kogan SERVICE MANUAL

Order No. TV1101S003V0

LED LCD TV

Model No. LET40T3

MSD209 Chassis

⚠ WARNING

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

Kogan Group

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Chapter 1.General Information

1-1. Document Information

Document format: Adobe PDF
Author:
Compiler:

1-2. General Guidelines

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

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

After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.
1) Leakage Current Cold Check
2) Leakage Current Hot Check
3) Prevention of Electro Static Discharge (ESD) to Electrostatically Sensitive

1-3. Important Notice

1-3-1. Follow the regulations and warnings

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

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

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

1-3-2. Be careful to the electrical shock

To prevent damage which might result in electric shock or fire, do not expose this TV set to rain or excessive moisture. This TV must not be exposed to dripping or splashing water, and objects filled with liquid, such as vases, must not be placed on top of or above the TV.

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

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. The following

techniques should be used to help reduce the incidence of component damage caused by electros static discharge (ESD).

Electrostatically Sensitive (ES) Devices

Some semiconductor (solid-state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the ncidence of component damage caused by static by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed to prevent potential shock reasons prior to applying power to the unit under test.

2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.

1-3-4. About lead free solder (PbF)

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

1-3-5. Use the genewing parts (specified parts)

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

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

Safety Component

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

1-3-6. Safety check after repairment

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

General Servicing Precautions

1. Always unplug the receiver AC power cord from the AC power source before:

a. Removing or reinstalling any component, circuit board module or any other receiver assembly.
b. Disconnecting or reconnecting any receiver electrical plug or other electrical connection.
c. Connecting a test substitute in parallel with an electrolytic capacitor in the receiver.

CAUTION: A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.

2. Test high voltage only by measuring it with an appropriate high voltage meter or other voltage measuring device (DVM, FETVOM, etc) equipped with a suitable high voltage probe.

Do not test high voltage by "drawing an arc".

3. Do not spray chemicals on or near this receiver or any of its assemblies.

4. Unless specified otherwise in this service manual, clean electrical contacts only by applying the following mixture to the contacts with a pipe cleaner, cotton-tipped stick or comparable non-abrasive applicator; 10% (by volume) Acetone and 90% (by volume) isopropyl alcohol (90%-99% strength).

CAUTION: This is a flammable mixture.
Unless specified otherwise in this service manual, lubrication of contacts is not required.
Capacitors may result in an explosion hazard.

5. Do not defeat any plug/socket B+ voltage interlocks with which receivers covered by this service manual might be equipped.

6. Do not apply AC power to this instrument and/or any of its electrical assemblies unless all solid-state device heat sinks are correctly installed.

7. Always connect the test receiver ground lead to the receiver chassis ground before connecting the test receiver positive lead.

Always remove the test receiver ground lead last. Capacitors may result in an explosion hazard.

8. Use with this receiver only the test fixtures specified in this service manual.

CAUTION: Do not connect the test fixture ground strap to any heat sink in this receiver.

9. Remove the antenna terminal on TV and turn on the TV.

10. Insulation resistance between the cord plug terminals and the eternal exposure metal should be more than Mohm by using the 500V insulation resistance meter.

11. If the insulation resistance is less than M ohm, the inspection repair should be required. If you have not the 500V insulation resistance meter, use a Tester. External exposure metal: Antenna terminal Headphone jack.

12. Use only a grounded-tip soldering iron to solder or unsolder ES devices.

13. Use only an anti-static type solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ES devices.

14. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.

15. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it.
(Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).

16. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

CAUTION: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

17. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device.)

1-3-7. Ordering Spare Parts

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

1. Model number, serial number and software version
The model number and serial number can be found on the back cover of each product. Software version can be found in the *Spare Parts List*.

2. Spare part No. and description
Spare part No. and description can be found in the *Spare Parts List*.

1-3-8. Photo used in this manual

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

1-4. How to Read this Service Manual

1-4-1. Using icons:

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

Note:

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

Caution:

A “caution” is used when there is danger that the reader, through incorrect manipulation, may damage equipment, loose data, get an unexpected result or has to restart(part of) a procedure.

Warning:

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

Reference:

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

Chapter 2. Specification

2-1. Specification list

Model	LET40T3
Screen size	40 inch
Aspect ratio	16:9
Resolution	1920*1080
Response Time(ms)	6 ms
Angel of view	178
Contrast	5000:1
Brightness	450cd/m2
OSD language	English etc.
Color system	PAL\SECAM
Audio system	BG\DK\I\L
Audio output power(Built-in)(W)	8W*2
Audio output power(outer)(W)	No
Total power input(W)	120W
Voltage range(V)	150-240V
Power frequency(Hz)	50/60HZ
Net weight(KG)	18.4
Gross weight(KG)	26
Net dimension(MM)	989*280*689
Packaged dimension(MM)	1360*290*760

2-2. External pictures (four faces)

Front Side

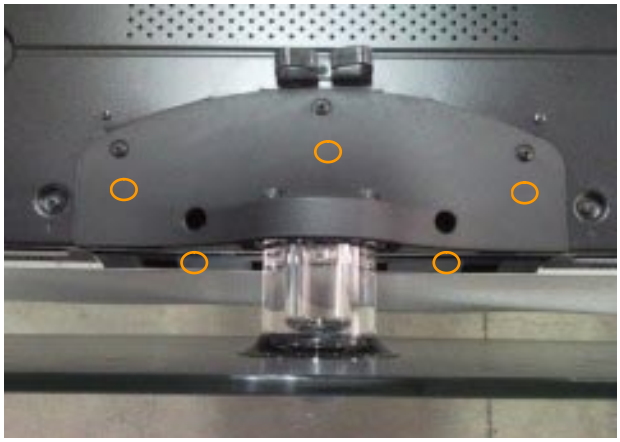
Left Side

Back Side

Chapter 3. Disassemble and Assemble

3-1. Remove the Stand

1. Lay down the unit so that back cover faces upward

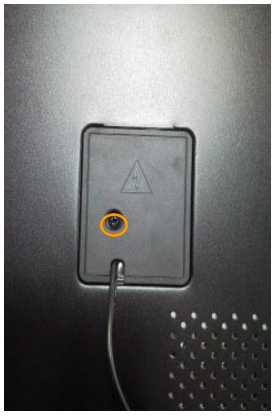


2. Remove the Five screws from the back cover which are indicated with the circles in the picture above.

3. Remove the stand

3-2. Remove the Power Cord

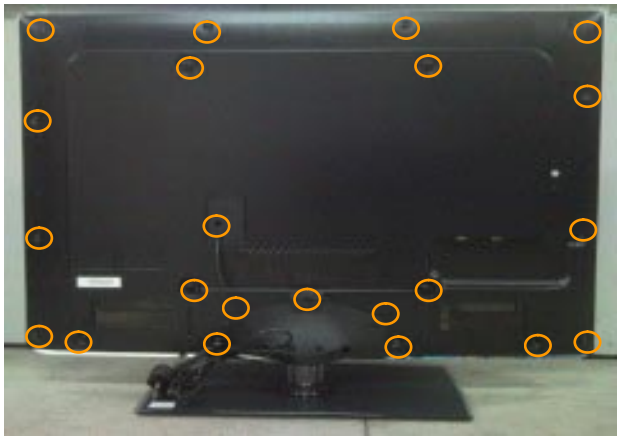
Remove the screw indicated by the red circles in below picture.



Then remove the power cord.

3-3. Remove the Back Cover

1. Remove the twenty-two screws indicated by the red circles in below picture.



2. Then remove the back cover from the unit.

3-4. Remove the Mainboard

Remove the five screws indicated by the red circles in below picture.

Then remove the mainboard.

3-5. Remove the speaker

Remove the screw indicated by the red circles in below picture.

Then remove the speaker.

3-6. Remove the Keypad

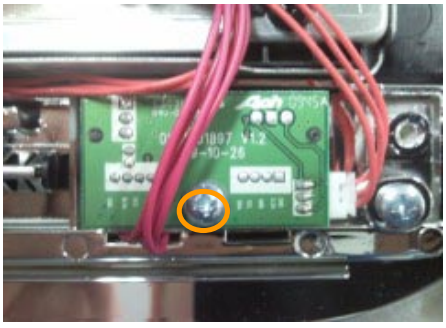
The Keypad is conglutinated with front frame , just uncover the keypad gently.

Then remove the keypad.

3-7. Remove the Remote Control Board

Remove the screw indicated by the red circles in below picture.

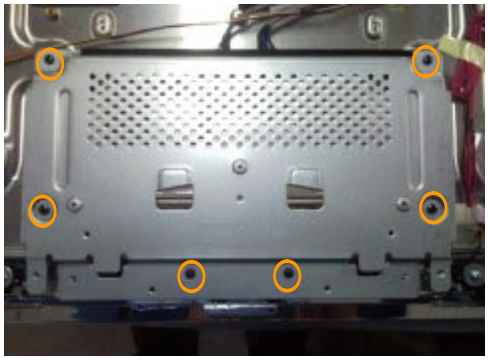
Take out the remote control board.



3-8. Remove the Stand backstop

Remove the six screws indicated by the red circles in below picture.

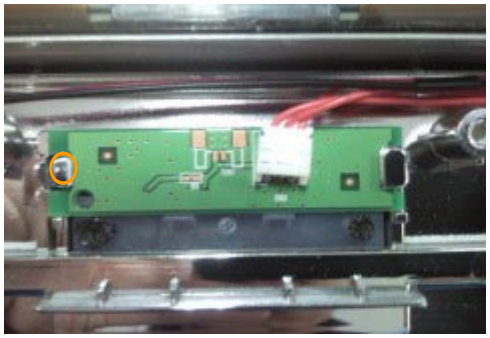
Take out the stand backstop.



3-9. Remove the indicator light

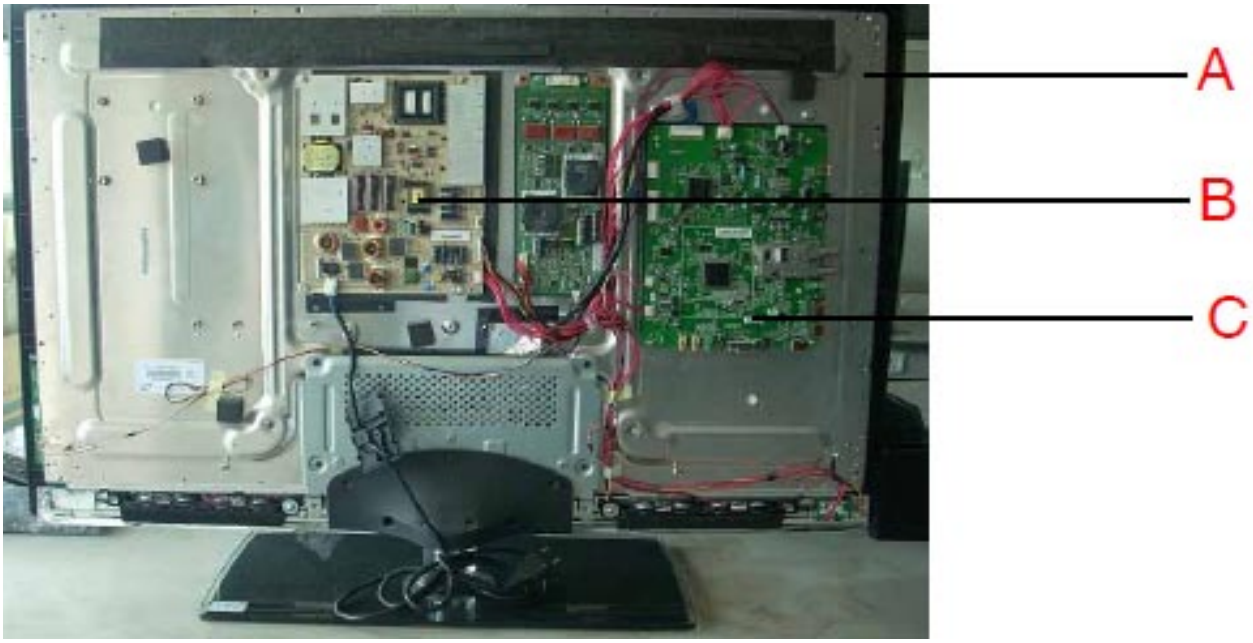
The indicator light is buckled into the front frame,remove the clasp indicated by the red circles in below picture.

Take out the indicator light.



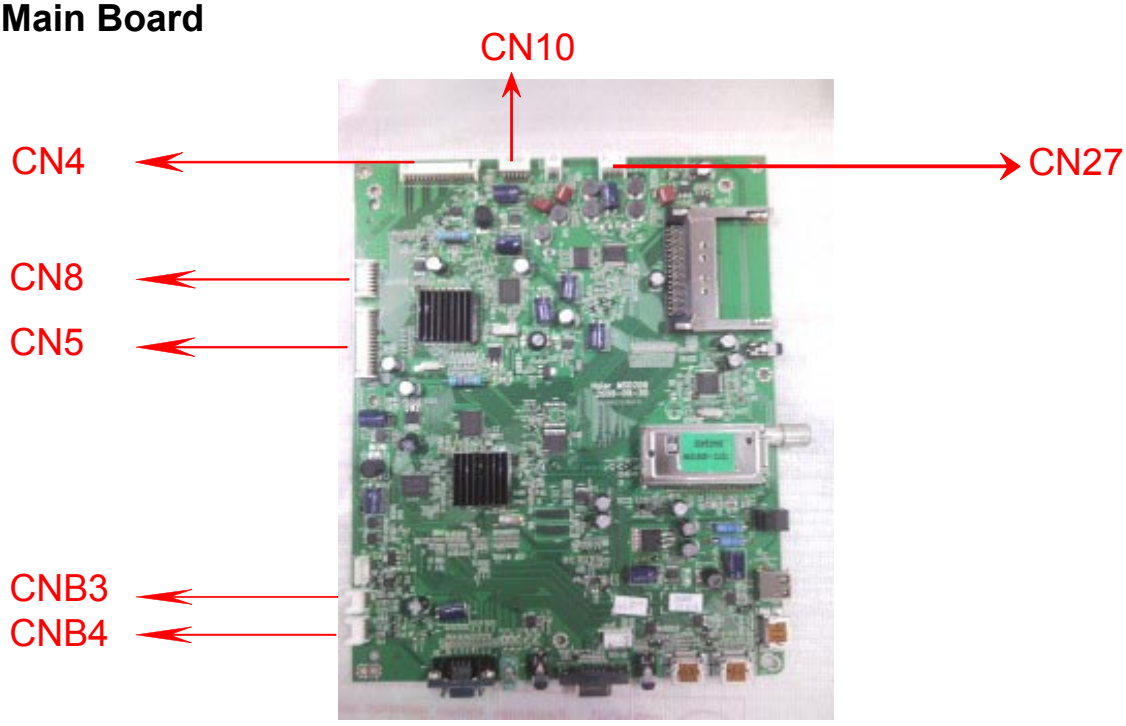
Chapter 4. Location of Controls and Components

4-1. Board Location



No.	Parts number	Description
A Board	0094001076AD	LCD Panel
B Board	0094001897	Power Board
C Board	DC19B0E0400M	Mainboard (0090723445)

4-2. Main Board



4-2-1. Function Description:

Main Board
Process signal which incept from exterior equipment then translate into signal that panel can display.

4-2-2. Connector definition

Main board connector

Speaker connector (CN27)

Pin number	Signal name
1	LOUT+
2	LOUT-
3	ROUT-
4	ROUT+

Keypad Connector (CNB3)

Pin number	Signal name
1	GND
2	KEY1
3	KEY0
4	3.3VS

12V/5V Connector (CN10)

Pin number	Signal name
1	+12V
2	+12V
3	GND
4	+12V
5	GND
6	GND
7	5VSTB
8	/
9	GND
10	PW-ON/OFF
11	PB-ADJUS
12	PB-ON/OFF

Rom connector (CNB4)

Pin number	Signal name
1	5VS
2	IR
3	LED-R
4	LED-G
5	GND

4-3. Power Supply Board

4-3-1. Function description:

To supply power for Mainboard, Panel.

