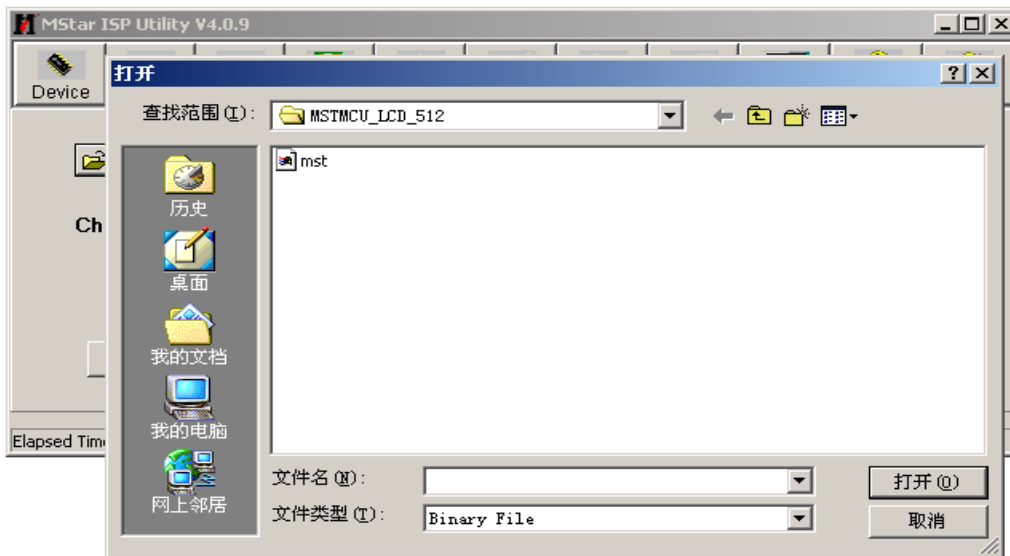
3.2.1 Double click the ISP_TOOL4.0.9 icon and a dialog window will show as following.



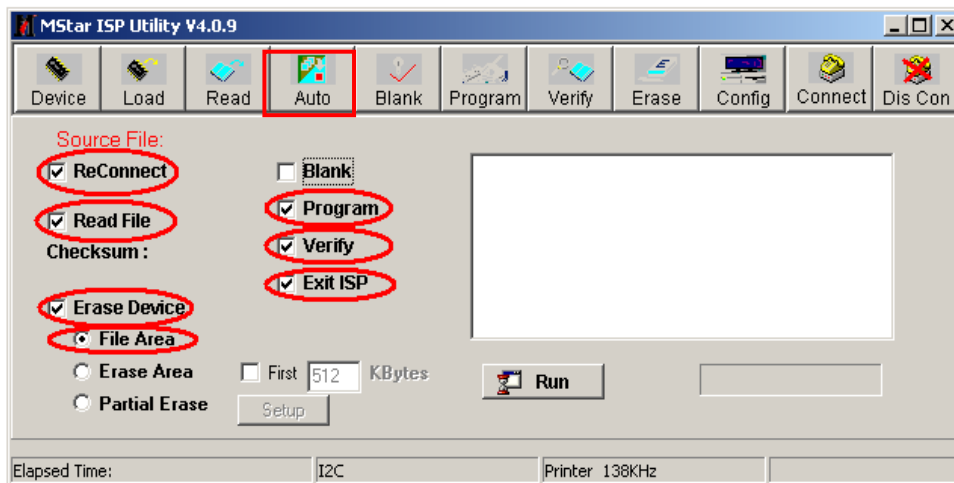
Click the "Read" button.



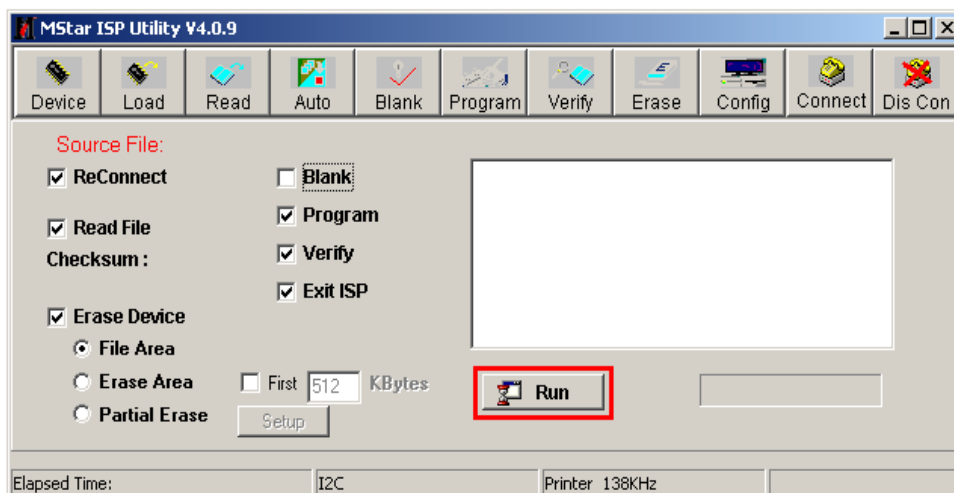
Choose the update file from the folder.



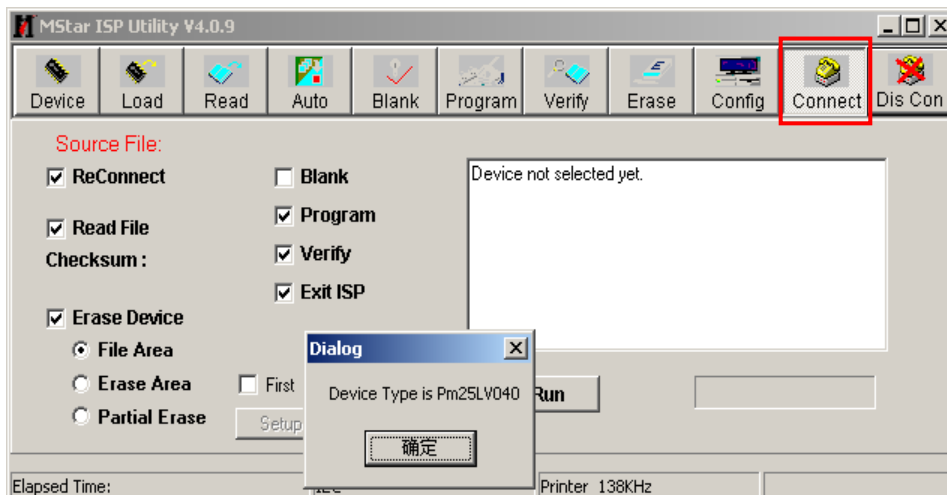
The update file has been chosen successfully.
Click the“Auto”button and choose parameters as following.

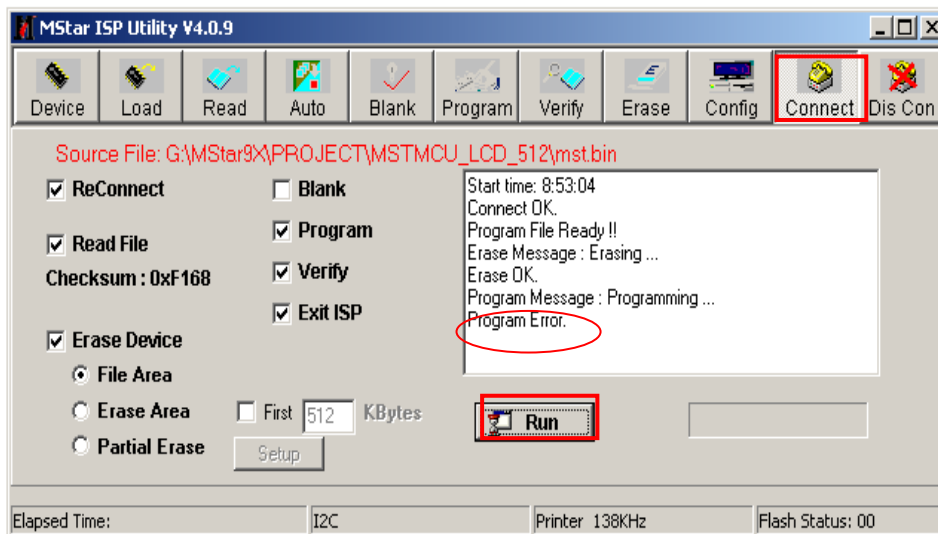


Click the“Run”button

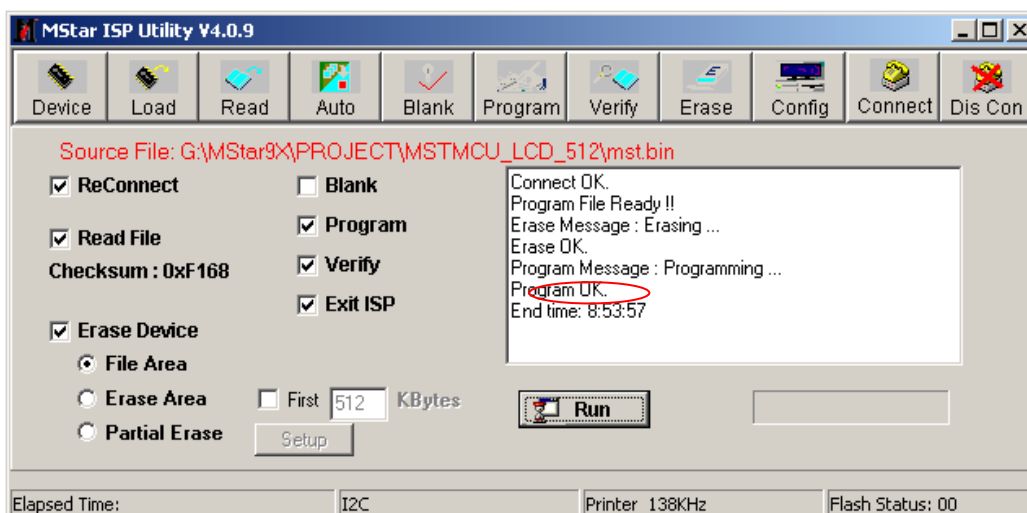
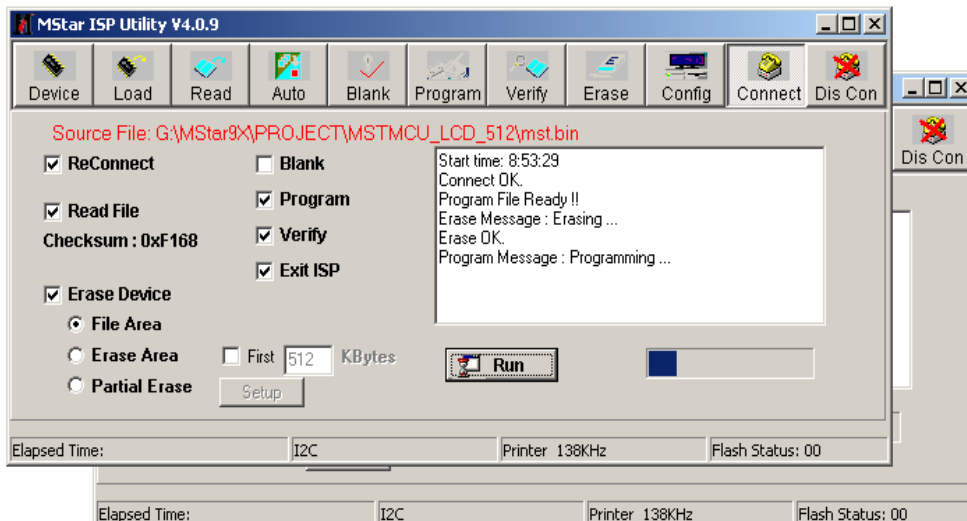


Click the“connect”button,then show a dialog box as following.





If show above then click the “Run” button again and again, till show the following dialog window.



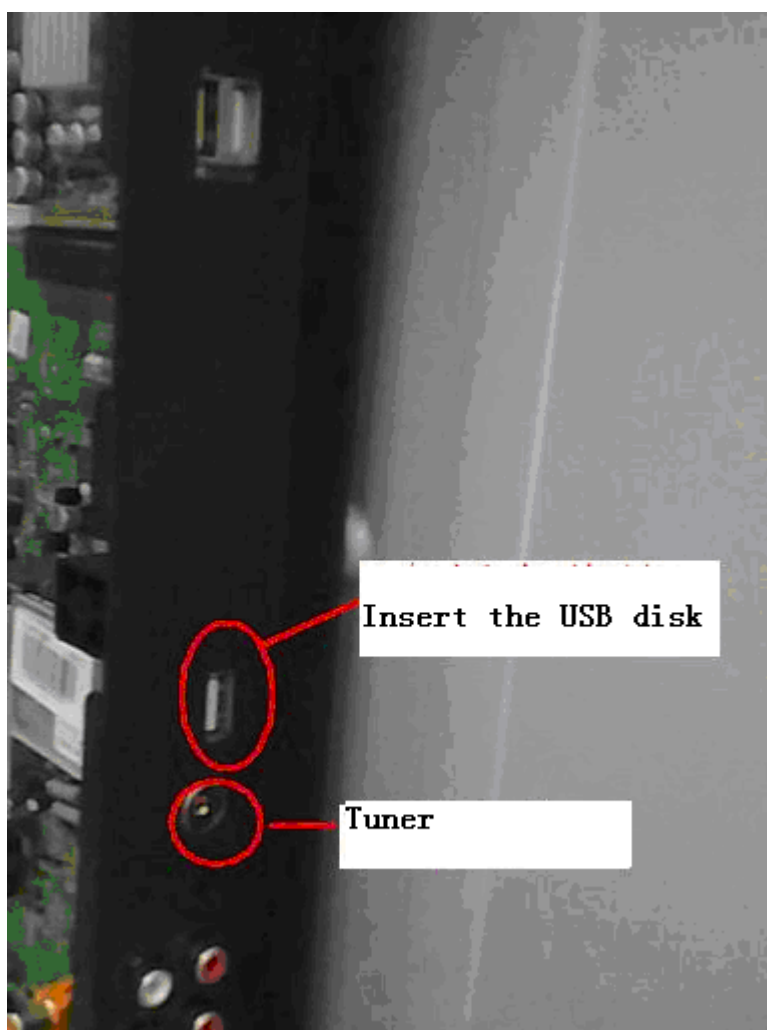
The above appears on the screen-the word “program ok”shows in the information displaying window,indicating upgrading is over。

3.2.2 After the update is over. Must Confirm the software Version in the Version Menu. If the update is successful, enter Factory Init Menu and select “Clear Unprotectly”

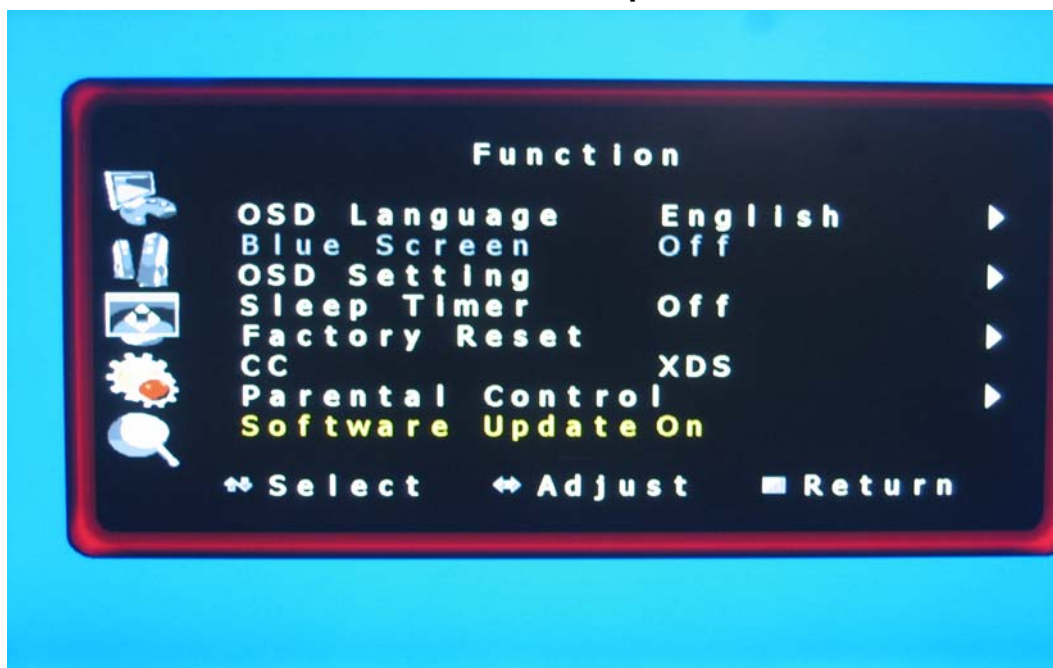
- a. Press VOL+ button to clear the EEPROM data.
- b. When the “Clear Unprotectly ” button becomes white, turn off the power.
- c. Restart the TV.

