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OLED TV
SERVICE MANUAL

CHASSIS : EA41C

MODEL : 77EG9700 77EG9700-UA

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

P/NO : MFL68163005 (1412-REV00)

Printed in Korea

CONTENTS

SAFETY PRECAUTIONS

IMPORTANT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by ⚠ in the Schematic Diagram and 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 it's components from being damaged by accidental shorts of the circuitry that may be inadvertently introduced during the service operation.

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

When replacing a high wattage resistor (Oxide Metal Film Resistor, over 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,

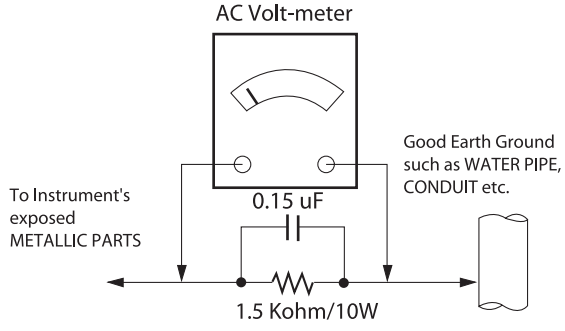
always perform an **AC leakage current check** on the exposed metallic parts of the cabinet, such as antennas, terminals, etc., to be sure the set is safe to operate without damage of electrical shock.

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 MΩ and 5.2 MΩ.
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 uF capacitor between a known good earth ground (Water Pipe, Conduit, etc.) and the exposed metallic parts.
Measure the AC voltage across the resistor using AC voltmeter with 1000 ohms/volt or more sensitivity.
Reverse plug the AC cord into the AC outlet and repeat AC voltage measurements for each exposed metallic part. Any voltage measured must not exceed 0.75 volt RMS which is corresponds to 0.5 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 Ω
*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;
   a. Removing or reinstalling any component, circuit board module or any other receiver assembly.
   b. Disconnecting or reconnecting any receiver electrical plug or other electrical connection.
   c. Connecting a test substitute in parallel with an electrolytic capacitor in the receiver.
   CAUTION: A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.
2. Test high voltage only by measuring it with an appropriate high voltage meter or other voltage measuring device (DVM, FETVOM, etc) equipped with a suitable high voltage probe. Do not test high voltage by "drawing an arc".
3. Do not spray chemicals on or near this receiver or any of its assemblies.
4. Unless specified otherwise in this service manual, clean electrical contacts only by applying the following mixture to the contacts with a pipe cleaner, cotton-tipped stick or comparable non-abrasive applicator; 10 % (by volume) Acetone and 90 % (by volume) isopropyl alcohol (90 % - 99 % strength)
   CAUTION: This is a flammable mixture.
   Unless specified otherwise in this service manual, lubrication of contacts in not required.
5. Do not defeat any plug/socket B+ voltage interlocks with which receivers covered by this service manual might be equipped.
6. Do not apply AC power to this instrument and/or any of its electrical assemblies unless all solid-state device heat sinks are correctly installed.
7. Always connect the test receiver ground lead to the receiver chassis ground before connecting the test receiver positive lead.
   Always remove the test receiver ground lead last.
8. Use with this receiver only the test fixtures specified in this service manual.
   CAUTION: Do not connect the test fixture ground strap to any heat sink in this receiver.

Electrostatically Sensitive (ES) Devices

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

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed to prevent potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static type solder removal device. Some solder removal devices not classified as “anti-static” can generate electrical charges sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.
   CAUTION: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device.)

General Soldering Guidelines

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

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

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

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

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

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

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

Fuse and Conventional Resistor
Removal/Replacement
1. Clip each fuse or resistor lead at top of the circuit board hollow stake.
2. Securely crimp the leads of replacement component around notch at stake top.
3. Solder the connections.
   CAUTION: Maintain original spacing between the replaced component and adjacent components and the circuit board to prevent excessive component temperatures.

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

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

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

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

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

SPECIFICATION

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

1. Application range

This spec sheet is applied OLED TV with EA41C chassis

2. Test condition

Each part is tested as below without special notice.

1) Temperature : 25 ºC ± 5 ºC(77 ± 9 ºF) , CST : 40 ºC±5 ºC
2) Relative Humidity: 65 % ± 10 %
3) Power Voltage

Market	Input voltage	Frequency	Remark
North America	120V	50/60Hz	Standard Voltage of each product is marked by models

4) Specification and performance of each parts are followed each drawing and specification by part number in accordance with BOM
5) The receiver must be operated for about 20 minutes prior to the adjustment

3. Test method

1) Performance: LGE TV test method followed
2) Demanded other specification
   Safety : UL, CSA, CE, IEC specification
   EMC: FCC, ICES, CE, IEC specification
   Wireless : Wireless HD Specification (Option)

4. General Specification

No	Item	Specification	Remark
1	Market	North America	
2	Broad casting System	1) ATSC / NTSC-M, 64 & 256 QAM (US)	1) VHF : 02~13 2) UHF : 14~69 3) DTV : 02-69 4) CATV : 01~135 5) CADTV : 01~135
3	Receiving System	1) ATSC / NTSC-M	
4	Input Voltage	AC 100 ~ 240V 50/60Hz	USA (110~240V, 50/60Hz)
5	Screen Size	77 inch Wide(3840 × 2160)	
6	Aspect Ratio	16:9	
7	Tuning System	FS	
8	OLED Module	77.0” QWUXGA OLED	
9	Operating Environment	1) Temp : 0 ~ 40 deg 2) Humidity : ~ 80 %	
10	Storage Environment	1) Temp : -20 ~ 60 deg 2) Humidity : ~ 85 %	

5. External input format

5.1. 2D mode

5.1.1. Component input (Y, CB/PB, CR/PR)

No.	Resolution	H-freq(kHz)	V-freq.(kHz)	Pixel clock	Proposed
1	720*480	15.73	60	13.5135	SDTV ,DVD 480I
2	720*480	15.73	59.94	13.5	SDTV ,DVD 480I
3	720*480	31.50	60	27.027	SDTV 480P
4	720*480	31.47	59.94	27.0	SDTV 480P
5	1280*720	45.00	60.00	74.25	HDTV 720P
6	1280*720	44.96	59.94	74.176	HDTV 720P
7	1920*1080	33.75	60.00	74.25	HDTV 1080I
8	1920*1080	33.72	59.94	74.176	HDTV 1080I
9	1920*1080	67.500	60	148.50	HDTV 1080P
10	1920*1080	67.432	59.94	148.352	HDTV 1080P
11	1920*1080	27.000	24.000	74.25	HDTV 1080P
12	1920*1080	26.97	23.976	74.176	HDTV 1080P
13	1920*1080	33.75	30.000	74.25	HDTV 1080P
14	1920*1080	33.71	29.97	74.176	HDTV 1080P

5.1.2. HDMI Input (PC/DTV)

No.	Resolution	H-freq(kHz)	V-freq.(kHz)	Pixel clock(MHz)	Proposed	
	HDMI-PC					DDC
1	640*350	31.468	70.09	25.17	EGA	
2	720*400	31.469	70.08	28.32	DOS	
3	640*480	31.469	59.94	25.17	VESA(VGA)	
4	800*600	37.879	60.31	40.00	VESA(SVGA)	
5	1024*768	48.363	60.00	65.00	VESA(XGA)	
6	1152*864	54.348	60.053	80.00	VESA	
7	1280*1024	63.981	60.020	108.00	VESA (SXGA)	
8	1360*768	47.712	60.015	85.50	VESA (WXGA)	
9	1920*1080	67.5	60	148.5	WUXGA(Reduced Blanking)	
10	3840*2160	54	24.00	297.00	UDTV 2160P	
11	3840*2160	56.25	25.00	297.00	UDTV 2160P	
12	3840*2160	67.5	30.00	297.00	UDTV 2160P	

No.	Resolution	H-freq(kHz)	V-freq.(kHz)	Pixel clock(MHz)	Proposed
	HDMI-DTV				
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	SDTV 480I
4	1280*720	44.96	59.94	74.176	SDTV 480I
5	1920*1080	33.75	60.00	74.25	SDTV 480P
6	1920*1080	33.72	59.94	74.176	SDTV 480P
7	1920*1080	67.500	60	148.50	HDTV 720P
8	1920*1080	67.432	59.939	148.352	HDTV 720P
9	1920*1080	27.000	24.000	74.25	HDTV 1080I
10	1920*1080	26.97	23.976	74.176	HDTV 1080I
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	61.43	29.970	297.00	HDTV 1080P
14	3840*2160	67.5	30.00	297.00	HDTV 1080P
15	3840*2160	135	59.94	594	HDTV 1080P
16	3840*2160	135	60	594	HDTV 1080P

5.2. 3D Mode

5.2.1. RF Input

No.	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	Remark
1	1920*1080	45.00	60	74.25	HDTV 1080I	Side by Side, Top & Bottom
2	1280*720	45.00	60	74.25	HDTV 720P	Side by Side, Top & Bottom

5.2.2. HDMI Input

5.2.2.1. HDMI 1.4/2.0(3D Supported mode manually)

No.	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	Remark
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	
5	1920*1080	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	
		67.50	60.00	148.5	HDTV 1080P	2D to 3D, Side by Side(Half), Top & Bottom, Checker Board, Single Frame Sequential, Row Interleaving, Column Interleaving
		56.250	50	148.5	HDTV 1080P	
6	3840*2160 4096*2160	53.95	23.976	296.703	HDTV 2160P	2D to 3D, Top & Bottom(half), Side by Side(half),
		54	24.00	297.00		
		56.25	25.00	297.00		
		61.43	29.970	296.703		
		67.5	30.00	297.00		
7	3840*2160 4096*2160	112.5	50	594	HDTV 2160P HDTV 2160P	2D to 3D, Top & Bottom(half), Side by Side(half), Port3 Only

5.2.2.2. HDMI 1.4b (3D Supported mode automatically)

No.	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	VIC	Proposed	Remark
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)
		31.469 / 31.5	59.94/ 60	50.35/50.4	1	Side-by-side(Full)	(SDTV 480P)
		62.938/63	59.94/ 60	50.35/50.4	1	Frame packing Line alternative	Secondary(SDTV 480P) (SDTV 480P)
2	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)
		31.469 / 31.5	59.94 / 60	54/54.06	2,3	Side-by-side(Full)	(SDTV 480P)
		62.938/63	59.94 / 60	54/54.06	2,3	Frame packing Line alternative	Secondary(SDTV 480P) (SDTV 480P)
3	720*576	31.25	50	27	17,18	Top-and-Bottom Side-by-side(half)	Secondary(SDTV 576P) Secondary(SDTV 576P)
		31.25	50	54	17,18	Side-by-side(Full)	(SDTV 576P)
		62.5	50	54	17,18	Frame packing Line alternative	Secondary(SDTV 576P) (SDTV 576P)
4	720*576	15.625	50	27	21	Frame packing Field alternative Side-by-side(Full) Top-and-Bottom Side-by-side(half)	Secondary(SDTV 576I) (SDTV 576I (SDTV 576I Secondary(SDTV 576I) Secondary(SDTV 576I)
5	1280*720	37.500	50	74.25	19	Top-and-Bottom Side-by-side(half)	Primary(HDTV 720P) Primary(HDTV 720P)
		37.500	50	148.5	19	Side-by-side(Full)	(HDTV 720P)
		44.96 / 45	59.94 / 60	74.17/74.25	4	Top-and-Bottom Side-by-side(half)	Primary(HDTV 720P) Primary(HDTV 720P)
		44.96 / 45	59.94 / 60	148.35/148.5	4	Side-by-side(Full)	(HDTV 720P)
		75	50	148.5	19	Frame packing Line alternative	Primary(HDTV 720P) (HDTV 720P)
		89.91/90	59.94 / 60	148.35/148.5	4	Frame packing Line alternative	Primary(HDTV 720P) (HDTV 720P)
6	1920*1080	28.125	50.00	74.25	20	Top-and-Bottom Side-by-side(half)	Secondary(HDTV 1080I) Primary(HDTV 1080I)
		28.125	50.00	148.5	20	Side-by-side(Full)	(HDTV 1080I)
		33.72 / 33.75	59.94 / 60	74.17/74.25	5	Top-and-Bottom Side-by-side(half)	Secondary(HDTV 1080I) Primary(HDTV 1080I)
		33.72 / 33.75	59.94 / 60	148.35/148.5	5	Side-by-side(Full)	(HDTV 1080I)
		56.25	50.00	148.5	20	Frame packing Field alternative	Primary(HDTV 1080I) (HDTV 1080I)
		67.432/67.50	59.94 / 60	148.35/148.5	5	Frame packing Field alternative	Primary(HDTV 1080I) (HDTV 1080I)

No.	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	VIC	Proposed	Remark
7	1920*1080	26.97 / 27	23.97 / 24	74.17/74.25	32	Top-and-Bottom Side-by-side(half)	Primary(HDTV 1080P) Primary(HDTV 1080P)
		26.97 / 27	23.97 / 24	148.35/148.5	32	Side-by-side(Full)	(HDTV 1080P)
		28.12	25	74.25	33	Top-and-Bottom Side-by-side(half)	Secondary(HDTV 1080P) Secondary(HDTV 1080P)
		28.12	25	148.5	33	Side-by-side(Full)	(HDTV 1080P)
		33.716 / 33.75	29.976 / 30.00	74.18/74.25	34	Top-and-Bottom Side-by-side(half)	Primary(HDTV 1080P) Secondary(HDTV 1080P)
		33.716 / 33.75	29.976 / 30.00	148.35/148.5	34	Side-by-side(Full)	(HDTV 1080P)
		43.94/54	23.97 / 24	148.35/148.5	32	Frame packing Line alternative	Primary(HDTV 1080P) (HDTV 1080P)
		56.25	25	148.5	33	Frame packing Line alternative	Secondary(HDTV 1080P) (HDTV 1080P)
		67.432 / 67.5	29.976 / 30.00	148.35/148.5	34	Frame packing Line alternative	Primary(HDTV 1080P) (HDTV 1080P)
		56.250	50	148.5	31	Top-and-Bottom Side-by-side(half)	Primary(HDTV 1080P) Secondary(HDTV 1080P)
		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)

5.2.3. HDMI-PC Input (3D supported mode manually)

No.	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	Remark
1	1024*768	48.36	60	65	HDTV 768P	2D to 3D, Side by Side(half), Top & Bottom
2	1360*768	47.71	60	85.5	HDTV 768P	2D to 3D, Side by Side(half), Top & Bottom
3	1920*1080	67.500	60	148.50	HDTV 1080P	2D to 3D, Side by Side(half), Top & Bottom, Checker Board, Single Frame Sequential, Row Interleaving, Column Interleaving
4	3840*2160	54	24.00	297.00	HDTV 2160P	2D to 3D, Top & Bottom(half), Side by Side(half),
		56.25	25.00	297.00		
		67.5	30.00	297.00		
5	4096*2160	54	24	297.00	HDTV 2160P	2D to 3D, Top & Bottom(half), Side by Side(half),
6	Others	-	-	-	640*350 720*400 640*480 800*600 1152*864	2D to 3D, Side by Side(half), Top & Bottom

5.2.4. USB Input

5.2.4.1. USB Input (3D supported mode automatically)

No.	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	Remark
1	1920*1080	33.75	30.000	74.25	HDTV 1080p	Side by Side, Top & Bottom, Checkerboard, MPO (Photo)

5.2.4.2. USB Input (3D supported mode manually)

No.	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	Remark
1	1920*1080	33.75	30.000	74.25	HDTV 1080p	Side by Side, Top & Bottom Checkerboard, Single Frame Sequential, Row Interleaving, Column Interleaving (Photo : Side by Side, Top & Bottom)

5.2.5. DLNA Input
5.2.5.1. DLNA Input (3D supported mode automatically)

No.	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	Remark
1	1920*1080	33.75	30.000	74.25	HDTV 1080p	Side by Side, Top & Bottom, Checkerboard, MPO (Photo)

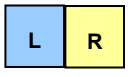
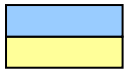
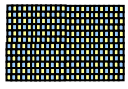
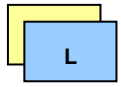
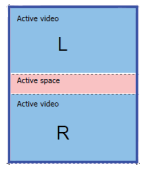
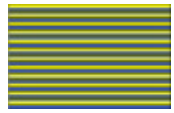
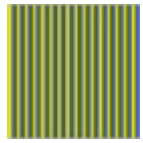
5.2.5.2. DLNA Input (3D supported mode manually)

No.	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	Remark
1	1920*1080	33.75	30.000	74.25	HDTV 1080p	Side by Side, Top & Bottom Checkerboard, Single Frame Sequential, Row Interleaving, Column Interleaving (Photo : Side by Side, Top & Bottom)

5.2.6. Component Input

No.	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	Remark
1	1280*720	44.96	59.94	74.176	HDTV 720P	Side by Side, Top & Bottom
2	1920*1080	33.75	60.00	74.25	HDTV 1080I	Side by Side, Top & Bottom
3	1920*1080	33.72	59.94	74.176	HDTV 1080I	Side by Side, Top & Bottom
4	1920*1080	67.500	60	148.50	HDTV 1080P	Side by Side, Top & Bottom
5	1920*1080	67.432	59.94	148.352	HDTV 1080P	Side by Side, Top & Bottom
6	1920*1080	27.000	24.000	74.25	HDTV 1080P	Side by Side, Top & Bottom
7	1920*1080	26.97	23.976	74.176	HDTV 1080P	Side by Side, Top & Bottom
8	1920*1080	33.75	30.000	74.25	HDTV 1080P	Side by Side, Top & Bottom
9	1920*1080	33.71	29.97	74.176	HDTV 1080P	Side by Side, Top & Bottom

● ***Remark: 3D Input mode***

No	Side by Side	Top & Bottom	Checkerboard	Single Frame Sequential	Frame Packing	Line Interleaving	Column Inter-leaving
1							

ADJUSTMENT INSTRUCTION

1. Application

This spec. sheet applies to EA41C Chassis applied OLED TV all models manufactured in TV factory

2. Specification

(1) Because this is not a hot chassis, it is not necessary to use an isolation transformer. However, the use of isolation transformer will help protect test instrument.
(2) Adjustment must be done in the correct order.
(3) The adjustment must be performed in the circumstance of 25 ±5 ºC of temperature and 65±10% of relative humidity if there is no specific designation
(4) The input voltage of the receiver must keep 100~240V, 50/60Hz
(5) The receiver must be operated for about 5 minutes prior to the adjustment when module is in the circumstance of over 15 ºC
In case of keeping module is in the circumstance of 0°C, it should be placed in the circumstance of above 15°C for 2 hours
In case of keeping module is in the circumstance of below -20°C, it should be placed in the circumstance of above 15°C for 3 hours.

※ Caution
When still image is displayed for a period of 20 minutes or longer (especially where W/B scale is strong.
Digital pattern 13ch and/or Cross hatch pattern 09ch), there can some afterimage in the black level area

3. Adjustment items

3.1. Main PCBA Adjustments

(1) ADC adjustment: Component 480i, 1080p
(2) EDID downloads for HDMI

※ Remark
- Above adjustment items can be also performed in Final Assembly if needed. Adjustment items in both PCBA and final assembly tages can be checked by using the INSTART Menu -> 1.ADJUST CHECK

3.2. Final assembly adjustment

(1) White Balance adjustment
(2) RS-232C functionality check
(3) Factory Option setting per destination
(4) Shipment mode setting (In-Stop)
(5) GND and HI-POT test

3.3. Appendix

(1)Tool option menu, USB Download (S/W Update, Option and Service only)
(2) Manual adjustment for ADC calibration and White balance.
(3) Shipment conditions, Channel pre-set

4. MAIN PCBA Adjustments

4.1. ADC Calibration

- An ADC calibration is not necessary because MAIN SoC (LGExxxx) is already calibrated from IC Maker

4.2. MAC Address, ESN, Widevine, HDCP2.0, DTCP Key download

4.2.1. Equipment & Condition

1) Play file: keydownload.exe

4.2.2. Communication Port connection

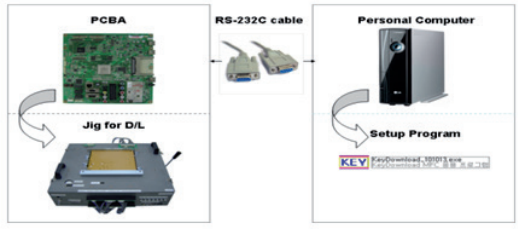
1) Key Write: Com 1,2,3,4 and 115200 (Baudrate)
2) Barcode: Com 1,2,3,4 and 9600 (Baudrate)

4.2.3. Download process

1) Select the download items.
2) Mode check: Online Only
3) Check the test process
- US, Canada models: DETECT -> MAC_WRITE -> WIDEVINE_WRITE
- Korea, Mexico models: DETECT -> MAC_WRITE -> WIDEVINE_WRITE
4) Play : START
5) Check of result: Ready, Test, OK or NG

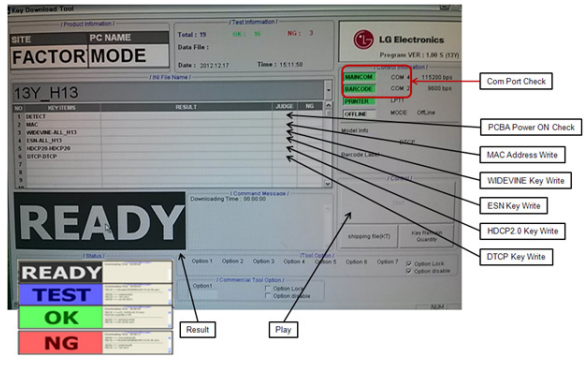
4.2.4. Communication Port connection

1) Connect: PCBA Jig -> RS-232C Port == PC -> RS-232C Port



4.2.5. Download

1) US, Canada, Japan, France models (14Y LCD TV + MAC + Widevine + ESN + HDCP2.0 + DTCP key)



4.2.6. Inspection

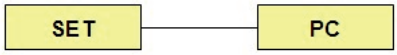
- In INSTART menu, check these keys.

4.3. LAN port Inspection (Ping Test)

4.3.1. Equipment setting

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

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



4.3.2. 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

4.4. EDID Download

4.4.1 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”.

4.4.2 Equipment

- Since embedded EDID data is used, EDID download JIG, HDMI cable and D-sub cable are not need.
- Adjust remocon

4.4.3 Download method

1) Press Adj. key on the Adj. R/C,
2) Select EDID D/L menu.
3) By pressing Enter key, EDID download will begin
4) If Download is successful, OK is display, but If Download is failure, NG is displayed.
5) If Download is failure, Re-try downloads.

※ Caution) Caution: When EDID Download, must remove HDMI Cable.

4.4.4. EDID DATA

(1) HDMI 1(C/S : E7 FD)

EDID Block 0, Bytes 0-127

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	00	FF	FF	FF	FF	FF	FF	00	1E	6D	01	00	01	01	01	01
10	01	18	01	03	80	A0	5A	78	0A	EE	91	A3	54	4C	99	26
20	0F	50	54	A1	08	00	31	40	45	40	61	40	71	40	81	80
30	01	01	01	01	01	01	02	3A	80	18	71	38	2D	40	58	2C
40	45	00	40	84	63	00	00	1E	66	21	50	B0	51	00	1B	30
50	40	70	36	00	40	84	63	00	00	1E	00	00	00	FD	00	3A
60	3E	1E	53	10	00	0A	20	20	20	20	20	20	00	00	00	FC
70	00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	01	E7

EDID Block 1, Bytes 128-255

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	02	03	3C	F1	4E	90	22	20	05	04	03	02	01	5D	5E	5F
10	62	63	64	23	09	57	07	7C	03	0C	00	10	00	B8	3C	20
20	C0	8E	01	02	03	04	01	4F	00	FE	08	10	06	10	18	10
30	28	10	38	10	E3	05	03	01	E3	0E	61	66	01	1D	80	18
40	71	1C	16	20	58	2C	25	00	40	84	63	00	00	9E	01	1D
50	00	72	51	D0	1E	20	6E	28	55	00	40	84	63	00	00	1E
60	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
70	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	FD

(2) HDMI 2(C/S : E7 ED)

EDID Block 0, Bytes 0-127

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	00	FF	FF	FF	FF	FF	FF	00	1E	6D	01	00	01	01	01	01
10	01	18	01	03	80	A0	5A	78	0A	EE	91	A3	54	4C	99	26
20	0F	50	54	A1	08	00	31	40	45	40	61	40	71	40	81	80
30	01	01	01	01	01	01	02	3A	80	18	71	38	2D	40	58	2C
40	45	00	40	84	63	00	00	1E	66	21	50	B0	51	00	1B	30
50	40	70	36	00	40	84	63	00	00	1E	00	00	00	FD	00	3A
60	3E	1E	53	10	00	0A	20	20	20	20	20	20	00	00	00	FC
70	00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	01	E7

EDID Block 1, Bytes 128-255

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	02	03	3C	F1	4E	90	22	20	05	04	03	02	01	5D	5E	5F
10	62	63	64	23	09	57	07	7C	03	0C	00	20	00	B8	3C	20
20	C0	8E	01	02	03	04	01	4F	00	FE	08	10	06	10	18	10
30	28	10	38	10	E3	05	03	01	E3	0E	61	66	01	1D	80	18
40	71	1C	16	20	58	2C	25	00	40	84	63	00	00	9E	01	1D
50	00	72	51	D0	1E	20	6E	28	55	00	40	84	63	00	00	1E
60	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
70	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	ED

(3) HDMI 3(C/S : A1 FC)

EDID Block 0, Bytes 0-127

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	00	FF	FF	FF	FF	FF	FF	00	1E	6D	01	00	01	01	01	01
10	01	18	01	03	80	A0	5A	78	0A	EE	91	A3	54	4C	99	26
20	0F	50	54	A1	08	00	31	40	45	40	61	40	71	40	81	80
30	01	01	01	01	01	01	08	E8	00	30	F2	70	5A	80	B0	58
40	8A	00	40	84	63	00	00	1E	02	3A	80	18	71	38	2D	40
50	58	2C	45	00	40	84	63	00	00	1E	00	00	00	FD	00	3A
60	3E	1E	88	3C	00	0A	20	20	20	20	20	20	00	00	00	FC
70	00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	01	A1

EDID Block 1, Bytes 128-255

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	02	03	46	F1	50	90	22	20	05	04	03	02	01	61	5D	5E
10	5F	66	62	63	64	23	09	57	07	7C	03	0C	00	30	00	B8
20	3C	20	C0	8E	01	02	03	04	01	4F	00	FE	08	10	06	10
30	18	10	28	10	38	10	67	D8	5D	C4	01	78	80	03	E3	05
40	03	01	E3	0F	00	11	66	21	50	B0	51	00	1B	30	40	70
50	36	00	40	84	63	00	00	1E	01	1D	00	72	51	D0	1E	20
60	6E	28	55	00	40	84	63	00	00	1E	00	00	00	00	00	00
70	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	FC

(3) HDMI 4(C/S : E7 CD)

EDID Block 0, Bytes 0-127																
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	00	FF	FF	FF	FF	FF	FF	00	1E	6D	01	00	01	01	01	01
10	01	18	01	03	80	A0	5A	78	0A	EE	91	A3	54	4C	99	26
20	0F	50	54	A1	08	00	31	40	45	40	61	40	71	40	81	80
30	01	01	01	01	01	01	02	3A	80	18	71	38	2D	40	58	2C
40	45	00	40	84	63	00	00	1E	66	21	50	B0	51	00	1B	30
50	40	70	36	00	40	84	63	00	00	1E	00	00	00	FD	00	3A
60	3E	1E	53	10	00	0A	20	20	20	20	20	20	00	00	00	FC
70	00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	01	E7

EDID Block 1, Bytes 128-255																
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	02	03	3C	F1	4E	90	22	20	05	04	03	02	01	5D	5E	5F
10	62	63	64	23	09	57	07	7C	03	0C	00	40	00	B8	3C	20
20	C0	8E	01	02	03	04	01	4F	00	FE	08	10	06	10	18	10
30	28	10	38	10	E3	05	03	01	E3	0E	61	66	01	1D	80	18
40	71	1C	16	20	58	2C	25	00	40	84	63	00	00	9E	01	1D
50	00	72	51	D0	1E	20	6E	28	55	00	40	84	63	00	00	1E
60	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
70	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	CD

5. Final Assembly Adjustment

5.1. White Balance Adjustment

5.1.1. Overview

5.1.1.1. 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) Adj. condition: normal temperature

- Surrounding Temperature: 25±5 °C
- Warm-up time: About 5 Min
- Surrounding Humidity: 20% ~ 80%
- Before White balance adjustment, Keep power on status, don't power off

5.1.1.2. Adj. 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 10cm 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.

5.1.2. Equipment

(1) Color Analyzer: CA-210 (NCG: CH 9 / WCG: CH12 / LED: CH14 / OLED : CH : 17)

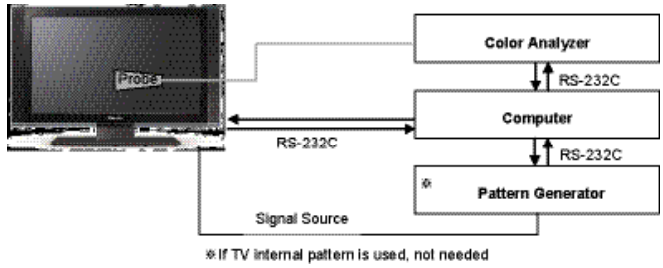
(2) Adj. Computer (During auto adj., RS-232C protocol is needed)

(3) Adjust Remocon

(4) Video Signal Generator MSPG-925F 720p/204-Gray (Model: 217, Pattern: 49)

※ Color Analyzer Matrix should be calibrated using CS-1000

5.1.3. Equipment connection



※If TV internal pattern is used, not needed

5.1.4. Adjustment Command (Protocol)

(1) RS-232C Command used during auto-adj.

RS-232C COMMAND			Explanation
CMD	DATA	ID	
Wb	00	00	Begin White Balance adj.
Wb	00	ff	End White Balance adj. (internal pattern disappears)

(2) Adjustment Map

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

5.1.5. Adjustment method

5.1.5.1. Auto WB calibration

(1) Set TV in ADJ mode using P-ONLY key (or POWER ON key)

(2) Place optical probe on the center of the display

- It need to check probe condition of zero calibration before adjustment.

(3) Connect RS-232C Cable

(4) Select mode in ADJ Program and begin a adjustment.

(5) When WB adjustment is completed with OK message, check adjustment status of pre-set mode (Cool, Medium, Warm)

(6) Remove probe and RS-232C cable.

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

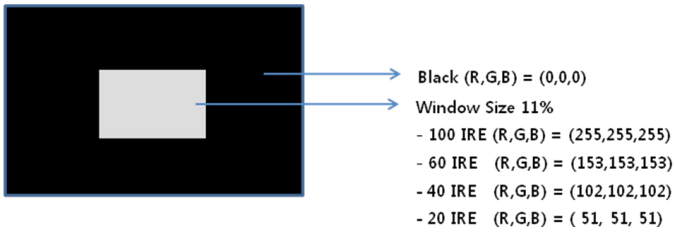
5.1.5.2. OLED White balance table

(1) Cool Mode
- Purpose : Especially B-gain fix adjust leads to the luminance enhancement. Adjust the color temperature to reduce the deviation of the module color temperature.
- Principle : To adjust the white balance without the saturation, Adjust the B gain more than 192 (If R gain or G gain is more than 255 , G gain can adjust less than 192) and change the others (R/G Gain).
- Adjustment mode : mode – Cool

(2) Medium / Warm Mode
- Purpose : Adjust the color temperature to reduce the deviation of the module color temperature
- Principle : To adjust the white balance without the saturation, Fix the B gain to 192 (default data) and decrease the others
- Adjustment mode : mode – Medium

(3) Warm
- Purpose : Adjust the color temperature to reduce the deviation of the module color temperature.
- Principle : To adjust the white balance without the saturation, Fix the W gain to 192 (default data) and decrease the others.
- Adjustment mode : mode – Warm

(4) THX(Warm)
- Purpose : Adjust the color temperature to reduce the deviation of the module color temperature.
- Principle : To adjust the white balance without the saturation, Fix the W gain to 192 (default data) and decrease the others.
- Adjustment mode : mode – Warm
- Auto White balance 4 point
- Adjust 100 IRE White Balance
- Adjust Gamam 2.2 each IRE (60, 40, 20). Using max luminance
- Complete 4 point gamma, W/B.



Picture is H 1/3, V 1/3
fixed Center Window size
Outer Black Picture do not need change Contrast / Brightness
Center Level can change Contrast / Bright
Window pattern of Center 0~255 level

5.1.6. Reference (White Balance Adj. coordinate and color temperature)

(1) Luminance: 204 Gray, 80IRE
(2) Standard color coordinate and temperature using CS-1000 (over 26 inch)

5.1.7. Reference (White Balance Adj. coordinate and color temperature)

▪ Luminance: 204 Gray
▪ Standard color coordinate and temperature using CS-1000 (over 26 inch)

Mode	Coordinate		Temp	△uv
	X	Y		
Cool	0.277	0.278	11,000K	-0.0030
Medium	0.286	0.289	9300K	0.0000
Warm	0.313	0.329	6500K	+0.0030

▪ Standard color coordinate and temperature using CA-210(CH-17)

Mode	Coordinate		Temp	△uv
	X	Y		
Cool	0.277±0.002	0.278±0.002	11000K	-0.0030
Medium	0.286±0.002	0.289±0.002	9300K	0.0000
Warm	0.313±0.002	0.329±0.002	6500K	+0.0030

5.2. Tool Option setting & Inspection per countries

5.2.1. Overview

(1) Tool option selection is only done for models in Non-USA North America due to rating
(2) Applied model: EA41C Chassis applied to CANADA and MEXICO

5.2.2. Country Group selection

(1) Press ADJ key on the Adj. R/C, and then select Country Group Menu
(2) Depending on destination, select US, then on the lower Country option, select US, CA, MX.
Selection is done using +, - KEY

5.3. Magic Motion remote controller Check

5.3.1. Test equipment

- RF-remote controller for check, IR-KEY-CODE remote controller.
- Check AA battery before test. A recommendation is that a tester change battery every lots.

5.3.2. Test

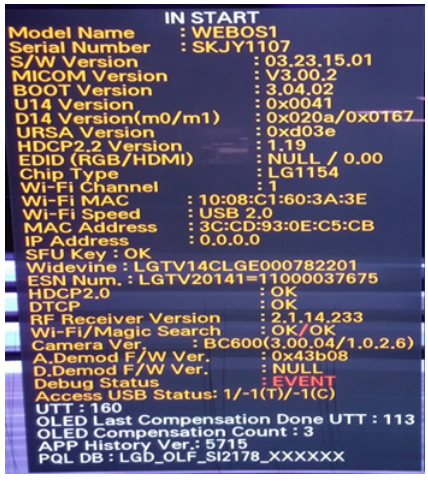
(1) Make pairing with TV set by pressing “Start key(Wheel key)” on RCU.
(2) Check a cursor on screen by pressing ‘Wheel key” of RCU
(3) Stop paring with TV set by pressing “Back+ Home” key of RCU

5.4. Wi-Fi MAC Address Check

5.4.1. Using RS232 Command

	Command	Set ACK
Transmission	[A][I][][Set ID][][20][Cr]	[O][K][x] or [N][G]

5.4.2. Check the menu on in-start



5.5. 3D pattern test (Only for 3D models)

5.5.1. Test equipment

(1) Pattern Generator MSHG-600 or MSPG-6100 (HDMI 1.4 support)
(2) Pattern: HDMI mode (model No. 872, pattern No. 83)

5.5.2. Test method

(1) Input 3D test signal as Fig.1.

Fig.1
<HDMI Mode 872번 , Pattern No. 83>

(2) Press ‘OK” key as a 3D input OSD is shown.
(3) Check pattern as Fig2 without 3D glasses. (3D mode without 3D glasses)

Fig.2
<OK in 3D mode without 3D glasses>

Fig.3
<NG in 3D mode without 3D glasses>

5.6. HDMI ARC Function Inspection

5.6.1. Test equipment

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

5.6.2. Test method

(1) Insert the HDMI Cable to the HDMI ARC port from the master equipment (HDMI2)

(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)

Flow Line

Cell Line

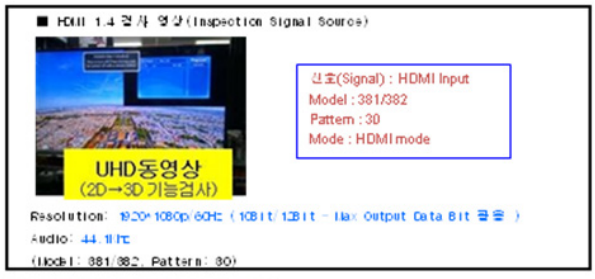
* Remark: Inspect in Power Only Mode and check SW version in a master equipment

5.7. 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 controller
- 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 3 Port.
- 2)Convert to UHD Inspection Pattern. (Use remote controller)
- 3)Check Video and Sound.
- 4)Convert to 64 Gray Inspection Pattern. (Refer to Pictures)
- 5)Check Video and Sound.
- 6)Inspect HDMI-CEC function. (Push Play & Pause button)

(3) 4K Inspection.(HEVC Inspection model only)
- 1) Insert USB that 4K video file is saved.
- 2) Check that the video plays normally.



UHD 검사용 PATTERN
(Pattern for UHD Inspection)

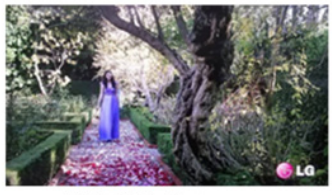
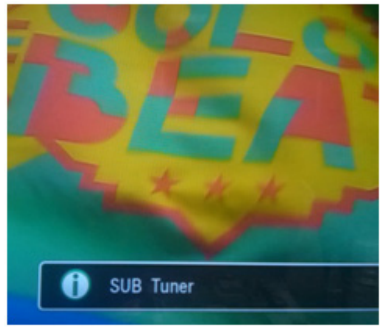


Fig1. <4K Video Play>

5.8. PIP/ W&R Function Inspection



(1) Objective : To check the connection between sub tuner and PCBA, and their Function

(2) Test Method : This Inspection is available only Power-Only Status.
- 1) Press exit key of the Adj. R/C and Press PIP key.
- 2) Check that the SUB TUNER pop up window on the TV Set.
- 3) Check that the normal operation (picture, sound) of DTV on the TV Set.

6. AUDIO output check

6.1. Audio input condition

(1) RF input: Mono, 1KHz sine wave signal, 100% Modulation
(2) CVBS, Component: 1KHz sine wave signal (0.4Vrms)
(3) RGB PC: 1KHz sine wave signal (0.7Vrms)

6.2. Specification

No	Item	Min	Typ	Max	Unit	Remark
1	Audio practical max Output, L/R (Distor-tion=10% max Output)	10.35 9.09	11.5 9.59	12.65 10.05	W Vrms	(1) Measurement condition - EQ/AVL/Clear Voice: Off (2) Speaker (8Ω Impedance)

6.3. Audio Output Inspection

(1) INPUT CHECK –S KEY OF ADJUST REMOTE CONTROLLER TO INSPECT SPEAKER

(2) When you click the first, the output volume of left & right main speakers must be 50

(3) When you click the second, the output volume of left & right main speakers must be 80.

(4) When you click the third, the output volume of left & right main speakers must be 100

(5) When you click the fourth, the output volume of left main speaker must be 50.

(6) When you click the fifth, the output volume of right main speaker must be 50.

7. Joystick check

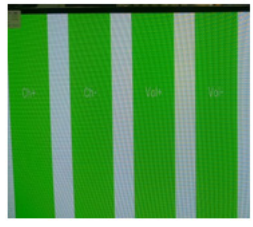
- Before you start a test, you must run a 'Power Only Mode'.

(1) Channel Up Test : Press UP KEY OF SET

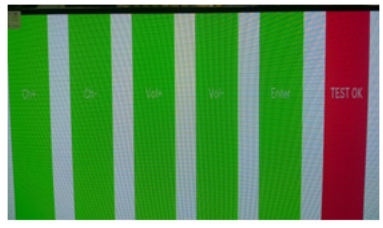
(2) Channel Down Test : Press DOWN KEY OF SET

(3) Volume Up Test : Press Left KEY OF SET

(4) Volume Down Test : Press Right KEY OF SET



(5) Enter Test : Press Enter KEY OF SET

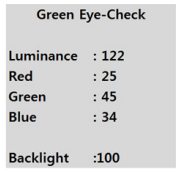


- Don't need to run a test with this sequence. For example, the sequence such as 'Right → Up → Down → Left → Enter' is allowed.

8. EYE Q Green Inspection

(1) Turn on TV

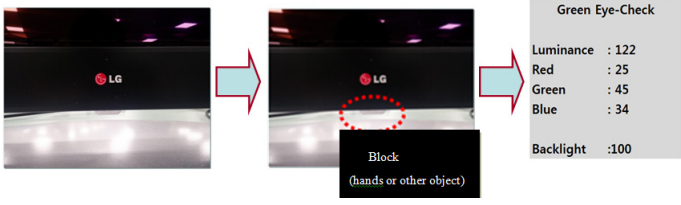
(2) After 25~30 seconds, Press “EYE” button on the Adjustment remote controller.



(3) Block the Intelligent Sensor module on the front C/A about 6 seconds.

When the “Sensor Data” is lower than 20, you can see the “OK” message

→ If it doesn’t show “OK” message, the Sensor Module is defected one. You have to replace that with a good one.



(4) After check the “OK” message come out, take ou t your hand from the Sensor module.

→ Check “Sensor Data” value change from “0” to “300” or not. If it doesn’t change the value, the sensor is also defected one. You have to replace it.

9. GND and HI-POT Test

9.1. GND & HI-POT auto-check preparation

(1) Check the POWER CABLE and SIGNAL CABE insertion condition

9.2. GND & HI-POT auto-check

(1) Pallet moves in the station. (POWER CORD / AV CORD is tightly inserted)

(2) Connect the AV JACK Tester.

(3) Controller (GWS103-4) on.

(4) GND Test (Auto)

- If Test is failed, Buzzer operates.
- If Test is passed, execute next process (Hi-pot test). (Remove A/V CORD from A/V JACK BOX)

(5) HI-POT test (Auto)

- If Test is failed, Buzzer operates.
- If Test is passed, GOOD Lamp on and move to next process automatically.

9.3. Checkpoint

(1) Test voltage

- GND: 1.5KV/min at 100mA
- SIGNAL: 3KV/min at 100mA

(2) TEST time: 1 second

(3) TEST POINT

- GND Test = POWER CORD GND and SIGNAL CABLE GND.
- Hi-pot Test = POWER CORD GND and LIVE & NEUTRAL.

(4) LEAKAGE CURRENT: At 0.5mArms

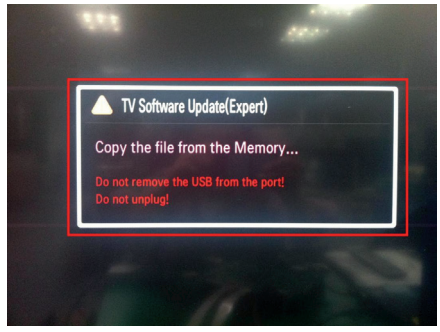
10. USB S/W Download (optional, Service only)

(1) Put the USB Stick to the USB socket

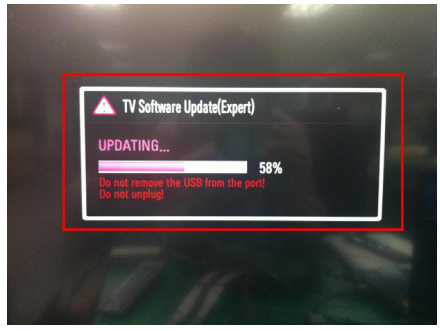
(2) Automatically detecting update file in USB Stick

- If your downloaded program version in USB Stick is lower than that of TV set, it didn’t work. Otherwise USB data is automatically detected.

(3) Show the message “Copying files from memory”



(4) Updating is staring



(5) Updating Completed, The TV will restart automatically

(6) If your TV is turned on, check your updated version and Tool option.

* 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, TOOL OPTION setting is needed again.

(1) Push "IN-START" key in service remote controller.

(2) Select "Tool Option 1" and Push “OK” button.

(3) Punch in the number. (Each model has their number.)

11. Optional adjustments

11.1. Manual ADC Calibration

11.1.1. Equipment & Condition

(1) Adjustment Remocon
(2) 801GF (802B, 802F, 802R) or MSPG925FA Pattern Generator
- Resolution: 480i Comp1 (MSPG-925FA: model-209, pattern-65)
- Resolution: 1080p Comp1 (MSPG-925FA: model-225, pattern-65)
- Resolution : 1080p RGB (MSPG-925FA: model-225, pattern-65)
- Pattern : Horizontal 100% Color Bar Pattern
- Pattern level: 0.7±0.1 Vp-p

11.1.2. Adjust method

11.1.2.1 ADC 480i/1080p Comp

(1) Check connected condition of Comp cable to the equipment
(2) Give a 480i Mode, Horizontal 100% Color Bar Pattern to Comp1. (MSPG-925FA -> Model: 209, Pattern: 65)
(3) Change input mode as Component1 and picture mode as “Standard”
(4) Press the In-start Key on the ADJ remote after at least 1 min of signal reception. Then, select 7.External ADC. And Press OK or Right Button for going to sub menu.
(5) Press OK in Comp 480i menu
(6) Give a 1080p Mode, Horizontal 100% Color Bar Pattern to Comp1. (MSPG-925FA -> Model: 225, Pattern: 65)
(7) Press OK in Comp 1080p menu
(8) If ADC Comp is successful, “ADC Component Success” is displayed. If ADC calibration is failure, “ADC Component Fail” is displayed.
(10) If ADC calibration is failure, after rechecking ADC pattern or condition, retry calibration
(11) If ADC calibration is failure, after recheck ADC pattern or condition, retry calibration

11.2. Manual White balance Adjustment

11.2.1. Adj. 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 10cm and perpendicular of the module surface (80°~ 100°)
(3) Aging time
1) After Aging Start, Keep the Power ON status during 5 Minutes.
2) In case of LCD, Back-light on should be checked using no signal or Full-white pattern.

11.2.2. Equipment

(1) Color Analyzer: CA-210 (NCG: CH 9 / WCG: CH12 / LED: CH14/ OLED : CH17)
(2) Adj. Computer (During auto adj., RS-232C protocol is needed)
(3) Adjust Remocon
(4) Video Signal Generator MSPG-925F 720p/216-Gray (Model: 217, Pattern: 78)

11.2.3. Adjustment

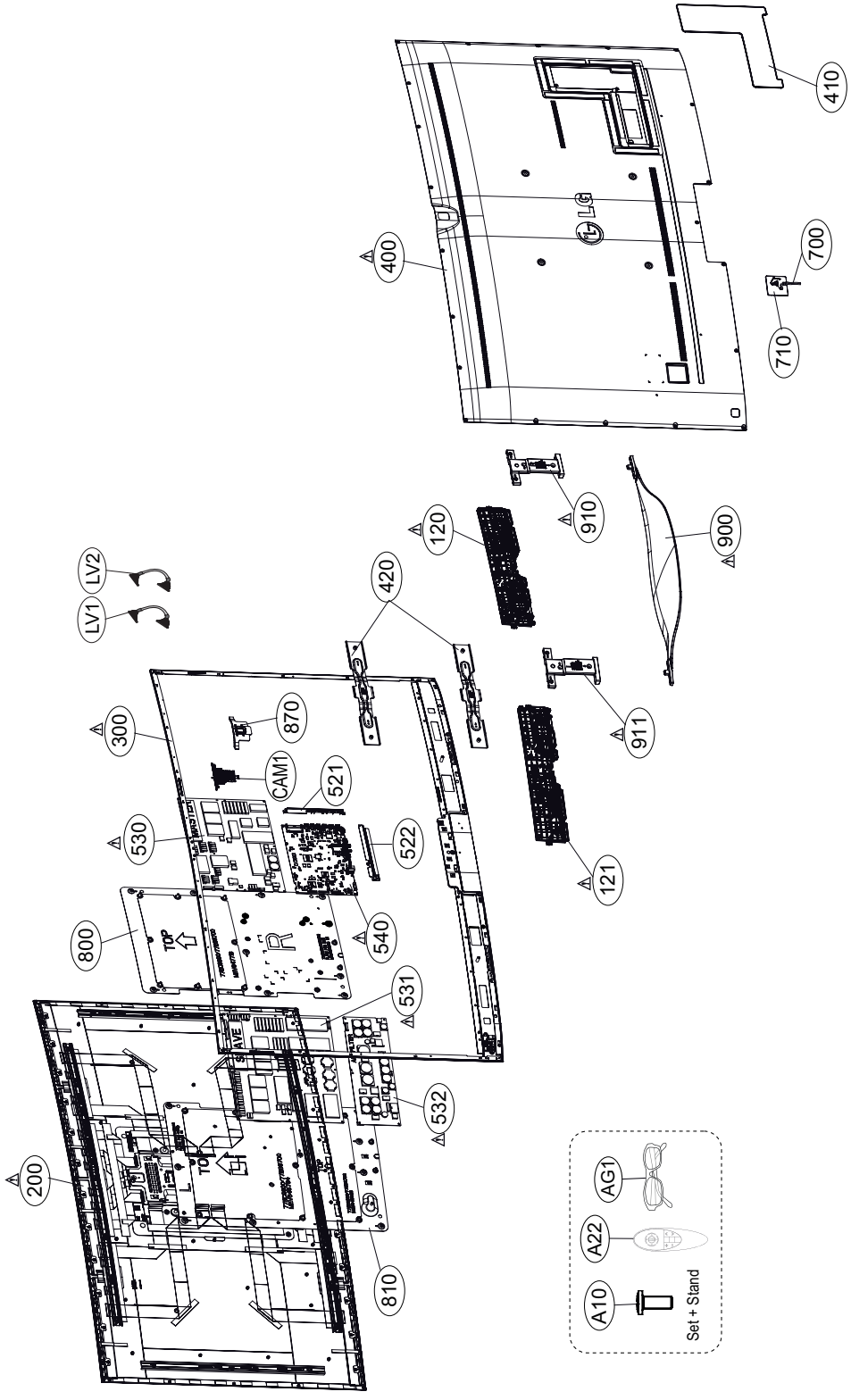
(1) Set TV in Adj. mode using POWER ON
(2) Zero Calibrate the probe of Color Analyzer, then place it on the center of LCD module within 10cm of the surface.
(3) Press ADJ key -> EZ adjust using adj. R/C -> 6. White-Balance then press the cursor to the right (KEY►). When KEY(►) is pressed 216 Gray internal 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) Adj. is performed in COOL, MEDIUM, WARM 3 modes of color temperature.

▪ If internal pattern is not available, use RF input. In EZ Adj. menu 6.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.

EXPLODED VIEW

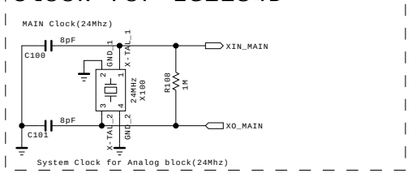
IMPORTANT SAFETY NOTICE

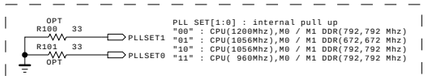
Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by ⚠ in the Schematic Diagram and EXPLODED VIEW.
It is essential that these special safety parts should be replaced with the same components as recommended in this manual to prevent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



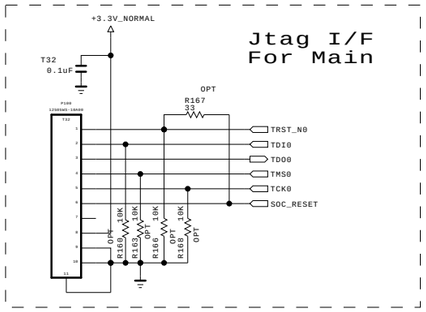
System Configuration

Clock for LG1154D

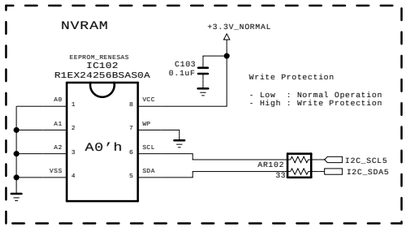


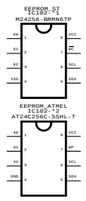


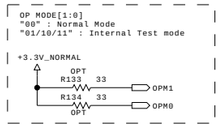
Jtag I/F For Main

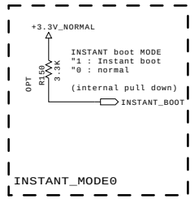


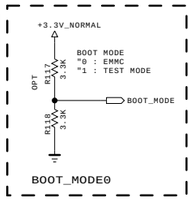
NVRAM



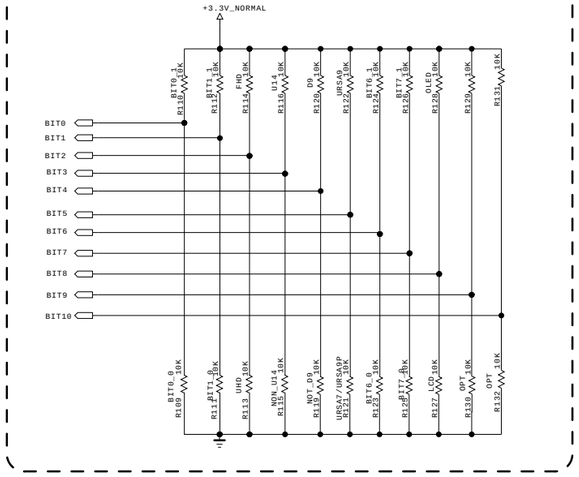








WebOS UHD HW Option



20131016 version

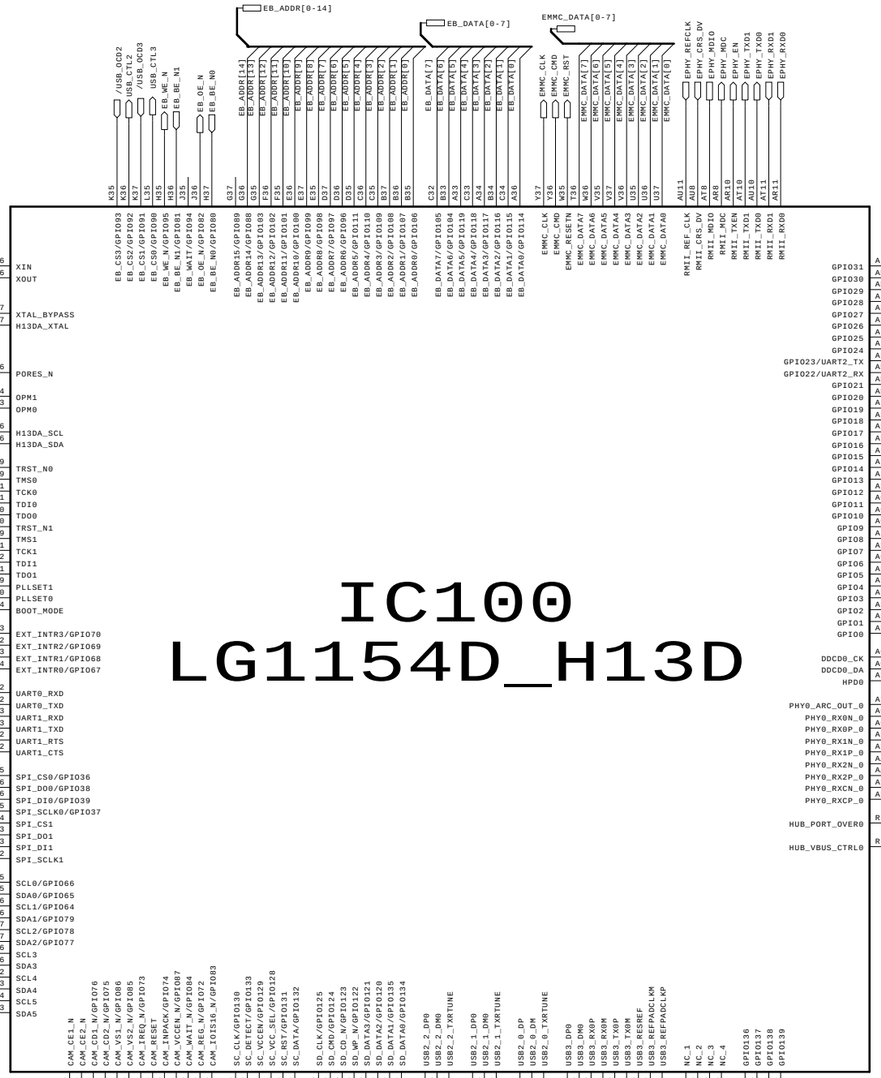
BIT(0/1)	DVB	ATSC	JP
00	TW/COL	North.AM.	
01	CN/HK	KR	JP
10	EU	BR	
11	AJJA		

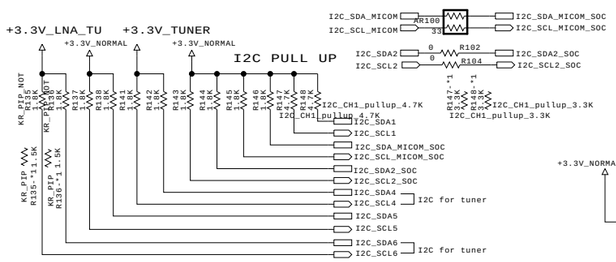
		High	Low
BIT2	Resolution	FHD	UHD
BIT3	Support U14	U14	Non_U14
BIT4	D9 Model	D9	Non_D9
BIT5	URSA7/URSA9	URSA9	URSA7/URSA9P

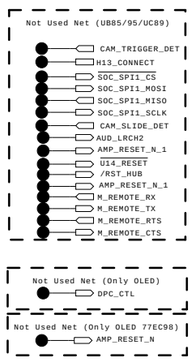
BIT(6/7)	EU/CIS	AJJA	TW/COL	CN/HK	KR	North.AM	BR	JP
00	T/C	T/C	T/C	Default	ATSC_PIP	ATSC_PIP	ISDB_PIP	Default
01	T2/C/S2/ATV_EXT	T2/C_PIP	T2/C_PIP		ATV_SOC	ATV_SOC	ISDB	
10	T2/C	T2/C	T2/C		ATV_EXT	ATV_EXT		
11	T2/C/S2/AT	T2/C/S2						

		High	Low
BIT8	Display	OLED	LCD
BIT9	Reserved		
BIT10	Reserved		

IC100 LG1154D_H13D







THE ⚠ SYMBOL MARK OF THIS SCHEMETIC 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 SCHEMETIC.

