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LCD TV

SERVICE MANUAL

CHASSIS : LA86A

MODEL : 37LG700H 37LG700H-UA

CAUTION

BEFORE SERVICING THE CHASSIS,
READ THE SAFETY PRECAUTIONS IN THIS MANUAL.



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SAFETY PRECAUTIONS

IMPORTANT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by $\triangle$ in the Schematic Diagram and Exploded View.

It is essential that these special safety parts should be replaced with the same components as recommended in this manual to prevent Shock, Fire, or other Hazards.

Do not modify the original design without permission of manufacturer.

General Guidance

An **isolation Transformer should always be used** during the servicing of a receiver whose chassis is not isolated from the AC power line. Use a transformer of adequate power rating as this protects the technician from accidents resulting in personal injury from electrical shocks.

It will also protect the receiver and its components from being damaged by accidental shorts of the circuitry that may be inadvertently introduced during the service operation.

If any fuse (or Fusible Resistor) in this TV receiver is blown, replace it with the specified.

When replacing a high wattage resistor (Oxide Metal Film Resistor, over 1W), keep the resistor 10mm away from PCB.

Keep wires away from high voltage or high temperature parts.

Before returning the receiver to the customer,

always perform an **AC leakage current check** on the exposed metallic parts of the cabinet, such as antennas, terminals, etc., to be sure the set is safe to operate without damage of electrical shock.

Leakage Current Cold Check(Antenna Cold Check)

With the instrument AC plug removed from AC source, connect an electrical jumper across the two AC plug prongs. Place the AC switch in the on position, connect one lead of ohm-meter to the AC plug prongs tied together and touch other ohm-meter lead in turn to each exposed metallic parts such as antenna terminals, phone jacks, etc.

If the exposed metallic part has a return path to the chassis, the measured resistance should be between $1M\Omega$ and $5.2M\Omega$.

When the exposed metal has no return path to the chassis the reading must be infinite.

An other abnormality exists that must be corrected before the receiver is returned to the customer.

Leakage Current Hot Check (See below Figure)

Plug the AC cord directly into the AC outlet.

Do not use a line Isolation Transformer during this check.

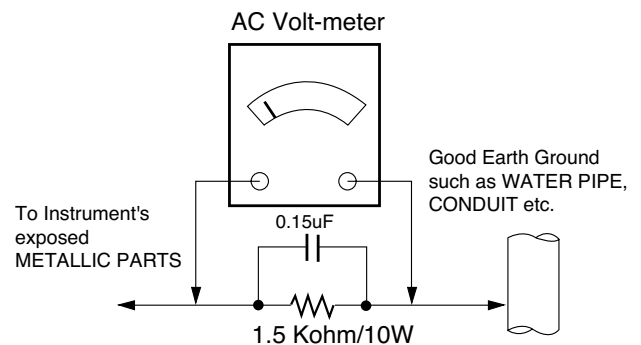
Connect 1.5K/10watt resistor in parallel with a 0.15uF capacitor between a known good earth ground (Water Pipe, Conduit, etc.) and the exposed metallic parts.

Measure the AC voltage across the resistor using AC voltmeter with 1000 ohms/volt or more sensitivity.

Reverse plug the AC cord into the AC outlet and repeat AC voltage measurements for each exposed metallic part. Any voltage measured must not exceed 0.75 volt RMS which corresponds to 0.5mA.

In case any measurement is out of the limits specified, there is possibility of shock hazard and the set must be checked and repaired before it is returned to the customer.

Leakage Current Hot Check circuit



SERVICING PRECAUTIONS

CAUTION: Before servicing receivers covered by this service manual and its supplements and addenda, read and follow the SAFETY PRECAUTIONS on page 3 of this publication.

NOTE: If unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions on page 3 of this publication, always follow the safety precautions. Remember: Safety First.

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)
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.
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.

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 incidence 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.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. 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.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. 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).
7. 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.
8. 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.)

General Soldering Guidelines

1. Use a grounded-tip, low-wattage soldering iron and appropriate tip size and shape that will maintain tip temperature within the range or 500°F to 600°F.
2. Use an appropriate gauge of RMA resin-core solder composed of 60 parts tin/40 parts lead.
3. Keep the soldering iron tip clean and well tinned.
4. Thoroughly clean the surfaces to be soldered. Use a mall wire-bristle (0.5 inch, or 1.25cm) brush with a metal handle. Do not use freon-propelled spray-on cleaners.
5. Use the following unsoldering technique
 - a. Allow the soldering iron tip to reach normal temperature. (500°F to 600°F)
 - b. Heat the component lead until the solder melts.
 - c. Quickly draw the melted solder with an anti-static, suction-type solder removal device or with solder braid.
CAUTION: Work quickly to avoid overheating the circuit board printed foil.
6. Use the following soldering technique.
 - a. Allow the soldering iron tip to reach a normal temperature (500°F to 600°F)
 - b. First, hold the soldering iron tip and solder the strand against the component lead until the solder melts.
 - c. Quickly move the soldering iron tip to the junction of the component lead and the printed circuit foil, and hold it there only until the solder flows onto and around both the component lead and the foil.
CAUTION: Work quickly to avoid overheating the circuit board printed foil.
 - d. Closely inspect the solder area and remove any excess or splashed solder with a small wire-bristle brush.

IC Remove/Replacement

Some chassis circuit boards have slotted holes (oblong) through which the IC leads are inserted and then bent flat against the circuit foil. When holes are the slotted type, the following technique should be used to remove and replace the IC. When working with boards using the familiar round hole, use the standard technique as outlined in paragraphs 5 and 6 above.

Removal

1. Desolder and straighten each IC lead in one operation by gently prying up on the lead with the soldering iron tip as the solder melts.
2. Draw away the melted solder with an anti-static suction-type solder removal device (or with solder braid) before removing the IC.

Replacement

1. Carefully insert the replacement IC in the circuit board.
2. Carefully bend each IC lead against the circuit foil pad and solder it.
3. Clean the soldered areas with a small wire-bristle brush.
(It is not necessary to reapply acrylic coating to the areas).

"Small-Signal" Discrete Transistor

Removal/Replacement

1. Remove the defective transistor by clipping its leads as close as possible to the component body.
2. Bend into a "U" shape the end of each of three leads remaining on the circuit board.
3. Bend into a "U" shape the replacement transistor leads.
4. Connect the replacement transistor leads to the corresponding leads extending from the circuit board and crimp the "U" with long nose pliers to insure metal to metal contact then solder each connection.

Power Output, Transistor Device

Removal/Replacement

1. Heat and remove all solder from around the transistor leads.
2. Remove the heat sink mounting screw (if so equipped).
3. Carefully remove the transistor from the heat sink of the circuit board.
4. Insert new transistor in the circuit board.
5. Solder each transistor lead, and clip off excess lead.
6. Replace heat sink.

Diode Removal/Replacement

1. Remove defective diode by clipping its leads as close as possible to diode body.
2. Bend the two remaining leads perpendicular y to the circuit board.
3. Observing diode polarity, wrap each lead of the new diode around the corresponding lead on the circuit board.
4. Securely crimp each connection and solder it.
5. Inspect (on the circuit board copper side) the solder joints of the two "original" leads. If they are not shiny, reheat them and if necessary, apply additional solder.

Fuse and Conventional Resistor

Removal/Replacement

1. Clip each fuse or resistor lead at top of the circuit board hollow stake.
2. Securely crimp the leads of replacement component around notch at stake top.
3. Solder the connections.

CAUTION: Maintain original spacing between the replaced component and adjacent components and the circuit board to prevent excessive component temperatures.

Circuit Board Foil Repair

Excessive heat applied to the copper foil of any printed circuit board will weaken the adhesive that bonds the foil to the circuit board causing the foil to separate from or "lift-off" the board. The following guidelines and procedures should be followed whenever this condition is encountered.

At IC Connections

To repair a defective copper pattern at IC connections use the following procedure to install a jumper wire on the copper pattern side of the circuit board. (Use this technique only on IC connections).

1. Carefully remove the damaged copper pattern with a sharp knife. (Remove only as much copper as absolutely necessary).
2. Carefully scratch away the solder resist and acrylic coating (if used) from the end of the remaining copper pattern.
3. Bend a small "U" in one end of a small gauge jumper wire and carefully crimp it around the IC pin. Solder the IC connection.
4. Route the jumper wire along the path of the out-away copper pattern and let it overlap the previously scraped end of the good copper pattern. Solder the overlapped area and clip off any excess jumper wire.

At Other Connections

Use the following technique to repair the defective copper pattern at connections other than IC Pins. This technique involves the installation of a jumper wire on the component side of the circuit board.

1. Remove the defective copper pattern with a sharp knife.
Remove at least 1/4 inch of copper, to ensure that a hazardous condition will not exist if the jumper wire opens.
2. Trace along the copper pattern from both sides of the pattern break and locate the nearest component that is directly connected to the affected copper pattern.
3. Connect insulated 20-gauge jumper wire from the lead of the nearest component on one side of the pattern break to the lead of the nearest component on the other side.
Carefully crimp and solder the connections.

CAUTION: Be sure the insulated jumper wire is dressed so the it does not touch components or sharp edges.

SPECIFICATION

NOTE : Specifications and others are subject to change without notice for improvement.

1. Application range

This specification is applied all of the 32", 37", 42" LCD TV with LA80A chassis.

2. Requirement for Test

Each part is tested as below without special appointment.

- 1) Temperature: 20±5°C
- 2) Relative Humidity: 65±10%
- 3) Power Voltage : Standard input voltage(100-120V~, 50/60Hz)
* Standard Voltage of each product is marked by models
- 4) Specification and performance of each parts are followed each drawing and specification by part number in accordance with BOM.
- 5) The receiver must be operated for about 20 minutes prior to the adjustment.

3. Test method

- 1) Performance: LGE TV test method followed
- 2) Demanded other specification
 - Safety: UL, CSA, IEC specification
 - EMC: FCC, ICES, IEC specification

Model	Market	Appliance
37LG700H-UA	North America	Safety : UL1492, CSA C22.2.No.1 EMC : FCC Class B, IEC Class B

4. General Specification(TV)

No	Item	Specification	Remark
1	Receivable System	VSB/64& 256 QAM/NTSC-M	
2	Available Channel	VHF : 02 ~ 13 UHF : 14 ~ 69 DTV : 02 ~ 69 CATV : 01 ~ 135 CADTV : 01 ~ 135	
3	Input Voltage	AC100-240V~, 50/60Hz	
4	Market	North America	
5	Screen Size	37 Inch	
6	Aspect Ratio	16:9	
7	Tuning System	FS	
8	LCD Module	EAJ57535001 V4 LC370WXN	LGD
9	Operating Environment	Temp : 0 ~ 40 deg Humidity : ~ 80 %	
10	Storage Environment	Temp : -20 ~ 50 deg Humidity : 10 ~ 90 %	

5. Component Video Input (Y, C_B/P_B, C_R/P_R)

No	Resolution	H-freq(kHz)	V-freq.(kHz)	Proposed
1	720*480	15.73	60	SDTV ,DVD 480I
2	720*480	15.73	59.94	SDTV ,DVD 480I
3	720*480	31.47	60	SDTV 480P
4	720*480	31.47	59.94	SDTV 480P
5	1280*720	45.00	60.00	HDTV 720P
6	1280*720	44.96	59.94	HDTV 720P
7	1920*1080	33.75	60.00	HDTV 1080I
8	1920*1080	33.72	59.94	HDTV 1080I

6. RGB Input (PC)

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	
	PC					DDC
1.	640*350	31.468	70.09	25.17	EGA	X
2.	720*400	31.469	70.08	28.32	DOS	O
3.	640*480	31.469	59.94	25.17	VESA(VGA)	O
4.	640*480	37.861	72.80	31.50	VESA(VGA)	O
5.	640*480	37.500	75.00	31.50	VESA(VGA)	O
6.	800*600	35.156	56.25	36.00	VESA(SVGA)	O
7.	800*600	37.879	60.31	40.00	VESA(SVGA)	O
8.	800*600	48.077	72.18	50.00	VESA(SVGA)	O
9.	800*600	46.875	75.00	49.50	VESA(SVGA)	O
10.	1024*768	48.363	60.00	65.00	VESA(XGA)	O
11.	1024*768	56.476	70.06	75.00	VESA(XGA)	O
12.	1024*768	60.023	75.02	78.75	VESA(XGA)	O
13.	1280*768	47.776	59.870	79.5	CVT(WXGA)	O
14.	1280*768	60.289	74.893	102.25	CVT(WXGA)	O
15.	1360*768	47.712	60.015	85.50	VESA (WXGA)	O
16.	1280*1024	63.981	60.020	108.00	VESA (SXGA)	O
17.	1280*1024	79.976	75.025	135	VESA (SXGA)	O

7. HDMI input (PC/DTV)

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	
	PC				DDC	
1	640*350	31.468	70.09	25.17	EGA	X
2	720*400	31.469	70.08	28.32	DOS	O
3	640*480	31.469	59.94	25.17	VESA(VGA)	O
4	800*600	35.156	56.25	36.00	VESA(SVGA)	O
5	800*600	37.879	60.31	40.00	VESA(SVGA)	O
6	800*600	48.077	72.18	50.00	VESA(SVGA)	O
7	800*600	46.875	75.00	49.50	ESA(SVGA)	O
8	1024*768	48.363	60.00	65.00	VESA(XGA)	O
9	1024*768	56.476	70.06	75.00	VESA(XGA)	O
10	1024*768	60.023	75.02	78.75	VESA(XGA)	O
11	1280*768	47.776	59.870	79.5	CVT(WXGA)	O
12	1360*768	47.712	60.015	85.50	VESA (WXGA)	O
13	1280*1024	63.981	60.020	108.00	VESA (SXGA)	O
14	1280*1024	79.976	75.025	135	VESA (SXGA)	O
	DTV					
1	720*480	31.47	60		SDTV 480P	
2	720*480	31.47	59.94		SDTV 480P	
3	1280*720	45.00	60.00		HDTV 720P	
4	1280*720	44.96	59.94		HDTV 720P	
5	1920*1080	33.75	60.00		HDTV 1080I	
6	1920*1080	33.72	59.94		HDTV 1080I	

ADJUSTMENT INSTRUCTION

1. Application Range

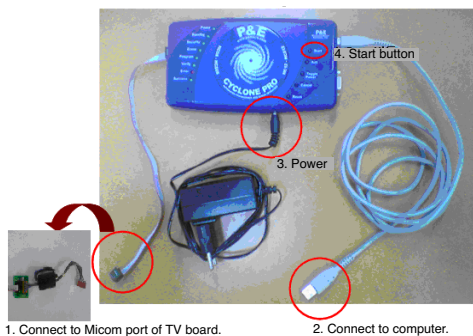
This specification sheet is applied for all of the LCD TV with LA80A chassis.

2. Specification

- (1) Because this is not a hot chassis, it is not necessary to use an isolation transformer. However, the use of isolation transformer will help protect test instrument.
- (2) Adjustment must be done in the correct order.
- (3) The adjustment must be performed in the circumstance of $25\pm5^{\circ}\text{C}$ of temperature and $65\pm10\%$ of relative humidity if there is no specific designation.
- (4) The input voltage of the receiver must keep 100~120V, 50/60Hz.
- (5) The receiver must be operated for about 5 minutes prior to the adjustment.
 - * After RGB Full White in HEAT-RUN Mode, the receiver must be operated prior to the adjustment.
 - * Enter into HEAT-RUN MODE
 - 1) Press the POWER ON KEY on R/C for adjustment.
 - 2) OSD display and screen display 100% full WHITE PATTERN.
 - * Set is activated HEAT run without signal generator in this mode.
 - * Single color pattern (RED / BLUE / GREEN) of HEAT RUN MODE uses to check panel.
 - * Caution: If you turn on a still screen more than 20 minutes (Especially digital pattern, cross hatch pattern : 13CH), an after image may be occur in the black level part of the screen.

3. Method of PTC MICOM Download

3.1. Connection of MICOM JIG

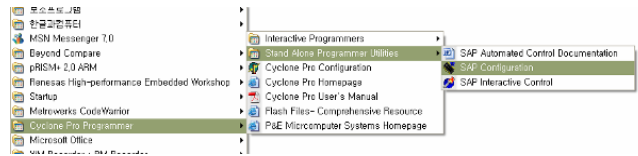


- (1) Connect port(3) with Power Code
- (2) Connect jack(1) with PTC Micom.
- (3) Connect USB Cable to the computer
- (4) Download Program execution (SAP Configuration)

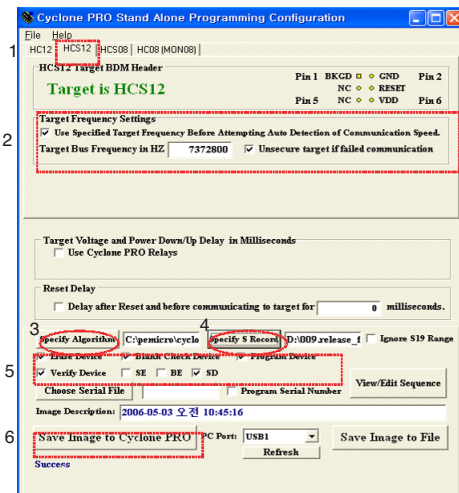
* Notice!

Because PTC Download JIG has internal memory, it can save download files using download program (SAP Configuration). Push the START button (4) after file saving, then it execute download.

