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# LED TV

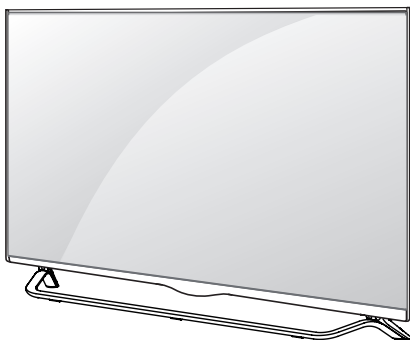
# SERVICE MANUAL

CHASSIS : LD41V

MODEL : 49UB850V 49UB850V-ZA

## CAUTION

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



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# SAFETY PRECAUTIONS

## IMPORTANT SAFETY NOTICE

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

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

Do not modify the original design without permission of manufacturer.

### General Guidance

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

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

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

When replacing a high wattage resistor (Oxide Metal Film Resistor, over 1 W), keep the resistor 10 mm 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 1 M $\Omega$  and 5.2 M $\Omega$ .

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 1.5 K / 10 watt resistor in parallel with a 0.15  $\mu$ F 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 0.5 mA.

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



When 25A is impressed between Earth and 2nd Ground for 1 second, Resistance must be less than 0.1  $\Omega$

\*Base on Adjustment standard

# 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;

- Removing or reinstalling any component, circuit board module or any other receiver assembly.
- Disconnecting or reconnecting any receiver electrical plug or other electrical connection.
- 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.

- 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".
- Do not spray chemicals on or near this receiver or any of its assemblies.
- 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.
- Do not defeat any plug/socket B+ voltage interlocks with which receivers covered by this service manual might be equipped.
- 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.
- 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.
- 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.

- 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.

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

- Use a grounded-tip, low-wattage soldering iron and appropriate tip size and shape that will maintain tip temperature within the range of 500 °F to 600 °F.
- Use an appropriate gauge of RMA resin-core solder composed of 60 parts tin/40 parts lead.
- Keep the soldering iron tip clean and well tinned.
- Thoroughly clean the surfaces to be soldered. Use a mall wire-bristle (0.5 inch, or 1.25 cm) brush with a metal handle. Do not use freon-propelled spray-on cleaners.
- Use the following unsoldering technique
  - Allow the soldering iron tip to reach normal temperature. (500 °F to 600 °F)
  - Heat the component lead until the solder melts.
  - 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.
- Use the following soldering technique.
  - Allow the soldering iron tip to reach a normal temperature (500 °F to 600 °F)
  - First, hold the soldering iron tip and solder the strand against the component lead until the solder melts.
  - 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.
  - 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 the LED TV used LD41V chassis.

## 2. Requirement for Test

Each part is tested as below without special appointment.

- 1) Temperature: 25 °C ± 5 °C(77 °F ± 9 °F), CST: 40 °C ± 5 °C
- 2) Relative Humidity: 65 % ± 10 %
- 3) Power Voltage
  - : Standard input voltage (AC 100-240 V~, 50/60 Hz)
  - \* 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 5 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

## 4. Model General Specification

No.	Item	Specification	Remarks
1	Market	EU(PAL Market-36Countries)/CIS + Morocco(Africa)	<p><b>DTV &amp; Analog (Total 37 countries)</b></p> <p><b>DTV (MPEG2/4, DVB-T) : 30 countries</b> Germany, Netherland, Switzerland, Hungary, Austria, Slovenia, Bulgaria, France, Spain, Italy, Belgium, Russia, Luxemburg, Greece, Czech, Croatia, Turkey, Morocco, Ireland, Latvia, Estonia, Lithuania, Poland, Portugal, Romania, Albania, Bosnia, Serbia, Slovakia, Belarus</p> <p><b>DTV (MPEG2/4, DVB-T2) : 8 countries</b> UK(Ireland), Sweden, Denmark, Finland, Norway, Ukraine, Kazakhstan, Russia</p> <p><b>DTV (MPEG2/4, DVB-C) : 37 countries</b> Germany, Netherland, Switzerland, Hungary, Austria, Slovenia, Bulgaria, France, Spain, Italy, Belgium, Russia, Luxemburg, Greece, Czech, Croatia, Turkey, Morocco, Ireland, Latvia, Estonia, Lithuania, Poland, Portugal, Romania, Albania, Bosnia, Serbia, Slovakia, Belarus, UK, Sweden, Denmark, Finland, Norway, Ukraine, Kazakhstan</p> <p><b>DTV (MPEG2/4, DVB-S/S2) : 30 countries</b> Germany, Netherland, Switzerland, Hungary, Austria, Slovenia, Bulgaria, France, Spain, Italy, Belgium, Russia, Luxemburg, Greece, Czech, Croatia, Turkey, Morocco, Ireland, Latvia, Estonia, Lithuania, Poland, Portugal, Romania, Albania, Bosnia, Serbia, Slovakia, Belarus, UK, Sweden, Denmark, Finland, Norway, Ukraine, Kazakhstan</p> <p><b>Supported satellite : 29 satellites</b> ABS1 75.0E/ AMOS 4.0W/ ASIATSATS 105.5E/ ASTRA1LHMKR 19.2E/ ASTRA2ABD 28.2E/ ASTRA3AB 23.5E/ ASTRA4A 4.8E/ ATLANTICBIRD2 8.0W/ ATLANTICBIRD3 5.0W/ BADR 26.0E/ EURO-BIRD3 33.0E/ EURO-BIRD9A 9.0E/ EUTELSATW2A 10.E/ EUTELSATW3A 7.0E/ EUTELSATW4W7 36.0E/ EUTELSESAT 16.0E/ EXPRESSAM1 40.0E/ EXPRESAM3 140.0E/ EXPRESSAM33 96.5E/ HELLASAT2 39.0E/ HISPASAT1CDE 30.0W/ HOTBIRD 13.0E/ INTELSAT10&amp;7 68.5E/ INTELSAT15 85.2E/ INTELSAT904 60.0E/ NILESAT 7.0W/ THOR 0.8W/ TURKSAT 42.0E/ YAMAL201 90.0E</p>

No.	Item	Specification	Remarks
2	Broadcasting system	1) PAL-BG/DK/I/I' 2) SECAM L/L', DK, BG, I 3) DVB-T/T2, C, S/S2	
3	Program coverage	1 ) Digital TV - VHF, UHF - C-Band, Ku-Band 2) Analogue TV -VHF : E2 to E12 -UHF : E21 to E69 -CATV : S1 to S20 -HYPER : S21 to S47	
4	Receiving system	Analog : Upper Heterodyne Digital : COFDM, QAM	<p>► DVB-T</p> <ul style="list-style-type: none"> <li>- Guard Interval(Bitrate_Mbit/s) 1/4, 1/8, 1/16, 1/32</li> <li>- Modulation : Code Rate QPSK : 1/2, 2/3, 3/4, 5/6, 7/8 16-QAM : 1/2, 2/3, 3/4, 5/6, 7/8 64-QAM : 1/2, 2/3, 3/4, 5/6, 7/8</li> </ul> <p>► DVB-T2</p> <ul style="list-style-type: none"> <li>- Guard Interval(Bitrate_Mbit/s) 1/4, 1/8, 1/16, 1/32, 1/128, 19/128, 19/256,</li> <li>- Modulation : Code Rate QPSK : 1/2, 2/5, 2/3, 3/4, 5/6 16-QAM : 1/2, 2/5, 2/3, 3/4, 5/6 64-QAM : 1/2, 2/5, 2/3, 3/4, 5/6 256-QAM : 1/2, 2/5, 2/3, 3/4, 5/6</li> </ul> <p>► DVB-C</p> <ul style="list-style-type: none"> <li>- Symbolrate : 4.0Msymbols/s to 7.2 Msymbols/s</li> <li>- Modulation : 16QAM, 64-QAM, 128-QAM and 256-QAM</li> </ul> <p>► DVB-S/S2</p> <ul style="list-style-type: none"> <li>- symbolrate : DVB-S2 (8PSK / QPSK) : 2 ~ 45 Msymbol/s DVB-S (QPSK) : 2 ~ 45 Msymbol/s</li> <li>- viterbi DVB-S mode : 1/2, 2/3, 3/4, 5/6, 7/8 DVB-S2 mode : 1/2, 2/3, 3/4, 3/5, 4/5, 5/6, 8/9, 9/10</li> </ul>
5	Input Voltage	AC 100 ~ 240V 50/60Hz	

## 5. External Input Support Format

### 5.1. Component (Y, C<sub>B</sub>/P<sub>B</sub>, C<sub>R</sub>/P<sub>R</sub>)

No.	Resolution	H-freq(kHz)	V-freq(Hz)	Pixel clock(MHz)	Proposed
1.	720×480	15.73	60.00	SDTV, DVD 480i	SDTV, DVD 480I(525I)
2.	720×480	15.63	59.94	SDTV, DVD 480i	SDTV, DVD 480I(525I)
3.	720×480	31.47	59.94	480p	SDTV, DVD 576I(625I) 50Hz
4.	720×480	31.50	60.00	480p	SDTV 480P
5.	720×576	15.625	50.00	SDTV 576i	SDTV 480P
6.	720×576	31.25	50.00	SDTV 576p	SDTV 576P 50Hz
7.	1280×720	45.00	50.00	HDTV 720p	HDTV 720P
8.	1280×720	44.96	59.94	HDTV 720p	HDTV 720P
9.	1280×720	45.00	60.00	HDTV 720p	HDTV 720P 50Hz
10.	1920×1080	31.25	50.00	HDTV 1080i	HDTV 1080I 50Hz,
11.	1920×1080	33.75	60.00	HDTV 1080i	HDTV 1080I
12.	1920×1080	33.72	59.94	HDTV 1080i	HDTV 1080I
13.	1920×1080	56.250	50	HDTV 1080p	HDTV 1080P
14.	1920×1080	67.5	60	HDTV 1080p	HDTV 1080P

## 5.2. HDMI(PC/DTV)

No.	Resolution	H-freq(kHz)	V-freq.(kHz)	Pixel clock(MHz)	Remarks	
	<b>HDMI-PC</b>					<b>DDC</b>
1	640*350	31.468	70.09	25.17	EGA	X
2	720*400	31.469	70.08	28.32	DOS	O
3	640*480	31.469	59.94	25.17	VESA(VGA)	O
4	800*600	37.879	60.31	40.00	VESA(SVGA)	O
5	1024*768	48.363	60.00	65.00	VESA(XGA)	O
6	1152*864	54.348	60.053	80.00	VESA	O
7	1280*1024	63.981	60.020	108.00	VESA (SXGA)	O
8	1360*768	47.712	60.015	85.50	VESA (WXGA)	O
9	1920*1080	67.5	60	148.5	WUXGA(Reduced Blanking)	O
10	3840*2160	67.5	30.00	297.00	UD	
11	3840*2160	56.25	25.00	297.00	UD	
12	3840*2160	54.0	24.00	297.00	UD	
	<b>HDMI-DTV</b>					
1	720*480	31.47	60	27.027	SDTV 480P	
2	720*480	31.47	59.94	27.00	SDTV 480P	
3	1280*720	45.00	60.00	74.25	HDTV 720P	
4	1280*720	44.96	59.94	74.176	HDTV 720P	
5	1920*1080	33.75	60.00	74.25	HDTV 1080I	
6	1920*1080	33.72	59.94	74.176	HDTV 1080I	
7	1920*1080	67.500	60	148.50	HDTV 1080P	
8	1920*1080	67.432	59.939	148.352	HDTV 1080P	
9	1920*1080	27.000	24.000	74.25	HDTV 1080P	
10	1920*1080	26.97	23.976	74.176	HDTV 1080P	
11	1920*1080	33.75	30.000	74.25	HDTV 1080P	
12	1920*1080	33.71	29.97	74.176	HDTV 1080P	
13	3840*2160	67.5	30.00	297.00	UDTV 2160P	
14	3840*2160	56.25	25.00	297.00	UDTV 2160P	
15	3840*2160	54.0	24.00	297.00	UDTV 2160P	

## 6. 3D Mode

### 6.1. RF Input (3D supported mode manually)

No.	Resolution	Proposed	Remarks
1	HD - DTV	1080I 720P	2D to 3D Side by Side(Half) Top & Bottom
2	SD - DTV	576P 576I	
3	SD – ATV(CVBS/SCART)		

### 6.2. RF Input (3D supported mode automatically)

No.	Resolution	Remarks
1	Frame Compatible	2D to 3D Side by Side(Half) Top & Bottom

## 6.2. HDMI Input

(1) HDMI 1.3 (3D Supported mode manually)

No.	Resolution	H-freq(kHz)	V-freq.(kHz)	Pixel clock(MHz)	Proposed	3D input proposed mode
1	720*480	31.5	60	27.03	SDTV 480P	2D to 3D, Side by Side(Half), Top & Bottom, Checker Board, Frame Sequential, Row Interleaving, Column Interleaving
2	720*576	31.25	50	27	SDTV 576P	
3	1280*720	45.00	60.00	74.25	HDTV 720P	
		37.500	50	74.25	HDTV 720P	
4	1920*1080	33.75	60.00	74.25	HDTV 1080I	2D to 3D, Side by Side(Half), Top & Bottom
		28.125	50.00	74.25	HDTV 1080I	
		27.00	24.00	74.25	HDTV 1080P	2D to 3D, Side by Side(Half), Top & Bottom, Checker Board, Row Interleaving, Column Interleaving
		28.12	25	74.25	HDTV 1080P	
		33.75	30.00	74.25	HDTV 1080P	2D to 3D, Side by Side(Half), Top & Bottom, Checker Board, Single Frame Sequential, Row Interleaving, Column Interleaving
		67.50	60.00	148.5	HDTV 1080P	
		56.250	50	148.5	HDTV 1080P	
5	3840*2160	53.95	23.976	297.00	HDTV 2160P	2D to 3D, Top & Bottom(half), Side by Side(half),
		54	24.00	296.703		
		56.25	25.00	297.00		
		61.43	29.970	297.00		
		67.5	30.00	296.703		

## (2) HDMI 1.4b (3D Supported mode automatically)

No.	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	VIC	3D input proposed mode	Proposed
1	640*480	31.469 / 31.5	59.94/ 60	25.125/25.2	1	Top-and-Bottom Side-by-side(half)	Secondary(SDTV 480P) Secondary(SDTV 480P)
2		62.938/63	59.94/ 60	50.35/50.4	1	Frame packing Line alternative	Secondary(SDTV 480P) (SDTV 480P)
3		31.469 / 31.5	59.94/ 60	50.35/50.4	1	Side-by-side(Full)	(SDTV 480P)
4	720*480	31.469 / 31.5	59.94 / 60	27.00/27.03	2,3	Top-and-Bottom Side-by-side(half)	Secondary(SDTV 480P) Secondary(SDTV 480P)
5		62.938/63	59.94 / 60	54/54.06	2,3	Frame packing Line alternative	Secondary(SDTV 480P) (SDTV 480P)
6		31.469 / 31.5	59.94 / 60	54/54.06	2,3	Side-by-side(Full)	(SDTV 480P)
7	720*576	31.25	50	27	17,18	Top-and-Bottom Side-by-side(half)	Secondary(SDTV 576P) Secondary(SDTV 576P)
8		62.5	50	54	17,18	Frame packing Line alternative	Secondary(SDTV 576P) (SDTV 576P)
9		31.25	50	54	17,18	Side-by-side(Full)	(SDTV 576P)
10	1280*720	37.500	50	74.25	19	Top-and-Bottom Side-by-side(half)	Primary(HDTV 720P) Primary(HDTV 720P)
11		75	50	148.5	19	Frame packing Line alternative	Primary(HDTV 720P) (HDTV 720P)
12		37.500	50	148.5	19	Side-by-side(Full)	(HDTV 720P)
13		44.96 / 45	59.94 / 60	74.18/74.25	4	Top-and-Bottom Side-by-side(half)	Primary(HDTV 720P) Primary(HDTV 720P)
14		89.91/90	59.94 / 60	148.35/148.5	4	Side-by-side(Full)	(HDTV 720P)
15		44.96 / 45	59.94 / 60	148.35/148.5	4	Frame packing Line alternative	Primary(HDTV 720P) (HDTV 720P)
16	1920*1080	33.72 / 33.75	59.94 / 60	74.18/74.25	5	Frame packing Line alternative	Primary(HDTV 720P) (HDTV 720P)
17		67.432/67.50	59.94 / 60	148.35/148.5	5	Top-and-Bottom Side-by-side(half)	Secondary(HDTV 1080I) Primary(HDTV 1080I)
18		33.72 / 33.75	59.94 / 60	148.35/148.5	5	Side-by-side(Full)	(HDTV 1080I)
19		28.125	50.00	74.25	20	Top-and-Bottom Side-by-side(half)	Secondary(HDTV 1080I) Primary(HDTV 1080I)
20		56.25	50.00	148.5	20	Frame packing Field alternative	Primary(HDTV 1080I) (HDTV 1080I)
21		28.125	50.00	148.5	20	Side-by-side(Full)	(HDTV 1080I)
22	1920*1080	26.97 / 27	23.97 / 24	74.18/74.25	32	Top-and-Bottom Side-by-side(half)	Primary(HDTV 1080P) Primary(HDTV 1080P)
23		43.94/54	23.97 / 24	148.35/148.5	32	Frame packing Line alternative	Primary(HDTV 1080P) (HDTV 1080P)
24		26.97 / 27	23.97 / 24	148.35/148.5	32	Side-by-side(Full)	(HDTV 1080P)
25		28.12	25	74.25	33	Top-and-Bottom Side-by-side(half)	Secondary(HDTV 1080P) Secondary(HDTV 1080P)
26		56.24	25	148.5	33	Frame packing Line alternative	Primary(HDTV 1080P) (HDTV 1080P)
27		28.12	25	148.5	33	Side-by-side(Full)	(HDTV 1080P)
28		33.716 / 33.75	29.976 / 30.00	74.18/74.25	34	Top-and-Bottom Side-by-side(half)	Secondary(HDTV 1080P) Secondary(HDTV 1080P)
29		67.432 / 67.5	29.976 / 30.00	148.35/148.5	34	Frame packing Line alternative	Primary(HDTV 1080P) (HDTV 1080P)
30		33.716 / 33.75	29.976 / 30.00	148.35/148.5	34	Side-by-side(Full)	(HDTV 1080P)
31		56.250	50	148.5	31	Top-and-Bottom Side-by-side(half)	Primary(HDTV 1080P) Secondary(HDTV 1080P)
32		67.43 / 67.5	59.94 / 60	148.35/148.50	16	Top-and-Bottom Side-by-side(half)	Primary(HDTV 1080P) Secondary(HDTV 1080P)

(3) HDMI-PC Input (3D) (3D Supported mode manually)

No.	Resolution	H-freq(kHz)	V-freq.(kHz)	Pixel clock(MHz)	3D input proposed mode	Proposed
1	1024*768	48.36	60	65	2D to 3D, Side by Side(half), Top & Bottom	HDTV 768P
2	1360*768	47.71	60	85.5	2D to 3D, Side by Side(half), Top & Bottom	HDTV 768P
3	1920*1080	67.500	60	148.50	2D to 3D, Side by Side(half), Top & Bottom, Checker Board, Single Frame Sequential, Row Interleaving, Column Interleaving	HDTV 1080P
4	3840*2160	54 56.25 67.5	24.00 25.00 30.00	296.703 297 296.703	2D to 3D, Top & Bottom(half), Side by Side(half),	HDTV 2160P
5	Others	-	-	-	2D to 3D, Side by Side(half), Top & Bottom	640*350 720*400 640*480 800*600 1152*864

(4) Component Input (3D) (3D Supported mode manually)

No.	Resolution	H-freq(kHz)	V-freq.(kHz)	Pixel clock(MHz)	3D input proposed mode	Proposed
1	1280*720	37.5	50	74.25	2D to 3D, Side by Side(half), Top & Bottom	HDTV 720P
2	1280*720	45.00	60.00	74.25	2D to 3D, Side by Side(half), Top & Bottom	HDTV 720P
3	1280*720	44.96	59.94	74.176	2D to 3D, Side by Side(half), Top & Bottom	HDTV 720P
4	1920*1080	33.75	60.00	74.25	2D to 3D, Side by Side(half), Top & Bottom	HDTV 1080I
5	1920*1080	33.72	59.94	74.176	2D to 3D, Side by Side(half), Top & Bottom	HDTV 1080I
6	1920*1080	28.12	50	74.25	2D to 3D, Side by Side(half), Top & Bottom	HDTV 1080I
7	1920*1080	67.500	60	148.50	2D to 3D, Side by Side(half), Top & Bottom	HDTV 1080P
8	1920*1080	67.432	59.94	148.352	2D to 3D, Side by Side(half), Top & Bottom	HDTV 1080P
9	1920*1080	27.000	24.000	74.25	2D to 3D, Side by Side(half), Top & Bottom	HDTV 1080P
10	1920*1080	28.12	25	74.25	2D to 3D, Side by Side(half), Top & Bottom	HDTV 1080P
11	1920*1080	56.25	50	74.25	2D to 3D, Side by Side(half), Top & Bottom	HDTV 1080P
12	1920*1080	26.97	23.976	74.176	2D to 3D, Side by Side(half), Top & Bottom	HDTV 1080P
13	1920*1080	33.75	30.000	74.25	2D to 3D, Side by Side(half), Top & Bottom	HDTV 1080P
14	1920*1080	33.71	29.97	74.176	2D to 3D, Side by Side(half), Top & Bottom	HDTV 1080P



(5) USB, DLNA - Movie (3D) (3D supported mode manually)

No.	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	3D input proposed mode
1	Under 704x480	-	-	-	2D to 3D
2	Over 704x480 interlaced	-	-	-	2D to 3D, Side by Side(Half), Top & Bottom
3	Over 704x480 progressive	-	50 / 60	-	2D to 3D, Side by Side(Half), Top & Bottom, Checker Board, Row Interleaving, Column Interleaving, Frame Sequential
		-	others	-	2D to 3D, Side by Side(Half), Top & Bottom, Checker Board, Row Interleaving, Column Interleaving

(6) USB, DLNA -Photo (3D) (3D supported mode manually)

No.	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	3D input proposed mode
1	Under 320x240	-	-	-	2D to 3D
2	Over 320x240	-	-	-	2D to 3D, Side by Side(Half), Top & Bottom









(7) USB, DLNA (3D) (3D supported mode automatically)

No.	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	3D input proposed mode
1	1080p	33.75	30	74.25	Side by Side(Half), Top & Bottom, Checker Board, MPO(Photo), JPS(Photo)

(8) Miracast, Widi (3D supported mode manually)

No.	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	3D input proposed mode
1	1024*768p	-	30/60	-	2D to 3D, Side by Side(Half), Top & Bottom
2	1280*720p	-	30/60	-	
3	1920*1080p	-	30/60	-	
4	Others	-	-	-	2D to 3D

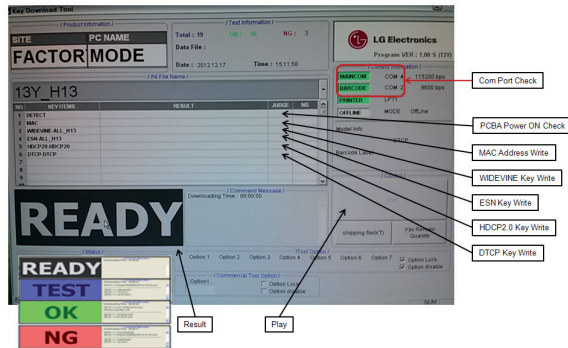
■ Remark: 3D Input mode

No.	Side by Side	Top & Bottom	Checker board	Single Frame Sequential	Frame Packing	Line Interleaving	Column Interleaving	2D to 3D
1								



### (5) Download

- 1) AJ/JA Models (13Y LCD TV + MAC + Widevine + ESN + HDCP2.0)



### 3.3.4. LAN PORT inspection (PING TEST)

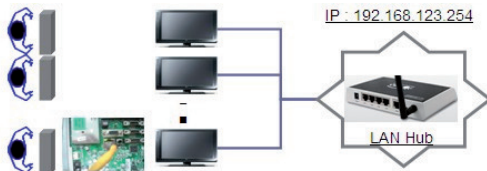
- (1) Play the LAN Port Test Program.
- (2) Connect each other LAN Port Jack.
- (3) Play Test (F9) button and confirm OK Message.
- (4) Remove LAN cable.



## 3.3. LAN Inspection

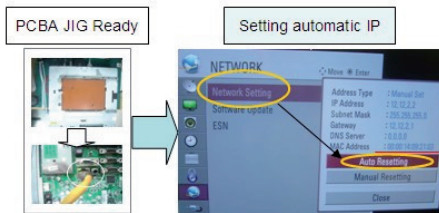
### 3.3.1. Equipment & Condition

- Each other connection to LAN Port of IP Hub and Jig



### 3.3.2. LAN inspection solution

- LAN Port connection with PCB
- Network setting at MENU Mode of TV
- Setting automatic IP
- Setting state confirmation
  - If automatic setting is finished, you confirm IP and MAC Address.



### 3.3.3. LAN PORT INSPECTION(PING TEST)

Connect SET -> LAN port == PC -> LAN Port



- (1) Play the LAN Port Test PROGRAM.
- (2) Input IP set up for an inspection to Test Program.  
\*IP Number : 12.12.2.2

## 3.4. Model name & Serial number Download

### 3.4.1. Model name & Serial number D/L

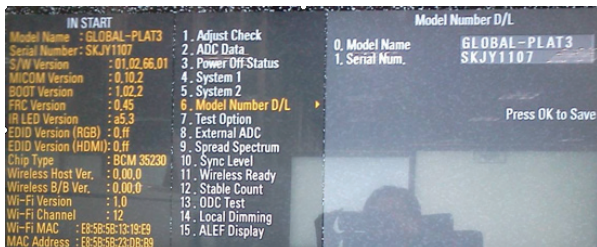
- Press "Power on" key of service remote control.
- (Baud rate : 115200 bps)
- Connect RS232 Signal to USB Cable to USB.
- Write Serial number by use USB port.
- Must check the serial number at Instart menu.

### 3.4.2. Method & notice

- (1) Serial number D/L is using of scan equipment.
- (2) Setting of scan equipment operated by Manufacturing Technology Group.
- (3) 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

\* Manual Download (Model Name and Serial Number)  
If the TV set is downloaded by OTA or service man, sometimes model name or serial number is initialized.(Not always)  
It is impossible to download by bar code scan, so It need Manual download.

- 1) Press the "Instart" key of Adjustment remote control.
- 2) Go to the menu "5.Model Number D/L" like below photo.
- 3) Input the Factory model name or Serial number like photo.



- 4) Check the model name Instart menu. → Factory name displayed.
- 5) Check the Diagnostics.(DTV country only) → Buyer model displayed.

### 3.5. WIFI MAC ADDRESS CHECK

(1) Using RS232 Command

	Command	Set ACK
Transmission	[A][ ][ ][Set ID][ ][20][Cr]	[O][K][X] or [NG]

(2) Check the menu on in-start.



## 4. Manual Adjustment

### 4.1. ADC adjustment

- (1) Remove Component and SCART Input Signal.
- (2) Press Adj. key on the Adjustment remote control, then select "9.ADC Calibration".
- (3) change ADC Type to Internal
- (4) Move cursor on the Start.
- (5) Press OK.

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

#### 4.2.1. Overview

It is a VESA regulation. A PC or a MNT will display an optimal resolution through information sharing without any necessity of user input. It is a realization of "Plug and Play".

#### 4.2.2. Equipment

- Since embedded EDID data is used, EDID download JIG, HDMI cable and D-sub cable are not need.
- Adjustment remote control

#### 4.2.3. Download method

- (1) Press "ADJ" key on the Adjustment remote control, then select "12.EDID D/L", By pressing "Enter" key, enter EDID D/L menu.



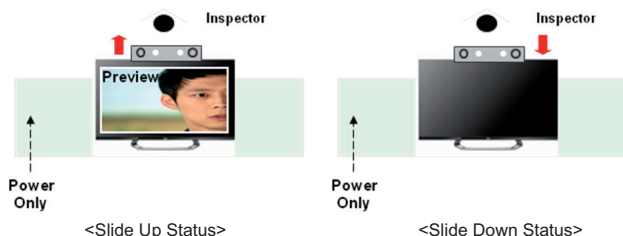
- (2) Select "Start" button by pressing "Enter" key, HDMI1/ HDMI2/ HDMI3/ HDMI4 are writing and display OK or NG.





### 4.3. Camera Function Inspection

- (1) Objective : To check how it connects between Camera and PCBA normally, and their Function
- (2) Test Method : This Inspection is available only Power-Only Status.
  - 1) Push Camera Up.
  - 2) Camera's Preview picture appears on TV Set.
  - 3) Push Camera Down.



- (3) RS-232C Command

RS-232C COMMAND			Explanation
CMD	DATA	ID	
ai	00	23	Camera Function Start.
ai	00	24	Camera Function End.

### 4.4. White Balance Adjustment

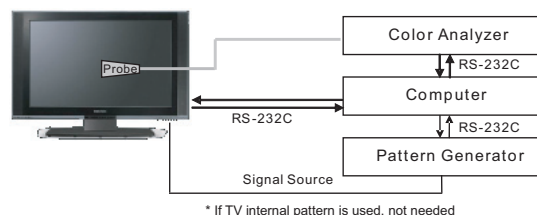
#### 4.4.1. Overview

- W/B adj. Objective & How-it-works
  - (1) Objective: To reduce each Panel's W/B deviation
  - (2) How-it-works : When R/G/B gain in the OSD is at 192, it means the panel is at its Full Dynamic Range. In order to prevent saturation of Full Dynamic range and data, one of R/G/B is fixed at 192, and the other two is lowered to find the desired value.
  - (3) Adjustment condition : normal temperature
    - 1) Surrounding Temperature : 25 °C ± 5 °C
    - 2) Warm-up time: About 5 Min
    - 3) Surrounding Humidity : 20 % ~ 80 %

#### 4.4.2. Equipment

- (1) Color Analyzer: CA-210 (LED Module : CH 14)
  - (2) Adjustment Computer(During auto adj., RS-232C protocol is needed)
  - (3) Adjustment Remote control
  - (4) Video Signal Generator MSPG-925F 720p/216-Gray (Model: 217, Pattern: 78)
    - Only when internal pattern is not available
- Color Analyzer Matrix should be calibrated using CS-100.

#### 4.4.3. Equipment connection MAP



#### 4.4.4. Adj. Command (Protocol)

<Command Format>

START	6E	A	50	A	LEN	A	03	A	CMD	A	00	A	VAL	A	CS	STOP
-------	----	---	----	---	-----	---	----	---	-----	---	----	---	-----	---	----	------

- LEN: Number of Data Byte to be sent
  - CMD: Command
  - VAL: FOS Data value
  - CS: Checksum of sent data
  - A: Acknowledge
- Ex) [Send: JA\_00\_DD] / [Ack: A\_00\_okDDX]

- RS-232C Command used during auto-adjustment.

RS-232C COMMAND [CMD ID DATA]			Explanation
CMD	ID	DATA	
wb	00	00	Begin White Balance adjustment
wb	00	10	Gain adjustment(internal white pattern)
wb	00	1f	Gain adjustment completed
wb	00	20	Offset adjustment(internal white pattern)
wb	00	2f	Offset adjustment completed
wb	00	ff	End White Balance adjustment (internal pattern disappears )

- Ex) wb 00 00 -> Begin white balance auto-adj.  
 wb 00 10 -> Gain adj.  
 ja 00 ff -> Adj. data  
 jb 00 c0  
 ...  
 ...  
 wb 00 1f -> Gain adj. completed  
 \*(wb 00 20(Start), wb 00 2f(end)) -> Off-set adj.  
 wb 00 ff -> End white balance auto-adj.

- Adj. Map

	Adj. item	Command (lower case ASCII)		Data Range (Hex.)		Default (Decimal)
		CMD1	CMD2	MIN	MAX	
Cool	R Gain	j	g	00	C0	
	G Gain	j	h	00	C0	
	B Gain	j	i	00	C0	
	R Cut					
	G Cut					
	B Cut					
Medium	R Gain	j	a	00	C0	
	G Gain	j	b	00	C0	
	B Gain	j	c	00	C0	
	R Cut					
	G Cut					
	B Cut					
Warm	R Gain	j	d	00	C0	
	G Gain	j	e	00	C0	
	B Gain	j	f	00	C0	
	R Cut					
	G Cut					
	B Cut					

#### 4.4.5. Adj. method

##### (1) Auto adj. method

- 1) Set TV in adj. mode using POWER ON key.
- 2) Zero calibrate probe then place it on the center of the Display.
- 3) Connect Cable.(RS-232C to USB)
- 4) Select mode in adj. Program and begin adj.
- 5) When adj. is complete (OK Sign), check adj. status pre mode. (Warm, Medium, Cool)
- 6) Remove probe and RS-232C cable to complete adj.

- W/B Adj. must begin as start command "wb 00 00" , and finish as end command "wb 00 ff", and Adj. offset if need.

##### (2) Manual adjustment. method

- 1) Set TV in Adj. mode using POWER ON.
- 2) Zero Calibrate the probe of Color Analyzer, then place it on the center of LCD module within 10 cm of the surface.
- 3) Press ADJ key → EZ adjust using adj. R/C → 7. White-Balance then press the cursor to the right(key ►).  
(When right key(►) is pressed 216 Gray internal pattern will be displayed)
- 4) One of R Gain / G Gain / B Gain should be fixed at 192, and the rest will be lowered to meet the desired value.
- 5) Adjustment is performed in COOL, MEDIUM, WARM 3 modes of color temperature.

##### \*\* G-fix adjustment

Adjust modes (Cool), Fix the G gain to 172 (default data) and change the others (G/B Gain).

Adjust two modes(Medium / Warm), Fix the one of R/G/B gain to 192 (default data) and decrease the others.

- If internal pattern is not available, use RF input. In EZ adj. menu 7.White Balance, you can select one of 2 Test-pattern: ON, OFF. Default is inner(ON). By selecting OFF, you can adjust using RF signal in 216 Gray pattern.

##### ▪ Adjustment condition and cautionary items

- 1) Lighting condition in surrounding area  
Surrounding lighting should be lower 10 lux. Try to isolate adj. area into dark surrounding.
- 2) Probe location  
: Color Analyzer(CA-210) probe should be within 10 cm and perpendicular of the module surface (80° ~ 100°)
- 3) Aging time  
- After Aging Start, Keep the Power ON status during 5 Minutes.  
- In case of LCD, Back-light on should be checked using no signal or Full-white pattern.

#### 4.4.6. Reference(White balance adjusmtment coordinate and color temperature)

- Luminance : 206 Gray
- Standard color coordinate and temperature using CS-1000 (over 26 inch)

Mode	Coordinate		Temp	Δuv
	x	y		
Cool	0.271	0.270	13000 K	0.0000
Medium	0.286	0.289	9300 K	0.0000
Warm	0.313	0.329	6500 K	0.0000

- Standard color coordinate and temperature using CA-210(CH 14)

Mode	Coordinate		Temp	Δuv
	x	y		
Cool	0.271 ± 0.002	0.270 ± 0.002	13000 K	0.0000
Medium	0.286 ± 0.003	0.289 ± 0.003	9300 K	0.0000
Warm	0.313 ± 0.002	0.329 ± 0.002	6500 K	0.0000

#### 4.4.7. EDGE & IOL LED White balance table

- EDGE LED module change color coordinate because of aging time.
- Apply under the color coordinate table, for compensated aging time.
- (Normal line) Edge & ALEF LED White balance table  
- gumi(Mar. ~ Dec.) & Global  
Model : (normal line) LGD, CMI

	Aging time (Min)	Cool		Medium		Warm	
		x	y	x	y	x	y
		271	270	286	289	313	329
1	0-2	282	289	297	308	324	348
2	3-5	281	287	296	306	323	346
3	6-9	279	284	294	303	321	343
4	10-19	277	280	292	299	319	339
5	20-35	275	277	290	296	317	336
6	36-49	274	274	289	293	316	333
7	50-79	273	272	288	291	315	331
8	80-119	272	271	287	290	314	330
9	Over 120	271	270	286	289	313	329

- gumi Winter table(Jan., Feb.)- Gumi producing model use only  
Model : (normal line) LGD, CMI

	Aging time (Min)	Cool		Medium		Warm	
		x	y	x	y	x	y
		271	270	286	289	313	329
1	0-5	286	295	301	314	328	354
2	6-10	284	290	299	309	326	349
3	11-20	282	287	297	306	324	346
4	21-30	279	283	294	302	321	342
5	31-40	276	278	291	297	318	337
6	41-50	274	275	289	294	316	334
7	51-80	273	272	288	291	315	331
8	81-119	272	271	287	290	314	330
9	Over 120	271	270	286	289	313	329

- (Aging Chamber) Edge & ALEF  
Model : (aging chamber)LGD, CMI

	Aging time (Min)	Cool		Medium		Warm	
		x	y	x	y	x	y
		271	270	285	293	313	329
1	0-5	280	285	294	308	319	340
2	6-10	276	280	290	303	315	335
3	11-20	272	275	286	298	311	330
4	21-30	269	272	283	295	308	327
5	31-40	267	268	281	291	306	323
6	41-50	266	265	280	288	305	320
7	51-80	265	263	279	286	304	318
8	81-119	264	261	278	284	303	316
9	Over 120	264	260	278	283	303	315

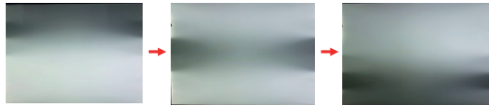
#### 4.4. Local Dimming Function Check

Step 1) Turn on TV.

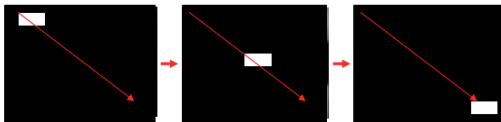
Step 2) At the Local Dimming mode, module Edge Backlight moving right to left Back light of IOP module moving.

Step 3) Confirm the Local Dimming mode.

Step 4) Press "exit" key.



Local Dimming Demo  
(Edge LED Model)



Local Dimming Demo  
(ALEF Model)

#### 4.5. Magic Motion Remote control test

- Equipment : RF Remote control for test, IR-KEY-Code Remote control for test

- You must confirm the battery power of RF-Remote control before test(recommend that change the battery per every lot)

- Sequence (test)

1) If you select the 'start key(OK)' on the Adjustment remote control, you can pairing with the TV SET.

2) You can check the cursor on the TV Screen, when select the "OK" key on the Adjustment remote control.

3) You must remove the pairing with the TV Set by select 'Mute + OK Key' on the Adjustment remote control.

#### 4.6. 3D function test

(Pattern Generator MSHG-600, MSPG-6100[Support HDMI1.4])

\* HDMI mode NO. 872 , pattern No.83

(1) Please input 3D test pattern like below.



(2) When 3D OSD appear automatically, then select green key.



(3) Don't wear a 3D Glasses, Check the picture like below.



#### 4.7. Option selection per country

##### 4.8.1. Overview

- Option selection is only done for models in AJ/JA/IL

##### 4.8.2.Method

(1) Press "ADJ" key on the Adjustment remote control, then select Country Group Menu.

(2) Depending on destination, select Country Group Code or Country Group then on the lower Country option, select US, CA, MX. Selection is done using +, - or ►◄ KEY.

#### 4.8. HDMI ARC Function Inspection

(1) Test equipment

- Optic Receiver Speaker
- MSHG-600 (SW: 1220 ↑)
- HDMI Cable (for 1.4 version)

(2) Test method

1) Insert the HDMI Cable to the HDMI ARC port from the master equipment (HDMI1)



2) Check the sound from the TV Set

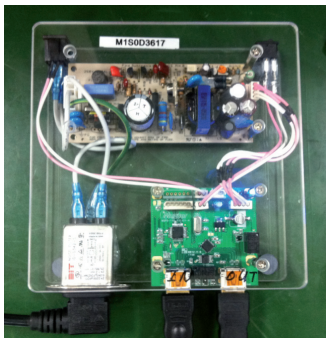


3) Check the Sound from the Speaker or using AV & Optic TEST program (It's connected to MSHG-600)



## 4.9. MHL Test

- (1) Turn on TV
- (2) Select HDMI4 mode using input Menu.
- (3) Set MHL Zig(M1S0D3617) using MHL input, output and power cord.
- (4) Connect HDMI cable between MHL Zig and HDMI4 port.
- (5) Check LED light of Zig and Module of Set



Result) If, the LED light is green and the Module shows normal stream → OK, Else → NG

## 4.10. UHD 4K Test

- (1) Video Inspection(UDG-4004NS)
  - 1) Insert the HDMI Cable to TV Set.
  - 2) Convert to HDMI Mode using TV/AV key on ADJ remote control
  - 3) Inspect the sound and picture operation well.  
(Color condition, Picture noise, Sound distortion etc.)
  - 4) Inspection 2D → 3D conversion
- (2) Pattern Inspection (MSPG-7100)
  - 1) Insert the HDMI Jack to HDMI 1 Port.
  - 2) Convert to UHD Inspection Pattern. (Use remote control)
  - 3) Check Video and Sound.
  - 4) Convert to 64 Gray Inspection Pattern.
  - 5) Check Video and Sound.
  - 6) Inspect HDMI-CEC function. (Push Play & Pause button)
- (3) If there are HDMI Port 2,3 and 4, Do each pattern Inspection.
- (4) 4K Inspection.(HEVC Inspection model only)
  - 1) Insert USB that 4K video file is saved.
  - 2) Check that the video plays normally.