SECRET
LGElectronics

LG ELECTRONICS

BSD-14Y-UD-001-HD

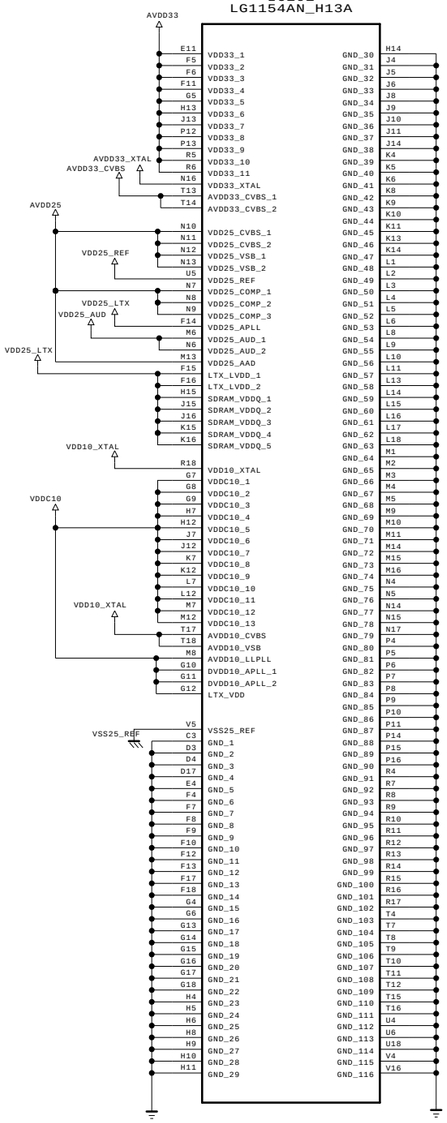
MODEL		DATE	2013-12-17
BLOCK	H13 D CHIP	SHEET	/

LG1154A LG1154D

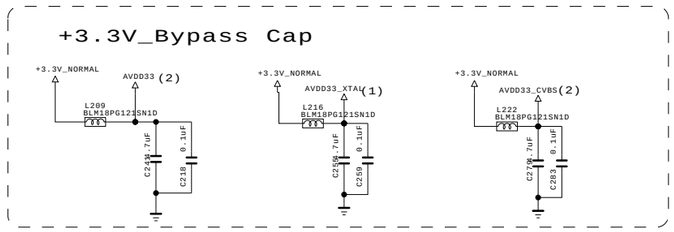
LG1154A

H13A_NON_BRAZIL

IC101
LG1154AN_H13A

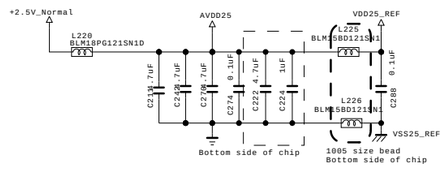


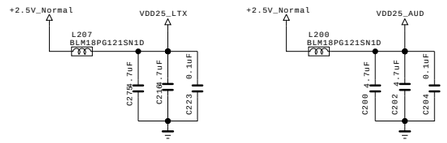
+3.3V_Bypass Cap



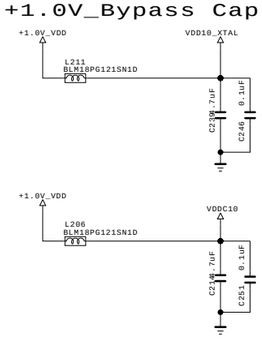
+2.5V_Bypass Cap

AFE 3CH Power

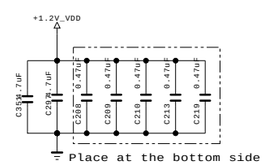


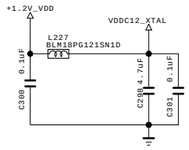


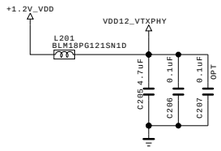
+1.0V_Bypass Cap



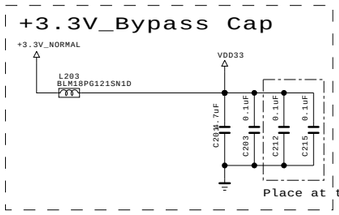
+1.24V_Bypass Cap



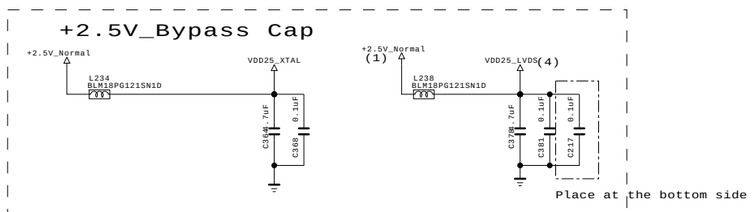




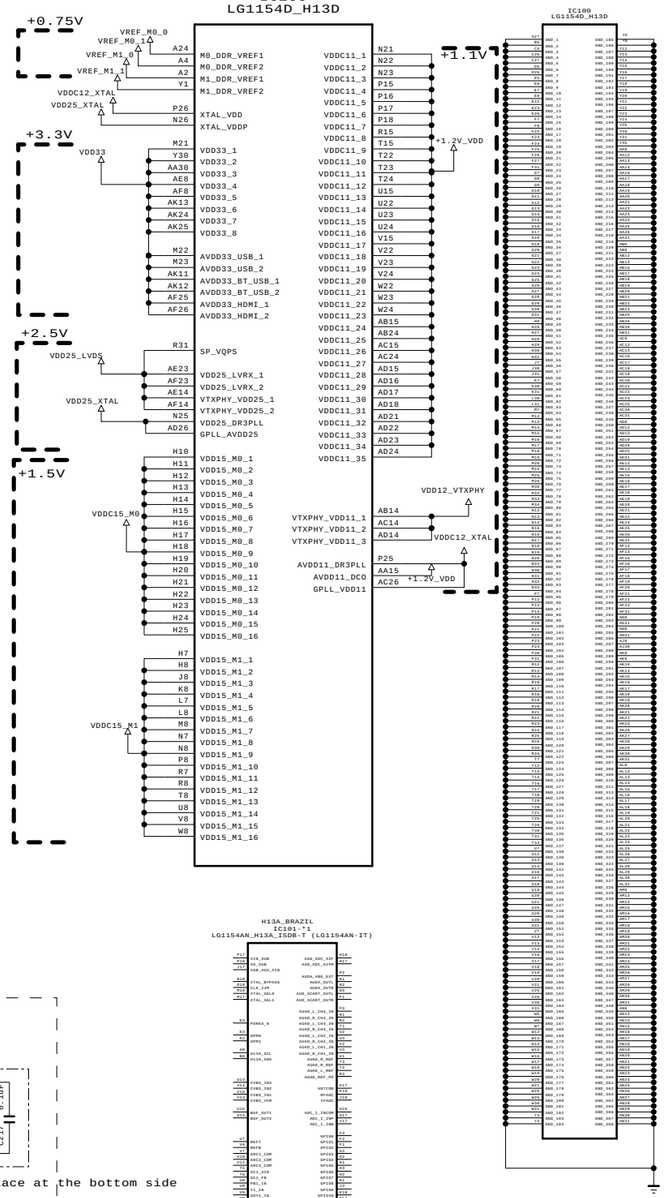
+3.3V_Bypass Cap



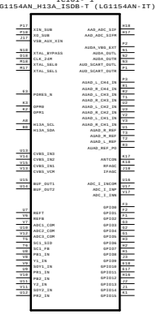
+2.5V_Bypass Cap



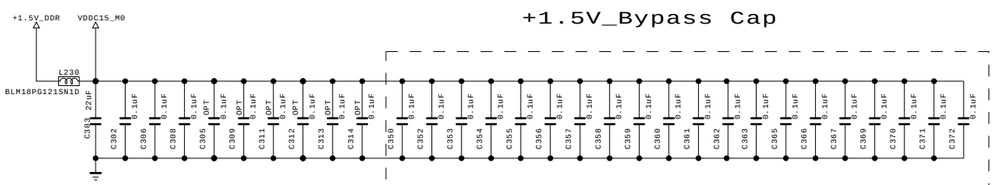
IC100
LG1154D_H13D

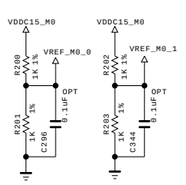


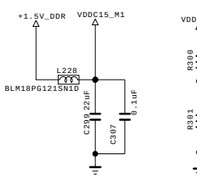
H13A_BRAZIL
IC101-*1
LG1154AN_H13A_ISDB-T (LG1154AN-IT)

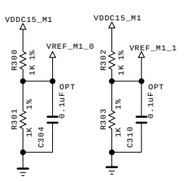


+1.5V_Bypass Cap

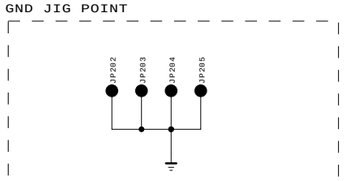




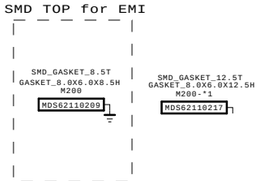




GND JIG POINT



SMD TOP for EMI



THE ⚠ SYMBOL MARK OF THIS SCHEMETIC 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 SCHEMETIC.

SECRET
LGElectronics

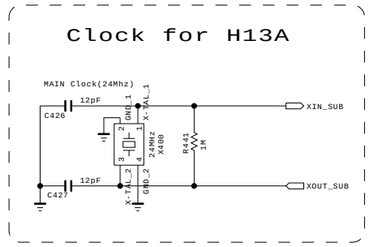
LG ELECTRONICS

BSD-14Y-UD-003-HD

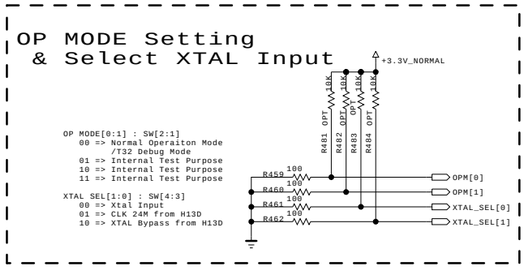
MODEL		DATE	2013-12-17
BLOCK	MAIN POWER	SHEET	/

11/05/31

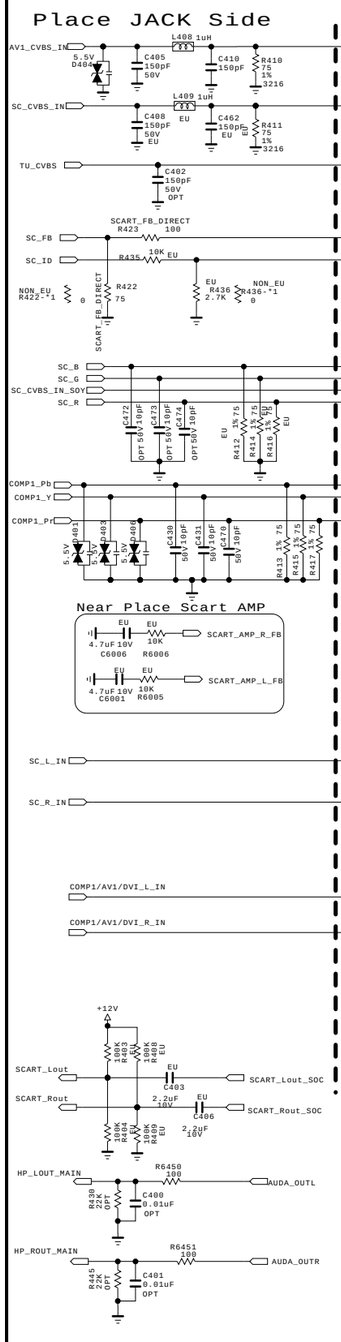
Clock for H13A



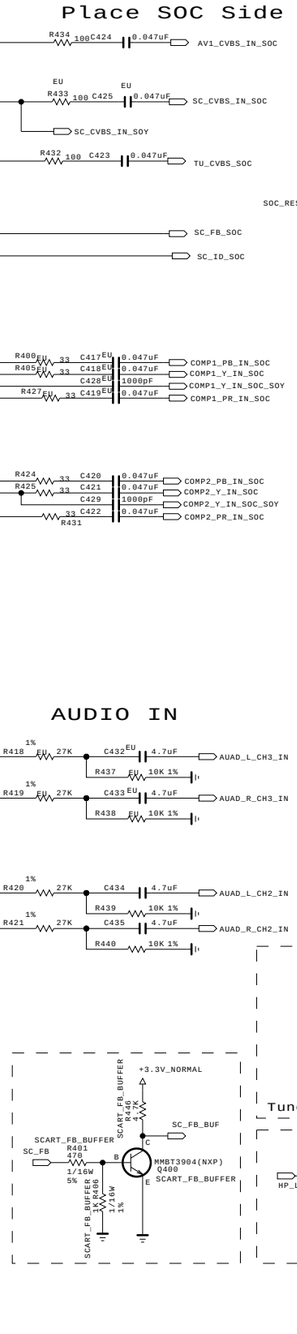
OP MODE Setting & Select XTAL Input



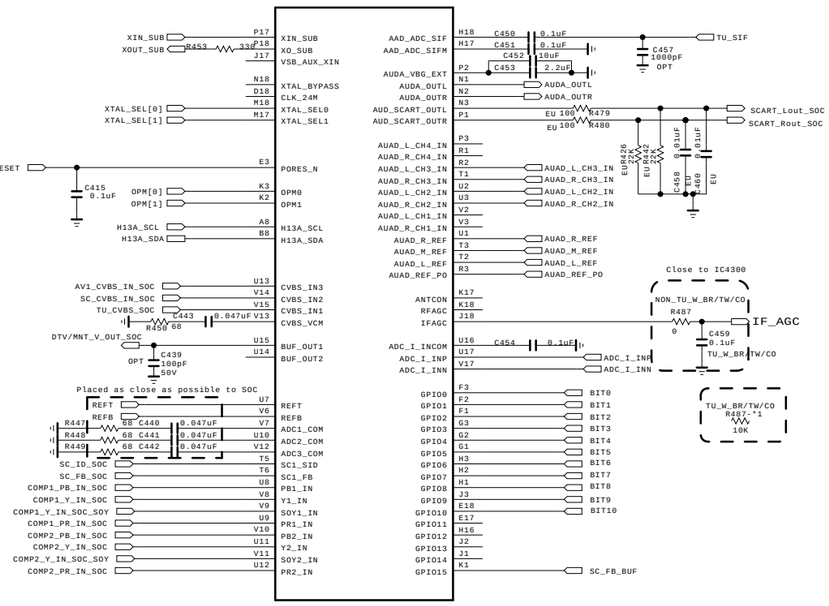
Place JACK Side



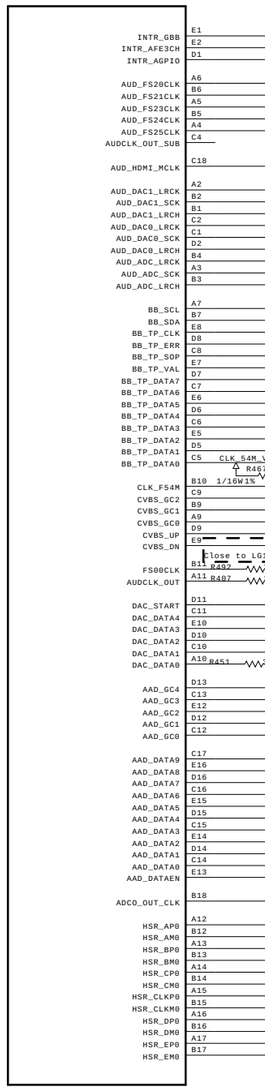
Place SOC Side



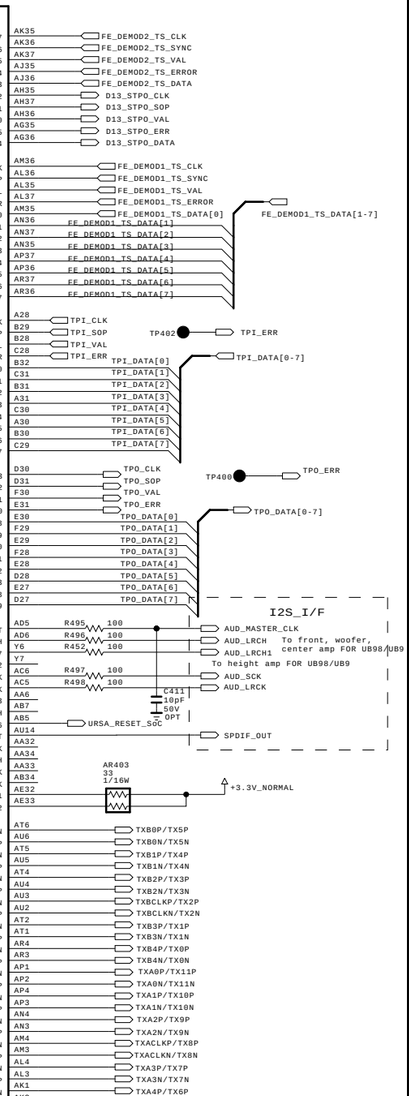
IC101H13A_NON_BRAZIL
LG1154AN_H13A



IC101
LG1154AN_H13A H13A_NON_BRAZIL

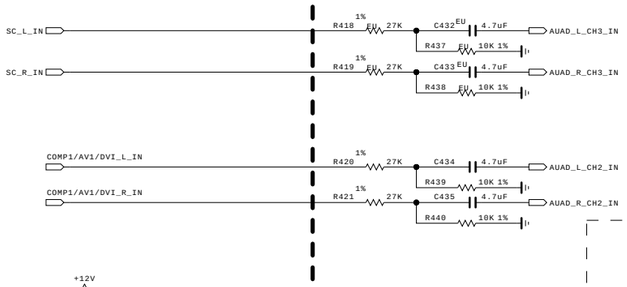


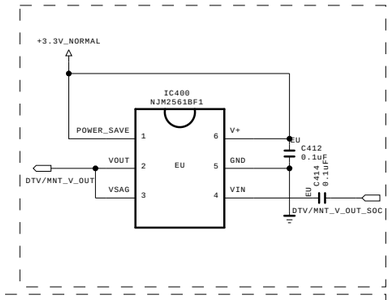
IC100
LG1154D_H13D

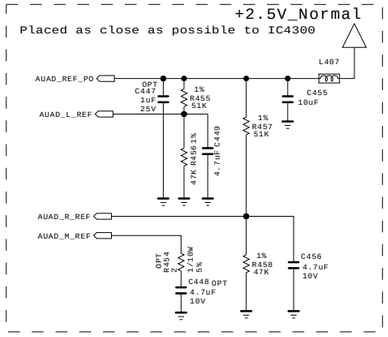


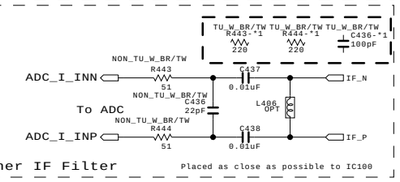
Near Place Scart AMP

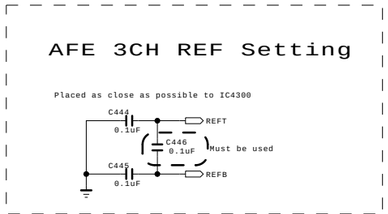
AUDIO IN

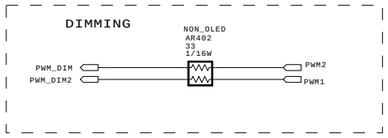












Not Used Net (UB85/95/UC89)
AUD_LRCH1

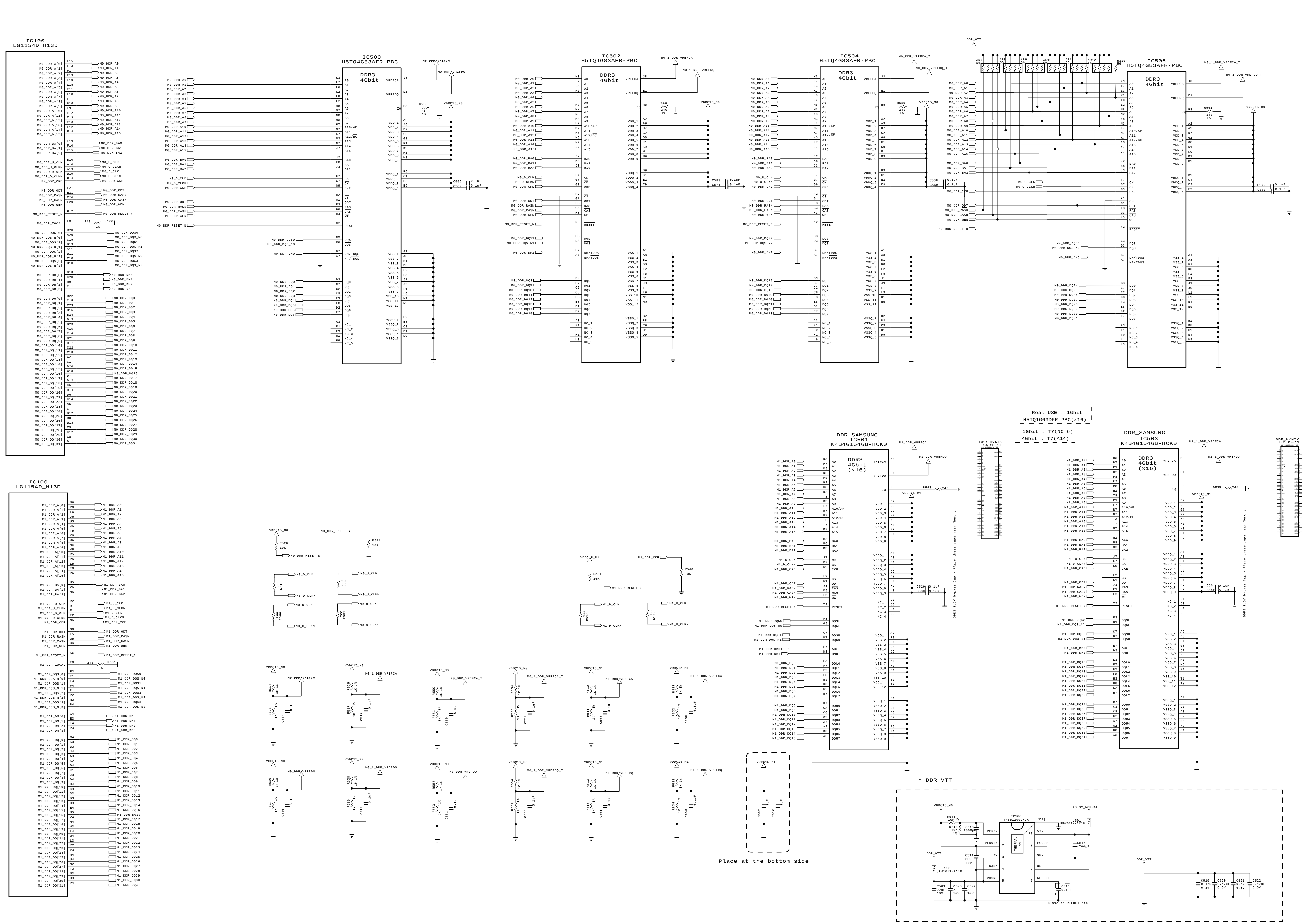
LG1154A LG1154D

SECRET
LGElectronics

LG ELECTRONICS

BSD-14Y-UD-004-HD

MODEL		DATE	2013-12-17
BLOCK	MAIN AUDIO/VIDEO	SHEET	/



BSD-14Y-UD-005-HD

THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES
SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION.
FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS
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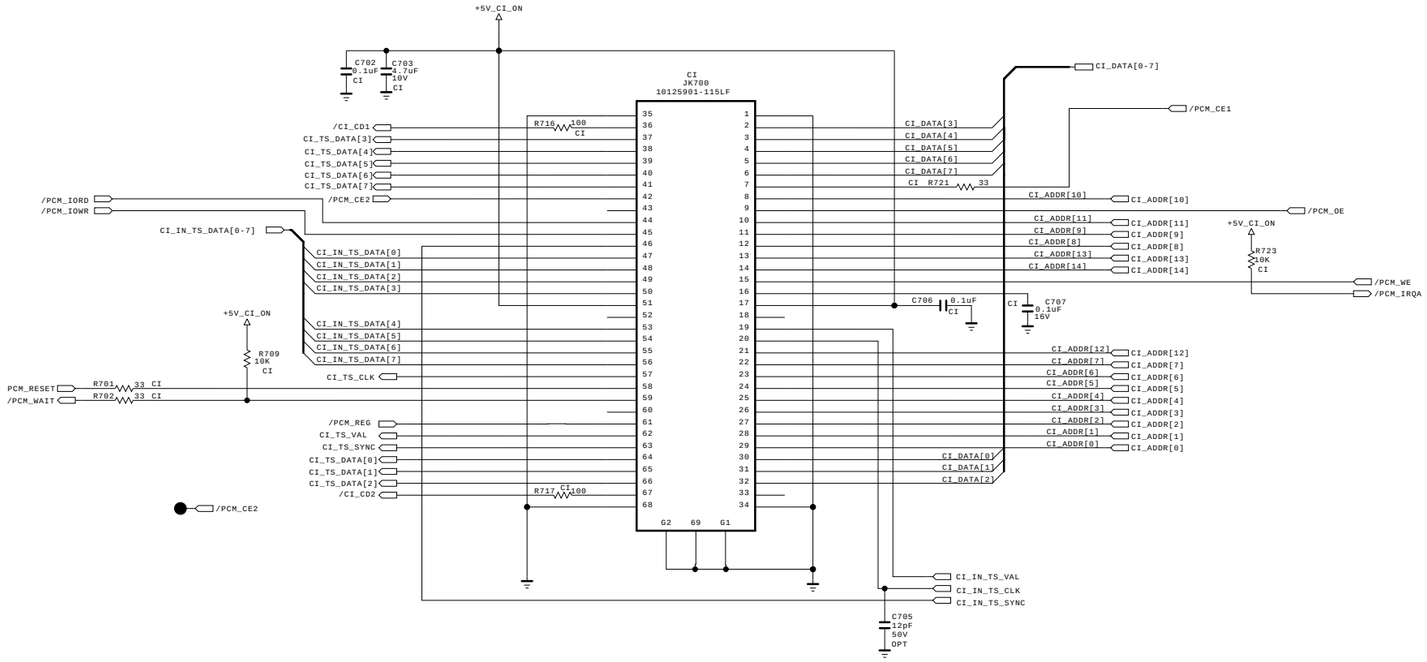
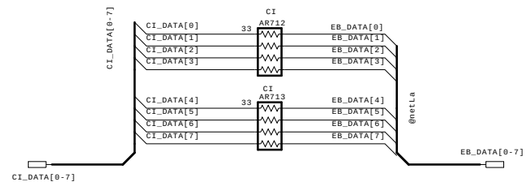
THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

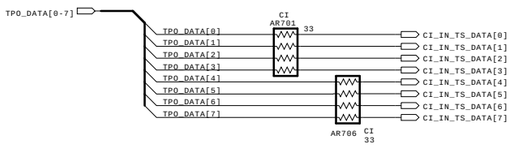
SECRET
LG Electronics

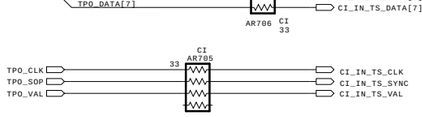
LG ELECTRONICS

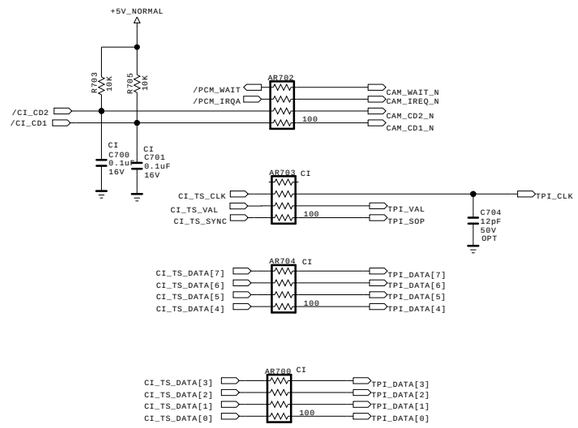
MODEL		DATE	2013-12-17
BLOCK	MAIN DDR	SHEET	/

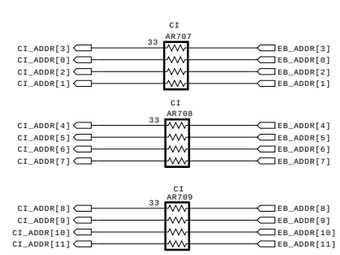


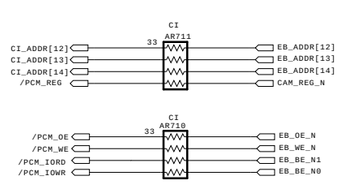




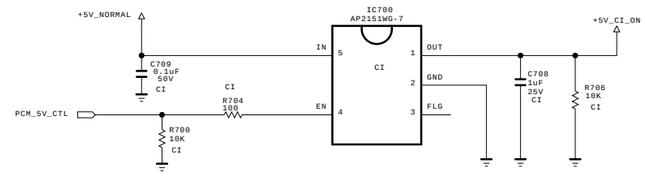








CI POWER ENABLE CONTROL



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SECRET

LGElectronics

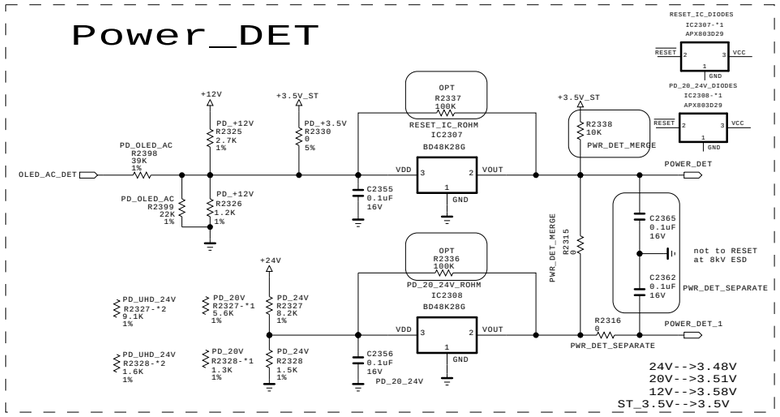
LG ELECTRONICS

BSD-14Y-UD-007-HD

MODEL		DATE	2013-12-17
BLOCK	PCMCIA	SHEET	/

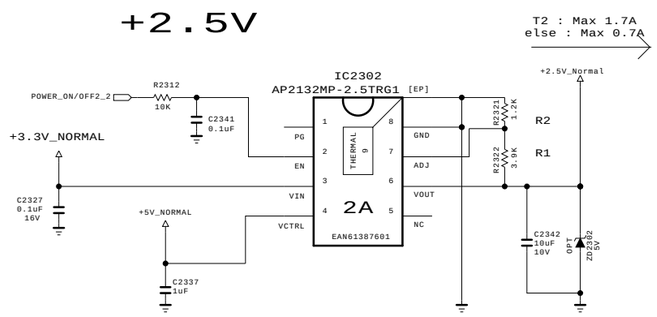
LGE Internal Use Only

Power_DET



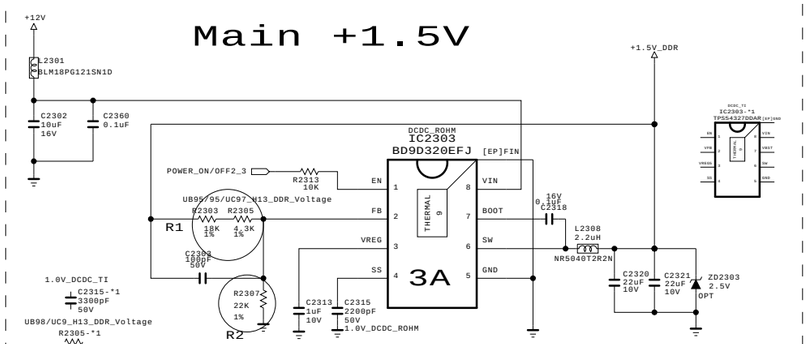
eMMC POWER

+2.5V



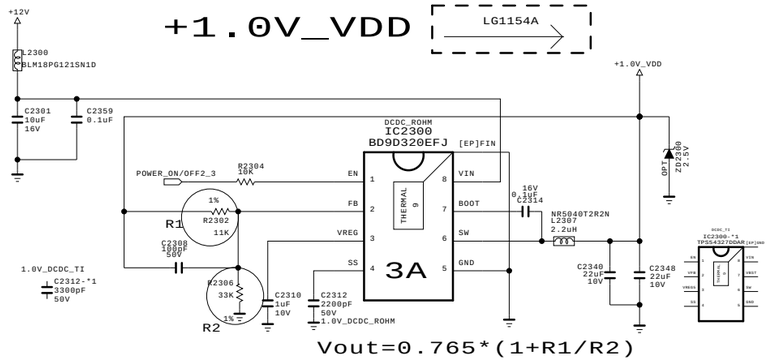
Vout=0.6*(1+R1/R2)

Main +1.5V



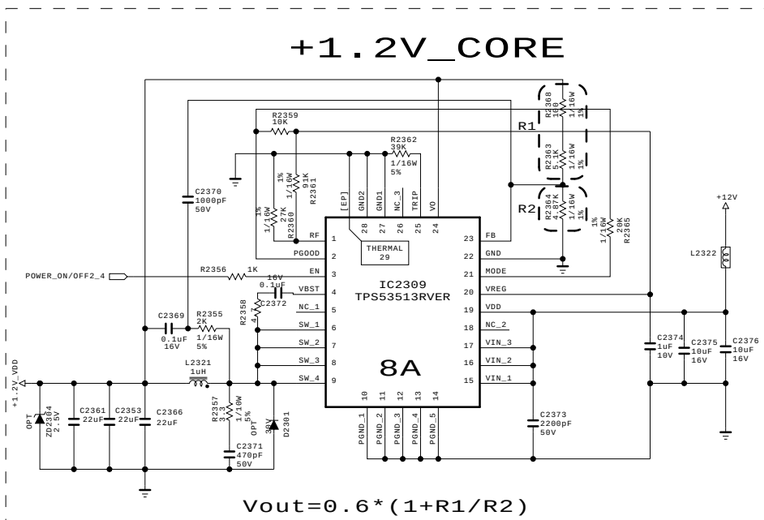
Vout=0.765*(1+R1/R2)=1.516V

+1.0V_VDD



Vout=0.765*(1+R1/R2)

+1.2V_CORE



Vout=0.6*(1+R1/R2)

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

THE ⚠ SYMBOL MARK OF THIS SCHEMETIC 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 SCHEMETIC.

SECRET

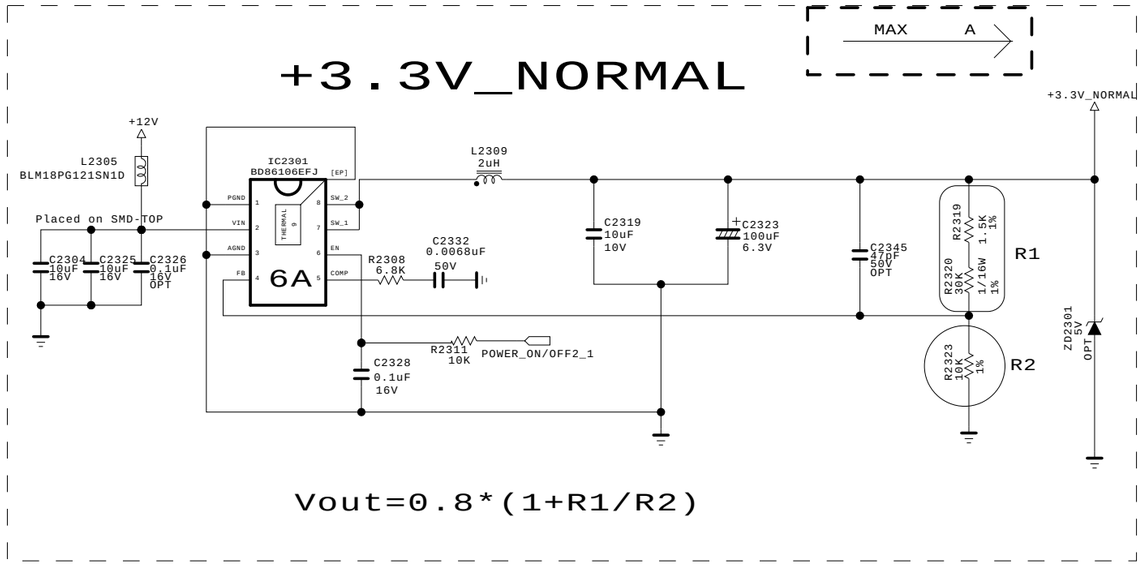
LGElectronics

LG ELECTRONICS

BSD-14Y-UD-023-HD

MODEL		DATE	2013-12-17
BLOCK	POWER	SHEET	/

Separation of +3.3_NORMAL(For CST)



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SECRET

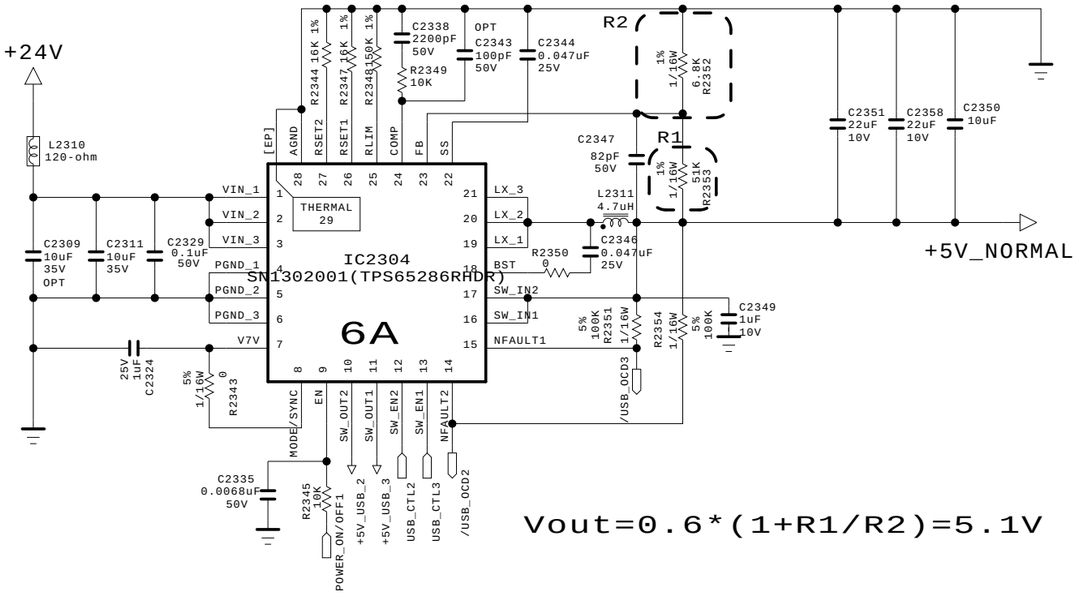
LGElectronics

LG ELECTRONICS

BSD-14Y-UD-024_02-HD

MODEL		DATE	2013.12.17
BLOCK	HDMI	SHEET	/

+5.0V normal & USB for UB model



Vout=0.6*(1+R1/R2)=5.1V

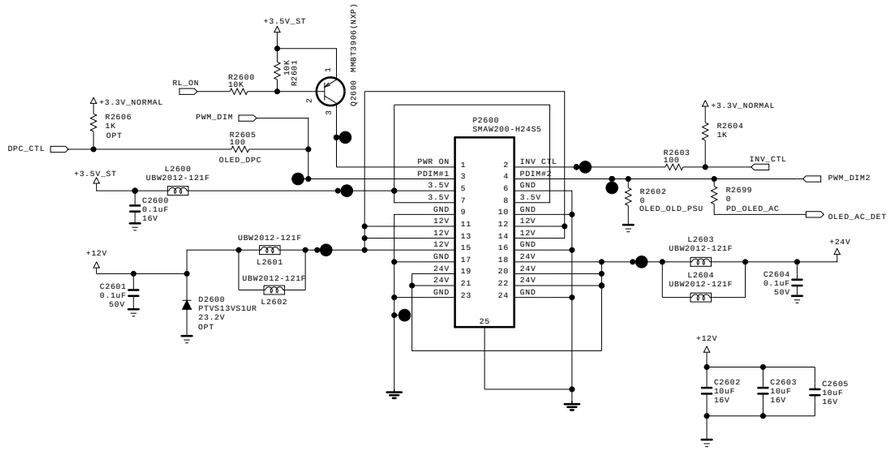
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

SECRET
LGElectronics

LG ELECTRONICS

MODEL		DATE	
BLOCK		SHEET	/

OLED POWER WAFER
(OLD PIN MAP)



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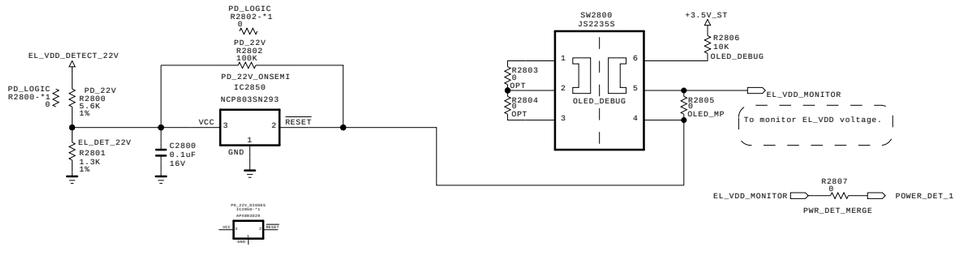
SECRET
LGElectronics

LG ELECTRONICS

BSD-14Y-UD-026-HD

MODEL	OLED	DATE	2014-06-03
BLOCK	OLD POWER PIN MAP	SHEET	/



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SECRET
LGElectronics

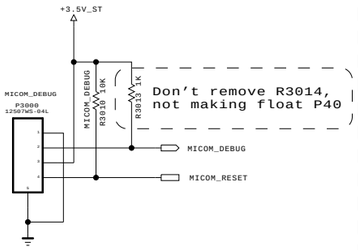
LG ELECTRONICS

BSD-14Y-UD-028-HD

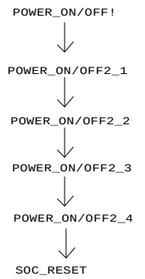
MODEL	OLED	DATE	2014-03-11
BLOCK	ELVDD DETECT	SHEET	/

Renesas MICOM

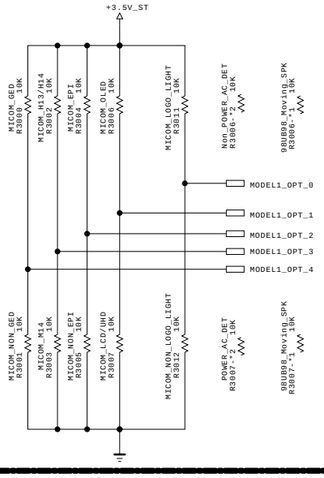
For Debug



GP4 High/MID Power SEQUENCE



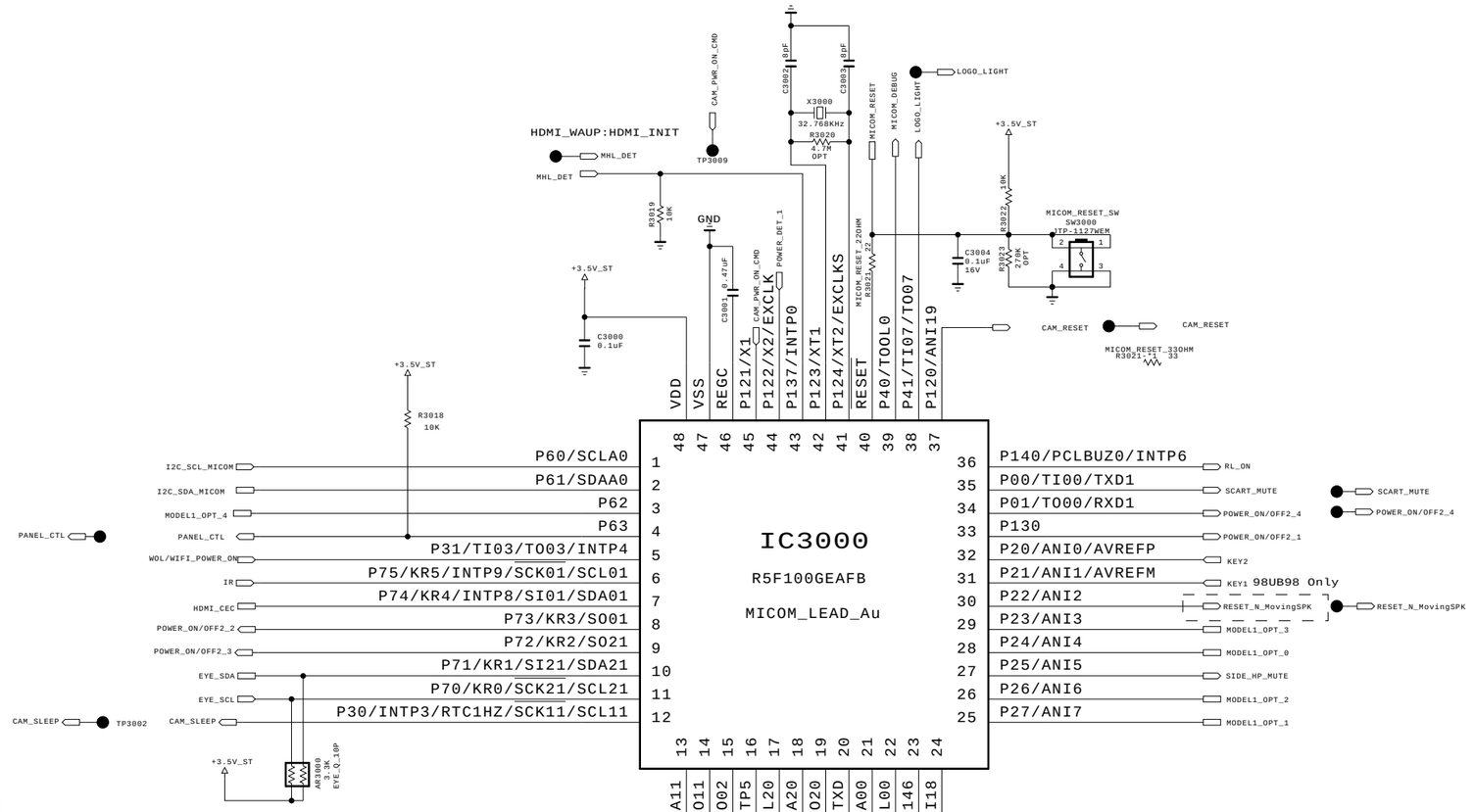
MICOM MODEL OPTION

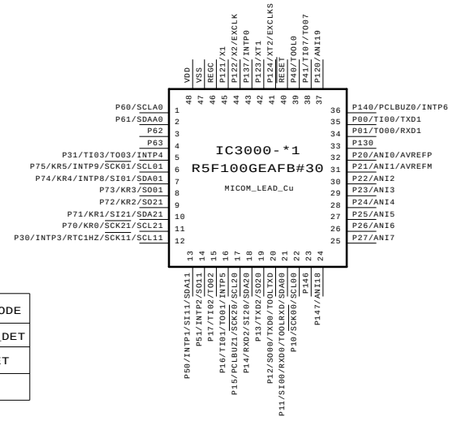


MICOM MODEL OPTION

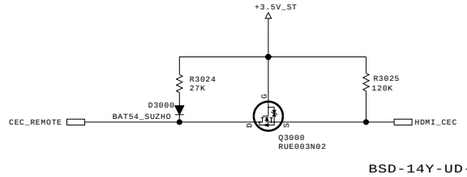
	0	1	
MODEL_OPT_0	NON LOGO	LOGO	For LOGO LIGHT
MODEL_OPT_1	LCD / UHD	OLED	Need to Assign ADC port
MODEL_OPT_2	NON_EPI	EPI	
MODEL_OPT_3	M14	H13 / H14	
MODEL_OPT_4	NON_GED	GED	

MODEL_OPT_1	LCD_MICOM_CODE	OLED_MICOM_CODE
Pull Up	MICOM_OLED	Non_POWER_AC_DET
Pull Down	MICOM_LCD/UHD	POWER_AC_DET
Pull up + pull down	98UB98_Moving_SPK	





For CEC



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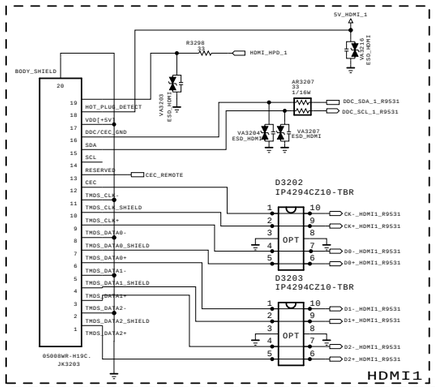
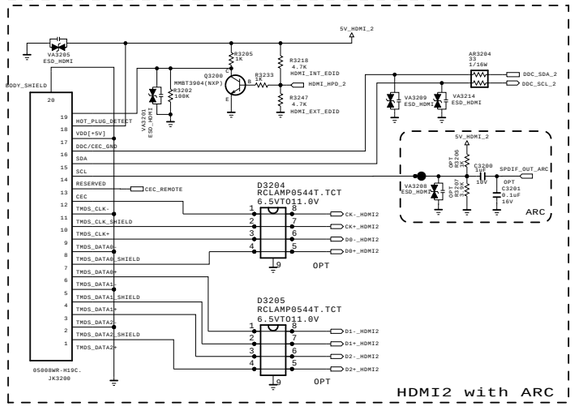
SECRET
LGElectronics

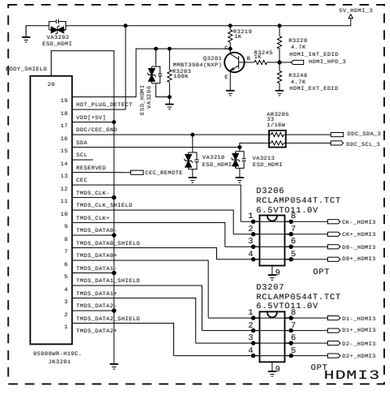
LG ELECTRONICS

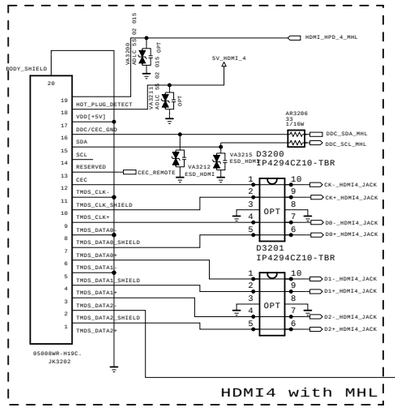
BSD-14Y-UD-030-HD

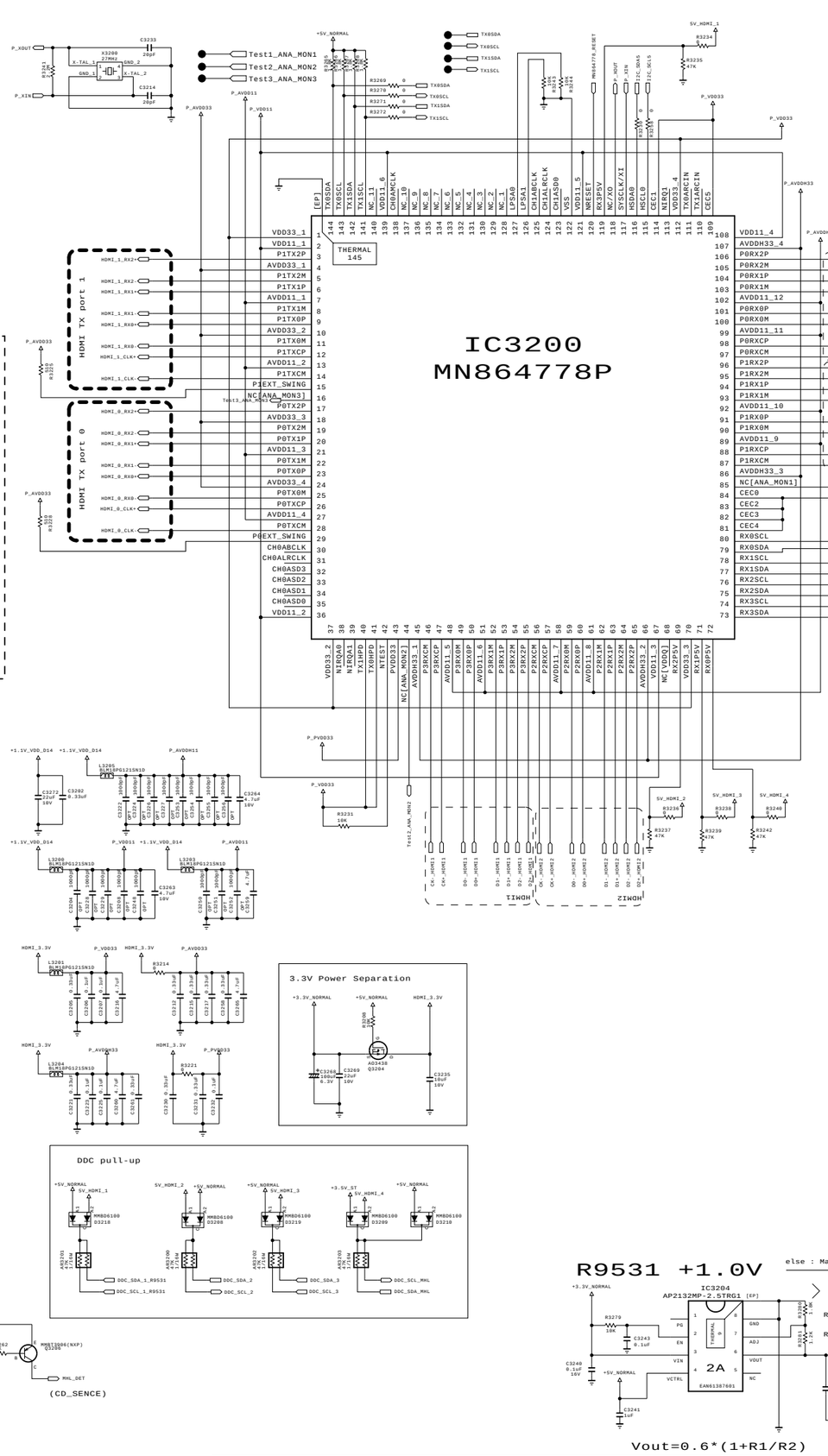
MODEL		DATE	2014.03.11
BLOCK	MICOM	SHEET	30

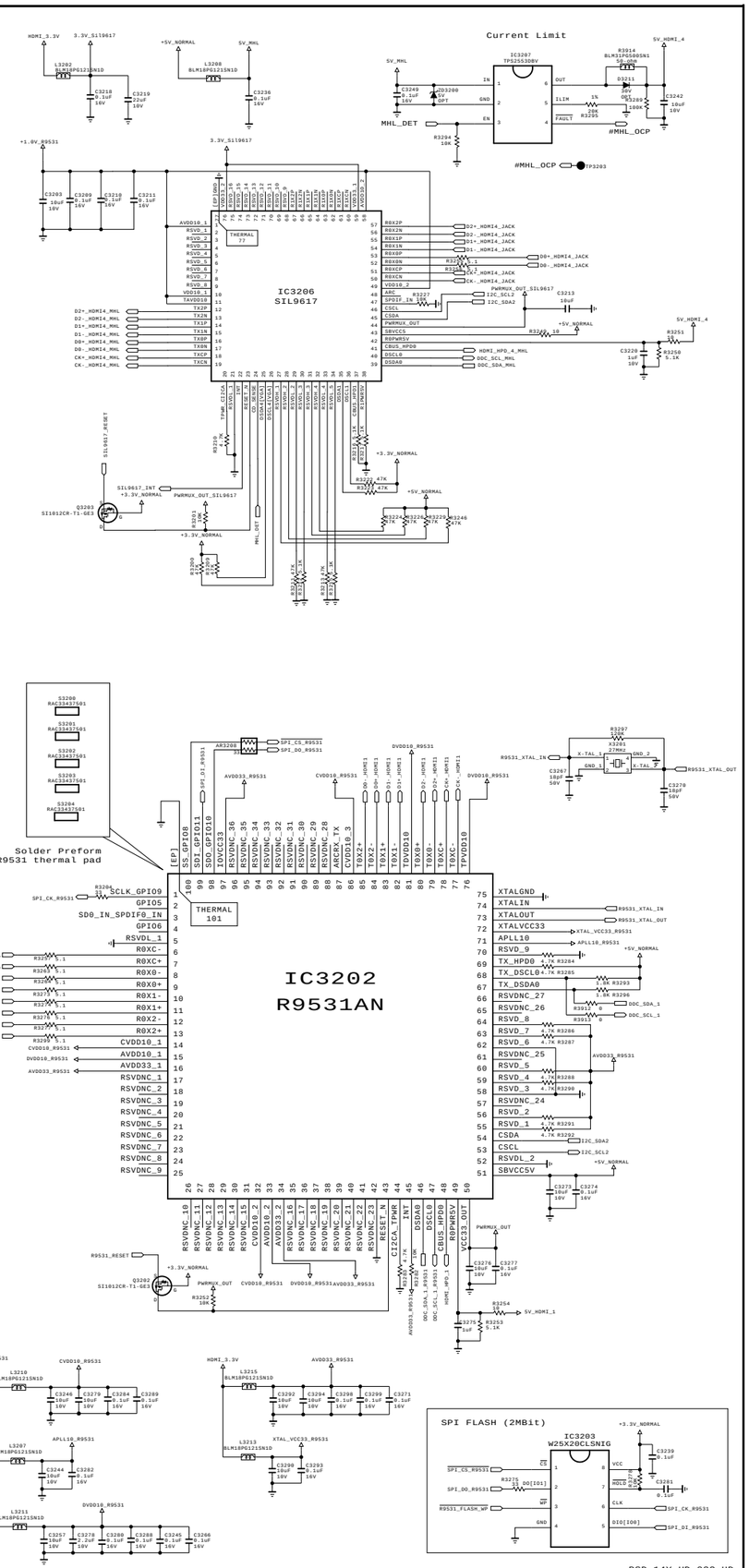












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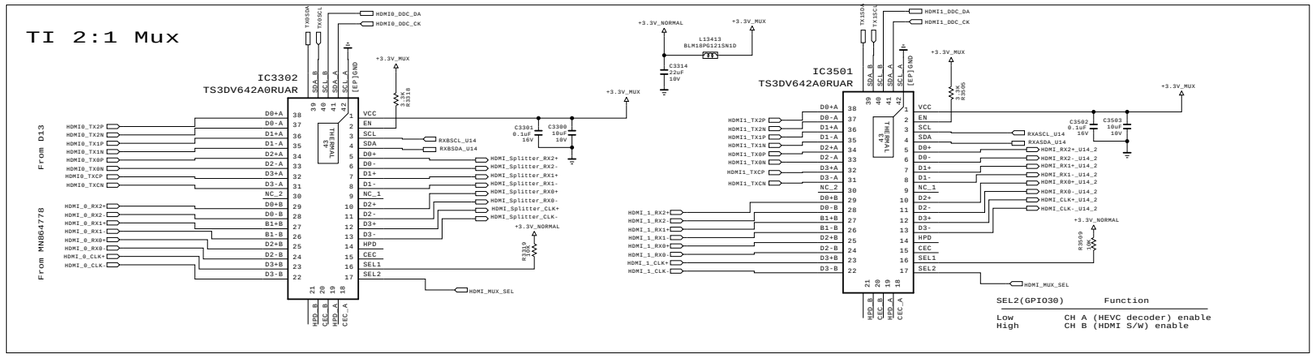
SECRET
LGElectronics

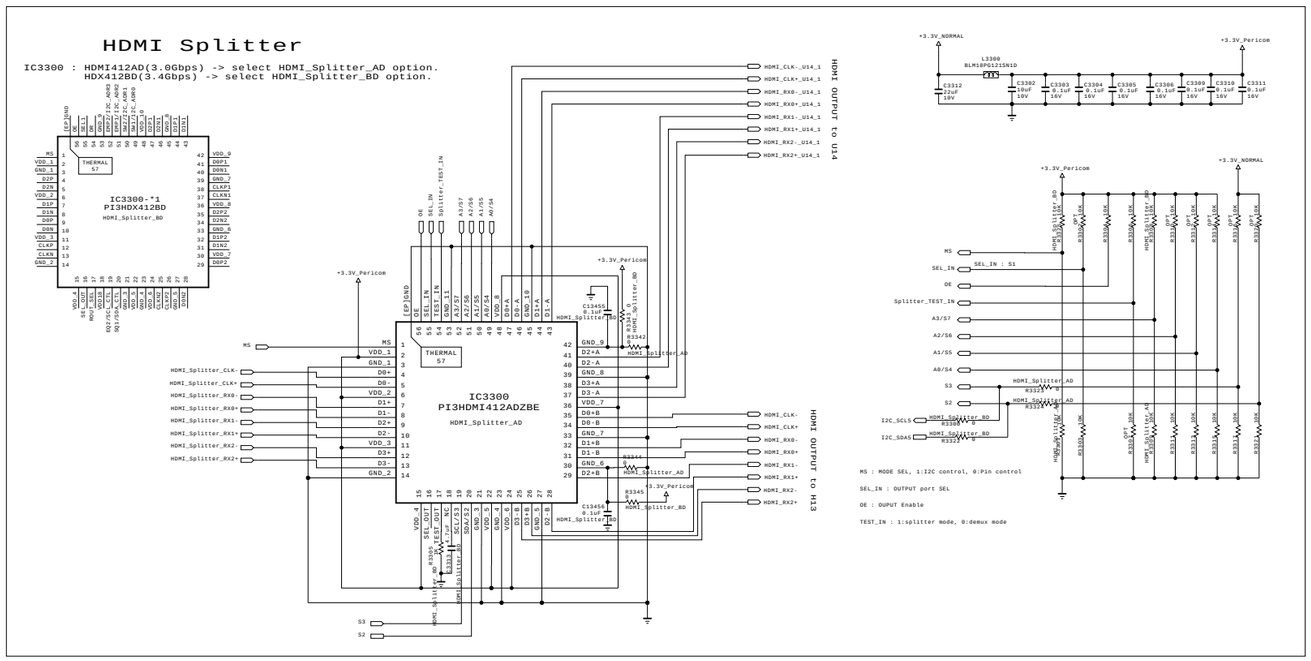
LG ELECTRONICS

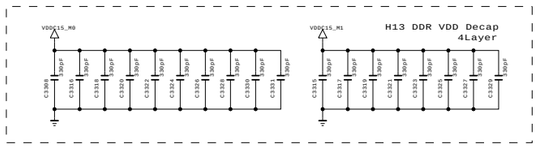
BSD-14Y-UD-032-HD

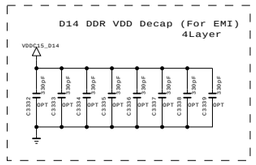
MODEL		DATE	2013.12.17
BLOCK	HDMI	SHEET	32