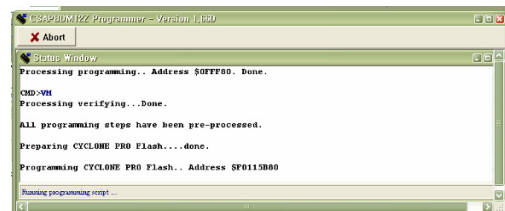
3.2. Execution of download program (SAP Configuration)



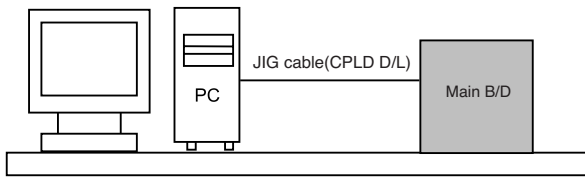
3.2.1. Execution of SAP Configuration



- (1) Select HCS12
- (2) Target Frequency Settings :
 - 1) Checking the factor -> Use Specified Target Frequency..., Unsecure target....
 - 2) Insert Target Bus Frequency -> 7372800
- (3) Specify Algorithm: 9S12dt128_128k .12P
- (4) Specify S Record: select download file.
- (5) Checking factor: Erase Device, Blank Check Device, Program Device, Verify Device
- * Notice!
Don't check other checking boxes. You must follow fig.
- (6) Push the 'Save Image to Cyclone PRO' button, files transfer from PC to the Download JIG.



4. Method of CPLD Download

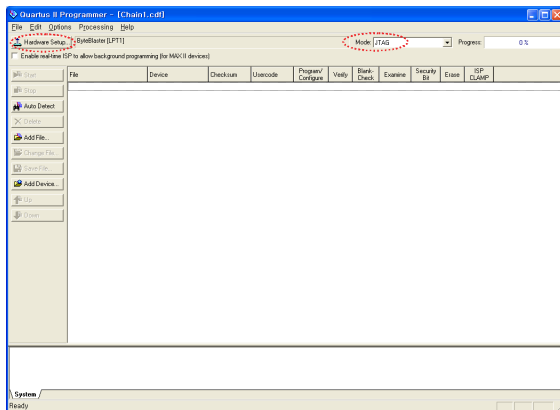


- Using equipment : PC, download JIG cable(Altera Byteblaster cable)

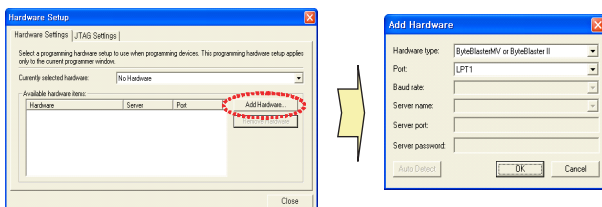
- (1) Connect the JIG cable between computer and Main board(P1500)



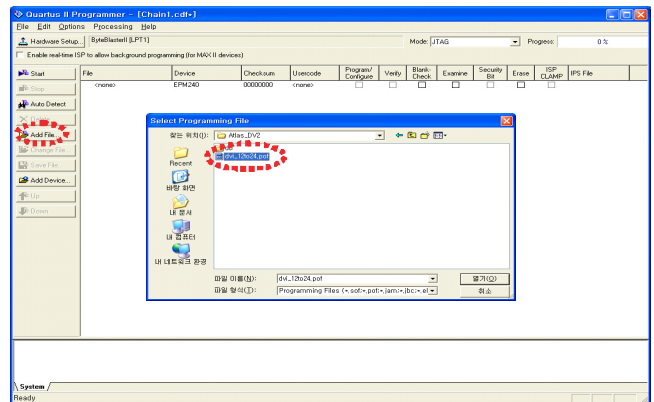
- (2) Connect the power cable of Main board and Turn on the Main power.
- (3) Launch the download program(QuartusII 6.1 programmer) in the Computer.



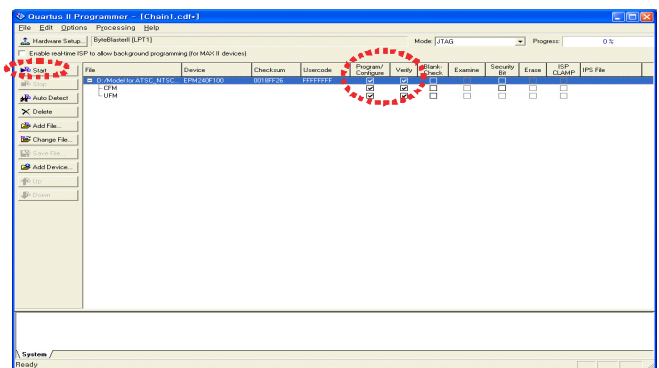
- (4) Setting the environment feature of the download program



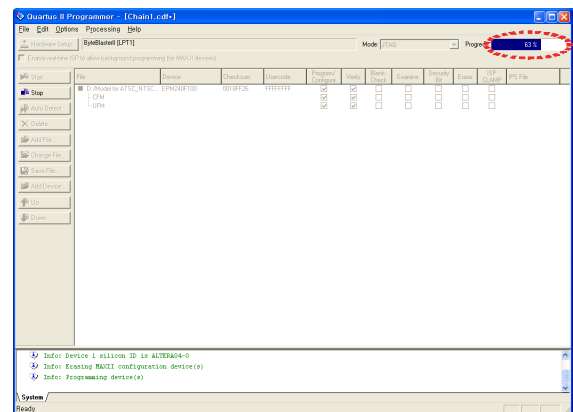
- (5) Click the “Add File...” menu and select the download file(dvi_12to24.pof) in your PC.



- (6) Check the “Program/Configure” and “Verify” box and then click “Start” button



- (7) Without any problem, you can see the normal status of the progress bar



5. Adjustment of ADC on PCB Ass'y Level

	480i Component	1080p Component / RGB
MSPG-925FA	Model No : 209	Pattern No : 65
	Model No : 225	Pattern No : 65

5.1. Method of adjustment through RS-232C

- System control RS-232 Host should be "PC" for adjustment.
Refer to the "6.1.2 Procedure of Adjustment" and adjust three items of ADC on PCB Ass'y level through the RS-232C.

Procedure	Command	Set Act
1. Entering ADC mode	ad 00 00	d 00 OK00x
2. Input change	kb 00 01	b 00 OK01x (Adjust RF and Video)
	kb 00 04	b 00 OK04x (Adjust 480i Comp1)
	kb 00 06	b 00 OK06x (Adjust 1080p Comp1/RGB)
3. Start ADC	ad 00 10	
4. Result return		OKx (Success)
		NGx (Fail)
5. Data read	(main)	(main)
	ad 00 20	00000000000000000000000000007c007b006dx
	(sub)	(Sub)
	ad 00 21	00000007000000000000000000007c00830077x
6. Data confirm	ad 00 99	NG 03 00x (Fail)
		NG 03 01x (Fail)
		NG 03 02x (Fail)
		OK 03 03x (Success)
7. Finish ADC	ad 00 90	d 00 OK90x

** ADC adjustment RS232C Protocol Ver 1.0

* Baud Rate : 115,200 bps
* RS232C Host : PC
* echo : None

- (1) Requirement for Adjustment
- Pattern Generator : MSPG-925FA
 - Adjust 480i Comp1(Model : 209, Pattern : 65)
 - Adjust 1080p Comp1 / RGB(Model : 225, Pattern : 65)

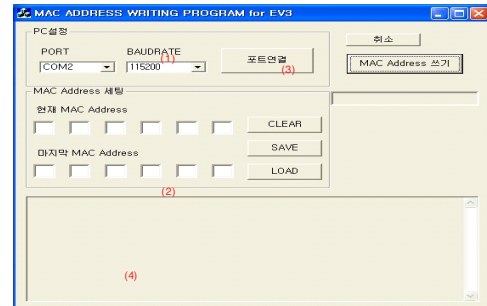
- (2) Adjustment Procedure
- ad 00 00 Entering ADC Adjustment Mode
 - kb 00 04 Component1 Input Change
 - ad 00 10 Adjust 480i Comp1
 - kb 00 06 RGB-DTV Input Change
 - ad 00 10 Adjust 1080p Comp1/RGB
 - ad 00 90 Finish adjustment

5.2. MAC Address Download

For downloading the MAC address which be allotted on each LAN Card.

(1) Adjustment Method

- 1) Connecting the TV set and the PC which has MAC Address Writing program through the RS232C cable.
- 2) Editing the macaddress.txt
(Inserting start MAC address at top low.
Inserting start MAC address at bottom low.
Launch MAC Address Writing program and set just like below picture. - (1)



- 3) Click the LOAD button for reading the MAC address.- (2)
(SAVE : Saving the current MAC Address
CLEAR : Initializing the space which insert MAC Address.
- 4) Click the "MAC Address writing" button to write current MAC Address.- (3)
- 5) In case of being downloaded normally, you can see the "OK" message in the window. - (4)
- 6) In case of being downloaded normally, MAC address increased one by one automatically. So the next set, just click the "MAC Address witing" button after connecting the port.
(Whenever be finished, the program saves the MAC Address in "macaddress.txt" file automatically.)

5.3. PING Test

* For confirm works normally the LAN card through PING TEST.

(1) Adjustment Method (PCB Ass'y Level)

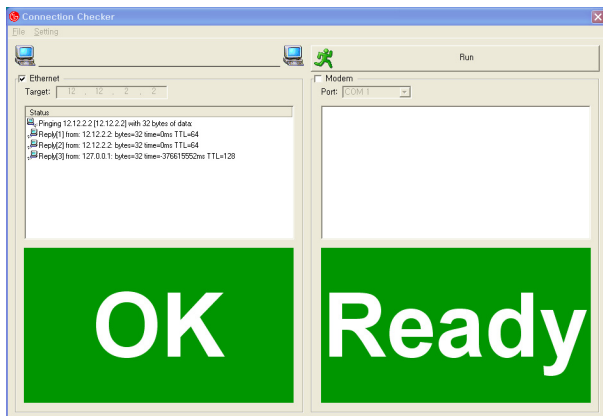
- 1) Connecting the LAN to Ass'y and then turn on the Power.
(Default IP Setting is "Automatic setting" and allocated the IP from Router each Power ON time automatically.)
- 2) Press the ADJ Key in the adjustment remote controller.
- 3) Press the "11. ACAP PING TEST" in EZ ADJUST menu to check the Network works well.

In case of normal status, you can see the "Networ is normal" message.

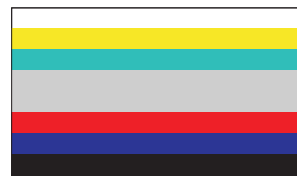
And abnormal case, you can see "Networ is not normal" message.

(2) Adjustment Method (Ass'y Line Level)

- 1) Connecting the LAN port in SET to the PC which has the PING Test program through a Cross LAN Cable. (PC LAN IP setting : 12.12.2.3)
 - 2) Launch the PING Test program and confirm the program Setting.
(Checking the TV's IP is set 12.12.2.2 in program. Don't check the Modem.)
 - 3) Press the Power Only Key in the adjustment remote controller. (Setting the TV IP)
 - 4) Click the "RUN" button of program, and then program display "OK" or "NG" like a below picture.
- * For clear the IP setting after the adjustment, press the INSTOP button.



- 7) Checking the connection of TV set and Pattern Generator.
-> MSPG-925FA, Model No : 225, Pattern No: 65
- 8) Set the TV source to Component and input the 100% Horizontal Color Bar Pattern(HozTV31Bar) of 1080p mode, and finally select picture mode to 'Normal' (standard).
- 9) After receiving the signal, Press ADJ key on R/C for adjustment
- 10) Select the 2. Adjust 1080p Comp1 / RGB and press the ►(Vol. ±) or Enter key operate to the set, and then it becomes automatically
- 11) In case of normal status "ADC Component1 Success" means completed adjustment.
And abnormal status "ADC Component1 1080p Fail"
- 12) After adjusting the Comp1, TV source will be changed RGB DTV mode.
Then Adjustment will be automatically done.
- 13) "ADC RGB 1080p Success" means completed adjustment.
- 14) After finish adjustment, press the ADJ key and quit the adjustment menu.



<Fig. 1. Adjust Pattern : 480i/ 1080p 60Hz pattern>

6. Assembly Line Level Adjustment

6.1. Adjust Component / RGB with remote controller.

- (1) Required Equipment
 - Remote controller for adjustment
 - AV Pattern Generator: 801GF(802B, 802F, 802R), Master (MSPG-925FA), etc
(Which has 480i/1080p Horizontal 100% Color Bar Pattern with 0.7±0.1 Vpp level. See Fig. 1)
 - It is very import to use correct adjustment pattern like Fig.1.

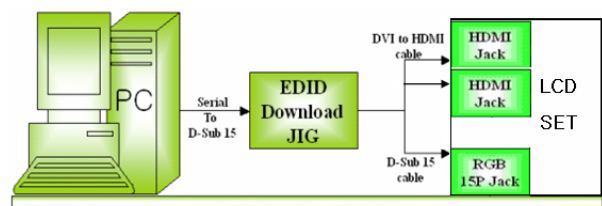
(2) Method of Adjusting 480i Comp1, 1080p Comp1 / RGB Color Balance

- 1) Checking the connection of TV set and Pattern Generator.
-> MSPG-925FA, Model No : 209, Pattern No: 65
- 2) Set the TV source to Component and input the 100% Horizontal Color Bar Pattern(HozTV31Bar), and finally select picture mode to 'Normal'(standard).
- 3) After receiving the signal, Press ADJ key on R/C for adjustment.
- 4) Select the 1. Adjust 480i Comp1 and press the ►(Vol. +) or Enter key operate to set, and then it becomes automatically.
- 5) "ADC Component1 Success" means completed adjustment.
- 6) If abnormal case, TV display the message "ADC Component1 480i Fail"

7. EDID / DDC INPUT

7.1. EDID(The Extended Display Identification Data)/DDC(Display Data Channel) download

- (1) Required Test Equipment
 - 1) Adjusting PC with S/W for writing EDID Data.
 - 2) A Jig for EDID Download
 - 3) Cable: Serial (9Pin or USB) to D-sub 15Pin cable, D-sub 15Pin cable, DVI to HDMI cable.
- (2) Setting of device



<Fig. 4 Connection Diagram of DDC download>

- 1) When input HDMI EDID data through RGB or HDMI jack, writing 8bits of the data at every turn with "DDC2B" protocol.

129B		Summary														
	x00	x01	x02	x03	x04	x05	x06	x07	x08	x09	x0A	x0B	x0C	x0D	x0E	x0F
x00	00	FF	FF	FF	FF	FF	FF	00	1E	6D	CF	9D	01	01	01	01
x01	00	12	01	03	01	46	27	78	04	CF	74	A3	57	4C	B0	23
x02	09	48	4C	AF	CF	00	31	4F	45	4F	61	4F	81	8F	01	01
x03	01	01	01	01	01	66	21	50	B0	51	00	1B	30	40	70	
x04	36	00	C4	8E	21	00	00	1E	00	00	00	00	00	00	00	00
x05	00	00	00	00	00	00	00	00	00	00	00	00	FC	00	4C	
x06	47	20	54	56	0A	20	20	20	20	20	20	00	00	00	FD	
x07	00	37	4D	18	53	0F	00	0A	20	20	20	20	20	00	10	

128 B	256 B	Summary															
x00	x01	x02	x03	x04	x05	x06	x07	x08	x09	x0A	x0B	x0C	x0D	x0E	x0F		
x00	00	FF	FF	FF	FF	FF	00	1E	6D	D0	9D	01	01	01	01		
x01	00	12	01	03	80	46	27	78	0A	CF	74	A3	57	4C	B0	23	
x02	09	48	4C	A3	CF	00	31	40	45	4F	61	4F	81	8F	01	01	
x03	01	01	01	01	01	66	21	50	B0	51	00	1B	30	40	70		
x04	36	00	C4	8E	21	00	00	1E	01	1D	00	72	51	D0	1E	20	
x05	6E	28	55	00	C4	8E	21	00	00	1E	00	00	00	FC	00	4C	
x06	47	20	54	56	0A	20	20	20	20	20	20	00	00	00	FD		
x07	00	37	4D	18	53	0F	00	0A	20	20	20	20	20	01	3F		

[illegible]

128	256	Summary															
	x0x0	x0x1	x0x2	x0x3	x0x4	x0x5	x0x6	x0x7	x0x8	x0x9	x0xA	x0xB	x0xC	x0xD	x0xE	x0xF	
x0x0	00	FF	FF	FF	FF	FF	FF	00	1E	bD	D0	9D	01	01	01	01	
x0x1	00	12	01	03	80	46	27	78	0A	CF	74	A3	57	4C	B0	23	
x0x2	09	48	4C	A3	CF	00	31	40	45	4F	61	4F	81	8F	01	01	
x0x3	01	01	01	01	01	01	01	1D	00	72	51	0D	1E	20	6E	28	
x0x4	55	00	C4	8E	21	00	00	1E	66	21	50	E0	51	00	1B	30	
x0x5	40	70	36	00	C4	8E	21	00	00	1E	00	00	00	FC	00	4C	
x0x6	47	20	54	56	0A	20	20	20	20	20	20	20	00	00	00	FD	
x0x7	00	37	4D	18	53	0F	00	0A	20	20	20	20	20	20	01	3F	

[illegible]

8. Adjustment of White Balance

- * When adjust White Balance automatically *
- Through the power only key on the R/C, operate the auto adjustment
- Setting the Baud Rate : 115200

- Wb 00 00 white balance auto adjustment start
- Wb 00 10 gain adjustment start (inner pattern)
- Ja 00 ff adjustment data
- Jb 00 c0
- ...¶
- Wb 00 1f gain adjustment finish
- * If occurs abnormal case, adjust the offset.(wb 00 20(start),
wb 00 2f(finish))
- Wb 00 ff white balance auto adjustment finish(disappearance
the inner pattern)

	RS-232C COMMAND [CMD ID DATA]			MIN	CENTER (DEFAULT)			Max
	Cool	Medium	Warm		Cool	Medium	Warm	
R Gain	jg	ja	jd	00	184	192	192	192
G Gain	jh	jb	je	00	187	183	159	192
B Gain	ji	jc	jf	00	192	161	95	192
R Cut					64	64	64	127
G Cut					64	64	64	127
B Cut					64	64	64	127

- (1) Select white pattern of heat-run mode by pressing power on key on remote control for adjustment then operate heat run more than 5 minutes.
- (2) Enter the White Balance adjustment mode by pressing the ADJ key (5. White Balance) on R/C.
- (3) Stick cursor to center of the screen and select each items using ◀/▶(CH +/-) key on R/C.
- (4) Adjust G Gain / B Gain using ▲/▼(VOL +/-) key on R/C.
- (5) Adjust it until color coordination becomes as below.