4-3-2. Connector definition:

CN1

Pin number	Signal name
1	L
2	R

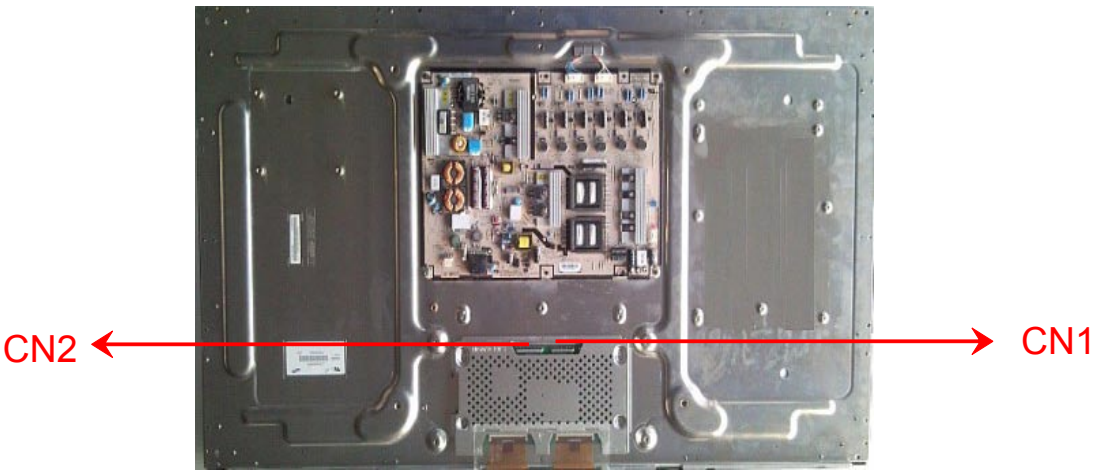
CN2

Pin number	Signal name
1	+12V
2	+12V
3	GND
4	+12V
5	GND
6	GND
7	5VSTB
8	E-PEM
9	GND
10	PW-ON/OFF
11	NC
12	PB-ON/OFF

CN3

Pin number	Signal name
1	24V
2	24V
3	24V
4	24V
5	24V
6	GND
7	GND
8	GND
9	GND
10	GND
11	NC
12	BL-ON/OFF
13	STATUS
14	E-PWM

4-4. LCD Panel



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

4-4-2. Connector definition:

CN1 Connector

Pin number	Symbol	Description
1	12V	DC Power Supply
2	12V	DC Power Supply
3	12V	DC Power Supply
4	12V	DC Power Supply
5	12V	DC Power Supply
6	NC	NC
7	GND	Ground
8	GND	Ground
9	GND	Ground
10	Rx1[0]N	1^{st} ,5^{th} LVDS Signal -
11	Rx1[0]P	1^{st} ,5^{th} LVDS Signal +
12	Rx1[1]N	1^{st} ,5^{th} LVDS Signal -
13	Rx1[1]P	1^{st} ,5^{th} LVDS Signal +
14	Rx1[2]N	1^{st} ,5^{th} LVDS Signal -
15	Rx1[2]P	1^{st} ,5^{th} LVDS Signal +
16	GND	Ground
17	Rx1CLK-	1^{st} ,5^{th} LVDS Clock -
18	Rx1CLK+	1^{st} ,5^{th} LVDS Clock +
19	GND	Ground
20	Rx1[3]N	1^{st} ,5^{th} LVDS Signal -
21	Rx1[3]P	1^{st} ,5^{th} LVDS Signal +
22	Rx1[4]N	1^{st} ,5^{th} LVDS Signal -
23	Rx1[4]P	1^{st} ,5^{th} LVDS Signal +
24	GND	Ground

Pin number	Symbol	Description
25	Rx3[0]N	3rd,7th LVDS Signal -
26	Rx3[0]P	3rd,7th LVDS Signal +
27	Rx3[1]N	3rd,7th LVDS Signal -
28	Rx3[1]P	3rd,7th LVDS Signal +
29	Rx3[2]N	3rd,7th LVDS Signal -
30	Rx3[2]P	3rd,7th LVDS Signal +
31	GND	Ground
32	Rx3CLK-	3rd,7th LVDS Clock -
33	Rx3CLK+	3rd,7th LVDS Clock +
34	GND	Ground
35	Rx3[3]N	3rd,7th LVDS Signal -
36	Rx3[3]P	3rd,7th LVDS Signal +
37	Rx3[4]N	3rd,7th LVDS Signal -
38	Rx3[4]P	3rd,7th LVDS Signal +
39	GND	Ground
40	NC	NC
41	NC	NC

CN2 Connector

Pin number	Symbol	Description
1	12V	DC Power Supply
2	12V	DC Power Supply
3	12V	DC Power Supply
4	12V	DC Power Supply
5	12V	DC Power Supply
6	NC	NC
7	GND	Ground
8	GND	Ground
9	GND	Ground
10	Rx2[0]N	2^{nd} ,6^{th} LVDS Signal -
11	Rx2[0]P	2^{nd} ,6^{th} LVDS Signal +
12	Rx2[1]N	2^{nd} ,6^{th} LVDS Signal -
13	Rx2[1]P	2^{nd} ,6^{th}LVDS Signal +
14	Rx2[2]N	2^{nd} ,6^{th} LVDS Signal -
15	Rx2[2]P	2^{nd} ,6^{th} LVDS Signal +
16	GND	Ground
17	Rx2CLK-	2^{nd} ,6^{th} LVDS Clock -
18	Rx2CLK+	2^{nd} ,6^{th} LVDS Clock +
19	GND	Ground
20	Rx2[3]N	2^{nd} ,6^{th}LVDS Signal -
21	Rx2[3]P	2^{nd} ,6^{th} LVDS Signal +
22	Rx2[4]N	2^{nd} ,6^{th} LVDS Signal -
23	Rx2[4]P	2^{nd} ,6^{th} LVDS Signal +
24	GND	Ground
25	Rx4[0]N	4^{th},8^{th} LVDS Signal -
26	Rx4[0]P	4^{th},8^{th} LVDS Signal +
27	Rx4[1]N	4^{th},8^{th} LVDS Signal -

Pin number	Symbol	Description
28	Rx4[1]P	4^{th},8^{th}LVDS Signal +
29	Rx4[2]N	4^{th},8^{th} LVDS Signal -
30	Rx4[2]P	4^{th},8^{th} LVDS Signal +
31	GND	Ground
32	Rx4CLK-	4^{th},8^{th} LVDS Clock -
33	Rx4CLK+	4^{th},8^{th} LVDS Clock +
34	GND	Ground
35	Rx4[3]N	4^{th},8^{th} LVDS Signal -
36	Rx4[3]P	4^{th},8^{th} LVDS Signal +
37	Rx4[4]N	4^{th},8^{th} LVDS Signal -
38	Rx4[4]P	4^{th},8^{th} LVDS Signal +
39	GND	Ground
40	NC	NC
41	NC	NC
42	NC	NC
43	NC	NC
44	NC	NC
45	LVDS_SEL	HIGH (3.3V) Normal LVDS Format LOW (GND) JEIDA LVDS Format
46	NC	NC
47	NC	NC
48	NC	NC
49	NC	NC
50	NC	NC
51	NC	NC

Chapter 5. Installation Instructions

5-1. External Equipment Connections

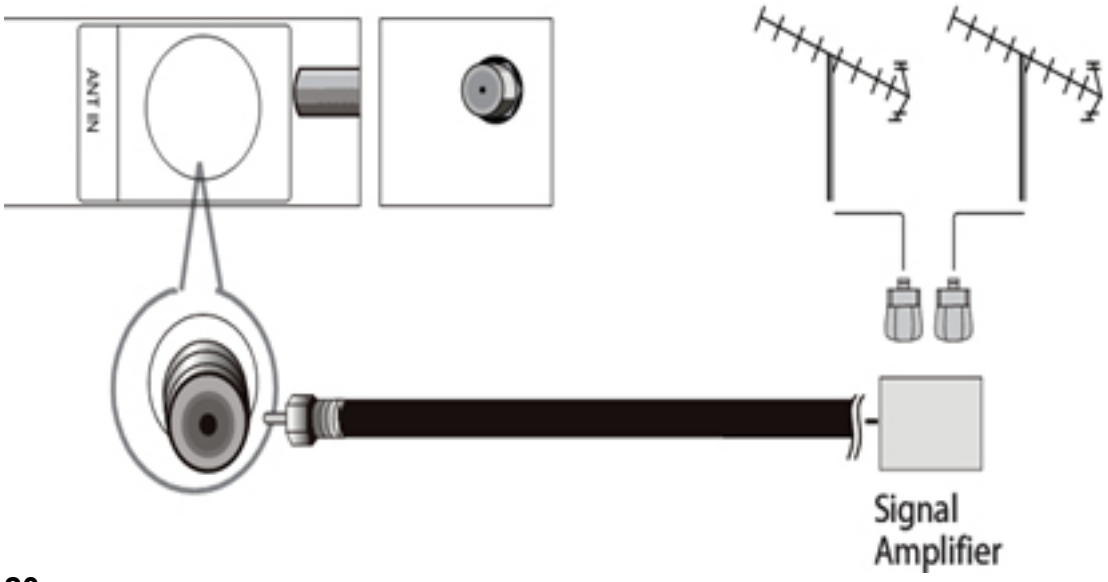
Accessories

Remote Control

Batteries

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

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



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

Choose Your Connection

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

VCR connection

Connecting a VCR with a standard AV cable.

A standard AV connection provides good video and audio.

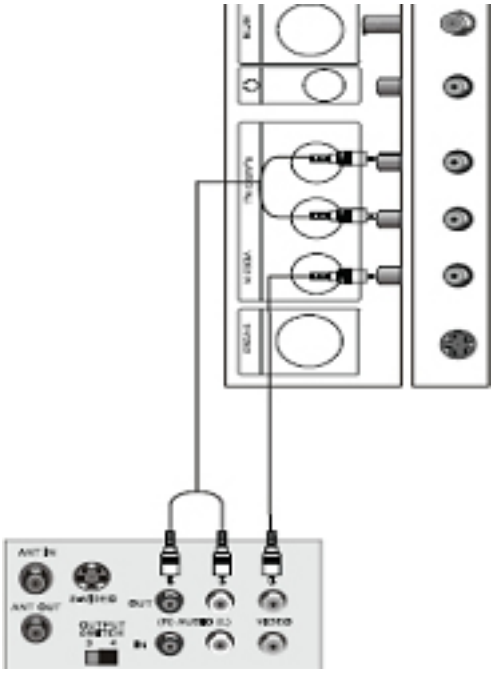
To connect a VCR with a standard AV cable:

1 Make sure that your TV/DVD combo and the VCR are turned off;

2 Connect a standard AV cable(not included) to the VIDEO IN (yellow) and adjust R (red) and L (white) AUDIO jacks on the back of your TV/DVD combo, then connect the other end of the cable to the VIDEO and AUDIO OUT jacks on the VCR;

3 Turn on your TV/DVD combo and the VCR;

4 Press INPUT, press CH+ or CH- to select VEDIO, then press ENTER.

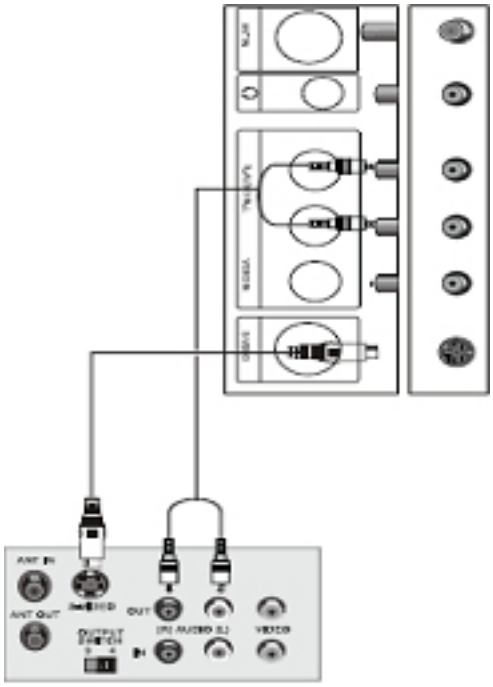


Connecting a VCR with an S-Video cable

An S-Video connection provides better video than a standard AV connection.

To connect a VCR with an S-Video cable:

1. Make sure that your TV/DVD combo and the VCR are turned off;
2. Connect an S-Video cable(not included) to the S-VIDEO jack on the back of your TV/DVD combo,then connect the other end of the S-VIDEO OUT jack on the VCR;
3. Connect a standard audio cable(not included)to the R and L AUDIO jacks to the left of the VIDEO jack on the back of your TV/DVD combo,them connect the other end of the cable to the AUDIO OUT jacks on the VCR;
4. Turn on your TV/DVD combo and the VCR;
5. Press INPUT,press CN+ or CN- to select S-VIDEO,then press ENTER.

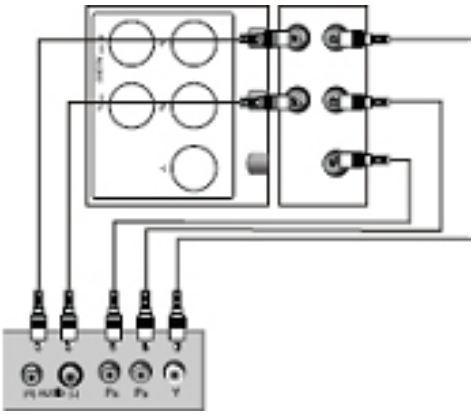


External Equipment Connections: Connecting a component video device

A component video device provides better video than an S-Video connection.

To connect a component video device.

1. Make sure that your TV/DVD combo and the component video device are turned off;
2. Connect a component video cable not included to the Pr,Pb,and V jades on the back of your TV/DVD combo,then connect the other end of the cable to the corresponding COMPONENT OUT jacks on the component video device;
3. Connect a standard audio cable(not included) to the R and L AUDIO jacks below the Pr,Pb,and Y jacks on the back of your TV/DVD combo,then connect the other end of the cable to the COMPONENT AUDIO OUT jacks on the VCR;
4. Turn on your TV/DVD combo and the component video device;
5. Press INPUT,press CH+ or CH- to seclect COMPONENT,then press ENTER.



Connecting an HDMI device

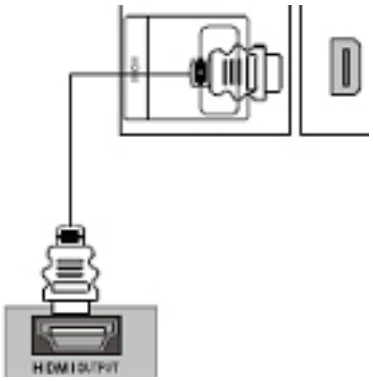
An HDMI connection provides the best video and audio,An HDMI cable carries both video and audio,so you do not need to make an audio connection.

To connection HDMI device:

1 Make sure that your TV/DVD combo and the HDMI device are turned off.

2 Connect an HDMI cable(not included) to the HDMI jack on the back of your TV/DVD combo,then connect the other end of the cable to the HDMI OUT jack on the HDMI device.

3 Press INPUT,press CH+ or CH- to select HDMI,then press ENTER.



Connecting a camcorder or video game

To connect a camcorder or video game:

Follow the instructions in "Connecting a VCR with a standard cable"

Connecting a computer

To connect a computer:

1. Make sure that the computer has a VGA jack.See the documentation that came with the computer;

2. Make sure that the computer and your TV/DVD combo are turned off;

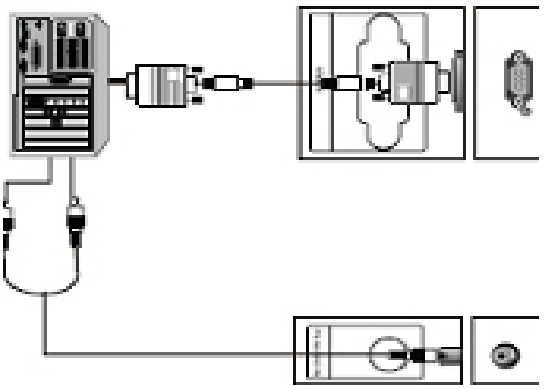
3. Connect a VGA cable(not supplied)to the VGA IN jack on the back of yout TV/DVD combo,then connect the other end of the cable to the VGA jack on the computer;

4. Connect an audio cable(not included)to the PC AUDIO IN on the back of your TV/DVD combo,then connect the other end of the cable to the AUDIO OUT jacks on the comouter;

5. Turn on your TV/DVD combo first,then turn on the computer;

6. Press INPUT.press CH+ or CH- to select PC,then press ENTER;

7. If you see video"noise on the screen,you may need to adjust brightness of contrast on your TV/DVD combo of the computer video resolution of refresh rate on the computer.For information about adjusting the video on your TV/DVD combo,see "Adjusting the comouter image" on page .For information about adjusting the video on the computer,see the documentation came with the computer.



Supported video modes for a computer

Mode	Resolution	Line frequency(KHZ)	Frame frequency
VGA	640*480	31.5	60
SVGA	800*600	37.9	60
XGA	1024*768	48.4	60

Notes:

If the computer dose not support one of the following videos, you may need to replace or add a video card.

Your TV/DVD support the following video modes.

5-2. HDMI Connections

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

How To Connect:

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

How To Use:

If the source device supports Auto HDMI function, the output resolution of the source device will be automatically

set to 1280x720p.

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

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

Select HDMI input source in input source option of Select Main source menu.

