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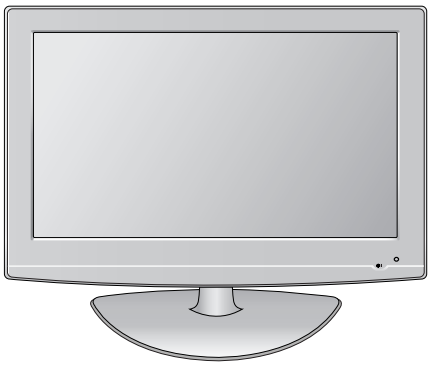
website:http://biz.LGservice.com

LCD TV
SERVICE MANUAL

CHASSIS : LD82D

MODEL : 42LG5500 42LG5500-ZB

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 ⚠ in the Schematic Diagram and Replacement Parts List.
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 it's 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,

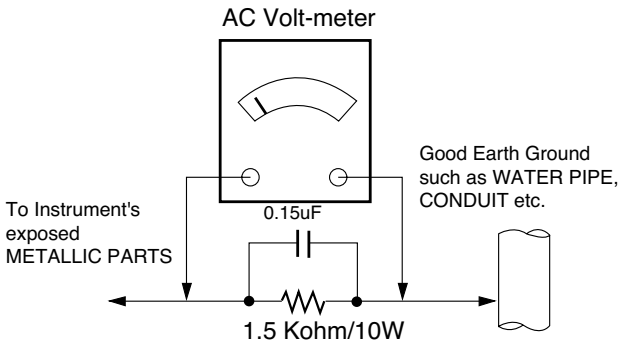
always perform an **AC leakage current check** on the exposed metallic parts of the cabinet, such as antennas, terminals, etc., to be sure the set is safe to operate without damage of electrical shock.

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 1MΩ and 5.2MΩ.
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 is 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



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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)
   CAUTION: This is a flammable mixture.
   Unless specified otherwise in this service manual, lubrication of contacts in not required.
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.

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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.

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SPECIFICATION

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

1. General Specification(TV)

No	Item	Specification	Remark
1.	Video input applicable system	PAL-D/K, B/G, I, SECAM	
2.	Receivable Broadcasting System	1) PAL/SECAM BG 2) PAL/SECAM DK 3) PAL I/I 4) SECAM L/L' 5) DVB-T	EU(PAL Market)
3.	RF Input Channel	VHF : E2 ~ E12 UHF : E21 ~ E69 CATV : S1 ~ S20 HYPER : S21~ S47	PAL
4.	Input Voltage	100 - 240V~ / 50Hz, 60Hz	
5.	Market	France	
6.	Picture Size	42 inch	
7.	Tuning System	FVS 100 program	PAL, 200 PR.(Option)
8.	Operating Environment	1) Temp : 0 ~ 40 deg 2) Humidity : 10~90 %	
9.	Storage Environment	3) Temp : -20 ~ 50 deg 4) Humidity : 10~90 %	
10.	Display	LCD Module	LPL

2. General Specification(LCD Module - LC420WU6-SLA1)

No	Item		Min.	Typ.	Max.	Unit	Remark
1	Display area		930.25 (H) x 523.01 (V)			mm	
2	Outline dimension		983 (W) x 576 (V) x 47.3 (D)			mm	
3	Number of Pixels		1920 (H) x 1080 (V)				1Pixel=3RGB Cells
4	Cell pitch		484.5um (H) x 484.5um (V)			μm	Standard : G cell
5	Color arrangement		RGB stripe arrangement				
6	Coating		Hard coating(3H), Anti-glare				
7	Operating Environment	Temperature	0 ~ 50			deg	Altitude - 0 to 1400feet
		Humidity	10 ~ 90			%	
8	Storage Environment	Temperature	-20 ~60			deg	Altitude - 0 to 4000feet
		Humidity	10 ~ 90			%	
9	Back Light		18 EEFL				

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3. Optical Feature(LCD Module)

No	Item	Specification		Min.	Typ.	Max.	Remark
1	Viewing Angle [CR>10]	R/L, U/D			178, 178		
2	Luminance	Luminance(cd/m^2)		400	500		
		Variation				1.3	MAX/ MIN
3	Contrast Ratio	CR(42")		700	1000		-Full white(100IRE) - Full black(0IRE) - Picture : Vivid(Cool) - Input : TV/DTV/AV1,2,3/Comp/ HDMI1,2,3 - CR without PWM-Dimming
		CRD (With AI)(42")		-	-		RGB/HDMI-PC -CR with PWM-Dimming
4	CIE Color Coordinates	White	Wx	-0.03	0.27	+0.03	- 85 IRE Full white pattern (216 gray) - Picture : Dynamic(Cool)
			Wy	-0.03	0.292	+0.03	
		Red	Xr	-0.03	0.640	+0.03	
			Yr	-0.03	0.343	+0.03	
		Green	Xg	-0.03	0.287	+0.03	
			Yg	-0.03	0.613	+0.03	
		Blue	Xb	-0.03	0.144	+0.03	
			Yb	-0.03	0.065	+0.03	

4. Model Specification

Item	Specification	Remark
Market	France	
Broadcasting system	PAL BG/I/DK, SECAM L/L', DVB-T	
Receiving system	Analog : Upper Heterodyne Digital : COFDM	
Scart Jack (2EA)	PAL, SECAM	
Video Input RCA(1EA)	PAL, SECAM, NTSC	4 System : PAL, SECAM, NTSC, PAL60
S-Video Input (1EA)	PAL, SECAM, NTSC	4 System : PAL, SECAM, NTSC, PAL60
Component Input(1EA)	Y/Cb/Cr, Y/ Pb/Pr	
RGB PC Input(1EA)	RGB-PC	Analog (D-SUB 15PIN)
HDMI Input(3EA)	HDMI1(DTV)/DVI, HDMI2/3(DTV)	HDMI ver 1.3, (Simplink HDMI1/2 Only)
Audio Input(3EA)	RGB/DVI Audio, Component, AV	L/R Input
SPDIF out(1EA)	SPDIF out	

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5. Component Video Input (Y, P_B, P_R)

No	Specification				Proposed
	Resolution	H-freq(kHz)	V-freq(Hz)		
1	720x480	15.73	59.94	SDTV, DVD 480i	
2	720x480	15.75	60	SDTV, DVD 480i	
3	720x480	31.47	59.94	SDTV 480p	
4	720X480	31.5	60	SDTV 480p	
5	720x576	15.625	50	SDTV, DVD 576i	
6	720x576	31.25	50	SDTV 576p	
7	1280x720	44.96	59.94	HDTV 720p	
8	1280x720	45	60	HDTV 720p	
9	1280x720	37.5	50	HDTV 720p	
10	1920x1080	28.125	50	HDTV 1080i	
11	1920x1080	33.75	60	HDTV 1080i	
12	1920x1080	33.72	59.94	HDTV 1080i	
13	1920x1080	27	24	HDTV 1080p	37/42LG5500 ONLY
14	1920x1080	33.75	30	HDTV 1080p	37/42LG5500 ONLY
15	1920x1080	56.25	50	HDTV 1080p	37/42LG5500 ONLY
16	1920x1080	67.433	59.94	HDTV 1080p	37/42LG5500 ONLY
17	1920x1080	67.5	60	HDTV 1080p	37/42LG5500 ONLY

6. RGB PC INPUT Mode Table

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed
1.	720x400	31.468	70.08	28.321	
2.	640x480	31.469	59.94	25.17	VESA
		37.500	75.00	31.50	
3.	800x600	37.879	60.31	40.00	VESA
		46.875	75.00	49.50	
4.	832x624	49.725	74.55	57.283	
5.	1024x768	48.363	60.00	65.00	VESA(XGA)
		56.476	70.00	75.00	
		60.023	75.03	78.75	
6.	1280x768	47.693	59.99	80.125	VESA(WXGA)
7.	1360x768	47.649	59.94	84.625	VESA(WXGA)
8.	1366x768	47.649	59.94	84.625	Supported
9.	1280x1024	63.595	60.00	108.875	SXGA (37/42LG5500 ONLY)
10.	1400x1050	65.150	60.00	122.50	SXGA (37/42LG5500 ONLY)
11.	1920x1080	66.647	59.988	138.625	WUXGA

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7. HDMI DTV Table

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Remark	Proposed
1	640x480	31.469	59.94	25.175	SDTV 480p 60Hz	PC mode ->
2	640x480	31.469	60	25.2	SDTV 480p 60Hz	Display 640*480
3	720x480	31.47	59.94	27	SDTV 480p 60Hz	
4	720x480	31.5	60	27.027	SDTV 480p 60Hz	
5	720x576	31.25	50	27	SDTV 576p 50Hz	
6	1280x720	37.5	50	74.176	HDTV 720p 50Hz	HDCP
7	1280x720	44.96	59.94	74.176	HDTV 720p 60Hz	HDCP
8	1280x720	45	60	74.25	HDTV 720p 60Hz	HDCP
9	1920x1080	28.125	50	74.25	HDTV 1080i 50Hz	HDCP
10	1920x1080	33.72	59.94	74.176	HDTV 1080i 60Hz	HDCP
11	1920x1080	33.75	60	74.25	HDTV 1080i 60Hz	HDCP
12	1920x1080	27	24	74.25	HDTV 1080P 24Hz	HDCP
13	1920x1080	33.75	30	74.25	HDTV 1080P 30Hz	HDCP
14	1920x1080	56.25	50	148.5	HDTV 1080P 50Hz	HDCP
15	1920x1080	67.433	59.94	148.352	HDTV 1080P 60Hz	HDCP
16	1920x1080	67.5	60	148.5	HDTV 1080P 60Hz	HDCP

8. HDMI PC Table

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed
1.	720x400	31.468	70.08	28.32	
2.	640x480	31.469	59.94	25.17	VESA
		37.500	75.00	31.50	
3.	800x600	37.879	60.31	40.00	VESA
		46.875	75.00	49.50	
4.	832x624	49.725	74.55	57.283	Macintosh
5.	1024x768	48.363	60.00	65.00	VESA(XGA)
		56.476	70.00	75.00	
		60.023	75.03	78.75	
6.	1280x768	47.693	59.99	80.125	VESA(WXGA)
7.	1360x768	47.649	59.94	84.625	VESA(WXGA)
8.	1366x768	47.649	59.94	84.625	Supported
9.	1280x1024	63.595	60.0	108.875	SXGA (37/42LG5500 ONLY)
10.	1400x1050	65.160	60.0	122.50	SXGA (37/42LG5500 ONLY)
11.	1600x1200	74.077	60.0	130.375	UXGA (37/42LG5500 ONLY)
12.	1920x1080	66.647	59.988	138.625	WUXGA

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ADJUSTMENT INSTRUCTION

1. Application Range

This spec. sheet is applied to all of the LD82D chassis manufactured at LG TV Plant all over the world.

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 to protect test instruments
2) Adjustment must be done in the correct sequence.
3) The adjustment must be performed at 25±5°C temperature and 65±10% relative humidity if there is no specified designation.
4) The input voltage of the receiver must be kept between 100-220V~, 50/60Hz.
5) Before adjustment, execute Heat-Run for 5 minutes at RF no signal.

3. Channel Memory

1) Press ADJ key in Adjust remote control.
2) Select “Channel Recover” by using ▲/▼ (CH+/-) key, and press ► (VOL+).
3) When Channel Recover is completed, set will be turned off and LED light go to stand-by mode.

* Before AV ADC Calibration, should be executed the “Tool option 1”

4. Select method of Tool option 1

1) Press ADJ Key in the Adjust remote control.
2) Select “Tool option 1” by using ▲/▼ (CH+/-) key, and press ■(ENTER).
3) Select “Maker” by using ▲/▼ (CH+/-) key, and change the module maker and. applied module classification by using ◄/► (VOL+/-).
4) Select “Inch” by using ▲/▼ (CH+/-) key, and change the module according to the inch of model.
5) Select “Tool” by using ▲/▼ (CH+/-) key, and change the tool name according to the model. (Vitiaz3 : 1, Other : 0)
   (Inch of model : 32”, 37”, 42”, Applied module under the classification)

Model Name	Tool Option 1	Maker	Inch	Tool
42LG5500	2772	LPL	42	LG5500

6) After changing the Tool option1, push the EXIT key.

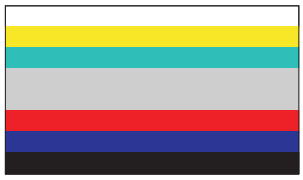
5. Substrate ADC Calibration

* Press EXIT Key to delete Installation Guide before PCB assembly adjustment. And then press FRONT-AV Key on Adjustment remote controller.
(RS-232C Host change : G-Probe => PC. Input change : AV3)

5.1. ADC Calibration Mode

(1) Adjustment of RF/AV

Model : 202 / Pattern : 65



<Fig. 1>

(2) Adjustment of Component.

Model : 215/ Pattern : 65

(3) Adjustment of RGB

Model : 3/ Pattern : 65

5.2. ADC Calibration Protocol [RS-232C]

	Item	CMD1	CMD2	Data0		Remark
ADC adjust	ADC Adjust	a	d	1	0	
Data Read	ADC Parameter (Main Display)	a	d	2	0	18Byte Transmission(Main diaplay) : Main Display Input & Resolution Data
	ADC Parameter (Sub Display)	a	d	2	1	18Byte Transmission (Sub Display) : Main Display Input & Resolution Data
	Digital Data (Main Display)	a	d	3	0	
	Digital Data (Sub Display)	a	d	3	1	
Default Write	ADC Parameter (Mean)	a	d	4	0	
	Adjustment Confirmation	a	d	9	9	Use to check ADC at Final assembly WB working process.
Adjustment Mode	Adjustment Mode In	a	d	0	0	When transmitting adjustment Mode In command, adjustment command is operated.
	Adjustment Mode Out	a	d	9	0	

■ Baud Rate : 115,200 bps
■ RS232C Host : PC
■ Echo : Nothing

- If ADC calibration don’t adjust at PCB assembly, ADC calibration adjust at Final assembly line.
- Don’t press the INSTOP KEY after completing the function inspection.

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6. EDID

* Caution

1) Use the proper signal cable for EDID Download
   - Analog EDID : Pin3 exists
   - Digital EDID : Pin3 exists
2) Never connect HDMI & D-sub Cable at the same time.
3) Use the proper cables below for EDID Writing.
4) Download HDMI1, HDMI2 separately because HDMI1 is different from HDMI2.

For Analog EDID	For HDMI EDID	
D-sub to D-sub	DVI-D to HDMI or HDMI to HDMI	

6.1. EDID Data

Item	Condition	Data(Hex)
Manufacturer ID	GSM	1E6D
Version	Digital : 1	01
Revision	Digital : 3	03

6.2. Data

(1) ANALOG (128 bytes)

	0x00	0x01	0x02	0x03	0x04	0x05	0x06	0x07	0x08	0x09	0x0A	0x0B	0x0C	0x0D	0x0E	0x0F
0x00	00	FF	FF	FF	FF	FF	FF	00	1E	6D	a		b			
0x01	c		01	03	08	46	27	78	EA	D9	B0	A3	57	49	9C	25
0x02	11	49	4B	A5	6E	00	31	40	45	40	61	40	81	80	90	40
0x03	D1	C0	01	01	01	01	1A	36	80	A0	70	38	1F	40	30	20
0x04	35	00	E8	26	32	00	00	1A	DA	2F	78	E0	51	1A	25	40
0x05	58	98	14	00	E8	26	32	00	00	1A	00	00	00	FD	00	39
0x06	4B	1F	54	12	00	0A	20	20	20	20	20	20	d			
0x07	d														00	e

(2) HDMI 1 (256 bytes)

	0x00	0x01	0x02	0x03	0x04	0x05	0x06	0x07	0x08	0x09	0x0A	0x0B	0x0C	0x0D	0x0E	0x0F
0x00	00	FF	FF	FF	FF	FF	FF	00	1E	6D	a		b			
0x01	c		01	03	80	46	27	78	EA	D9	B0	A3	57	49	9C	25
0x02	11	49	4B	A5	6E	00	31	40	45	40	61	40	81	80	90	40
0x03	A9	40	D1	C0	01	01	1A	36	80	A0	70	38	1F	40	30	20
0x04	35	00	E8	26	32	00	00	1A	1B	21	50	A0	51	00	1E	30
0x05	48	88	35	00	BC	86	21	00	00	1C	00	00	00	FD	00	39
0x06	4B	1F	54	12	00	0A	20	20	20	20	20	20	d			
0x07	d														01	e
0x00	02	03	23	F1	4E	81	02	03	15	12	13	04	14	05	20	21
0x01	22	1F	10	23	09	07	07	83	01	00	00	f				
0x02	f			01	1D	00	80	51	D0	1C	20	40	80	35	00	BC
0x03	88	21	00	00	1E	8C	0A	D0	8A	20	E0	2D	10	10	3E	96
0x04	00	13	8E	21	00	00	18	02	3A	80	18	71	38	2D	40	58
0x05	2C	45	00	06	44	21	00	00	1E	01	1D	80	18	71	1C	16
0x06	20	58	2C	25	00	C4	8E	21	00	00	9E	4E	1F	00	80	51
0x07	00	1E	30	40	80	37	00	BC	88	21	00	00	18	00	00	e

=> Detail EDID Options are below (a, b, c, d, e, f)

(a) Product ID

(b) Serial No: Controlled on production line.