LGE Internal Use Only

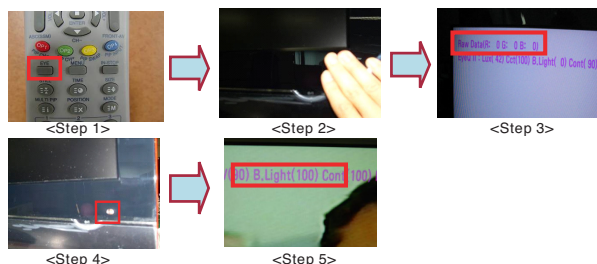
* Target value

	X	Y	Temp(Δuv)
Cool	0.276±0.002	0.283±0.002	11,000K(0.000)
Medium	0.285±0.002	0.293±0.002	9300k(0.000)
Warm	0.313±0.002	0.329±0.002	6,500K(0.003)

(6) When adjustment is completed, Exit adjustment mode using EXIT key on R/C.

9. Checking the EYE-Q operation.

- Step 1) Press the EYE Key on the Adjustment remote controller.
- Step 2) Screen the Eye Q sensor in front of the TV by hands, and keep up about 6 seconds.
- Step 3) Checking "Raw Data(R: G: B:)" value are changed less than "10", or not. If the values are not changed, exchange the sensor unit by soldering.
- Step 4) Pull out the hands, keep up about 6 seconds.
- Step 5) Checking "B.Light(XXX)" value increase from "0", or not. If the values are not changed, exchange the sensor unit by soldering.



10. GND and Inspection for against Pressure

- (1) GND & Auto Inspection for against surge voltage
 - Confirm that the power cord is inserted TV SET perfectly.
- (2) Operation the GND & Auto Inspection for against surge voltage
 - 1) The TV set is entered auto inspection Line. Undoubtedly the TV set is confirmed that Power cord, Tuner cable, A/V cables are inserted perfectly.
 - 2) Connect the D-terminal AV JACK tester.
 - 3) Turn on the Auto controller (GWS103-4)
 - 4) Operate the GND test
 - 5) If case of NG, the BUZZER will be alarmed.
 - 6) Case of OK, the process will be changed Inspection for against surge voltage automatically.
 - (Disconnect the cord, A/V from AV JACK box)
 - 7) Start the Inspection for against surge voltage TEST
 - 8) If case of NG, the BUZZER will be alarmed.
 - 9) Case of OK, GOOD LAMP will be turned on and the TV moved next process.

(3) Caring Items

- 1) TEST Voltage
 - GND : 1.5KV/min at 100mA
 - SIGNAL : 3KV/min at 100mA
- 2) TEST time : 1 second
- 3) TEST POINT
 - GND TEST = POWER CORD GND fl± SIGNAL CABLE METAL GND
 - Inspection for against surge voltage test = Power cord GND fl± live & neutral
- 4) Leakage Current : Setting less than 0.5mArms

11. IR IN/Out, Lodgenet Check

11.1. Check Order "OK" Judgment

- (1) The method of Cable connecting from jig to TV.
 - 1) Power Cable is connected to jig for supplying voltage. (as below picture point2)
 - 2) Phone jack is Connected for IR out test from TV REMOTE CONTROL OUT(JK900) to jig. (as below picture point1)
 - 3) In the right side of check jig, 11pin SPI/MPI signal cable is connected to MPI dummy board. (as below picture point3)
- (2) Test sequence
 - 1) Press EYE using adjust remote-control.
 - 2) Then, tuning the channel 96- 1.(Lodgenet digital1.) automatically.
 - 3) Check it whether the video is clear and 1~5 factor "OK" like below picture.
 - (IR IN / IR OUT / SPI TEST / MPI TEST / 12V IN)

If you find any problem, press <Eye> button and retest.

11.2. Need JIG & Equip & Cable

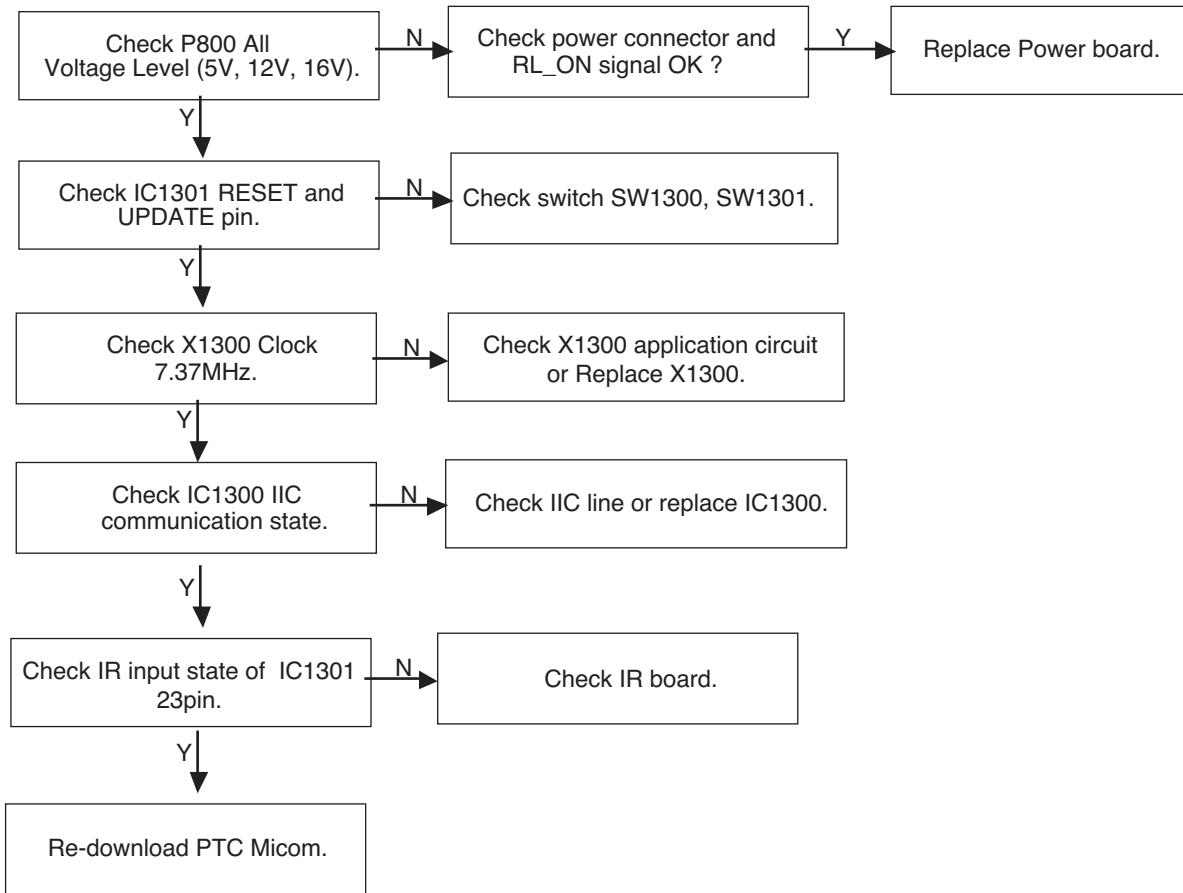
- (1) adjust remote-control
- (2) commercial check jig & adapter
- (3) 11 pin cable
- (4) Phone jack Cable

12. Auto camport test

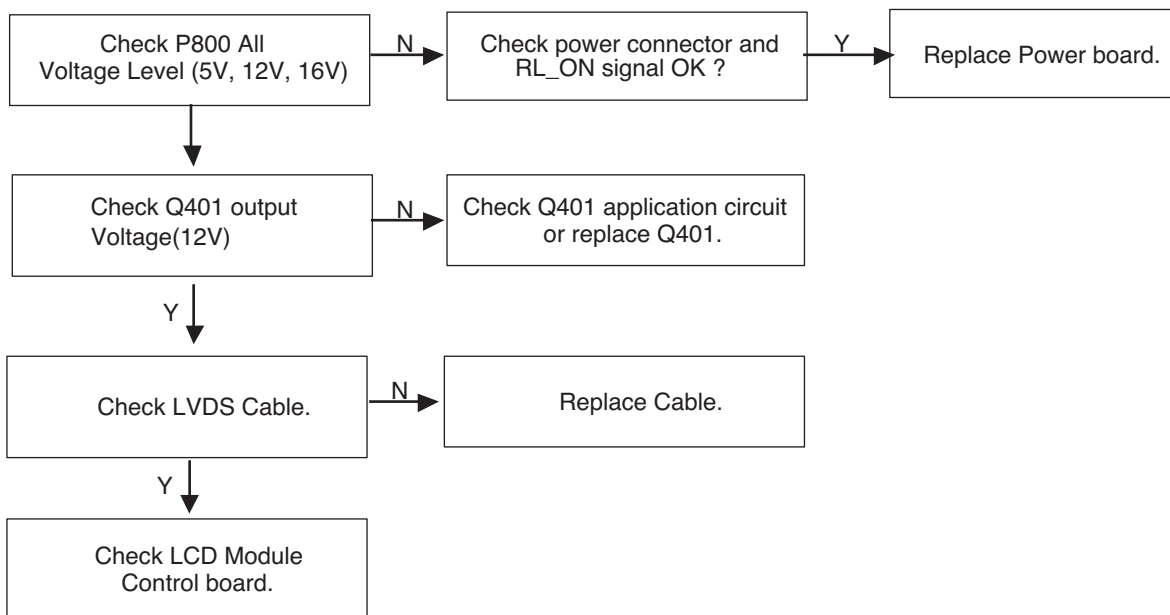
After D-box on, AC power Off and On.
When available AV signal comes to side AV jack, input mode changing to AV2 automatically.

