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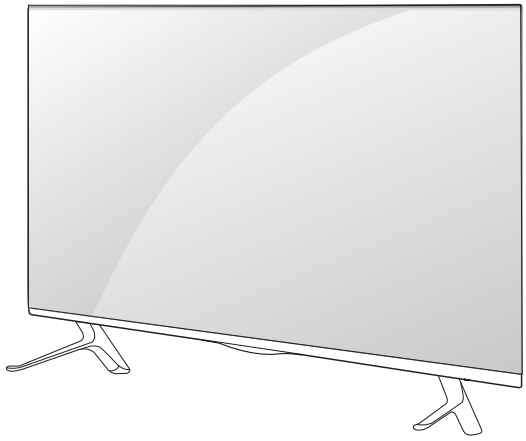
LED TV
SERVICE MANUAL

CHASSIS : LA48V

MODEL : 40UB8000 40UB8000-UB

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



P/NO : MFL68500706 (1408-REV00)

Printed in Korea

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SAFETY PRECAUTIONS

IMPORTANT SAFETY NOTICE

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

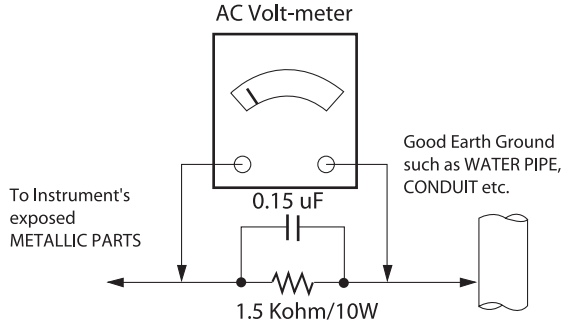
always perform an **AC leakage current check** on the exposed metallic parts of the cabinet, such as antennas, terminals, etc., to be sure the set is safe to operate without damage of electrical shock.

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 to the LED TV used LA48V

2. Test condition

Each part is tested as below without special notice.

1) Temperature : 25 ºC ± 5 ºC(77±9ºF), CST : 40 ºC±5 ºC
2) Relative Humidity: 65 % ± 10 %
3) Power Voltage
   Standard input voltage (100~240V@ 50/60Hz)
   * Standard Voltage of each products is marked by models.
4) Specification and performance of each parts are followed each drawing and specification by part number in accordance with BOM.
5) The receiver must be operated for about 20 minutes prior to the adjustment.

3. Test method

1) Performance: LGE TV test method followed
2) Demanded other specification
   - Safety : 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	1) North America		
2	Receiving System	ATSC / NTSC-M / 64 QAM / 256 QAM		
3	Input Voltage	AC 100 - 240V ~ 60Hz		
4	Available Channel	1) VHF : 02~13 2) UHF : 14~69 3) DTV : 02-69 4) CATV : 01~135 5) CADTV : 01~135		
5	Input Voltage	AC 100-240V ~50/60Hz		
6	Screen Size	40 inch Wide(3840 × 2160) 49 inch Wide(3840 × 2160) 55 inch Wide(3840 × 2160) 60 inch Wide(3840 × 2160) 65 inch Wide(3840 × 2160)		40UB8000-UB 49UB8300-UG, 49UB8200-UH 55UB8300-UG, 55UB8200-UH 60UB8300-UG, 60UB8200-UH 65UB9200-UA
5	Aspect Ratio	16:9		
6	Tuning System	FS		
7	LCD Module	V400DK1-KS1 LC490EQE-XGF2 LC490EQE-XGM1 LC550EQE-PGF2 LC550EQE-PGM1 LC650EQF-FGM1	INX LGD LGD LGD LGD LGD LGD LGD	40UB8000-UB, 49UB8300-UG, 49UB8200-UH, 55UB8300-UG, 55UB8200-UH, 60UB8300-UG, 60UB8200-UH, 65UB9200-UA
8	Operating Environment	1) Temp : 0 ~ 40 deg 2) Humidity : ~ 80 %		
9	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.(Hz)	Pixel clock(MHz)	Proposed
1	720*480	15.73	60	13.514	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

5.1.2. HDMI Input (PC/DTV)

No.	Resolution	H-freq(kHz)	V-freq.(kHz)	Pixel clock(MHz)	Proposed	
	HDMI-PC				EGA	
1	640*350	31.468	70.09	25.17	DOS	X
2	720*400	31.469	70.08	28.32	VESA(VGA)	O
3	640*480	31.469	59.94	25.17	VESA(SVGA)	O
4	800*600	37.879	60.317	40.00	VESA(XGA)	O
5	1024*768	48.363	60.00	65.00	VESA	O
6	1152*864	54.348	60.053	80.00	VESA (SXGA)	O
7	1280*1024	63.981	60.020	108.00	VESA (WXGA)	O
8	1360*768	47.712	60.015	85.50	VESA (WXGA)	O
9	1920*1080	67.5	60	148.5	WUXGA(Reduced Blanking)	O
10	3840*2160	54	24.00	297.00	UDTV 2160P	O
11	3840*2160	56.25	25.00	297.00	UDTV 2160P	O
12	3840*2160	67.5	30.00	297.00	UDTV 2160P	O
14	4096*2160	53.95	23.98	297.00	UDTV 2160P	O
15	4096*2160	54.00	24.00	297.00	UDTV 2160P	O

	HDMI-DTV				
1	640 * 480	31.469	59.94		SDTV 480P
2	640 * 480	31.5	60		SDTV 480P
3	720*480	31.469	59.94	27.00	SDTV 480P
4	720*480	31.50	60	27.027	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	59.939	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
15	3840*2160	67.5	30.00	297.00	UDTV 2160P
16	3840*2160	61.43	29.97	296.703	UDTV 2160P
17	3840*2160	56.25	25.00	297.00	UDTV 2160P
18	3840*2160	54.0	24.00	297.00	UDTV 2160P
19	3840*2160	53.95	23.976	296.703	UDTV 2160P
20	3840*2160	135	59.94	593.41	UDTV 2160P(8 bit / YCbCr 4:2:0 Only)
21	3840*2160	135	60	594.00	UDTV 2160P(8 bit / YCbCr 4:2:0 Only)
22	4096*2160	53.95	23.976	296.703	UDTV 2160P
23	4096*2160	54	24	297	UDTV 2160P
24	4096*2160	56.25	25	297	UDTV 2160P
25	4096*2160	61.43	29.97	296.703	UDTV 2160P
26	4096*2160	67.5	30	297	UDTV 2160P
27	4096*2160	135	59.94	593.41	UDTV 2160P(8 bit / YCbCr 4:2:0 Only)
28	4096*2160	135	60	594.00	UDTV 2160P(8 bit / YCbCr 4:2:0 Only)

5.2. 3D Mode

5.2.1. HDMI Input 1.4b (3D supported mode automatically)

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock (MHz)	VIC	3D input proposed mode	Proposed
1	640*480	31.469 / 31.5	59.94/ 60	25.175/25.2	1	Top-and-Bottom Side-by-side(half) Side-by-side(full)	Secondary(SDTV 480P) Secondary(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) Side-by-side(full)	Secondary(SDTV 480P) Secondary(SDTV 480P)
		62.938 / 63	59.94 / 60	54/54.06	2,3	Frame packing Line alternative	Secondary(SDTV 480P) (SDTV 480P)
3	1280*720	44.96 / 45	59.94 / 60	74.18/74.25	4	Top-and-Bottom Side-by-side(half) Side-by-side(full)	Primary(HDTV 720P) Primary(HDTV 720P)
		89.91 / 90	59.94 / 60	148.35/148.5	4	Frame packing Line alternative	Primary(HDTV 720P) (HDTV 720P)
4	1920*1080	33.72 / 33.75	59.94 / 60	74.18/74.25	5	Top-and-Bottom Side-by-side(half) Side-by-side(full)	Secondary(HDTV 1080I) Primary(HDTV 1080I)
		67.432 / 67.5	59.94 / 60	148.35/148.5	5	Frame packing Field alternative	Primary(HDTV 1080I) (HDTV 1080I)
		26.97 / 27	23.97 / 24	74.18/74.25	32	Top-and-Bottom Side-by-side(half) Side-by-side(full)	Primary(HDTV 1080P) Primary(HDTV 1080P)
		43.94 / 54	23.97 / 24	148.35/148.5	32	TFrame packing Line alternative	Primary(HDTV 1080P) (HDTV 1080P)
		28.125	25	74.25	33	Top-and-Bottom Side-by-side(half) Side-by-side(full)	Secondary(HDTV 1080P) Secondary(HDTV 1080P)
		56.25	25	148.5	33	Frame packing Line alternative	Secondary(HDTV 1080P) (HDTV 1080P)
		33.716 / 33.75	29.976 / 30.00	74.18/74.25	34	Top-and-Bottom Side-by-side(half) Side-by-side(full)	Primary(HDTV 1080P) Secondary(HDTV 1080P)
		67.432 / 67.5	29.976 / 30.00	148.35/148.5	34	Frame packing Line alternative	Primary(HDTV 1080P) (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)

5.2.2. HDMI 1.4/2.0(3D Supported mode manaually)

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock (MHz)	Proposed	3D input proposed mode
1.	720*480	31.5	60	27.03	SDTV 480P	2D to 3D, Side by Side(Half), Top & Bottom, Checker Board, Frame Sequential, Row Interleaving, Column Interleaving
2.	1280*720	45.00	60.00	74.25	HDTV 720P	
3.	1920*1080	33.75	60.00	74.25	HDTV 1080I	2D to 3D, Side by Side(Half), Top & Bottom
4.	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
5.	1920*1080	28.12	25	74.25	HDTV 1080P	
6.	1920*1080	33.75	30.00	74.25	HDTV 1080P	
7.	1920*1080	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
8.	3840*2160	53.95	23.976	296.703	HDTV 2160P	
9.	3840*2160	54	24.00	297.00	HDTV 2160P	
10.	3840*2160	56.25	25.00	297.00	HDTV 2160P	
11.	3840*2160	61.43	29.970	296.703	HDTV 2160P	
12.	3840*2160	67.5	30.00	297.00	HDTV 2160P	
13.	4096*2160	53.95	23.976	296.703	HDTV 2160P	
14.	4096*2160	54	24.00	297.00	HDTV 2160P	
15.	4096*2160	56.25	25.00	297.00	HDTV 2160P	
16.	4096*2160	61.43	29.970	296.703	HDTV 2160P	
17.	4096*2160	67.5	30.00	297.00	HDTV 2160P	
18.	3840*2160	135	60	594	HDTV 2160P	2D to 3D, Top & Bottom(half), Side by Side(half), Port3 Only
19.	4096*2160	135	60	594	HDTV 2160P	2D to 3D, Top & Bottom(half), Side by Side(half), Port3 Only

5.2.3. HDMI-PC Input (3D) (3D Supported Mode Manually)

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock (MHz)	Proposed	3D input proposed mode
1.	1024*768	48.36	60	65	HDTV 768P	2D to 3D, Side by Side(half), Top & Bottom
2.	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
3.	3840*2160	54	24.00	296.703	HDTV 2160P	2D to 3D, Top & Bottom, Side by Side(half),
		56.25	25.00	297		
		67.5	30.00	296.703		
4.	4096*2160	54	24.00	297.00	HDTV 2160P	2D to 3D, Side by Side(half), Top & Bottom
5.	Others	-	-	-		2D to 3D, Side by Side(half), Top & Bottom

5.2.4. RF Input(3D supported mode manually)

No.	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	3D input proposed mode
1	DTV			74.25	HD/SD	2D to 3D, Side by Side, Top & Bottom
2	ATV			74.25	SD	2D to 3D, Side by Side, Top & Bottom

5.2.5. RF Input (3D supported mode automatically)

No.	Signal	3D input proposed mode
1	Frame Compatible	Side by Side(Half), Top & Bottom

5.2.6. USB, DLNA (Movie) Input (3D supported mode manually)

No.	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	3D input proposed mode
1	Under 704x480	-	-	-	2D to 3D
2	Over 704x480 interlaced	-	-	-	2D to 3D, Side by Side(Half), Top & Bottom
3	Over 704x480 progressive	-	60	-	2D to 3D, Side by Side(Half), Top & Bottom, Checker Board, Row Interleaving, Column Interleaving, Frame Sequential
4	Over 704x480 progressive	-	others	-	2D to 3D, Side by Side(Half), Top & Bottom, Checker Board, Row Interleaving, Column Interleaving
5	Over 2160P	-	24/25/30	-	2D to 3D, Side by Side(Half), Top & Bottom, USB Only

5.2.7. USB, DLNA (Photo) Input (3D supported mode manually)

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

5.2.8. USB, DNLA Input (3D supported mode automatically) – not used

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	3D input proposed mode
1	1080P	33.75	30	-	Side by Side(Half), Top & Bottom, Checker Board, MPO(Photo)
2	2160p	67.5	30	297	MPO(Photo), JPS(Photo)

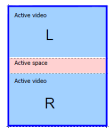
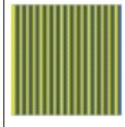
5.2.9. Component Input(3D supported mode manually)

No.	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	Remark
1	1280*720	45.00	60.00	74.25	HDTV 720P	2D to 3D, Side by Side(Half), Top & Bottom
2	1280*720	44.96	59.94	74.176	HDTV 720P	
3	1920*1080	33.75	60.00	74.25	HDTV 1080I	
5	1920*1080	33.72	59.94	74.176	HDTV 1080I	
5	1920*1080	27.00	24.00	74.25	HDTV 1080P	
6	1920*1080	26.97	23.976	74.176	HDTV 1080P	
7	1920*1080	28.12	25	74.25	HDTV 1080P	
8	1920*1080	33.75	30.00	74.25	HDTV 1080P	
9	1920*1080	33.71	29.97	74.176	HDTV 1080P	
10	1920*1080	67.50	60.00	148.5	HDTV 1080P	
11	1920*1080	67.432	59.94	148.352	HDTV 1080P	

5.2.10. Miracast, Widi (3D supported mode manually)

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	3D input proposed mode
1	1024X768p	-	30 / 60	-	2D to 3D, Side by Side(Half), Top & Bottom
2	1280x720p	-	30 / 60	-	
3	1920X1080p		30 / 60		
4	Others		-		2D to 3D

**Remark: 3D Input mode

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

ADJUSTMENT INSTRUCTION

1. Application Range

This spec. sheet applies to LA48V Chassis applied LED 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 ±5ºC 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 15ºC

- 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. PCB assembly adjustment items

1) MAC Address, ESN Key and Wide-vine Key D/L
2) LAN Test(Ping-Test)
3) Main S/W program download : Using USB Memory stick
4) Input Tool - Option
5) Download EDID
6) ADC Calibration – RGB & Component
7) Check SW Version

3.2. SET assembly adjustment items

1) Input Area option.
2) Adjustment of White Balance : Auto
3) Adjustment of White Balance : Manual
4) Intelligent Sensor Inspection Guide
5) LAN Inspection Guide
6) Widevine Key Inspection Guide
7) Model name & Serial number D/L
8) Wi-Fi MAC Address Check
9) Local Dimming Inspection Guide
10) Preset CH information
11) GND and Internal Pressure check
12) Motion Remote controller Inspection
13) 3D Function test
14) Outgoing Condition Configuration
15) Sound spec
16) Factoring Option Data input.

4. PCB assembly adjustment method

4.1. ADC Calibration : component using internal pattern

- An ADC calibration is needed to fine the optimum black level and gain in Analog-to-Digital device

.

4.1.1. Adj. method

- Using RS-232C, adjust items listed in “4.1.2”

4.1.2. Adj. protocol

Protocol	Command	Set ACK
Enter adj. mode	aa 00 00	a 00 OK00x
Source change	xb 00 40	b 00 OK04x (Adjust 480i, 1080p Comp1)
Begin adj.	ad 00 10	OKx (Case of Success) NGx (Case of Fail)
Read adj. data	ad 00 20	00000000000000000000000007c007b-006dx
Confirm adj.	ad 00 99	NG 01 00x (Fail) OK 01 01x (Success)
End adj.	ad 00 90	a 00 OK90x

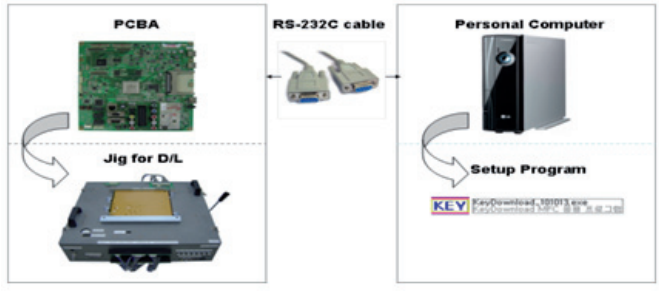
4.1.3. Adj. Order (TBD)

- aa 00 00 [Enter adj. mode]
- xb 00 04 [Change input source to Component1(480i&1080p)]
- ad 00 10 [Adjust 480i&1080p Comp1]
- aa 00 90 [End adj.]

4.2. 4.2.MAC Address, ESN Key and Wide-vine Key Download

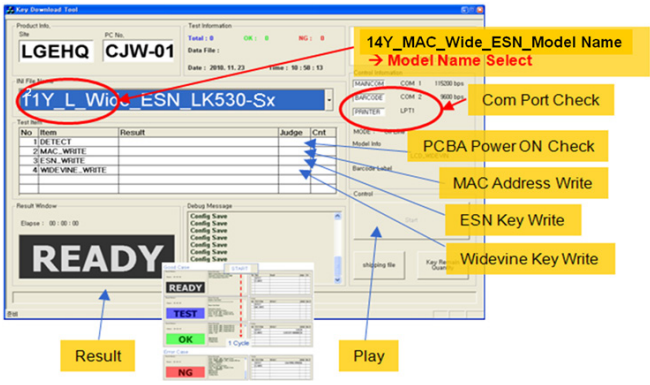
4.2.1. Equipment & Condition

1) Play file: keydownload.exe
2) Key Write: Com 1,2,3,4 and 115200 (Baudrate)
3) Barcode: Com 1,2,3,4 and 9600 (Baudrate)



4.2.2. Download process (14Y ULTRA HD TV + MAC + WIDEVINE + ESN)

1) Execute “keydownload.exe” on PC
2) Select the download items.
3) Mode check : Online only
4) Check the test process
   - DETECT -> MAC_WRITE -> ESN_WRITE (only Colombia/ Panama) ->WIDEVINE_WRITE
5) Play: START
6) Check of result: Ready, Test, OK or NG



4.2.3. Inspection : InINSTART menu, check these keys

4.3. PING Test(LAN Operating Test)

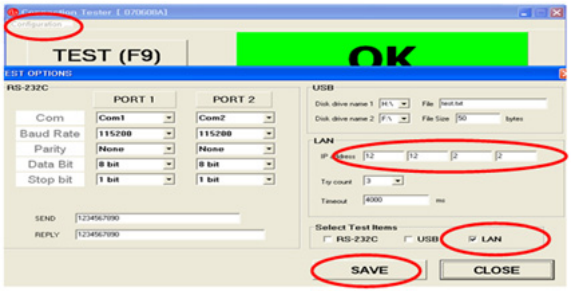
4.3.1. Check PCBA

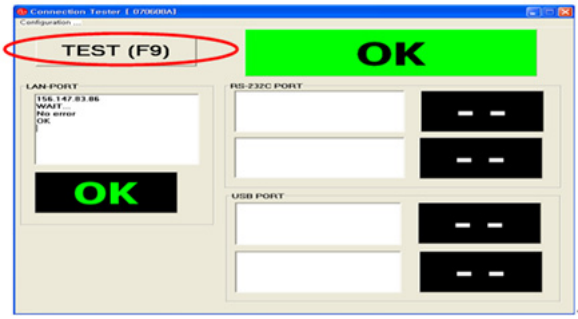
1) Connect LAN to PCBA& Power On.(Default IP can be set to automatic setting. When power ON, IP can be Automatically be achieved from the router)
2) Push ADJ key on Adjust remote-controller.
3) Enter “13. ACAP PING TEST” & check Network.

4.3.2. Check Set(Manufacturer)

1) Connect TV-Set & PC with Cross LAN cable.(PC IP : 12.12.2.3)
2) Execute “PINT Test program”, Check setting data of program. (TV-Set IP : 12.12.2.2)

3) Push Power Only key on Adjust remote-controlle.
4) Click “RUN”, Check “OK” or “NG”

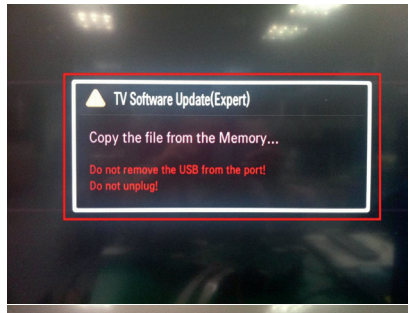


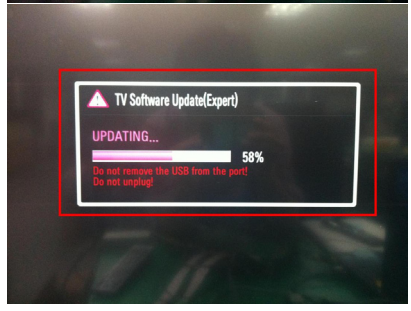


4.4. Main S/W program download

4.4.1. Using the Memory Stick

** USB DOWNLOAD : Service Mode
1) Insert the USB memory Stick to the USB port
2) Automatically detect the SW Version.
   -> S/W download process is executed automatically.
3) Show the message “Copy the file from the Memory”





4) After Finished the Download, Automatically DC Off -> On

5) If the TV IS Turn On, Check the updated SW Version and Tool Option.

4.5. EDID D/L method

Recommend that don't connect HDMI and RGB(D-SUB) cable when downloading the EDID.
If not possible, recommend that connect the MSPG equipment.
There are two methods of downloading the edid data

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"

4.5.1. 1st Method

EDID data's are automatically downloaded when adjusting the Tool Options.
Automatically downloaded when pushing the enter key in the EDID D/L menu.
It takes about 2seconds

4.5.2. 2st Method

=> Caution : Must be checked that the tool option is right or not. If tool option is wrong, HDMI edid data could not be downloaded well.

1) Press the ADJ key
2) Move to the 13. EDID D/L and Press the right direction key(►)
3) Press the right direction key(►) at Start.
4) After about a few seconds, appear "Waiting.." => "OK", then complete.

4.5.3. RS-232C command Method

1) Command : AE 00 10

=> Caution : Don't connect HDMI and RGB(D-SUB) cable when downloading the EDID. If the cables are connected, Downloading of edid could be failed.

4.5.4. EDID DATA

▪ Reference
- HDMI1 ~ HDMI3
- In the data of EDID, bellows may be different by Input mode

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0x00	00	FF	FF	FF	FF	FF	FF	00	1E	6D	ⓐ		ⓑ			
0x01	ⓒ		01	03	80	A0	5A	78	0A	EE	91	A3	54	4C	99	26
0x02	0F	50	54	A1	8	00	31	40	45	40	61	40	71	40	81	80
0x03	01	01	01	01	01	01	02	3A	80	18	71	38	2D	40	58	2C
0x04	45	00	40	84	63	00	00	1E	66	21	50	B0	51	00	1B	30
0x05	40	70	36	00	40	84	63	00	00	1E	00	00	00	FD	00	3A
0x06	3E	1E	53	10	00	0A	20	20	20	20	20	20	ⓓ			
0x07	ⓓ														01	ⓑ1
0x00	02	03	3A	F1	4E	10	9F	04	13	05	14	03	02	12	20	21
0x01	22	15	01	29	3D	06	C0	15	07	50	ⓕ					
0x02	ⓕ															
0x03	ⓕ			10	28	10	E3	05	03	01	02	3A	80	18	71	38
0x04	2D	40	58	2C	45	00	40	84	63	00	00	1E	01	1D	80	18
0x05	71	1C	16	20	58	2C	25	00	40	84	63	00	00	9E	01	1D
0x06	00	72	51	D0	1E	20	6E	28	55	00	40	84	63	00	00	1E
0x07	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	ⓑ2

ⓐ Product ID
ⓑ Serial No: Controlled on production line.
ⓒ Month, Year: Controlled on production line:
ex) Monthly : '01' -> '01'
Year : '2014' -> '18
ⓓ Model Name(Hex): LGTV
ⓔ Checksum(LG TV): Changeable by total EDID data.
ⓕ Vendor Specific(HDMI)

4.5.4.1. EDID

#DTS HDMI1 (C/S: F7 82)
EDID Block 0, Bytes 0-127

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	FC
00	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	42	F1	4E	90	22	20	05	04	03	02	01	5D	5E	5F
10	62	63	64	29	3D	06	C0	15	07	50	09	57	07	7C	03	0C
20	00	10	00	B8	3C	20	C0	8E	01	02	03	04	01	4F	00	FE
30	08	10	06	10	18	10	28	10	38	10	E3	05	03	01	E3	0E
40	61	66	01	1D	80	18	71	1C	16	20	58	2C	25	00	40	84
50	63	00	00	9E	01	1D	00	72	51	D0	1E	20	6E	28	55	00
60	40	84	63	00	00	1E	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	82

#DTS HDMI2 (C/S: E7 72)
EDID Block 0, Bytes 0-12

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	FC
00	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	42	F1	4E	90	22	20	05	04	03	02	01	5D	5E	5F
10	62	63	64	29	3D	06	C0	15	07	50	09	57	07	7C	03	0C
20	00	20	00	B8	3C	20	C0	8E	01	02	03	04	01	4F	00	FE
30	08	10	06	10	18	10	28	10	38	10	E3	05	03	01	E3	0E
40	61	66	01	1D	80	18	71	1C	16	20	58	2C	25	00	40	84
50	63	00	00	9E	01	1D	00	72	51	D0	1E	20	6E	28	55	00
60	40	84	63	00	00	1E	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	72

#DTS HDMI3 (C/S: A1 81)
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	4C	F1	50	90	22	20	05	04	03	02	01	61	5D	5E
10	5F	66	62	63	64	29	3D	06	C0	15	07	50	09	57	07	7C
20	03	0C	00	30	00	B8	3C	20	C0	8E	01	02	03	04	01	4F
30	00	FE	08	10	06	10	18	10	28	10	38	10	67	D8	5D	C4
40	01	78	80	03	E3	05	03	01	E3	0F	00	11	66	21	50	B0
50	51	00	1B	30	40	70	36	00	40	84	63	00	00	1E	01	1D
60	00	72	51	D0	1E	20	6E	28	55	00	40	84	63	00	00	1E
70	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	81

DTS HDMI4 (C/S: E7 52)
EDID Block 0, Bytes 0-127

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	FC
00	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	42	F1	4E	90	22	20	05	04	03	02	01	5D	5E	5F
10	62	63	64	29	3D	06	C0	15	07	50	09	57	07	7C	03	0C
20	00	40	00	B8	3C	20	C0	8E	01	02	03	04	01	4F	00	FE
30	08	10	06	10	18	10	28	10	38	10	E3	05	03	01	E3	0E
40	61	66	01	1D	80	18	71	1C	16	20	58	2C	25	00	40	84
50	63	00	00	9E	01	1D	00	72	51	D0	1E	20	6E	28	55	00
60	40	84	63	00	00	1E	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	52

AC3 HDMI1 (C/S: E7 8B)
EDID Block 0, Bytes 0-127

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	FC
00	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	3F	F1	4E	90	22	20	05	04	03	02	01	5D	5E	5F
10	62	63	64	26	15	07	50	09	57	07	7C	03	0C	00	10	00
20	B8	3C	20	C0	8E	01	02	03	04	01	4F	00	FE	08	10	06
30	10	18	10	28	10	38	10	E3	05	03	01	E3	0E	61	66	01
40	1D	80	18	71	1C	16	20	58	2C	25	00	40	84	63	00	00
50	9E	01	1D	00	72	51	D0	1E	20	6E	28	55	00	40	84	63
60	00	00	1E	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	8B

AC3 HDMI2 (C/S: E7 7B)
EDID Block 0, Bytes 0-127

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	FC
00	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	3F	F1	4E	90	22	20	05	04	03	02	01	5D	5E	5F
10	62	63	64	26	15	07	50	09	57	07	7C	03	0C	00	20	00
20	B8	3C	20	C0	8E	01	02	03	04	01	4F	00	FE	08	10	06
30	10	18	10	28	10	38	10	E3	05	03	01	E3	0E	61	66	01
40	1D	80	18	71	1C	16	20	58	2C	25	00	40	84	63	00	00
50	9E	01	1D	00	72	51	D0	1E	20	6E	28	55	00	40	84	63
60	00	00	1E	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	7B

AC3 HDMI3 (C/S: A1 8A)
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	4C	F1	50	90	22	20	05	04	03	02	01	61	5D	5E
10	5F	66	62	63	64	26	15	07	50	09	57	07	7C	03	0C	00
20	30	00	B8	3C	20	C0	8E	01	02	03	04	01	4F	00	FE	08
30	10	06	10	18	10	28	10	38	10	67	D8	5D	C4	01	78	80
40	03	E3	05	03	01	E3	0F	00	11	66	21	50	B0	51	00	1B
50	30	40	70	36	00	40	84	63	00	00	1E	01	1D	00	72	51
60	D0	1E	20	6E	28	55	00	40	84	63	00	00	1E	00	00	00
70	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	8A

PCM HDMI1 (C/S: F7 FD)
EDID Block 0, Bytes 0-127

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	FC
00	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

AC3 HDMI4 (C/S: E7 5B)
EDID Block 0, Bytes 0-127

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	FC
00	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	3F	F1	4E	90	22	20	05	04	03	02	01	5D	5E	5F
10	62	63	64	26	15	07	50	09	57	07	7C	03	0C	00	40	00
20	B8	3C	20	C0	8E	01	02	03	04	01	4F	00	FE	08	10	06
30	10	18	10	28	10	38	10	E3	05	03	01	E3	0E	61	66	01
40	1D	80	18	71	1C	16	20	58	2C	25	00	40	84	63	00	00
50	9E	01	1D	00	72	51	D0	1E	20	6E	28	55	00	40	84	63
60	00	00	1E	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	5B

PCM HDMI1(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
00	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

PCM HDMI3 (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	04	05	03	02	20	22	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

PCM HDMI4 (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
00	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

* Checksum (HDMI 1/2/3/4)

Input	DTS FFh		AC3 FFh		PCM FFh	
HDMI1	E7	82	E7	8B	E7	FD
HDMI2	E7	72	E7	7B	E7	ED
HDMI3	A1	81	A1	8A	A1	FC
HDMI4	E7	52	E7	5B	E7	CD

4.6. Camera Port Inspection

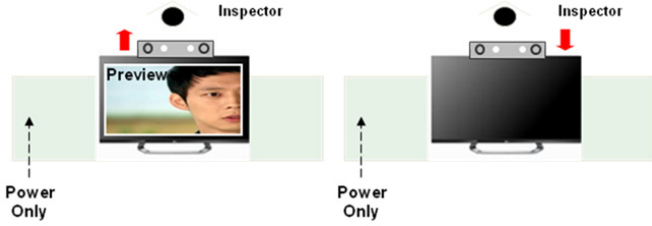
(1) Objective : To check how it connects between Camera and PCBA normally, and their Function

(2) Test Method : This Inspection is available only Power-Only Status.

i) Push Camera Up

ii) Camera's Preview picture appears on TV Set

iii) Push Camera Down



(3) RS-232C Command

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

5. SET assembly adjustment method

5.1. Input Area-Option

(1) Profile : Must be changed the Area option value because being different of each Country's Language and signal Condition.

(2) Equipment : adjustment remote control.

(3) Adjustment method

- The input methods are same as other chassis.(Use IN-START Key on the Adjust Remocon.)

Refer to Job Expression of each main chassis ass'y (EBTxxxxxxxx) for Option value.

5.2. Adjustment of White Balance

- 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.

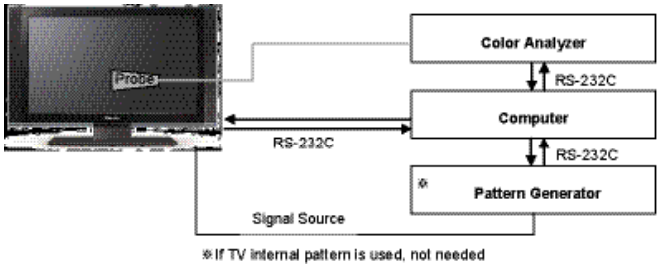
- Purpose : Adjust the color temperature to reduce the deviation of the module color temperature.
- Principle : To adjust the white balance without the saturation, Fix the one of R/G/B gain to 192 (default data) and decrease the others.
- Adjustment mode : Three modes – Cool / Medium / Warm

* Required Equipment
- Remote controller for adjustment
- Color Analyzer : CA100+ or CA-210 or same product (should be used in the calibrated ch by CS-1000)
  - LCD TV : CH-9
  - PDP TV : CH-10
  - White LED TV : CH-14
  - ALEF : CH-18
  - RGB LED(MNT) : CH-16
- Auto W/B adjustment instrument(only for Auto adjustment)

5.2.1. Adjustment of White Balance :

(For Automatic Adjustment)

Connecting diagram of equipment for measuring (For Automatic Adjustment)



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

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

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

5.2.2. Adjustment of White Balance

(For Automatic Adjustment)

5.2.2.1. 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 (90+/-2.5°)
3) Aging time
   A. After Aging Start, Keep the Power ON status during 5 Minutes.
   B. In case of LCD, Back-light on should be checked using no signal or Full-white pattern.

5.2.2.2. Equipment
1) Color Analyzer: CA-210 (NCG: CH 9 / WCG: CH12 / LED: CH14)
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)

5.2.2.3. 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.

** R-fix adjustment
Adjust modes (Cool), Fix the R gain to 210 (default data) and change the others (G/B Gain).
- Adjust the R gain more than 210 (If G gain or B gain is less than 0 , R gain can adjust more than 210) and change the others (G/B Gain). Adjust two modes(Medium / Warm), Fix the one of R/G/B gain to 192 (default data) and decrease the others.

5.2.3. LED White balance table

5.2.3.1. Cool Mode

1) Purpose : Especially G-gain fix adjust leads to the luminance enhancement. Adjust the color temperature to reduce the deviation of the module color temperature.
2) Principle : To adjust the white balance without the saturation, Adjust the G gain more than 172 (If R gain or G gain is more than 255 , G gain can adjust less than 172) and change the others (R/B Gain).
3) Adjustment mode : mode – Cool

5.2.3.2. Medium / Warm Mode

1) Purpose : Adjust the color temperature to reduce the deviation of the module color temperature.
2) Principle : To adjust the white balance without the saturation, Fix the one of R/G/B gain to 192 (default data) and decrease the others.
3) Adjustment mode : Two modes – Medium / Warm

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

Mode	Coordinate		Temp	△uv
	X	Y		
Cool	0.271	0.270	13,000K	0.0000
Medium	0.286	0.289	9,300K	0.0000
Warm	0.313	0.329	6,500K	0.0000

* Change reason : When vivid mode, more detail than other company set.