## 4.11. Tool Option selection

- Method : Press "ADJ" key on the Adjustment remote control, then select Tool option.

## 4.12. Ship-out mode check (In-stop)

- After final inspection, press In-Stop key of the Adjustment remote control and check that the unit goes to Stand-by mode.

## 5. GND and Internal Pressure check

### 5.1. Method

- (1) GND & Internal Pressure auto-check preparation
  - Check that Power Cord is fully inserted to the SET. (If loose, re-insert)
- (2) Perform GND & Internal Pressure auto-check
  - Unit fully inserted Power cord, Antenna cable and A/V arrive to the auto-check process.
  - Connect D-terminal to AV JACK TESTER
  - Auto CONTROLLER(GWS103-4) ON
  - Perform GND TEST
  - If NG, Buzzer will sound to inform the operator.
  - If OK, changeover to I/P check automatically.  
(Remove CORD, A/V form AV JACK BOX.)
  - Perform I/P test
  - If NG, Buzzer will sound to inform the operator.
  - If OK, Good lamp will lit up and the stopper will allow the pallet to move on to next process.

### 5.2. Checkpoint

- TEST voltage
  - GND: 1.5 KV / min at 100 mA
  - SIGNAL: 3 KV / min at 100 mA
- TEST time: 1 second
- TEST POINT
  - GND TEST = POWER CORD GND & SIGNAL CABLE METAL GND
  - Internal Pressure TEST = POWER CORD GND & LIVE & NEUTRAL
- LEAKAGE CURRENT: At 0.5 mArms

## 6. Audio

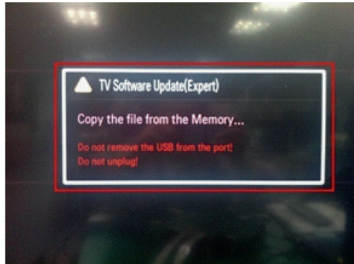
No.	Item	Min	Typ	Max	Unit	
1	Audio practical max Output, L/R (Distortion=10% max Output)		10	12	W	EQ Off AVL Off Clear Voice Off
			8.10	10.8	Vrms	
2	Speaker (8 Ω Impedance)		10	12	W	EQ On AVL On Clear Voice On

Measurement condition:

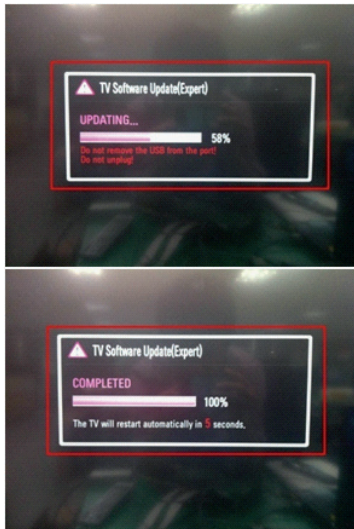
- (1) RF input: Mono, 1 KHz sine wave signal, 100 % Modulation
- (2) CVBS, Component: 1 KHz sine wave signal 0.5 Vrms
- (3) RGB PC: 1KHz sine wave signal 0.7 Vrms

## 7. USB S/W download(Service only)

- (1) Put the USB Stick to the USB socket.
- (2) Automatically detecting update file in USB Stick.
  - If your downloaded program version in USB Stick is Low, it didn't work. But your downloaded version is High, USB data is automatically detecting.(Download Version High & Power only mode, Set is automatically Download)
- (3) Show the message "Copying files from memory".



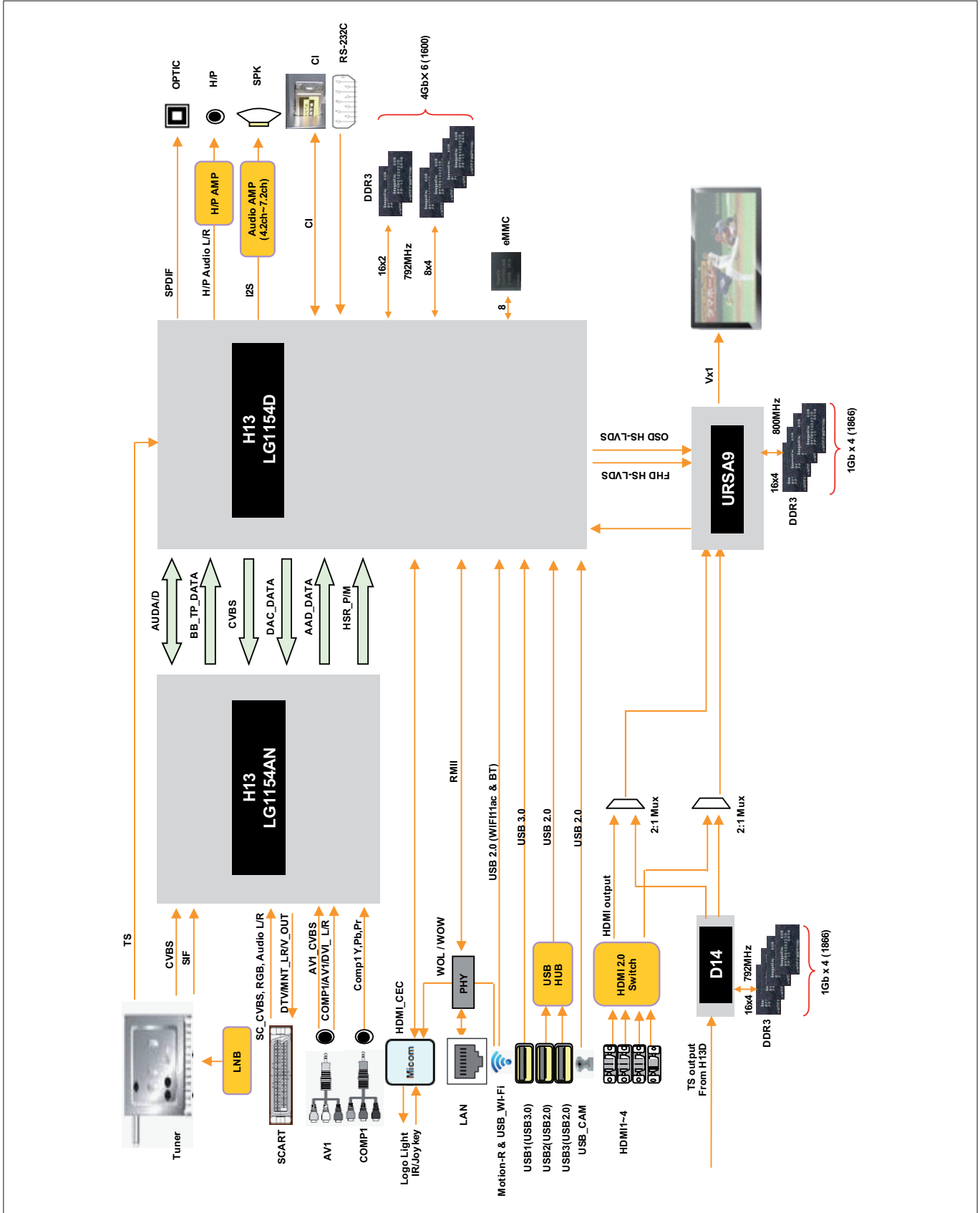
- (4) Updating is starting.
- (5) Updating Completed, The TV will restart automatically.



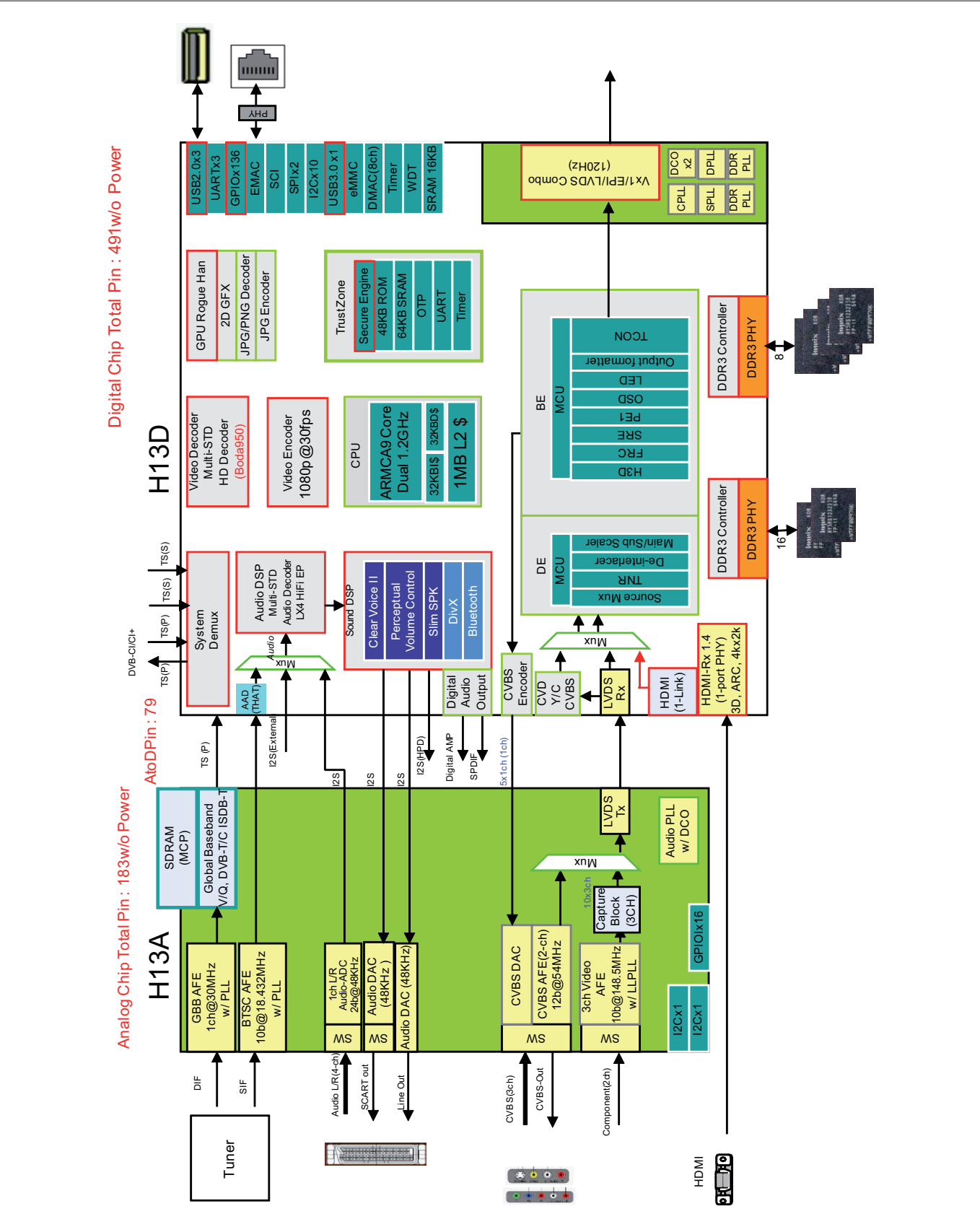
- (6) If your TV is turned on, check your updated version and Tool option. (explain the Tool option, next stage)
    - \* If downloading version is more high than your TV have, TV can lost all channel data. In this case, you have to channel recover. if all channel data is cleared, you didn't have a DTV/ATV test on production line.
- \* After downloading, have to adjust TOOL OPTION again.
- 1) Push "IN-START" key in service remote control.
  - 2) Select "Tool Option 1" and push "OK" key.
  - 3) Punch in the number. (Each model has their number.)

# BLOCK DIAGRAM

## 1. External



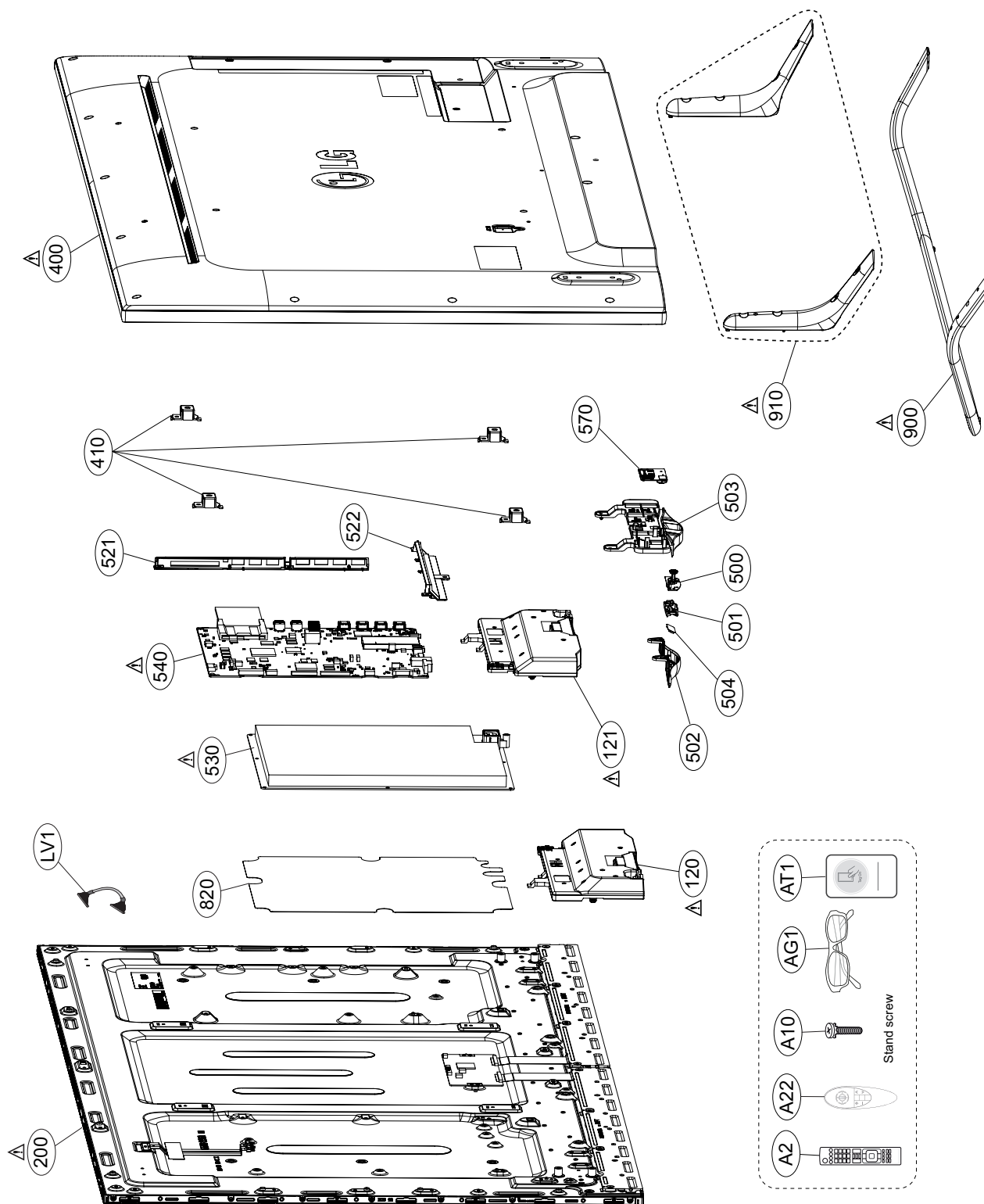
2. Internal



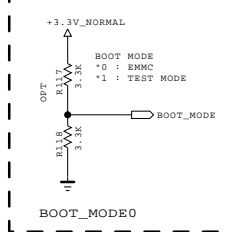
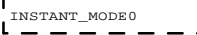
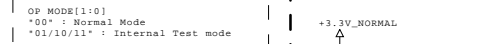
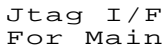
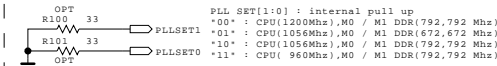
# EXPLODED VIEW

## IMPORTANT SAFETY NOTICE

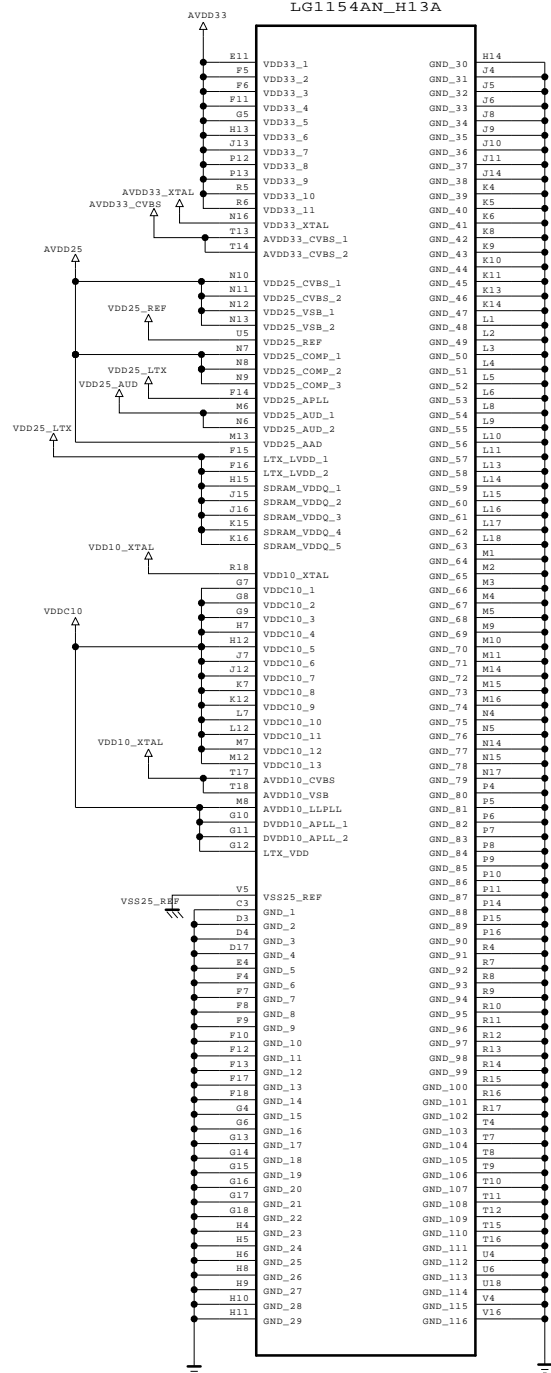
Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by  $\Delta$  in the Schematic Diagram and EXPLODED VIEW. It is essential that these special safety parts should be replaced with the same components as recommended in this manual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



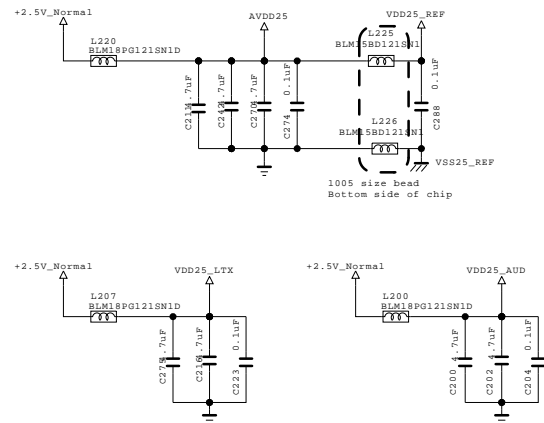
## Clock for LG1154D



IC101  
154AN\_H13A

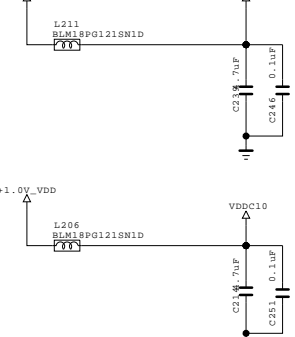


AFE 3CH Power



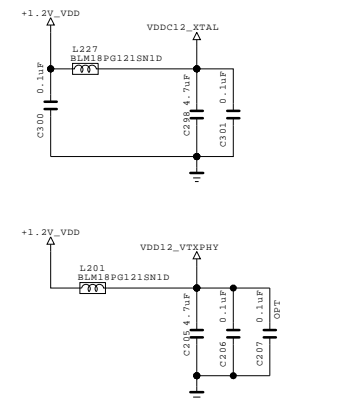
+1.0V\_VDD                      VDD10\_XTAL

▲                                  ▲



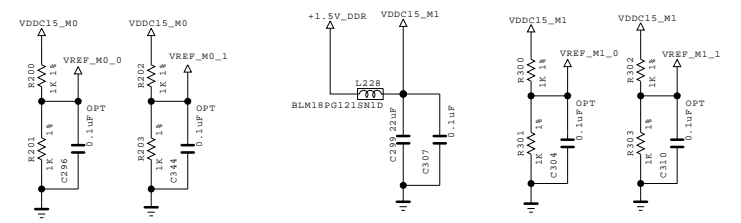
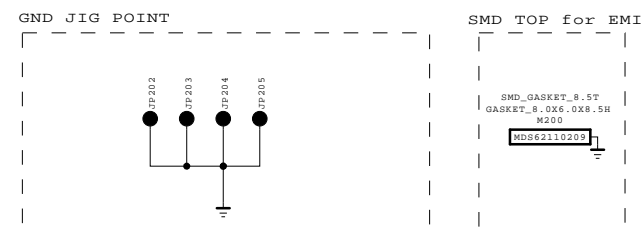
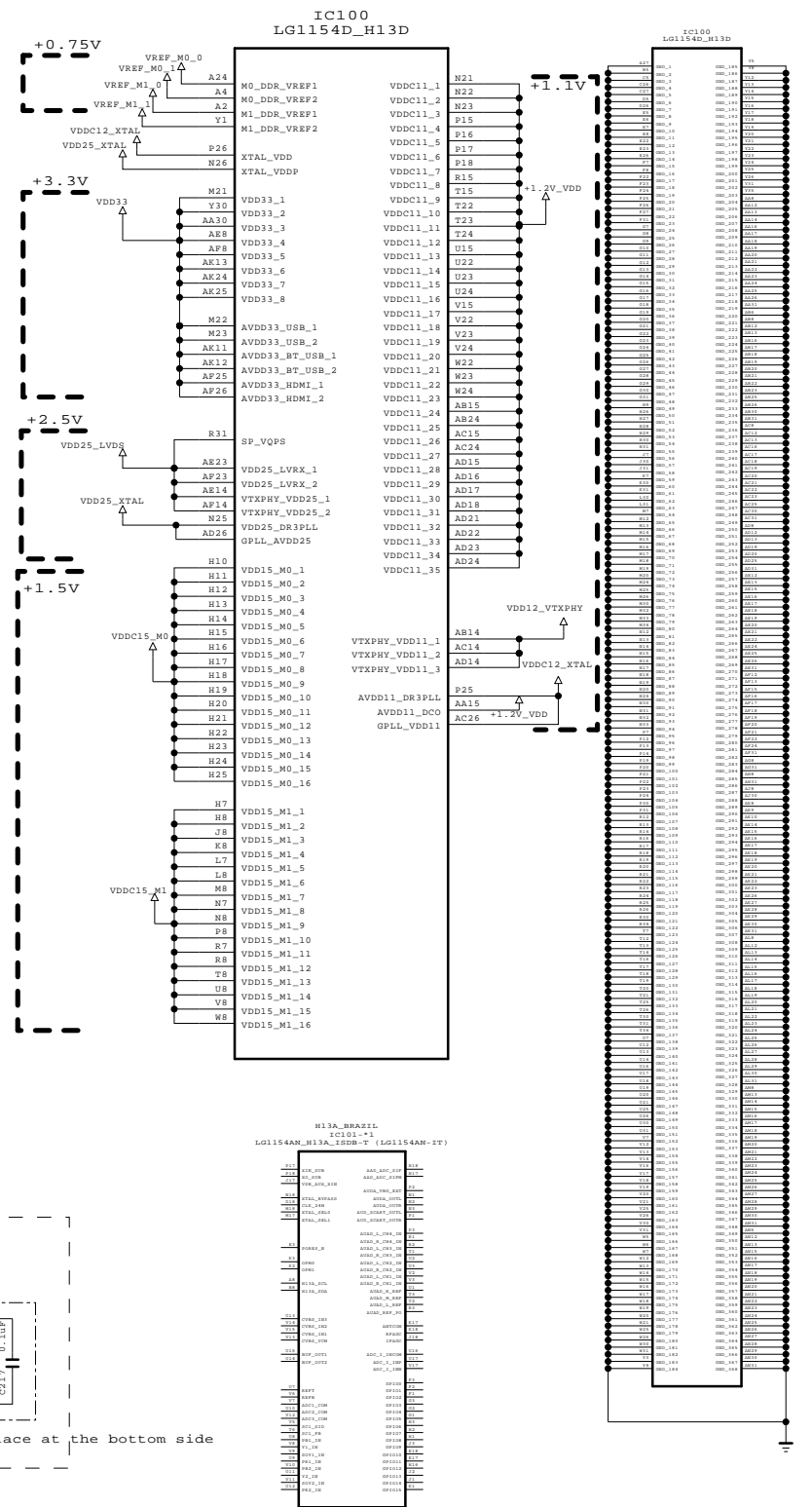
Place at the bottom side

1 Place at the bottom side

[illegible]

Place at the bottom side

Place at the bottom side

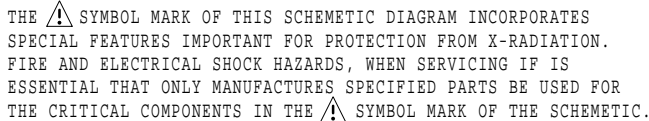


SECRET  
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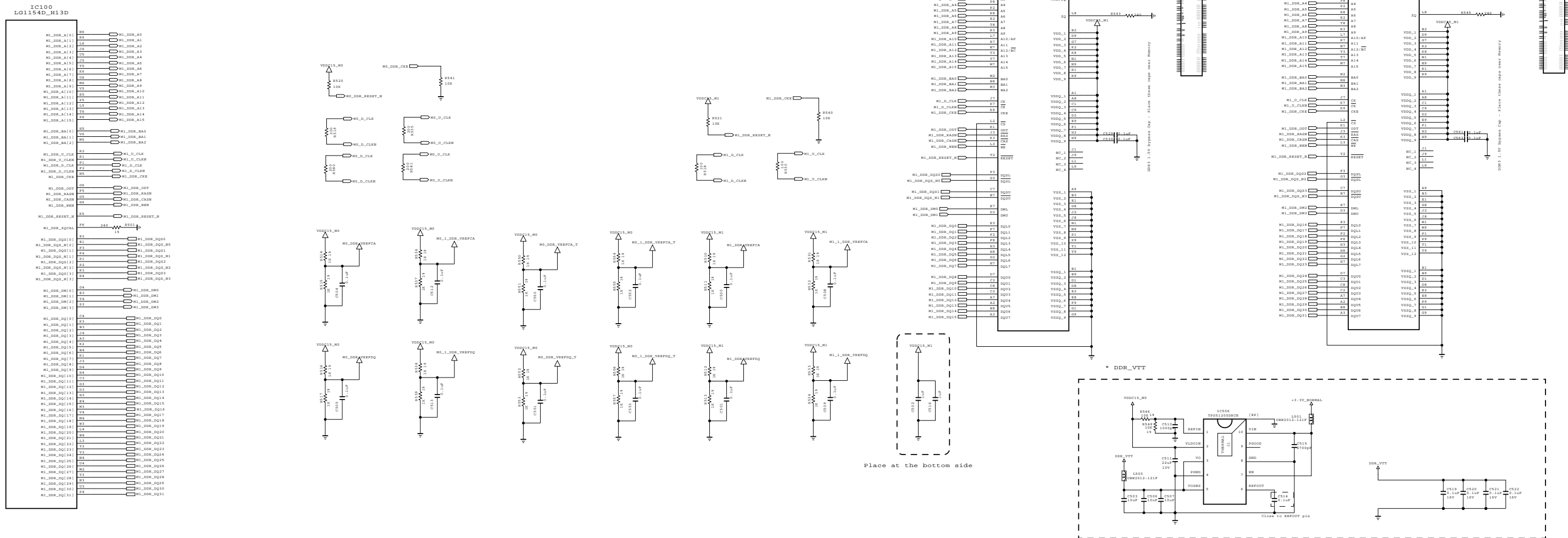
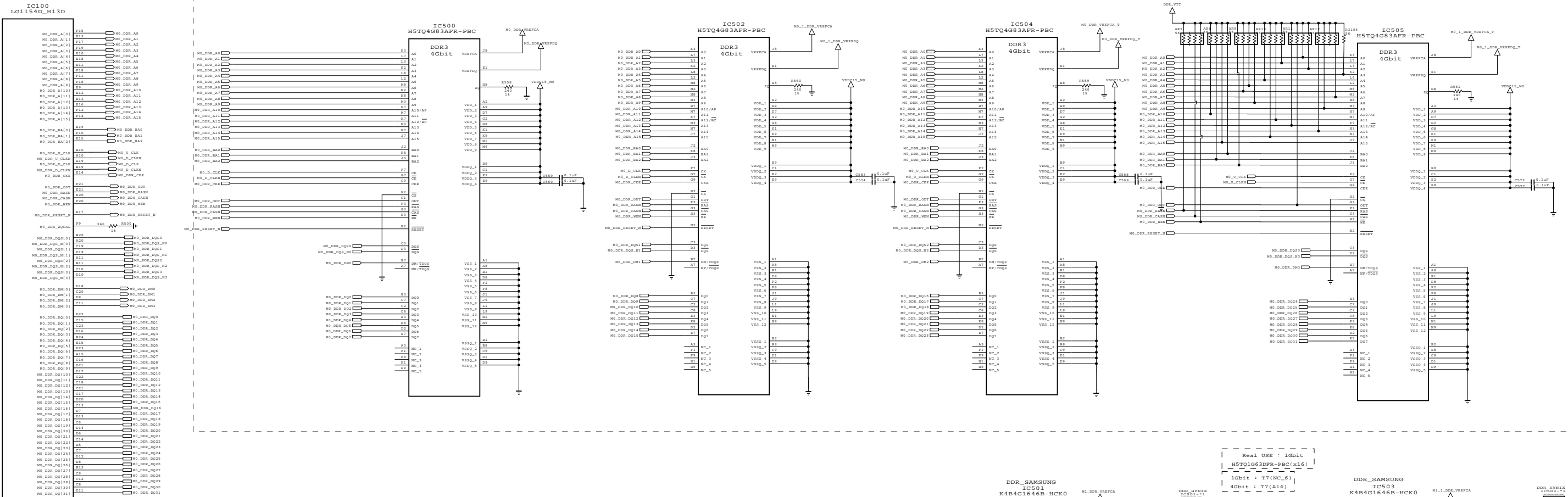
MODEL		DATE	2013-12-17
BLOCK	MAIN POWER	SHEET	/







2013-12-17





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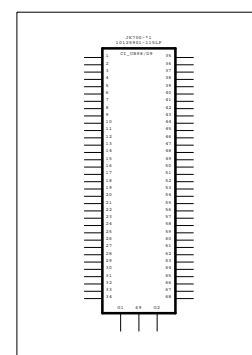
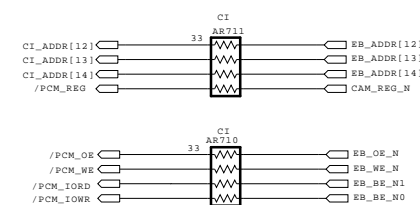
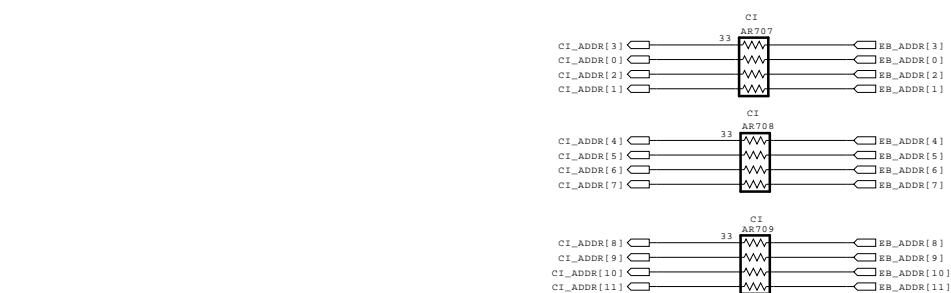
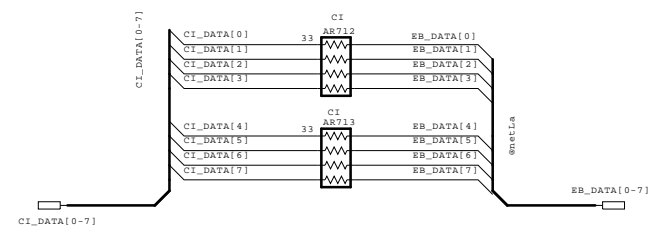
SECRET  
LGElectronics

LG ELECTRONICS

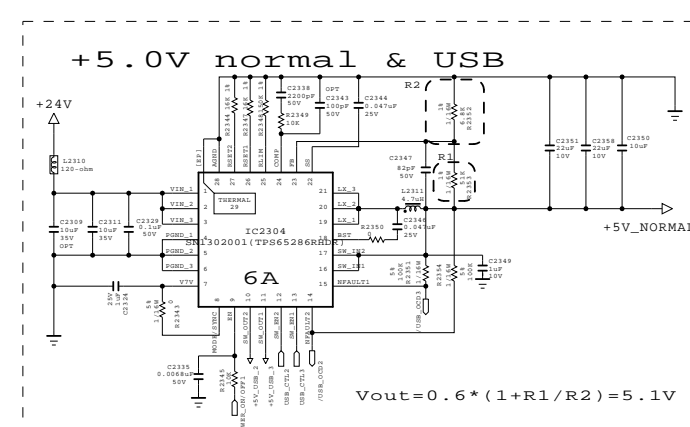
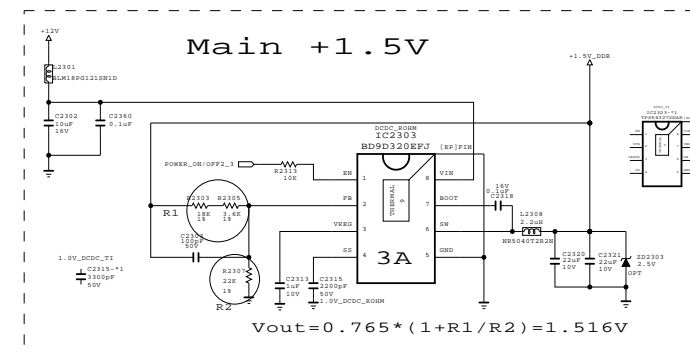
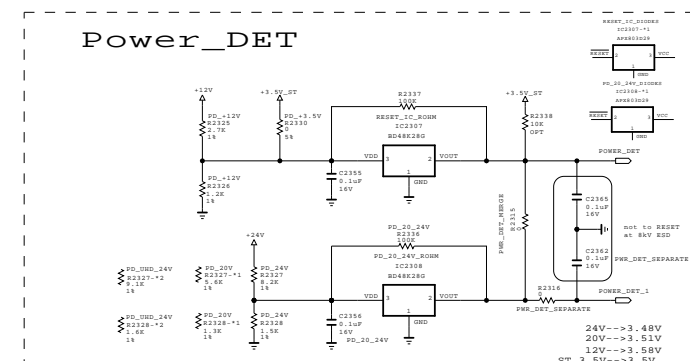
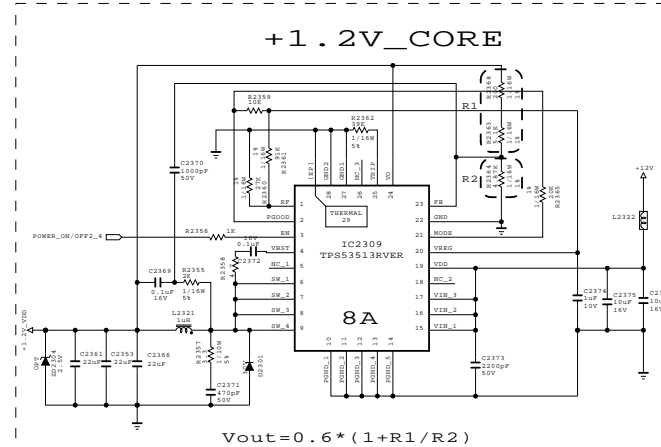
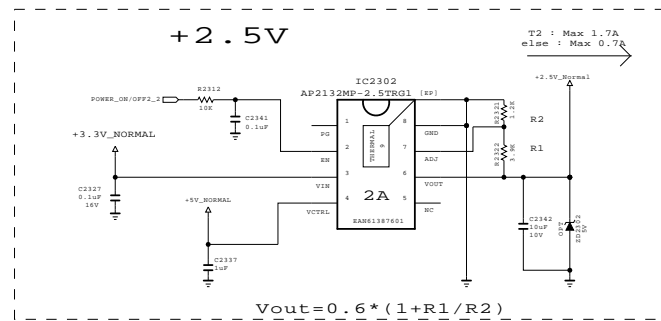
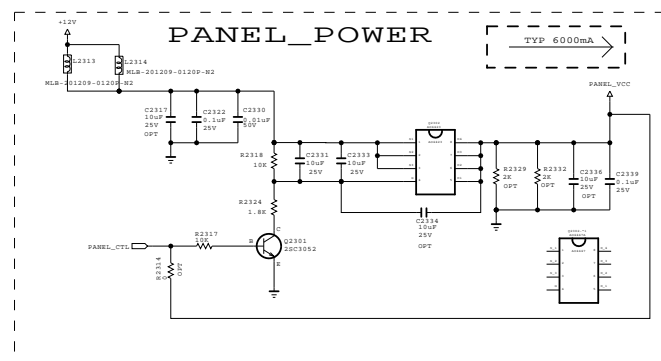
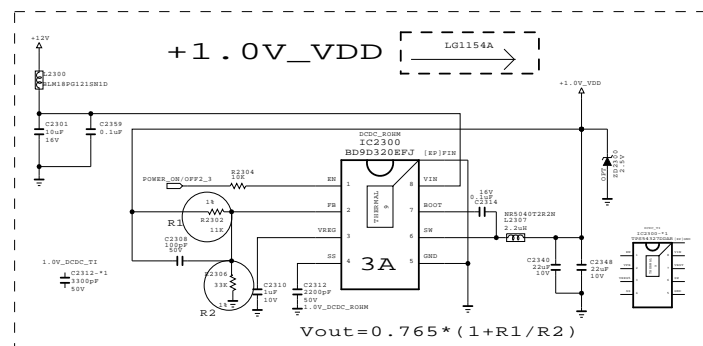
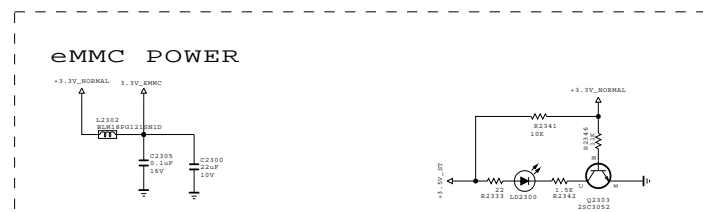
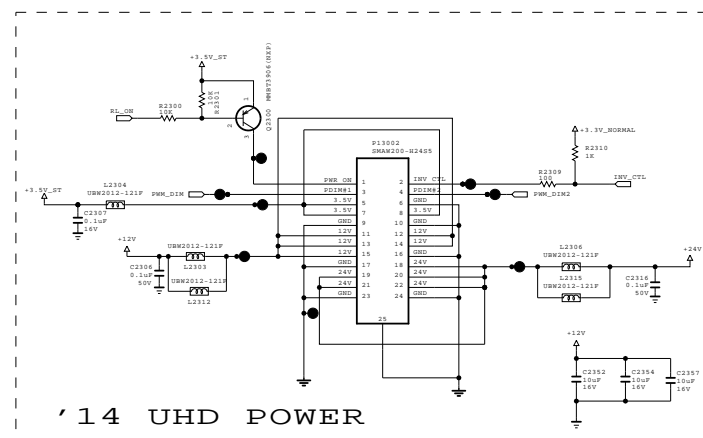
MODEL  
BLOCK