3.3 USB Software upgrading

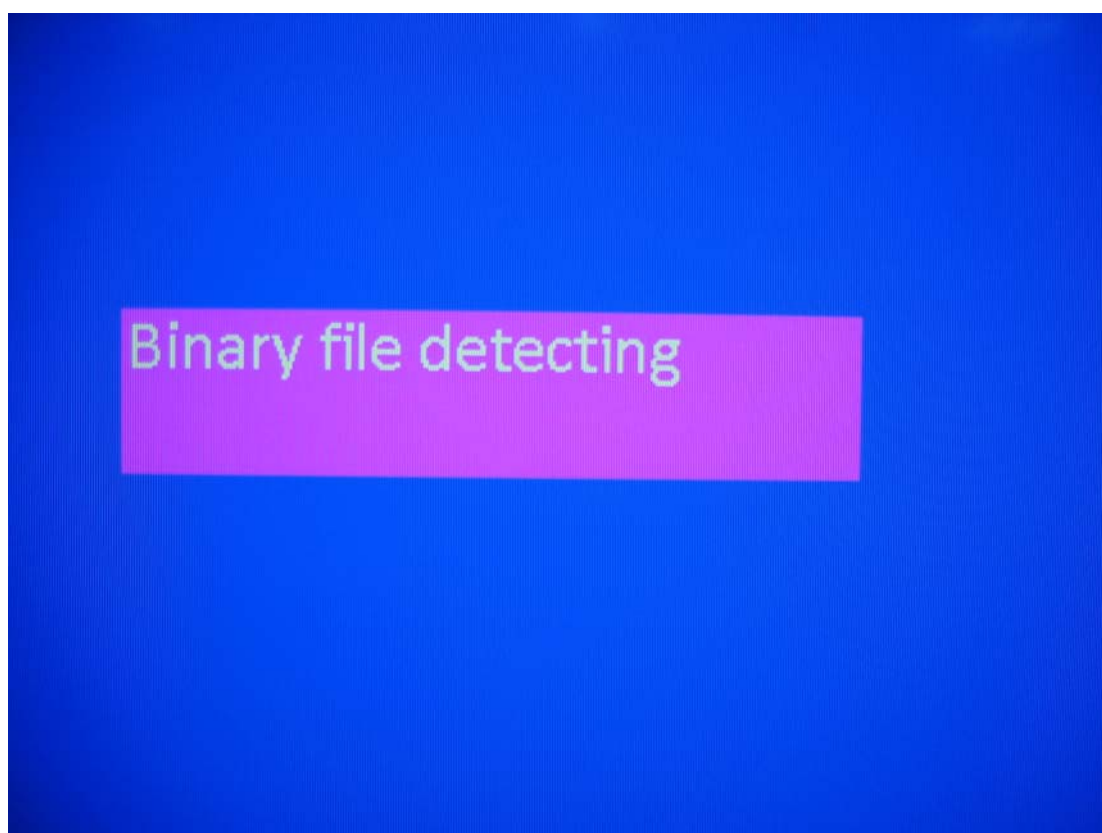
3.3.1、 Copy the Updating software to the USB root directory, the software named *.bin. for example the TV LCD19W58AM(30) named LCD19W58AM.bin. If the TV has internet function, Insert the USB disk to the interface nearly the Tuner.



3.3.2 the “Function” Menu “Software Update” choose “on”, see the next figure.



3.3.3 AC power off, then restart the TV.

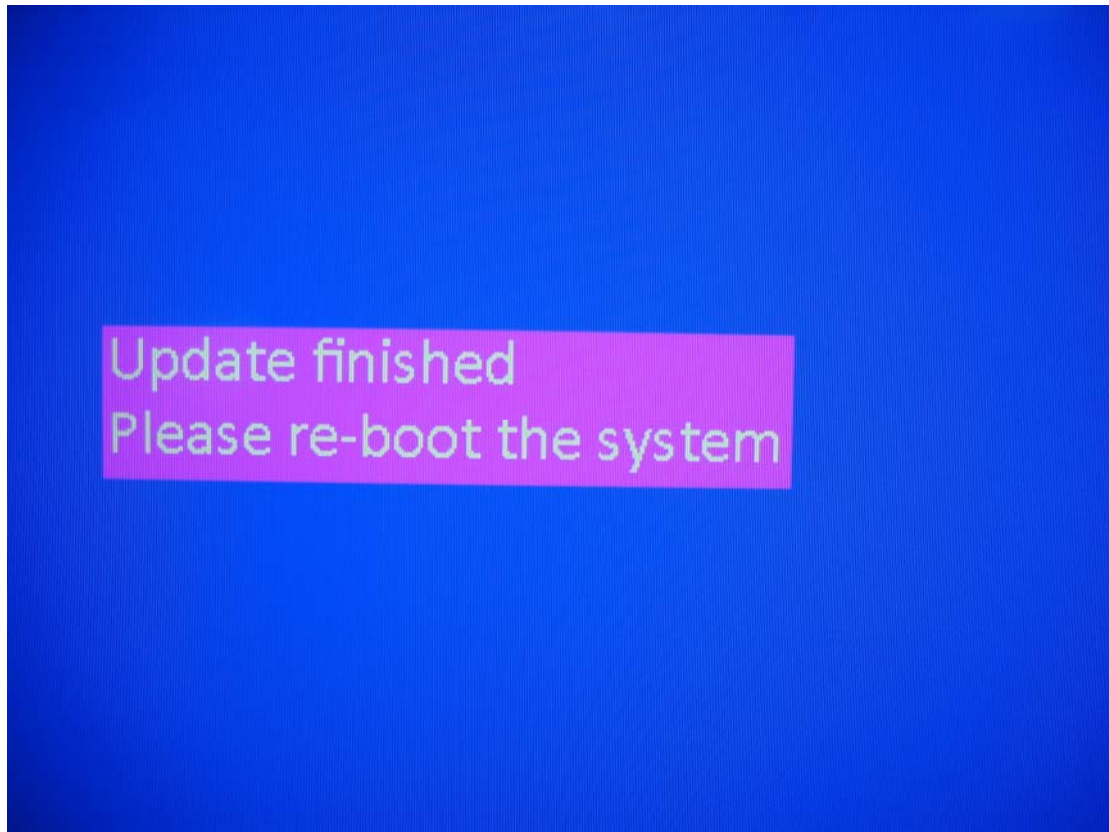


Chip erasing

..

Chip programing

.....



3.3.4 After update success, AC power off, and restart the TV.

If only appear the figure: "Binary file detecting", the last three figures not. Please modify the name of sotrware.

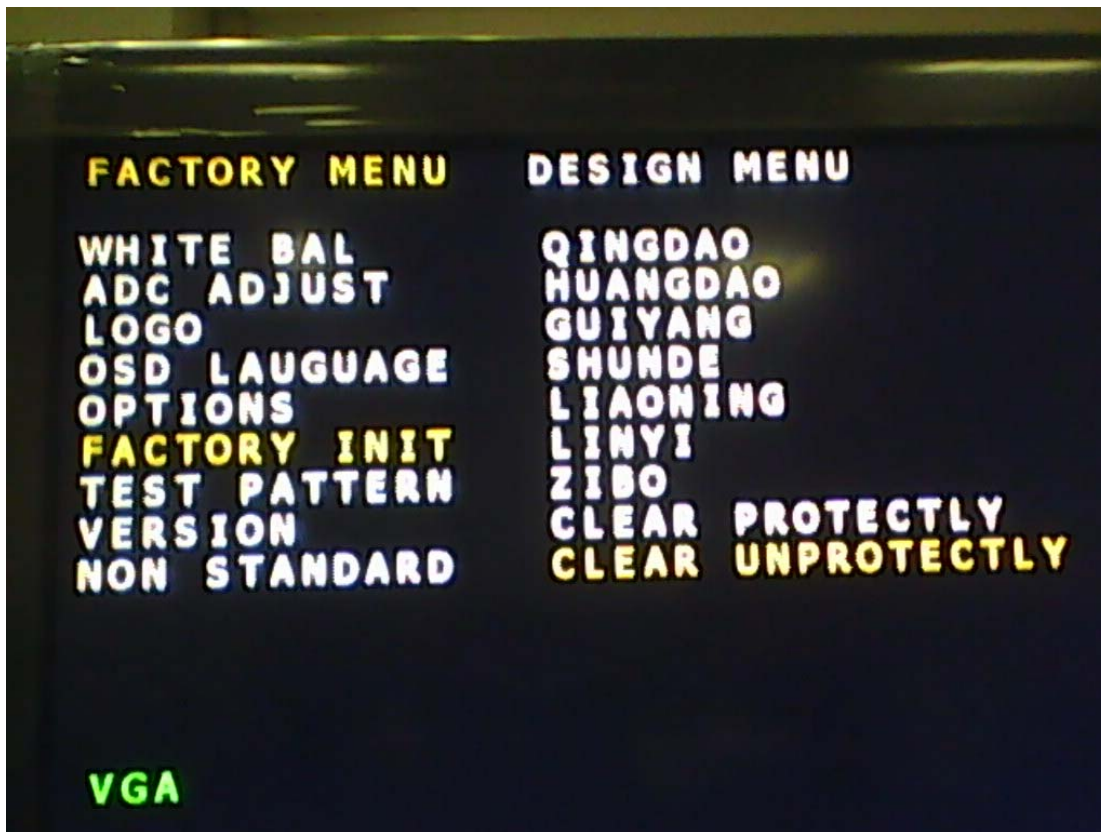
3.3.5、 After the update is over. Must confirm the software Version in the Version Menu.

If the update is successful, enter Factory Init Menu and select "Clear Unprotectly"

d. Press VOL+ button to clear the EEPROM data.

e. When the "Clear Unprotectly " button becomes white, turn off the power.

f. Restart the TV.



3.3.6、 Chasis MST6E16 includes 6E16GS and 6E16JS

Chassis 6E16GS must be the last 8 bit figures and letters in front of .bin For example : LCD19W58AM(30) named D19W58AM.bin.

Chassis 6E16JS must be the TV name in front of .bin. For example : LCD19W58AM(30) named LCD19W58AM.bin.

4. Circuit instruction

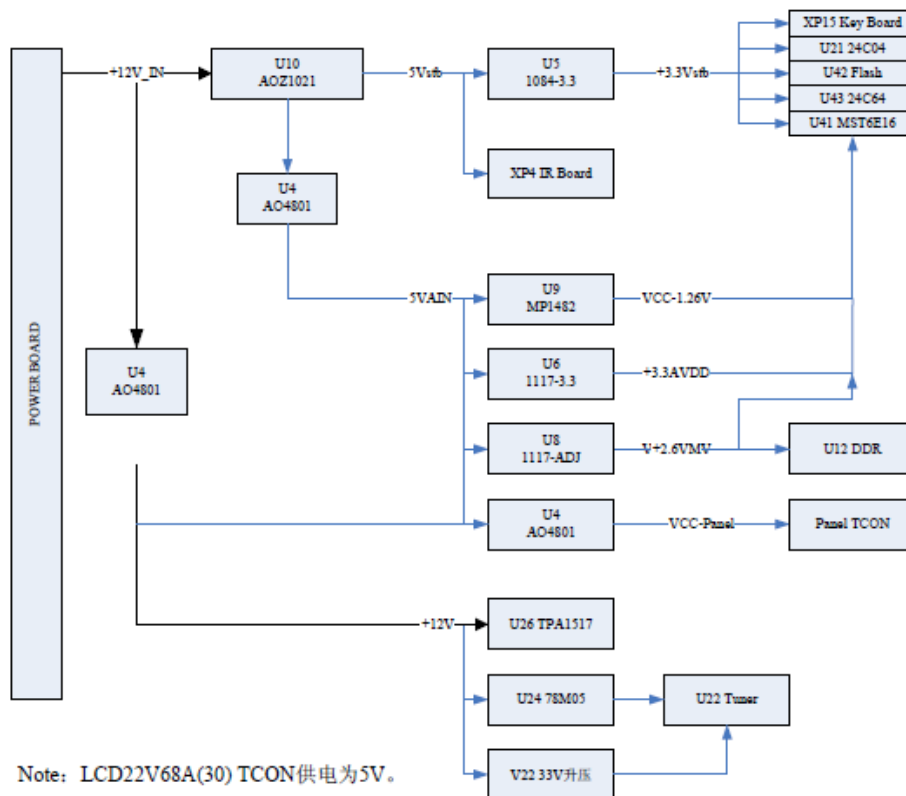
4.1 Main board Power assign and block diagram

Power assign:

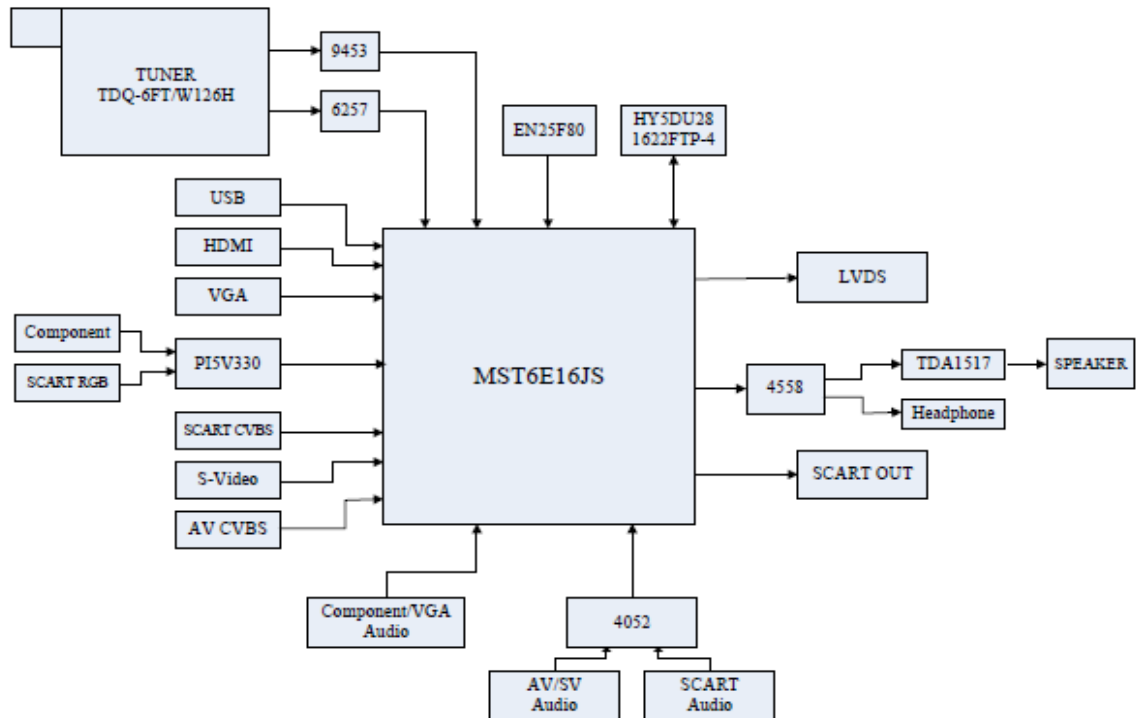
The Power only has 12V output , other voltages are converted from 12V.