▪ Standard color coordinate and temperature using CA-210(CH-14) – by aging time

(1) Normal line in Korea (From January to February) : LGD (UB98xxx, UB95/93xxx, UB85xxx, UB83xxx, UC97 Series models)

	Aging time (Min)	Cool		Medium		Warm	
		X	Y	X	Y	X	Y
		271	270	286	289	313	329
1	0-2	286	295	301	314	328	354
2	3-5	284	290	299	309	326	349
3	6-9	282	287	297	306	324	346
4	10-19	279	283	294	302	321	342
5	20-35	276	278	291	297	318	337
6	36-49	274	275	289	294	316	334
7	50-79	273	272	288	291	315	331
8	80-119	272	271	287	290	314	330
9	Over 120	271	270	286	289	313	329

▪ Standard color coordinate and temperature using CA-210(CH-14) – by aging time

(2) Normal line in Korea (From March to December) : : LGD (UB98xxx, UB95/93xxx, UB85xxx, UB83xxx, UC97 Series models)

* Normal line in Mexico : LGD (UB98xxx, UB95/93xxx, UB85xxx, UB83xxx ,UC97 Series models)

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

(3) O/S Module(AUO, INX, Sharp, CSOT, BOE)

	Cool		Medium		Warm	
	X	Y	X	Y	X	Y
spec	271	270	286	289	313	329
target	278	280	293	299	320	339

-. To check the Coordinates of White Balance, you have to measure at the below conditions.
Picture Mode : select Vivid and change
Dynamic Contrast : Off ,
Dynamic Colour : Off,
Clear White : Off
-> Picture Mode change : Vidid -> Vivid(User)
(If you miss the upper condition, the coordinates of W/B can be lower than the spec.)

5.3. Model name & Serial number D/L

5.3.1. Notice

1) Serial number D/L is using of scan equipment.
2) Setting of scan equipment operated by Manufacturing Technology Group.
3) Serial number D/L must be conformed when it is produced in production line, because serial number D/L is mandatory by D-book 4.0
4) Check the model name In-start menu -> Factory name displayed (ex 42LV5500-DD)
5) Check the Diagnostics (DTV country only) -> Buyer model displayed (ex 42LV5500-DD)

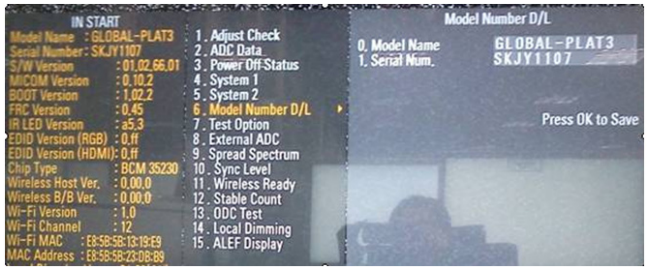
5.3.2. Method : Auto

1) Press “Power on” key of service remocon.(Baud rate : 115200 bps)
2) Connect RS232 Signal Cable to RS-232 Jack
3) Write Serial number by use RS-232.
4) Must check the serial number at Instart menu.

5.3.3. Method : Manual

* If the TV set is downloaded By OTA or Service man, Sometimes model name or serial number is initialized. (Not always) It is impossible to download by bar code scan, so It need Manual download.

1) Press the ‘instart’ key of ADJ remote controller.
2) Go to the menu ‘6.Model Number D/L’ like below photo.
3) Input the Factory model name or Serial number like photo.

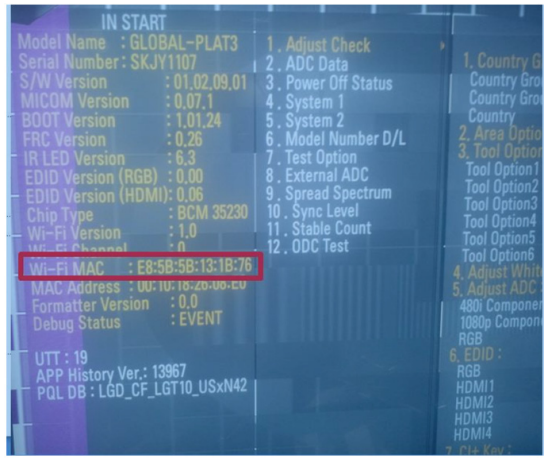


5.4. Wi-Fi MAC Address Check

5.4.1. Using RS232 Command

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

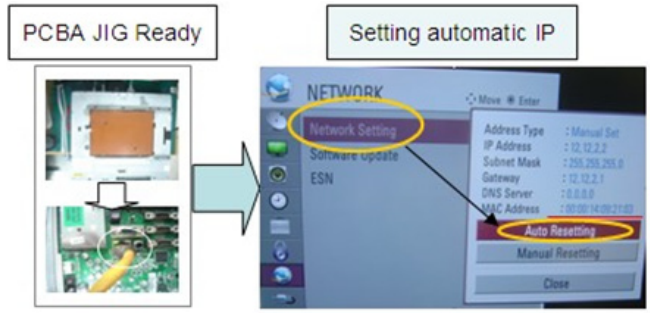
5.4.2. Check the menu on in-start



5.5. LAN Inspection

5.5.1. LAN Port connection with PCB

1) Network setting at MENU Mode of TV
2) Setting automatic IP
3) Setting state confirmation
4) If automatic setting is finished, you confirm IP and MAC Address

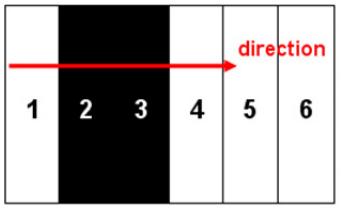


5.6. WIDEVINE Key Inspection

1) Confirm Key input Data at the “IN START” MENU Mode

5.7. Local Dimming Inspection (Optional)

1) Press 'TILT" key of the Adj. R/C and check moving patterns. The black bar patterns moves from top left to bottom right. If local dimming function does not work, a whole screen shows full white.



5.8. Motion Remote controller Inspection

1) Equipment : Motion remote controller for test, IR-KEY-CODE remote controller for test Check battery before test. (Recommend : Change battery for every Lot.)
2) Process
- If you select the 'start key(wheel)' on the controller, you can pairing with the TV SET.
- You can check the cursor on the TV Screen, when select the 'Wheel Key' on the controller
- You must remove the pairing with the TV Set by select 'Back + Home Key' on the controller

5.9. 3D function test

1) Equipment : Pattern Generator MSHG-600, MSPG-6100 [SUPPORT HDMI1.4, HDMI mode 872, pattern No. 83
2) Process

(A) Please input 3D test pattern like below (HDMI mode NO. 872 , pattern No.83)

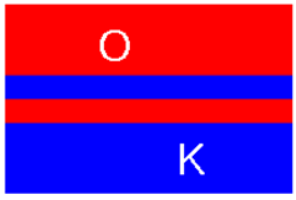


Fig.1
<HDMI Mode 872번 , Pattern No. 83>

(B) When 3D OSD appear automatically , then select green button.

Fig.3
<OK Key>

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

Fig.2
<3D Mode 진입 후 화면>
* 안경을 착용하지 않은 상태임.

5.10. HDMI ARC Function Inspection

5.10.1. Test equipment

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

5.10.2. Test method

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

(2) Check the sound from the TV Set

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

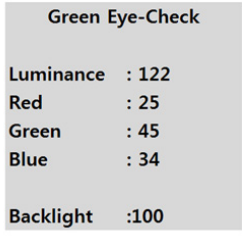
Flow Line

Cell Line

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

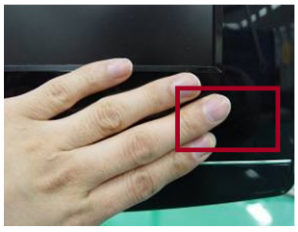
5.11. Eye-Q Green Inspection Guide (Change to Motion EYE care)

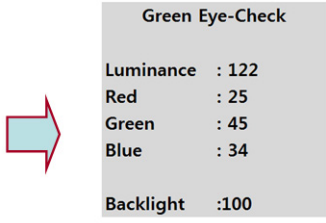
1) Turn on the TV set.
2) Press “EYE” button on the Adjustment remote controller.



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 out 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.

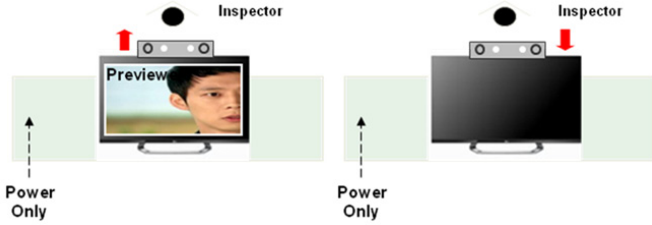
5.12. AUDIO

No	Item	Min	Typ	Max	Unit	Remark
1	Audio practical max Output, L/R (Distortion=10% max Output)	9.0	10.0	12.0	W	Measurement condition
		8.5	8.9	9.8	Vrms	
2	Speaker (8Ω Impedance)		10.0	15.0	W	Measurement condition

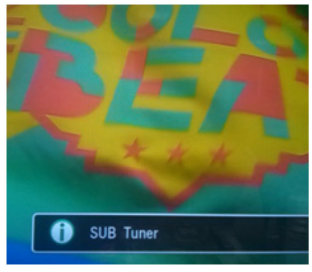
*Measurement condition:
(1) RF input: Mono, 1KHz sine wave signal, 100% Modulation
(2) CVBS, Component: 1KHz sine wave signal (0.4Vrms)
(3) RGB PC: 1KHz sine wave signal (0.7Vrms)

5.13. Camera Function Inspection

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



5.14. PIP/ W&R Function Inspection

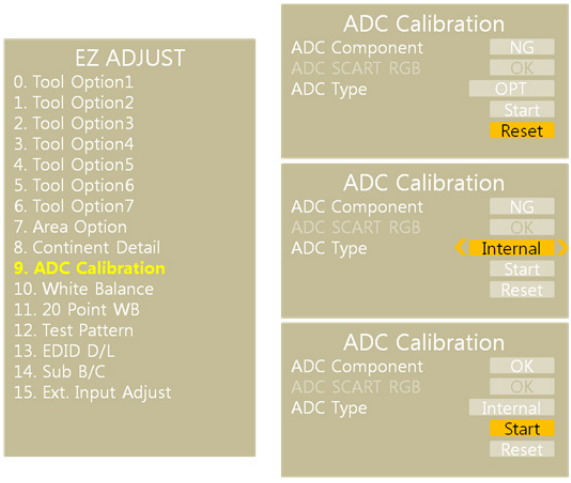


(1) Objective : To check the connection between sub tuner and PCBA, and their Function
(2) Test Method : This Inspection is available only Power-Only Status.
1) Press exit key of the Adj. R/C and Press PIP key.
2) Check that the SUB TUNER pop up window on the TV Set.
3) Check that the normal operation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

5.15. Manual ADC Calibration(Optional)

5.15.1. Adjust method

(1) Enter Service Mode by pushing “ADJ” key
(2) Enter ADC Calibration by pushing “►” key at “9. ADC Calibration”
(3) Select [Reset] button by pressing Enter key
(4) Change “OTP” to “Internal” by pushing “►” key
(5) Select [Start] button by pressing Enter key, then it will operate ADC adjustment.



5.16. GND and Hi-Pot test

5.16.1. GND & HI-POT auto-check preparation

1) Check the POWER CABLE and SIGNAL CABE insertion condition

5.16.2. 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.

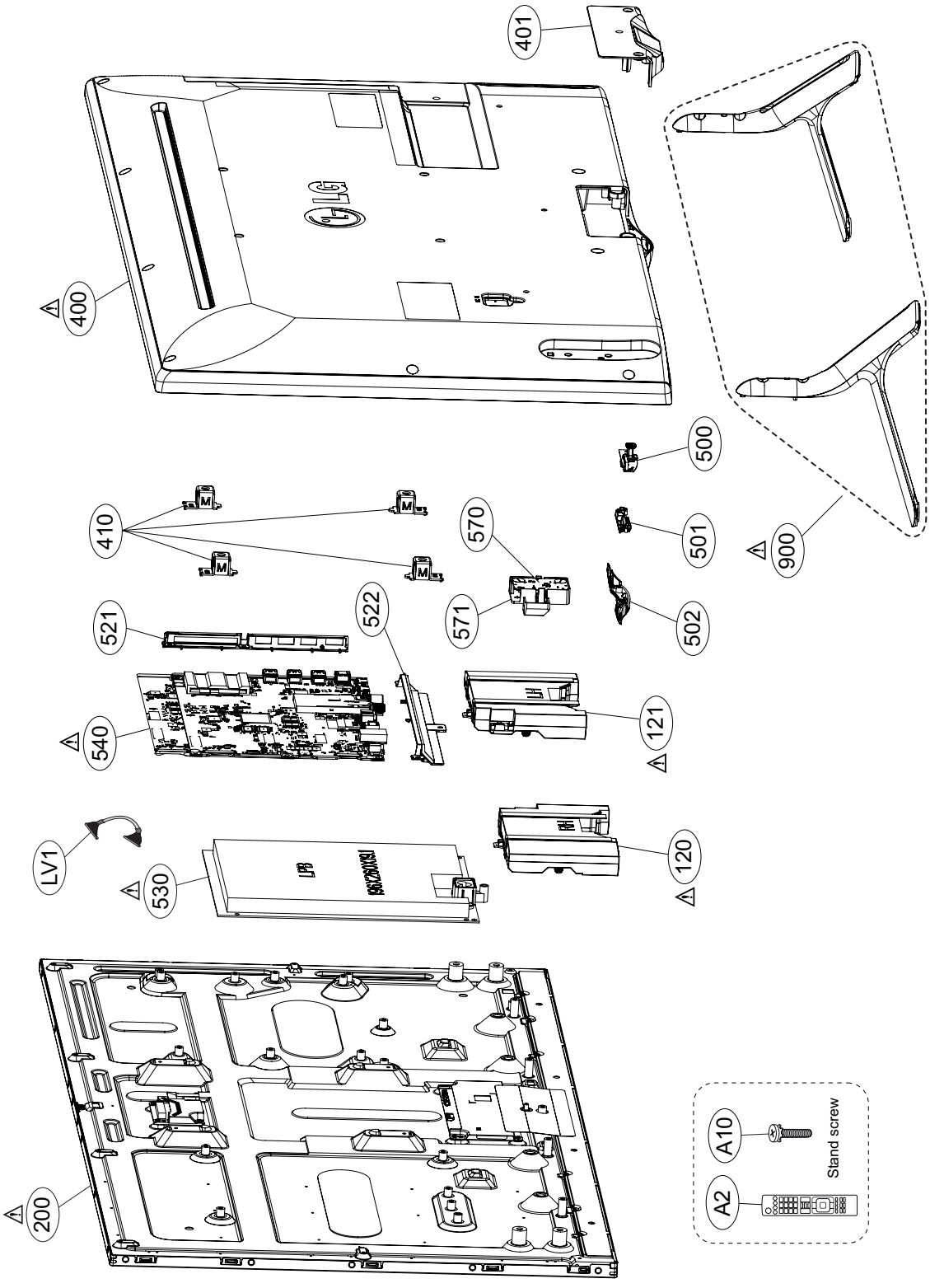
5.16.3. Check point

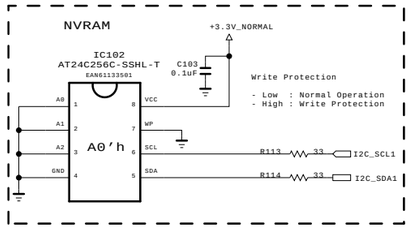
1) Test voltage
   (A) 3 Poles
   - GND: 1.5KVac/min at 100mA
   - SIGNAL: 3KVac/min at 100mA
2) TEST time: 1 second
3) TEST POINT
   (B) 3 Poles
   - GND Test = POWER CORD GND and SIGNAL CABLE GND.
   - Hi-pot Test = POWER CORD GND and LIVE & NEUTRAL.
4) LEAKAGE CURRENT: At 0.5mArms

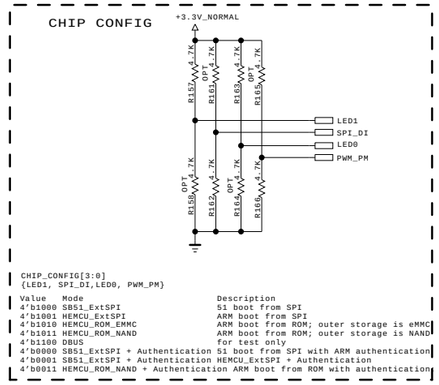
EXPLODED VIEW

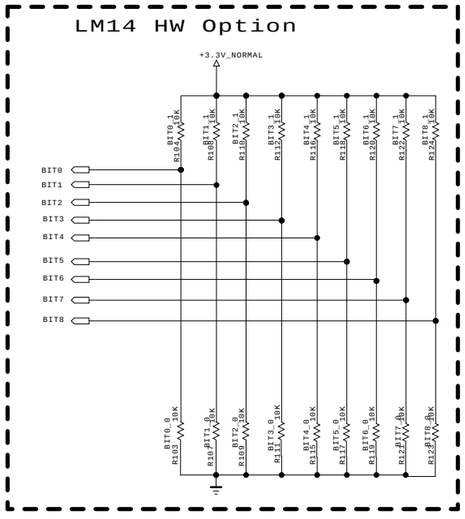
IMPORTANT SAFETY NOTICE

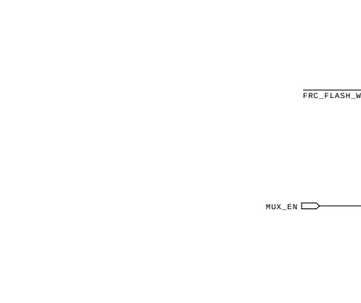
Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by ⚠ in the Schematic Diagram and EXPLODED VIEW.
It is essential that these special safety parts should be replaced with the same components as recommended in this manual to prevent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

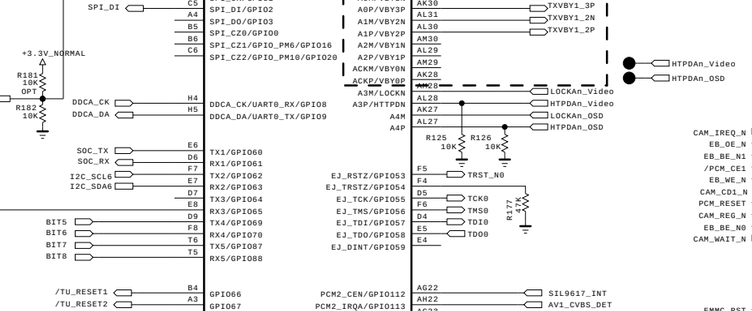


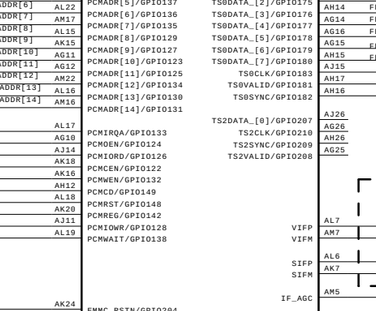


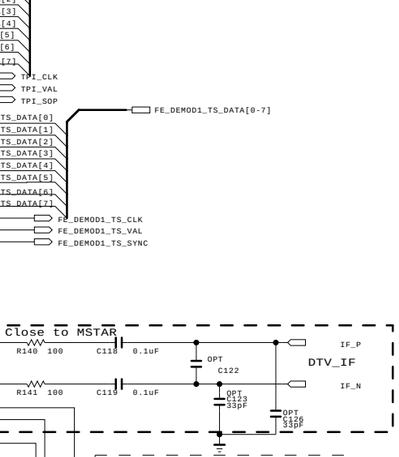












BIT(0/1)	DVB	ATSC	JP
00	TW/COL	US	
01	CN/HK	KR	JP
10	EU	BR	
11	AJJA	CI	

BIT(2/3)	EU/CIS	AJJA	TW/COL	CN/HK	KR	North.AM	BR	JP
00	T/C	T/C	ATV_INT DTV_EXT	Default	ATSC_PIP	ATSC_PIP	ATV_INT DTV_INT	Default
01	T2/C/S2/ATV_EXT	T2/C_PIP			ATV_SOC	ATV_SOC		
10	T2/C	T2/C			ATV_EXT	ATV_EXT		
11	T2/C/S2/AT	T2/C/S2						

		Low	High
BIT4	Vx1 Division	2-Division	Non-Division
BIT5	Resolution	FHD	UHD

* BIT4: LM14 TX Division OPT
(LM14+URSA9: Non Division)

		Low	High
BIT6	MODEL	LM14+URSA9	LM14 ONLY
BIT7	Reserved		
BIT8	Reserved		

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SECRET
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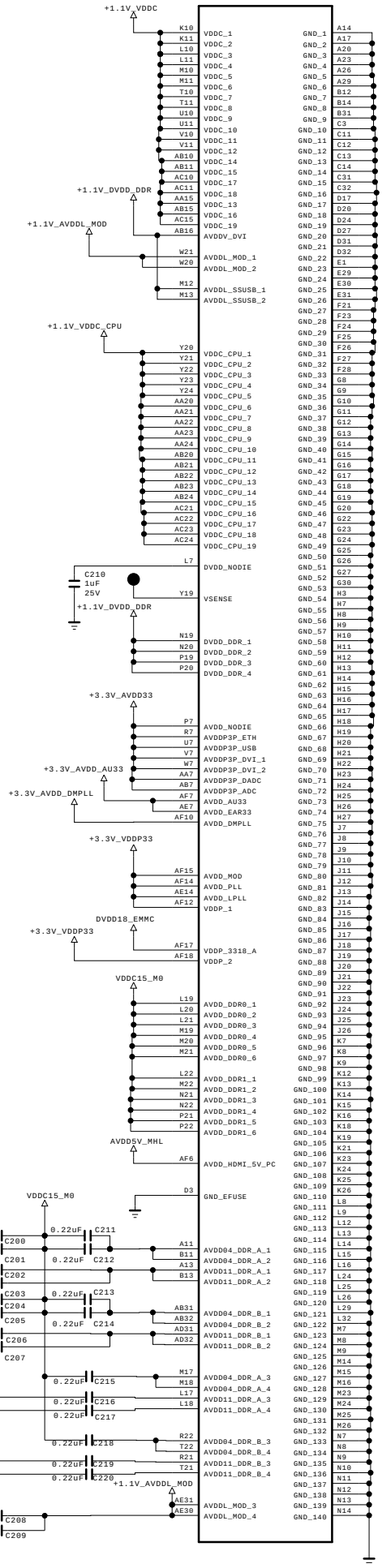
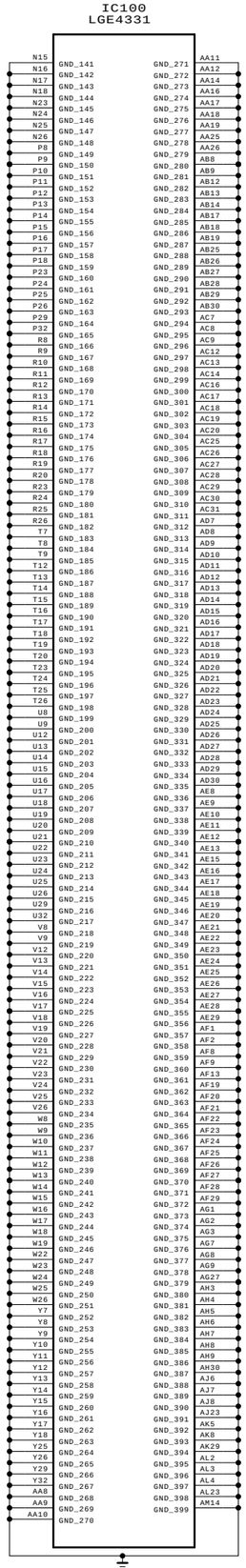
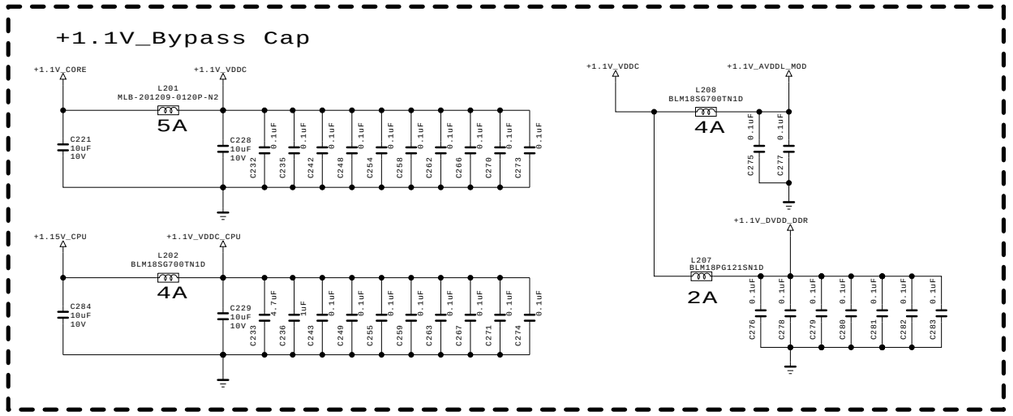
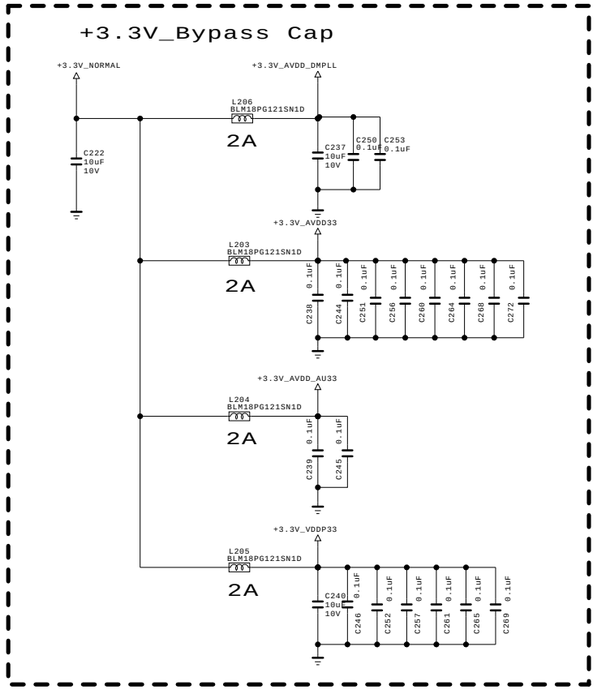
LG ELECTRONICS

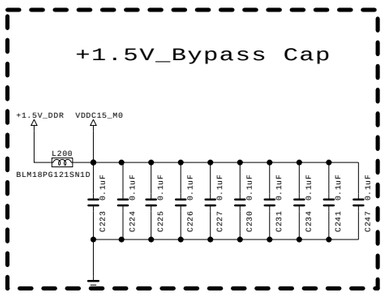
MODEL	UB83	DATE	2013-10-28
BLOCK	LM14 SYSTEM	SHEET	01

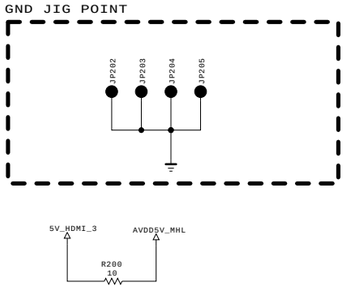












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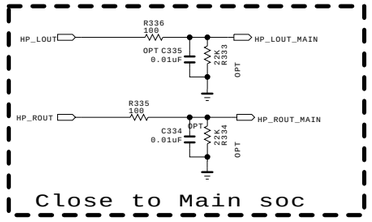
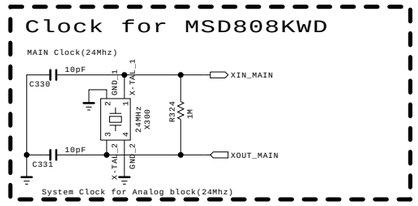
LG ELECTRONICS

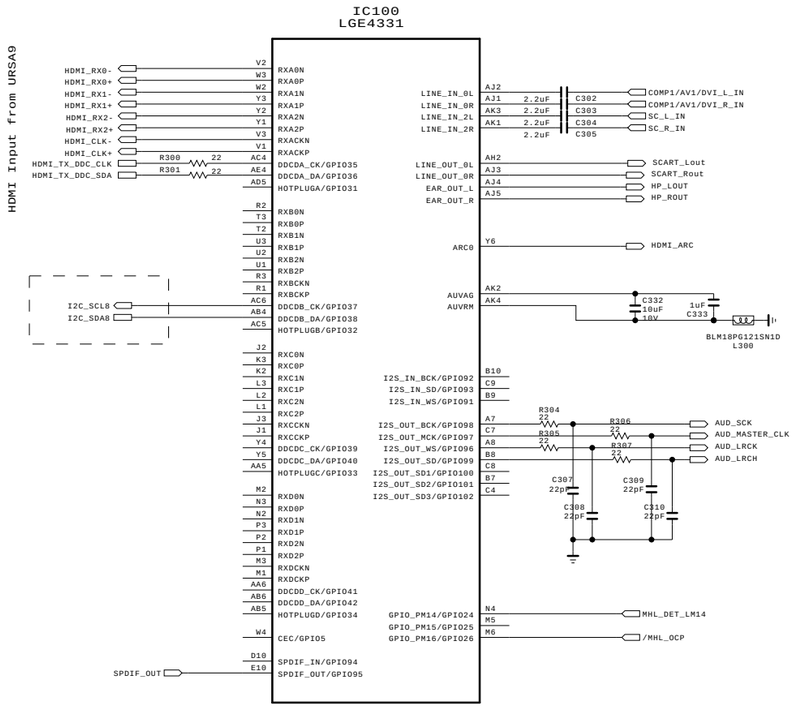
MODEL	UB83	DATE	2013-10-28
BLOCK	LM14 POWER	SHEET	02

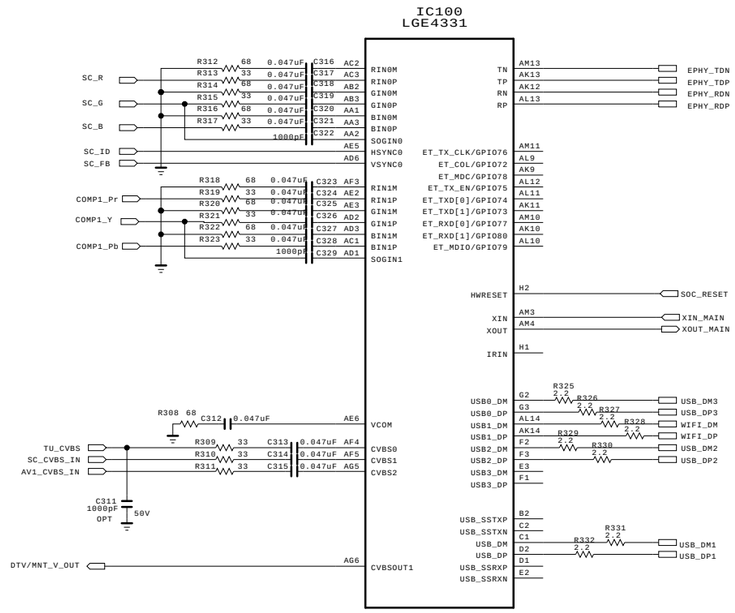
11/05/31

LGE Internal Use Only









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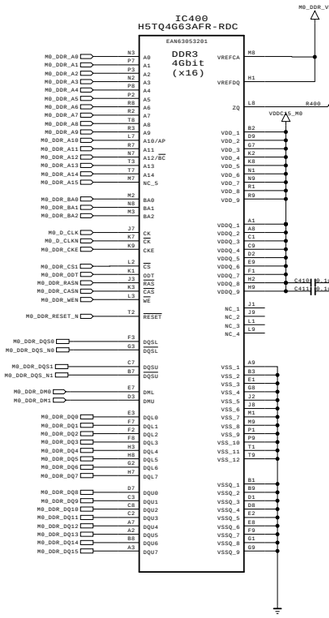
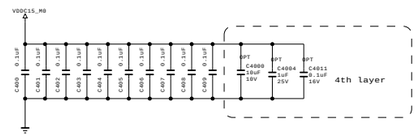
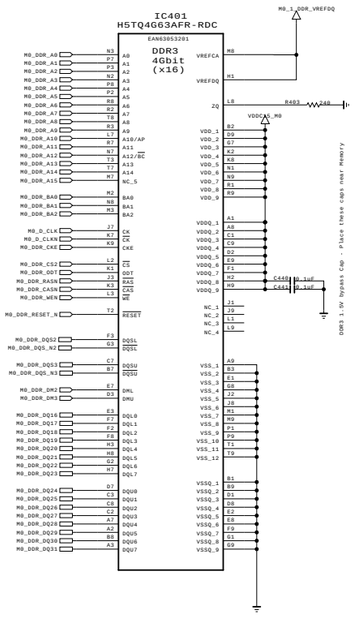
MODEL	UB83	DATE	2013-10-28
BLOCK	LM14 INPUT	SHEET	03