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

How To Connect

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

How To Use

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

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

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

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

Installation

Cable sample

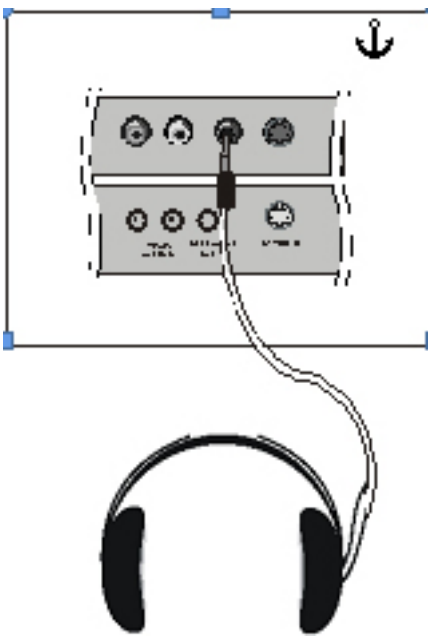
HDMI Cable
(not supplied with the product)

HDMI to DVI Cable
(not supplied with the product)

Analog Audio Cable
(Stereo to RCA type)
(not supplied with the product)

Connecting Headphones

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



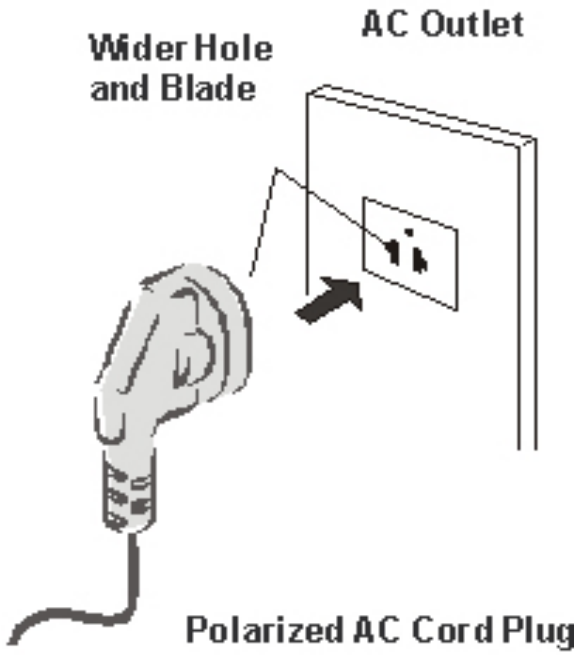
Plug a set of headphones into the 3.5mm mini-jack socket on the rear panel of the set.

Note

■ Prolonged use of headphones at a high volume may damage your hearing.

■ You will not receive sound from the speakers when you connect headphones to the system.

TO USE AC POWER SOURCE



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

NOTES:

■ Never connect the AC line cord plug to other than the specified voltage. Use the attached power cord only.

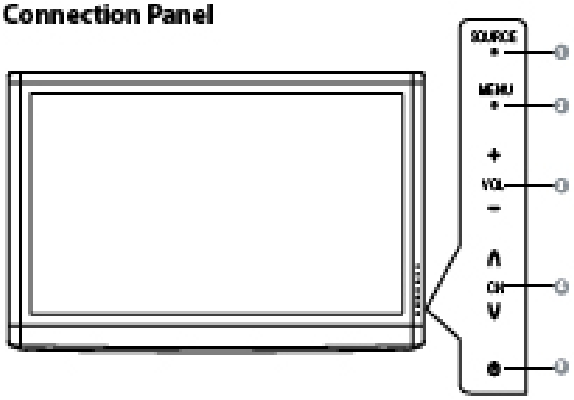
■ If the polarized AC cord does not fit into a non-polarized AC outlet. Do not attempt to file or cut the blade. It is the user`s responsibility to have an electrician replace the obsolete outlet.

■ If you cause a static discharge when touching the unit and the unit fails to function, simply unplug the unit from the AC outlet and plug it back in. The unit should return to normal operation.

Chapter 6. Operation Instructions

6-1. Get to know your TV

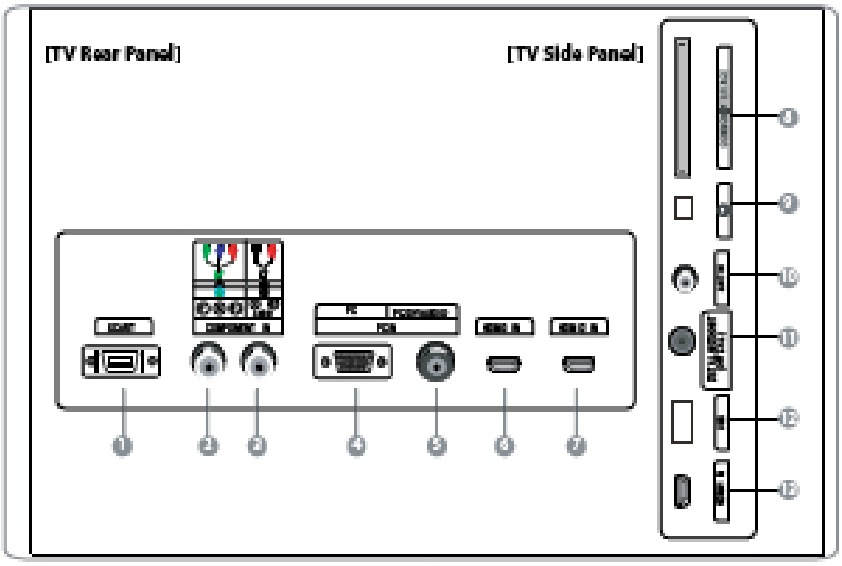
Viewing the Connection Panel



①	SOURCE	Toggles between all the available input sources
②	MENU	Press to see an on-screen menu of your TV's features.
③	VOL+/-	Press to increase or decrease the volume .

④	CH+/-	Press to change channels.
⑤	POWER	Press to turn the TV on and off.

Viewing the Connection Panel



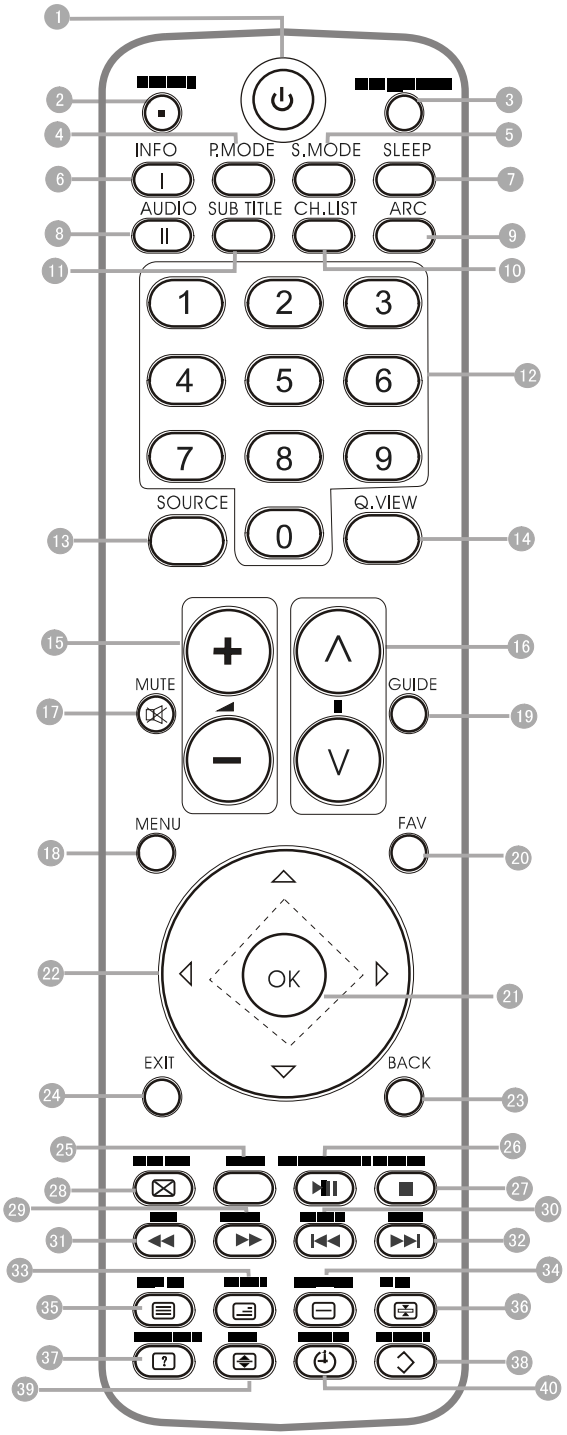
①	SCART	Input
②	Component	Input
③	Component Audio	Input
④	PC	Input
⑤	PC/DVI AUDIO	Input
⑥	HDMI3 IN	Input
⑦	HDMI2 IN	Input

⑧	Common Interface	
⑨	Earphone	
⑩	ANTENNA	Input
⑪	Optical	output
⑫	USB	
⑬	HDMI1 IN	Input

6-2. Get to know your remote control

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

Buttons on the remote control

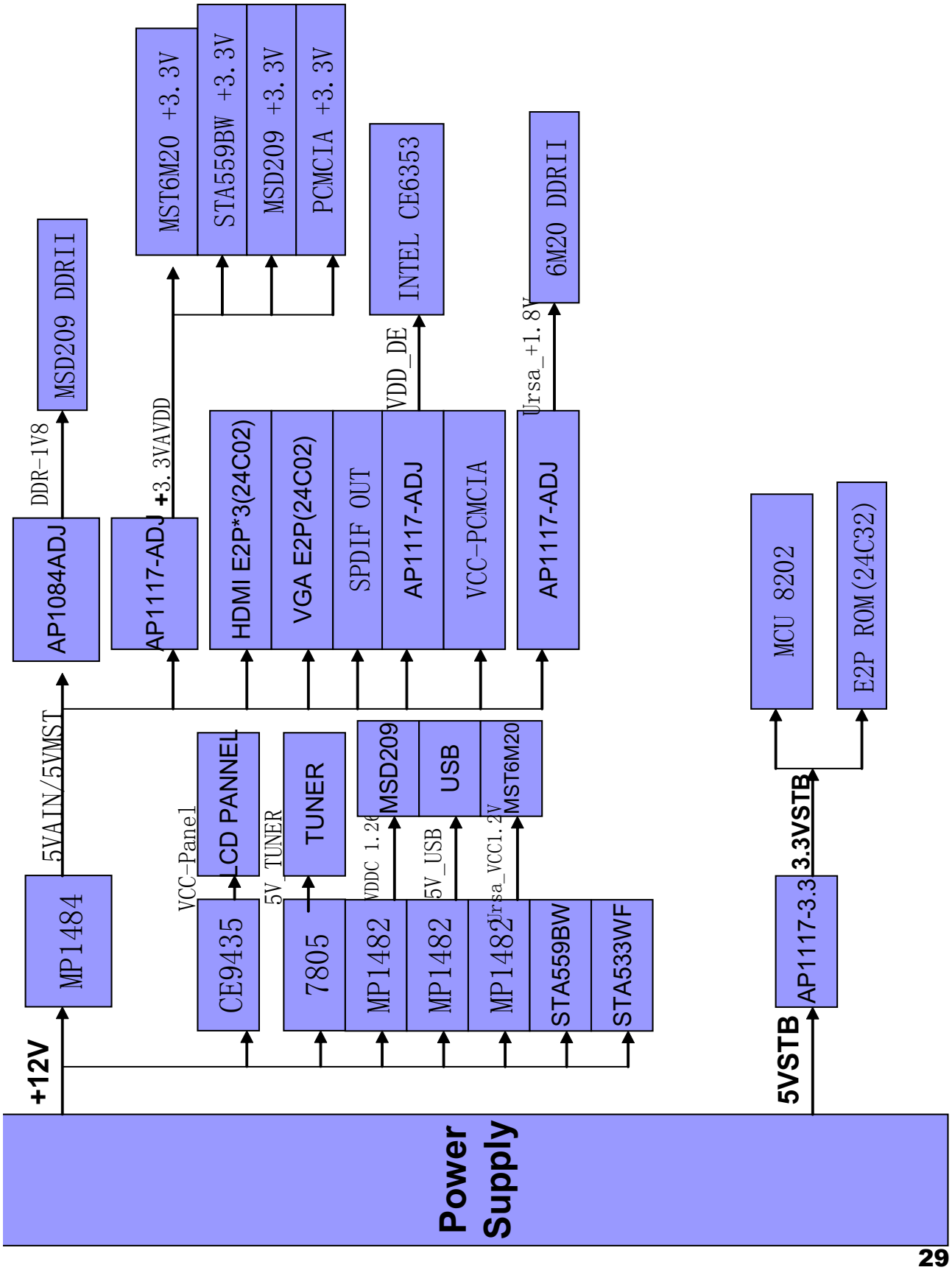


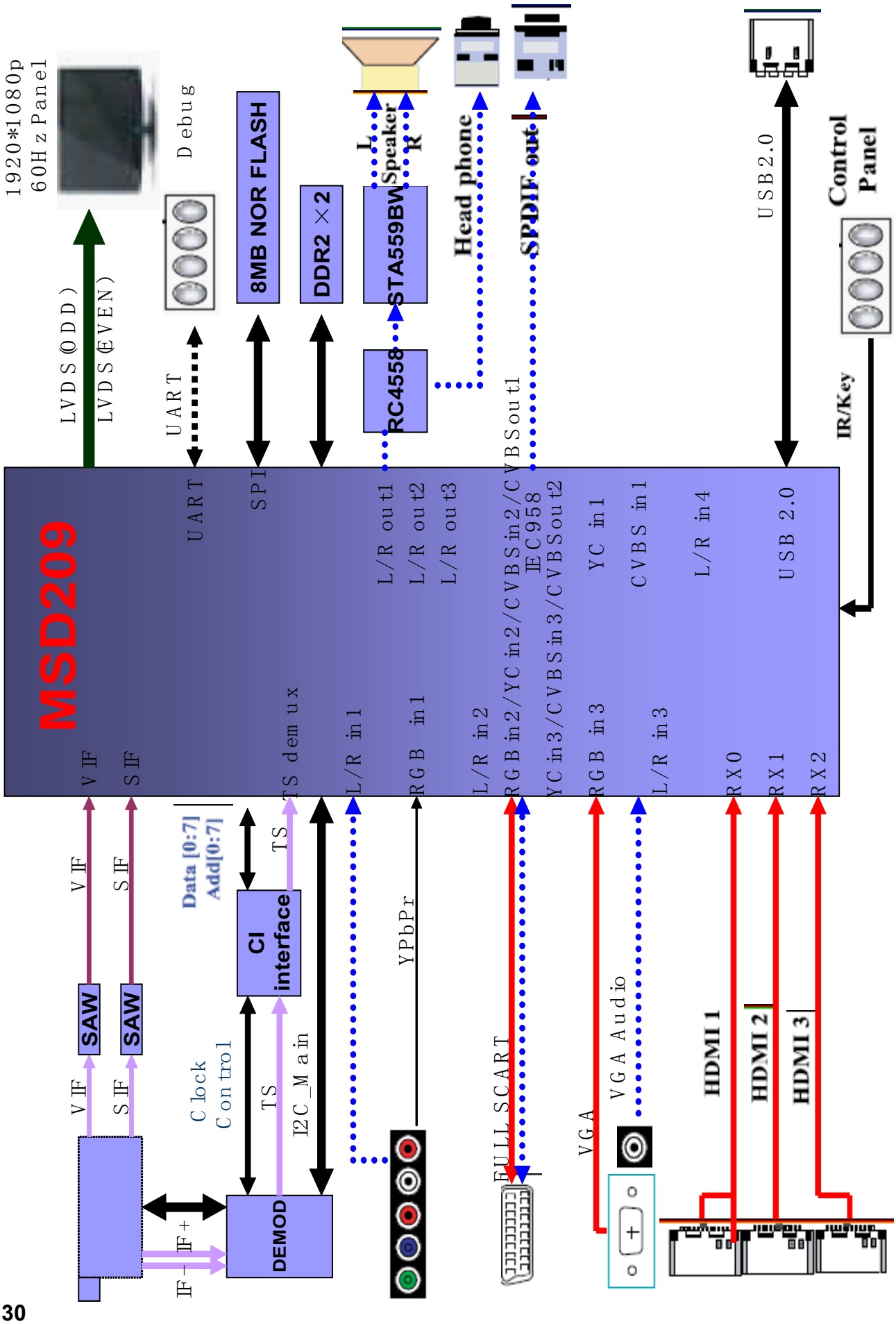
NOTE:Red button， GREEN button, blue button and yellow button are fast text button in analog signal .Function button in DVBT (jusr reference the OSD)

1. Stand By
2. DVD Menu
3. DVD open/close
4. Picture Mode
5. Sound Mode
6. Call Screen Display
7. Sleep button
8. DTV Audio/NICAM/DVD Audio
9. Aspect Ratio Control button(except for DVD&USB)
10. Channel list button
11. Subtitle button
12. Program Number Channel selection
13. Source Exchange
14. Q.VIEW
15. V+/V- :Volume selection
16. P+/P-:Channel selection
17. Mute
18. Menu button
19. GUIDE Button (only for DTV)
20. Favourite button
21. OK button
22. Cursor Mover Button
23. Back button (only for USB)
24. Exit Screen Display
25. Zoom(only for DVD &USB)
26. Play/pause button(only for DVD &USB)
27. Teletext index(only for TV)/STOP(only for DVD &USB)
28. REPEAT/CANCEL button (only for DVD &USB)
29. FAST FORWARD(only for DVD &USB)
30. PREVIOUS(only for DVD &USB)
31. FAST REVERSE(only for DVD &USB)
32. NEXT(only for DVD &USB)
33. DVD TITLE/TELETEXT MIX
34. DVD SEARCH/TELETEXT SUBCODE
35. DVD SET UP/ TEXT
36. DVD 10+/TELETEXT HOLD
37. DVD PROGRAM/TELETEXT REVEAL
38. DVD CALL/TELETEXT MODE
39. DVD A-B REPEAT/TELETEXT SIZE
40. DVD ANGLE/TELETEXT TIME