- 5V_{stb} is converted by U10 from 12V, 5V_{AIN} and +5V_USB are converted by U7 from 5V_{stb}.
- +3.3V_{stb} that standby power supply for main IC (U41)、Flash (U42)、EEPROM (U43)、HDCP EEPROM (U21)、Key is converted by 5V_{stb} from U5.
- U28 and U30 power supply from 5V_{AIN}
- +3.3AVDD supply power for main is converted by U6 from 5V_{AIN}; +2.6VM supply power for DDR is converted by U8 from 5V_{AIN}; VCC-1.26V supply power for main IC(core voltage) is converted by U9 from 5V_{AIN};
- +12V supply power for audio amplify is converted by U6 from +12V_IN; 5V-IN supply power for Tuner is converted by U24 from +12V_IN;
- VCC-Panel supply power for Panel is converted by U4 from 5V_{AIN} or +12V_IN

Block diagram:



4.2 Image and signal process

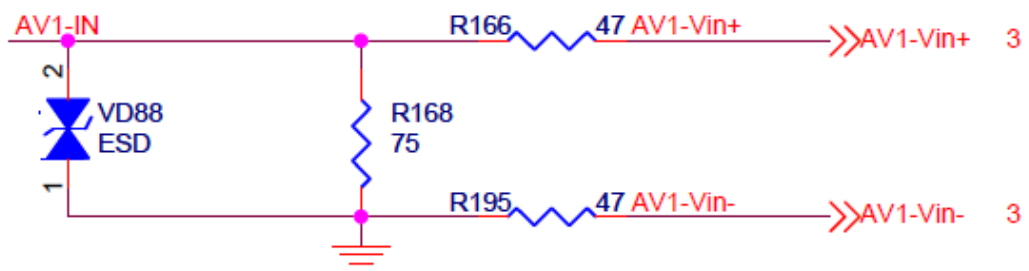


e. RF Signal

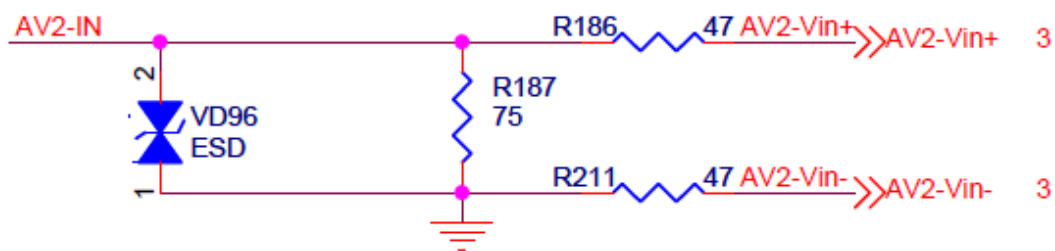
RF Signal pass Tuner(U22) and surface acoustic wave filter(U23、 U25) then output SIF and VIF signal, which input to the main IC to have convert.

f. AV Signal

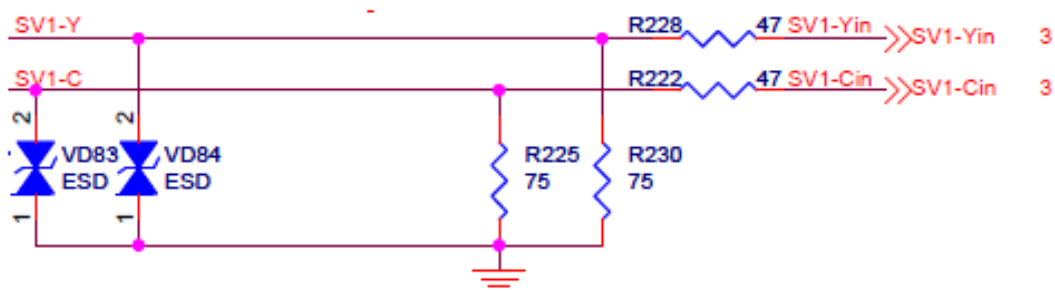
The video signal of AV input from terminal XS2, last enter the pin 37 of U41. as following



The CVBS video signal of SCART input from terminal XS39, last enter the pin35 of U41. as following

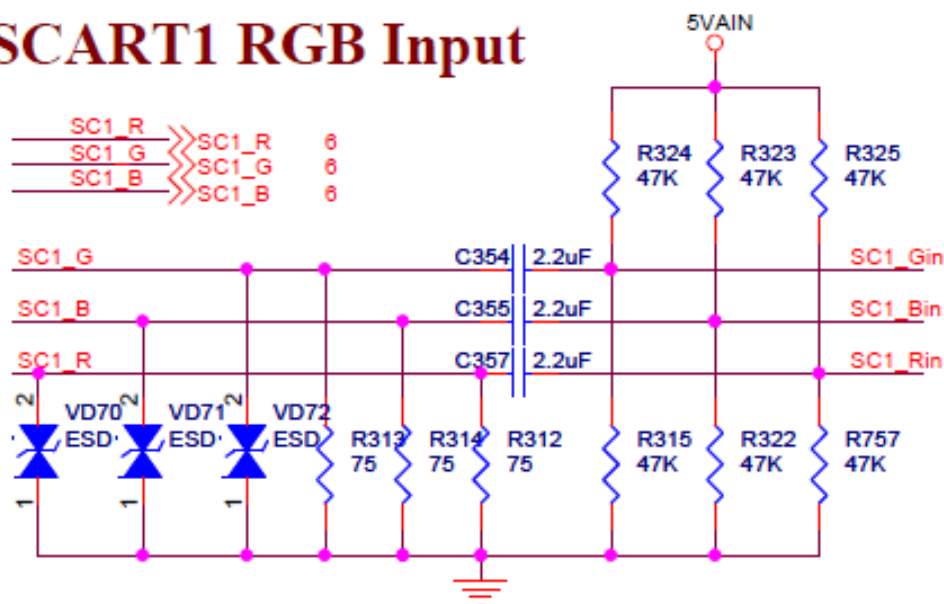


The YC video signal of S-Video input from terminal XS31, last enter pin 32、33 of U41. as following

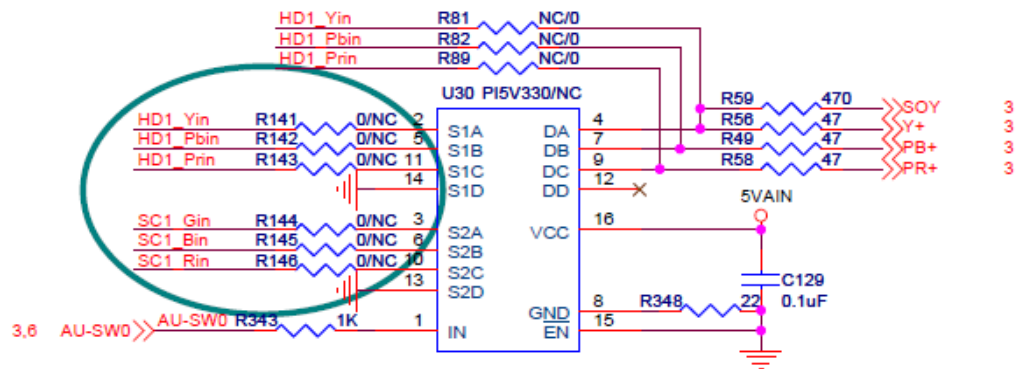


The RGB video signal of SCART input from terminal XS39, Ypbpr video signal of SCART input from terminal XS7. The two signals pass U30 (IC\P15V330Q), then enter pin17-20 of U41. last pass XP11/J2 directly output to the Panel

SCART1 RGB Input



a

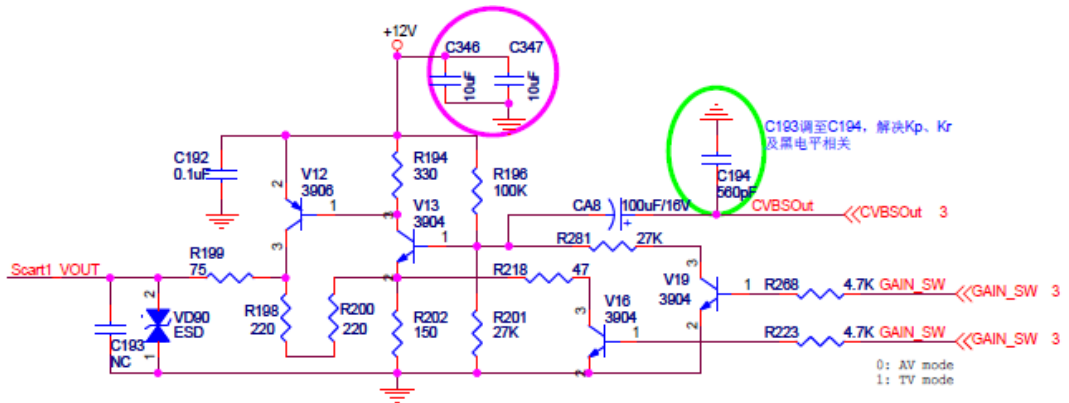


b

PC (VGA) signal input from Terminal XS39, after having converted,. last enter the pin 22、 24、 25、 26 of U41.

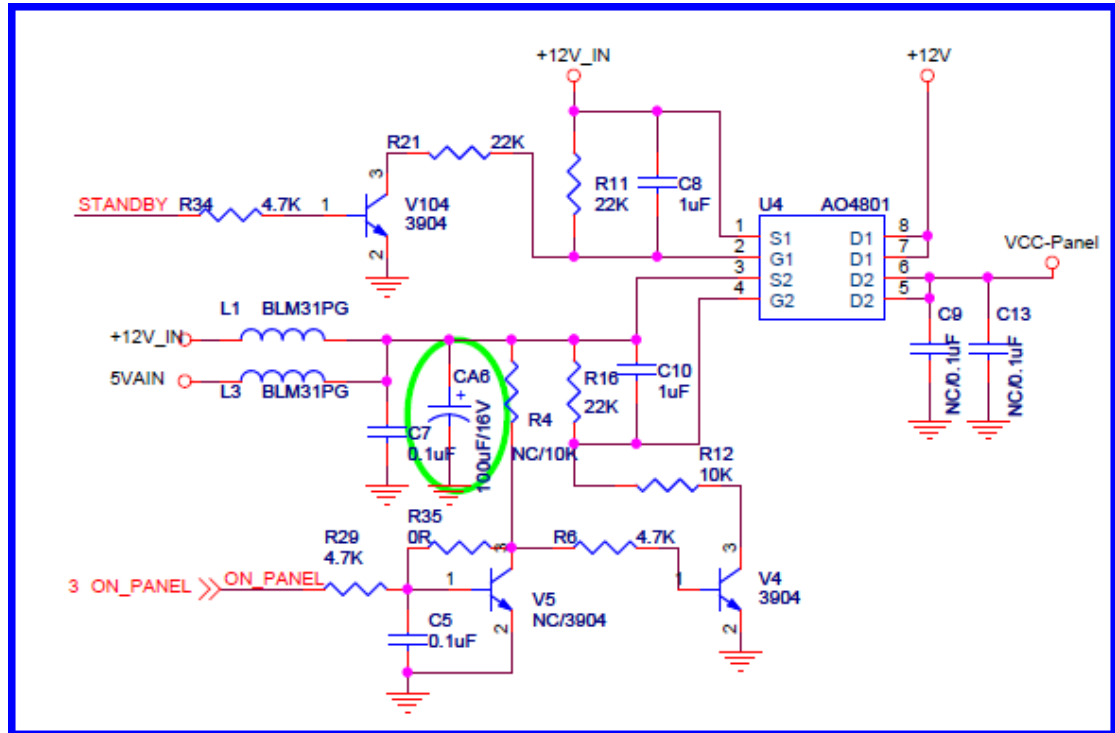
Audio signal of HDMI and USB directly input IC U41.

Output of Scart (owning to have CANAL+ function , only output RF Signal)which by Pin 40 of U41, As the following amplified circuit.. Output from terminal XS39.



g. Audio Signal (except HDMI and USB)

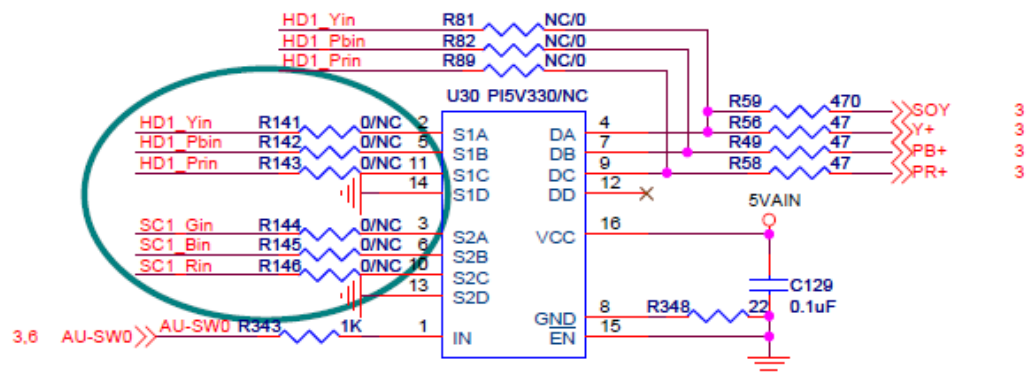
Audio Signal of TV is that the SIF signal pass through Tuner(U22) and surface acoustic wave filter(U23、 U25) was converted by U41.



The video input signal of SCART RGB and Component was converted by U30, controlled by AU-SW0 signal. According current signal choose one channel output from 4、7、9 of U30

The control method as following:

Current channel	AU-SW0	Switch output signal
Component	Low level	Component YPbPr
SCART	High level	SCART RGB

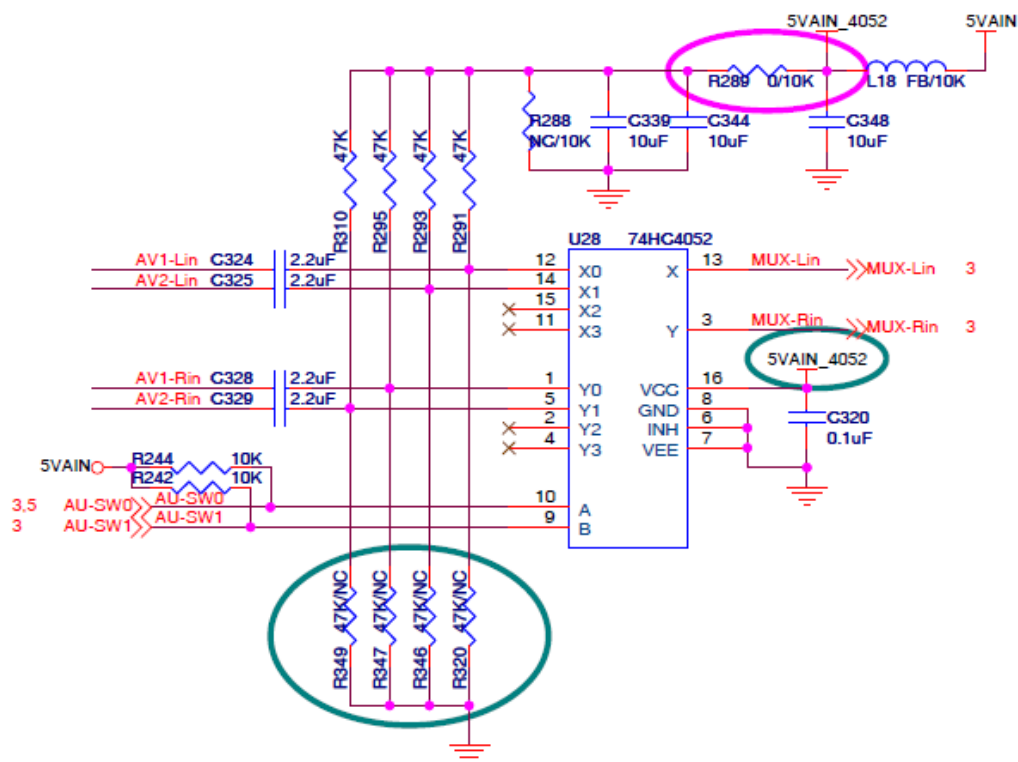


The audio input signal of SCART and AV was converted by U28, controlled by AU-SW0、AU-SW1 signal. According current signal choose one channel output from 3、13 of U28