TROUBLE SHOOTING

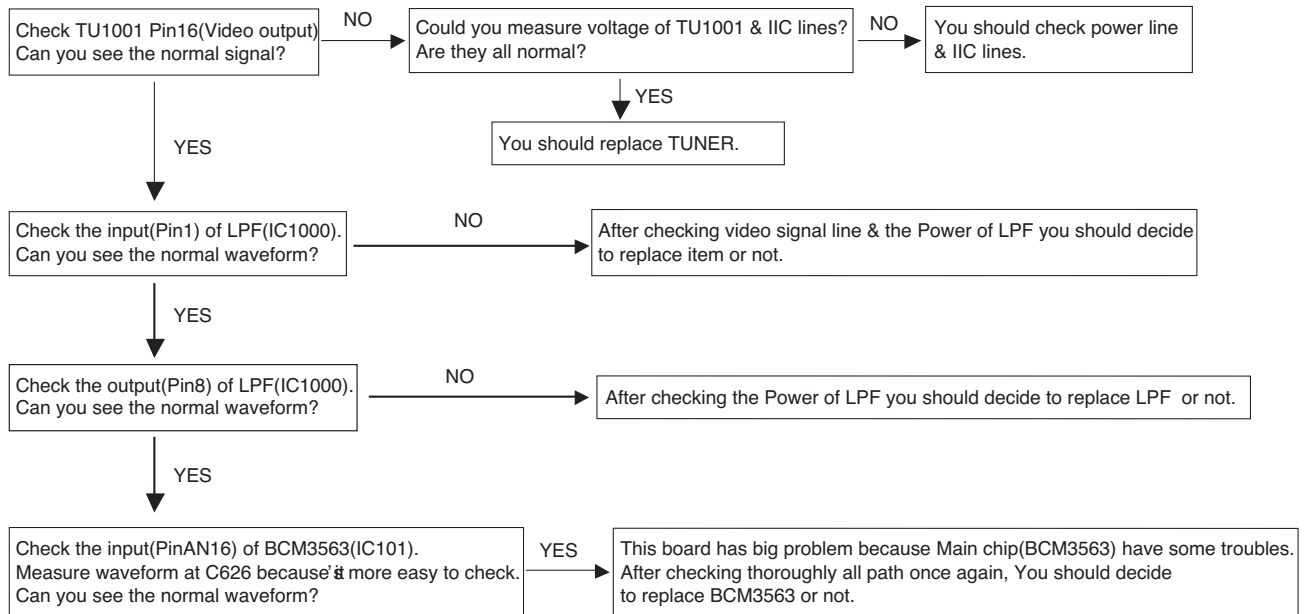
1. Power-Up Boot Fail



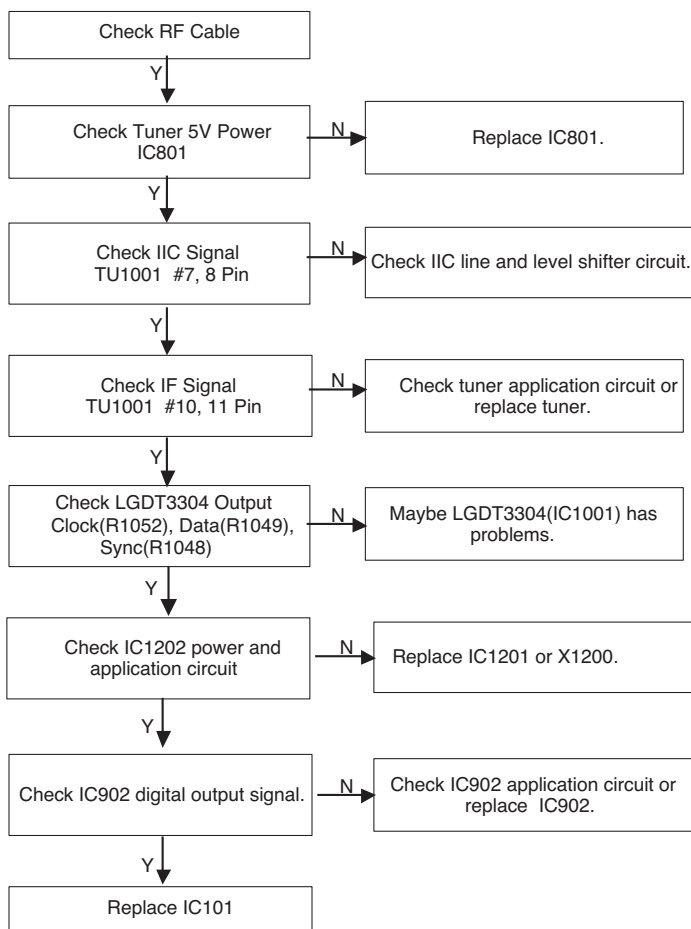
2. No OSD



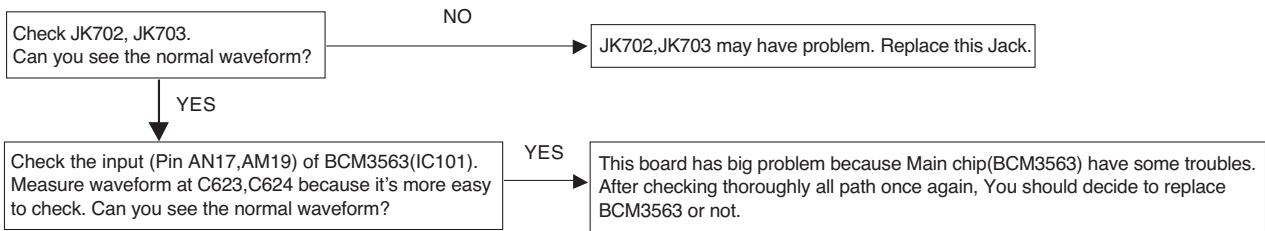
3. Analog RF Video



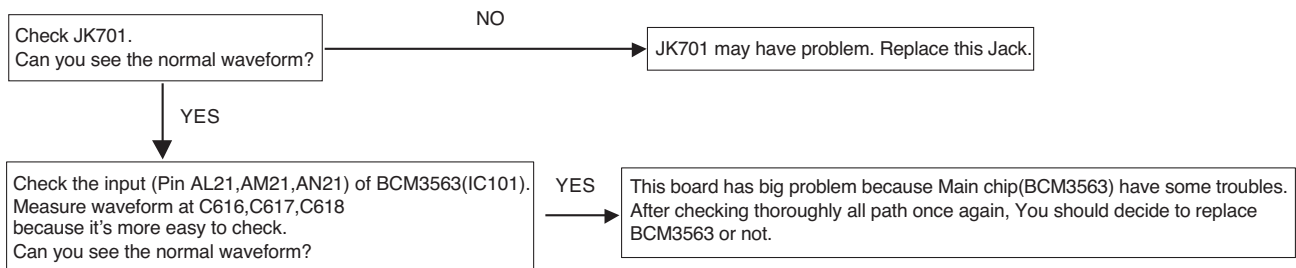
4. Digital RF



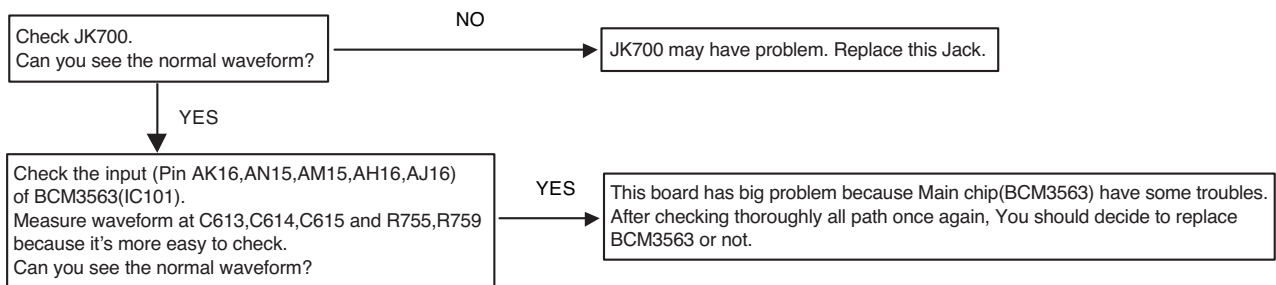
5. AV Video



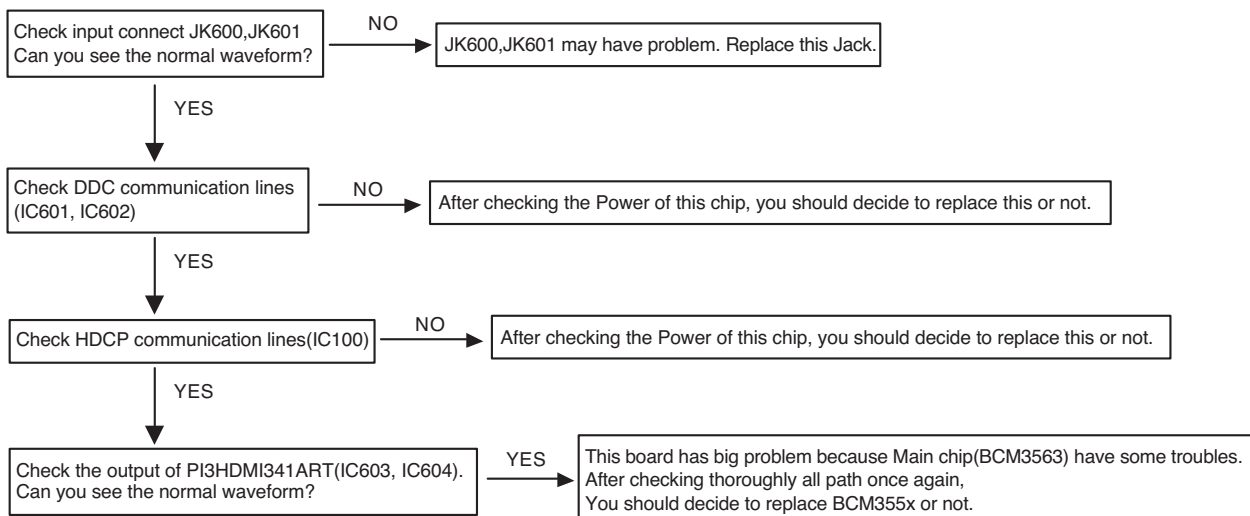
6. Component Video



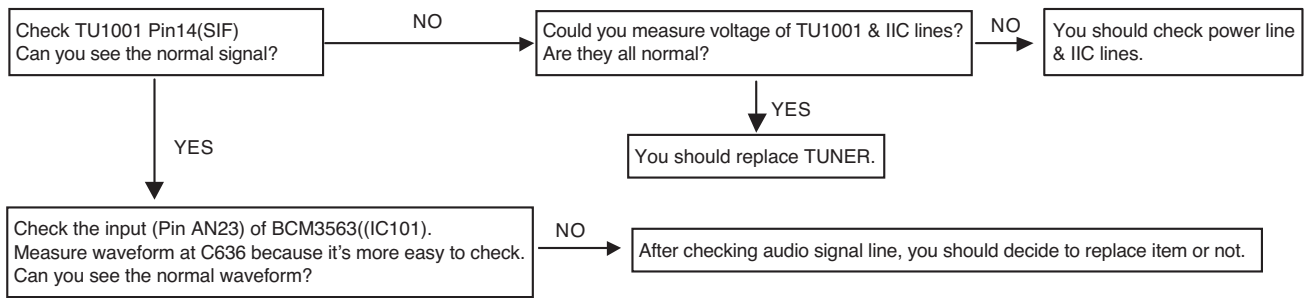
7. RGB-PC Video



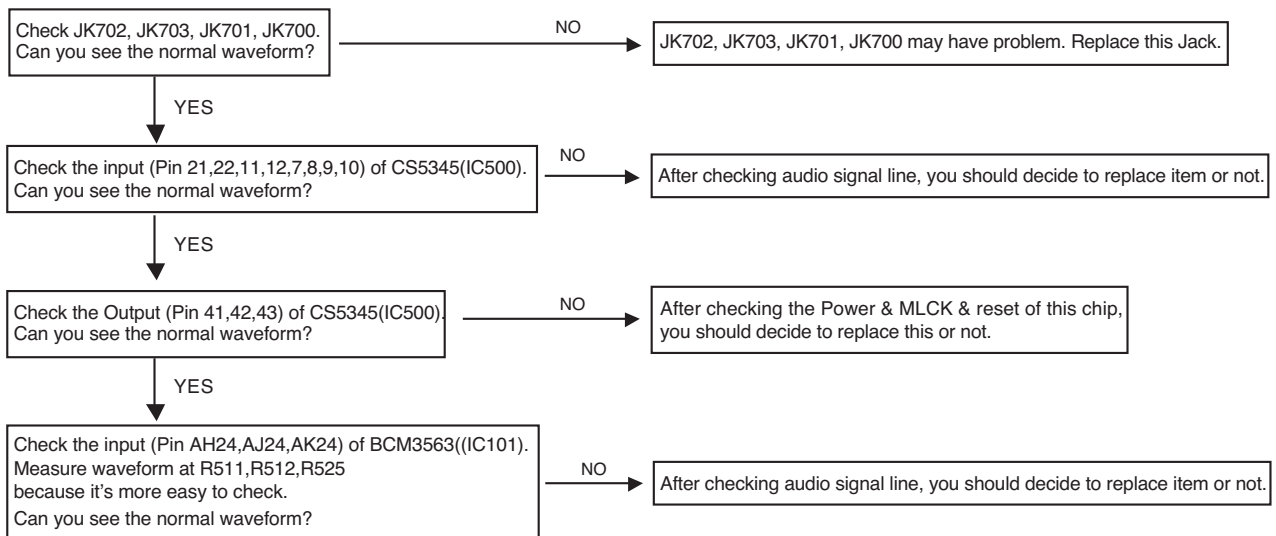
8. HDMI Video



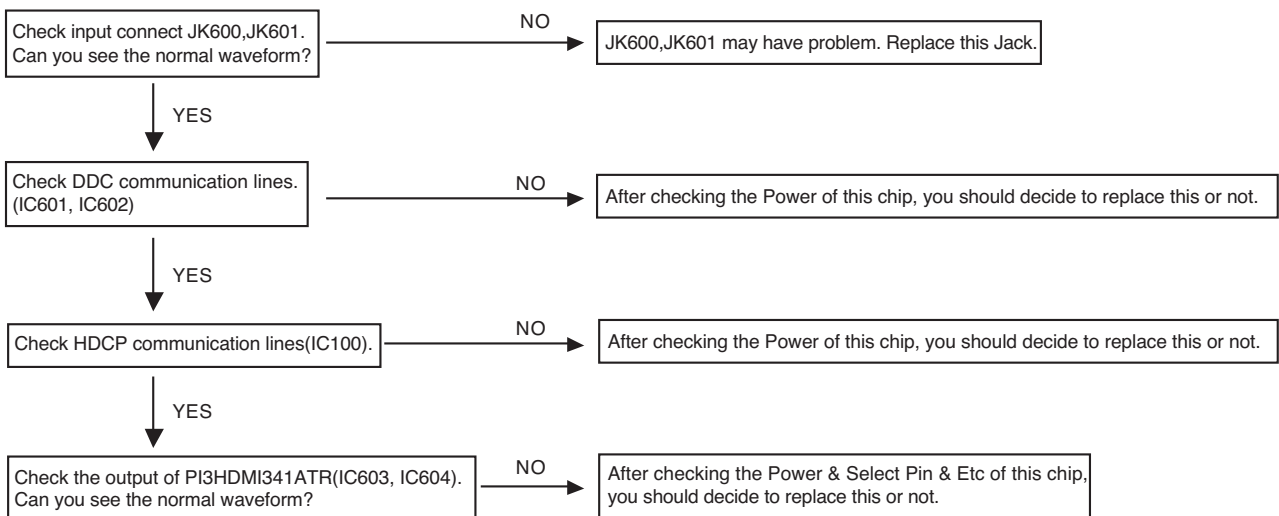
9. Analog RF Audio



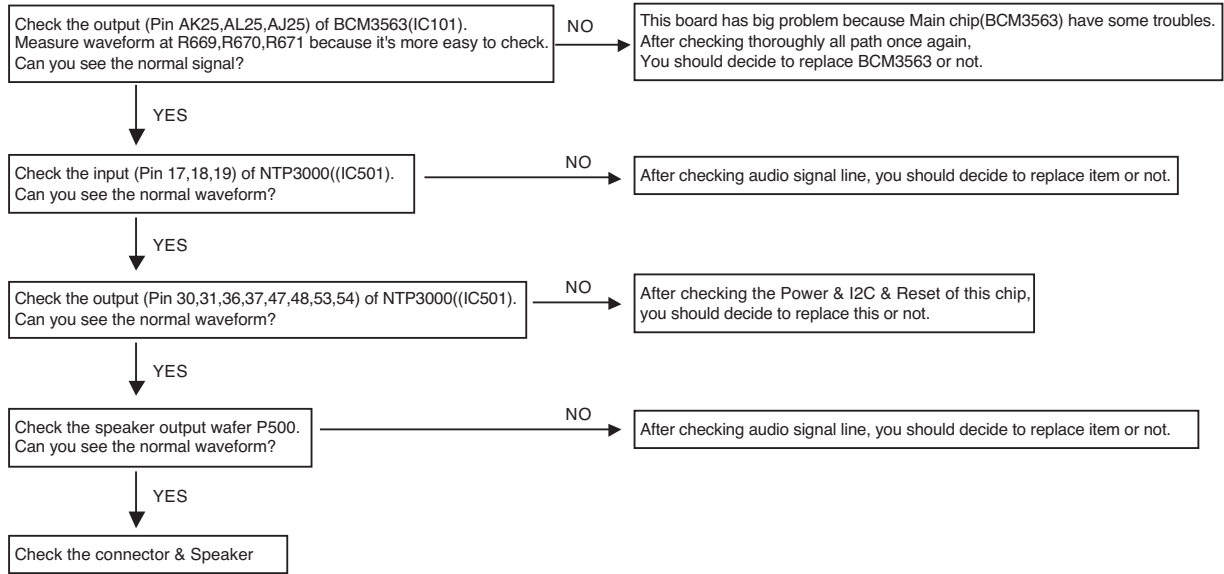
10. AV/ Component/ RGB-PC Audio(in)



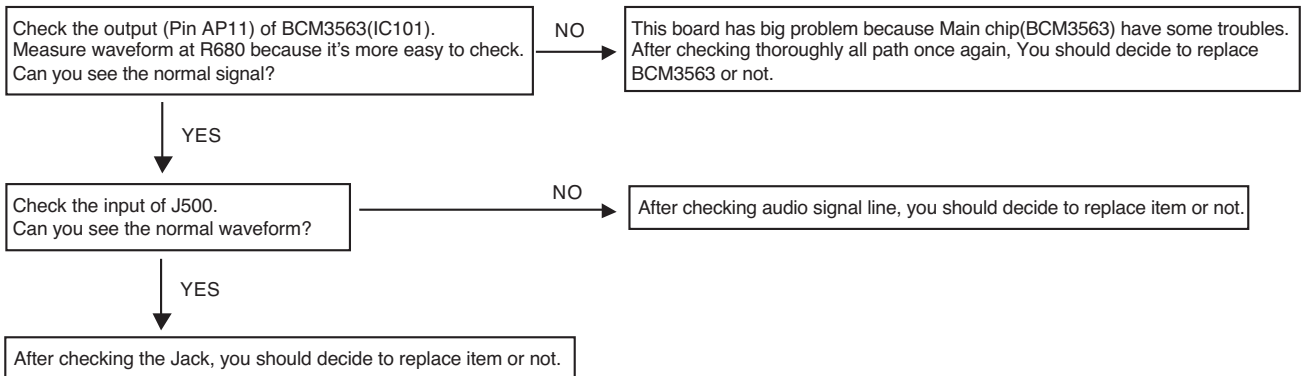
11.HDMI Audio(in)