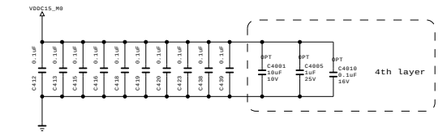


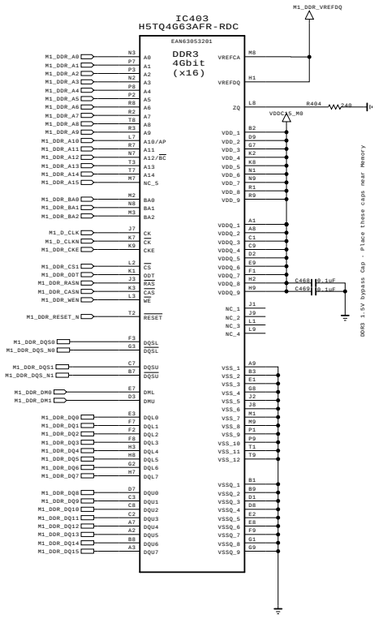
+1.5V_Bypass Cap
Close to DDR Power Pin





+1.5V_Bypass Cap
Close to DDR Power Pin





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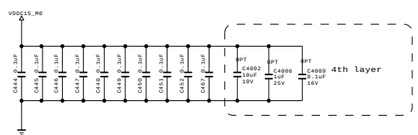
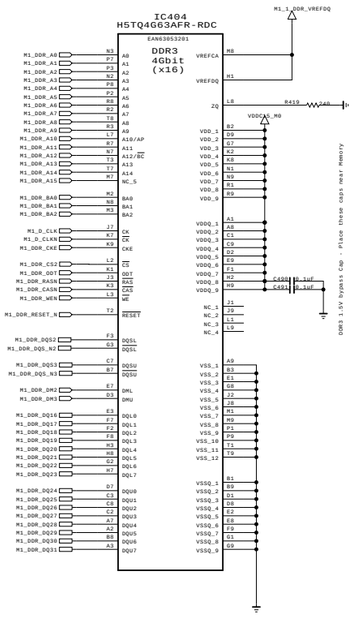
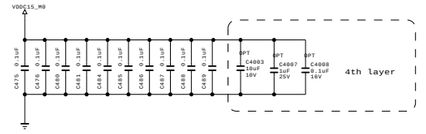
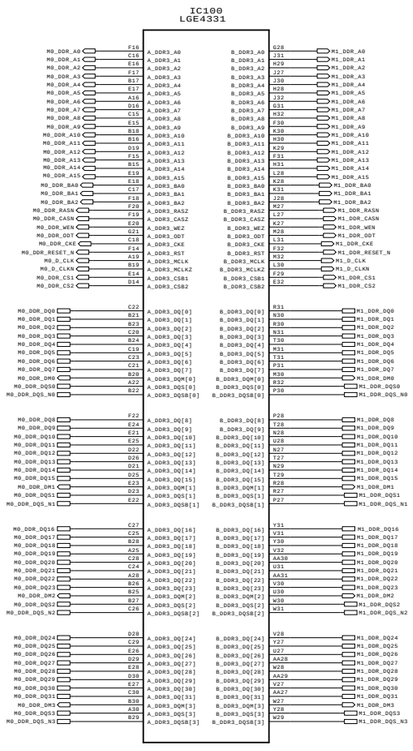
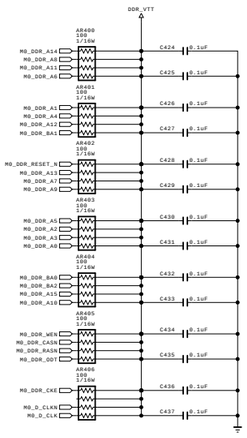


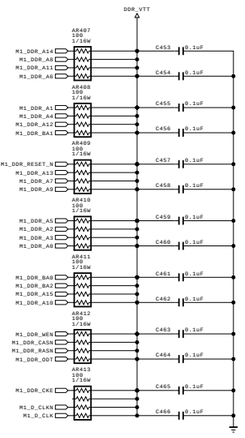


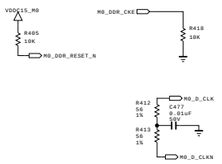
+1.5V_Bypass Cap
Close to DDR Power Pin



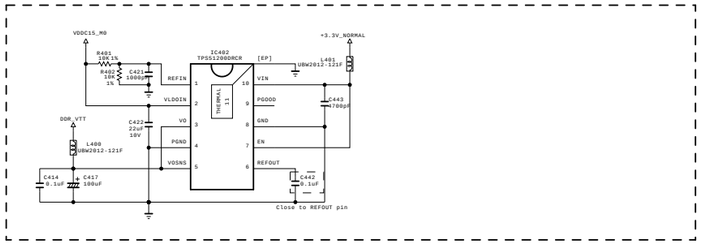


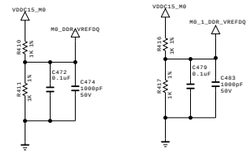






* DDR_VTT





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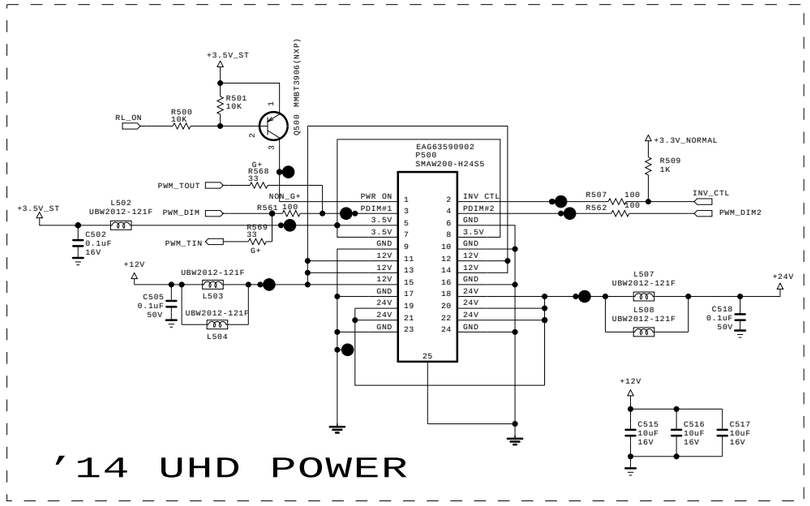
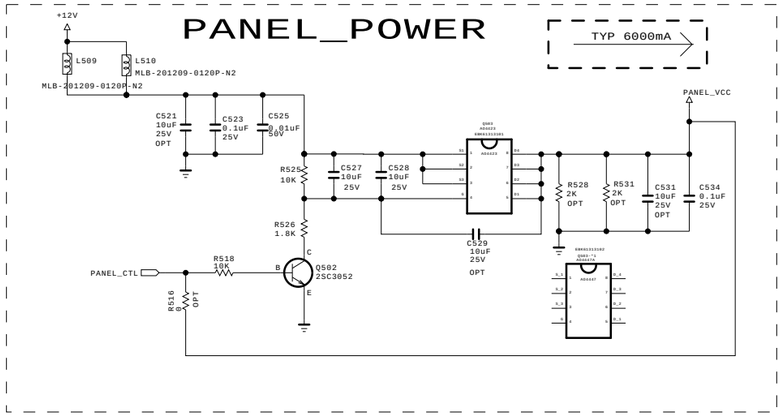
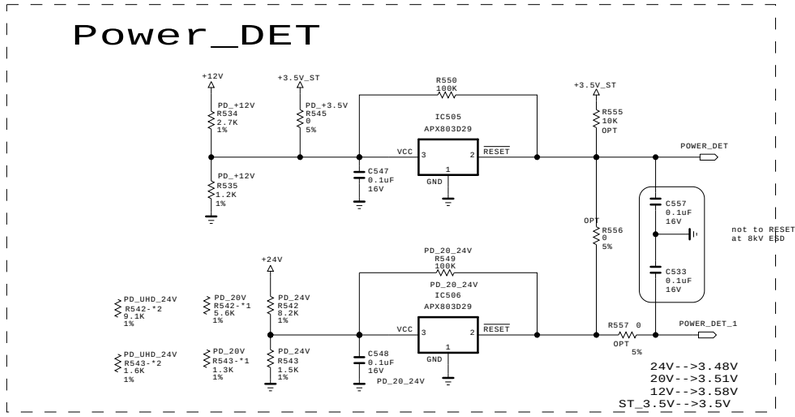
SECRET
LGElectronics

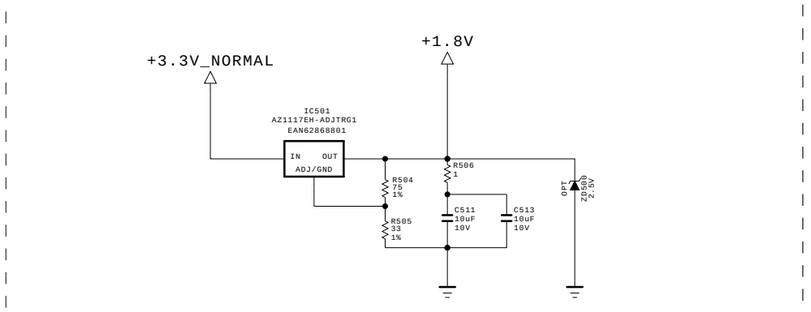
LG ELECTRONICS

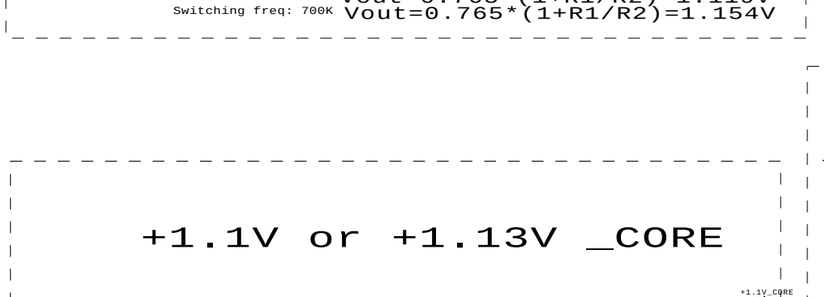
MODEL	UB83	DATE	2013-10-28
BLOCK	LM14 DDR	SHEET	04

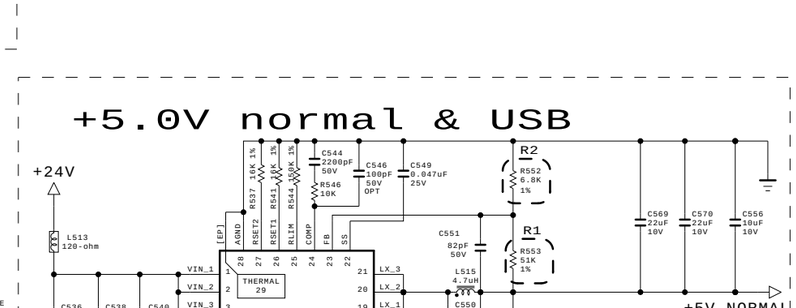


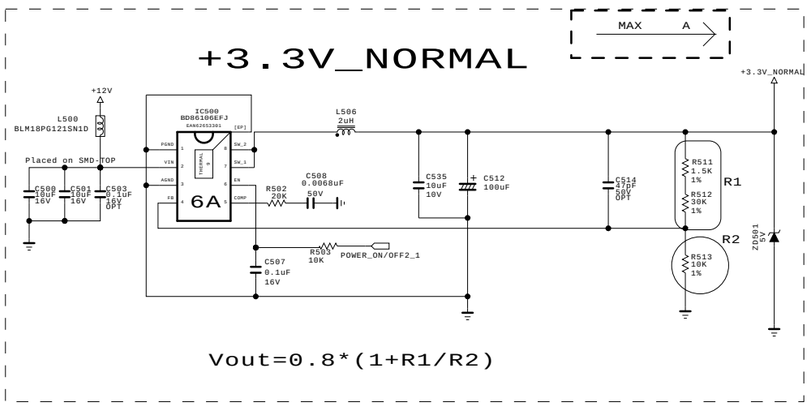


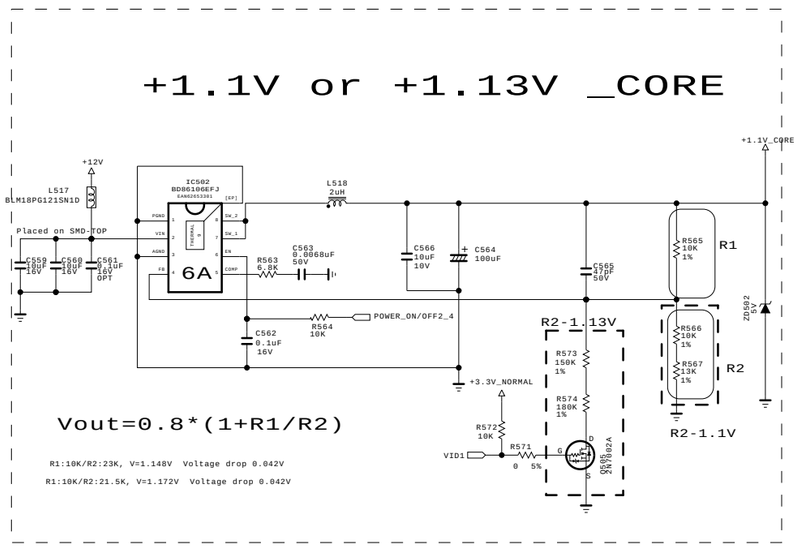












POWER UP SEQUENCE
5V/3.3V->1.5V/1.1V->1.0V

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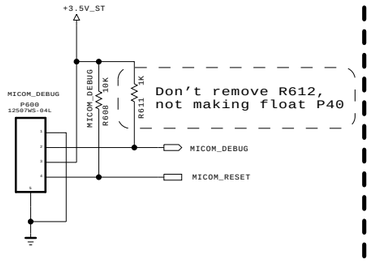
LG ELECTRONICS

MODEL	UB83	DATE	2013-10-28
BLOCK	POWER	SHEET	05

Renesas MICOM

For Debug



LM14 Power SEQUENCE

POWER_ON/OFF!(5V)

↓

POWER_ON/OFF2_1(3.3V)

↓

POWER_ON/OFF2_3(1.5V)

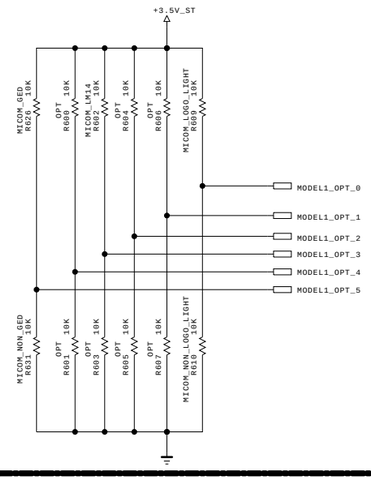
↓

POWER_ON/OFF2_4(1.1V)

↓

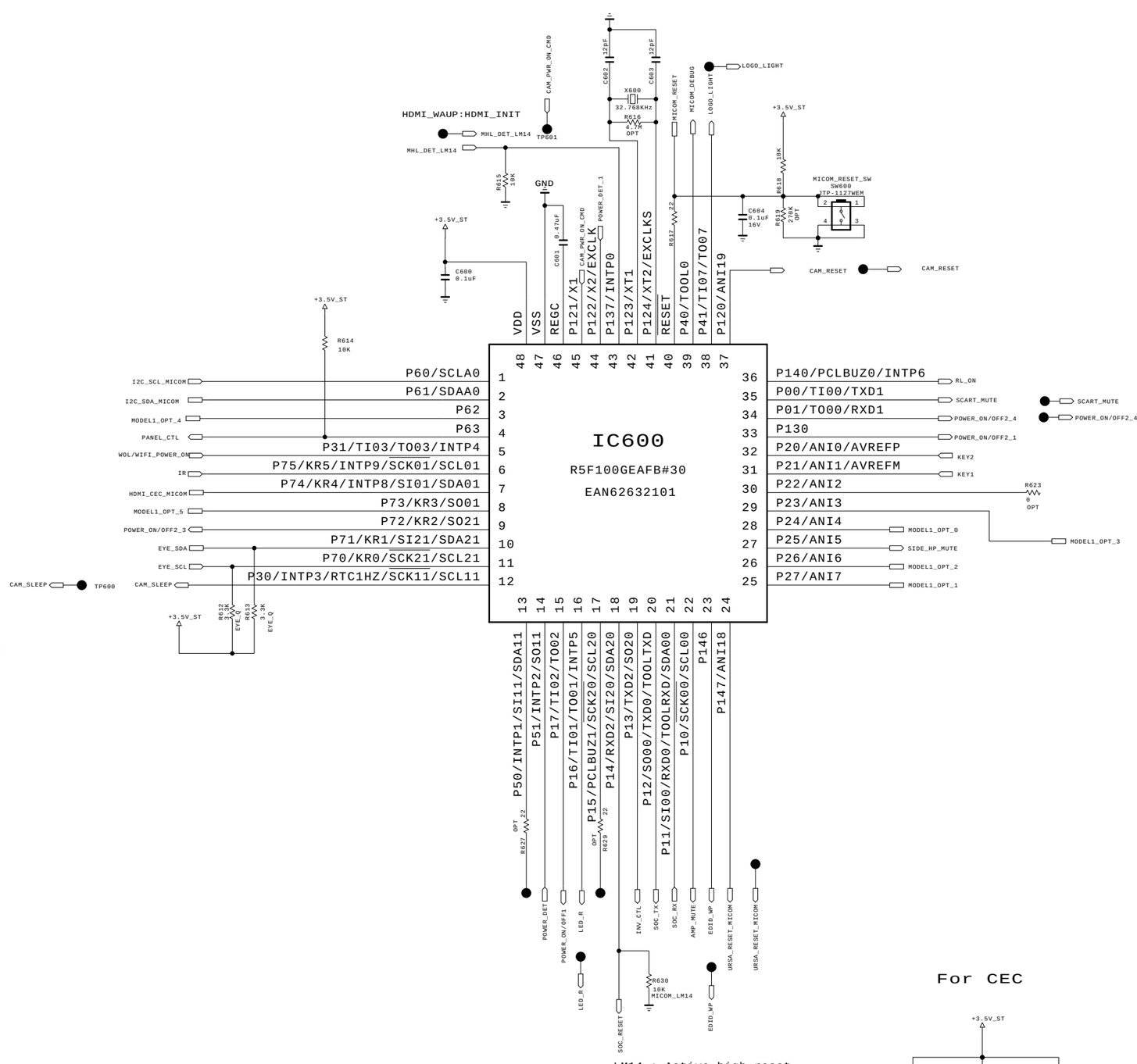
SOC_RESET

MICOM MODEL OPTION



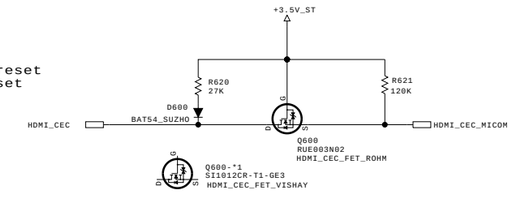
MICOM MODEL OPTION

	0	1	
MODEL_OPT_0	MICOM_NON_LOGO_LIGHT	MICOM_LOGO_LIGHT	
MODEL_OPT_1			Reserved
MODEL_OPT_2			Reserved
MODEL_OPT_3		LM14	
MODEL_OPT_4			Reserved
MODEL_OPT_5	NON_GED	GED	



LM14 : Active high reset
H13 : Active low reset

For CEC



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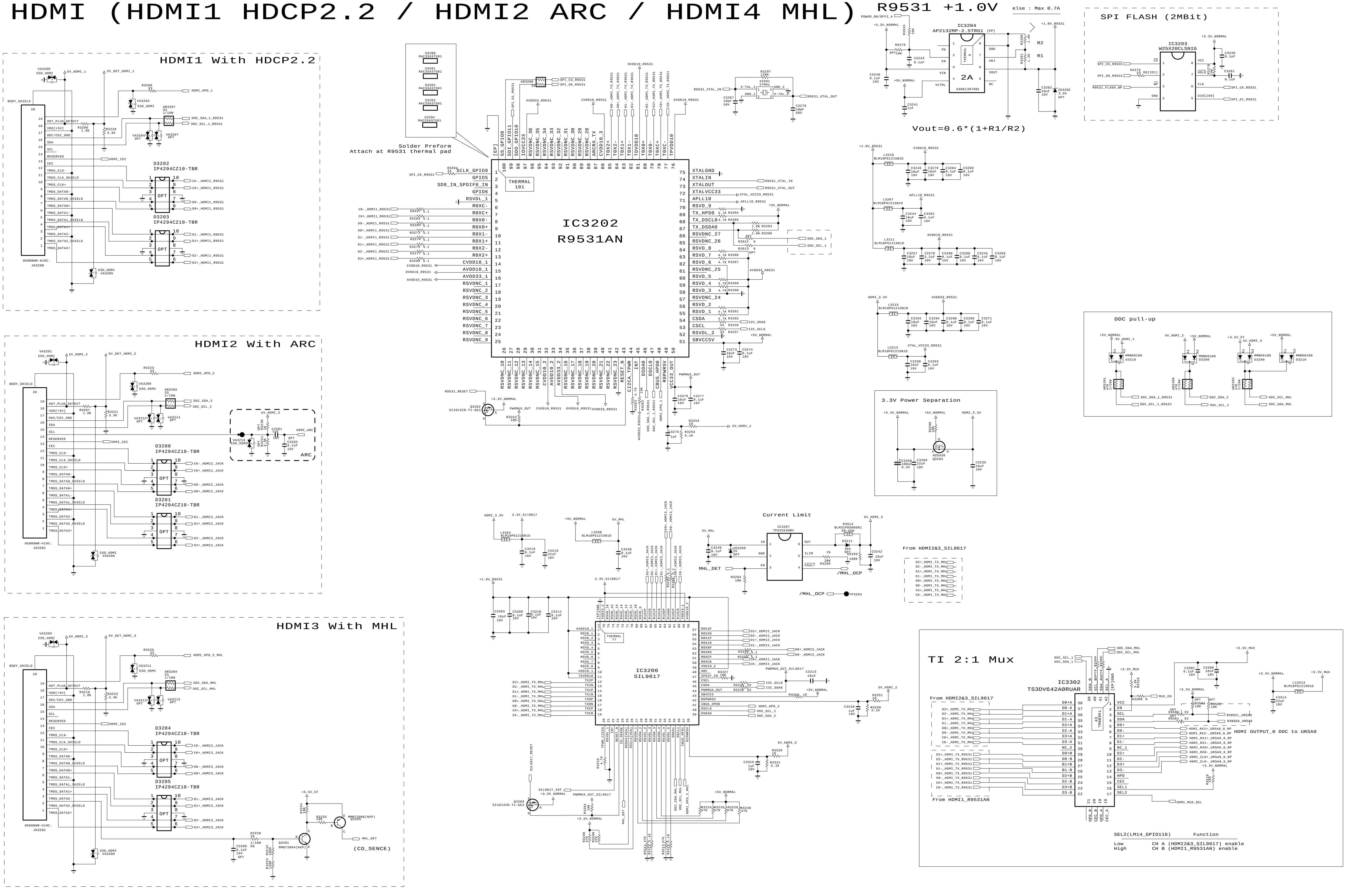
LG ELECTRONICS

MODEL	UB83	DATE	2013-10-28
BLOCK	MICOM	SHEET	06

HDMI (HDMI1 HDCP2.2 / HDMI2 ARC / HDMI4 MHL)



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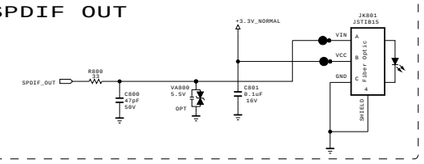
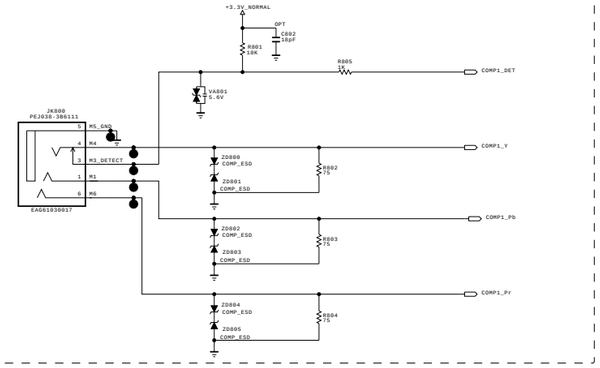
MODEL	UB83	DATE	2013-10-28
BLOCK	HDMI JACK	SHEET	07

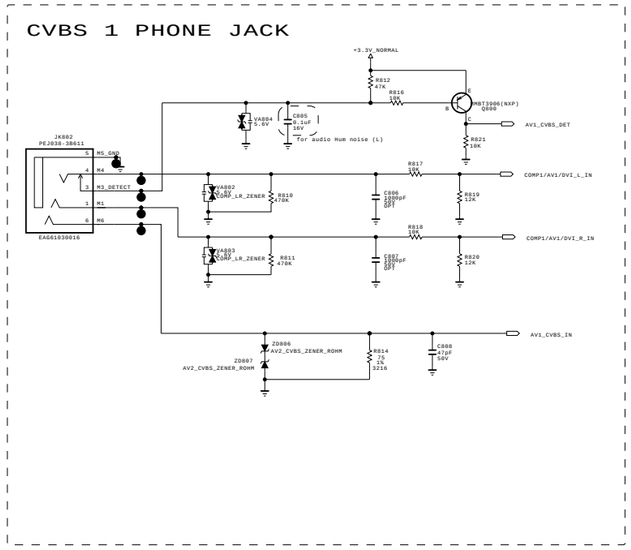
SPDIF OUT



COMPONENT 1 PHONE JACK



CVBS 1 PHONE JACK



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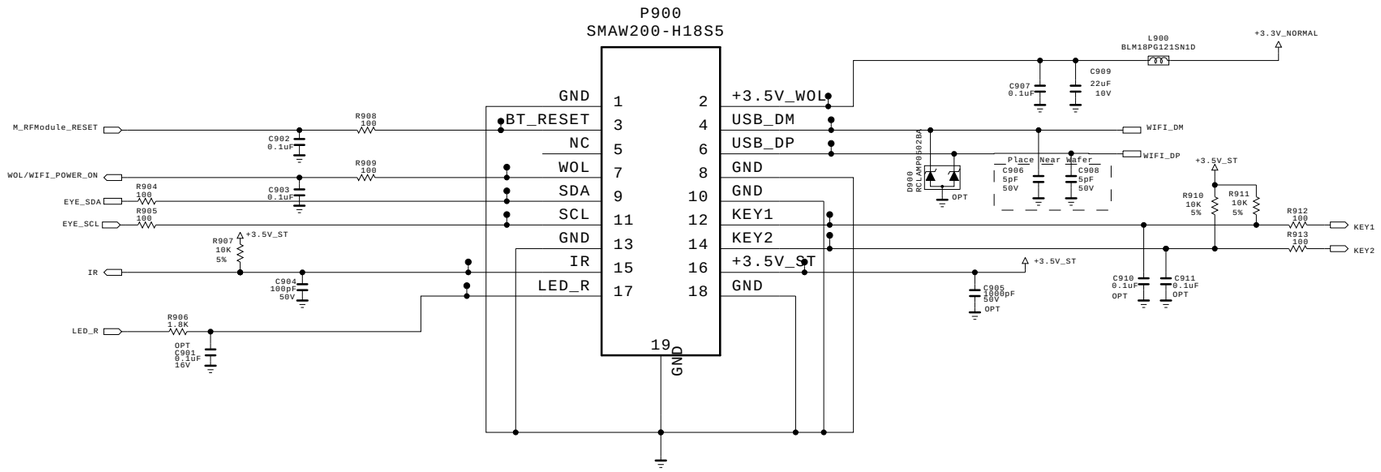
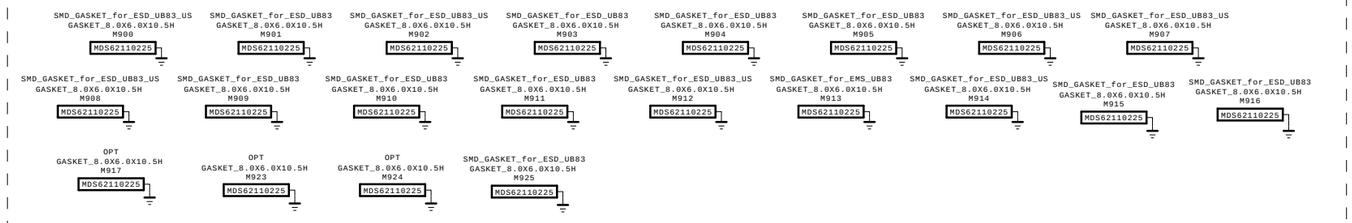
LG ELECTRONICS

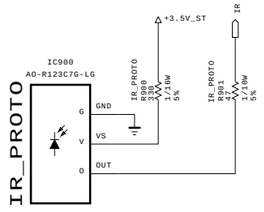
MODEL	UB83	DATE	2013-10-28
BLOCK	AV&COMP JACK	SHEET	08



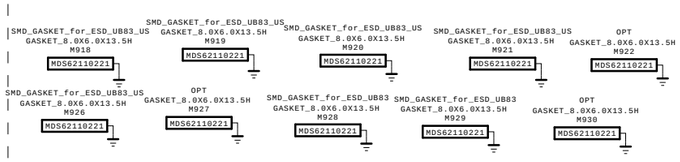
SMD bottom for ESD_UB8 10.5T



only for proto board



SMD T0P for EMI_UB8 13.5T



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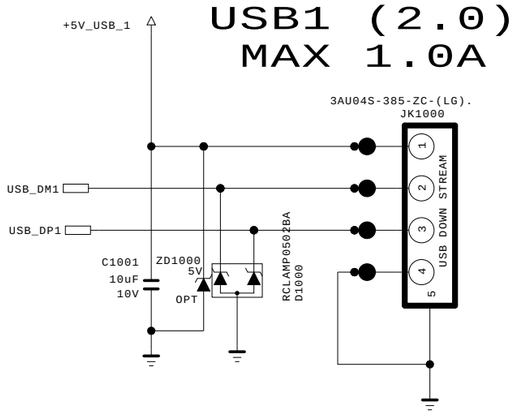
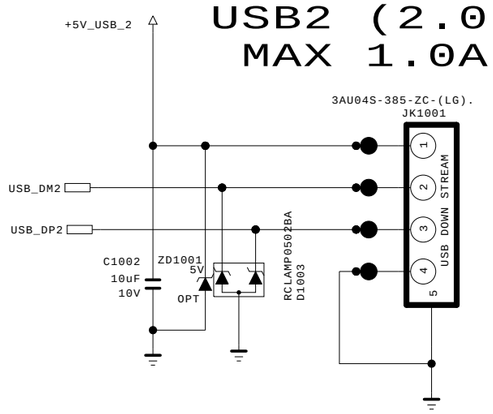
LG ELECTRONICS

MODEL	UB83	DATE	2013-10-28
BLOCK	IR/KEY/WIFI/BT	SHEET	09

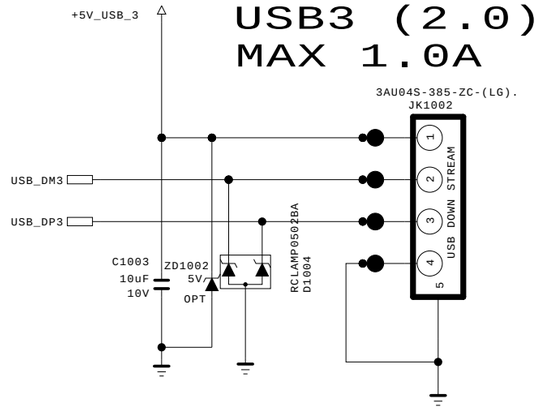
USB1 (2.0) MAX 1.0A



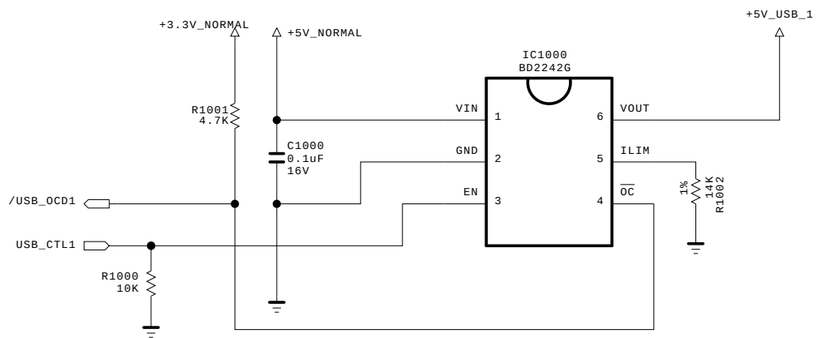
USB2 (2.0) MAX 1.0A



USB3 (2.0) MAX 1.0A



OCP USB1



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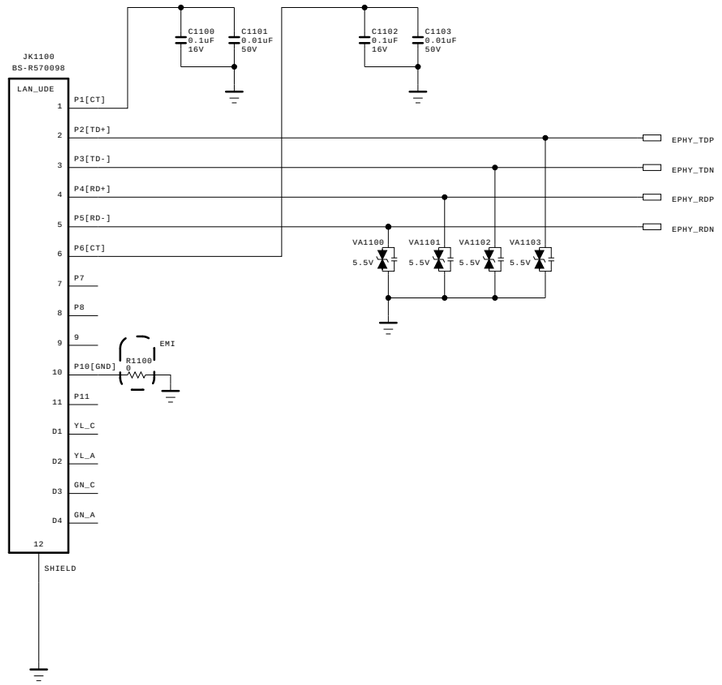
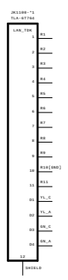
MODEL	UB83	DATE	2013-10-28
BLOCK	USB JACK	SHEET	10