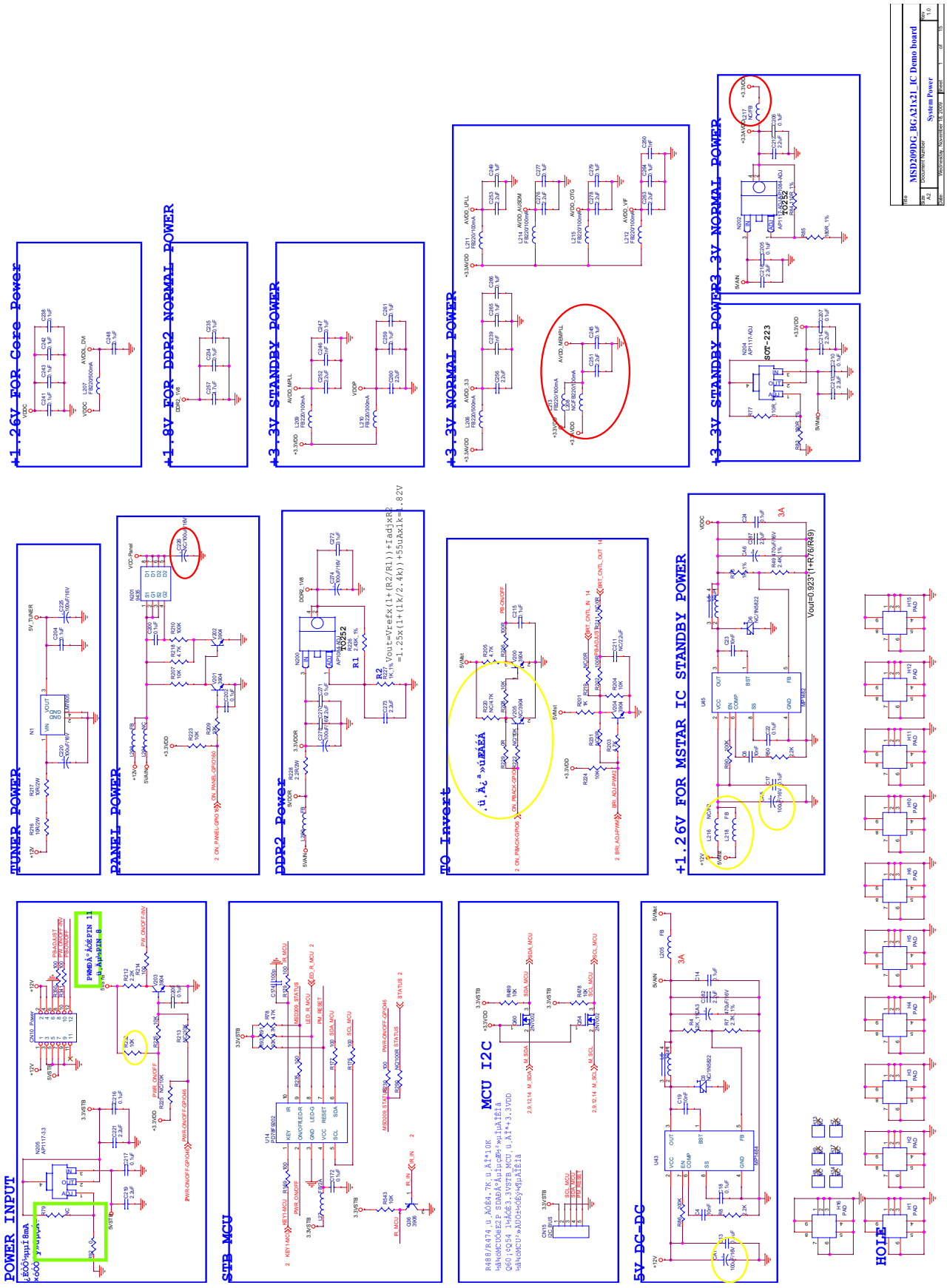
Chapter 7. Electrical Parts

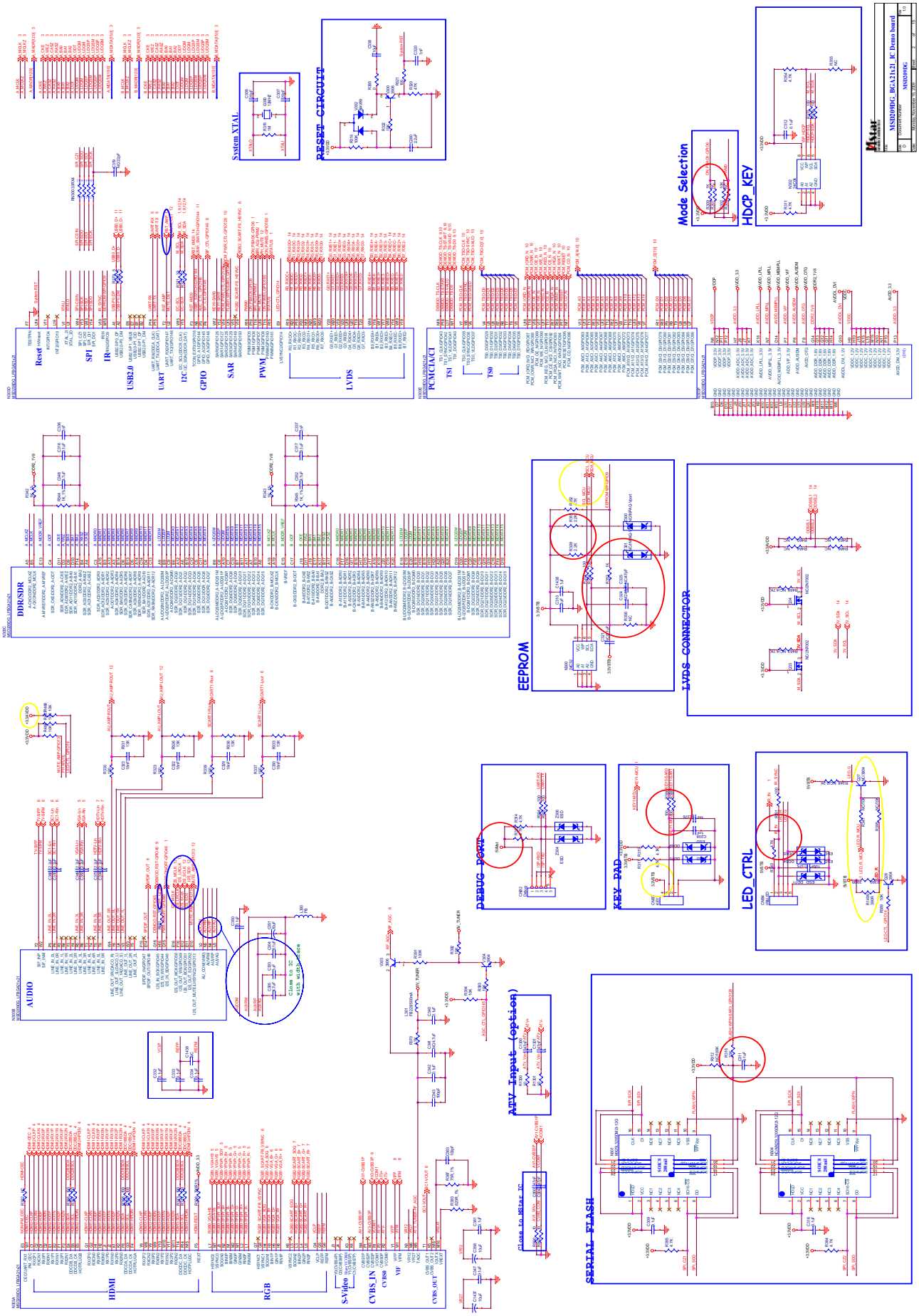
7-1. Block Diagram

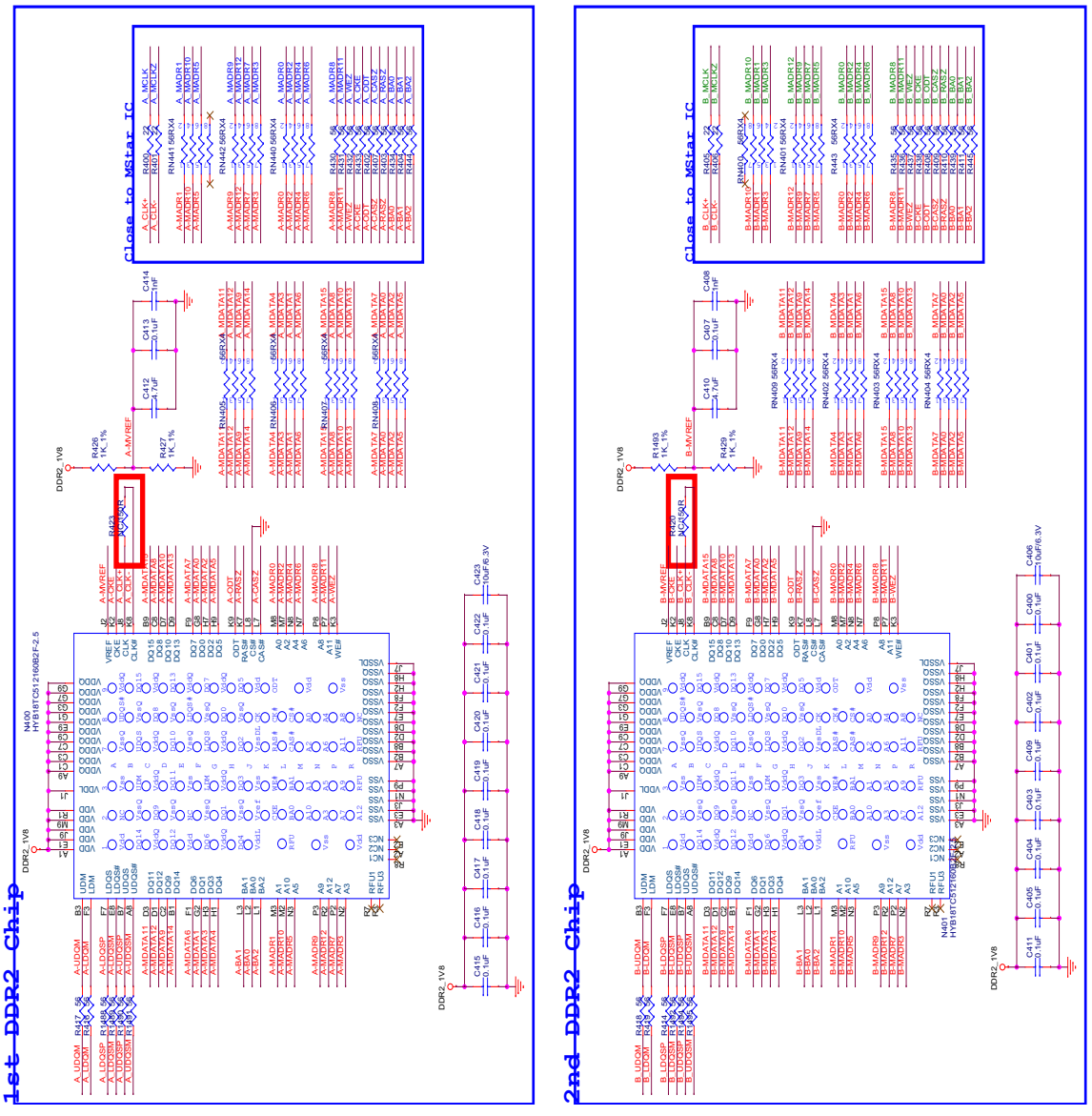



1920*1080p
60Hz Panel
LVDS (ODD)
LVDS (EVEN)
Debug
UART
8MB NOR FLASH
DDR2 ×2
L
Speaker
R
STA559BW
RC4558
Head phone
SPDIF out
USB2.0
Control
Panel
IR/Key
MSD209
V IF
S IF
UART
SPI
TS demux
L/R in1
RGB in1
L/R in2
RGB in2/YC in2/CVBS in2/CVBS out1
YC in3/CVBS in3/CVBS out2
IEC958
L/R out1
L/R out2
L/R out3
YC in1
RGB in3
CVBS in1
L/R in3
L/R in4
RX0
RX1
RX2
USB 2.0
SAW
SAW
CI interface
Data [0:7]
Add[0:7]
TS
DEMOD
IF+
IF-
Clock Control
I2C_Main
YPbPr
FULL SCART
VGA
VGA Audio
HDMI 1
HDMI 2
HDMI 3