12. Audio out

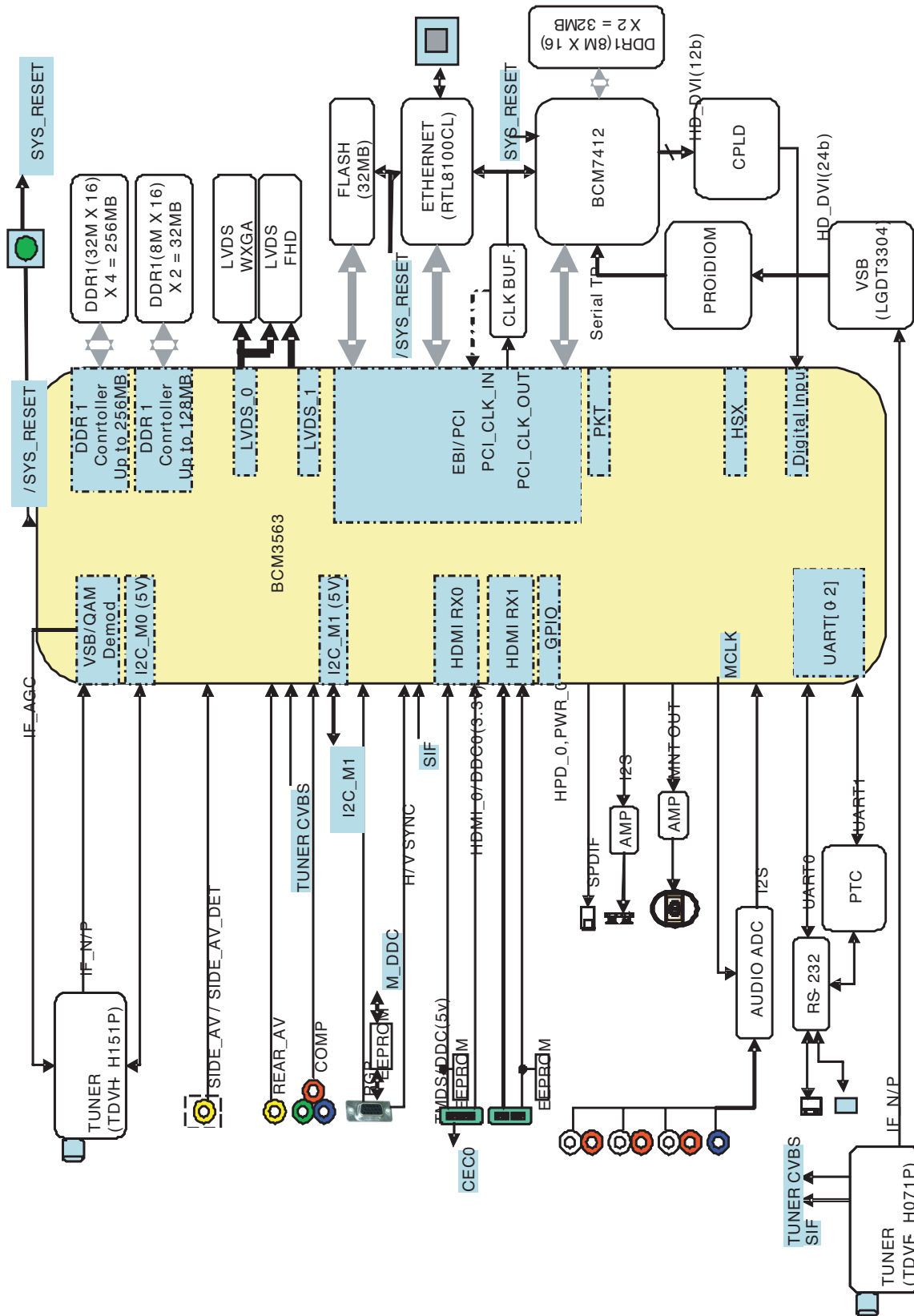


13. SPDIF Audio

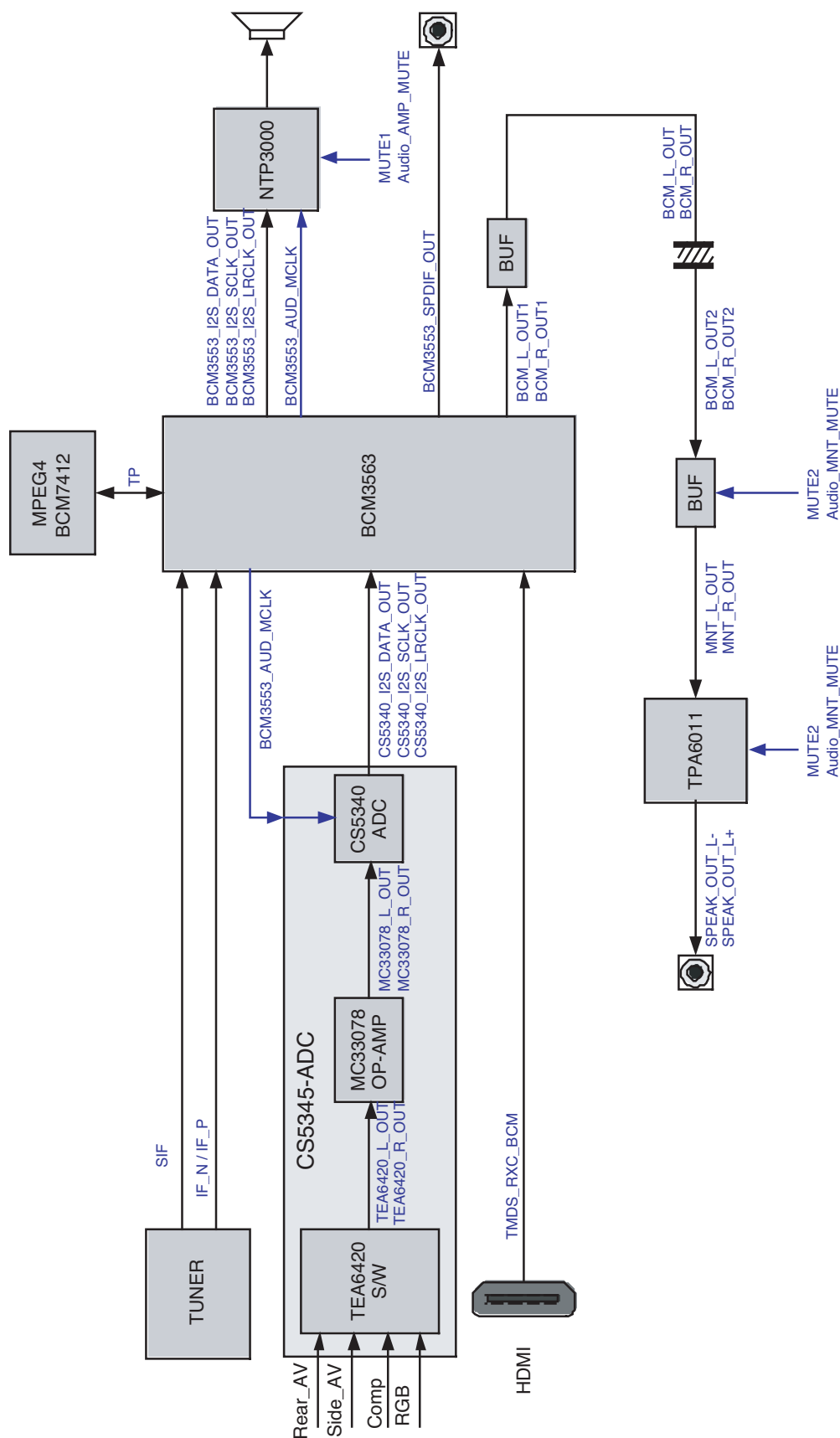


BLOCK DIAGRAM

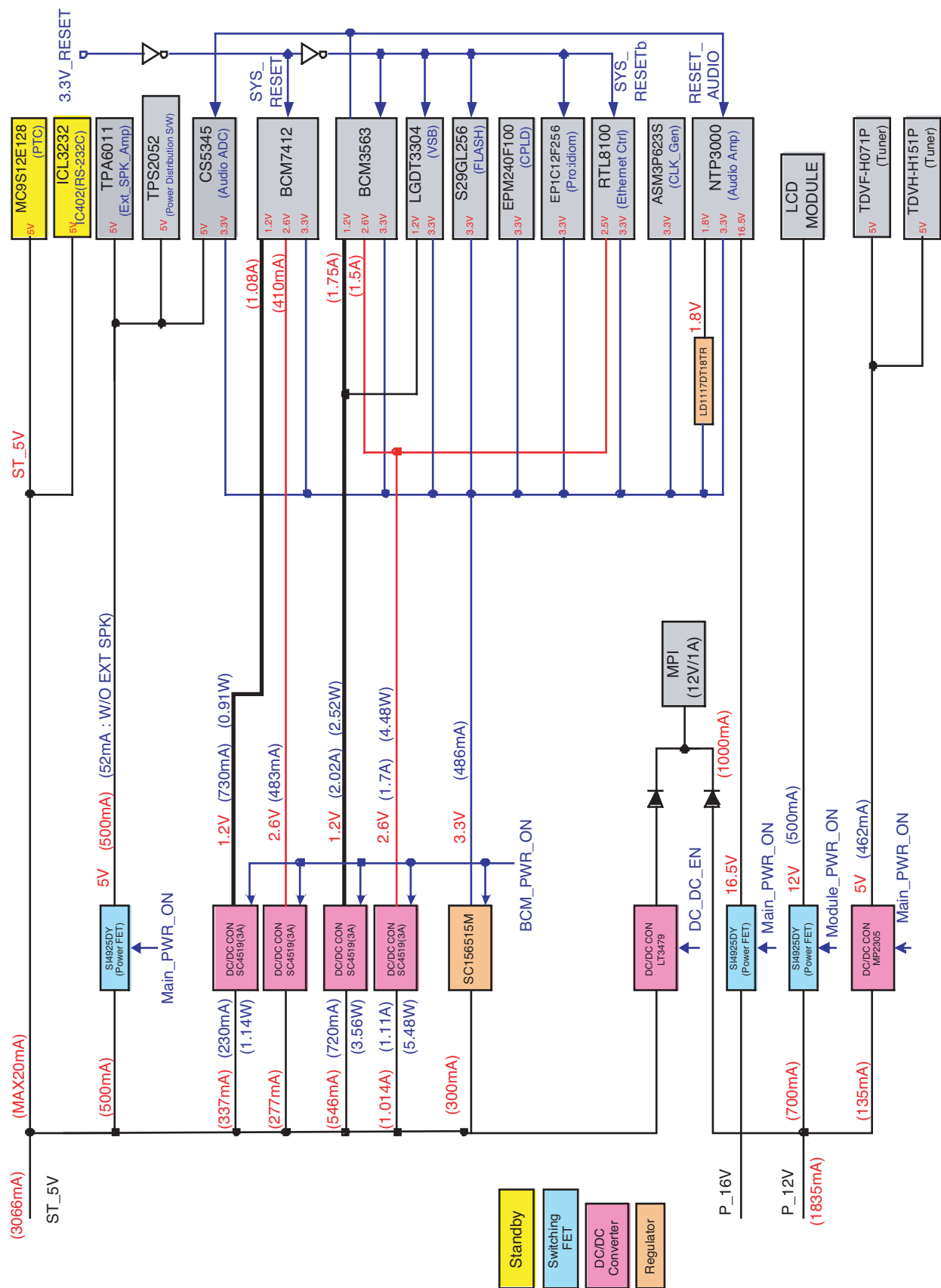
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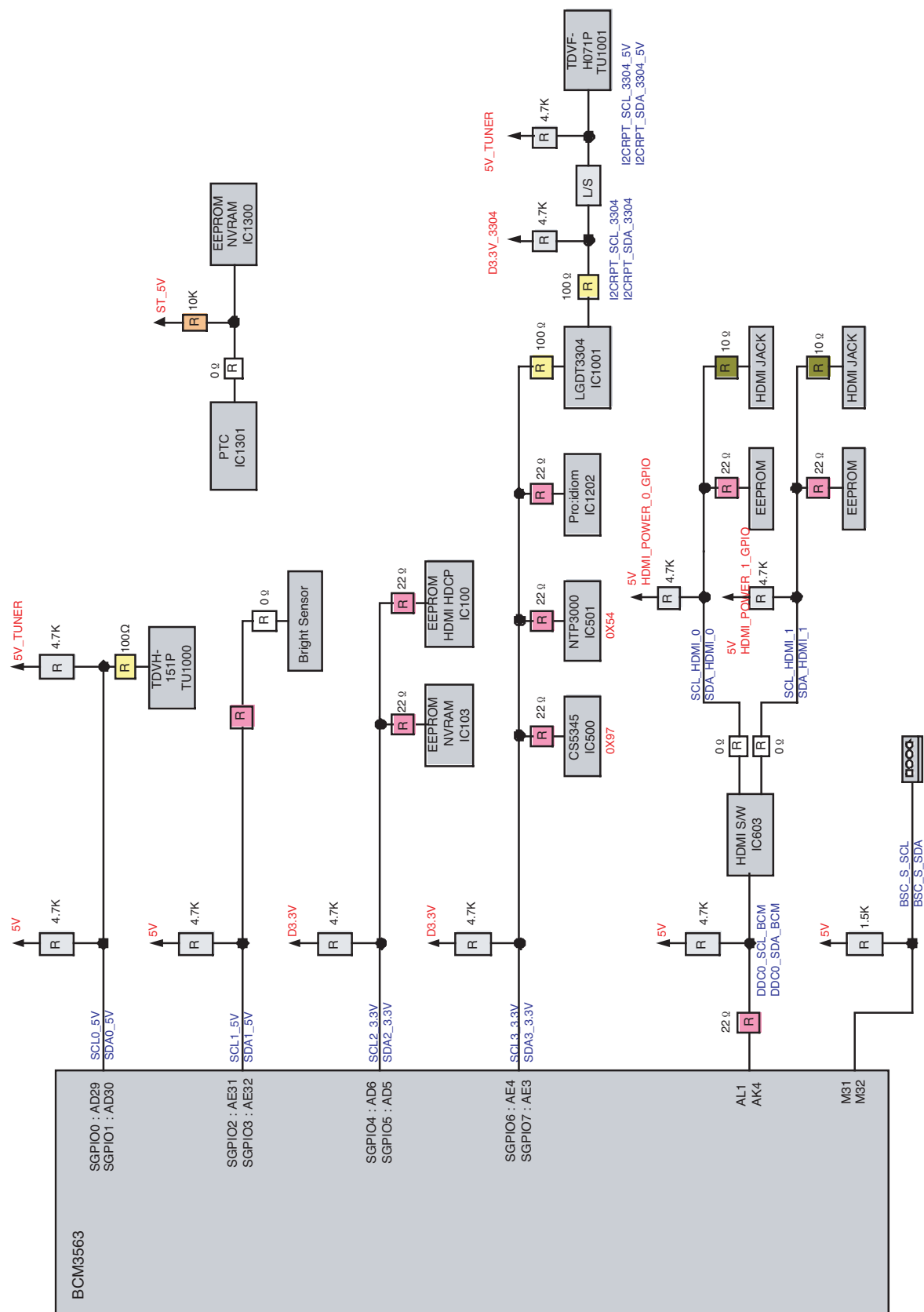
2. AUDIO