The control method as following:

Current channel	AU-SW0	AU-SW1	Switch output signal
AV/SV	Low level	x	AV/SV L/R

SCART	High level	x	SCART RGB
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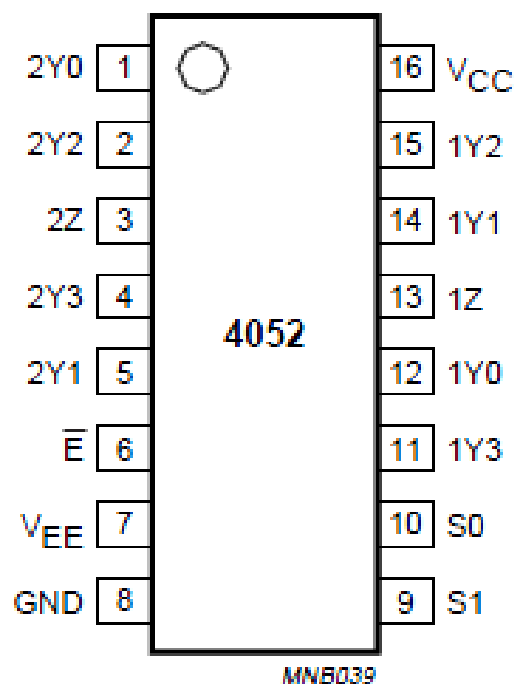
The main control signal, as list:

Control Signal	Internet mark	recommend	Remark
Standby signal (Power control)	STANDBY	High level power on	PW_CTL pass V1、V26 inverse phase
	PW_CTL	High level power on	
BL-control	BL-ON/OFF	High level power on	ON_PBACK pass V2 inverse phase
	ON_PBACK	Low level power on	
LVDS VCC	ON_Panel	High level TCON on	
Audio amplify mute	AMP-MUTE	High level mute	
33V PWM	PWM3		33V rising voltage circuit
Key "0"	Key0-in		Key

Key “1”	Key1-in		Key
Remote control signal	IR-SYNC		IR

4.3 The main IC description

74HC4052D:



PINNING

PIN	SYMBOL	DESCRIPTION
1	2Y0	independent input or output
2	2Y2	independent input or output
3	2Z	common input or output
4	2Y3	independent input or output
5	2Y1	independent input or output
6	\bar{E}	enable input (active LOW)
7	V_{EE}	negative supply voltage
8	GND	ground (0 V)
9	S1	select logic input
10	S0	select logic input
11	1Y3	independent input or output
12	1Y0	independent input or output
13	1Z	common input or output
14	1Y1	independent input or output
15	1Y2	independent input or output
16	V_{CC}	positive supply voltage

AOZ1021

General Description

The AOZ1021 is a synchronous high efficiency, simple to use, 3A buck regulator. The AOZ1021 works from a 4.5V to 16V input voltage range, and provides up to 3A of continuous output current with an output voltage adjustable down to 0.8V.

The AOZ1021 comes in an SO-8 packages and is rated over a -40°C to +85°C ambient temperature range.

Features

- 4.5V to 16V operating input voltage range
- Synchronous rectification: 130mΩ internal high-side switch and 65mΩ Internal low-side switch
- High efficiency: up to 95%
- Internal soft start
- Active high power good state
- Output voltage adjustable to 0.8V
- 3A continuous output current
- Fixed 500kHz PWM operation
- Cycle-by-cycle current limit
- Pre-bias start-up
- Short-circuit protection
- Thermal shutdown
- Small size SO-8 packages

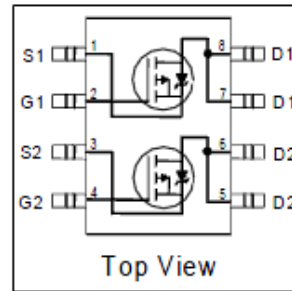
Applications

- Point of load DC/DC conversion
- PCIe graphics cards
- Set top boxes
- DVD drives and HDD
- LCD panels
- Cable modems
- Telecom/Networking/Datacom equipment

RF7314

HEXFET® Power MOSFET

- Generation V Technology
- Ultra Low On-Resistance
- Dual P-Channel MOSFET
- Surface Mount
- Fully Avalanche Rated



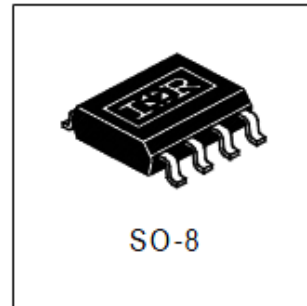
$$V_{DS} = -20V$$

$$R_{DS(on)} = 0.058\Omega$$

Description

Fifth Generation HEXFETs from International Rectifier utilize advanced processing techniques to achieve extremely low on-resistance per silicon area. This benefit, combined with the fast switching speed and ruggedized device design that HEXFET Power MOSFETs are well known for, provides the designer with an extremely efficient and reliable device for use in a wide variety of applications.

The SO-8 has been modified through a customized leadframe for enhanced thermal characteristics and multiple-die capability making it ideal in a variety of power applications. With these improvements, multiple devices can be used in an application with dramatically reduced board space. The package is designed for vapor phase, infra red, or wave soldering techniques.



Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ Unless Otherwise Noted)

	Symbol	Maximum	Units
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	± 12	
Continuous Drain Current ^⑤	I_D	-5.3	A
		-4.3	
Pulsed Drain Current	I_{DM}	-21	
Continuous Source Current (Diode Conduction)	I_S	-2.5	
Maximum Power Dissipation ^⑤	P_D	2.0	W
		1.3	
Single Pulse Avalanche Energy	E_{AS}	150	mJ
Avalanche Current	I_{AR}	-2.9	A
Repetitive Avalanche Energy	E_{AR}	0.20	mJ
Peak Diode Recovery dv/dt ^③	dv/dt	-5.0	V/ ns
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to + 150	$^\circ\text{C}$

Thermal Resistance Ratings

Parameter	Symbol	Limit	Units
Maximum Junction-to-Ambient ^⑤	$R_{\theta JA}$	62.5	$^\circ\text{C/W}$

Electrical Characteristics @ $T_J = 25^{\circ}\text{C}$ (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	-20	—	—	V	$V_{GS} = 0V, I_D = -250\mu A$
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.031	—	V/ $^{\circ}\text{C}$	Reference to 25°C , $I_D = -1mA$
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	0.049	0.058	Ω	$V_{GS} = -4.5V, I_D = -2.9A$ ④
		—	0.082	0.098		$V_{GS} = -2.7V, I_D = -1.5A$ ④
$V_{GS(th)}$	Gate Threshold Voltage	-0.70	—	—	V	$V_{DS} = V_{GS}, I_D = -250\mu A$
g_{fs}	Forward Transconductance	—	5.9	—	S	$V_{DS} = -10V, I_D = -1.5A$
I_{DSS}	Drain-to-Source Leakage Current	—	—	-1.0	μA	$V_{DS} = -16V, V_{GS} = 0V$
		—	—	-25		$V_{DS} = -16V, V_{GS} = 0V, T_J = 55^{\circ}\text{C}$
I_{GSS}	Gate-to-Source Forward Leakage	—	—	100	nA	$V_{GS} = -12V$
	Gate-to-Source Reverse Leakage	—	—	-100		$V_{GS} = 12V$
Q_g	Total Gate Charge	—	19	29	nC	$I_D = -2.9A$
Q_{gs}	Gate-to-Source Charge	—	4.0	6.1		$V_{DS} = -16V$
Q_{gd}	Gate-to-Drain ("Miller") Charge	—	7.7	12		$V_{GS} = -4.5V$, See Fig. 10 ④
$t_{d(on)}$	Turn-On Delay Time	—	15	22	ns	$V_{DD} = -10V$
t_r	Rise Time	—	40	60		$I_D = -2.9A$
$t_{d(off)}$	Turn-Off Delay Time	—	42	63		$R_G = 6.0\Omega$
t_f	Fall Time	—	49	73		$R_D = 3.4\Omega$ ④
C_{iss}	Input Capacitance	—	780	—	pF	$V_{GS} = 0V$
C_{oss}	Output Capacitance	—	470	—		$V_{DS} = -15V$
C_{rss}	Reverse Transfer Capacitance	—	240	—		$f = 1.0MHz$, See Fig. 5

MP1482

DESCRIPTION

The MP1482 is a monolithic synchronous buck regulator. The device integrates two 130m Ω MOSFETs, and provides 2A of continuous load current over a wide input voltage of 4.75V to 18V. Current mode control provides fast transient response and cycle-by-cycle current limit.

An adjustable soft-start prevents inrush current at turn-on, and in shutdown mode the supply current drops to 1 μA .

This device, available in an 8-pin SOIC package, provides a very compact solution with minimal external components.

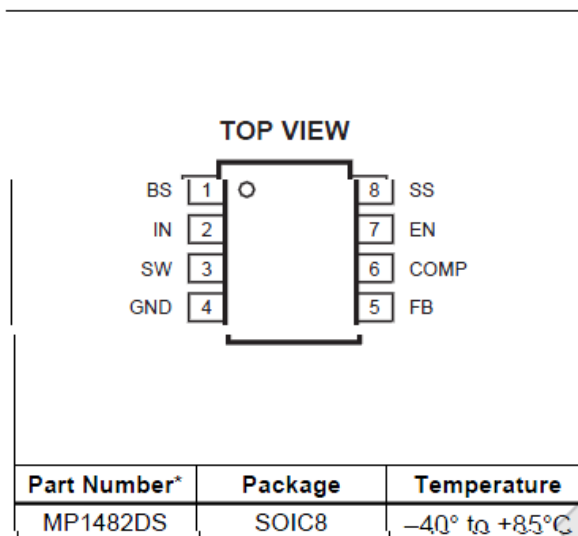
FEATURES

- 2A Output Current
- Wide 4.75V to 18V Operating Input Range
- Integrated 130m Ω Power MOSFET Switches
- Output Adjustable from 0.923V to 15V
- Up to 93% Efficiency
- Programmable Soft-Start
- Stable with Low ESR Ceramic Output Capacitors
- Fixed 340KHz Frequency
- Cycle-by-Cycle Over Current Protection
- Input Under Voltage Lockout

APPLICATIONS

- Distributed Power Systems
- Networking Systems
- FPGA, DSP, ASIC Power Supplies
- Green Electronics/ Appliances
- Notebook Computers

PACKAGE REFERENCE



* For Tape & Reel, add suffix -Z (e.g. MP1482DS-Z)
For Lead Free, add suffix -LF (e.g. MP1482DS-LF-Z)

ABSOLUTE MAXIMUM RATINGS⁽¹⁾

Supply Voltage V_{IN}	-0.3V to +20V
Switch Node Voltage V_{SW}	21V
Boost Voltage V_{BS}	$V_{SW} - 0.3V$ to $V_{SW} + 6V$
All Other Pins	-0.3V to +6V
Junction Temperature	150°C
Lead Temperature	260°C
Storage Temperature	-65°C to +150°C

Recommended Operating Conditions⁽²⁾

Input Voltage V_{IN}	4.75V to 18V
Output Voltage V_{OUT}	0.923V to 15V
Ambient Operating Temperature	-40°C to +85°C

Thermal Resistance⁽³⁾

	θ_{JA}	θ_{JC}
SOIC8	90	45

Notes:

- Exceeding these ratings may damage the device.
- The device is not guaranteed to function outside of its operating conditions.
- Measured on approximately 1" square of 1 oz copper.

TPA1517

DESCRIPTION

The TPA1517 is a stereo audio power amplifier that contains two identical amplifiers capable of delivering 6 W per channel of continuous average power into a 4- Ω load at 10% THD+N or 5 W per channel at 1% THD+N. The gain of each channel is fixed at 20 dB. The amplifier features a mute/standby function for power-sensitive applications. The amplifier is available in the PowerPAD™ 20-pin surface-mount thermally-enhanced package (DWP) that reduces board space and facilitates automated assembly while maintaining exceptional thermal characteristics. It is also available in the 20-pin thermally enhanced DIP package (NE).

AVAILABLE OPTIONS

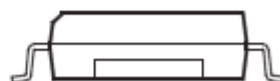
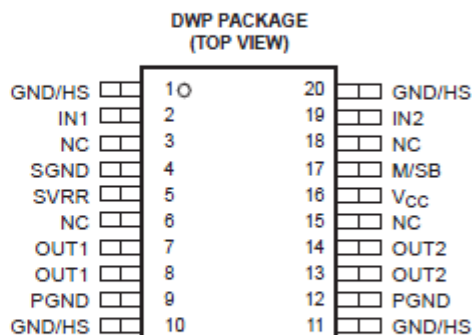
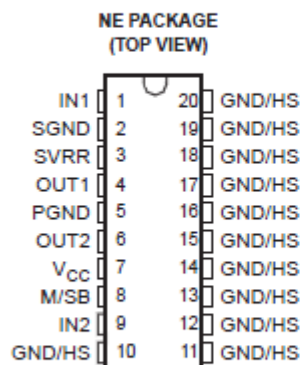
T_A	PACKAGED DEVICES ⁽¹⁾	
	THERMALLY ENHANCED PLASTIC DIP	THERMALLY ENHANCED SURFACE MOUNT (DWP) ⁽²⁾
-40°C to 85°C	TPA1517NE	TPA1517DWP ⁽²⁾

- For the most current package and ordering information, see the Package Option Addendum at the end of this document, or see the TI Web site at www.ti.com.
- The DWP package is available taped and reeled. To order a taped and reeled part, add the suffix R (e.g., TPA1517DWPR).