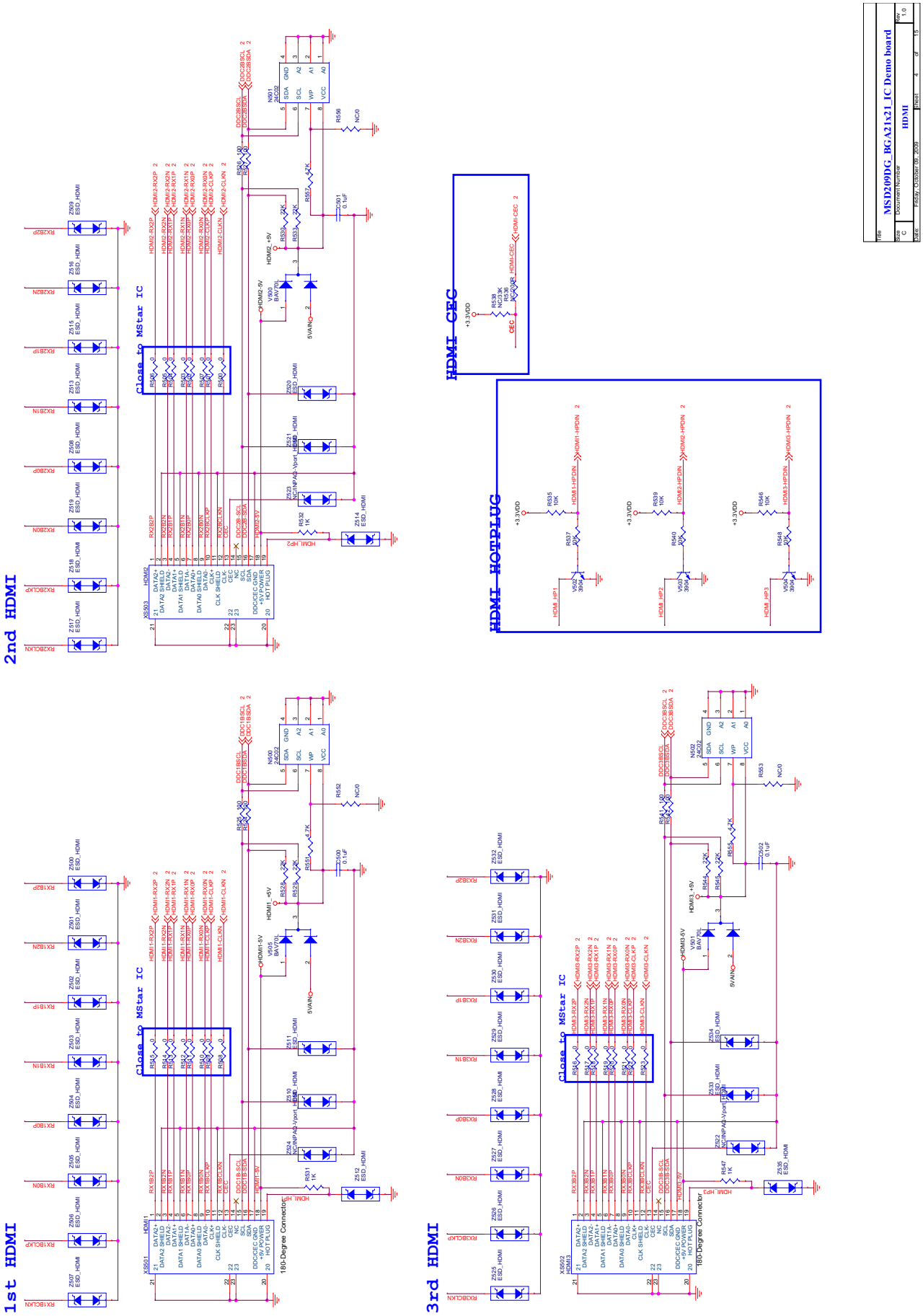
7-2. Circuit Diagram

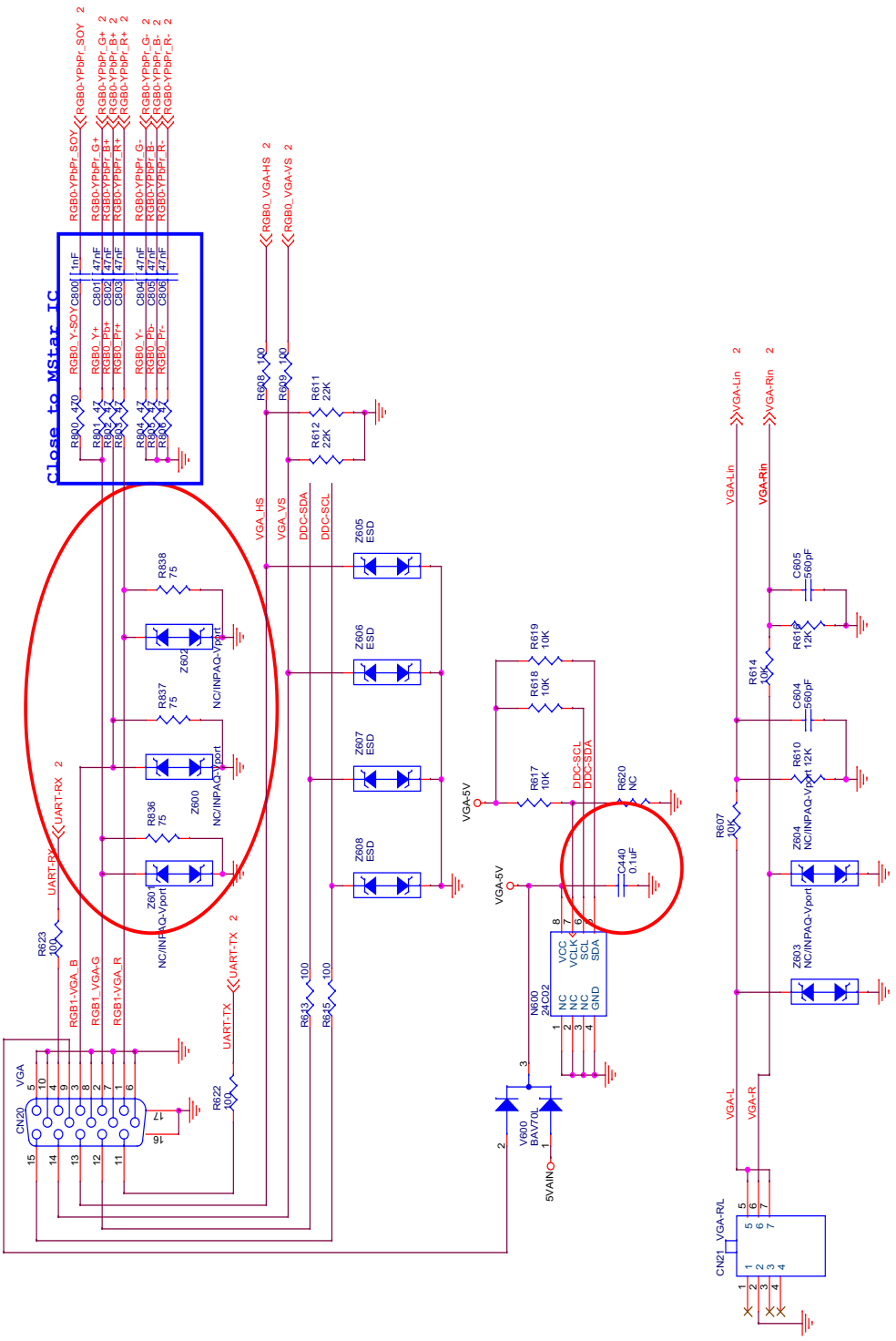



MSD2099G_BGA13x13_IC Demo board
MSD2099G
Reset
SPI
IR
USB2.0
UART
I2C
GPIO
SAR
PWM
LVDS
TSI
TS0
RESET CIRCUIT
System XTAL
Mode Selection
HDCP_KEY
DDR/SDR
EEPROM
LVDS_CONNECTOR
DEBUG_PORT
KEY_PAD
LED_CTRL
SERIAL_FLASH
AUDIO
HDMI
RGB
SAVideo
CVBS_IN
CVBS_OUT
APV_Input (option)


1st DDR2 Chip
2nd DDR2 Chip
Close to MStar IC
DDR2_1V8
N400
HYB18TC512160B2F-2.5
N401
HYB18TC512160B2F-2.5
R426
1K, 1%
R427
1K, 1%
R429
1K, 1%
R1493
1K, 1%
R423
NC/0R
R428
NC/0R
RN441 56RX4
RN442 56RX4
RN440 56RX4
RN439 56RX4
RN405 56RX4
RN406 56RX4
RN407 56RX4
RN408 56RX4
RN409 56RX4
RN402 56RX4
RN403 56RX4
RN404 56RX4
C414 1nF
C413 0.1uF
C412 4.7uF
C408 1nF
C407 0.1uF
C410 4.7uF
C423 10uF/6.3V
C422 0.1uF
C421 0.1uF
C420 0.1uF
C419 0.1uF
C418 0.1uF
C417 0.1uF
C416 0.1uF
C415 0.1uF
C406 10uF/6.3V
C400 0.1uF
C401 0.1uF
C402 0.1uF
C409 0.1uF
C403 0.1uF
C404 0.1uF
C405 0.1uF
C411 0.1uF


Title
MSD209DG_BGA21x21_1C Demo board
Size
C
Document Number
DDR2_32Bit
Rev
1.0
Date:
Sunday, September 27, 2009
Sheet
3
of
15


2nd HDMI
Close to MStar IC
HDMI CEC
HDMI HOTPLUG
1st HDMI
3rd HDMI
180-Degree Connector
MSD209DG_BGA21x21_IC Demo board
HDMI



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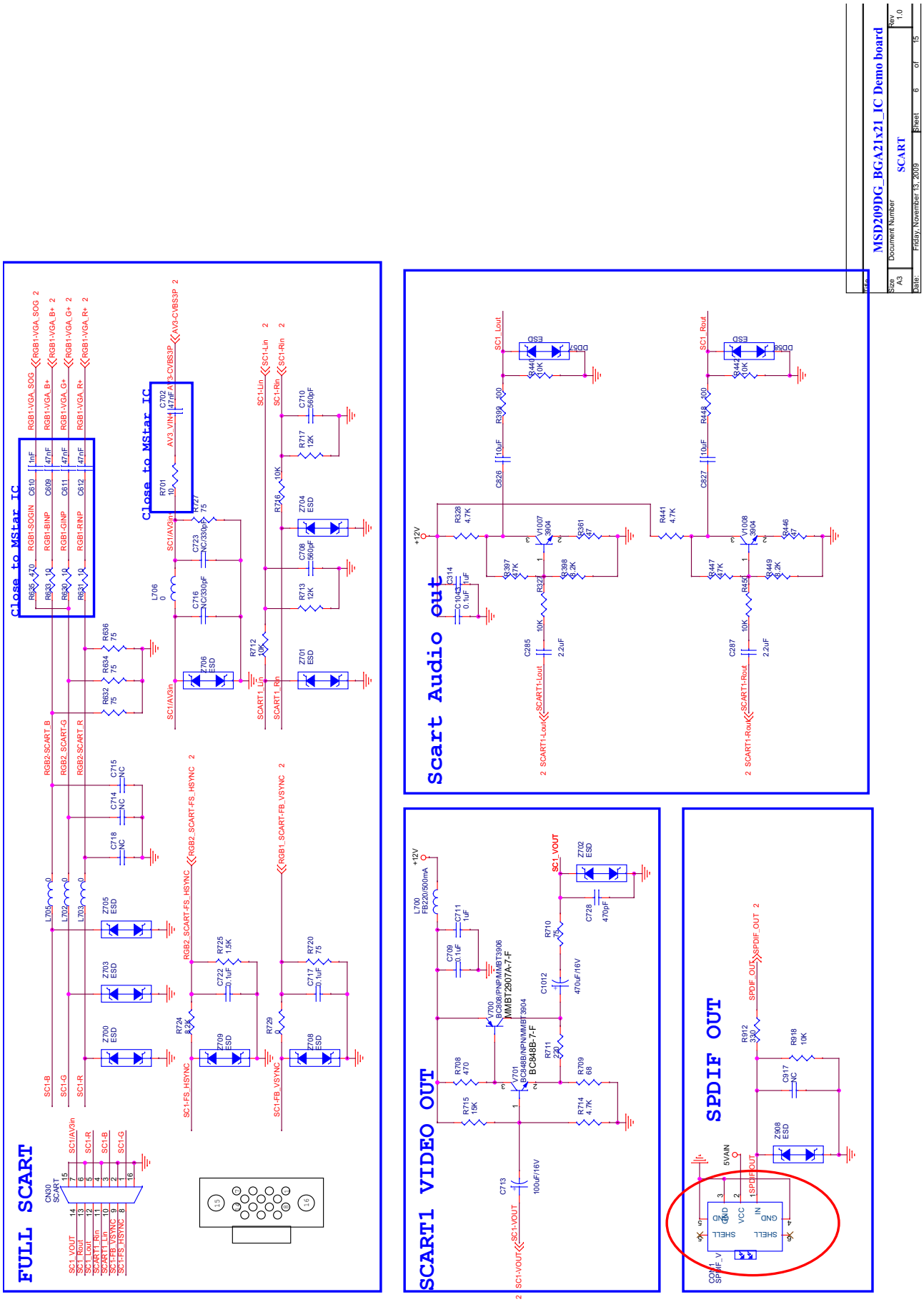
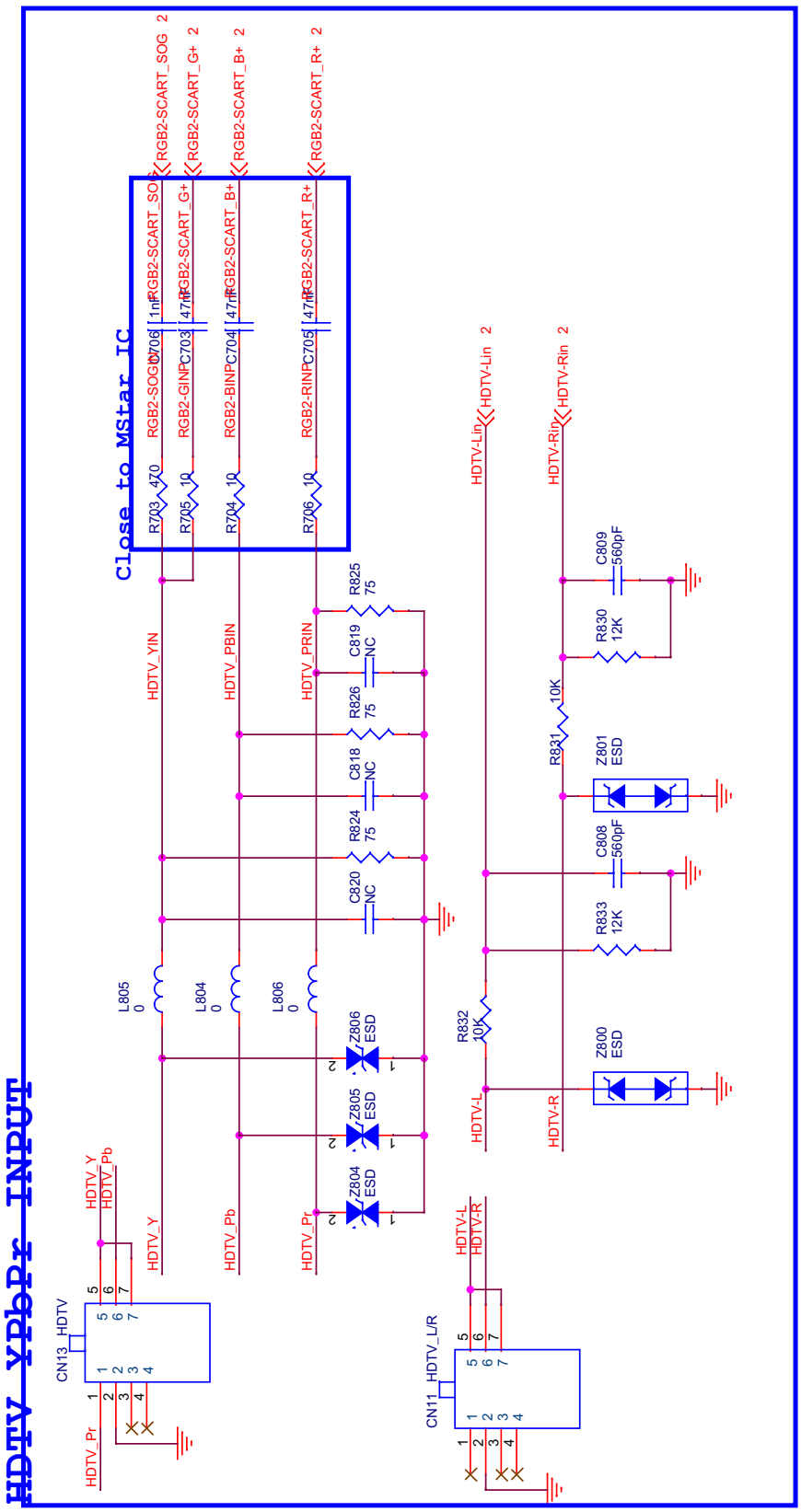
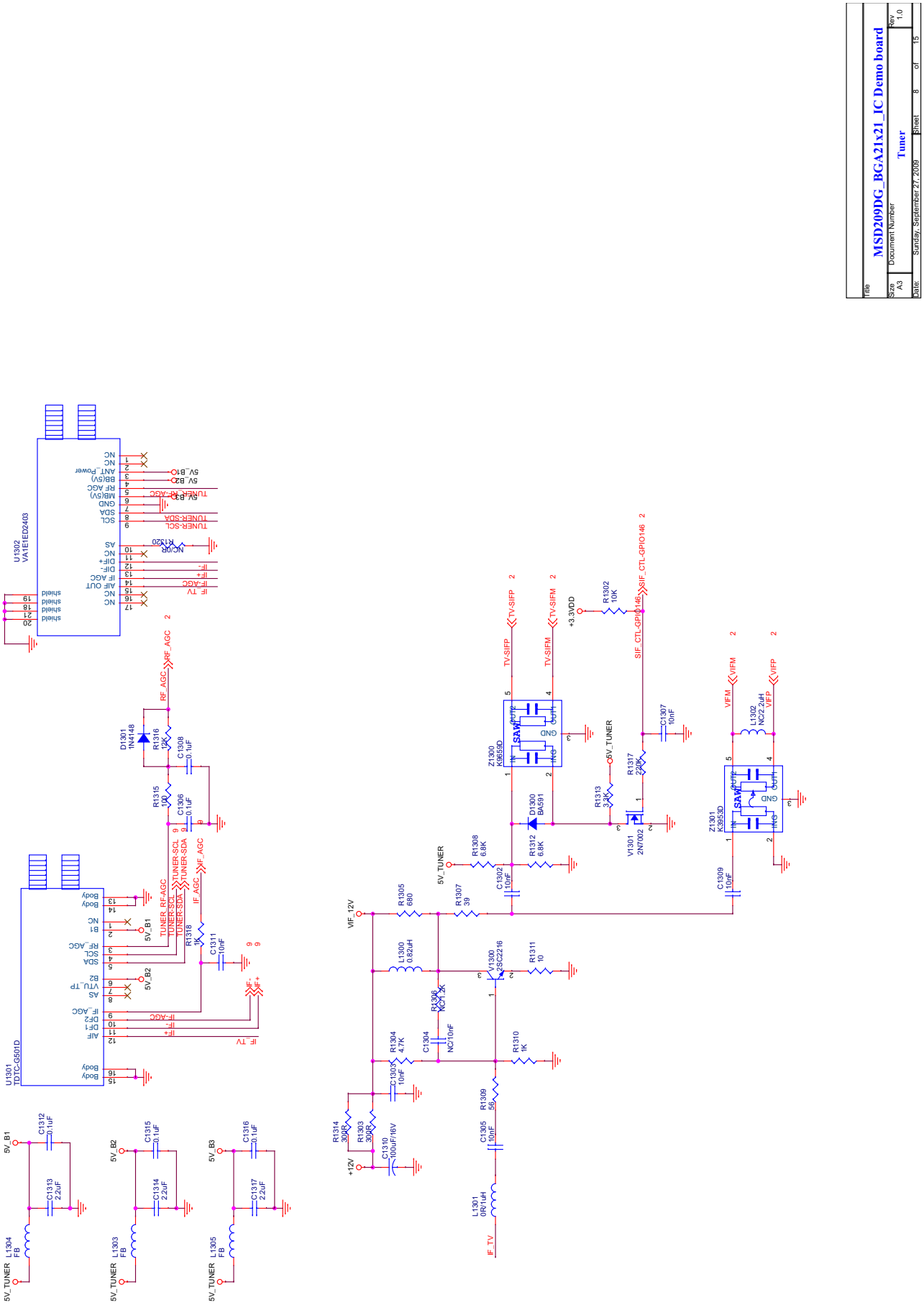
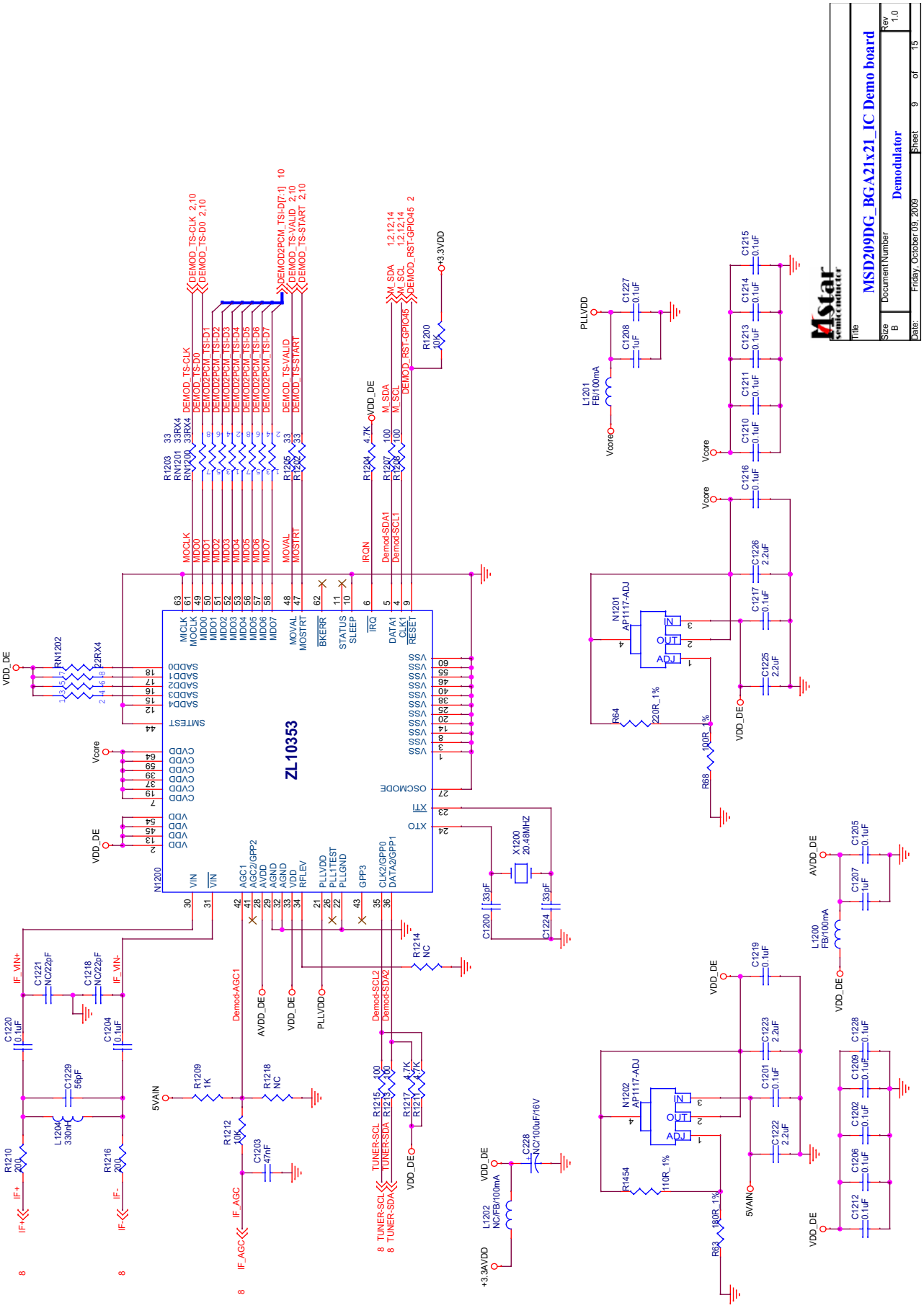
Size A3	Document Number VGA		Rev 1.0
Date: Sunday, September 27, 2009		Sheet 5 of 15	