(c) Month, Year: Controlled on production line:
ex) Monthly : '09' -> '09'
Year : '2006' -> '10'

(d) Model Name(Hex):

INPUT	MODEL NAME(HEX)
HDMI1	67030C001000B82D
HDMI2	67030C002000B82D
HDMI3	67030C003000B82D

(e) Checksum: Changeable by total EDID data.

(f) Vendor Specific(HDMI)

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7. ADC Calibration

ADC	RF/AV/S-VIDEO		Component	RGB-PC
MSPG925FS	PALJ		Model:215 (720P)	Model: 60
	INPUT SELECT	AV3	Pattern:65	(1024*768 60Hz)
	Model: 202 (PAL-BGDHI)		* 720P/50Hz	Pattern: 65
	Pattern: 65		7 Color Bar	
	* PAL 7 Color Bar			

<Caution>
- System control RS-232 Host should be “PC” for adjustment.
- Before AV ADC Calibration, execute the “Module selection”.

7.1. Adjustment of RF/AV/S-VIDEO

(1) Required Equipments

- Remote controller for adjustment
- MSPG-925FS Pattern Generator (Which has Video Signal: 7 Color Bar Pattern shown in Fig. 1)
  => Model: 202 / Pattern: 65

(2) Method of Auto RF/AV/S-VIDEO Color Balance.

1) Input the Video Signal : 7 Color Bar signal into AV3.
2) Set the PSM to Dynamic mode in the Picture menu.
3) Press ADJ key on R/C for adjustment.
4) Press the ►(Vol.+) key to operate the set, then it becomes automatically.
5) On bottom side of OSD, “AV OK” means the adjustment is completed.

7.2. Adjustment of Component

(1) Required Equipments

- Remote controller for adjustment
- MSPG-925FS Pattern Generator (Which has 720p/50Hz YPbPr output Pattern shown in Fig.1)
  => Model:215/Pattern: 65

(2) Method of Auto Component Color Balance

1) Input the Component 720p/50Hz 7 Color Bar(MSPG-925FS model:215, pattern:65) signal into Component.
2) Set the PSM to Dynamic mode in the Picture menu.
3) Press the ADJ key on R/C for adjustment.
4) Press the ►(Vol.+) key to operate the set , then it becomes automatically.
5) On bottom side of OSD, “Component OK” means the adjustment is completed.

7.3 Adjustment of RGB

(1) Required Equipments

- Remote controller for adjustment
- MSPG-925F Pattern Generator (Which has XGA [1024*768] 60Hz 8color bar 100% pattern shown in Fig.1)

(2) Method of Auto RGB Color Balance

1) Input the PC 1024x768@60Hz 100% Color Bar pattern (MSPG-925F model:65, pattern:60) into RGB.
   (Using D-sub to D-sub cable)
2) Set the PSM to Dynamic mode in Picture menu.
3) Press the IN-START key on R/C for adjustment
4) Press the ►(Vol.+) key operate To set , then it becomes automatically.
5) On bottom side of OSD, “RGB OK” means the adjustment is completed.

*** Before White-balance, the AV ADC should be done.**

8. White Balance

* Test Equipment
Color Analyzer (CA-210/CH.9)
-> When you adjust LCD color temperature, on Color analyzer (CA-210), you should use Channel 9 which is Matrix compensated (White, Red, Green, Blue revised) by CS-1000 and adjust in accordance with White balance adjustment coordinate which is specified on the next.

* Color temperature standards according to CSM and Module
Cool : 11,000k
Medium : 9,300k
Warm : 6,500k

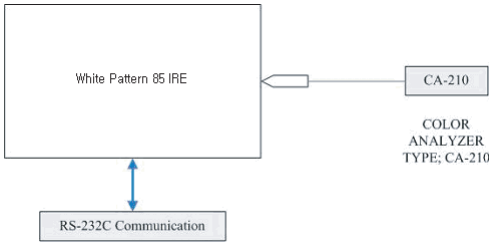
* White balance adjustment coordinate and color temperature

Cool	**CS-1000**	**CA-210(CH 9)**
x	0.276	0.276±0.002
y	0.283	0.283±0.002
Δuv	0.000	0.000
Medium	**CS-1000**	**CA-210(CH 9)**
x	0.285	0.285±0.002
y	0.293	0.293±0.002
Δuv	0.000	0.000
Warm	**CS-1000**	**CA-210(CH 9)**
x	0.313	0.313±0.002
y	0.329	0.329±0.002
Δuv	0.004	0.004

- PC (for communication through RS-232C)
  -> UART Baud rate : 115200 bps
- Luminance Y AV : upper 200 cd/m^2≥ (Typ : 350 cd/m^2)
  -> Applying to Cool, Medium, Warm mode

* Connecting picture of the measuring instrument (On Automatic control)
Inside PATTERN is used when W/B is controlled. Connect to auto controller or push control R/C IN-START -> Enter the mode of White-Balance, the pattern will come out.

* Measurement color analyzer : CS1000 or CA210(CH 9)



<Fig. 2> Connecting picture (On Automatic Control)

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* Auto adjustment Map (RS-232C)

Type	LD82D				
Baud Rate	Data bit		Stop bit		Parity
115200	8		1		None
Index	Cmd 1	Cmd 2	Data	Min Value	Max Value
R-Gain_Normal	j	a		00(00)	128(80)
G-Gain_Normal	j	b		00(00)	128(80)
B-Gain_Normal	j	c		00(00)	128(80)
R-Gain_Warm	j	d		00(00)	128(80)
G-Gain_Warm	j	e		00(00)	128(80)
B-Gain_Warm	j	f		00(00)	128(80)
R-Gain_Cool	j	g		00(00)	128(80)
G-Gain_Cool	j	h		00(00)	128(80)
B-Gain_Cool	j	i		00(00)	128(80)
R-Offset_Normal	l	j		00(00)	128(80)
G-Offset_Normal	l	k		00(00)	128(80)
B-Offset_Normal	l	l		00(00)	128(80)
R-Offset_Warm	l	m		00(00)	128(80)
G-Offset_Warm	l	n		00(00)	128(80)
B-Offset_Warm	l	o		00(00)	128(80)
R-Offset_Cool	l	p		00(00)	128(80)
G-Offset_Cool	l	q		00(00)	128(80)
B-Offset_Cool	l	r		00(00)	128(80)
Internal Pattern signal	w	b	00	Starting W/B ADJ	
Internal Pattern signal	w	b	10	Using internal Pattern	
Internal Pattern signal	w	b	ff	Ending W/B ADJ	

* Auto-control interface and directions
1) Adjust in the place where the influx of light like floodlight around is blocked. (illumination is less than 10ux).
2) Adhere closely the Color Analyzer (CA-210) to the module less than 10cm distance, keep it with the surface of the Module and Color Analyzer's Prove vertically. (80~100°).
3) Aging time
- After aging start, keep the power on (no suspension of power supply) and heat-run over 15 minutes.
- Using 'no signal' or 'full white pattern' or the others, check the back light on.

8.1. Auto white Balance

(set:RS-233 Host:PC, Baud Rate:115200bps, Download:Cortez)
: Inside pattern is used when white balance is controlled. Connect as below figure and click the start button on W/B execution program. W/B is automatically processing Cool_Medium_Warm in order.
When W/B is completed, you can see 'OK' on PC monitor.

8.2. Manual white Balance

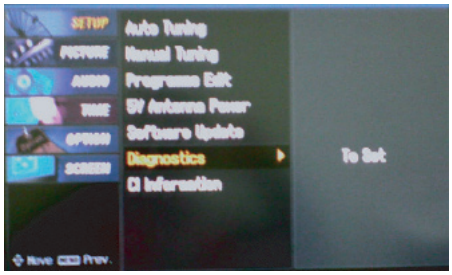
- One of R Gain / G Gain / B Gain should be kept on 80, and others are controlled lowering from 80
1) Press 'power on' of the control R/C, set heat run to white by pressing ▶, and heat run over 15 minutes. (Set : RS-233 Host : PC, Baud Rate : 115200bps, Download : Cortez)
2) Zero Calibrate CA-210, and when controlling, stick the sensor to the center of LCD module surface.
3) Double click In-start key on Controlling R/C and get in 'white balance'.
4) Set test-pattern on and display inside pattern. Control is carried out on three color temperature, COOL, MEDIUM, WARM. (Control is carried out three times,)
5) When the R/G/B GAIN is 80 on OSD, it is the FULL DYNAMIC Range of the Module. In order to control white balance without the saturation of FULL DYNAMIC Range and DATA, one of R Gain / G Gain / B Gain should be kept on 80, and other two is controlled lowering from 80.

* Color Temperature: Cool, Medium, Warm
1) When R GAIN is set to 80
- Control G GAIN and B GAIN by lowering from 80.
2) When B GAIN is set to 80
- Control R GAIN and G GAIN by lowering from 80.
3) When G GAIN is set to 80
- Control R GAIN and B GAIN by lowering from 80.
One of R Gain / G Gain / B Gain should be kept on 80, and adjust other two lower than 80.
(When R/G/B GAIN are all 80, it is the FULL DYNAMIC Range of Module)

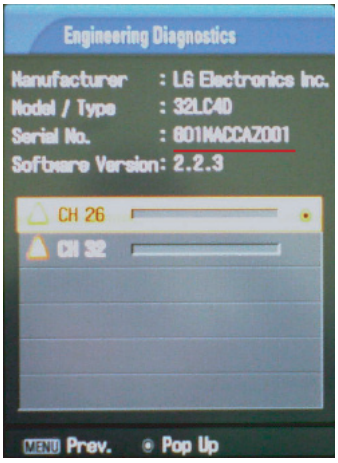
9. Set information(Serial No & Model name)

(1) Setting up like bottom figure (After setting white balance, this is set)
(Setting : Press IN-START key in the Adjust remote control. Select "System Control 2" by using ▲/▼ (CH+/-) key, and press ■ (ENTER). Using Adjust remote control, RS-232 Host & Baud Rate & Download value change
RS-232 Host:PC, Baud Rate:115200bps, Download:Cortez)

(2) Bar-code scanning
1) Push the menu button in DTV mode.
Select the SETUP -> Diagnostics -> To set



2) Check the Serial Number.



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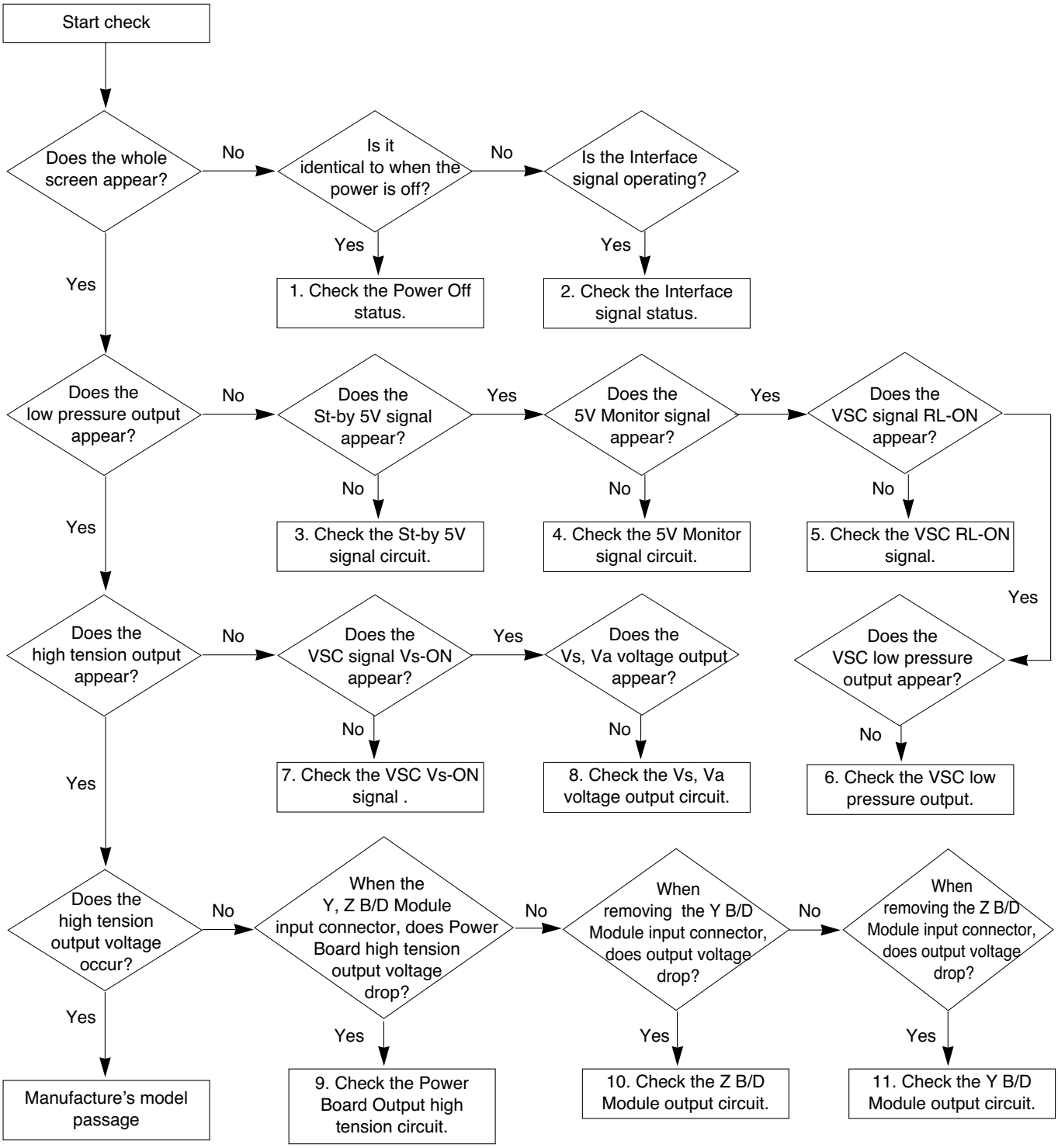
TROUBLESHOOTING

1. Power Board

1-1. The full flowchart for the voltage output



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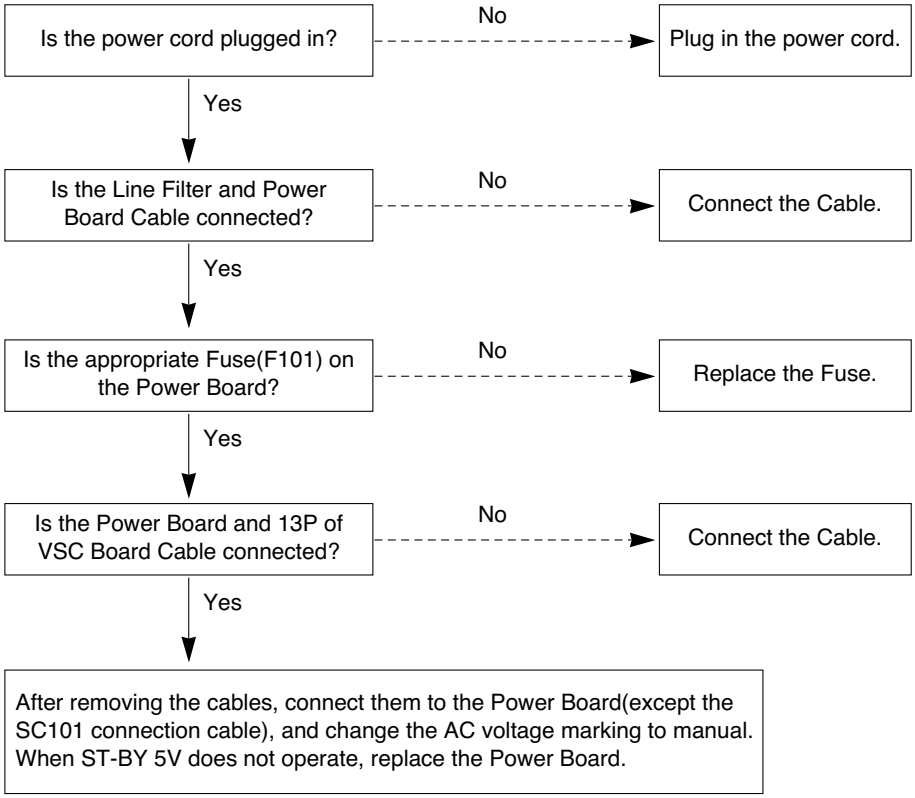
2. No Power

(1) Symptom

1) Does not minute discharge at module.
2) Non does not come into the front LED.

