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# LCD TV

# SERVICE MANUAL

CHASSIS : LD88D

MODEL : 32LG7000      32LG7000-ZA

## CAUTION

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



# CONTENTS

<b>CONTENTS .....</b>	<b>2</b>
<b>PRODUCT SAFETY .....</b>	<b>3</b>
<b>SPECIFICATION .....</b>	<b>6</b>
<b>ADJUSTMENT INSTRUCTION .....</b>	<b>10</b>
<b>TROUBLE SHOOTING .....</b>	<b>14</b>
<b>BLOCK DIAGRAM.....</b>	<b>23</b>
<b>EXPLODED VIEW .....</b>	<b>33</b>
<b>SVC. SHEET .....</b>	

# 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.

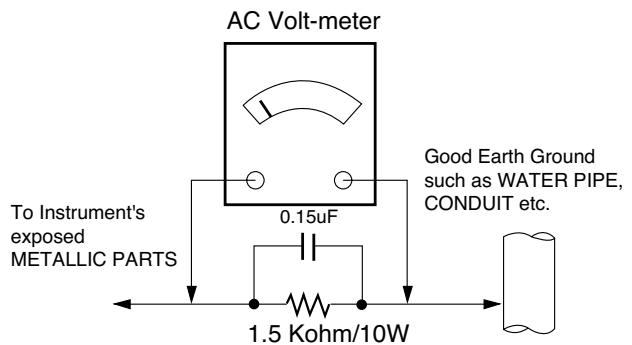
Connect 1.5K/10watt resistor in parallel with a 0.15uF capacitor between a known good earth ground (Water Pipe, Conduit, etc.) and the exposed metallic parts.

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)

**CAUTION:** This is a flammable mixture.

Unless specified otherwise in this service manual, lubrication of contacts is 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.

### 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 to LD88D chassis.

## 2. Requirement for Test

Each part is tested as below without special appointment.

- (1) Temperature :  $25 \pm 5^{\circ}\text{C}$ ( $77 \pm 9^{\circ}\text{F}$ ), CST :  $40 \pm 5^{\circ}\text{C}$
- (2) Humidity :  $65\% \pm 10\%$
- (3) Power : Standard input voltage (100-240V~, 50/60Hz)  
\* Standard Voltage of each products 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 : CE, IEC Specification  
EMC : CE, IEC

## 3 General Specification(LCD Module)

No.	Item	Specification	Remark
1	Display Screen Device	31.5 inch Color TFT-LCD Module(AUO)	LCD
2	Aspect Ratio	16:9	
3	LCD Module	Pixel Format: 1920 horiz. By 1080 vert. pixels RGB stripe arrangement	
4	Operating Environment	1) Temp. : 0 ~ 40 deg 2) Humidity : 20 ~ 80%	LGE SPEC
5	Storage Environment	3) Temp. : -20 ~ 60 deg 4) Humidity : 10 ~ 90 %	
6	Input Voltage	AC100-240V~, 50/60Hz	Maker LG

## 4. Model Specification

No.	Item	Specification	Remark
1	Market	Austria, Belgium, Bulgaria, Croatia, Czech, Denmark, Finland, France, Germany, Greece, Hungary, Italy, Luxembourg, UK Morocco, Netherlands, Norway, Poland, Portugal, Romania, Russia, Serbia, Slovenia, Spain, Sweden, Switzerland, Turkey,	25 Country -> 27 country
2	Broadcasting system	1) PAL/SECAM BG 2) PAL/SECAM DK 3) PAL I/II 4) SECAM L/L' 5) DVB T	EU (PAL Market)
3	Receiving system	Analog : Upper Heterodyne Digital : COFDM	
4	Scart Jack (2EA)	PAL, SECAM	Scart 1 Jack is Full scart and support RF-OUT(Analog) Scart 2 jack is Half scart and support MNT-OUT.
5	Video Input (1EA)	PAL, SECAM, NTSC	Side AV
6	S-Video Input (1EA)	PAL, SECAM, NTSC	Side AV
7	Component Input (1EA)	Y/Cb/Cr, Y/ Pb/Pr	
8	RGB Input	RGB-PC	Analog (D-Sub 15Pin)
9	HDMI Input (4EA)	HDMI-PC HDMI-DTV	HDMI1/DVI, HDMI2, HDMI3, HDMI4 All HDMI inputs support V1.3 of HDMI
10	Audio Input (3 EA)	RGB/DVI Audio, Component, AV	L/R Input
11	SPDIF Out(1 EA)	SPDIF Out	
12	USB	For SVC, S/W Download, X-Studio	Side(X-Studio Only Series)
13	Bluetooth	Bluetooth Phone(JPEG), Headset	32/37/42/47/52LG7000 models

## 5. Component Video Input (Y, P<sub>B</sub>, P<sub>R</sub>)

No.	Resolution	H-freq(kHz)	V-freq(Hz)	Pixel clock(MHz)	Proposed
1	720*480	15.73	59.94	13.500	SDTV, DVD 480I(525I)
2	720*480	15.75	60.00	13.514	SDTV, DVD 480I(525I)
3	720*576	15.625	50.00	13.500	SDTV, DVD 576I(625I) 50Hz
4	720*480	31.47	59.94	27.000	SDTV 480P
5	720*480	31.50	60.00	27.027	SDTV 480P
6	720*576	31.25	50.00	27.000	SDTV 576P 50Hz
7	1280*720	44.96	59.94	74.176	HDTV 720P
8	1280*720	45.00	60.00	74.250	HDTV 720P
9	1280*720	37.50	50.00	74.25	HDTV 720P 50Hz
10	1920*1080	33.72	59.94	74.176	HDTV 1080I
11	1920*1080	33.75	60.00	74.250	HDTV 1080I
12	1920*1080	28.125	50.00	74.250	HDTV 1080I 50Hz,
13	1920*1080	56.25	50		HDTV 1080P
14	1920*1080	67.5	60		HDTV 1080P

## 6. RGB input (Analog PC)

No.	Resolution	H-freq(kHz)	V-freq(Hz)	Pixel clock(MHz)	Proposed	Remark
1.	720*400	31.468	70.08	28.32		
2.	640*480	31.469	59.94	25.17	VESA	
3.	800*600	37.879	60.31	40.00	VESA	
4.	1024*768	48.363	60.00	65.00	VESA(XGA)	
5.	1280*768	47.78	59.87	80.125	VESA(WXGA)	
6	1360*768	47.72	59.80	84.625	VESA(WXGA)	
7	1280*1024	63.98	60.02	108.	SXGA	FULL HD only
8	1400*1050	65.317	59.979	121.75	SXGA	FULL HD only
9.	1920*1080	66.587	59.934	138.5	WUXGA	



## 7. HDMI DTV

No.	Resolution	H-freq(kHz)	V-freq(Hz)	Pixel clock(MHz)	Proposed	
1	640*480	31.649	59.94	25.175	SDTV 480p 60Hz	
2	640*480	31.469	60	25.20	SDTV 480p 60Hz	
3	720*480	31.47	59.94	27.00	SDTV 480p 60Hz	
4	720*480	31.50	60	27.027	SDTV 480p 60Hz	
5	720*576	31.25	50.00	27.00	SDTV 576p 50Hz	
6	1280*720	37.50	50.00	74.176	HDTV 720p 50Hz	
7	1280*720	44.96	59.94	74.176	HDTV 720p 60Hz	
8	1280*720	45.00	60	74.250	HDTV 720p 60Hz	
9	1920*1080	28.125	50.00	74.250	HDTV 1080i 50Hz	
10	1920*1080	33.72	59.94	74.176	HDTV 1080i 60Hz	
11	1920*1080	33.75	60	74.250	HDTV 1080i 60Hz	
12	1920*1080	27.00	24.00	74.25	HDTV 1080p 24Hz	
13	1920*1080	33.750	30	74.25	HDTV 1080p 30Hz	
14	1920*1080	56.25	50.00	148.50	HDTV 1080p 50Hz	
15	1920*1080	67.433	59.94	148.352	HDTV 1080p 60Hz	
16	1920*1080	67.50	60	148.50	HDTV 1080p 60Hz	

## 8. HDMI PC

No.	Resolution	H-freq(kHz)	V-freq(Hz)	Pixel clock(MHz)	Proposed	Remark
1.	720*400	31.468	70.08	28.32		
2.	640*480	31.469	59.94	25.17	VESA	
3.	800*600	37.879	60.31	40.00	VESA	
4.	1024*768	48.363	60.00	65.00	VESA(XGA)	
5.	1280*768	47.78	59.87	80.125	VESA(WXGA)	
6	1360*768	47.72	59.80	84.625	VESA(WXGA)	
7	1280*1024	63.98	60.02	108.	SXGA	FULL HD only
8	1400*1050	65.317	59.979	121.75	SXGA	FULL HD only
9.	1920*1080	66.587	59.934	138.5	WUXGA	

# ADJUSTMENT INSTRUCTION

## 1. Application Range

This spec. sheet is applied to all of the LD88D 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 protect test instrument.
  - (2) Adjustment must be done in the correct order.
  - (3) The adjustment must be performed in the circumstance of 25±5°C of temperature and 65±10% of relative humidity if there is no specific designation.
  - (4) The input voltage of the receiver must keep 100-240V, 50/60Hz.
  - (5) The receiver must be operated for about 15 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 Adjustment R/C.
      - 2) Press the "ADJ KEY" on Adjustment R/C.
      - 3) Select "3. Test Pattern" by using ▲/▼(CH +/-) and press ENTER(■)
      - 4) Select "White" by using ◀/▶(VOL +/-) and press ENTER(■)
- \* 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 pattern more than 20 minutes (Especially digital pattern, cross hatch pattern), an after image may be occur in the black level part of the screen.

## 3. PCB assembly adjustment method

Caution: Using 'power on' button of the Adjustment R/C , power on TV.

\* ADC Calibration Protocol (RS232)

	Item	CMD1	CMD2	Data0	
Enter Adjust Mode	Adjust 'Mode In'	A	D	0 0	When transfer the 'Mode In', Carry the command.
ADC adjust	ADC Adjust	A	D	1 0	Automatically adjustment (The use of a internal pattern)
	Adjust 'Mode Out'	A	D	9 0	
	Adjustment Confirmation	A	D	9 9	To check ADC Adjustment on Assembly line.

\* EDID data and Model option download (RS232)

NO	Item	CMD1	CMD2	Data0	
Enter download MODE	Download 'Mode In'	A	E	0 0	When transfer the 'Mode In', Carry the command.
Edid data and Model option download	Download	A	E	*Note1 *Note2	Automatically download (The use of a internal Data)
	Adjust 'Mode Out'	A	E	9 0	
	Adjustment Confirmation	A	E	9 9	To check download on assembly line

\*\* Note 1 & Note 2

Model Option	Note 1	Note 2
32LG7000-ZA	5	6
37LG7000-ZA	5	7
42LG7000-ZA	5	8
47LG7000-ZA	5	9
52LG7000-ZA	5	A

- Baud rate : 115200 bps
- RS232 Host : PC
- echo : none

## 3.1. ADC adjustment

RF input	AV / Component / RGB input
NO SIGNAL or White noise	NO SIGNAL

- \* Adjustment can be done using only internal ADC, so input signal is not necessary.
- \* Required equipment : Adjustment R/C.

- 1) Press ADJ key on adjustment R/C.
- 2) Select "1. ADC calibration" by using ▲/▼(CH +/-) and press ENTER(■)
- 3) Select "Start" by using ◀/▶(VOL +/-) and press ENTER(■)
- 4) ADC adjustment is executed automatically.

## 3.2 PCMCIA CARD Checking Method

You must adjust DTV 29 Channel and insert PCMCIA CARD to socket.

- 1) If PCMCIA CARD works normally, normal signals display on screen. But it works abnormally, "No CA module" words display on screen.

\* Caution: Set up "RF mode" before launching products.

## 4. EDID (The Extended Display Identification DATA)

\* When company internal production(total assembly), EDID data must scan in DDC line.

### 4.1. EDID Download

Before downloading EDID Data, check the RGB/HDMI cable is disconnected.

- 1) Press ADJ key on Adjustment R/C.
- 2) Select "5.EDID D/L" by using ▲/▼(CH +/-) and press ENTER(■)
- 3) Select "Start" by using ◀/▶(VOL +/-) and press ENTER(■)
- 4) EDID DownLoad is executed if word "NG" is changed to "OK" about all HDMI ports.

### 4.2. EDID Data

#### (1) HDMI1

	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						
0x10			01	03	80	46	27	78	EA	D9	B0	A3	57	49	9C	25
0x20	11	49	4B	A1	08	00	31	40	45	40	61	40	81	80	90	40
0x30	D1	C0	01	01	01	01	1A	36	80	A0	70	38	1F	40	30	20
0x40	35	00	E8	26	32	00	00	1A	1B	21	50	A0	51	00	1E	30
0x50	48	88	35	00	BC	86	21	00	00	1C	00	00	00	FD	00	39
0x60	4B	1F	54	12	00	0A	20	20	20	20	20	20				
0x70															01	
0x80	02	03	23	F1	4E	81	02	03	15	12	13	04	14	05	20	21
0x90	22	1F	10	23	09	57	07	83	01	00	00	67	03	0C	00	
0xA0	00	B8	2D	01	1D	00	80	51	D0	1C	20	40	80	35	00	BC
0xB0	88	21	00	00	1E	8C	0A	D0	8A	20	E0	2D	10	10	3E	96
0xC0	00	13	8E	21	00	00	18	02	3A	80	18	71	38	2D	40	58
0xD0	2C	45	00	06	44	21	00	00	1E	01	1D	80	18	71	1C	16
0xE0	20	58	2C	25	00	C4	8E	21	00	00	9E	4E	1F	00	80	51
0xF0	00	1E	30	40	80	37	00	BC	88	21	00	00	18	00	00	

#### Product ID

MODEL NAME	PRODUCT ID	HEX	EDID Table
32LG7000	30302	765E	5E76
37LG7000	30264	7638	3876
42LG7000	40360	9DA8	A89D
47LG7000	40362	9DAA	AA9D
52LG7000	50202	C41A	1AC4

Serial No: Controlled on production line.

Month, Year: Controlled on production line

: ex) Monthly : '09' -> '09'

Year: '2006' -> '10'

Model Name(Hex):

MODEL NAME	MODEL NAME(HEX)
32LG7000	00 00 00 FC 00 33 32 4C 47 37 30 30 30 0A 20 20 20
37LG7000	00 00 00 FC 00 33 37 4C 47 37 30 30 30 0A 20 20 20
42LG7000	00 00 00 FC 00 34 32 4C 47 37 30 30 30 0A 20 20 20
47LG7000	00 00 00 FC 00 34 37 4C 47 37 30 30 30 0A 20 20 20
52LG7000	00 00 00 FC 00 35 32 4C 47 37 30 30 30 0A 20 20 20

Checksum: Changeable by total EDID data.

Port No.

10:HDMI1, 20:HDMI2, 30:HDMI3, 40:HDMI4

#### (2) RGB

	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						
0x01			01	03	01	46	27	78	EA	D9	B0	A3	57	49	9C	25
0x02	11	49	4B	A1	08	00	31	40	45	40	61	40	81	80	90	40
0x03	81	80	01	01	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				
0x07															00	

#### Product ID

MODEL NAME	PRODUCT ID	HEX	EDID Table
32LG7000	30301	765D	5D76
37LG7000	30263	7637	3776
42LG7000	40359	9DA7	A79D
47LG7000	40361	9DA9	A99D
52LG7000	50201	C419	19C4

Serial No: Controlled on production line.

Month, Year: Controlled on production line

: ex) Monthly : '09' -> '09'

Year: '2006' -> '10'

Model Name(Hex):

MODEL NAME	MODEL NAME(HEX)
32LG7000	00 00 FC 00 33 32 4C 47 37 30 30 30 2D 0A 20 20 20
37LG7000	00 00 FC 00 33 37 4C 47 37 30 30 30 2D 0A 20 20 20
42LG7000	00 00 FC 00 34 32 4C 47 37 30 30 30 2D 0A 20 20 20
47LG7000	00 00 FC 00 34 37 4C 47 37 30 30 30 2D 0A 20 20 20
52LG7000	00 00 00 FC 00 35 32 4C 47 37 30 30 30 0A 20 20 20

Checksum: Changeable by total EDID data

## 5. Model option download(Manual method)

- (1) Press 'Adj' key of Adjust Remocon ( p/n : 105-201M).
- (2) Select 'Model Option' by using ▲/▼ (CH+/-) key, and press 'VOL+' of 'Enter'.
- (3) Enter the Model number or Select 'Model Name' by using ▲/▼ (CH+/-) key.  
32LG7000-ZA -> 7700000
- (4) And then, Press 'Enter' or 'Vol+'
- (5) The set is turned off and Turned On automatically.

## 6. Serial number D/L

### 6.1 Signal TABLE

CMD	LENGTH	ADH	ADL	DATA_1	...	Data_n	CS	DELAY
-----	--------	-----	-----	--------	-----	--------	----	-------

CMD : A0h  
 LENGTH : 85~94h (1~16 bytes)  
 ADH : EEPROM Sub Address high (00~1F)  
 ADL : EEPROM Sub Address low (00~FF)  
 Data : Write data  
 CS : CMD + LENGTH + ADH + ADL + Data\_1 + ... + Data\_n  
 Delay : 20ms

### 6.2 Command Set

No.	Adjust mode	CMD(hex)	LENGTH(hex)	Description
1	EEPROM WRITE	A0h	84h+n	n-bytes Write (n = 1~16)

\* Description  
 FOS Default write : <7mode data> write  
 Vtotal, V\_Frequency, Sync\_Polarity, Htotal, Hstart, Vstart, 0, Phase  
 Data write : Model Name and Serial Number write in EEPROM,.