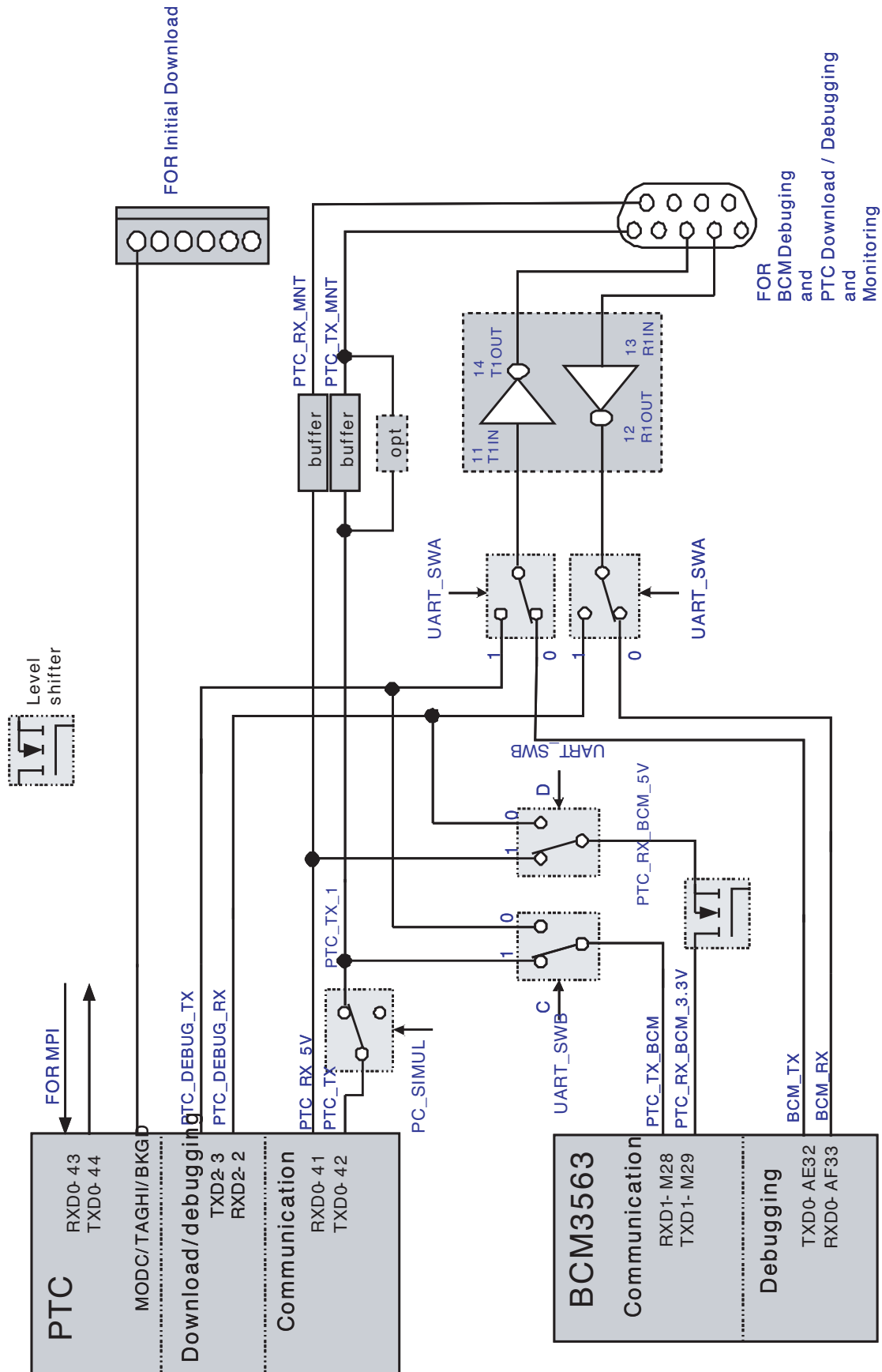
3. POWER



4. IIC



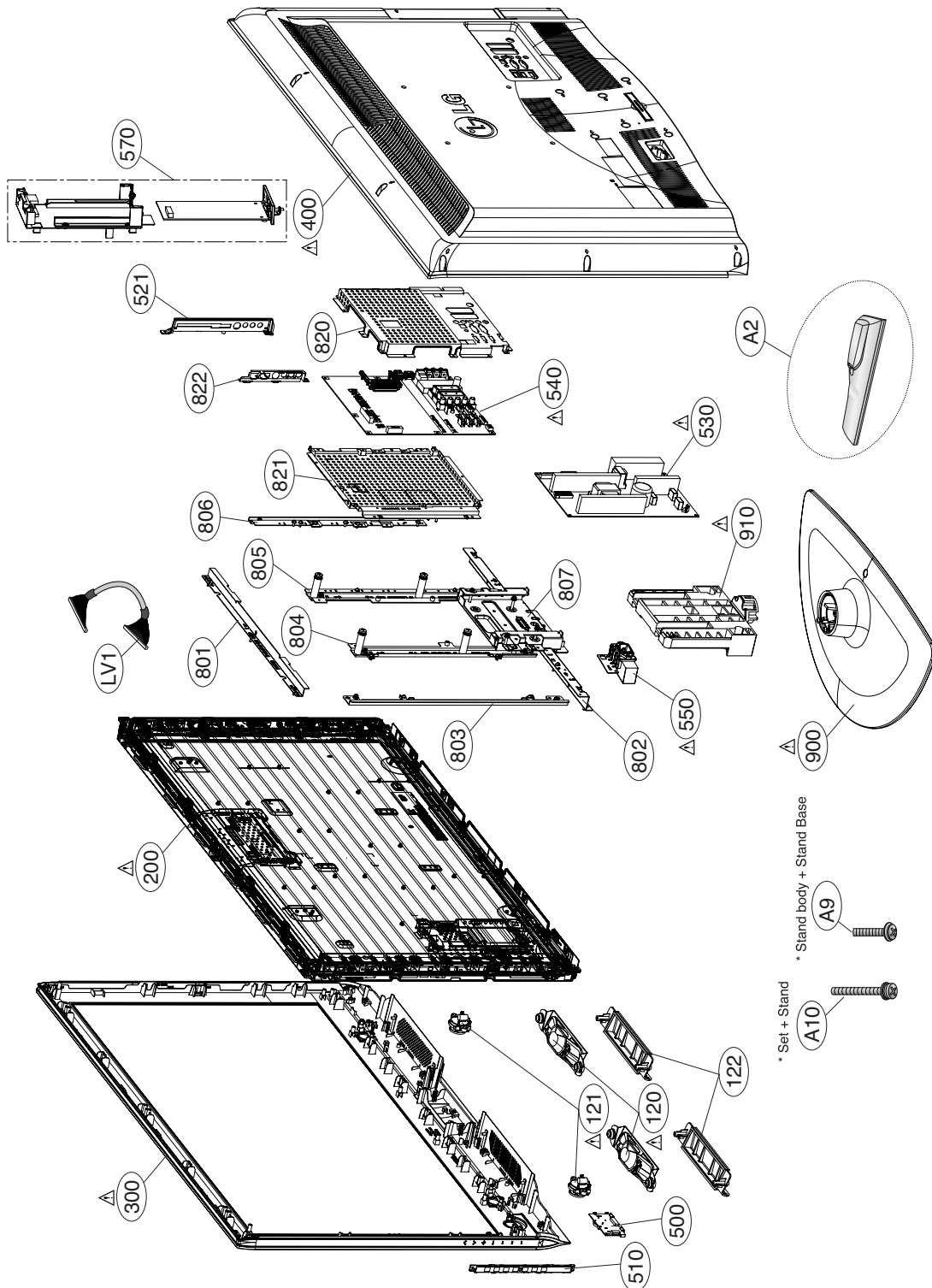
5. UART



EXPLODED VIEW

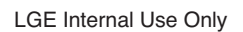
IMPORTANT SAFETY NOTICE

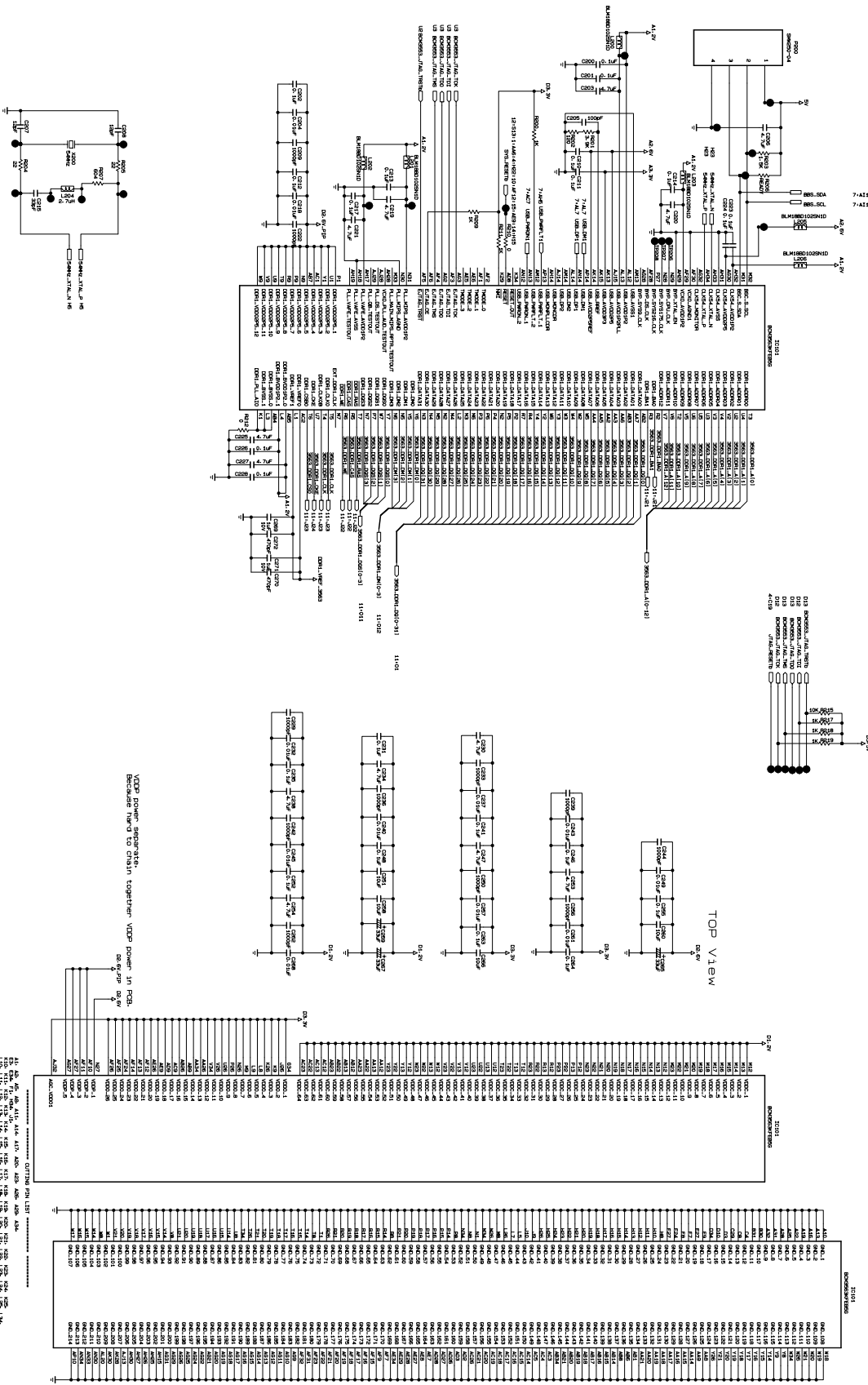
Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by Δ in the Schematic Diagram and EXPLODED VIEW. It is essential that these special safety parts should be replaced with the same components as recommended in this manual to prevent X-RADIATION, Shock, Fire, or other Hazards. Do not modify the original design without permission of manufacturer.



* Stand body + Stand Base
A9

* Set + Stand
A10





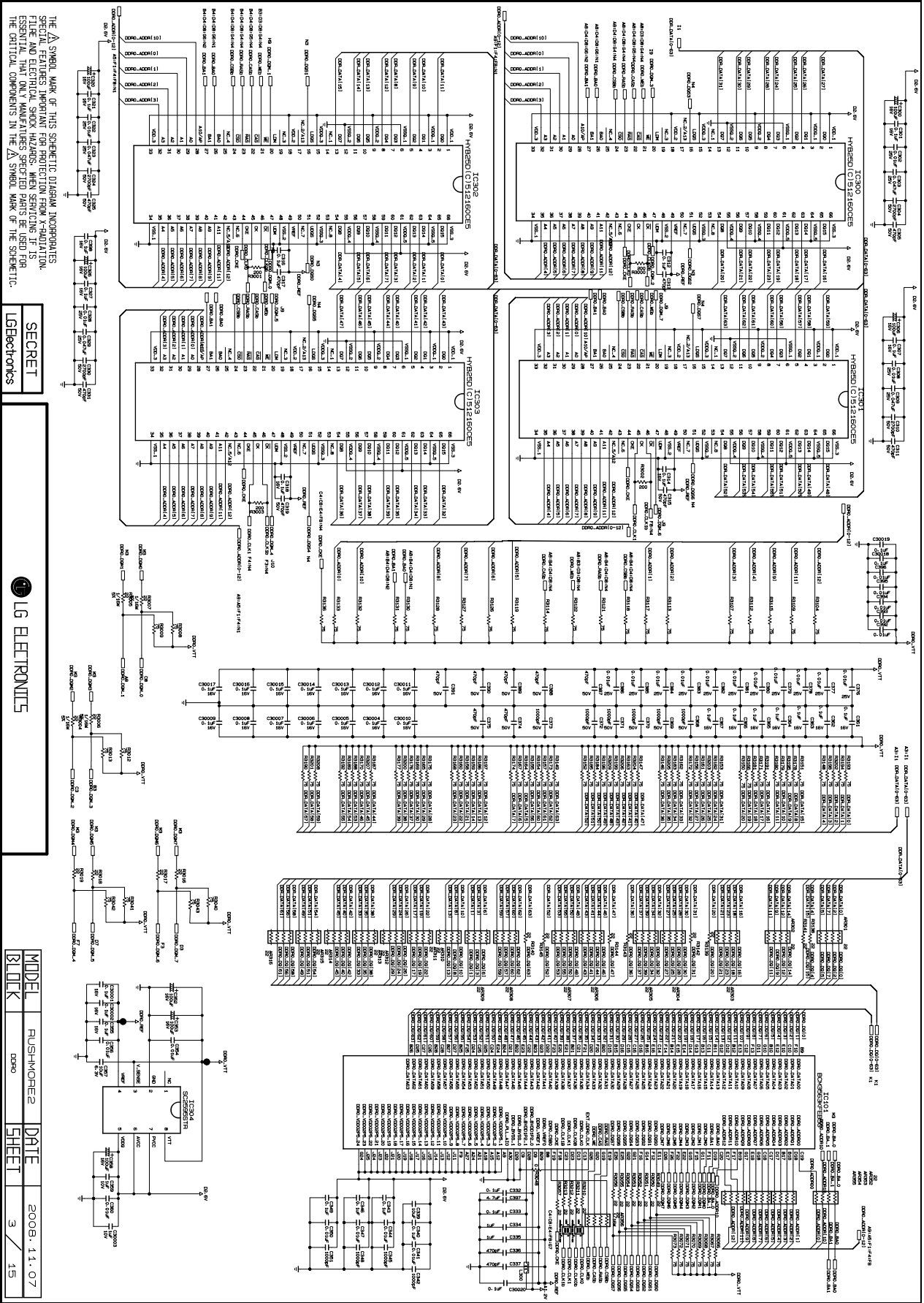
THE Δ SYMBOL MARK OF THIS SPECIFIC DIAGRAM INCORPORATES SPECIFIC FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FLUORESCENT AND ELECTRICAL SHOCK HAZARDS. WHEN SERVING, IT IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE Δ SYMBOL MARK OF THE SPECIFIC.

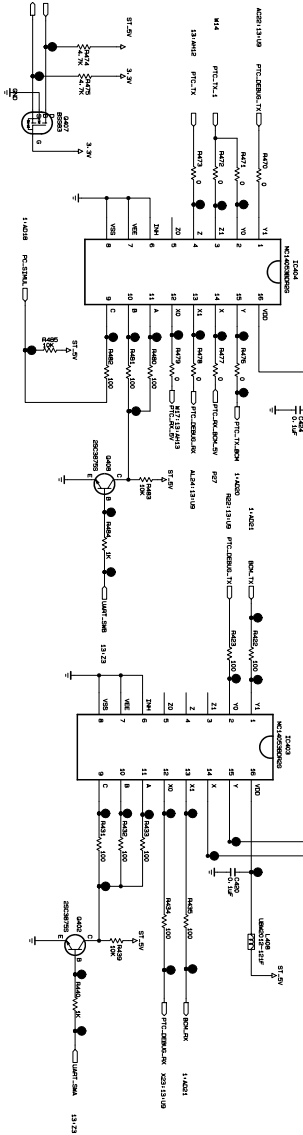
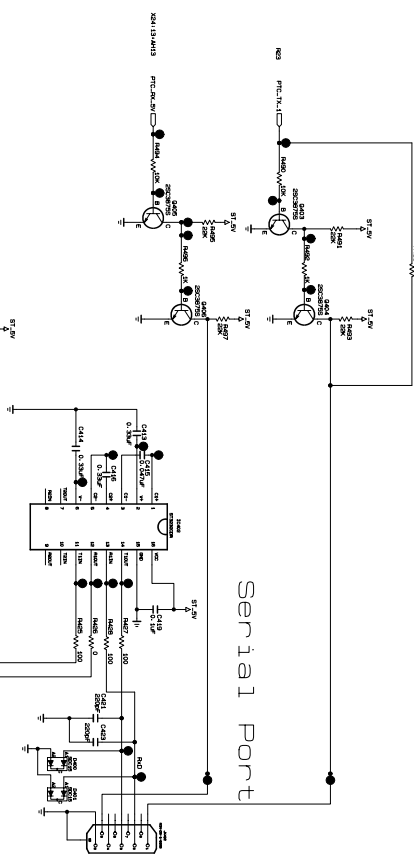
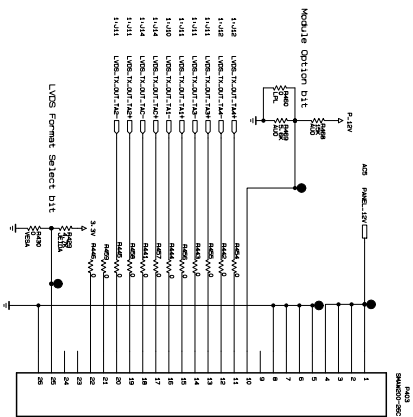
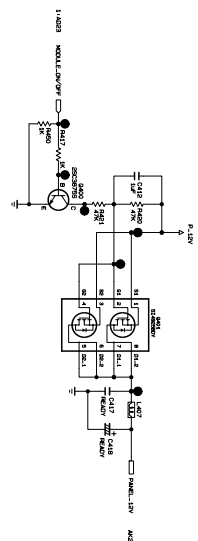
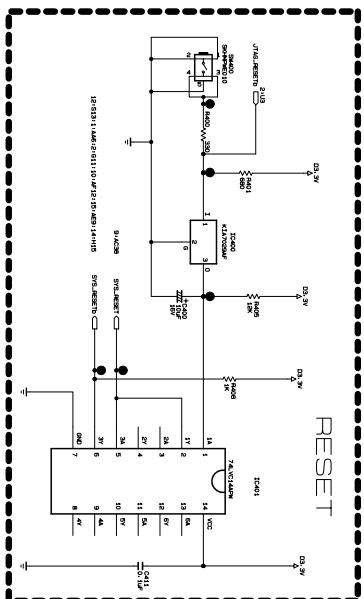
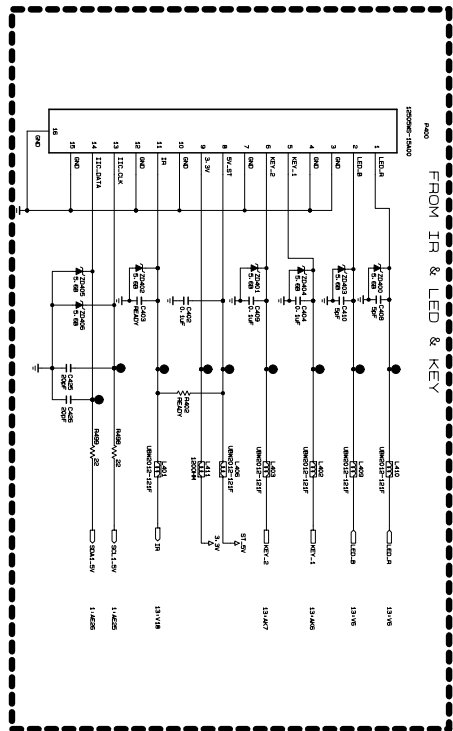
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MODEL	RUSHMORE2	DATE
BOM PO	SHEET	2008.11.07
		2 / 15



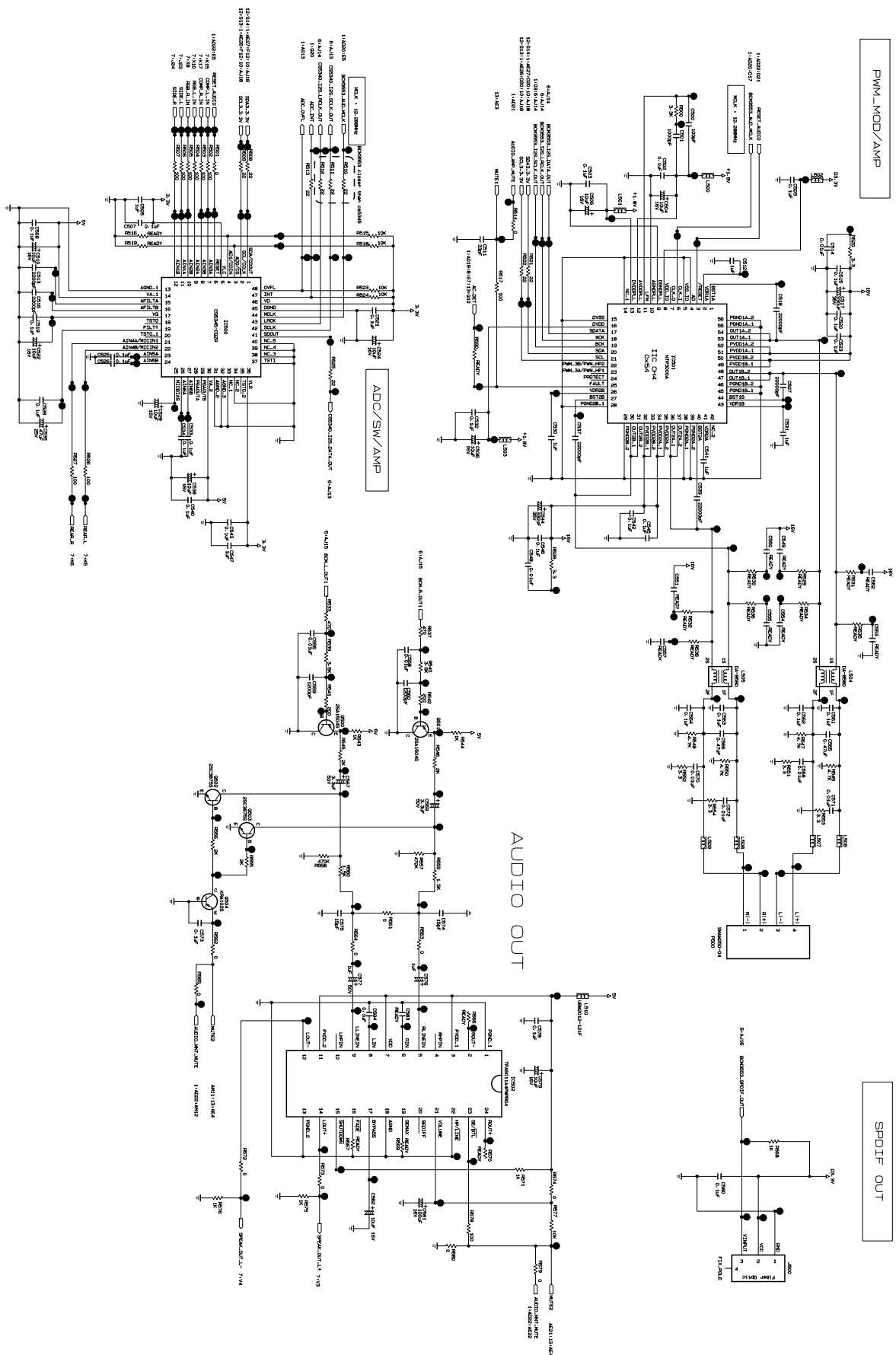


THE Δ SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIFIC FEATURES NECESSARY FOR PROTECTION FROM IMITATION, FLOOD AND ELECTRICAL SHOCK HAZARDS. WHEN SERVING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE Δ SYMBOL MARK OF THE SCHEMATIC.

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MODEL	RUSHMORE2	DATE	2008.11/07
BLOCK	LVDS IR, UART	SHEET	4 / 15

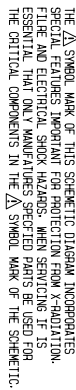


THE Δ SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIFIED FEATURES IMPORTANT FOR PROTECTING FROM X-RADIATION, FLAME AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING, IF IS ESSENTIAL, THAT ONLY MANUFACTURER SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE Δ SYMBOL MARK OF THE SCHEMATIC.