MAIN DDR  
SHEET

BSD-14Y-UD-005-HD  
DATE 2013-12-17



MODEL		DATE	2013-12-17
BLOCK	PCMCIA	SHEET	/





POWER UP SEQUENCE

5V/3.3V->2.5V->1.5V/1.1V->1.0V

LG1154D : 3.3V->2.5V->1.5V->1.1V

LG1154AN : 3.3V->2.5V->1.0V

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SECRET  
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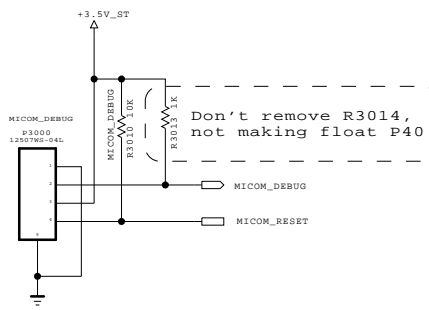
LG Electronics



BSD-14Y-UD-023-HD

MODEL		DATE	2013-12-17
BLACK	POWER	SHEET	/

For Debug



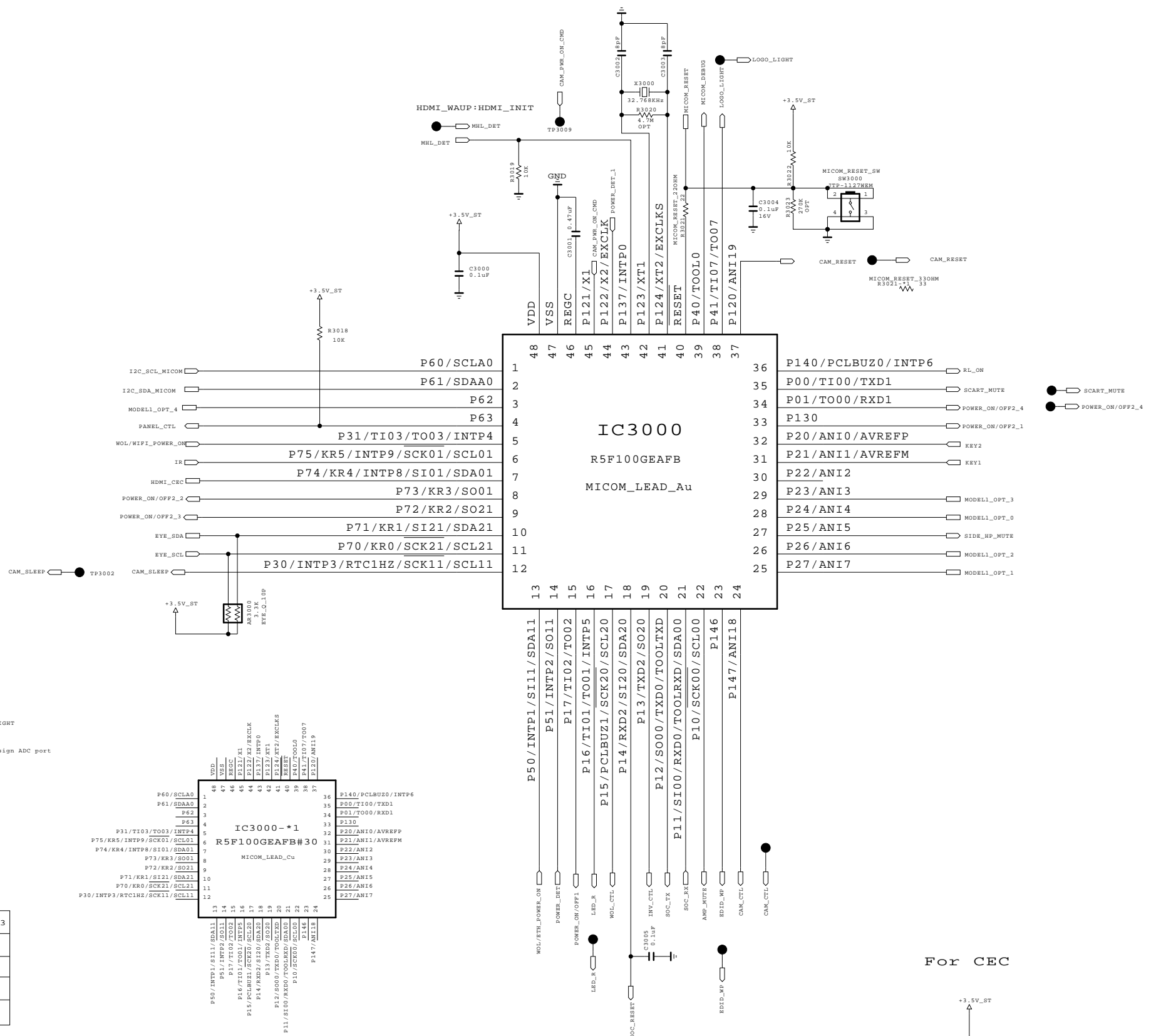
```

graph TD
    A[POWER_ON/OFF!] --> B[POWER_ON/OFF2_1]
    B --> C[POWER_ON/OFF2_2]
    C --> D[POWER_ON/OFF2_3]
    D --> E[POWER_ON/OFF2_4]
    E --> F[SOC_RESET]

```

	0	1	
MODEL_OPT_0	NON LOGO	LOGO	For LOGO LIGHT
MODEL_OPT_1	LCD / UHD	OLED	Need to Assign ADC port
MODEL_OPT_2	NON_EPI	EPI	
MODEL_OPT_3	M14	H13 / H14	
MODEL_OPT_4	NON_GED	GED	

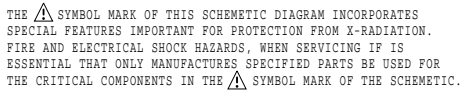
	MODEL_OPT_1	MODEL_OPT_3
M14 FHD LCD	0	0
M14 FHD OLED	1	0
H13/H14 UHD LCD	0	1
H13/H14 UHD OLED	1	1

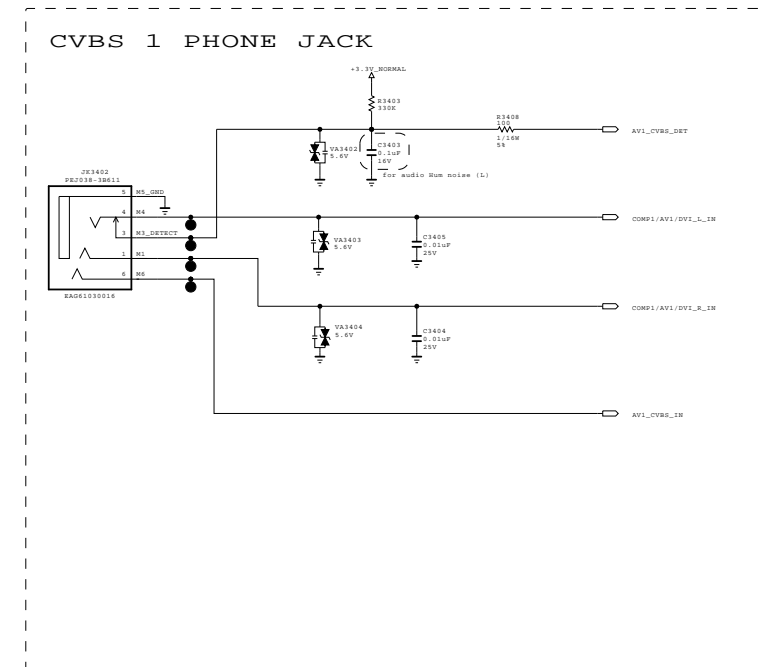
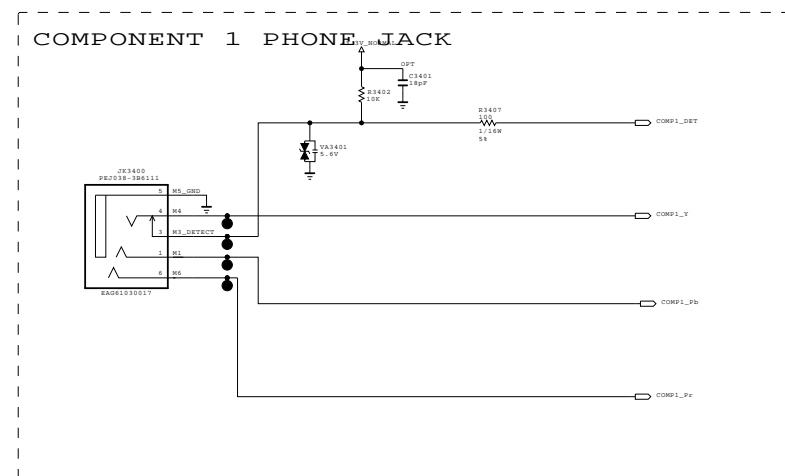
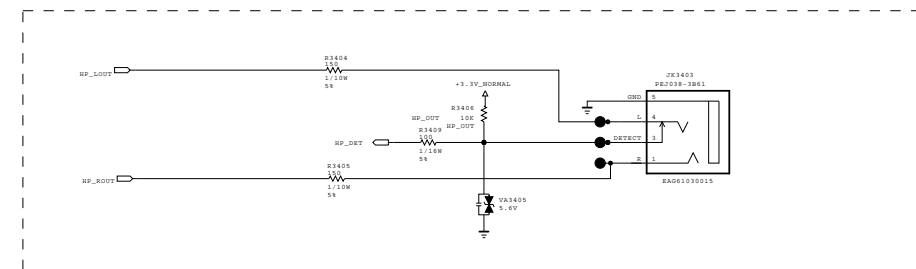
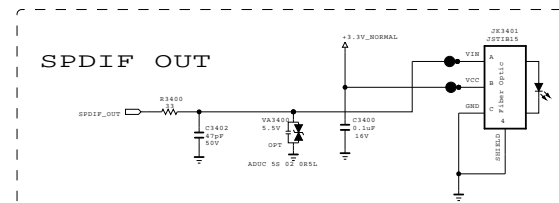




SECRET  
LGElectronics



MODEL		DATE	2013.12.17
BLOCK	MICOM	SHEET	30 /





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

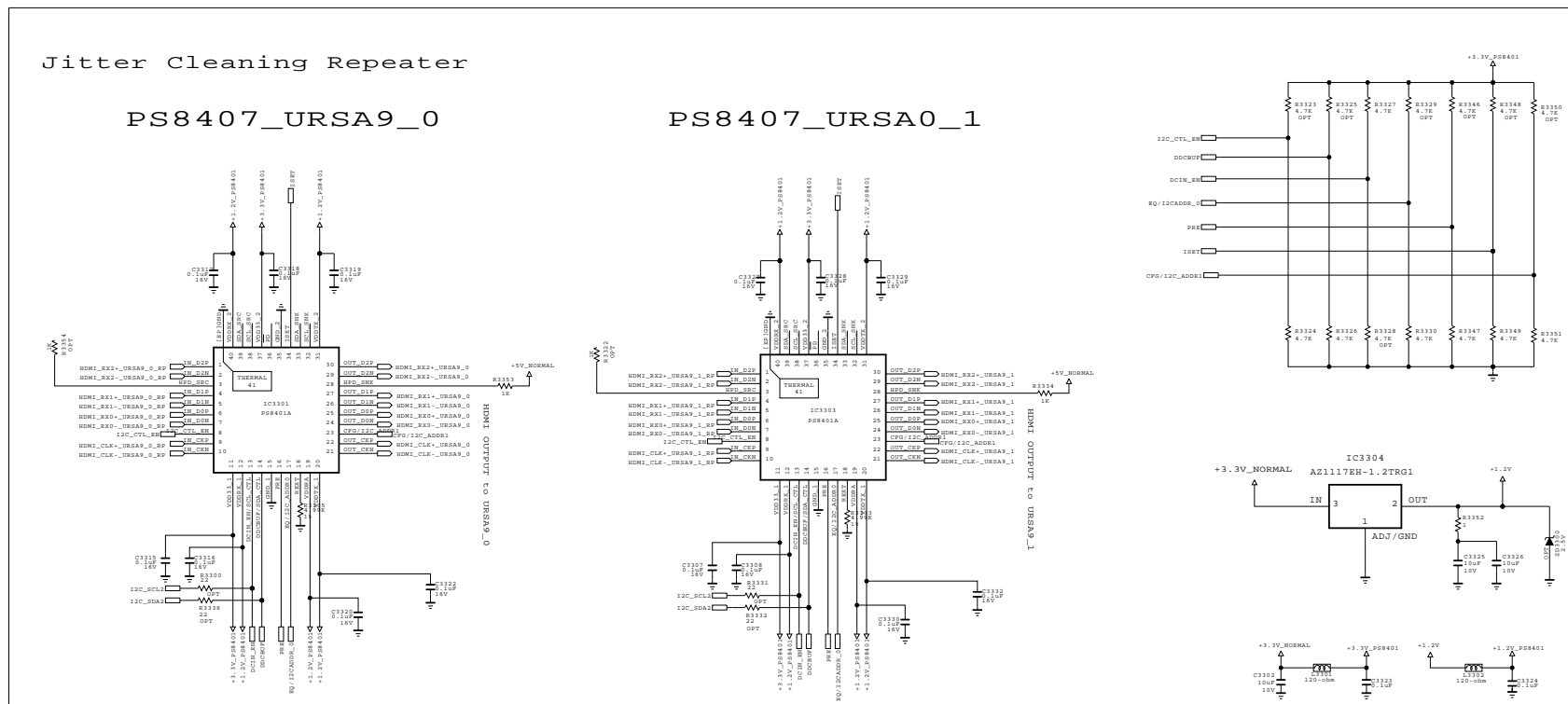
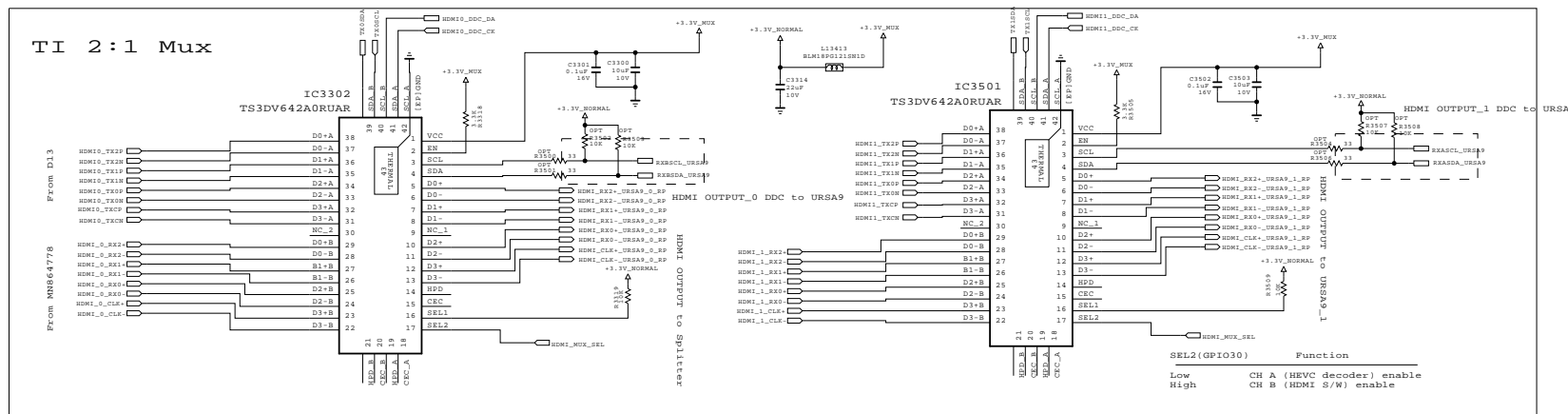
SECRET  
LGElectronics



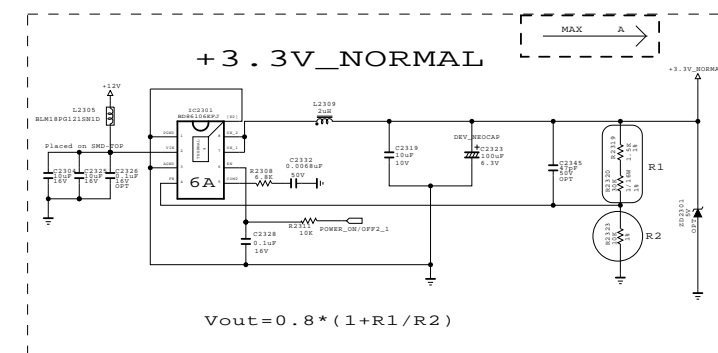
BSD-14Y-UD-034-HD

MODEL	JACK HIGH/MID	DATE	2013.12.17
BLOCK		SHEET	/

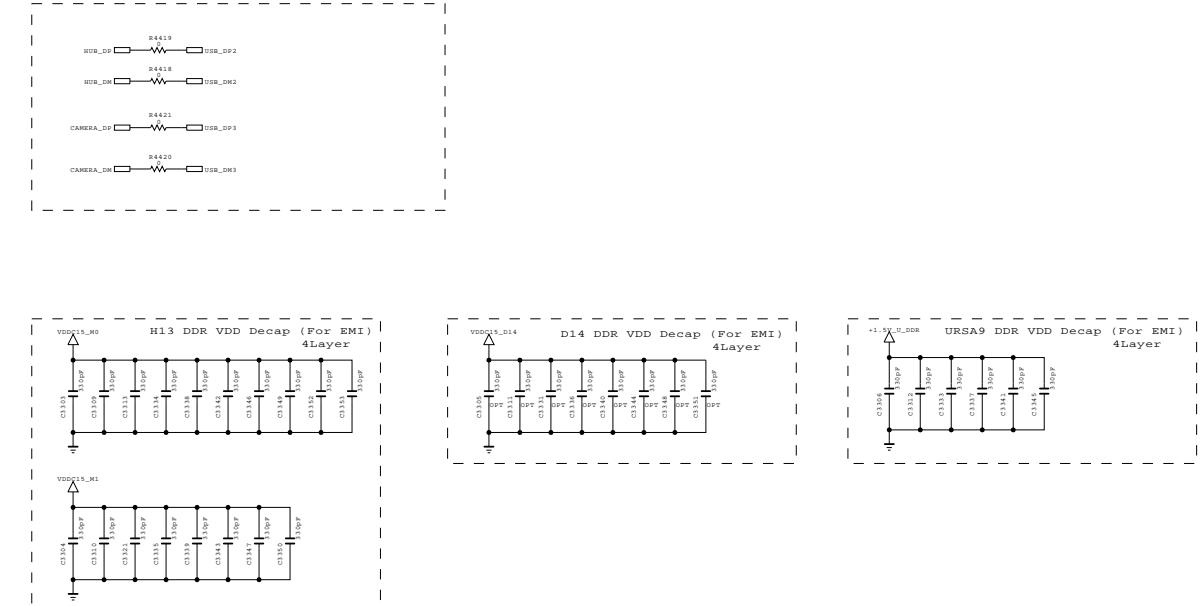
# UB85/95/UC97 only



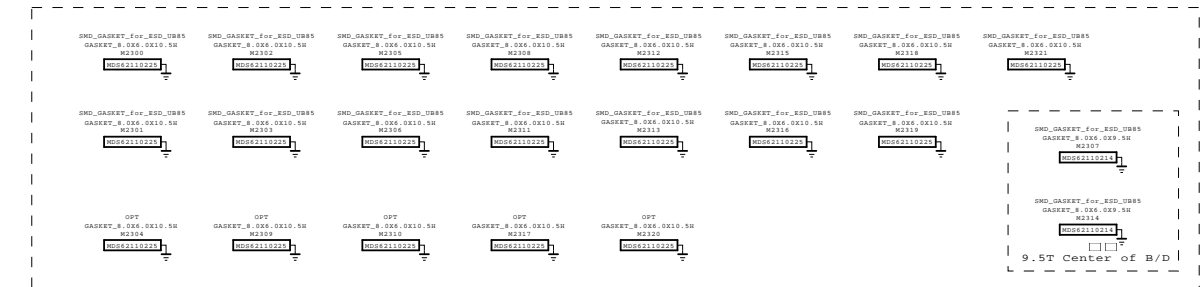
## Separation of +3.3V\_NORMAL (For CST)



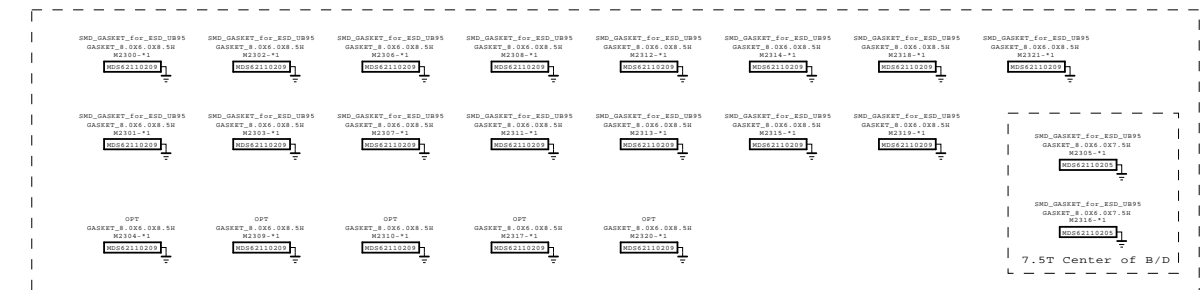
## USB NET Change: UB85/95/UC97



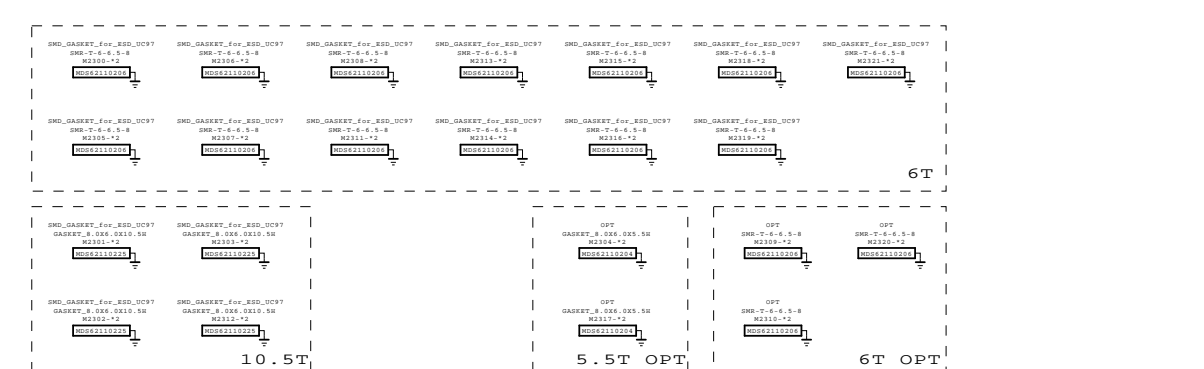
## SMD bottom for ESD\_UB85 10.5T





## SMD bottom for ESD\_UB95 8.5T



## SMD bottom for ESD\_UC97 10.5T/6T/5.5T



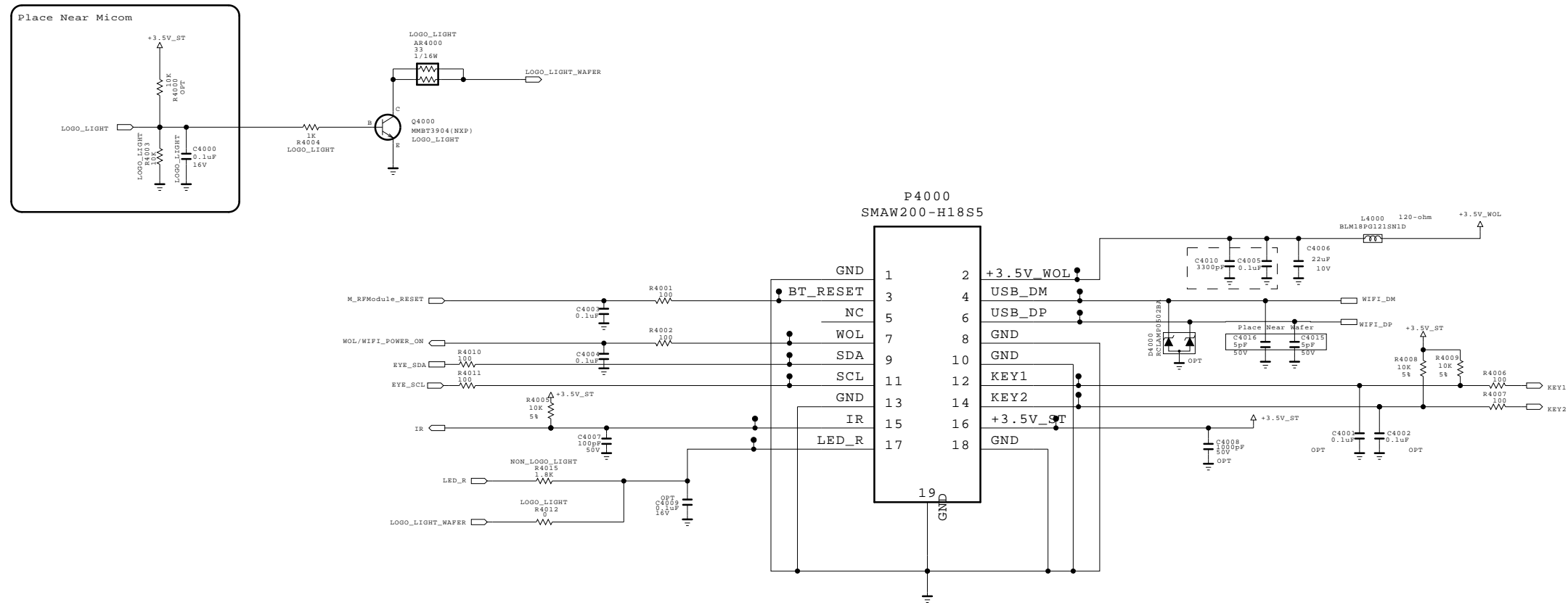
THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURERS SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.



SECRET  
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LG ELECTRONICS

MODEL BLOCK	HDMI	BSD-14Y-UD-033_02-HD	
		DATE SHEET	2013.12.17 /

## UB85 / 95 / UC97 only



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

SECRET  
G Electronics

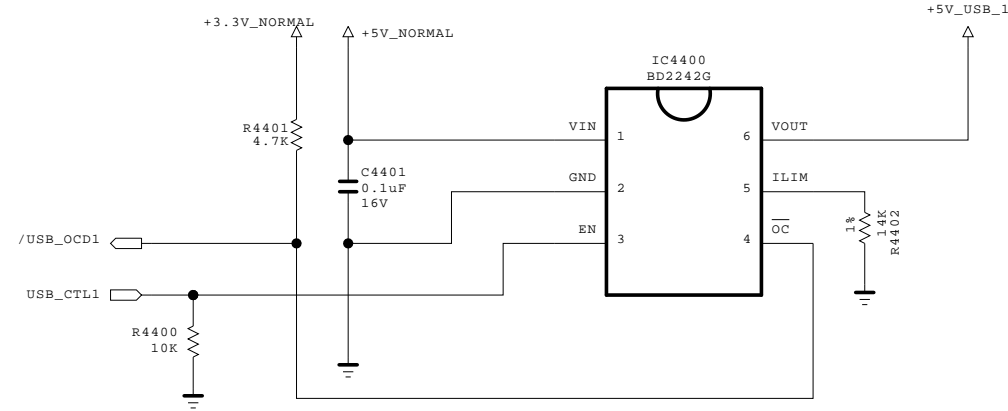


BSD-14Y-UD-040\_02-HD

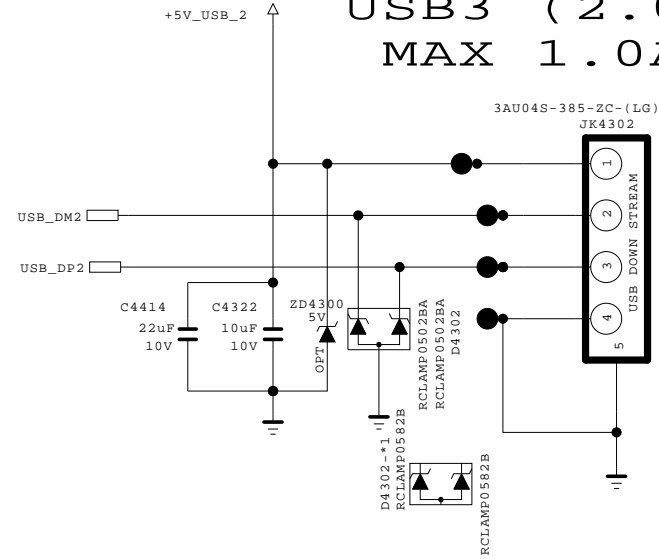
MODEL	IR / KEY	DATE	2013.12.17
BLOCK		SHEET	/



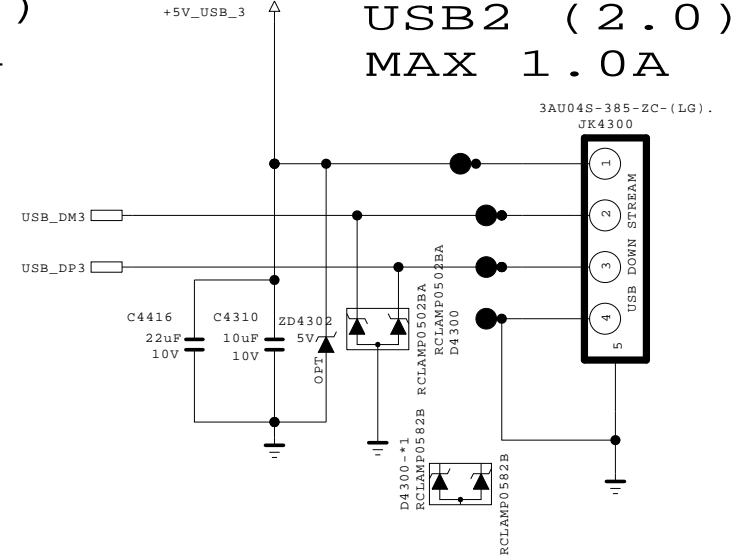
OCF USB1



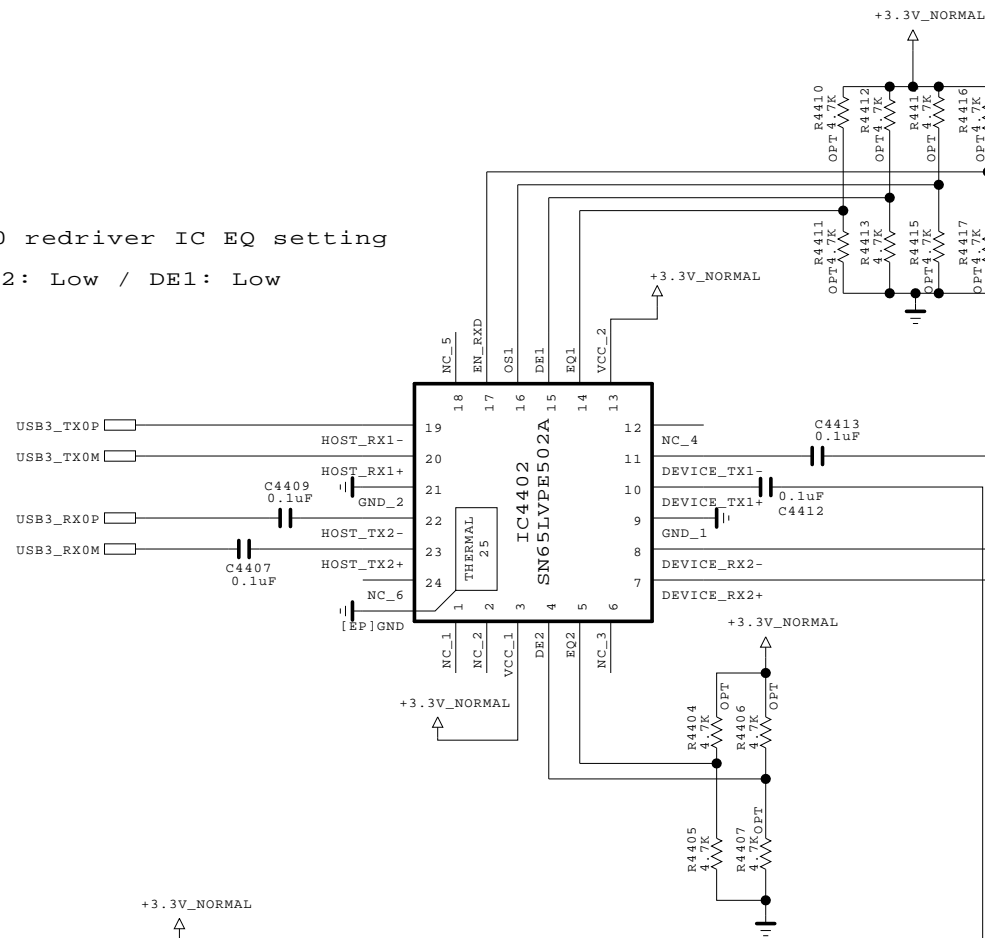
USB3 (2.0)  
MAX 1.0A



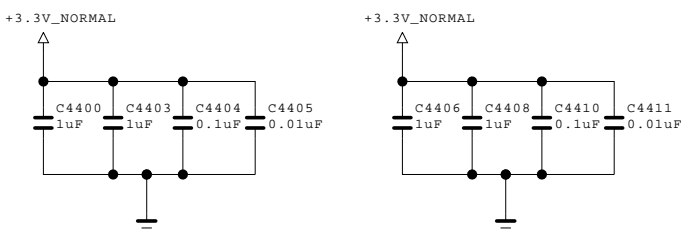
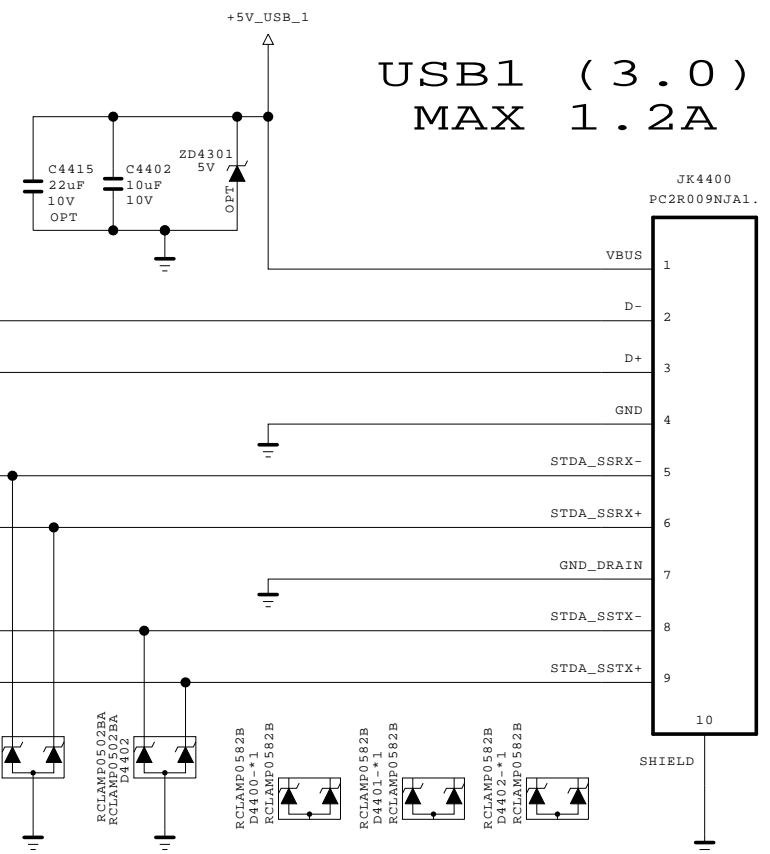
USB2 (2.0)  
MAX 1.0A



USB3.0 redriver IC EQ setting  
-> EQ2: Low / DE1: Low



USB1 (3.0)  
MAX 1.2A



Place under DUT Near SN65LVPE502CP PIN VCC

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SECRET

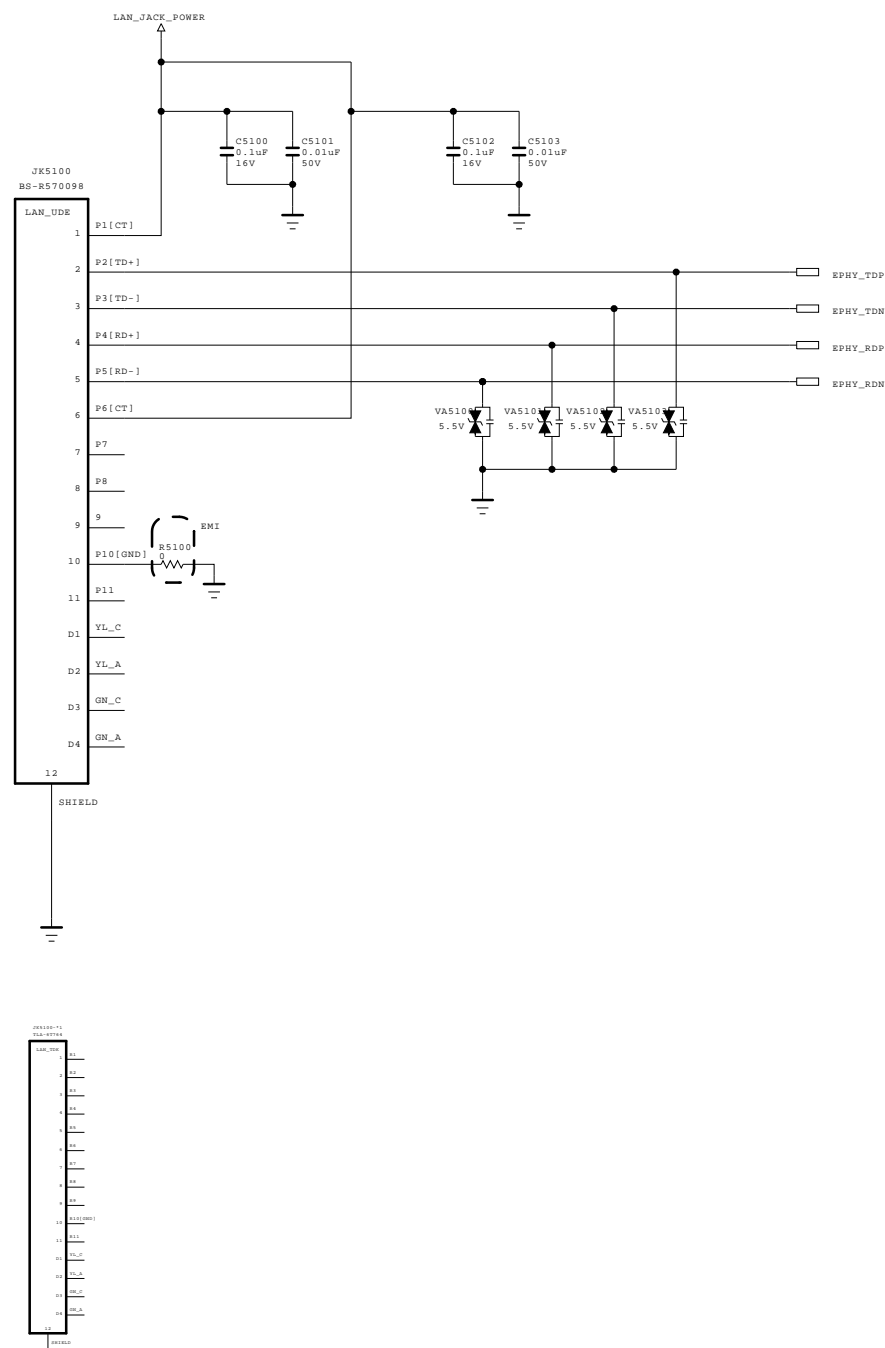
LG Electronics



LG ELECTRONICS

BSD-14Y-UD-044-HD			
MODEL		DATE	2013-12-17
BLOCK	USB JACK	SHEET	/



# Ethernet Block



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

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LGElectronics



MODEL	LAN_VERTICAL	DATE	2012.12.17
BLOCK		SHEET	51 /

The schematic diagram illustrates the RTL8201F-VB-CG Ethernet PHY circuit. The central component is the IC5200 (RTL8201F-VB-CG), which is connected to various power and signal pins. Key components include capacitors (C5201-C5209), resistors (R5201-R5215), and a crystal (X5200). The circuit is powered by +3.5V\_WOL and +3.5V\_WOL. Signal pins include LAN\_JACK\_POWER, ET\_COL/SNI, ET\_RXER, EPHY\_ACTIVITY, and EPHY\_TXD1. The diagram also shows the connection to the IC5201 (AP2191MG-7) for WOL power enable control.