(2) Procedure check



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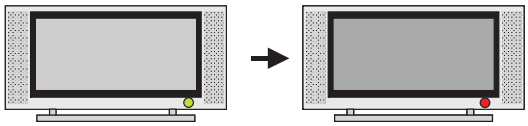
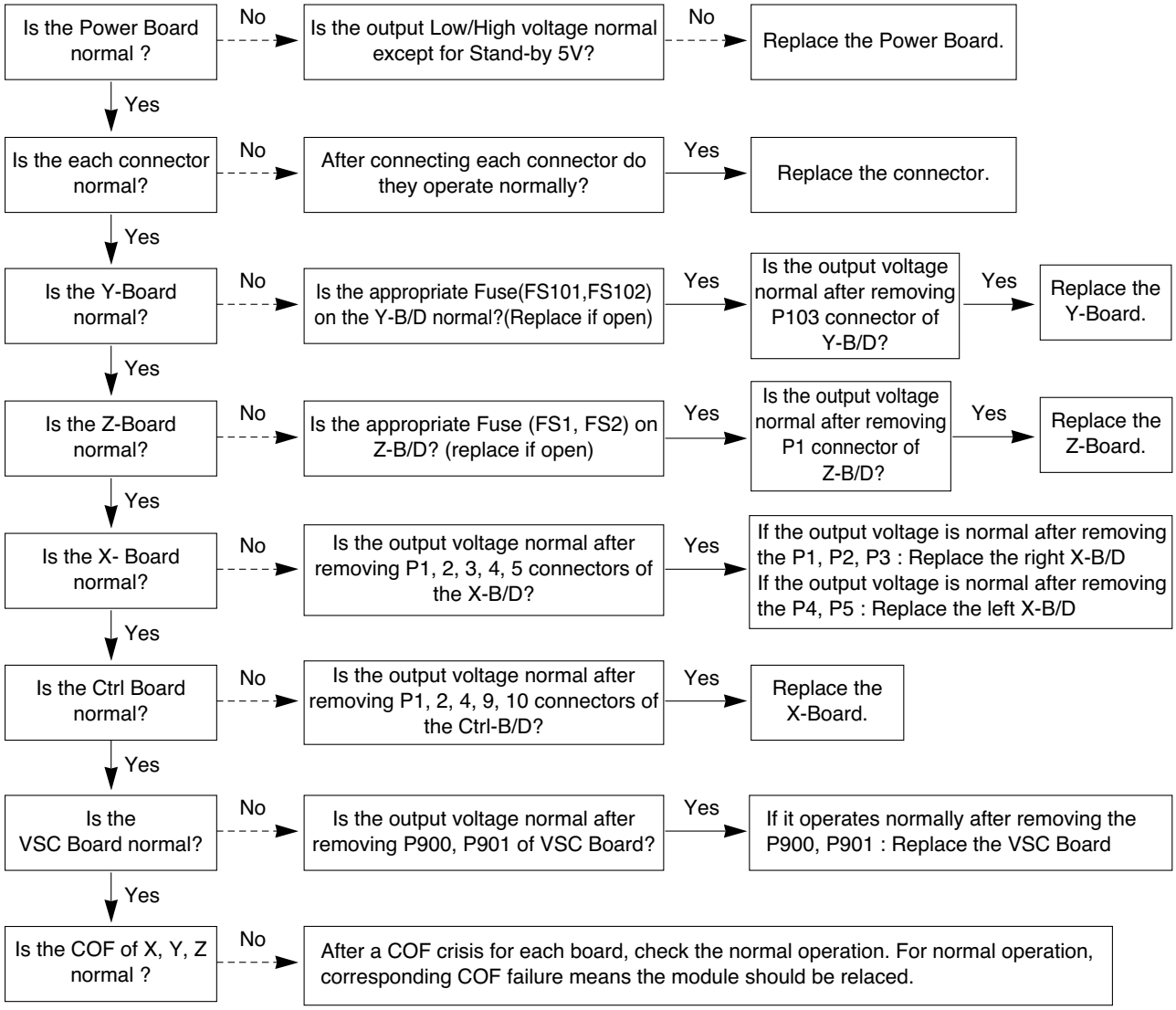
3. Protect Mode

(1) Symptom

1) After lighting up once, it does not discharge minutely from module.
2) The rely falls.(there is an audible “click”)
3) The color of the front LED turns from green to red.



(2) Procedure check



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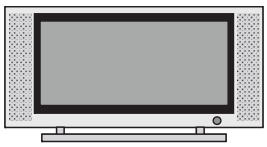
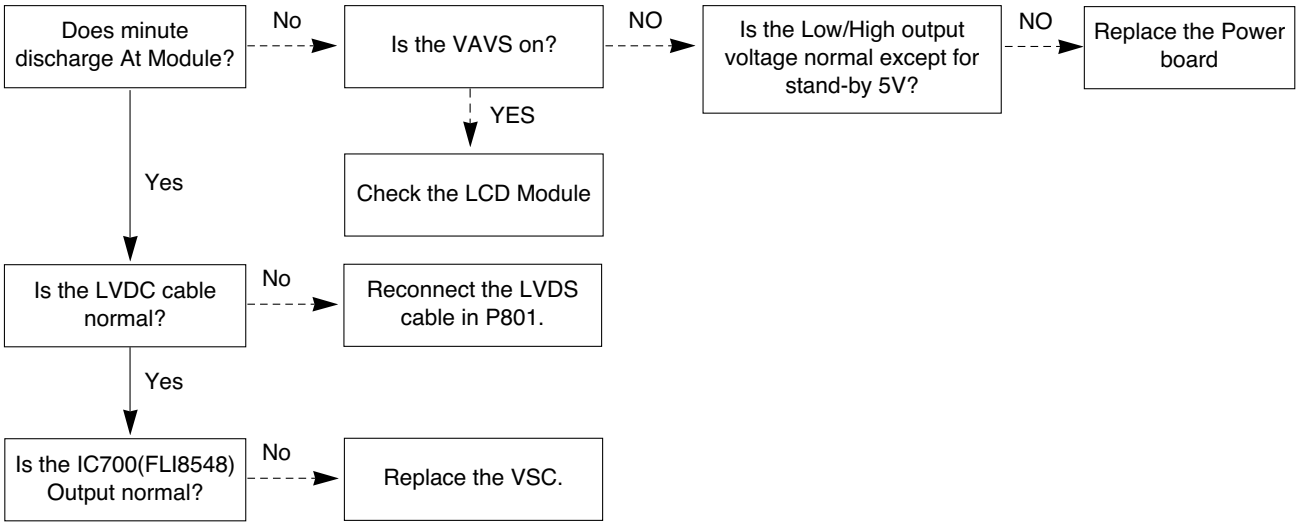
4. No Raster



(1) Symptom

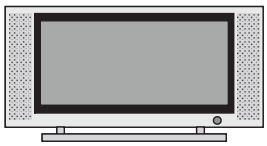
1) No OSD and image occur at screen.
2) It maintains the condition where the front LED is green.

(2) Procedure check



5. In case of strange screen display in specific modes

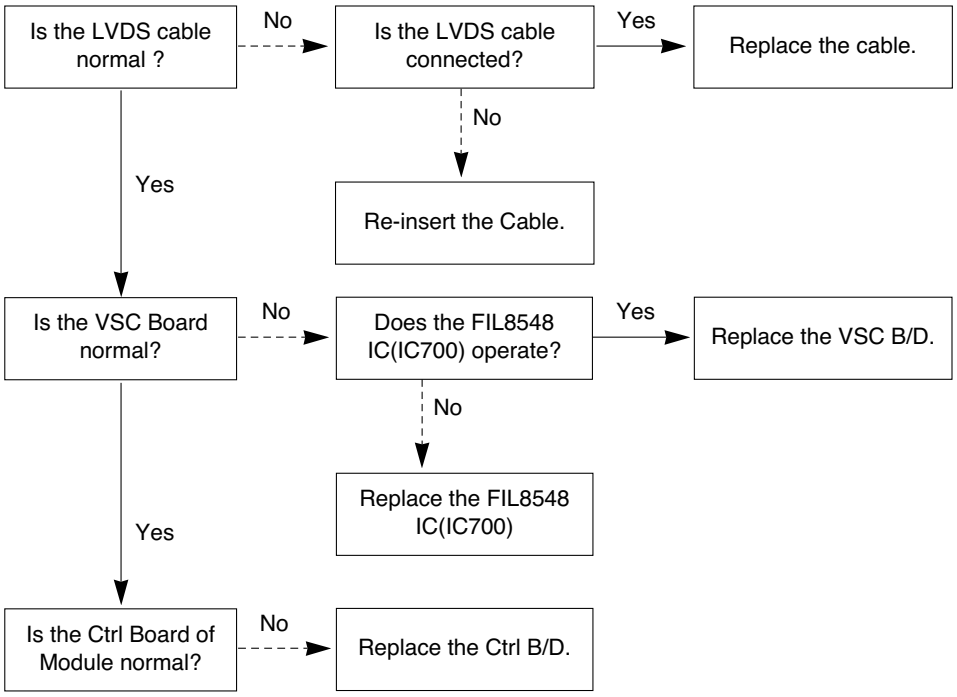
5-1. In case of no OSD display



(1) Symptom

1) LED is green.
2) The minute discharge is continuously accomplished from the module.

(2) Procedure check



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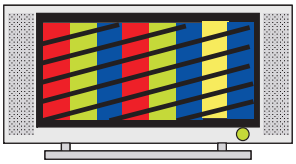
5-2. In case there is no display on the screen in specific modes



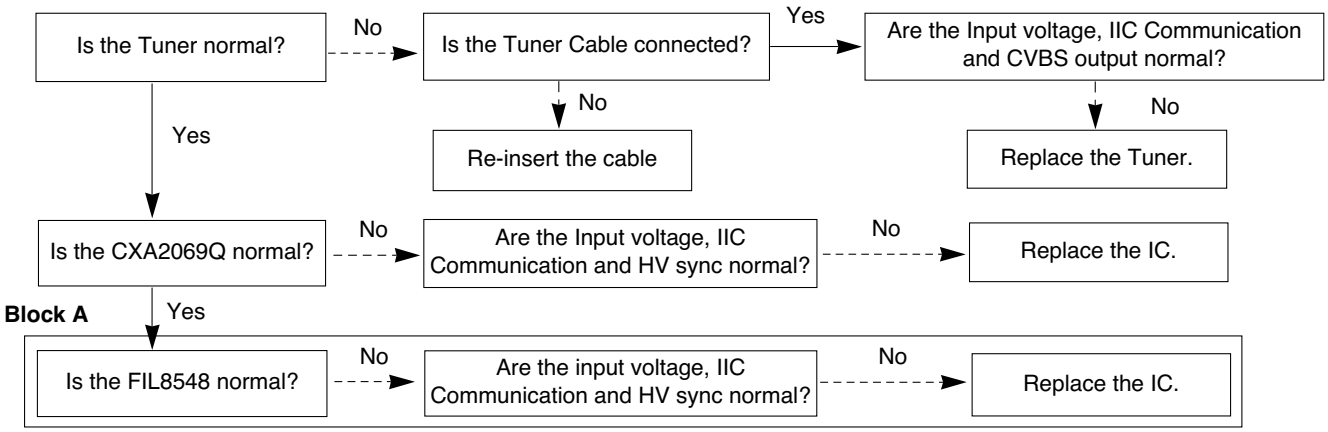
(1) Symptom

1) There is no screen display from a specific input mode (RF, AV, Component, RGB, DVI).

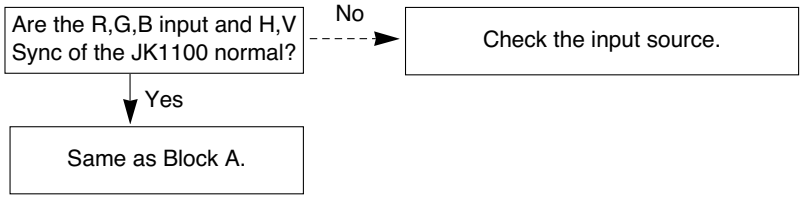
(2) Procedure check

1) Check the all input modes have normal display.
2) Check the video(main)/ data(sub), video(main)/ video(sub) have normal displays from the PIP mode or DW mode(re-check it/ swap).

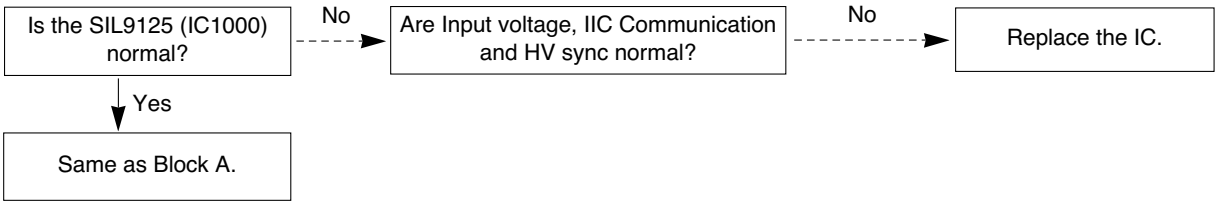
(3) In case of an unusual display in RF mode



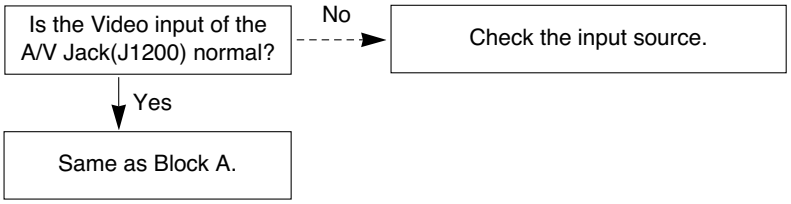
(4) In case of an unusual display in Component, RGB mode



(5) In case of an unusual display in HDMI mode



(6) In case of an unusual display in SCART1 mode



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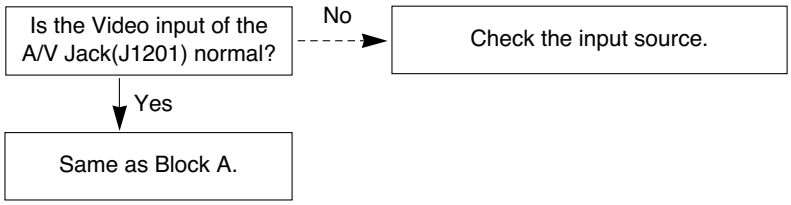
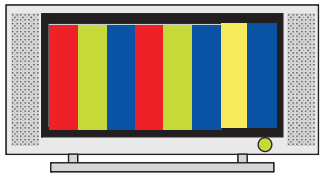
(7) In case of an unusual display in SCART2 mode