FEATURES

- TDA1517P Compatible
- High Power Outputs (6 W/Channel)
- Surface Mount Availability 20-Pin Thermal SOIC PowerPAD™

- Thermal Protection
- Fixed Gain: 20 dB
- Mute and Standby Operation
- Supply Range: 9.5 V - 18 V

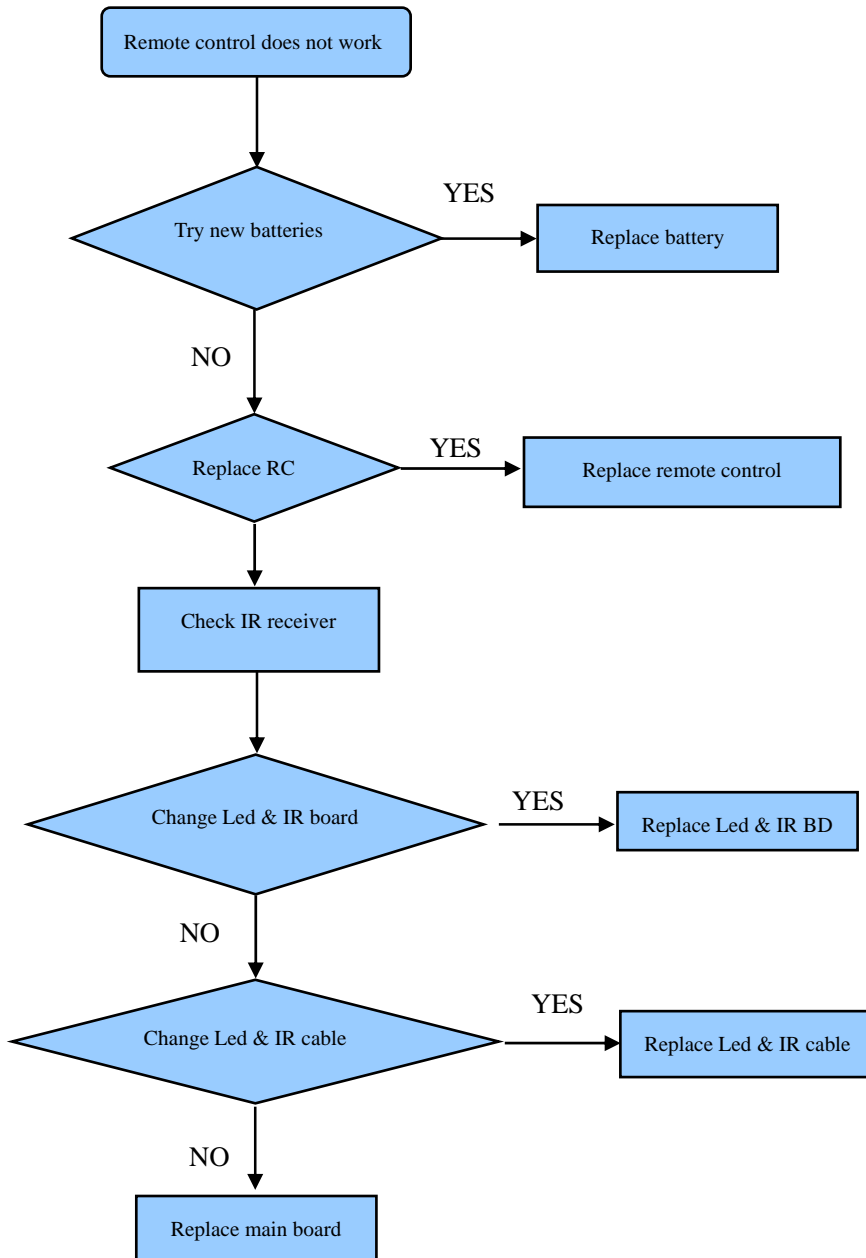


Cross Section View Showing PowerPAD

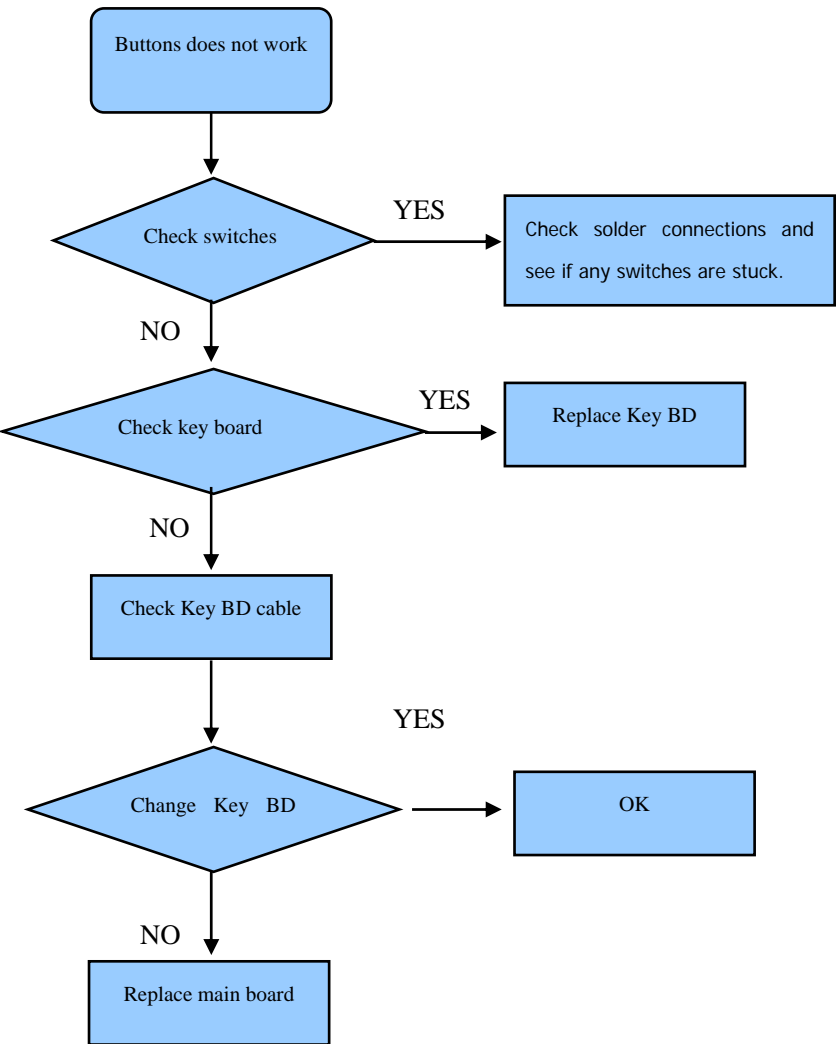
NC – No internal connection

4.4 Troubleshooting

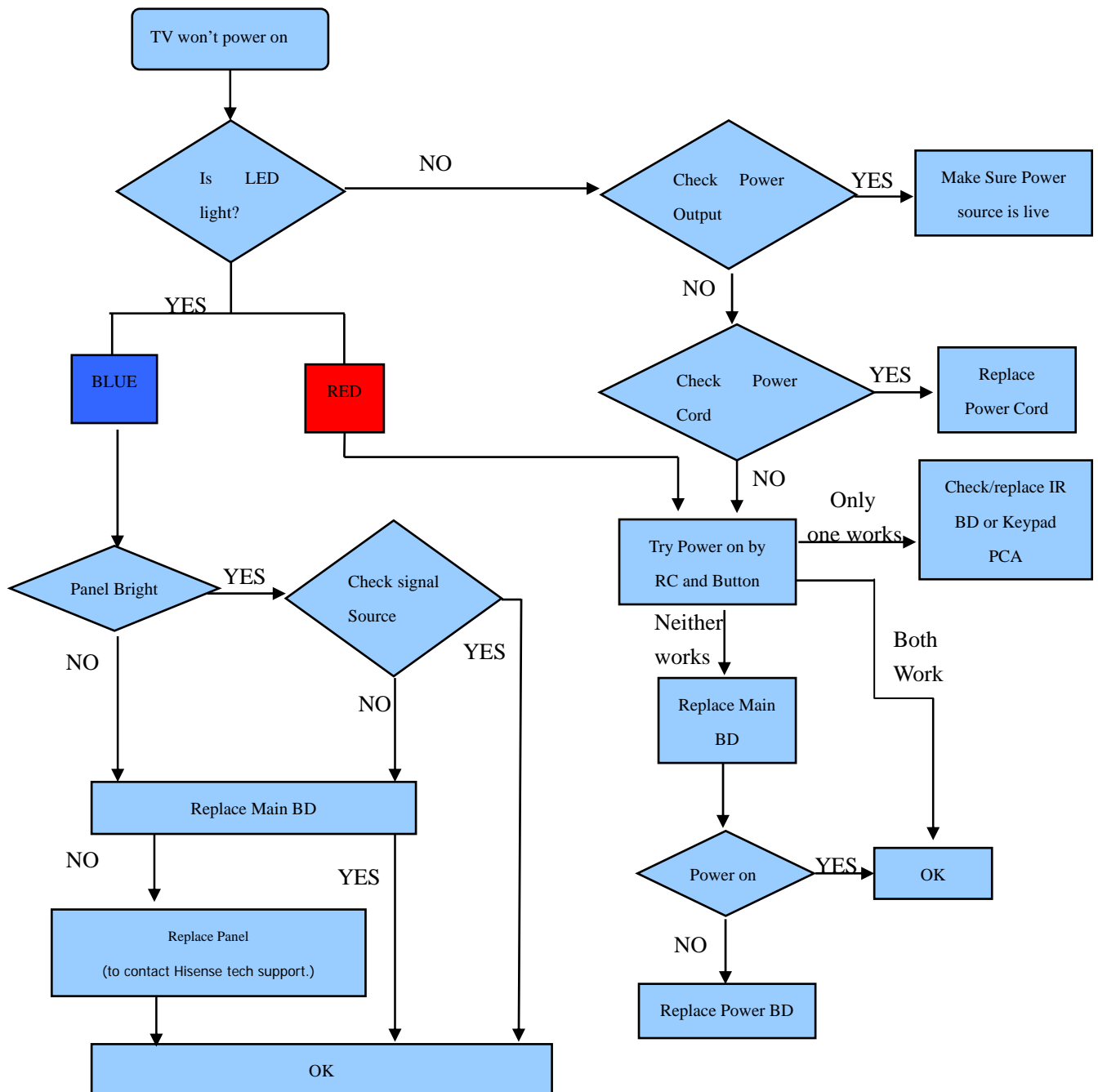
4.4.1 Troubleshooting for Remote Control