**Power and Ground Connections:**

- +3.5V\_WOL:** Connected to the VDDIO pin (pin 1) and the VDDIO pin (pin 1).
- GND:** Connected to the GND pin (pin 2) and the GND pin (pin 2).

**Signal Connections:**

- LAN\_JACK\_POWER:** Connected to the LAN\_JACK\_POWER pin (pin 3).
- ET\_COL/SNI:** Connected to the ET\_COL/SNI pin (pin 4).
- ET\_RXER:** Connected to the ET\_RXER pin (pin 5).
- EPHY\_ACTIVITY:** Connected to the EPHY\_ACTIVITY pin (pin 6).
- EPHY\_TXD1:** Connected to the EPHY\_TXD1 pin (pin 7).

**Component Values:**

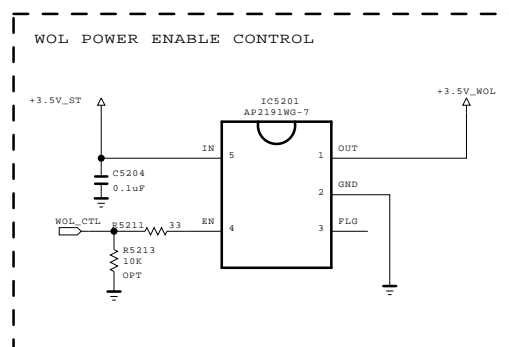
- Capacitors:** C5201 (0.1uF), C5202 (0.1uF), C5203 (0.1uF), C5204 (0.1uF), C5205 (0.1uF), C5206 (0.1uF), C5207 (0.1uF), C5208 (0.1uF), C5209 (0.1uF).
- Resistors:** R5201 (3.3K), R5202 (3.3K), R5203 (3.3K), R5204 (3.3K), R5205 (3.3K), R5206 (3.3K), R5207 (3.3K), R5208 (3.3K), R5209 (3.3K), R5210 (3.3K), R5211 (3.3K), R5212 (3.3K), R5213 (3.3K), R5214 (3.3K), R5215 (3.3K).
- Crystal:** X5200 (25MHz).

**IC5201 (AP2191MG-7) Connections:**

- +3.5V\_WOL:** Connected to the VDDIO pin (pin 1).
- GND:** Connected to the GND pin (pin 2).

**IC5200 (RTL8201F-VB-CG) Connections:**

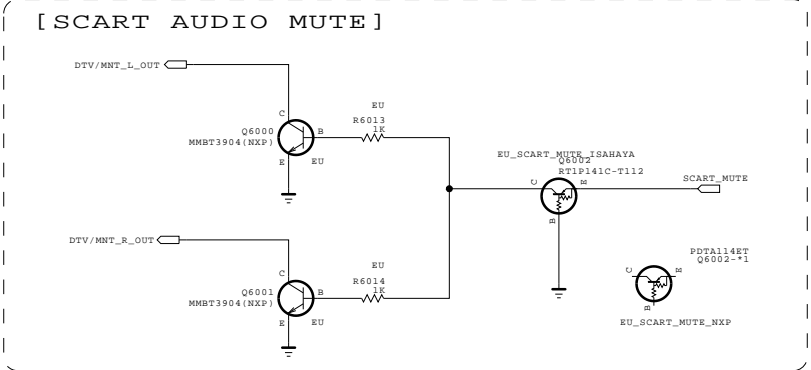
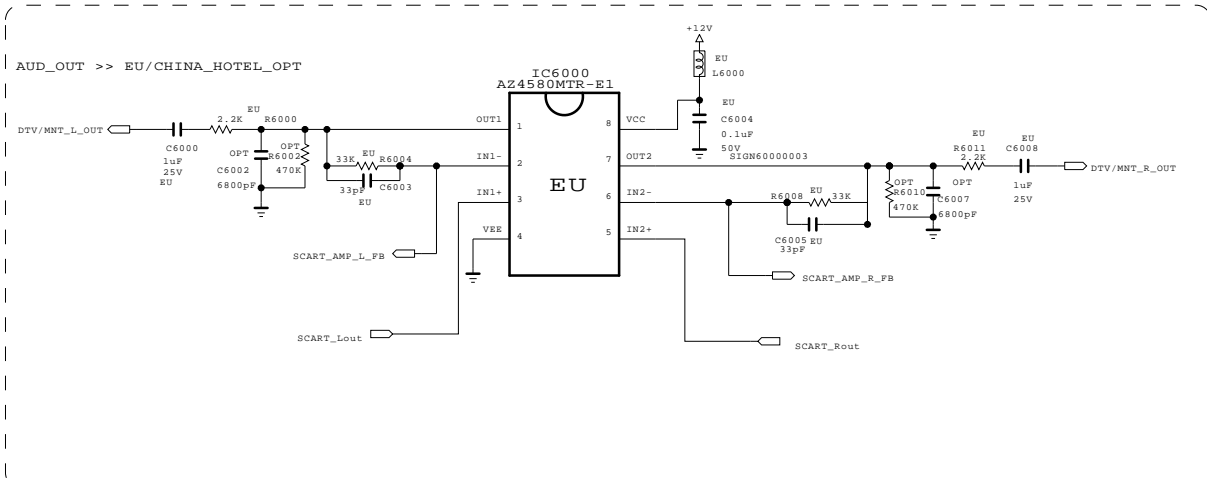
- VDDIO:** Connected to pin 1.
- GND:** Connected to pin 2.
- MDIO:** Connected to pin 3.
- MDC:** Connected to pin 4.
- PHYRSTB:** Connected to pin 5.
- TXEN:** Connected to pin 6.
- TXD[3]:** Connected to pin 7.
- TXD[2]:** Connected to pin 8.
- TXD[1]:** Connected to pin 9.
- TXD[0]:** Connected to pin 10.
- RXC[3]:** Connected to pin 11.
- RXC[2]:** Connected to pin 12.
- RXC[1]:** Connected to pin 13.
- RXC[0]:** Connected to pin 14.
- TXC:** Connected to pin 15.
- TXD[0]:** Connected to pin 16.
- TXD[1]:** Connected to pin 17.
- TXD[2]:** Connected to pin 18.
- TXD[3]:** Connected to pin 19.
- TXEN:** Connected to pin 20.
- PHYRSTB:** Connected to pin 21.
- MDC:** Connected to pin 22.
- MDIO:** Connected to pin 23.
- WOL/ETH\_POWER\_ON:** Connected to pin 24.
- LED0/PHYAD[0]/PMEB:** Connected to pin 25.
- LED1/PHYAD[1]:** Connected to pin 26.
- LED2/PHYAD[2]:** Connected to pin 27.
- LED3/PHYAD[3]:** Connected to pin 28.
- LED4/PHYAD[4]:** Connected to pin 29.
- LED5/PHYAD[5]:** Connected to pin 30.
- LED6/PHYAD[6]:** Connected to pin 31.
- LED7/PHYAD[7]:** Connected to pin 32.
- LED8/PHYAD[8]:** Connected to pin 33.
- LED9/PHYAD[9]:** Connected to pin 34.
- LED10/PHYAD[10]:** Connected to pin 35.
- LED11/PHYAD[11]:** Connected to pin 36.
- LED12/PHYAD[12]:** Connected to pin 37.
- LED13/PHYAD[13]:** Connected to pin 38.
- LED14/PHYAD[14]:** Connected to pin 39.
- LED15/PHYAD[15]:** Connected to pin 40.
- LED16/PHYAD[16]:** Connected to pin 41.
- LED17/PHYAD[17]:** Connected to pin 42.
- LED18/PHYAD[18]:** Connected to pin 43.
- LED19/PHYAD[19]:** Connected to pin 44.
- LED20/PHYAD[20]:** Connected to pin 45.
- LED21/PHYAD[21]:** Connected to pin 46.
- LED22/PHYAD[22]:** Connected to pin 47.
- LED23/PHYAD[23]:** Connected to pin 48.
- LED24/PHYAD[24]:** Connected to pin 49.
- LED25/PHYAD[25]:** Connected to pin 50.
- LED26/PHYAD[26]:** Connected to pin 51.
- LED27/PHYAD[27]:** Connected to pin 52.
- LED28/PHYAD[28]:** Connected to pin 53.
- LED29/PHYAD[29]:** Connected to pin 54.
- LED30/PHYAD[30]:** Connected to pin 55.
- LED31/PHYAD[31]:** Connected to pin 56.
- LED32/PHYAD[32]:** Connected to pin 57.
- LED33/PHYAD[33]:** Connected to pin 58.
- LED34/PHYAD[34]:** Connected to pin 59.
- LED35/PHYAD[35]:** Connected to pin 60.
- LED36/PHYAD[36]:** Connected to pin 61.
- LED37/PHYAD[37]:** Connected to pin 62.
- LED38/PHYAD[38]:** Connected to pin 63.
- LED39/PHYAD[39]:** Connected to pin 64.
- LED40/PHYAD[40]:** Connected to pin 65.
- LED41/PHYAD[41]:** Connected to pin 66.
- LED42/PHYAD[42]:** Connected to pin 67.
- LED43/PHYAD[43]:** Connected to pin 68.
- LED44/PHYAD[44]:** Connected to pin 69.
- LED45/PHYAD[45]:** Connected to pin 70.
- LED46/PHYAD[46]:** Connected to pin 71.
- LED47/PHYAD[47]:** Connected to pin 72.
- LED48/PHYAD[48]:** Connected to pin 73.
- LED49/PHYAD[49]:** Connected to pin 74.
- LED50/PHYAD[50]:** Connected to pin 75.
- LED51/PHYAD[51]:** Connected to pin 76.
- LED52/PHYAD[52]:** Connected to pin 77.
- LED53/PHYAD[53]:** Connected to pin 78.
- LED54/PHYAD[54]:** Connected to pin 79.
- LED55/PHYAD[55]:** Connected to pin 80.
- LED56/PHYAD[56]:** Connected to pin 81.
- LED57/PHYAD[57]:** Connected to pin 82.
- LED58/PHYAD[58]:** Connected to pin 83.
- LED59/PHYAD[59]:** Connected to pin 84.
- LED60/PHYAD[60]:** Connected to pin 85.
- LED61/PHYAD[61]:** Connected to pin 86.
- LED62/PHYAD[62]:** Connected to pin 87.
- LED63/PHYAD[63]:** Connected to pin 88.
- LED64/PHYAD[64]:** Connected to pin 89.
- LED65/PHYAD[65]:** Connected to pin 90.
- LED66/PHYAD[66]:** Connected to pin 91.
- LED67/PHYAD[67]:** Connected to pin 92.
- LED68/PHYAD[68]:** Connected to pin 93.
- LED69/PHYAD[69]:** Connected to pin 94.
- LED70/PHYAD[70]:** Connected to pin 95.
- LED71/PHYAD[71]:** Connected to pin 96.
- LED72/PHYAD[72]:** Connected to pin 97.
- LED73/PHYAD[73]:** Connected to pin 98.
- LED74/PHYAD[74]:** Connected to pin 99.
- LED75/PHYAD[75]:** Connected to pin 100.
- LED76/PHYAD[76]:** Connected to pin 101.
- LED77/PHYAD[77]:** Connected to pin 102.
- LED78/PHYAD[78]:** Connected to pin 103.
- LED79/PHYAD[79]:** Connected to pin 104.
- LED80/PHYAD[80]:** Connected to pin 105.
- LED81/PHYAD[81]:** Connected to pin 106.
- LED82/PHYAD[82]:** Connected to pin 107.
- LED83/PHYAD[83]:** Connected to pin 108.
- LED84/PHYAD[84]:** Connected to pin 109.
- LED85/PHYAD[85]:** Connected to pin 110.
- LED86/PHYAD[86]:** Connected to pin 111.
- LED87/PHYAD[87]:** Connected to pin 112.
- LED88/PHYAD[88]:** Connected to pin 113.
- LED89/PHYAD[89]:** Connected to pin 114.
- LED90/PHYAD[90]:** Connected to pin 115.
- LED91/PHYAD[91]:** Connected to pin 116.
- LED92/PHYAD[92]:** Connected to pin 117.
- LED93/PHYAD[93]:** Connected to pin 118.
- LED94/PHYAD[94]:** Connected to pin 119.





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MODEL		DATE	2013-12-17
BLOCK	ETHERNET	SHEET	/



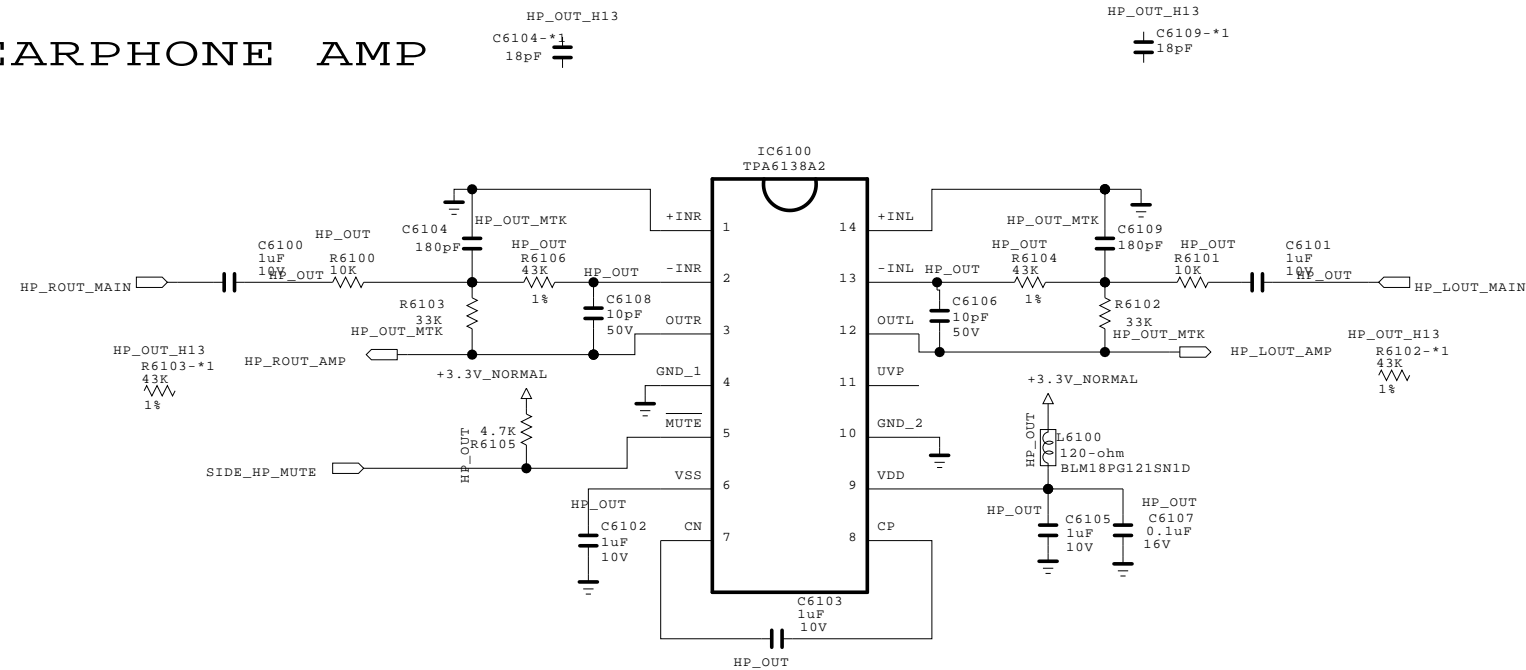
THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.



SECRET  
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BSD-14Y-UD-060-HD			
MODEL	SCART AUDIO AMP	DATE	2012.12.17
BLOCK		SHEET	60 /

EARPHONE AMP



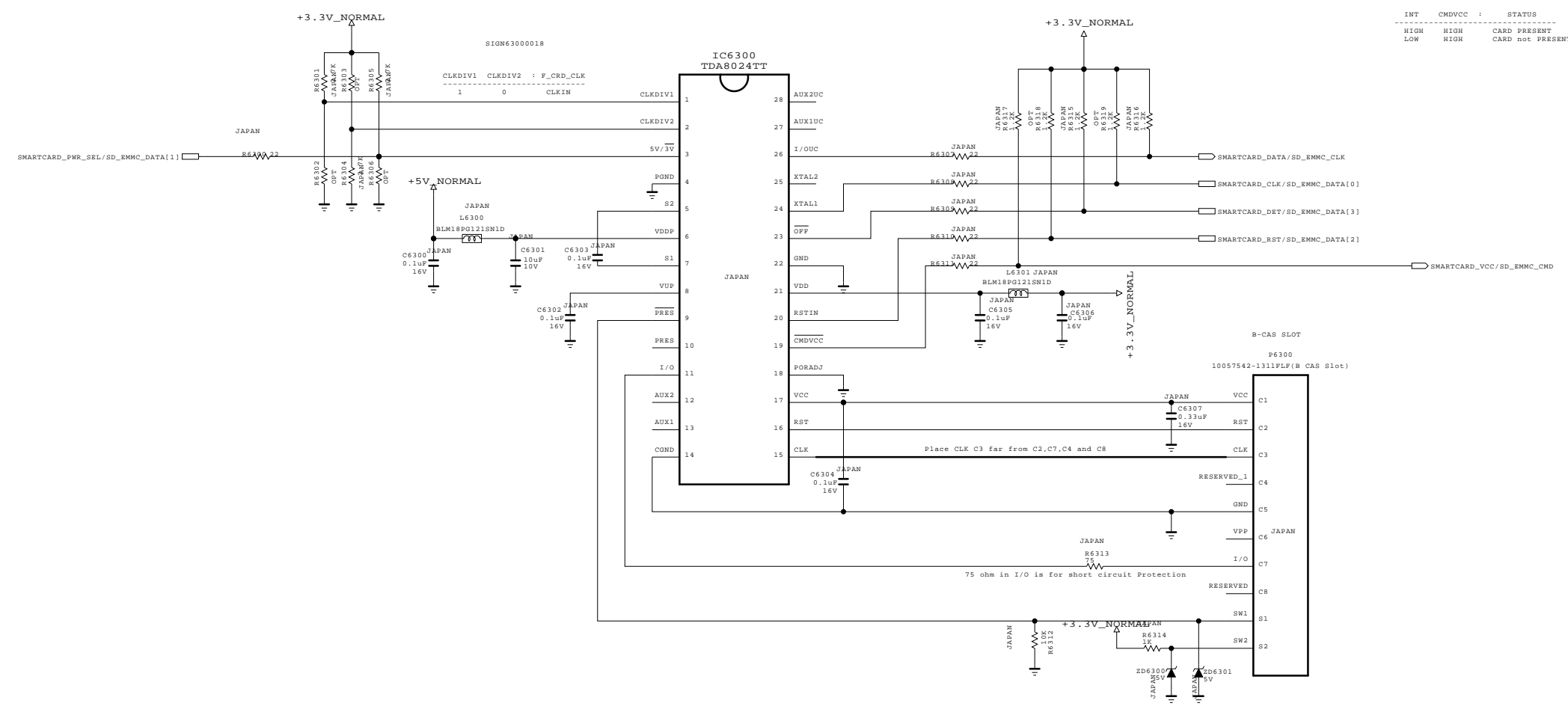
THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.



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MODEL	HEADPHONE AMP	DATE	2013.12.17
BLOCK		SHEET	61 /

B-CAS (SMART CARD) INTERFACE

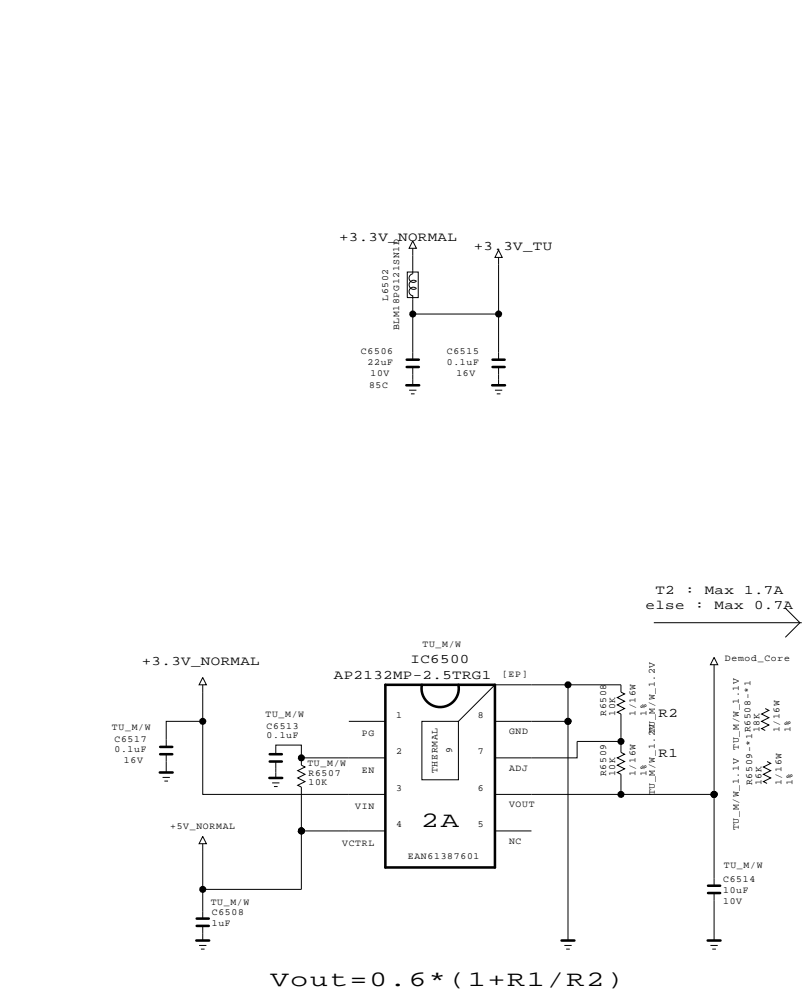


THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.

SECRET  
LGElectronics



MODEL		DATE	2012.12.17
BLOCK	JAPAN_BCAS	SHEET	63



```

13' Tuner type for Global
TDS'S'-G501D : T/C Half NIM Horizontal Type
TDS'Q'-G501D : T/C/S2 Combo Horizontal type
TDS'Q'-G601D : T2/C/S2 Combo Horizontal Type
TDS'Q'-G651D : T2/C/S2 Combo Vertical Type
TDS'M'-C601D : China NIM with Isolater Type
TDS'W'-J551F : Japan Dual NIM
TDS'W'-B651F : Brazil 2Tuner
TDS'W'-A651F : Taiwan 2Tuner
TDS'W'-K651F : Colombia DVB-T2 2Tuner

```

SECRET  
LGElectronics

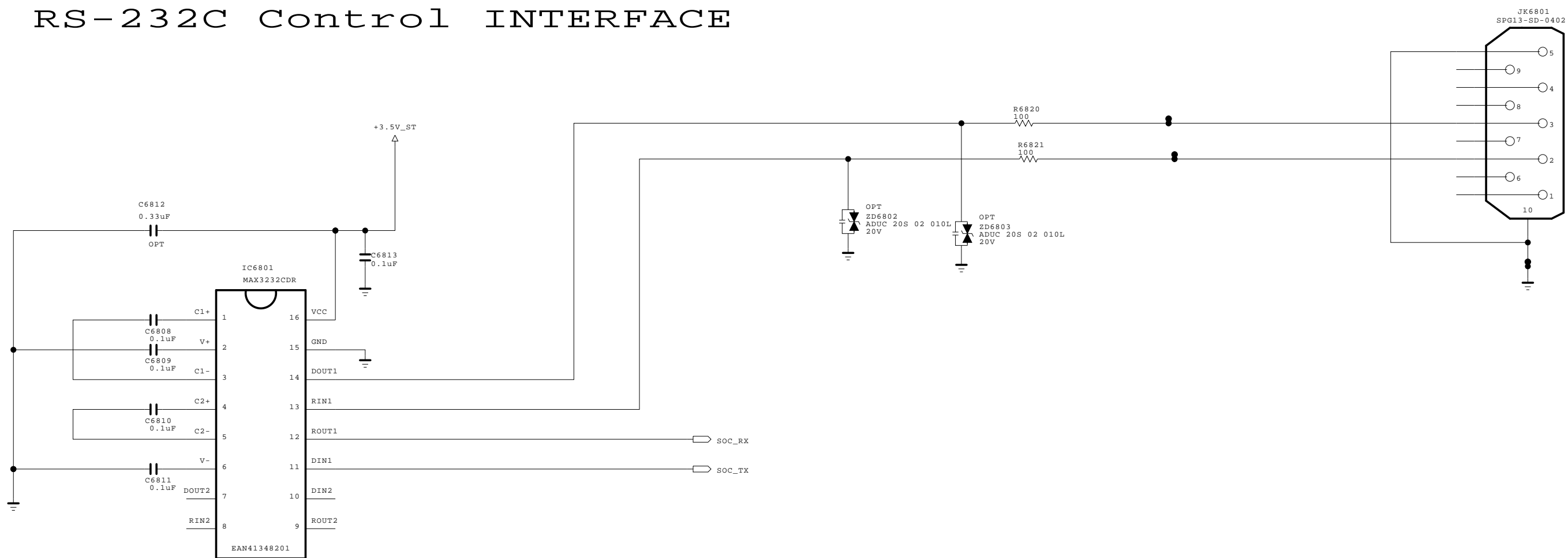




MODEL	TUNER	DATE	2013.12.17
BLOCK		SHEET	65 /



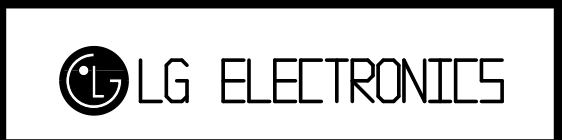


RS-232C Control INTERFACE



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

SECRET  
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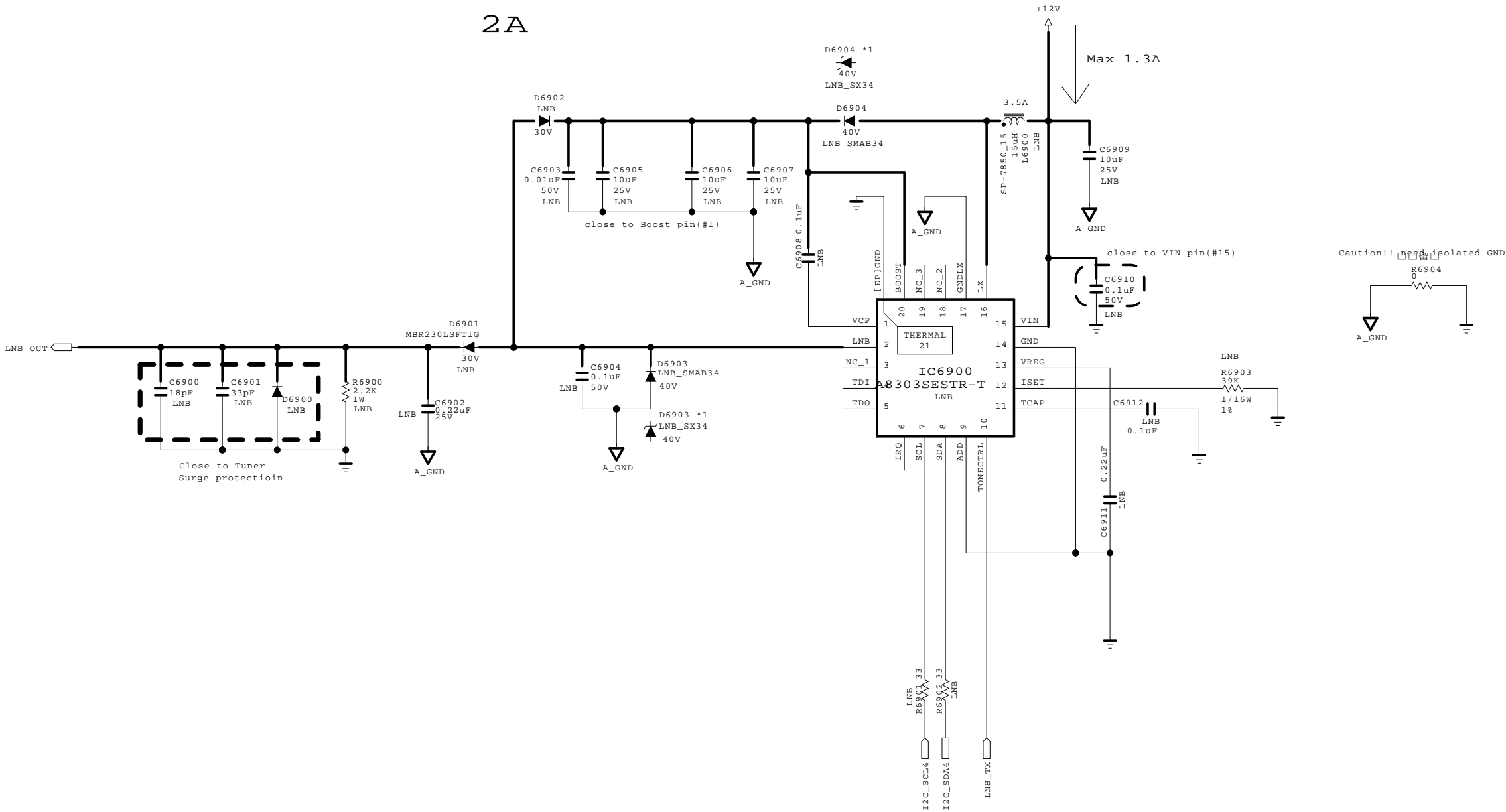
MODEL		DATE	2013.12.17
BLOCK	RS232C	SHEET	68 /

DVB-S2 LNB Part Allegro

(Option:LNB)

3A

Input trace widths should be sized to conduct at least 3A  
Ouput trace widths should be sized to conduct at least 2A



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

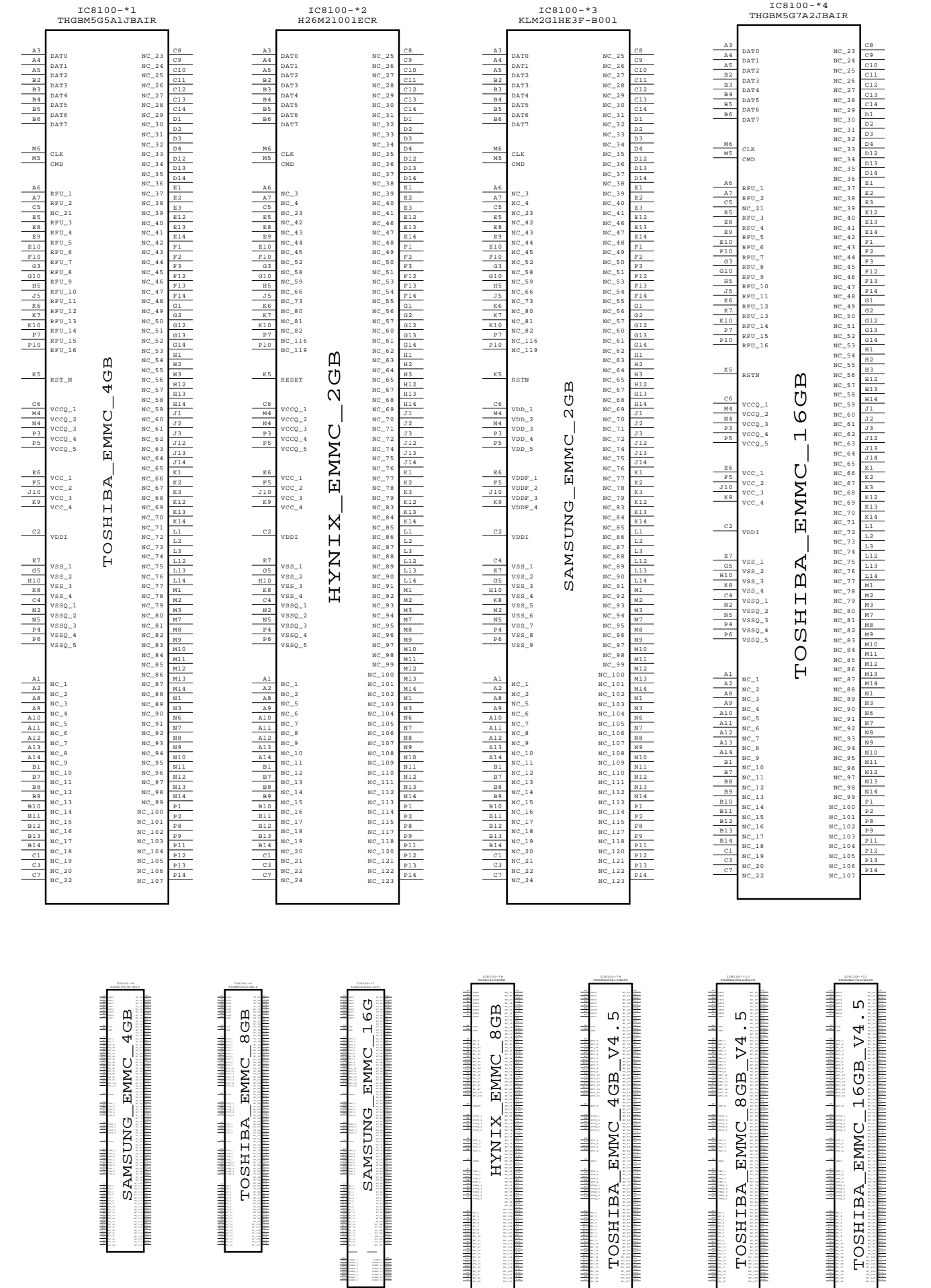
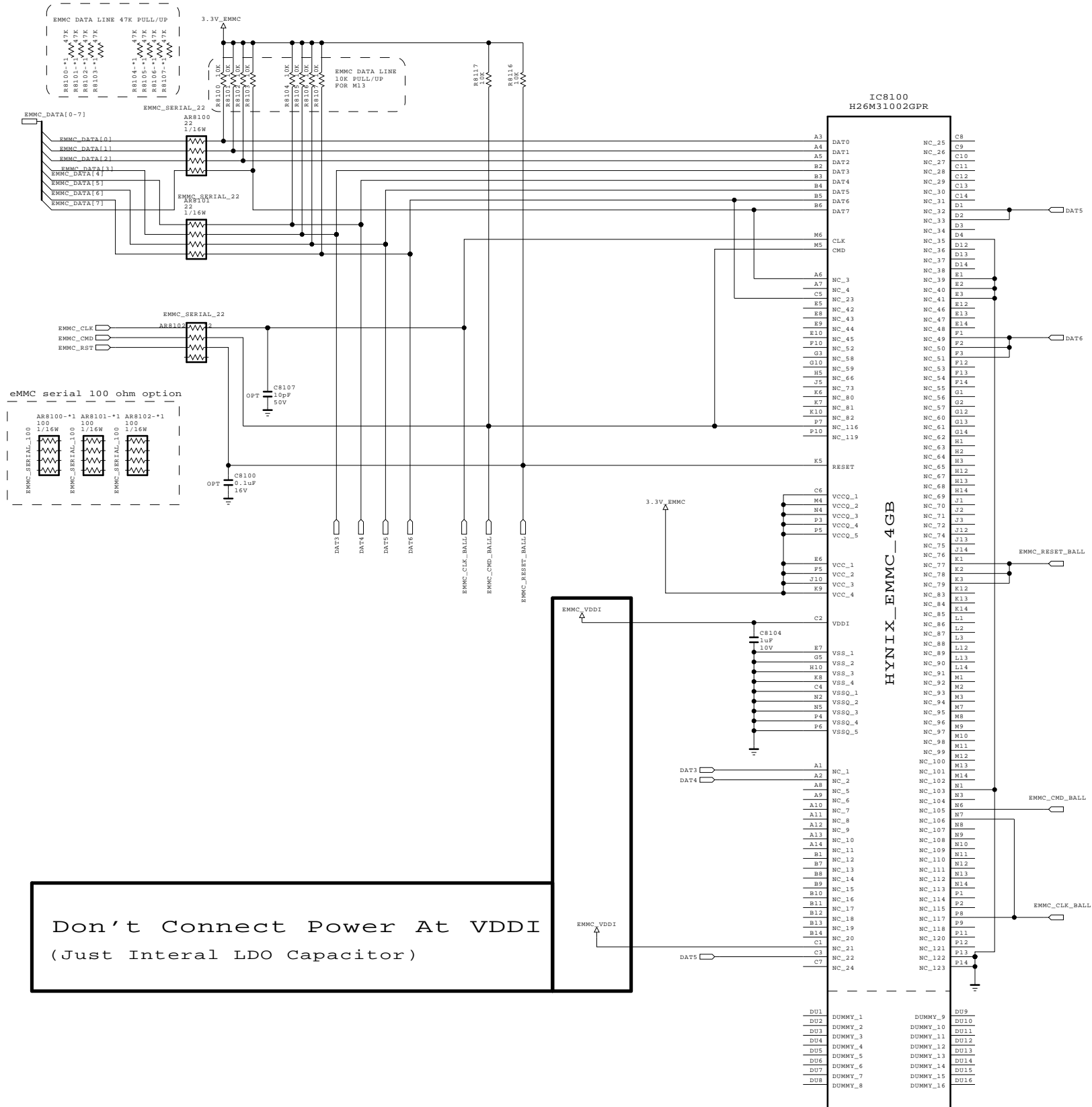
SECRET