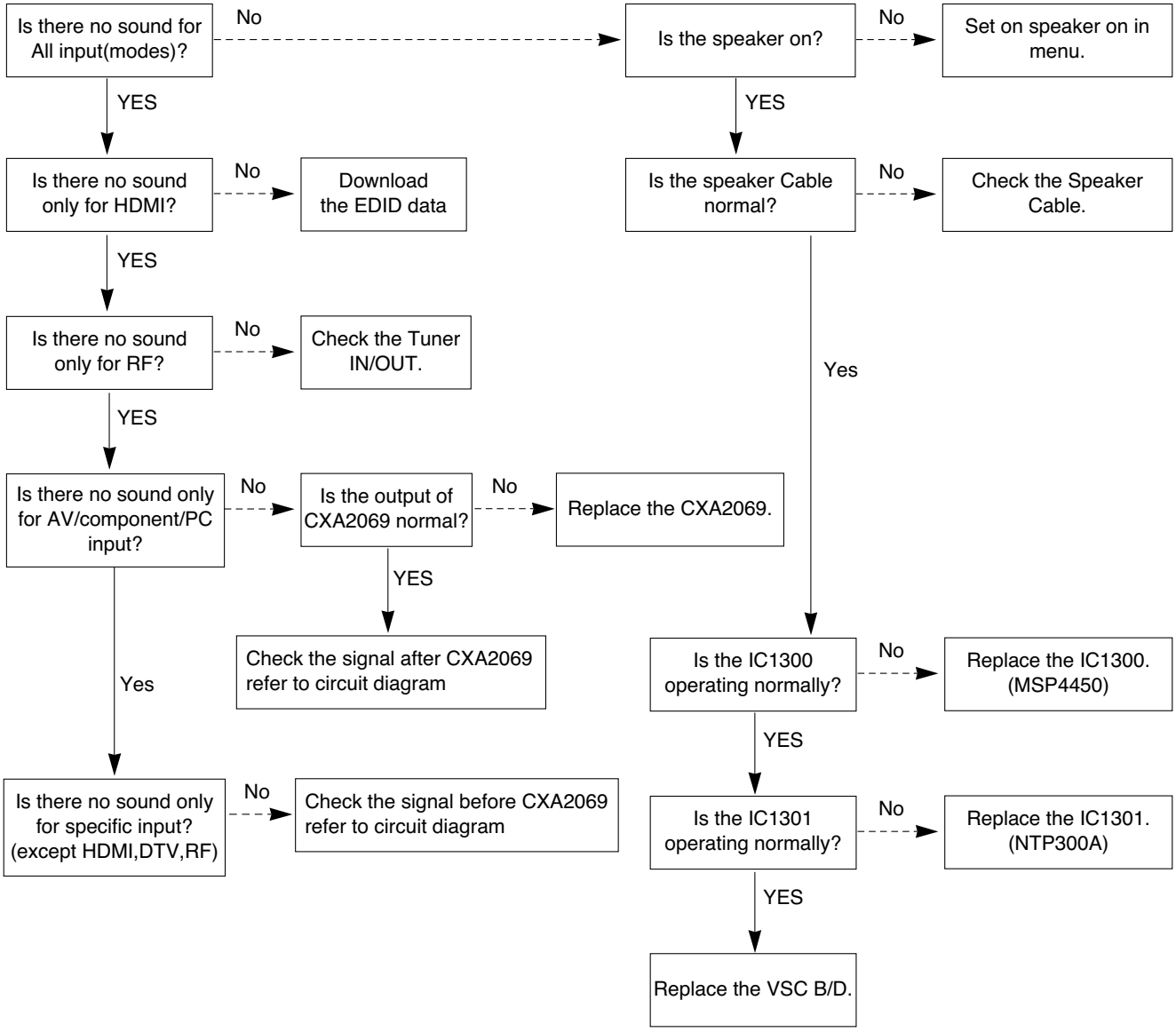
6. In case of no sound



(1) Symptom

1) LED is Green.
2) Screen display appears but there is no sound.

(2) Procedure check



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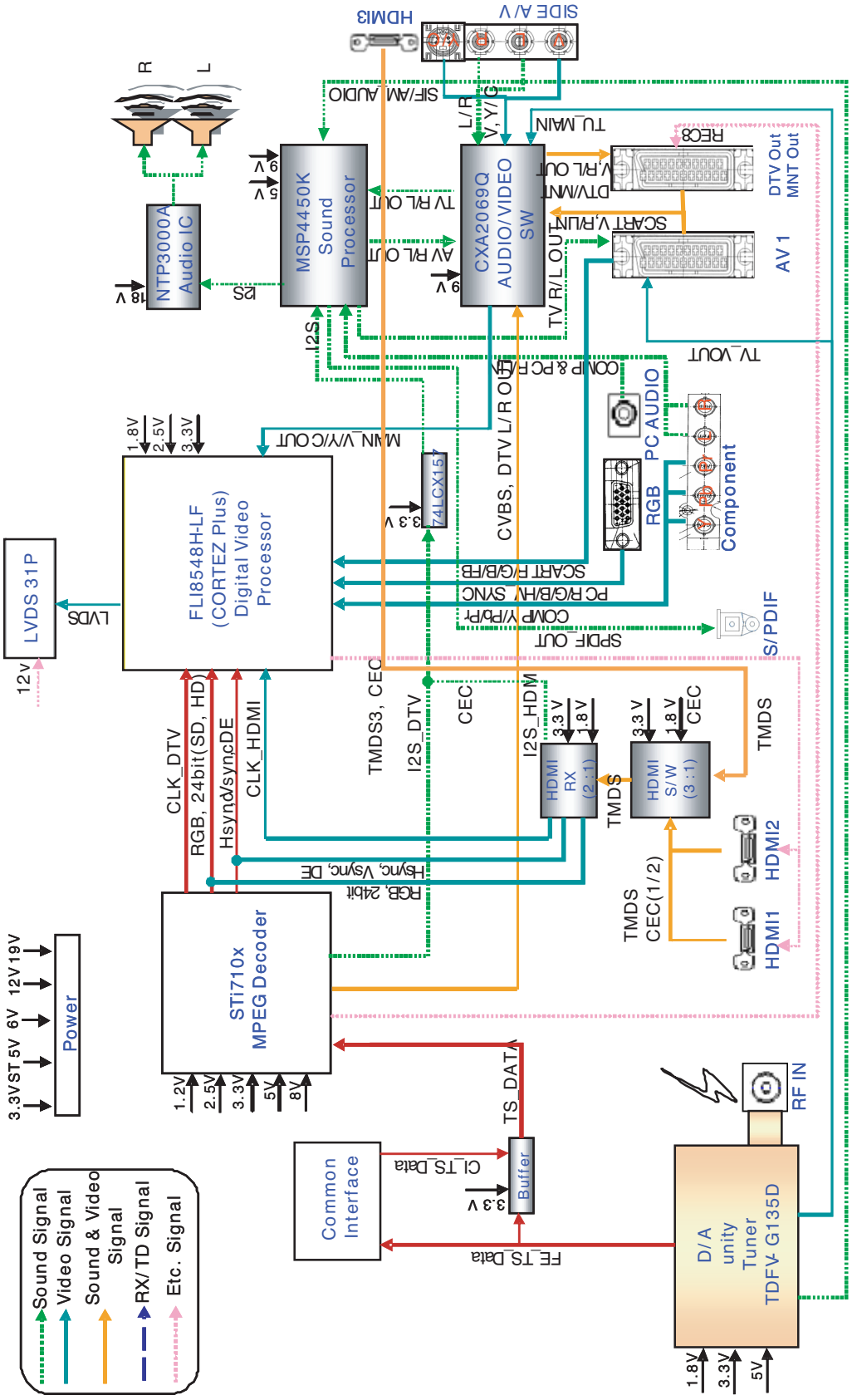
BLOCK DIAGRAM



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MEMO

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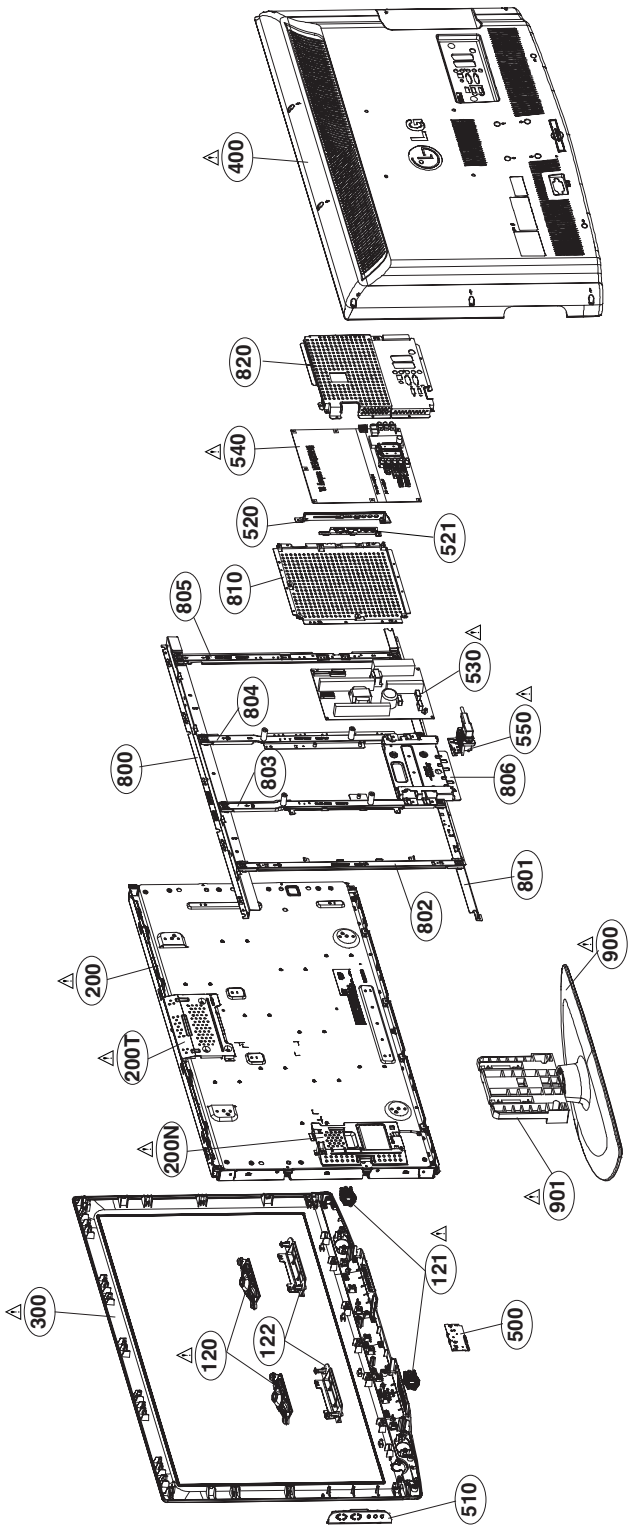
EXPLODED VIEW

IMPORTANT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by ⚠ 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.



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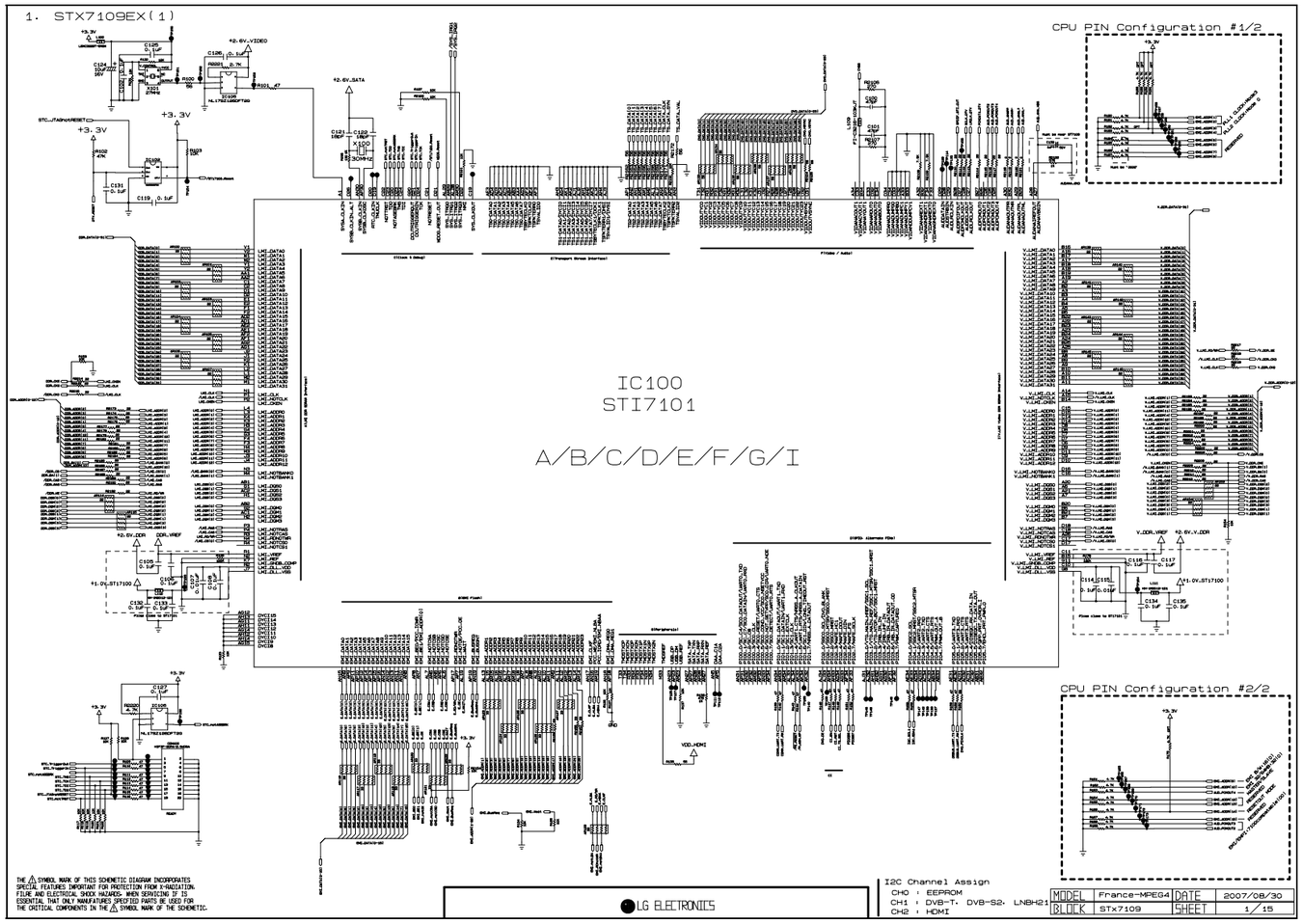
1. STX7109EX(1)