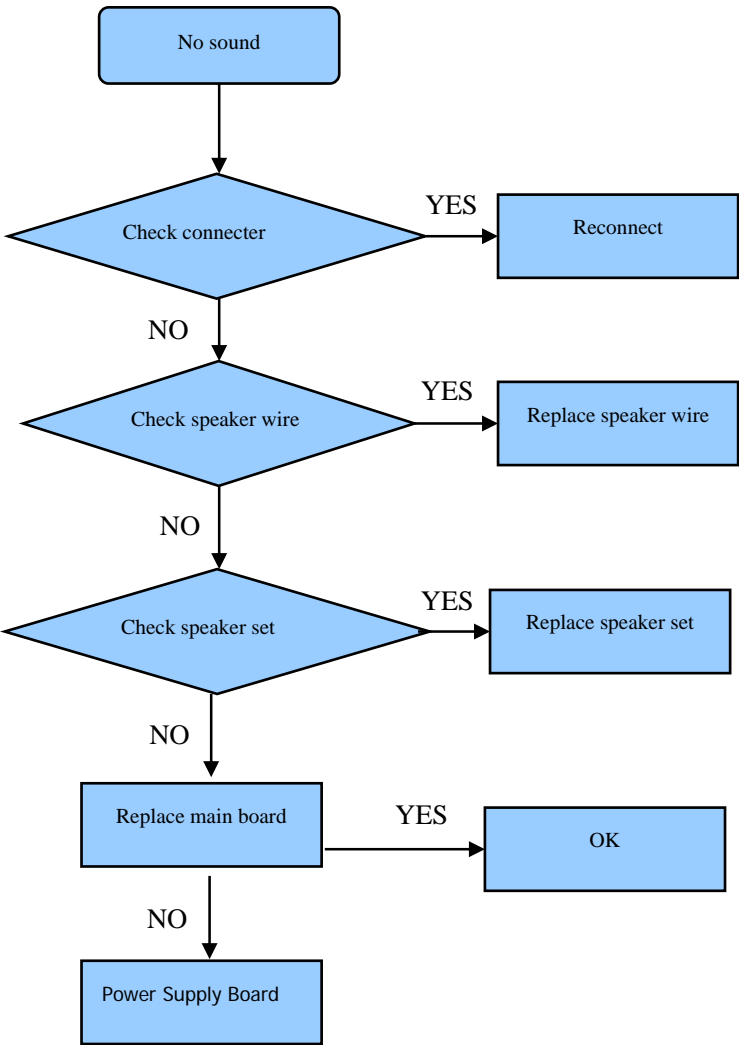
4.4.2 Troubleshooting for Function Key



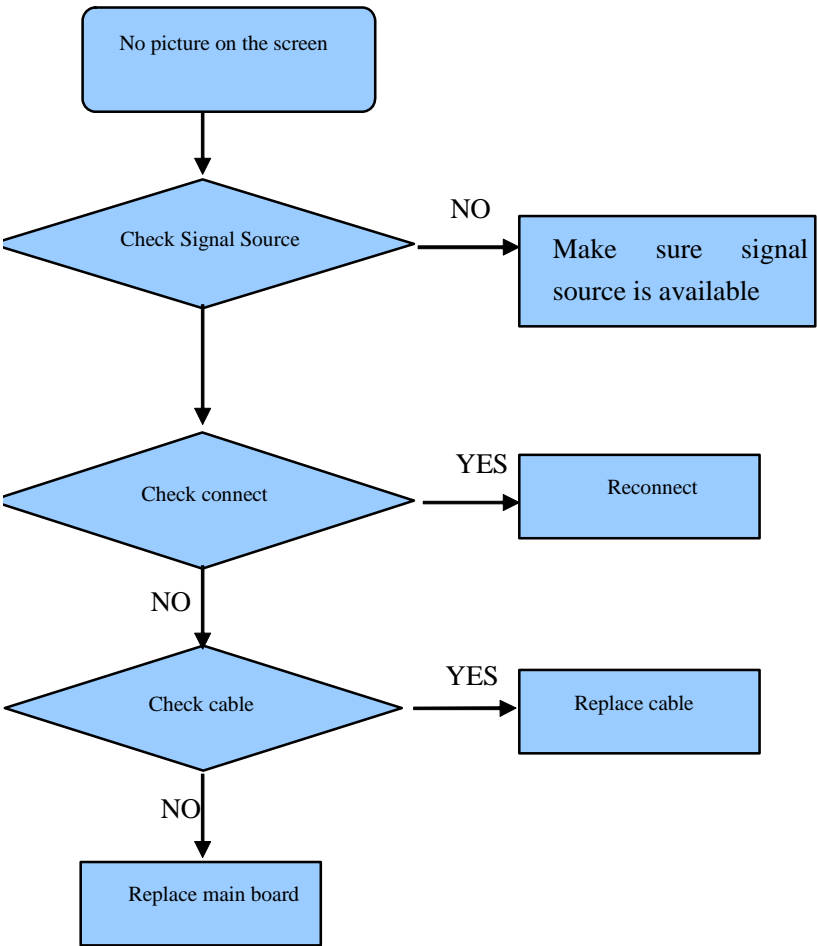
4.4.3 TV won't Power On



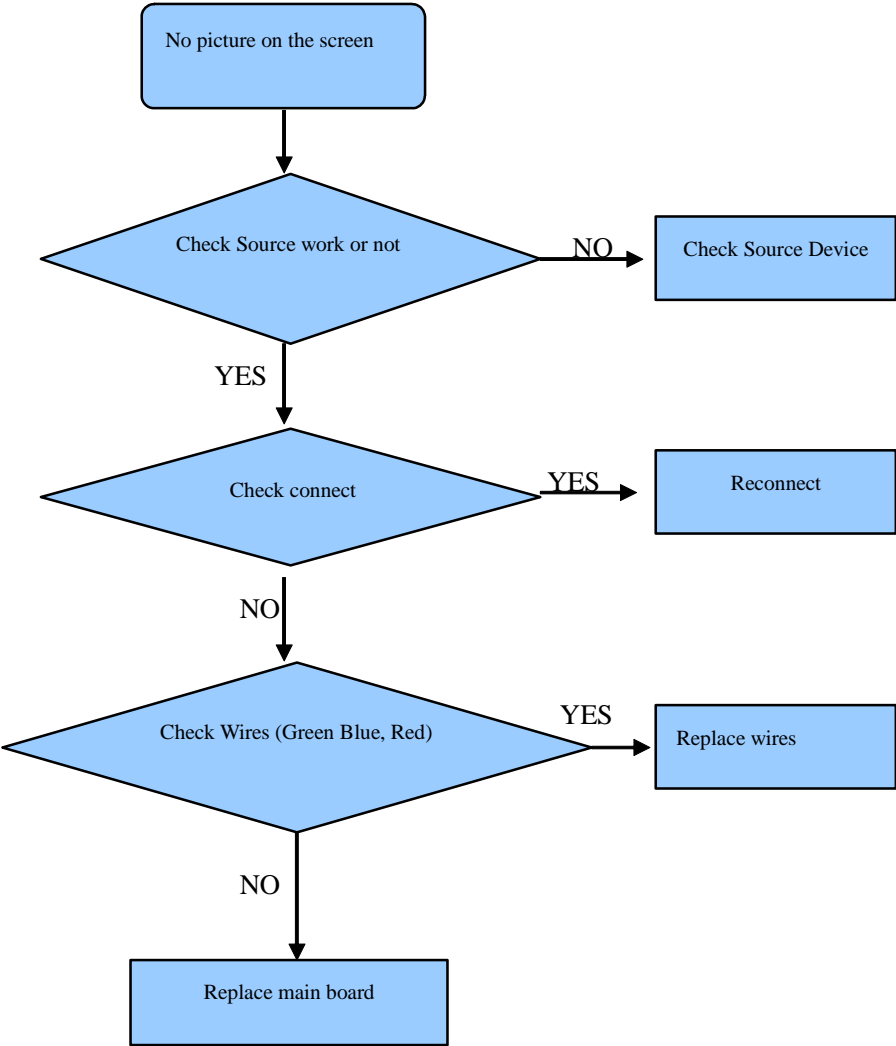
4.4.4 Troubleshooting for Audio



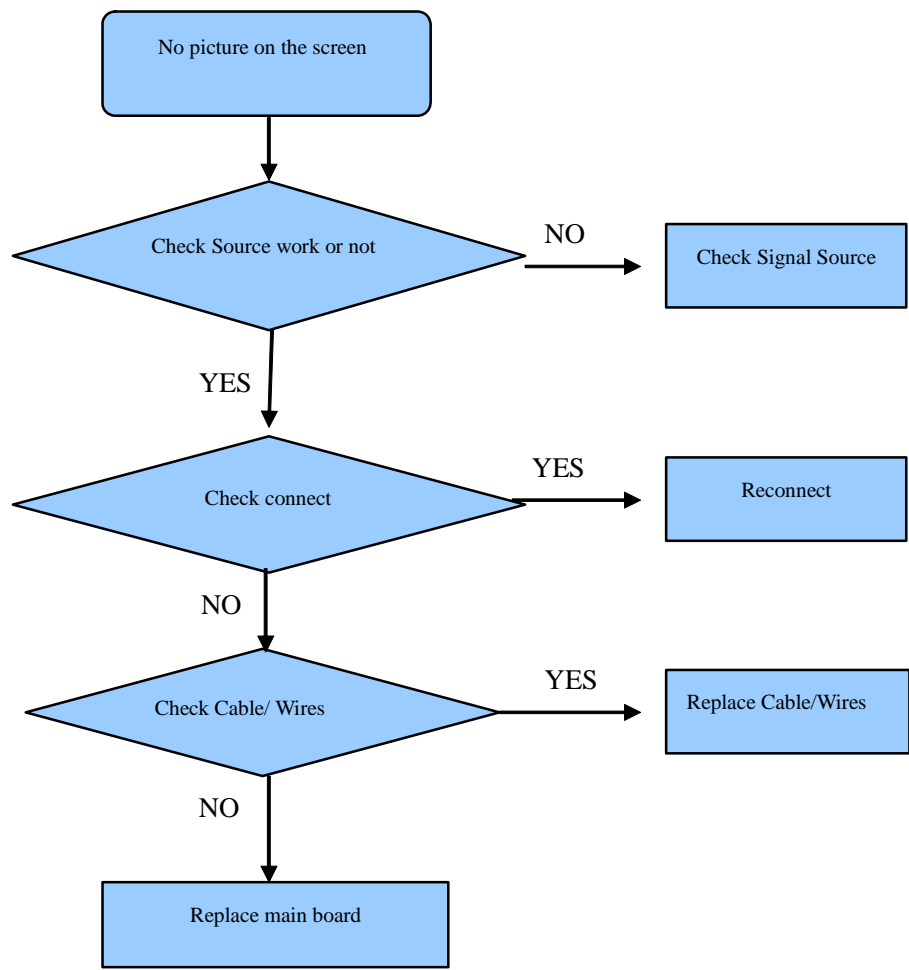
4.4.5 Troubleshooting for TV/VGA/HDMI input



4.4.6 Troubleshooting for YPbPr input

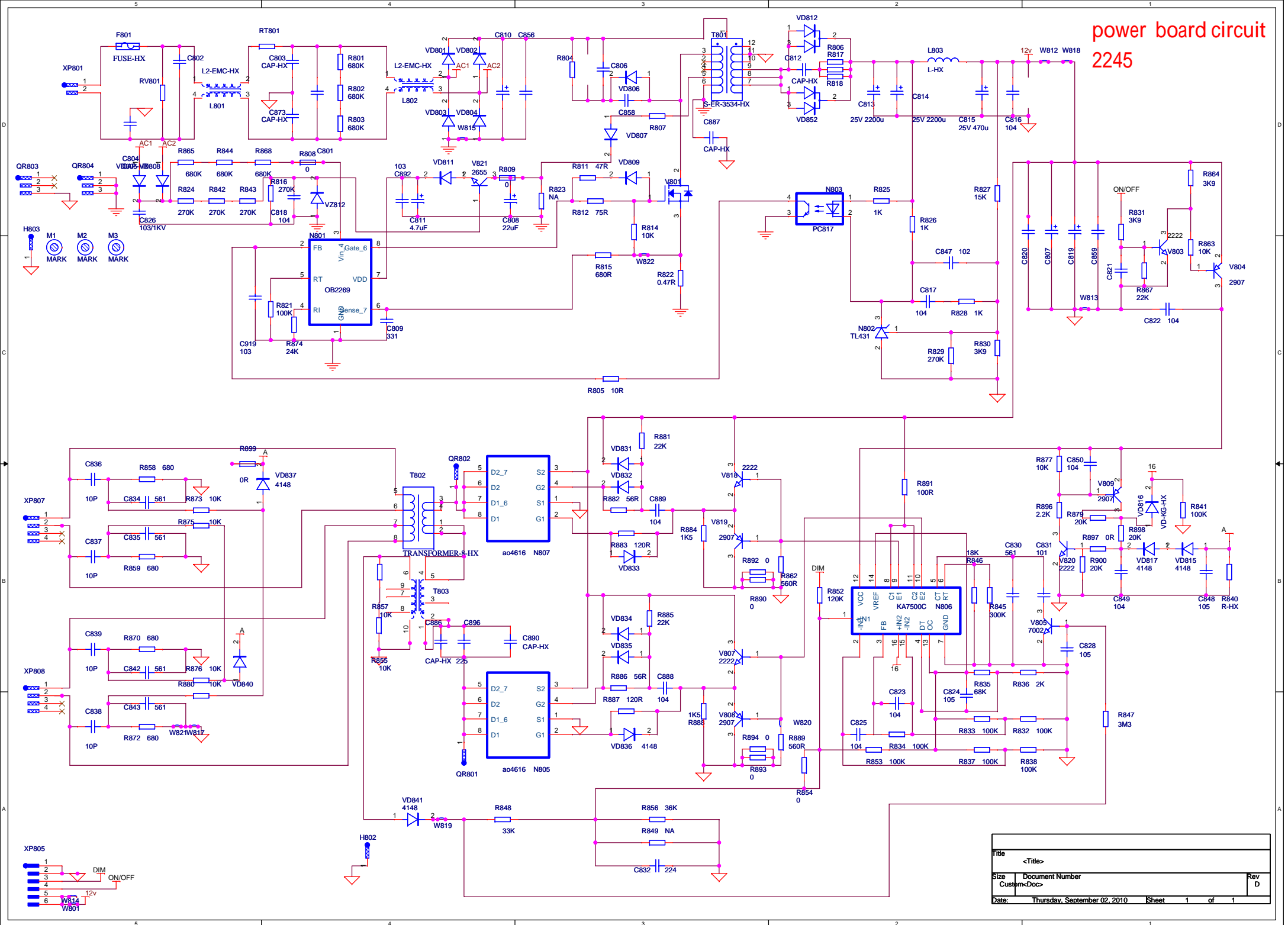


4.4.7 Troubleshooting for Video/S-Video input

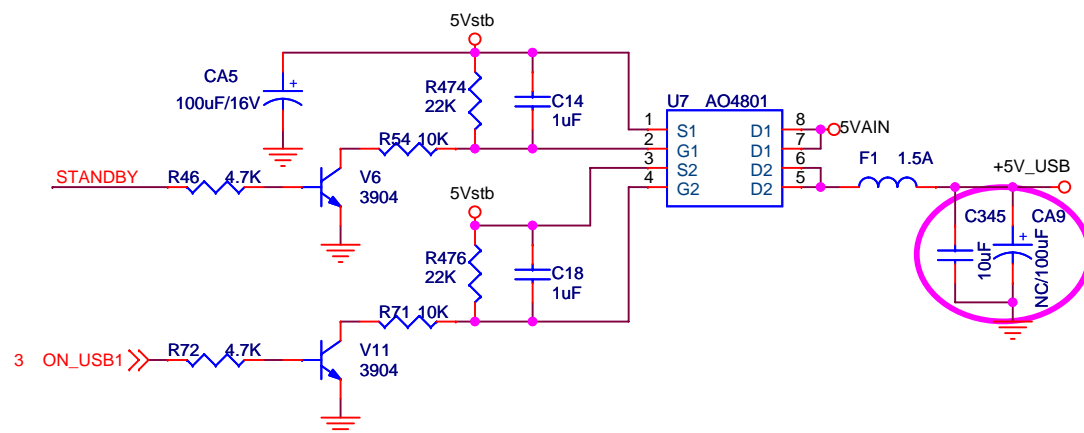
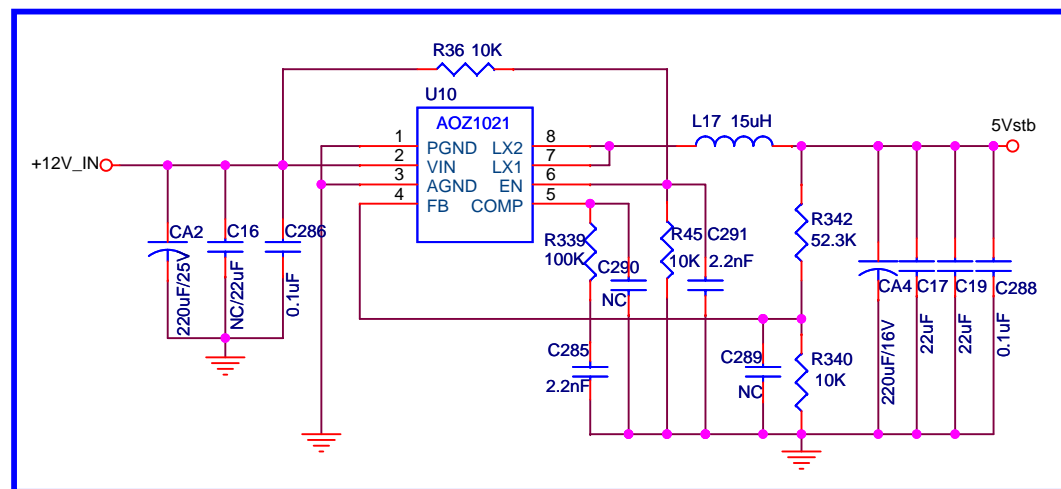
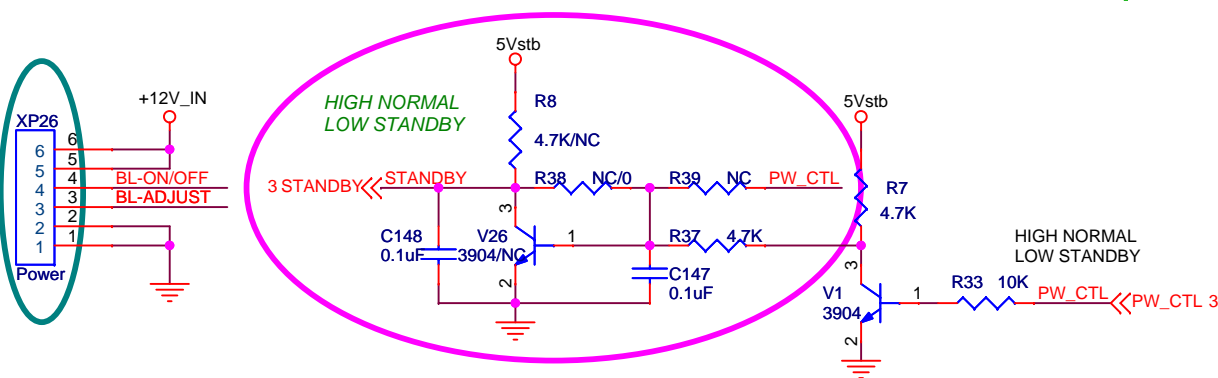


5. Schematic circuit diagram

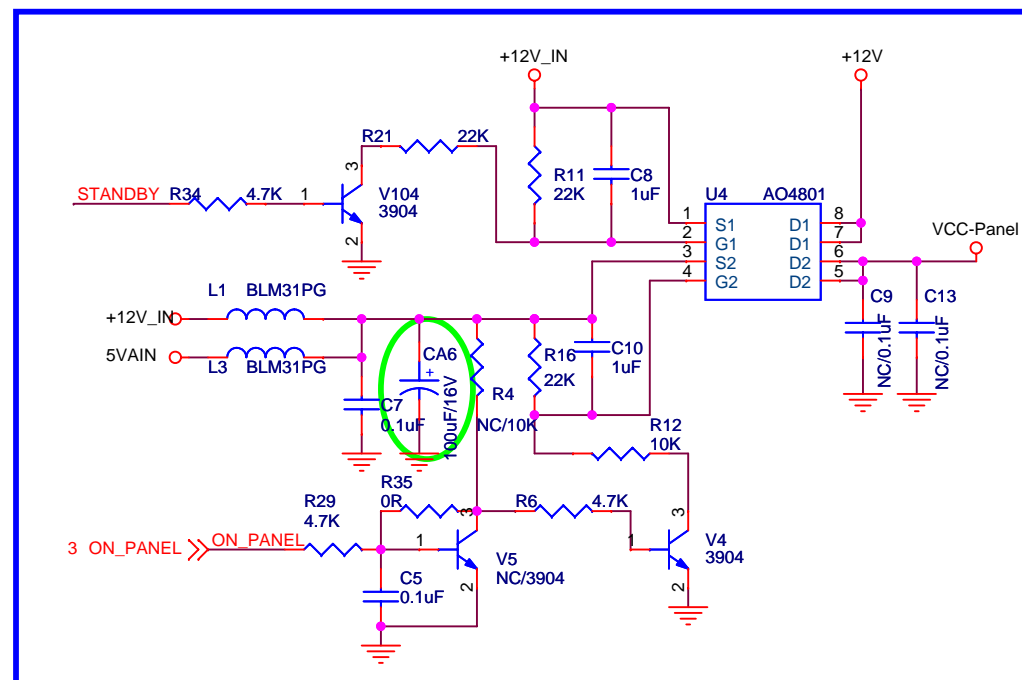
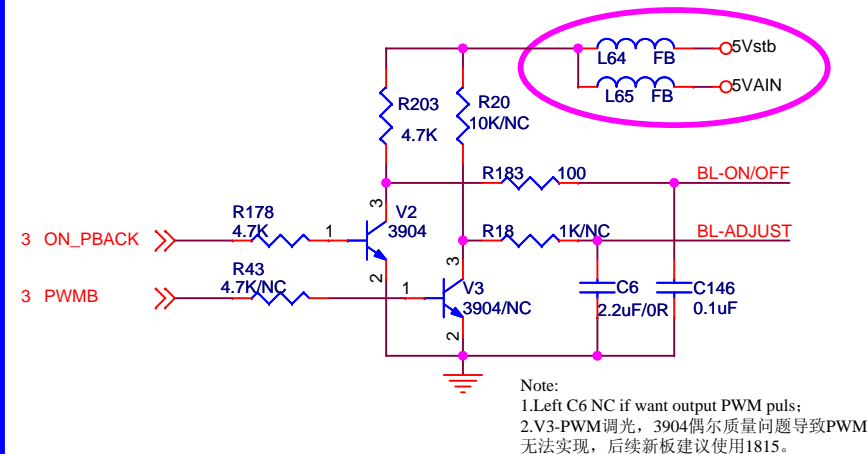
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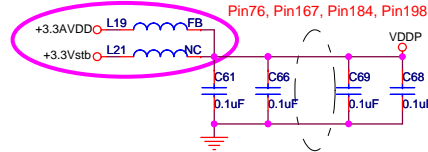
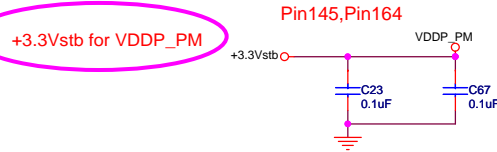
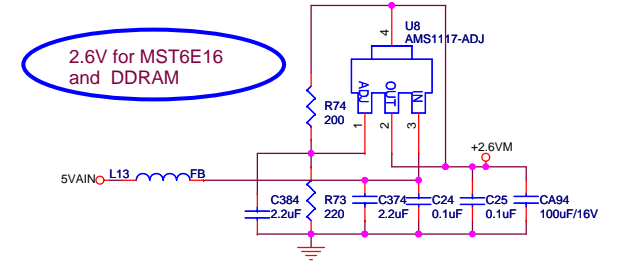
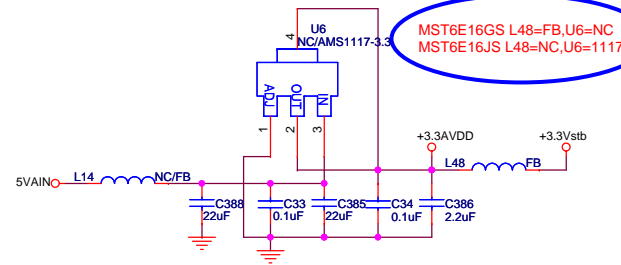
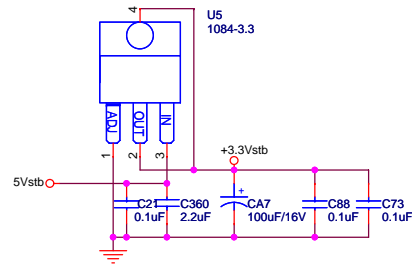