LG Electronics

LG ELECTRONICS

MODEL	LNB	DATE	2013.12.17
BLOCK		SHEET	69 /

# eMMC I/F



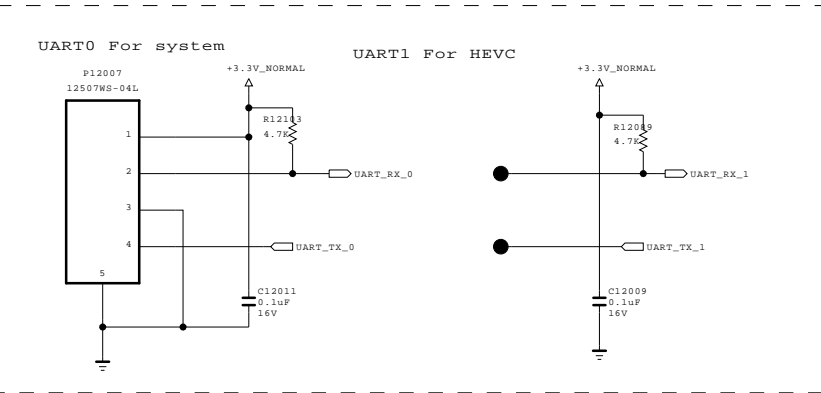
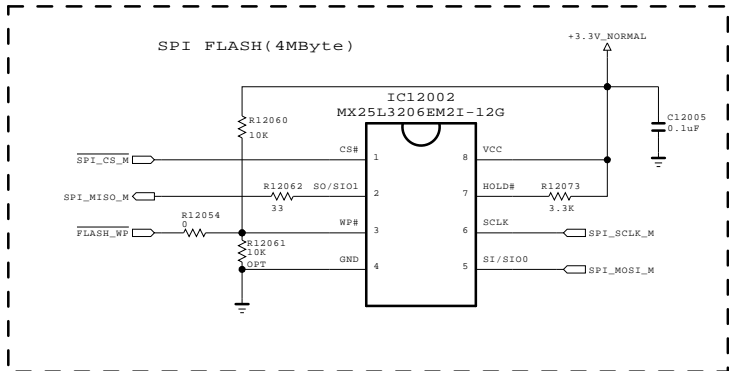
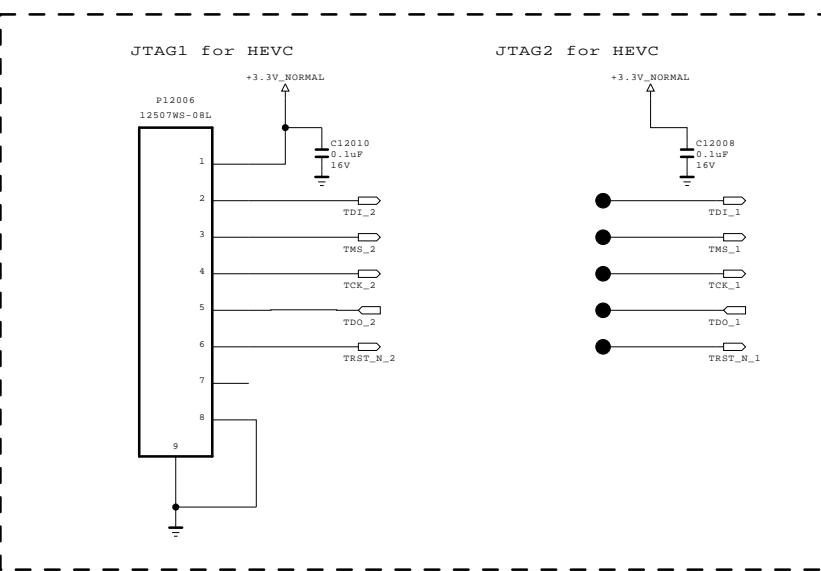
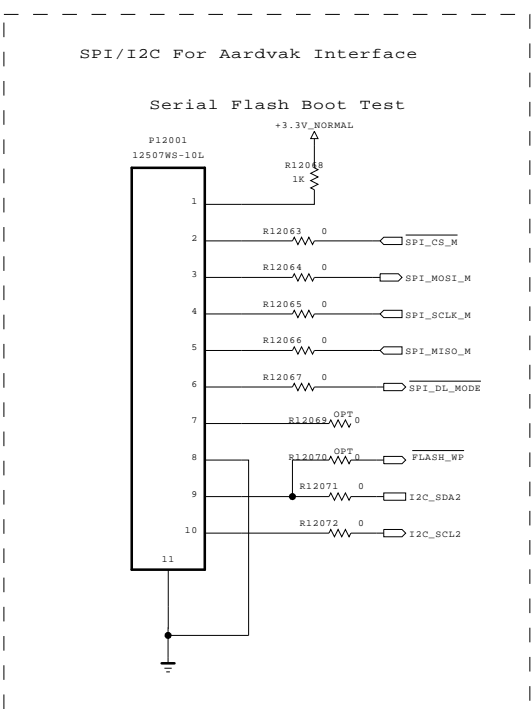
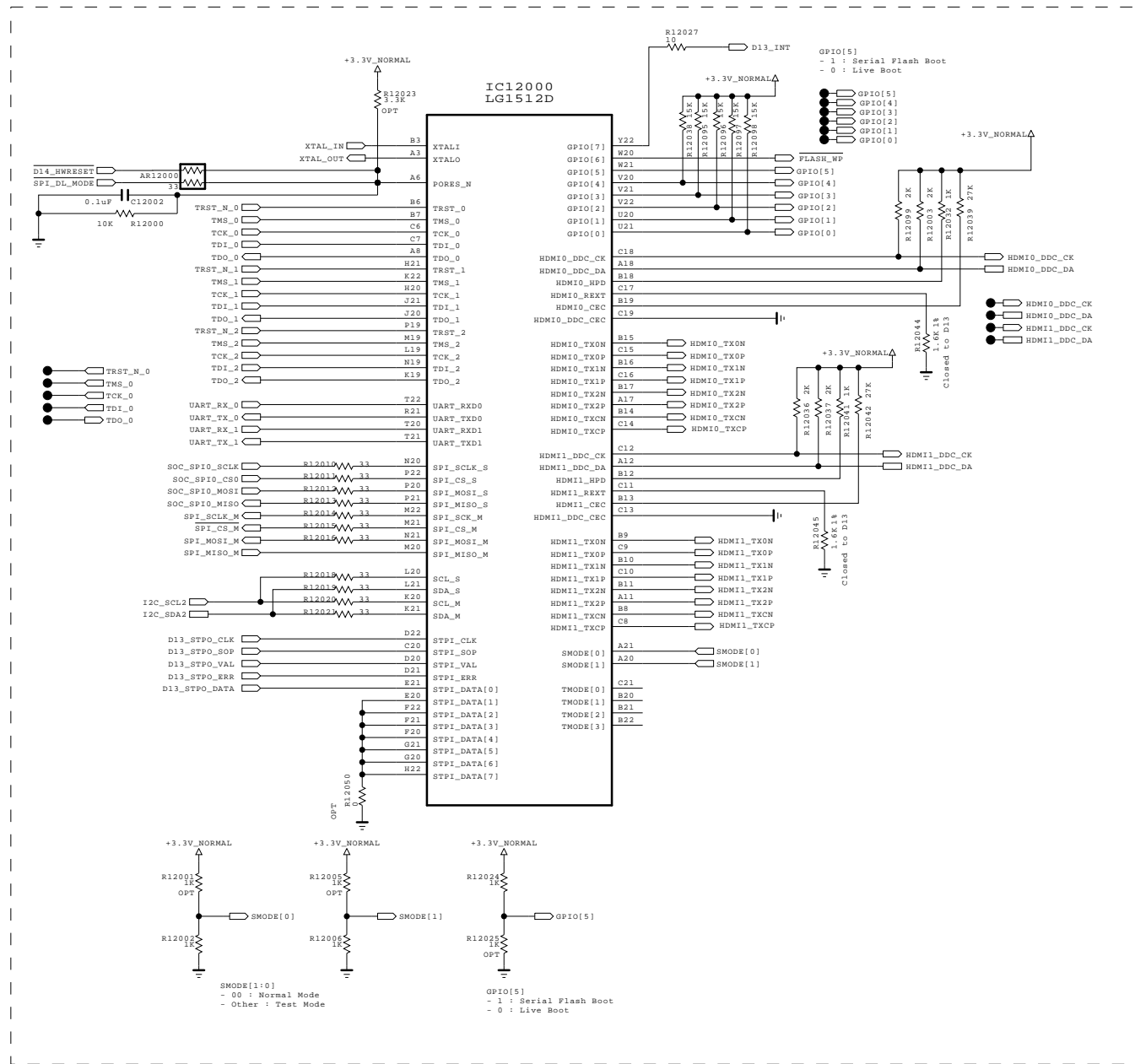
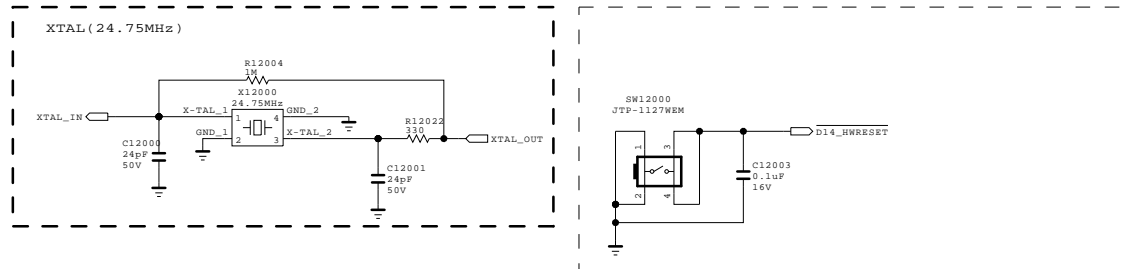
THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.

SECRET  
LGElectronics



MODEL	eMMC	DATE	2013.12.17
BLOCK		SHEET	81

BSD-14Y-UD-081-HD

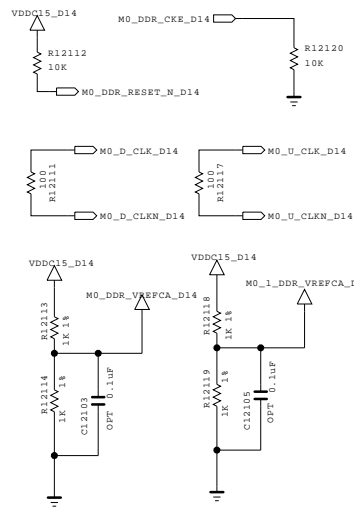
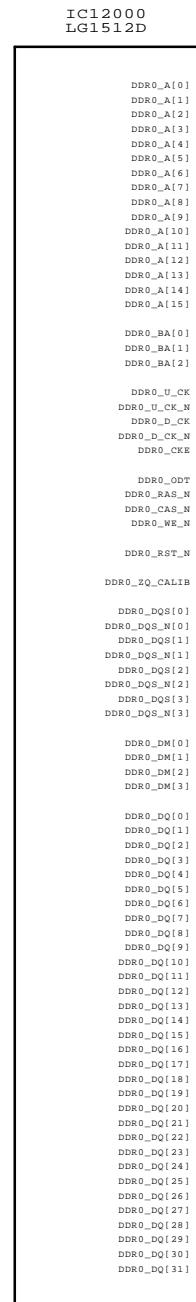


THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.

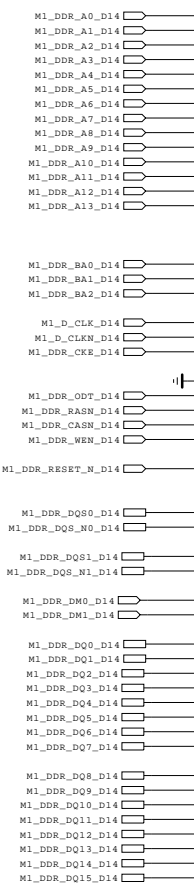
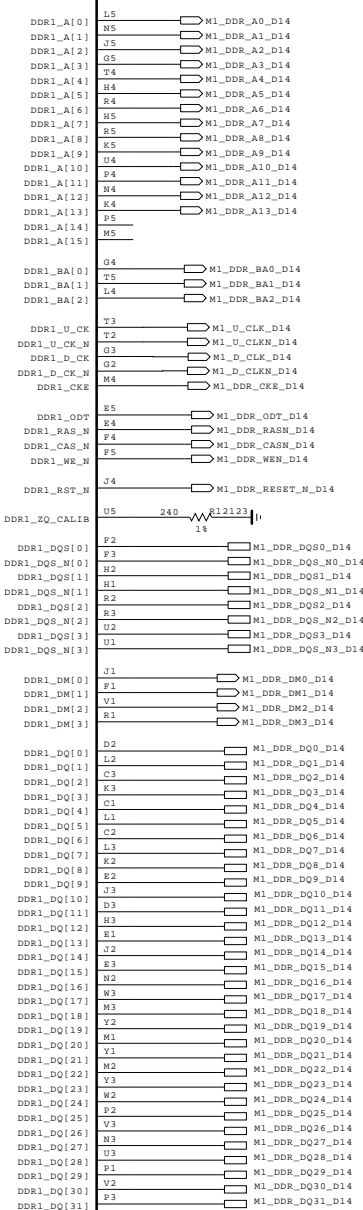
SECRET  
LGElectronics

LG ELECTRONICS

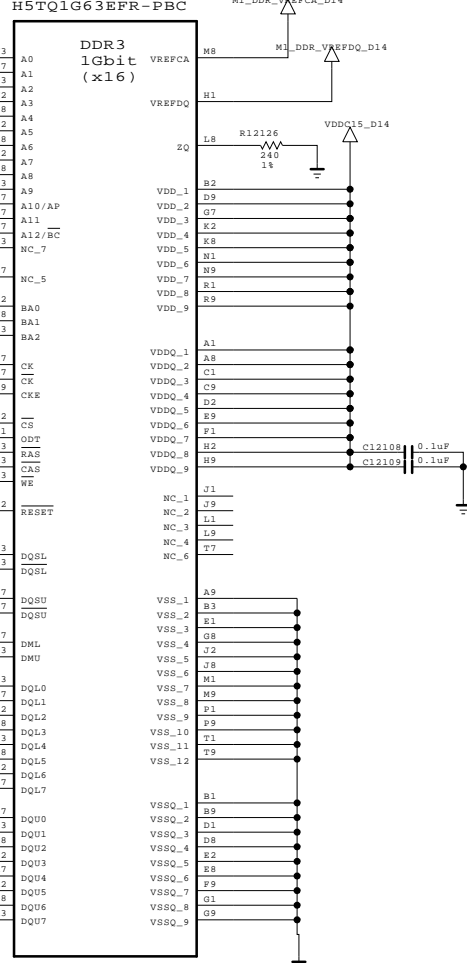
MODEL		DATE	2013.12.17
BLOCK		SHEET	/



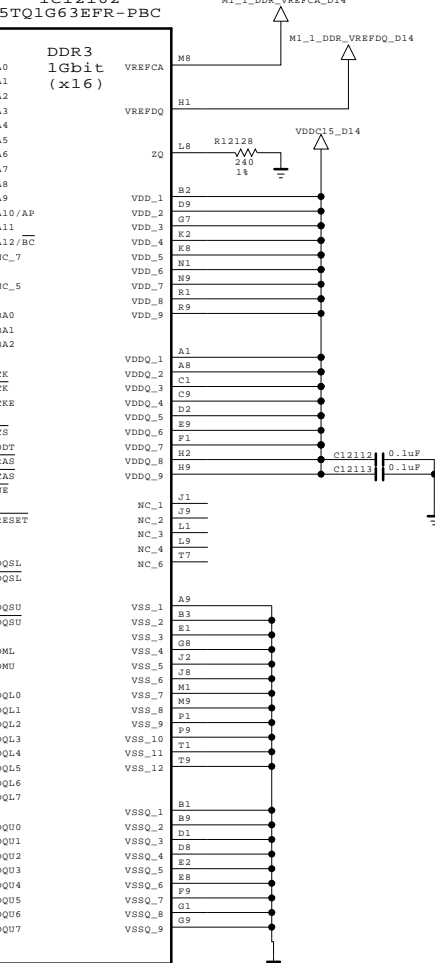
IC12000  
LG1512D





IC12100  
H5TQ1G63EFR-PBC



IC12102  
H5TQ1G63EFR-PBC

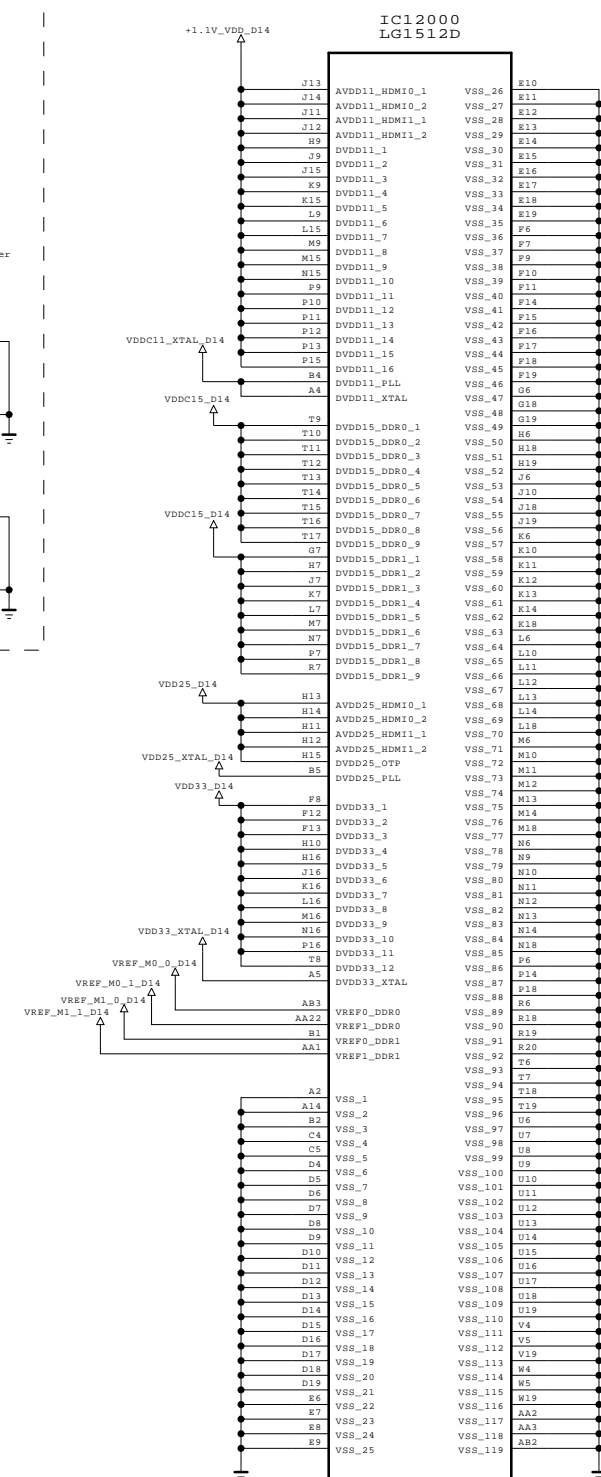
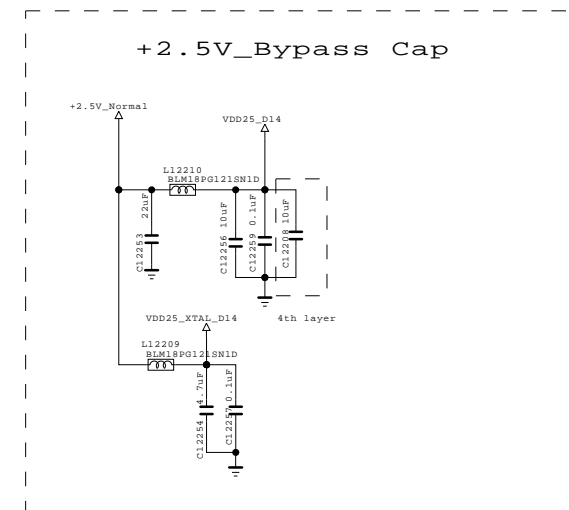
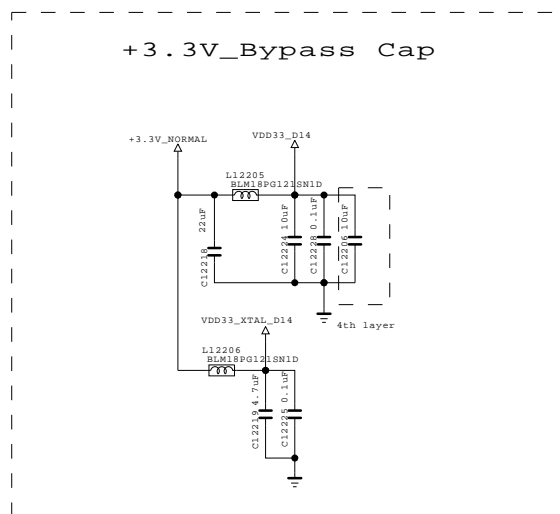
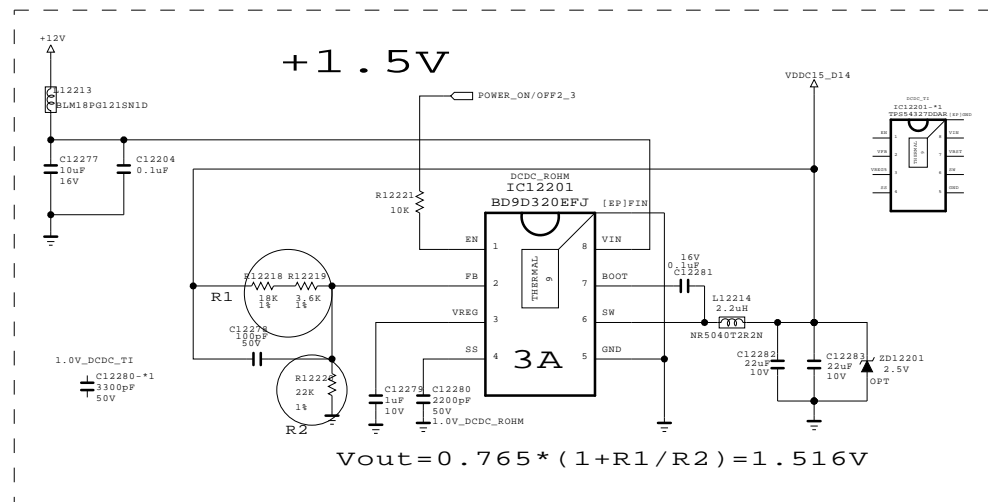


THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.

SECRET  
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MODEL	DATE	BSD-14Y-UD-121-HD
BLOCK	SHEET	2013.12.17

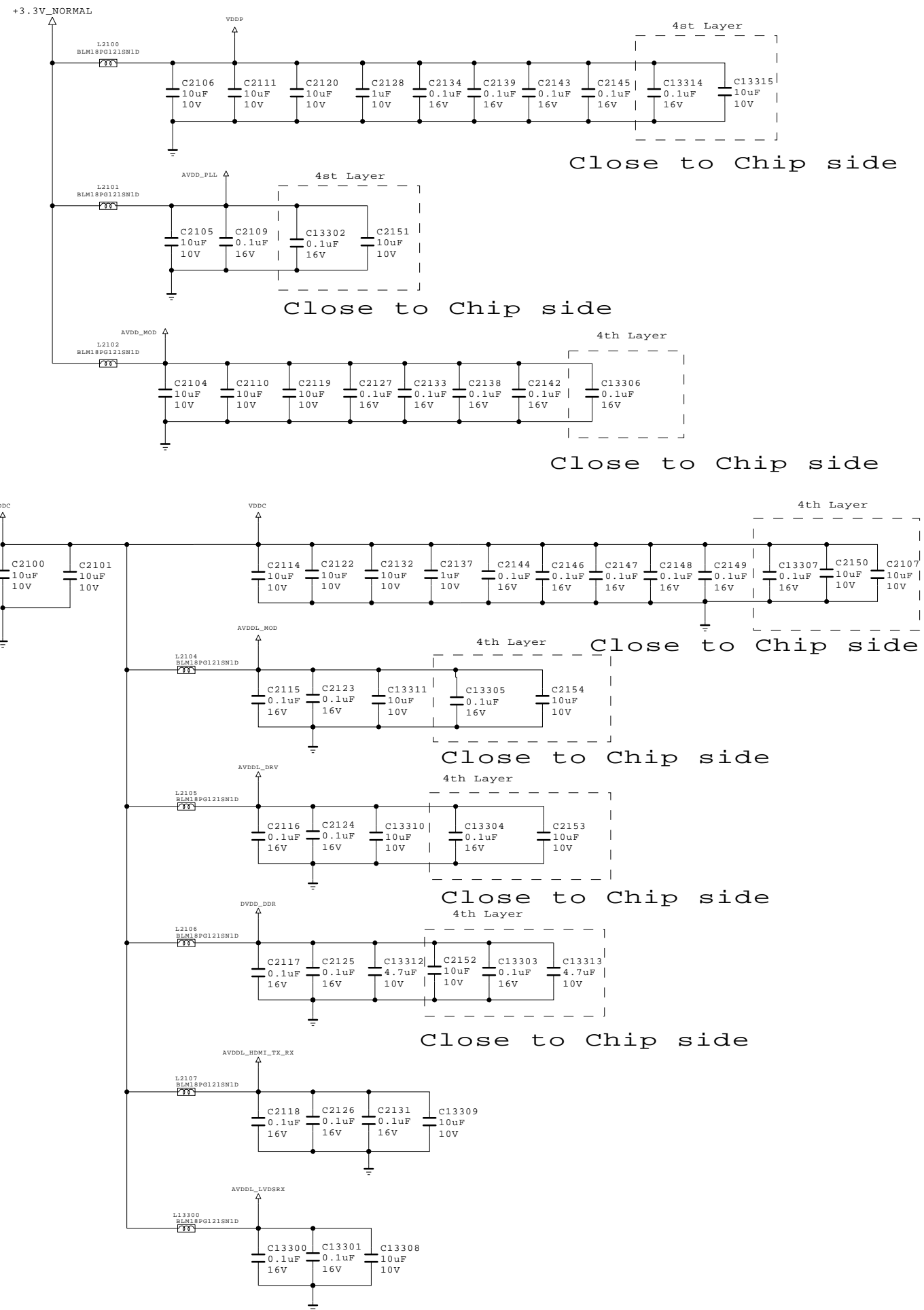
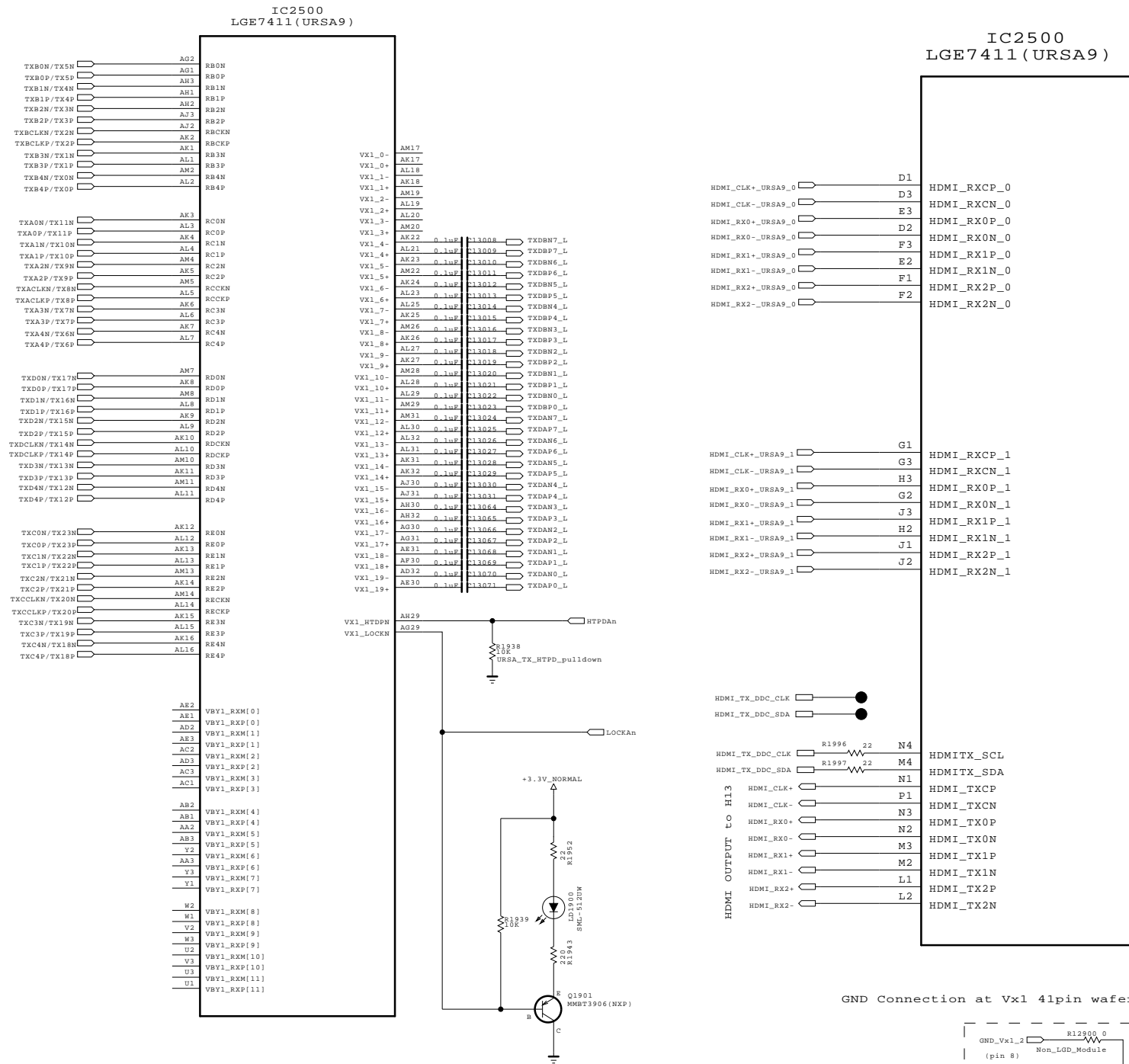




SECRET  
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MODEL		DATE	2013.12.17
BLOCK		SHEET	/

## UB85 / 95 / UC89 only



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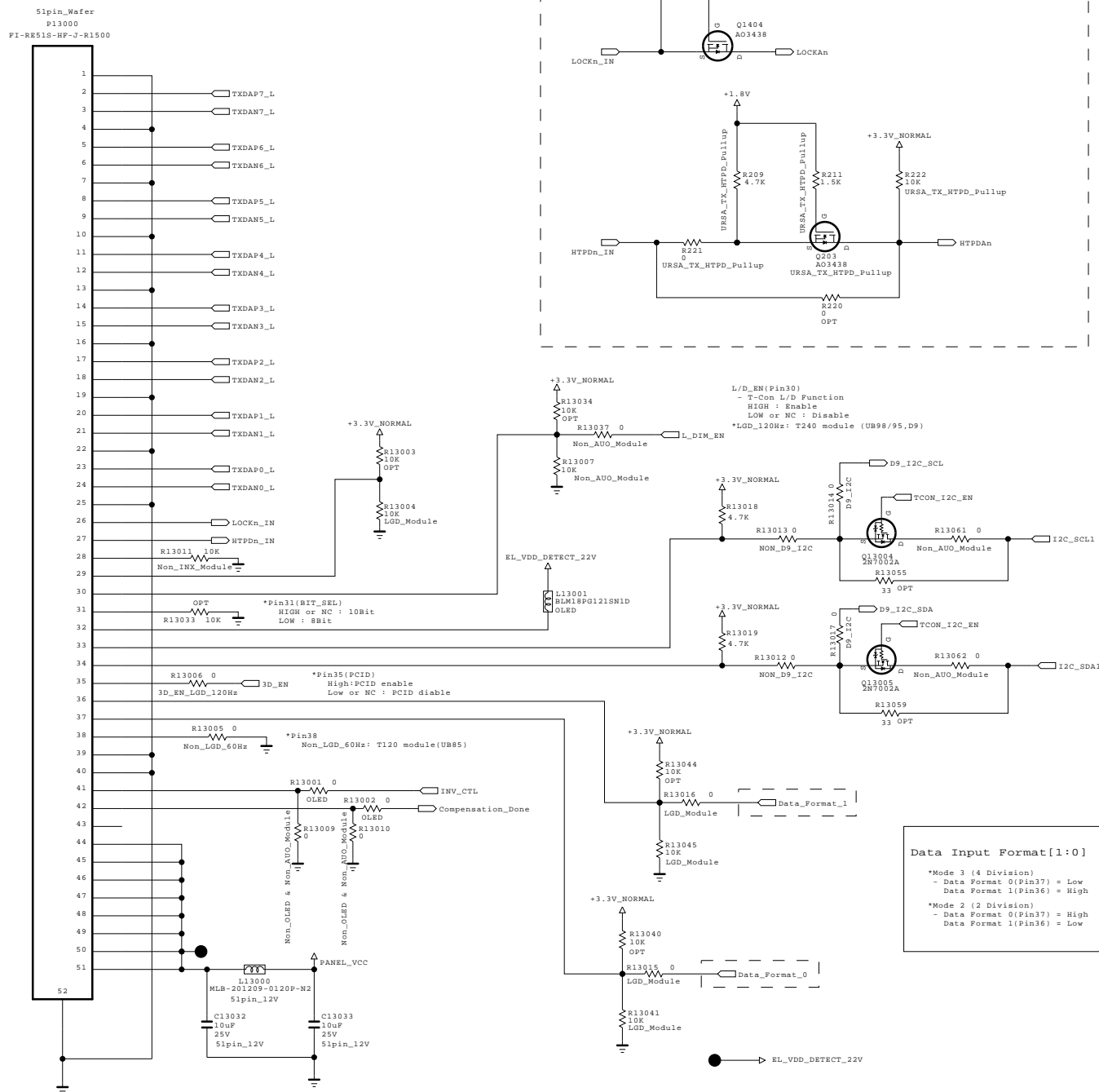
SECRET  
LGElectronics



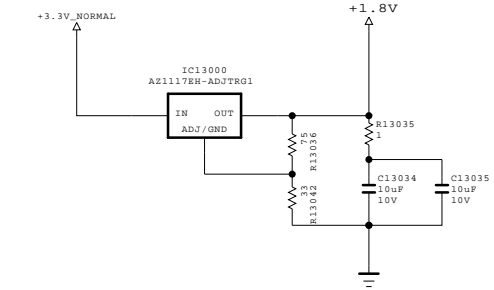
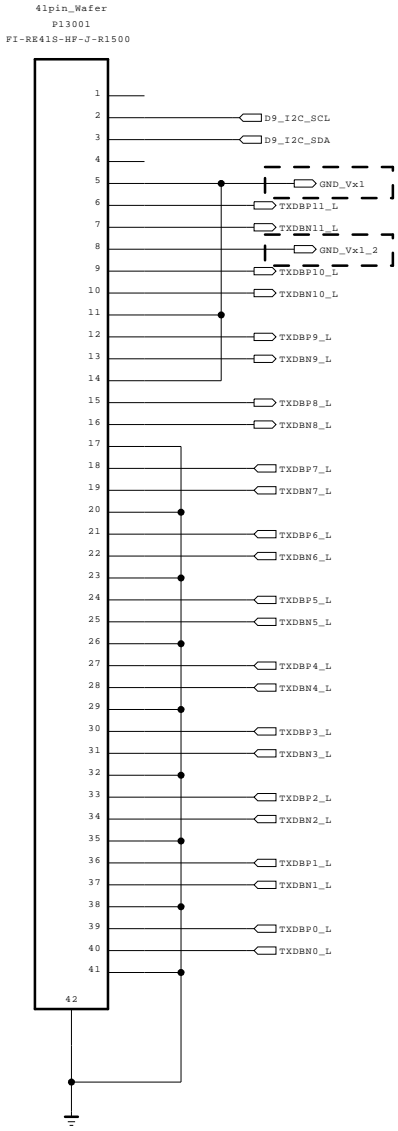
MODEL		DATE	2013.12.17
BLOCK	U_LVDS INPUT	SHEET	/





[ 51P Vx1  
output wafer ]



[ 41P Vx1  
output wafer ]

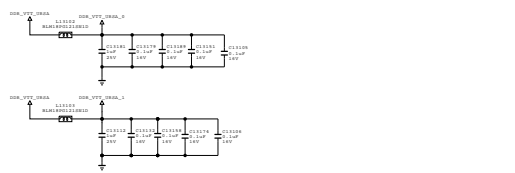
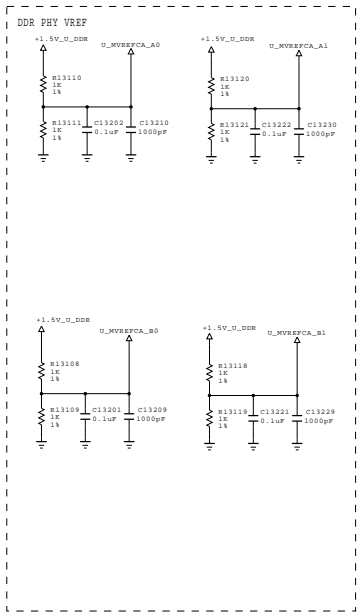


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MODEL		DATE	2013.12.17
BLOCK	Output_wafer	SHEET	/



Close to DDR Power pin

1.5V\_PSDR

C13102 0.1uF 16V

C13107 0.1uF 16V

C13115 0.1uF 25V

C13126 0.1uF 16V

C13135 0.1uF 16V

C13144 0.1uF 16V

C13154 0.1uF 16V

C13162 0.1uF 10V

C13170 0.1uF 16V

C13176 0.1uF 16V

C13184 0.1uF 16V

C13192 0.1uF 16V

C13196 0.1uF 16V

C13204 0.1uF 16V

C13212 0.1uF 25V

C13216 0.1uF 16V

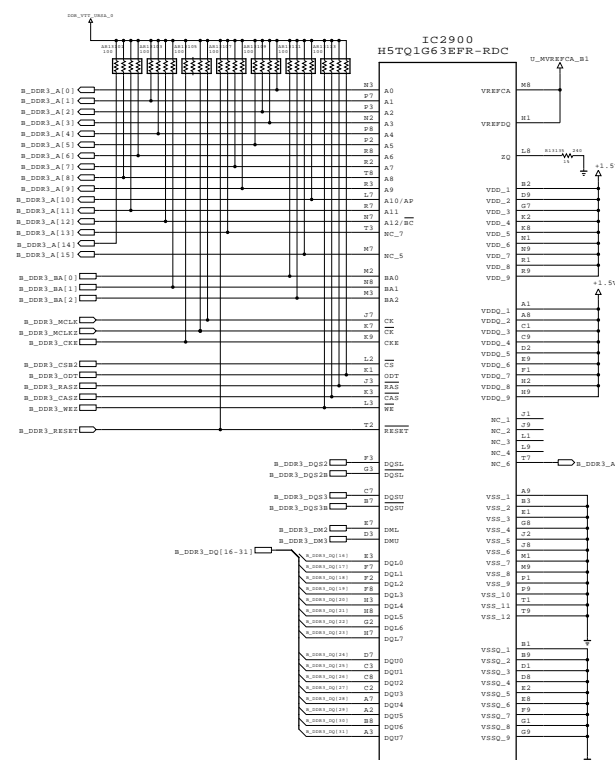
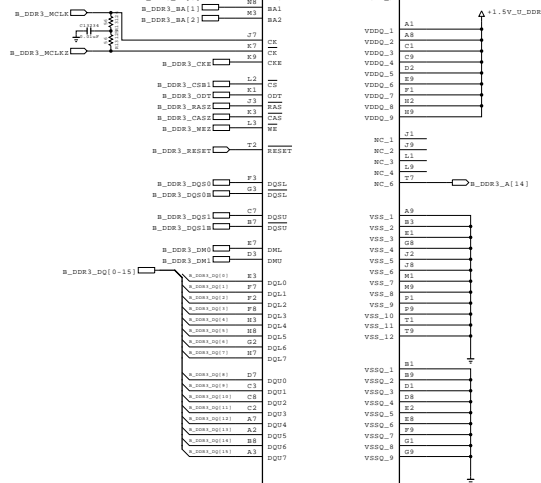
C13224 0.1uF 16V

C13232 0.1uF 16V

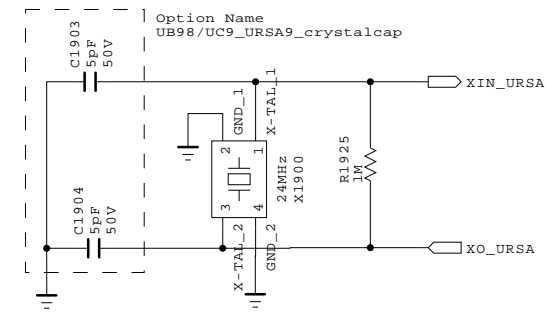
C13100 100pF

C13101 10V

Close to DDR Power pin  
Decap removed



## Clock for URSA9

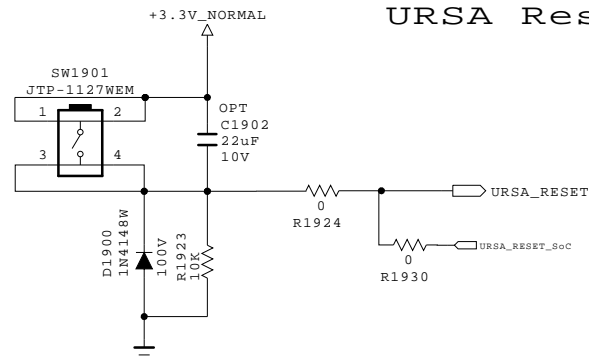


Option Name  
UB98/UC9\_URSA9\_crystalcap

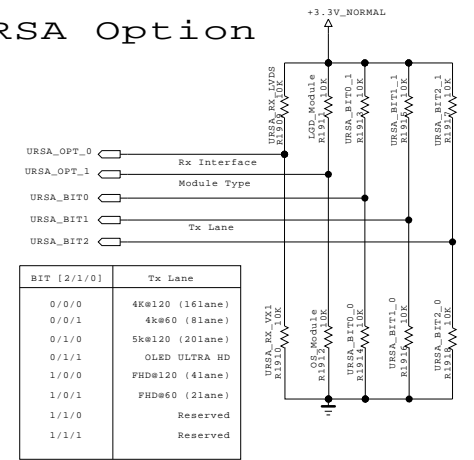
C1904-\*1  
8pF  
50V

C1903-\*1  
8pF  
50V

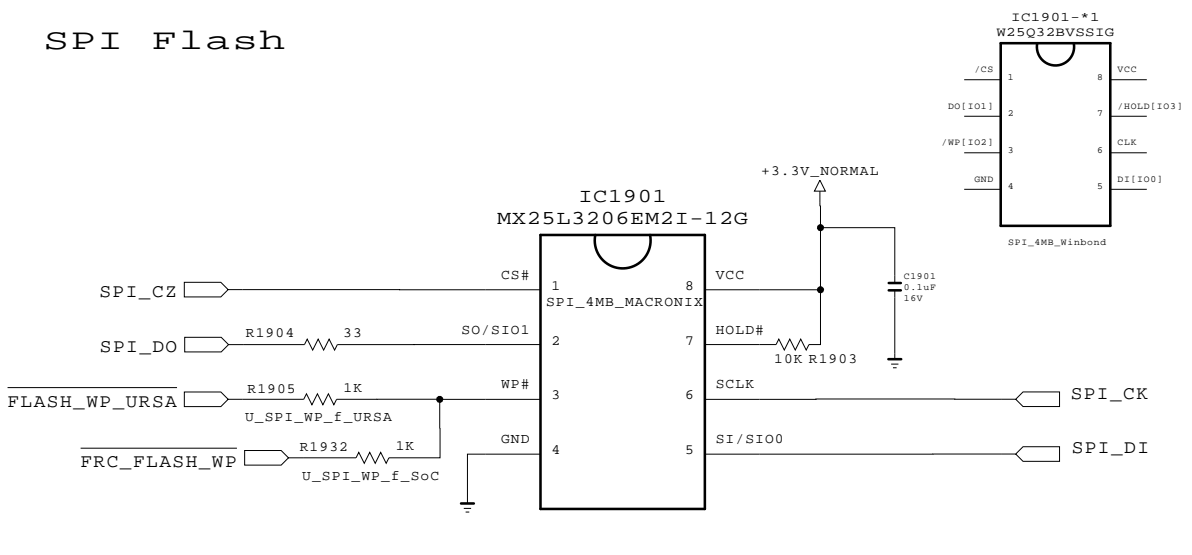
## URSA Reset



## URSA Option

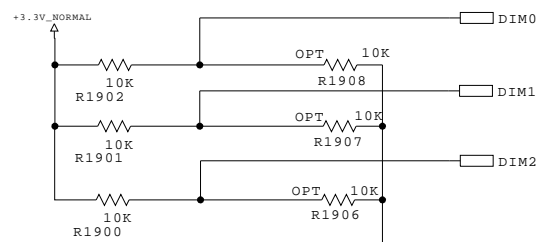


## SPI Flash



## Chip Config

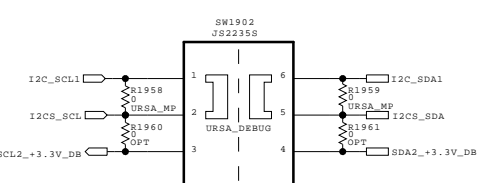
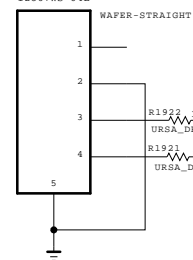
Debug/ISP ADDR  
Slave (Debug Port:0XB4,ISP:0X98)  
CHIP\_CONF:{DIM2,DIM1,DIM0}  
CHIP\_CONF=3'd7:111:boot from SPI Flash