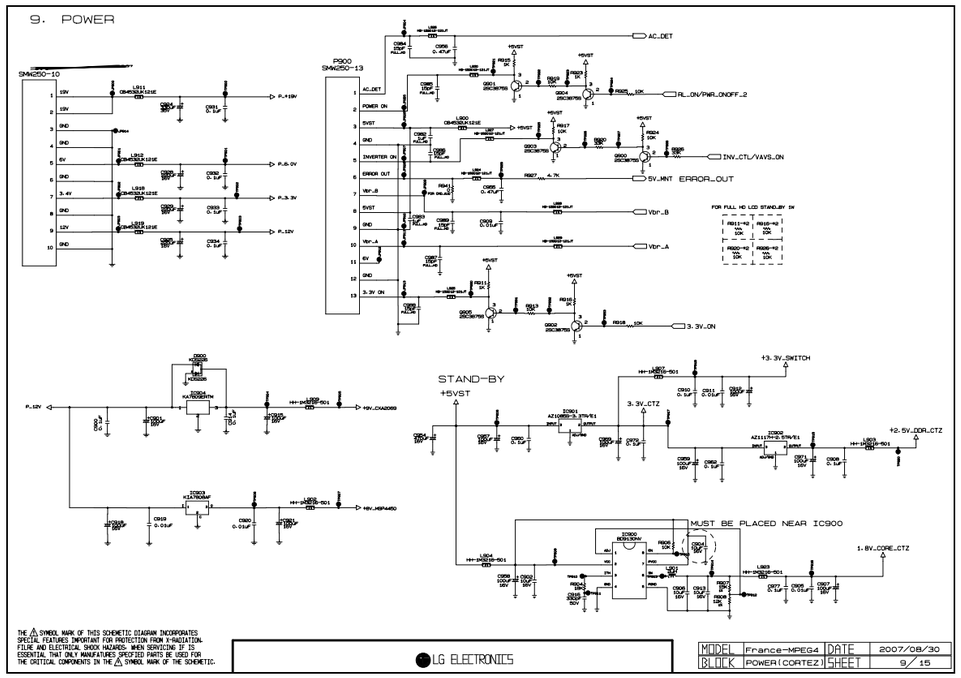


THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

LG ELECTRONICS

MODEL	France-MPEG4	DATE	2007/08/30
BLOCK	STx7109	SHEET	1/15

9. POWER

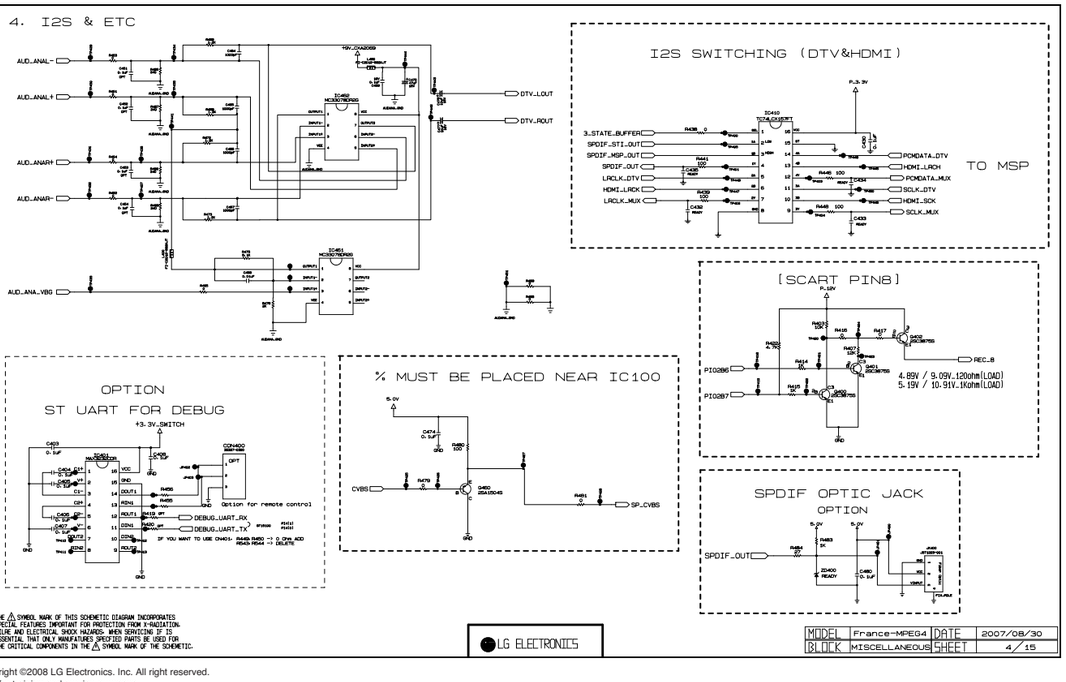


THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

LG ELECTRONICS

MODEL	France-MPEG4	DATE	2007/08/30
BLOCK	POWER(CORTEZ)	SHEET	9/15

4. I2S & ETC



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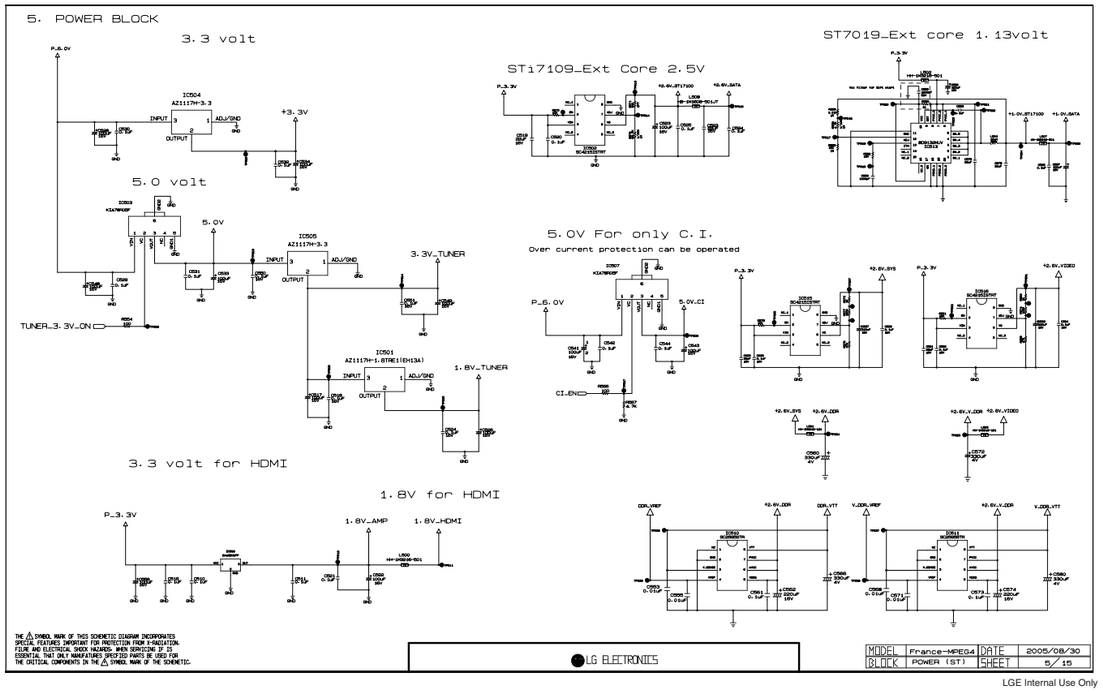
LG ELECTRONICS

MODEL	France-MPEG4	DATE	2007/08/30
BLOCK	MISCELLANEOUS	SHEET	4/15

5. POWER BLOCK



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LG ELECTRONICS

MODEL	France-MPEG4	DATE	2005/08/30
BLOCK	POWER (ST)	SHEET	5/15

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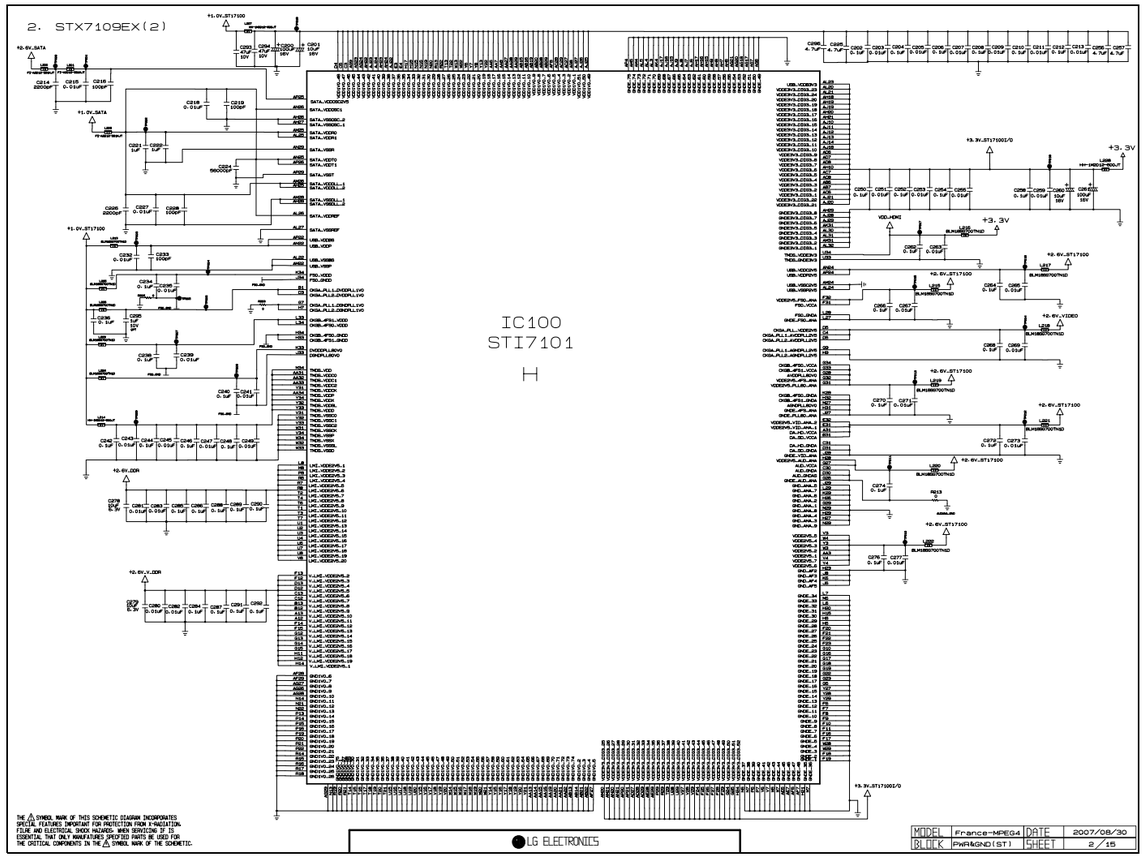