### 6.3 method & notice

- A. Serial number D/L is using of scan equipment.
- B. Setting of scan equipment operated by Manufacturing Technology Group.
- C. Serial number D/L must be conformed when it is produced in production line, because serial number D/L is mandatory by D-book 4.0

## 7. Adjustment of White Balance

### 7.1. Test Equipment

- Color Analyzer (CS-1000, CA-100+(CH.9), CA-210(CH.9) )
- Please adjust CA-100+ / CA-210 by CS-1000 before measuring
- > 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.

\* Color temperature standards according to CSM and Module

CSM	LCD
Cool	11000K
Medium	9300K
Warm	6500K

\* Change target luminance and range of the Auto adjustment W/B equipment.

Target luminance	65
Gamma	20

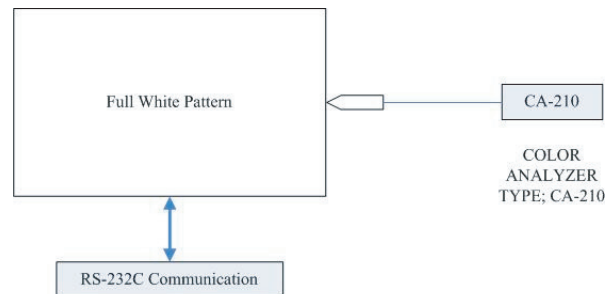
\* White balance adjustment coordinate and color temperature

	CS-1000	CA-100+(CH.9)	CA-210(CH.9)
<b>Cool</b>			
X	0.276	0.276±0.002	0.276±0.002
Y	0.283	0.283±0.002	0.283±0.002
Δuv	0.000	0.000	0.000
<b>Medium</b>			
X	0.285	0.285±0.002	0.285±0.002
Y	0.293	0.293±0.002	0.293±0.002
Δuv	0.000	0.000	0.000
<b>Warm</b>			
X	0.313	0.313±0.002	0.313±0.002
Y	0.329	0.329±0.002	0.329±0.002
Δuv	0.000	0.000	0.000

- PC (for communication through RS-232C) -> UART Baud rate : 115200 bps
- Luminance Y AV : upper 150 cd/m<sup>2</sup> (TYP : 350 cd/m<sup>2</sup>)
- > Applying to Cool, Medium, Warm mode

### 7.2. Connecting picture of the measuring instrument (On Automatic control)

Inside PATTERN is used when W/B is controlled. Connect to auto controller or push Adjustment R/C IN-START -> Enter the mode of White-Balance, the pattern will come out.



<Fig. 1> connecting picture (On Automatic Control)

### 7.3. Auto White Balance

- 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 (CA210) to the module less than 10cm distance, keep it with the surface of the Module and Color Analyzer's Probe 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.

- Auto adjustment Map(RS-232C)

	RS-232C COMMAND [CMD ID DATA]			MIN	CENTER (DEFAULT)			Max
	Cool	Medium	Warm		Cool	Medium	Warm	
	R Gain	jg	Ja		jd	00	192	
G Gain	jh	Jb	je	00	192	192	192	255
B Gain	ji	Jc	jf	00	192	192	192	255
R Cut					64	64	64	128
G Cut					64	64	64	128
B Cut					64	64	64	128

### 7.4. Manual white Balance

- (1) Press the ADJ KEY on Adjustment R/C.
  - Select "3. Test Pattern" by using ▲/▼(CH +/-) and press ENTER(■)
  - Select "White" by using ◀/▶(VOL +/-) and press ENTER(■) and heat run over 15 minutes.
- (2) Zero Calibrate CA-100+ / CA-210, and when controlling, stick the sensor to the center of LCD module surface.
- (3) Press the ADJ KEY on Adjustment R/C
- (4) Select "2. White Balance" and press ▶(VOL +)
  - Set test-pattern on and display inside pattern.
- (5) Control is carried out on three color temperatures, COOL, MEDIUM, WARM.
  - (Control is carried out three times)

< Temperature: COOL >

- R-Cut / G-Cut / B-Cut is set to 64.
- Gain of Fixed color should be kept on 192, and adjust other two lower than 192.
- Each gain is limited to 192.

< Temperature: MEDIUM >

- R-Cut / G-Cut / B-Cut is set to 64.
- Gain of Fixed color should be kept on 192, and adjust other two lower than 192.
- Each gain is limited to 192.

< Temperature: WARM >

- R-Cut / G-Cut / B-Cut is set to 64.
- Gain of Fixed color should be kept on 192, and adjust other two lower than 192.
- Each gain is limited to 192.

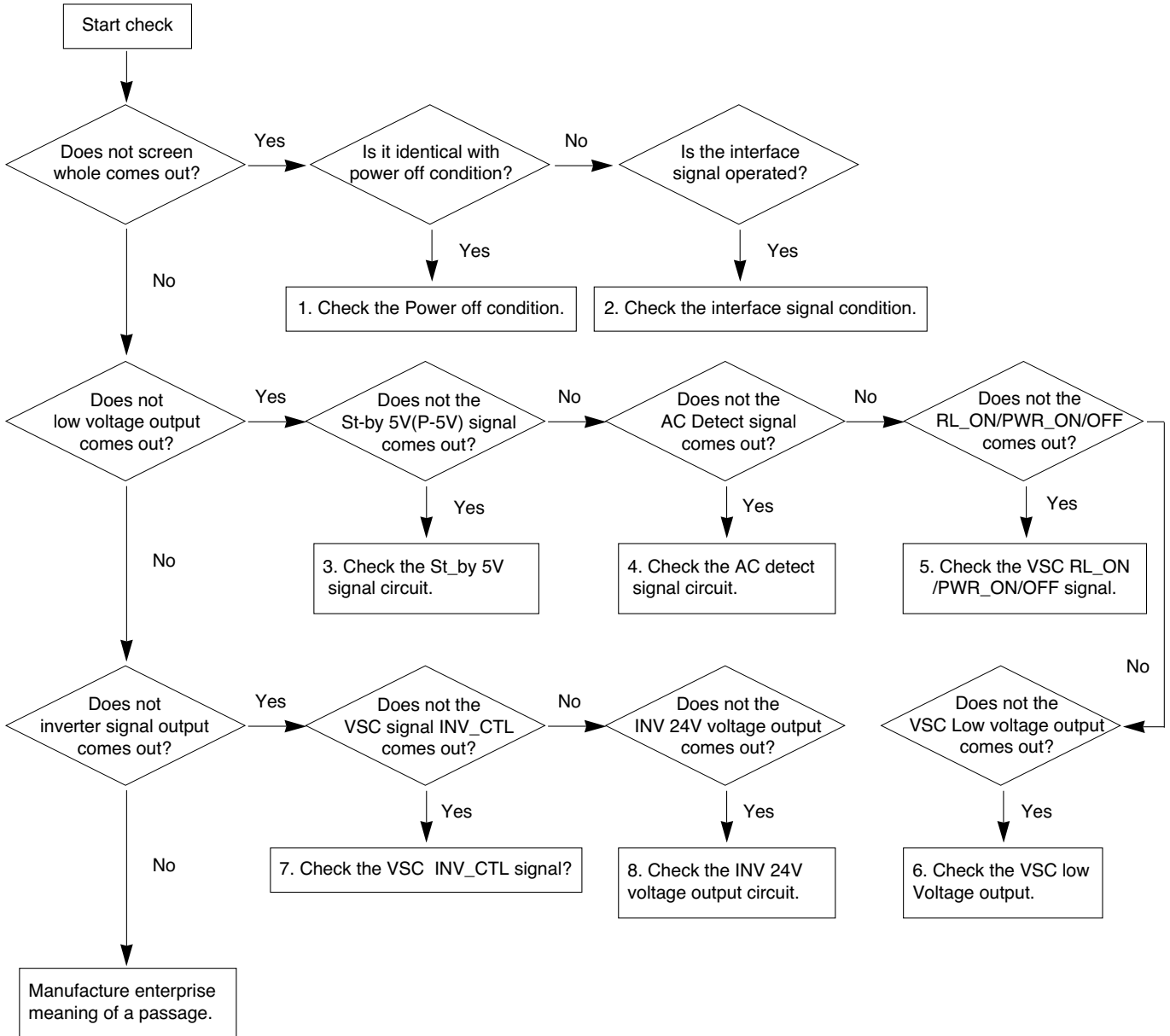
\* One of R Gain / G Gain / B Gain should be kept on 192, and adjust other two lower than 192.

(When R/G/B GAIN are all 192, it is the FULL DYNAMIC Range of Module)

# TROUBLE SHOOTING

## 1. Power Board

### 1-1. The whole flow chart which it follows in voltage output state

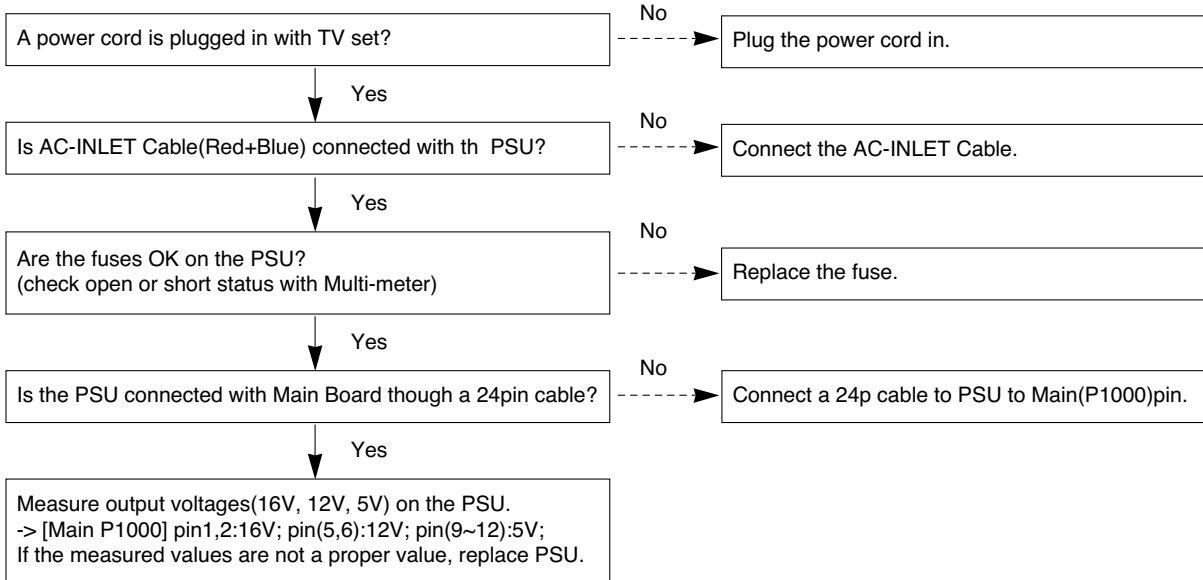


## 1-2. In case of No Power

### (1) Symptom

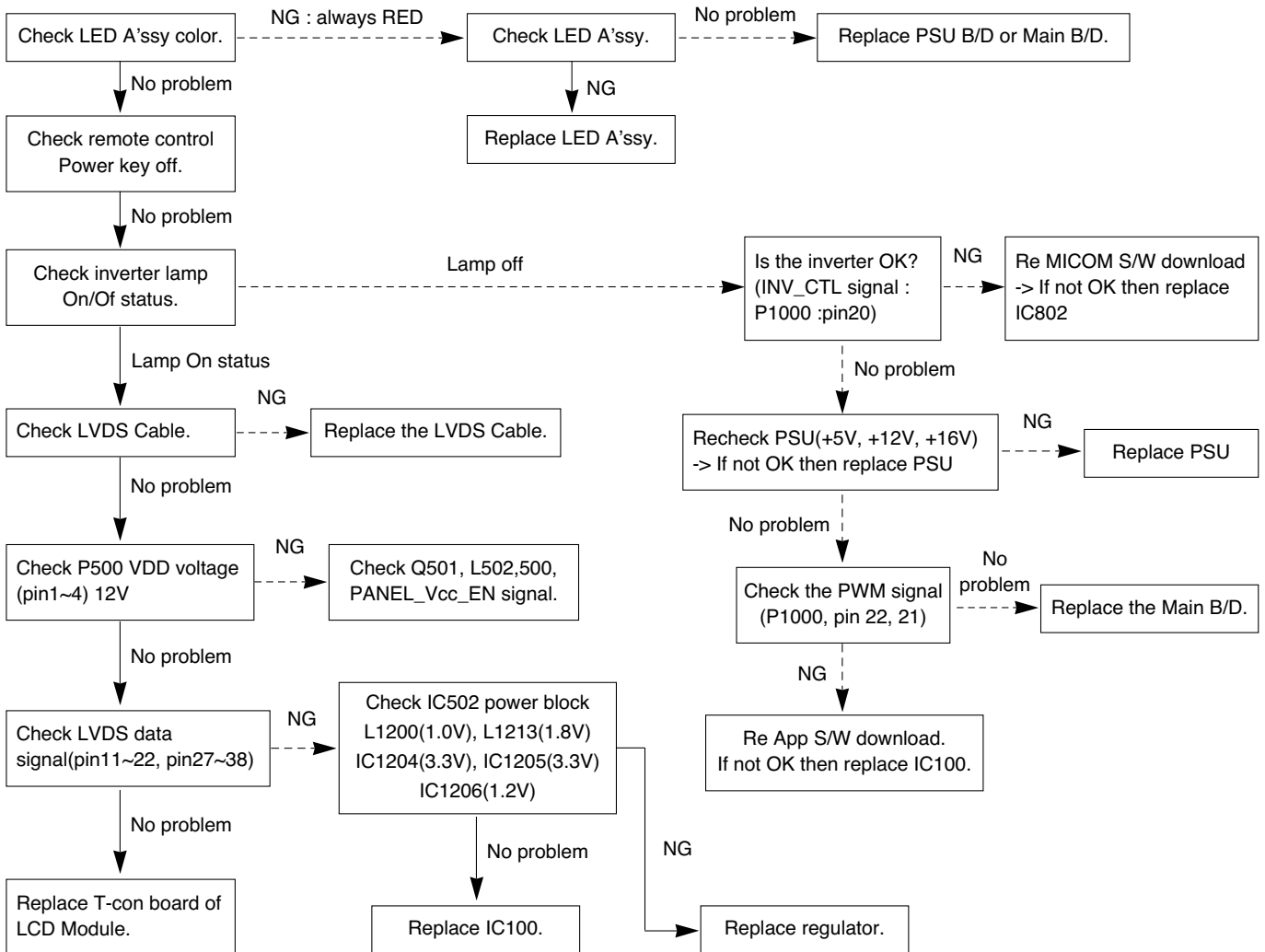
- 1) It does not charge at module.
- 2) Front LED does not work.