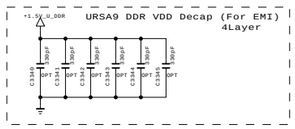
UB98/UC9 only



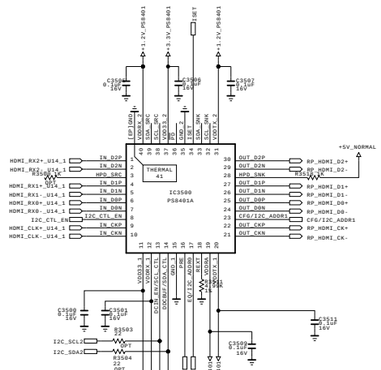


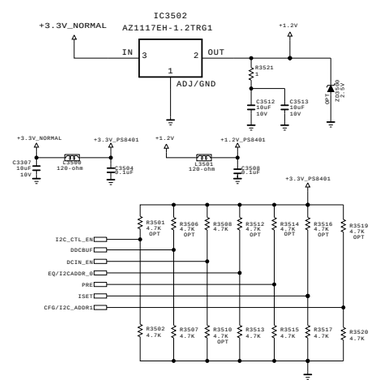






PS8407





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SECRET
LGElectronics

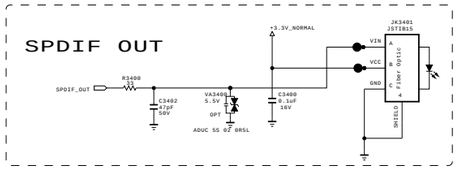
LG ELECTRONICS

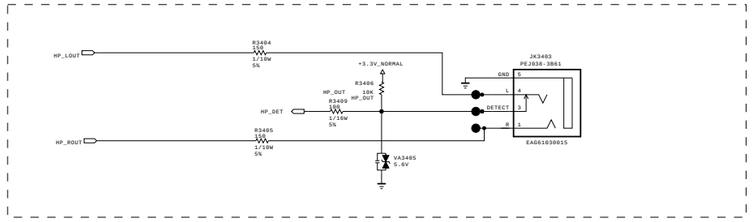
BSD-14Y-UD-033_01-HD

MODEL		DATE	2013.12.17
BLOCK	HDMI	SHEET	/

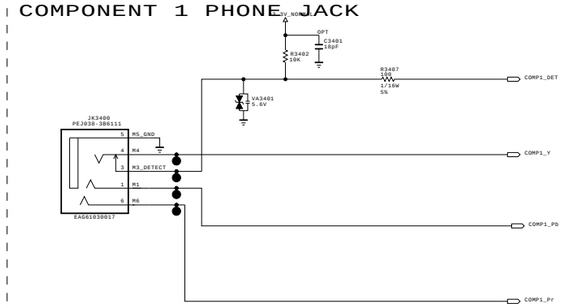
LGE Internal Use Only

SPDIF OUT

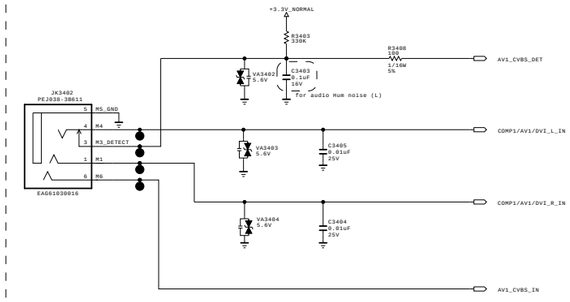




COMPONENT 1 PHONE JACK



CVBS 1 PHONE JACK



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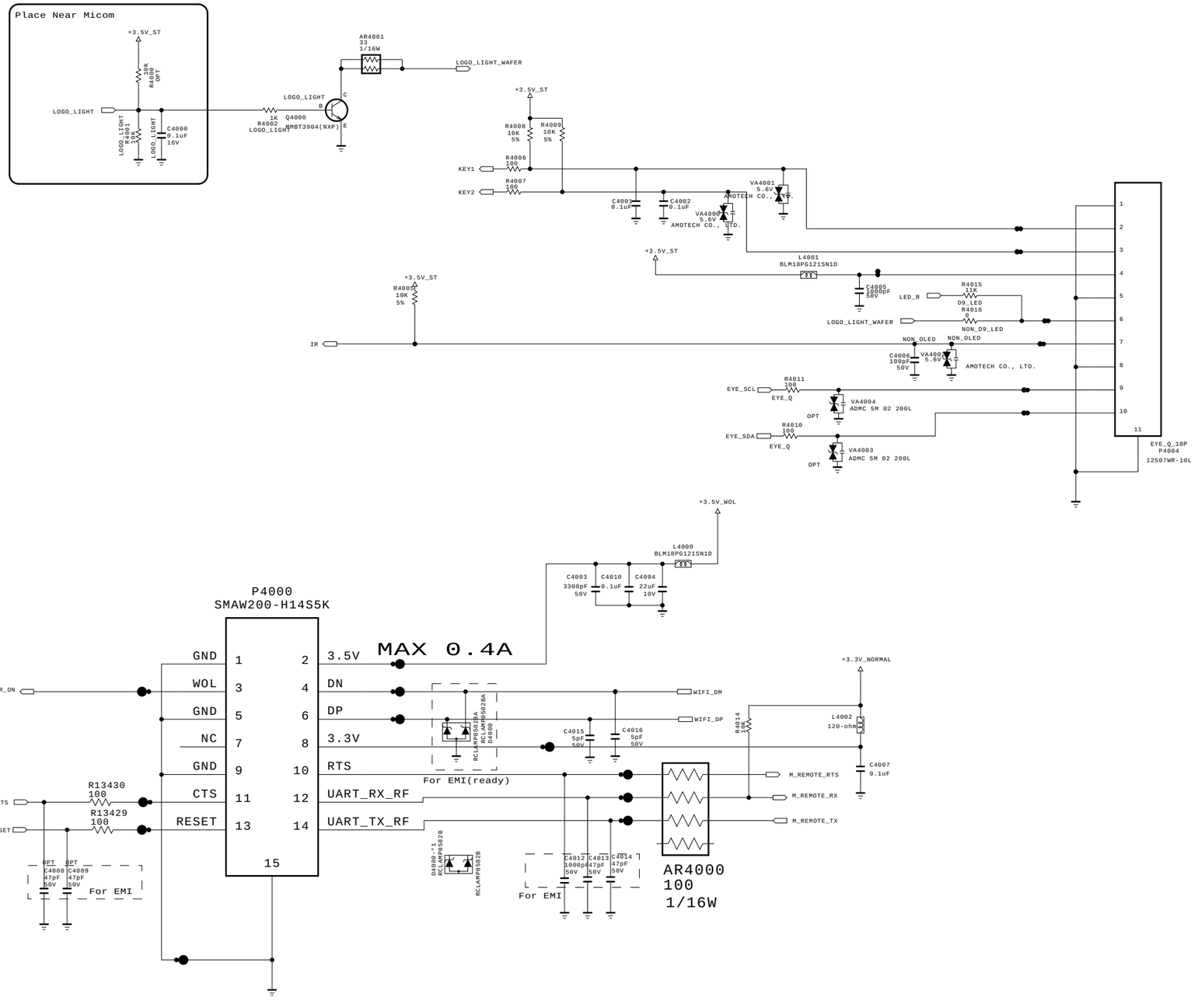
SECRET
LGElectronics

LG ELECTRONICS

BSD-14Y-UD-034-HD

MODEL	JACK HIGH/MID	DATE	2013.12.17
BLOCK		SHEET	/

UB98/UC9 only



LOCAL MODIFY

Deleted P4005, L4004, R4017

SECRET

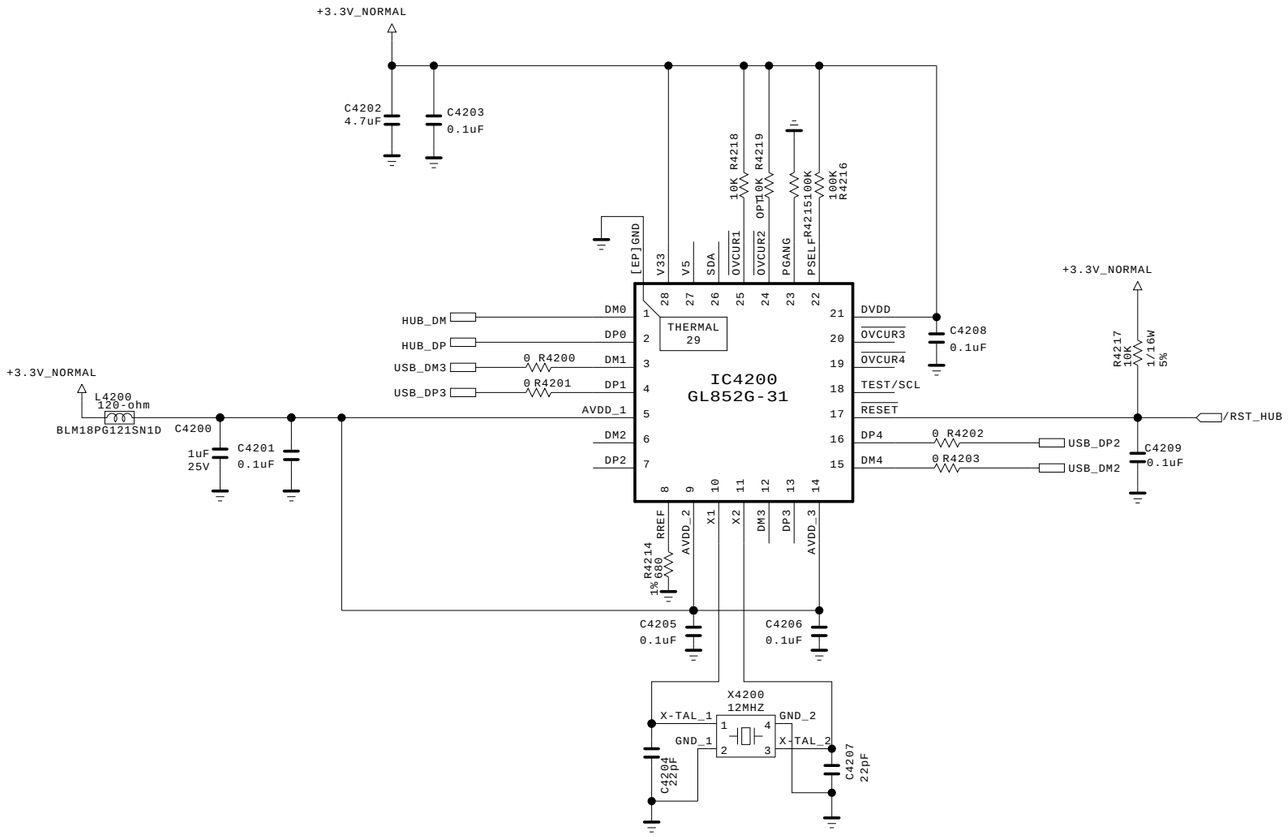
LGElectronics

LG ELECTRONICS

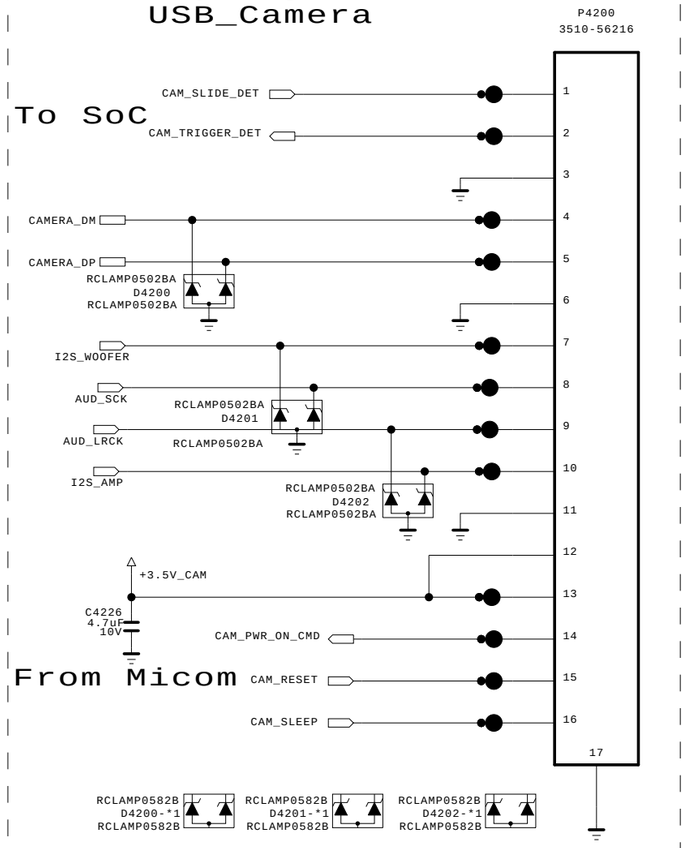
BSD-14Y-UD-040_01-HD

MODEL	IR / KEY	DATE	2013.12.17
BLOCK		SHEET	/

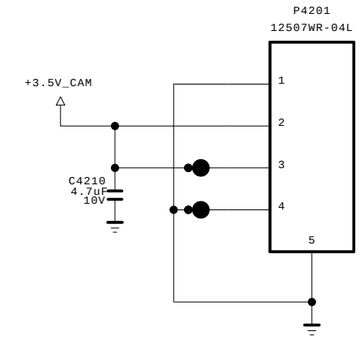
UB98/D9 only



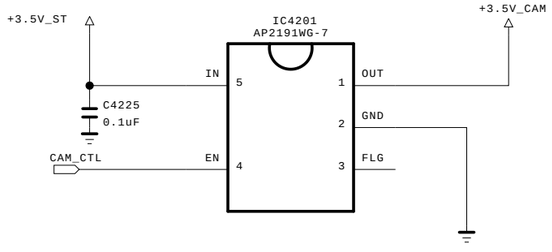
From HUB USB_Camera



Camera Power CNT



CAMERA POWER ENABLE CONTROL



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SECRET

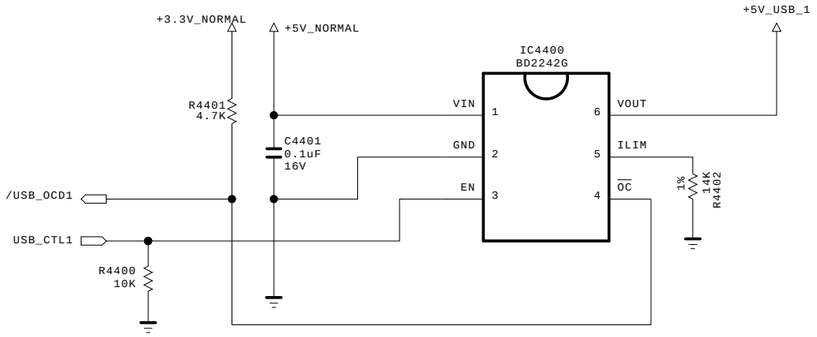
LGElectronics

LG ELECTRONICS

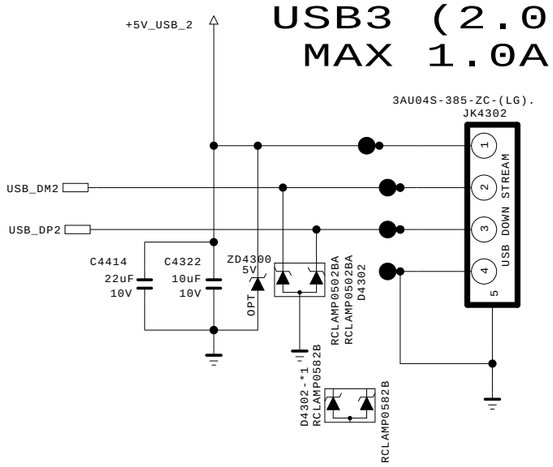
BSD-14Y-UD-042-HD

MODEL	USB3_HUB	DATE	2013.12.17
BLOCK		SHEET	/

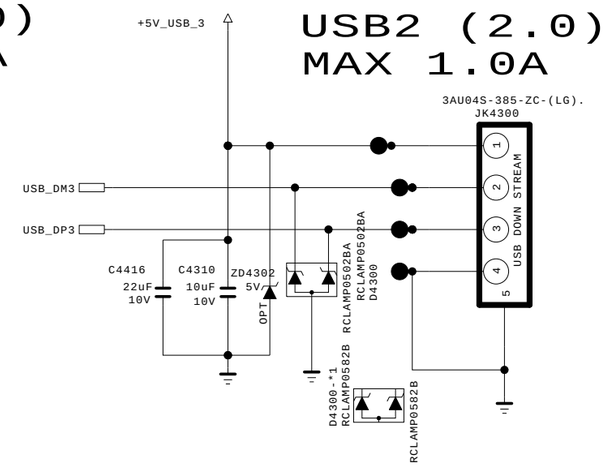
OCP USB1



USB3 (2.0) MAX 1.0A

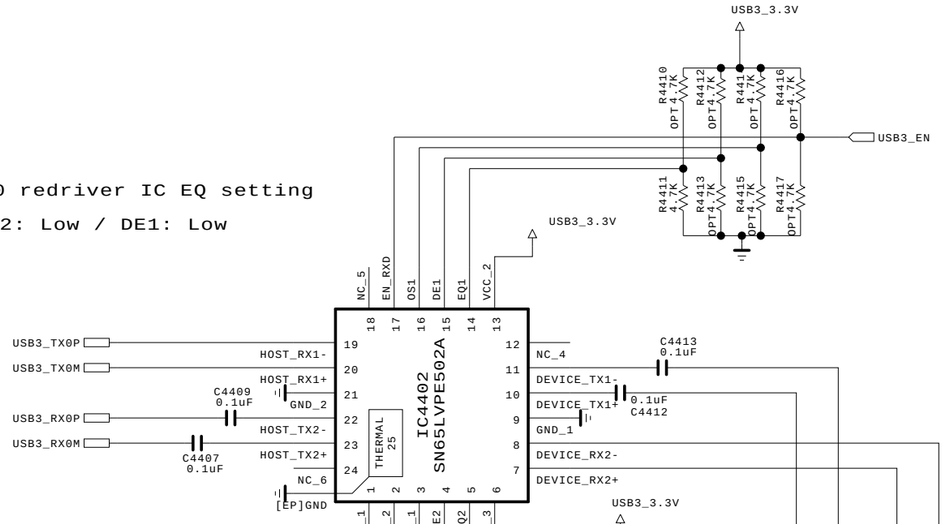


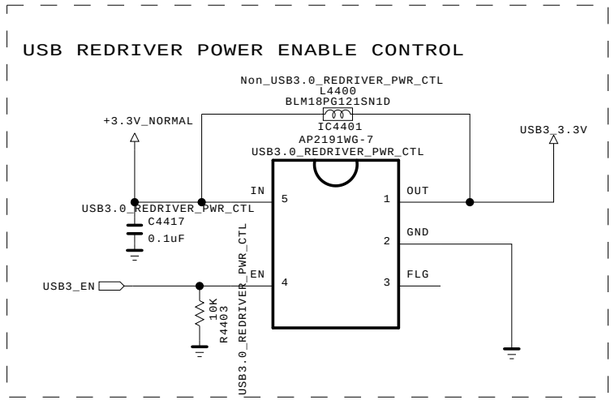
USB2 (2.0) MAX 1.0A



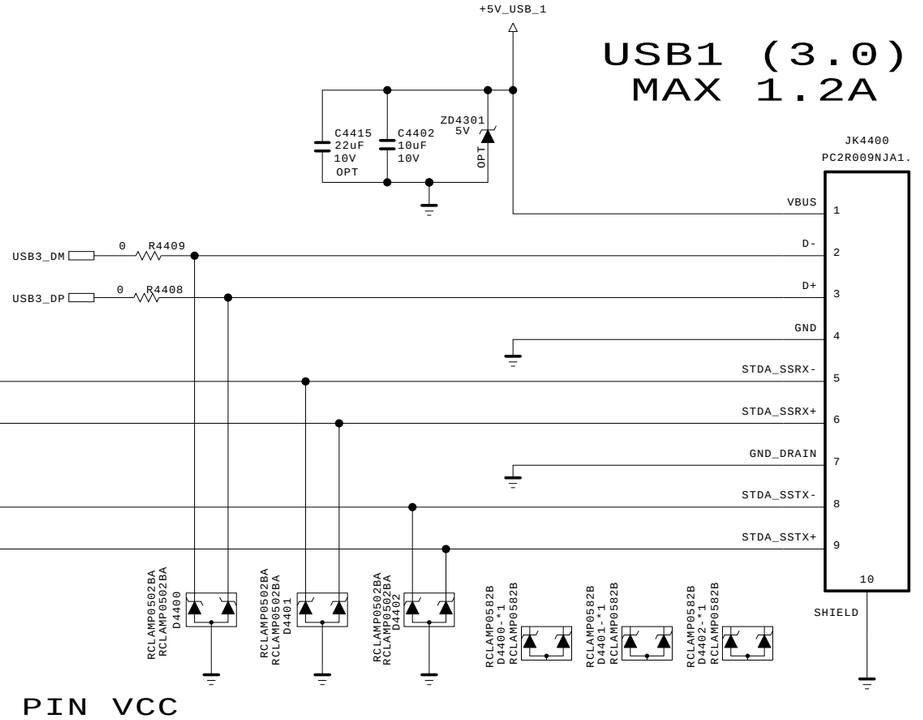
USB3.0 redriver IC EQ setting

-> EQ2: Low / DE1: Low





USB1 (3.0) MAX 1.2A



Place under DUT Near SN65LVPE502CP PIN VCC

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SECRET

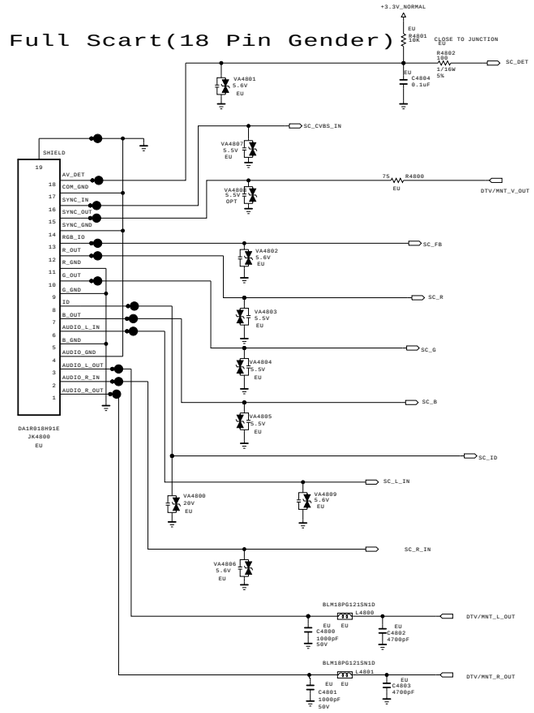
LGElectronics

LG ELECTRONICS

BSD-14Y-UD-044-HD

MODEL		DATE	2013-12-17
BLOCK	USB JACK	SHEET	/

Full Scart(18 Pin Gender)



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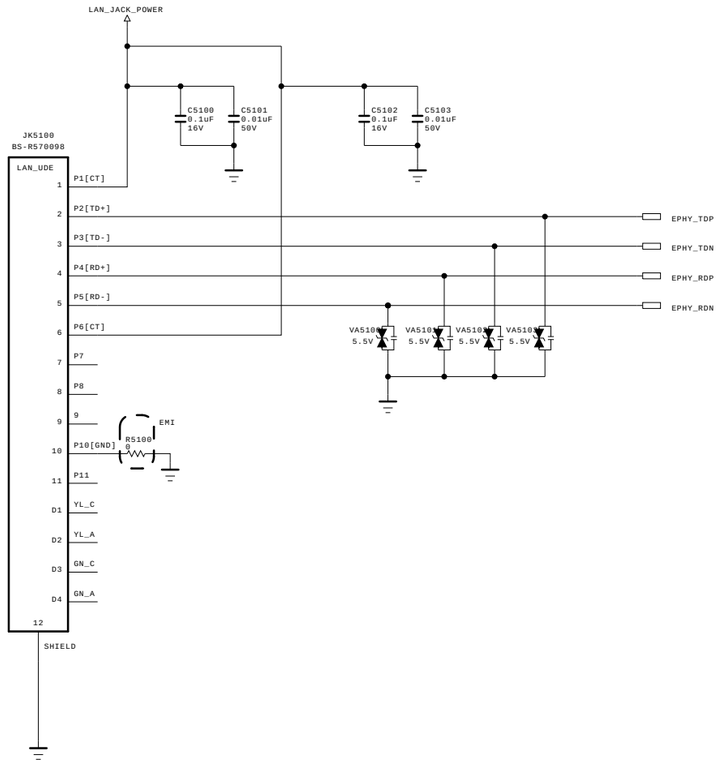
SECRET
LGElectronics

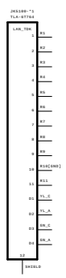
LG ELECTRONICS

BSD-14Y-UD-048-HD

MODEL		DATE	2013.12.17
BLOCK	SCART GENDER	SHEET	/

Ethernet Block





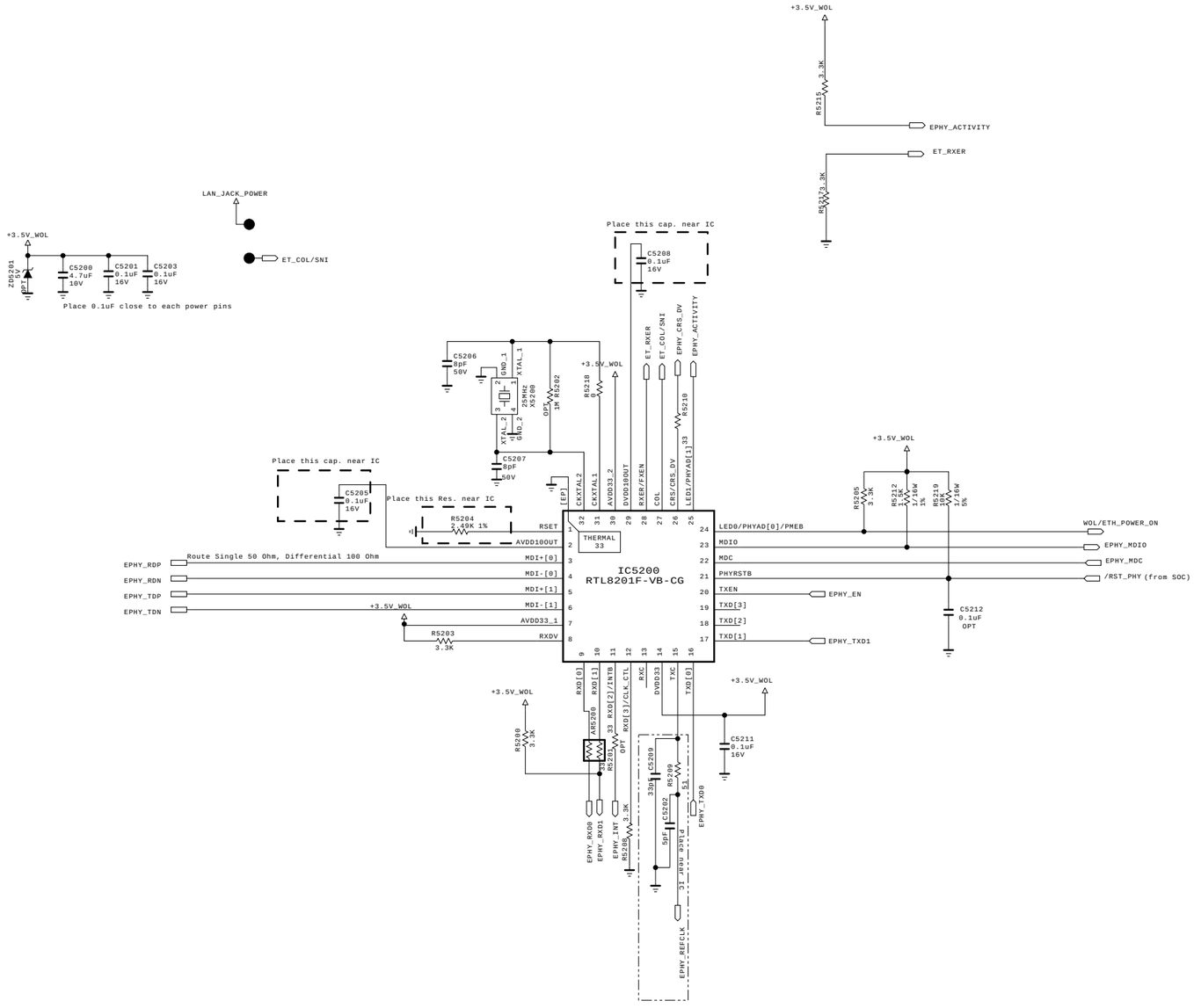
SECRET
LGElectronics

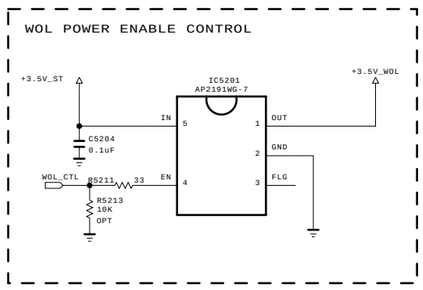
LG ELECTRONICS

BSD-14Y-UD-051-HD

MODEL	LAN_VERTICAL	DATE	2012.12.17
BLOCK		SHEET	51

Ethernet Block





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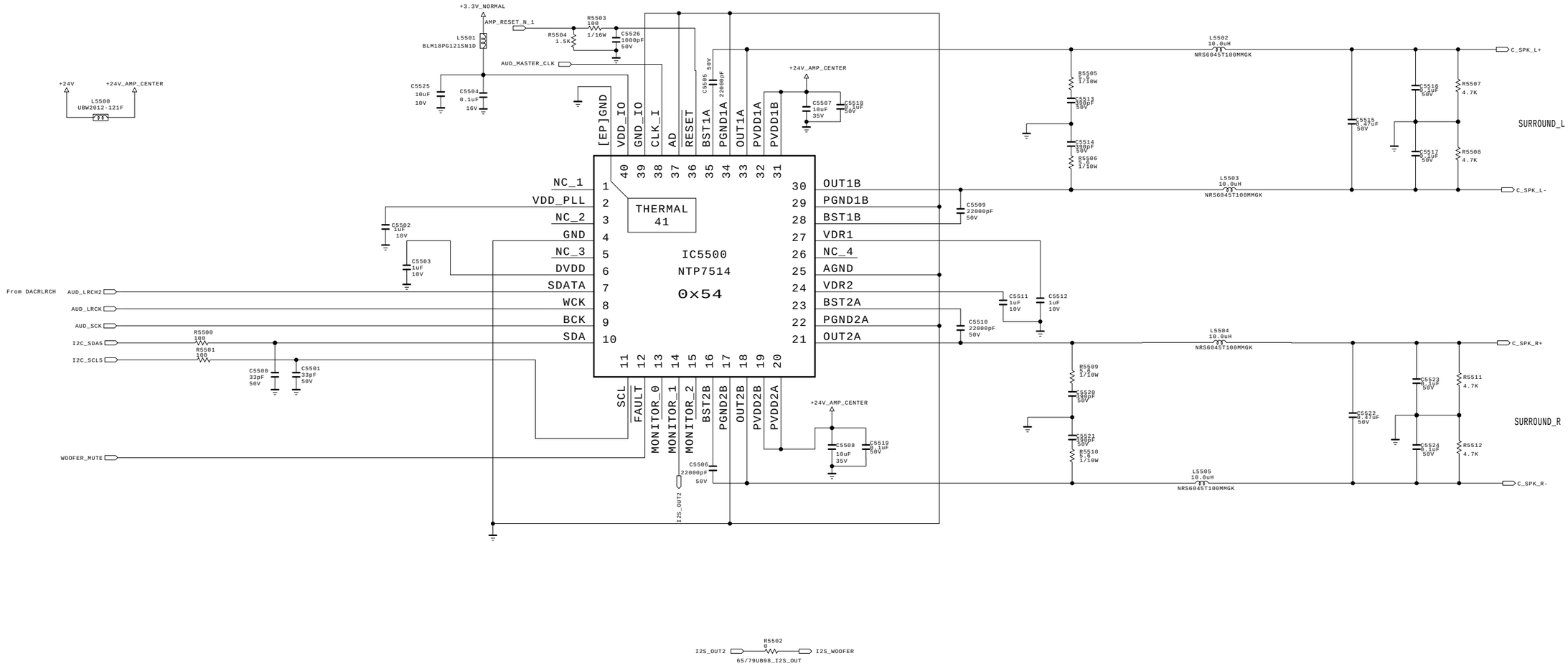
SECRET
LGElectronics

LG ELECTRONICS

BSD-14Y-UD-052-HD

MODEL		DATE	2013-12-17
BLOCK	ETHERNET	SHEET	/

77EC98



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SECRET
LGElectronics

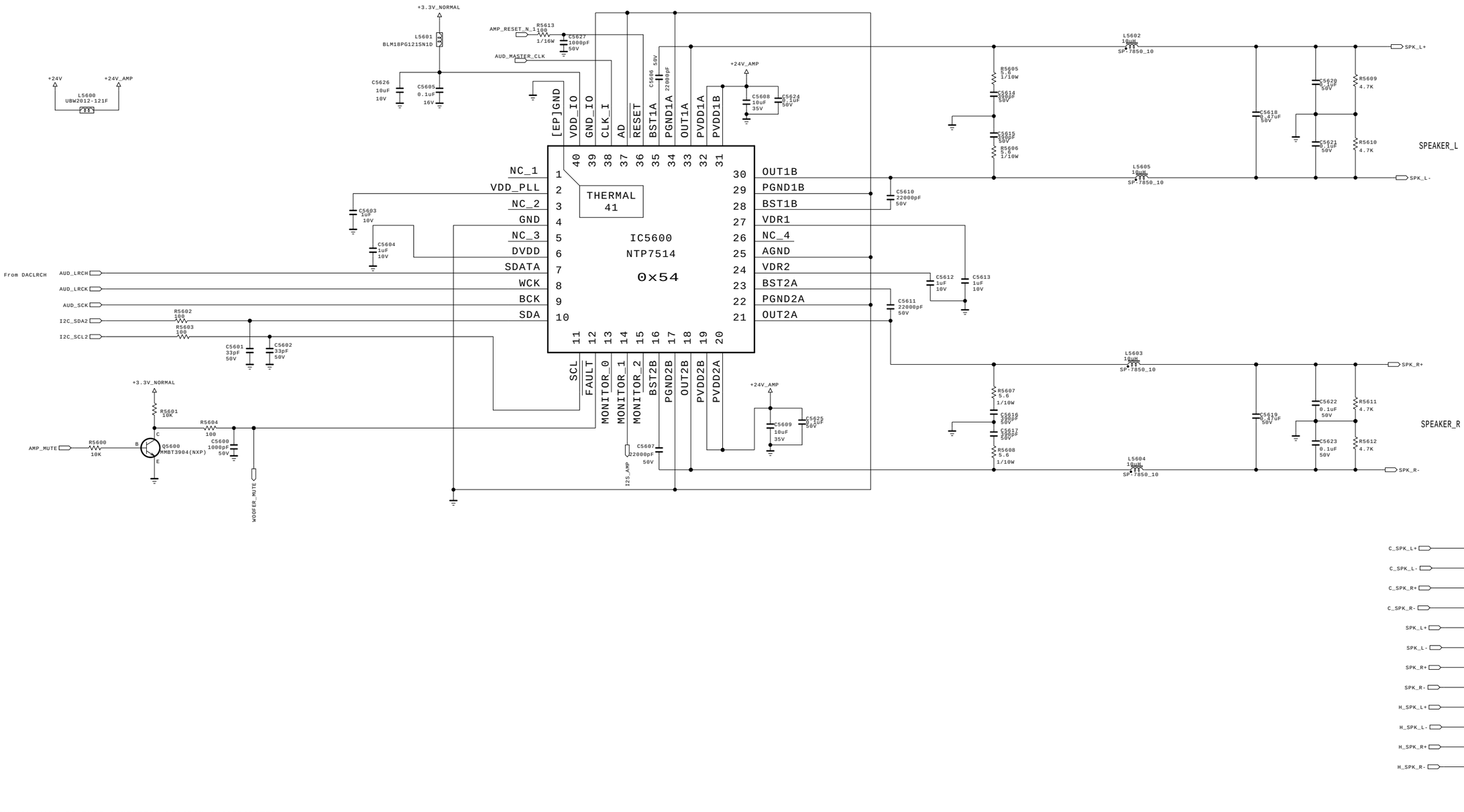
LG ELECTRONICS

BSD-14Y-UD-055_01-HD

MODEL	77EC9800	DATE	2014-03-08
BLOCK	SURROUND_AMP	SHEET	/

UB98/UC9 only

Front speaker



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SECRET
LGElectronics

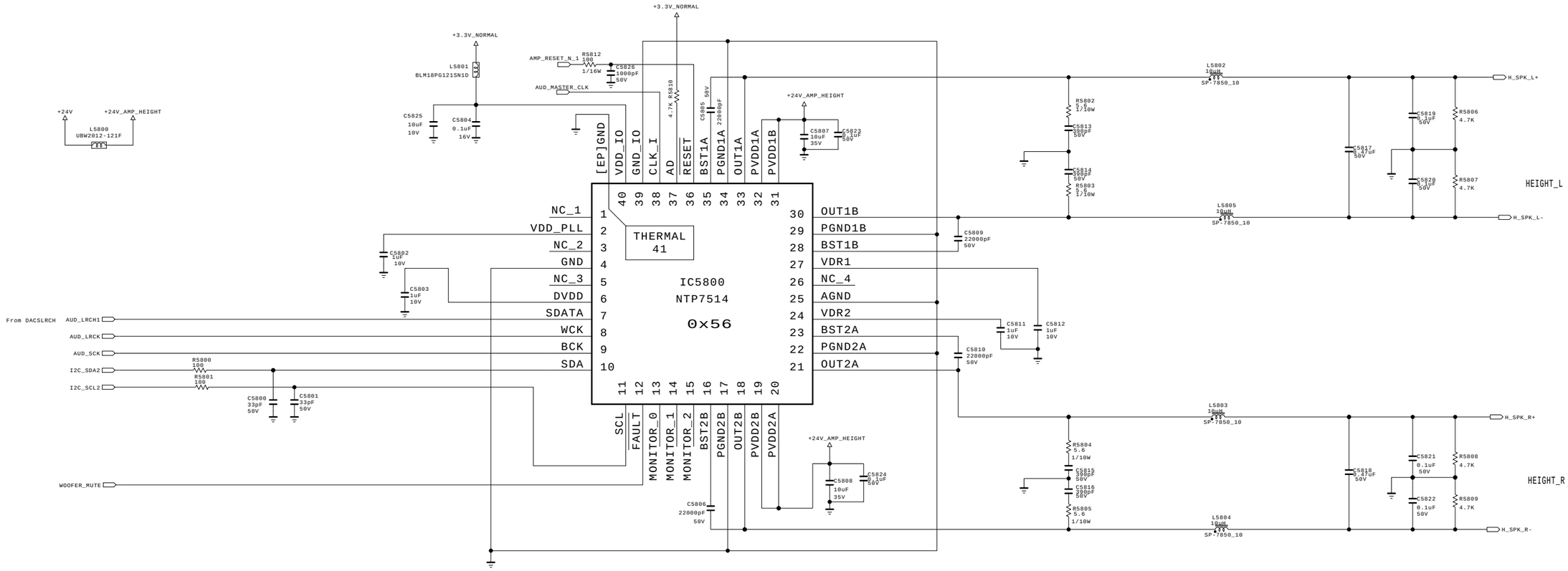
LG ELECTRONICS

BSD-14Y-UD-056-01-HD

MODEL		DATE	2013.12.17
BLOCK		SHEET	/

LGE Internal Use Only

77EC98_Height



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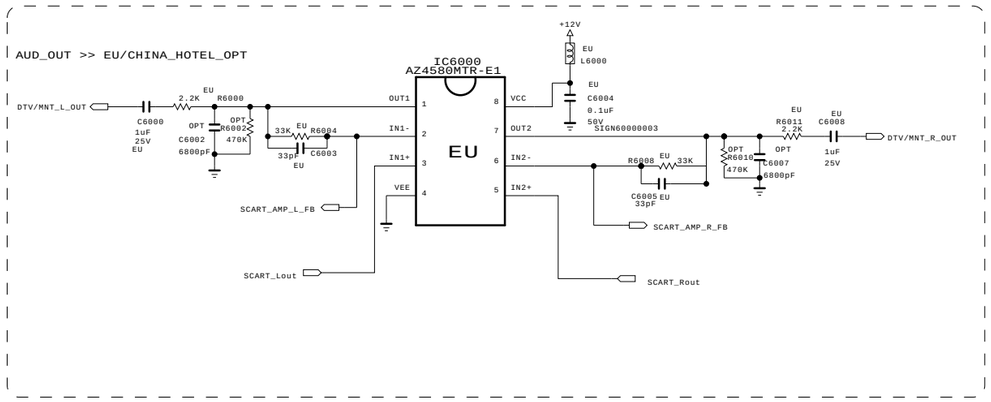
SECRET

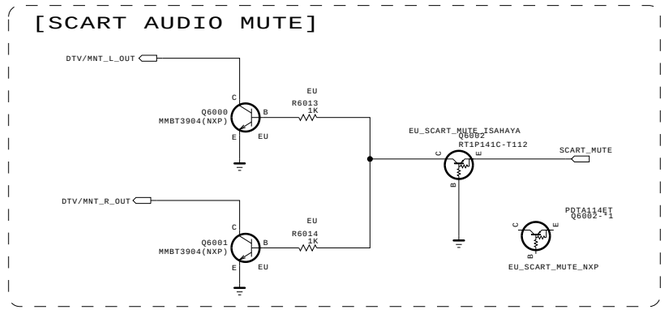
LGElectronics

LG ELECTRONICS

BSD-14Y-UD-058_01-HD

MODEL	77EC9800	DATE	2014-03-08
BLOCK	Height Amp	SHEET	/





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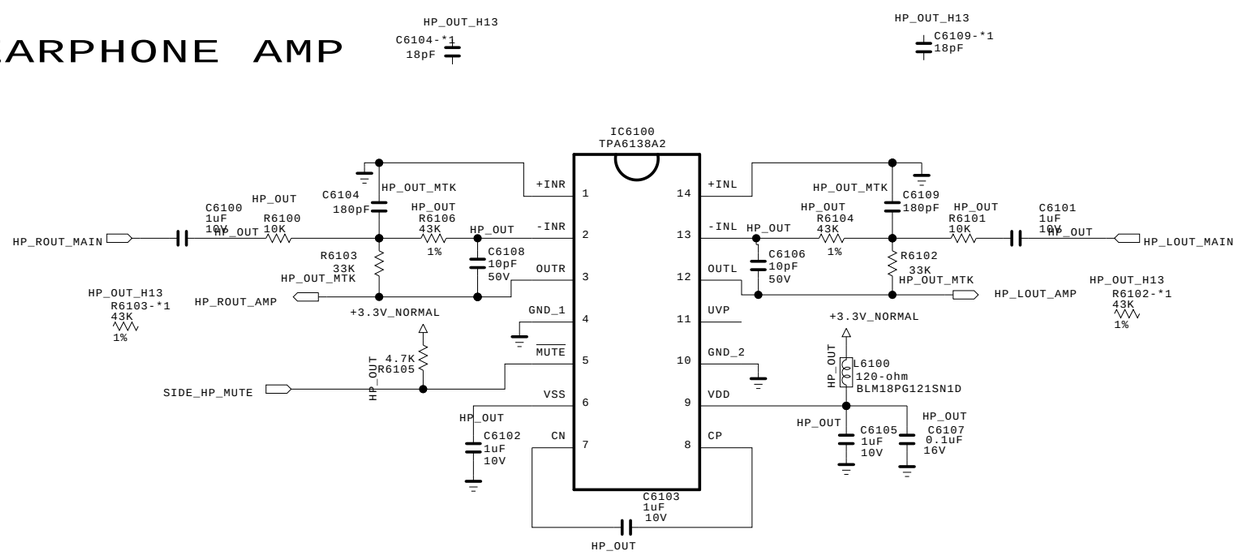
SECRET
LGElectronics

LG ELECTRONICS

BSD-14Y-UD-060-HD

MODEL		DATE	2012.12.17
BLOCK	SCART AUDIO AMP	SHEET	60

EARPHONE AMP



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SECRET

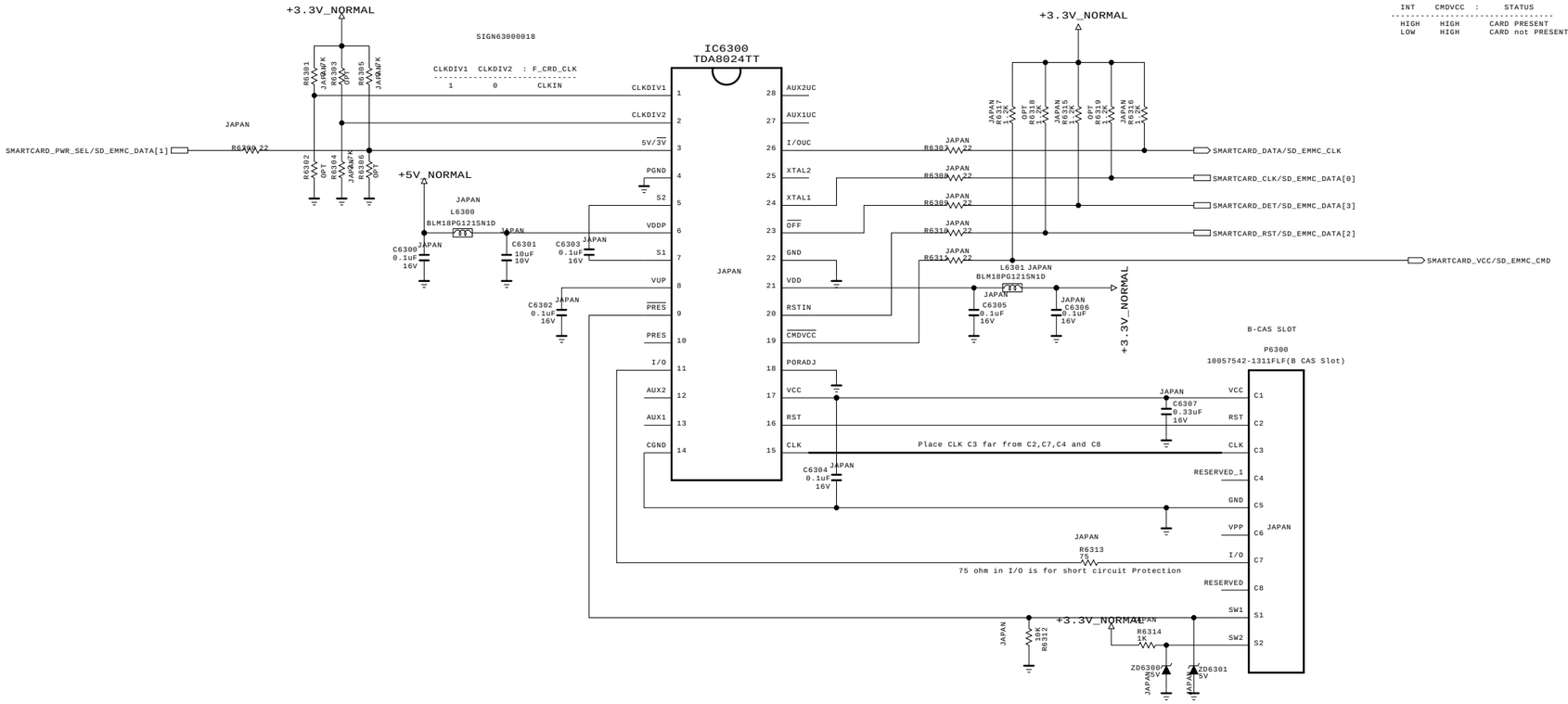
LGElectronics

LG ELECTRONICS

BSD-14Y-UD-061-HD

MODEL	HEADPHONE AMP	DATE	2013.12.17
BLOCK		SHEET	61

B-CAS (SMART CARD) INTERFACE



INT	CMDVCC	: STATUS
HIGH	HIGH	CARD PRESENT
LOW	HIGH	CARD not PRESENT

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SECRET

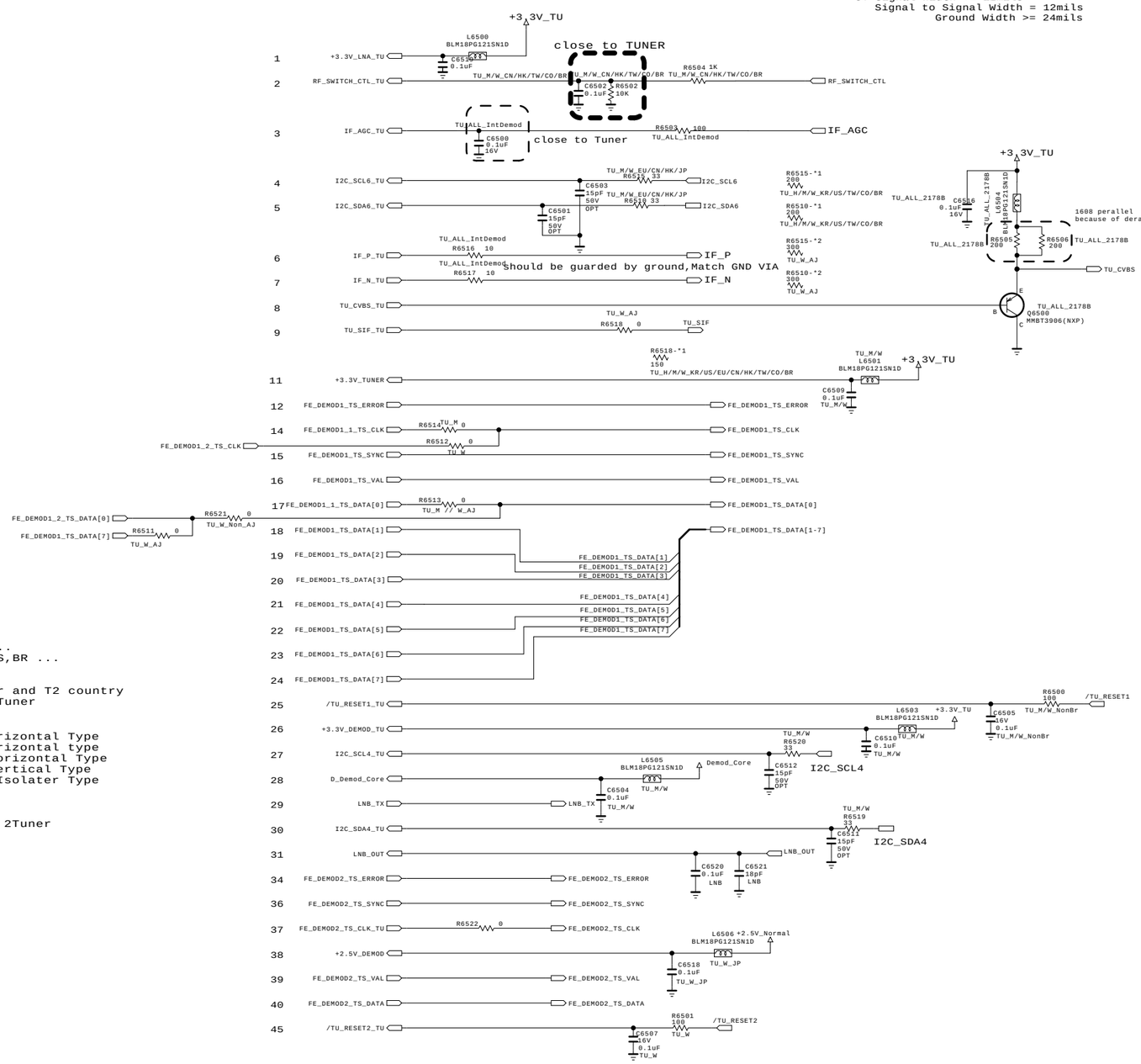
LGElectronics

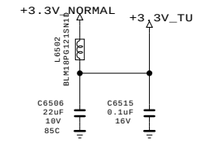
LG ELECTRONICS

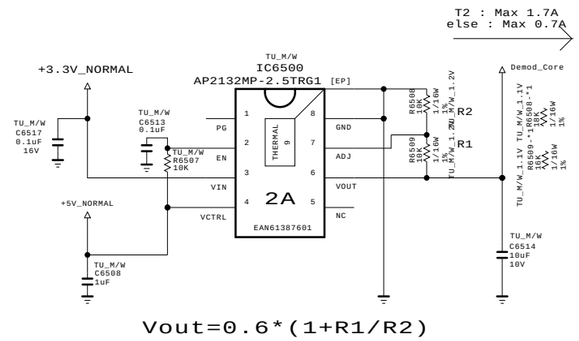
BSD-14Y-UD-063-HD

MODEL		DATE	2012.12.17
BLOCK	JAPAN_BCAS	SHEET	63

1. should be guarded by ground
2. No via on both of them
3. Signal Width >= 12mils
   Signal to Signal Width = 12mils
   Ground Width >= 24mils







Vout=0.6*(1+R1/R2)

Global F/E Option Name
1. TU
2. Tuner Name = TDS'S',TDS'Q'...
3. Country Name = T,T2,S2,KR,US,BR ...

Example of Option name
TU_Q_T2 = apply TDSQ type tuner and T2 country
TU_M/W = apply TDSM&TDSW Type Tuner

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

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SECRET
LGElectronics

LG ELECTRONICS

BSD-14Y-UD-065-HD

MODEL	TUNER	DATE	2013.12.17
BLOCK		SHEET	65

LGE Internal Use Only

TDJW_A152D
TU6800
TDJW-A152D

1	B1[+3.3V]
2	NC_1
3	NC_2
4	SCL_RF
5	SDA_RF
6	NC_3
7	NC_4
8	M_SIF
9	M_CVBS
10	NC_5
11	B2[+3.3V]
12	NC_6
13	GROUND_1
25	M_RESET_DEMOD
26	B3[+3.3V]
27	SCL_DEMOD
28	B4[+1.2V]
29	NC_7
30	SDA_DEMOD
33	NC_8
34	M_ERROR
35	GROUND_2
36	M_SYNC
37	M_MCLK
38	NC_9
39	M_VALID
40	M_DATA
41	S_ERROR
42	S_SYNC
43	S_MCLK
44	S_VALID
45	S_RESET_DEMOD
46	S_DATA_7
47	S_DATA_0
48	S_DATA_1
49	S_DATA_2
50	S_DATA_3
51	S_DATA_4
52	S_DATA_5
53	S_DATA_6

A1 A1 54 B1 B1
SHIELD
TU_GND_A
TU_GND_B

TDJW-J251F
TU6700
TDJW-J251F

1	B1[+3.3V]
2	NC_1
3	NC_2
4	SCL_RF
5	SDA_RF
6	NC_3
7	NC_4
8	NC_5
9	NC_6
10	NC_7
11	B2[+3.3V]
12	NC_8
13	GND_1
25	M_RESET_DEMOD
26	B3[+3.3V]
27	SCL_DEMOD
28	B4[+1.2V]
29	NC_9
30	SDA_DEMOD
31	LNB
32	GND_2
33	NC_10
34	M_ERROR — FE_DEMOD2_TS_ERROR
35	GND_3
36	M_SYNC — FE_DEMOD2_TS_SYNC
37	M_MCLK — FE_DEMOD2_TS_CLK_TU
38	B5[+2.5V] — +2.5V_DEMOD
39	M_VALID — FE_DEMOD2_TS_VAL
40	M_DATA — FE_DEMOD2_TS_DATA
41	S_ERROR — FE_DEMOD1_TS_ERROR
42	S_SYNC — FE_DEMOD1_TS_SYNC
43	S_MCLK — FE_DEMOD1_2_TS_CLK
44	S_VALID — FE_DEMOD1_TS_VAL
45	S_RESET_DEMOD — /TU_RESET2_TU
46	S_DATA — FE_DEMOD1_2_TS_DATA[0]

A1 A1 47 B1 B1
SHIELD
TU_GND_A
TU_GND_B

TDJM_G251D
TU6707
TDJM-G251D

1	B1[+3.3V]
2	NC_1
3	NC_2
4	SCL_RF
5	SDA_RF
6	NC_3
7	NC_4
8	SIF
9	CVBS
10	NC_5
11	B2[+3.3V]
12	ERROR
13	GND_1
14	MCLK
15	SYNC
16	VAILD
17	D0
18	D1
19	D2
20	D3
21	D4
22	D5
23	D6
24	D7
25	RESET_DEMOD
26	B3[+3.3V]
27	SCL_DEMOD
28	B4[+1.1V]
29	F22_OUTPUT
30	SDA_DEMOD
31	LNB
32	GND_2

A1 A1 47 B1 B1
SHIELD
TU_GND_A
TU_GND_B

TU_M/W_EU/JP C6704 3300pF 630V
TU_M/W_EU/JP C6702 1000pF 630V
C6700 1000pF 630V TU_W_TW/CO/BR/JP
R6702 0
R6703 0
C6700-*1 3300pF 630V TU_M_CN/HK
TU_H/M/W_KR/US/JP/EU
TU_H/M/W_KR/US/JP/EU
TU_H/M/W_KR/US/EU/AJ/JP/TW/CO/BR

TU_H/M/W_EU/AJ/US_3300pF
C6708 3300pF 630V
C6709 3300pF 630V
C6710 3300pF 630V
C6701 1000pF 630V
C6703 1000pF 630V TU_W_EU/JP
C6707 1000pF 630V TU_W_JP
C6701-*1 3300pF 630V TU_M_CN/HK
C6703-*1 3300pF 630V TU_H/W_AJ/US_3300pF
C6703-*2 0.022uF 630V TU_W_AJ_2.2nF

URSA9 I2C cap. Ready
I2CS_SDA — C15001 OPT 20pF
I2CS_SCL — C15002 OPT 20pF

TDJM_H151F
TU6701
TDJM-H151F

1	B1[+3.3V]
2	NC_1
3	M_DIF_AGC
4	SCL_RF
5	SDA_RF
6	M_DIF[P]
7	M_DIF[N]
8	S_SIF
9	S_CVBS
10	NC_2
11	B2[+3.3V] — +3.3V_TUNER
12	S_ERROR — FE_DEMOD1_TS_ERROR
13	GND_1
14	S_MCLK — FE_DEMOD1_1_TS_CLK
15	S_SYNC — FE_DEMOD1_TS_SYNC
16	S_VAILD — FE_DEMOD1_TS_VAL
17	S_DATA — FE_DEMOD1_1_TS_DATA[0]
18	NC_3 — FE_DEMOD1_TS_DATA[1]
19	NC_4 — FE_DEMOD1_TS_DATA[2]
20	NC_5 — FE_DEMOD1_TS_DATA[3]
21	NC_6 — FE_DEMOD1_TS_DATA[4]
22	NC_7 — FE_DEMOD1_TS_DATA[5]
23	NC_8 — FE_DEMOD1_TS_DATA[6]
24	NC_9 — FE_DEMOD1_TS_DATA[7]
25	S_RESET_DEMOD — /TU_RESET1_TU
26	B3[+3.3V] — +3.3V_DEMOD_TU
27	SCL_DEMOD — I2C_SCL4_TU
28	B4[+1.1V] — D_Demod_Core
29	NC_10 — LNB_TX
30	SDA_DEMOD — I2C_SDA4_TU
	LNB_OUT

A1 A1 47 B1 B1
SHIELD
TU_GND_A
TU_GND_B

TU_H/M/W_EU/AJ/US_3300pF
TU_GND_B
TU_GND_A

R6701 EMS_S4_GND_Connection
GND_3
for tuner EMS (S4) testing

TDJH_H251F
TU6703
TDJH-H251F

1	B1[+3.3V] — +3.3V_LNA_TU
2	NC — RF_SWITCH_CTL_TU
3	DIF_AGC — IF_AGC_TU
4	SCL — I2C_SCL6_TU
5	SDA — I2C_SDA6_TU
6	DIF[P] — IF_P_TU
7	DIF[N] — IF_N_TU
8	SIF — TU_SIF_TU
9	CVBS — TU_CVBS_TU

A1 A1 47 B1 B1
SHIELD
TU_GND_A
TU_GND_B

TU6701-*1 TDJM-C351D
TU6800-*1 TDJW-K152F
TU6800-*2 TDJW-H151F
TU6800-*3 TDJW-B251F

Temporary Page: For EU S4

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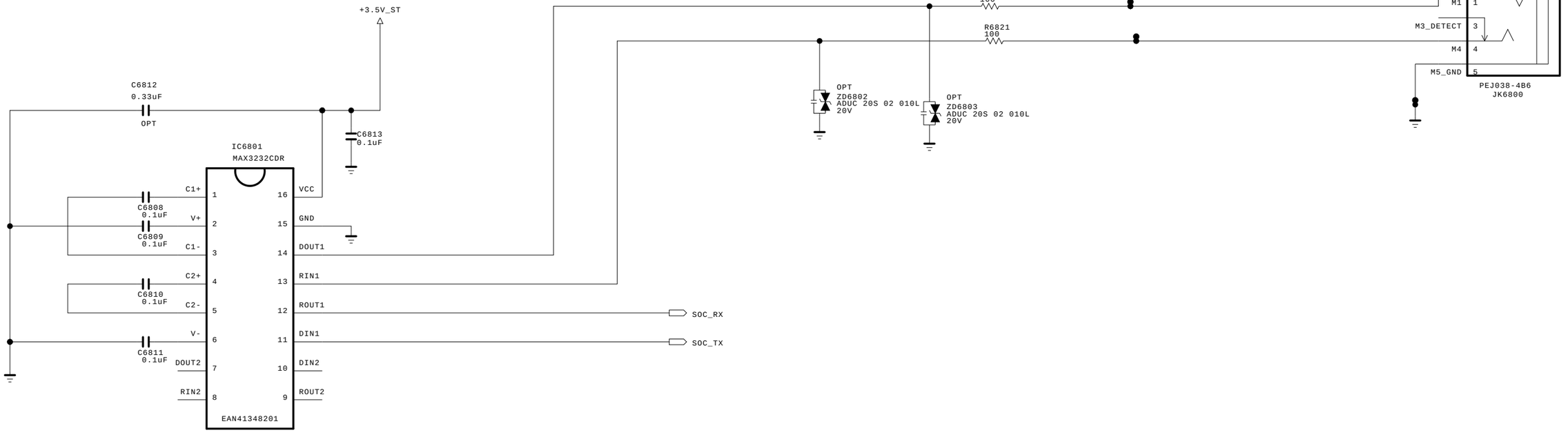
SECRET
LGElectronics

LG ELECTRONICS

BSD-14Y-UD-067_02-HD

MODEL	TU_SYMBOL_EU	DATE	2014.03.12
BLOCK		SHEET	/

RS-232C Control INTERFACE



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SECRET

LGElectronics

LG ELECTRONICS

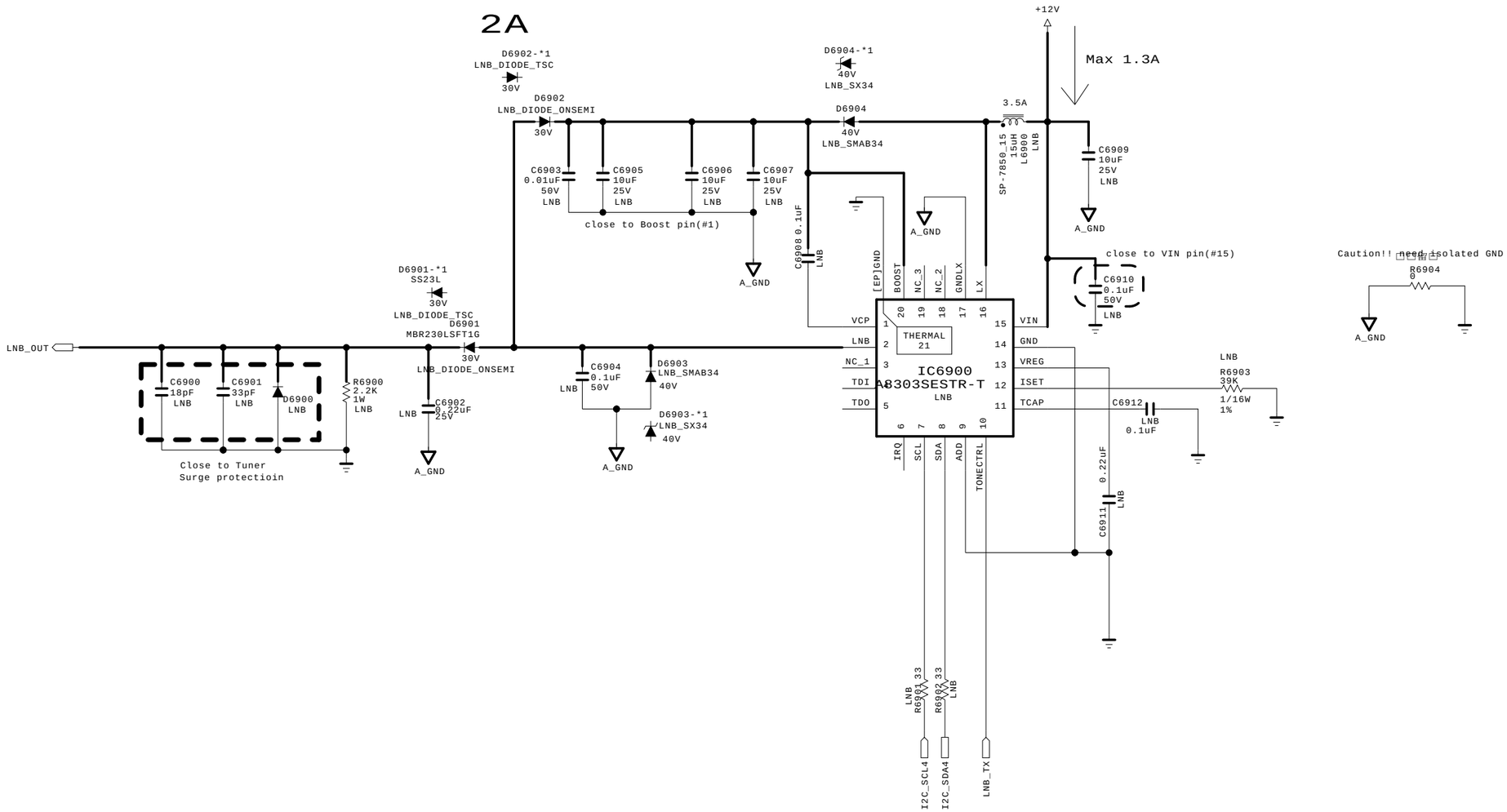
MODEL		DATE	12/08/16
BLOCK	RS232C	SHEET	68 /