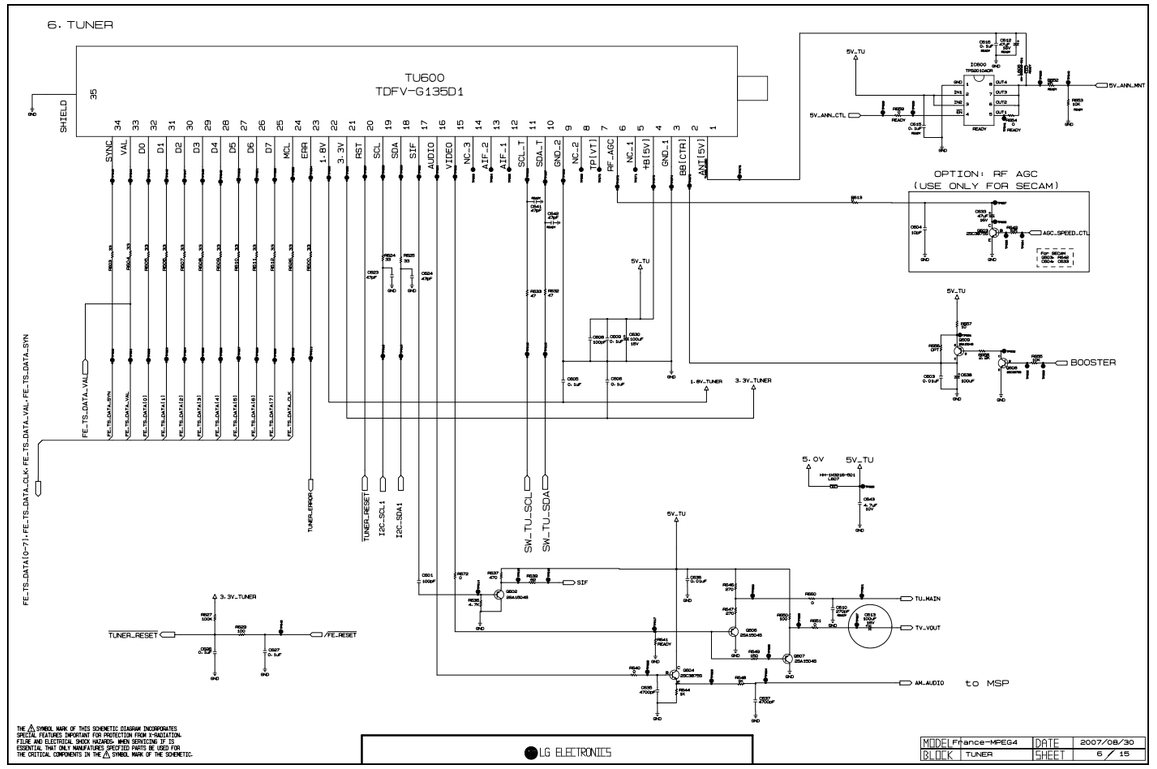

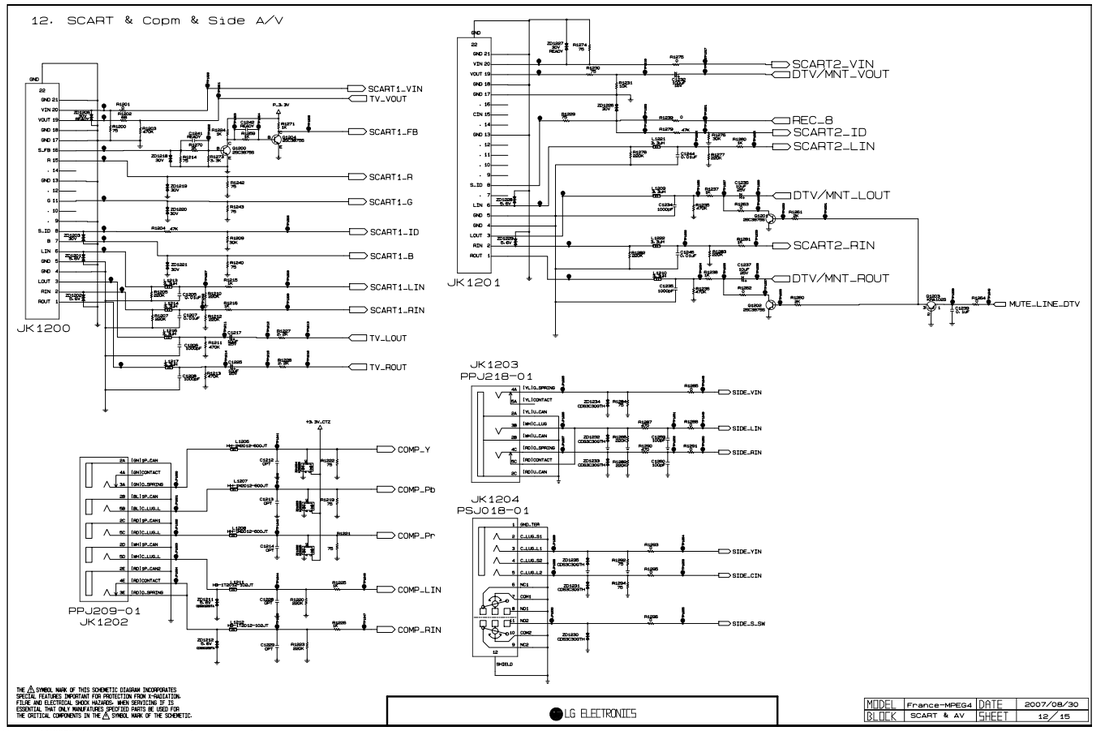

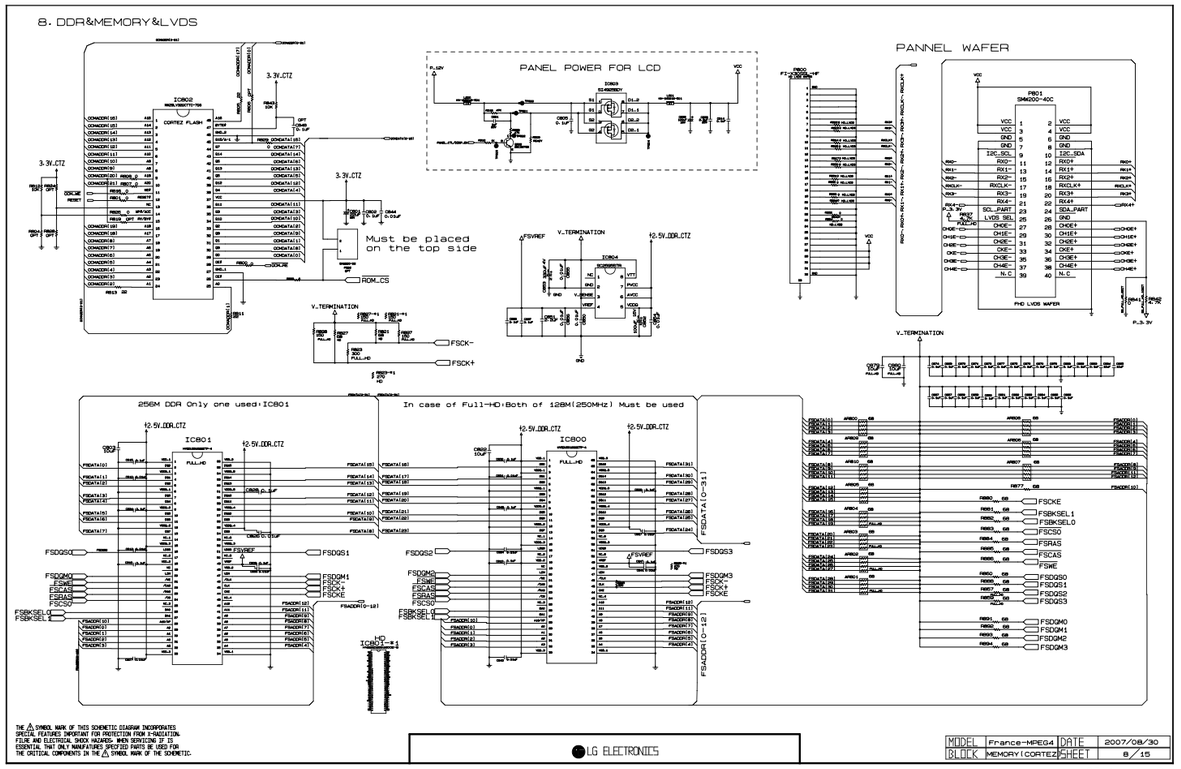

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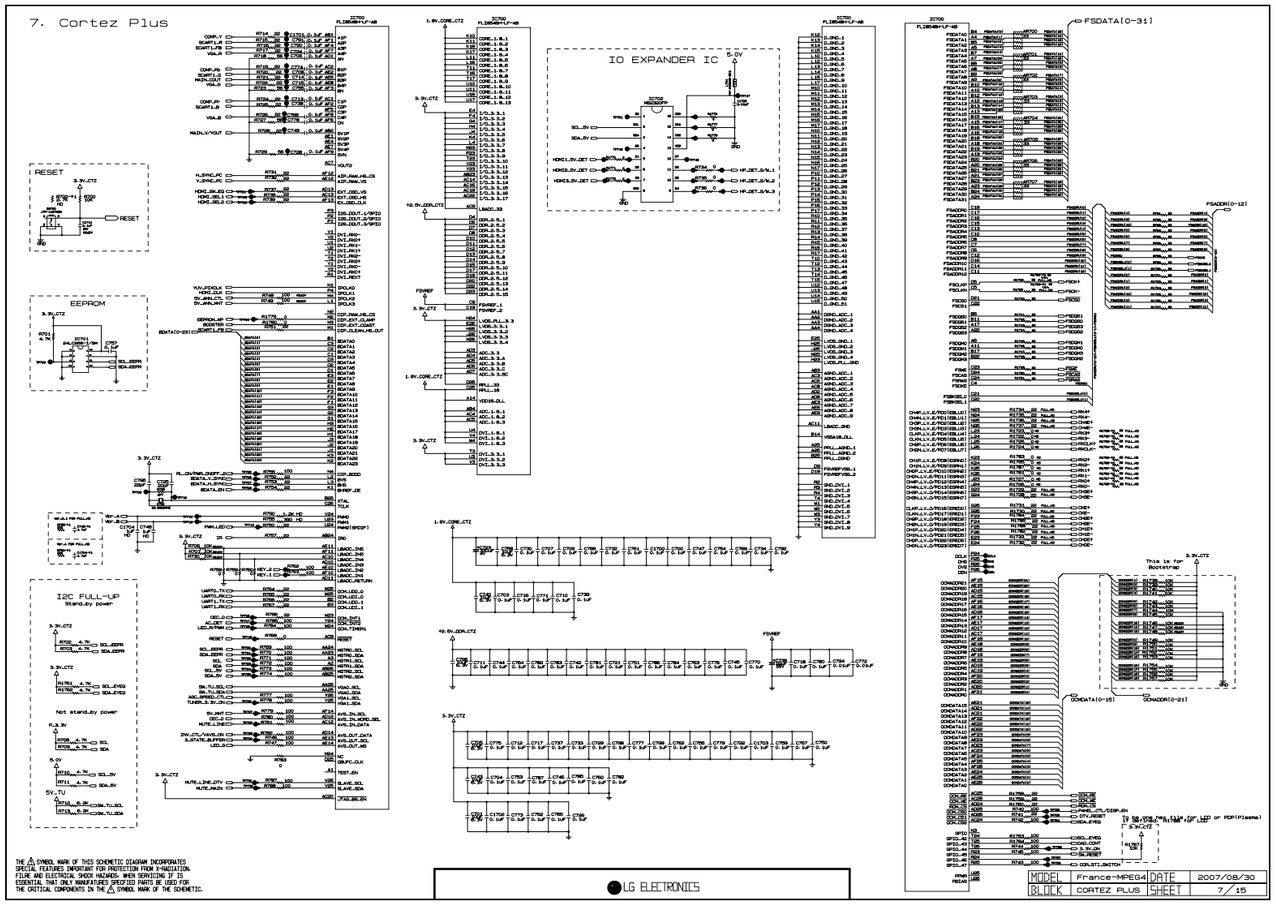

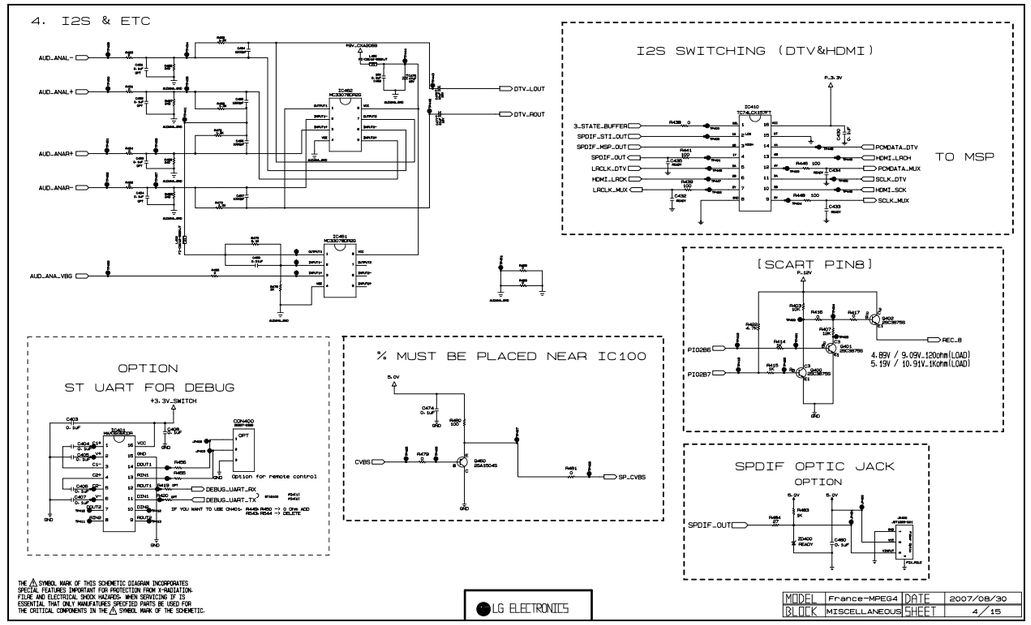

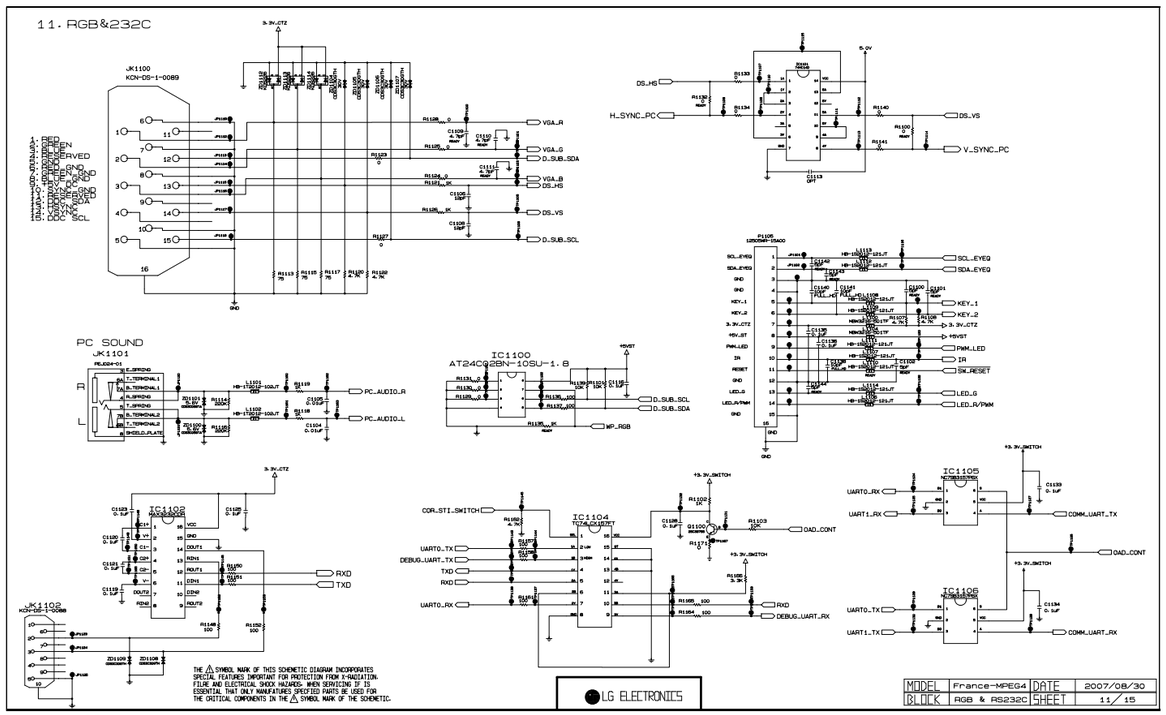

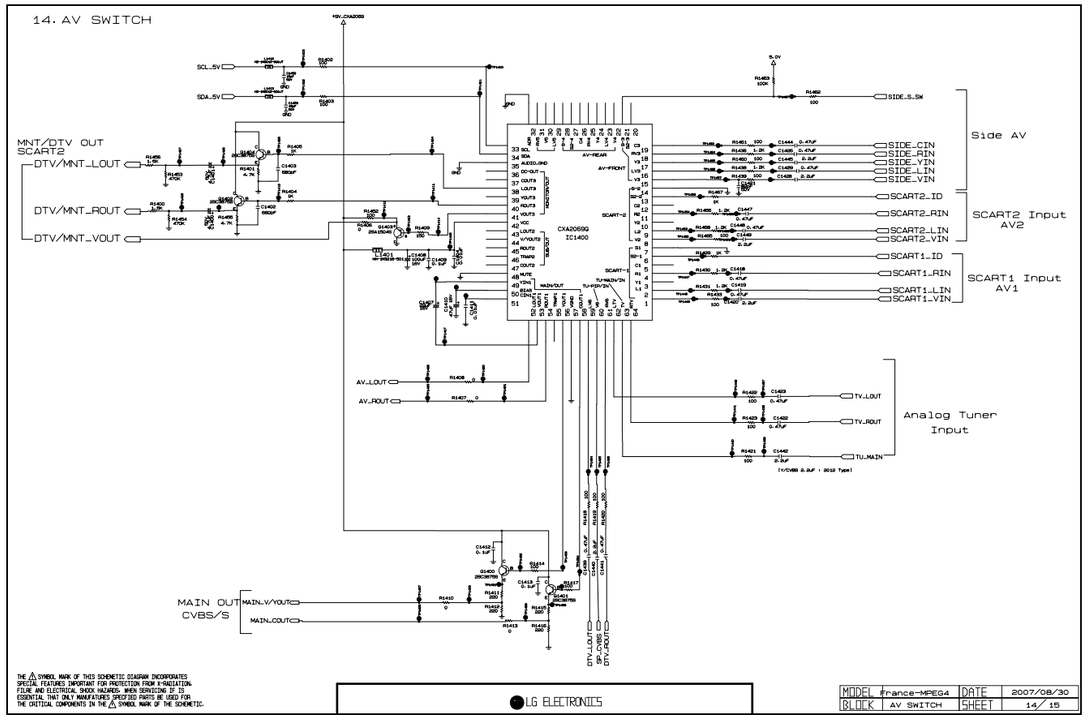

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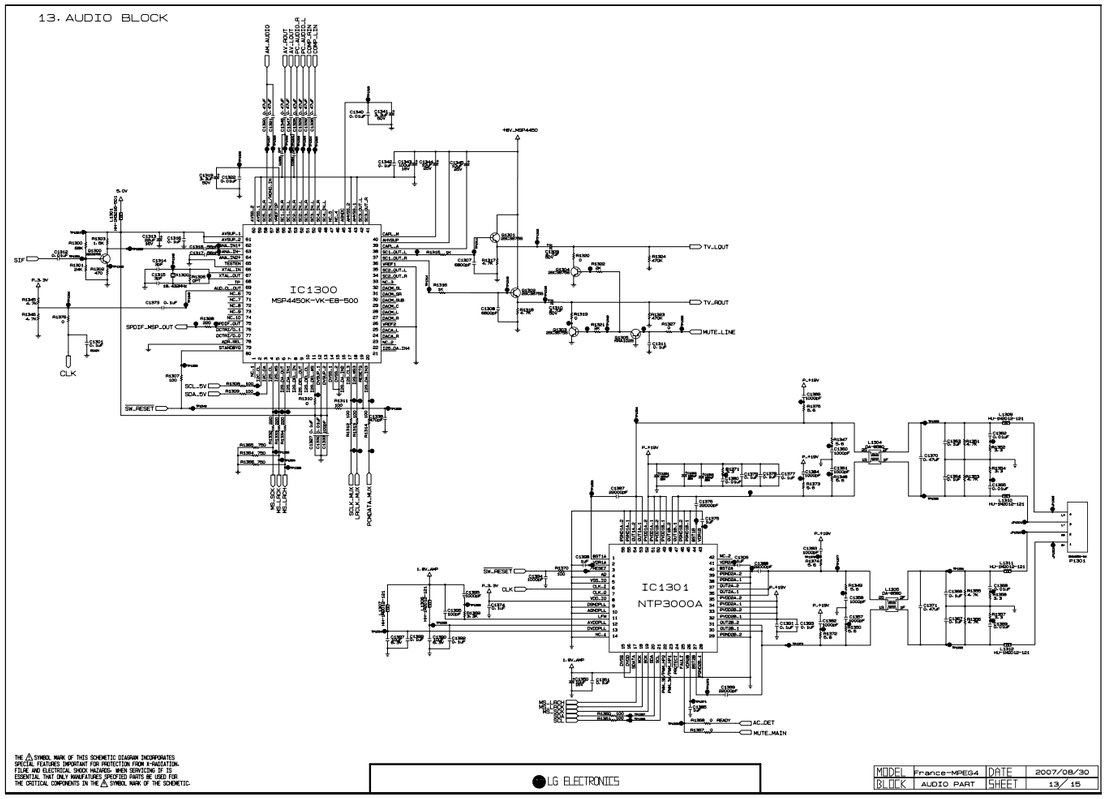