### (2) Check the followings



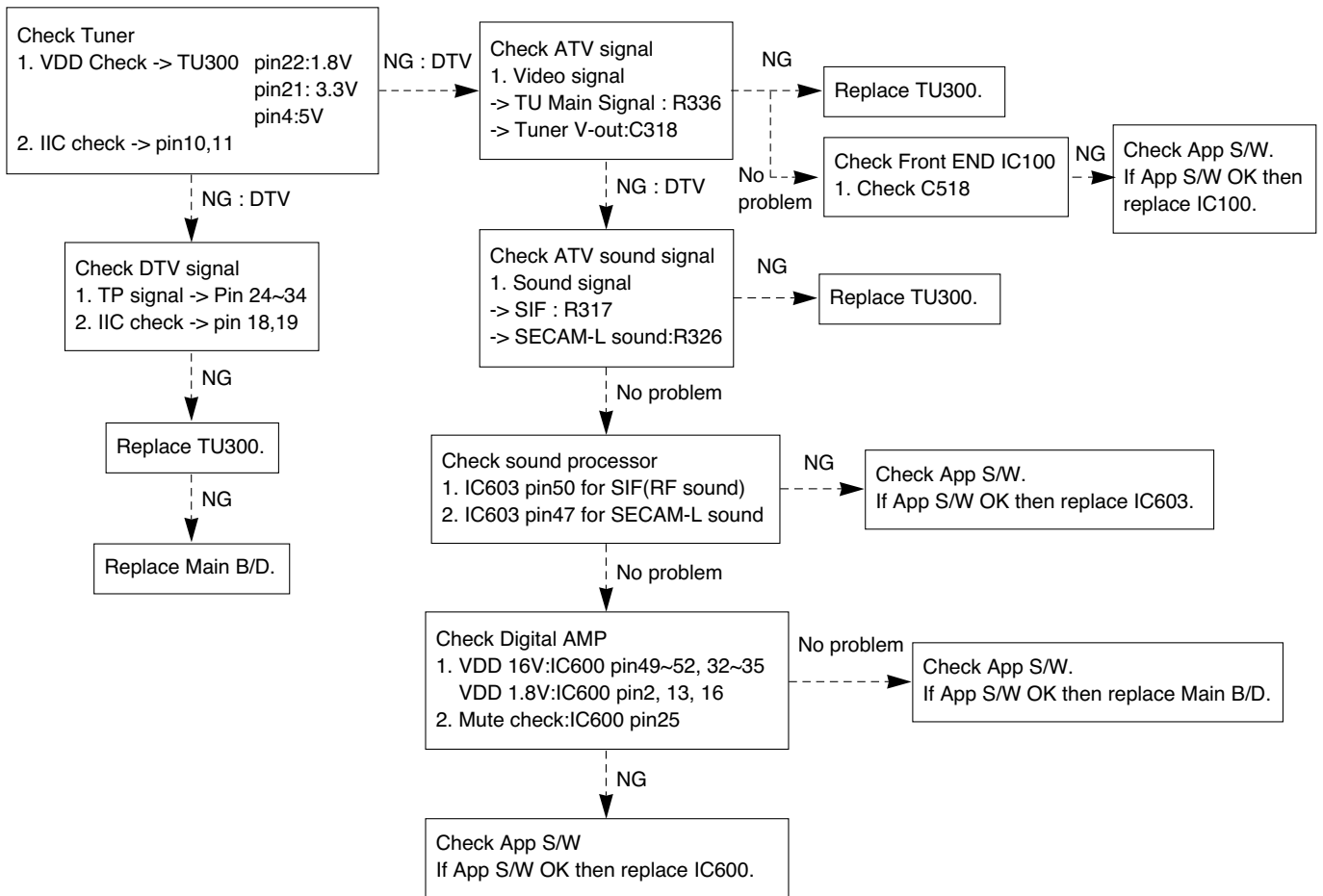
## 2. Main Board & Sub FRC B/D

### 2-1. In case of No Raster

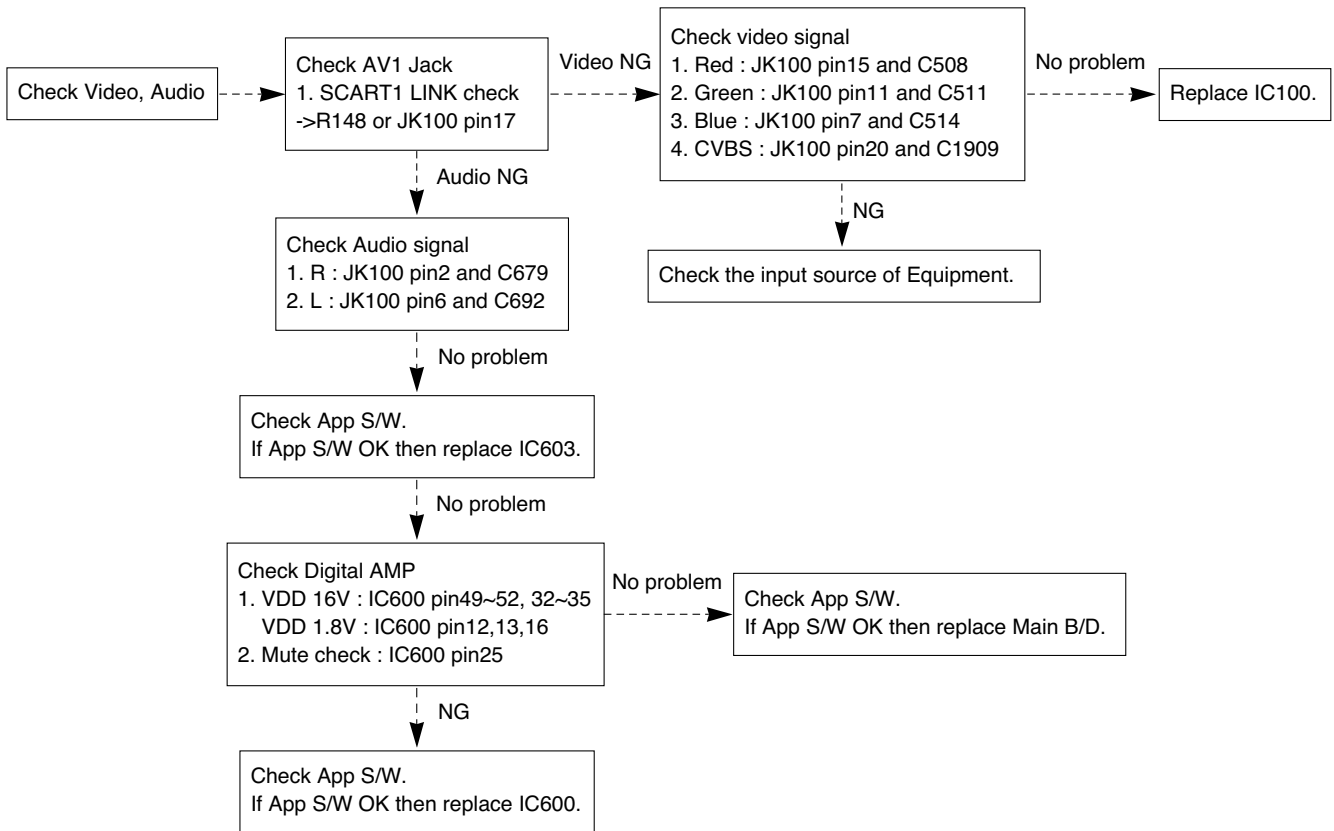




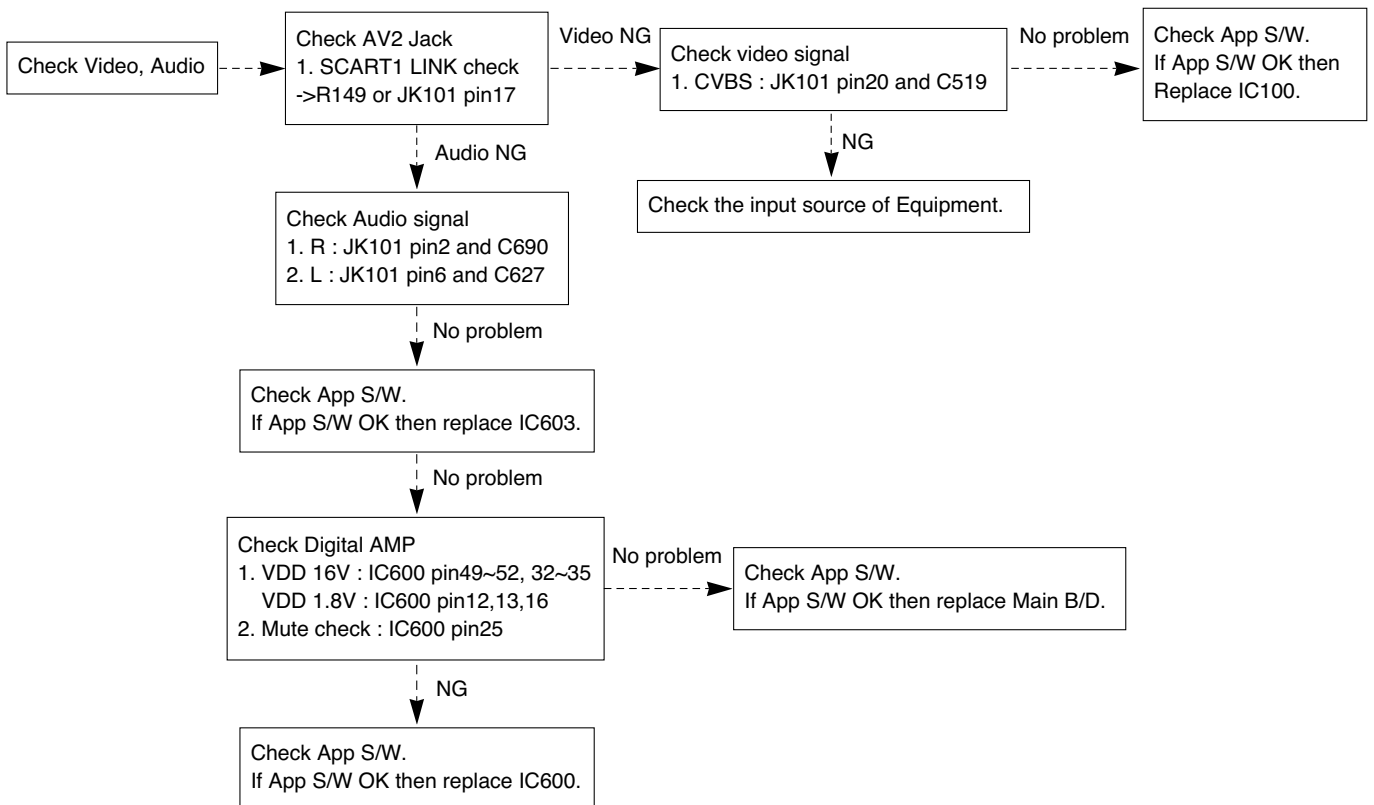
## 2-2. In case of abnormal display or sound when RF mode



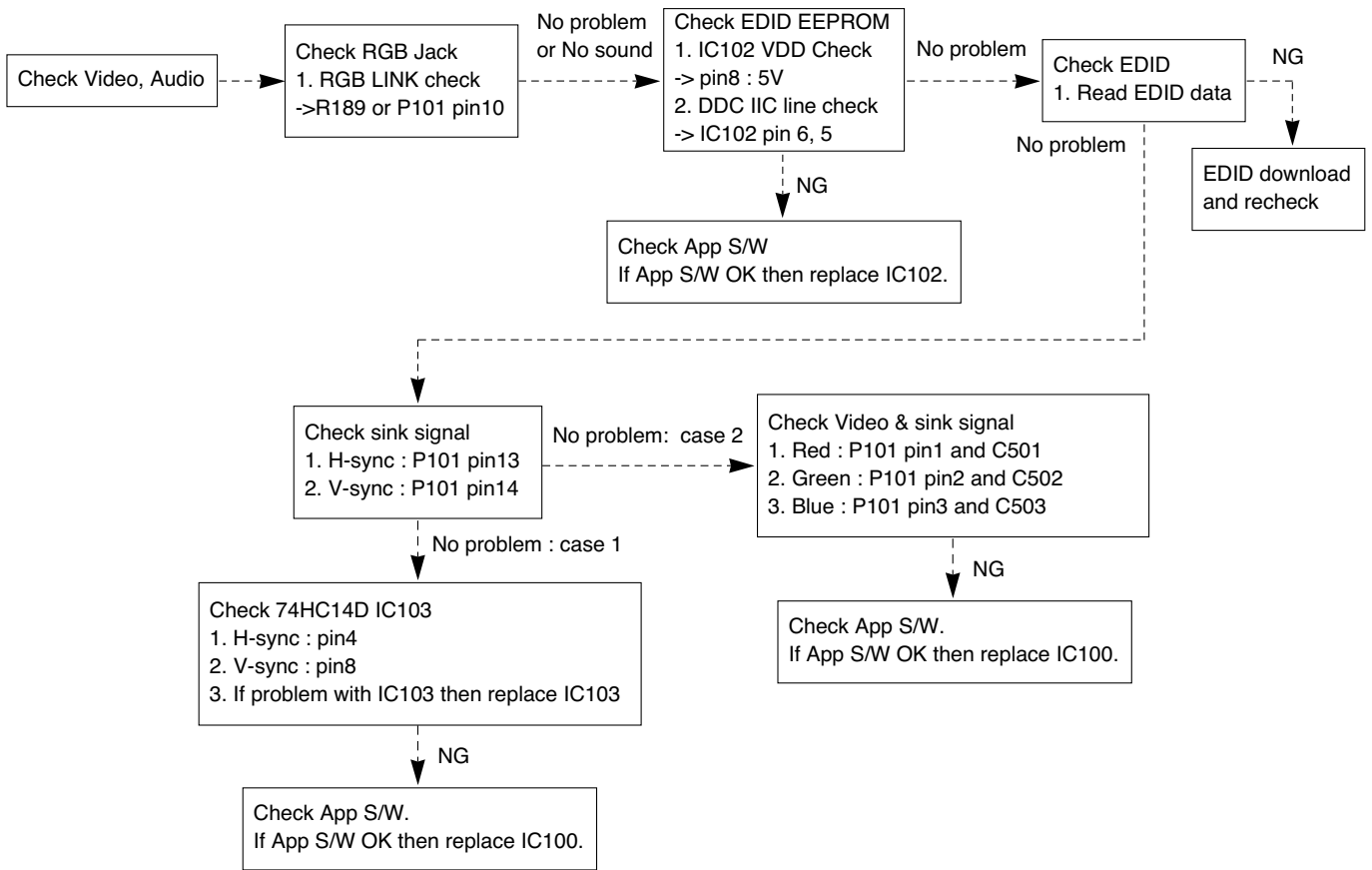
### 2-3. In case of abnormal display or sound when side AV1(SCART1) mode



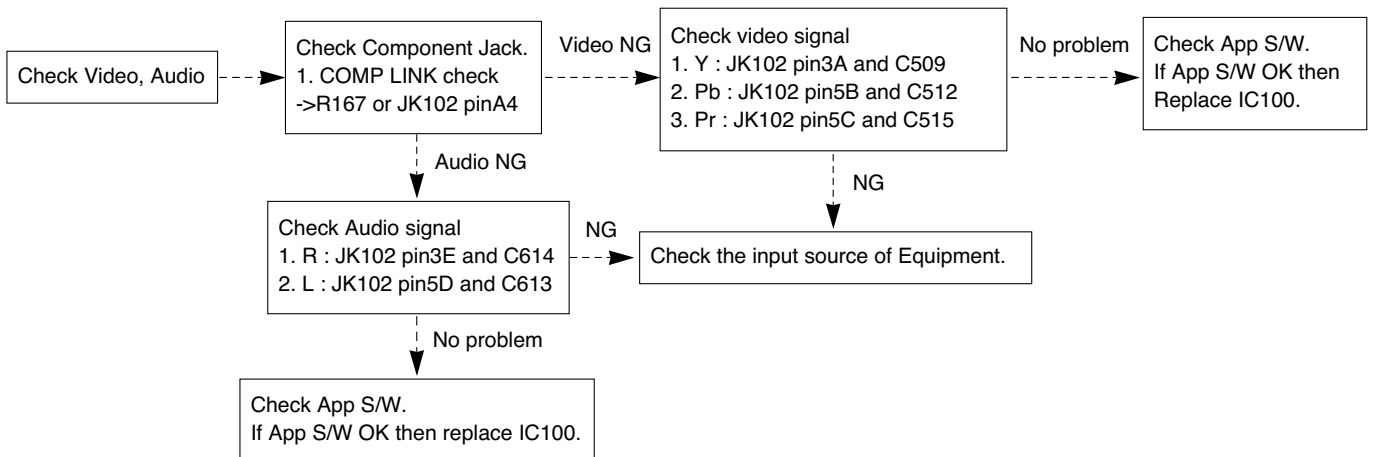
### 2-4. In case of abnormal display or sound when side AV2(SCART2) mode



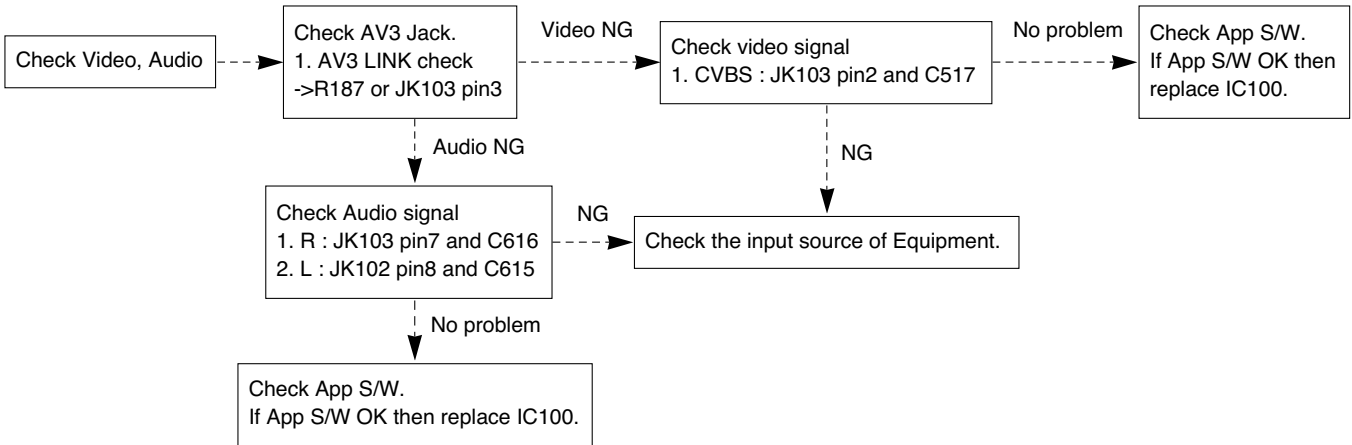
## 2-5. In case of abnormal display or sound when VGA Input mode