Ethernet Block





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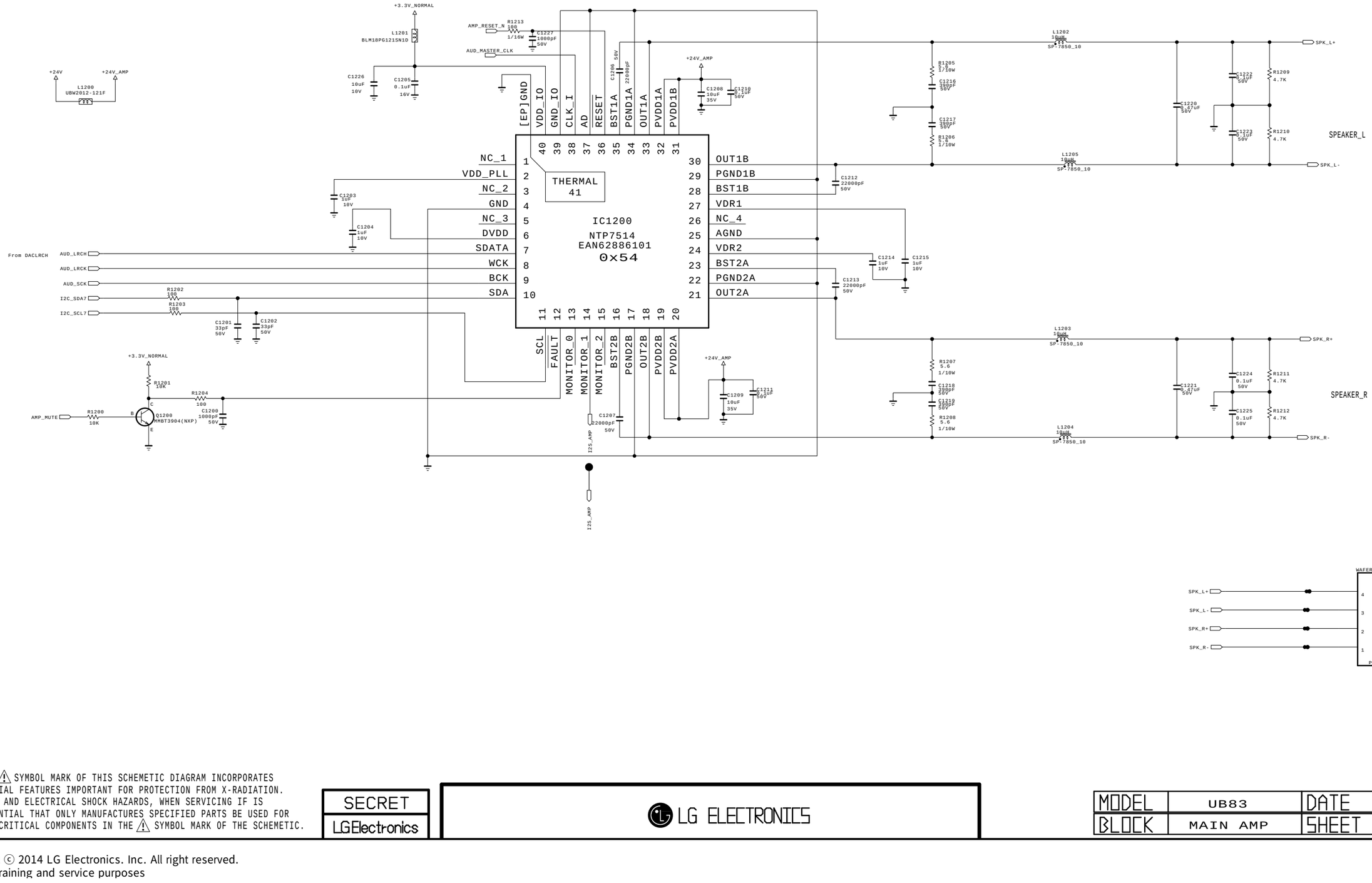
MODEL	UB83	DATE	2013-10-28
BLOCK	LAN JACK	SHEET	11

LGE Internal Use Only

Main AMP



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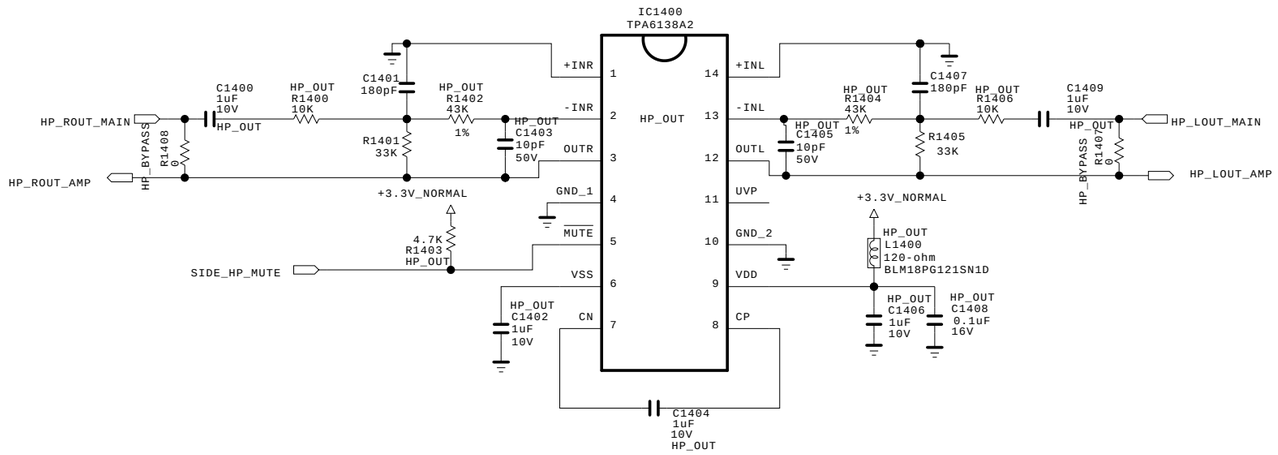
LG ELECTRONICS

MODEL	UB83	DATE	2013-10-28
BLOCK	MAIN AMP	SHEET	12 /

EARPHONE AMP



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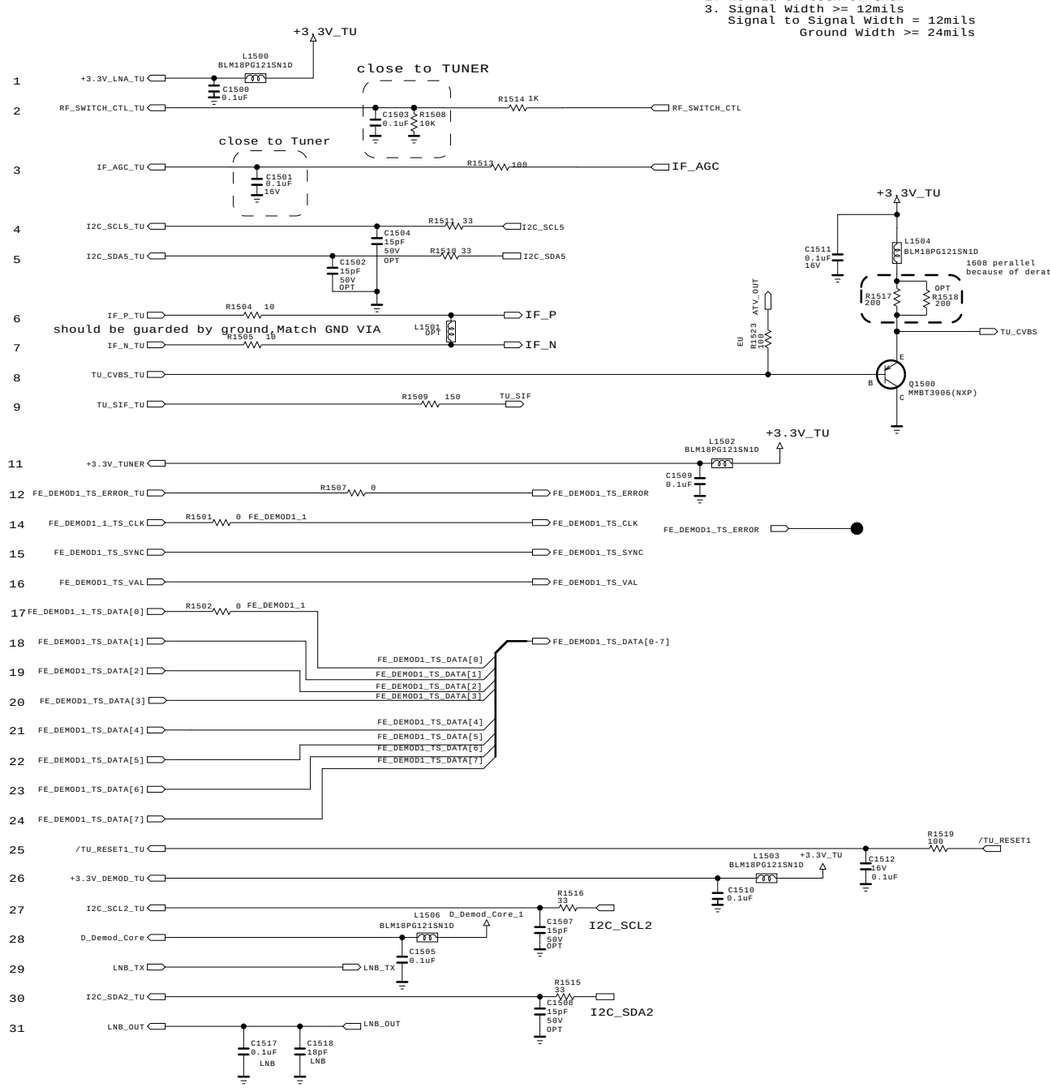
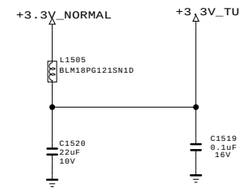
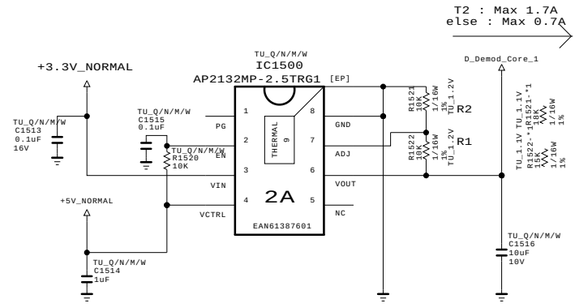
LG ELECTRONICS

MODEL	UB83	DATE	2013-10-28
BLOCK	HEADPHONE AMP	SHEET	14

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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LG ELECTRONICS

MODEL	UB83	DATE	2013-10-28
BLOCK	TU CIRCUIT	SHEET	15

DEV_TDJM_G251D
TU1602
TDJM-G251D
EBL61400503

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

DEV_TDJM_H151F
TU1603
TDJM-H151F
EBL61400602

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]
12	S_ERROR
13	GND_1
14	S_MCLK
15	S_SYNC
16	S_VAILD
17	S_DATA
18	NC_3
19	NC_4
20	NC_5
21	NC_6
22	NC_7
23	NC_8
24	NC_9
25	S_RESET_DEMOD
26	B3[+3.3V]
27	SCL_DEMOD
28	B4[+1.1V]
29	NC_10
30	SDA_DEMOD

A1 A1 47 B1 B1
SHIELD
TU_GND_A
TU_GND_B

DEV_TDJM-K151F
TU1607
TDJM-K151F
EBL61400802

1	B1[+3.3V]	
2	RF_SW_CTL	
3	AIF_AGC	
4	SCL_RF	
5	SDA_RF	
6	AIF[P]	
7	AIF[N]	
8	NC_1	
9	NC_2	
10	NC_3	
11	NC_4	+3.3V_TUNER
12	ERROR	FE_DEMOD1_TS_ERROR_TU
13	GND	
14	MCLK	FE_DEMOD1_1_TS_CLK
15	SYNC	FE_DEMOD1_TS_SYNC
16	VAILD	FE_DEMOD1_TS_VAL
17	D0	FE_DEMOD1_1_TS_DATA[0]
18	D1	FE_DEMOD1_TS_DATA[1]
19	D2	FE_DEMOD1_TS_DATA[2]
20	D3	FE_DEMOD1_TS_DATA[3]
21	D4	FE_DEMOD1_TS_DATA[4]
22	D5	FE_DEMOD1_TS_DATA[5]
23	D6	FE_DEMOD1_TS_DATA[6]
24	D7	FE_DEMOD1_TS_DATA[7]
25	RESET_DEMOD	/TU_RESET1_TU
26	B2[+3.3V]	+3.3V_DEMOD_TU
27	SCL_DEMOD	I2C_SCL2_TU
28	B3[+1.2V]	D_Demod_Core
29	NC_5	LNB_TX
30	SDA_DEMOD	I2C_SDA2_TU
		LNB_OUT

A1 A1 47 B1 B1
SHIELD
TU_GND_A
TU_GND_B

DEV_TDJH_H251F
TU1604
TDJH-H251F
EBL61380102

1	B1[+3.3V]
2	NC
3	DIF_AGC
4	SCL
5	SDA
6	DIF[P]
7	DIF[N]
8	SIF
9	CVBS

A1 A1 47 B1 B1
SHIELD
TU_GND_A
TU_GND_B

DEV_TDJK-T151F
TU1606
TDJK-T151F
EBL61400002

1	B[+3.3V]
2	RF_SW_CTL
3	IF_AGC
4	SCL
5	SDA
6	IF[P]
7	IF[N]
8	NC_1
9	NC_2

+3.3V_LNA_TU
RF_SWITCH_CTL_TU
IF_AGC_TU
I2C_SCL5_TU
I2C_SDA5_TU
IF_P_TU
IF_N_TU
TU_SIF_TU
TU_CVBS_TU

A1 A1 47 B1 B1
SHIELD
TU_GND_A
TU_GND_B

TU_M/W_EU_3300pF
TU_M/W_EU_3300pF
TU_M/W_EU_3300pF
C1605 3300pF 630V
C1603 3300pF 630V
C1604 3300pF 630V
TU_GND_B
TU_GND_A

C1606-*1 3300pF 630V
C1602 1000pF 630V
C1606 1000pF 630V
R1602 0
R1603 0
TU_M/W_CN/HK/TW/BR/EU_3300pF
TU_M/W_CN/HK/TW/BR/EU_1000pF
TU_M/W_CN/HK/TW/BR/EU_1000pF
TU_H/M_KR/US/JP/EU
TU_H/M_KR/US/JP/EU
TU_GND_A

C1601 1000pF 630V
C1600 1000pF 630V
C1601-*1 3300pF 630V
TU_H/M/W_KR/US/CN/JP/TW/BR/EU/A1_1000pF
TU_H/M/W_KR/US/CN/JP/TW/BR/EU/A1
TU_H/M/W_KR/US/CN/JP/TW/BR/EU/A1_3300pF
TU_GND_B

R1601 0
GND_3
for tuner EMS (S4) testing

TU1603-*2
TDJH-C351D

TU1602-*1
TDJH-G255D

TU1603-*1
TDJH-H101F

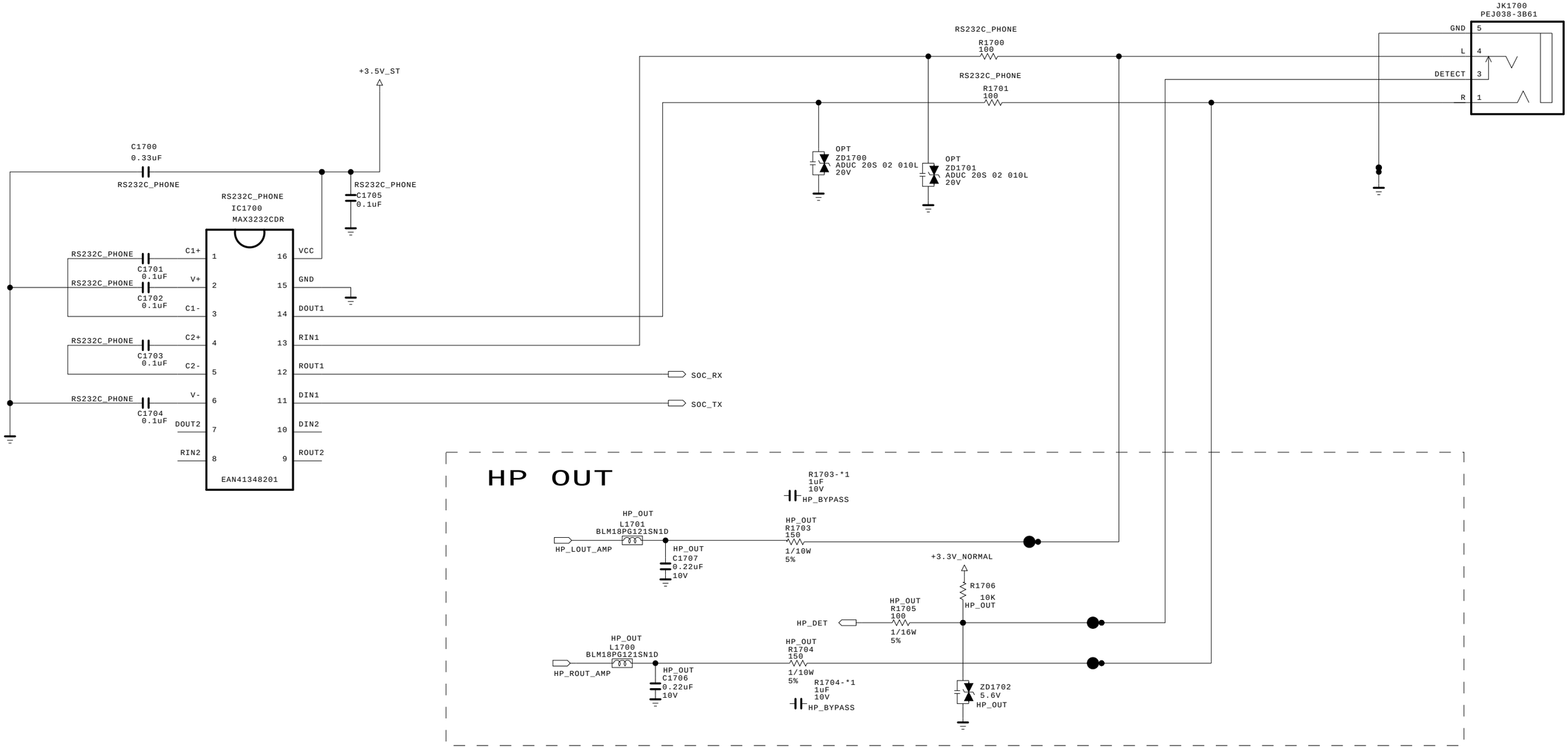
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

SECRET
LGElectronics

LG ELECTRONICS

MODEL	UB83	DATE	2013-10-28
BLOCK	TU_SYMBOL	SHEET	16

RS-232C Control INTERFACE



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

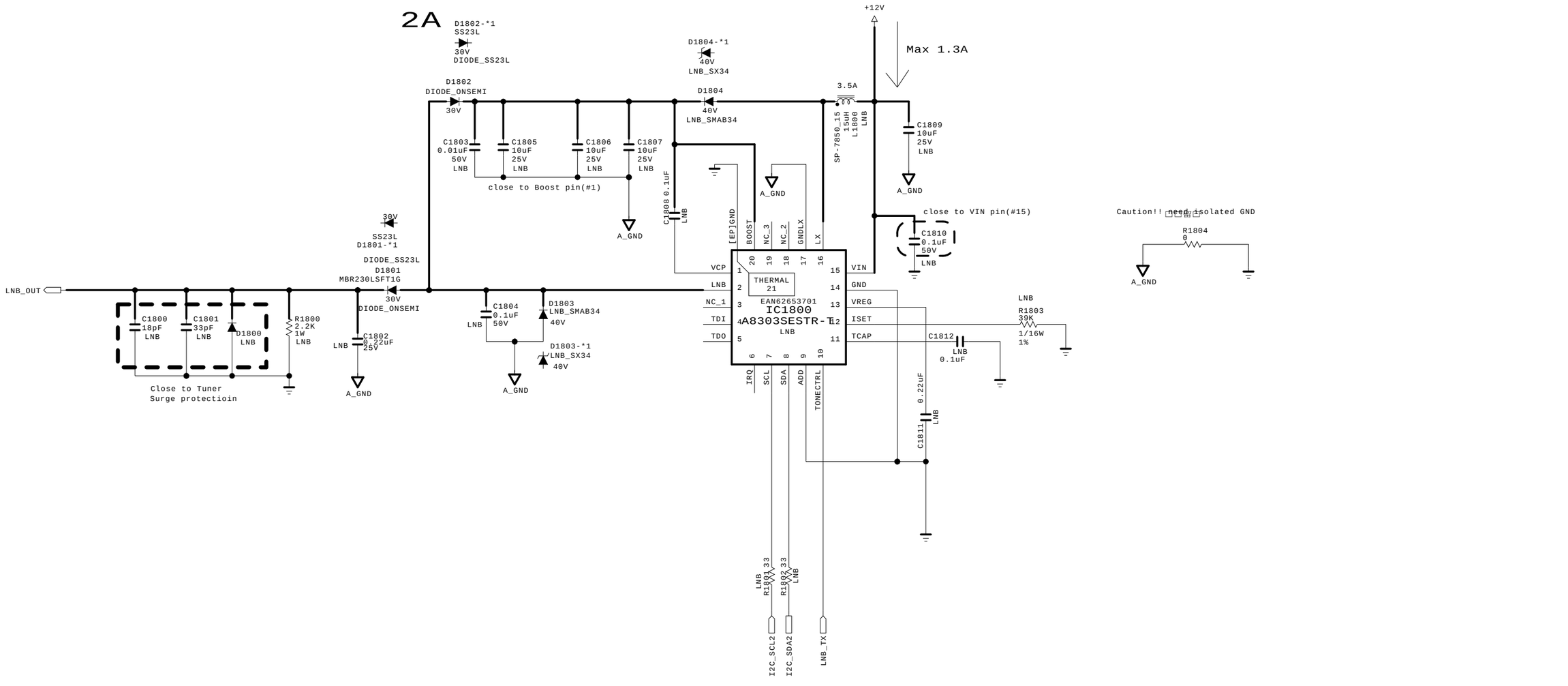
MODEL	UB83	DATE	2013-10-28
BLOCK	RS232C	SHEET	17

DVB-S2 LNB Part Allegro

(Option:LNB)

3A

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



THE ⚠ SYMBOL MARK OF THIS 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.

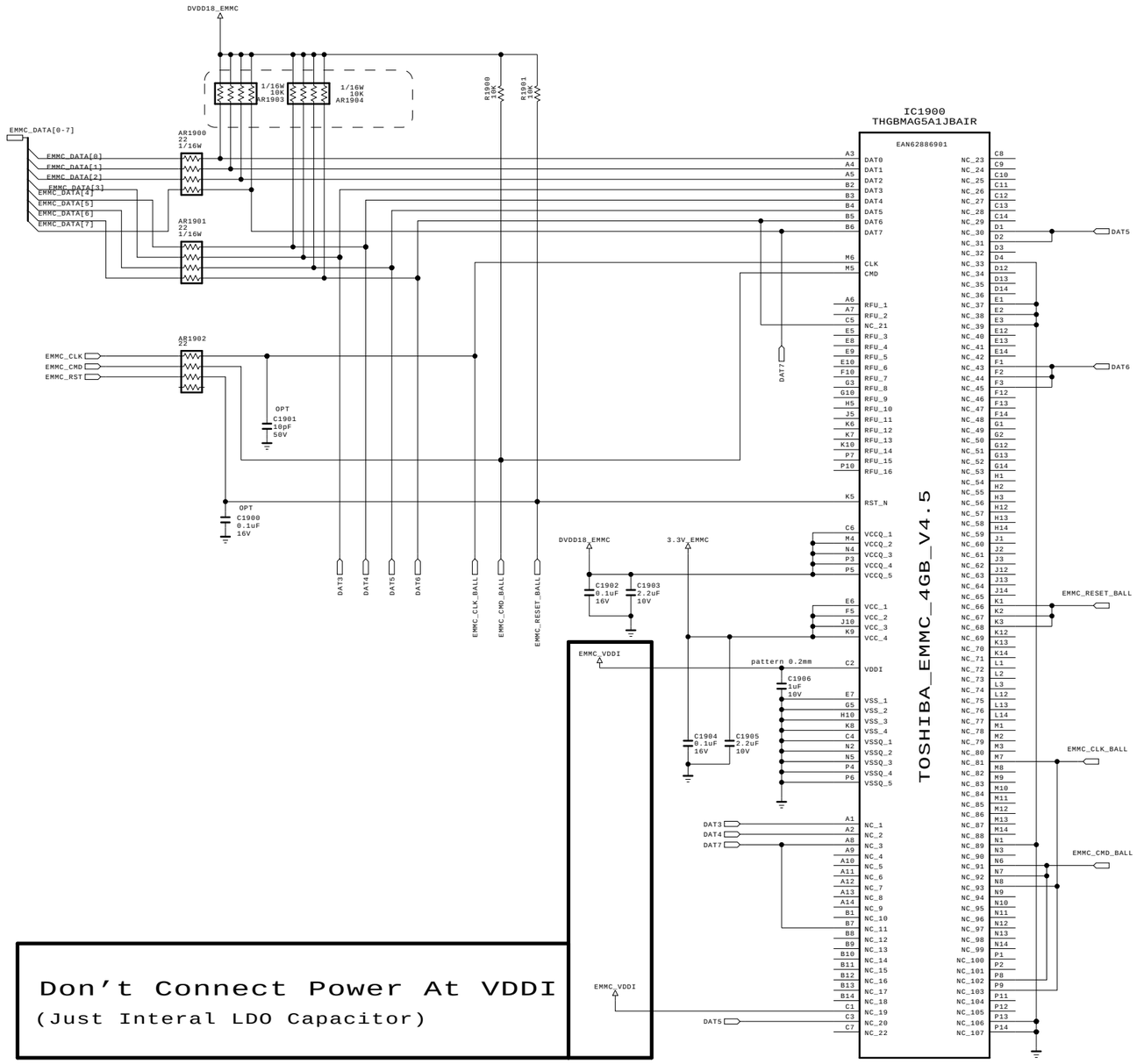
SECRET

LGElectronics

LG ELECTRONICS

MODEL	UB83	DATE	2013-10-28
BLOCK	LNB	SHEET	18

eMMC I/F



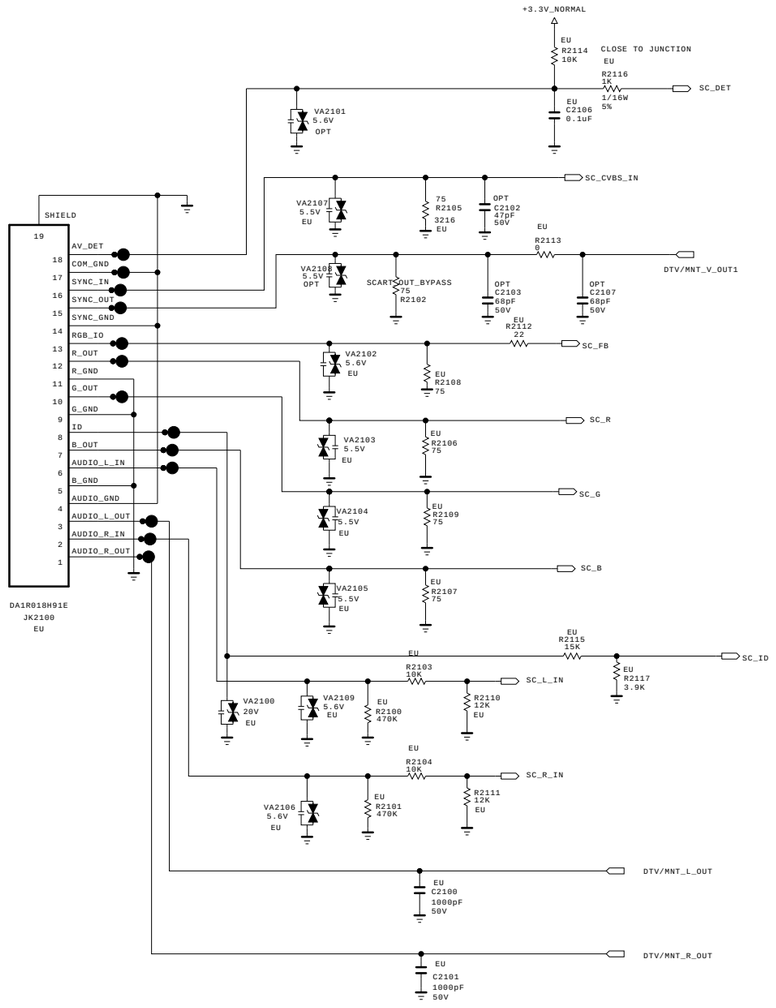
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

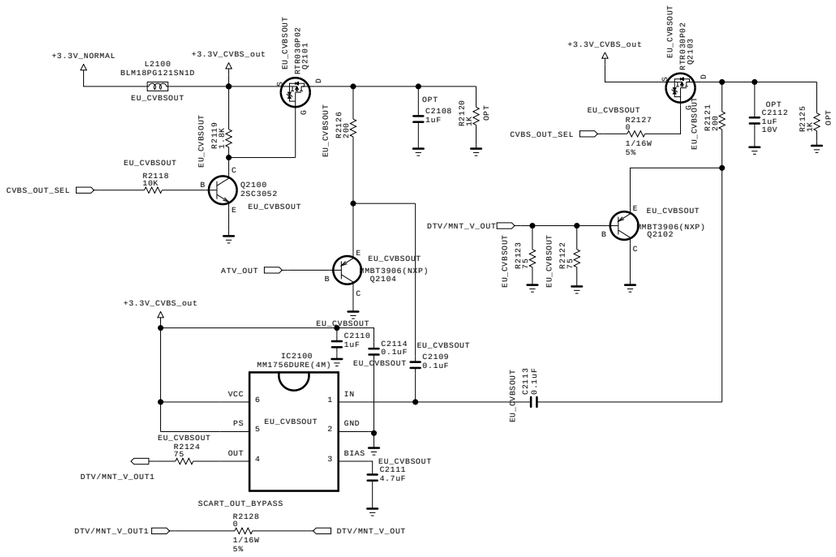
SECRET
LGElectronics

LG ELECTRONICS

MODEL	UB83	DATE	2013-10-28
BLOCK	EMMC	SHEET	19

Full Scart(18 Pin Gender)





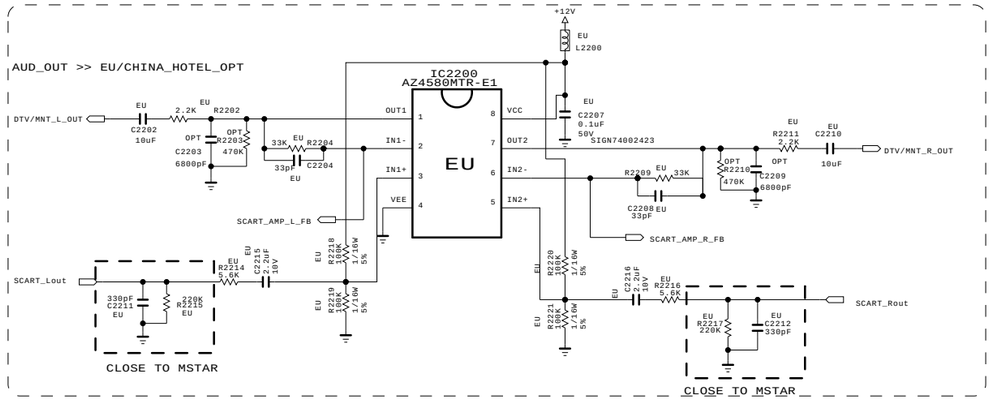
CVBS_OUT_SEL	0	1	
DTV_MNT_V_OUT1	DTV OUT	ATV OUT	

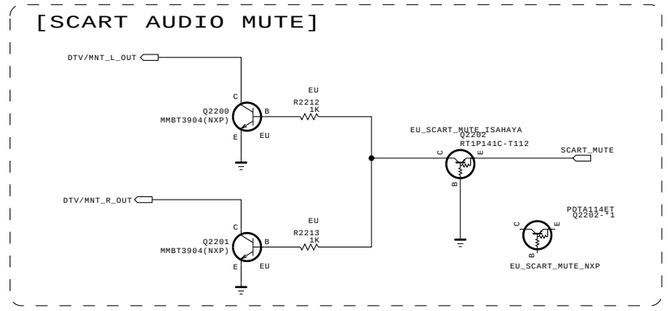
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

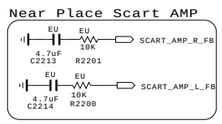
SECRET
LGElectronics

LG ELECTRONICS

MODEL	UB83	DATE	2013-10-28
BLOCK	SCART JACK	SHEET	21







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SECRET
LGElectronics

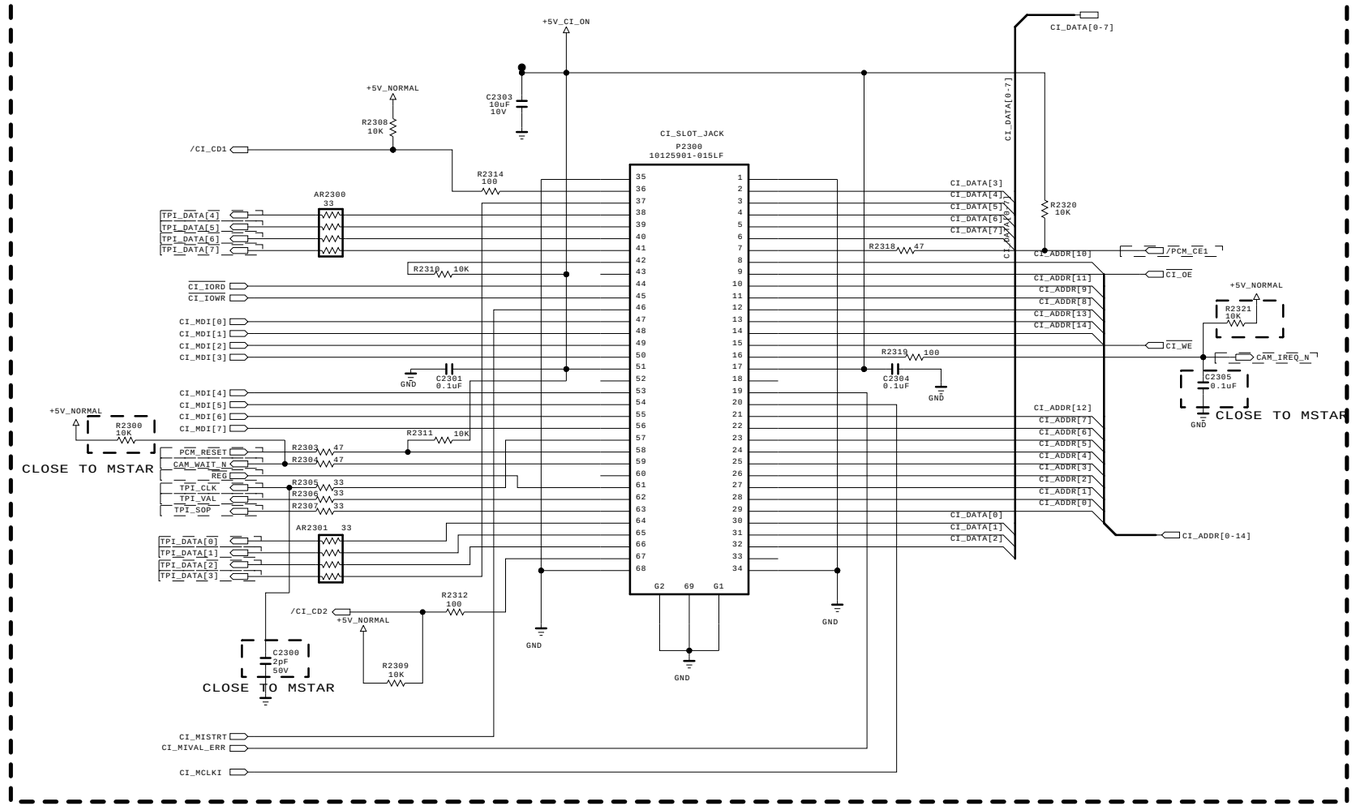
LG ELECTRONICS

MODEL	UB83	DATE	2013-10-28
BLOCK	SCART JACK	SHEET	21

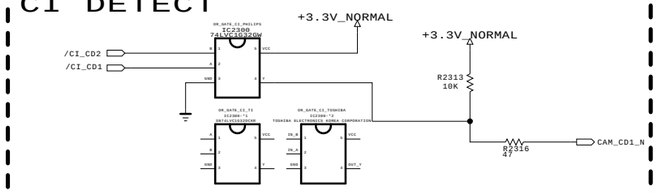
CI Region

* Option name of this page : CI_SLOT
(because of Hong Kong)