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



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SECRET

LGElectronics

LG ELECTRONICS

BSD-14Y-UD-069-HD

MODEL	LNB	DATE	2013.12.17
BLOCK		SHEET	69

SMD bottom for ESD

SMD_GASKET_for_ESD GASKET_8.0X6.0X7.5H M7301 MDS62110215

OPT GASKET_8.0X6.0X7.5H M7304 MDS62110215

SMD_GASKET_for_ESD GASKET_8.0X5.0X6.5H M7303 MDS62110212

SMD_GASKET_for_ESD GASKET_8.0X5.0X6.5H M7312 MDS62110212

SMD_GASKET_for_ESD GASKET_8.0X5.0X6.5H M7313 MDS62110212

SMD_GASKET_for_ESD GASKET_8.0X5.0X6.5H M7315 MDS62110212

SMD_GASKET_for_ESD GASKET_8.0X5.0X6.5H M7314 MDS62110212

SMD_GASKET_for_ESD GASKET_8.0X6.0X8.5H M7302 MDS62110216

OPT GASKET_8.0X6.0X8.5H M7305 MDS62110216

SMD_GASKET_for_ESD GASKET_8.0X6.0X8.5H M7311 MDS62110216

SMD_GASKET_for_ESD GASKET_8.0X6.0X8.5H M7316 MDS62110216

SMD_GASKET_for_ESD GASKET_8.0X6.0X8.5H M7300 MDS62110216

GASKET_8.0X6.0X10.5H SMD_GASKET_for_ESD M7306 MDS62110225

GASKET_8.0X6.0X10.5H SMD_GASKET_for_ESD M7308 MDS62110225

GASKET_8.0X6.0X10.5H SMD_GASKET_for_ESD M7309 MDS62110225

GASKET_8.0X6.0X10.5H SMD_GASKET_for_ESD M7310 MDS62110225

SMD_GASKET_for_Tuner GASKET_8.0X6.0X7.5H M7317 MDS62110215

FOR U14 SMD GASKET

OPT GASKET_8.0X5.0X6.5H M7307 MDS62110212

SMD_GASKET_for_ESD GASKET_8.0X5.0X6.5H M7318 MDS62110212

M7319 MGJ64401301 URSA9_Case

URSA9 Shield Case

URSA9 Decap for testing

+1.5V_U_DDR: C7300 0.1uF 16V, C7305 10uF 10V

VDDC: C7301 0.1uF 16V

H13D Decap for testing

VDDC15_M0: C7309 0.1uF 16V, C7312 0.1uF 16V, C7314 10uF 10V, C7316 10uF 10V

VDDC15_M1: C7310 0.1uF 16V

+1.2V_VDD: C7313 0.1uF 16V, C7315 0.1uF 16V

D14 Decap for testing

VDDC15_D14: C7318 0.1uF 16V, C7321 0.1uF 16V, C7323 0.1uF 16V, C7326 0.1uF 16V, C7327 0.1uF 16V, C7328 1uF 25V, C7330 0.1uF 16V, C7331 0.1uF 16V

+1.1V_VDD_D14: C7324 0.1uF 16V, C7325 0.1uF 16V

U14 Decap for testing

VDDC15_U14_DDR: C7302 0.1uF 16V, C7304 0.1uF 16V, C7306 0.1uF 16V, C7307 0.1uF 16V, C7308 0.1uF 16V, C7311 1uF 25V, C7329 0.1uF 16V

+1.1V_U14_VDD: C7303 0.1uF 16V

MN864778P decap

P_AVDDH33: C7332 0.1uF 16V

Pin 107

R9531 Decap for testing

CVDD10_R9531: C7319 0.1uF 16V, C7322 0.1uF 16V

DVDD10_R9531: C7317 0.1uF 16V, C7320 0.1uF 16V

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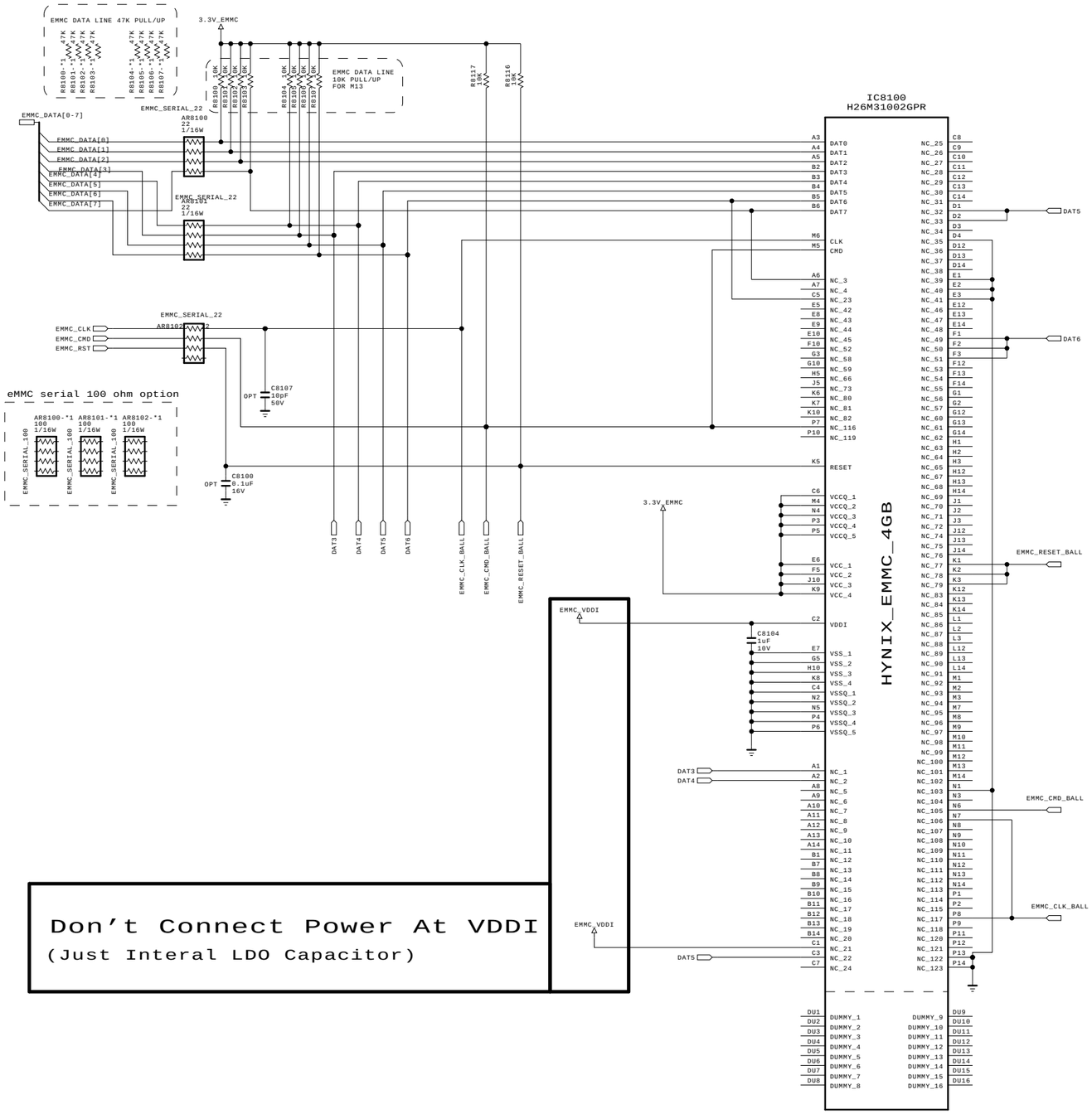
SECRET
LGElectronics

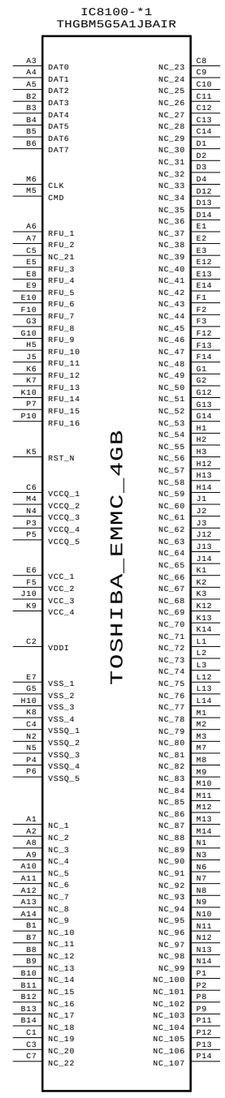
LG ELECTRONICS

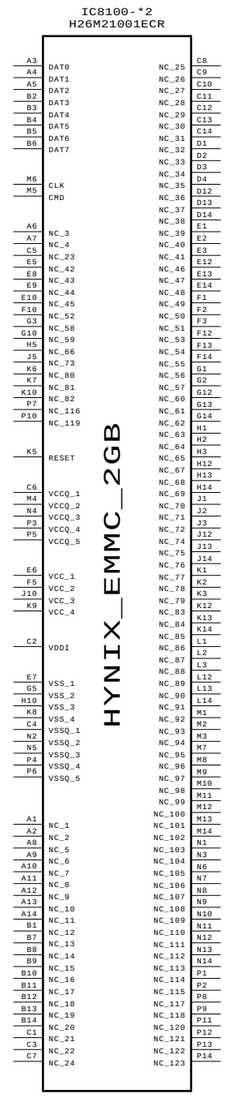
BSD-14Y-UD-073-HD

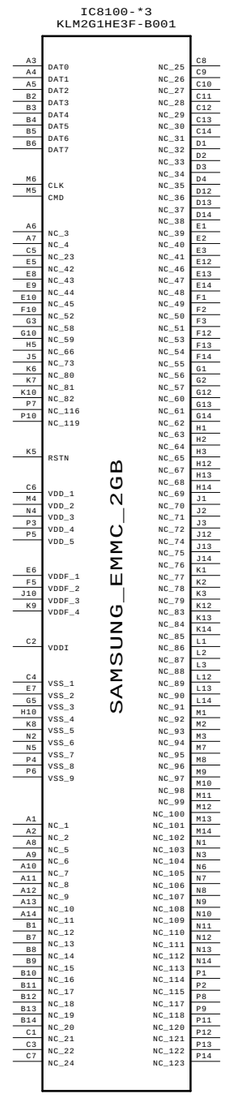
MODEL	77EC9800	DATE	2014-06-03
BLOCK	SMD Gasket	SHEET	/

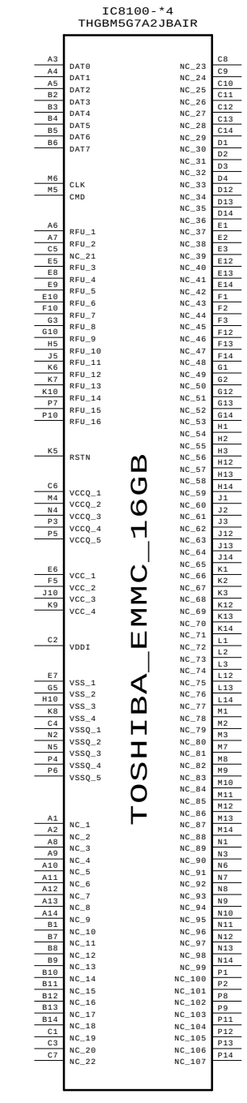
eMMC I/F

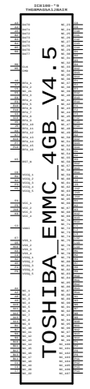


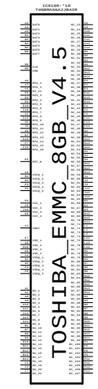


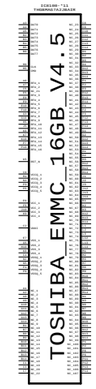












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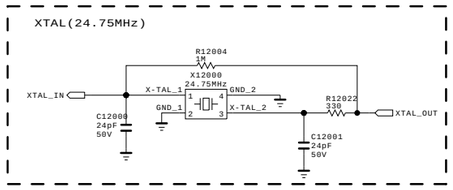
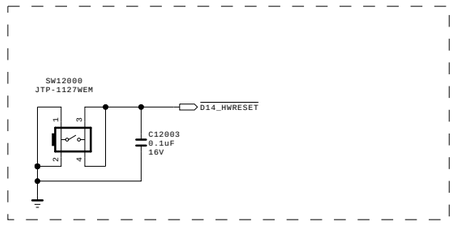
SECRET
LGElectronics

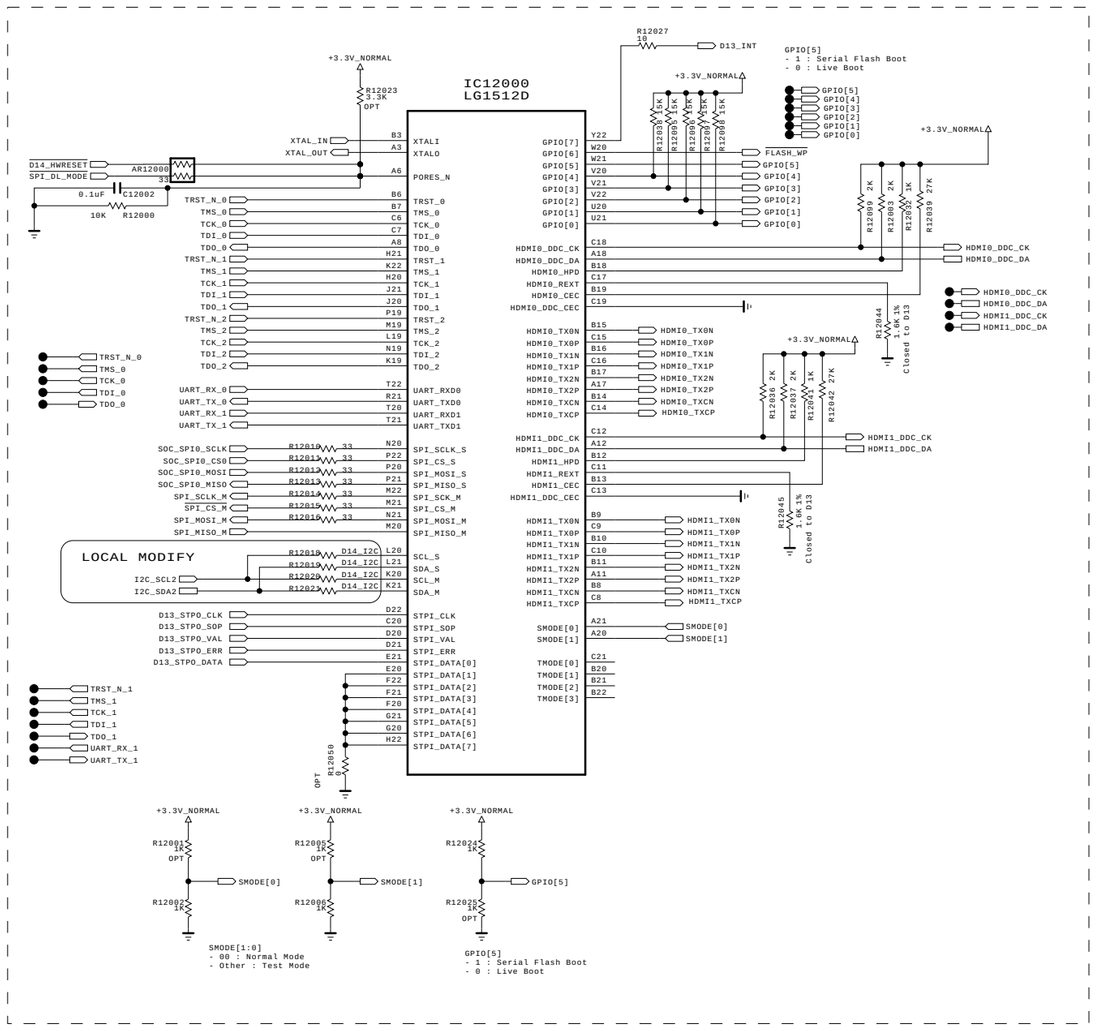
LG ELECTRONICS

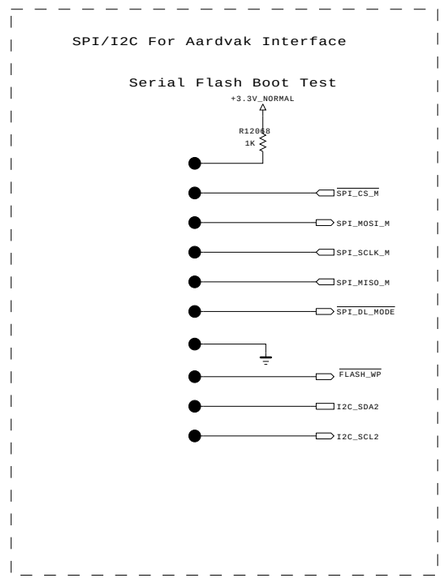
BSD-14Y-UD-081-HD

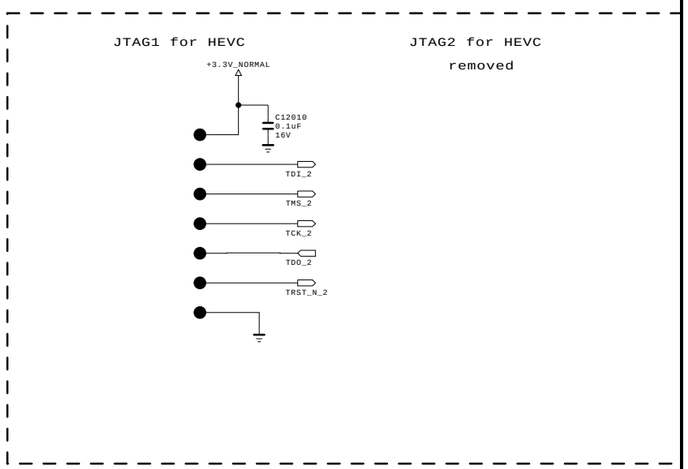
MODEL	eMMC	DATE	2013.12.17
BLOCK		SHEET	81

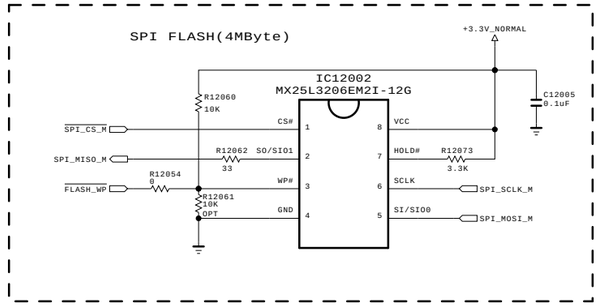


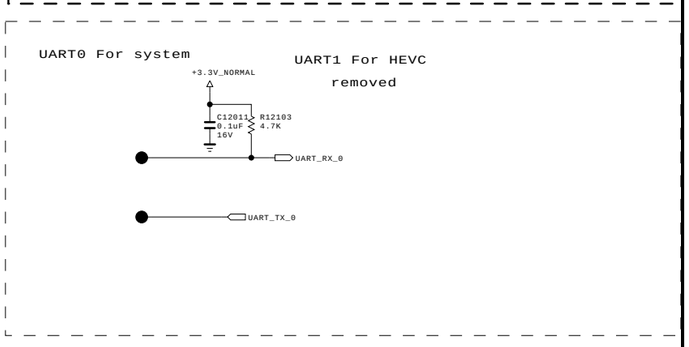












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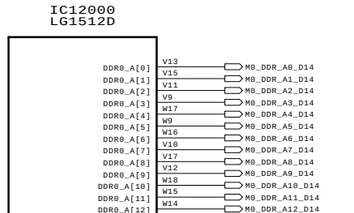
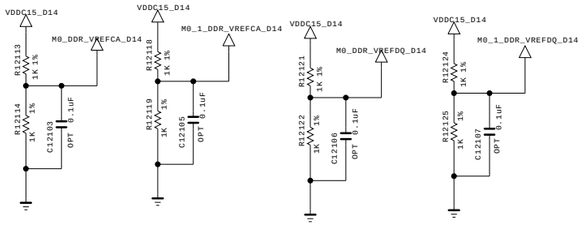
SECRET
LGElectronics

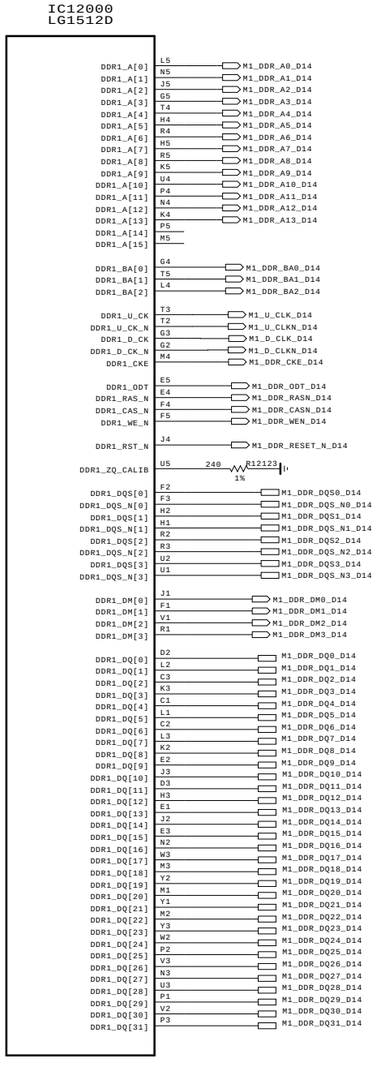
LG ELECTRONICS

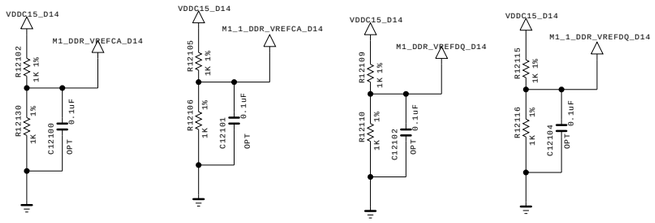
BSD-14Y-UD-119-HD

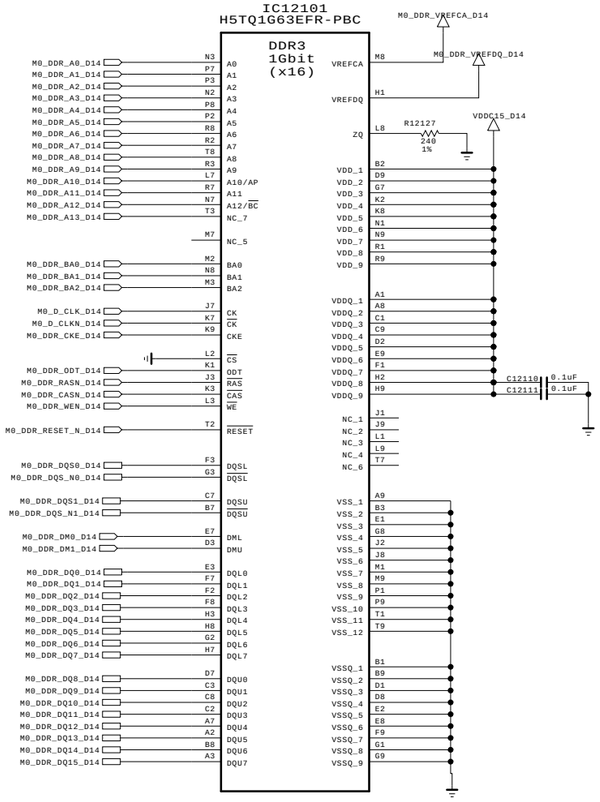
MODEL		DATE	2013.12.17
BLOCK		SHEET	/

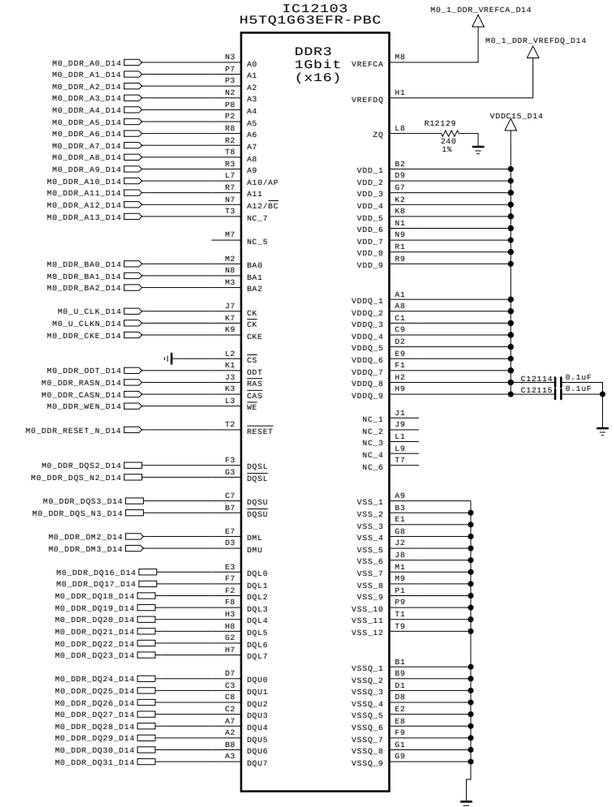


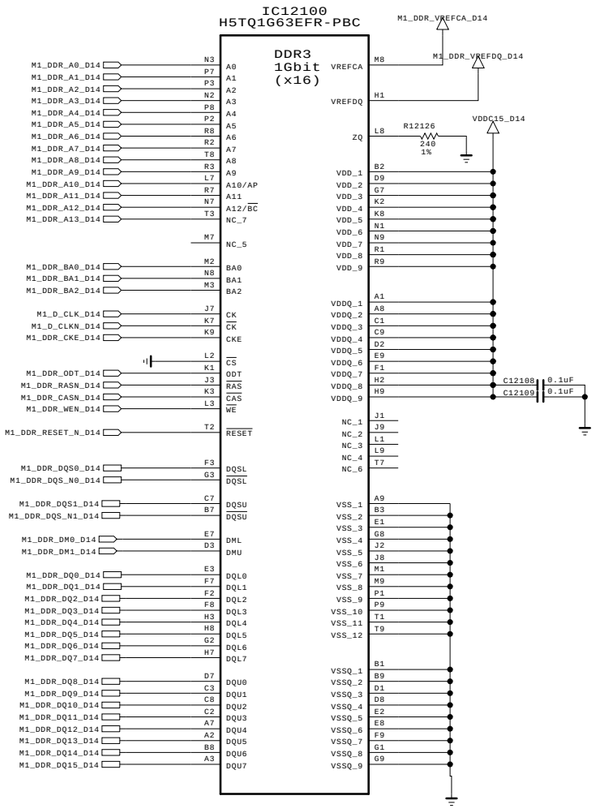


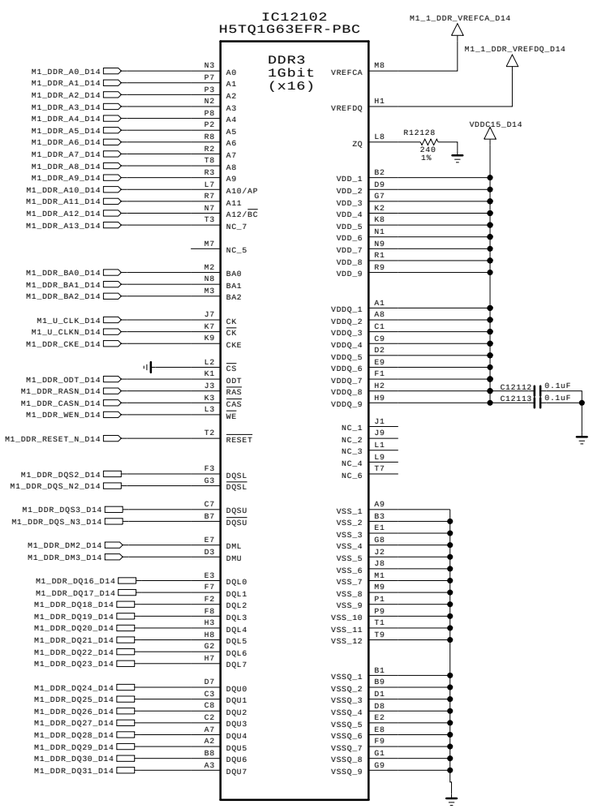












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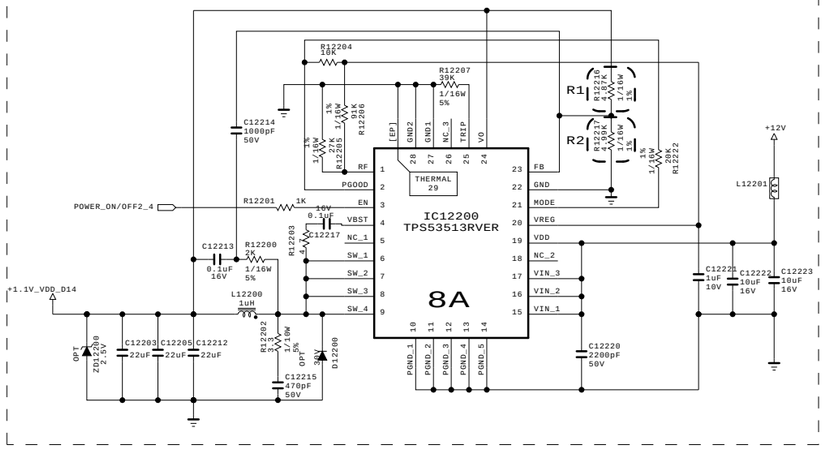
SECRET
LGElectronics

LG ELECTRONICS

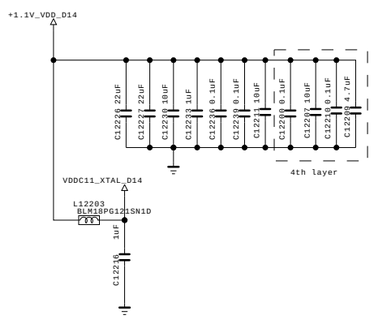
BSD-14Y-UD-121-HD

MODEL		DATE	2013.12.17
BLOCK	D14_DDR	SHEET	/

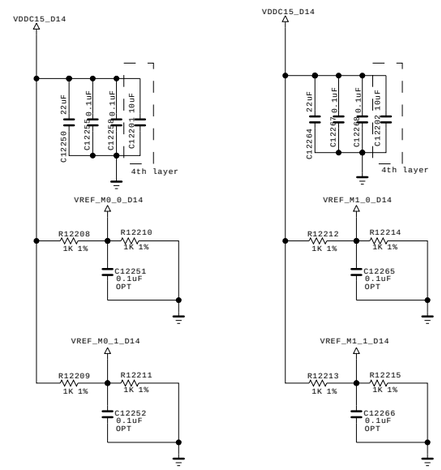
+1.1V_VDD



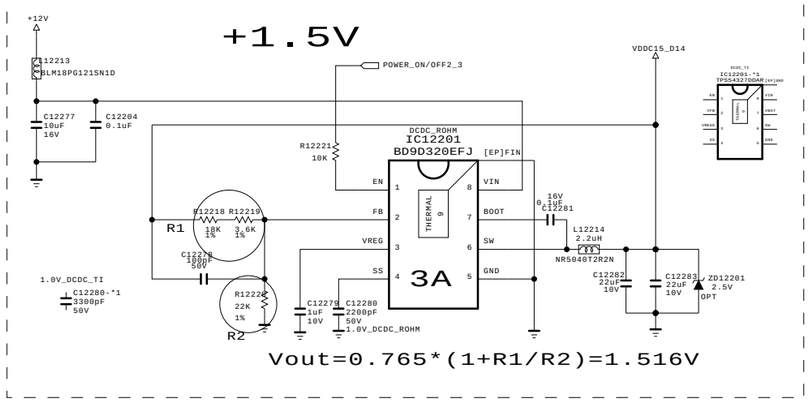
+1.1V_Bypass Cap



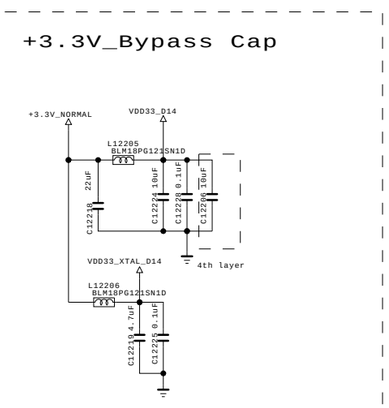
+1.5V_Bypass Cap



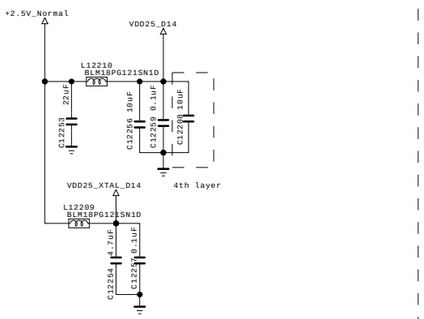
+1.5V



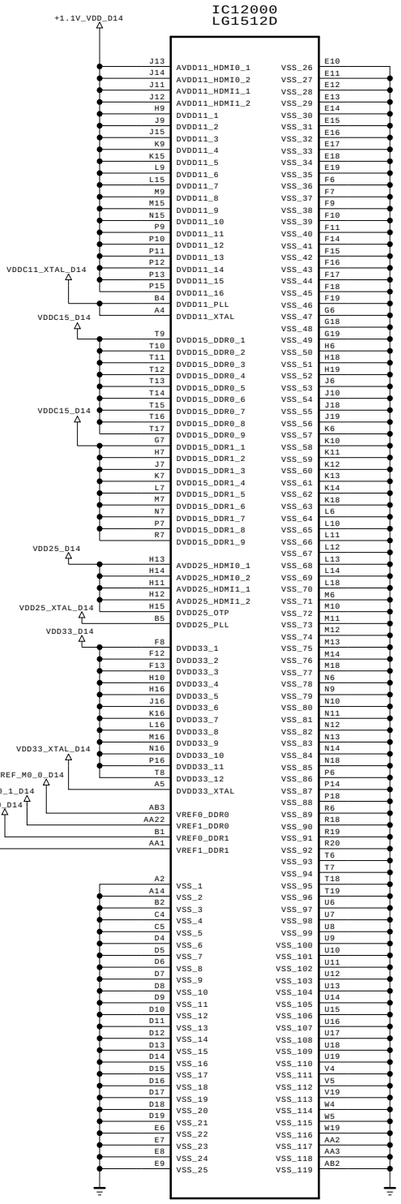
+3.3V_Bypass Cap



+2.5V_Bypass Cap



IC12000 LG1512D



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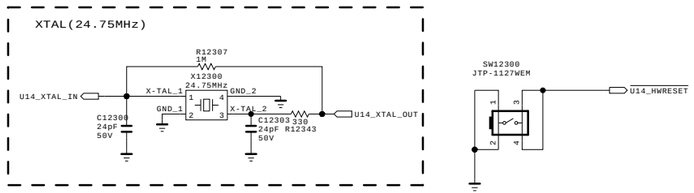
SECRET
LGElectronics

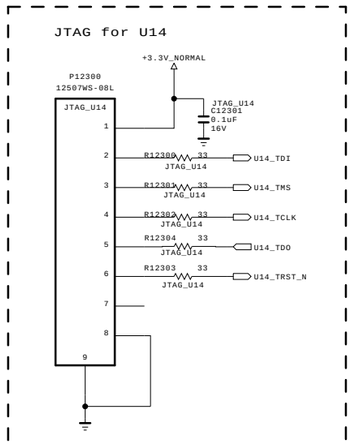
LG ELECTRONICS

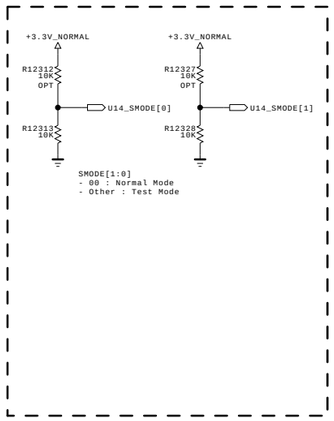
BSD-14Y-UD-122-HD

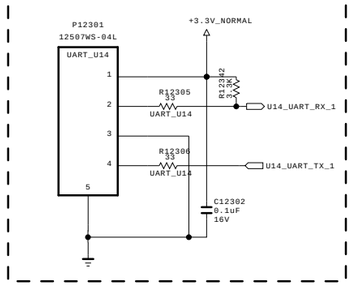
MODEL		DATE	2013.12.17
BLOCK		SHEET	/

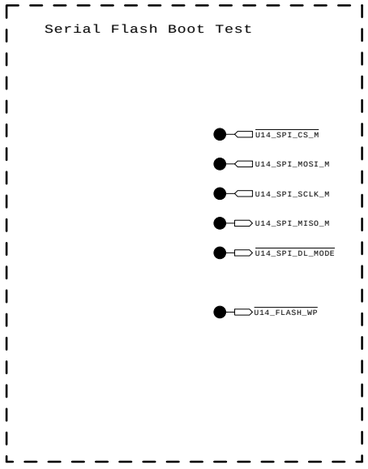
HW RESET

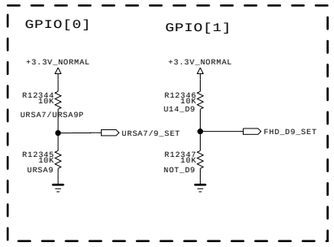




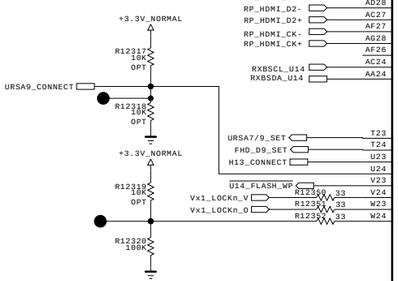


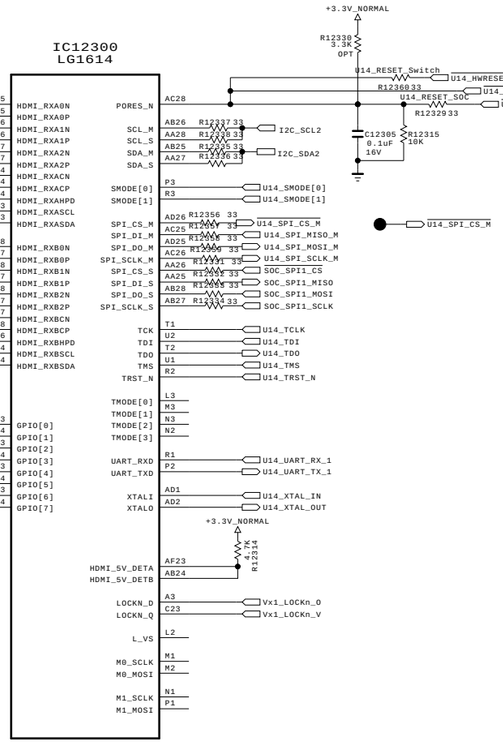


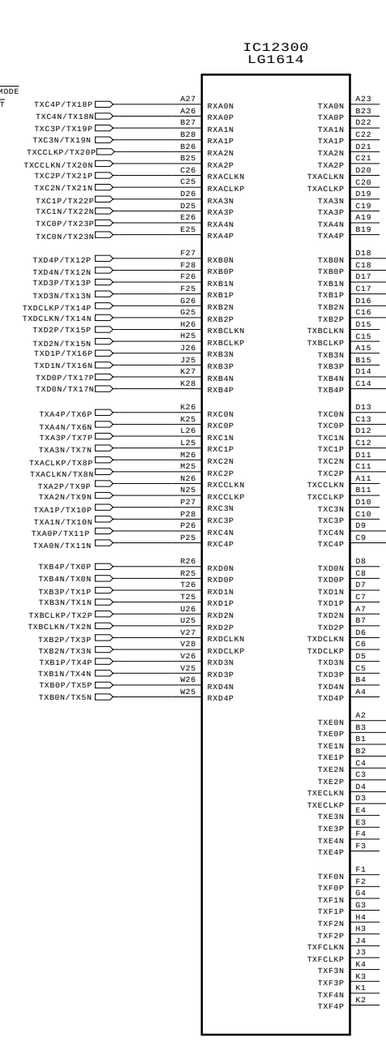


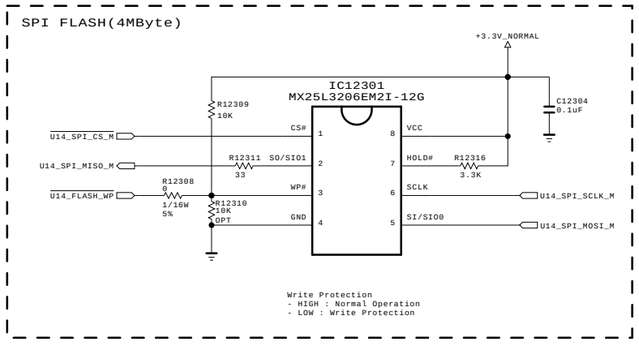


		GPIO[0]	GPIO[1]
URSA9	1920x1080@60p	pull-down	pull-down
	2560x1080@60p	pull-down	pull-up
URSA7	1920x1080@60p	pull-up	pull-down
	2560x1080@60p	pull-up	pull-up









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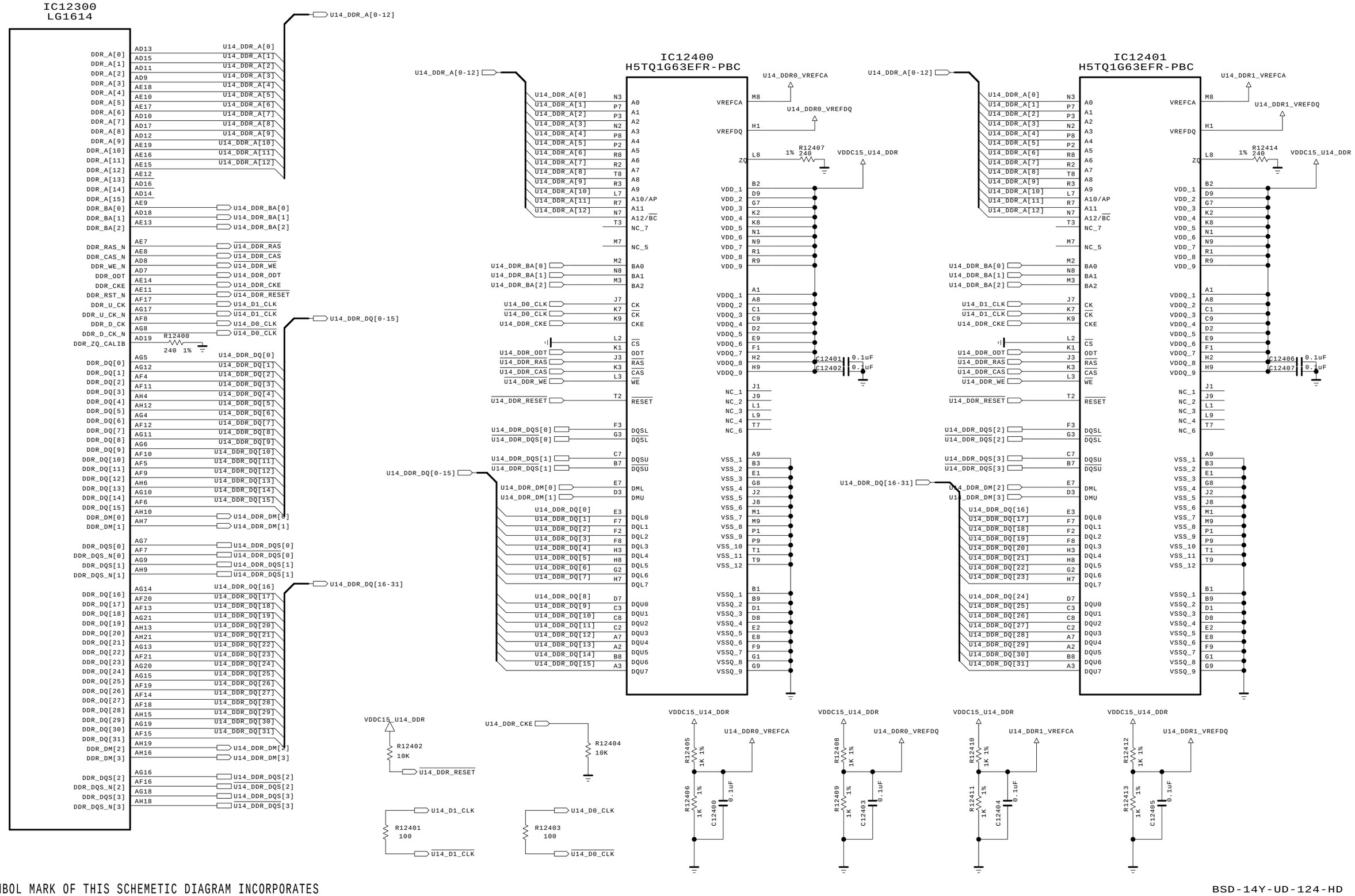
SECRET
LGElectronics

LG ELECTRONICS

BSD-14Y-UD-123-HD

MODEL		DATE	2013.12.17
BLOCK	U14	SHEET	/



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SECRET

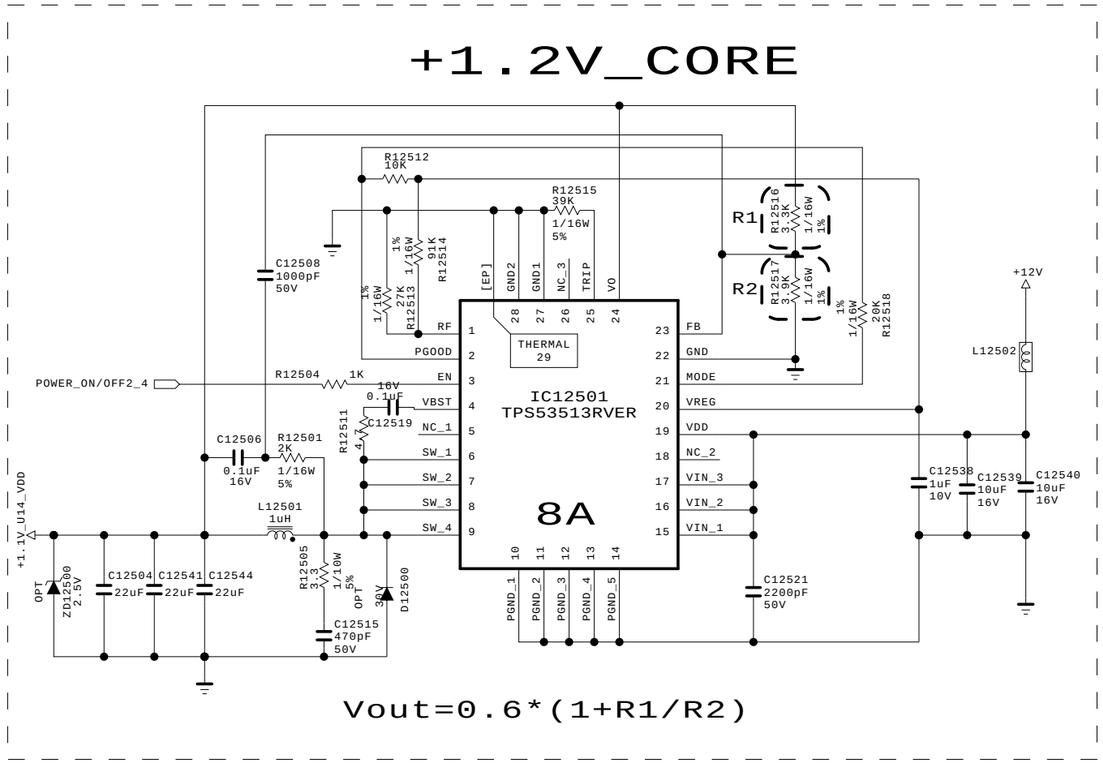
LGElectronics

LG ELECTRONICS

BSD-14Y-UD-124-HD

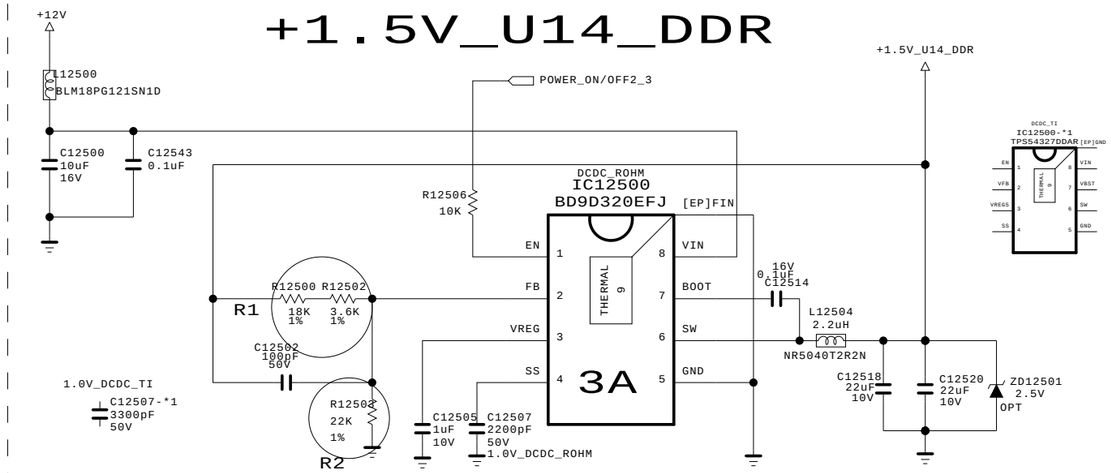
MODEL		DATE	2013.12.17
BLOCK	U14 DDR	SHEET	/

+1.2V_CORE

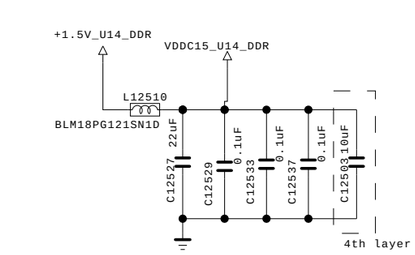


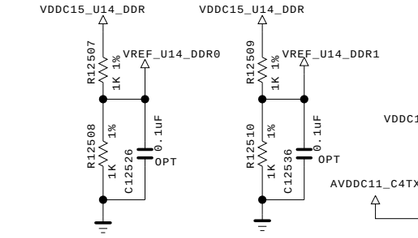
Vout=0.6*(1+R1/R2)

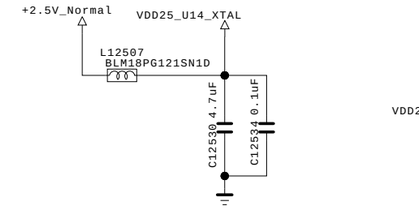
+1.5V_U14_DDR

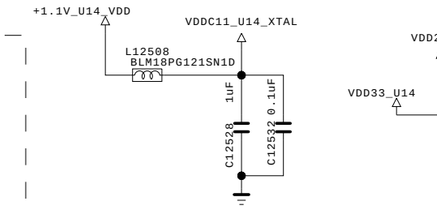


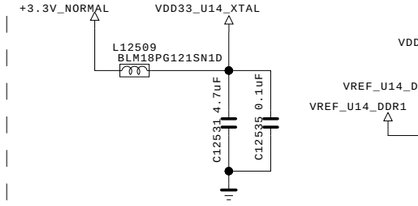
Vout=0.765*(1+R1/R2)=1.516V

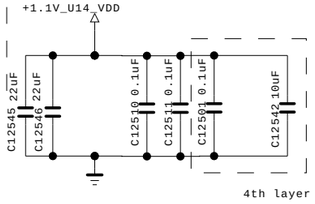


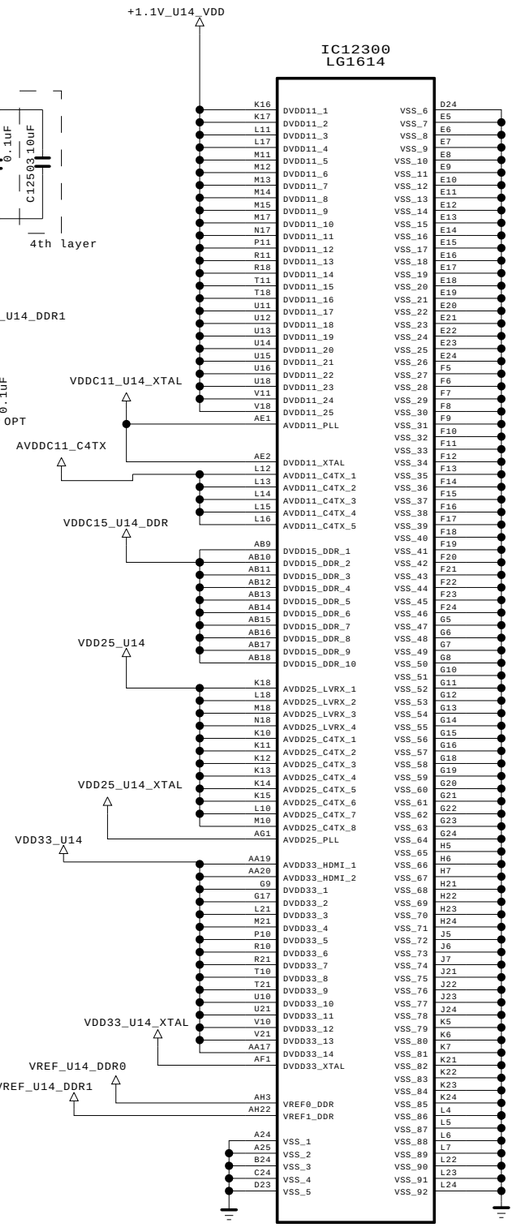


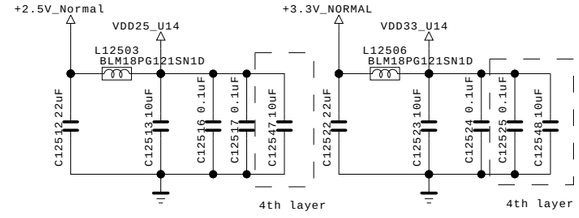


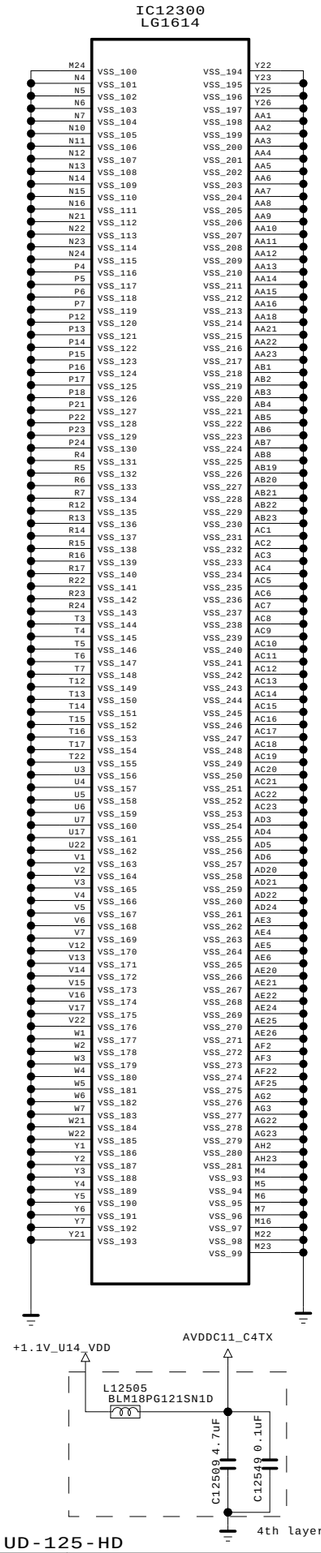












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SECRET

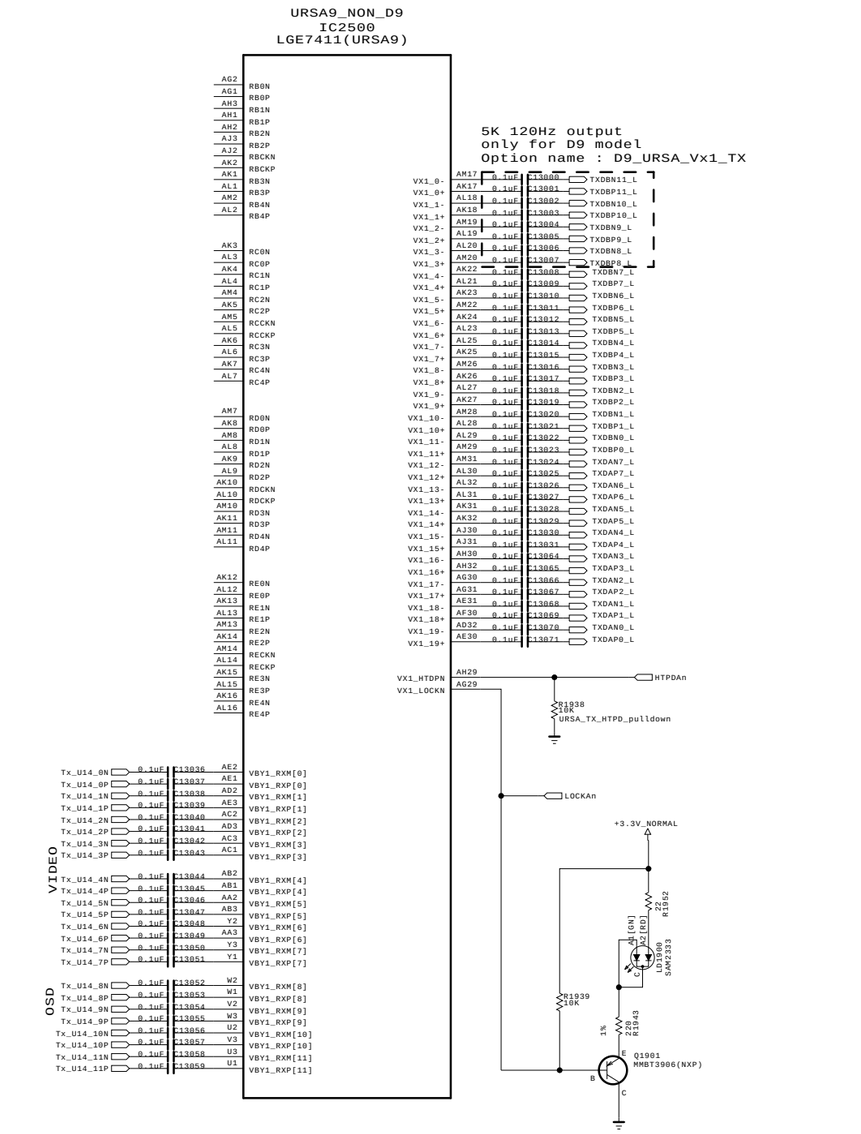
LGElectronics

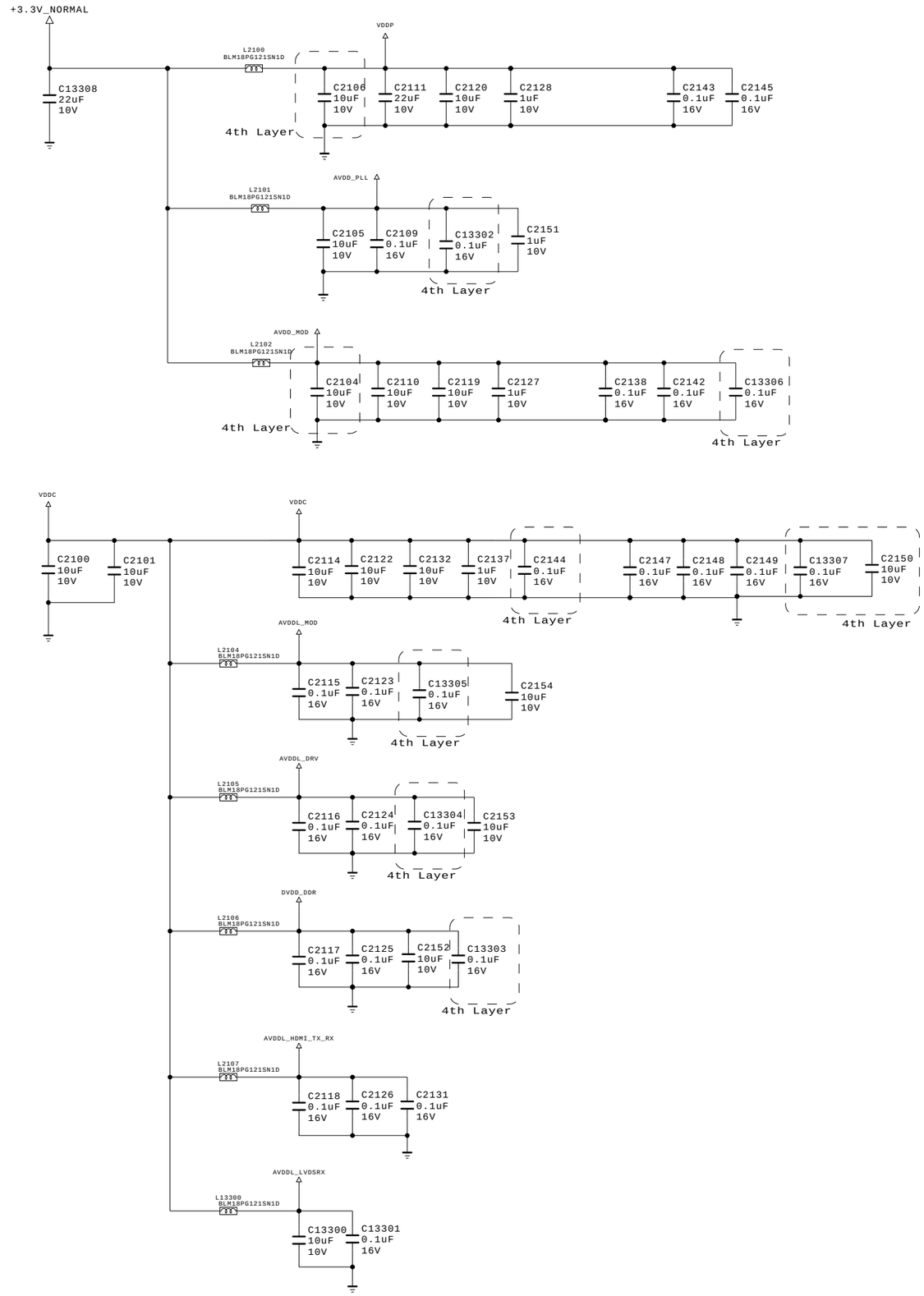
LG ELECTRONICS

BSD-14Y-UD-125-HD

MODEL		DATE	2013.12.17
BLOCK	U14 Power	SHEET	/

UB98/D9 only





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SECRET
LGElectronics

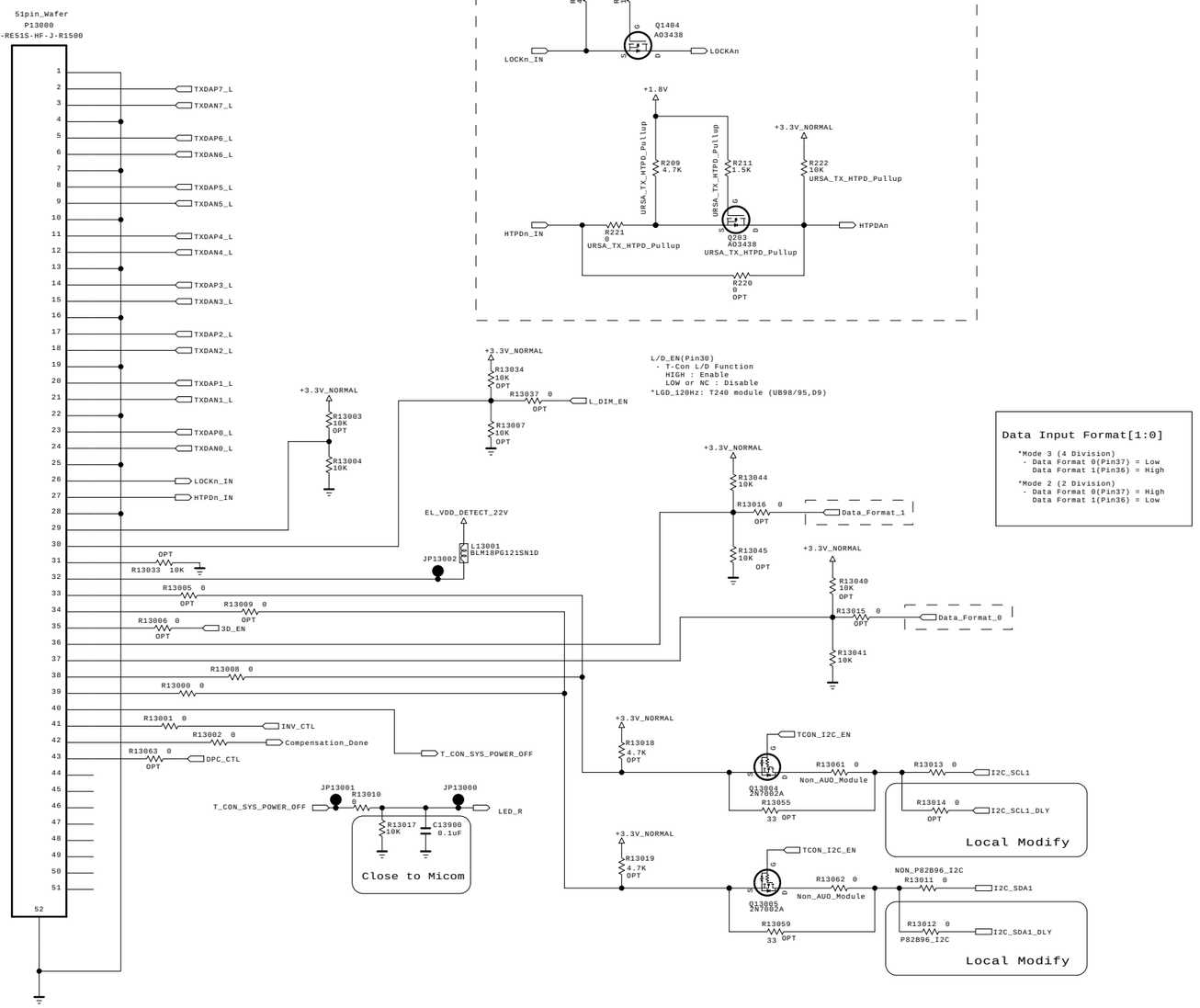
LG ELECTRONICS

BSD-14Y-UD-128-HD

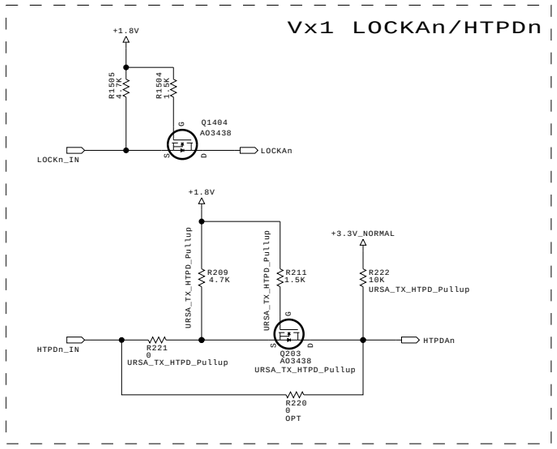
MODEL		DATE	2013.12.17
BLOCK	U_LVDS INPUT	SHEET	/