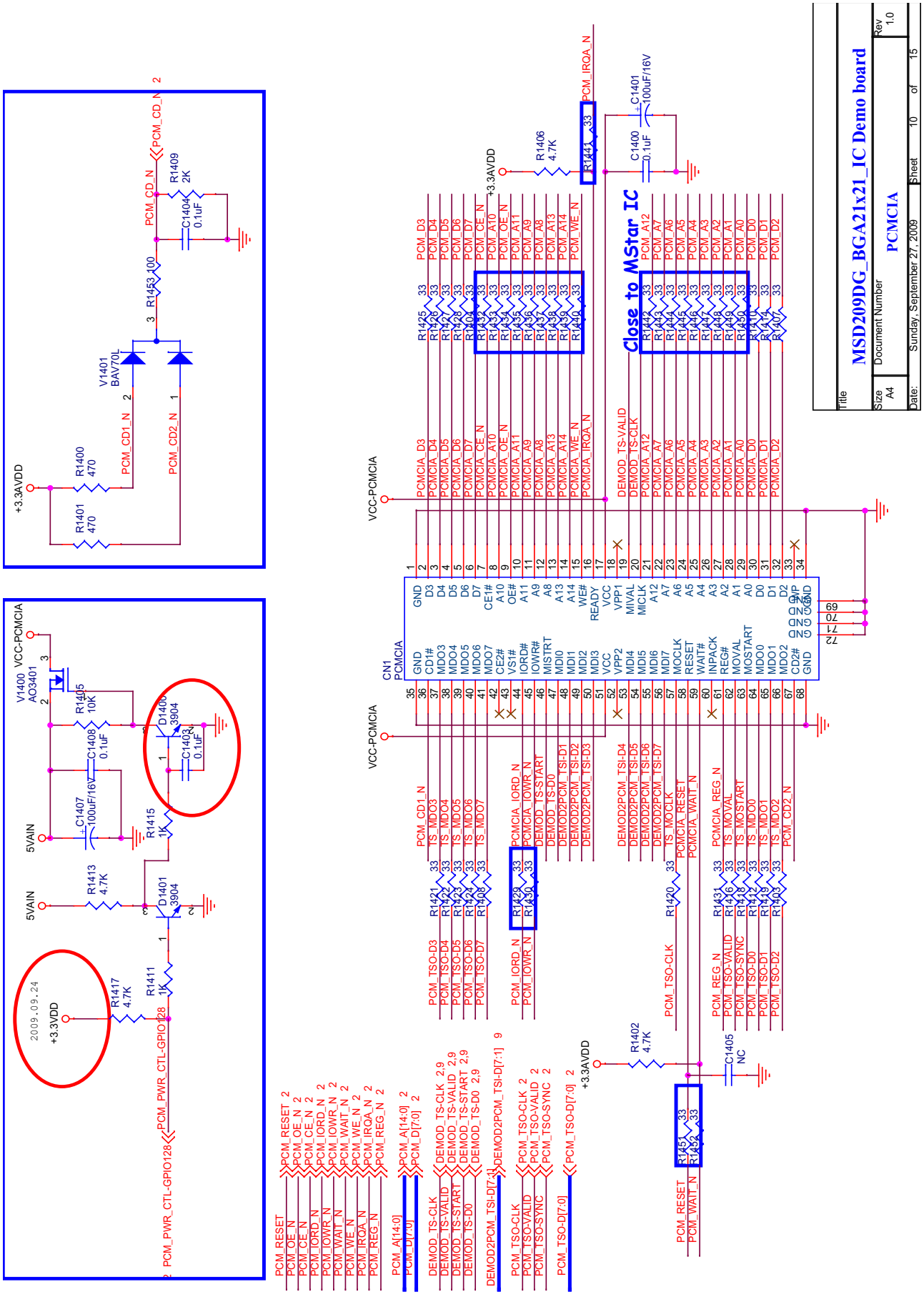

FULL SCART
SCART1 VIDEO OUT
Scart Audio out
SPDIF OUT
Close to MStar IC
MSD209DG_BGA21x21_IC Demo board
SCART
Document Number
Friday, November 13, 2009



Title	MSD209DG_BGA21x21_IC Demo board		
Size A4	Document Number HDTV		Rev 1.0
Date: Sunday, September 27, 2009	Sheet 7	of	15


Title
MSD209DG_BGA21x21_IC Demo board
Size
A3
Document Number
Tuner
Rev
1.0
Date:
Sunday, September 27, 2009
Sheet
8
of
15
U1302
VA1E1ED2403
U1301
TDTC-G501D
Z1300
K9659D
Z1301
K9853D
SAW
D1301
1N4148
D1300
BA591
V1300
2SC2216
V1301
2N7002
5V_TUNER
+3.3VDD
+12V
VIF_12V
IF_TV
RF_AGC
IF_AGC
TUNER_RF-AGC
TUNER-SCL
TUNER-SDA
TV-SIFP
TV-SIFM
SIF_CTL-GPIO146
VIFM
VIFP


ZL10353
MSD209DG_BGA21x21_IC Demo board
Demodulator
Mstar Semiconductor
Title
Size B
Document Number
Rev 1.0
Date: Friday, October 09, 2009
Sheet 9 of 15


MSD209DG_BGA21x21_IC Demo board
PCMCIA
Close to MStar IC
CN1
PCMCIA
VCC-PCMCIA
+3.3AVDD
5VAIN
+3.3VDD
2009.09.24
V1400 AO3401
V1401 BAV70L
D1400 3904
D1401 3904
PCM_PWR_CTL-GPIO128
PCM_CD_N
PCM_CD1_N
PCM_CD2_N
PCM_RESET
PCM_OE_N
PCM_CE_N
PCM_IORD_N
PCM_IOWR_N
PCM_WAIT_N
PCM_WE_N
PCM_IRQA_N
PCM_REG_N
PCM_A[14:0]
PCM_D[7:0]
DEMOD_TS-CLK
DEMOD_TS-VALID
DEMOD_TS-START
DEMOD_TS-D0
DEMOD2PCM_TSI-D[7:1]
PCM_TSO-CLK
PCM_TSO-VALID
PCM_TSO-SYNC
PCM_TSO-D[7:0]
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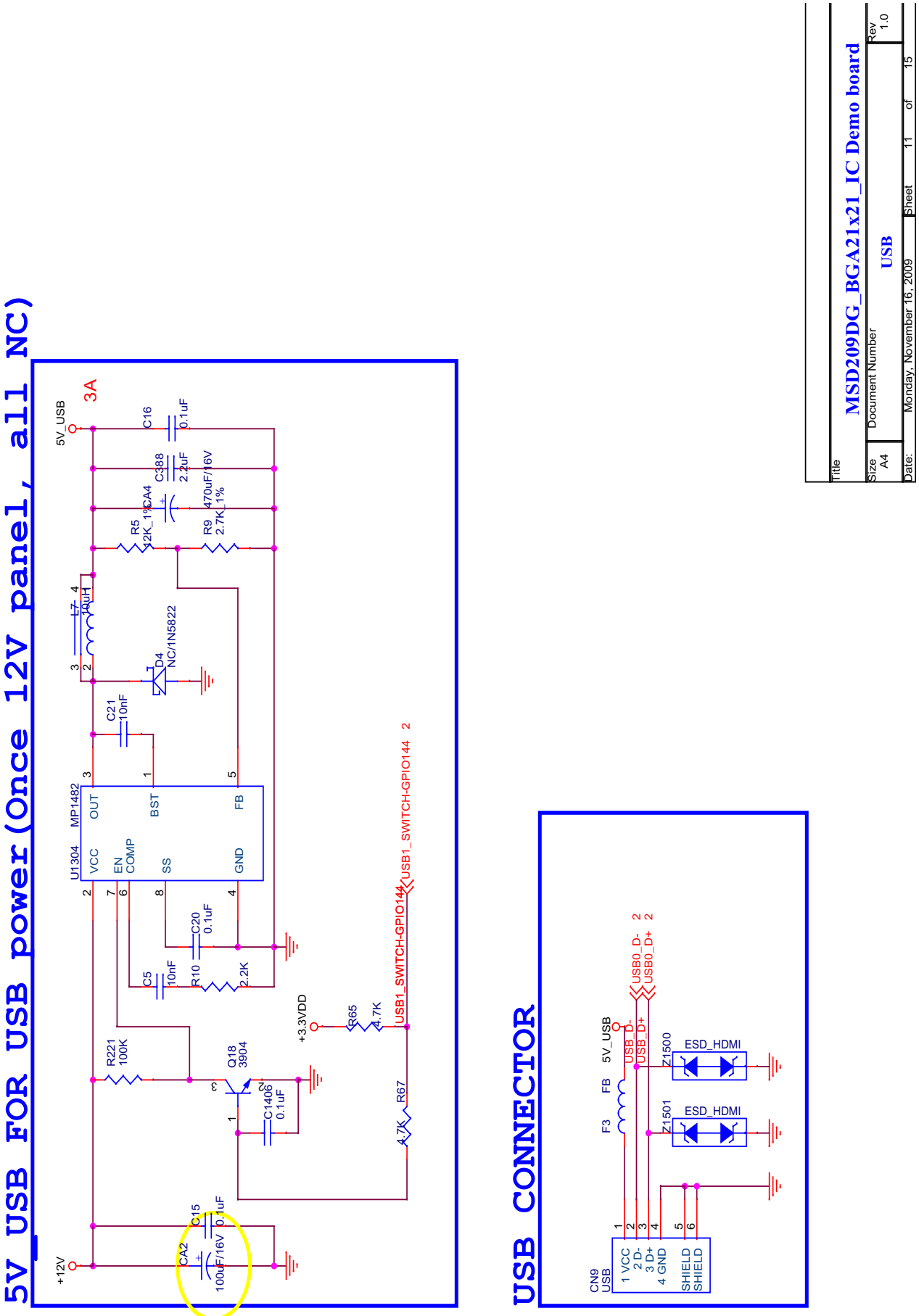
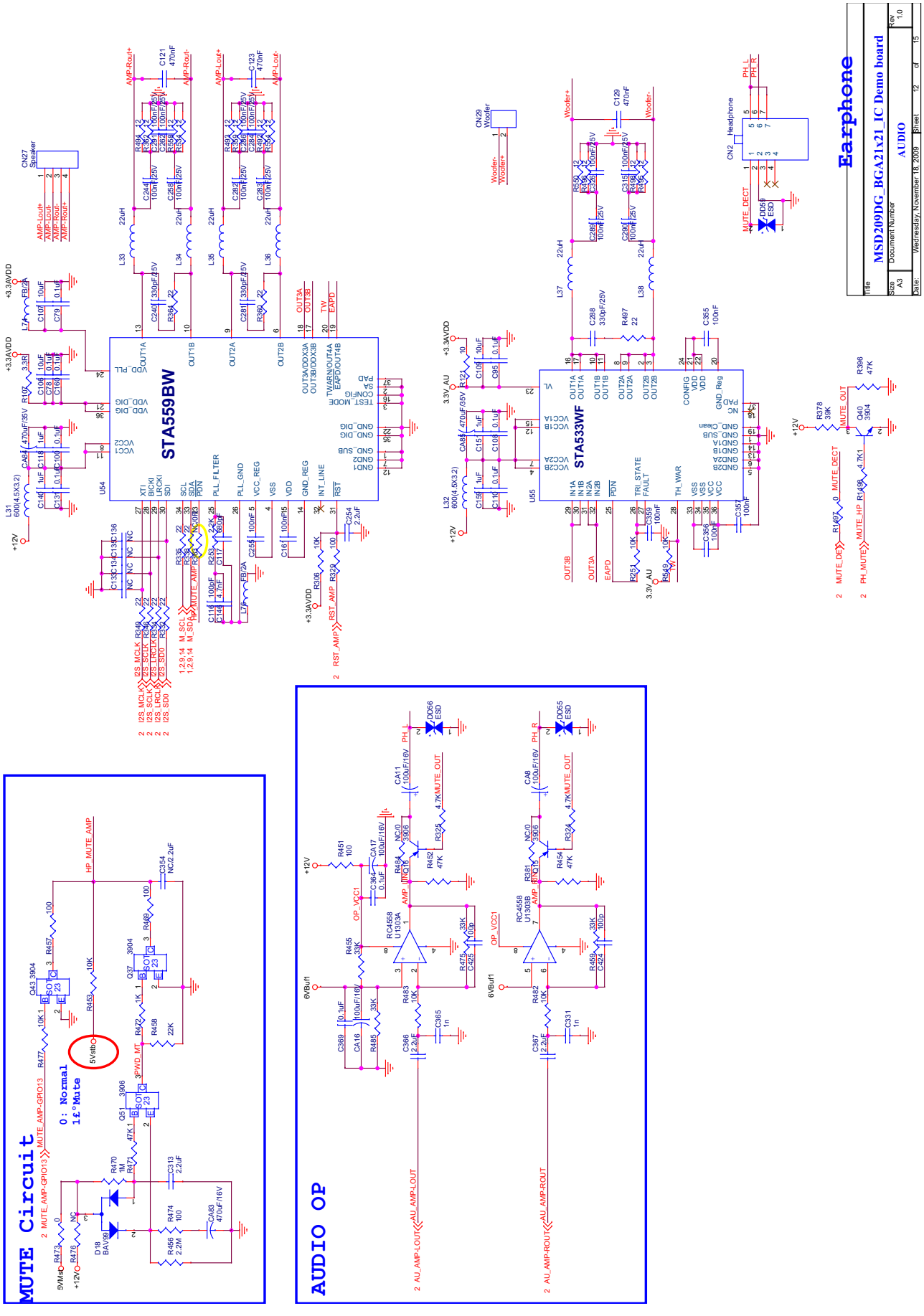
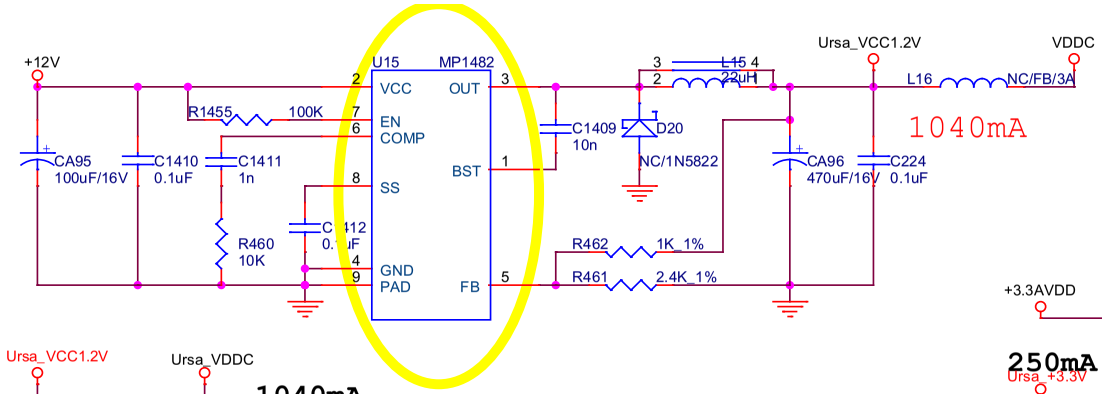
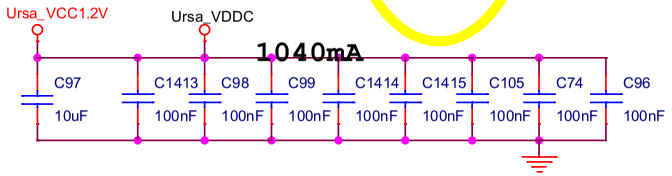
Size A4
Document Number
PCMCIA
Rev 1.0
Date: Sunday, September 27, 2009
Sheet 10 of 15