T0 Inverter Board



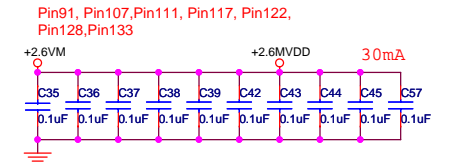
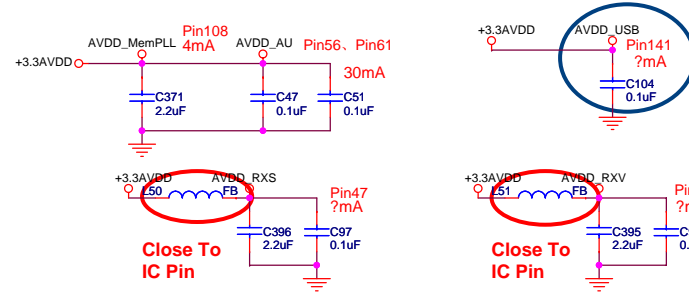
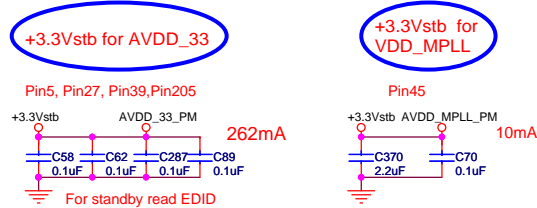
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Date:	Thursday, July 23, 2009	Sheet	1 of 9

main board pcb 1861

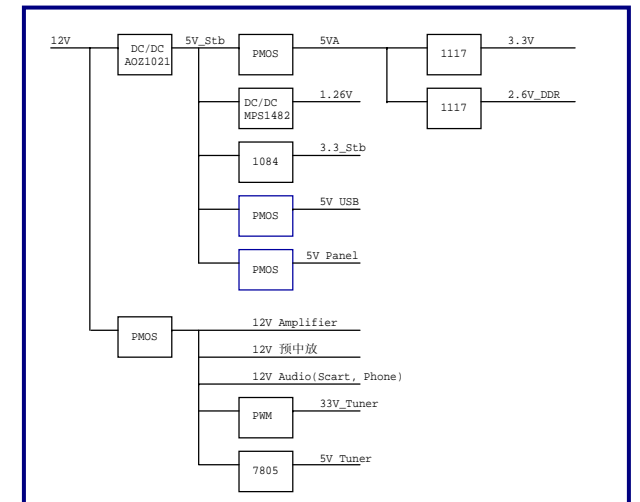
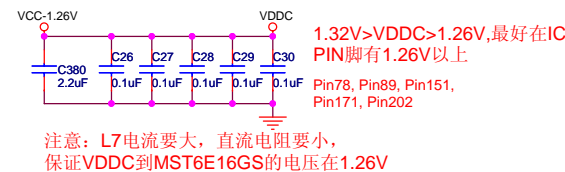
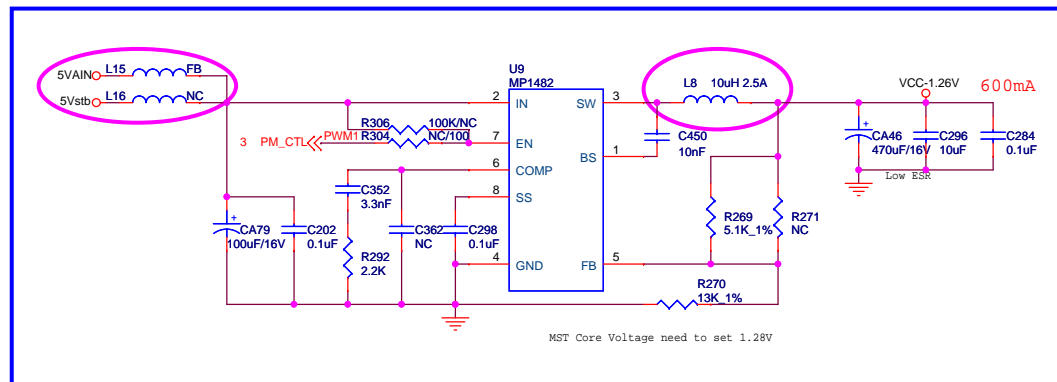


FOR use DDR, +2.6VM must be 2.6V

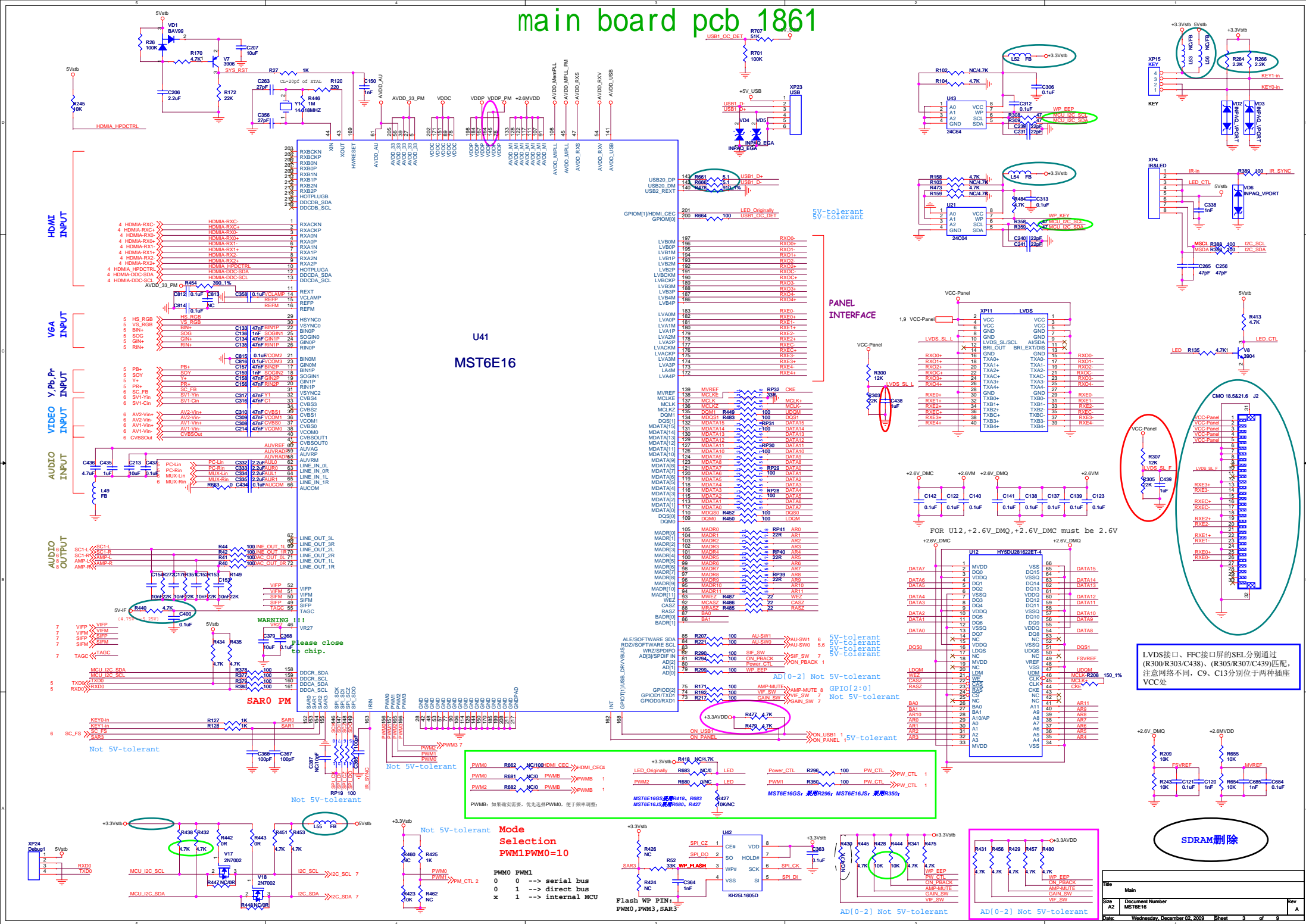
+2.6V for MST6E16

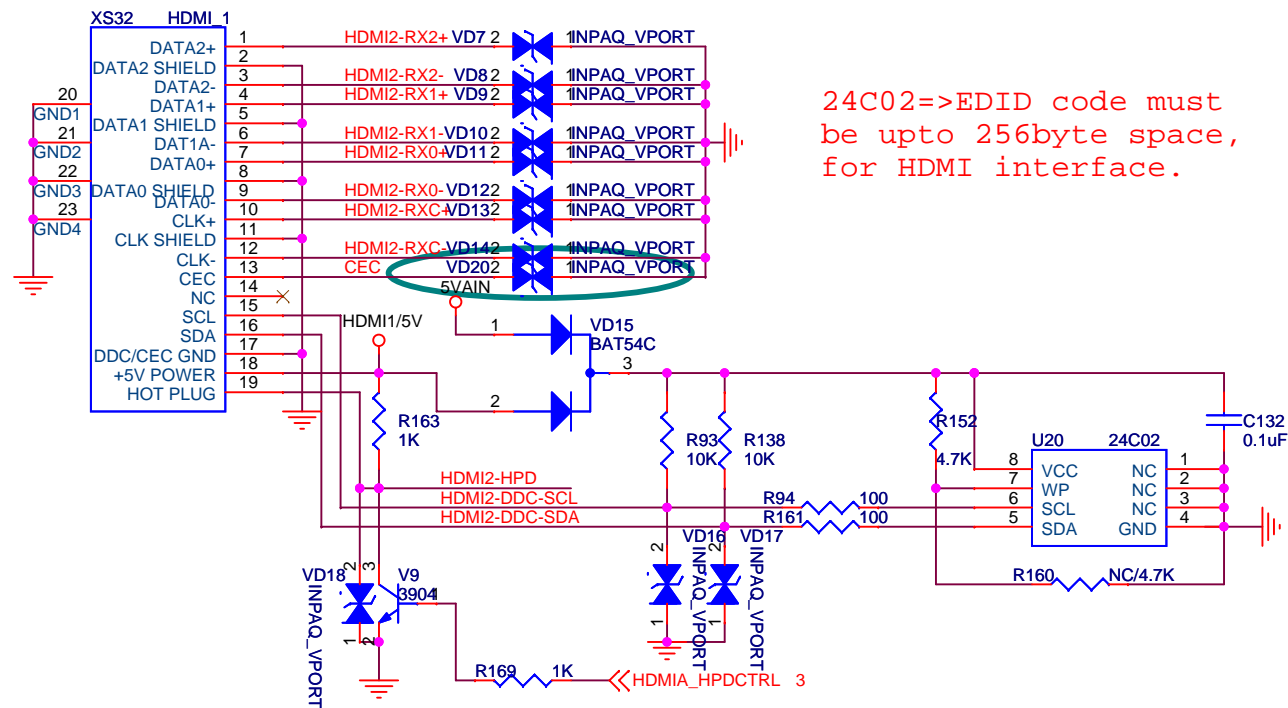


Vcc 1.26V for MST6E16 Core power



main board pcb 1861

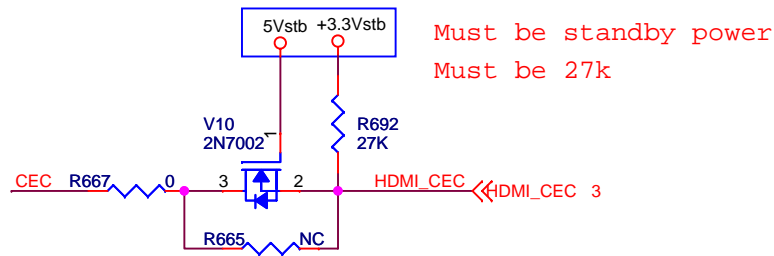




24C02=>EDID code must be upto 256byte space, for HDMI interface.

HDMI2-RX2+	R182	10	HDMIA-RX2+	HDMIA-RX2+ 3
HDMI2-RX2-	R184	10	HDMIA-RX2-	HDMIA-RX2- 3
HDMI2-RX1+	R185	10	HDMIA-RX1+	HDMIA-RX1+ 3
HDMI2-RX1-	R190	10	HDMIA-RX1-	HDMIA-RX1- 3
HDMI2-RX0+	R206	10	HDMIA-RX0+	HDMIA-RX0+ 3
HDMI2-RX0-	R173	10	HDMIA-RX0-	HDMIA-RX0- 3
HDMI2-RXC+	R175	10	HDMIA-RXC+	HDMIA-RXC+ 3
HDMI2-RXC-	R176	10	HDMIA-RXC-	HDMIA-RXC- 3
HDMI2-DDC-SCL	R177	100	HDMIA-DDC-SCL	HDMIA-DDC-SCL 3
HDMI2-DDC-SDA	R181	100	HDMIA-DDC-SDA	HDMIA-DDC-SDA 3