LGE Internal Use Only

[51P Vx1 output wafer]



Vx1 LOCKAn/HTPDn

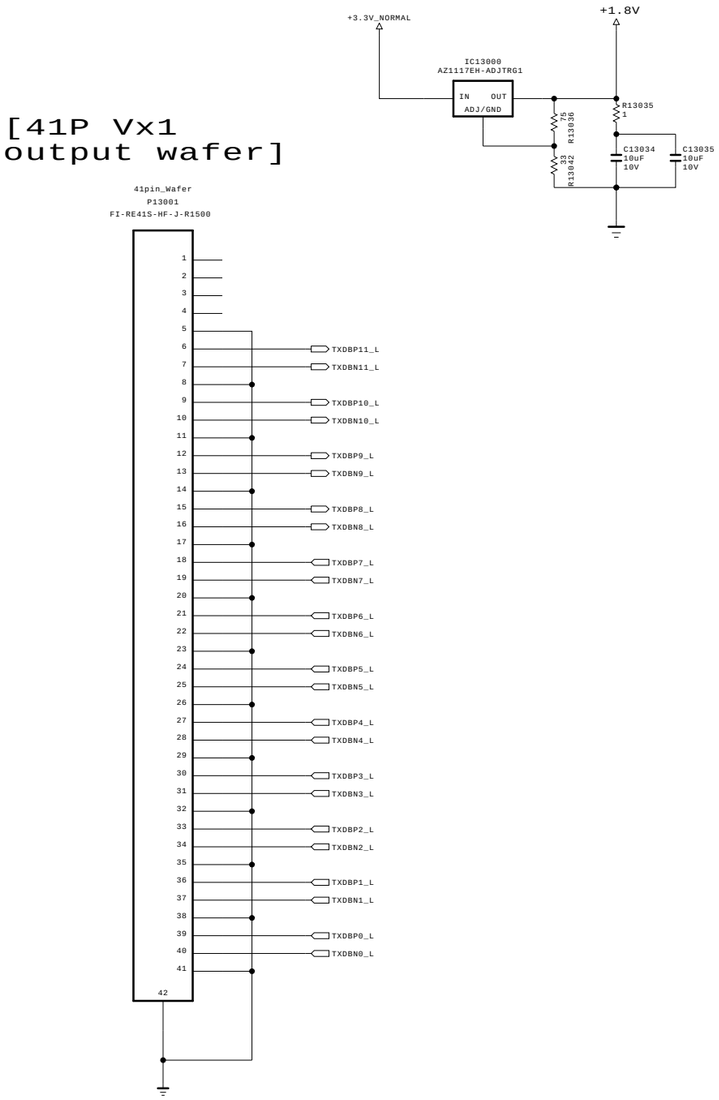


Data Input Format[1:0]

*Mode 3 (4 Division)
- Data Format 0(Pin37) = Low
Data Format 1(Pin36) = High

*Mode 2 (2 Division)
- Data Format 0(Pin37) = High
Data Format 1(Pin36) = Low

[41P Vx1 output wafer]



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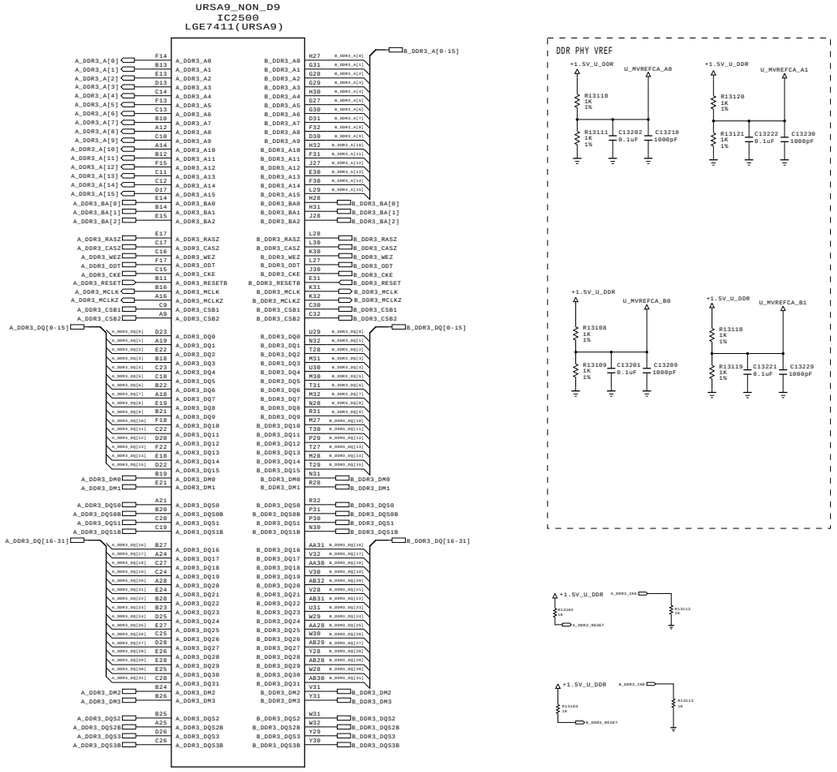
SECRET
LGElectronics

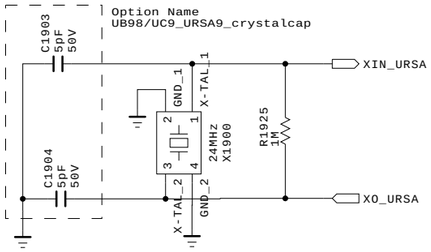
LG ELECTRONICS

BSD-14Y-UD-130-HD

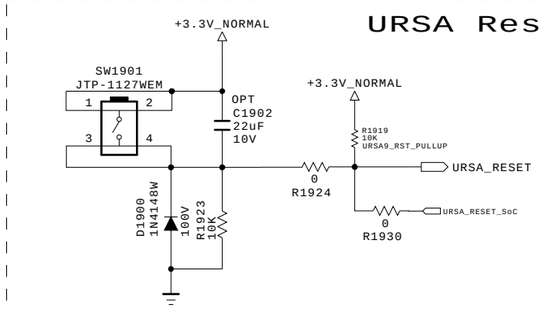
MODEL	OLED OUTPUT	DATE	2014.06.03
BLOCK	Output_wafer	SHEET	/



Clock for URSA9



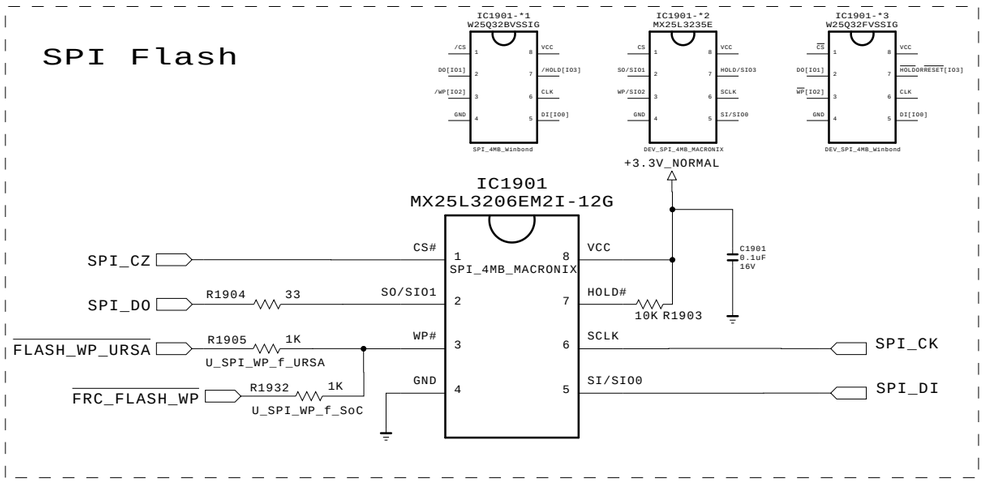
URSA Reset



Option Name
UB85/95/UC97_URSA9_crystalcap

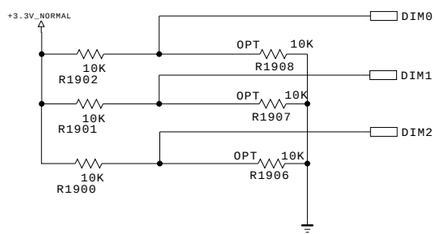
C1904-*1 8pF 50V
C1903-*1 8pF 50V

SPI Flash

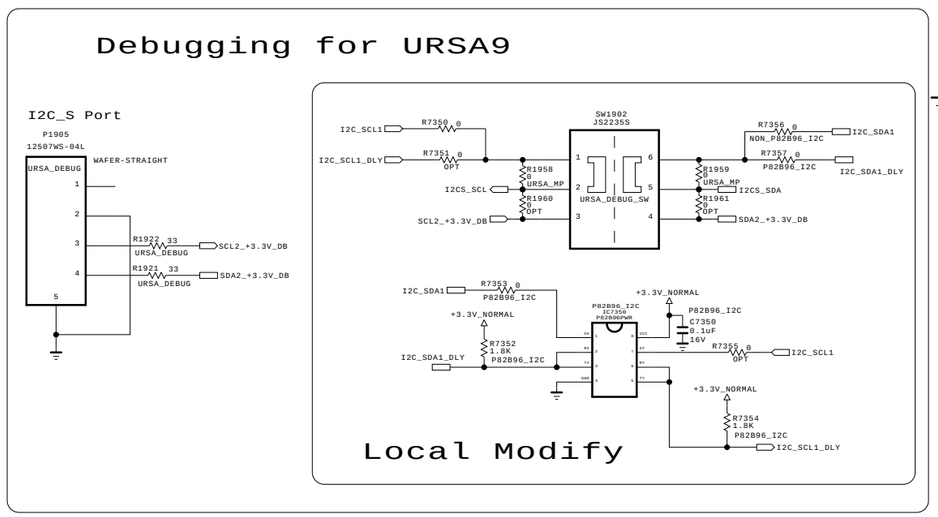


Chip Config

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



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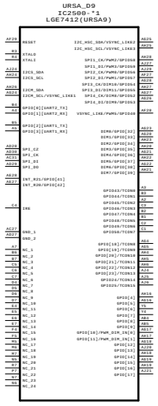
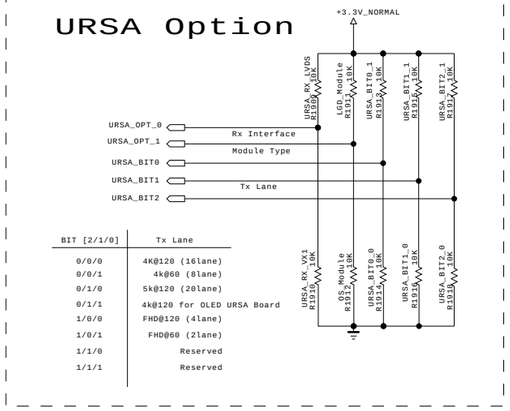
URSA_D9
IC2500-*1
LGE7412(URSA9)

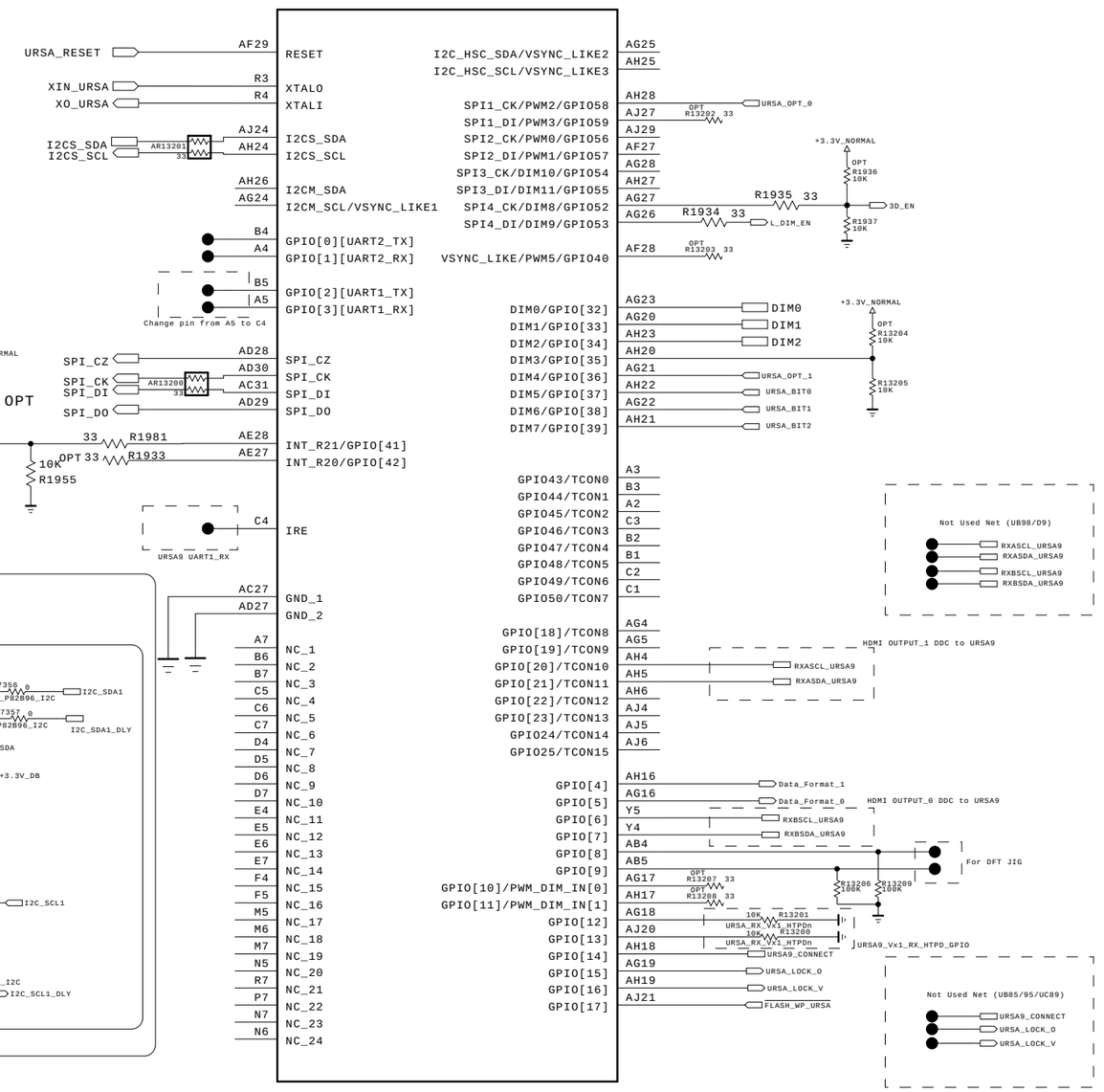


URSA Option



BIT [2/1/0]	Tx Lane
0/0/0	4K@120 (16lane)
0/0/1	4k@60 (8lane)
0/1/0	5k@120 (20lane)
0/1/1	4k@120 for OLED URSA Board
1/0/0	FHD@120 (4lane)
1/0/1	FHD@60 (2lane)
1/1/0	Reserved
1/1/1	Reserved

URSA9_NON_D9
IC2500
LGE7411(URSA9)



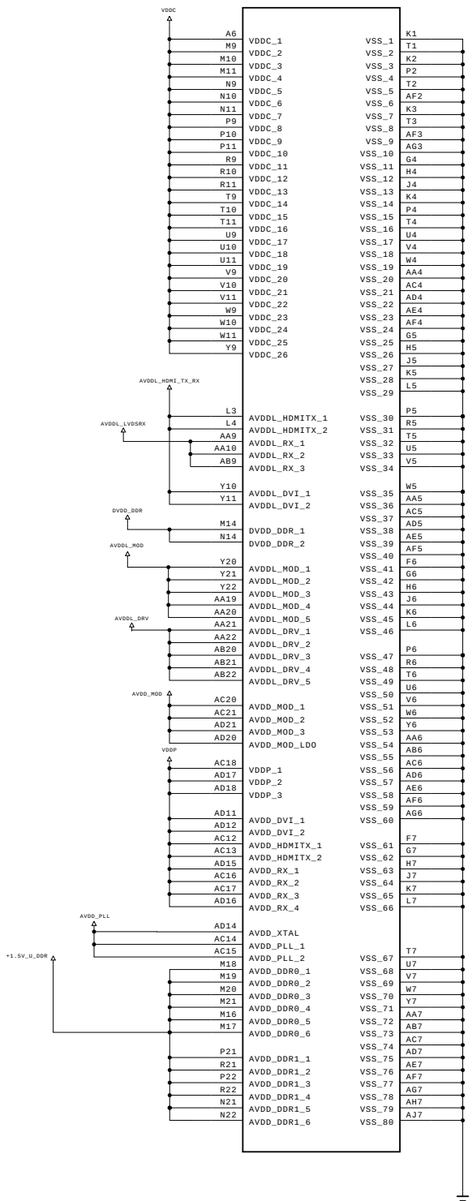
BSD-14Y-UD-132-HD

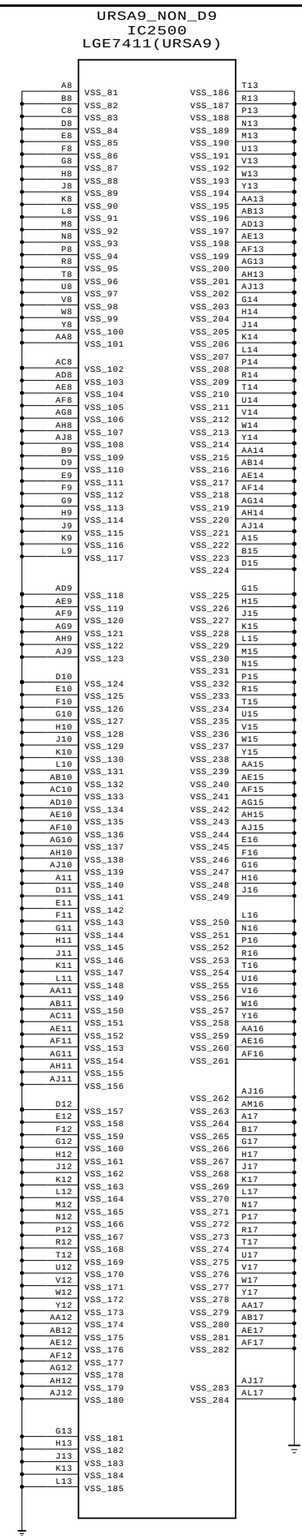
MODEL		DATE	2013.12.17
BLOCK		SHEET	/

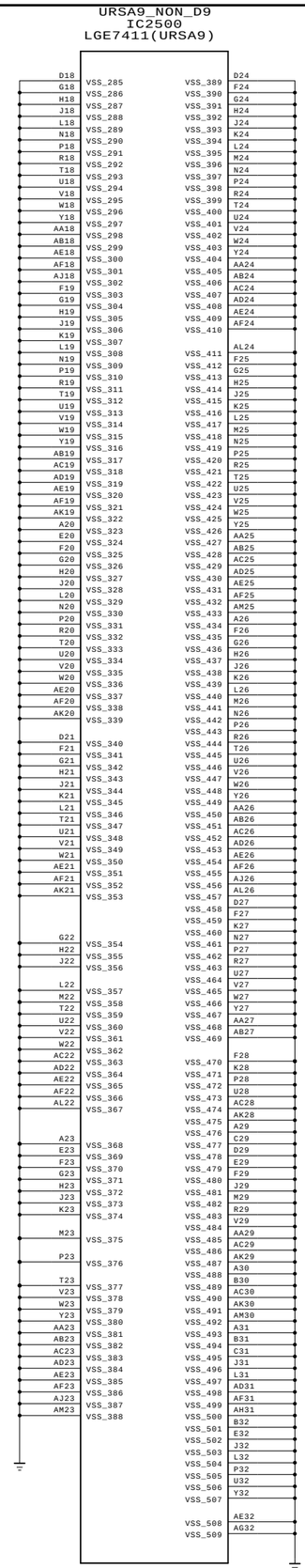
SECRET
LGElectronics

LG ELECTRONICS

LGE Internal Use Only







THE ⚠ SYMBOL MARK OF THIS SCHEMETIC 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 SCHEMETIC.

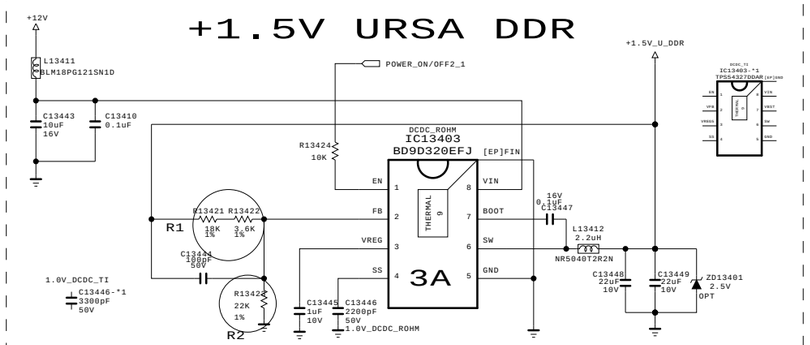
SECRET
LGElectronics

LG ELECTRONICS

BSD-14Y-UD-133-HD

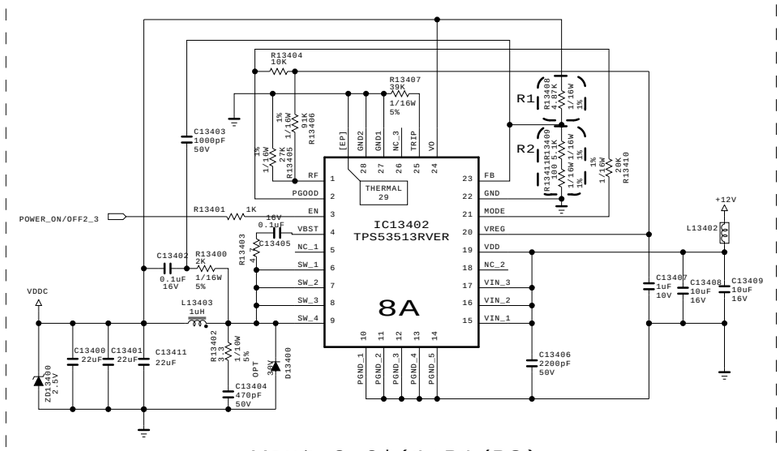
MODEL		DATE	2013.12.17
BLOCK	U_Power	SHEET	/

+1.5V URSA DDR



Vout=0.765*(1+R1/R2)=1.516V

+1.15V URSA9 Core



Vout=0.6*(1+R1/R2)

THE ⚠ SYMBOL MARK OF THIS SCHEMETIC 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 SCHEMETIC.

SECRET
LGElectronics

LG ELECTRONICS

BSD-14Y-UD-134-HD

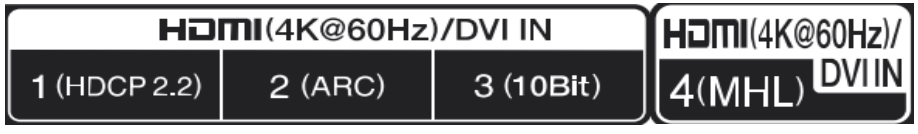
MODEL		DATE	2013.12.17
BLOCK		SHEET	/


LG
Life's Good

Overview for ’14 OLED ULTRA HD Model (Hardware)

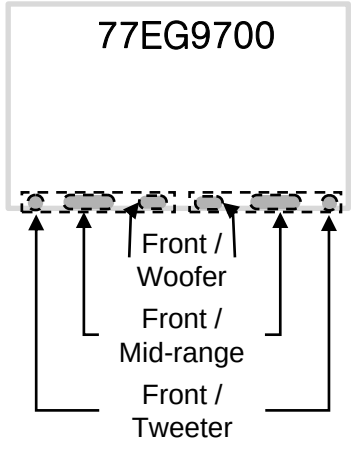
`14 OLED ULTRA HD New Feature 1. HDMI

	HDMI 3G	HDMI 6G	HDCP2.2	ARC	MHL2.1	HDMI Legacy
HDMI 4	X	X	X	X	O	X
HDMI 3	O	O	X	X	X	O
HDMI 2	O	X	X	O	X	O
HDMI 1	O	X	O	X	X	△



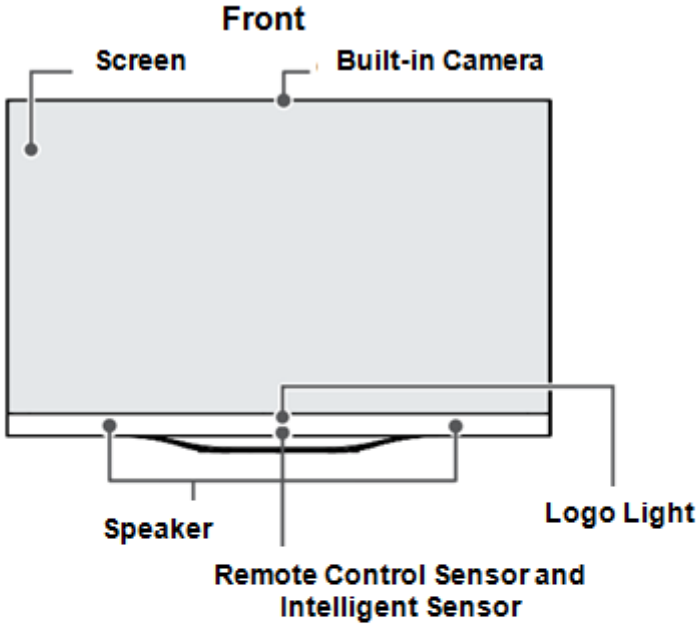
It is different form each HDMI port spec.
We offer a HDMI cable for HDMI legacy issue.

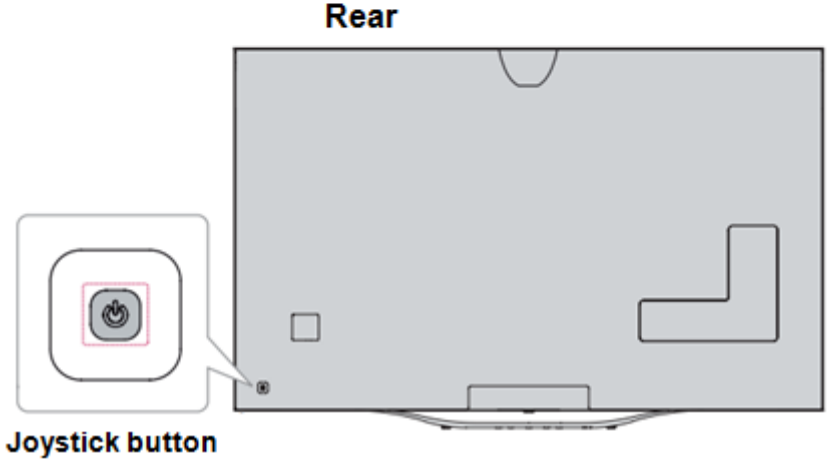
`14 OLED ULTRA HD New Feature 2. Audio



• **Total W** • **ch** (inch)	**Output & Channel**			
	Amp. Output	**Output (W)**	**Amp. Input channel**	**Amp. Output channel**
• **70W** • **4ch** (77”)	• Mid-range • Tweeter • Woofer	• 11.5W+11.5W • 13.5W+13.5W • 10W+10W	• L / R • Lt / Rt • Lw / Rw	• L / R • Lt / Rt • Lw / Rw

`14 OLED ULTRA HD New Feature 3. Sub Assy (Joy stick, Color sensor)

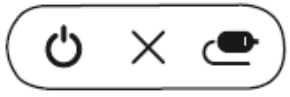




1. Joy stick button

This button is located behind the TV screen.

You can adjust the Menu items moving the joystick button.



You can see the UI.

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

2. Color sensor

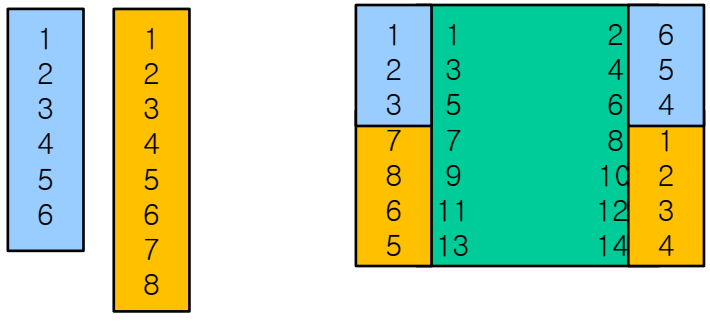
Adjusts the image quality and brightness based on the surrounding environment.

2014 model : Intelligent sensor + Color sensor

`14 OLED ULTRA HD New Feature 3. Sub Assy (WiFi)

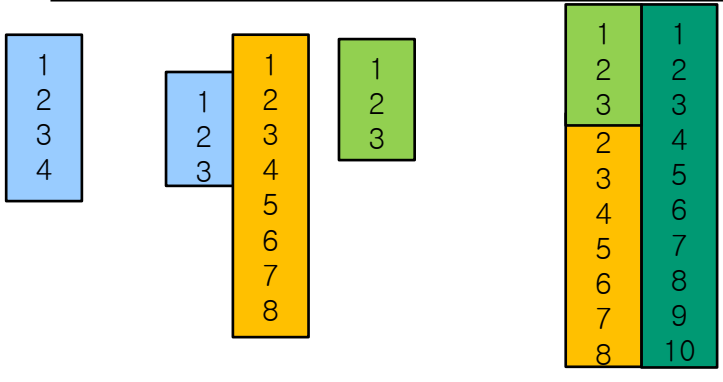
EG97	77”	16:9	BT	WiFi
			’13 Carry Over	802.11ac

WI-FI(6p)/Bluetooth(8p)-Main(14p)



	Pin name	sub wafer	color	Main wafer
WIFI	GND	1	-(Brown)-	1
	WOWL	2	-(Yellow)-	3
	GND	3	-(Black)-	5
	USB_DP	4	-(White)-	6
	USB_DN	5	-(Green)-	4
	VDD	6	-(Red)-	2
BT	3.3V	1	-(Brown)-	8
	RTS	2	-(Blue)-	10
	UART_RX_RF	3	-(Yellow)-	12
	UART_TX_RF	4	-(Black)-	14
	RESET	5	-(White)-	13
	CTS	6	-(Green)-	11
	NC	7	-(N.C)-	7
	GNC	8	-(Red)-	9

Logo(4p)-IR(8p)/Jog(3p)-Main(10p)



	Pin name	color	Main wafer
IR	GND	-(Blue)-	1
	KEY1	-(Gray)-	2
	KEY2	-(Gray)-	3
	3.5V_ST	-(Blue)-	4
	GND	-(Gray)-	5
	LOGO	-(Gray)-	6
	IR	-(Gray)-	7
	GND	-(Gray)-	8
	EYE_SCL	-(Gray)-	9
	EYE_SDA	-(Gray)-	10

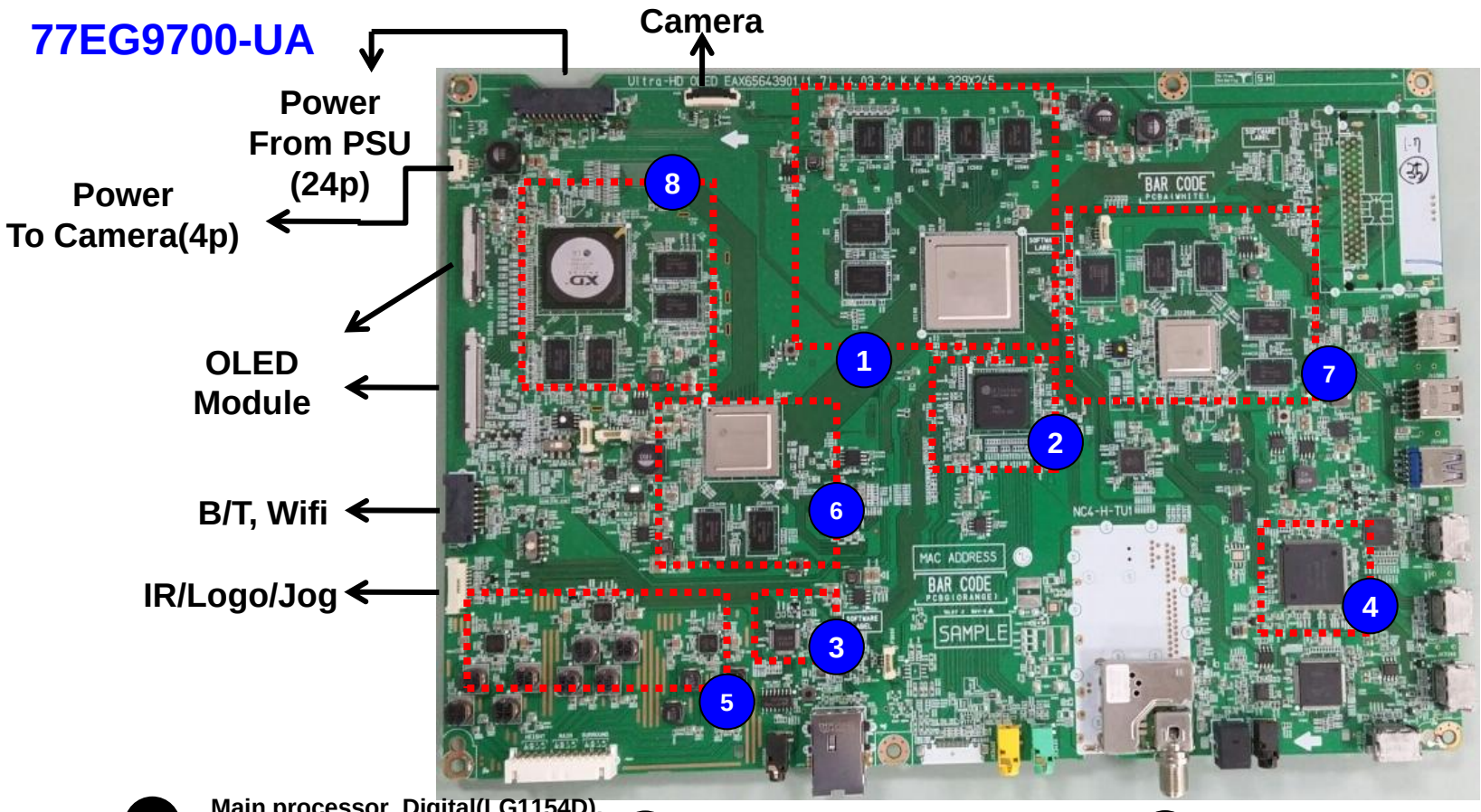
OLED TV Repair Guide

`14 years New Models

< Applicable Model >
77EG9700-UA

Main PCB

77EG9700-UA



1. Main processor_Digital(LG1154D), DDR Memory, eMMC Memory
2. Main processor_analog(LG1152AN)
3. Micom for Key/IR sensing
4. HDMI switch
5. Audio AMP
6. Video processor (LG1614), DDR Memory, Flash Memory
7. 4K processor_Digital(LG1512), DDR Memory, eMMC Memory
8. Video processor (LGE7411:URSA9), DDR Memory, Flash Memory

`14Y OLED ULTRA HD Block Diagram

목차

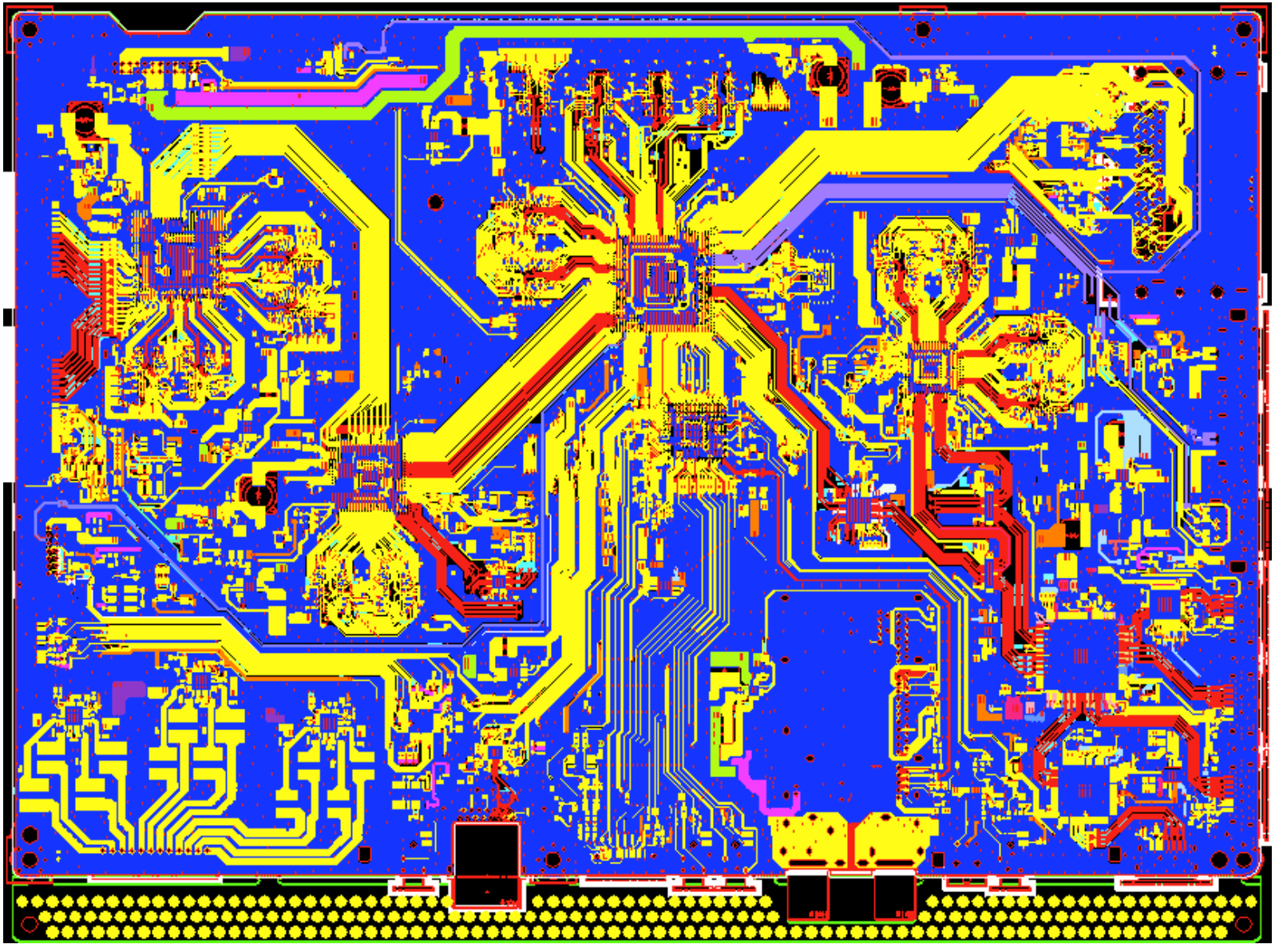
2014.08.04

TV Research lab

TV Product Development 2Team

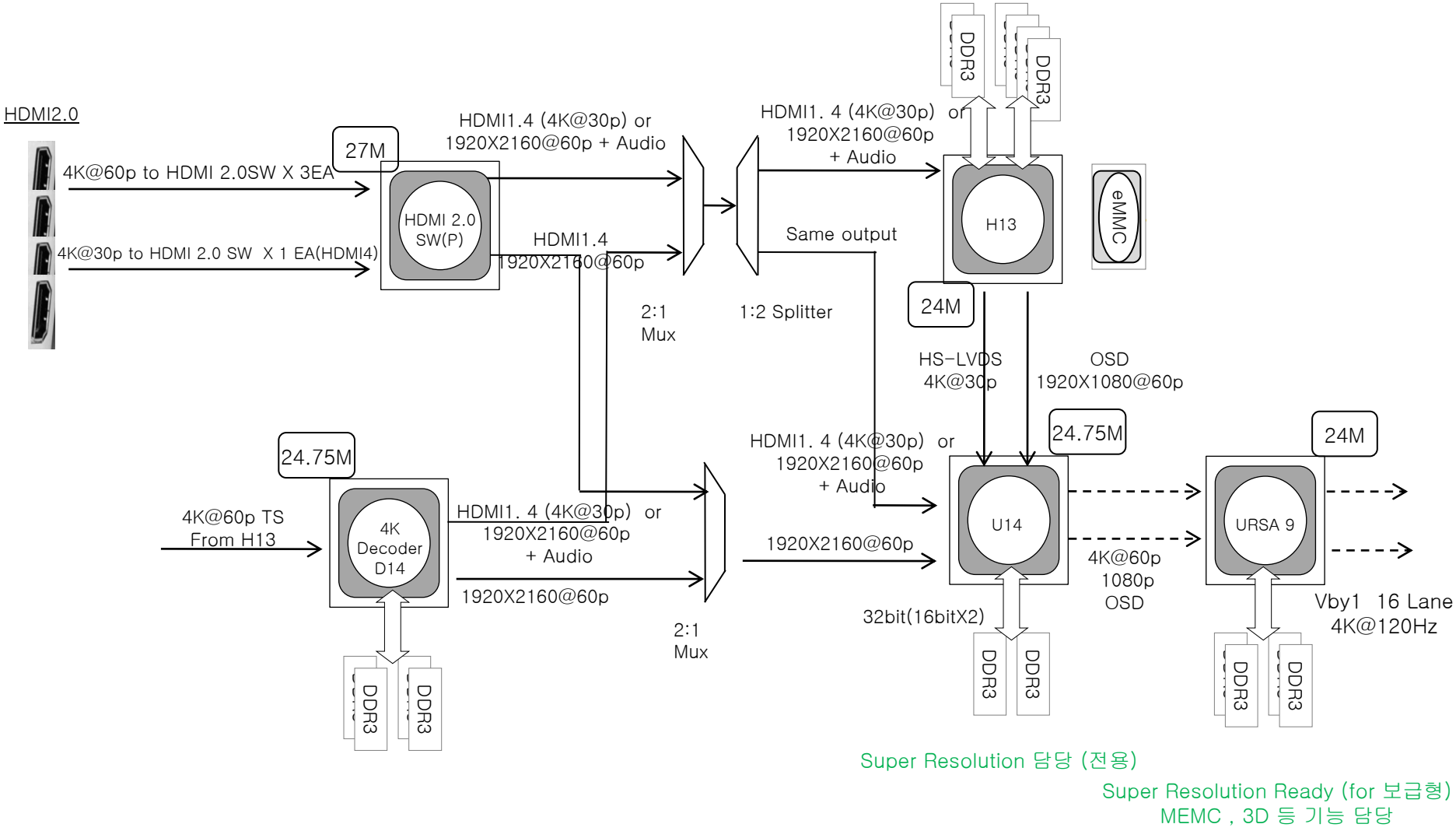
`14Y OLED ULTRA HD System Board Overview

Main Board
329x245



`14Y OLED ULTRA HD Main + Back-End

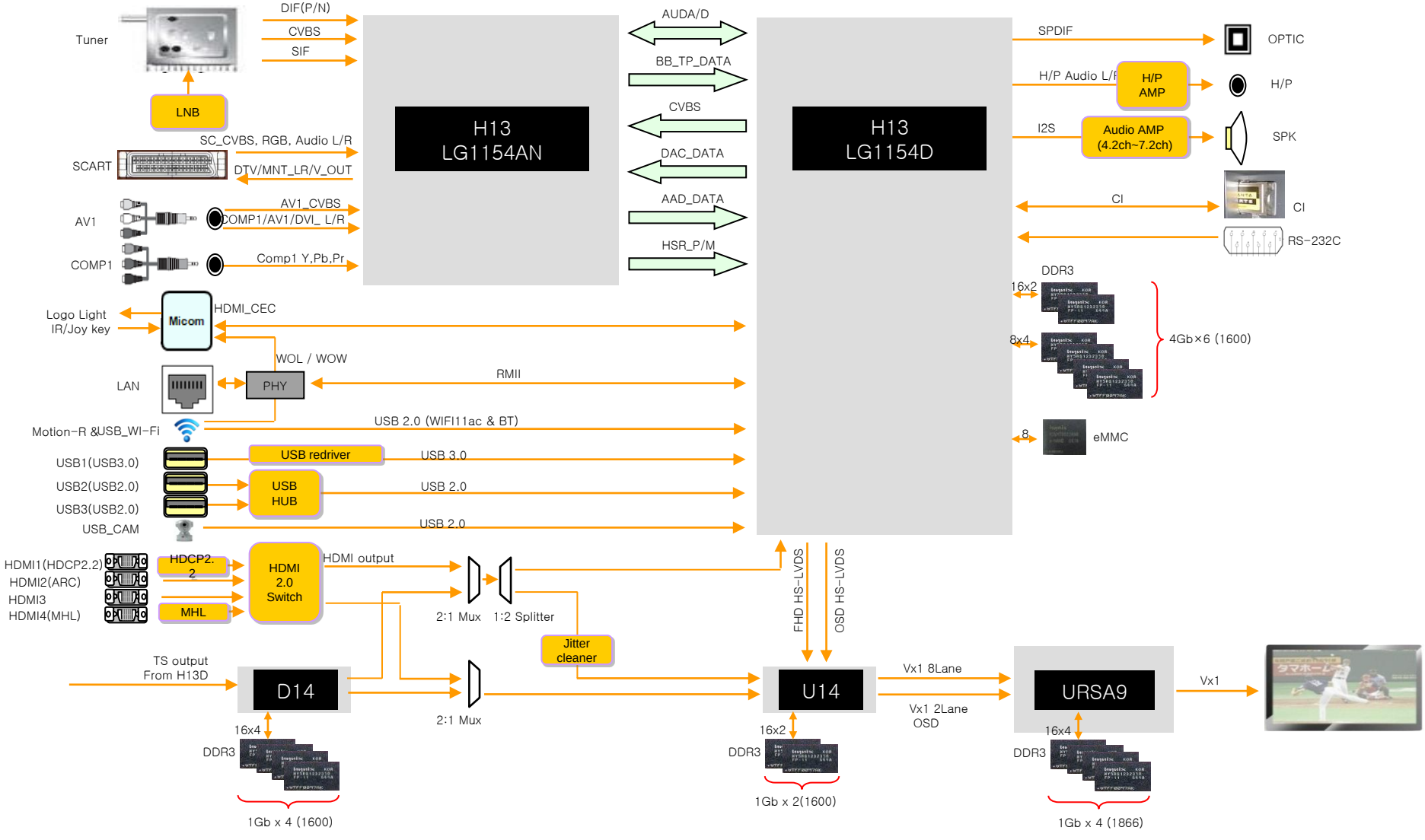
※ Main + Back-End (Back-End IC 1 chip)



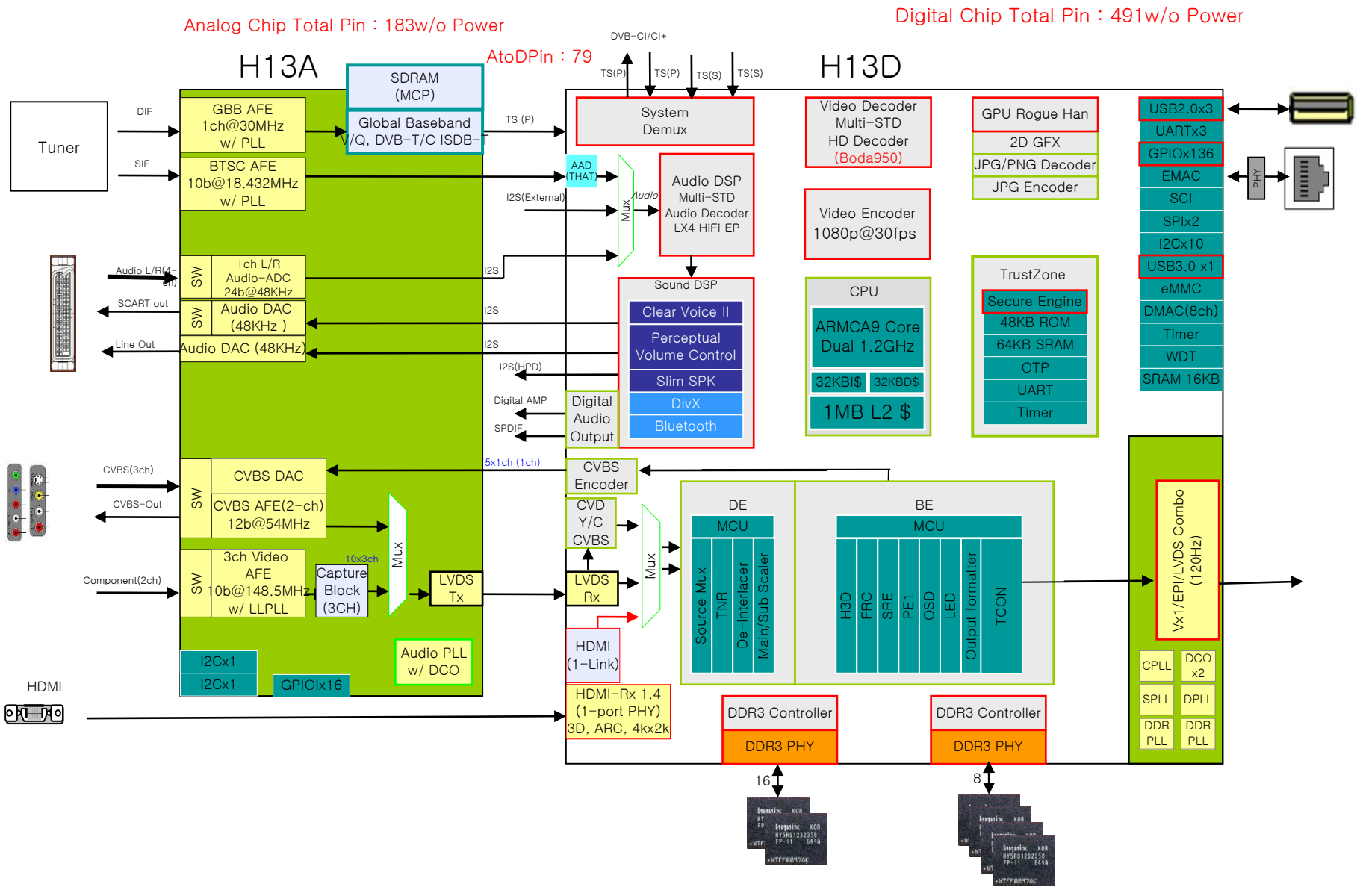
Super Resolution 담당 (전용)

Super Resolution Ready (for 보급형)
MEMC , 3D 등 기능 담당

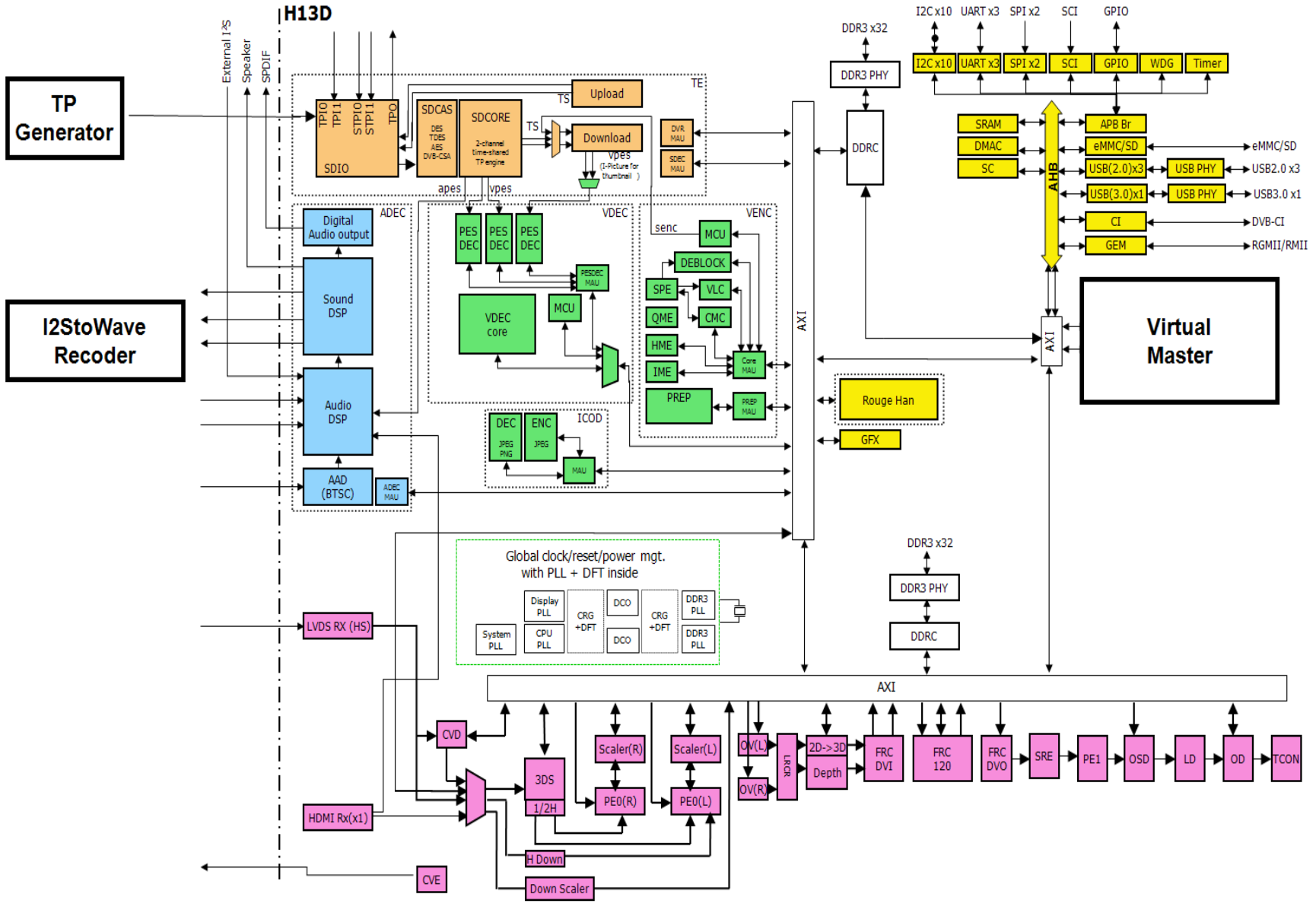
H13 Block Diagram (External)