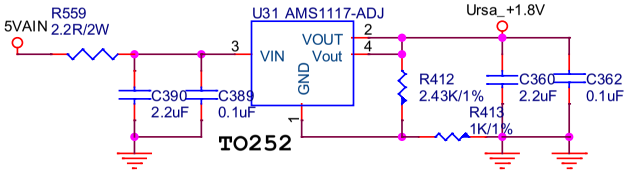

5V_USB FOR USB power(Once 12V panel, all NC)
USB CONNECTOR
MSD209DG_BGA21x21_IC Demo board
USB
Document Number
Rev 1.0
Monday, November 16, 2009
Sheet 11 of 15
Size A4
Date:
Title
5V_USB
3A
+12V
+3.3VDD
U1304 MP1482
VCC
EN
COMP
OUT
BST
SS
GND
FB
L7 4 10uH
D4 NC/1N5822
C16 0.1uF
C388 2.2uF
CA4 470uF/16V
R5 12K_1%
R9 2.7K_1%
C21 10nF
C20 0.1uF
C5 10nF
R10 2.2K
R65 4.7K
R67 4.7K
R221 100K
Q18 3904
C1406 0.1uF
CA2 100uF/16V
C15 0.1uF
USB1_SWITCH-GPIO144
CN9 USB
1 VCC
2 D-
3 D+
4 GND
SHIELD
F3 FB
USB0_D-
USB0_D+
Z1500 ESD_HDMI
Z1501 ESD_HDMI


STA559BW
STA533WF
MUTE Circuit
AUDIO OP
Earphone
MSD209DG_BGA21x21_IC Demo board
AUDIO
0: Normal
1:Mute

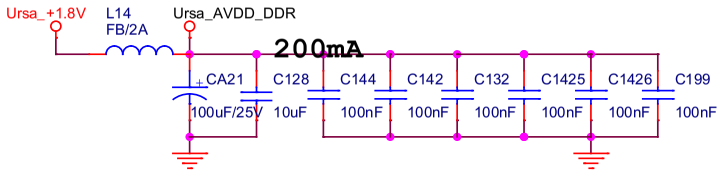


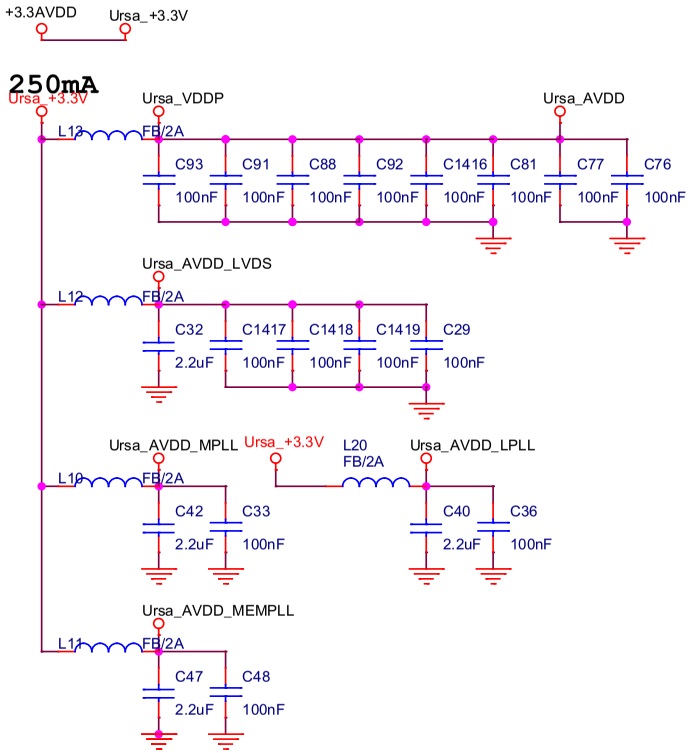


Ursa DDR2 +1.8V POWER

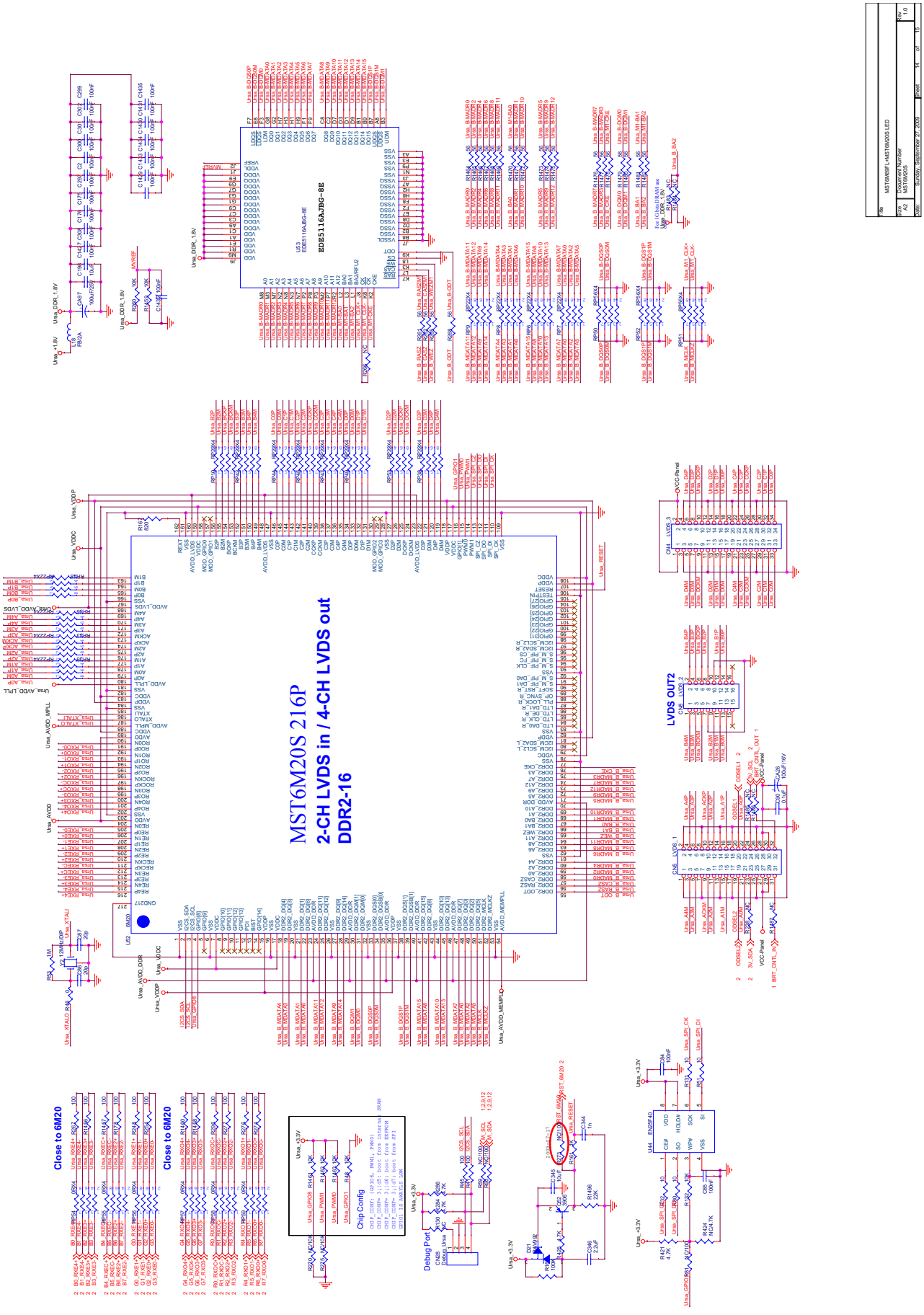


Vout=Vrefx(1+(R2/R1))+IadjxR2
=1.25x(1+(1k/2.4k))+55uAx1k=1.82V

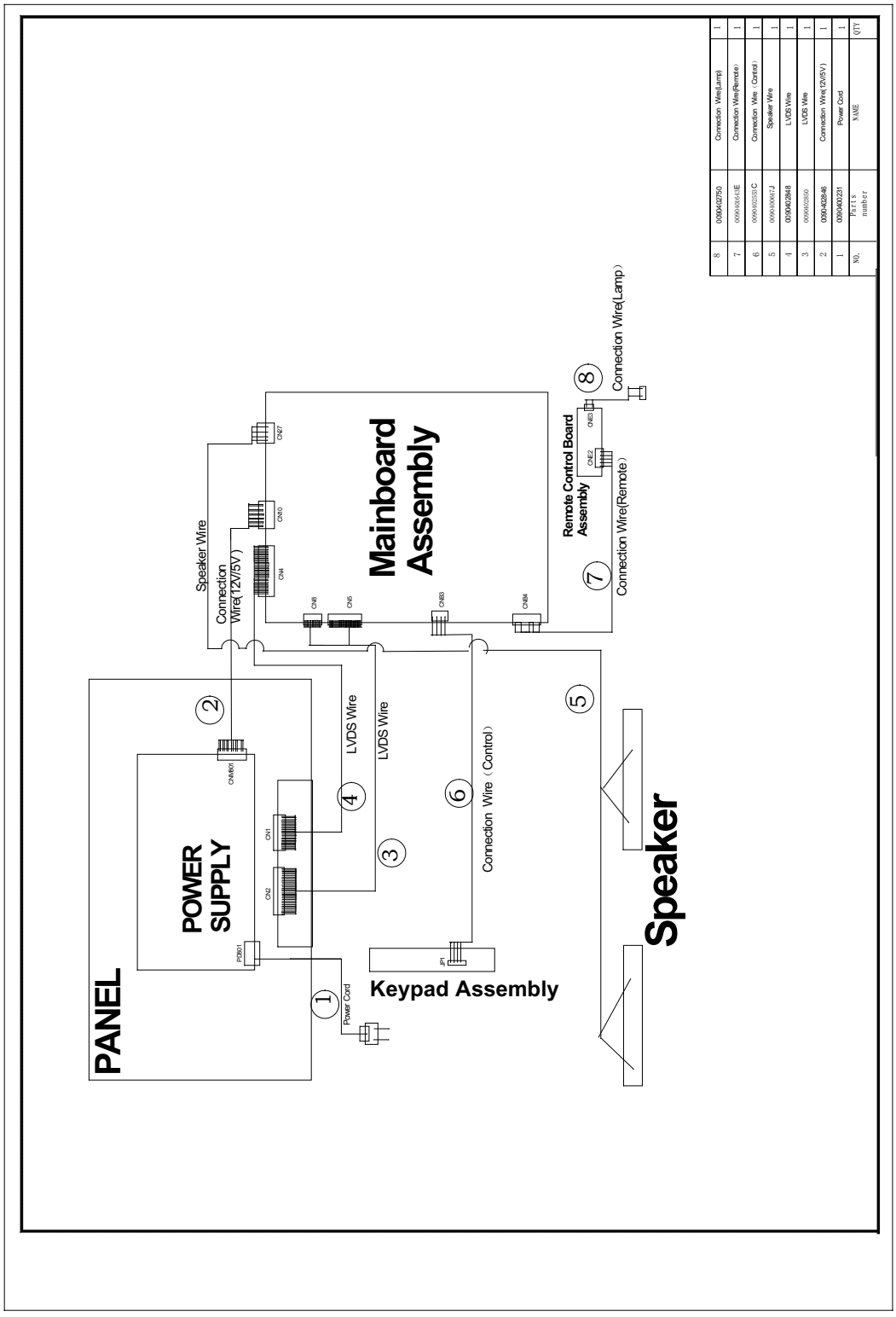




Title: MST6M69FL+MST6M20S LED		
Size: A4	Document Number: MST6M20S Power	Rev: 1.0
Date: Monday, November 16, 2009	Sheet 13 of 15	


MST6M20S 216P
2-CH LVDS in / 4-CH LVDS out
DDR2-16
LVDS OUT2
Close to 6M20
Close to 6M20
Debug Port
Chip Config

7-3. Wiring Connection Diagram



NO.	Parts number	NAME	QTY
8	0390402750	Connection Wire(Lamp)	1
7	0090104141E	Connection Wire(Remote)	1
6	0090102353C	Connection Wire（Control）	1
5	0090100947J	Speaker Wire	1
4	0390402948	LVDS Wire	1
3	0090102850	LVDS Wire	1
2	0390402846	Connection Wire(12V/5V)	1
1	0390402231	Power Cord	1

Chapter 8. Measurements and Adjustments

8-1. Service Mode

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

The way to the factory mode menu:
1st, press menu,
2en, input 8893,
Finished these operations ,system will be into the factory mode menu.
At the end of the main factory menu, you can see the edition of the software,
like this" L_MSD209_AU32 ".

8-1-2.How to exit

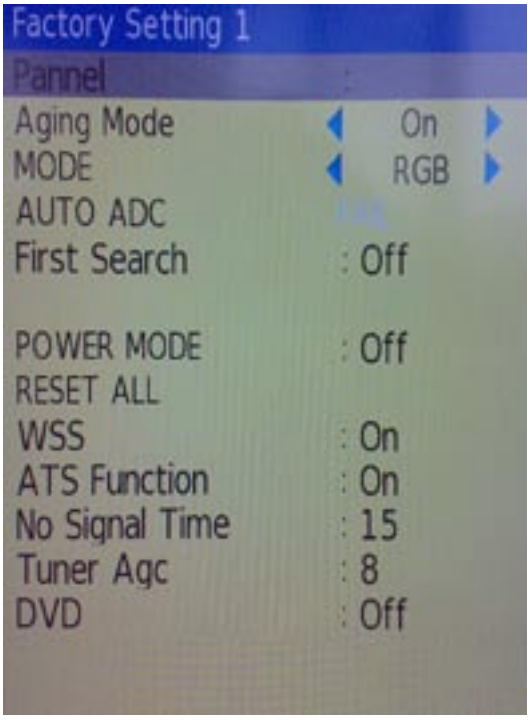
If you want to exit this factory menu, please press the button "Exit" on the remote.
system will be out the factory mode menu.

8-2. Measurements and Adjustments

8-2-1. The Main Menu

In factory mode menu,press up/down button to choose the up/down item,press left/right button to the submenu,press "OK"button to affirm .press MENU button go to the next page.