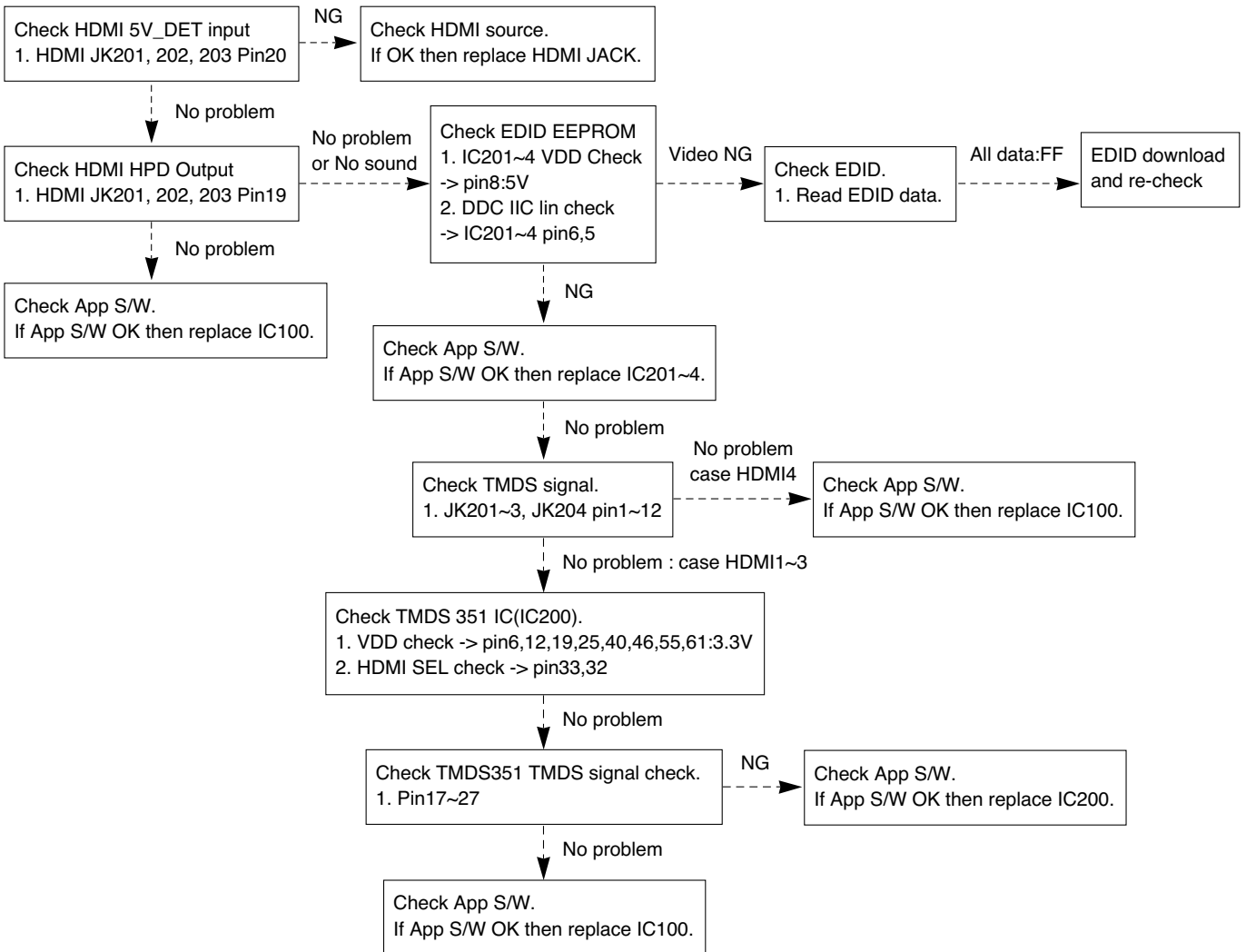
## 2-6. In case of abnormal display or sound when Component Input mode



## 2-7. In case of abnormal display or sound when side AV3 mode



## 2-8. In case of abnormal display or sound when HDMI1,2,3,4 mode

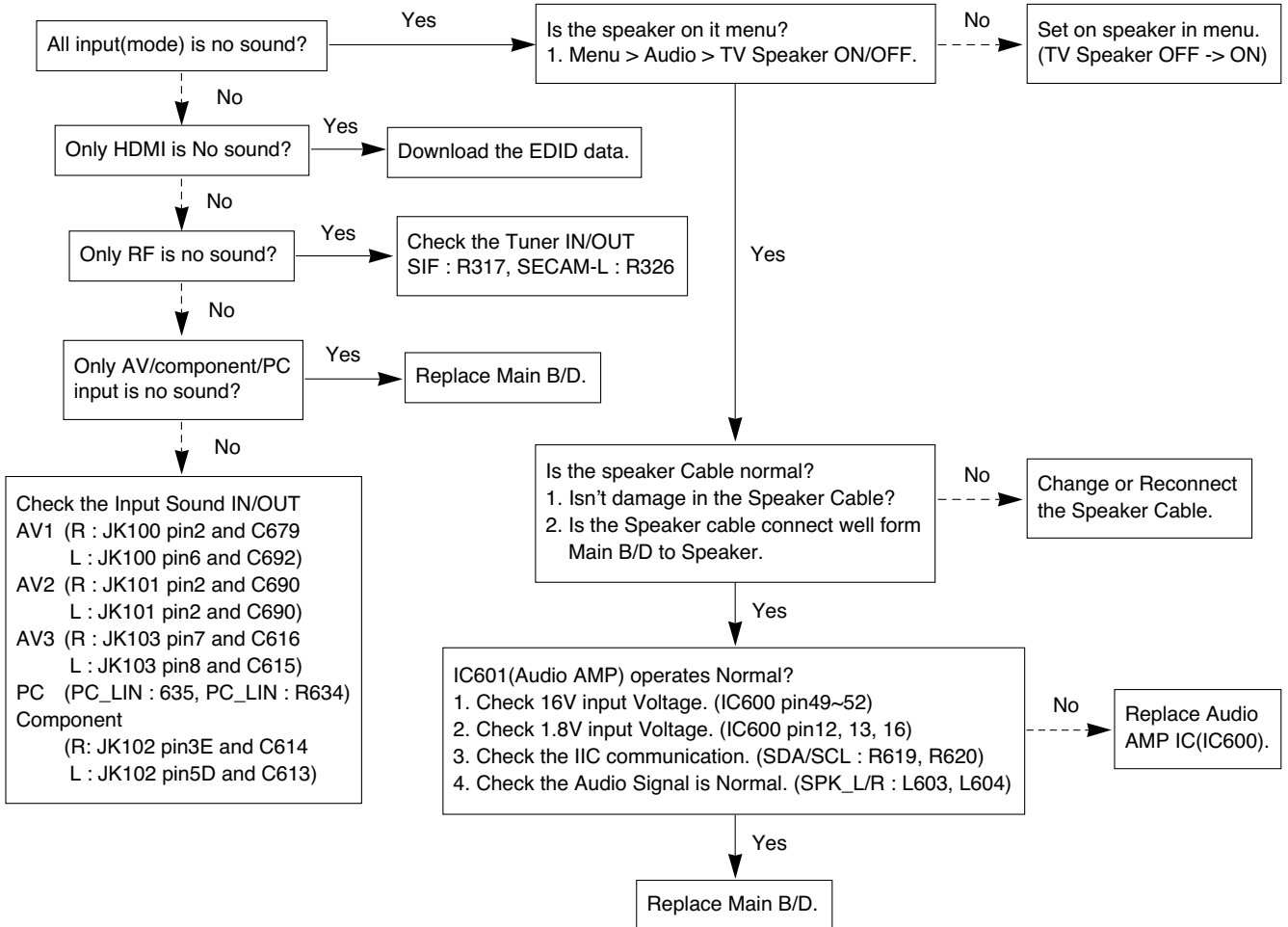


## 2-9. In case of No sound

### (1) Symptom

- 1) LED is green.
- 2) Screen display but sound is not output.

### (2) Check the followings

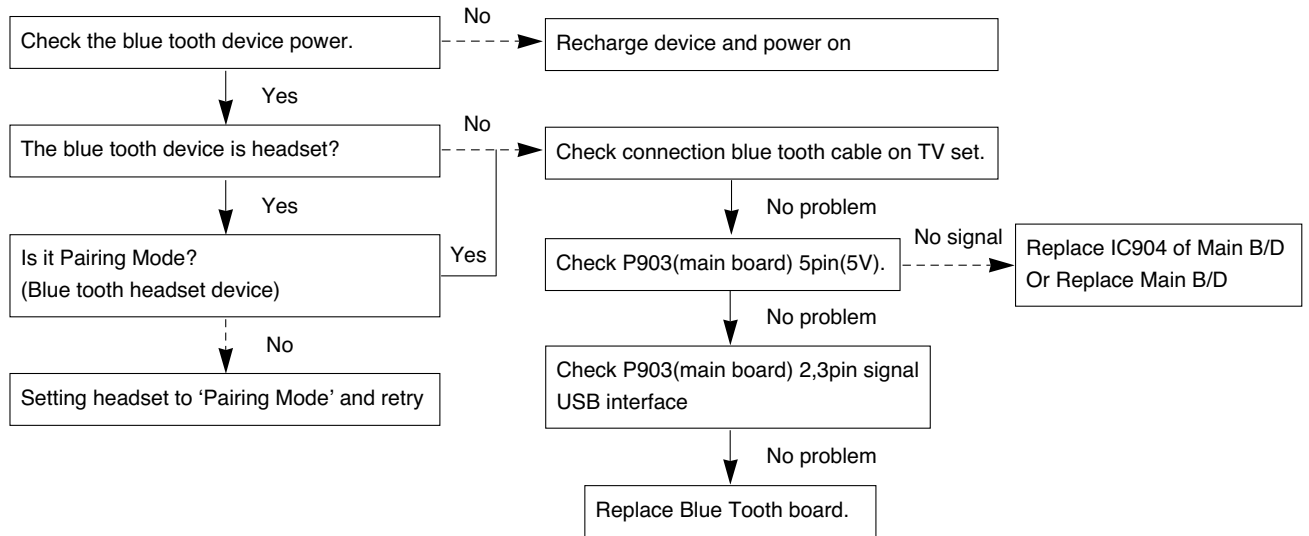


## 2-10. In case of no connection blue tooth device

### (1) Symptom

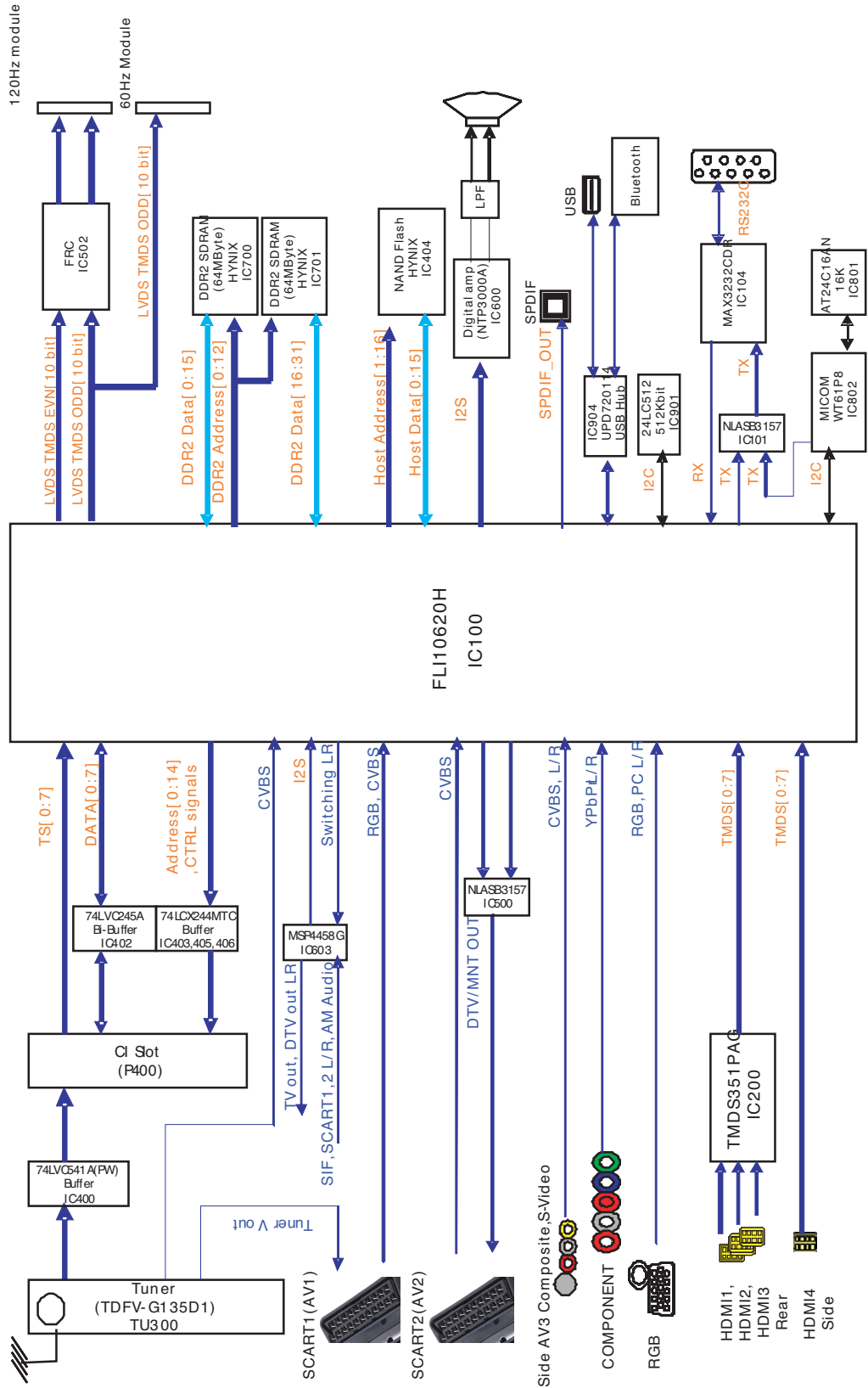
- 1) TV set display is fine.
- 2) TV set don't search blue Tooth device.