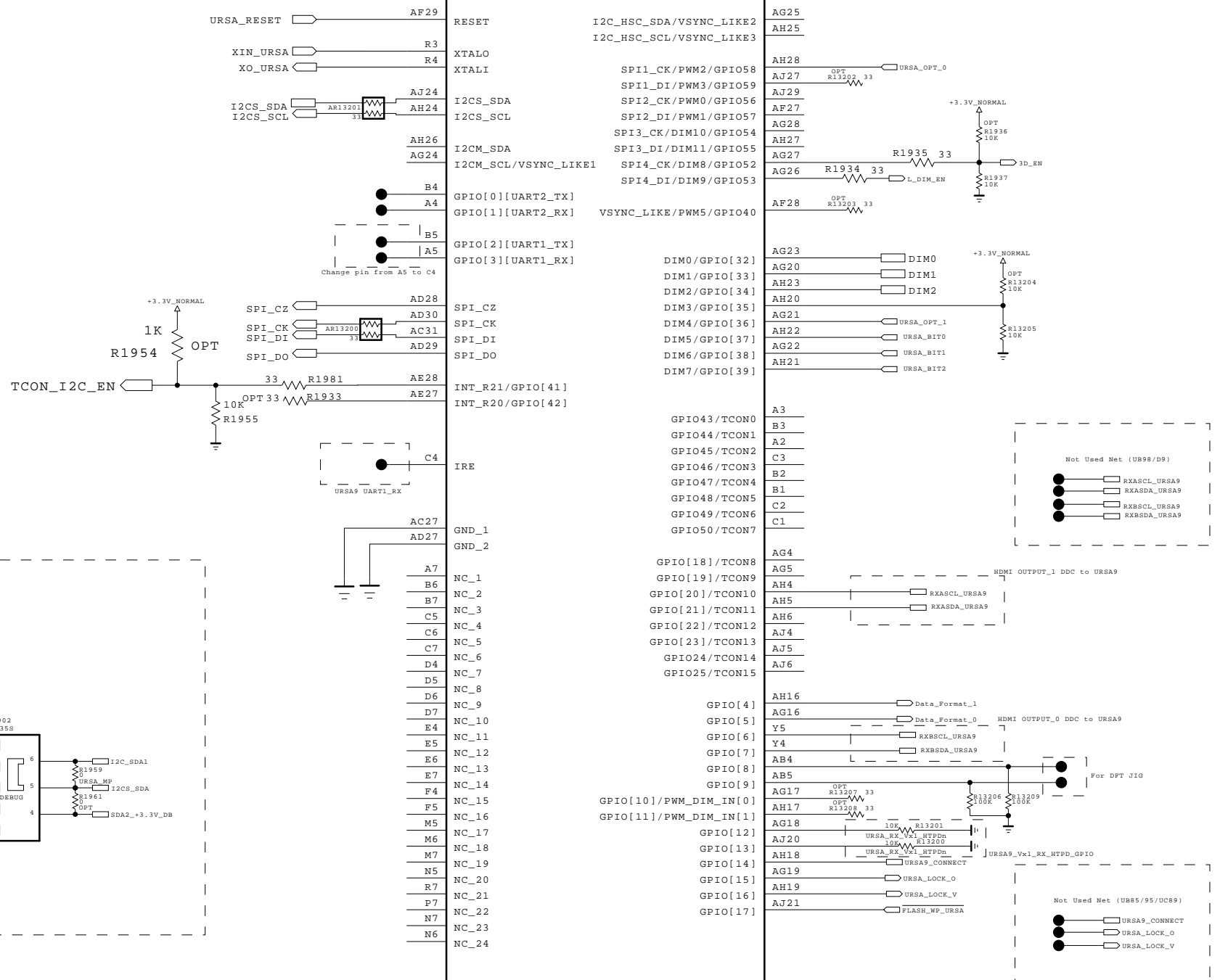
## Debugging for URSA9

### I2C\_S Port

P1905  
12507MS-04L



## IC2500 LGE7411 (URSA9)



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

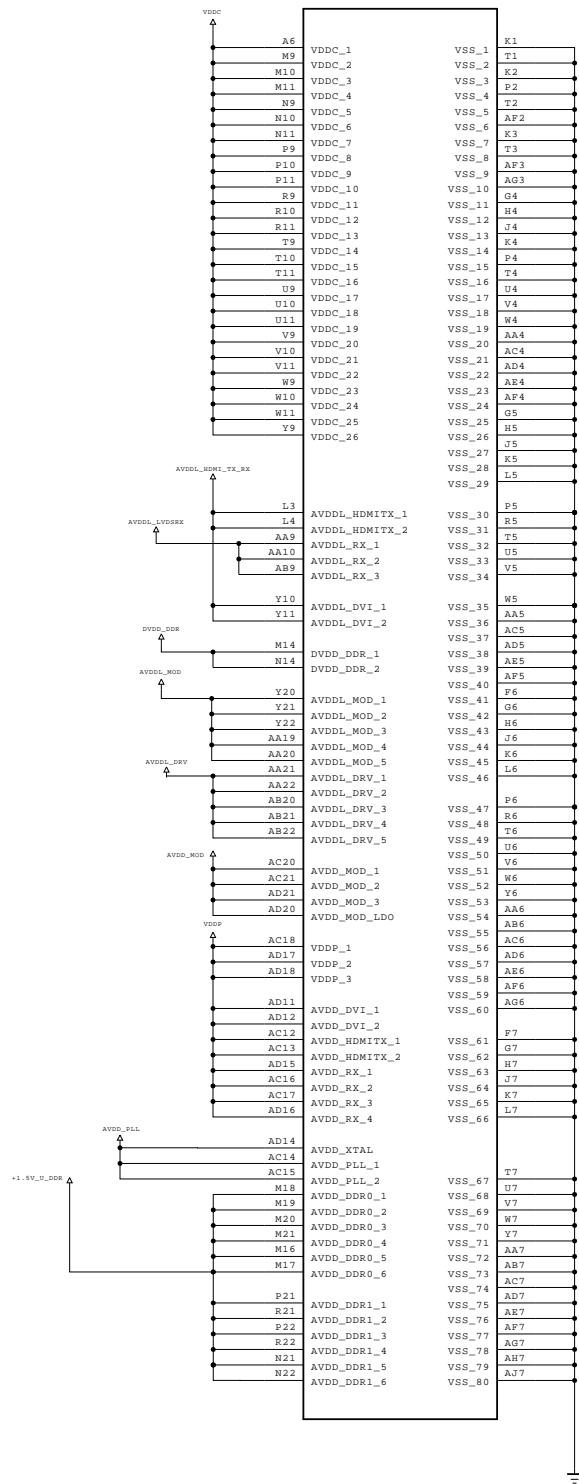
SECRET  
LGElectronics

LG ELECTRONICS

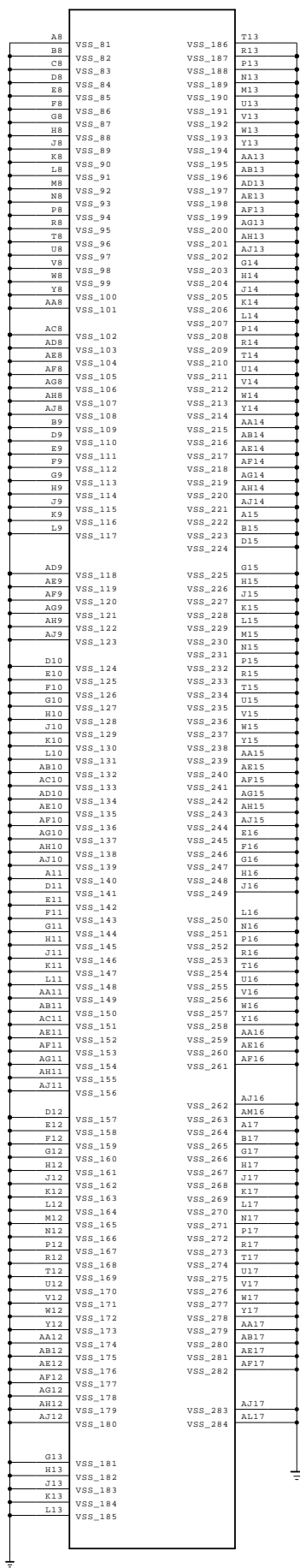
MODEL		DATE	2013.12.17
BLOCK		SHEET	/

BSD-14Y-UD-132-HD

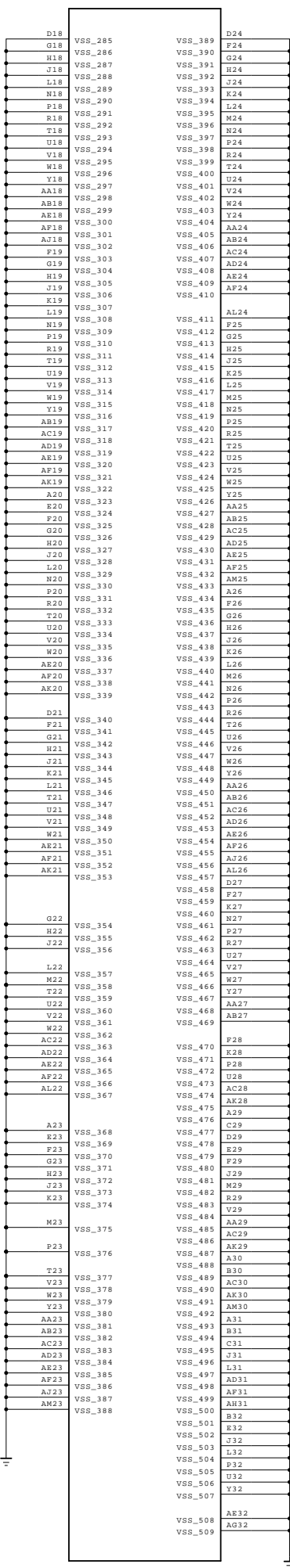
IC2500  
LGE7411 (URSA9)





IC2500  
LGE7411 (URSA9)



IC2500  
LGE7411 (URSA9)



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

SECRET  
LGElectronics



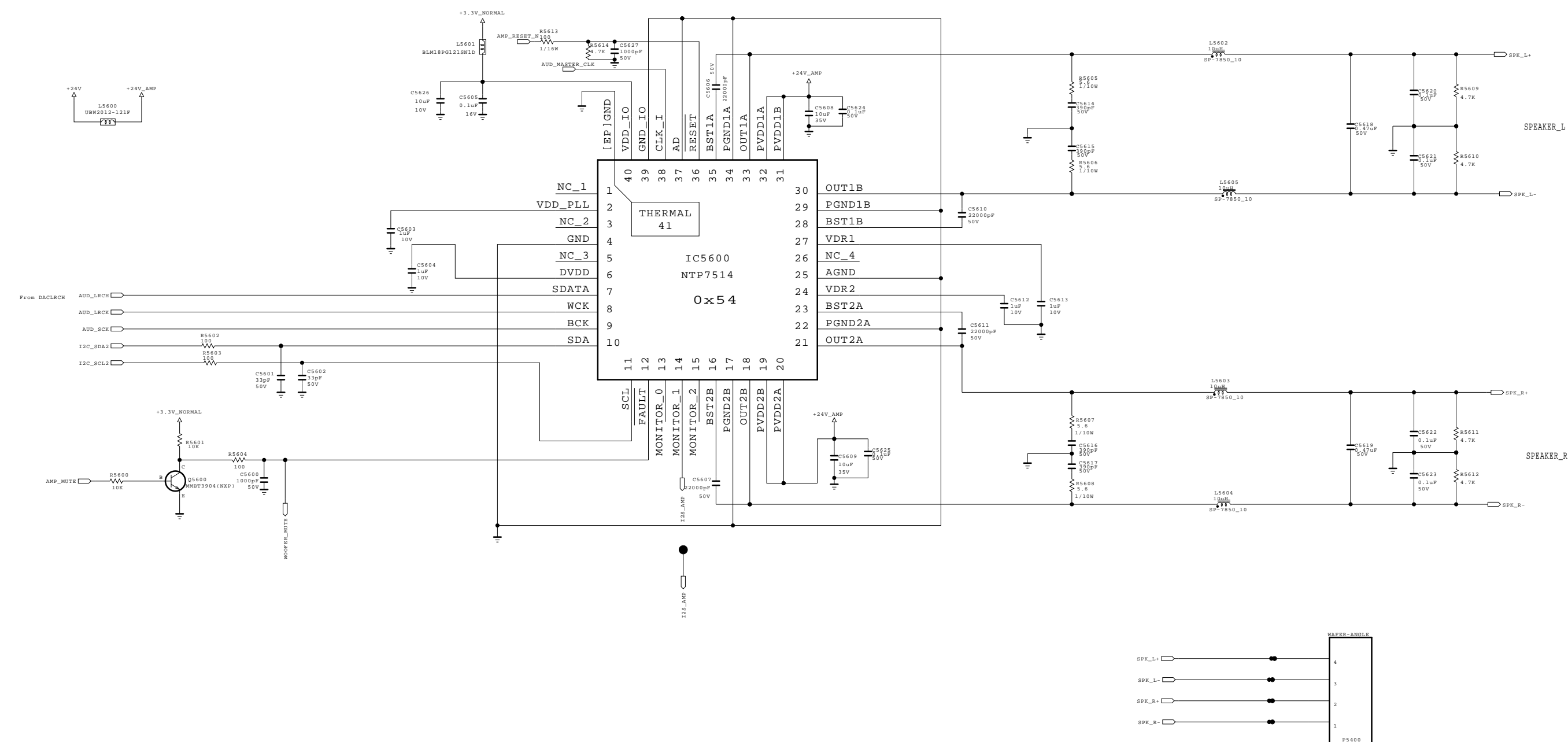
MODEL	DATE
BLOCK	SHEET
U_Power	



BSD-14Y-UD-133-HD  
2013.12.17



# UB85 / 95 / UC89 only

## Front speaker



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

SECRET  
LGElectronics

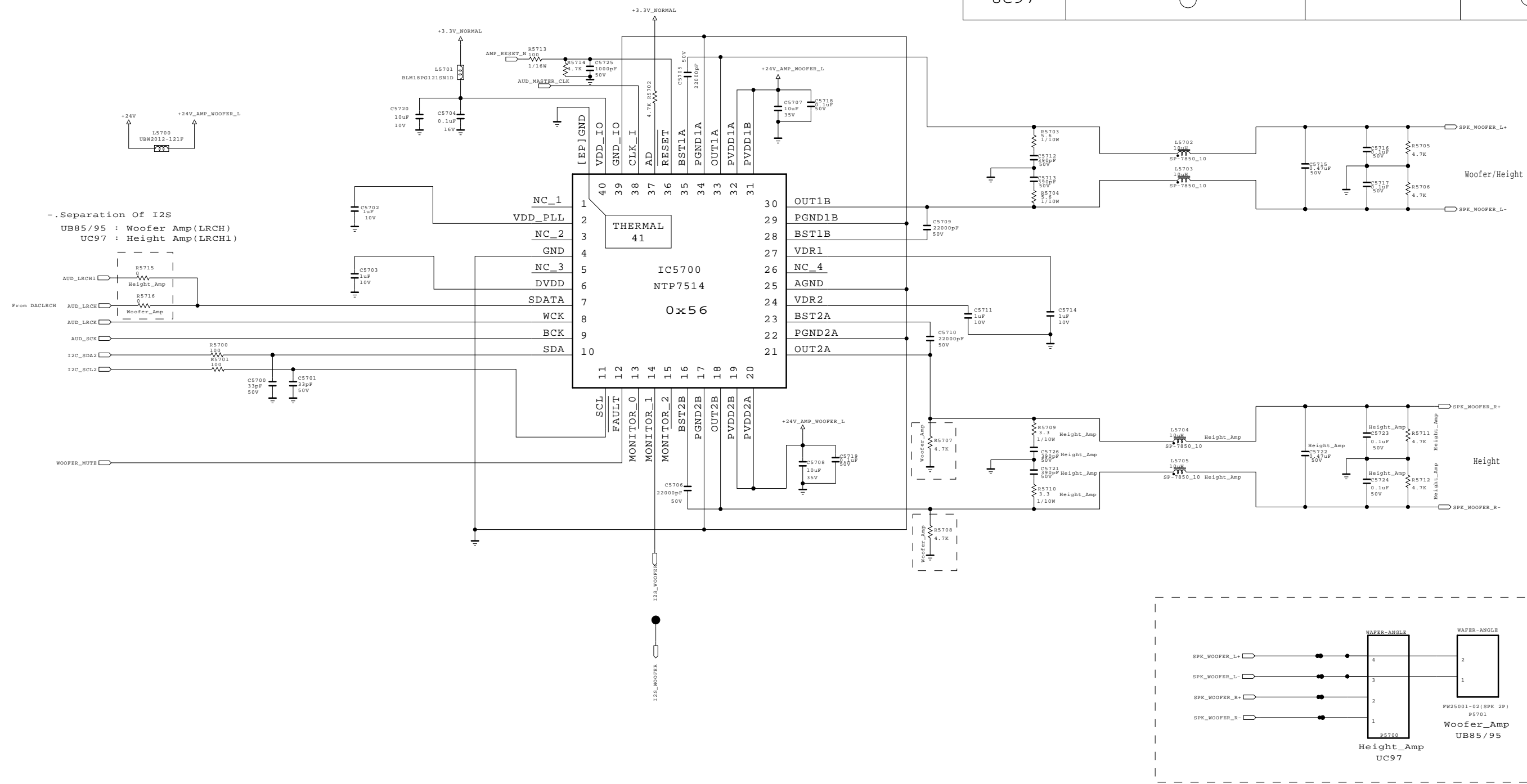


MODEL		DATE	2013.12.17
BLOCK		SHEET	/

# UB85 / 95 / UC97 only

UB85 / 95 : Woofer Amp  
UC97 : Height Amp

OPTION Selection			
	Woofer/Height_Amp	Woofer_Amp	Height_Amp
UB85 / 95	<input type="radio"/>	<input type="radio"/>	
UC97	<input type="radio"/>		<input type="radio"/>



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

SECRET  
LGElectronics

LG ELECTRONICS

MODEL		DATE	
BLOCK		SHEET	

BSD-14Y-UD-057-02-HD  
2013.12.17





# Repair Guide

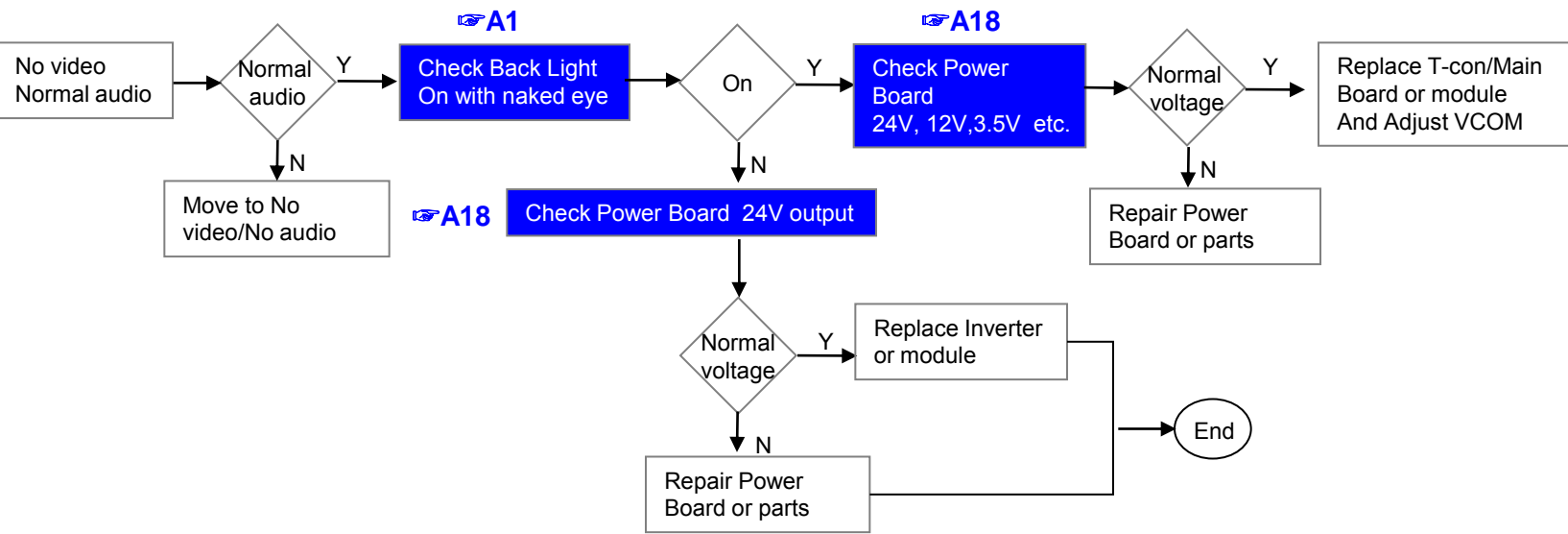
# Contents of LCD TV Standard Repair Process

No.	Error symptom (High category)	Error symptom (Mid category)	Page	Remarks
1	A. Video error	No video/Normal audio	1	
2		No video/No audio	2	
3		Picture broken/ Freezing	3	
4		Color error	4	
5		Vertical/Horizontal bar, residual image, light spot, external device color error	5	
6	B. Power error	No power	6	
7		Off when on, off while viewing, power auto on/off	7	
8	C. Audio error	No audio/Normal video	8	
9		Wrecked audio/discontinuation/noise	9	
10	D. Function error	Remote control & Local switch checking	10	
11		MR13 operating checking	11	
12		Wifi operating checking	12	
13		Camera operating checking	13	
14		External device recognition error	14	
15	E. Noise	Circuit noise, mechanical noise	15	
16	F. Exterior error	Exterior defect	16	

**First of all, Check whether there is SVC Bulletin in GCSC System for these model.**

LCD TV	Error symptom	A. Video error	Established date	2013.01.31	
		No video/ Normal audio	Revised date		1/16

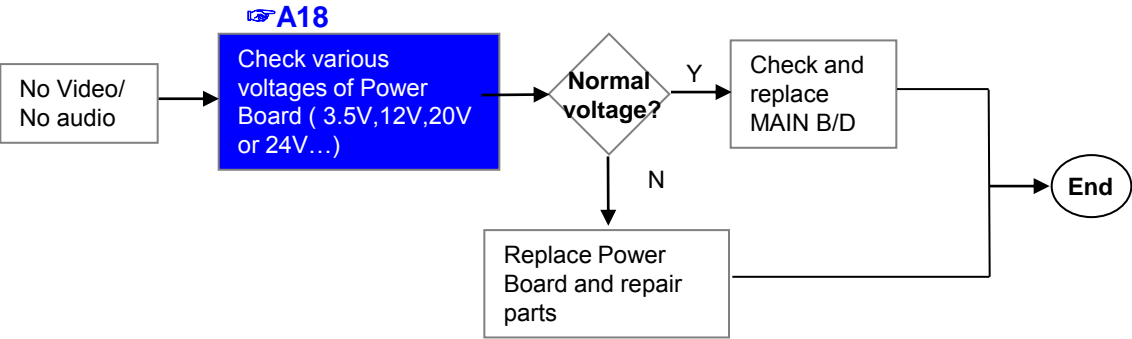
**First of all, Check whether all of cables between board is inserted properly or not.**  
**(Main B/D↔ Power B/D, LVDS Cable, Speaker Cable, IR B/D Cable,,)**



**※Precaution A4 & A2**



Standard Repair Process					
LCD TV	Error symptom	A. Video error	Established date	2013.01.31	
		No video/ No audio	Revised date		2/16

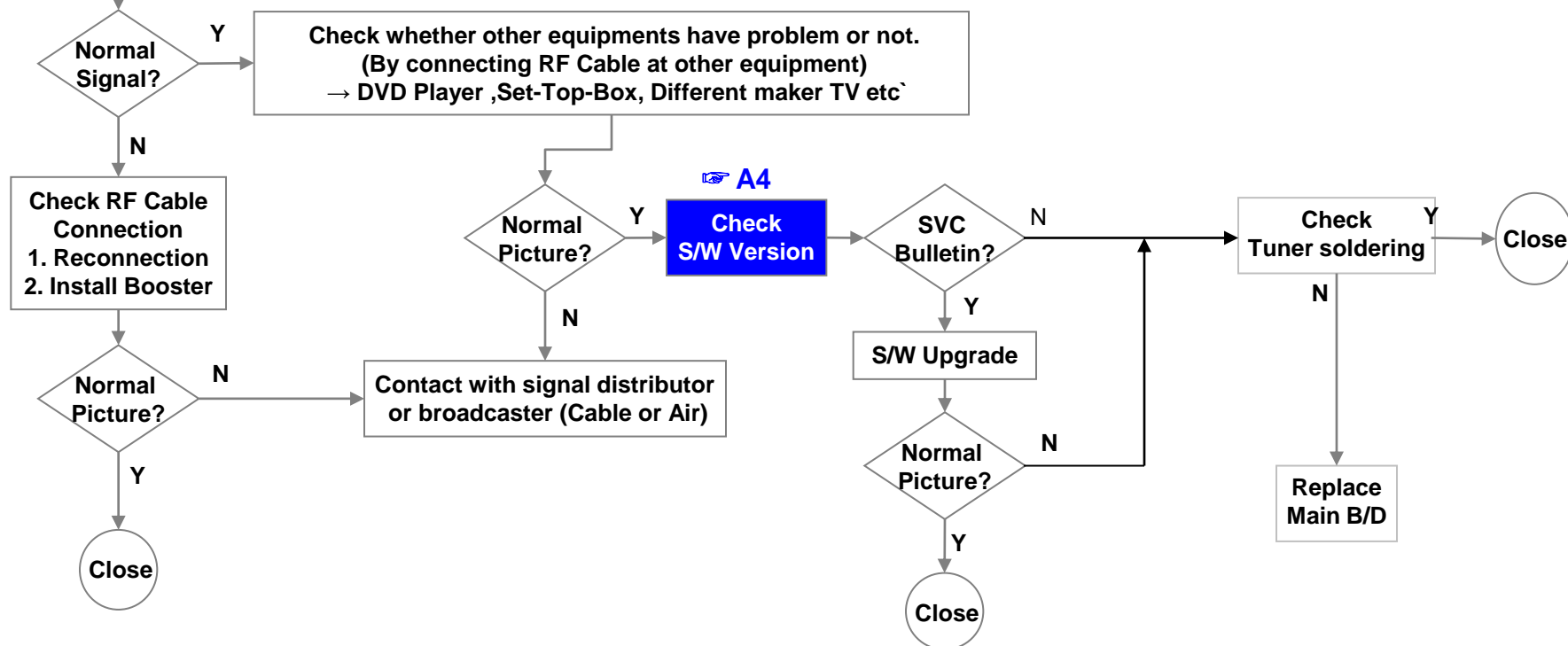


LCD TV	Error symptom	A. Video error	Established date	2013.01.31	
		Picture broken/ Freezing	Revised date		3/16

👉 A3

**Check RF Signal level**

- . By using Digital signal level meter
- . By using Diagnostics menu on OSD  
( Setting → Quick Setting → Programmes → Programme Tuning → Manual Tuning → Check the Signal )
- Signal strength (Normal : over 50%)
- Signal Quality (Normal: over 50%)



LCD TV	Error symptom	A. Video error	Established date	2013.01.31	
		Color error	Revised date		4/16

**A6**

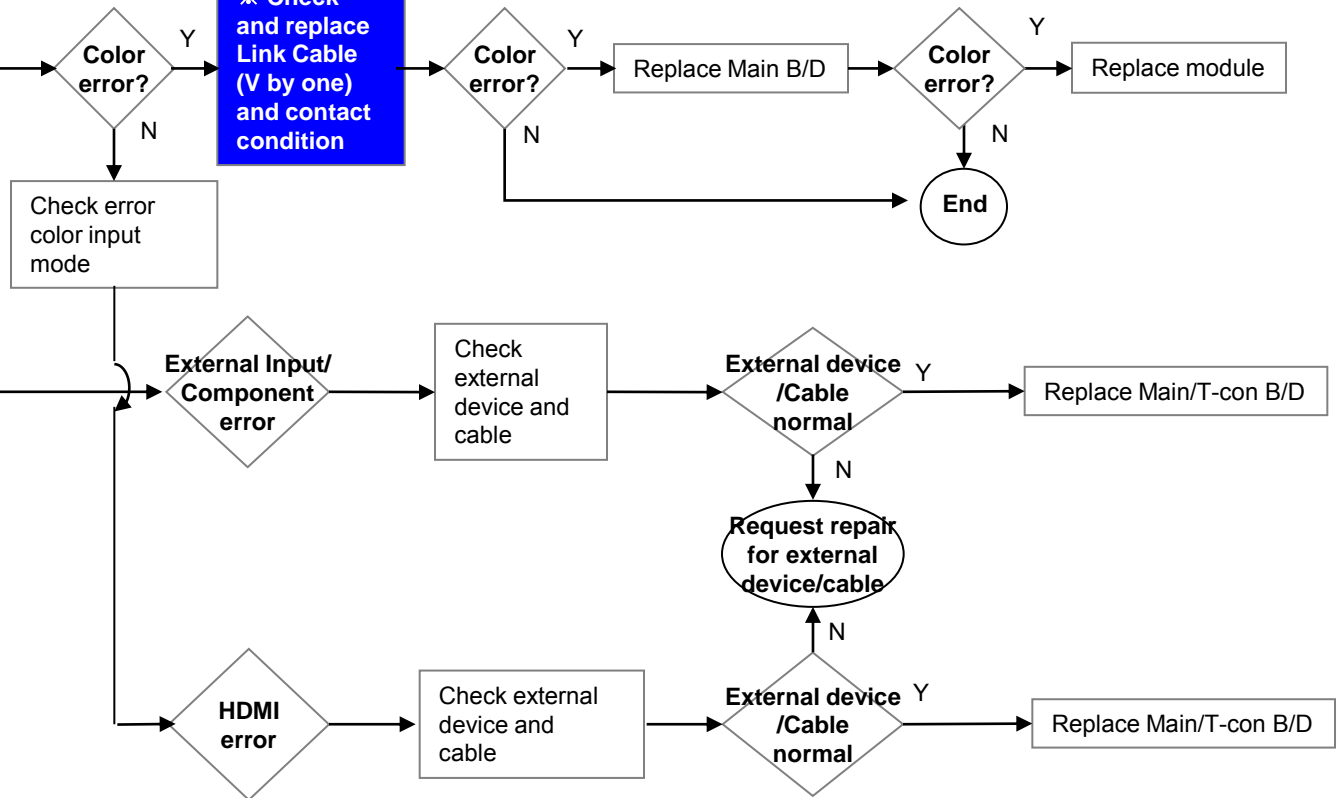
Check color by input  
-External Input  
-COMPONENT  
-AV  
-HDMI

**A7**

※ Check and replace Link Cable (V by one) and contact condition

**A8**

Check Test pattern



LCD TV	Error symptom	A. Video error	Established date	2013.01.31	
		Vertical / Horizontal bar, residual image, light spot, external device color error	Revised date		5/16

## Vertical/Horizontal bar, residual image, light spot

## A6

Check color condition by input  
-External Input  
-Component  
-HDMI

## A8

Check Test pattern

Screen normal?

Replace module

Check external device connection condition

Normal?

Request repair for external device

## A7

Check and replace Link Cable

Screen normal?

End

Replace Main/T-con B/D (adjust VCOM)

For LGD panel

Replace Main B/D

For other panel

Screen normal?

End

Replace Module

## External device screen error-Color error

Check S/W Version

Check version

S/W Upgrade

Normal screen?

End

Check screen condition by input  
-External Input  
-Component  
-HDMI/DVI

External Input error

Component error

HDMI/DVI

Connect other external device and cable  
(Check normal operation of External Input, Component, RGB and HDMI/DVI by connecting Jig, pattern Generator, Set-top Box etc.)

Connect other external device and cable  
(Check normal operation of External Input, Component, RGB and HDMI/DVI by connecting Jig, pattern Generator, Set-top Box etc.)

Screen normal?

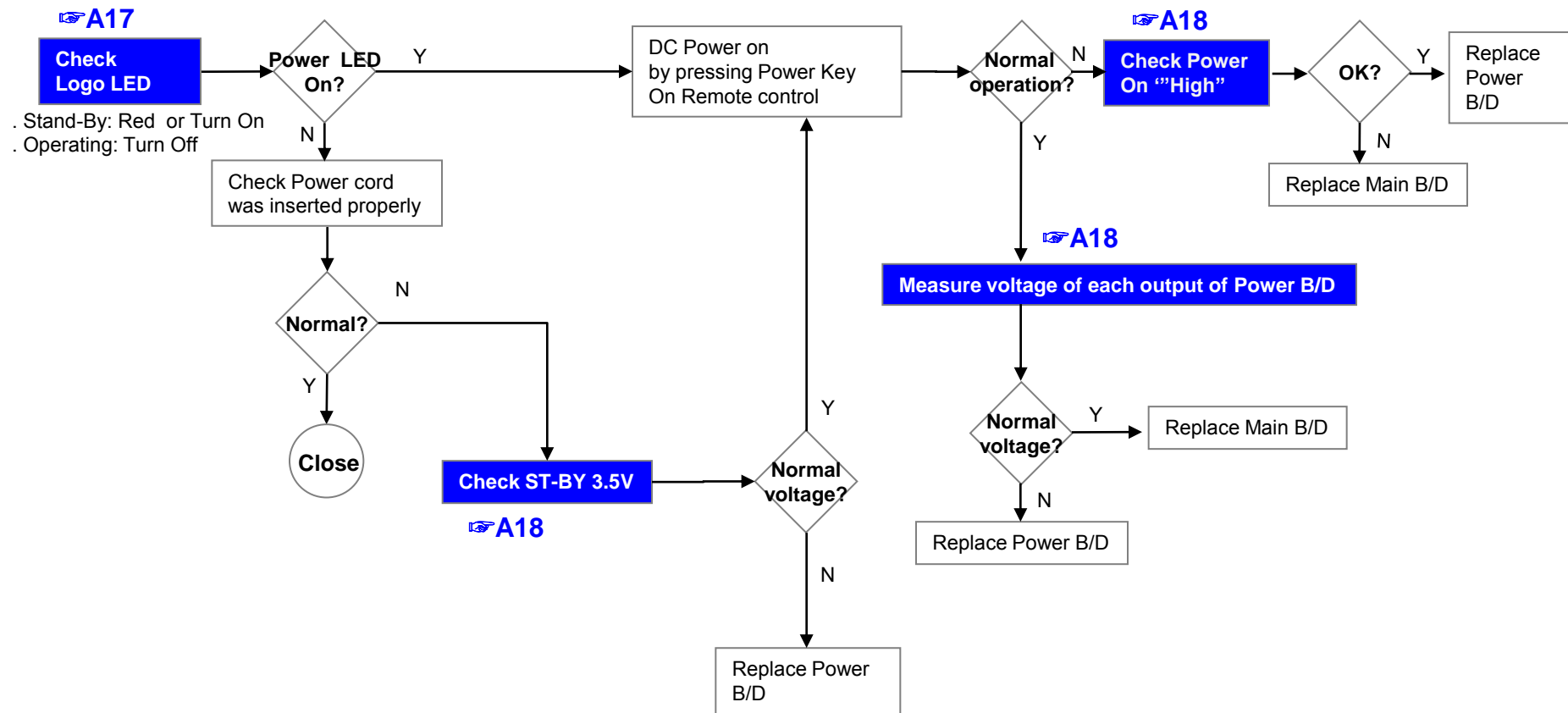
Replace Main/T-con B/D

Request repair for external device

Screen normal?