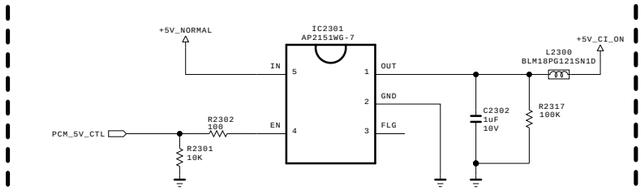
CI SLOT



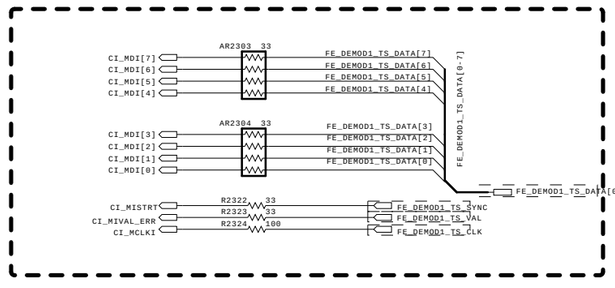
CI DETECT



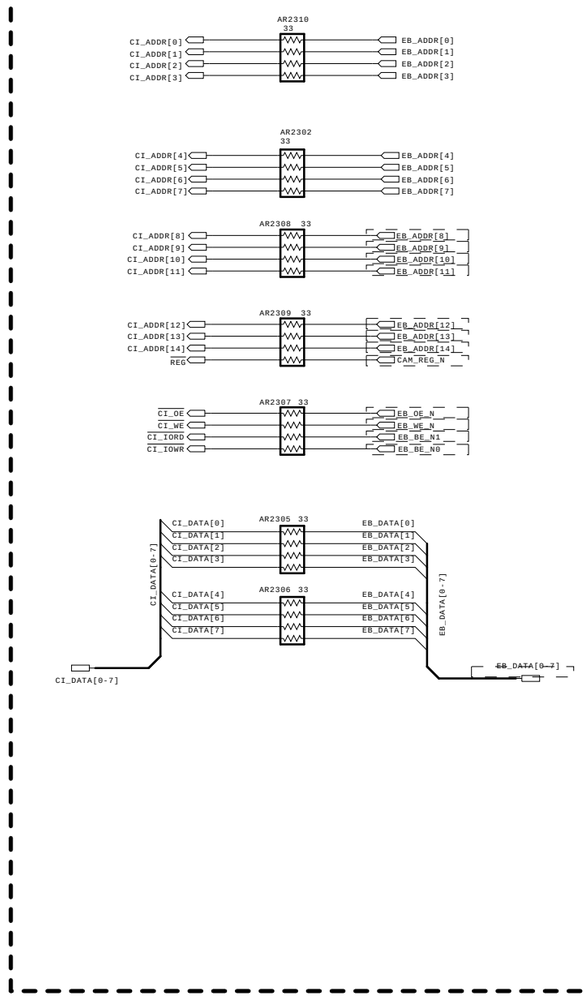
CI POWER ENABLE CONTROL



CI TS INPUT



CI HOST I/F



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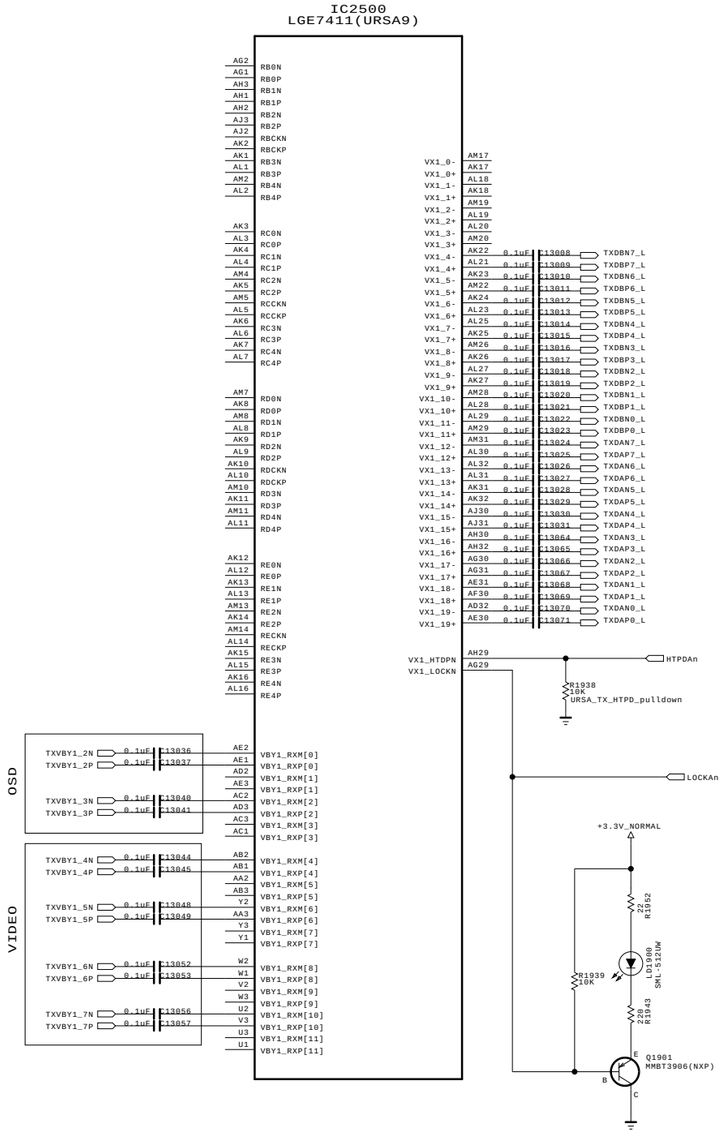
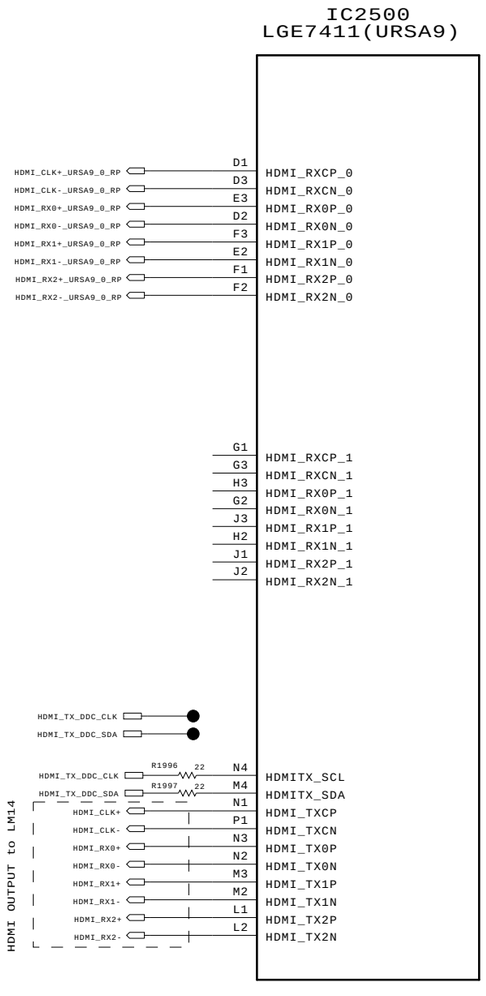
SECRET
LGElectronics

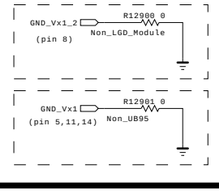
LG ELECTRONICS

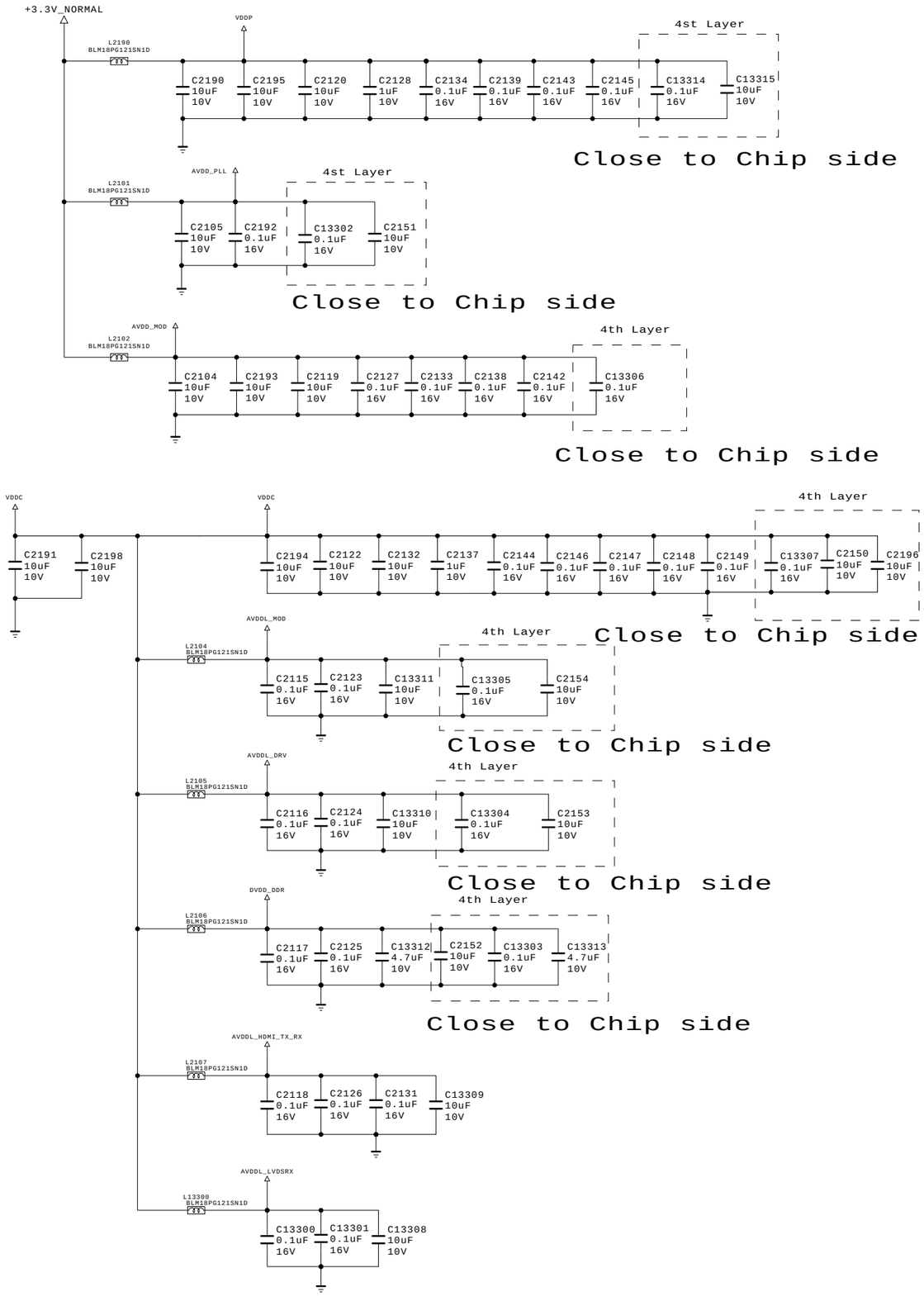
MODEL	NC5_M1A	DATE	2013.04.29
BLOCK	PCMCI	SHEET	19





GND Connection at Vx1 41pin wafer





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SECRET
LGElectronics

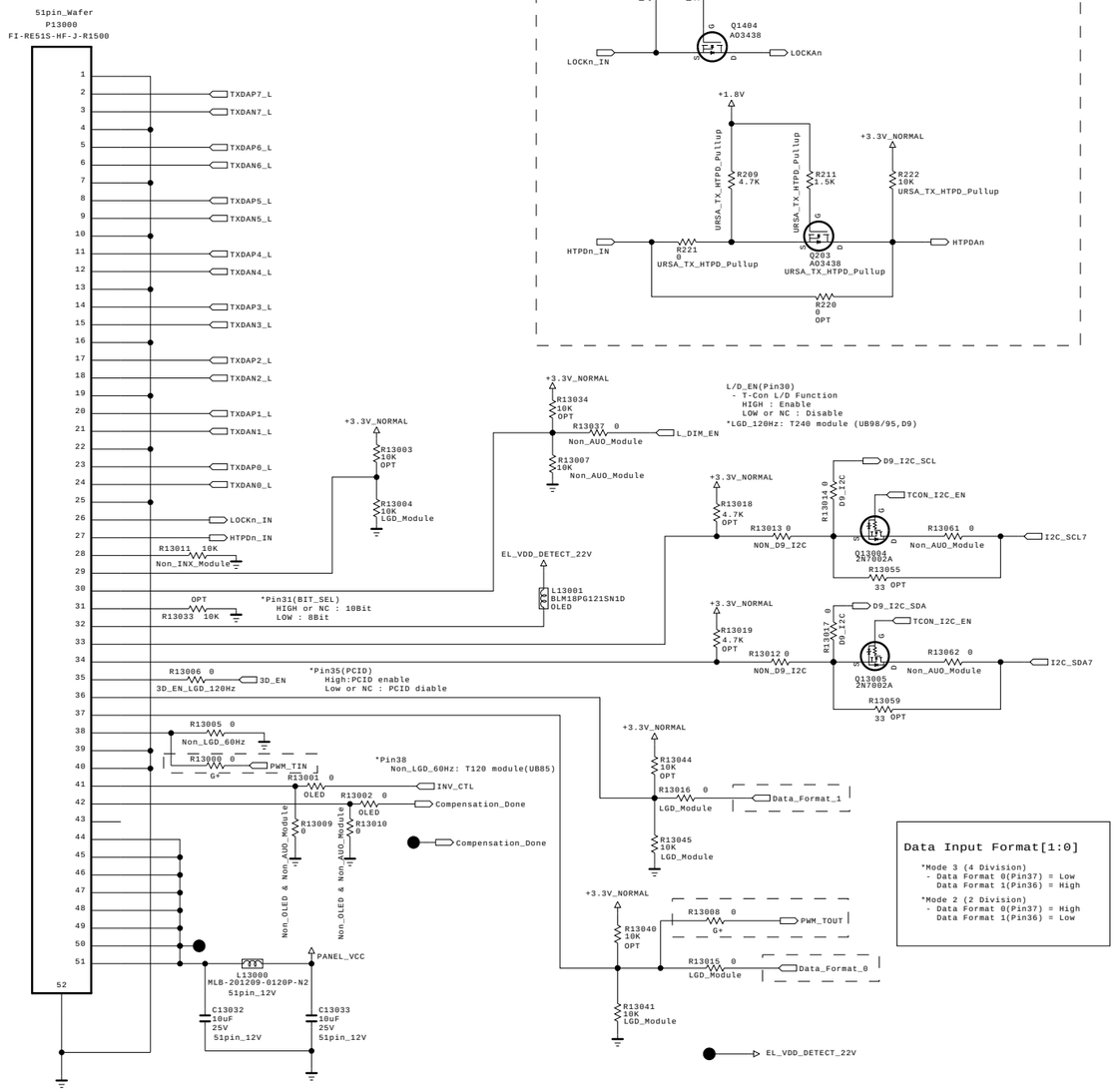
LG ELECTRONICS

BSD-14Y-UD-128-02-HD

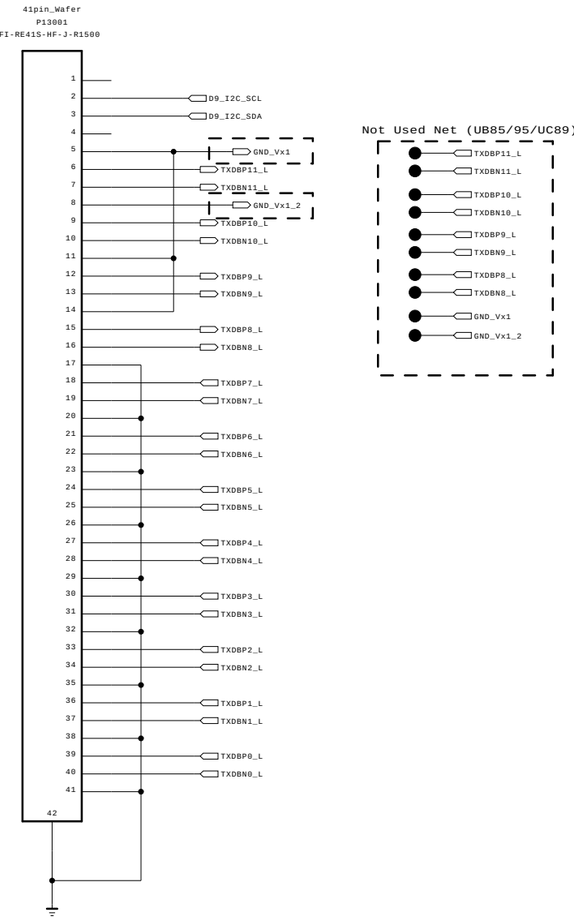
MODEL		DATE	2013.12.17
BLOCK	U_LVDS INPUT	SHEET	/

LGE Internal Use Only

[51P Vx1 output wafer]



[41P Vx1 output wafer]



Not Used Net (UB85/95/UC89)

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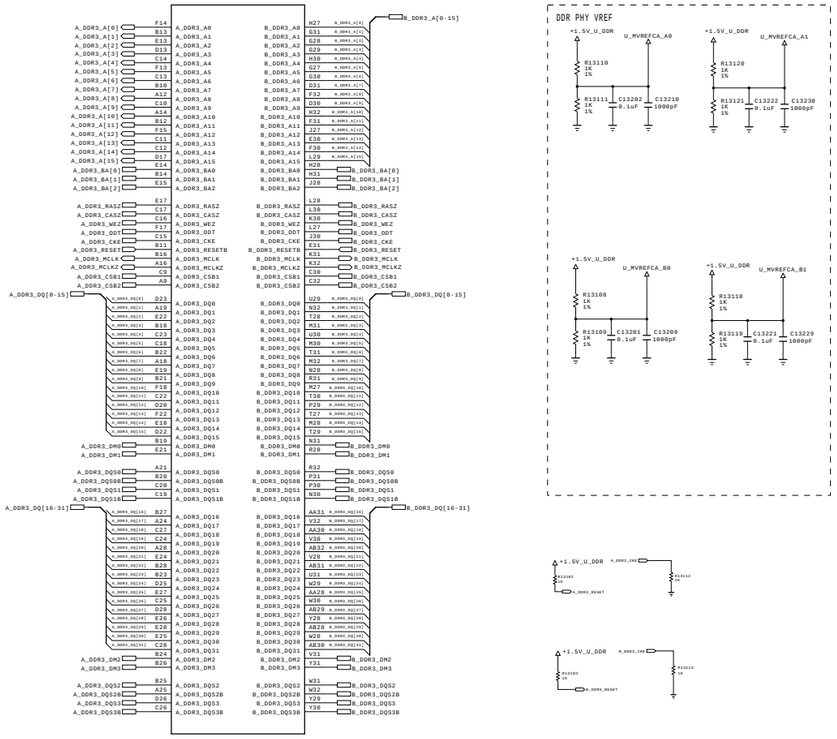
SECRET
LGElectronics

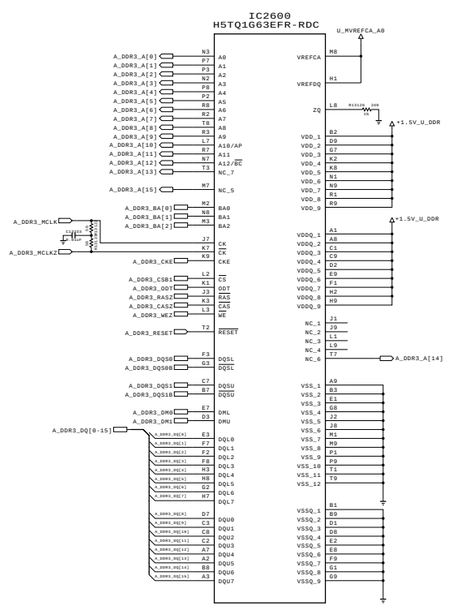
LG ELECTRONICS

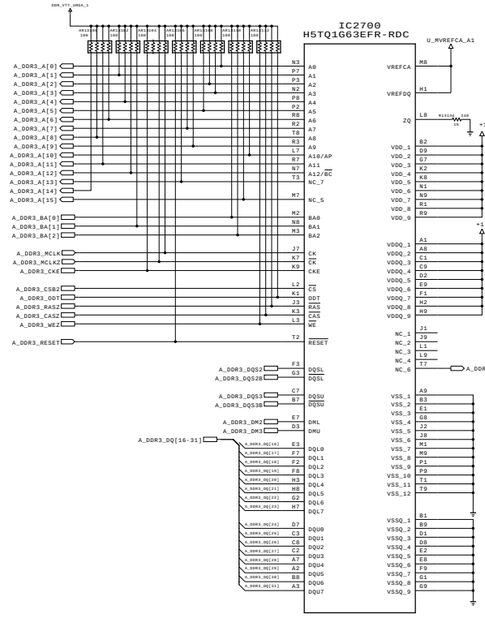
BSD-14Y-UD-130-HD

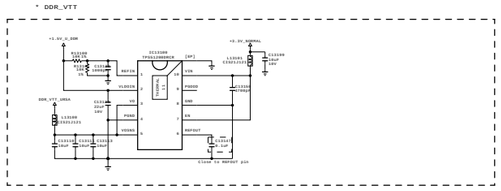
MODEL		DATE	2013.12.17
BLOCK	Output_wafer	SHEET	/

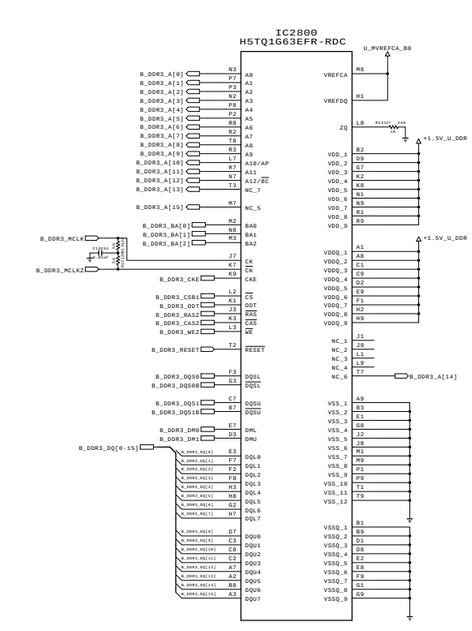
LGE Internal Use Only

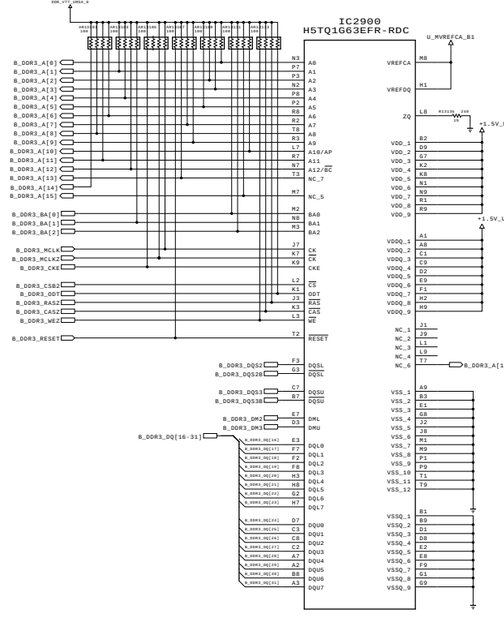


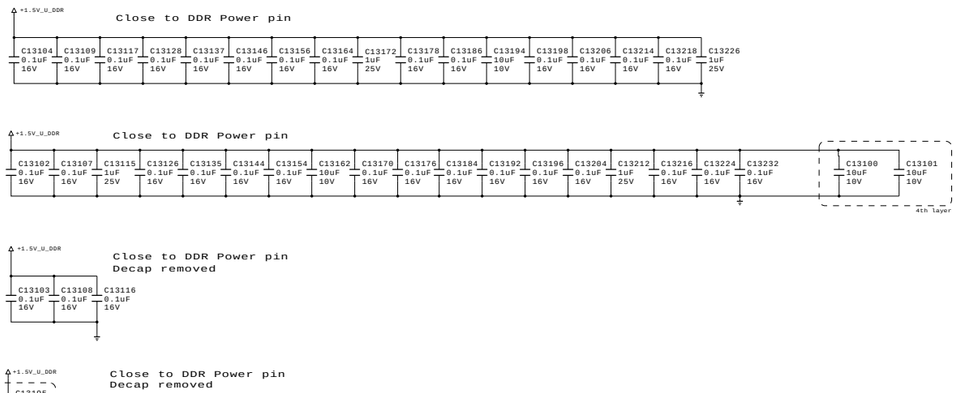












BSD-14Y-UD-131-HD

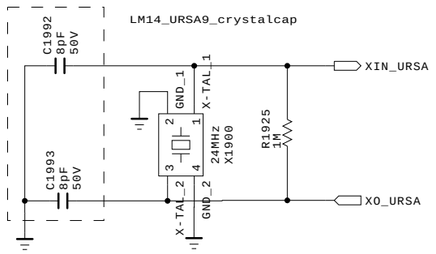
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

MODEL		DATE	2013.12.17
BLOCK	URSA7_DDR	SHEET	

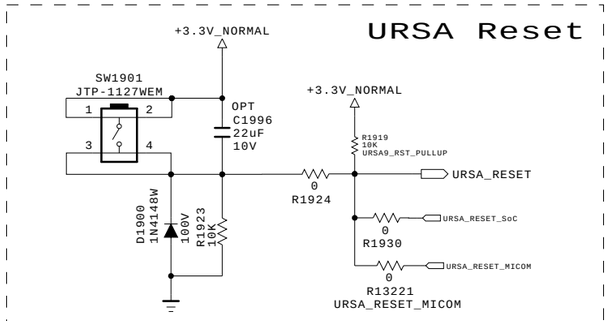
SECRET
LGElectronics

LG ELECTRONICS

Clock for URSA9



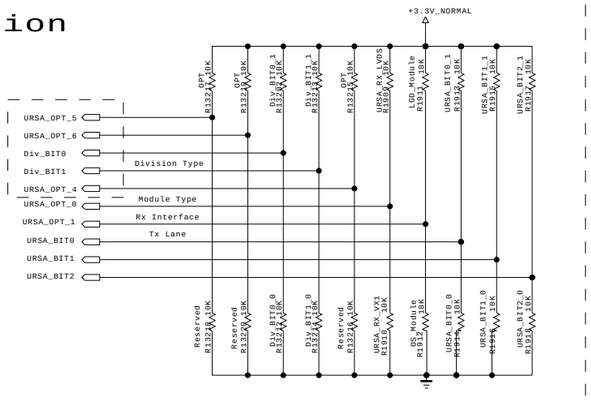
URSA Reset



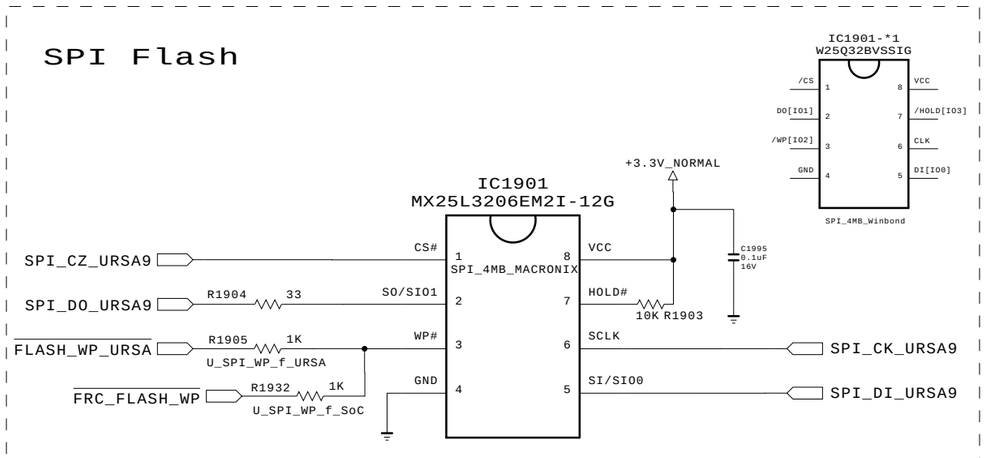
URSA9 Option

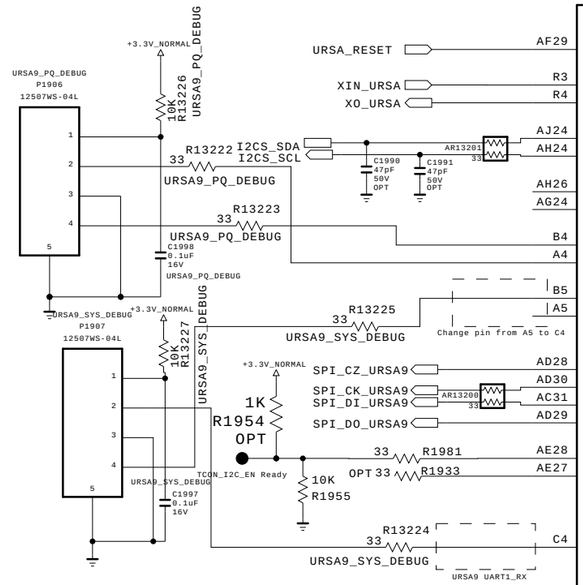
BIT [1/0]	Module Division
0/0	Non Division
0/1	2 Division
1/0	4 Division
1/1	8 Division

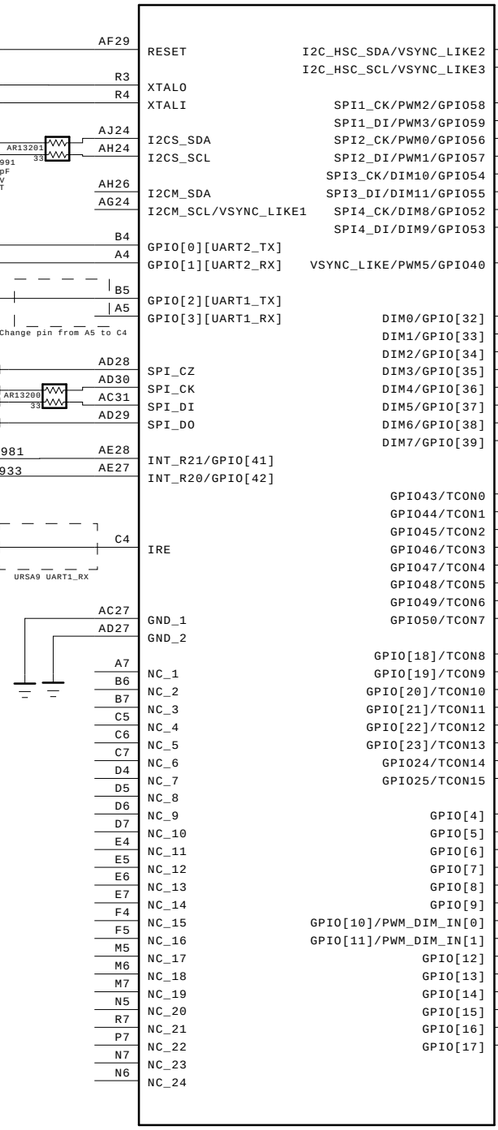
BIT [2/1/0]	Tx Lane
0/0/0	4K@120 (16lane)
0/0/1	4k@60 (8lane)
0/1/0	5k@120 (20lane)
0/1/1	OLED ULTRA HD
1/0/0	FHD@120 (4lane)
1/0/1	FHD@60 (2lane)
1/1/0	Reserved
1/1/1	Reserved



SPI Flash



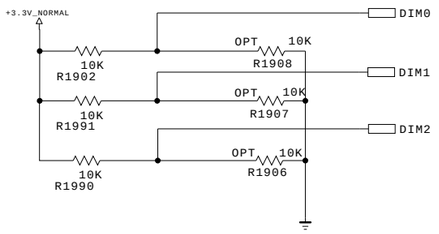




IC2500
LGE7411(URSA9)

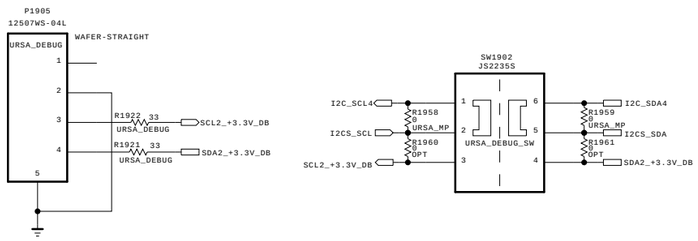
Chip Config

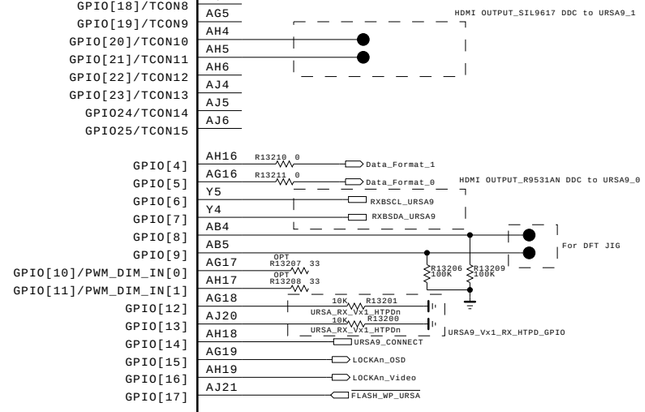
Debug/ISP ADDR
Slave (Debug Port:0XB4,ISP:0X98)
CHIP_CONF:{DIM2,DIM1,DIM0}
CHIP_CONF=3'd7:111:boot from SPI Flash