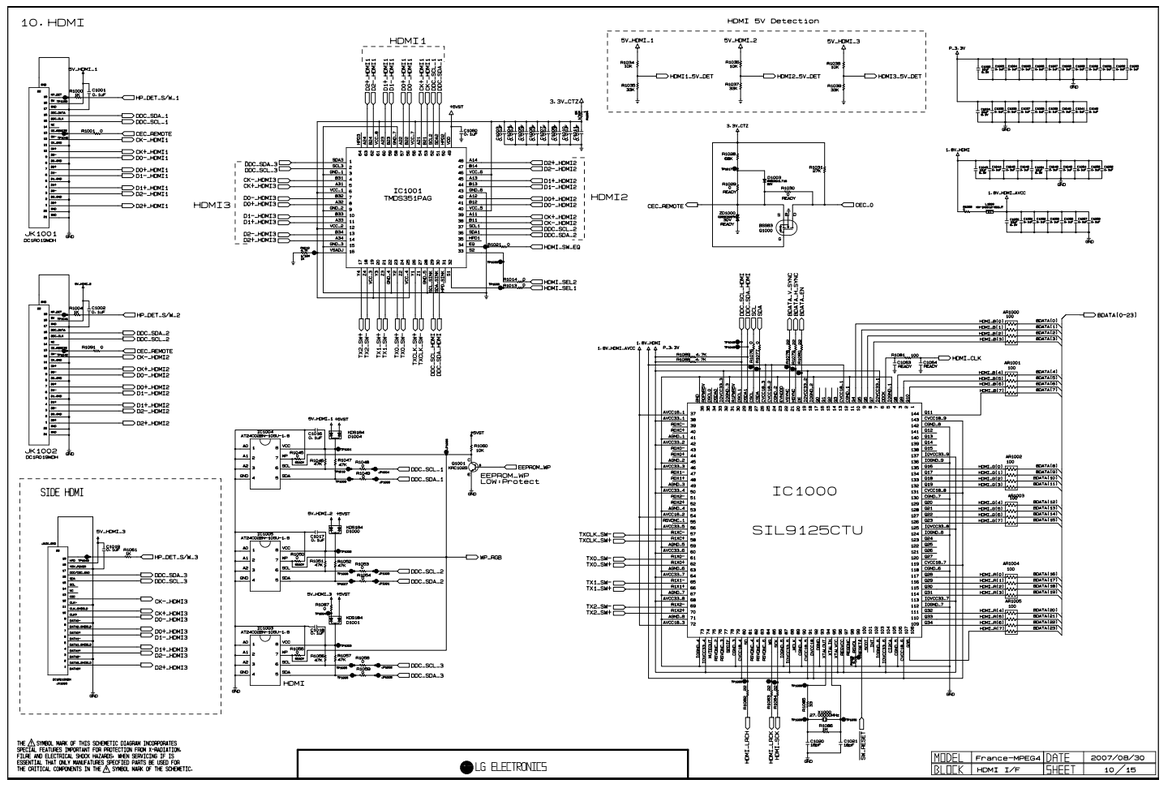

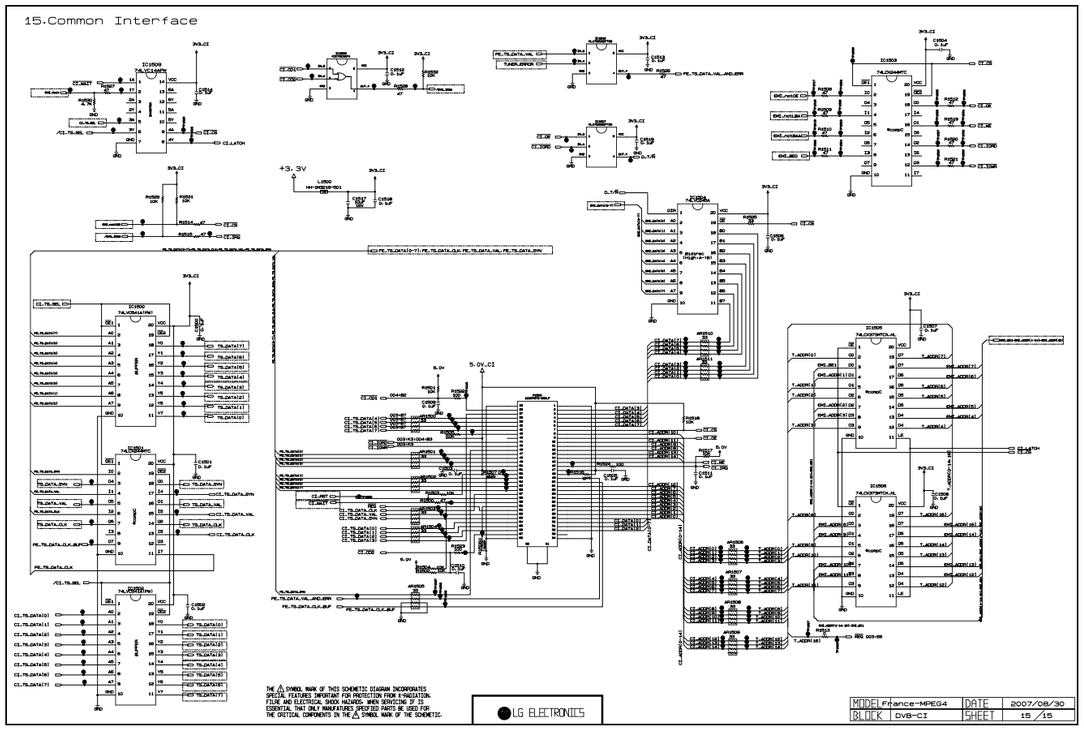

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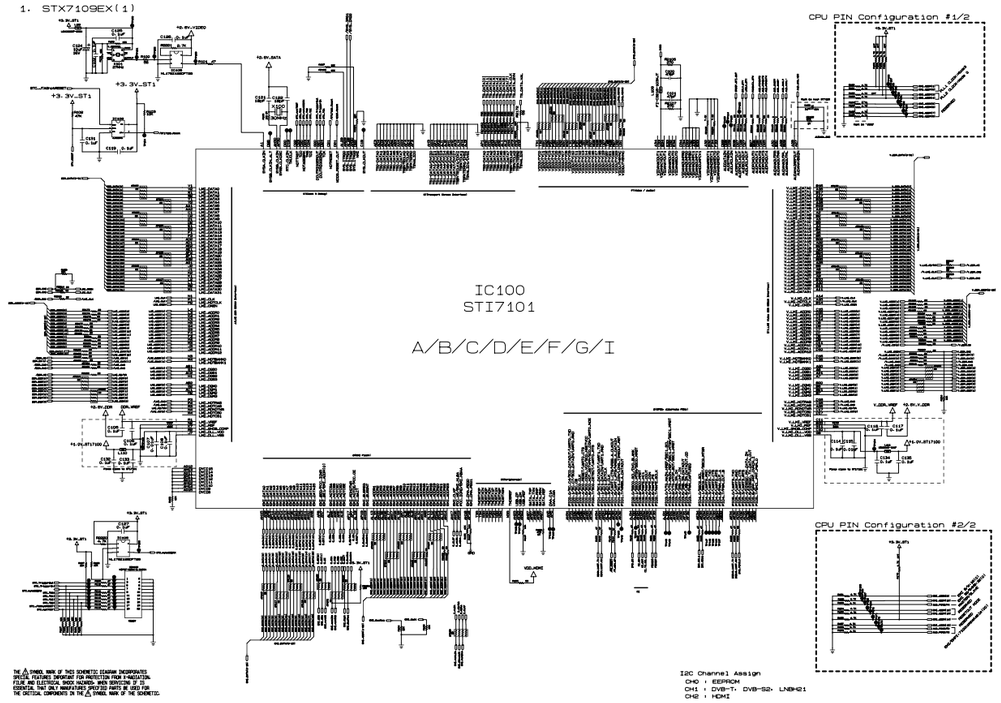
1. STX7109EX(1)



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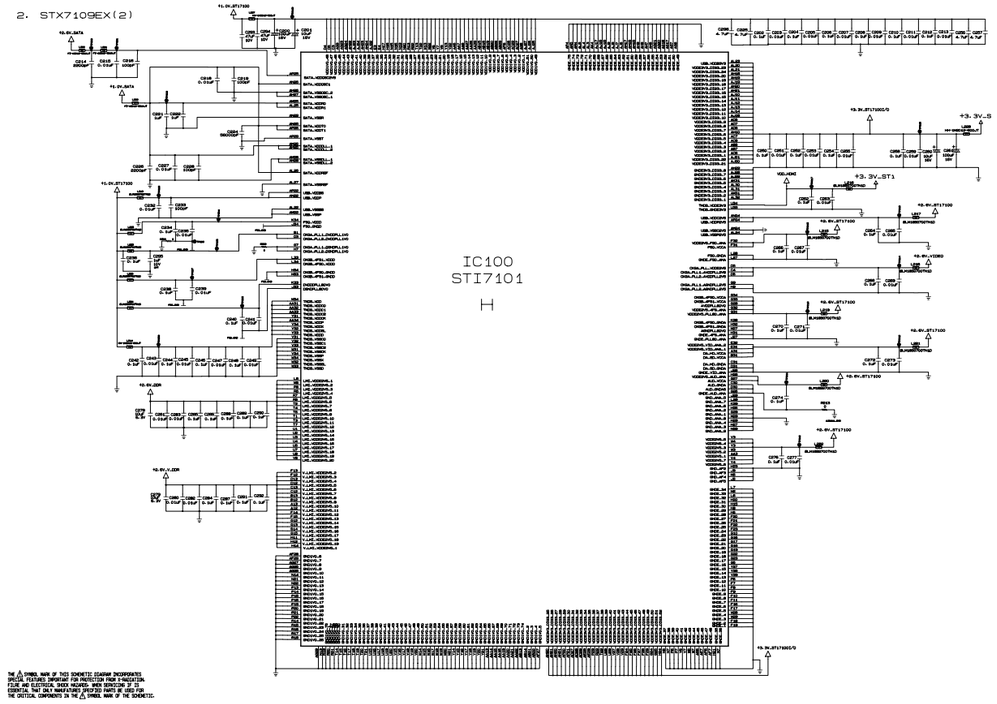
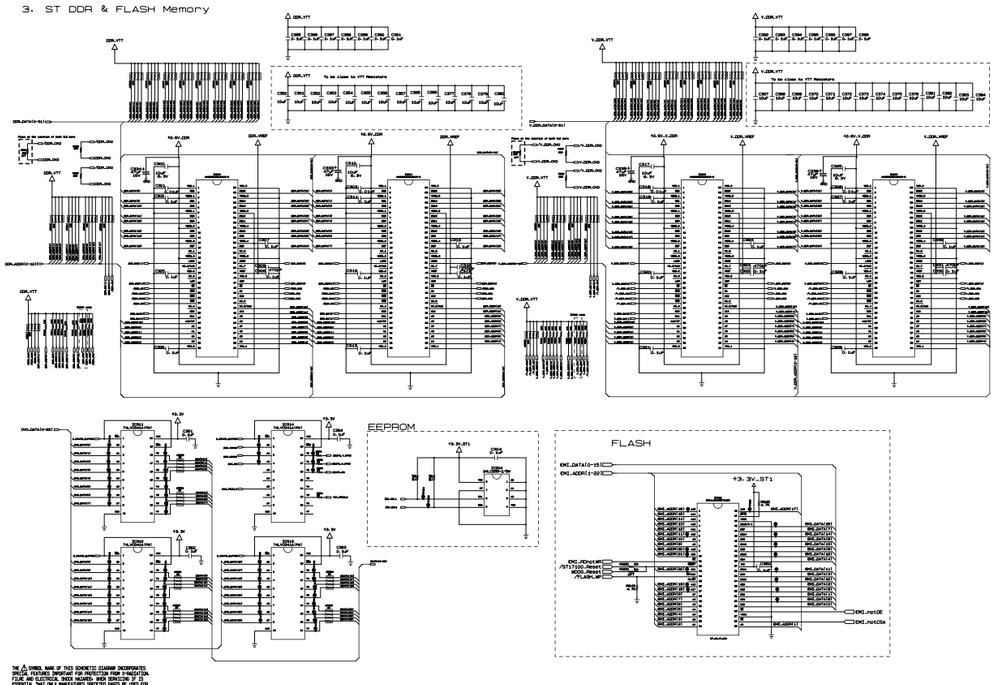
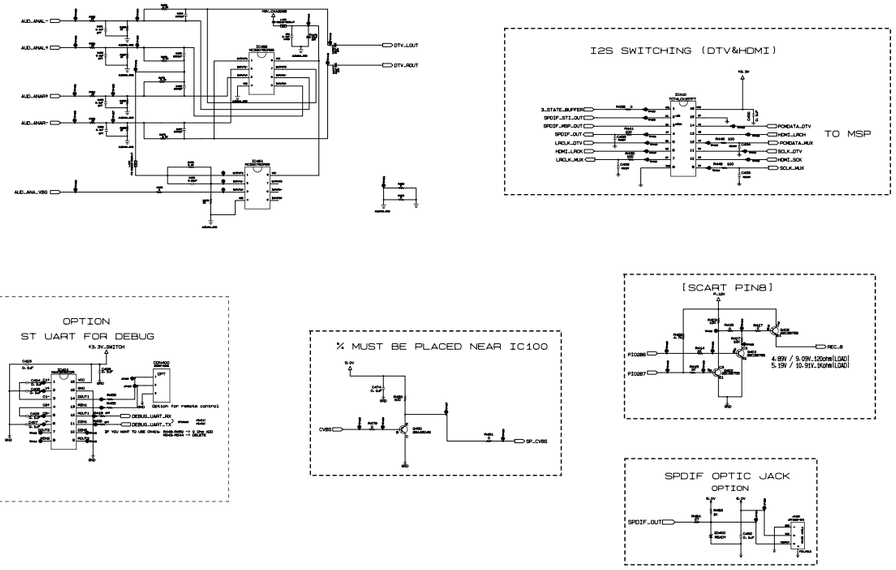


3. ST DDR & FLASH Memory



4. I2S & ETC



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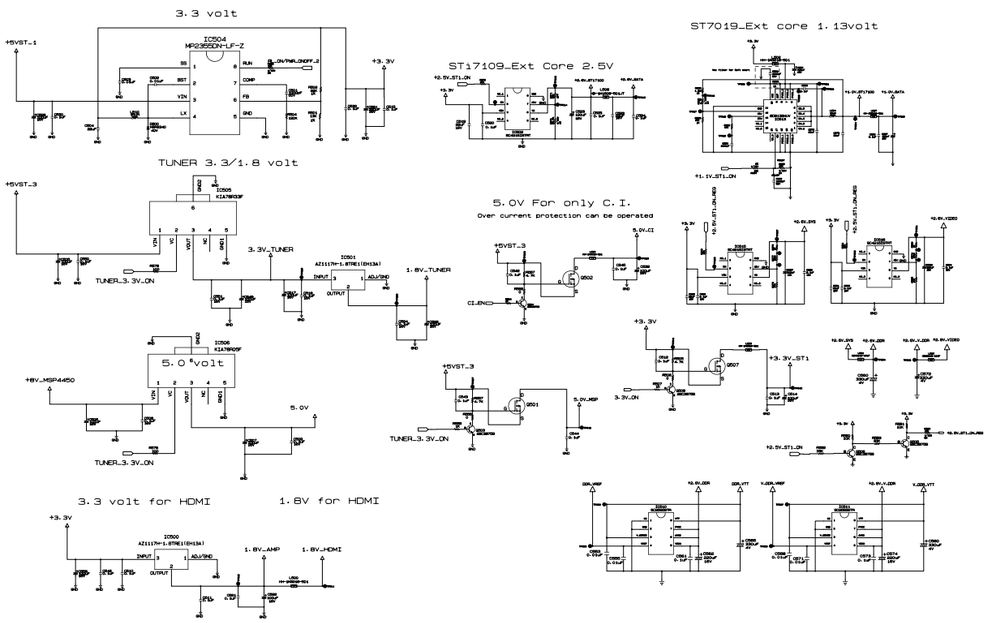
5. POWER BLOCK



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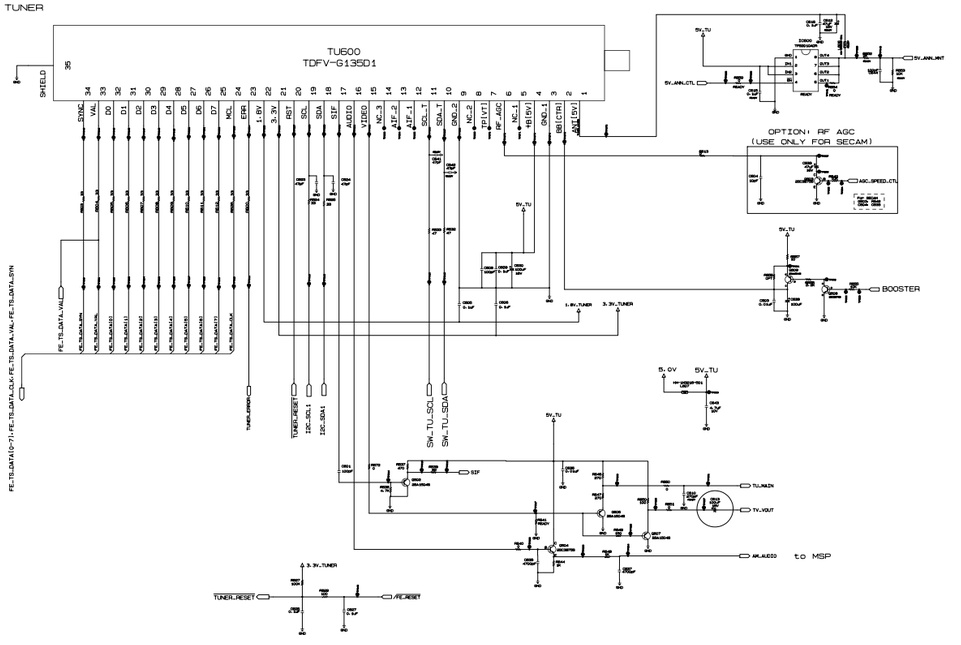
6. TUNER