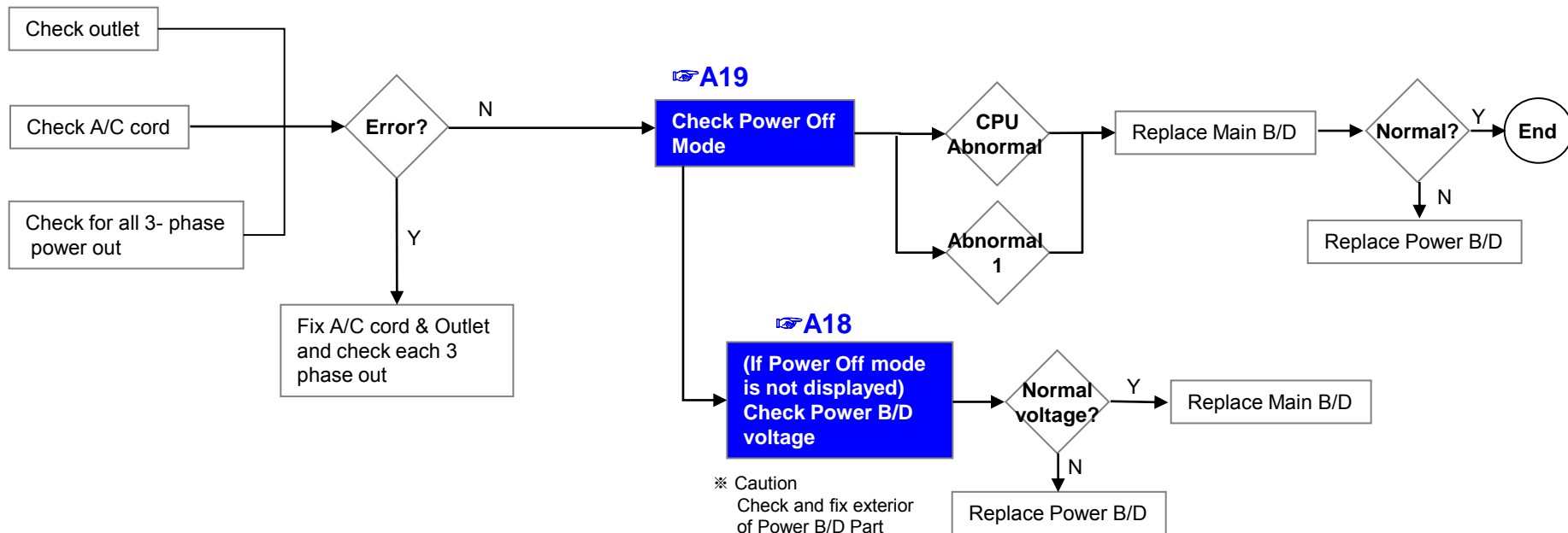
Replace Main /T-con B/D

LCD TV	Error symptom	B. Power error	Established date	2013.01.31	
		No power	Revised date		6/16





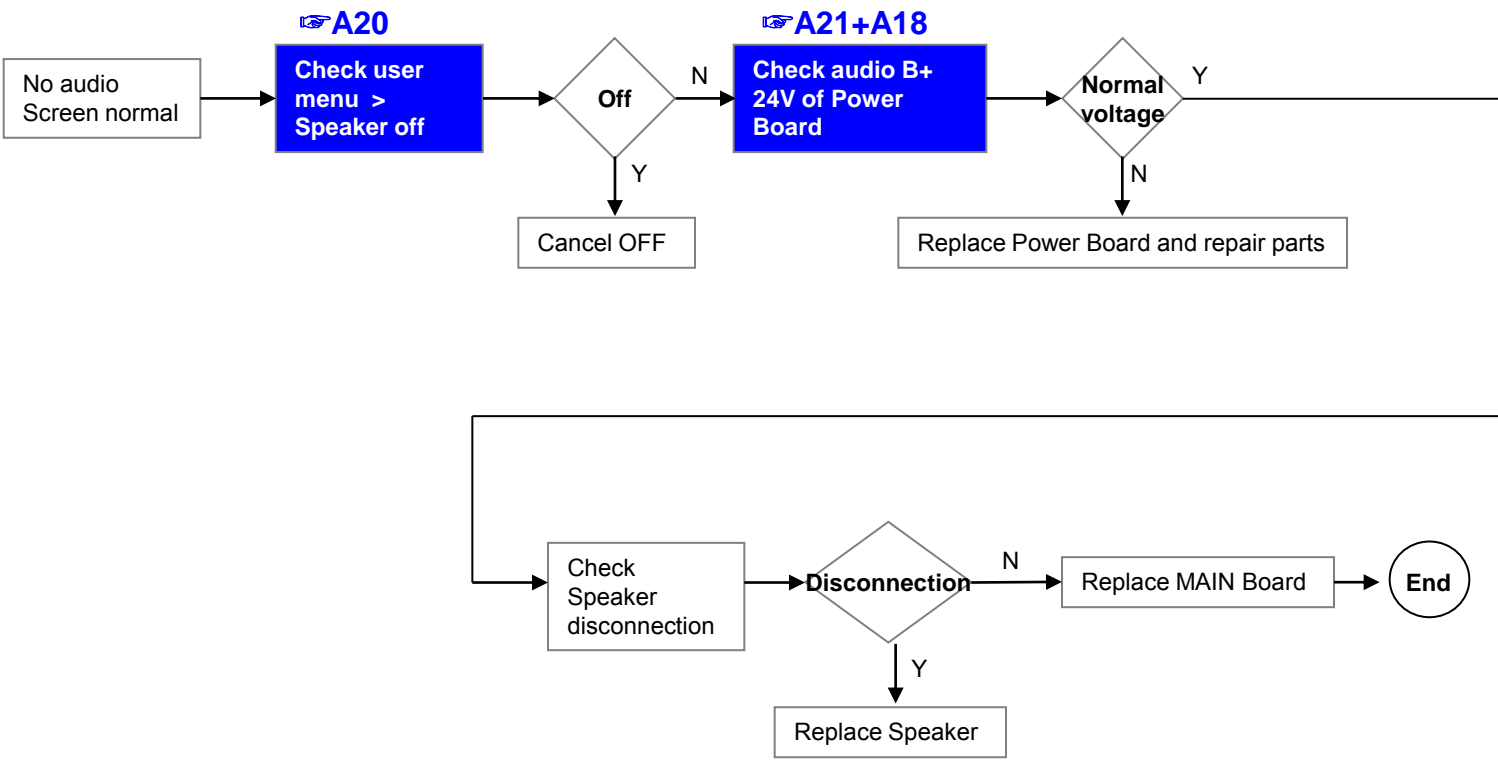
LCD TV	Error symptom	B. Power error	Established date	2013.01.31	
		Off when on, off while viewing, power auto on/off	Revised date		7/16



\* Please refer to the all cases which can be displayed on power off mode.

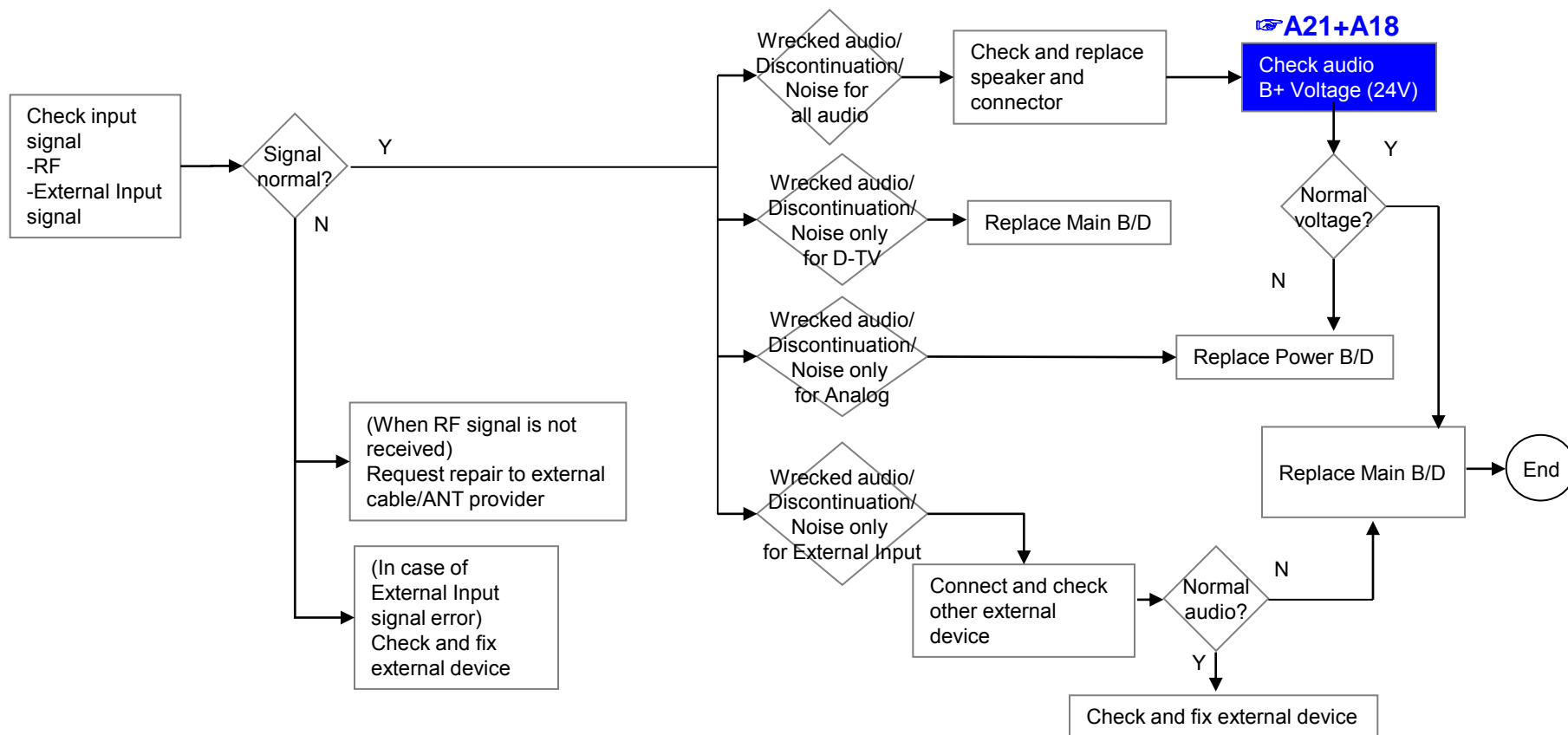
Status	Power off List	Explanation
Normal	"POWEROFF_REMOTEKEY"	Power off by REMOTE CONTROL
	"POWEROFF_OFFTIMER"	Power off by OFF TIMER
	"POWEROFF_SLEEPTIMER"	Power off by SLEEP TIMER
	"POWEROFF_INSTOP"	Power off by INSTOP KEY
	"POWEROFF_AUTOOFF"	Power off by AUTO OFF
	"POWEROFF_ONTIMER"	Power off by ON TIMER
	"POWEROFF_RS232C"	Power off by RS232C
	"POWEROFF_RESREC"	Power off by Reserved Record
	"POWEROFF_RECEND"	Power off by End of Recording
	"POWEROFF_SWDOWN"	Power off by S/W Download
	"POWEROFF_UNKNOWN"	Power off by unknown status except listed case
Abnormal	"POWEROFF_ABNORMAL1"	Power off by abnormal status except CPU trouble
	"POWEROFF_CPUABNORMAL"	Power off by CPU Abnormal

LCD TV	Error symptom	C. Audio error	Established date	2013.01.31	
		No audio/ Normal video	Revised date		8/16



LCD TV	Error symptom	C. Audio error	Established date	2013.01.31	
		Wrecked audio/ discontinuation/noise	Revised date		9/16

→ abnormal audio/discontinuation/noise is same after “Check input signal” compared to No audio



LCD TV

Error  
symptom

## D. Function error

Established  
date

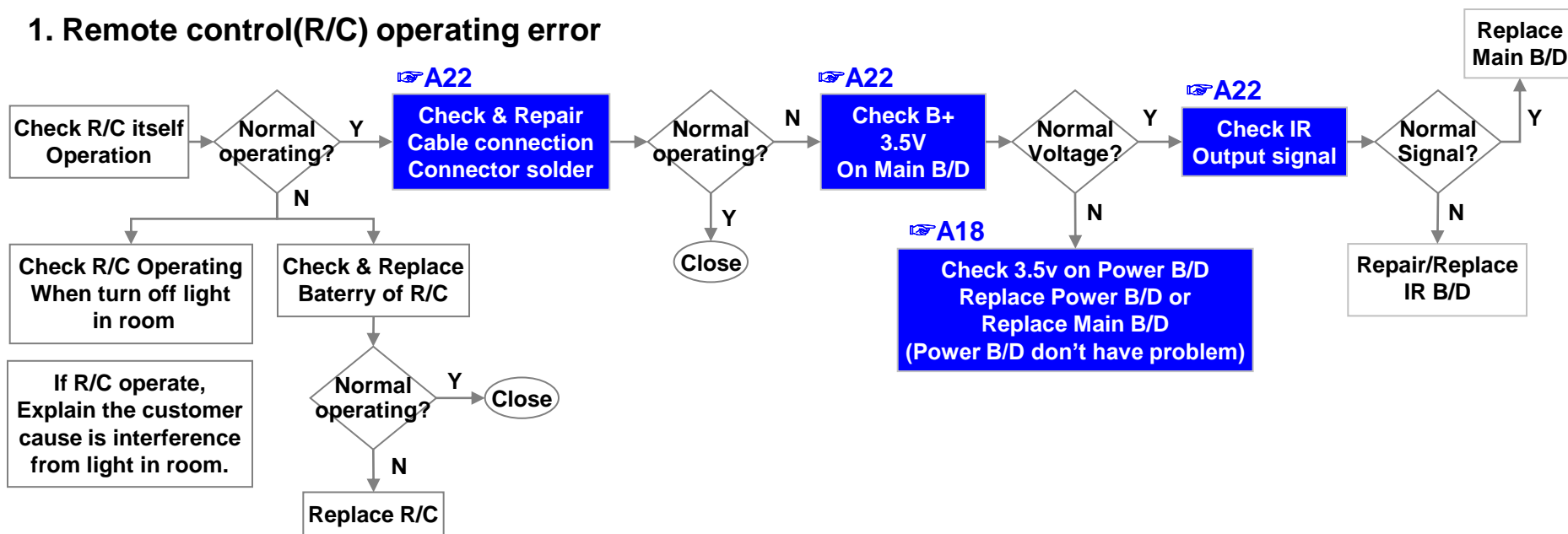
2013.01.31

Remote control &amp; Local switch checking

Revised date

10/16

## 1. Remote control(R/C) operating error



LCD TV

Error  
symptom

## D. Function error

Established  
date

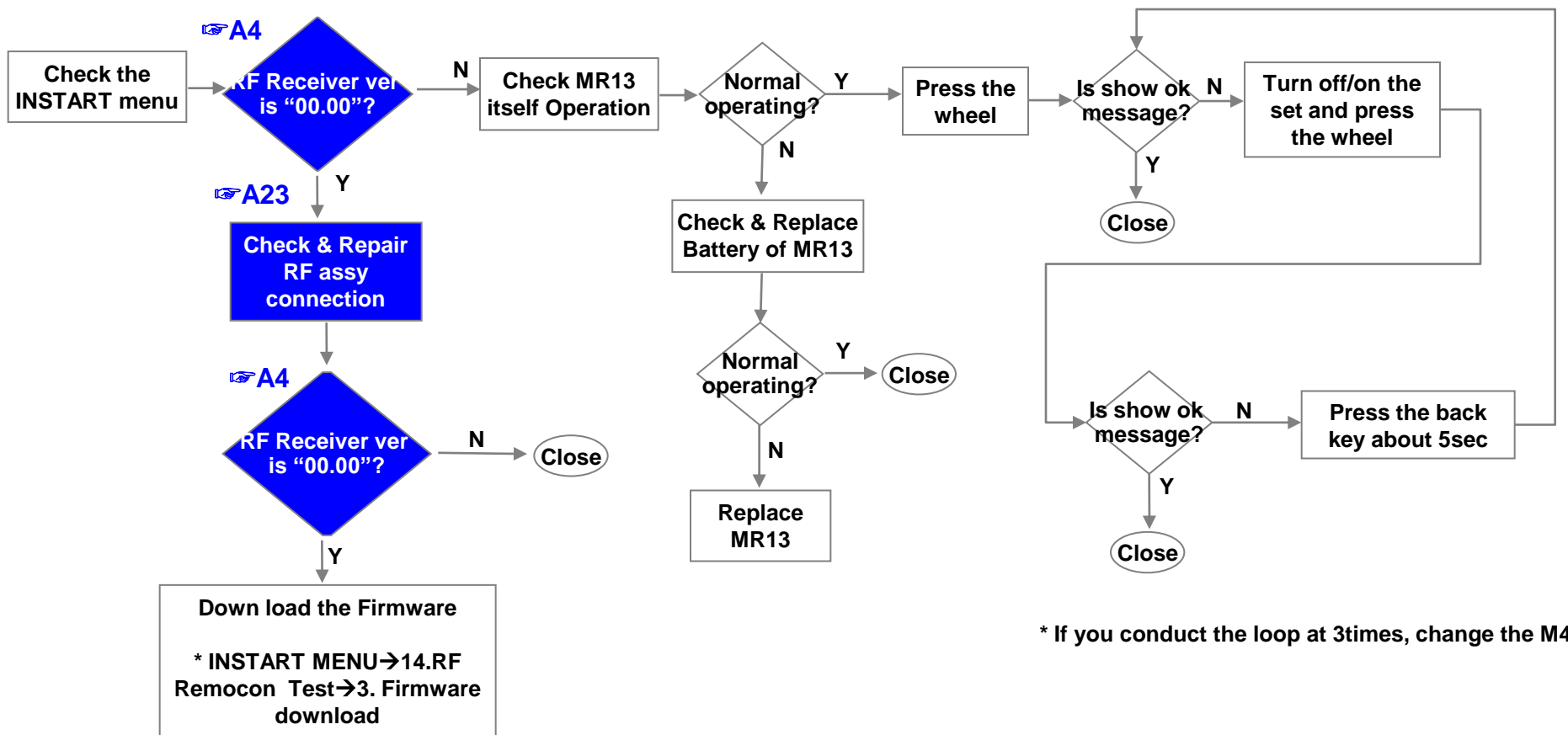
2013.01.31

MR13 operating checking

Revised date

11/16

## 2. MR13(Magic Remocon) operating error



LCD TV

Error  
symptom

## D. Function error

Established  
date

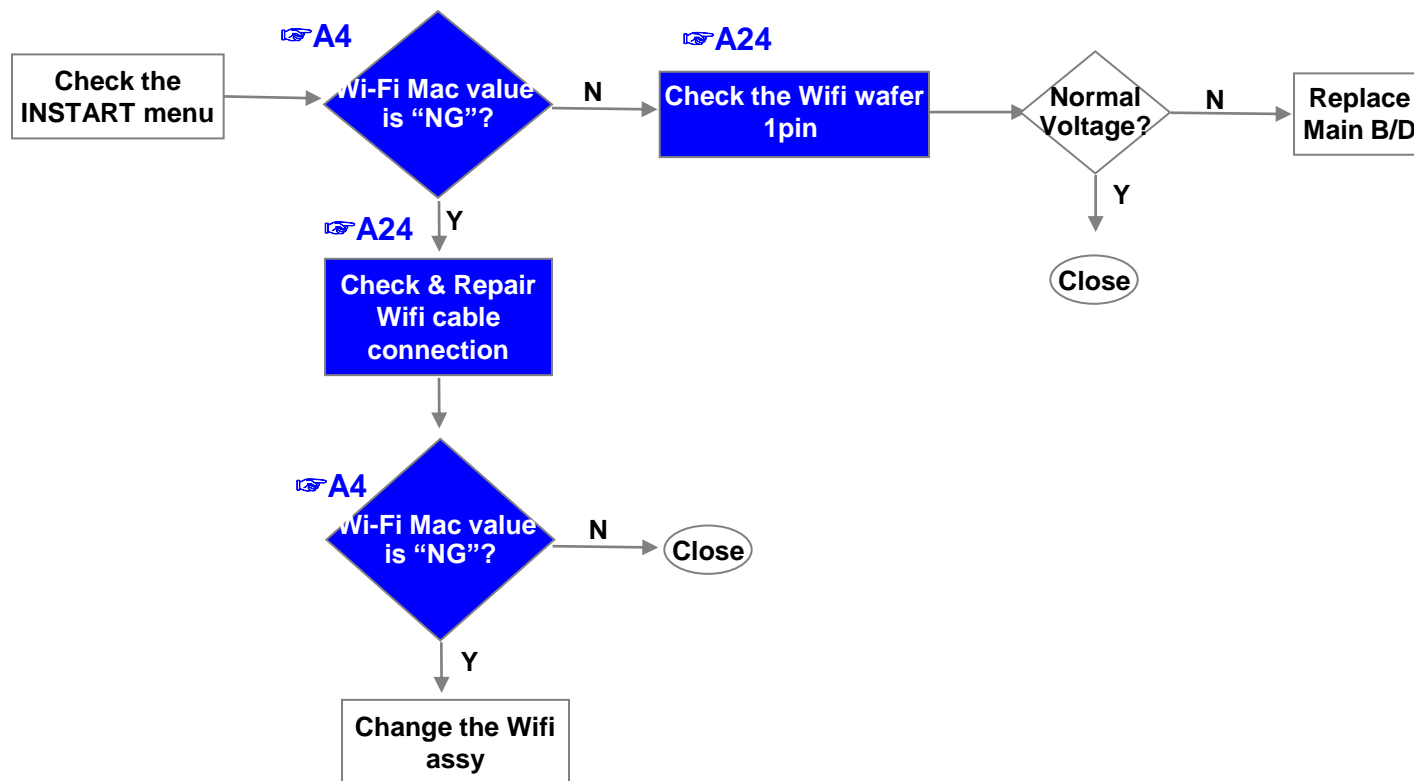
2013.01.31

Wifi operating checking

Revised date

12/16

## 3.Wifi operating error



LCD TV

Error  
symptom

## D. Function error

Established  
date

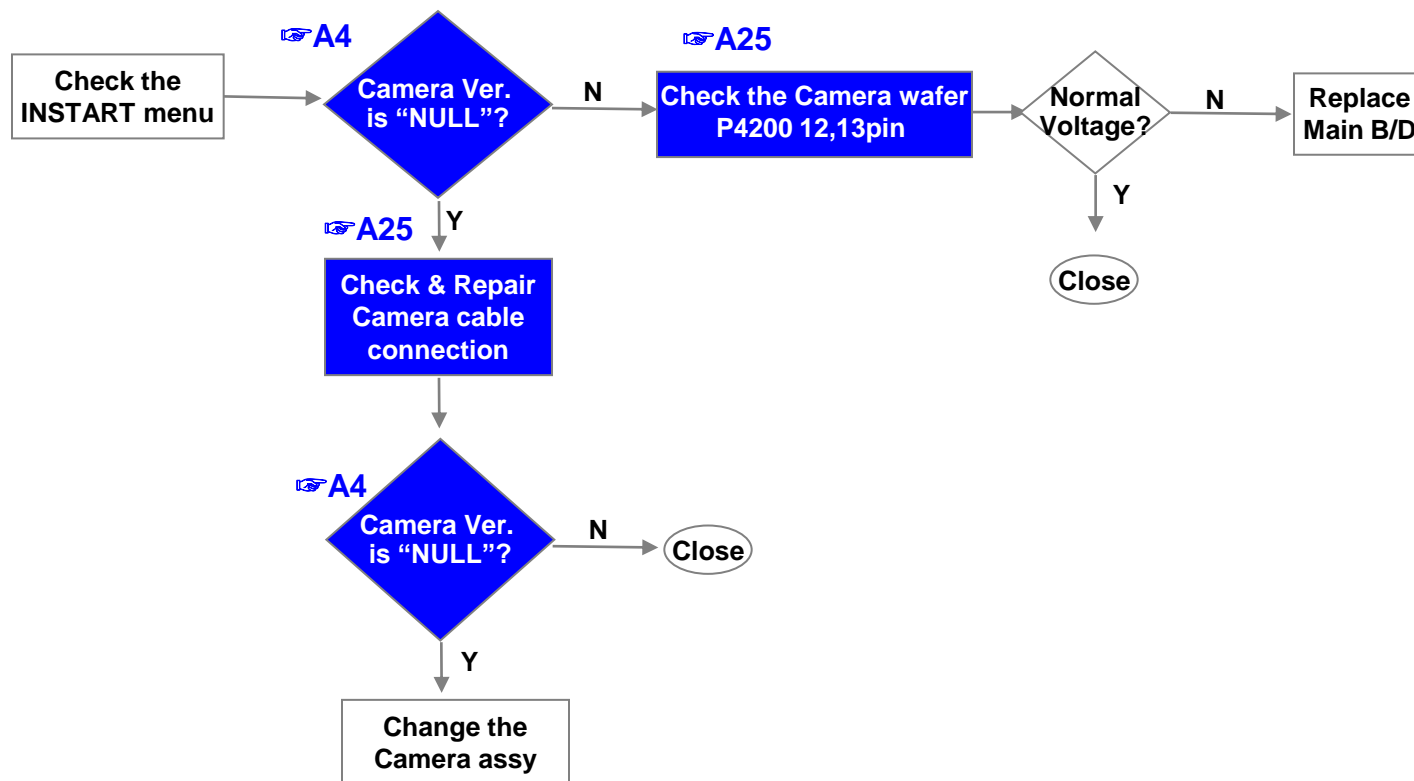
2013.01.31

Camera operating checking

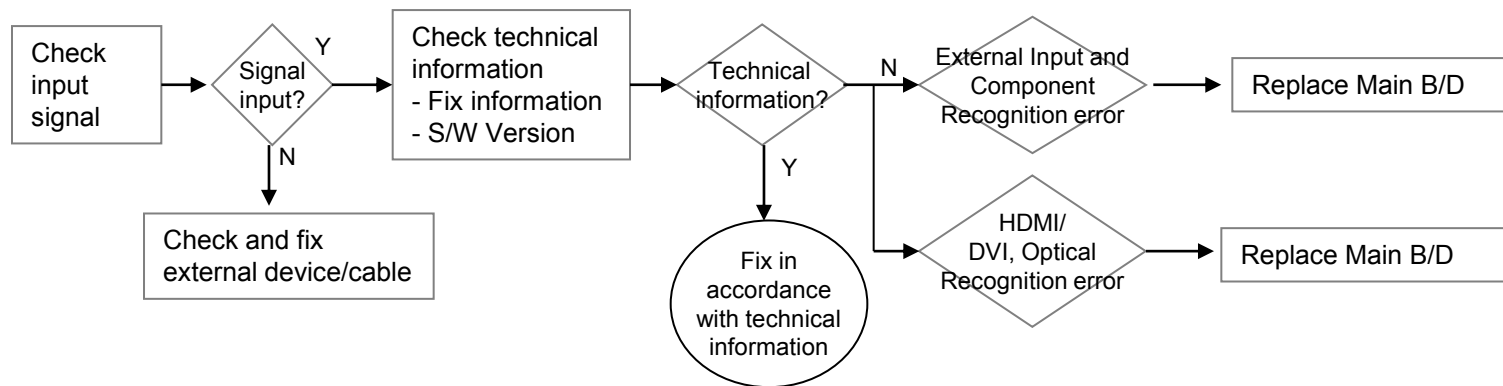
Revised date

13/16

## 4.Camera operating error

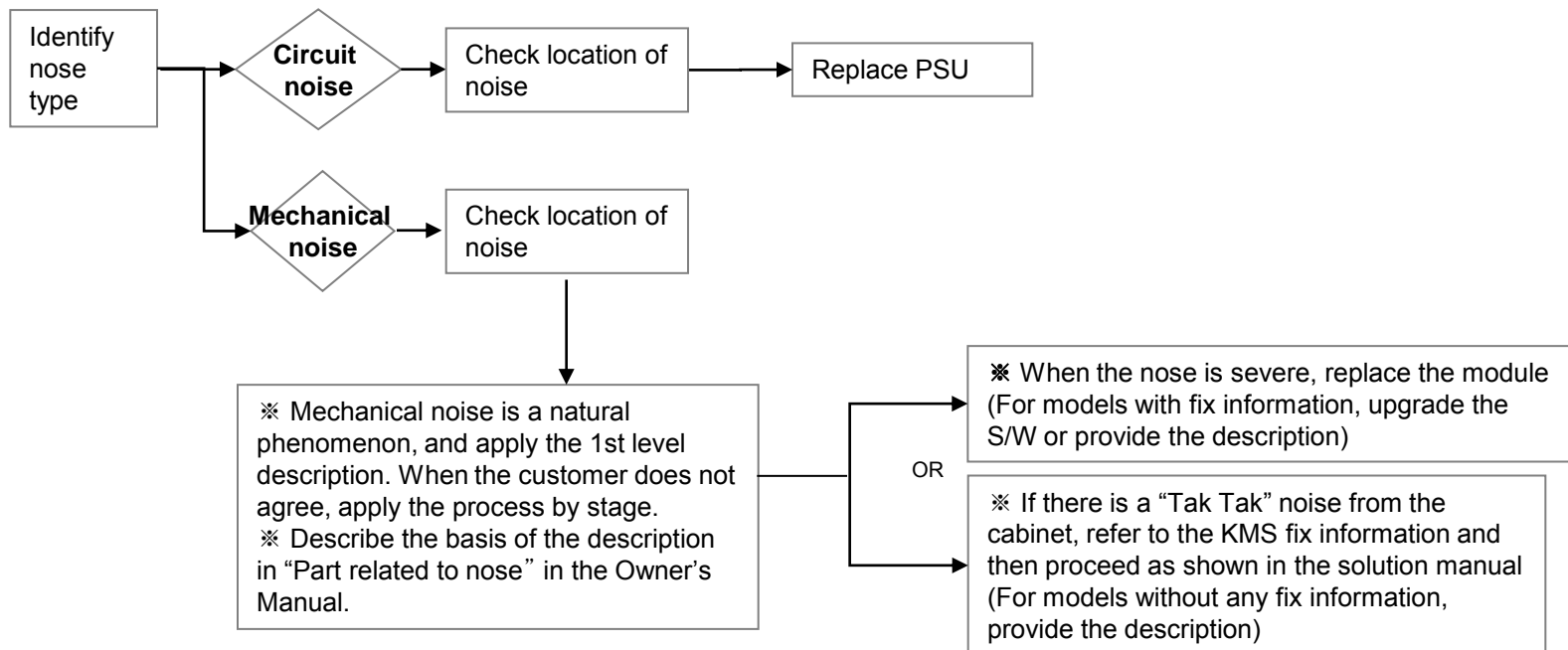


LCD TV	Error symptom	D. Function error	Established date	2013.01.31	
		External device recognition error	Revised date		14/16

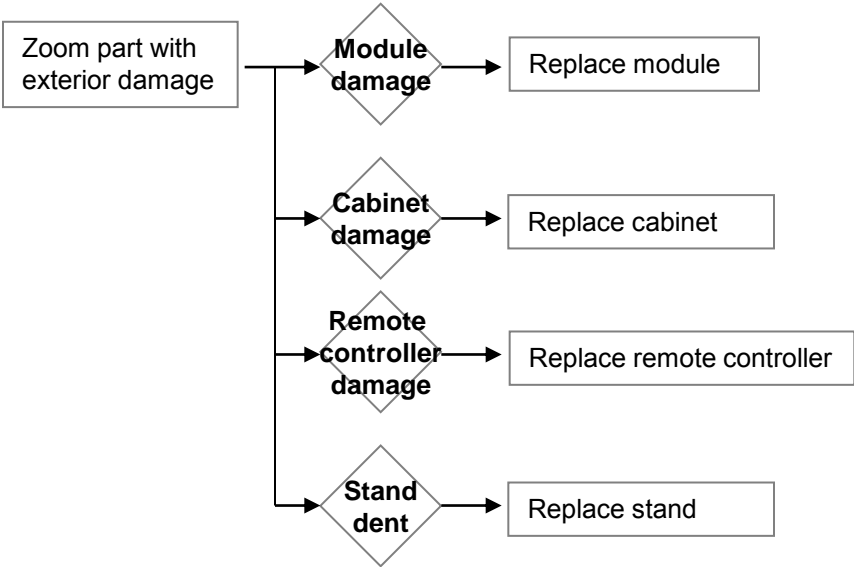




LCD TV	Error symptom	E. Noise	Established date	2013.01.31	
		Circuit noise, mechanical noise	Revised date		15/16



Standard Repair Process					
LCD TV	Error symptom	F. Exterior defect	Established date	2013.01.31	
		Exterior defect	Revised date		16/16



# Contents of LCD TV Standard Repair Process Detail Technical Manual

No.	Error symptom	Content	Page	Remarks
1	A. Video error_ No video/Normal audio	Check LCD back light with naked eye	A1	
2		Check White Balance value	A2	
4	A. Video error_ video error /Video lag/stop	TUNER input signal strength checking method	A3	
5		LCD-TV Version checking method	A4	
6		Tuner Checking Part	A5	
7	A. Video error _Vertical/Horizontal bar, residual image, light spot	LCD TV connection diagram	A6	
8	A. Video error_ Color error	Check Link Cable (EPI) reconnection condition	A7	
9		Adjustment Test pattern – ADJ Key	A8	
10	<b>&lt;Appendix&gt;</b> Defected Type caused by T-Con/ Inverter/ Module	Exchange Main Board (1)	A-1/5	
11		Exchange Main Board (2)	A-2/5	
12		Exchange Power Board (PSU)	A-3/5	
13		Exchange Module (1)	A-4/5	
14		Exchange Module (2)	A-5/5	

**Continue to the next page**

# Contents of LCD TV Standard Repair Process Detail Technical Manual

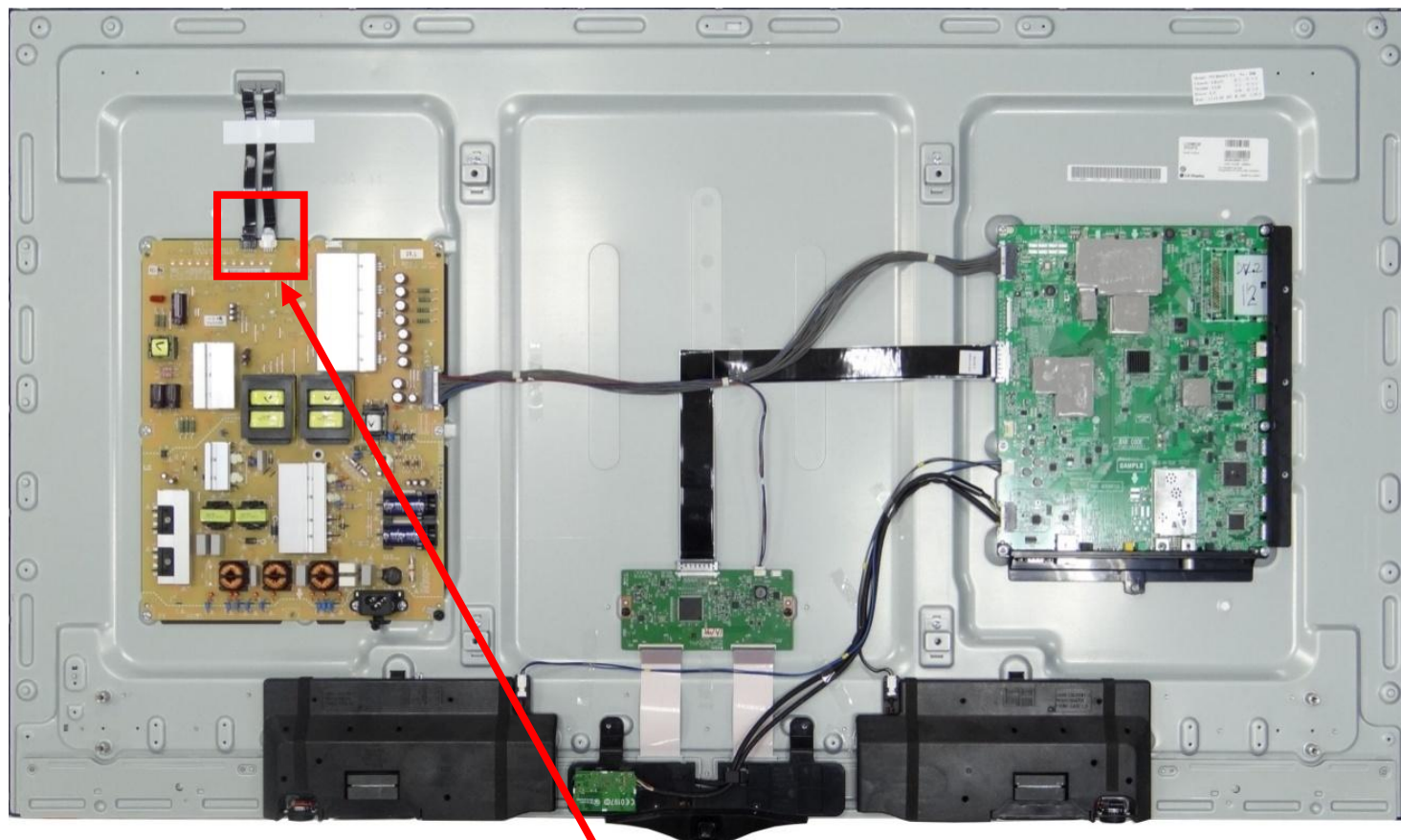
Continued from previous page

No.	Error symptom	Content	Page	Remarks
16	B. Power error_ No power	Check front display LED	A17	
17		Check power input Voltage & ST-BY 3.5V	A18	
18	B. Power error_Off when on, off while viewing	POWER OFF MODE checking method	A19	
19	C. Audio error_ No audio/Normal video	Checking method in menu when there is no audio	A20	
20		Voltage and speaker checking method when there is no audio	A21	
21	D. Function error	Remote controller operation checking method	A22	
22		Motion Remote operation checking method	A23	
23		Wifi operation checking method	A24	
24		Camera operation checking method	A25	Not Used
25	E. Etc	Tool option changing method	A26	

# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error_No video/Normal audio	Established date	2013.01.31	
	Content	Check LCD back light with naked eye	Revised date		A1

<49/55UB850X-XX>



After turning on the power and disassembling the case, check with the naked eye, whether you can see light from locations.

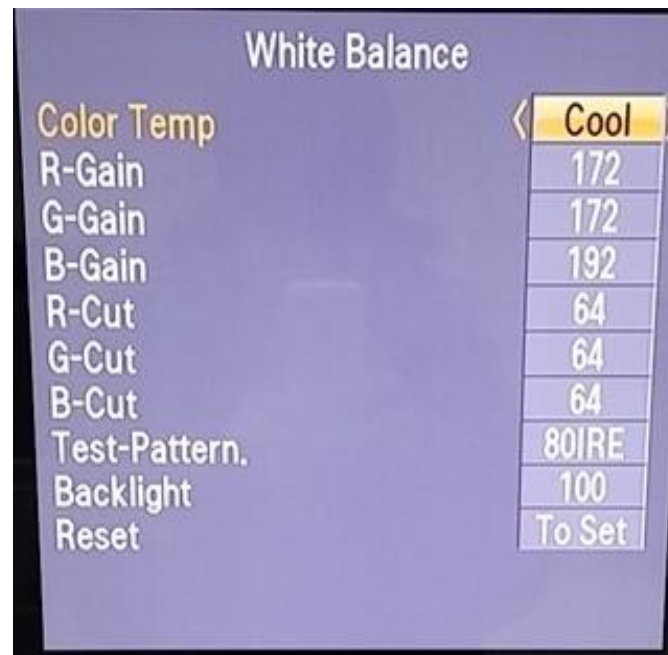
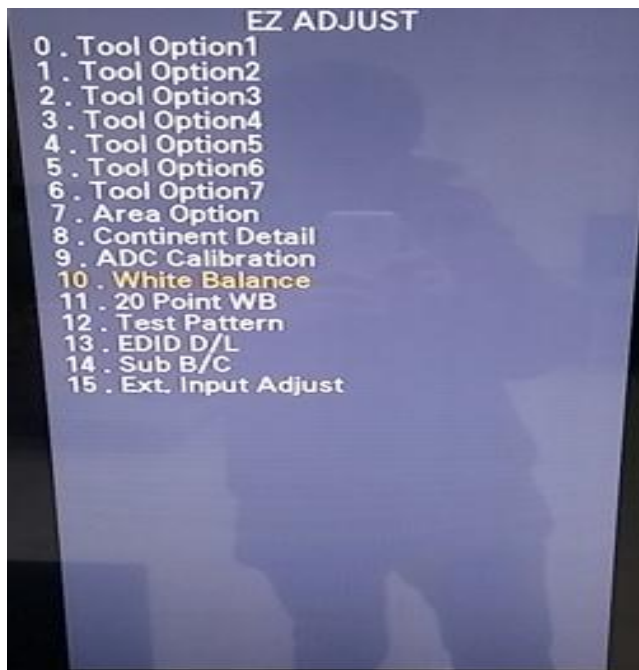
A1

\* Tuner is different from region

# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error_No video/Normal audio	Established date	2014.02.14	
	Content	Check White Balance value	Revised date		A2

<ALL MODELS>



## Entry method

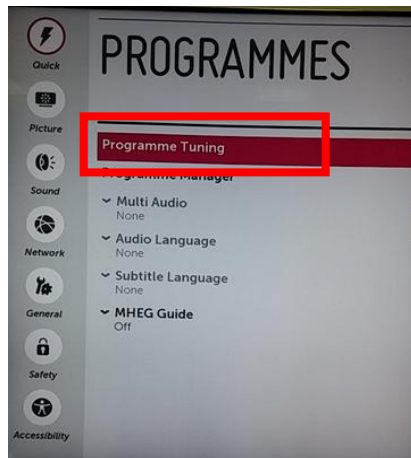
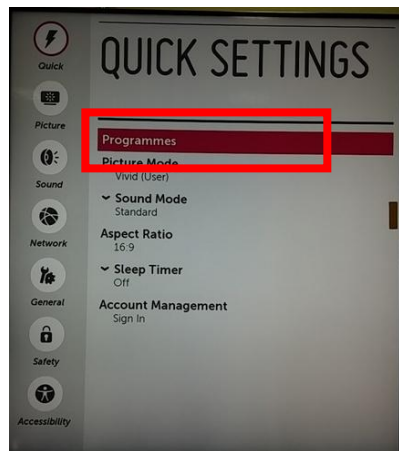
1. Press the ADJ button on the remote controller for adjustment.
2. Enter into White Balance of item 10.
3. After recording the R, G, B (GAIN, Cut) value of Color Temp (Cool/Medium/Warm), re-enter the value after replacing the MAIN BOARD.