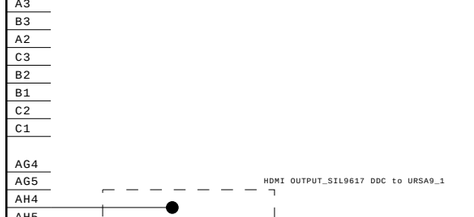


Debugging for URSA9

I2C_S Port





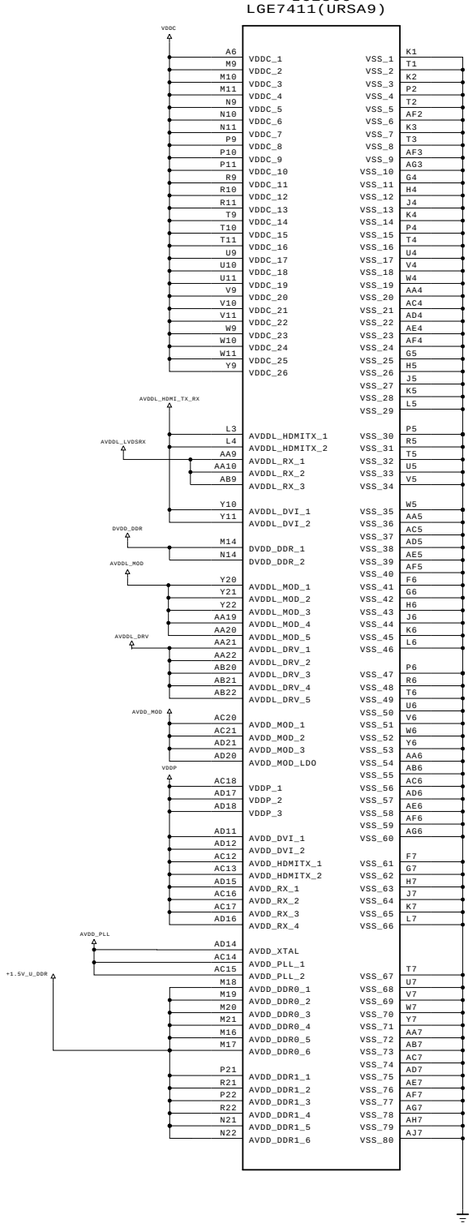


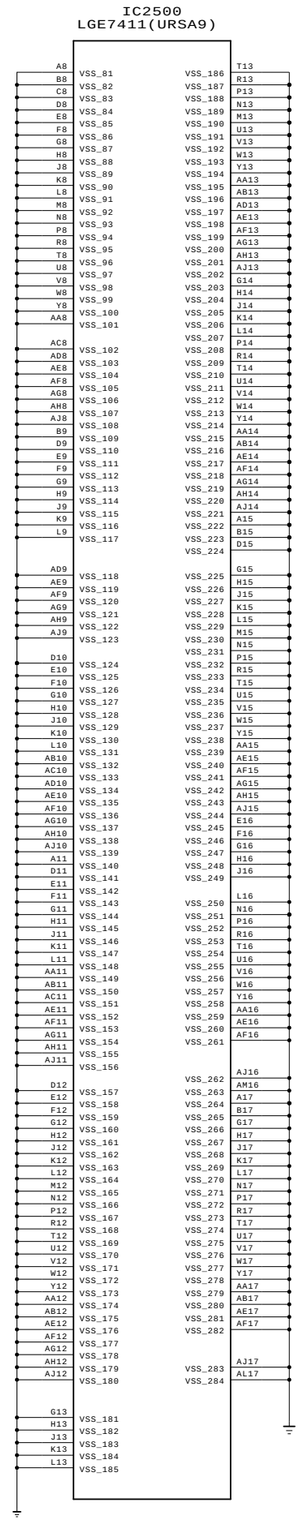
SECRET
LGElectronics

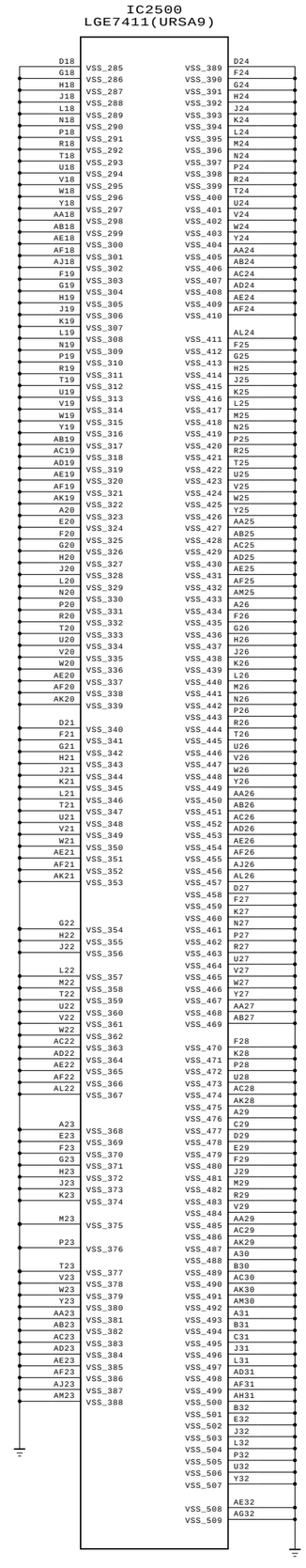
LG ELECTRONICS

BSD-14Y-UD-132-HD

MODEL		DATE	2013.12.17
BLOCK		SHEET	/







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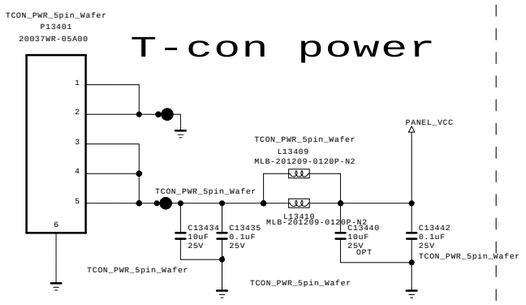
SECRET
LGElectronics

LG ELECTRONICS

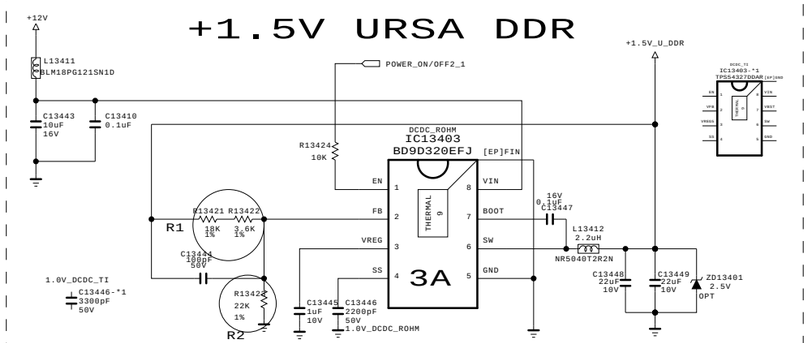
BSD-14Y-UD-133-HD

MODEL		DATE	2013.12.17
BLOCK	U_Power	SHEET	/

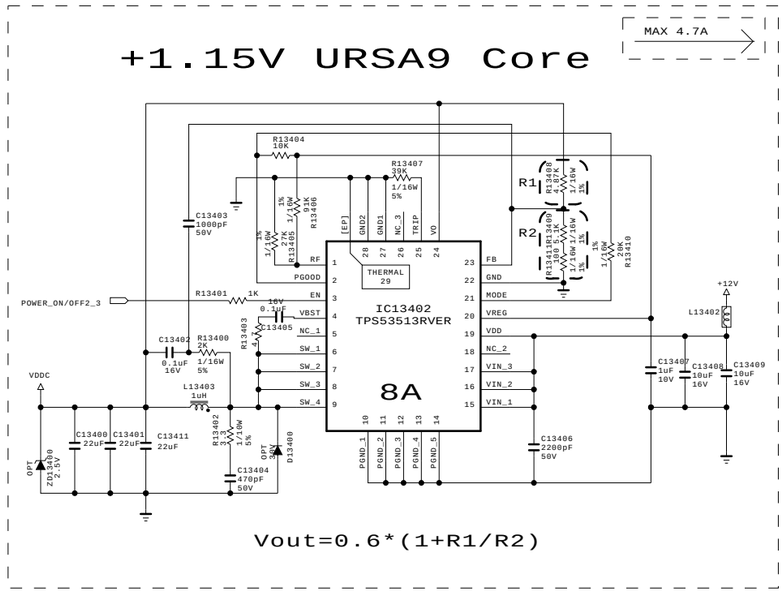
T-con power



+1.5V URSA DDR



+1.15V URSA9 Core



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	/

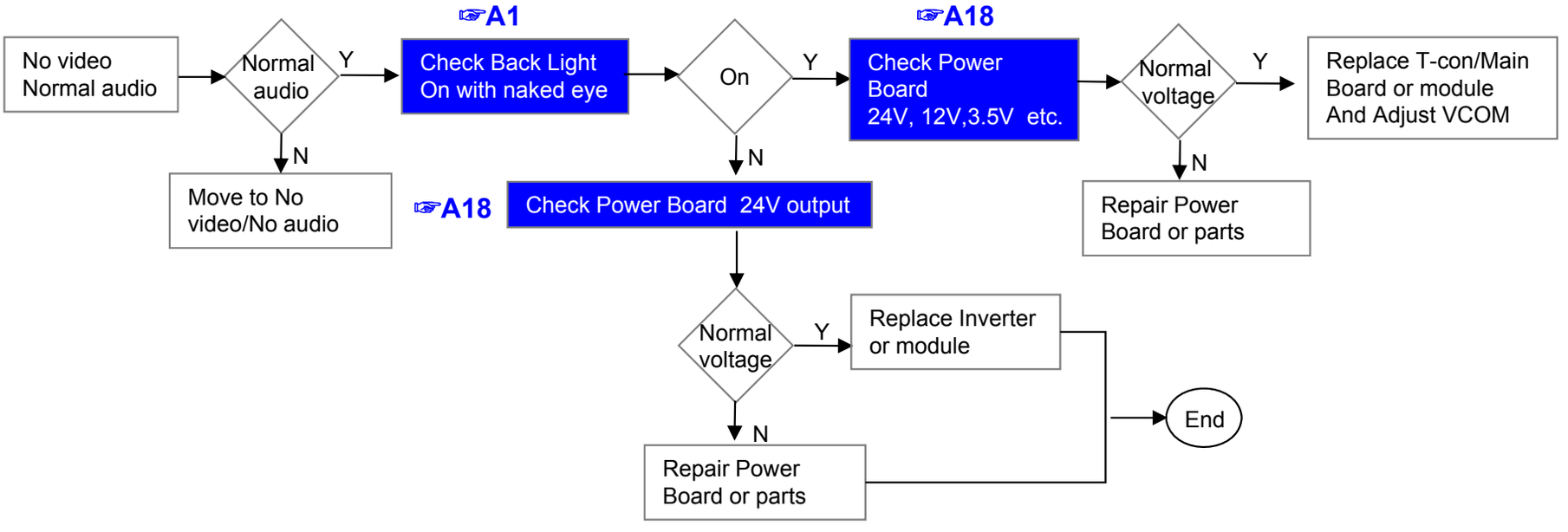

LG
Life's Good

Contents of LCD TV Standard Repair Process

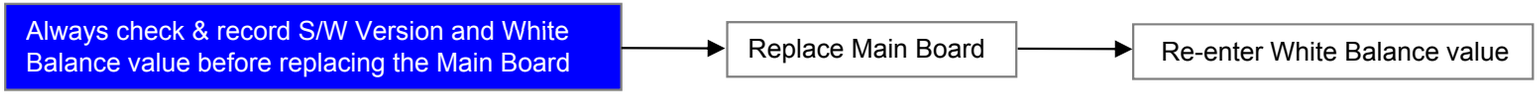
First of all, Check whether there is SVC Bulletin in GCSC System for these model.

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

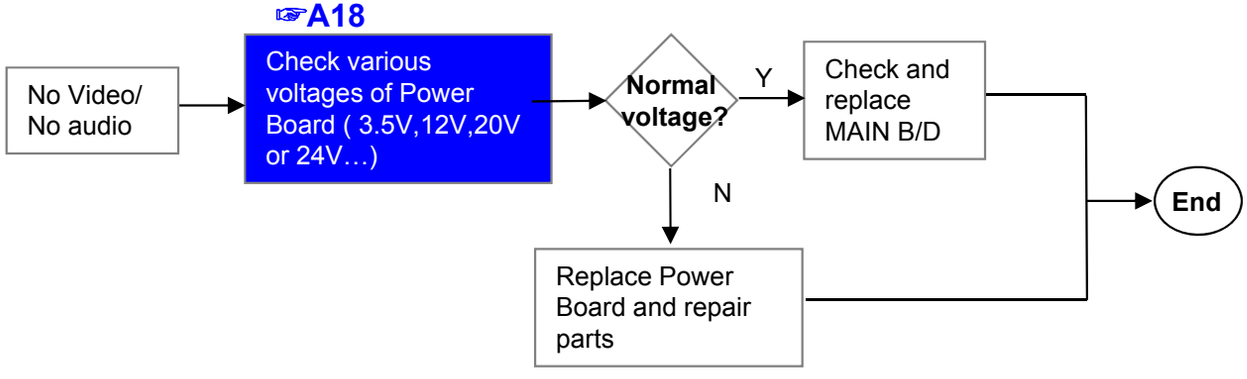
First of all, Check whether all of cables between board is inserted properly or not.
(Main B/D↔ Power B/D, LVDS Cable, Speaker Cable, IR B/D Cable,,,)



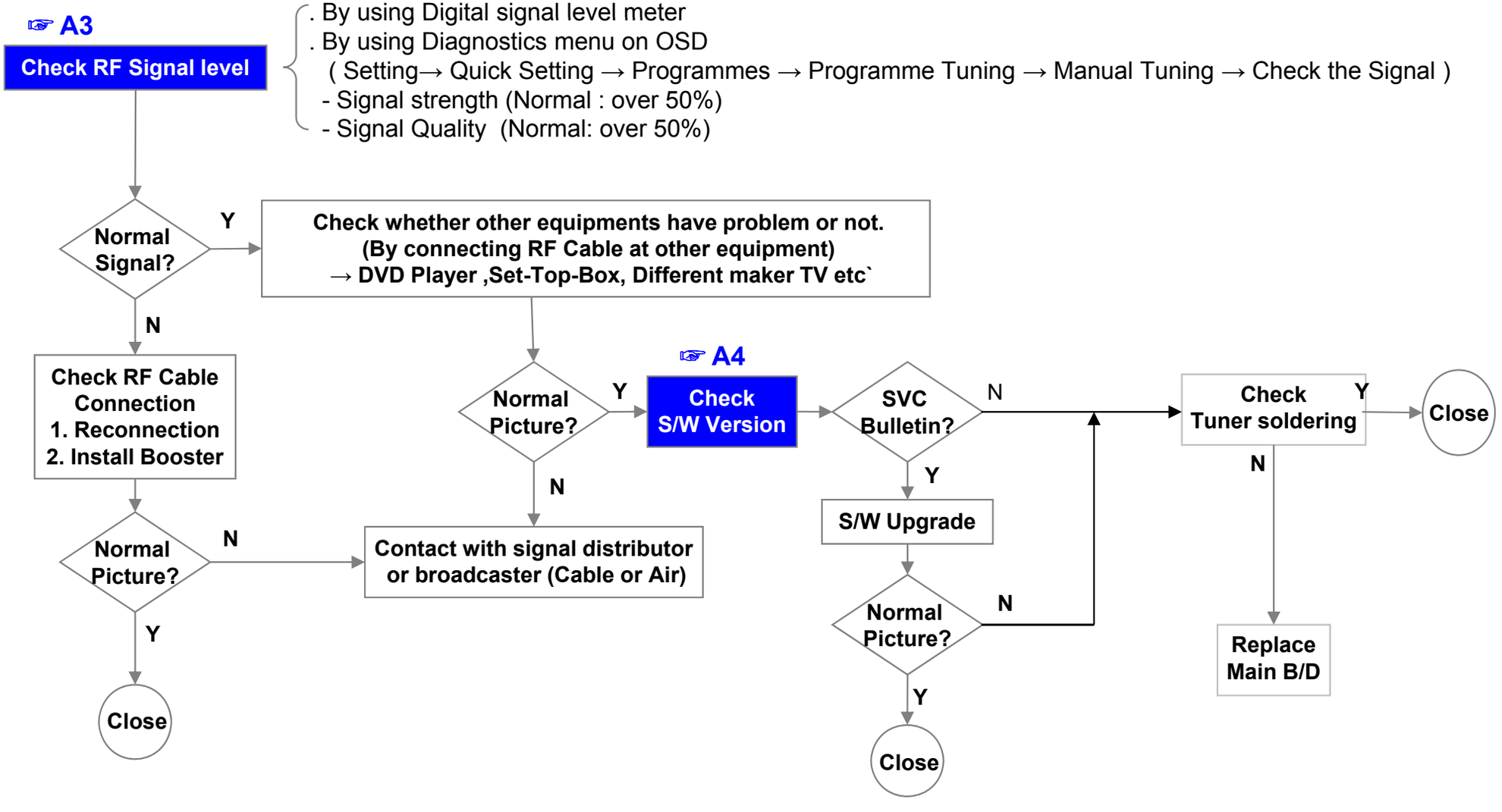
※Precaution ☞A4 & A2



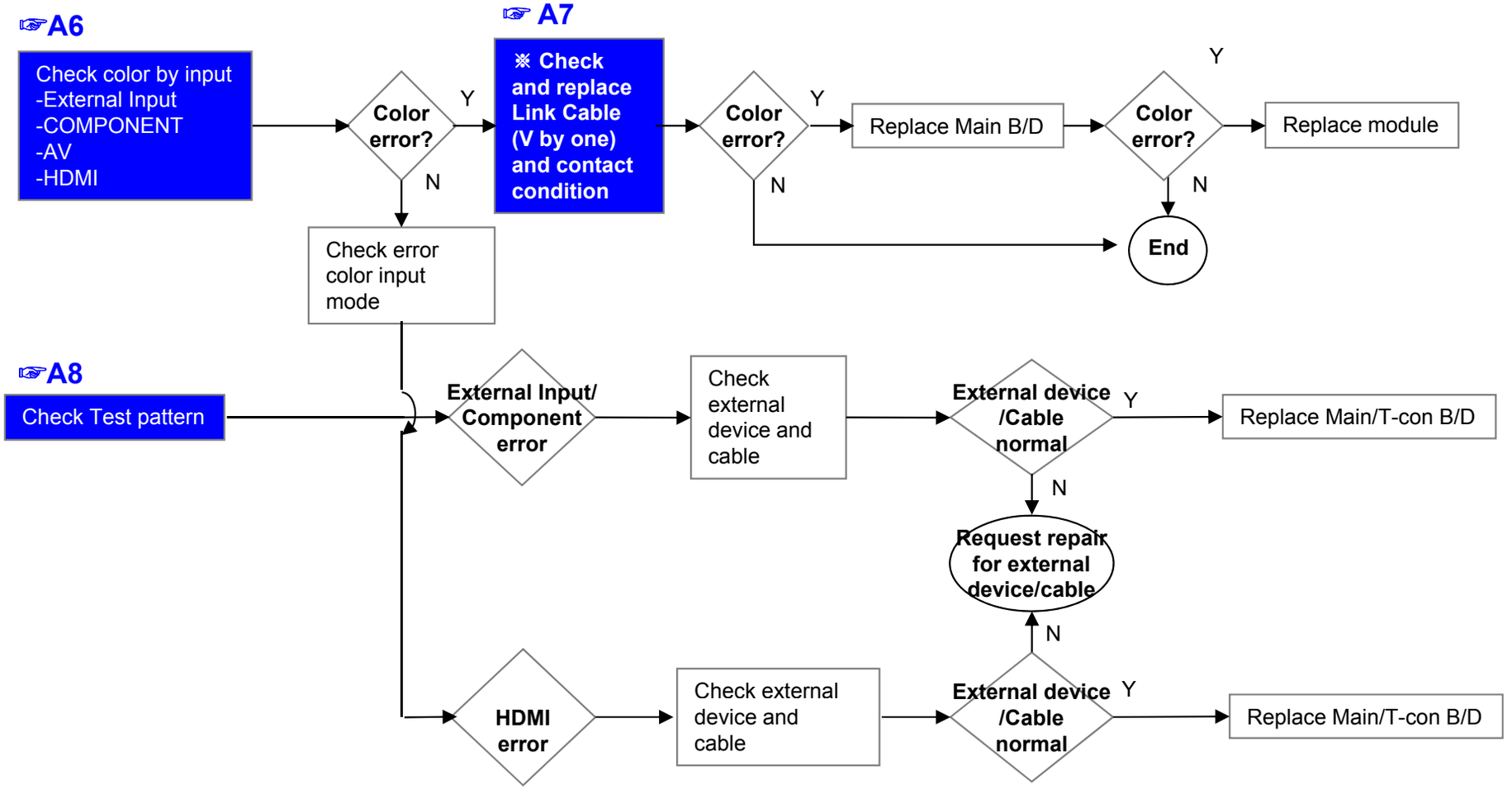
LCD TV	Error symptom	A. Video error	Established date	2013.01.31	
		No video/ No audio	Revised date		2/16



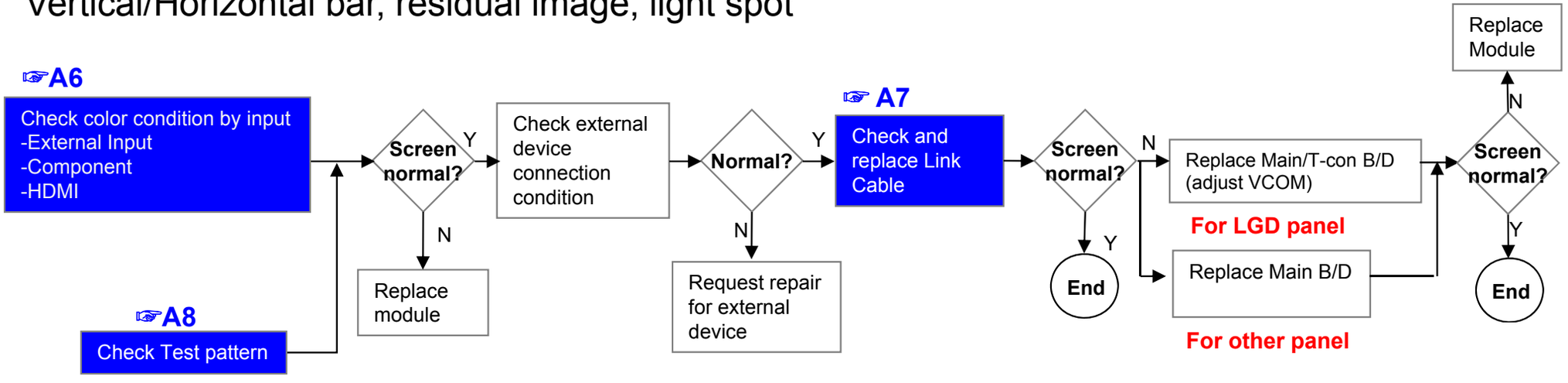
LCD TV	Error symptom	A. Video error	Established date	2013.01.31	
		Picture broken/ Freezing	Revised date		3/16



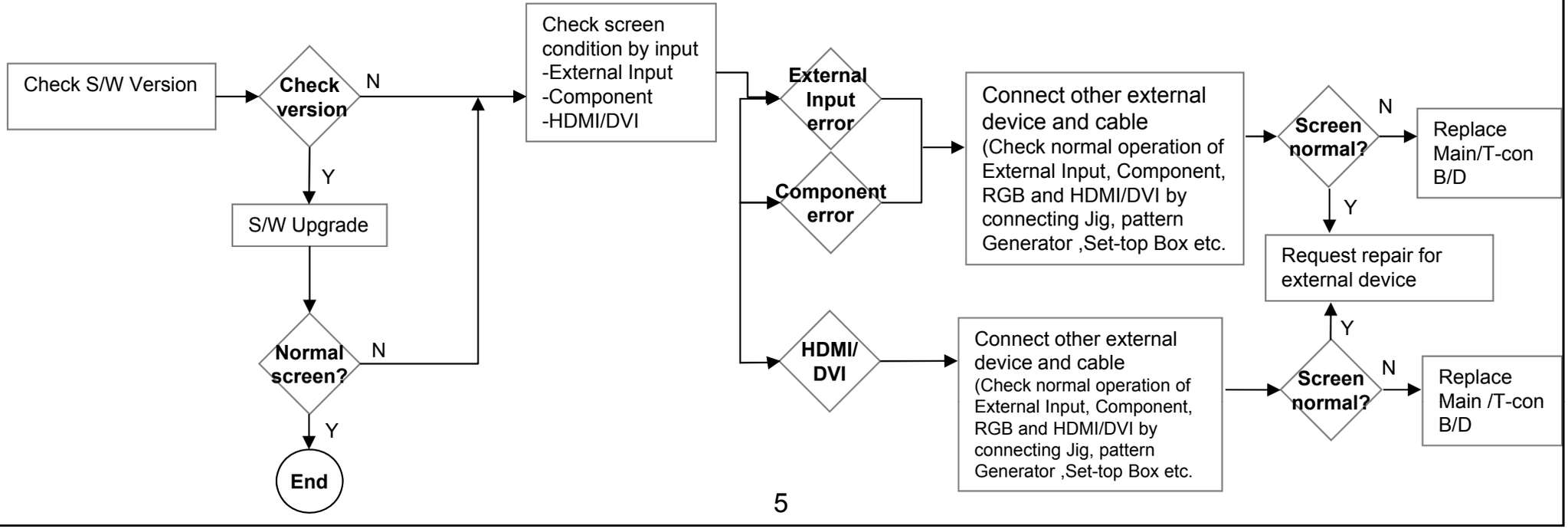
LCD TV	Error symptom	A. Video error	Established date	2013.01.31	
		Color error	Revised date		4/16



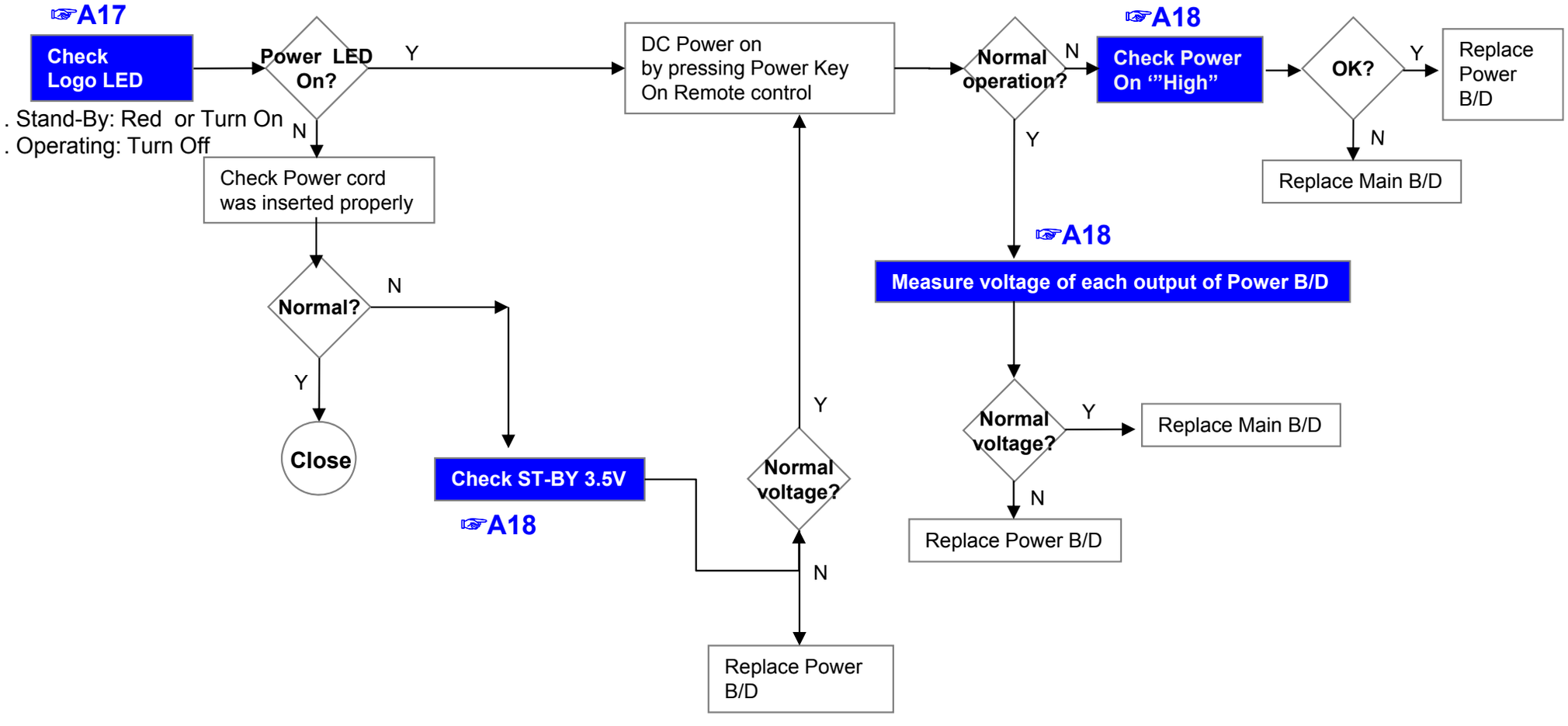
Vertical/Horizontal bar, residual image, light spot



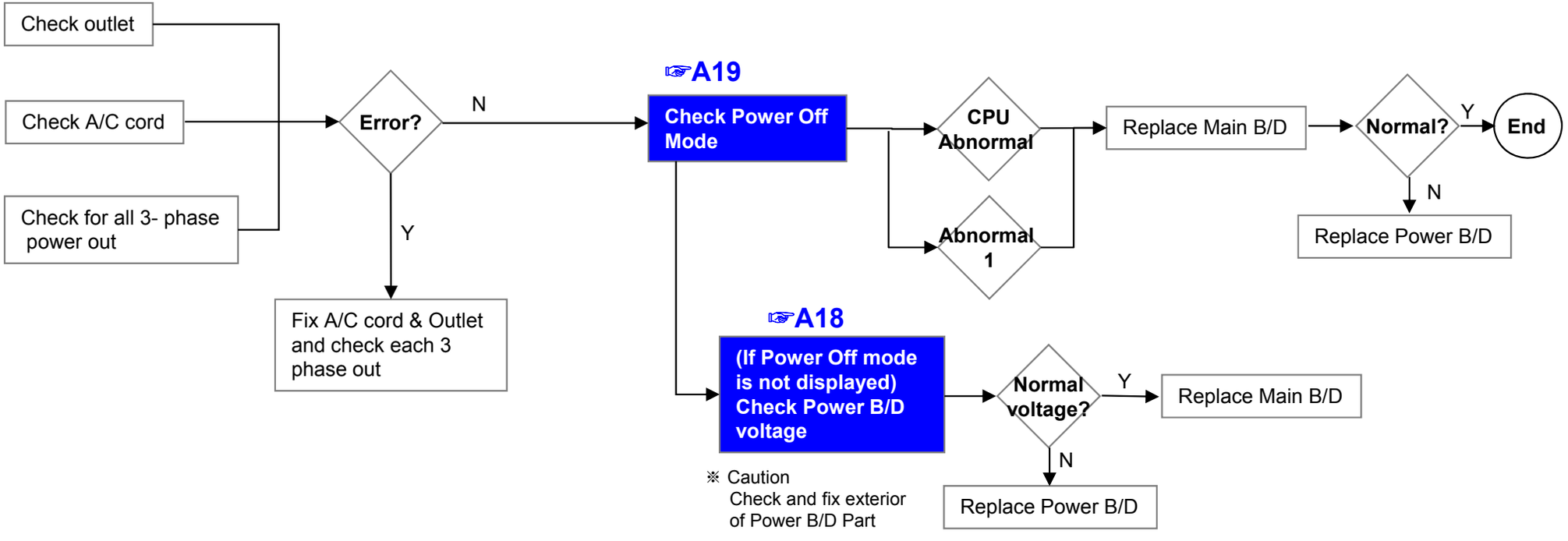
External device screen error-Color error