### (2) Check the followings



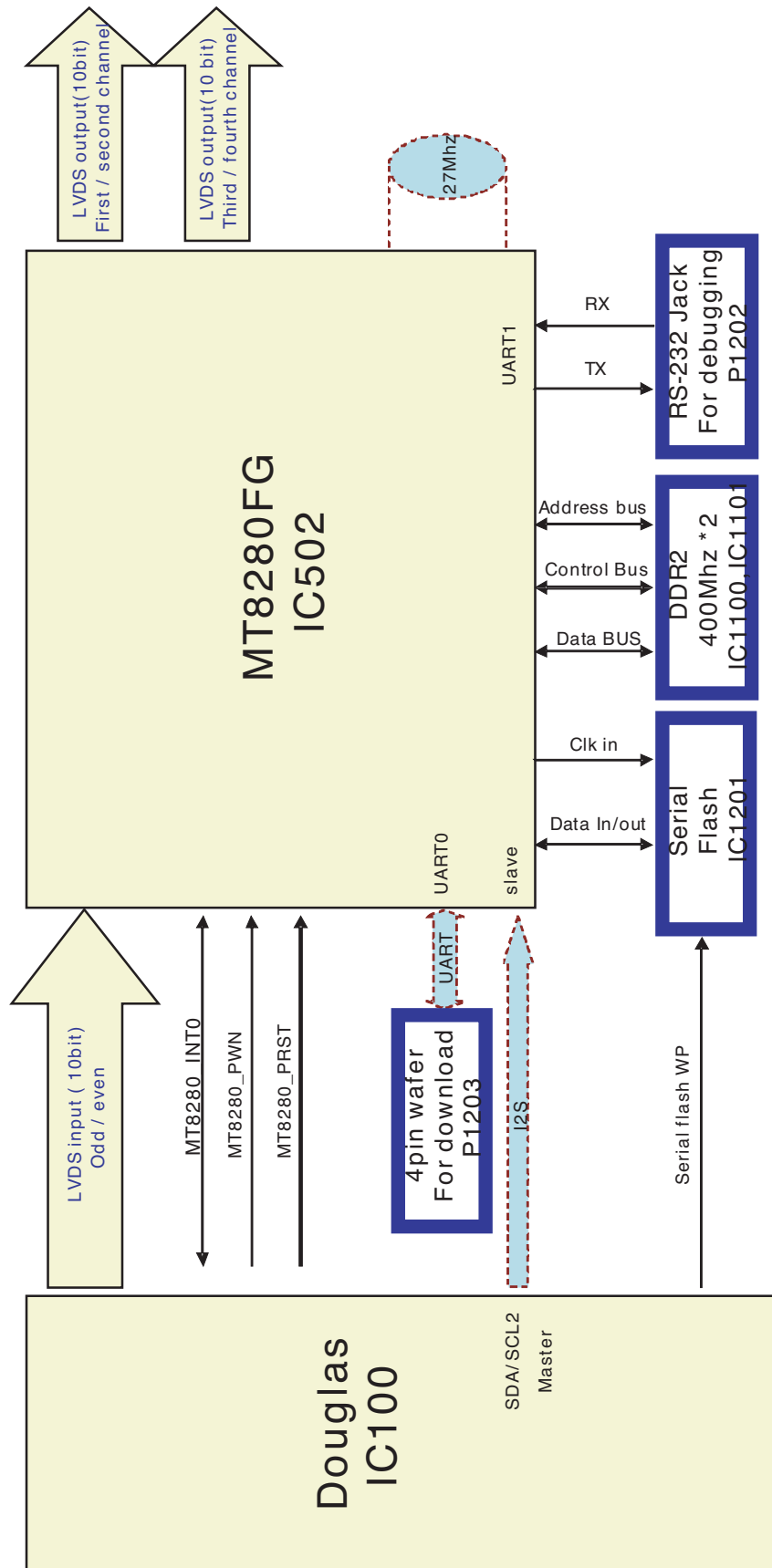
# BLOCK DIAGRAM

## 1. Main



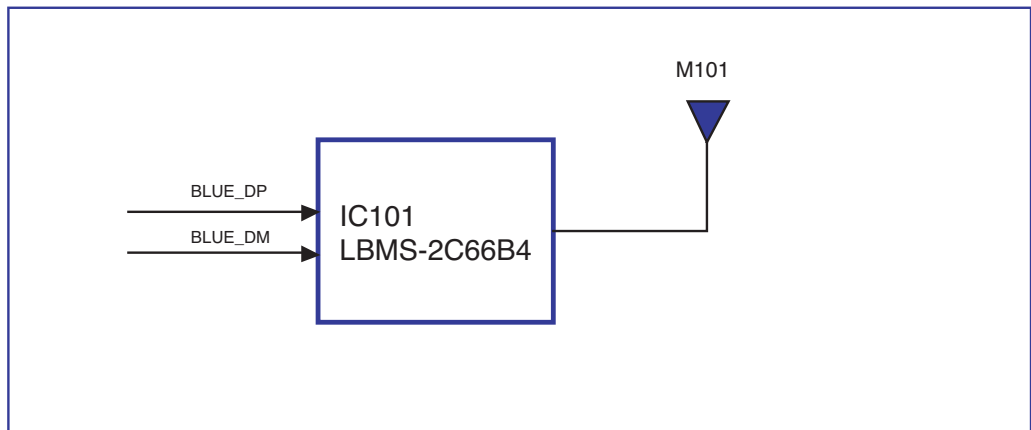
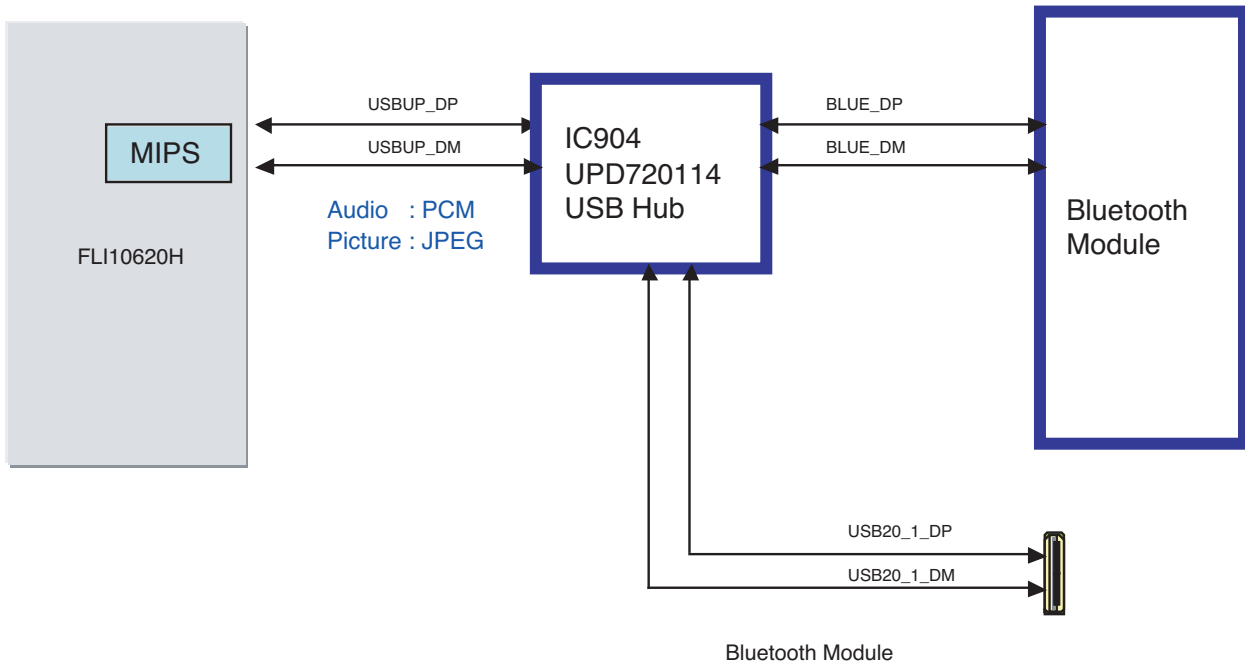
< 1 / 11 >

## 2. FRC



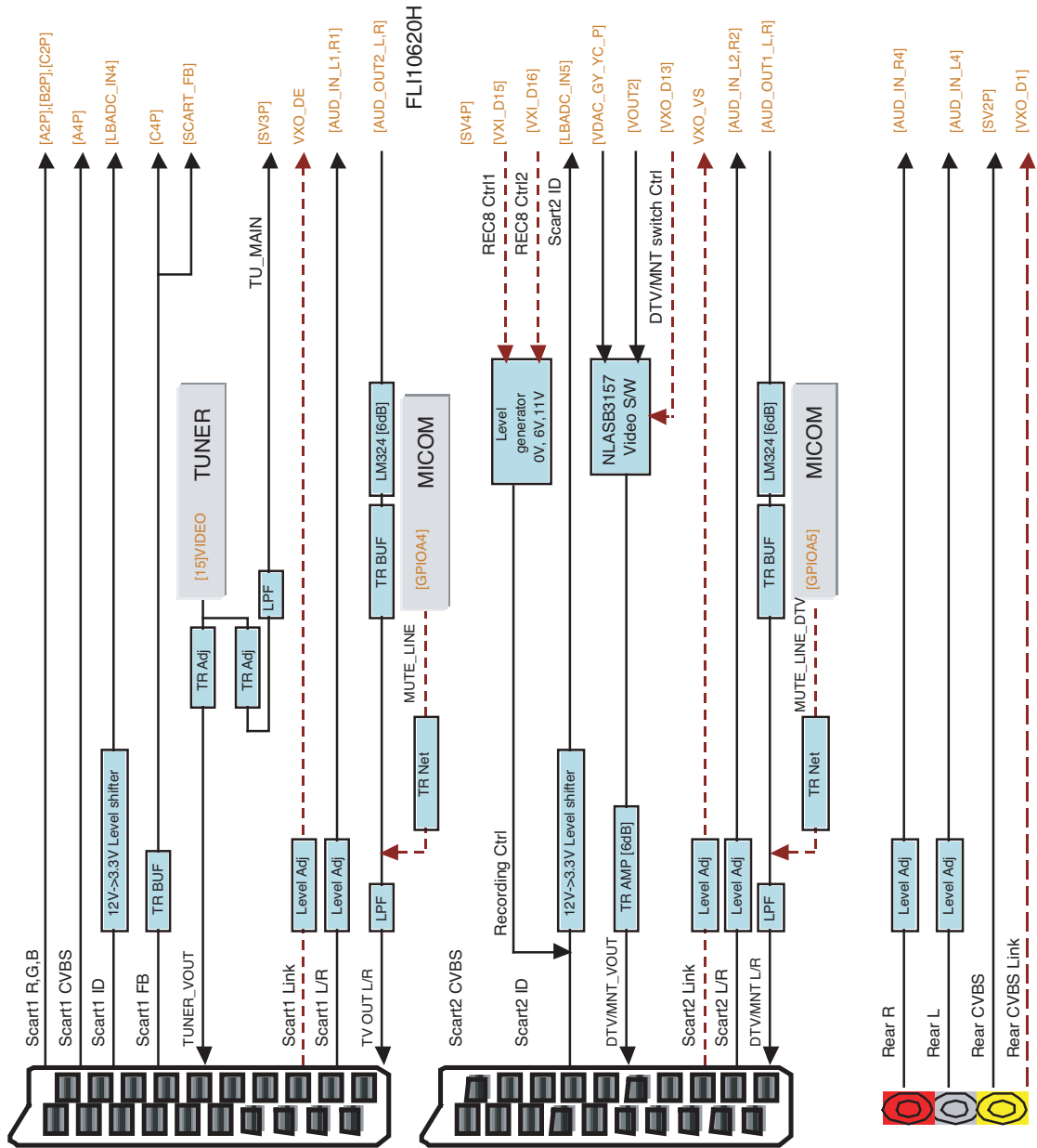


### 3. Bluetooth

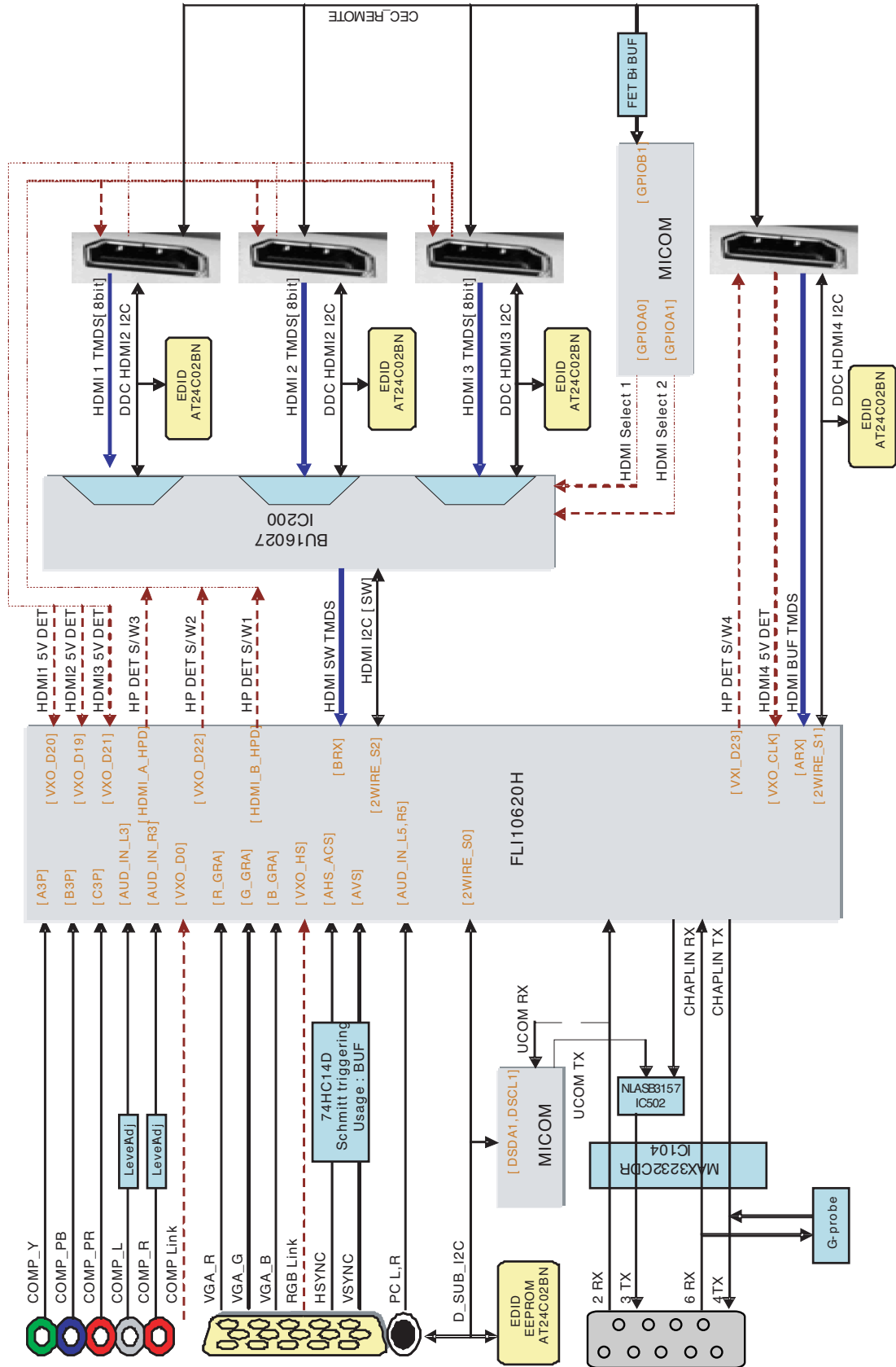


# 4. SCART 1, 2, AV3

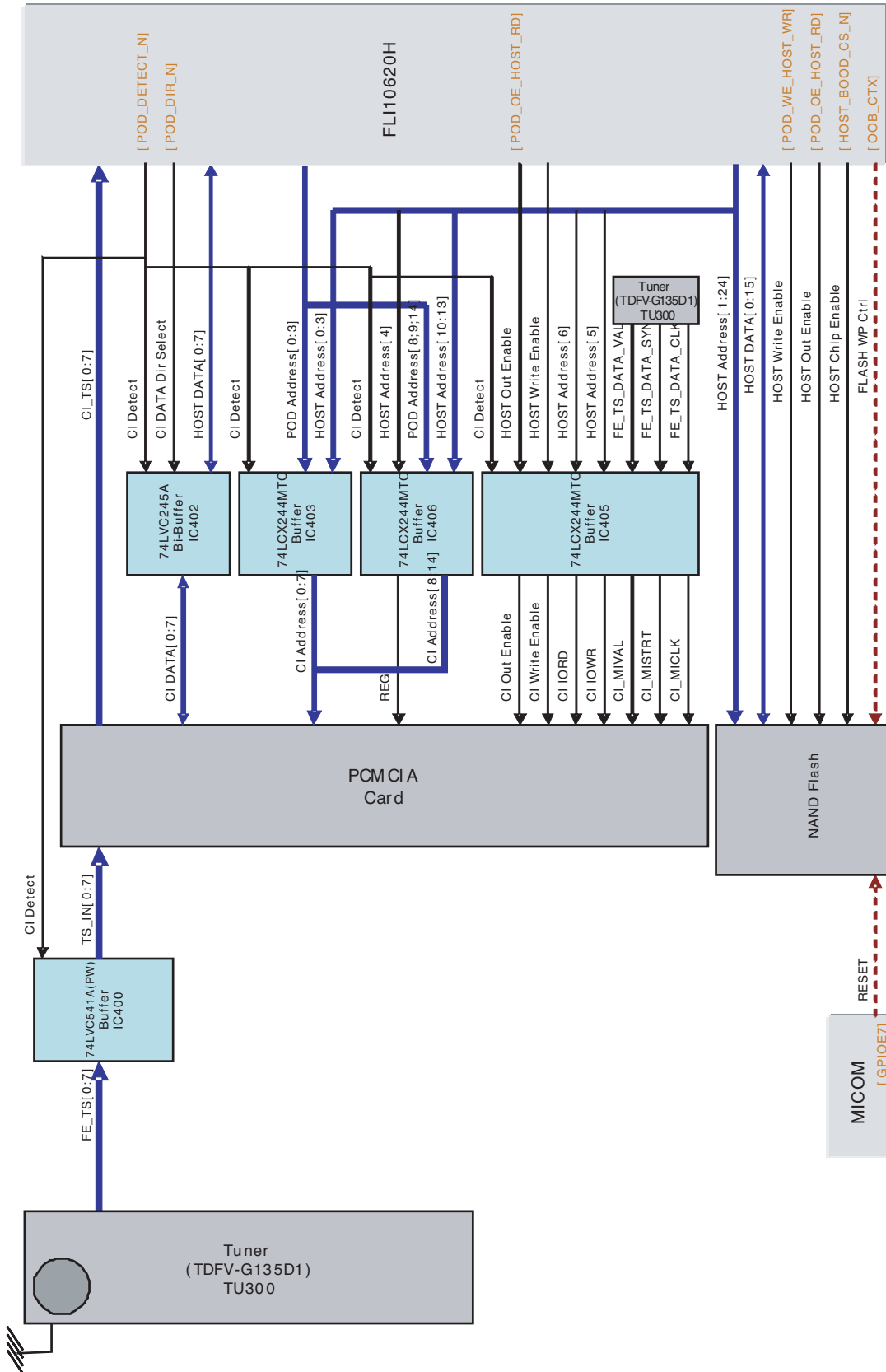
SCART 1	SCART 2
1:Audio R out (TV)	1:Audio R out (DTV)
2:audio R in	2:audio R in
3:audio L out (TV)	3:audio L out (DTV)
4:audio GND	4:audio GND
5:blue GND	5:GND
6:audio L in	6:audio L in
7:Blue	7:CVBS in
8:SCART ID	8:function select
9:green GND	9:GND
10:data 2	10:data 2
11:Green	11:CVBS in
12:data 1	12:data 1
13:red GND	13:GND
14:data GND	14:data GND
15:Red	15:C in
16:SCART FB	16:
17:video GND	17:video GND
18:RGB Control GND	18:
19:CVBS out (TV out)	19:CVBS out (DTV out)
20:CVBS in	20:CVBS in
21:safety GND	21:safety GND
22:GND	22:GND
23:GND	23:GND