A2

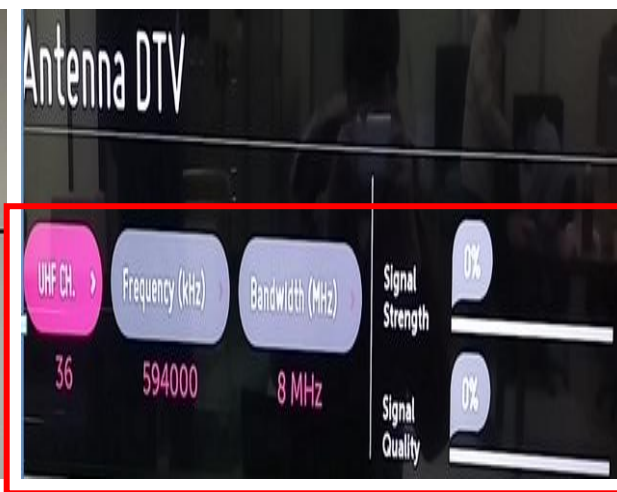
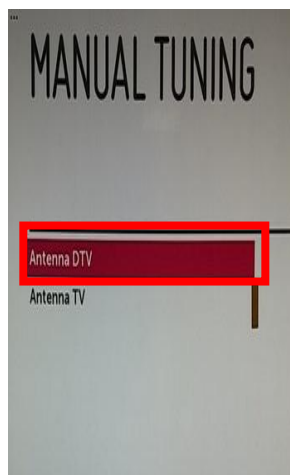
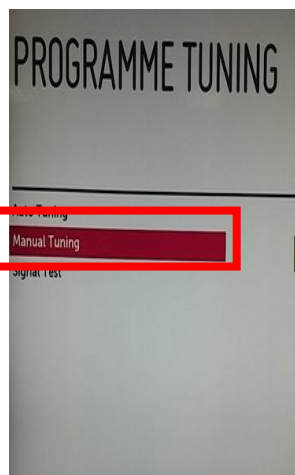
# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error_Video error, video lag/stop	Established date	2014.02.14	A3
	Content	TUNER input signal strength checking method	Revised date		

<ALL MODELS>



Quick Settings → Programmes → Programme Tuning  
→ Manual Tuning



When the signal is strong, use the attenuator (-10dB, -15dB, -20dB etc.)



# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error_Video error, video lag/stop	Established date	2014.02.14	
	Content	LCD-TV Version checking method	Revised date		A4

<ALL MODELS>

## 1. Checking method for remote controller for adjustment

Version

IN START

Model Name	: 55UB850T-TA
Serial Number	: 401KCRNB8422
S/W Version	: 02.07.13.01
MICOM Version	: V1.01.1
BOOT Version	: 3.03.65
U14 Version	: NULL
D14 Version(m0/m1)	: 0x0103/0x0103
URSA Version	: 0xd01a
EDID (RGB/HDMI)	: NULL / 0.00
Chip Type	: LG1154
Wi-Fi Channel	: 1
Wi-Fi MAC	: 9C:80:DF:24:73:40
MAC Address	: CC:2D:8C:9E:CD:AB
IP Address	: 0.0.0.0
Widevine	: LGTV14CLGE000011915
ESN Num.	: LGTV20141=11000090167
HDCP2.0	: OK
RF Receiver Version	: 1.2.7.37
Wi-Fi/Magic Search	: OK/NG
Camera Ver.	: NULL
A.Demod F/W Ver.	: 0x43b00x40b1L
D.Demod F/W Ver.	: 0x40b1LGD_ELF
Debug Status	: 1
Access USB Status:	1/-1(T)/-1(C)
UTT	: 1
APP History Ver.	: 13
PQL DB	: LGD_ELF_SI2178_XXXXUx



Press the IN-START with the remote controller for adjustment

A4



# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error_Video error, video lag/stop	Established date	2014.02.14	
	Content	TUNER checking part	Revised date		A5

<ALL MODELS>



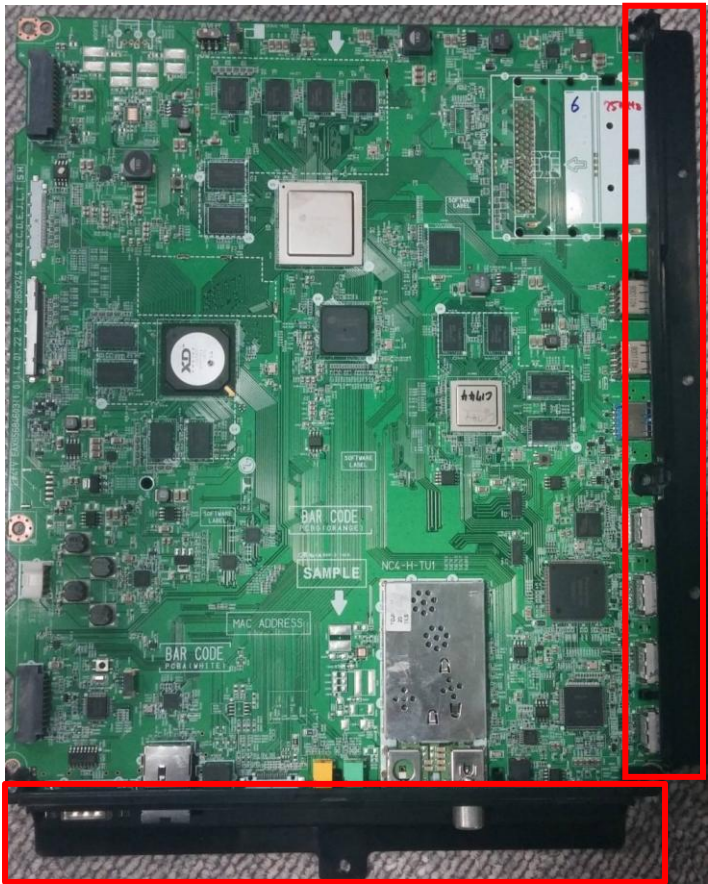
Checking method:

1. Check the signal strength or check whether the screen is normal when the external device is connected.
2. After measuring each voltage from power supply, finally replace the MAIN BOARD.

# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error _Vertical/Horizontal bar, residual image, light spot	Established date	2014.02.14	
	Content	LCD TV connection diagram (1)	Revised date		A6

<ALL MODELS>



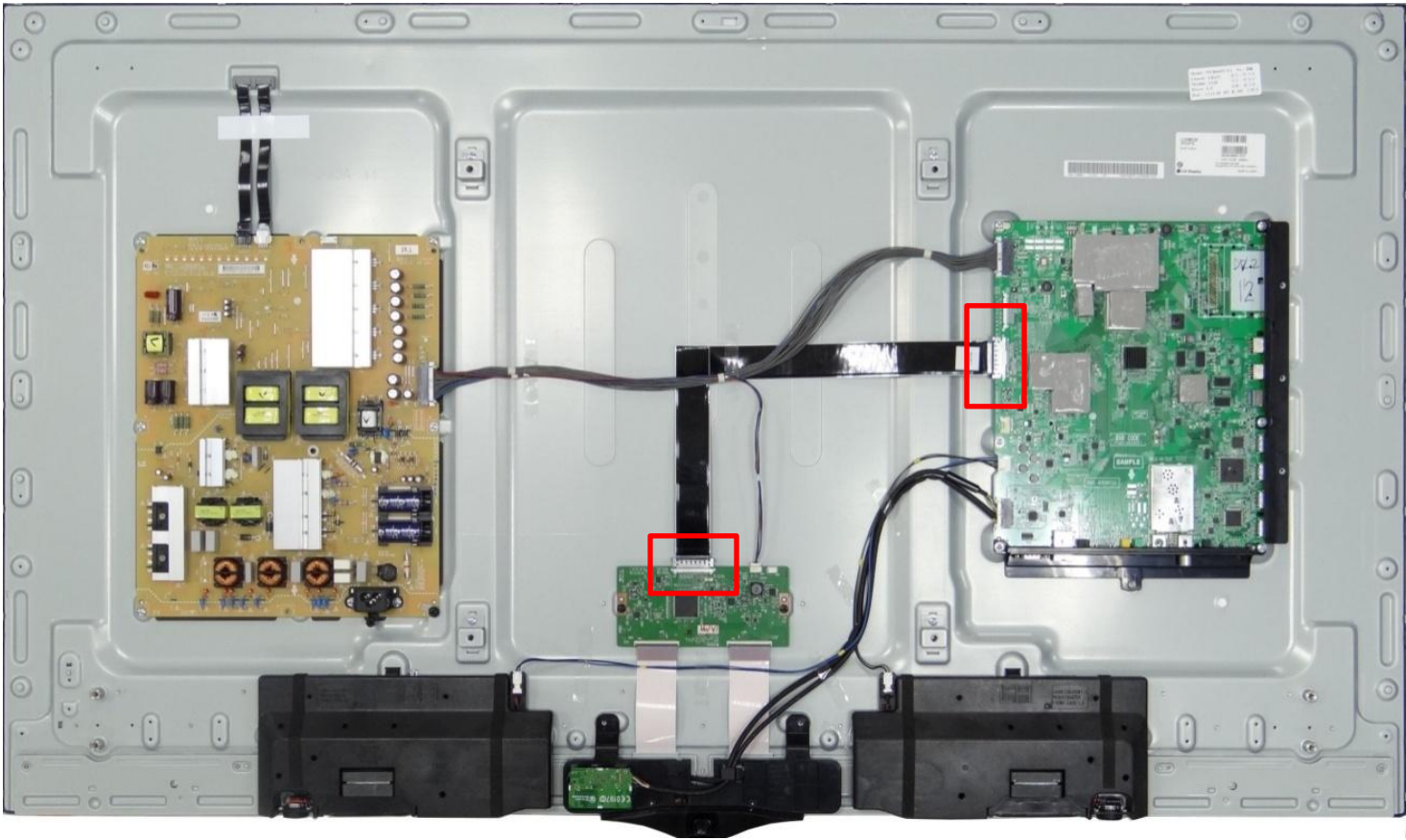
As the part connecting to the external input, check the screen condition by signal

A6

# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error_Color error	Established date	2014.02.14	A7
	Content	Check Link Cable (LVDS) reconnection condition	Revised date		

<ALL MODELS>



Check the contact condition of the Link Cable, especially dust or mis insertion.

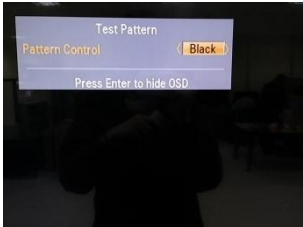
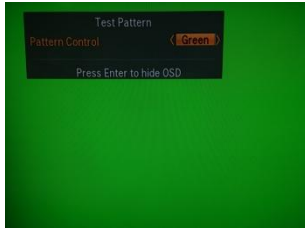
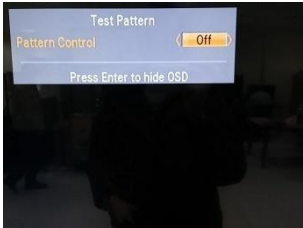
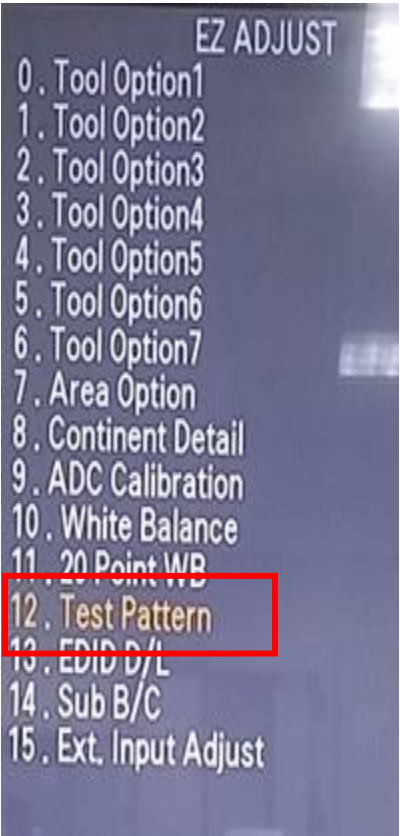
A7

\* Tuner is different from region



# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error_Color error	Established date	2014.02.14	
	Content	Adjustment Test pattern - ADJ Key	Revised date		A8



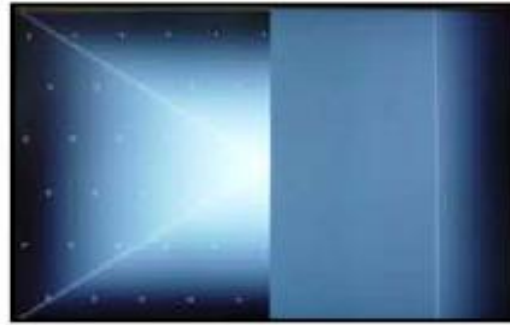
You can view 6 types of patterns using the ADJ Key

Checking item : 1. Defective pixel    2. Residual image    3. MODULE error (ADD-BAR,SCAN BAR..)  
4.Video error (Classification of MODULE or Main-B/D!)

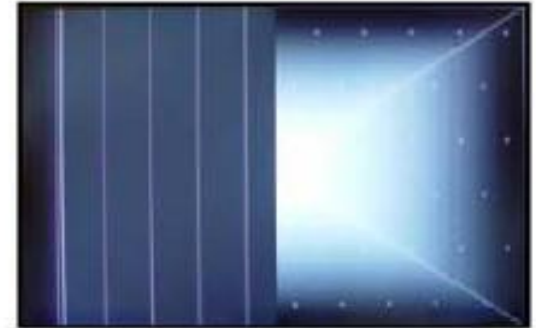
## Appendix : Exchange Main Board (1)



Solder defect, CNT Broken



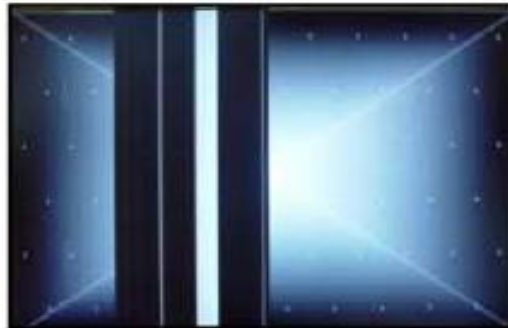
Solder defect, CNT Broken



Solder defect, CNT Broken



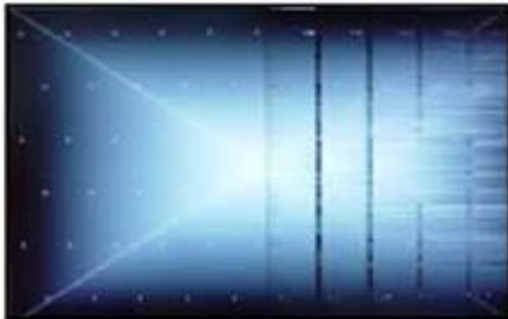
Solder defect, CNT Broken



Solder defect, CNT Broken



Abnormal Power Section



Solder defect, Short/Crack



Abnormal Power Section



Solder defect, Short/Crack

## Appendix : Exchange Main Board (2)



Abnormal Power Section



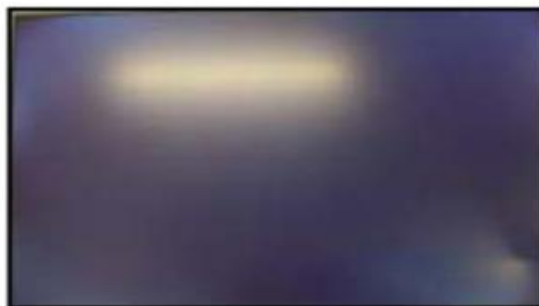
Abnormal Power Section



Solder defect, Short/Crack



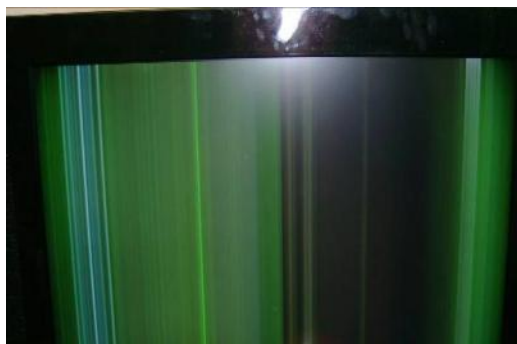
Solder defect, Short/Crack



Fuse Open, Abnormal power section



Abnormal Display



GRADATION



Noise



GRADATION

## Appendix : Exchange Power Board (PSU)



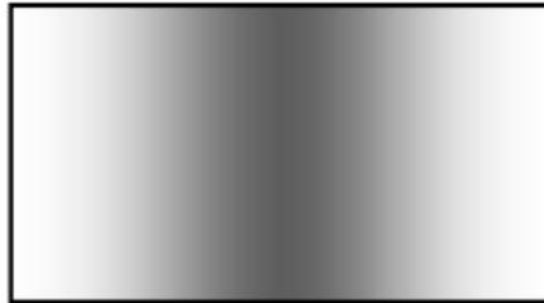
No Light



Dim Light



Dim Light



Dim Light



No picture/Sound Ok

## Appendix : Exchange the Module (1)



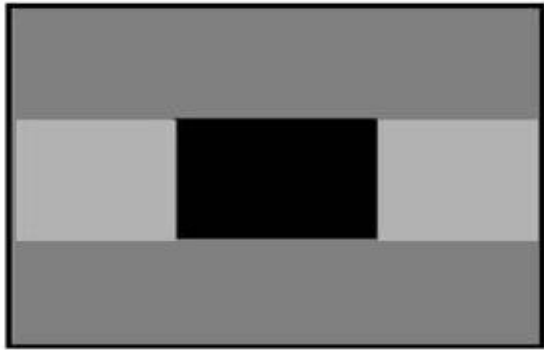
Panel Mura, Light leakage



Panel Mura, Light leakage



Press damage



Crosstalk



Press damage



Crosstalk



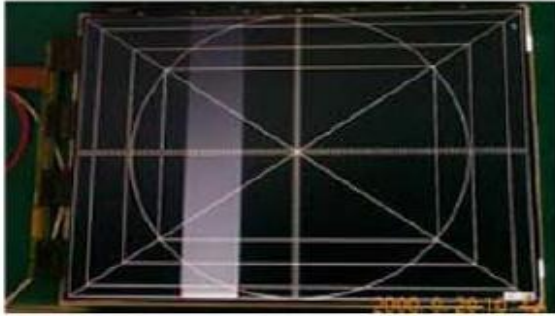
Press damage

### Un-repairable Cases

In this case please exchange the module.



## Appendix : Exchange the Module (2)



Vertical Block  
Source TAB IC Defect



Vertical Line  
Source TAB IC Defect



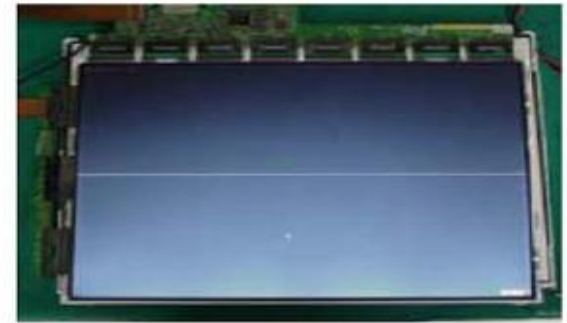
Vertical Block  
Source TAB IC Defect



Horizontal Block  
Gate TAB IC Defect



Horizontal Block  
Gate TAB IC Defect



Horizontal line  
Gate TAB IC Defect



Horizontal Block  
Gate TAB IC Defect

**Un-repairable Cases**  
**In this case please exchange the module.**

# Standard Repair Process Detail Technical Manual

LCD TV

Error  
symptom

B. Power error \_No power

Established  
date

2014.02.07

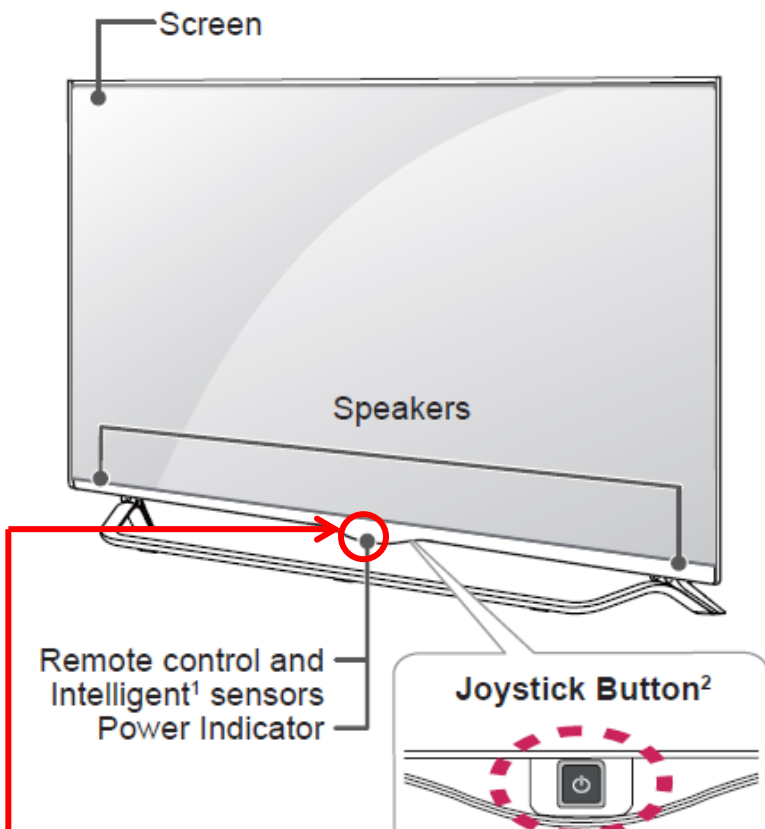
Content

Check front Power Indicator

Revised  
date

A17

<49/55UB850X-XX>



**NOTE**

- You can set the LG Logo Light or power indicator light to on or off by selecting **GENERAL** in the main menus.

## Using the joystick button

You can operate the TV by pressing the button or moving the joystick left, right, up, or down.

### Basic Functions

	Power On	When the TV is turned off, place your finger on the joystick button and press it once and release it.
	Power Off	When the TV is turned on, place your finger on the joystick button and press it once for a few seconds and release it.
	Volume Control	If you place your finger over the joystick button and move it left or right, you can adjust the volume level you want.
	Programmes Control	If you place your finger over the joystick button and move it up or down, you can scrolls through the saved programmes you want.



**NOTE**

- When your finger over the joystick button and push it to the up, down, left or right, be careful not to press the joystick button. If you press the joystick button first, you can not adjust the volume level and saved programmes.

### Adjusting the Menu

When the TV is turned on, press the joystick button one time.

You can adjust the Menu items (⏻, ✕, 📺) moving the joystick button up, down, left or right.

	⏻	TV OFF	Turns the power off.
	✕	CLOSE	Clears on-screen displays and return to TV viewing.
	📺	INPUT	Changes the input source.

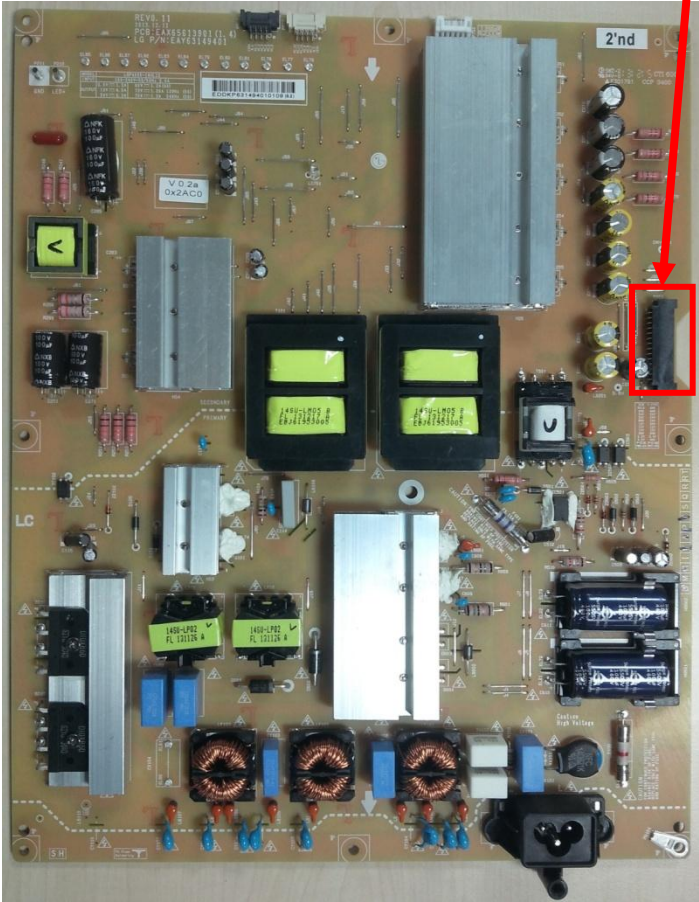
ST-BY condition: On or Off  
Power ON condition: Turn Off

A17

Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	B. Power error _No power	Established date	2014.02.05	A18
	Content	Check power input voltage and ST-BY 3.5V	Revised date		

Check the DC 24V, 12V, 3.5V.



P\_main  
Maker : Yeonho  
28Pin SMAW200-H28S5K  
28Pin map (LPB)

1	PWR ON	2	DVR_ON
3	P_DIM #1	4	PDIM #2
5	3.5V	6	GND
7	3.5V	8	3.5V
9	GND	10	GND
11	12V	12	12V
13	12V	14	12V
15	12V	16	GND
17	GND	18	24V
19	24V	20	24V
21	24V	22	24V
23	GND	24	GND
25	SCLK	26	GND
27	SIN	28	VSYN

# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	B. Power error _Off when on, off whiling viewing	Established date	2014.02.05	
	Content	POWER OFF MODE checking method	Revised date		A19

<ALL MODELS>

IN START		Power Off Status
Model Name : WEBOS1	1. Adjust Check	0. POWER_OFF_BY_ACDET
Serial Number : SKJY1107	2. ADC Data	1. POWER_OFF_BY_REMOTE_KEY
S/W Version : 02.06.14.01	3. Power Off Status	2. POWER_OFF_BY_REMOTE_KEY
MICOM Version : V1.00.9	4. System 1	3. POWER_OFF_BY_ACDET
BOOT Version : 3.03.44	5. System 2	4. POWER_OFF_BY_INSTOP_KEY
U14 Version : 0x0026	6. System 3	5. POWER_OFF_BY_UNKNOWN
D14 Version(m0/m1) : 0x0103/0x0100	7. Model Number D/L	6. POWER_OFF_BY_UNKNOWN
URSA Version : 0xa00e	8. Test Option	7. POWER_OFF_BY_UNKNOWN
EDID (RGB/HDMI) : NULL / 0.00	9. Spread Spectrum	8. POWER_OFF_BY_UNKNOWN
Chip Type : LG1154	10. Stable Count	9. POWER_OFF_BY_UNKNOWN
Wi-Fi Channel : N/A	11. SDP Server Selection	10. POWER_OFF_BY_UNKNOWN
Wi-Fi MAC : NG	12. RF Remocon Test	11. POWER_OFF_BY_UNKNOWN
MAC Address : CA:84:B0:E5:E8:44	13. Access Code	12. POWER_OFF_BY_UNKNOWN
IP Address : 0.0.0.0		13. POWER_OFF_BY_UNKNOWN
Widevine : NG		14. POWER_OFF_BY_UNKNOWN
ESN Num. : NG		15. POWER_OFF_BY_UNKNOWN
HDCP2.0 : NG		16. POWER_OFF_BY_UNKNOWN
RF Receiver Version : 0.0.0.0		17. POWER_OFF_BY_UNKNOWN
Wi-Fi/Magic Search : NG/NG		18. POWER_OFF_BY_UNKNOWN
Camera Ver. : NULL		19. POWER_OFF_BY_UNKNOWN
A.Demod F/W Ver. : 0x43b00x40b1L		20. POWER_OFF_BY_UNKNOWN
D.Demod F/W Ver. : 0x40b1LGD_ELF		21. POWER_OFF_BY_UNKNOWN
Debug Status : EVENT		22. POWER_OFF_BY_UNKNOWN
Access USB Status: 1/-1(T)/-1(C)		23. POWER_OFF_BY_UNKNOWN
UTT : 1		24. POWER_OFF_BY_UNKNOWN
APP History Ver.: 509		
PQL DB : LGD_ELF_SI2178_XXXXUo		

## Entry method

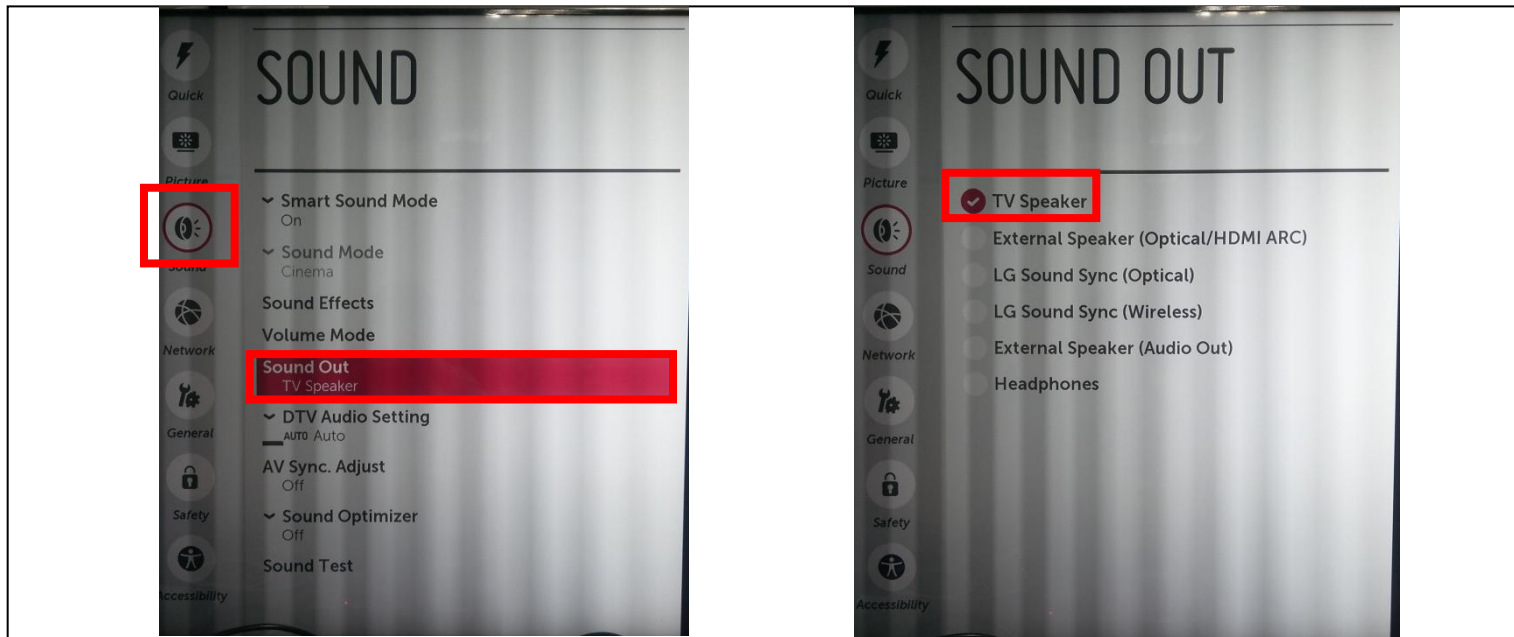
1. Press the IN-START button of the remote controller for adjustment
2. Check the entry into adjustment item 3



# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	C. Audio error_No audio/Normal video	Established date	2014.02.05	A20
	Content	Checking method in menu when there is no audio	Revised date		

<ALL MODELS>



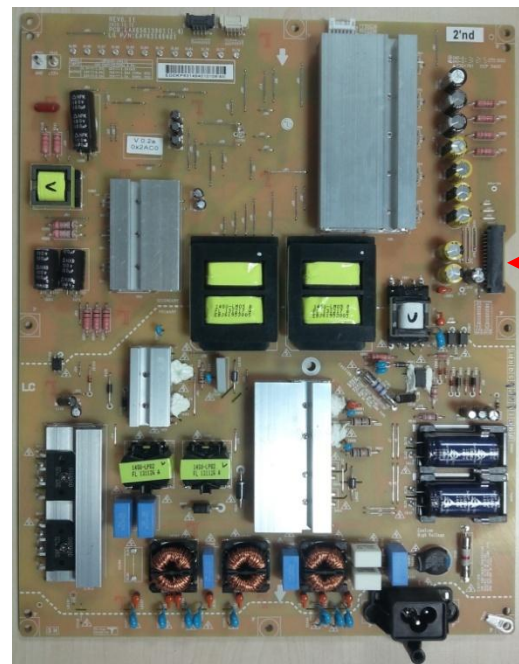
## Checking method

1. Press the Setting button on the remote controller
2. Select the Sound function of the Menu
3. Select the Sound Out
4. Select TV Speaker

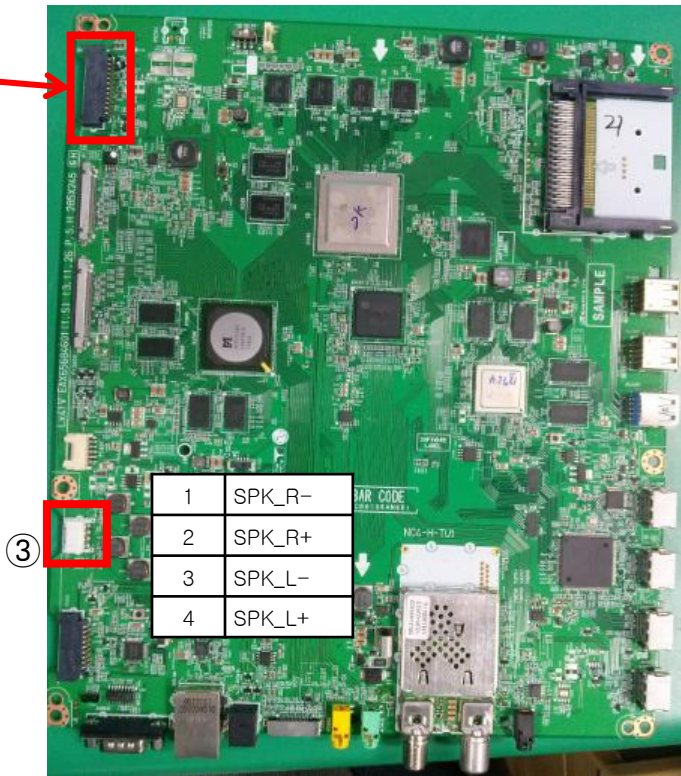
# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	C. Audio error_No audio/Normal video	Established date	2014.02.05	A21
	Content	Voltage and speaker checking method when there is no audio	Revised date		

<49/55UB850X-XX>



1	PWR ON	2	DVR_ON
3	P_DIM #1	4	PDIM #2
5	3.5V	6	GND
7	3.5V	8	3.5V
9	GND	10	GND
11	12V	12	12V
13	12V	14	12V
15	12V	16	GND
17	GND	18	24V
19	24V	20	24V
21	24V	22	24V
23	GND	24	GND
25	SCLK	26	GND
27	SIN	28	VSYNC



## Checking order when there is no audio

1. Check the contact condition of or 24V connector of Main Board
2. Measure the 24V input voltage supplied from Power Board  
(If there is no input voltage, remove and check the connector)
3. Connect the tester RX1 to the speaker terminal and if you hear the Chik Chik sound when you touch the GND and output terminal, the speaker is normal.

# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	D. Function error	Established date	2014.02.07	
	Content	Remote controller operation checking method	Revised date		A22

<49/55UB850X-XX>

Front



Back

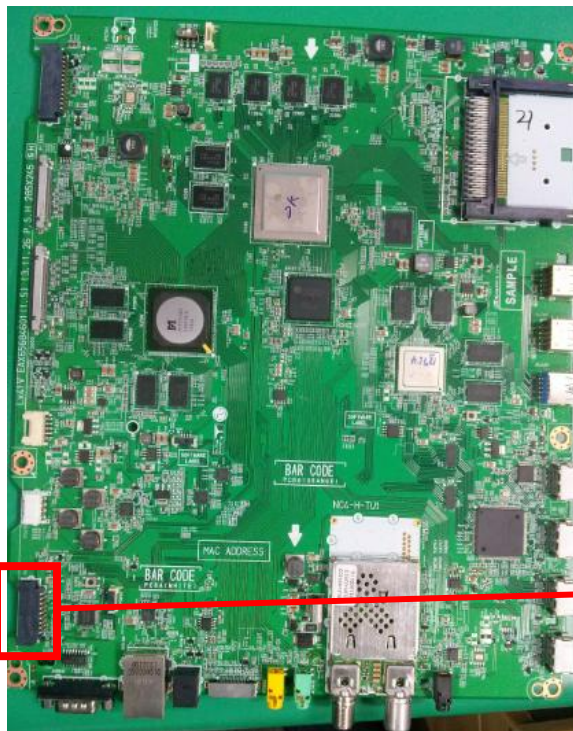


① Wifi/ BT Combo

## Checking order to check remote controller

### Checking order

1. Check IR cable condition between IR & Main board. ( Check picture number ① and ② )
2. Check the standby 3.5V on the terminal 16 pin (③)
3. AS checking the Pre-Amp(IR LED light) , the power is in ON condition, an Analog Tester needle should move slowly, otherwise, it's defective.



1	GND
2	+3.5V WOL
3	BT_RESET
4	USB_DM
5	NC
6	USB_DP
7	WOL
8	GND
9	SDA
10	GND
11	SCL
12	KEY1
13	GND
14	KEY2
15	IR
16	+3.5V_ST
17	LED_R
18	GND



Standard Repair Process Detail Technical Manual

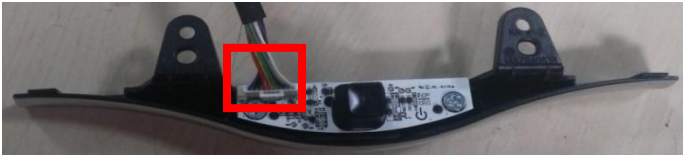
LCD TV	Error symptom	D. Function error	Established date	2014.02.07	A23
	Content		Revised date		

<49/55UB850X-XX>

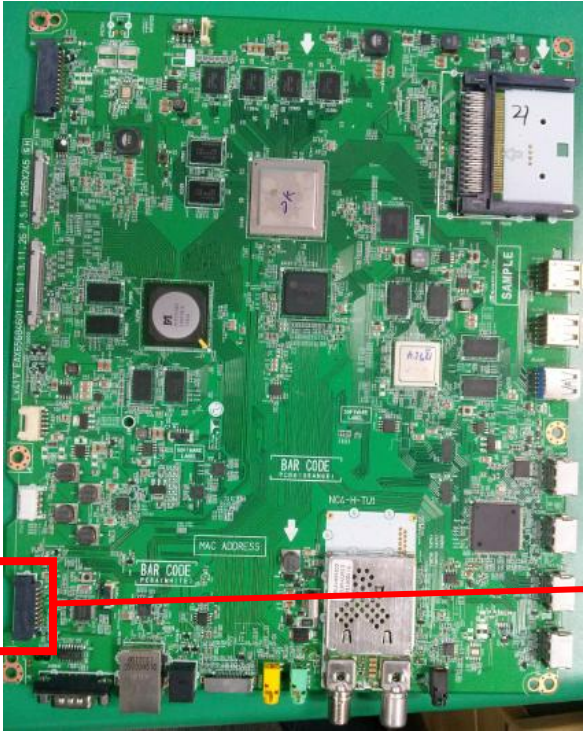
Front



Back



① Wifi/ BT Combo



1	GND
2	+3.5V WOL
3	BT_RESET
4	USB_DM
5	NC
6	USB_DP
7	WOL
8	GND
9	SDA
10	GND
11	SCL
12	KEY1
13	GND
14	KEY2
15	IR
16	+3.5V_ST
17	LED_R
18	GND

Checking order to check motion remote/wifi

Checking order

- 1.Check BT/Wifi cable condition between BT/Wifi assy & Main board.
- 2.Check the 3.5V on the terminal 16



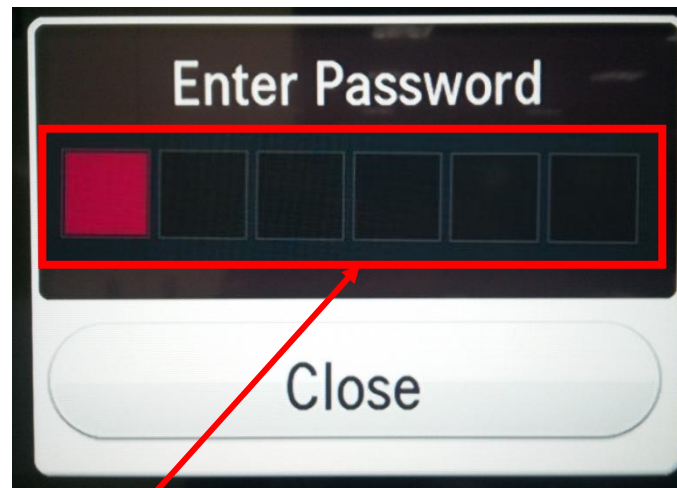
# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	E. Etc	Established date	2014.02.05	
	Content	Tool option changing method	Revised date		A26

<49/55UB850X-XX>



①



②

## Changing method

1. Contact the USB memory. (USB 1,2,3 jack)
  2. Enter the password. (ex. 000000)
- \* Access USB Memory has each password.

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