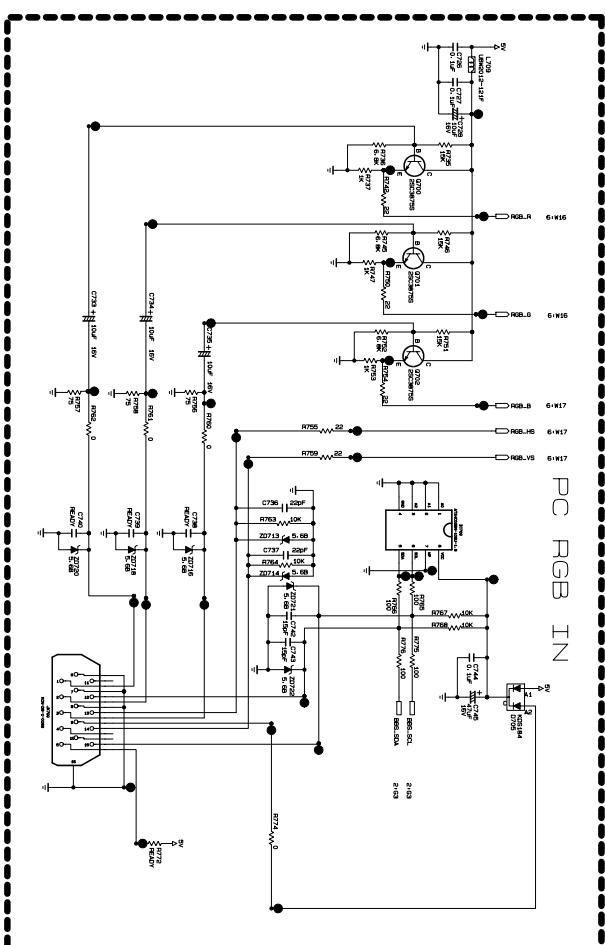
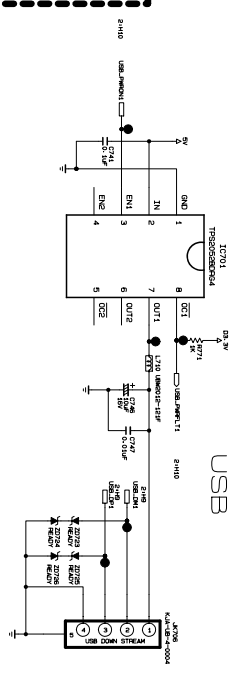
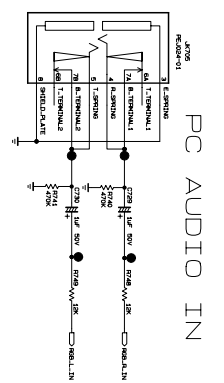
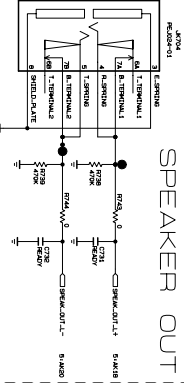
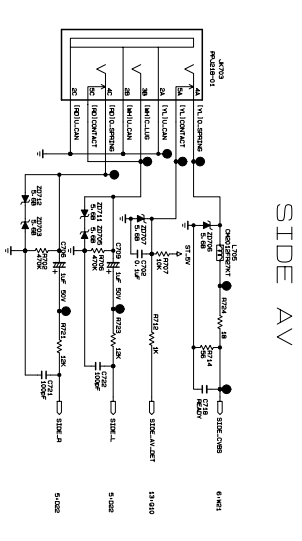
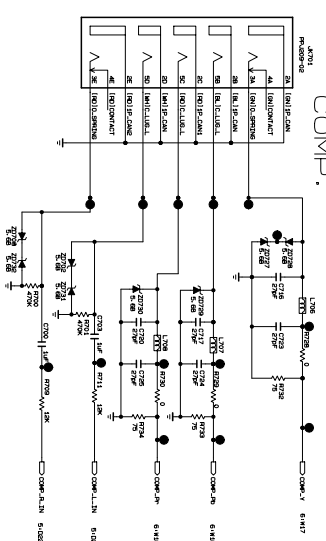
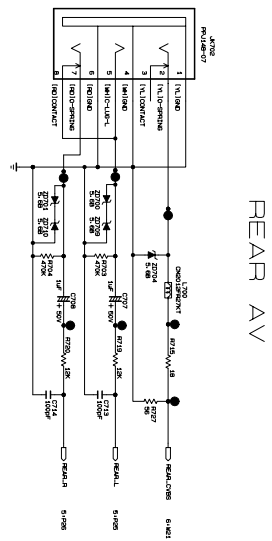
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MODEL	PUSHMORE2	DATE	2008.11.07
BLOCK	AUDIO	SHEET	5 / 15



MODEL	RUSHMORE2	DATE	2008. 11. 07
BLOCK	HOME INPUT	SHEET	6 / 15



SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVING IT IS ESSENTIAL THAT ONLY MANUFACTURER SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE Δ SYMBOL MARK OF THE SCHEMATIC.

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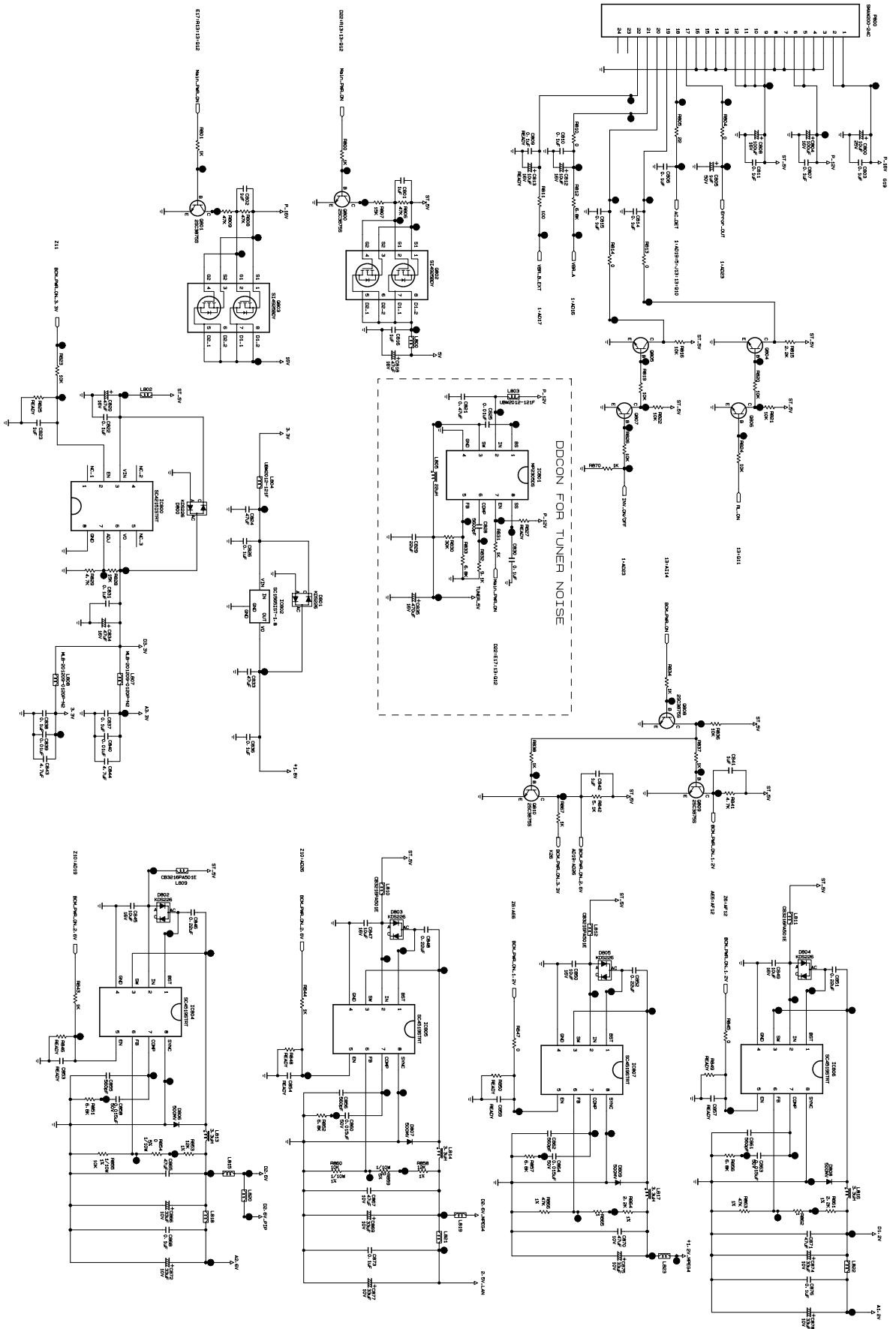
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BL00K	EXT INPUT USB	SHEET
		2008.11.07
		7 / 15

THE Δ SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIFIC FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FLAME AND ELECTRICAL SHOCK HAZARDS. WHEN SERVING, IT IS ESSENTIAL THAT ONLY MANUFACTURERS SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE Δ SYMBOL MARK OF THE SCHEMATIC.

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BLOCK	POWER	SHEET	8 / 15

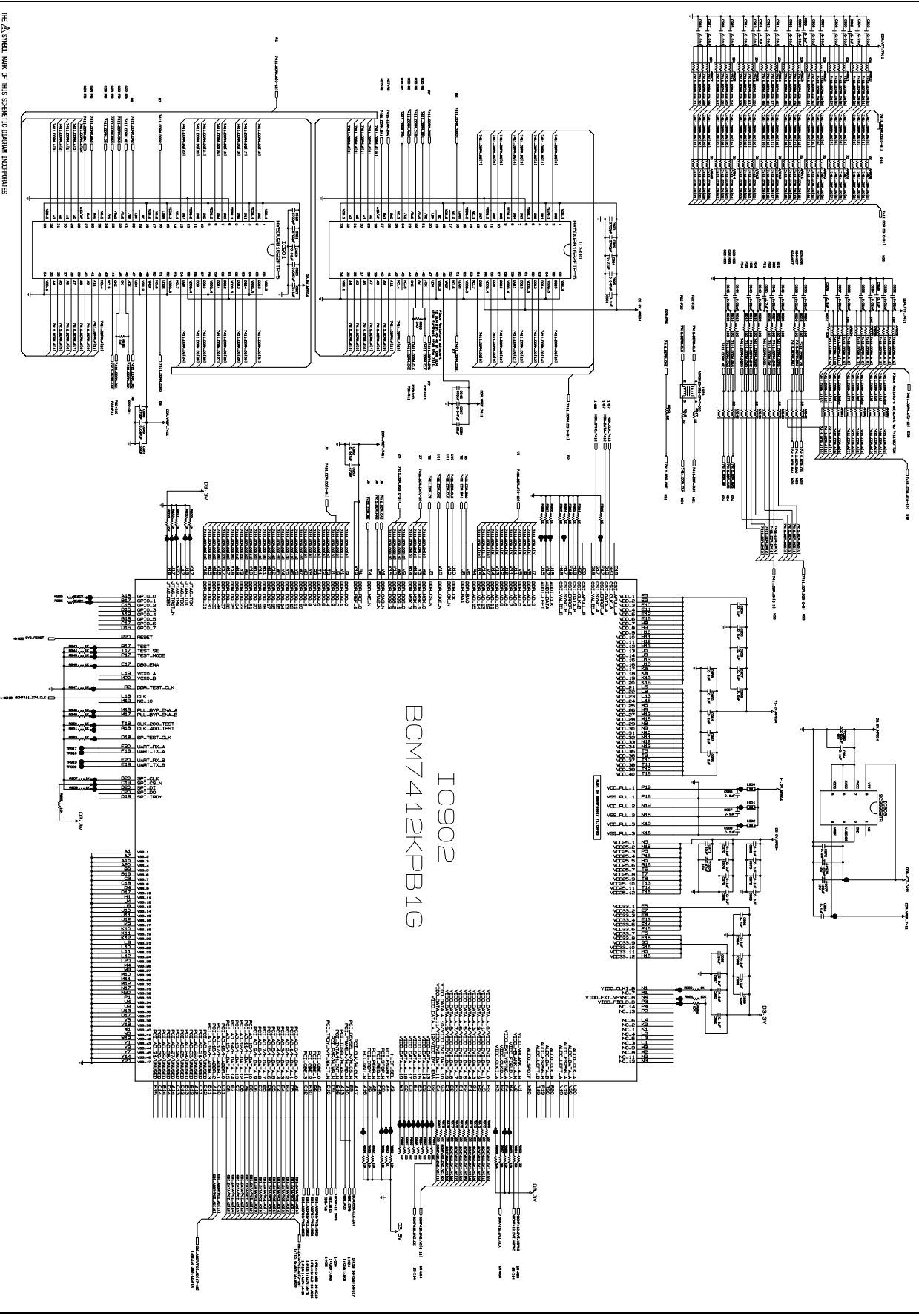


BE A SHARP USER OF THIS SCHEMATIC DIAGRAM. THIS SCHEMATIC DIAGRAM IS A REPRESENTATION OF THE ELECTRICAL CONNECTIONS BETWEEN THE IC AND THE BOARD. IT IS NOT A PHYSICAL REPRESENTATION OF THE BOARD. THE ELECTRICAL CONNECTIONS ARE BASED ON THE SCHEMATIC DIAGRAM OF THE BOARD. THE ELECTRICAL CONNECTIONS ARE BASED ON THE SCHEMATIC DIAGRAM OF THE BOARD.

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MODEL RUSHMORE2 DATE 2008.11.07
BLK MPEGA4 SHEET 9 / 15

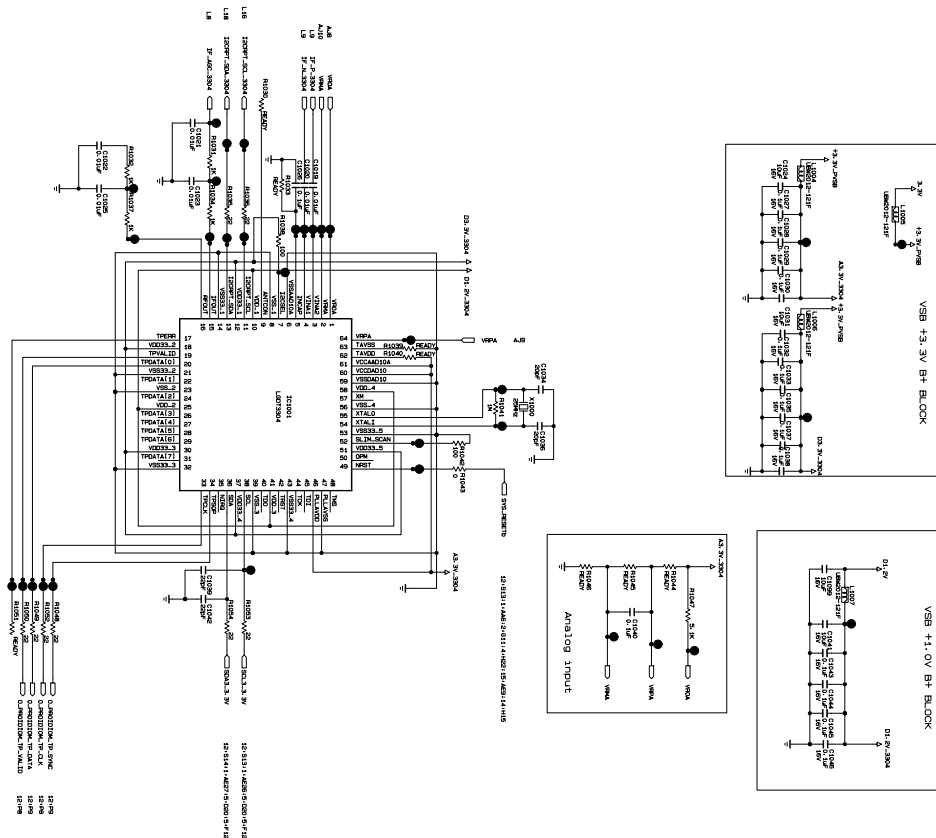
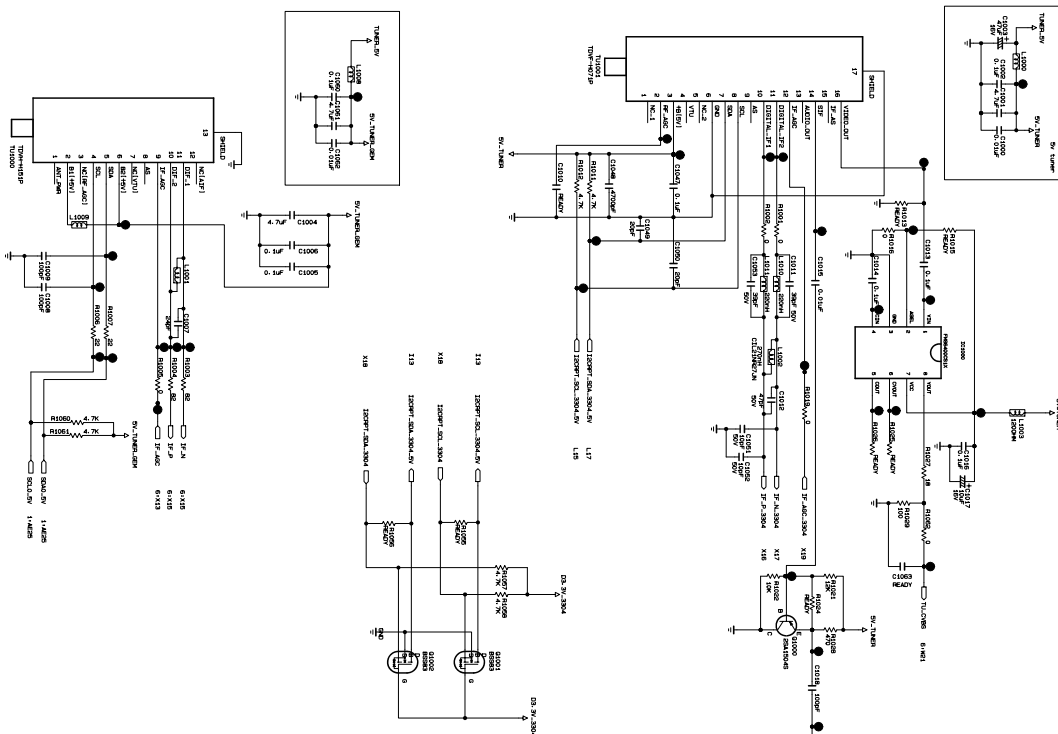