MSD209 Factory Menu

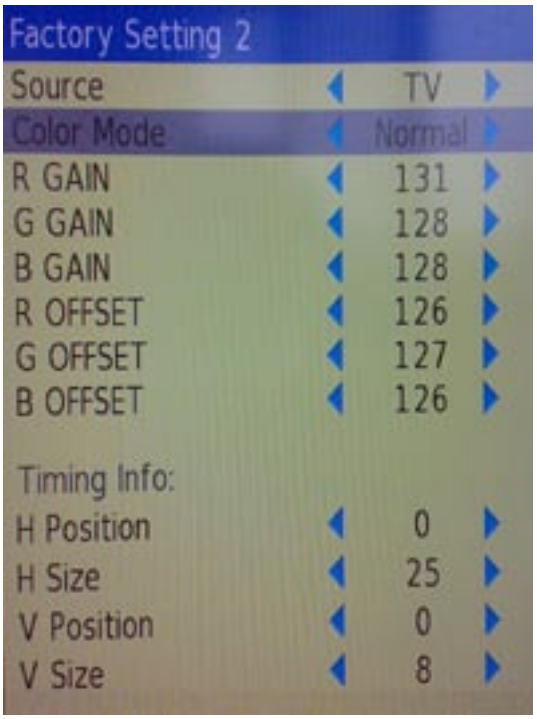


In this page, you just consider "RESET ALL" function.This function you can reset all date return to factory state.if you encounter inextricable problem,you can try this function.

Press up/down button to select "RESET ALL",press "OK" button.It needs a few secounds.

NOTE : After reset ,please shut off the power.
Be carefully use this function.

8-2-2. Video



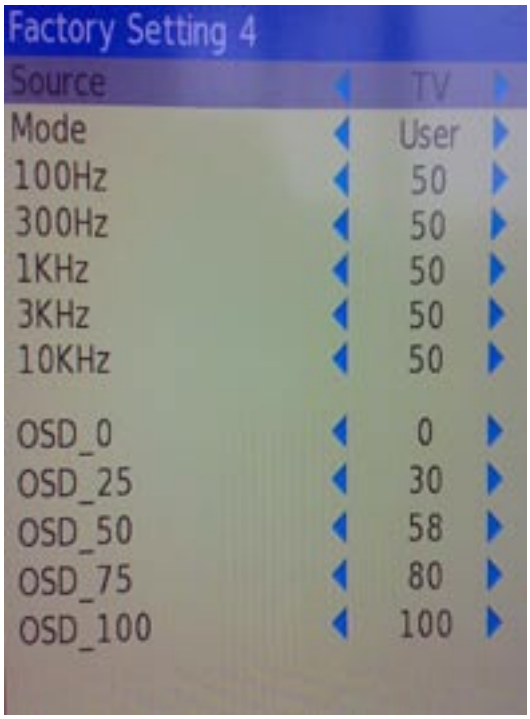
Color Temperature

This page is control the Color Temperature, and the picture size.

Picture Mode

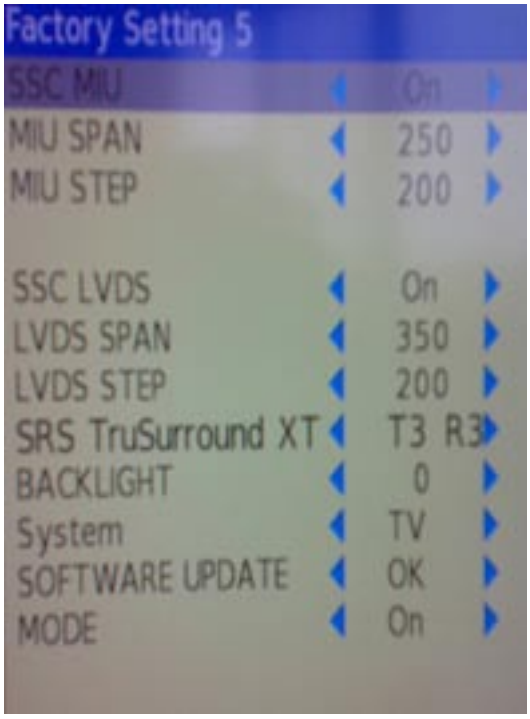
This page is control the picture effect , like Brightness,contrast,color,sharpness.

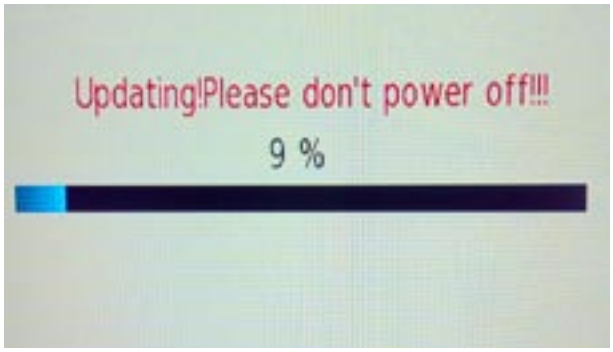
8-2-3. Audio



This page is control the sound effect ,from 100Hz to 10KHz.

8-2-4. Software UpDate





In this page , you just consider the software update function.Plug USB into the 1st USB port ,select "SOFTWARE UPDATE" press "OK", Then flip the other window,perss "OK",The update is going work.

NOTE : After software update ,turn to the Factory Setting 1 page reset all.

Chapter 9. Trouble shooting

9-1. Simple check

No picture/ No sound	Verify if the television is properly plugged Verify if the television is properly supplied power Verify if electricity is available.
Blank screen	Verify if correct signals are input Press INPUT button to change signal input to TV input Restart the television of power supply is interrupted
No sound	Press Mute button and verify if Mute mode is set. Switch to otger channel and verify if the same problem happens. Press VOL+ button to see of he problem can be solved.
Poor sound	Verufy if sound system is correct .Refer to some chapter for adjust.
No picture in some channel	Verify if correct channel is selected. Adjust the antenna. Make adjustments by Fine Tune and MANUAL Scan.
No color for some channel program (black and white)	Verify if the same problem exists in other channels. check out of picture and sound system. Refer to relative instructions in the Manual for color adjust.
Spots with some or all pictures	Verify if the antennal is correctly connected. Verify if the antennal is in good condition. Make fine adjustment of channel.
Horizontal/ vertical bars or picture shaking	Check for local interference such as an electrical appliance or power tool.
Television out of control	Disconnect the television from power supply and 10 seconds later, connect the television to the power supply. If the problem still exists, contact authorized after-sales service for technical assistance.

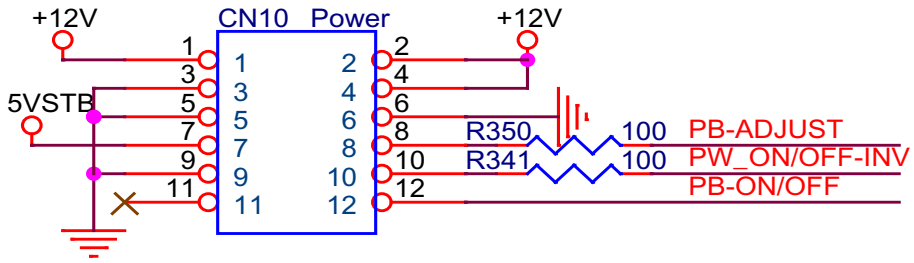
9-2. Power Supply Board Failure Check.

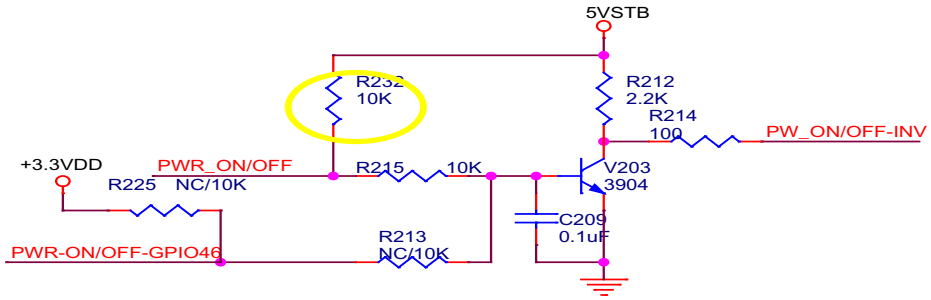
State:No picture

First,check cables which connect with PSU,then check as follows

Check input voltage

voltage: +5VSB----POWER ON(2.6V) -----+12V





State:No sound

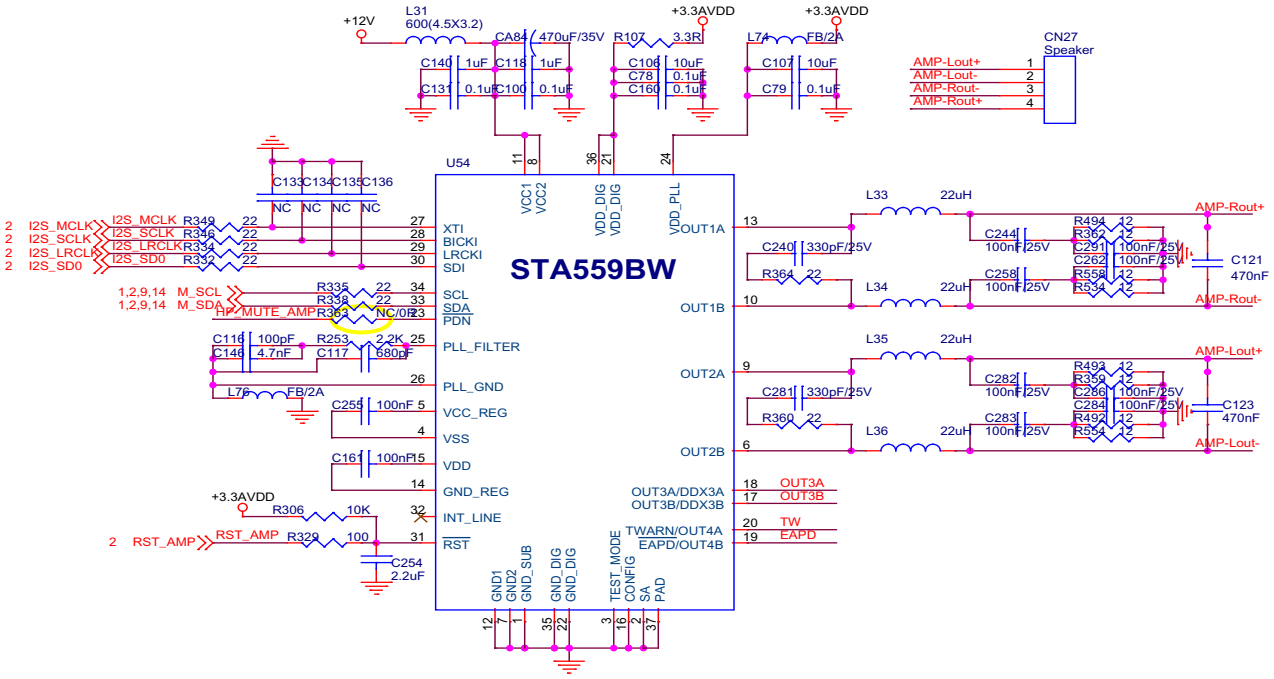
First,check cables which connect with PSU,then check as follows

1) Check input voltage as NO picture

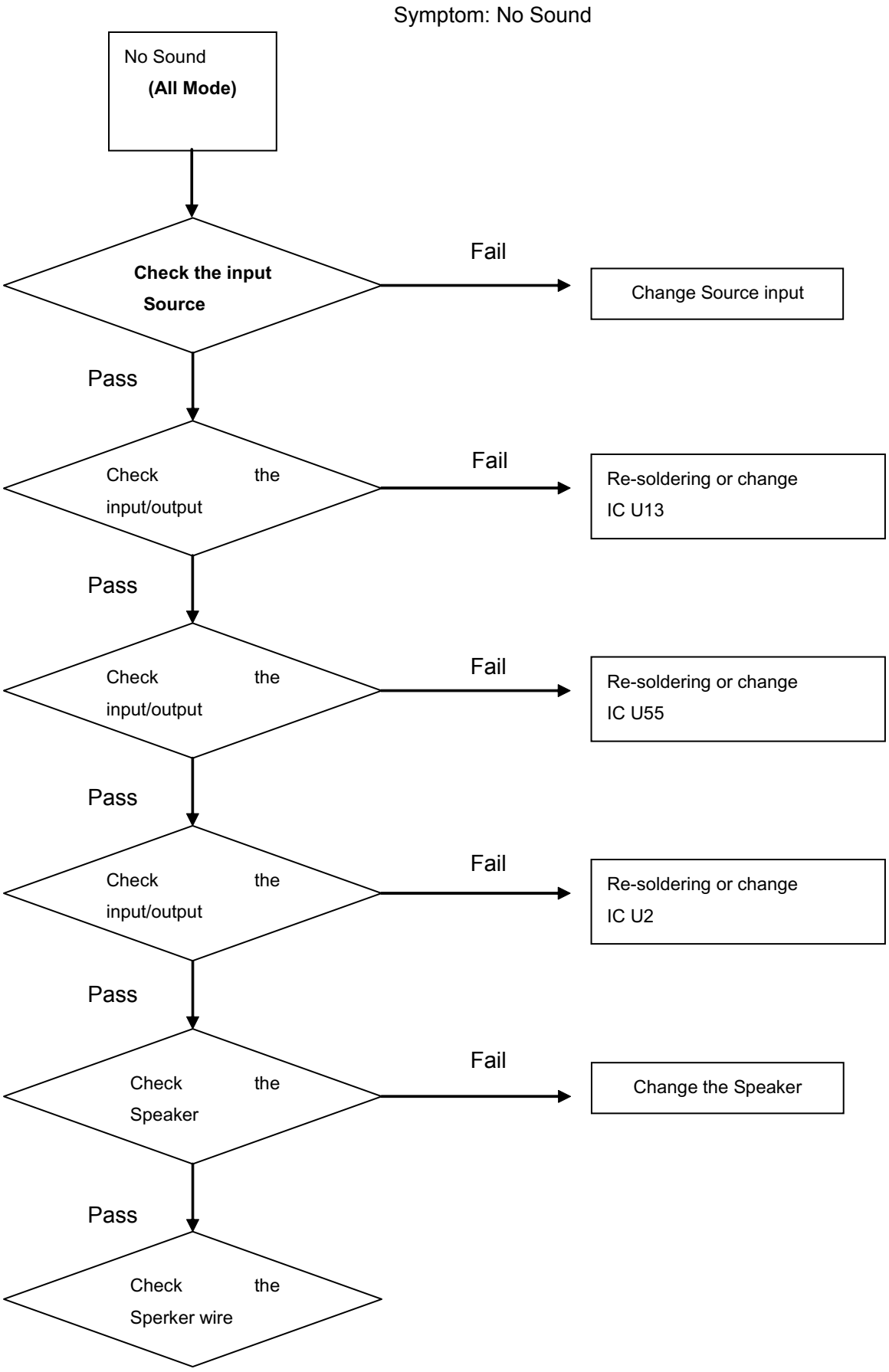
2) Check speaker output

First,check speaker anode(+) and cathode(-),confirm speaker short or not.If short ,replace speaker.

Second,check CN27 with oscillograph,confirm wave output or not.



9-3. Mainboard Failure Check



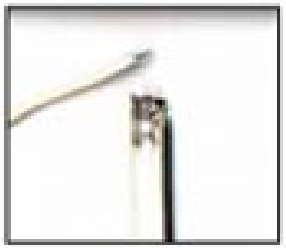
9-4. Pannel Failure

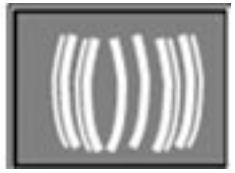
Failure Mode

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

Part	Name	Description	Phenomena	Failure Cause
Panel or Polarlzer	Dot Defect	Bright dot dark dot in pannel		Incoming Inspection Standard
	Polarizer Bubble	Bladder in Polarizer		Bladder between Polarizer and top glass
	Polarizer Scratch	Polarizer Scratch		Tine or rigidity arose
	F/inside Polarizer	Eyewinker inside Polarizer		Eyewinker inside Polarizer
Circuit	Abnormal Display	Abnormal Display		1.Chip lose action 2.IC ahort or jointiog bad 3.Pannel and vsc connect bad
	Flashing	Bright and dark display alternately		

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

Part	Name	Description	Phenomena	Failure cause
	Mechanlcal Nolse	When turn panel,appear cacophony		Caused by Mechanica noise of backlight unit
	Ripple	Connectric circle		Causeed by between mechanism and pannel
	B/L off	B/L lose action		*Connect badness between wire and electrode
	B/L dark	B/L brightness darker than normal		*Connect badnessShort between wire and electrode
	B/L wire damaged	B/L wire damaged		Operation abnormal or systemic noise
	B/L wire open	Without backlight		Operation abnormal or systemic noise
	B/L shut down	B/L shutdown in sometime		Short bitween lamp housing and wire, Because consume power too much
	F/M	F/M inB/L ,white,balck Rotundity or wirelike		F/M in B/L unit

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

Sincere Forever

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