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



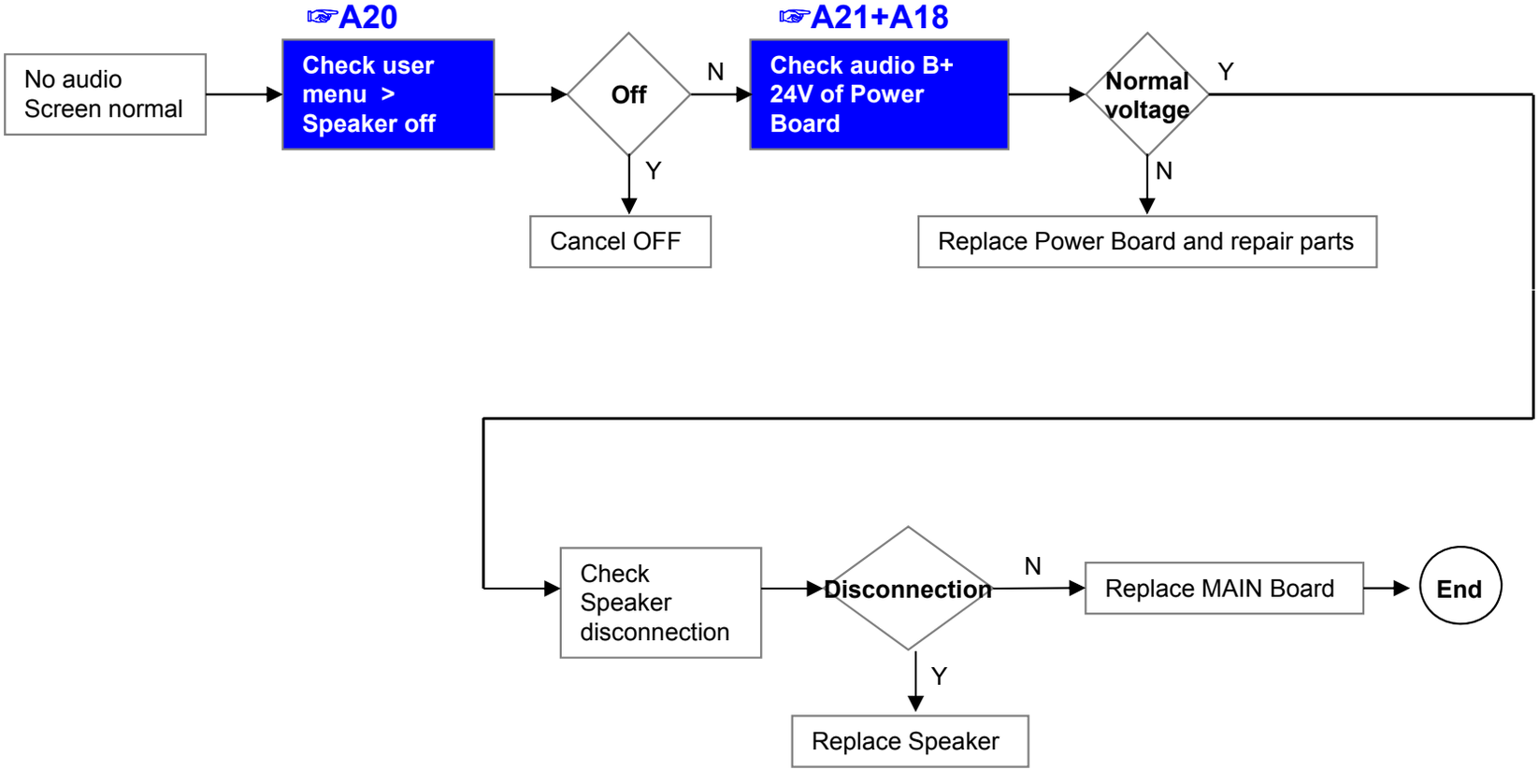
LCD TV	Error symptom	B. Power error	Established date	2013.01.31	
		Off when on, off while viewing, power auto on/off	Revised date		7/16



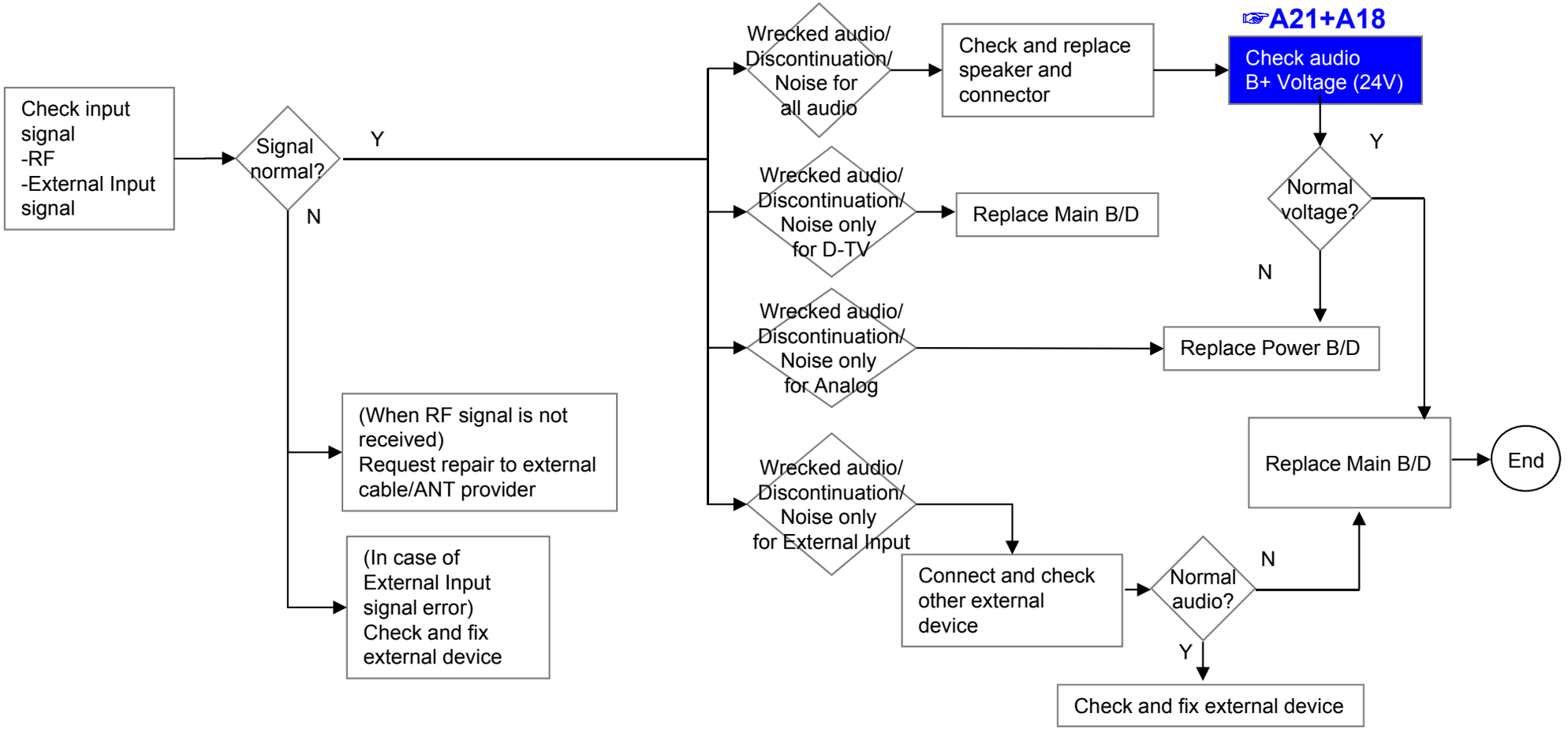
*** Please refer to the all cases which can be displayed on power off mode.**

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

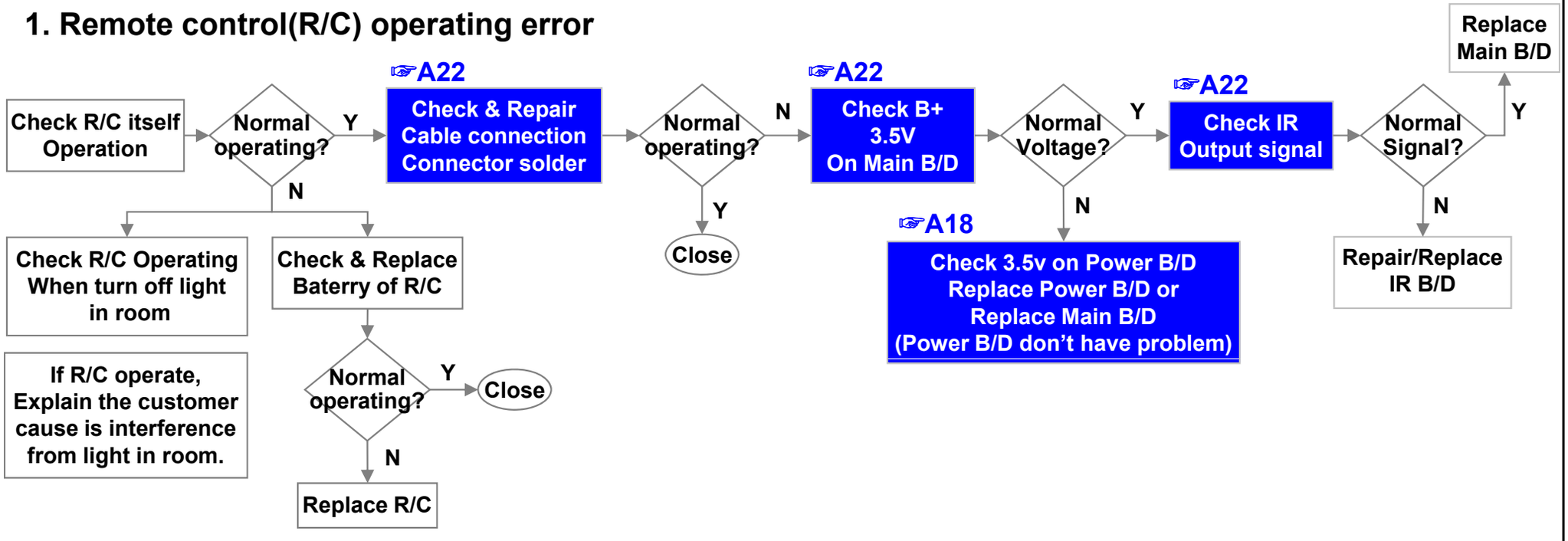
LCD TV	Error symptom	C. Audio error	Established date	2013.01.31	
		No audio/ Normal video	Revised date		8/16



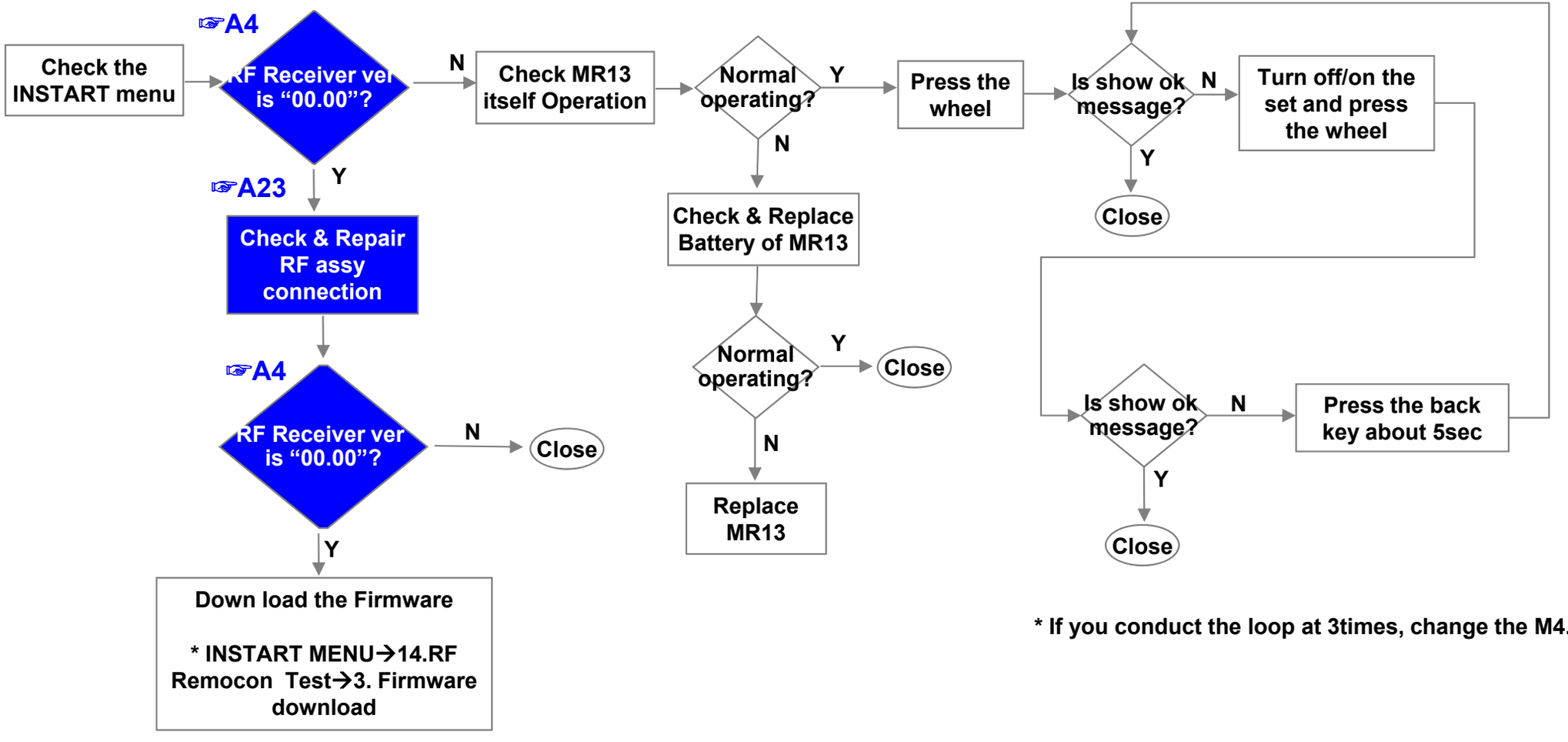
→ abnormal audio/discontinuation/noise is same after "Check input signal" compared to No audio



1. Remote control(R/C) operating error

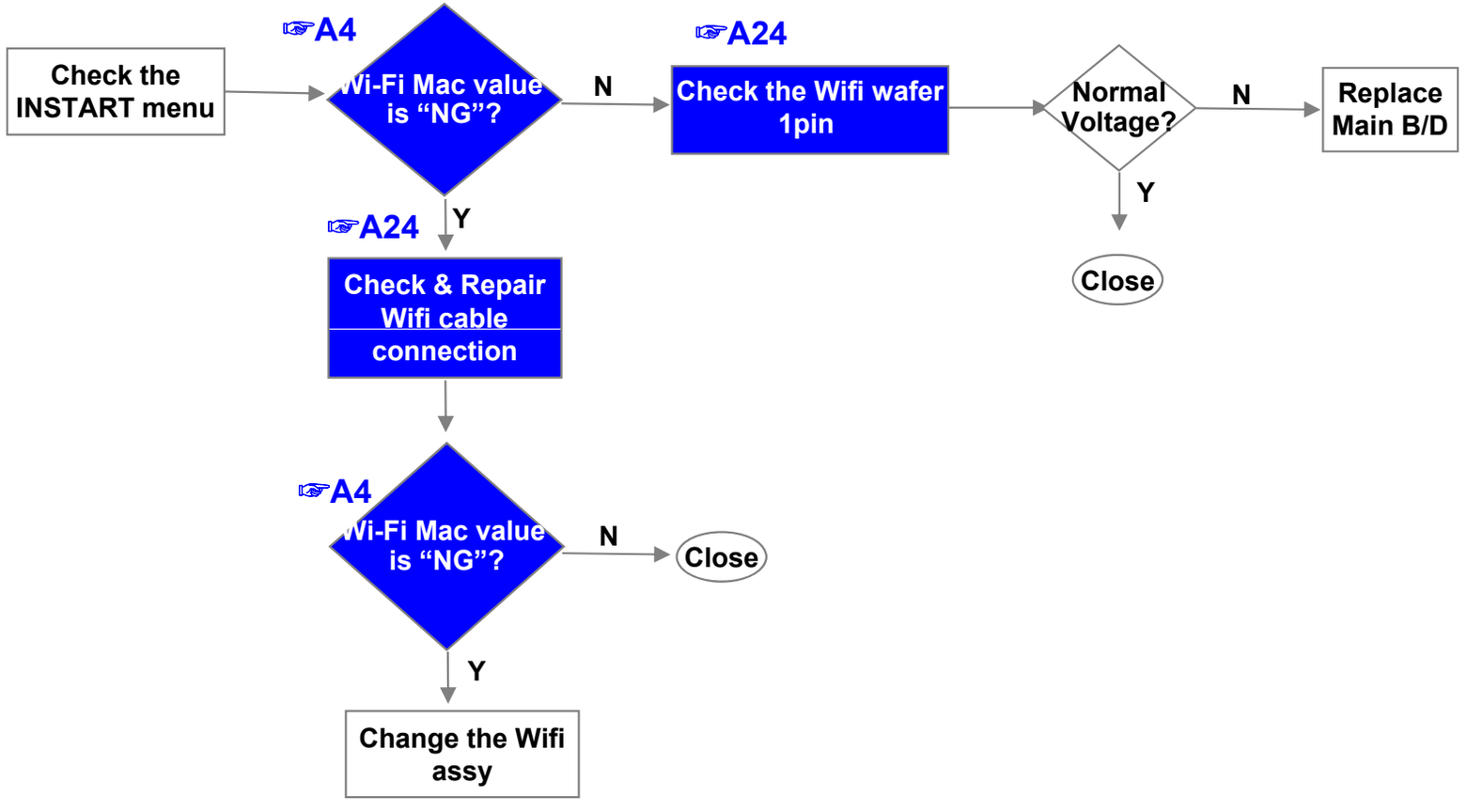


2. MR13(Magic Remocon) operating error

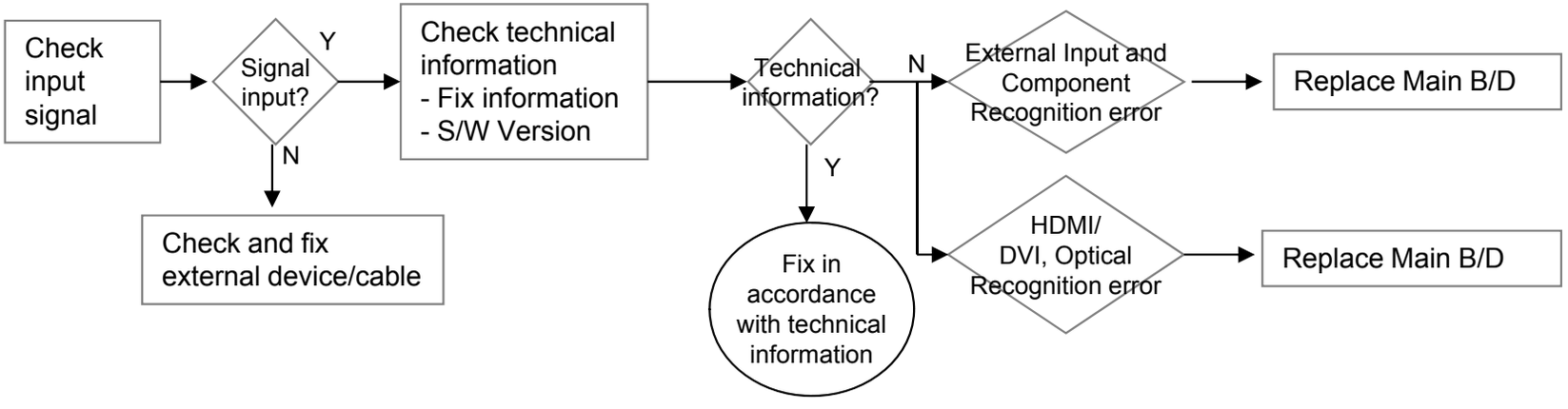


* If you conduct the loop at 3times, change the M4.

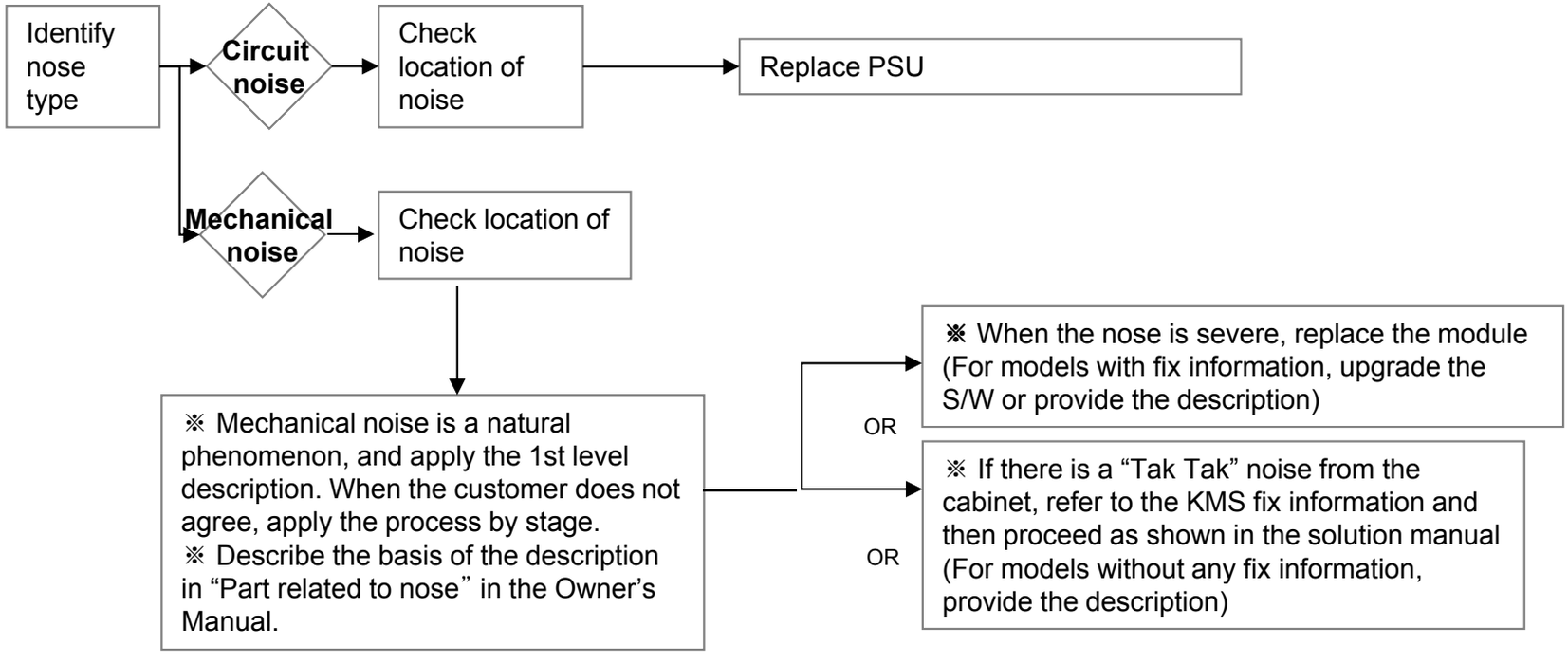
3.Wifi operating error



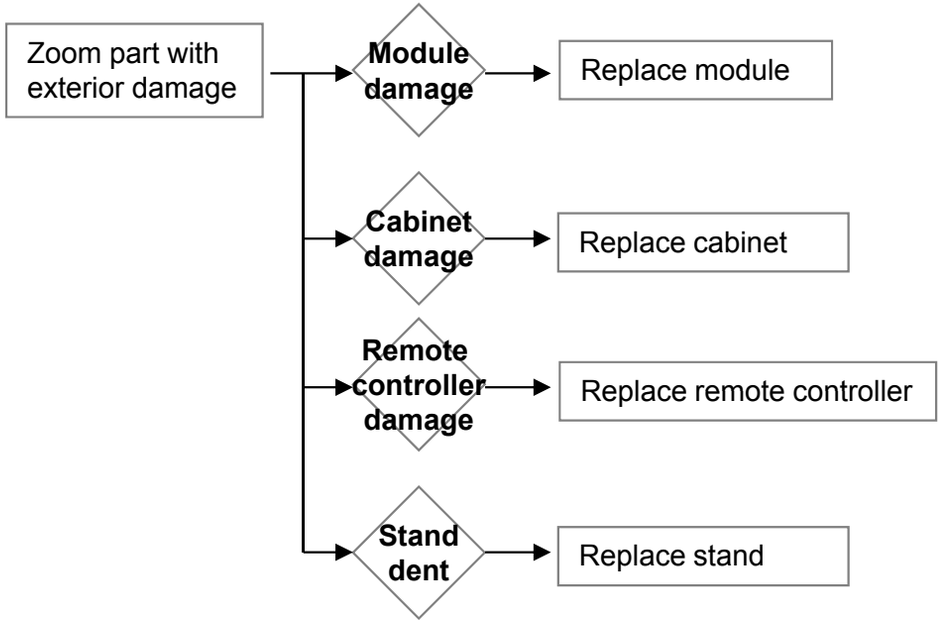
LCD TV	Error symptom	D. Function error	Established date	2013.01.31	
		External device recognition error	Revised date		14/16



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



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



Contents of LCD TV Standard Repair Process Detail Technical Manual

Continue to the next page

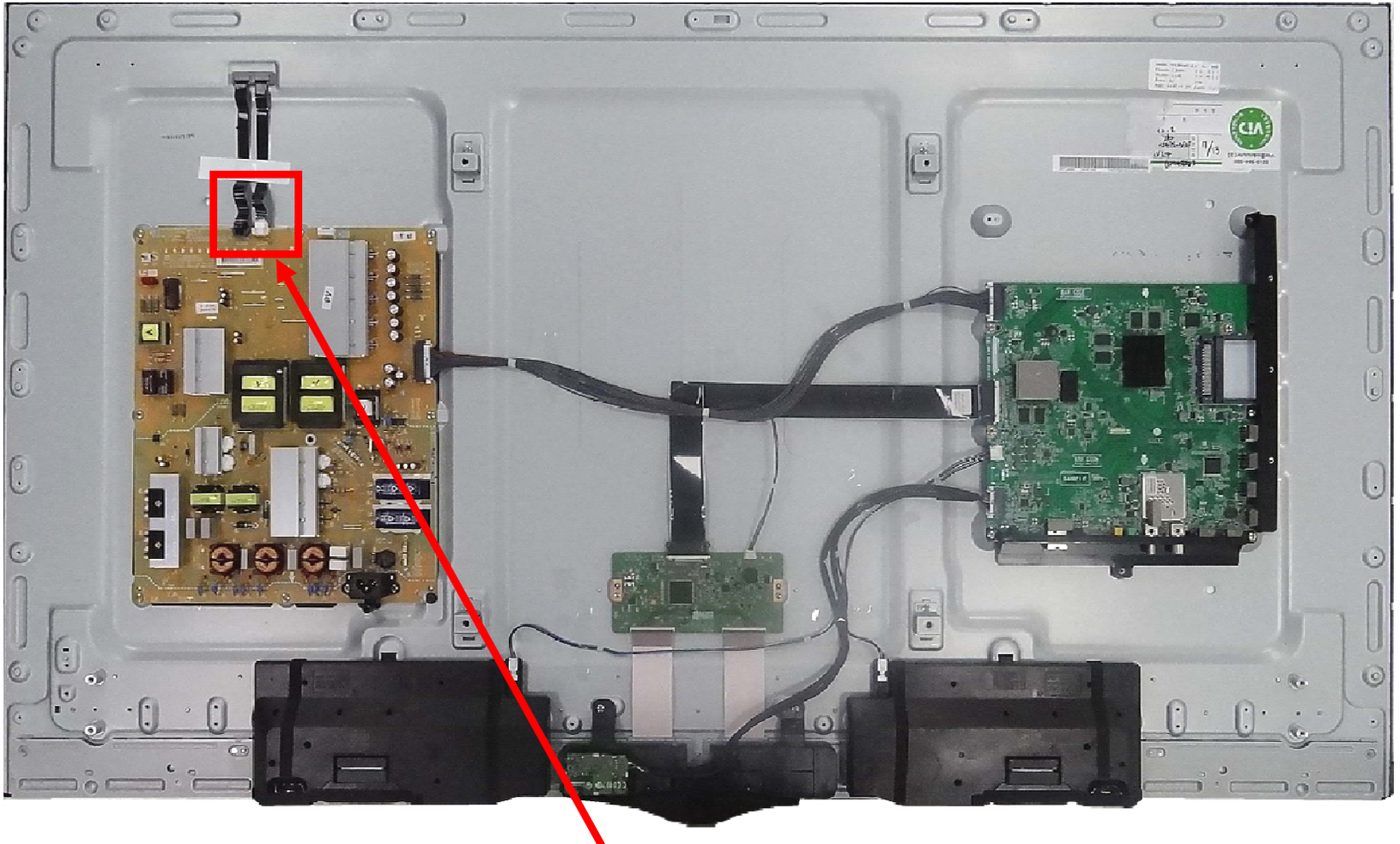
Contents of LCD TV Standard Repair Process Detail Technical Manual

Continued from previous page

Standard Repair Process Detail Technical Manual

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

<XXUB83/820X-XX>



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

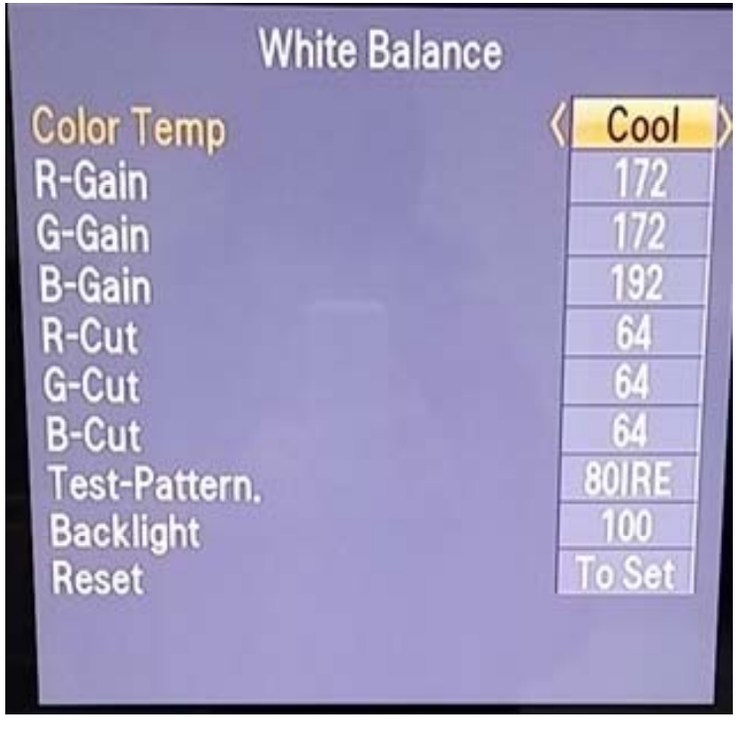
A1

*** Tuner is different from region**

Standard Repair Process Detail Technical Manual

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

<ALL MODELS>



Entry method

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

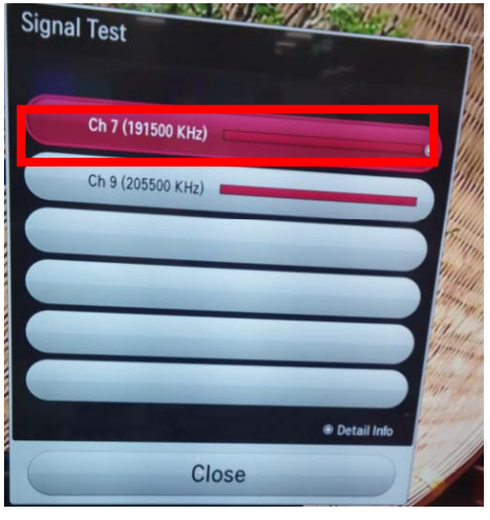
2. Enter into White Balance of item 10.