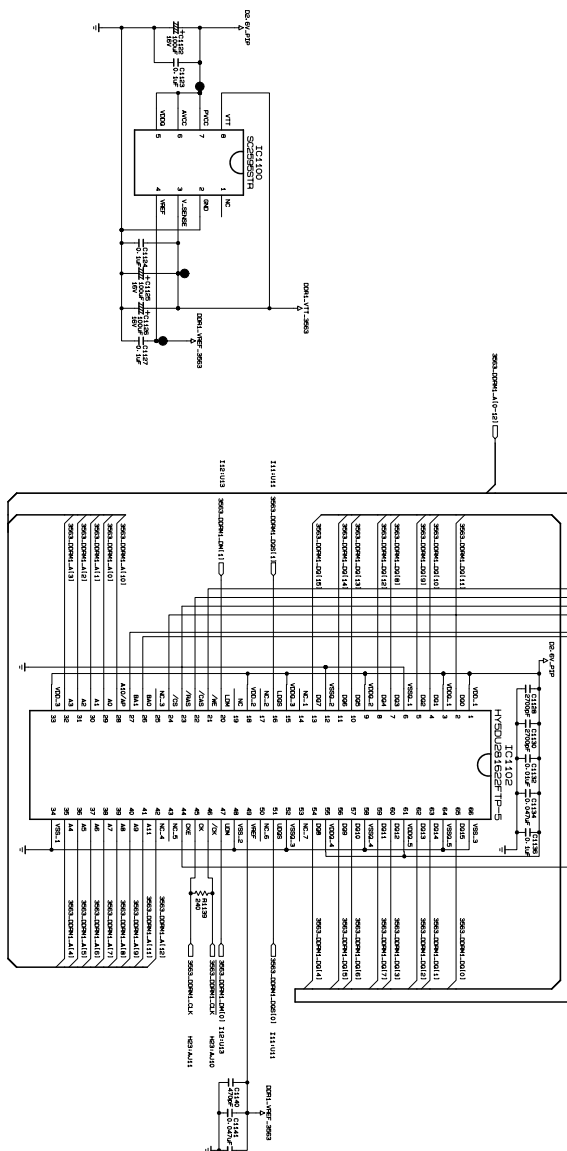
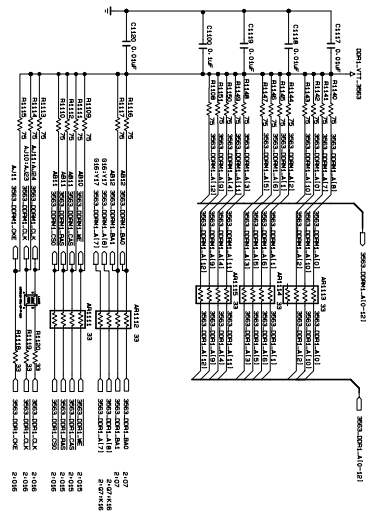
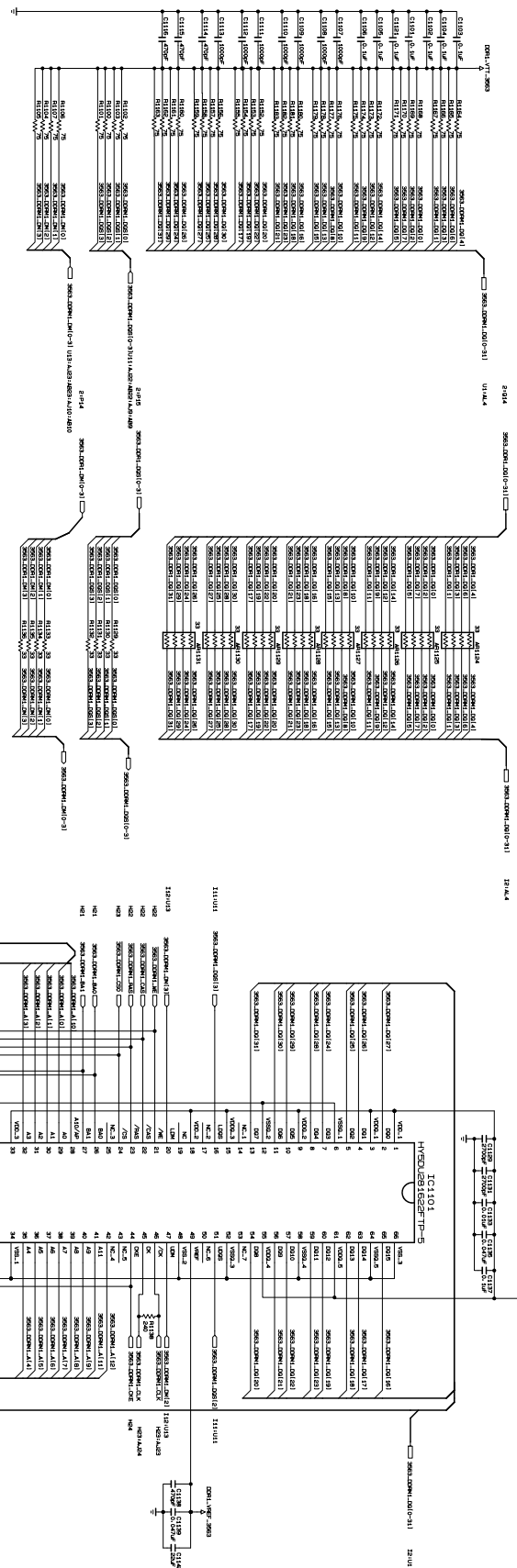
THE Δ SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPARTANT FOR PROTECTION FROM X-RADIATION, FLUKE AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING, IT IS ESSENTIAL THAT ONLY MANUFACTURER SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE Δ SYMBOL MARK OF THE SCHEMATIC.

SECRET

LG ELECTRONICS

MODEL	RUSH-MORE2	DATE	2008.11.07
BLOCK	TUNER - 3304	SHEET	10 / 15





THE Δ SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FILE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE Δ SYMBOL MARK OF THE SCHEMATIC.

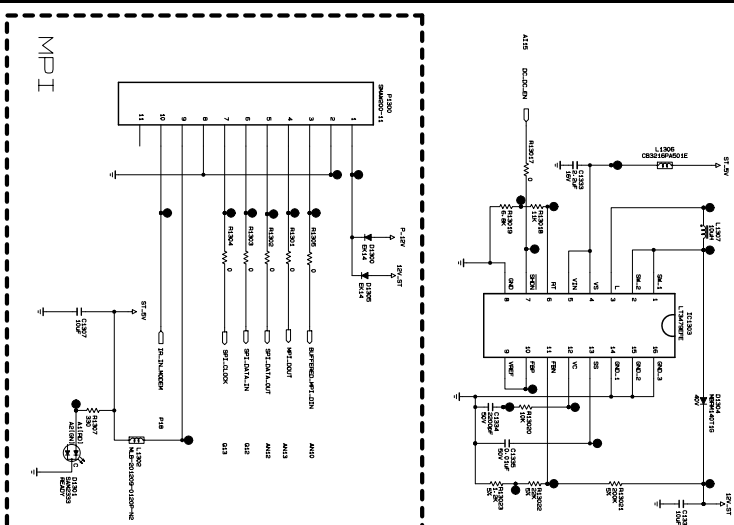
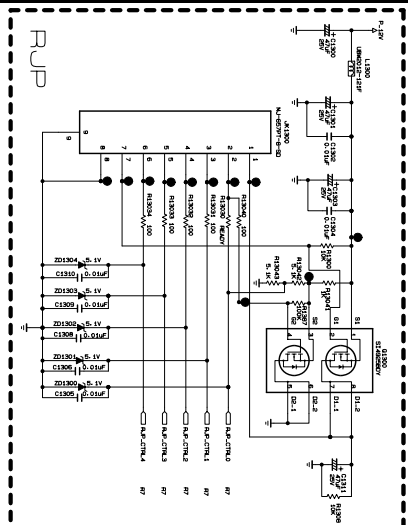
SECRET
LG Electronics



S ELECTRONICS

MODEL	RUSHMORE2	DATE	2008.11.07
BLOCK	DDR 1/F FOR PIP	SHEET	11 / 15

LD1401 - Power (very helpful, you have to keep this)

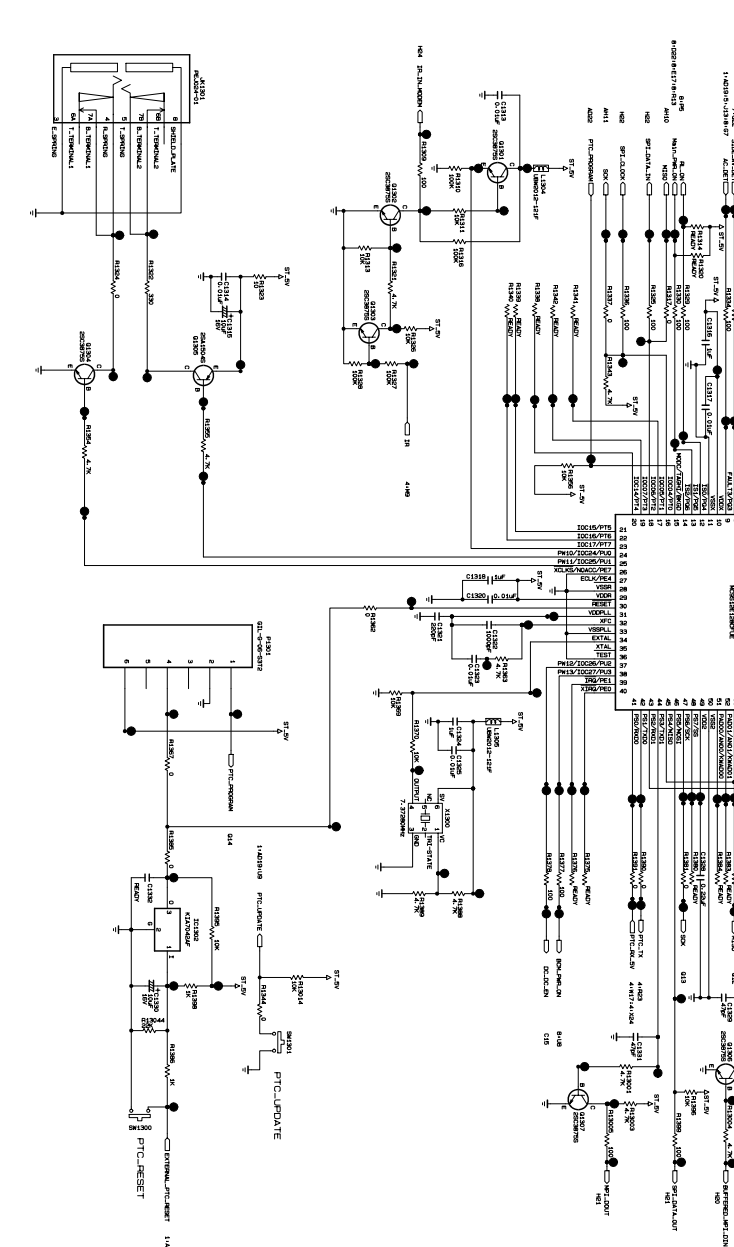
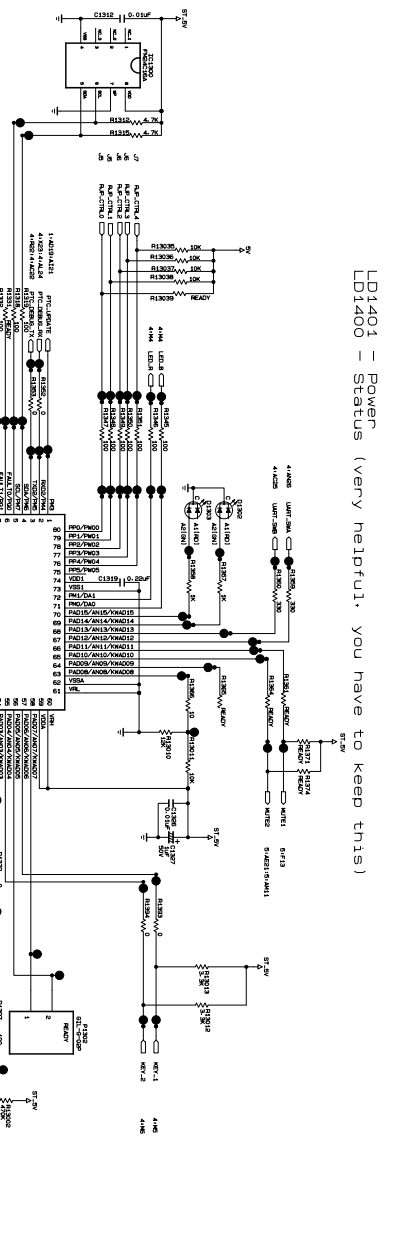


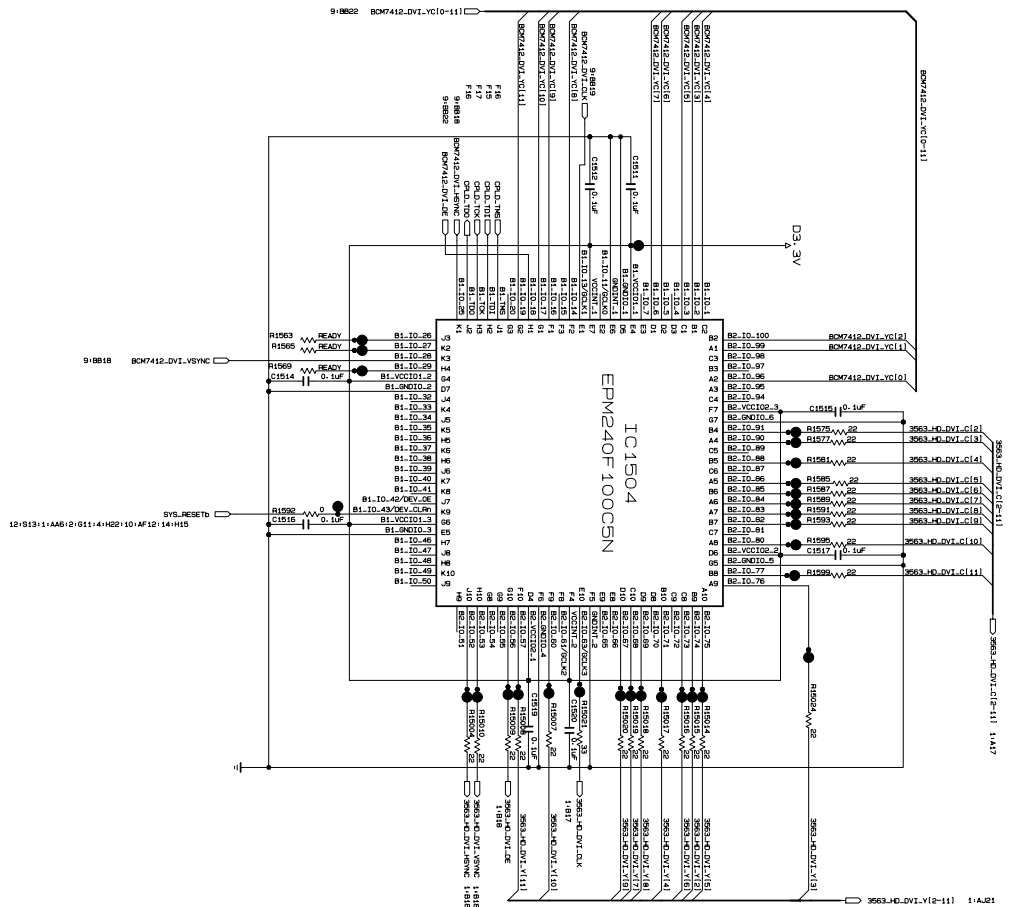
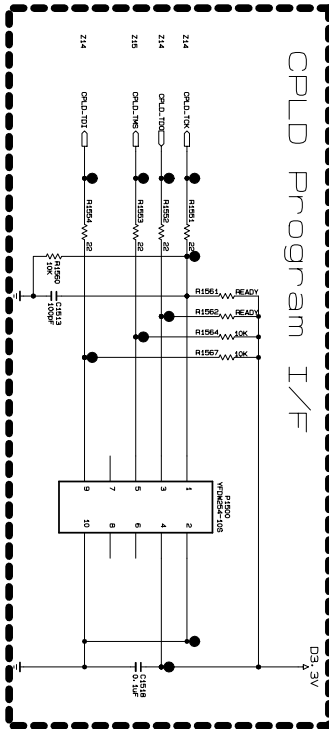
THE Δ SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIFIED PARTS MANUFACTURER'S DESIGNATION AND KILOHM, MEGAHM, AND MICROHM PREFIXES. THE Δ SYMBOL MARK IS ESSENTIAL THAT ONLY MANUFACTURER'S SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE Δ SYMBOL MARK OF THE SCHEMATIC.

SECRET
LGElectronics

LG ELECTRONICS

MODEL	RUSHMORE2	DATE
BLOCK	PTC/MPI/RUP	SHEET
		13 / 15





THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FILTPE AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING IT IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.

SECRET
LGElectronics

 LG ELECTRONICS

MODEL	RUSHMORE2	DATE	2008.11.07
BLOCK	CPLD	SHEET	15 / 15



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