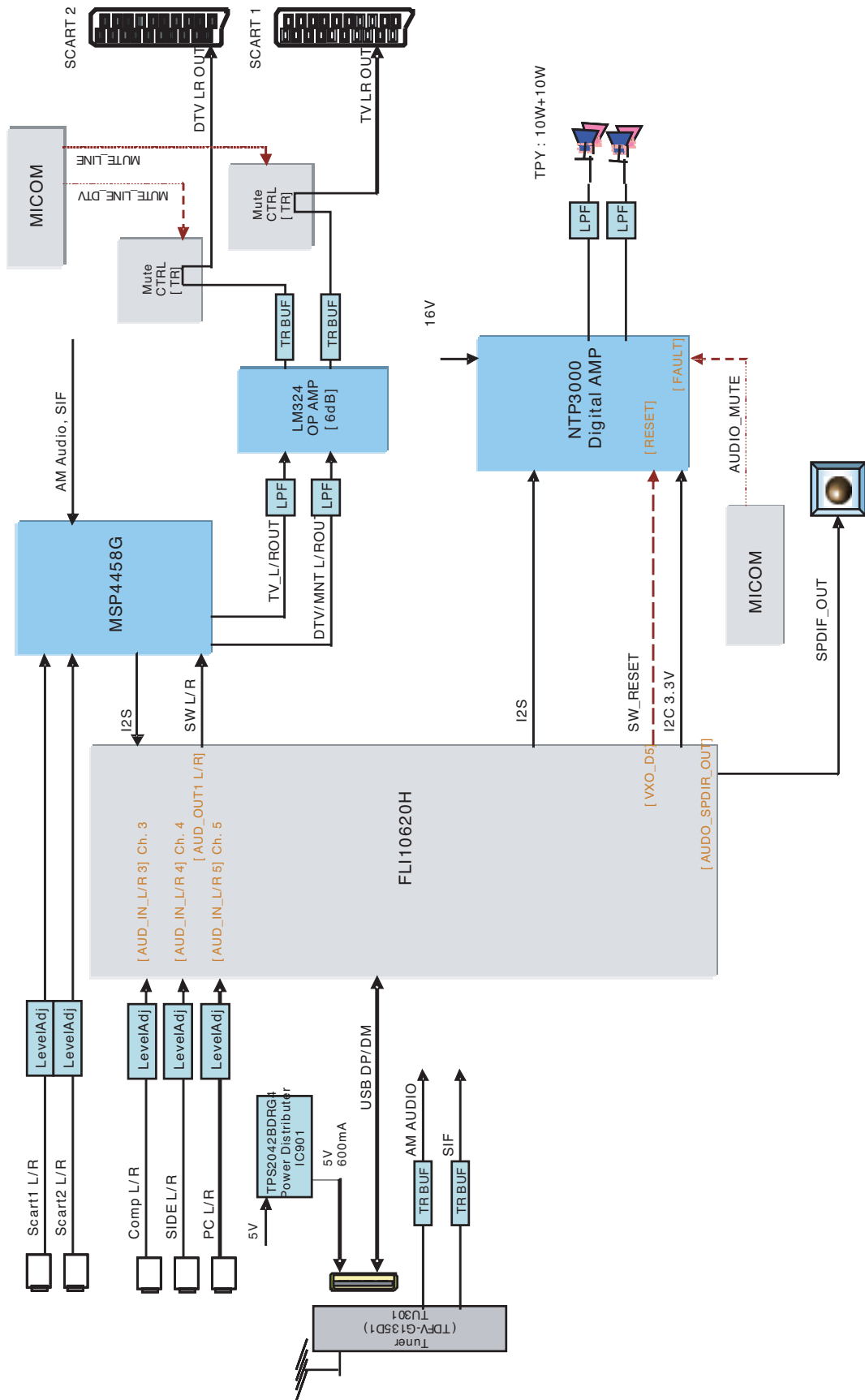
# 5. Component, RGB, HDMI, RS232



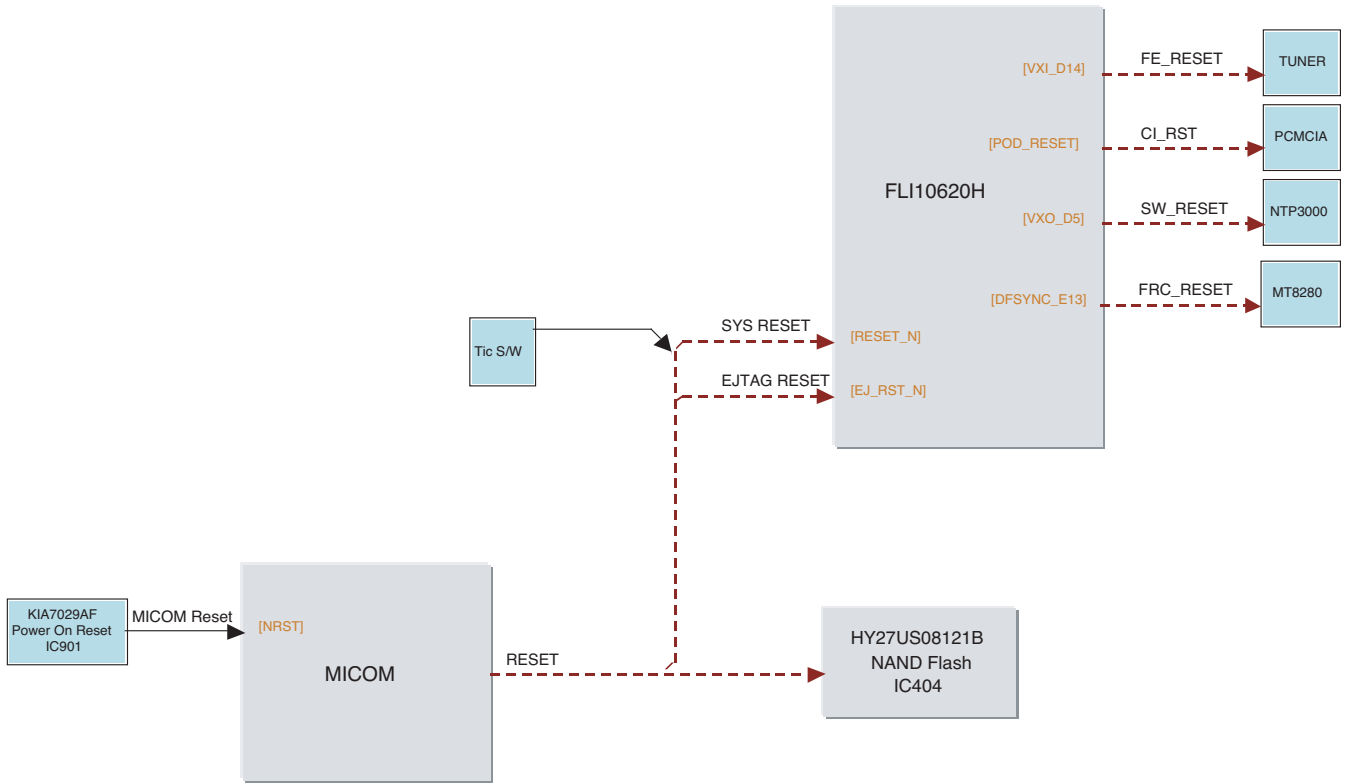
# 6. Tuner, CI



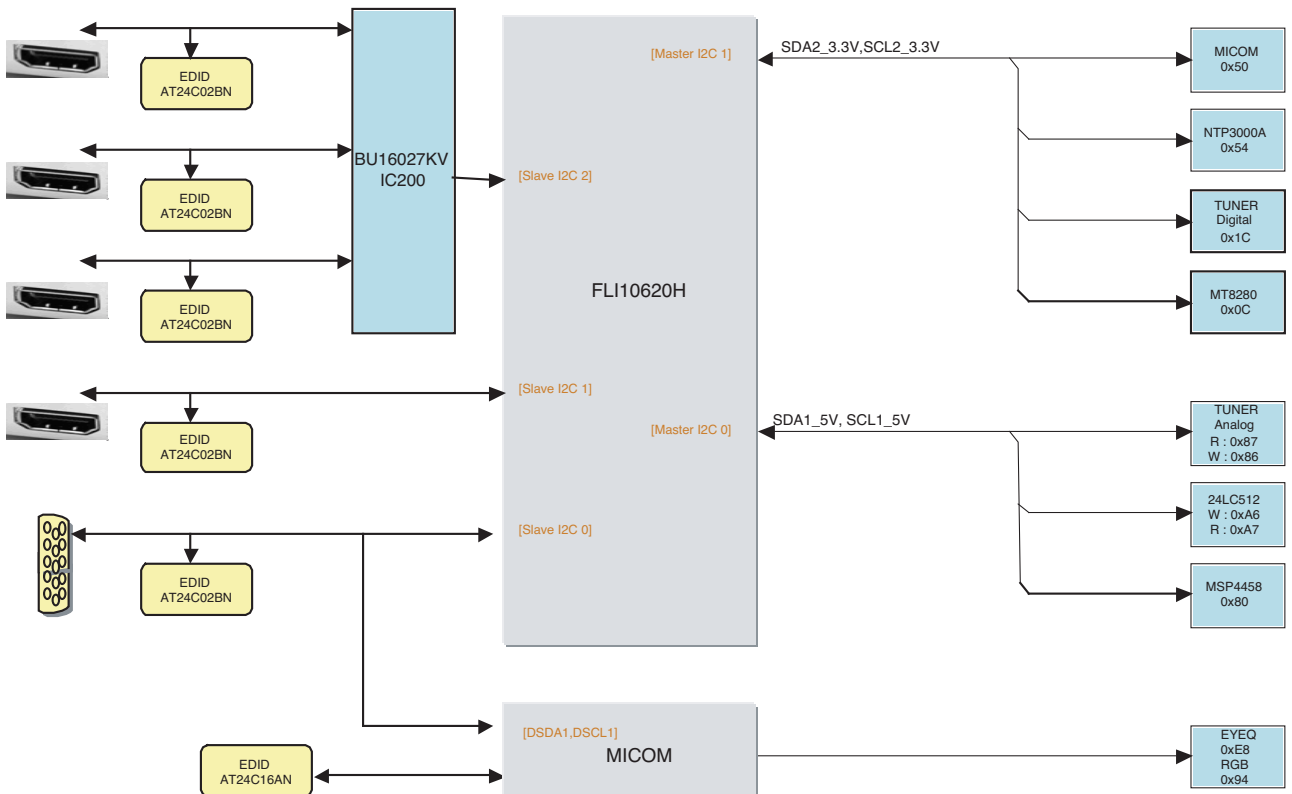
# 7. Audio Path(MSP4458, NTP3000A)