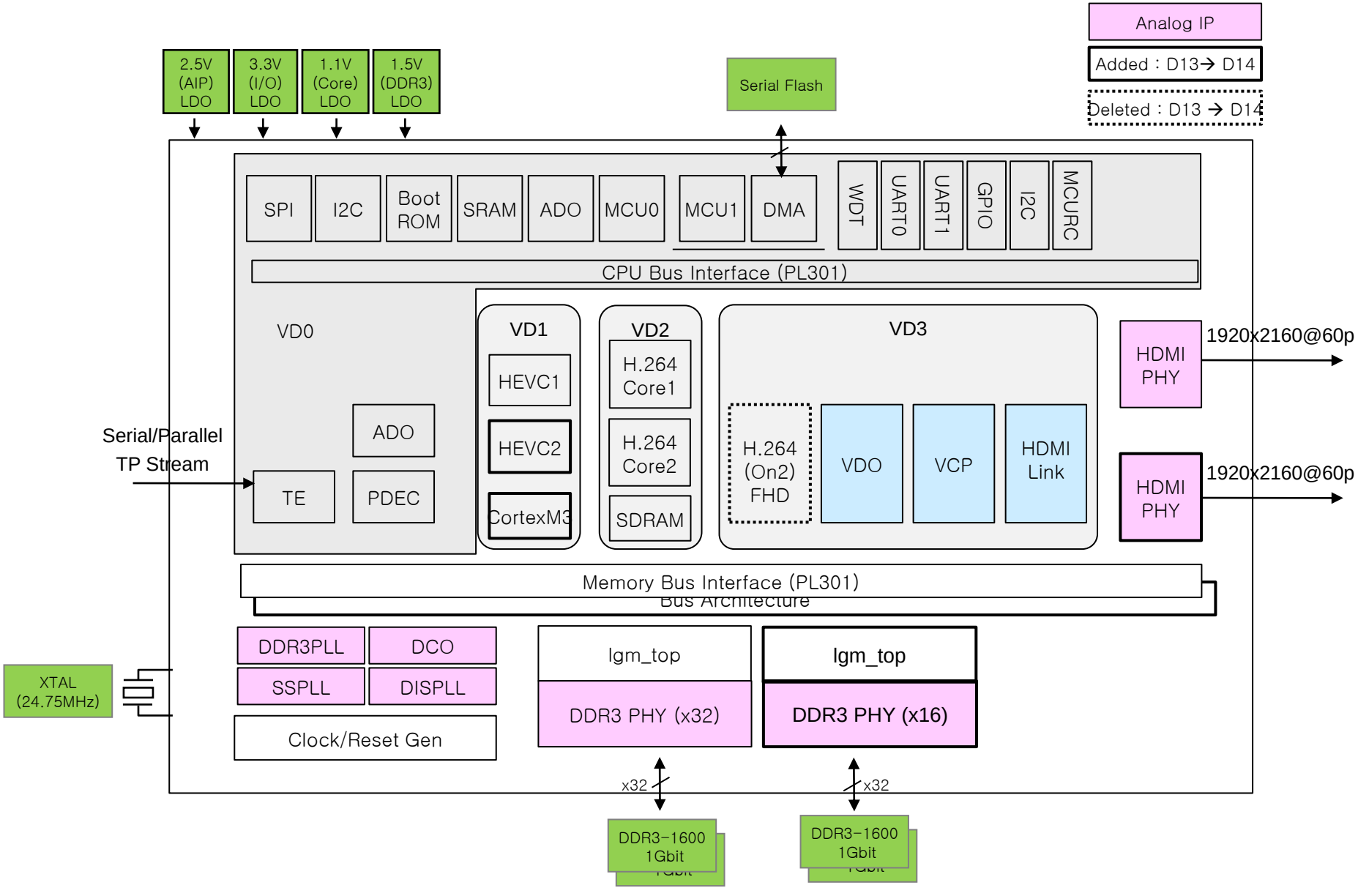
H13 Block Diagram (Internal)



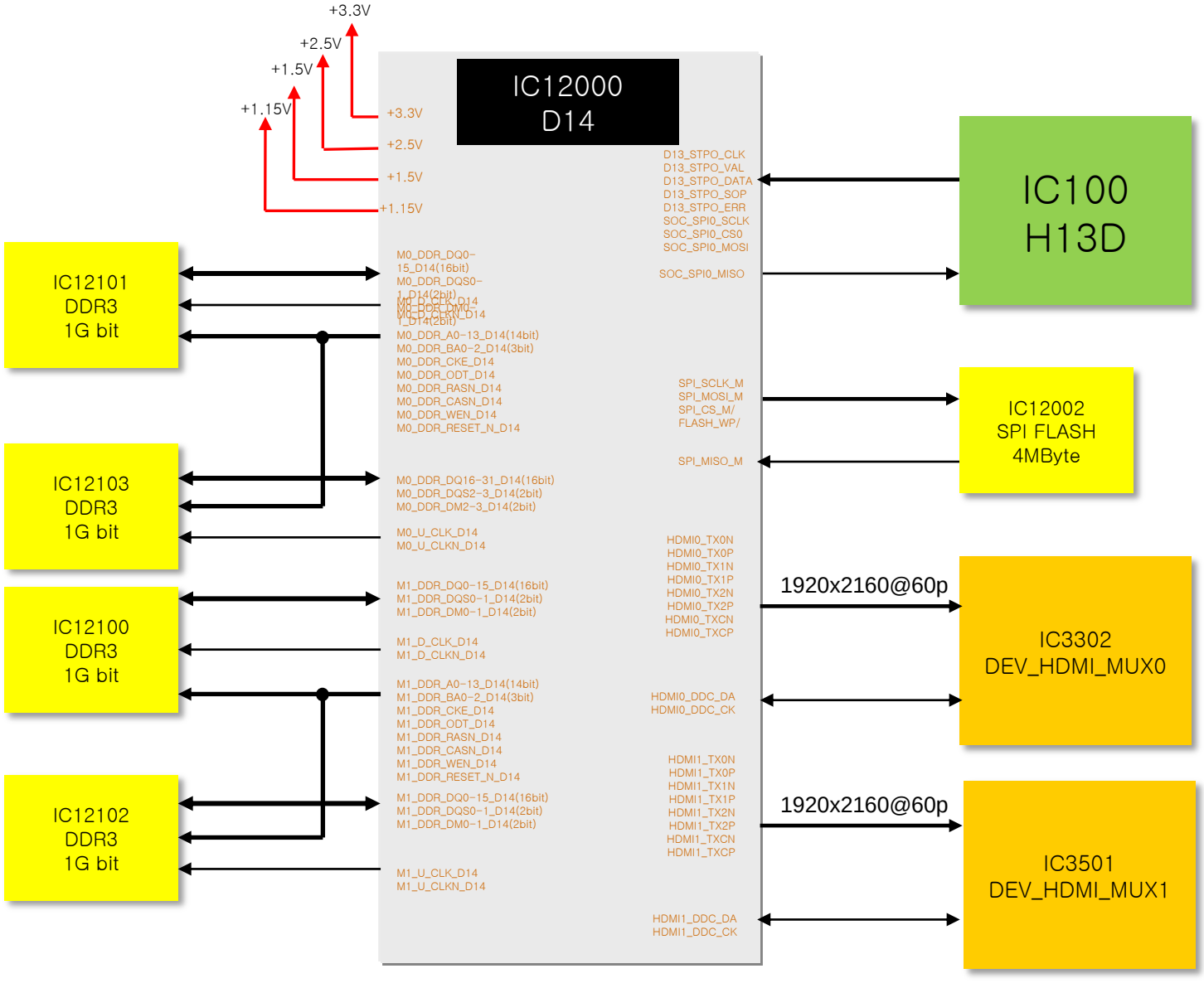
Data Path Diagram



D14 Block Diagram (Internal)

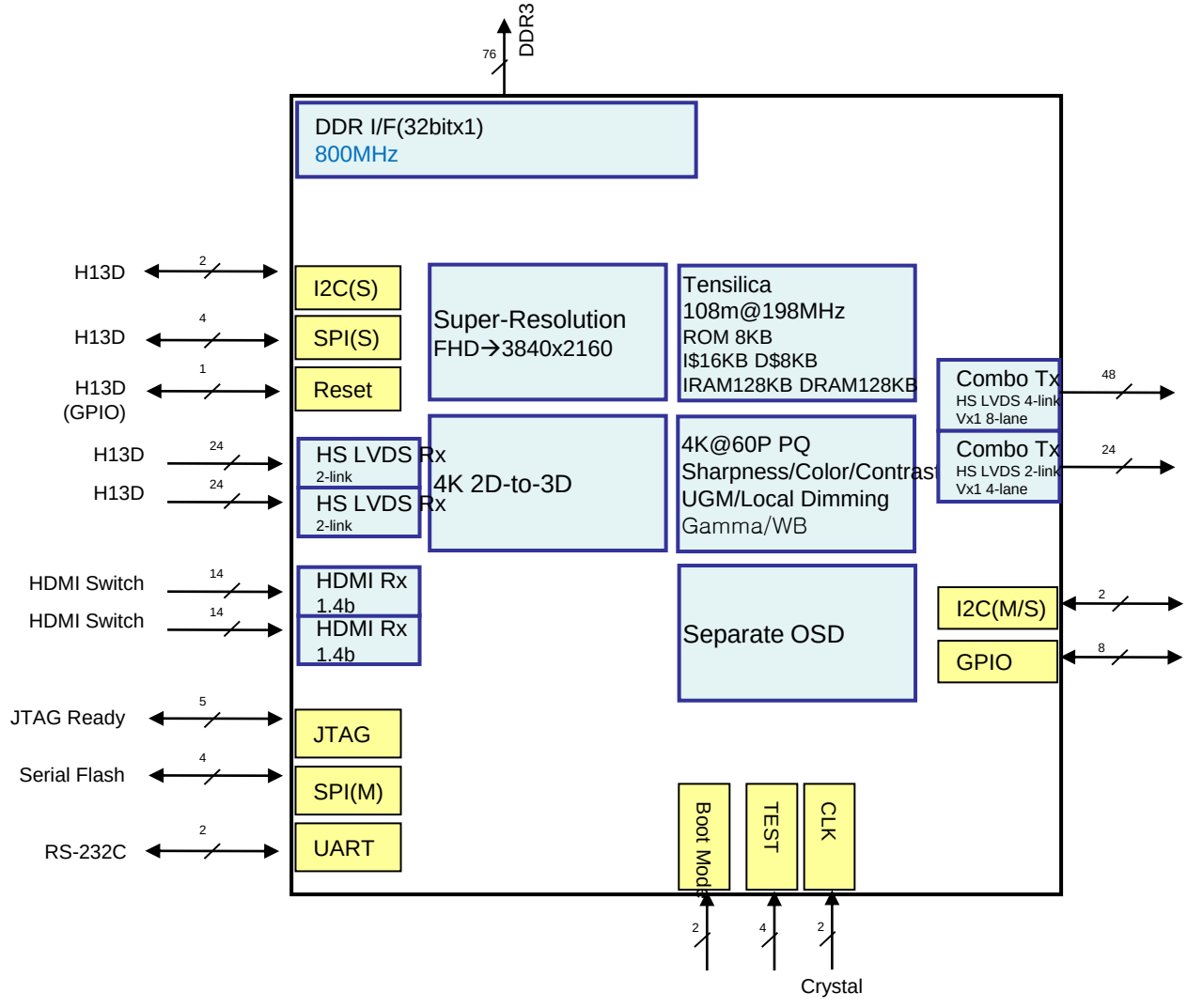


D14 Block Diagram (External)

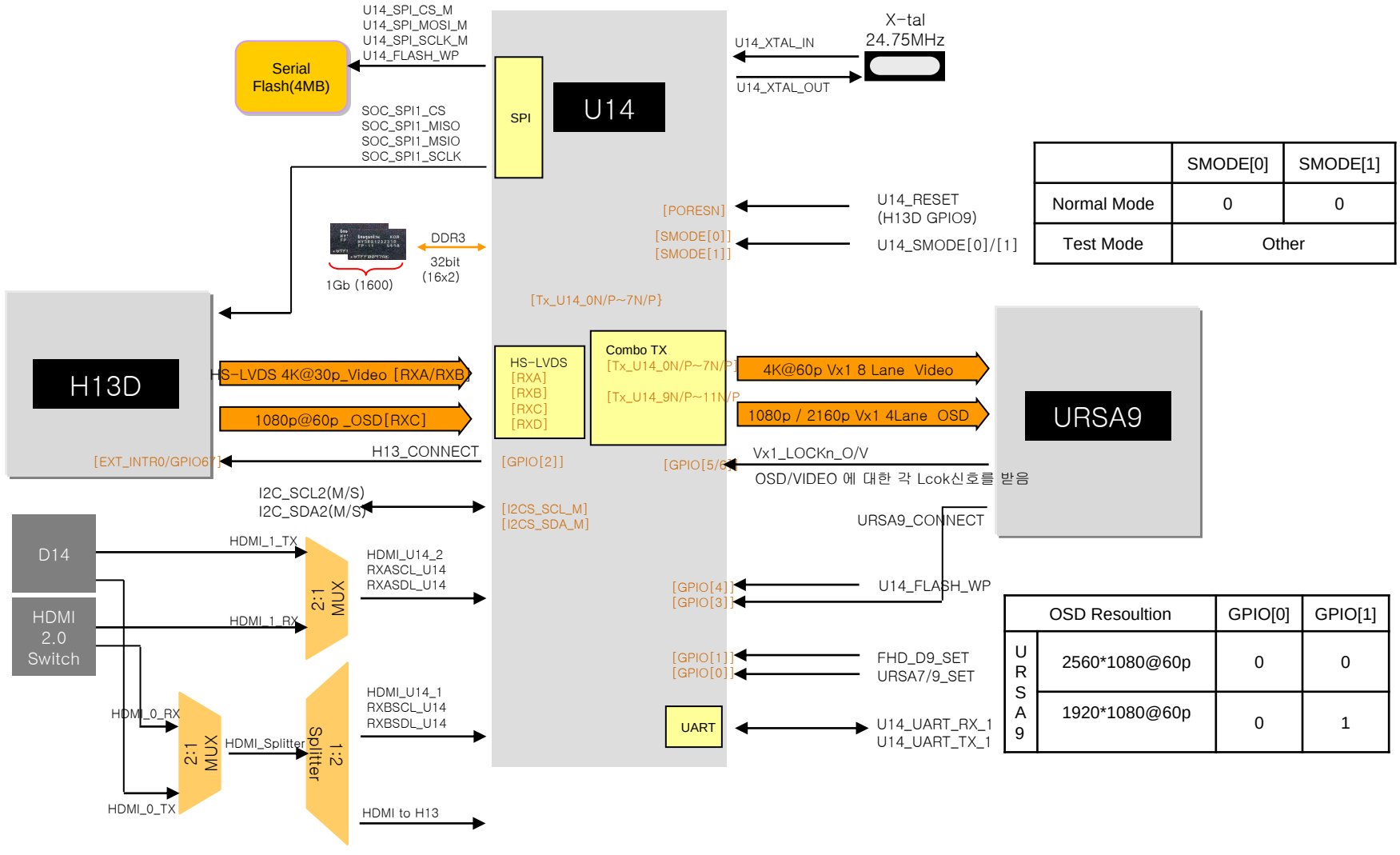


U14 Block Diagram (Internal)

- MCU
  - ✓ Tensilica's 108mini
- Memory
  - ✓ Unified memory architecture
  - ✓ DDR3-1600MHz 32bit
- Interface
  - ✓ Input
    - : HS-LVDS 4-link (2+2)
    - : HDMI1.4 2-port
  - ✓ Output
    - : HS-LVDS 6-link (4+2)
    - : Vx1 12-lane (8+4)
- PKG
  - ✓ 23X23 FcBGA



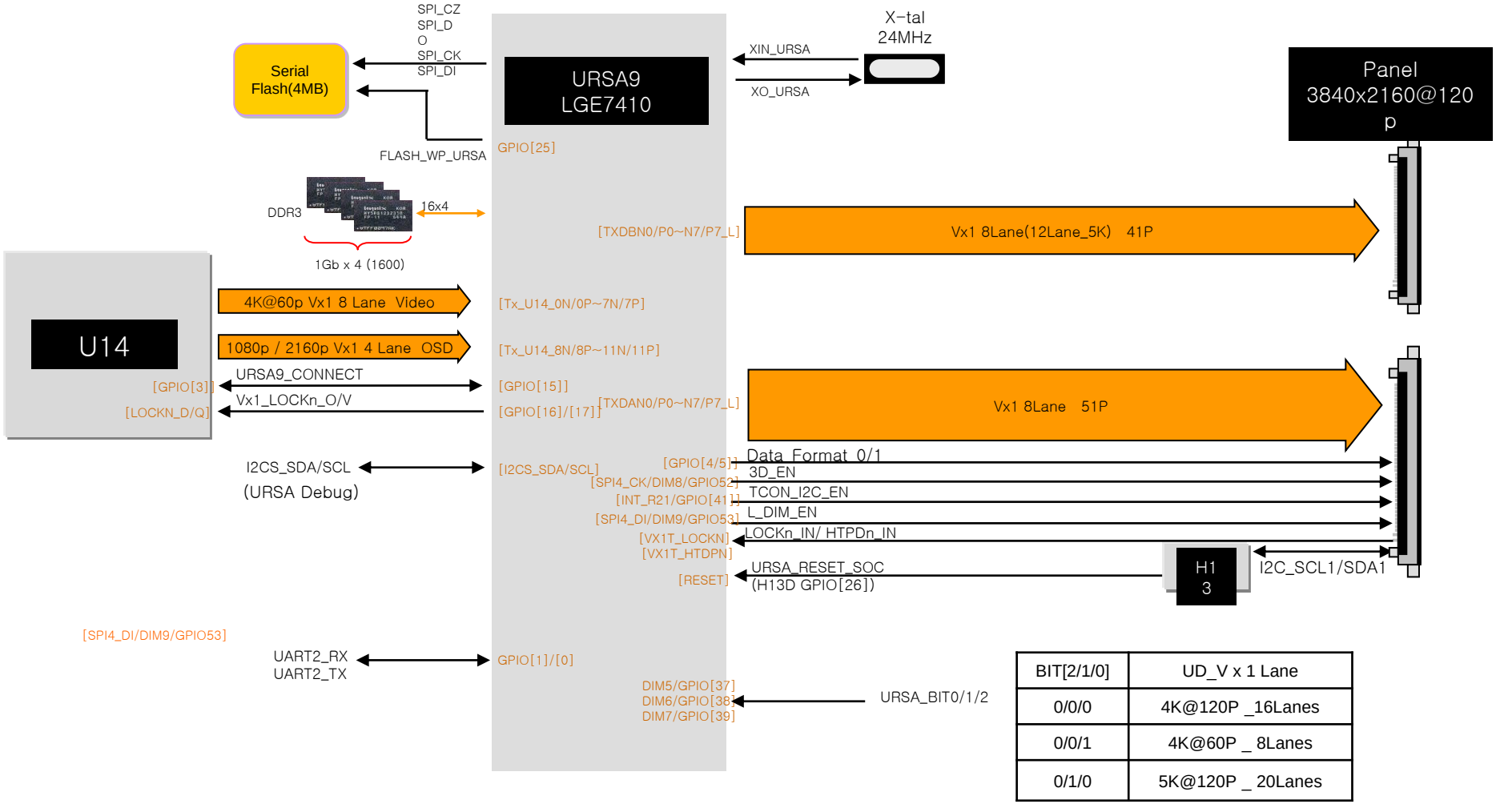
U14 Block Diagram (External)



	SMODE[0]	SMODE[1]
Normal Mode	0	0
Test Mode	Other	

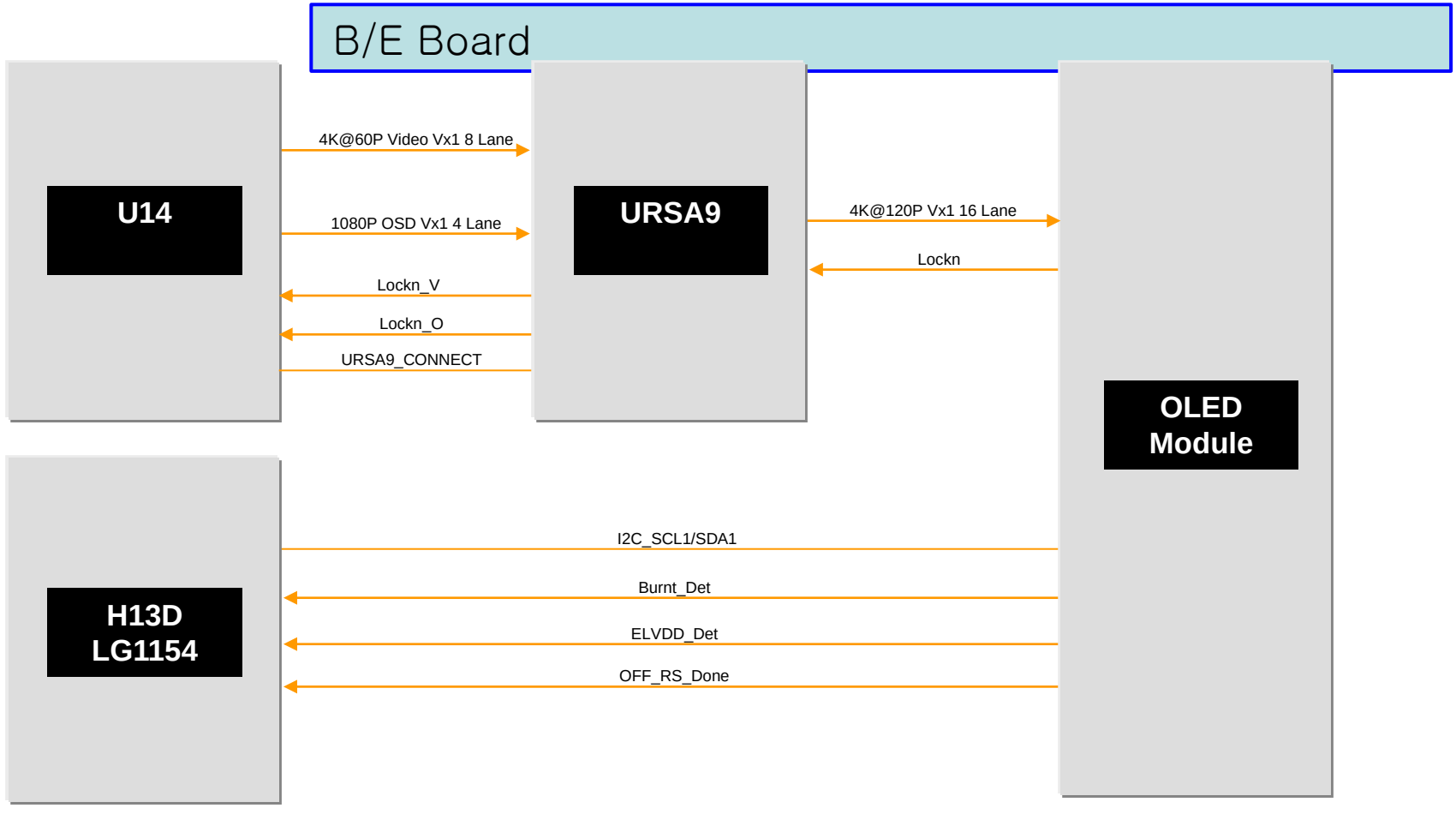
	OSD Resoultion	GPIO[0]	GPIO[1]
URSA9	2560*1080@60p	0	0
	1920*1080@60p	0	1

URSA9 Block Diagram

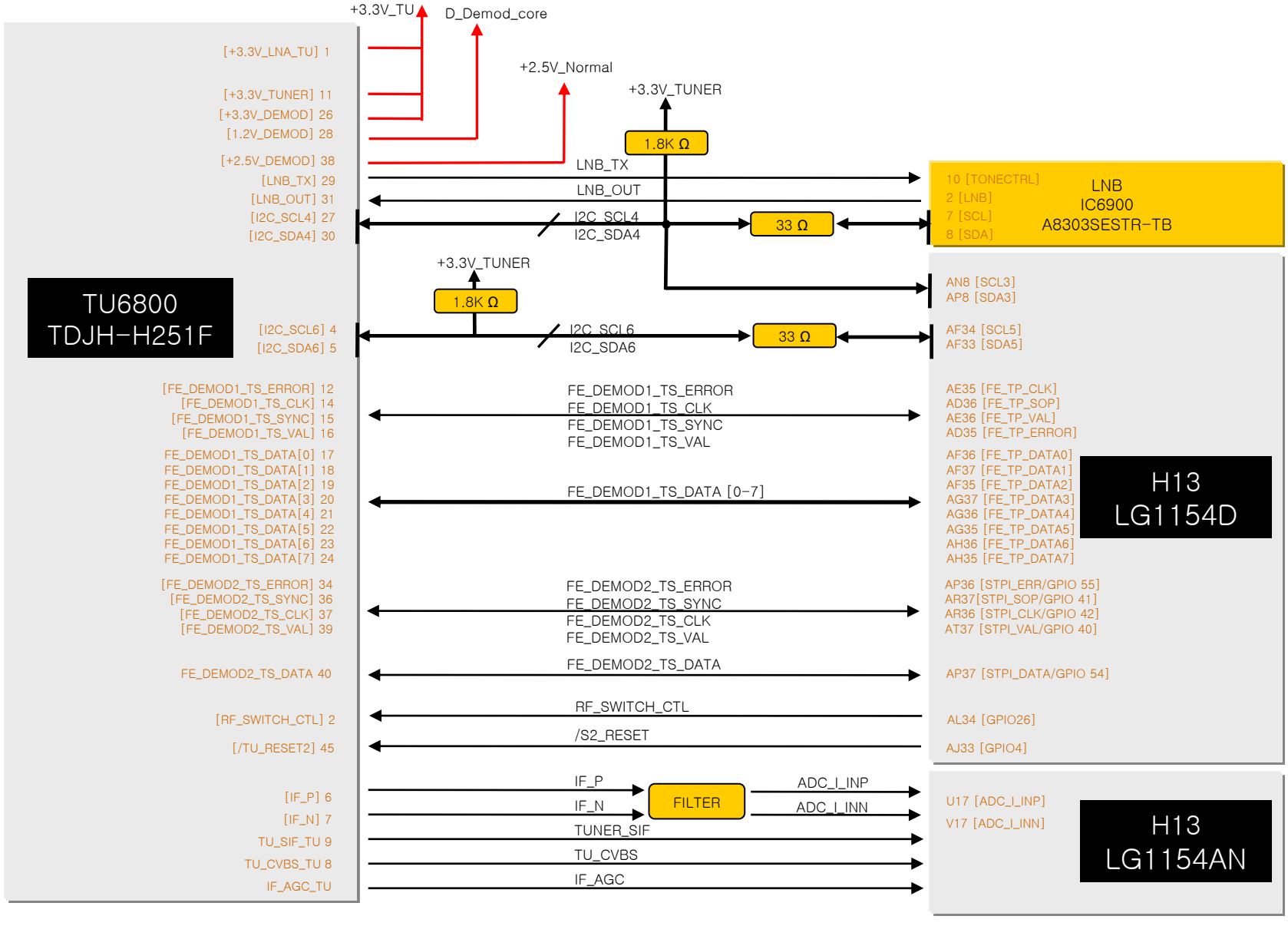


BIT[2/1/0]	UD_V x 1 Lane
0/0/0	4K@120P _16Lanes
0/0/1	4K@60P _ 8Lanes
0/1/0	5K@120P _ 20Lanes

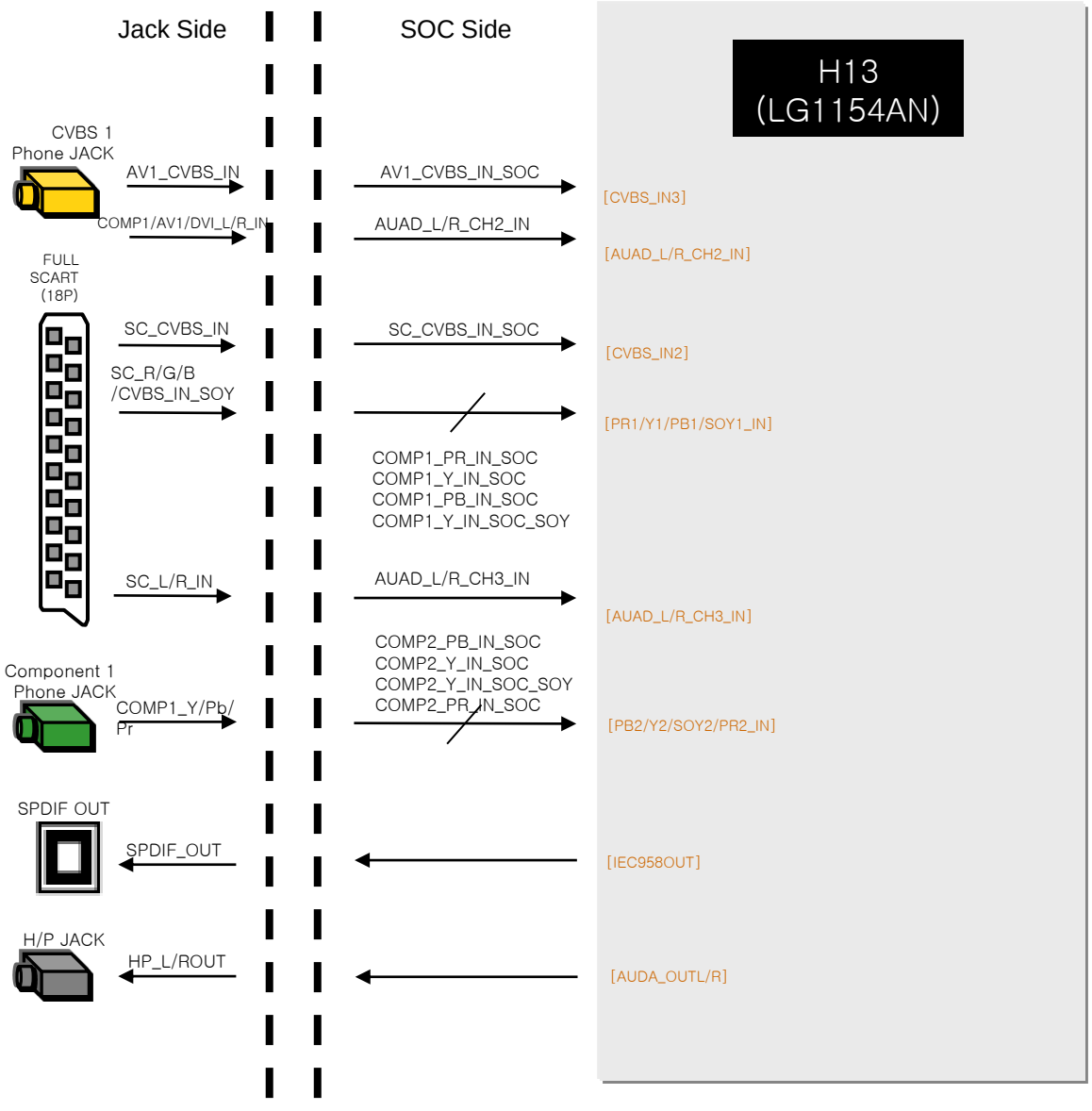
B/E



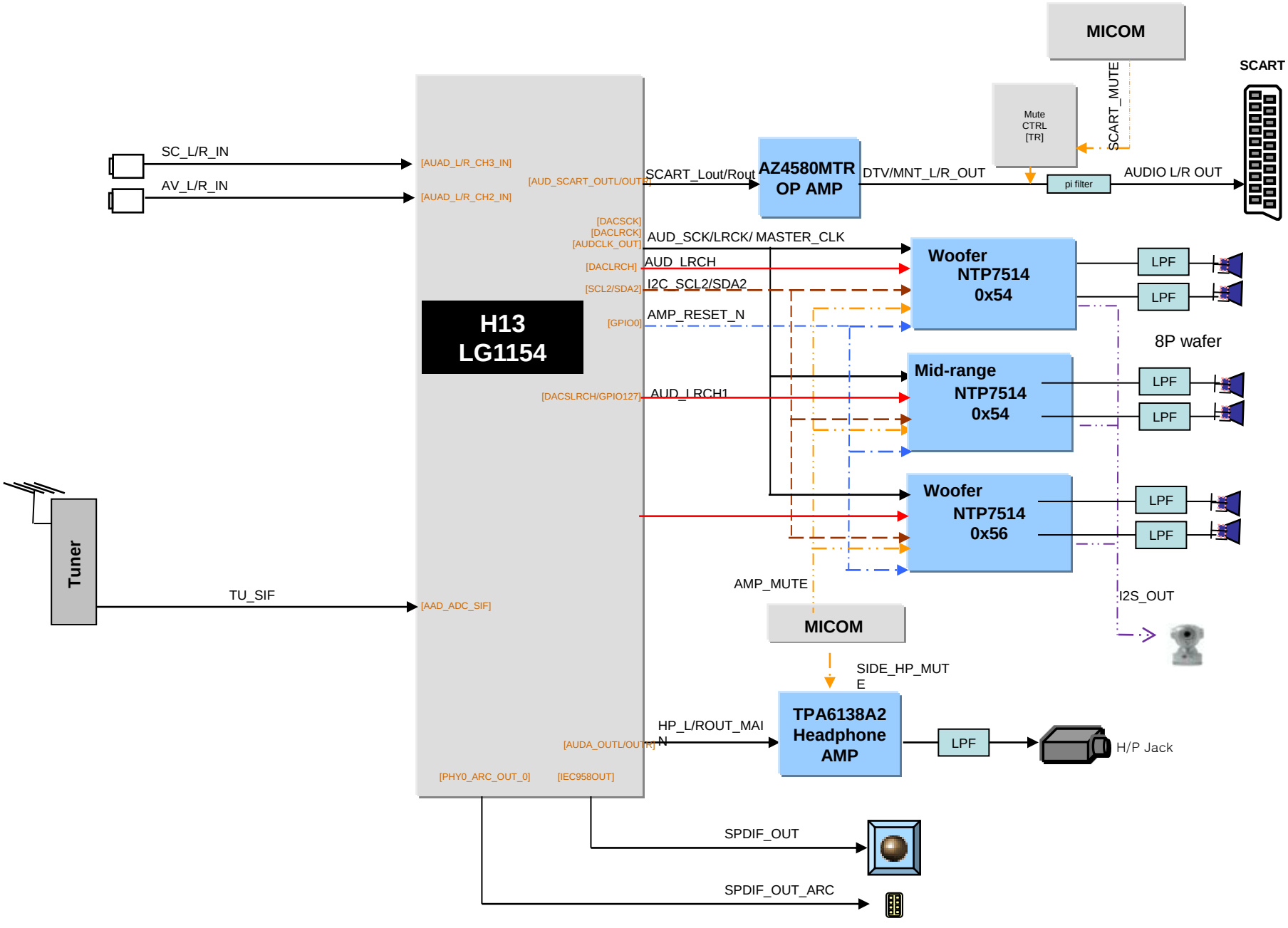
Tuner



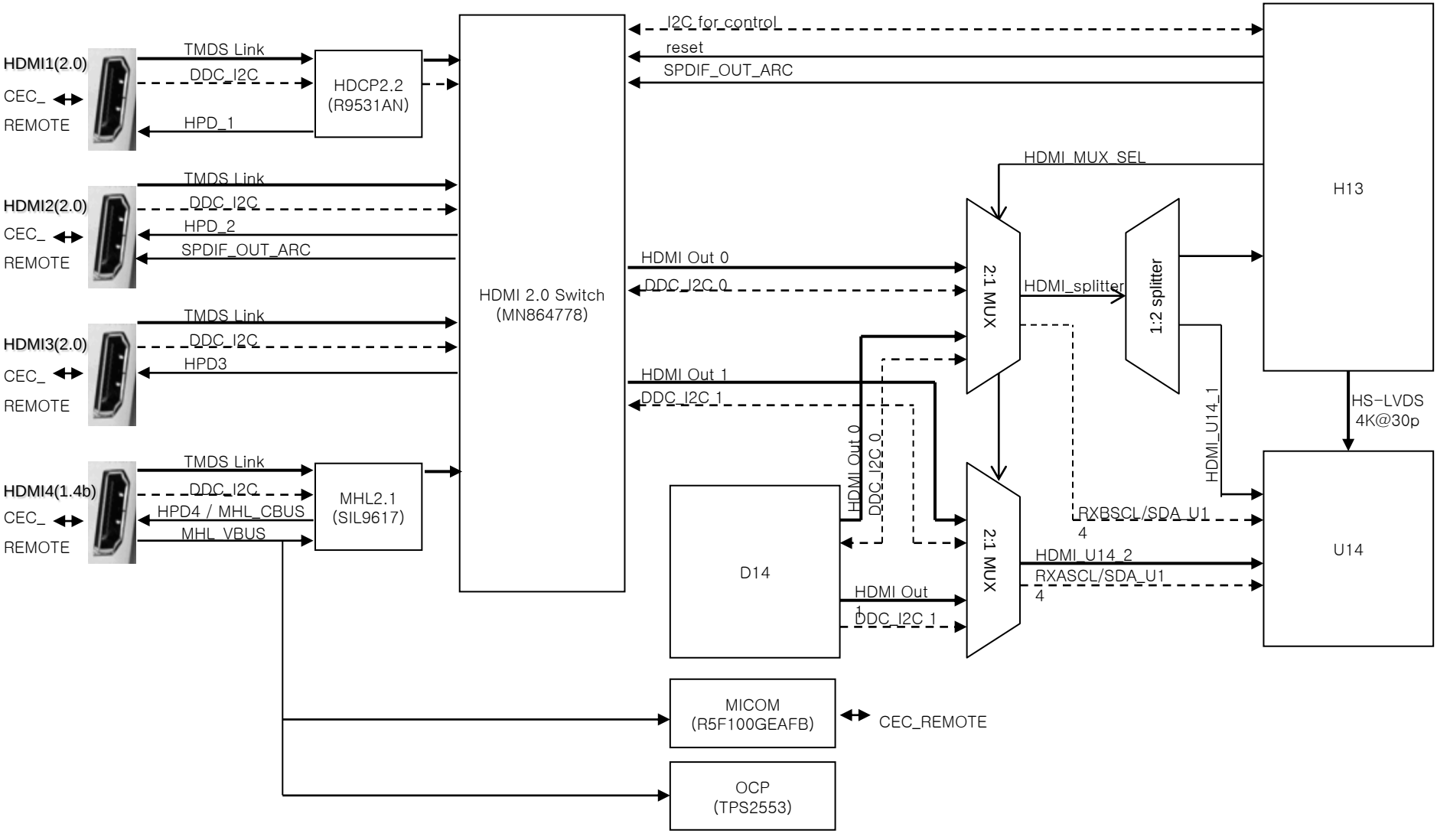
Video & Audio IN/OUT



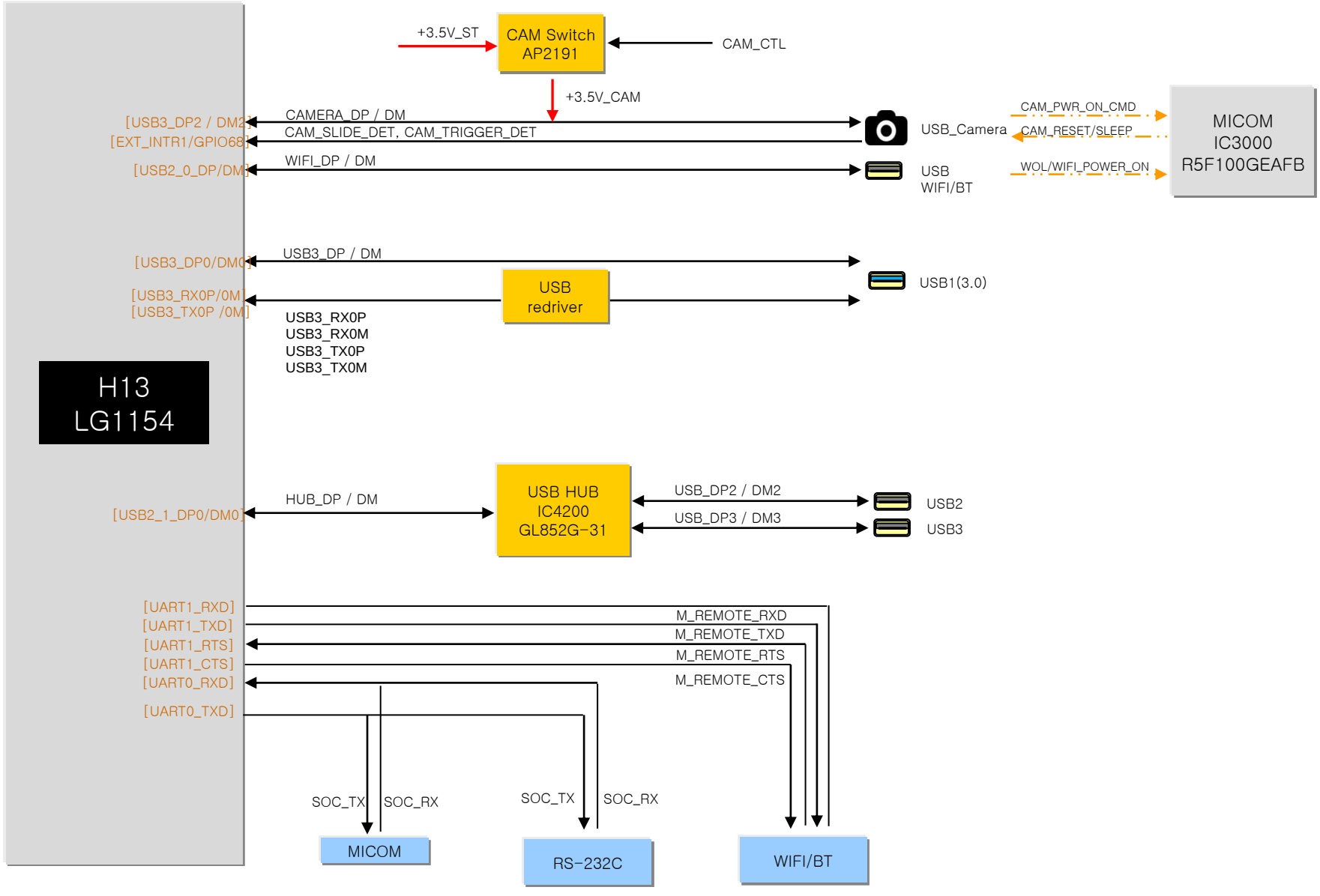
Audio OUT



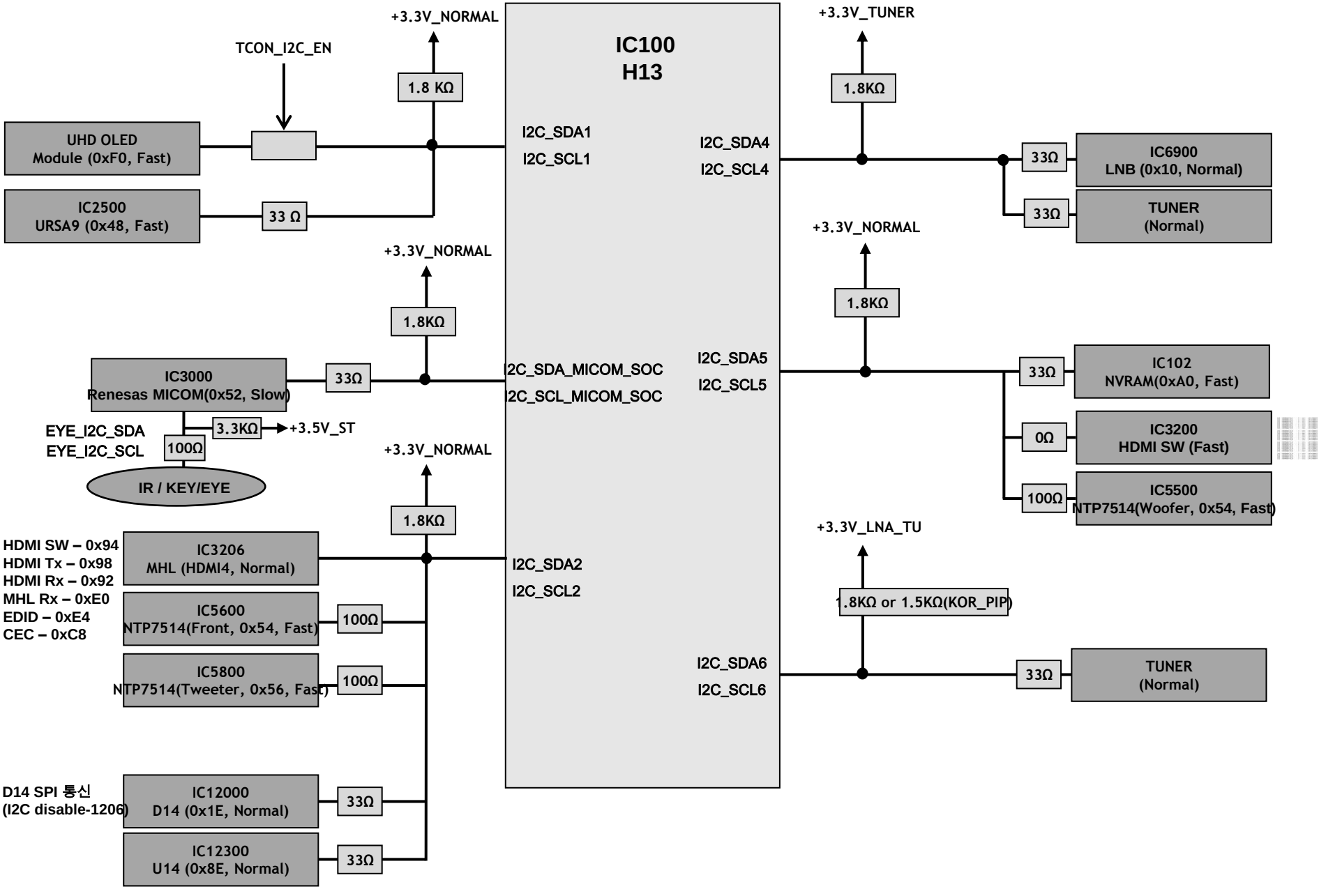
HDMI2.0 Block



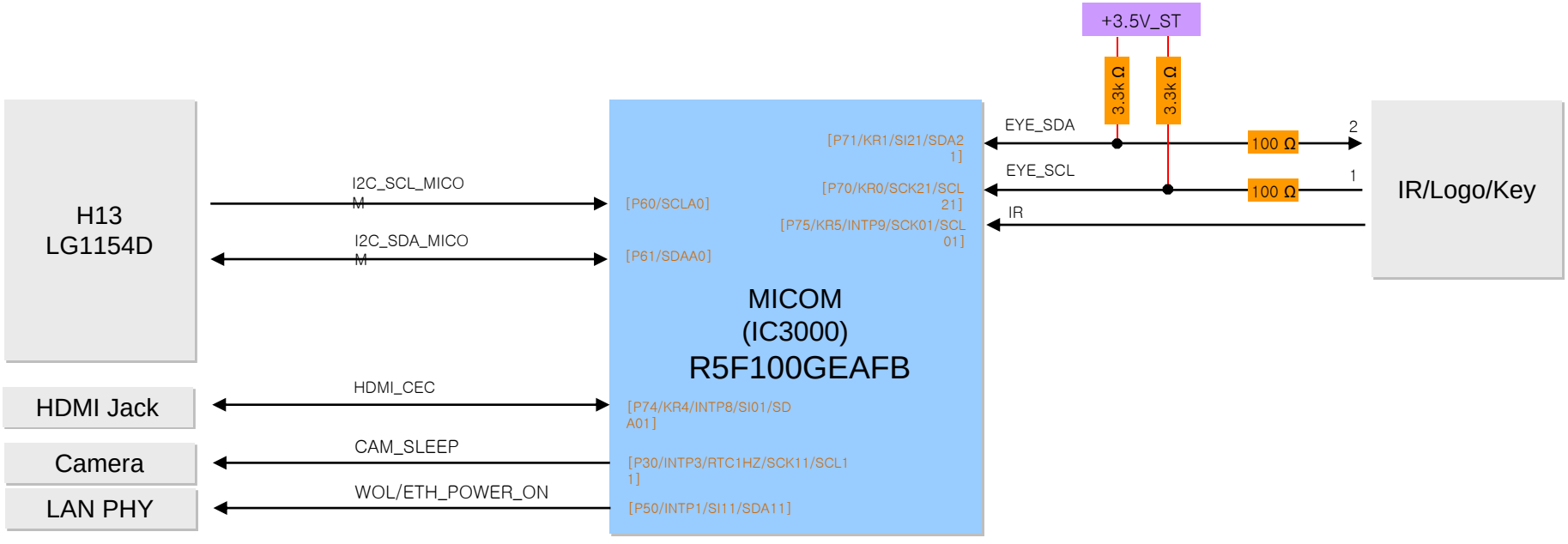
USB / WIFI / M-REMOTE / UART



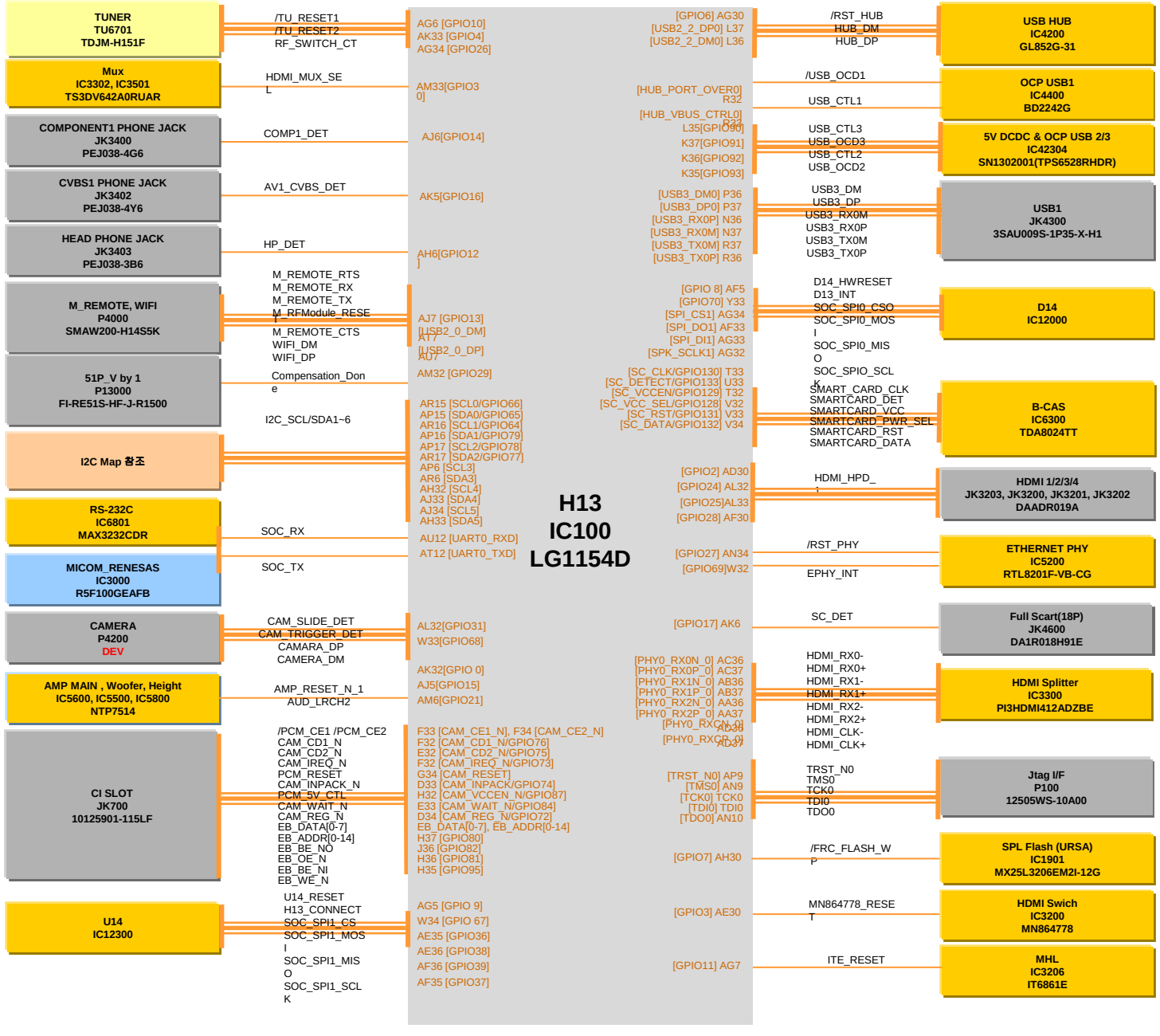
I2C Map (H13)



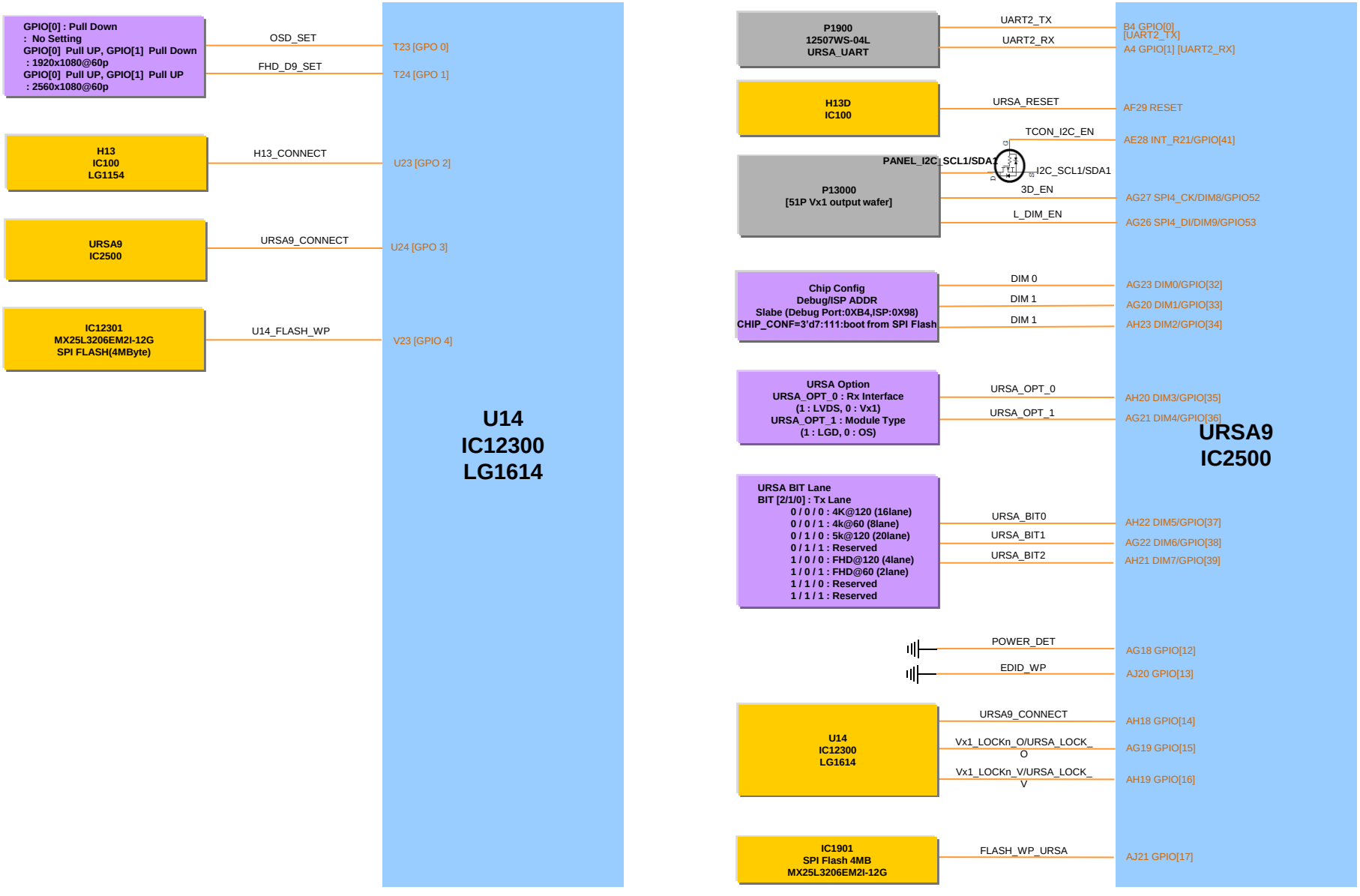
I2C Map (MICOM)



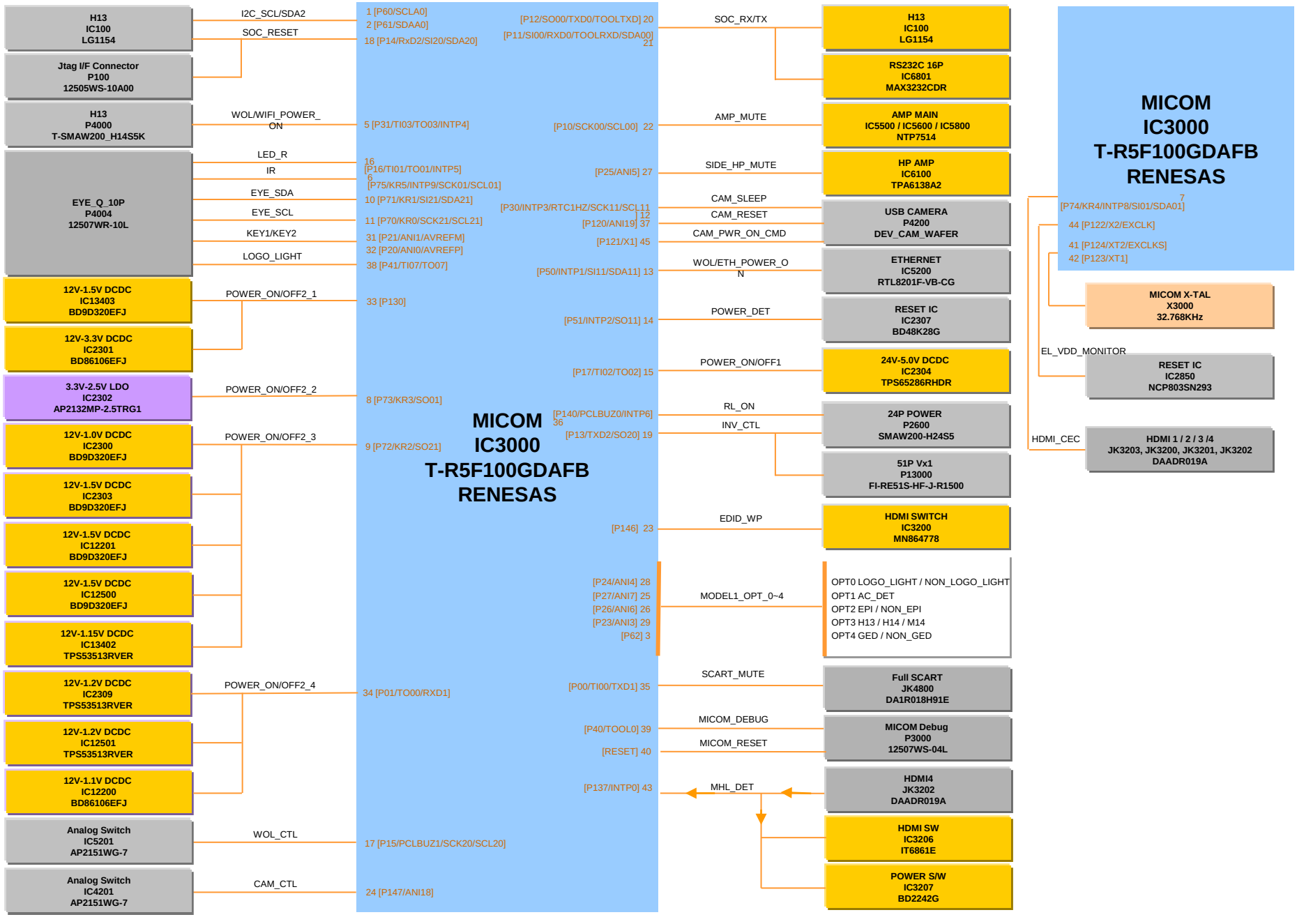
GPIO (H13)



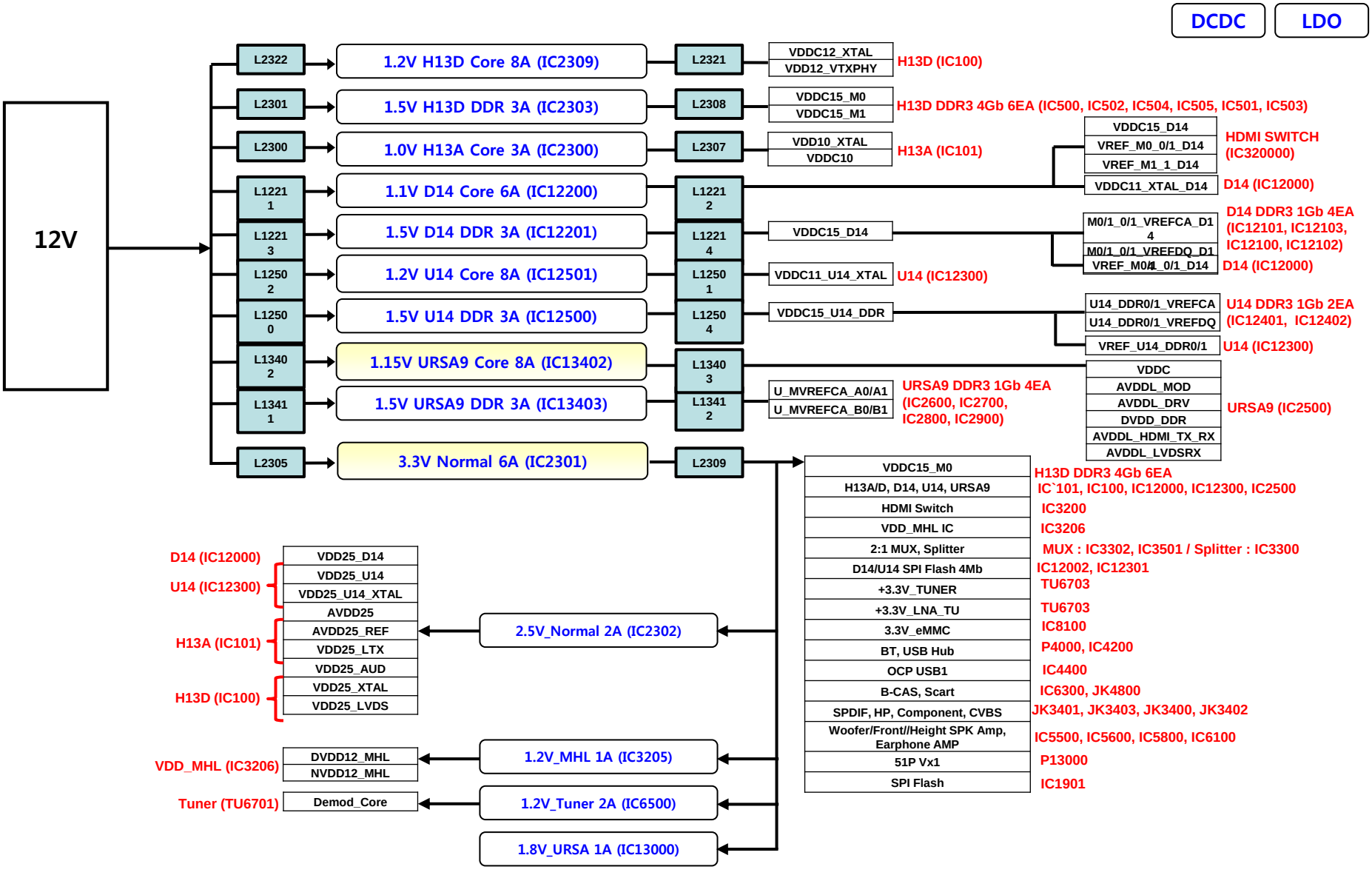
GPIO (U14/URSA9)