For CEC Leakage Protect

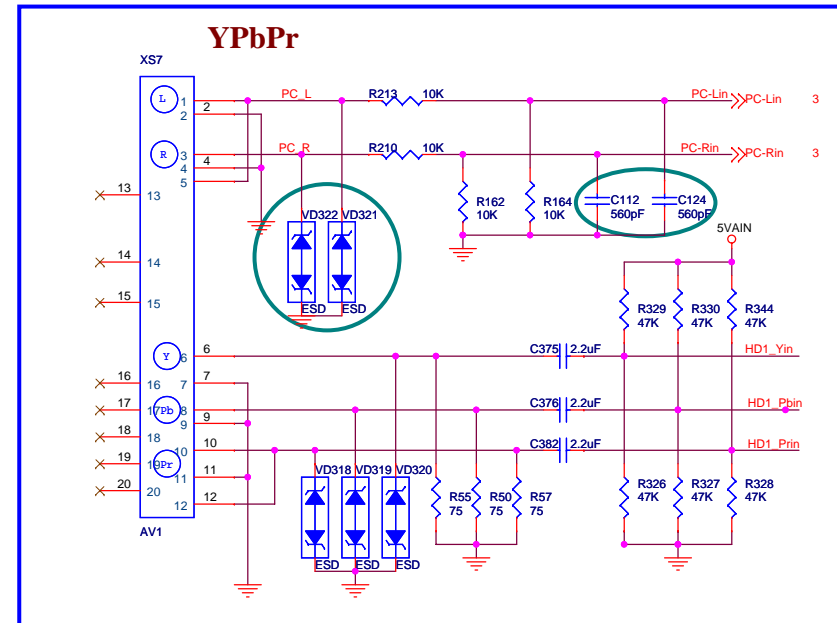
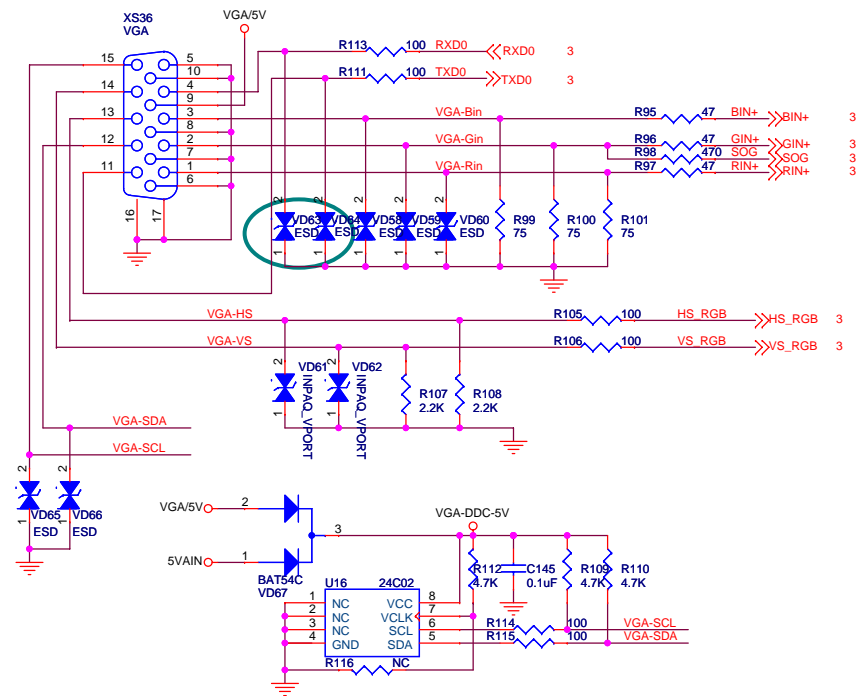


Must be standby power

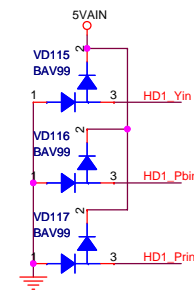
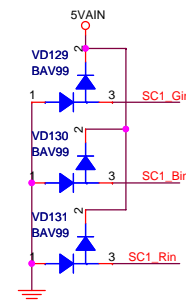
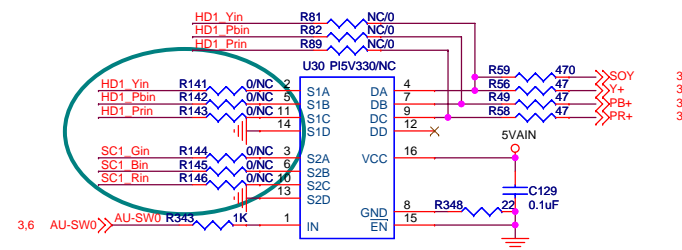
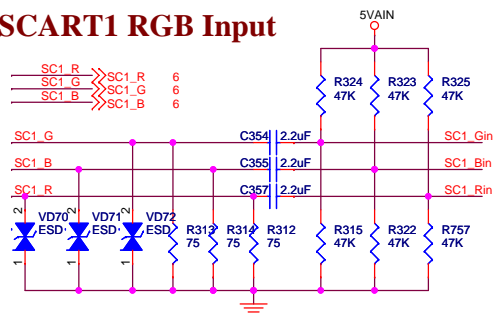
Must be 27k

		深圳市高新区南区科技南十路国际技术创新研究院C座4楼	
TEL:0755-26996895		FAX:0755-26996830	
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Date: Saturday, April 25, 2009		Sheet: 4	of: 9

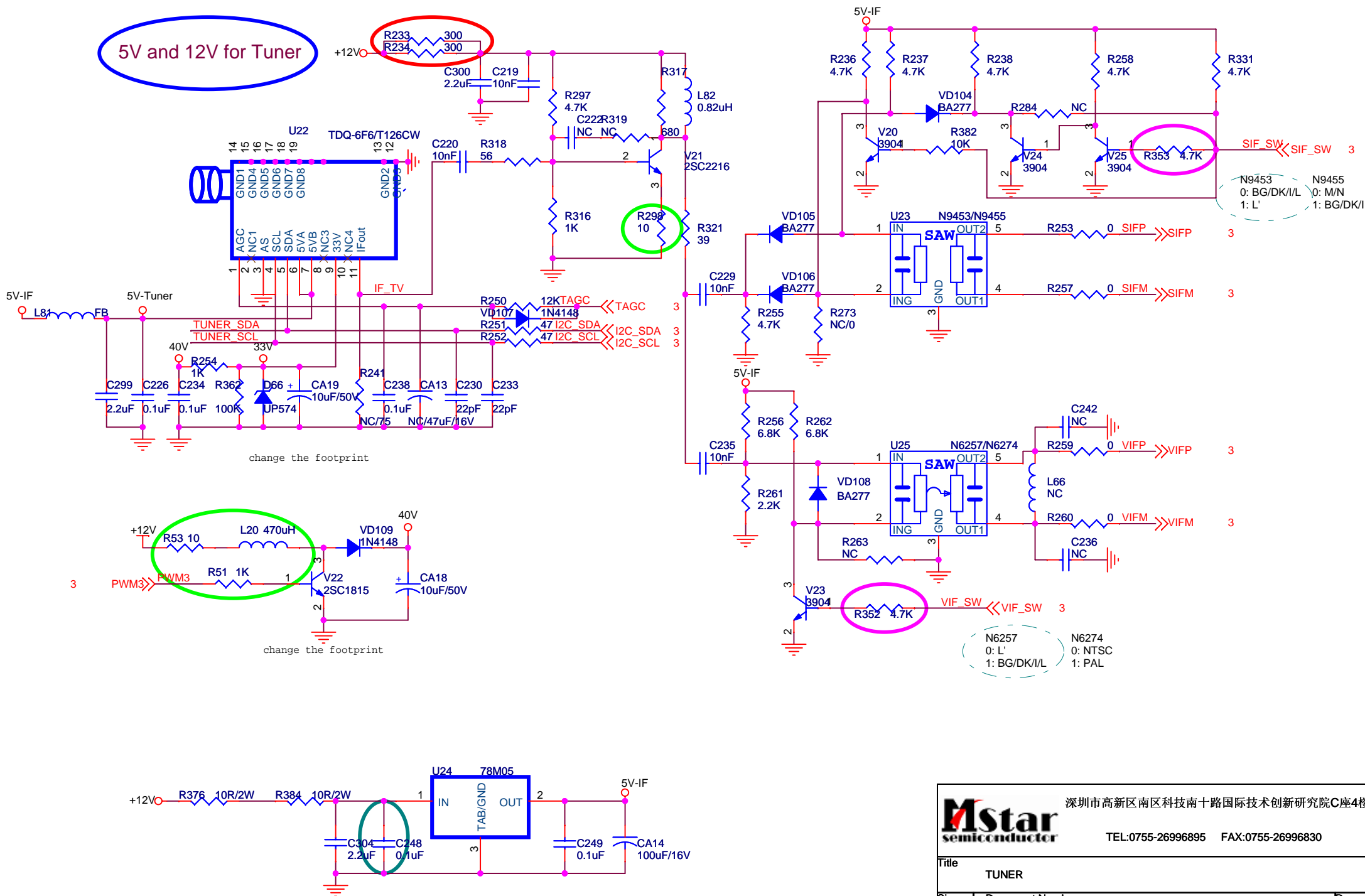
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main board pcb 1861		



SCART1 RGB Input

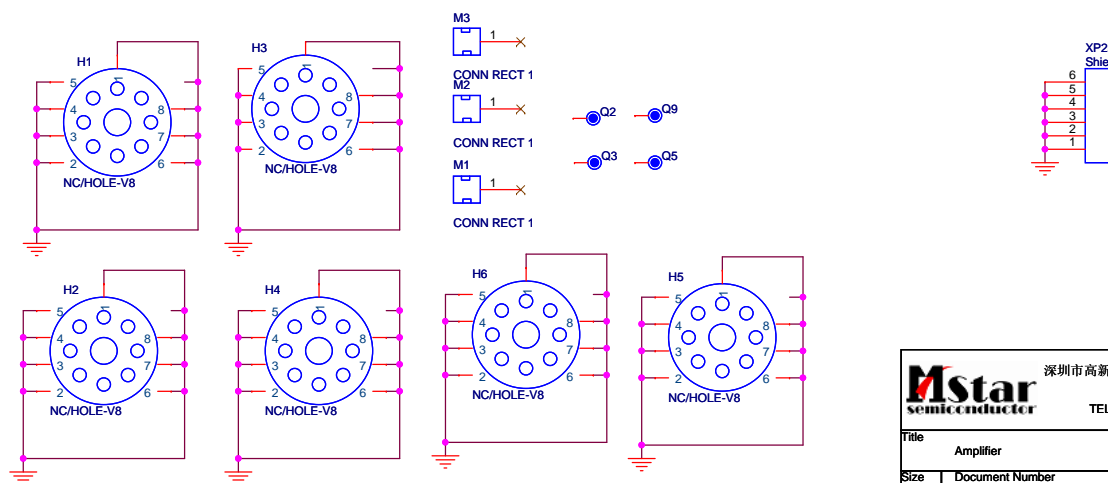
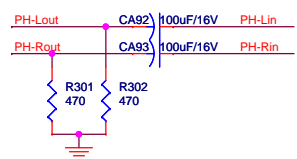
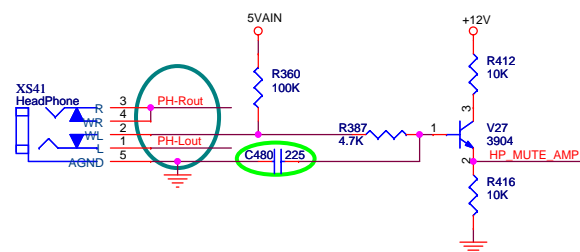
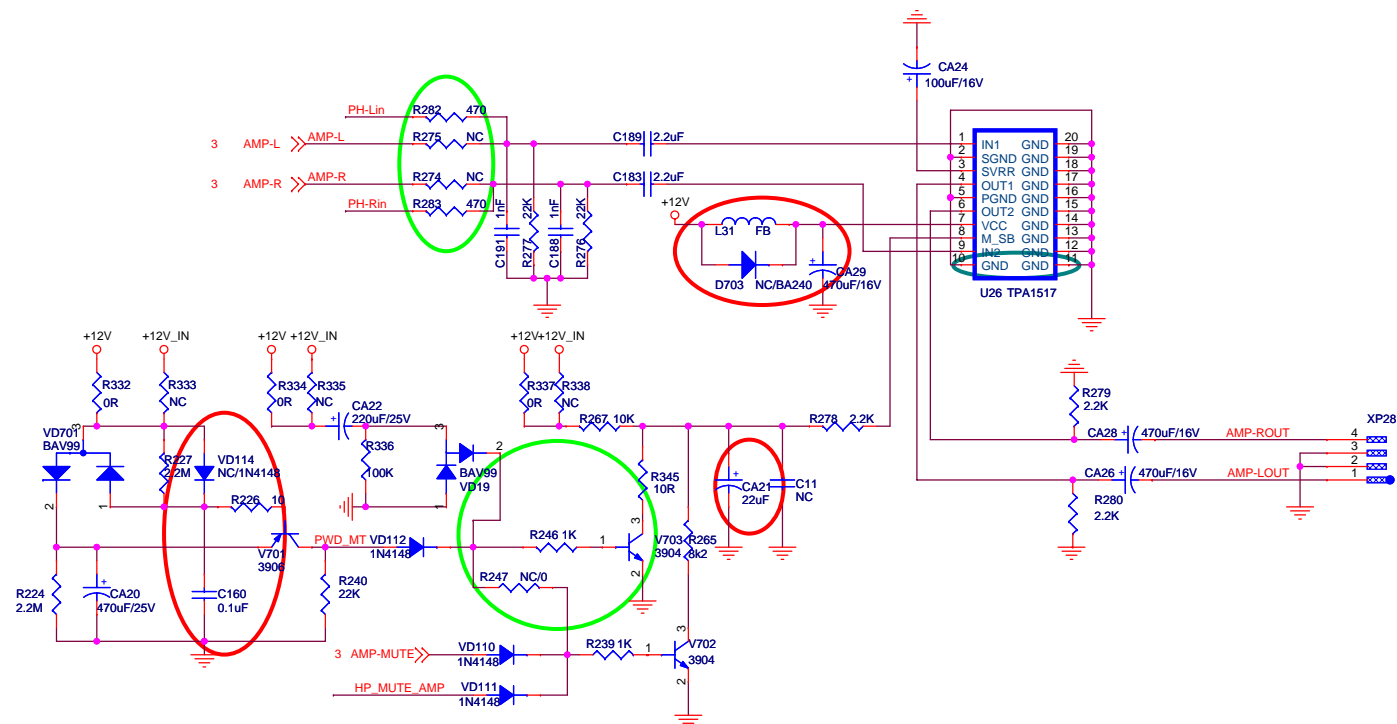
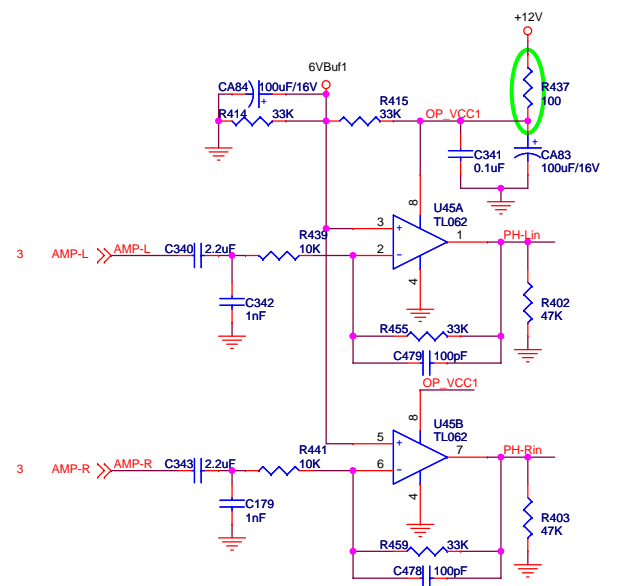


main board pcb 1861



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TPA1517(可兼容TDA1517P,10、11NC即可)



Version A:在LCD22W57DEU_ZB_1701_C的基础上更改。

Page1

- 1、STANDBY部分待机低功耗IC电路，注意采用原芯片增加R37、R38 0R；
- 2、BL_ON/OFF、BL_ADJUST上拉电压预留；
- 3、USB滤波电容位置预留；

Page2

- 1、DCDC部分待机低功耗IC电路，L8物料更换（成本），注意采用原芯片增加L16、更换L8；
- 2、VDDP、VDDP_PM调整，注意涉及电容排布，建议丝印依照原理图；

Page3

- 1、LED、PWMB、HDMI_CEC等网络调整，注意采用原芯片增加R683；
- 2、ON_USB1、ON_PANEL上拉增加；
- 3、PW_CTL调整，注意IC差异；
- 4、部分GPIO上拉电压更改，参照紫红标注部分；

Page6

- 1、4052 VCC电路优化，兼容原板增加R289 0R；
- 2、CVBSout VCC滤波电容，增加C346、C347；

Page4-6

压敏电阻封装更改为0402，注意兼容原板定额更改；

Page7

增加R352、R353，注意兼容原板定额更改。

Version B:在MST6E16JS_ZB_1861_A的基础上更改。

Page1

- 1、CA6位置调整，避免部分屏掉电残影等问题；

Page2

- 1、删除L19、L21；//改板方便，不再更改；

Page3

- 1、删除R456、R480；//改板方便，不再更改；
- 2、调整LED网络，删除R684,增加R427；
- 3、PCB增加主芯片散热焊盘；

Page6

- 1、增加C194；



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