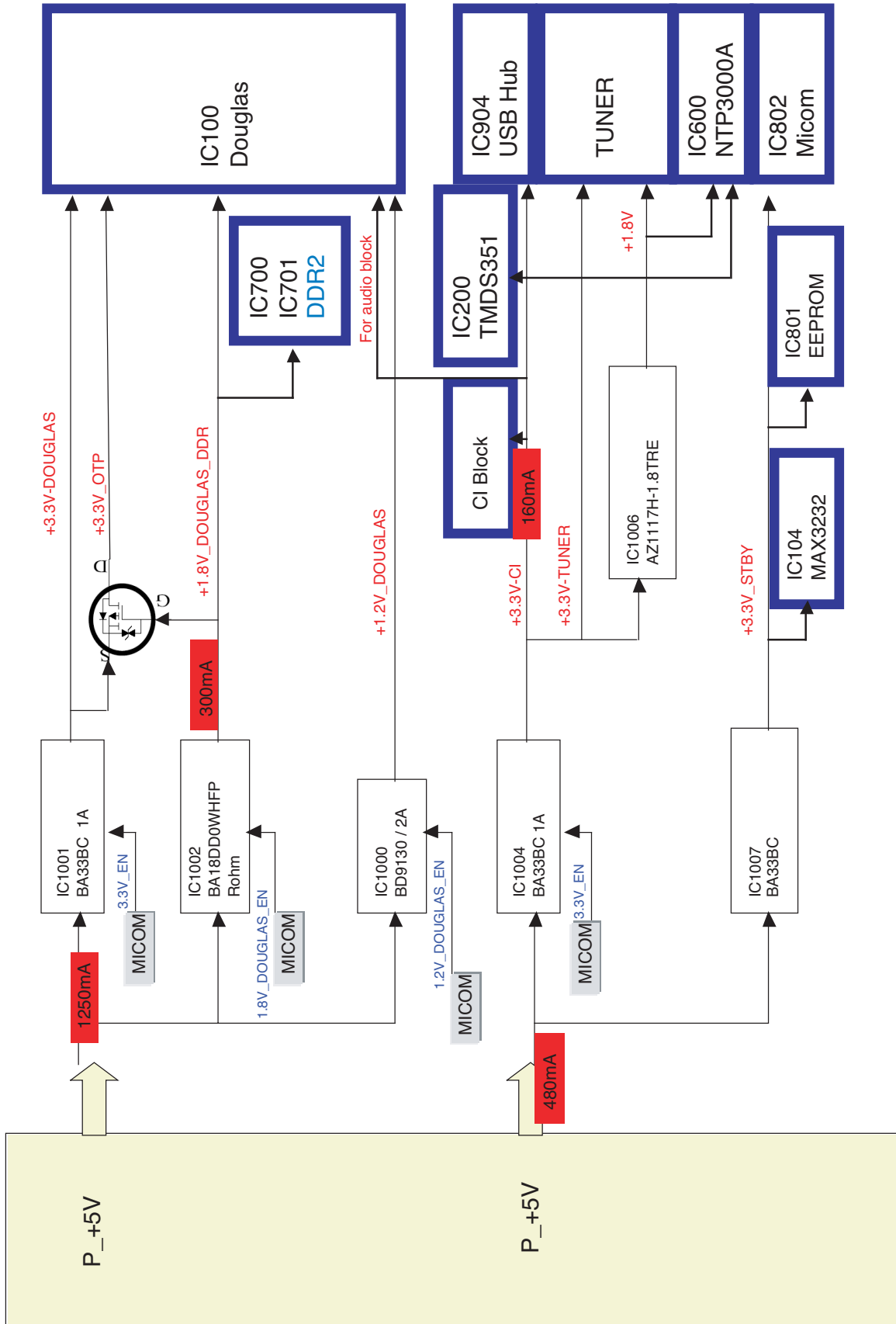
# 8. Reset



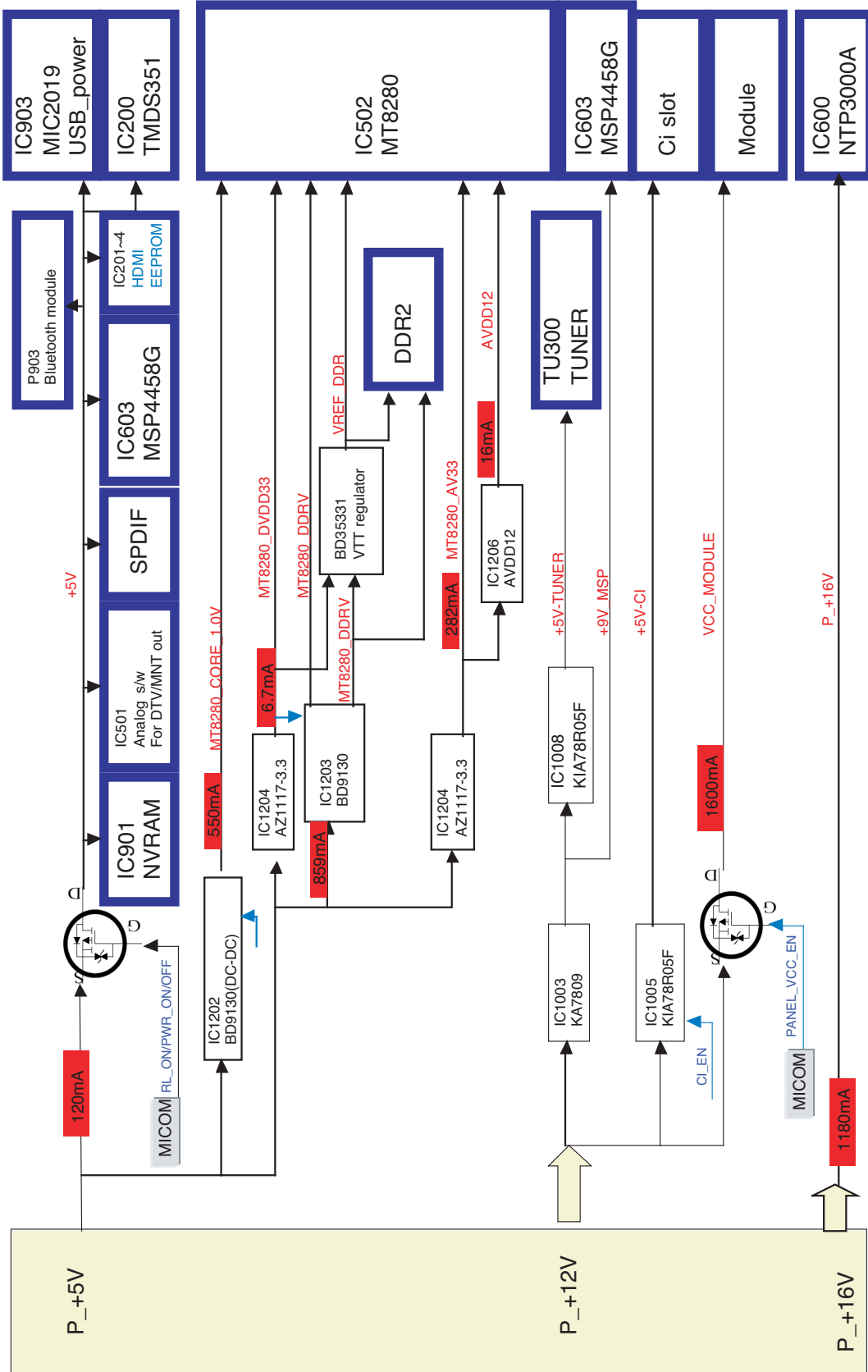
# 9. I2C Control



# 10-1. Power tree



# 10-2. Power tree

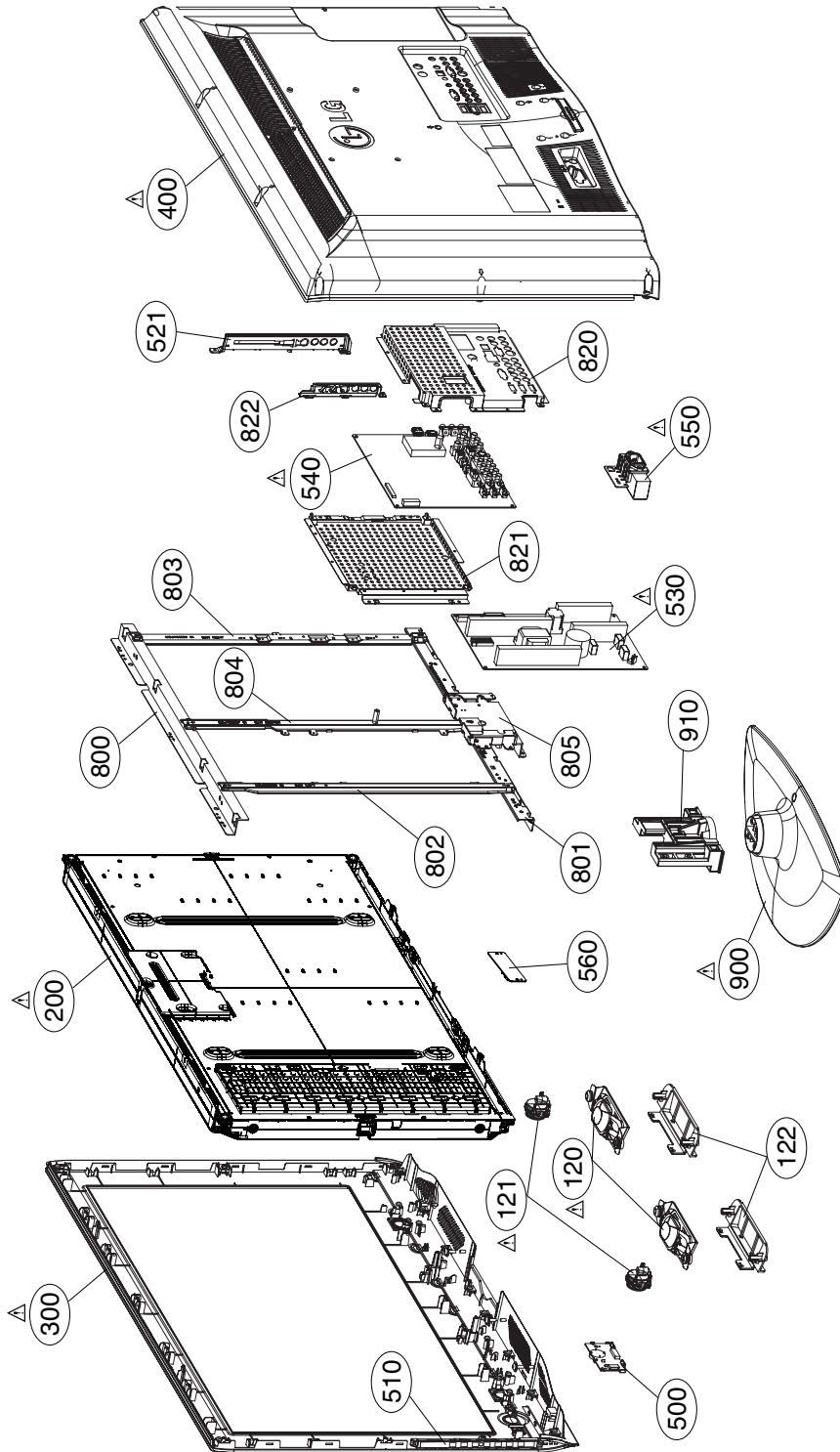


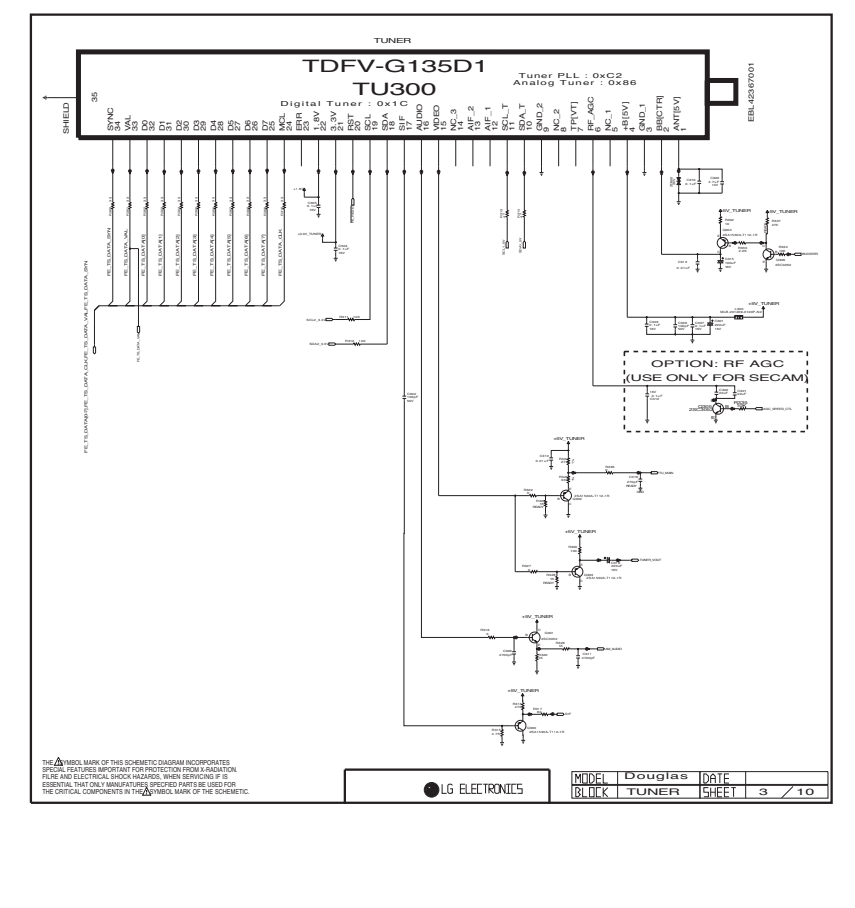
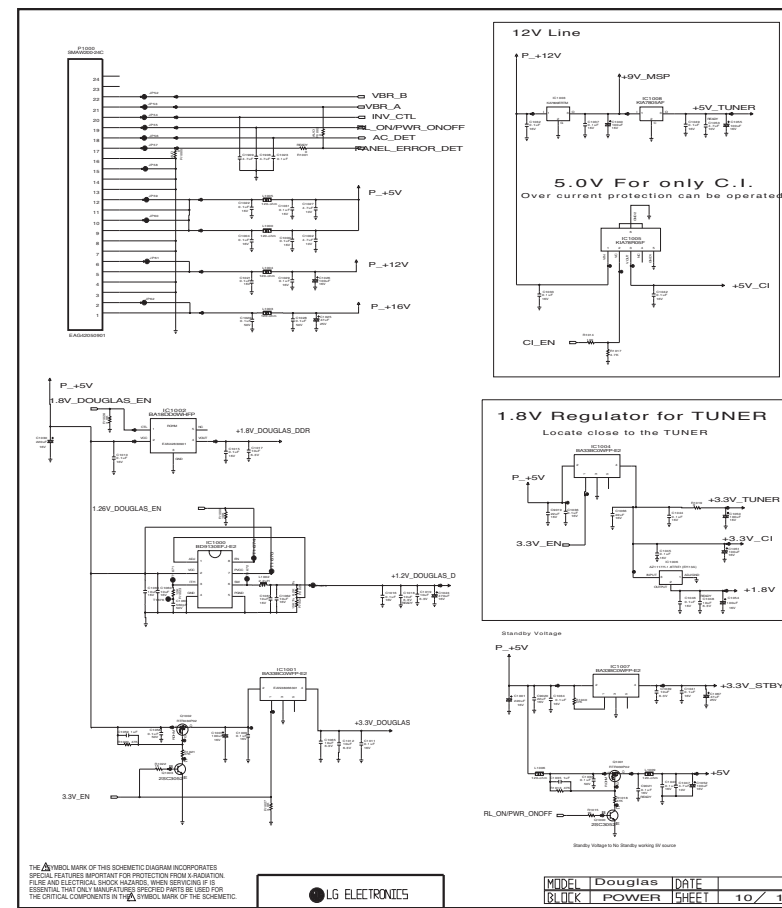
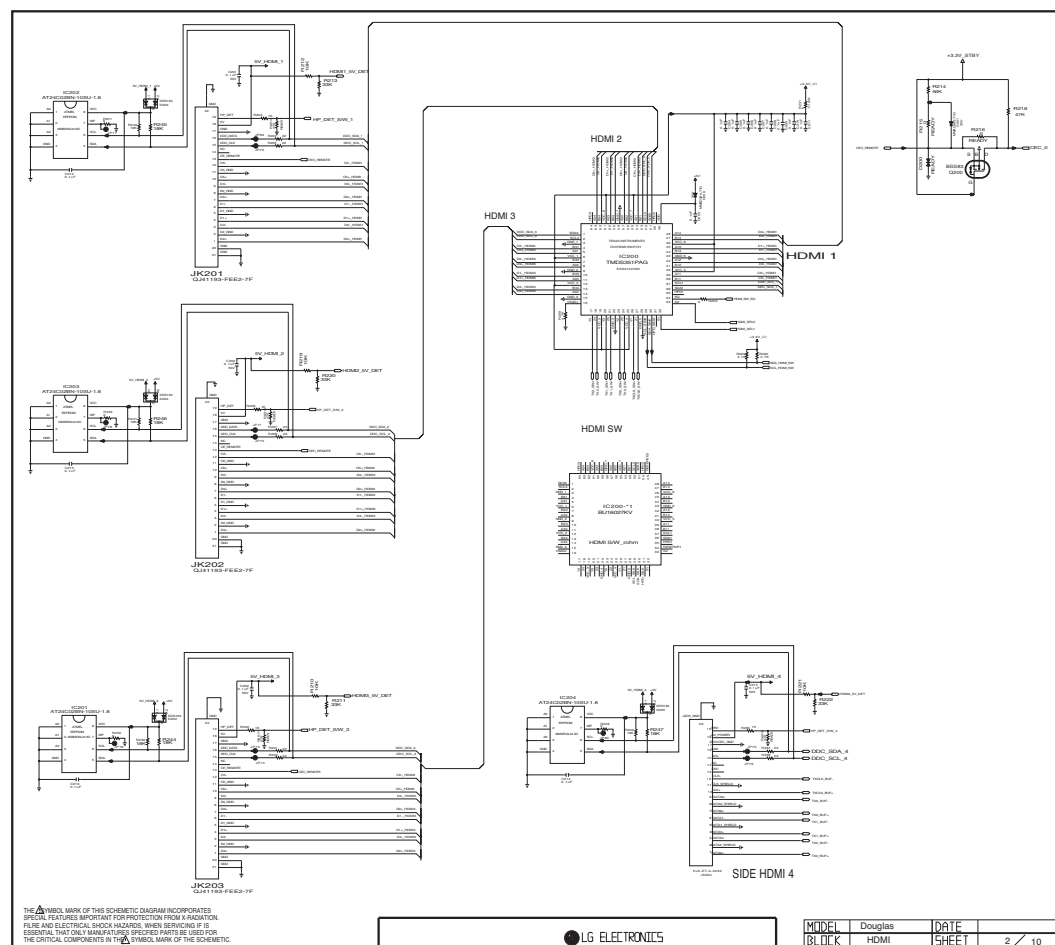
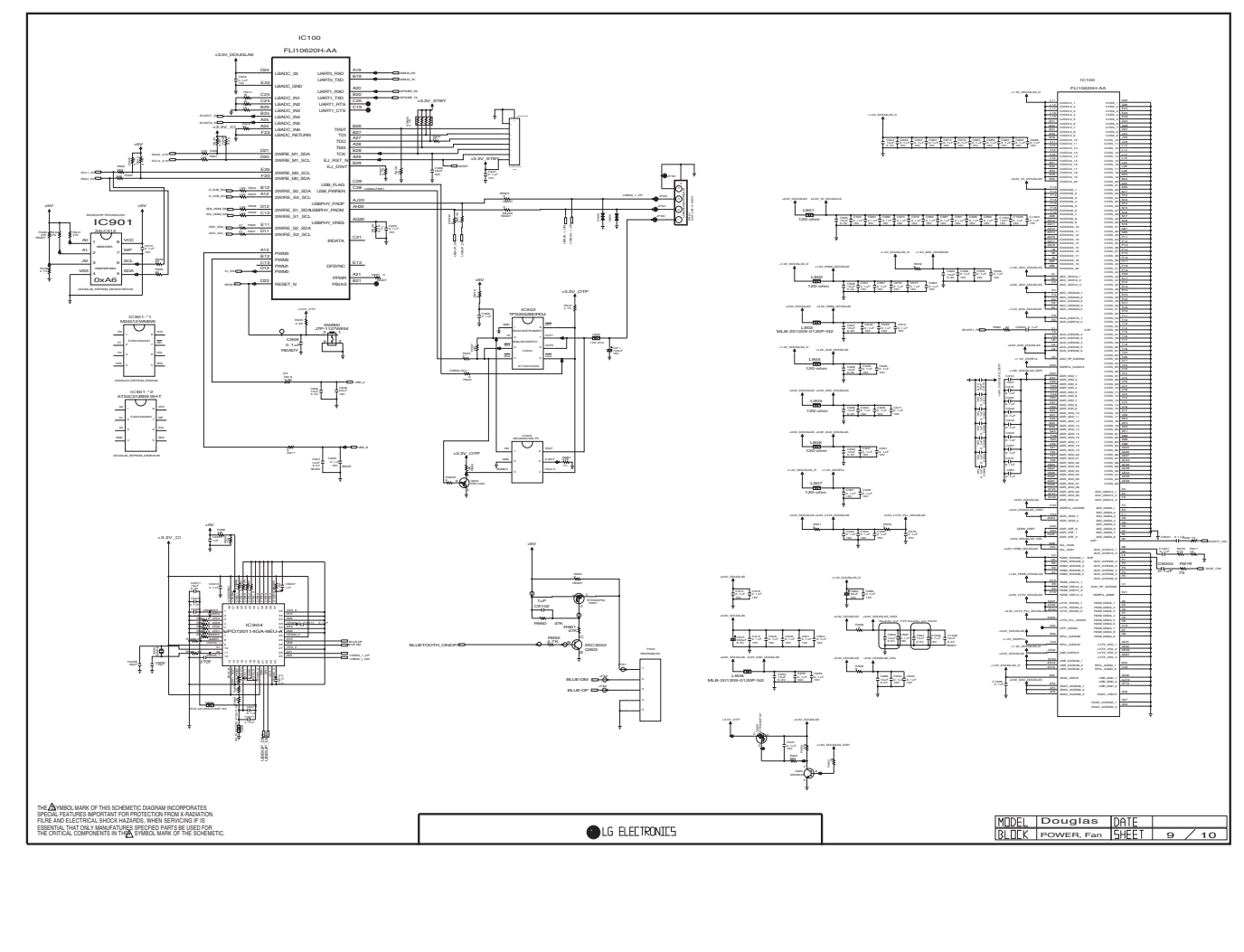
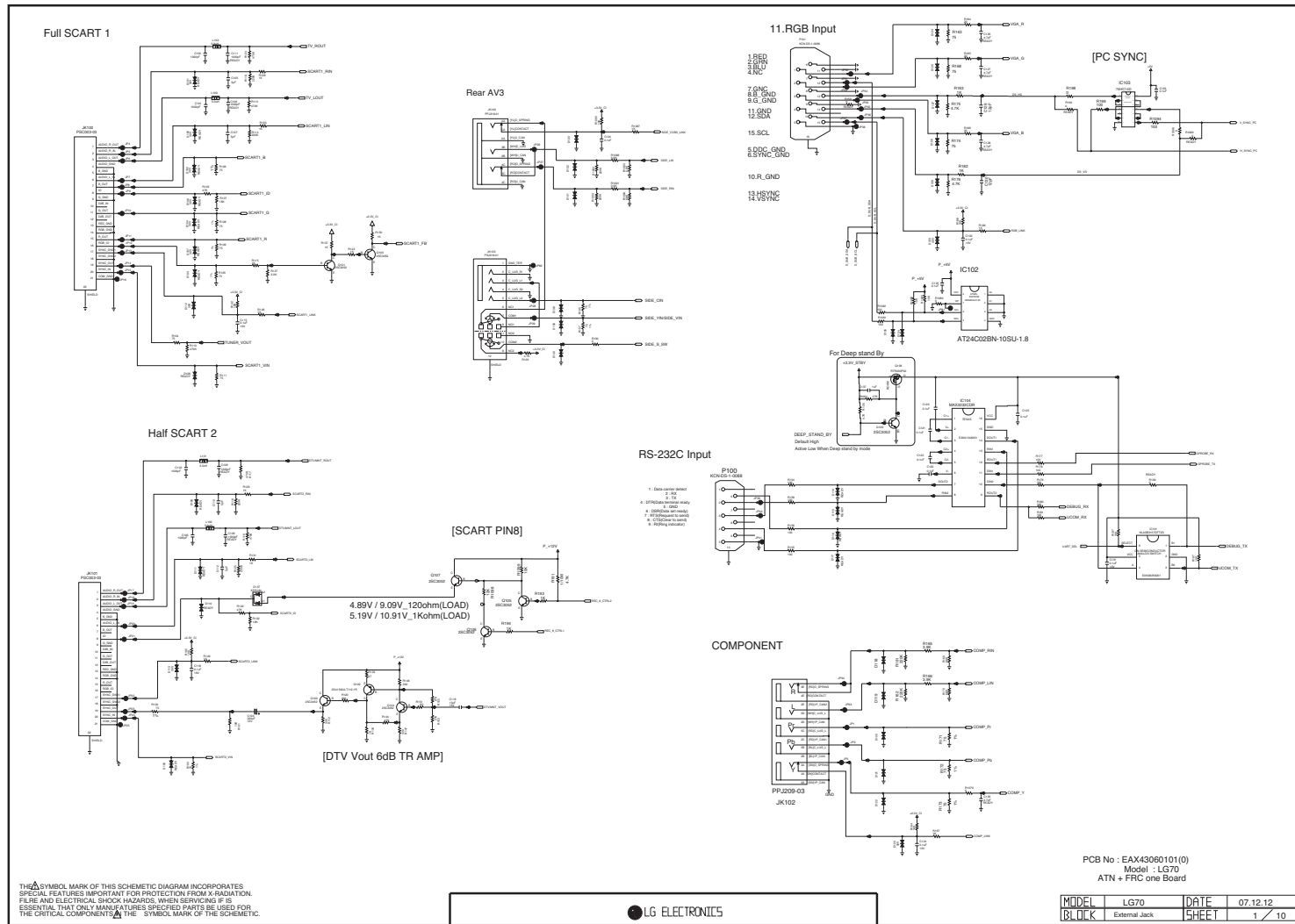