GPIO (MICOM)

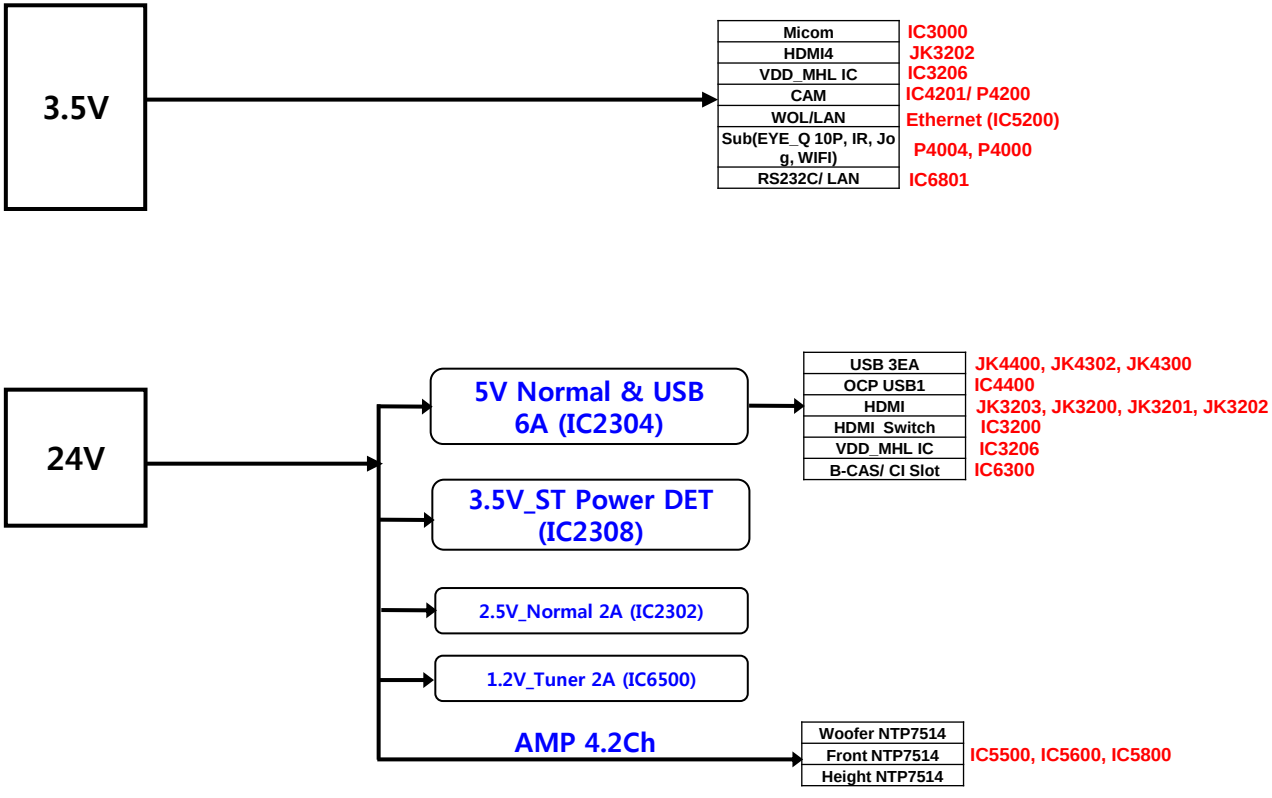


Power Block

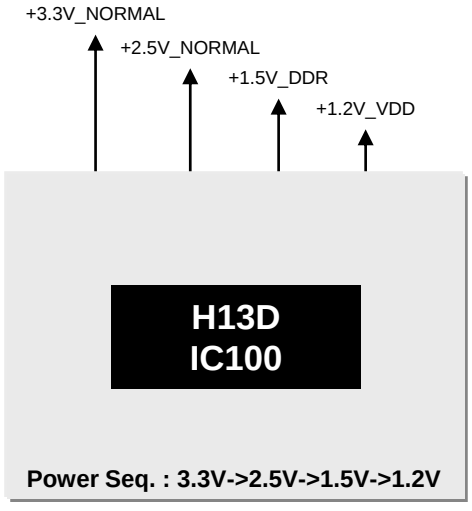


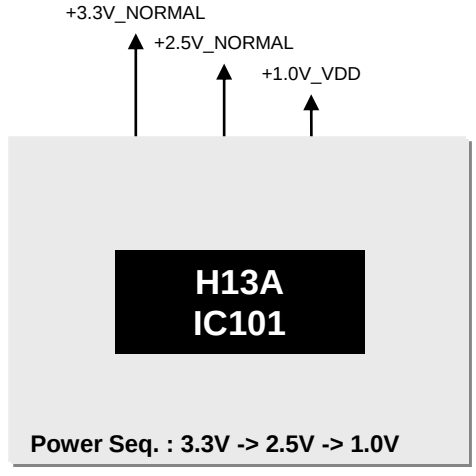
Power Block

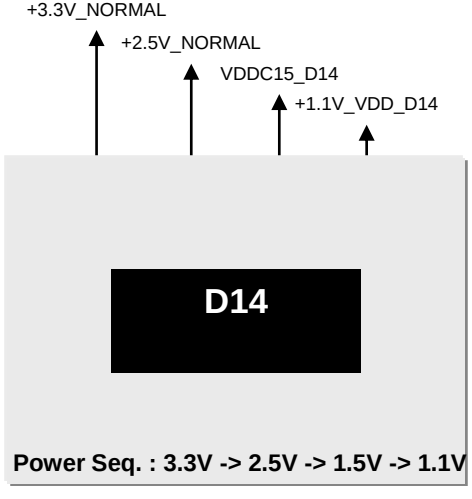
DCDC LDO

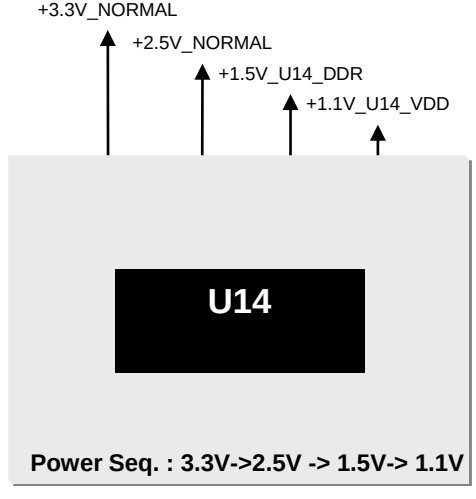


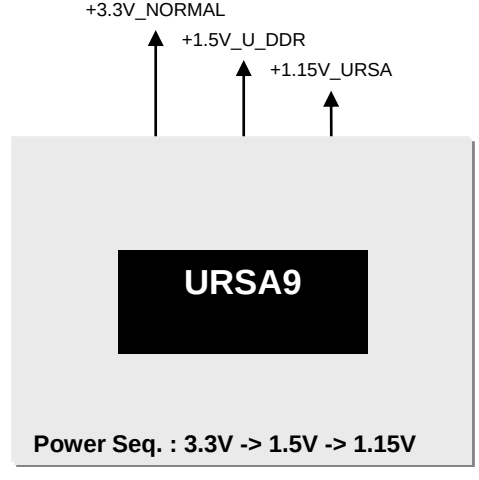
Power Block





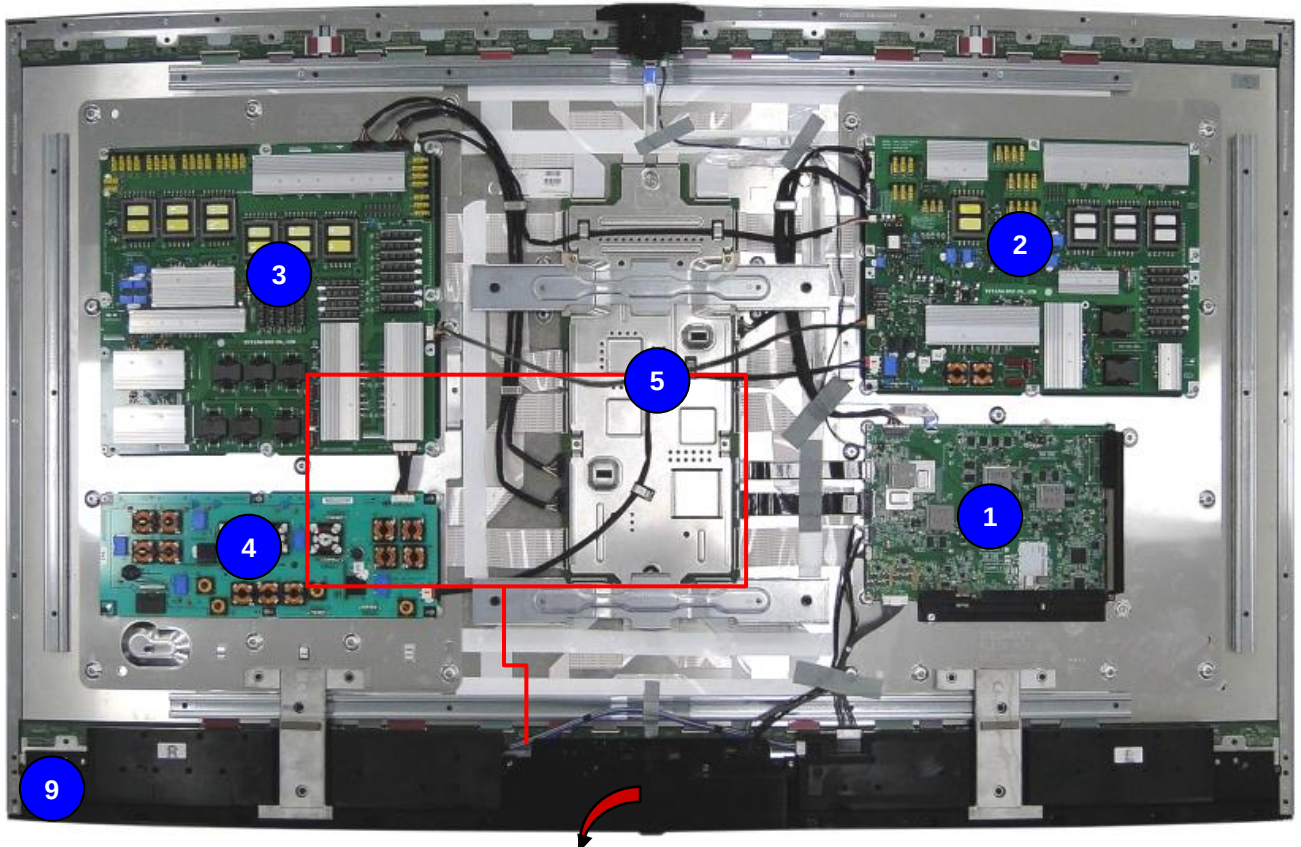






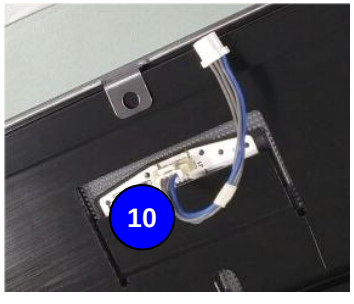
Interconnection – sub PCB (77EG9700)

77EG9700



[PCBs]

1. Main PCB
2. PSU - Master
3. PSU – Slave
4. PSU – AC
5. T – CON (Main PCB Under)
6. IR
7. BT MOTION ASSY
8. WIFI ASSY
9. Jog key
10. Logo Light



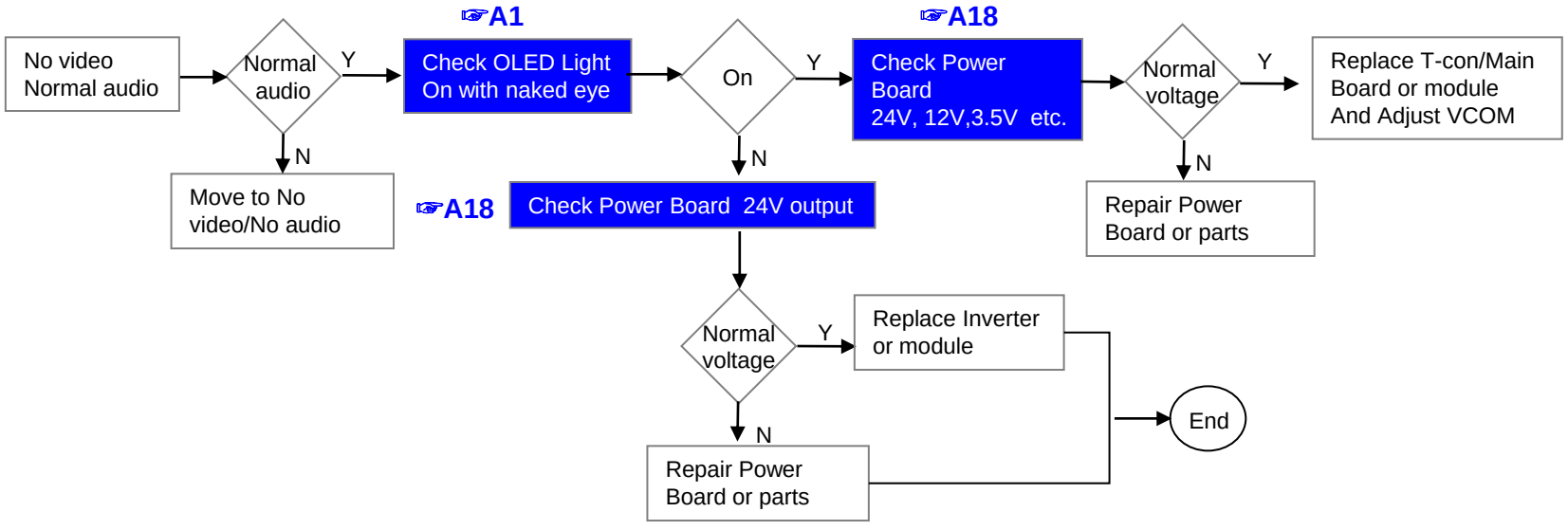
Contents of OLED TV Standard Repair Process

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

OLED 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.

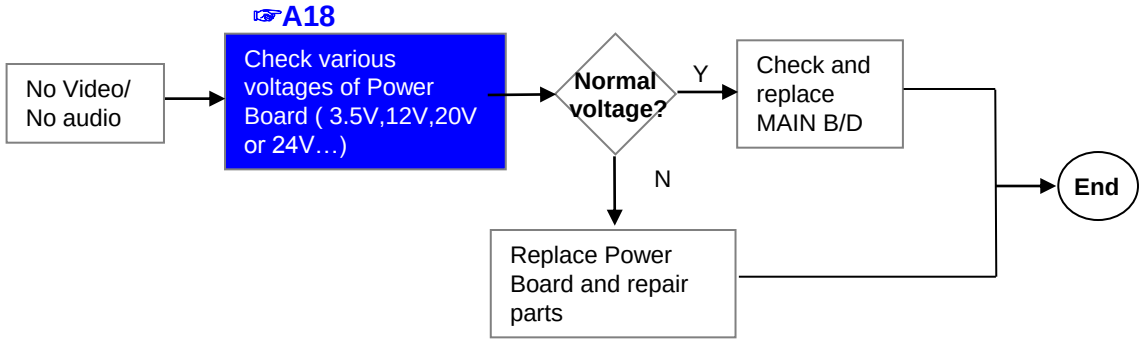
(Main B/D↔ Power B/D, LVDS Cable, Speaker Cable, IR B/D Cable,,,)



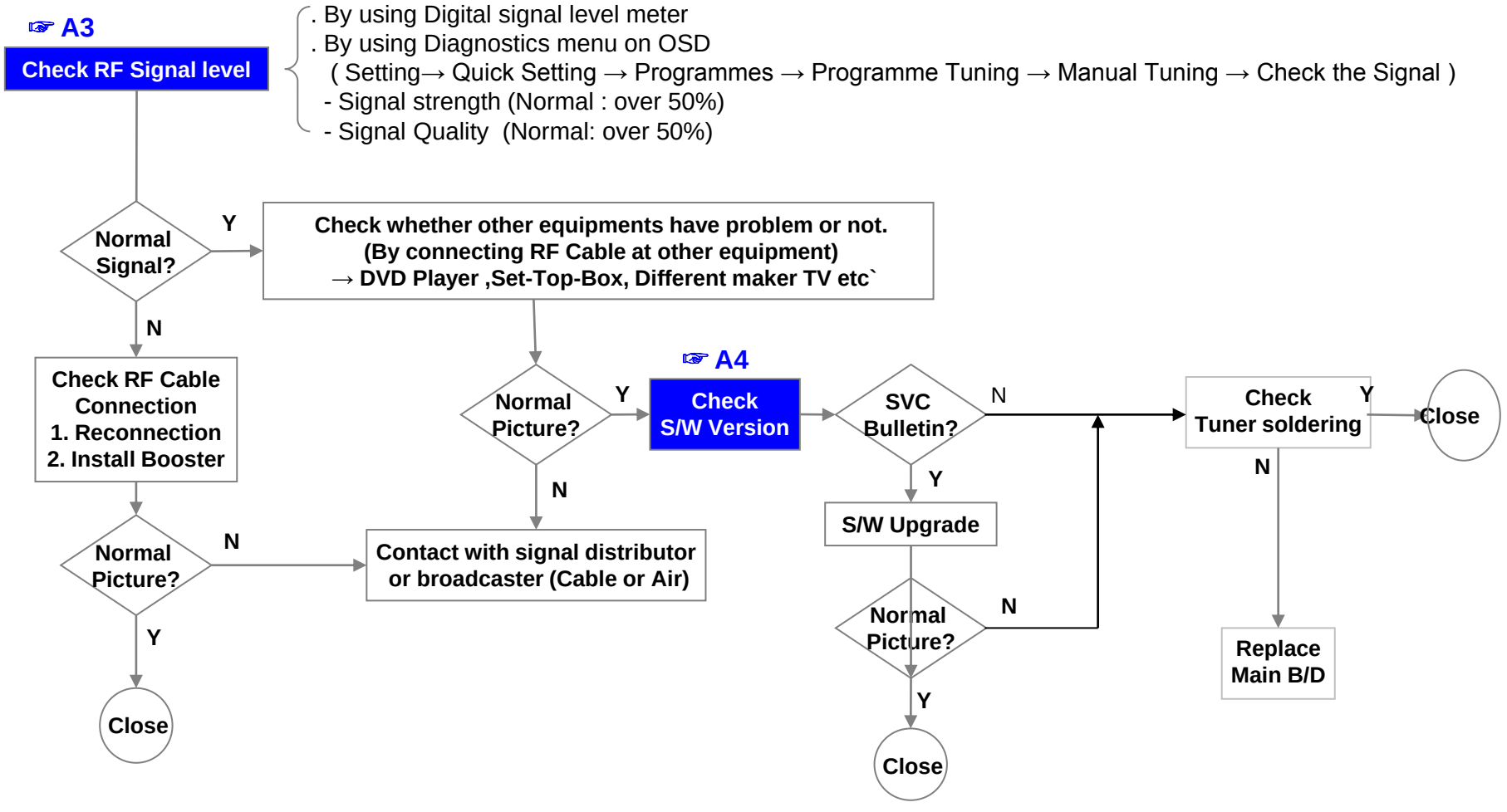
※Precaution ☞A4 & A2

Always check & record S/W Version and White Balance value before replacing the Main Board → Replace Main Board → Re-enter White Balance value

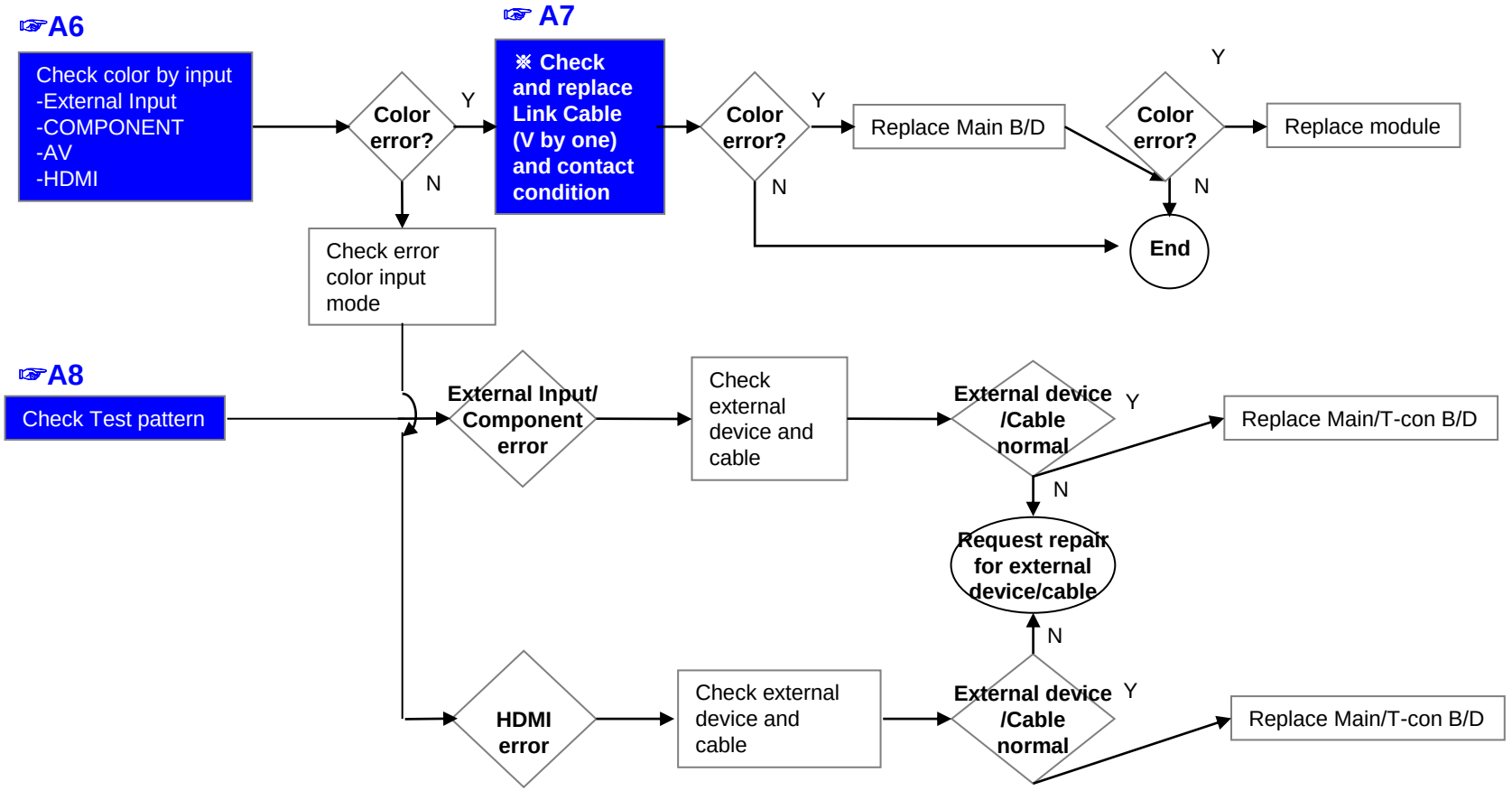
OLED TV	Error symptom	A. Video error	Established date	2013.01.31	
		No video/ No audio	Revised date		2/16



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

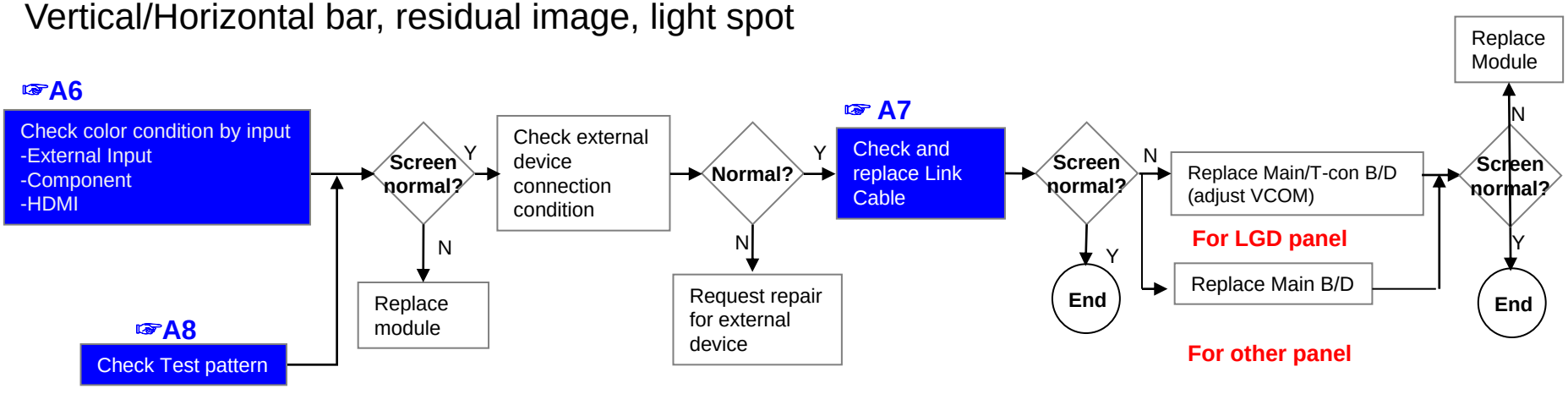


OLED TV	Error symptom	A. Video error	Established date	2013.01.31	
		Color error	Revised date		4/16

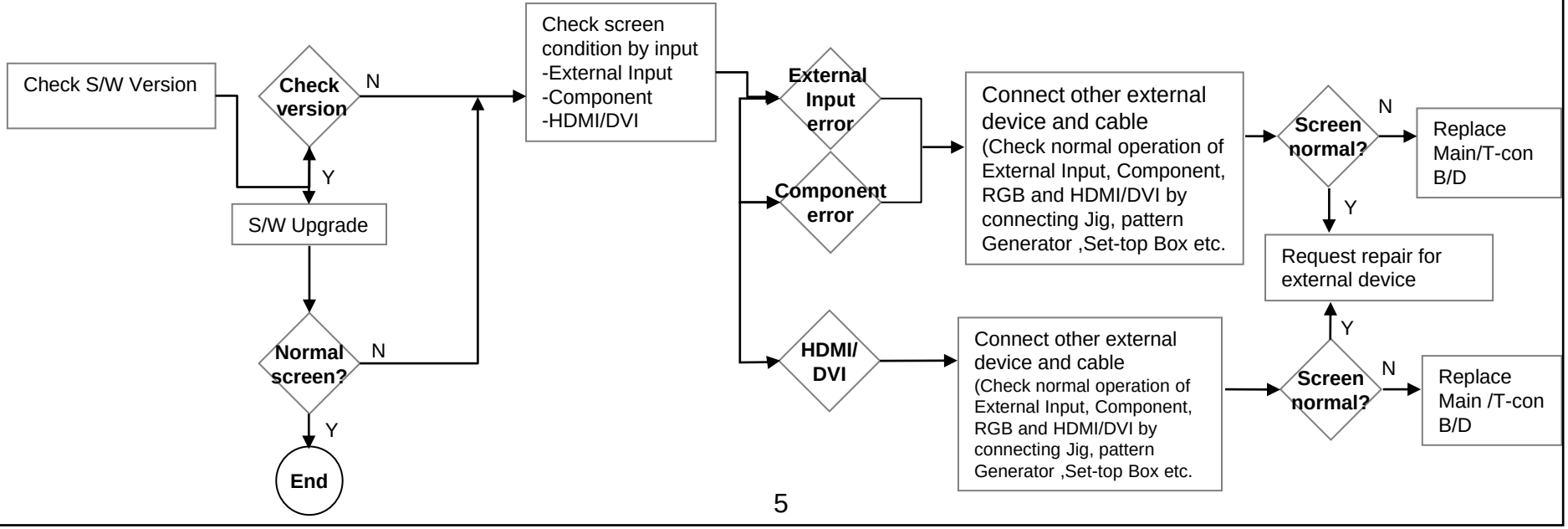


OLED TV	Error symptom	A. Video error	Established date	2013.01.31	
		Vertical / Horizontal bar, residual image, light spot, external device color error	Revised date		5/16

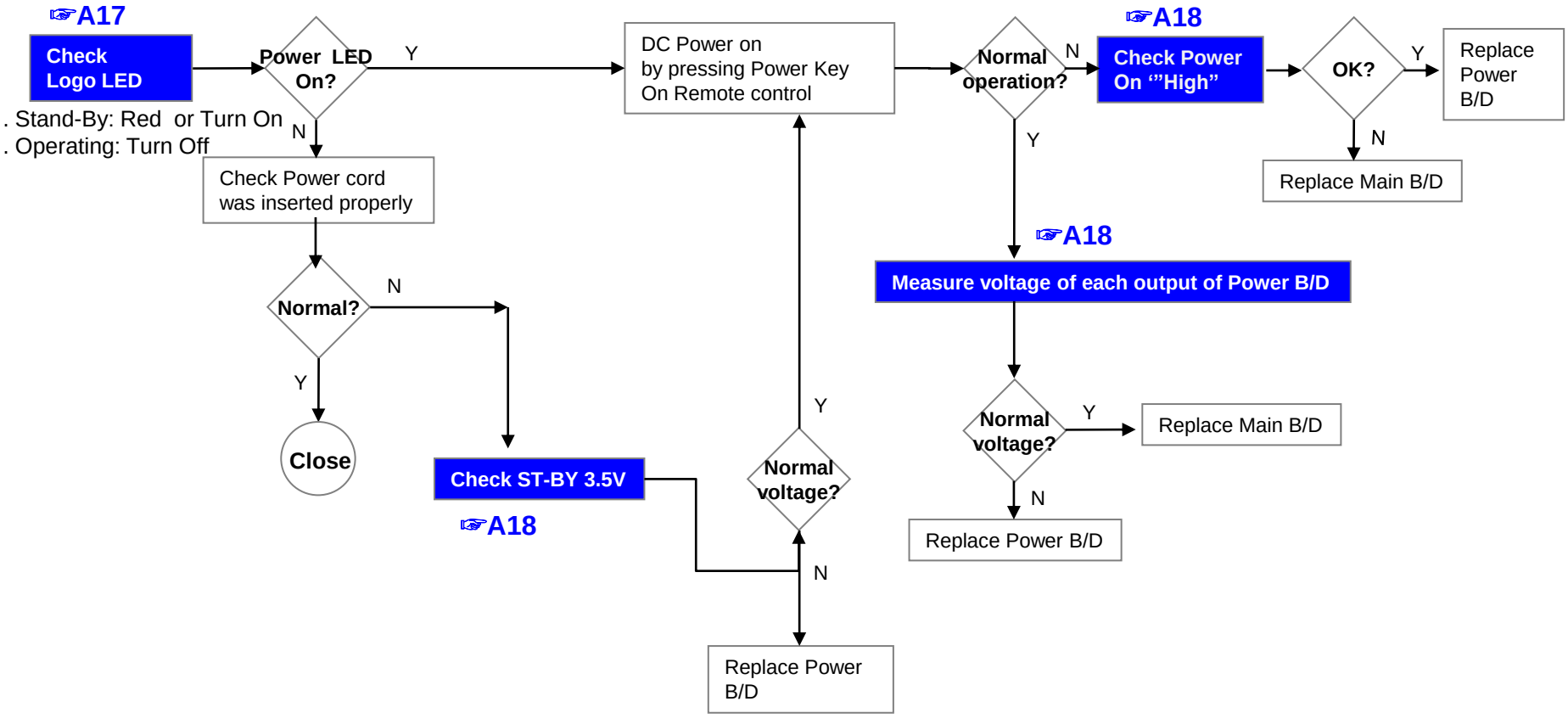
Vertical/Horizontal bar, residual image, light spot



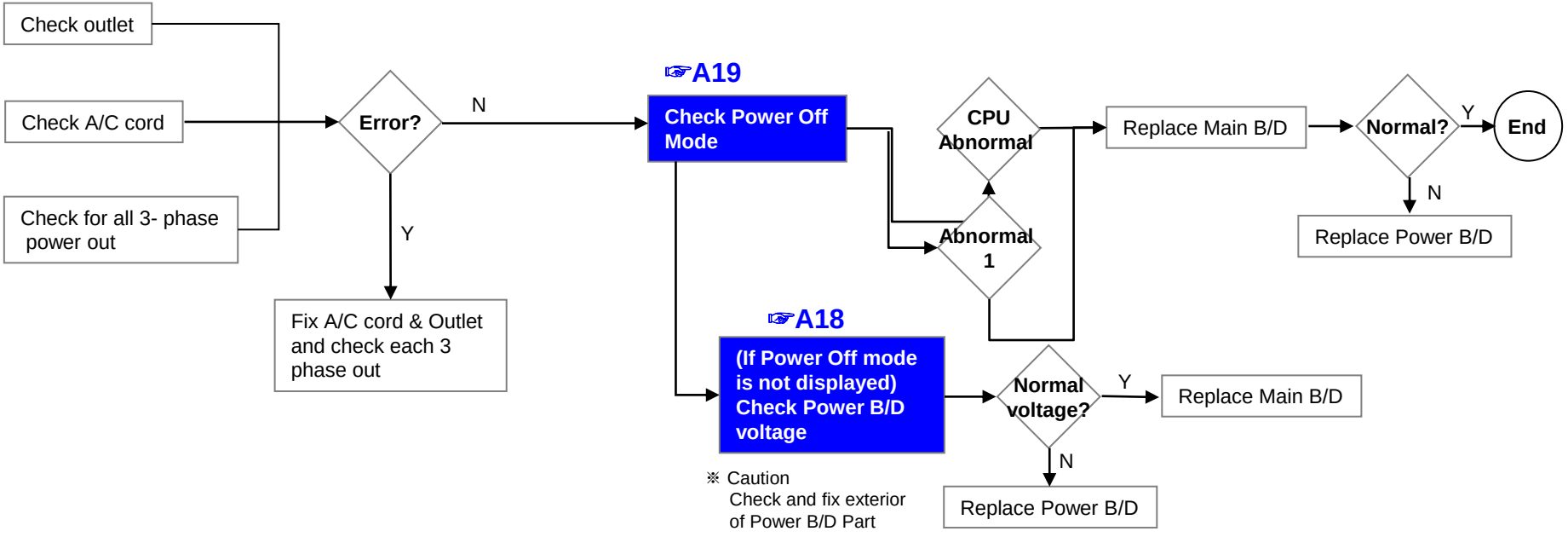
External device screen error-Color error



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



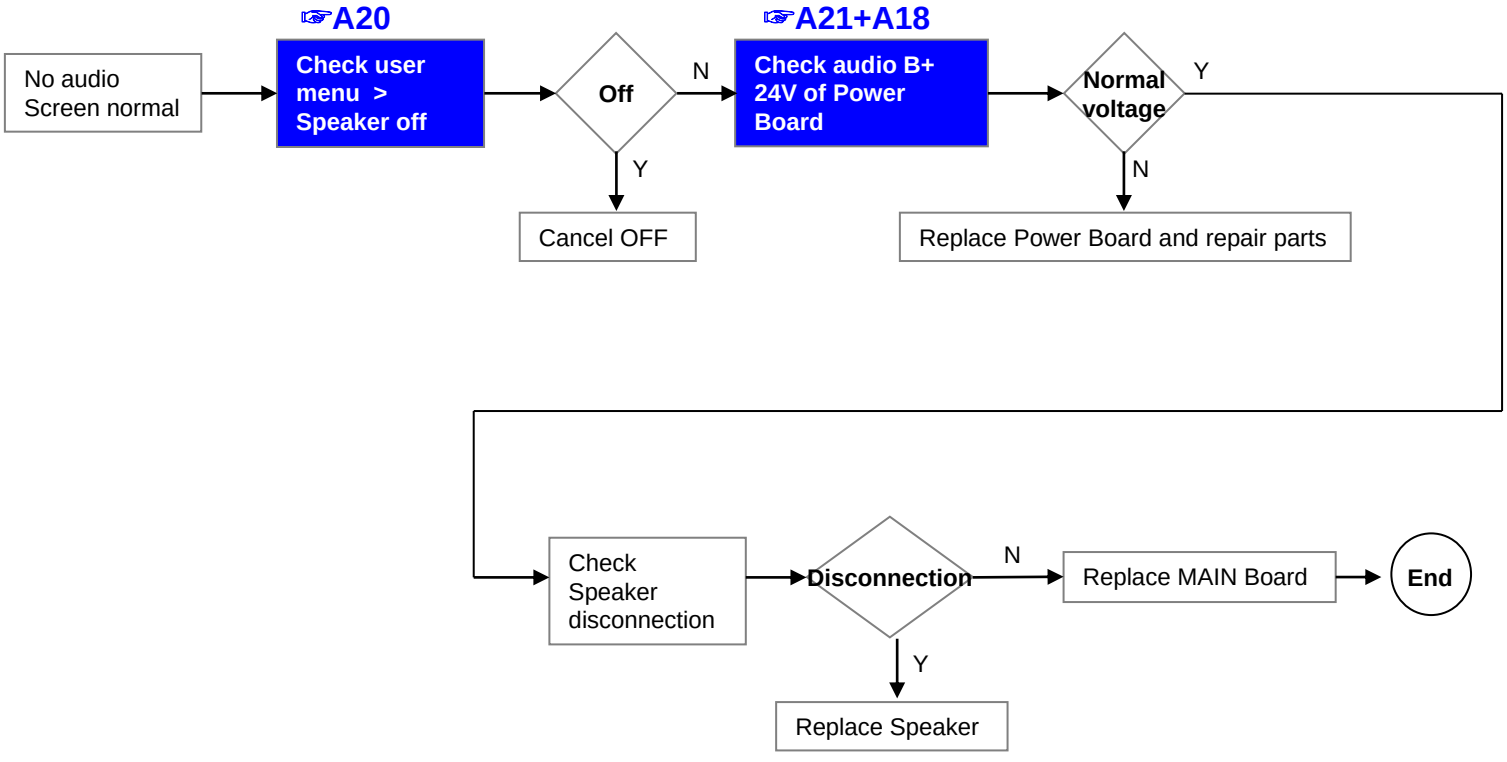
OLED TV	Error symptom	B. Power error	Established date	2013.01.31	
		Off when on, off while viewing, power auto on/off	Revised date		7/16



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

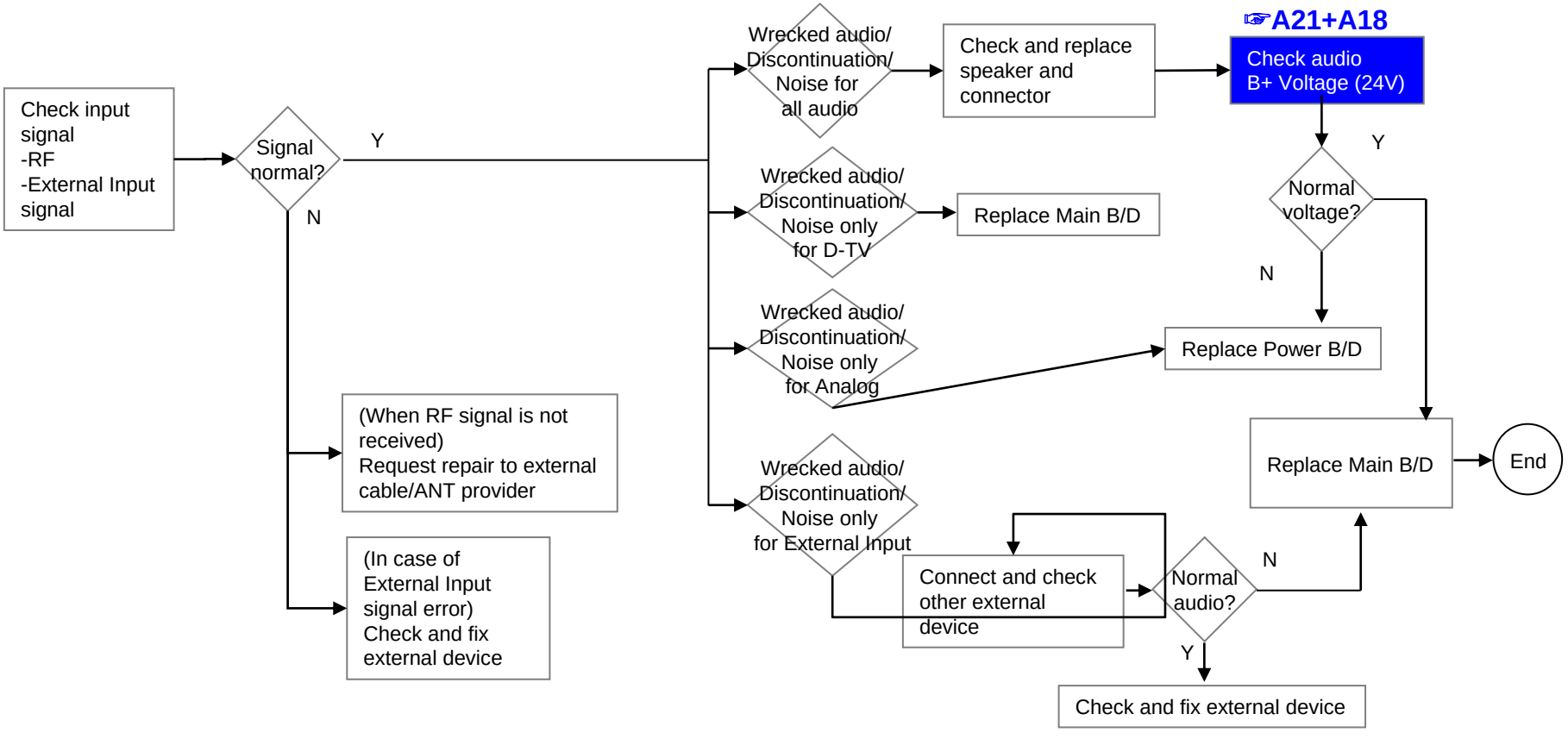
Status	Power off List	Explanation
Normal	"POWEROFF_REMOTEKEY"	Power off by REMOTE CONTROL
	"POWEROFF_OFFTIMER"	Power off by OFF TIMER
	"POWEROFF_SLEEPTIMER"	Power off by SLEEP TIMER
	"POWEROFF_INSTOP"	Power off by INSTOP KEY
	"POWEROFF_AUTOOFF"	Power off by AUTO OFF
	"POWEROFF_ONTIMER"	Power off by ON TIMER
	"POWEROFF_RS232C"	Power off by RS232C
	"POWEROFF_RESREC"	Power off by Reservated 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

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



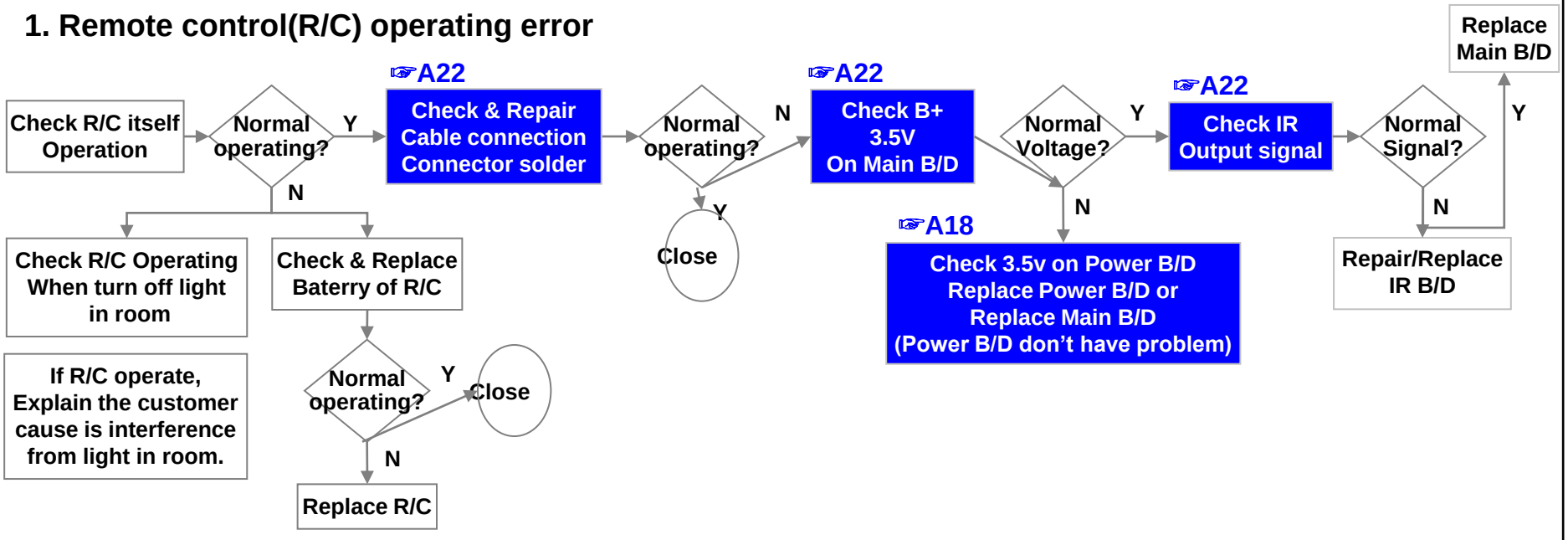
OLED TV	Error symptom	C. Audio error	Established date	2013.01.31	
		Wrecked audio/ discontinuation/noise	Revised date		9/16

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

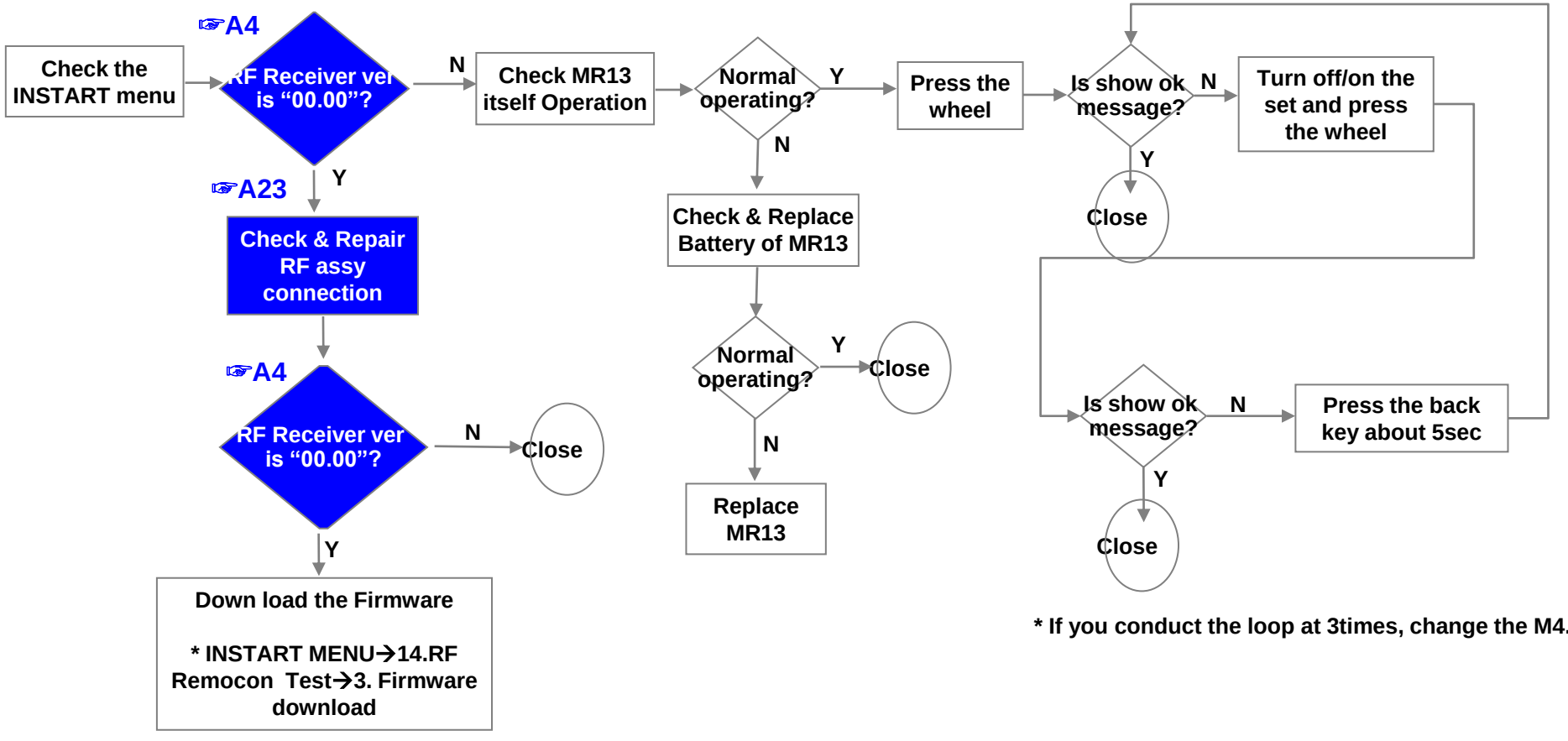


OLED TV	Error symptom	D. Function error	Established date	2013.01.31	
		Remote control & Local switch checking	Revised date		10/16

1. Remote control(R/C) operating error

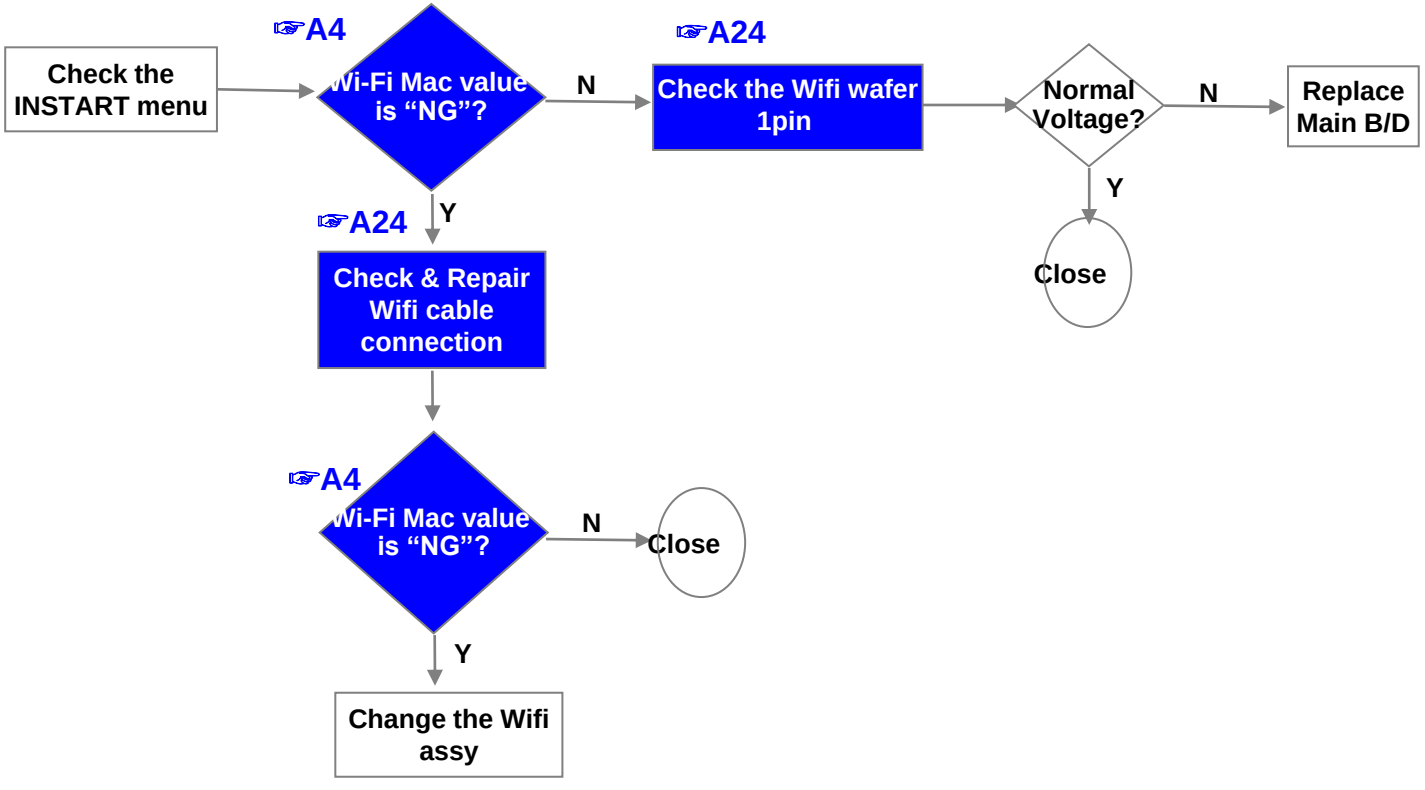


2. MR13(Magic Remocon) operating error

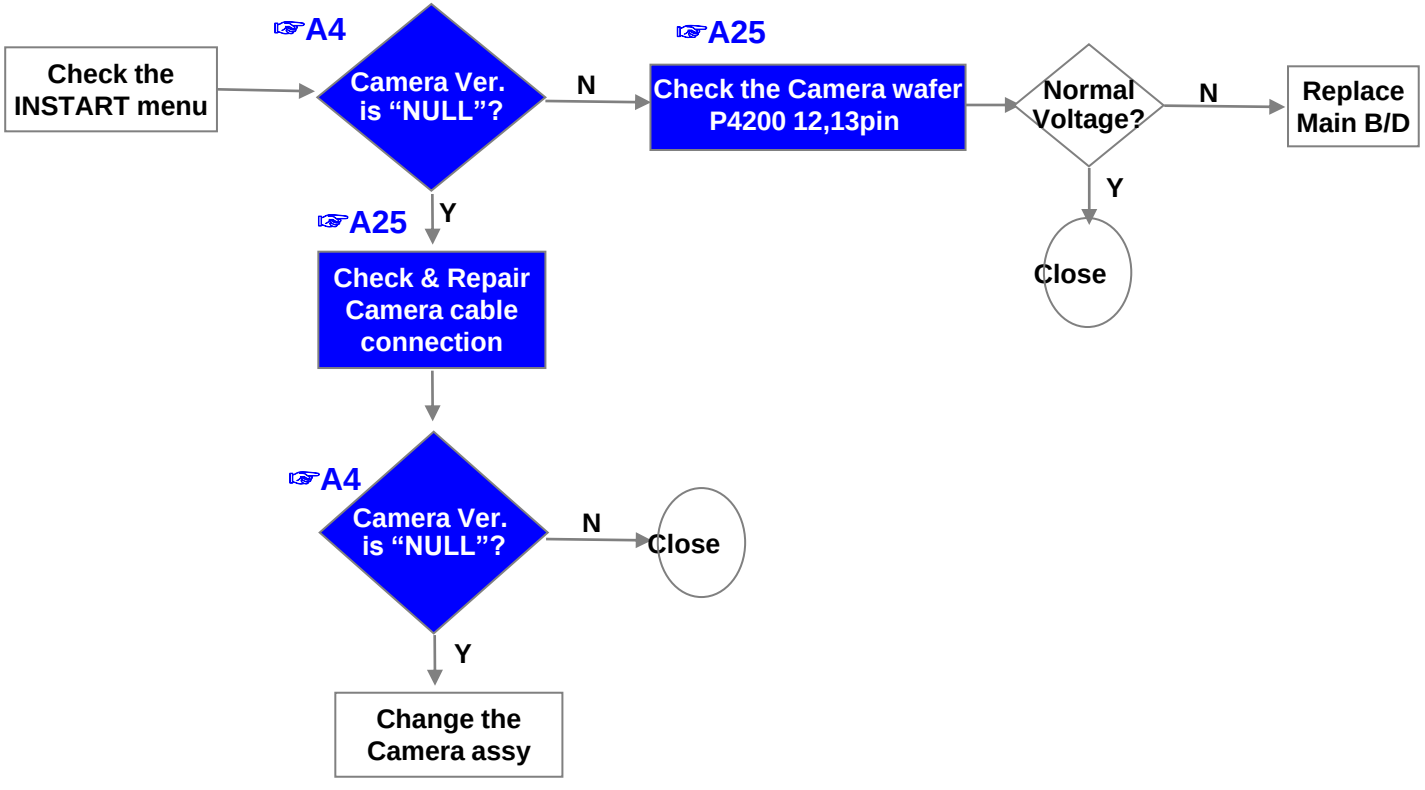


* If you conduct the loop at 3times, change the M4.