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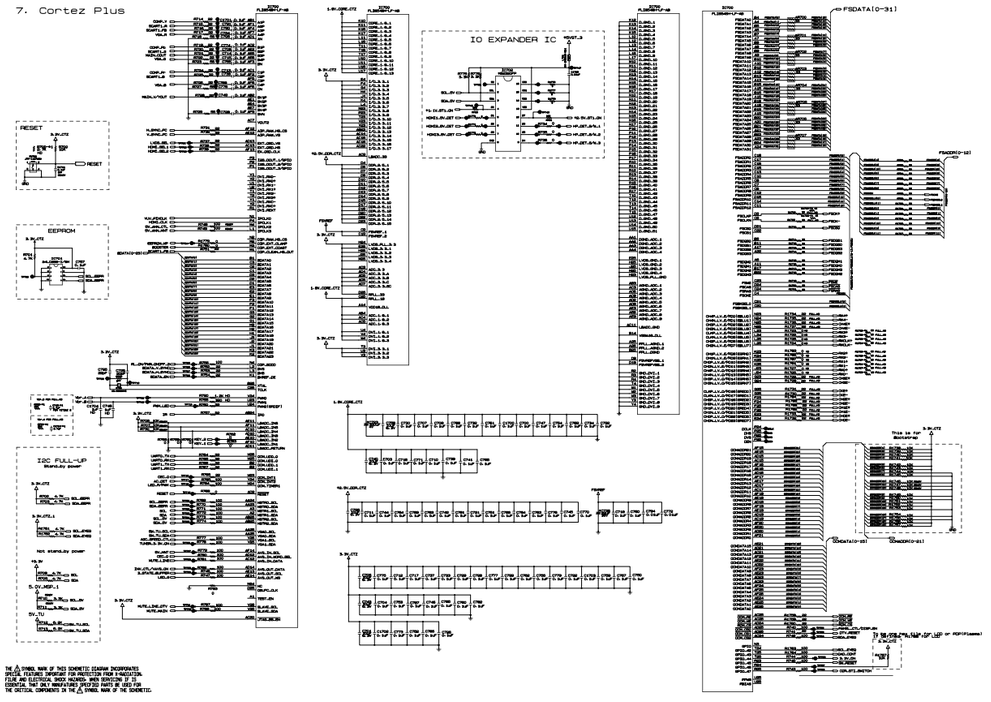
7. Cortez Plus



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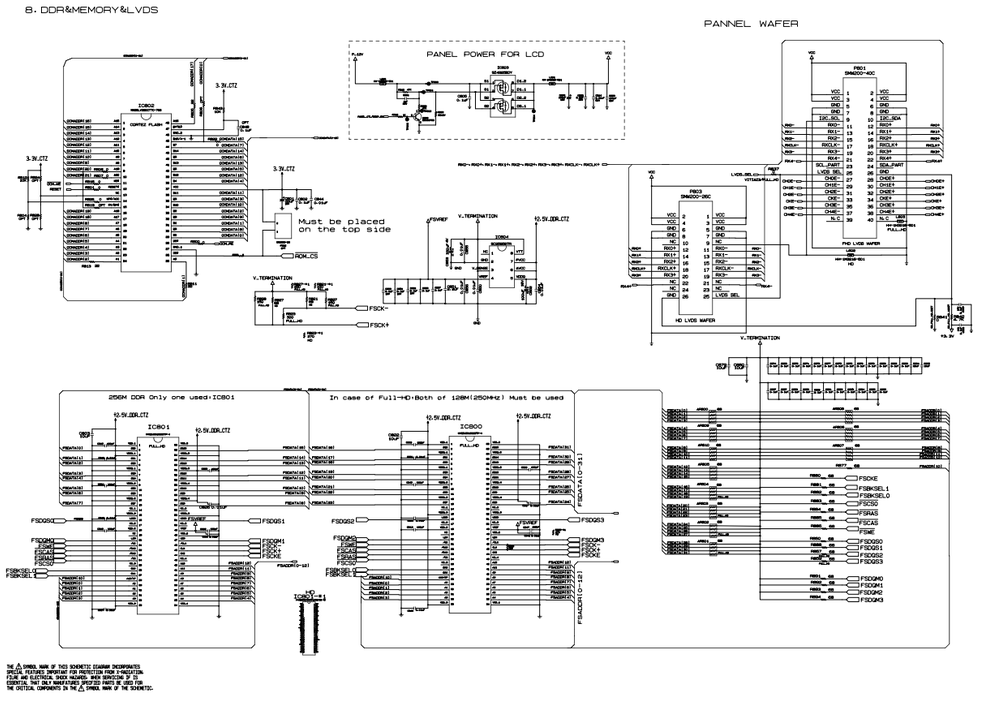
8. DDR&MEMORY&LVDS



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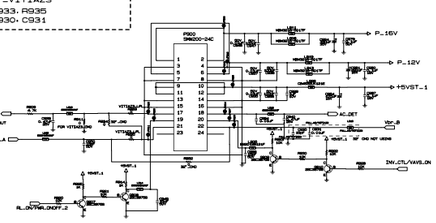
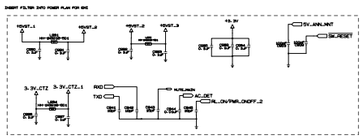
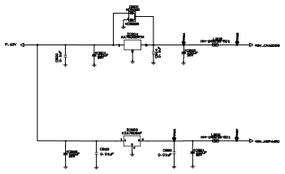
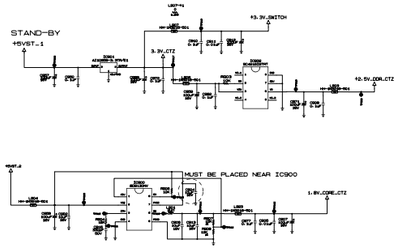
9. POWER

32" _CMO
ADD : R911, R932, R934
DELETE : R933, R935, L916, C930, C931
32" /37" /42" _VITIAZ3
ADD : R911, R933, R935
L916, C930, C931









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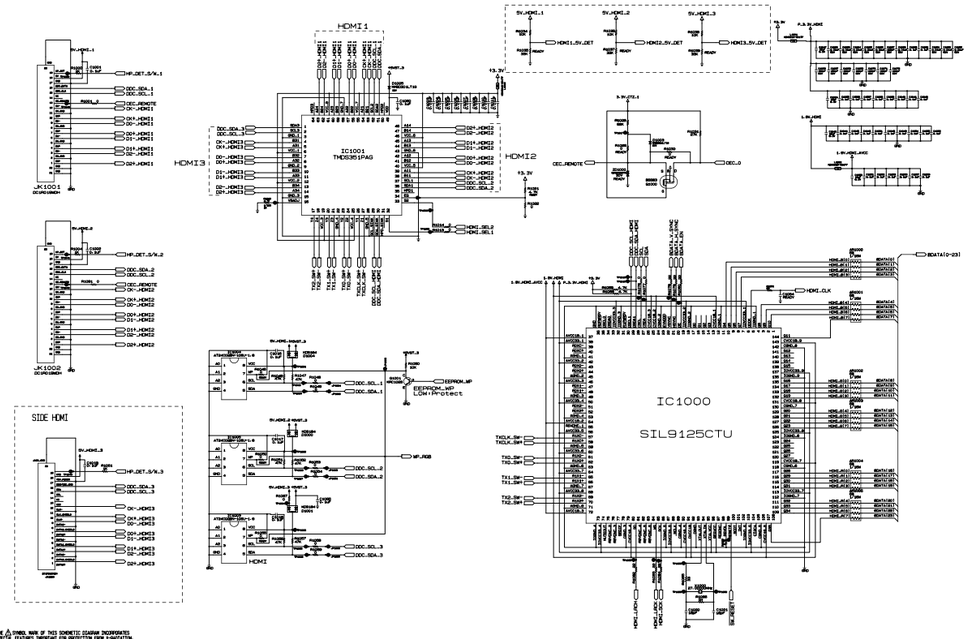
10. HDMI



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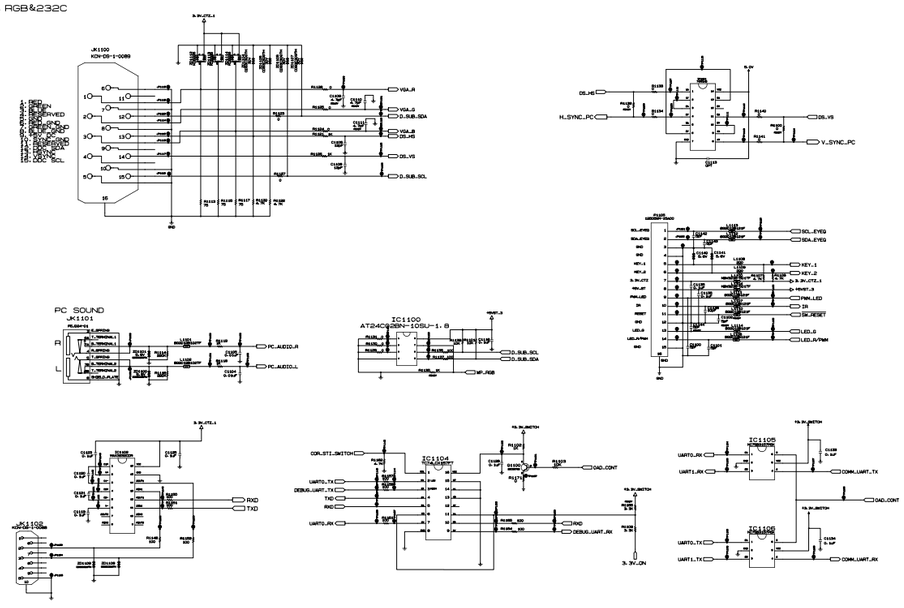
11. RGB&232C



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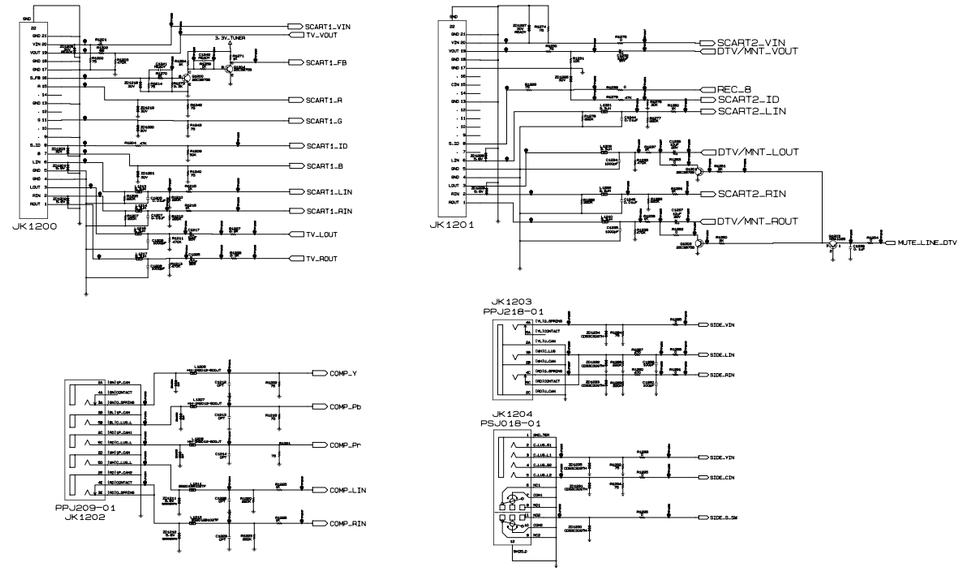
12. SCART & Copm & Side A/V



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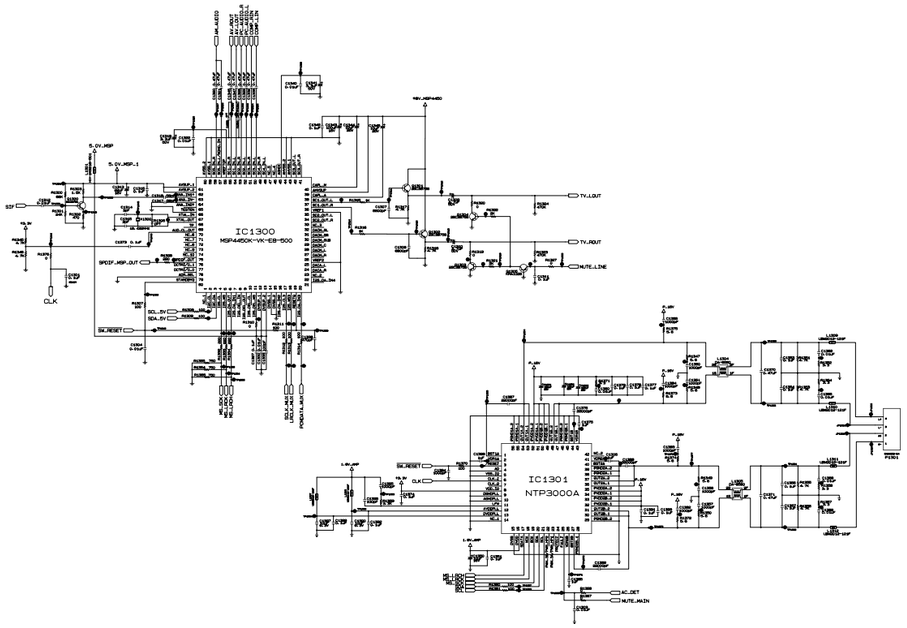
13. AUDIO BLOCK



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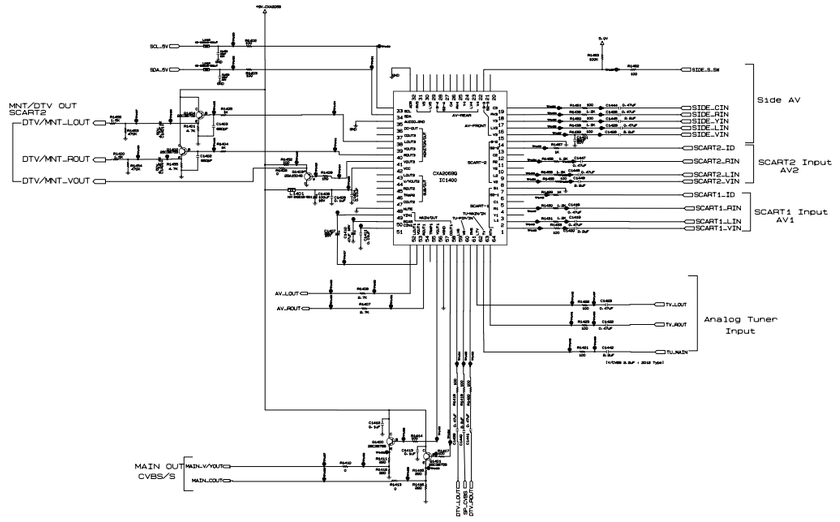
14. AV SWITCH



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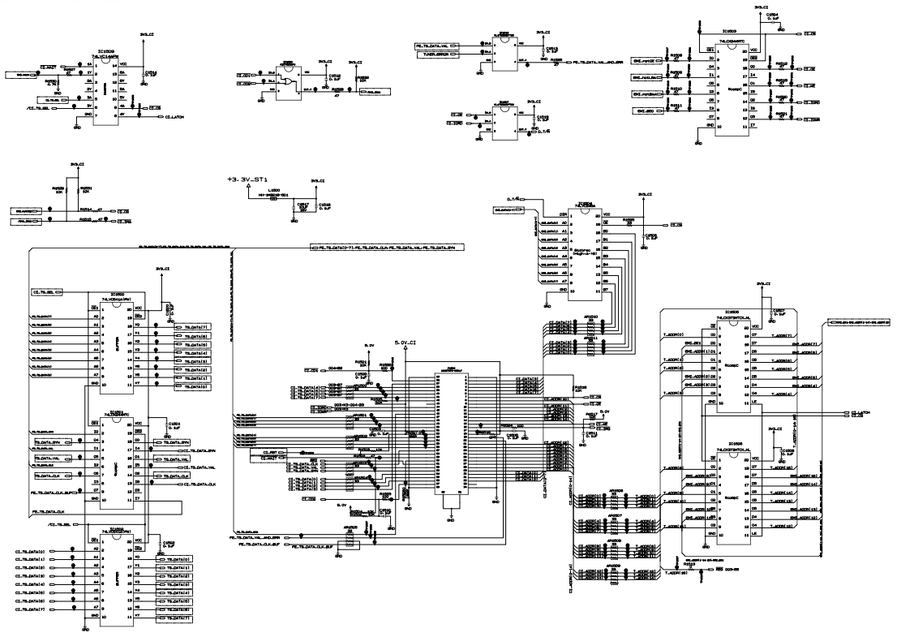
15. Common Interface



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