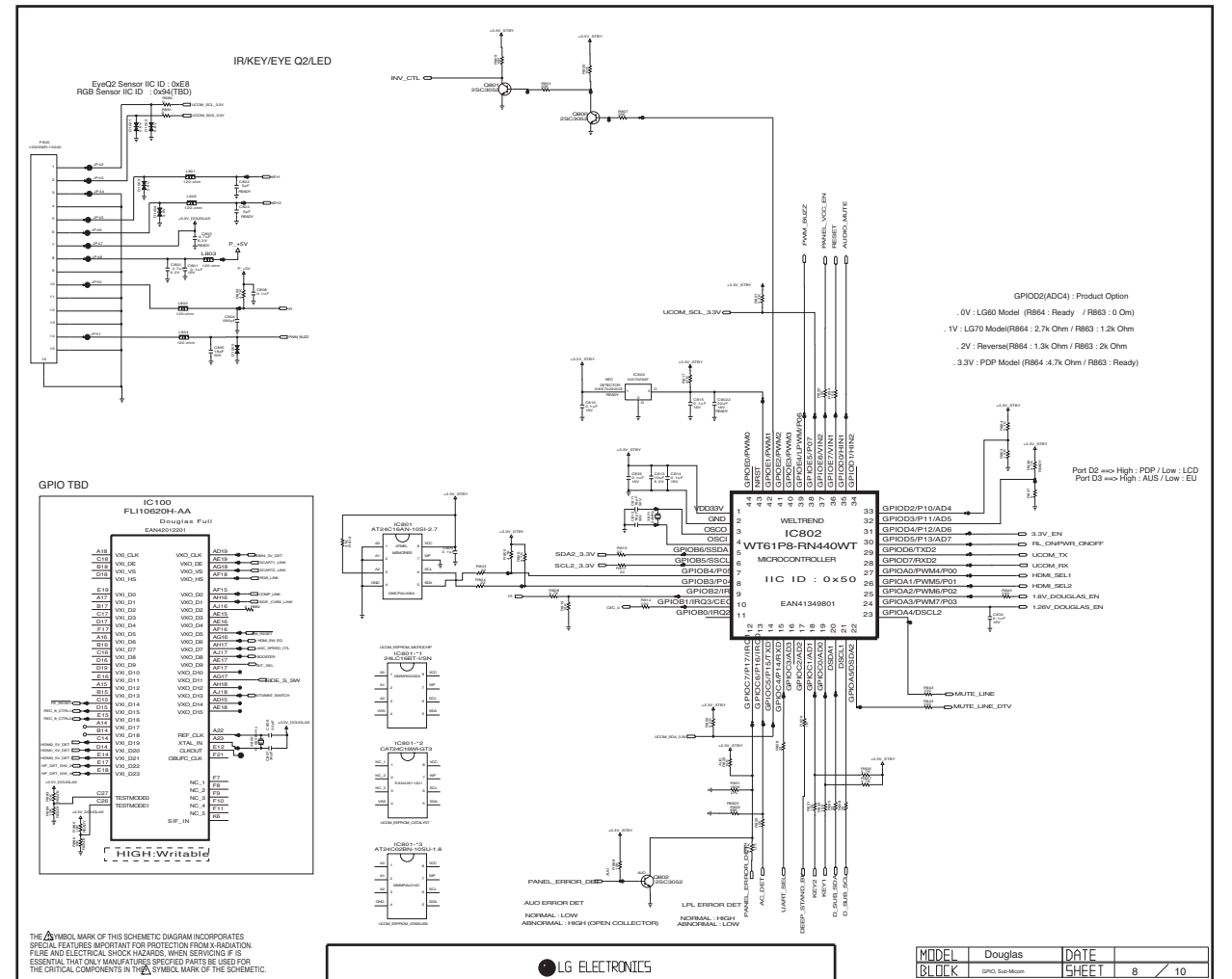
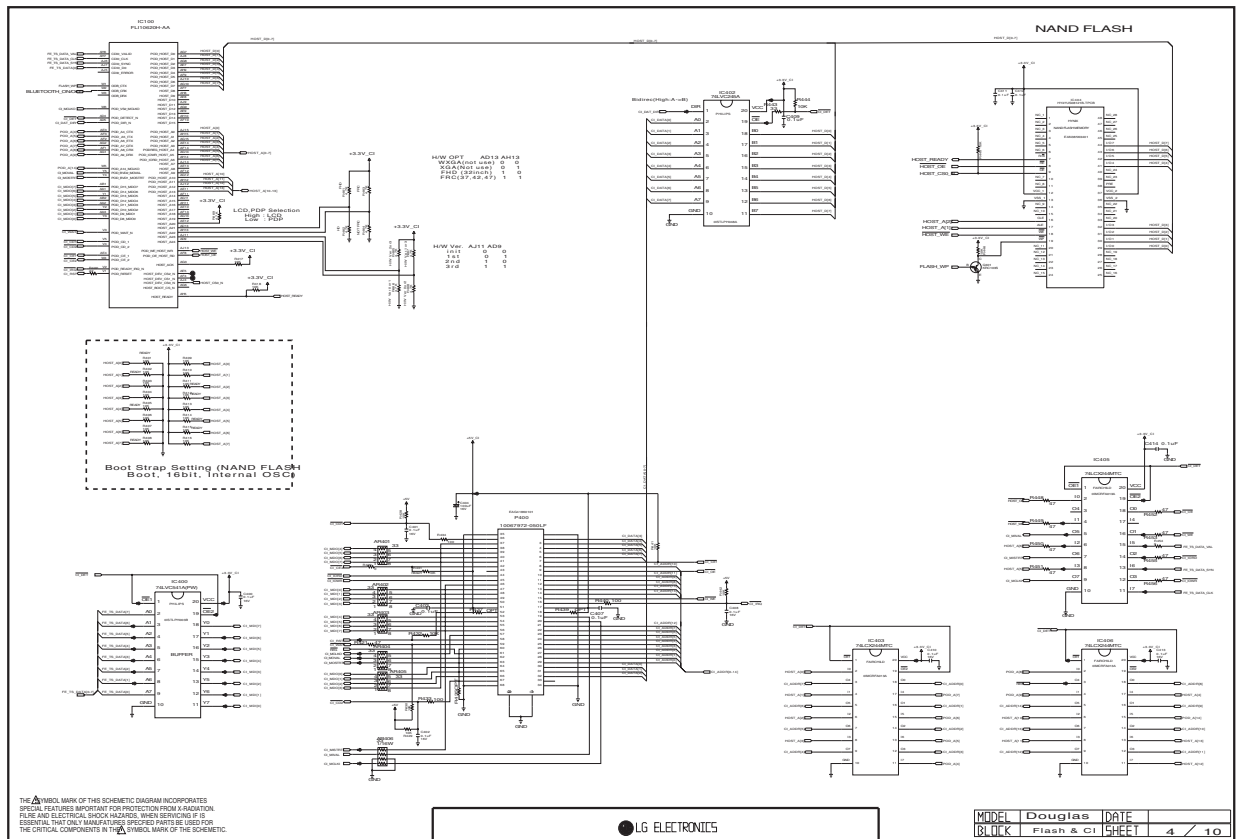
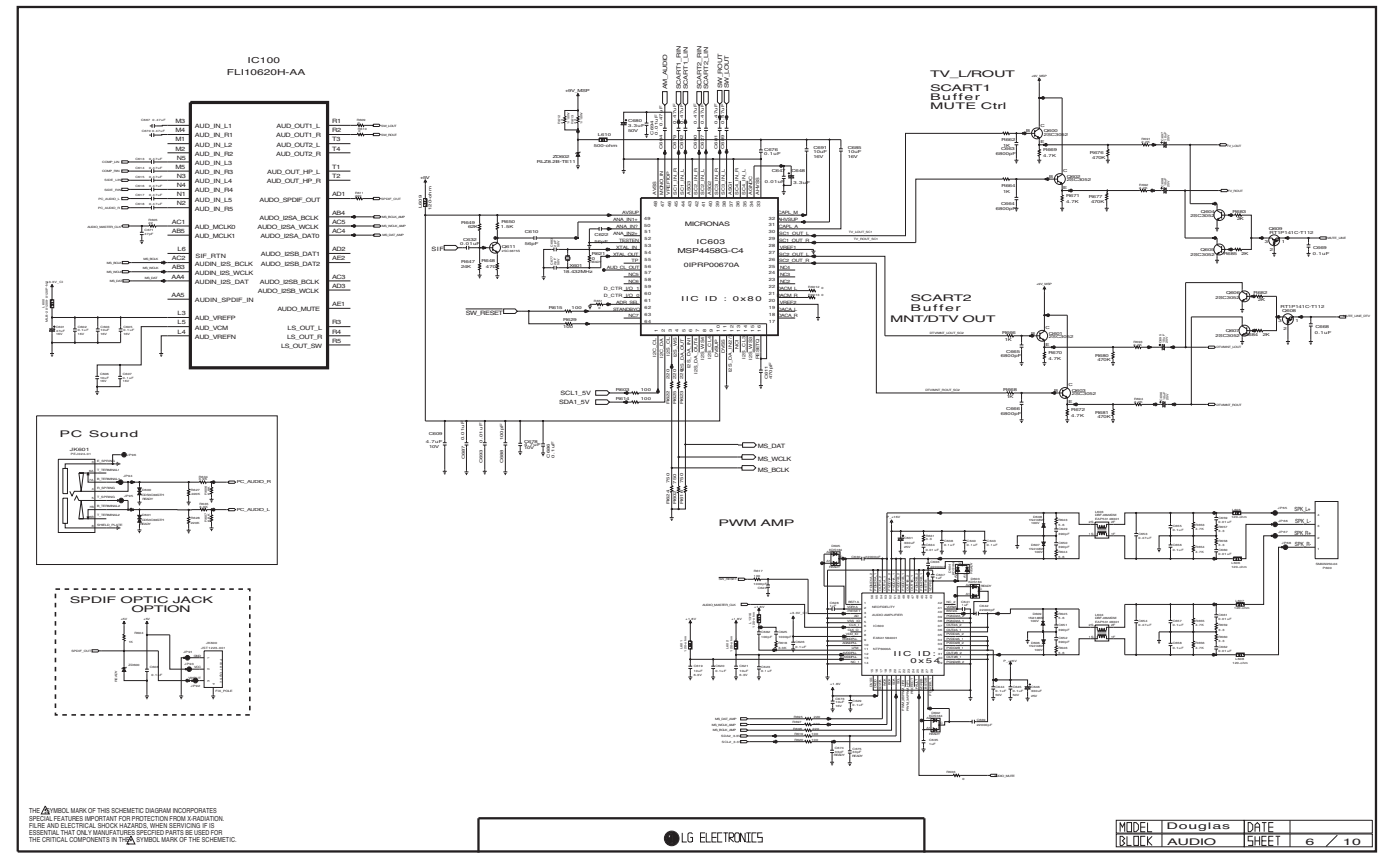
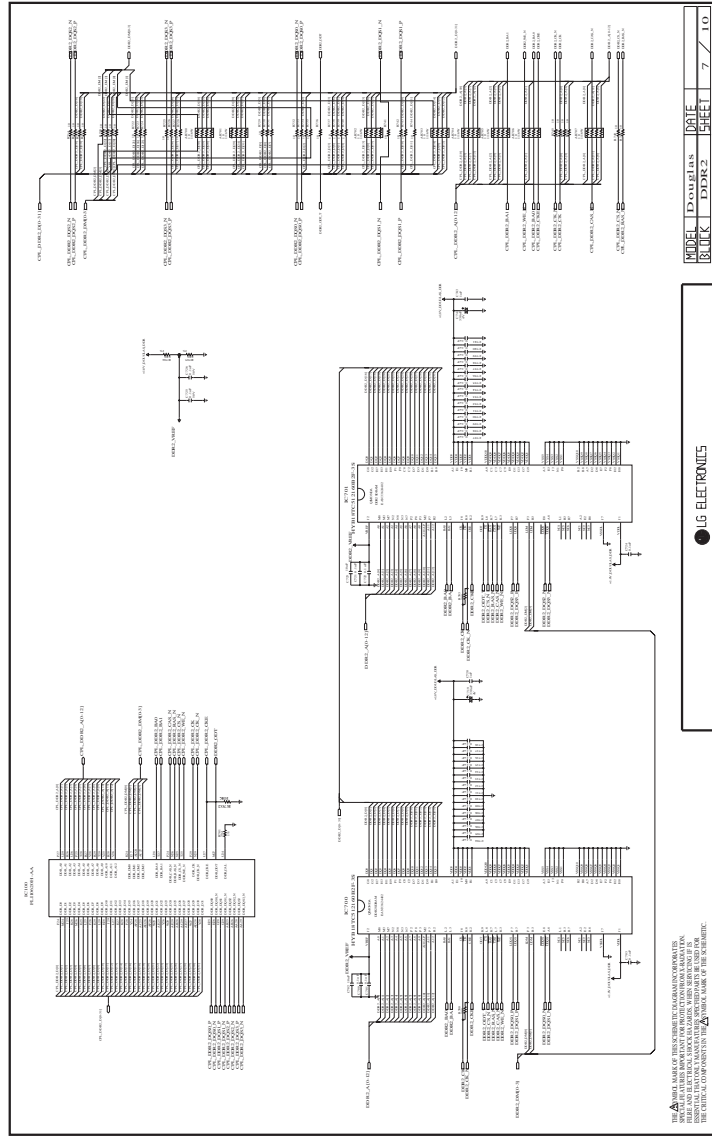
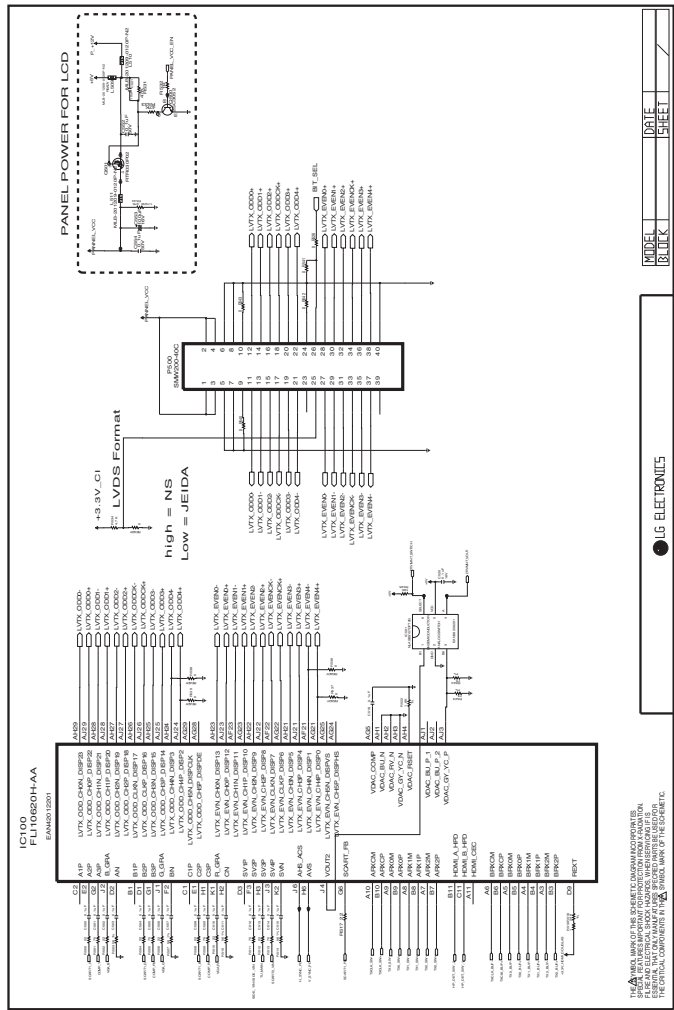
# EXPLODED VIEW

## IMPORTANT SAFETY NOTICE

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