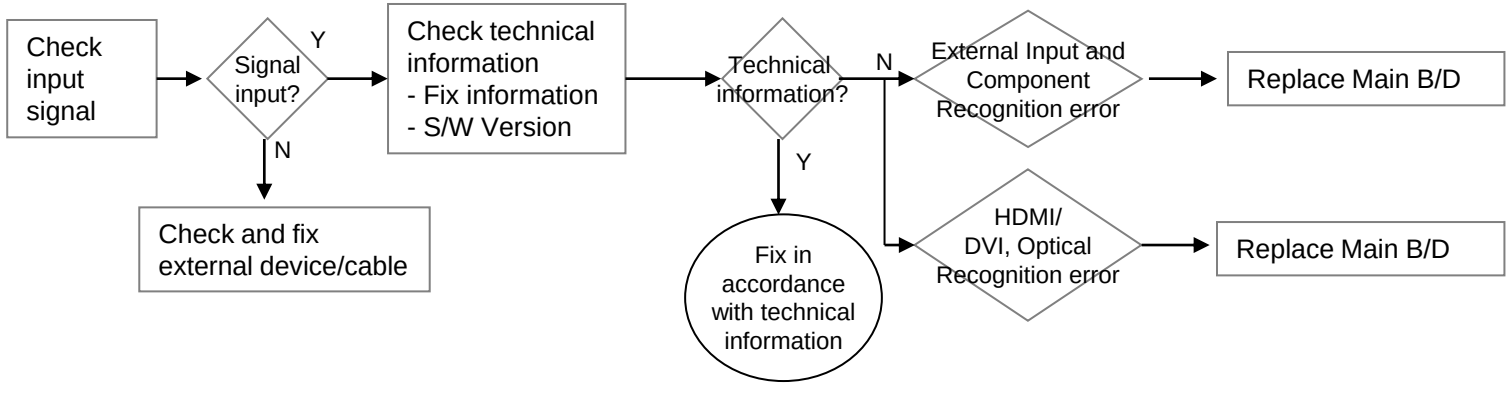
3.Wifi operating error



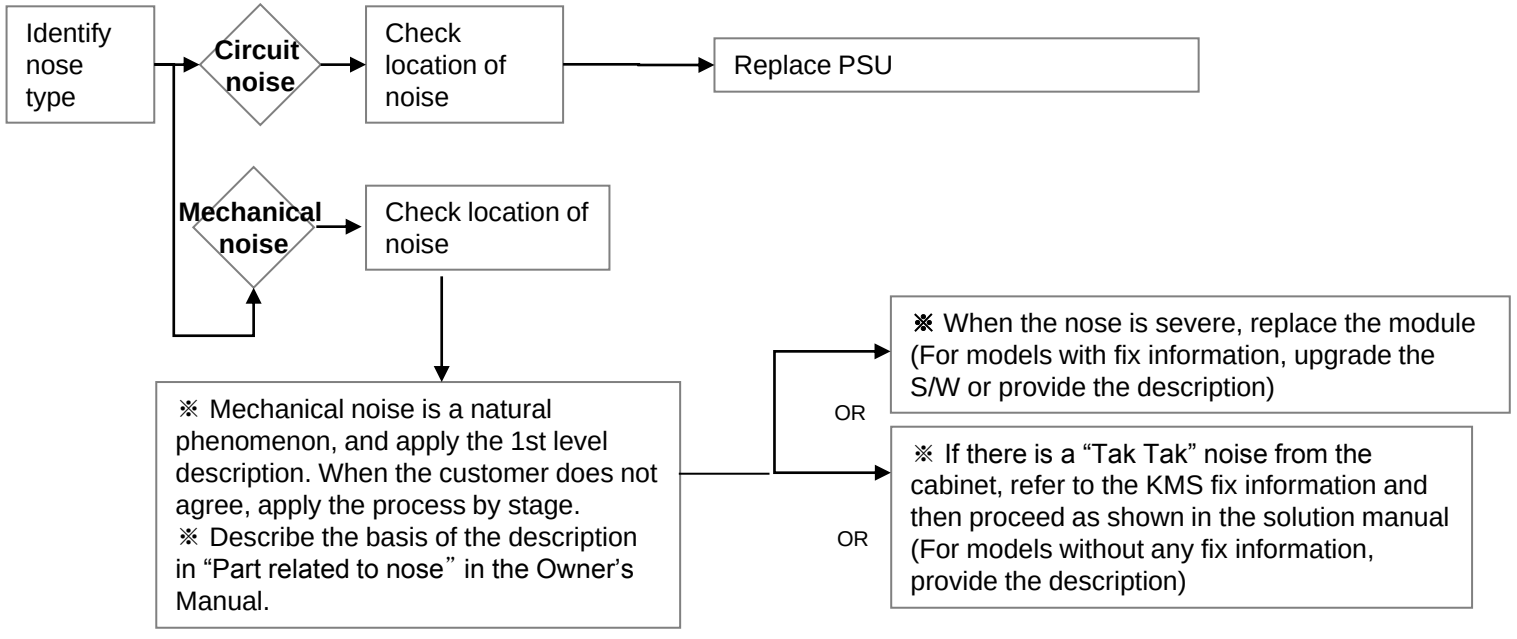
4.Camera operating error



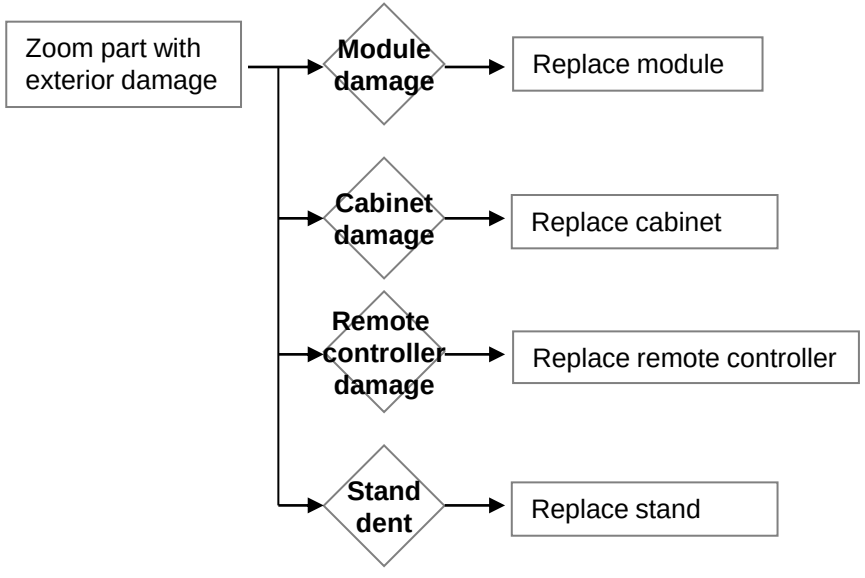
OLED TV	Error symptom	D. Function error	Established date	2013.01.31	
		External device recognition error	Revised date		14/16



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



OLED TV	Error symptom	F. Exterior defect	Established date	2013.01.31	
		Exterior defect	Revised date		16/16



Contents of OLED TV Standard Repair Process Detail Technical Manual

Continue to the next page

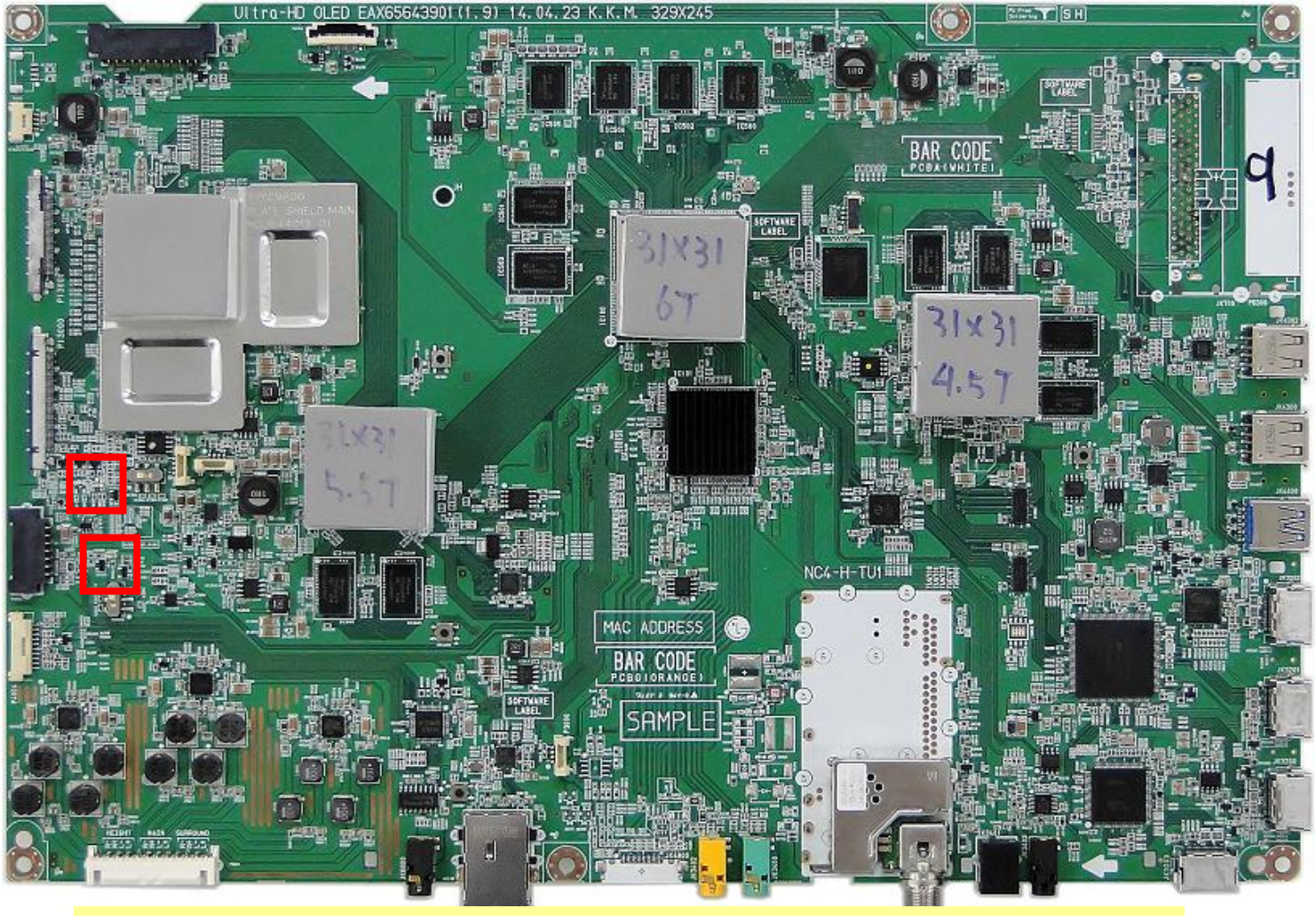
Contents of OLED TV Standard Repair Process Detail Technical Manual

Continued from previous page

Standard Repair Process Detail Technical Manual

OLED TV	Error symptom	A. Video error_No video/Normal audio	Established date	2013.01.31	
	Content	Check Vx1 lock LED light with naked eye	Revised date		A1

<77EG9700-UA>

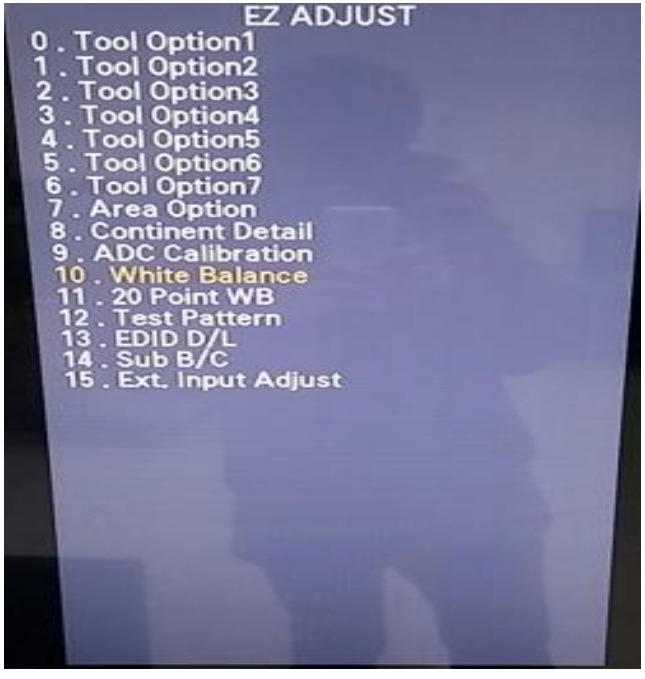


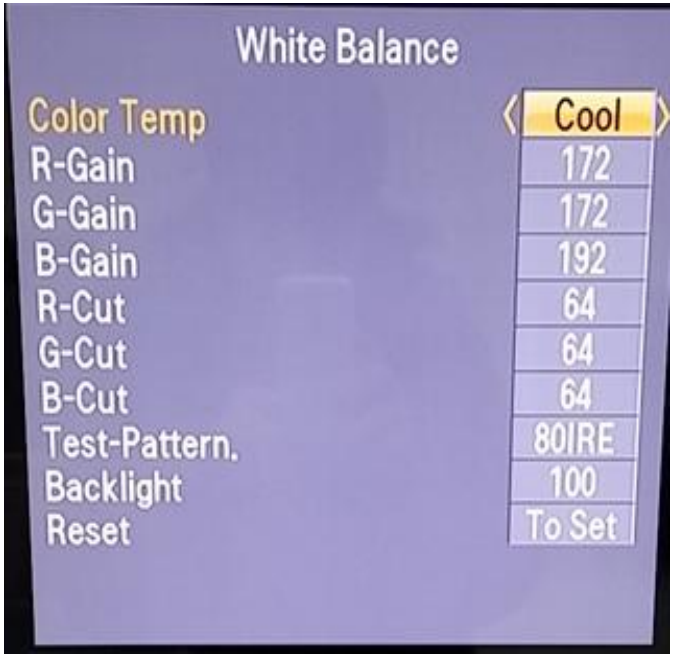
Turning on the power and check with the naked eye,
Where you can see light from locations. (2point)

A1

OLED 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>





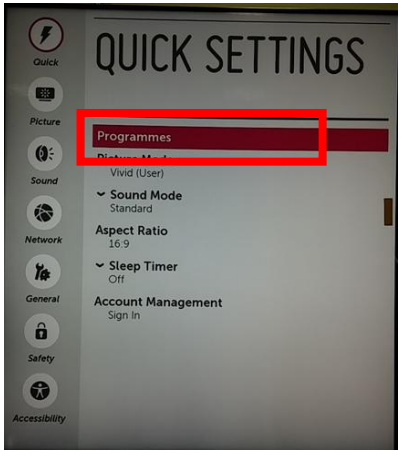
Entry method

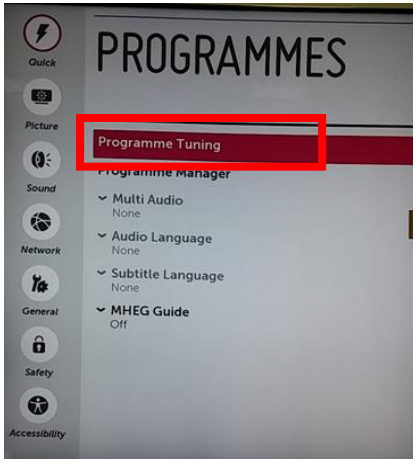
1. Press the ADJ button on the remote controller for adjustment.

2. Enter into White Balance of item 10.

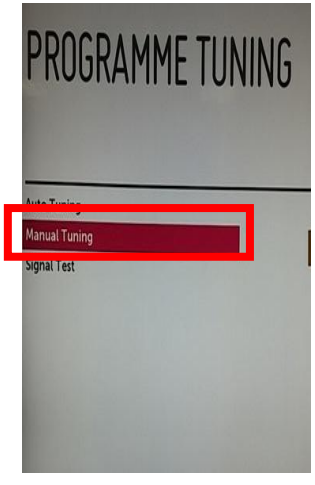
3. After recording the R, G, B (GAIN, Cut) value of Color Temp (Cool/Medium/Warm), re-enter the value after replacing the MAIN BOARD.

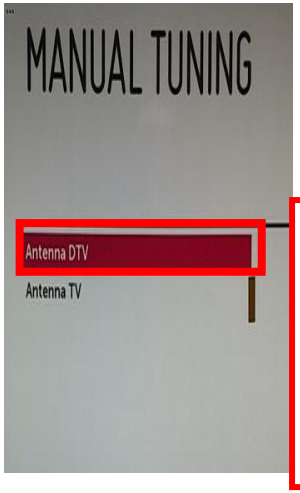
<ALL MODELS>

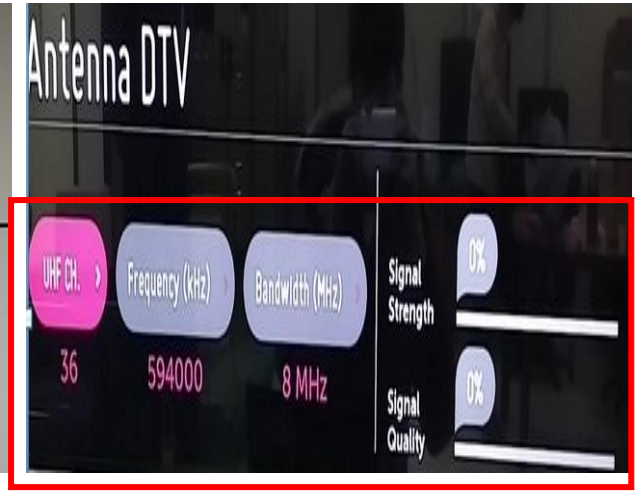




Quick Settings → Programmes → Programme Tunning → Manual Tuning





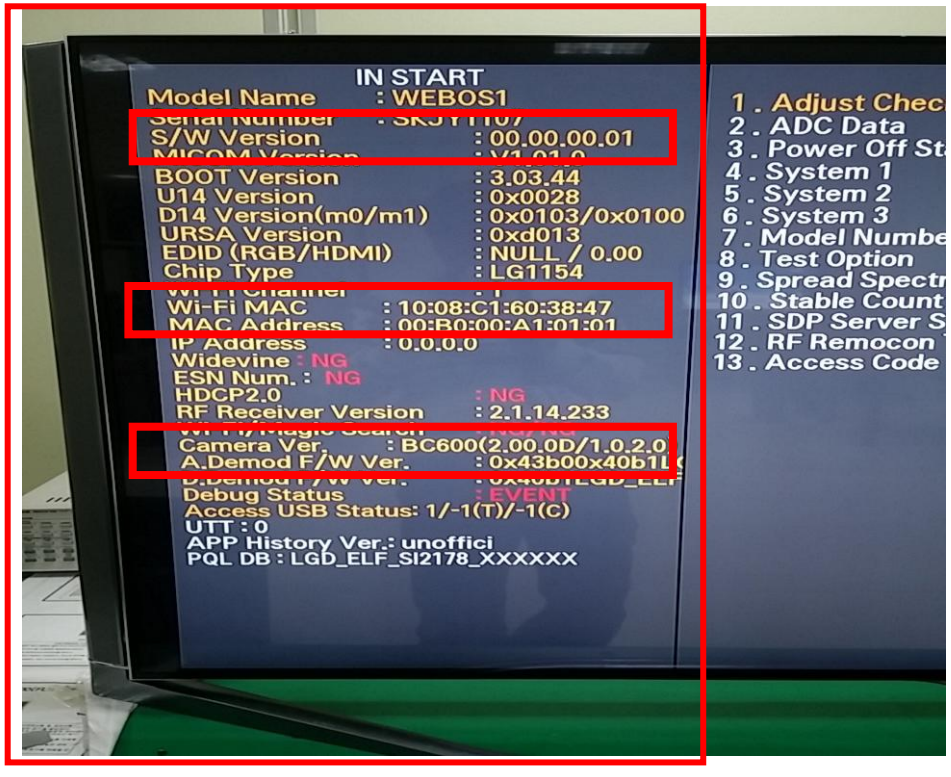


When the signal is strong, use the attenuator (-10dB, -15dB, -20dB etc.)

<ALL MODELS>

1. Checking method for remote controller for adjustment

Version

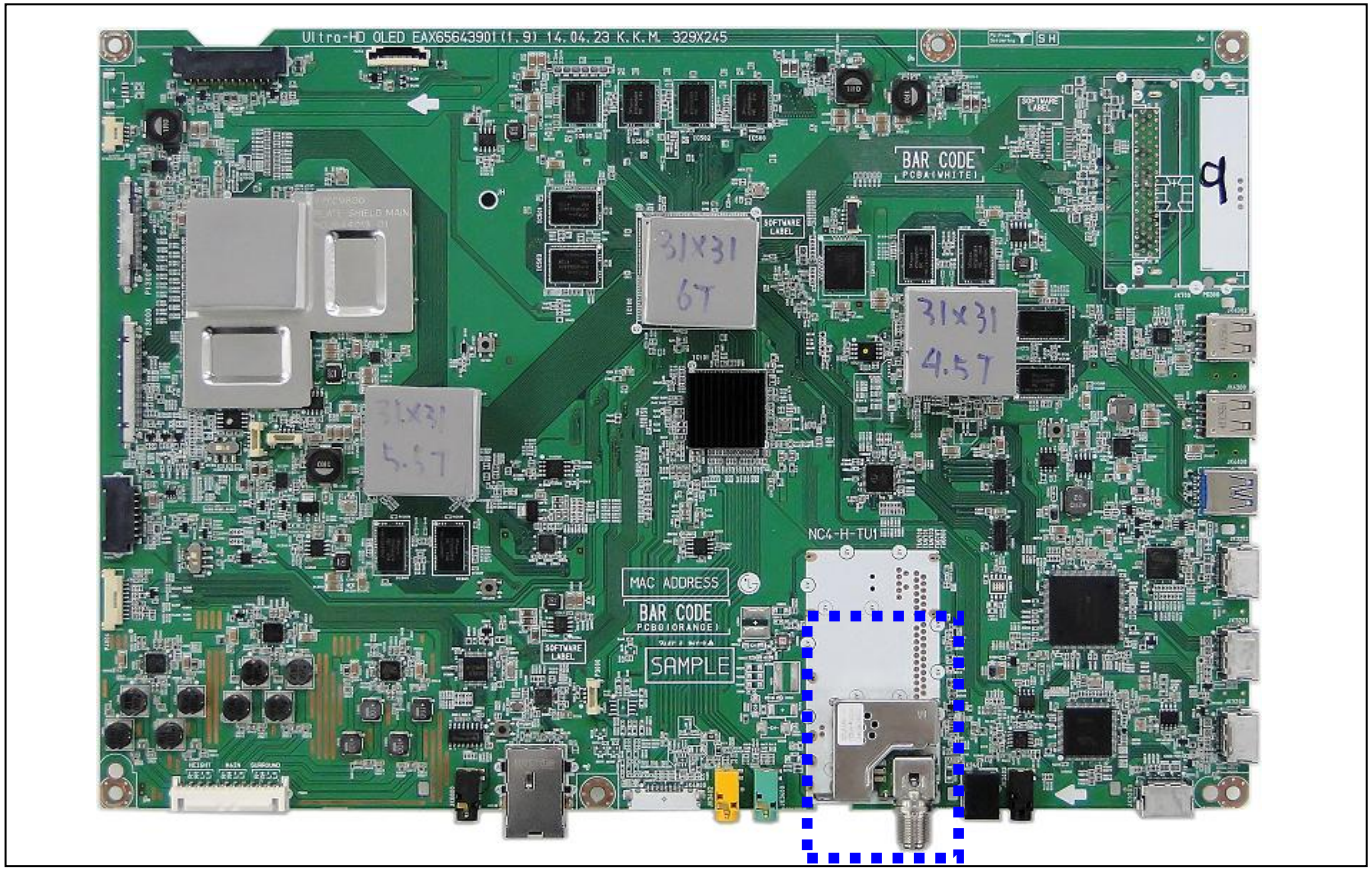


Press the IN-START with the remote controller for adjustment

Standard Repair Process Detail Technical Manual

OLED TV	Error symptom	A. Video error_Video error, video lag/stop	Established date	2013.01.31	
	Content	TUNER checking part	Revised date		A5

<ALL MODELS>

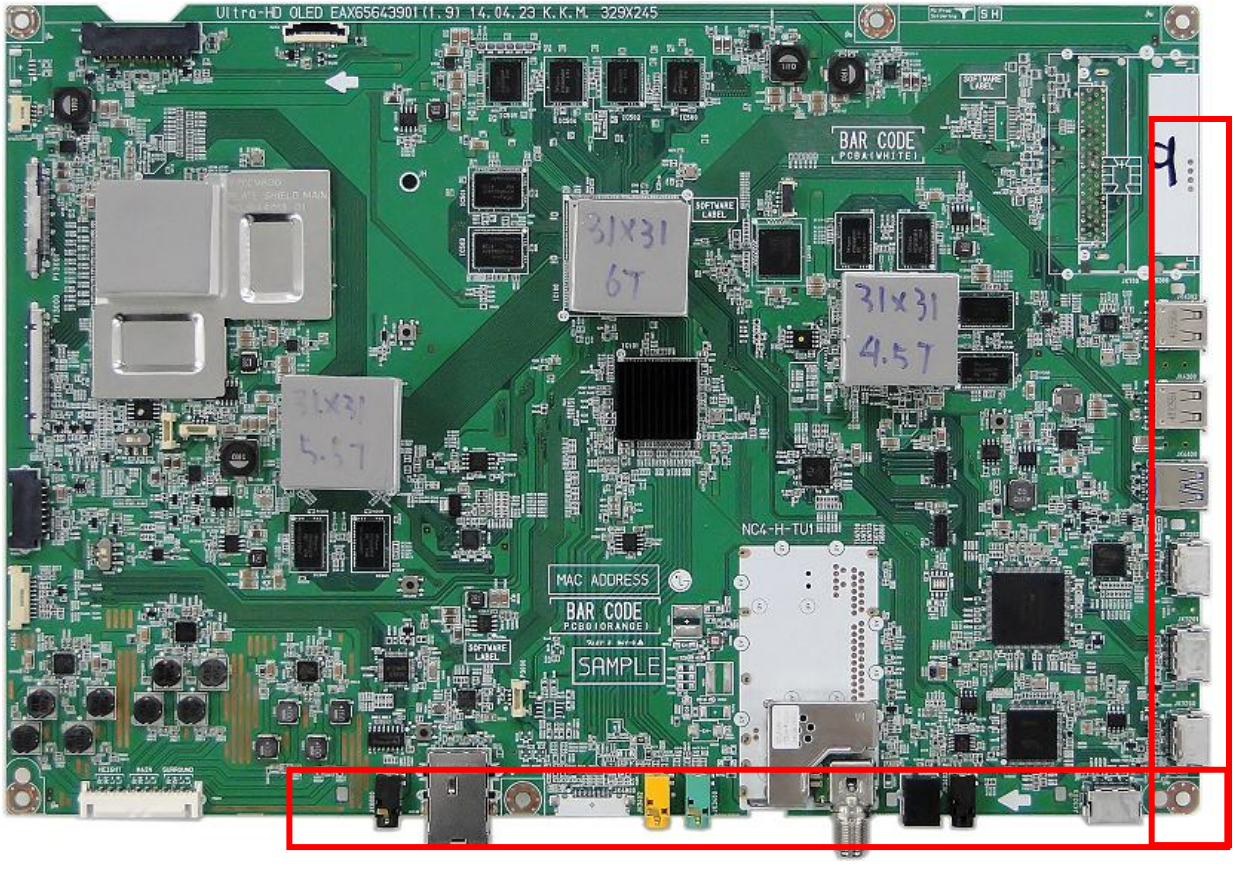


Checking method:
1. Check the signal strength or check whether the screen is normal when the external device is connected.
2. After measuring each voltage from power supply, finally replace the MAIN BOARD.

Standard Repair Process Detail Technical Manual

OLED TV	Error symptom	A. Video error _Vertical/Horizontal bar, residual image, light spot	Established date	2013.01.31	
	Content	OLED TV connection diagram (1)	Revised date		A6

<ALL MODELS>



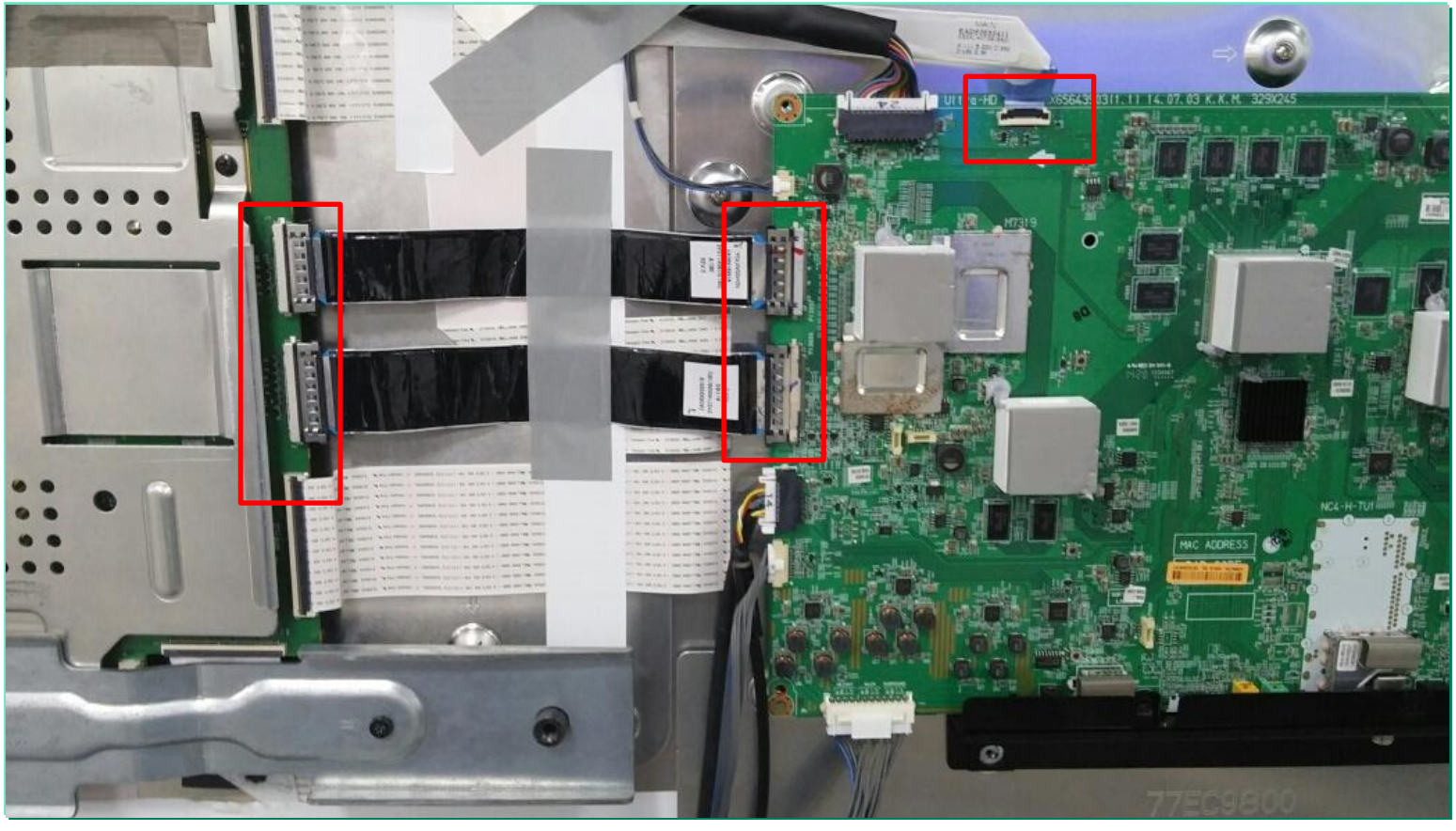
As the part connecting to the external input, check the screen condition by signal

A6

Standard Repair Process Detail Technical Manual

OLED TV	Error symptom	A. Video error_Color error	Established date	2013.01.31	
	Content	Check Link Cable (Vx1) reconnection condition	Revised date		A7

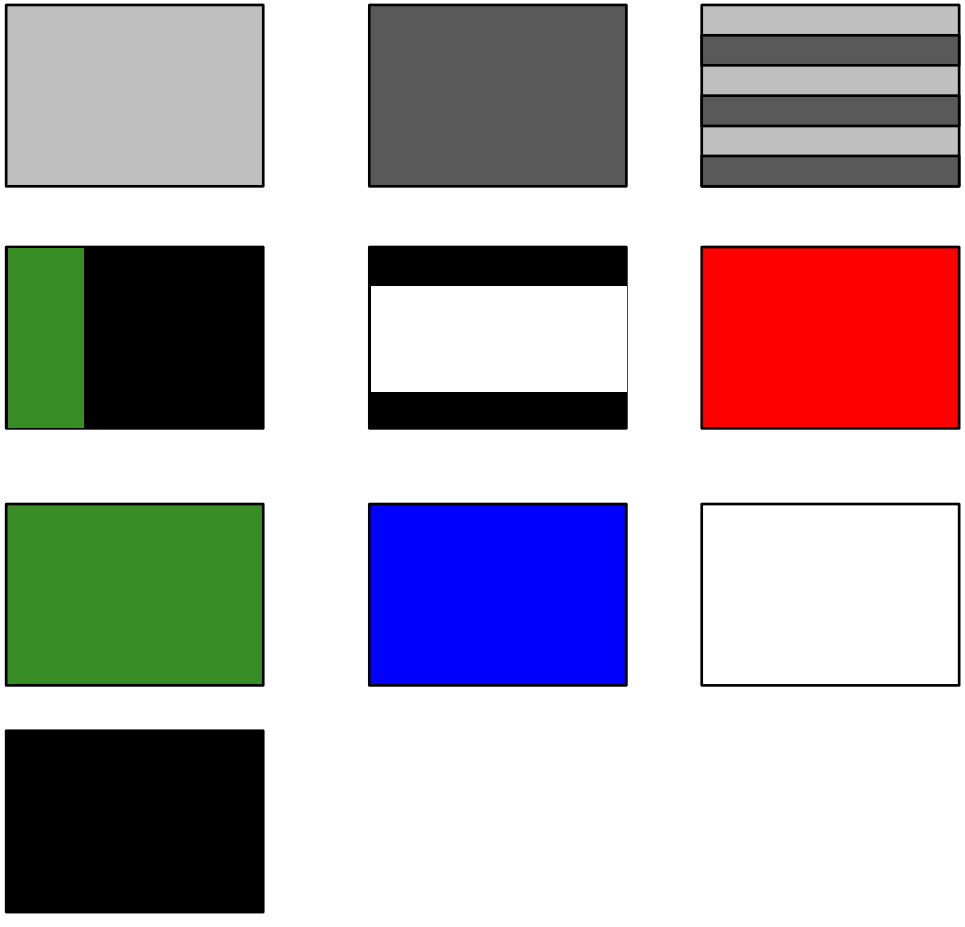
<ALL MODELS>



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

Standard Repair Process Detail Technical Manual

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

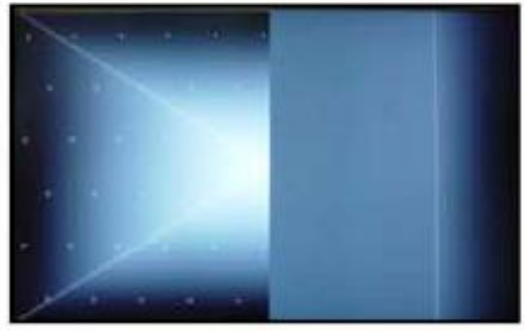


You can view 10 types of patterns using the Yellow Key (When TV is Power Only Condition)
And then, You can change Pattern Pic using the Ch UP/DOWN,

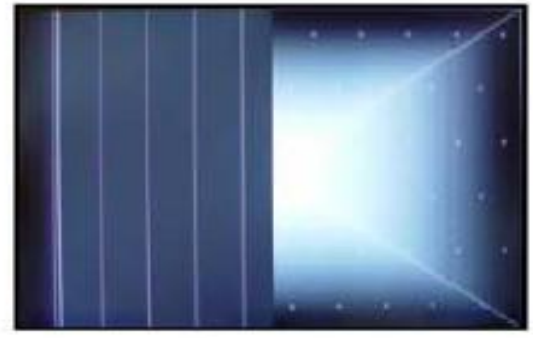
Checking item : 1. Defective pixel 2. Residual image 3. MODULE error (ADD-BAR,SCAN BAR..)
4.Video error (Classification of MODULE or Main-B/D!)

Appendix : Exchange Main Board (1)

Solder defect, CNT Broken

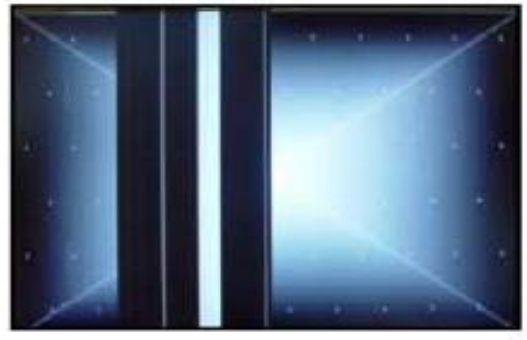


Solder defect, CNT Broken

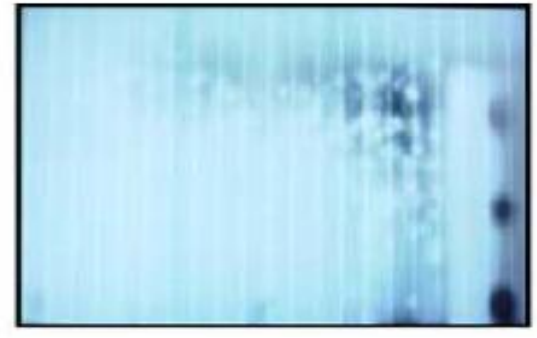


Solder defect, CNT Broken

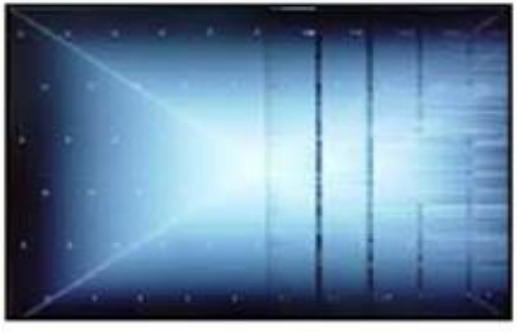
Solder defect, CNT Broken



Solder defect, CNT Broken



Abnormal Power Section

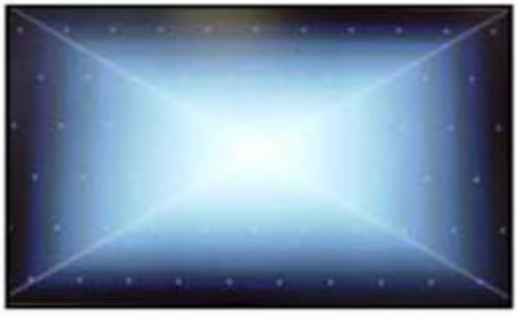


Solder defect, Short/Crack

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

A - 2/5

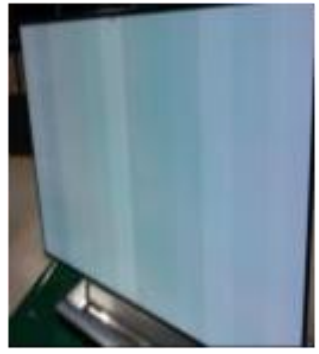
Appendix : Exchange Power Board (PSU)

No Light

No picture/Sound Ok

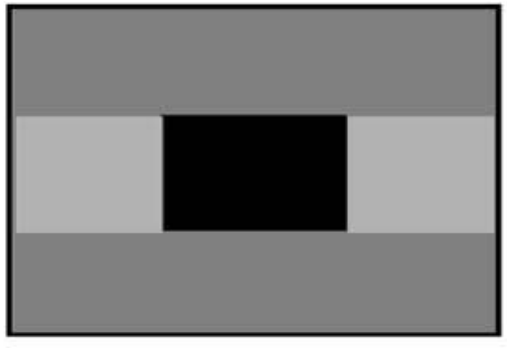
Appendix : Exchange the Module (1)

Vertical bar



Brightness difference

Line Dim



Crosstalk

Press damage

Crosstalk

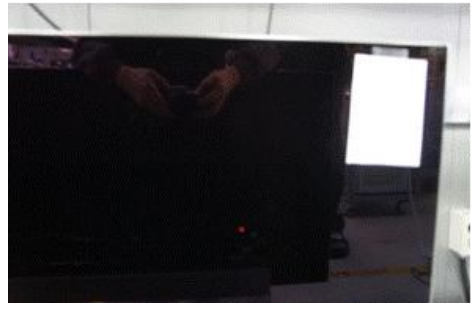
Burnt

Un-repairable Cases

In this case please exchange the module.

Appendix : Exchange the Module (2)

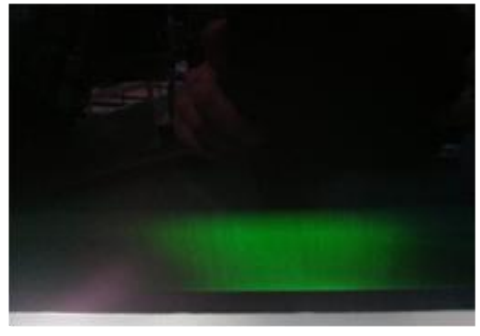
Angle view Color difference



Brightness dot noise

Half dead

Brightness difference



Green Noise on power on/off time

Line Defect

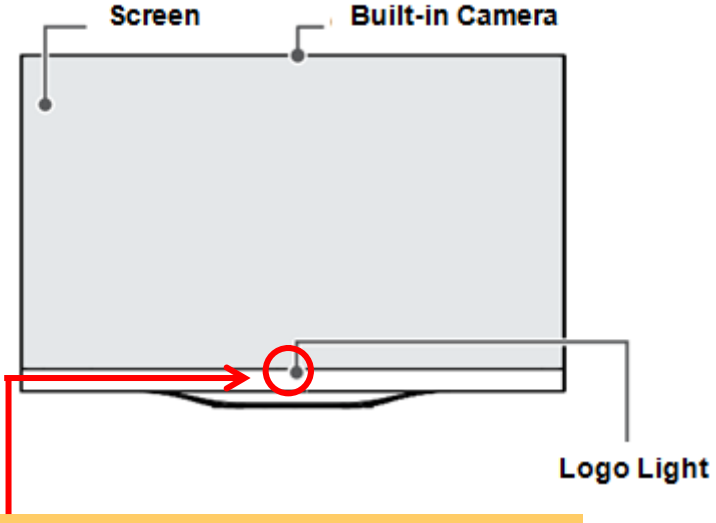
Mura

Un-repairable Cases

In this case please exchange the module.

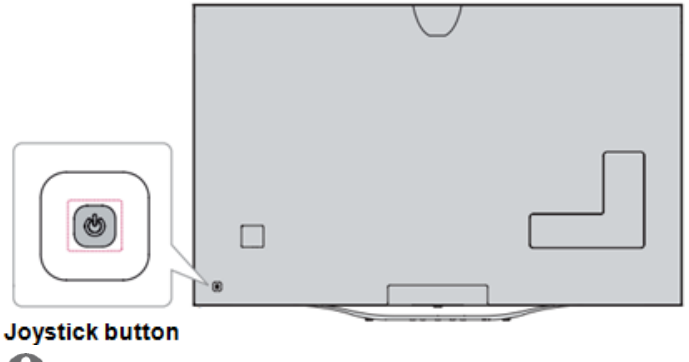
<65UB980T-TA>

Front



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

Rear



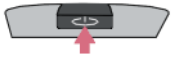
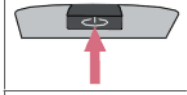
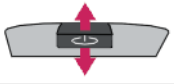
NOTE

- 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

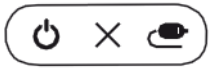
	Power On	When the TV is turned off, place your finger on the joystick button and press it once and release it.
	Power Off	When the TV is turned on, place your finger on the joystick button and press it once for a few seconds and release it.
	Volume Control	If you place your finger over the joystick button 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.

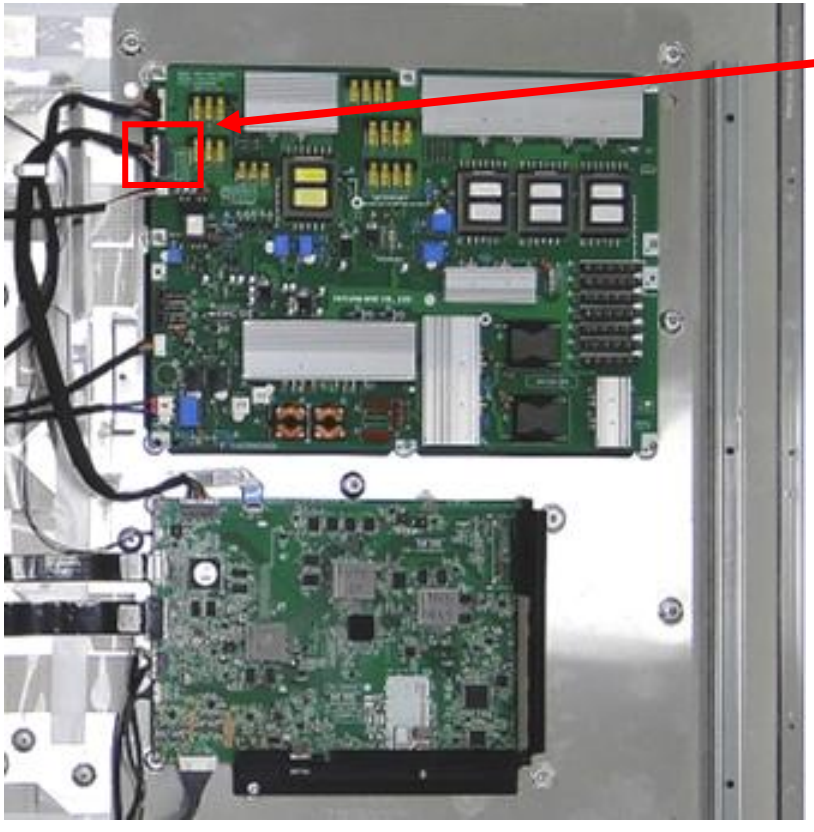
Adjusting the Menu

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.

Standard Repair Process Detail Technical Manual

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

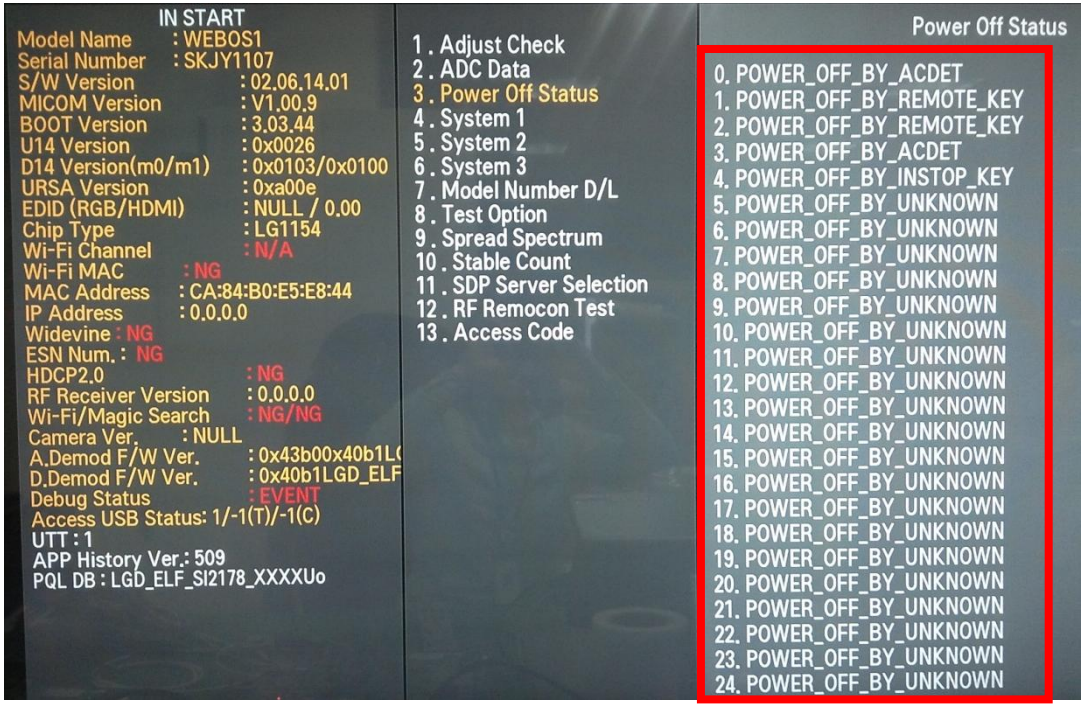


24 Pin (Power Board ↔ Main Board)			
1	Power on	2	DRV ON (INT CTL)
3	DPC_CTL	4	AC_DET
5	3.5V	6	GND
7	3.5V	8	3.5V
9	GND	10	GND
11	12V	12	12V
13	12V	14	12V
15	12V	16	GND
17	GND	18	24V
19	24V	20	24V
21	24V	22	24V
22	GND	24	GND

Standard Repair Process Detail Technical Manual

OLED 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>

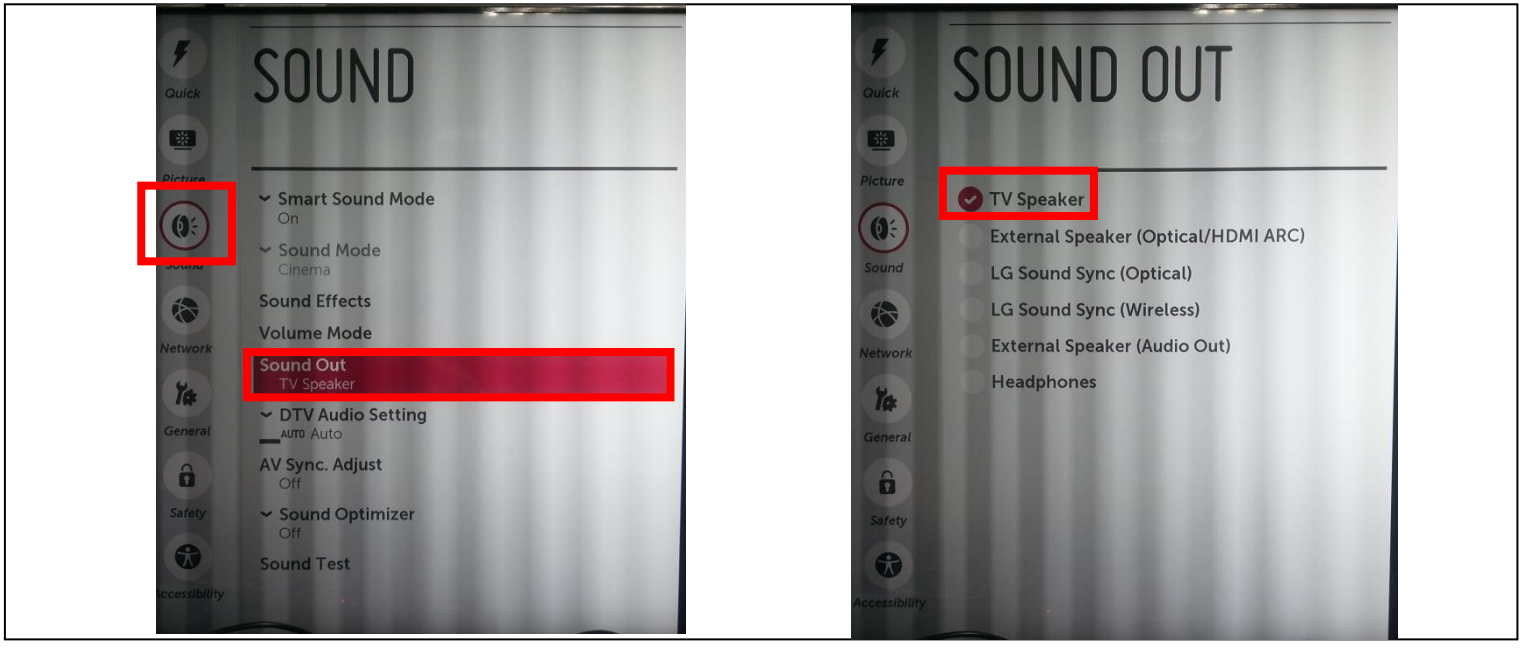


Entry method

1. Press the IN-START button of the remote controller for adjustment

2. Check the entry into adjustment item 3

<ALL MODELS>

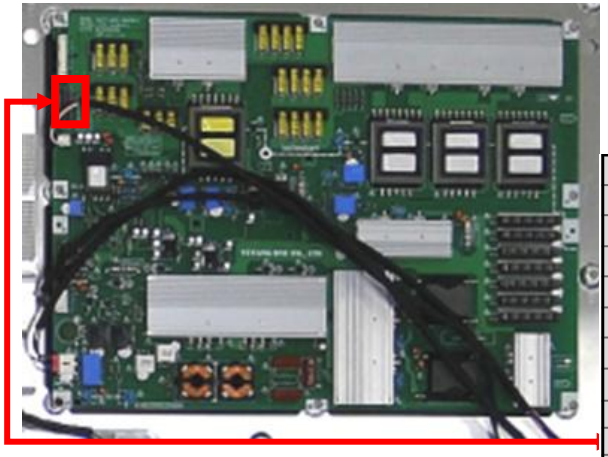


Checking method

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

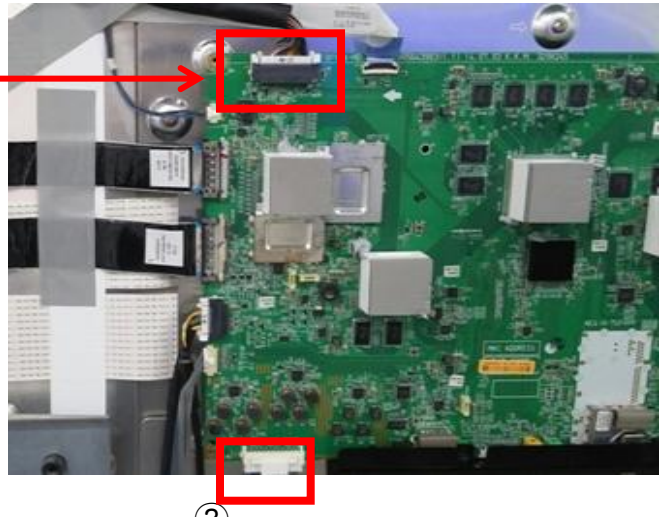
OLED TV	Error symptom	C. Audio error_No audio/Normal video	Established date	2014.02.05	
	Content	Voltage and speaker checking method when there is no audio	Revised date		A21



②

1	Poweron	2	DRV ON(INTCTL)
3	DPC_CTL	4	AC_DET
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
22	GND	24	GND

①



③

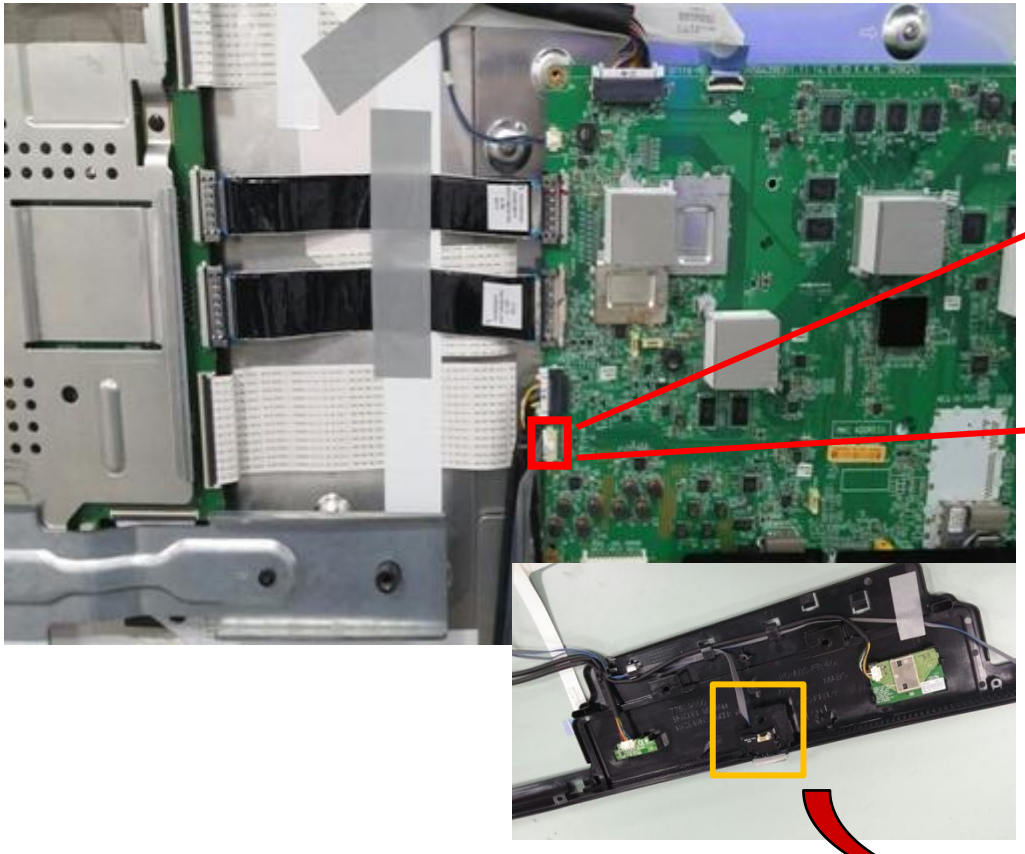
1	Tweeter_R-	2	Tweeter_R+
3	Tweeter_L-	4	Tweeter_L+
5	Middle_R-	6	Middle_R+
7	Middle_L-	8	Middle_L+
9	Woofer_R-	10	Woofer_R+
11	Woofer_L-	12	Woofer_L+

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.



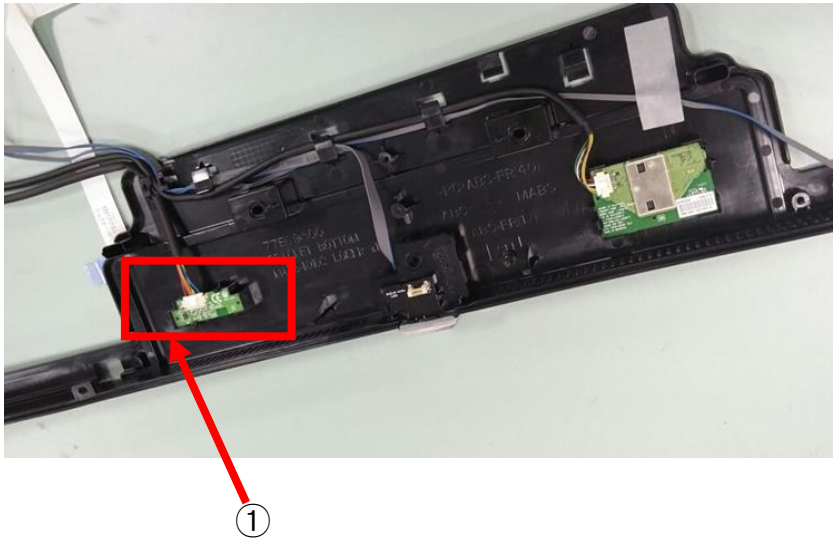
	Pin name	color	Main wafer
IR	GND	-(Blue)-	1
	KEY1	-(Gray)-	2
	KEY2	-(Gray)-	3
	3.5V_ST	-(Blue)-	4
	GND	-(Gray)-	5
	LOGO	-(Gray)-	6
	IR	-(Gray)-	7
	GND	-(Gray)-	8
	EYE_SCL	-(Gray)-	9
	EYE_SDA	-(Gray)-	10

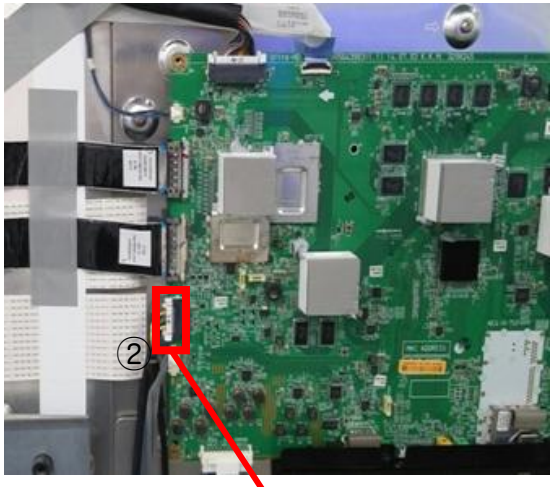
Checking order

1. Check IR cable condition between IR & Main board.
2. Check the st-by 3.5V on the terminal 4,7.
3. When checking the Pre-Amp when the power is in ON condition, it is normal when the Analog Tester needle moves slowly, and defective when it does not move at all.

Standard Repair Process Detail Technical Manual

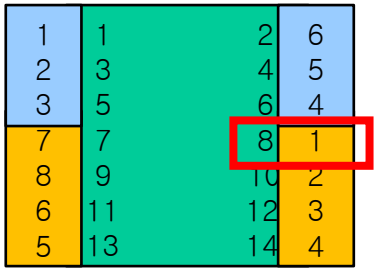
OLED TV	Error symptom	D. Function error	Established date	2014.02.07	
	Content	Motion Remote operation checking method	Revised date		A23





Checking order

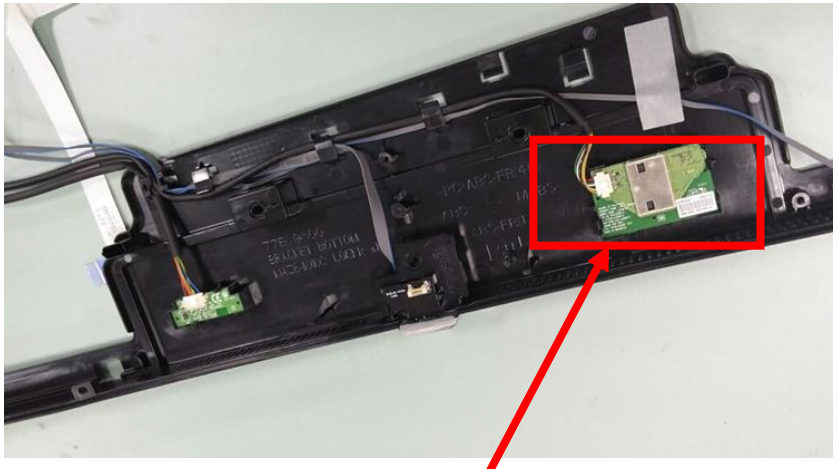
1, 2. Check Motion cable condition between Motion assy & Main board.
3. Check the 3.3V on the terminal 2.

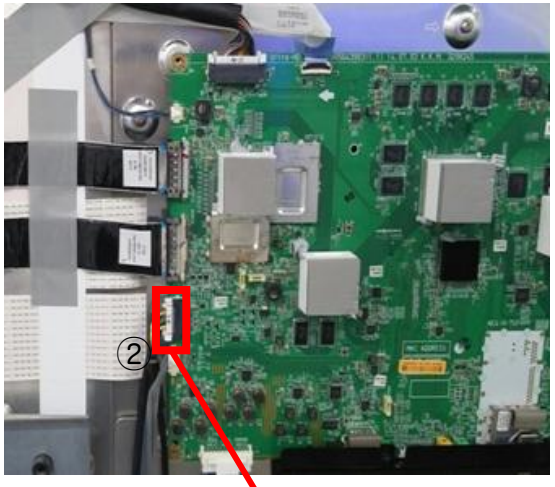


	Pin name	sub wafer	color	Main wafer
WIFI	GND	1	-(Brown)-	1
	WOWL	2	-(Yellow)-	3
	GND	3	-(Black)-	5
	USB_DP	4	-(White)-	6
	USB_DN	5	-(Green)-	4
	VDD	6	-(Red)-	2
BT	3.3V	1	-(Brown)-	8
	RTS	2	-(Blue)-	10
	UART_RX_RF	3	-(Yellow)-	12
	UART_TX_RF	4	-(Black)-	14
	RESET	5	-(White)-	13
	CTS	6	-(Green)-	11
	NC	7	-(N.C)-	7
	GNC	8	-(Red)-	9

Standard Repair Process Detail Technical Manual

OLED TV	Error symptom	D. Function error	Established date	2014.02.07	
	Content	Wifi operation checking method	Revised date		A24





1	1	2	6
2	3	4	5
3	5	6	4
7	7	8	1
8	9	10	2
6	11	12	3
5	13	14	4

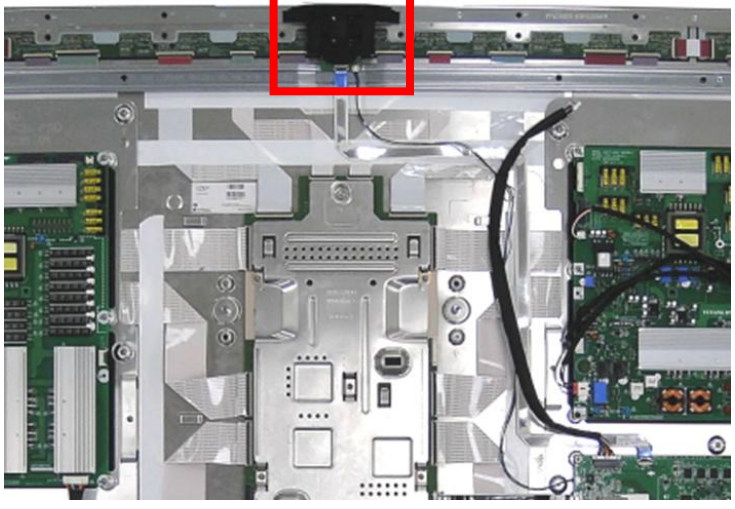
	Pin name	sub wafer	color	Main wafer
WIFI	GND	1	-(Brown)-	1
	WOWL	2	-(Yellow)-	3
	GND	3	-(Black)-	5
	USB_DP	4	-(White)-	6
	USB_DN	5	-(Green)-	4
	VDD	6	-(Red)-	2
BT	3.3V	1	-(Brown)-	8
	RTS	2	-(Blue)-	10
	UART_RX_RF	3	-(Yellow)-	12
	UART_TX_RF	4	-(Black)-	14
	RESET	5	-(White)-	13
	CTS	6	-(Green)-	11
	NC	7	-(N.C)-	7
	GND	8	-(Red)-	9

Checking order

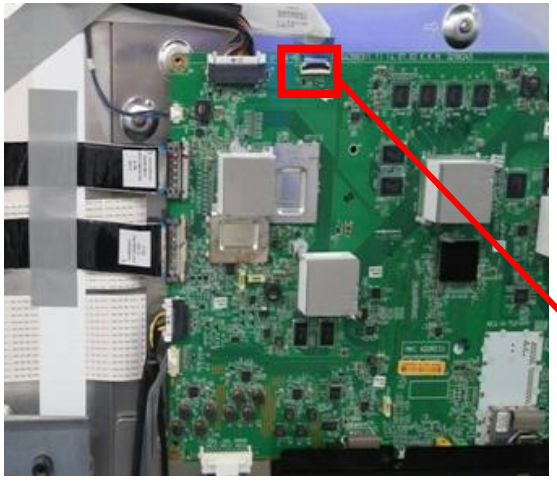
1, 2. Check Wifi cable condition between Wifi assy & Main board.
3. Check the 3.3V on the terminal 2.

OLED TV	Error symptom	D. Function error	Established date	2014.02.05	
	Content	Camera operation checking method	Revised date		A25

①



②



③

1	CAM_SLIDE_DET
2	CAM_TRIGGER_DET
3	GND
4	CAMERA_DM
5	CAMERA_DP
6	GND
7	I2S_WOOFER
8	AUD_SCK
9	AUD_LRCK
10	I2S_AMP
11	GND
12	+3.5V_CAM
13	+3.5V_CAM
14	CAM_PWR_ON_CMD
15	CAM_RESET
16	CAM_SLEEP
17	GND

Checking order

1, 2. Check Camera cable condition between Camera assy & Main board.
3. Check the 3.5V on the terminal 2.