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

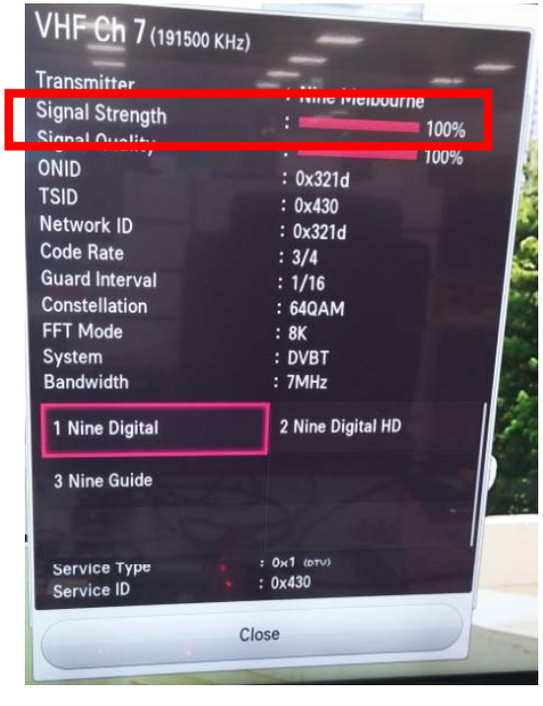
Standard Repair Process Detail Technical Manual

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

<ALL MODELS>



MENU → support → signal test → select channel



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

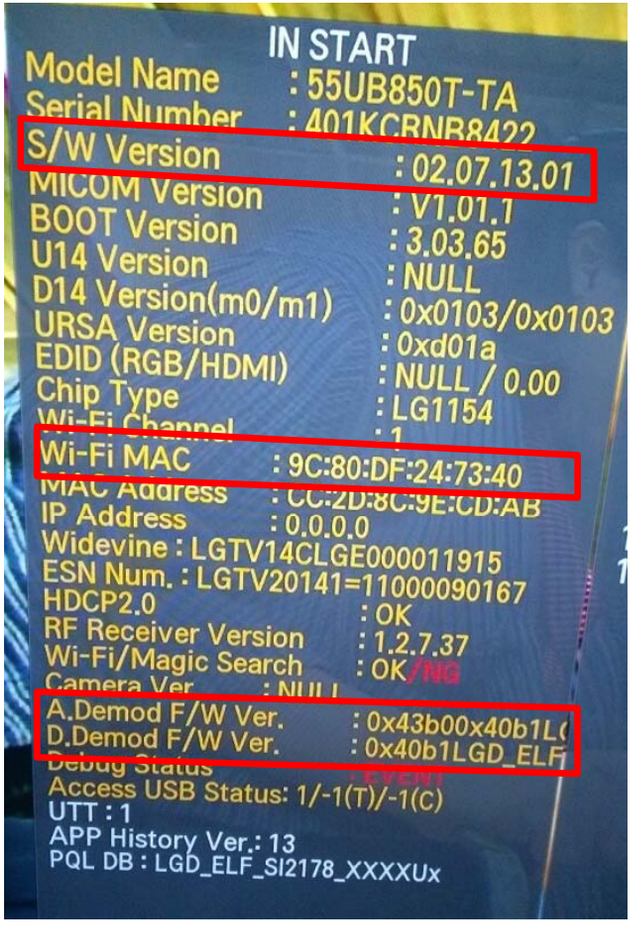
Standard Repair Process Detail Technical Manual

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

<ALL MODELS>

1. Checking method for remote controller for adjustment

Version

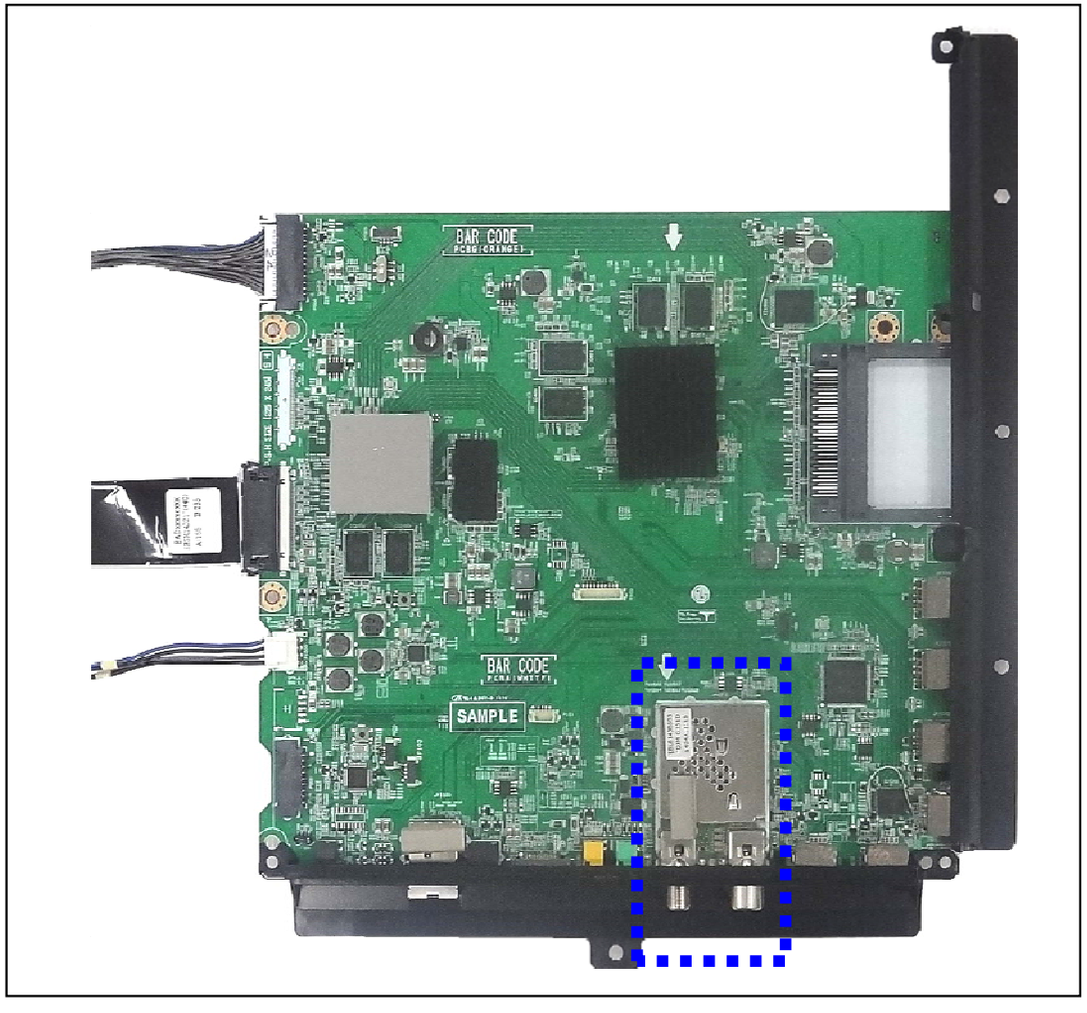


Press the IN-START with the remote controller for adjustment

Standard Repair Process Detail Technical Manual

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

<ALL MODELS>

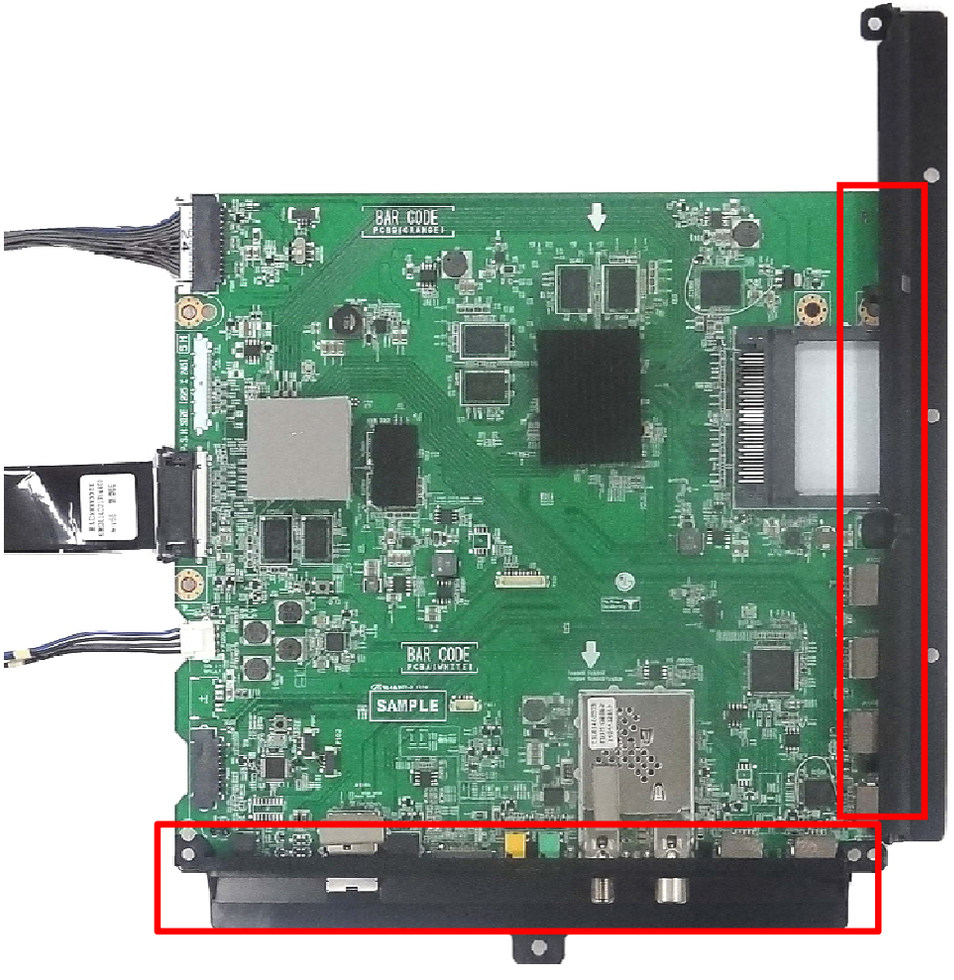


Checking method:
1. Check the signal strength or check whether the screen is normal when the external device is connected.
2. After measuring each voltage from power supply, finally replace the MAIN BOARD.

Standard Repair Process Detail Technical Manual

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

<ALL MODELS>



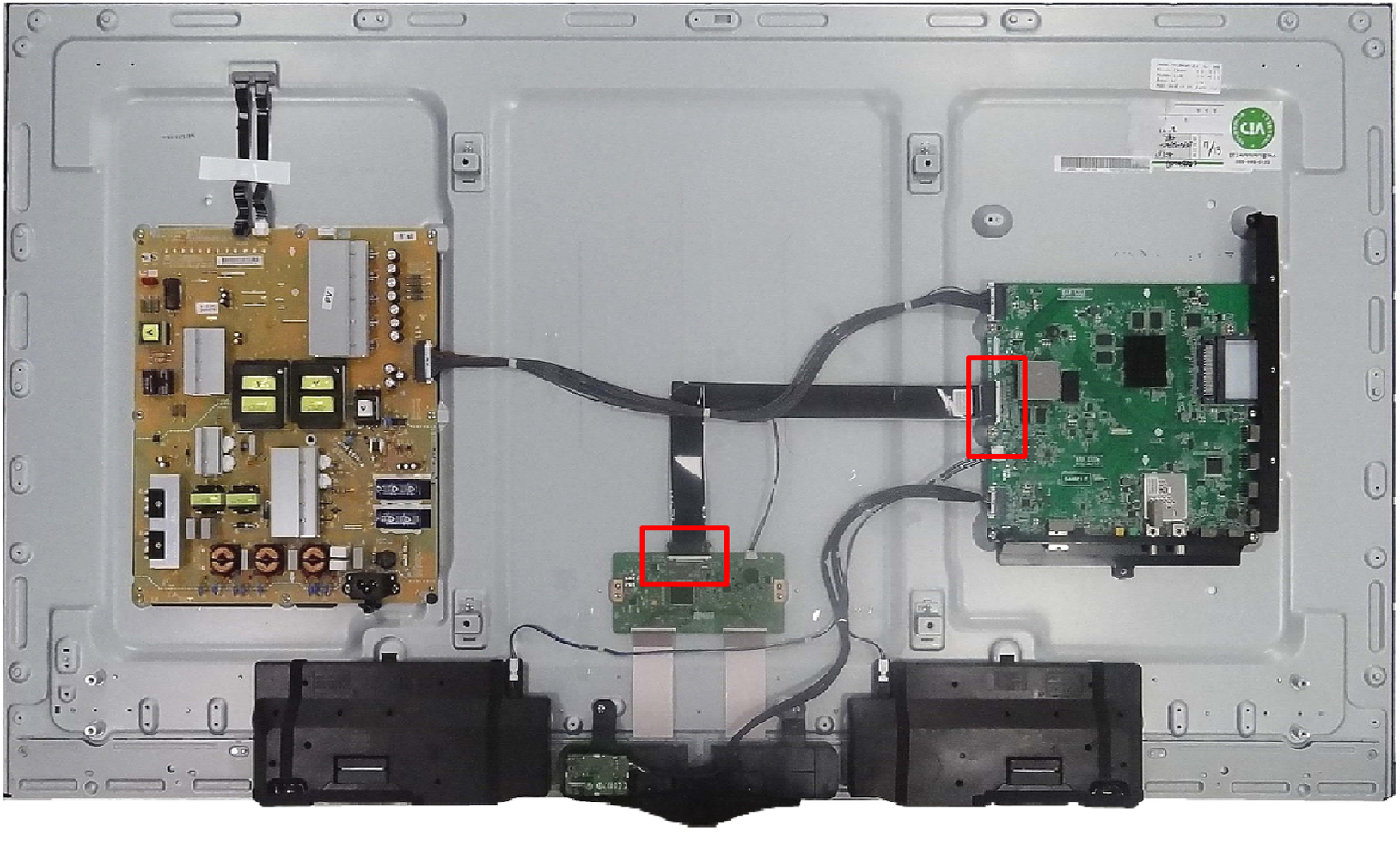
As the part connecting to the external input, check the screen condition by signal

A6

Standard Repair Process Detail Technical Manual

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

<ALL MODELS>

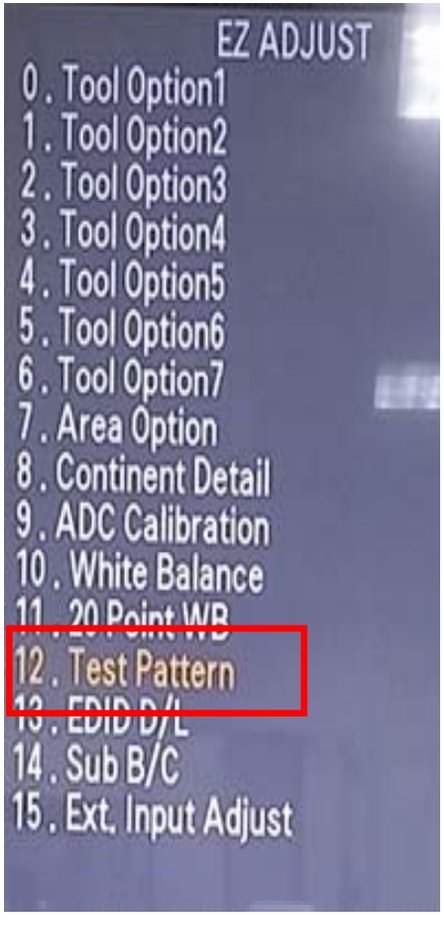


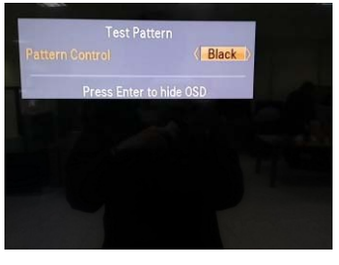
Check the contact condition of the Link Cable, especially dust or mis insertion.

A7 *** Tuner is different from region**

Standard Repair Process Detail Technical Manual

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





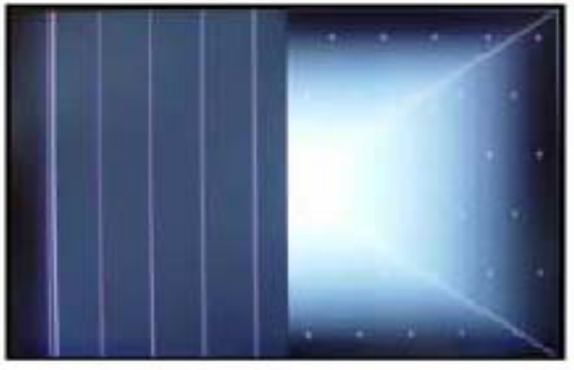
You can view 6 types of patterns using the ADJ Key

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

Appendix : Exchange Main Board (1)

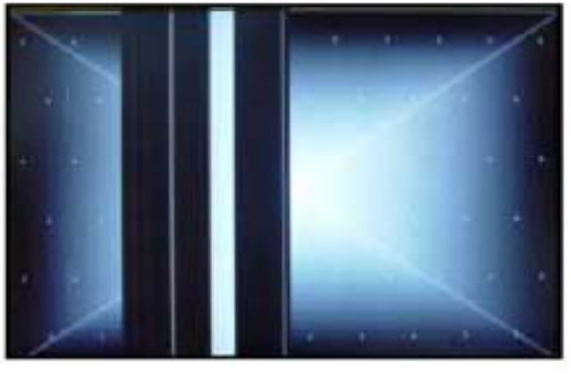
Solder defect, CNT Broken

Solder defect, CNT Broken

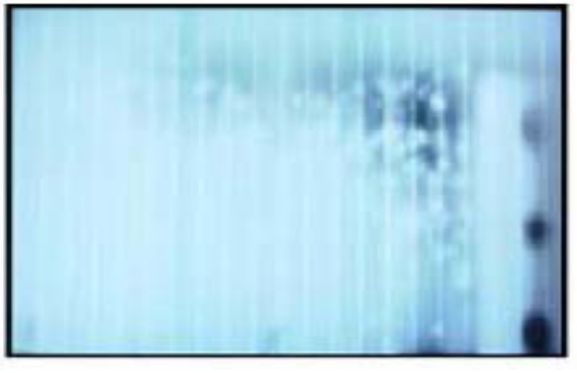


Solder defect, CNT Broken

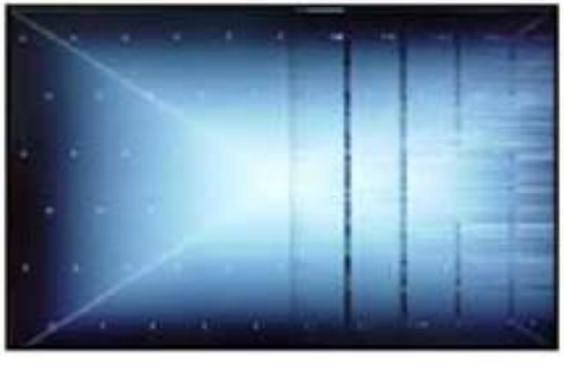
Solder defect, CNT Broken



Solder defect, CNT Broken



Abnormal Power Section

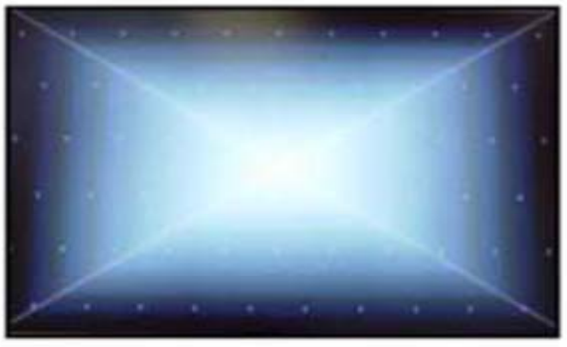


Solder defect, Short/Crack

Abnormal Power Section

Solder defect, Short/Crack

Appendix : Exchange Main Board (2)



Abnormal Power Section

Abnormal Power Section

Solder defect, Short/Crack

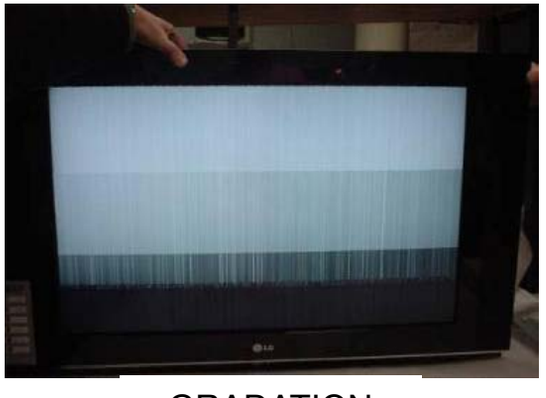
Solder defect, Short/Crack

Fuse Open, Abnormal power section

Abnormal Display

GRADATION

Noise



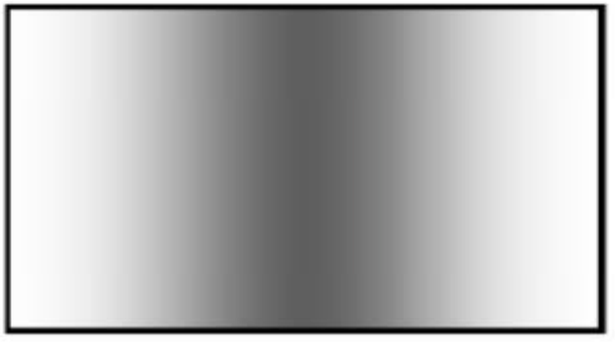
GRADATION

Appendix : Exchange Power Board (PSU)

No Light

Dim Light

Dim Light



Dim Light

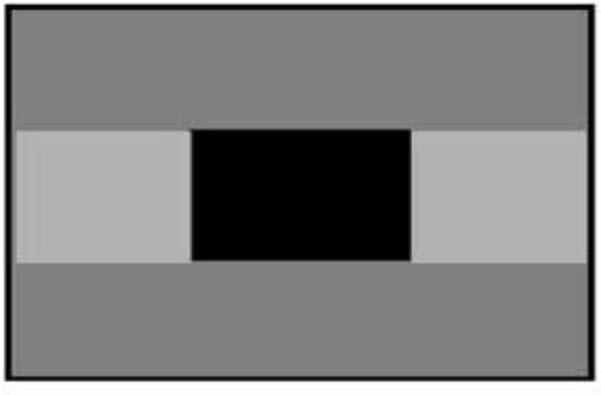
No picture/Sound Ok

Appendix : Exchange the Module (1)

Panel Mura, Light leakage

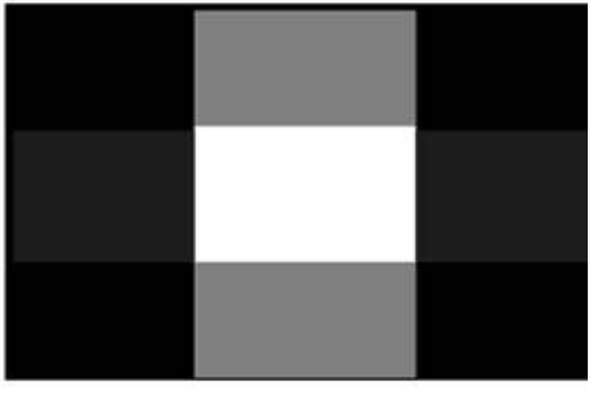
Panel Mura, Light leakage

Press damage



Crosstalk

Press damage



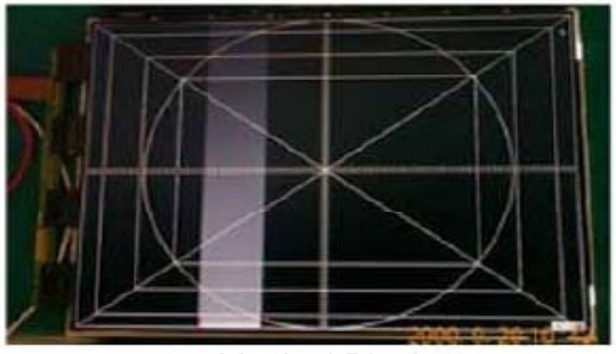
Crosstalk

Press damage

Un-repairable Cases

In this case please exchange the module.

Appendix : Exchange the Module (2)



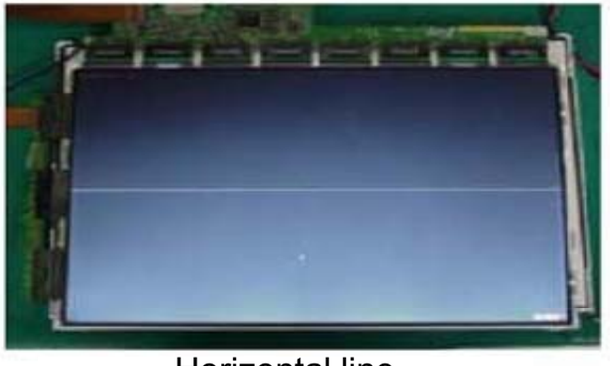
Vertical Block
Source TAB IC Defect

Vertical Line
Source TAB IC Defect

Vertical Block
Source TAB IC Defect

Horizontal Block
Gate TAB IC Defect

Horizontal Block
Gate TAB IC Defect



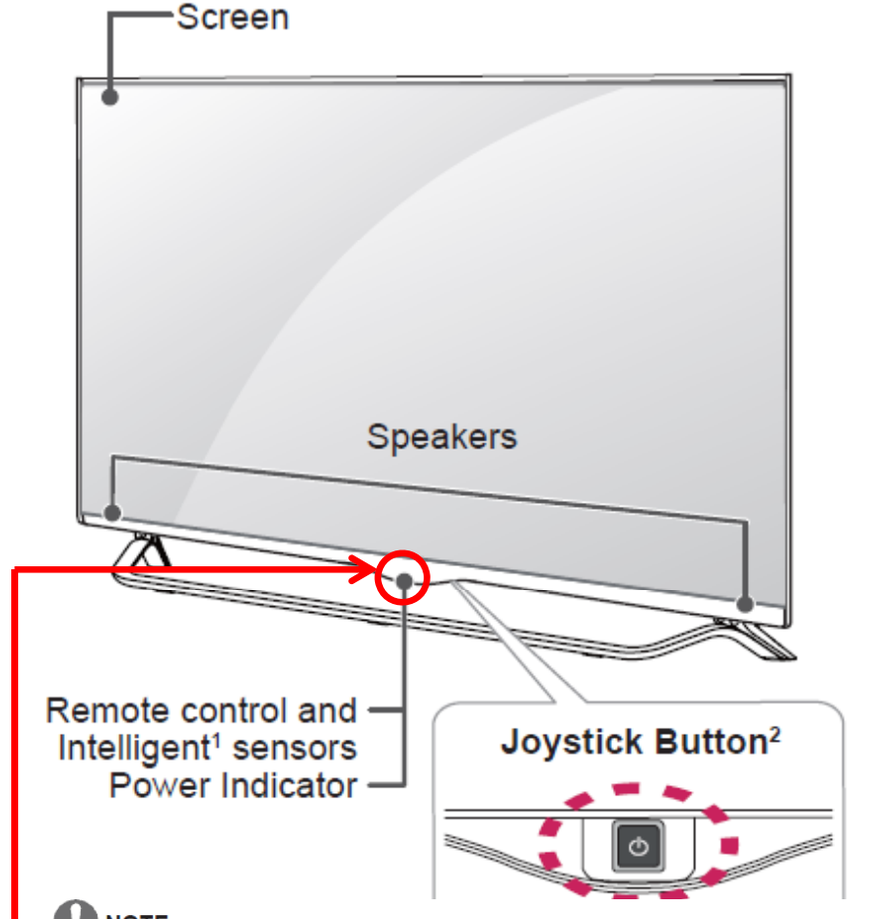
Horizontal line
Gate TAB IC Defect

Horizontal Block
Gate TAB IC Defect

Un-repairable Cases

In this case please exchange the module.

<XXUB83/820X-XX>



NOTE

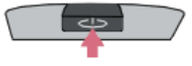
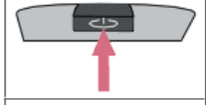
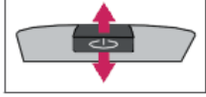
- You can set the LG Logo Light or power indicator light to on or off by selecting **GENERAL** in the main menus.

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

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

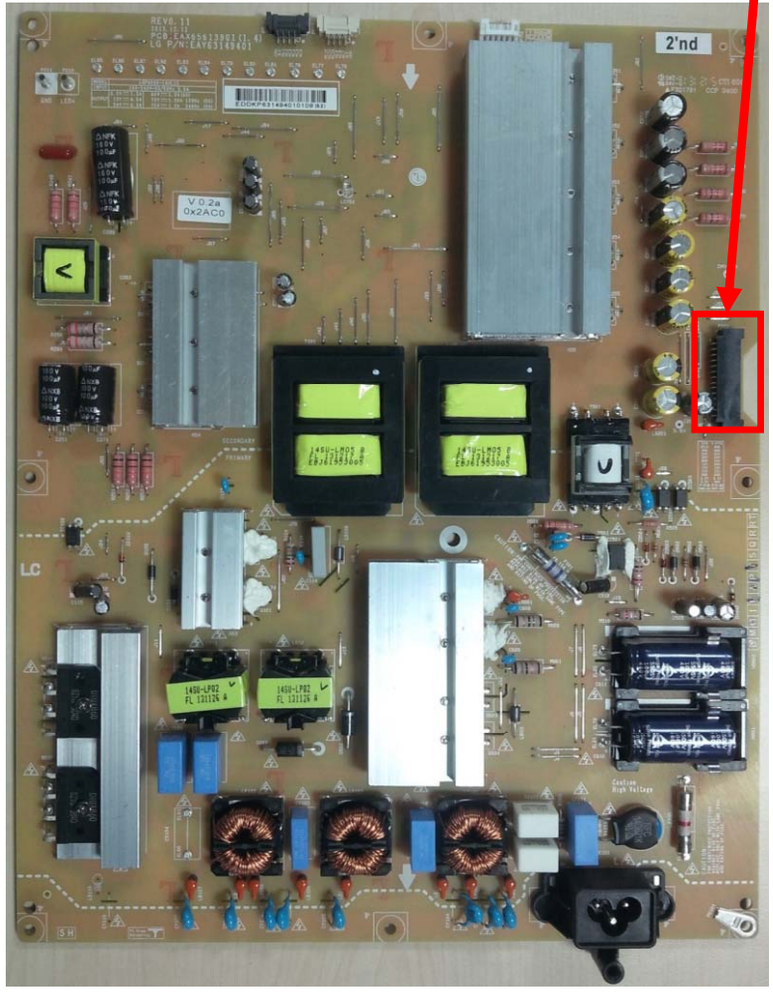
When the TV is turned on, press the joystick button one time.
You can adjust the Menu items (⏻, ✕, ⏍) moving the joystick button up, down, left or right.

	⏻	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

LCD 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

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



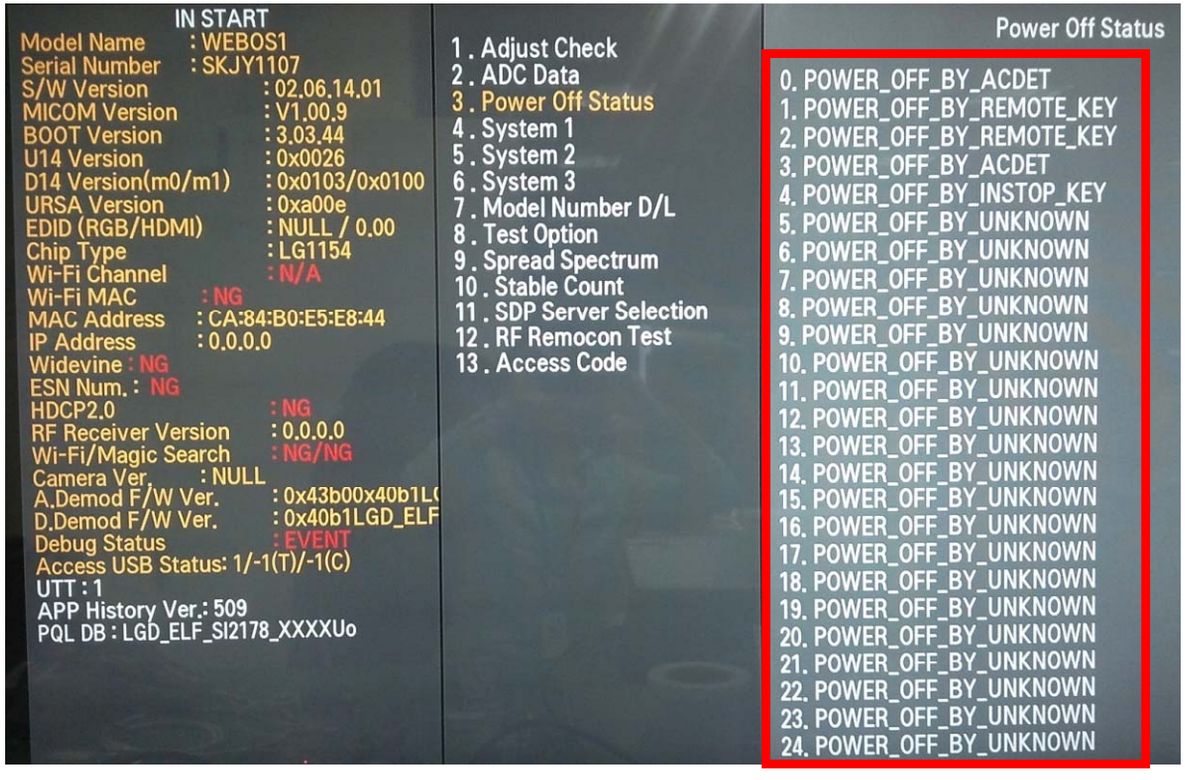
P_main
Maker : Yeonho
28Pin SMAW200-H28S5K
'14년 적용 28Pin map (LPB)

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

Standard Repair Process Detail Technical Manual

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

<ALL MODELS>



Entry method

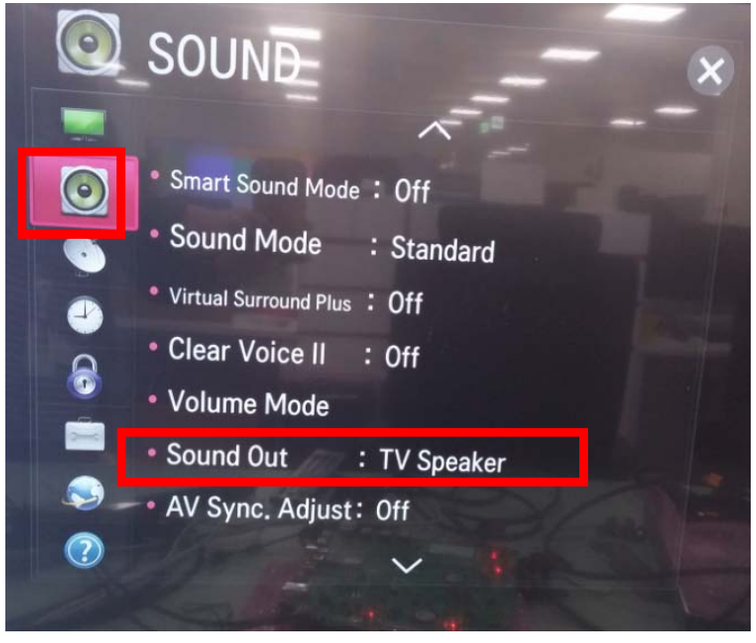
1. Press the IN-START button of the remote controller for adjustment

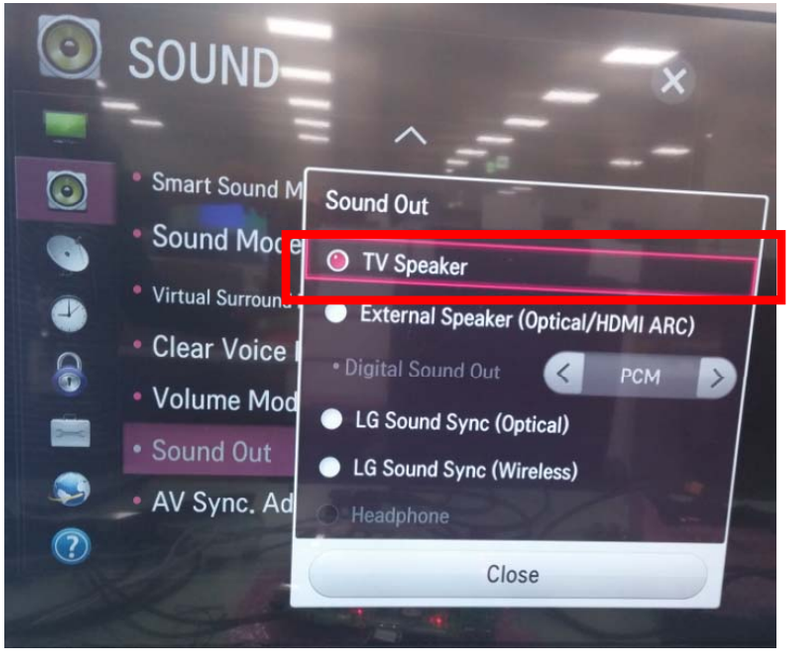
2. Check the entry into adjustment item 3

Standard Repair Process Detail Technical Manual

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

<XXUB83/820X-XX>





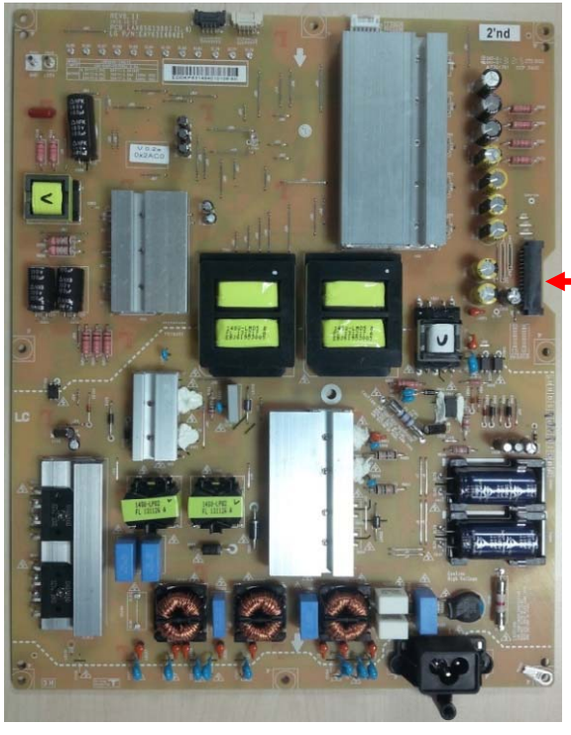
Checking method

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

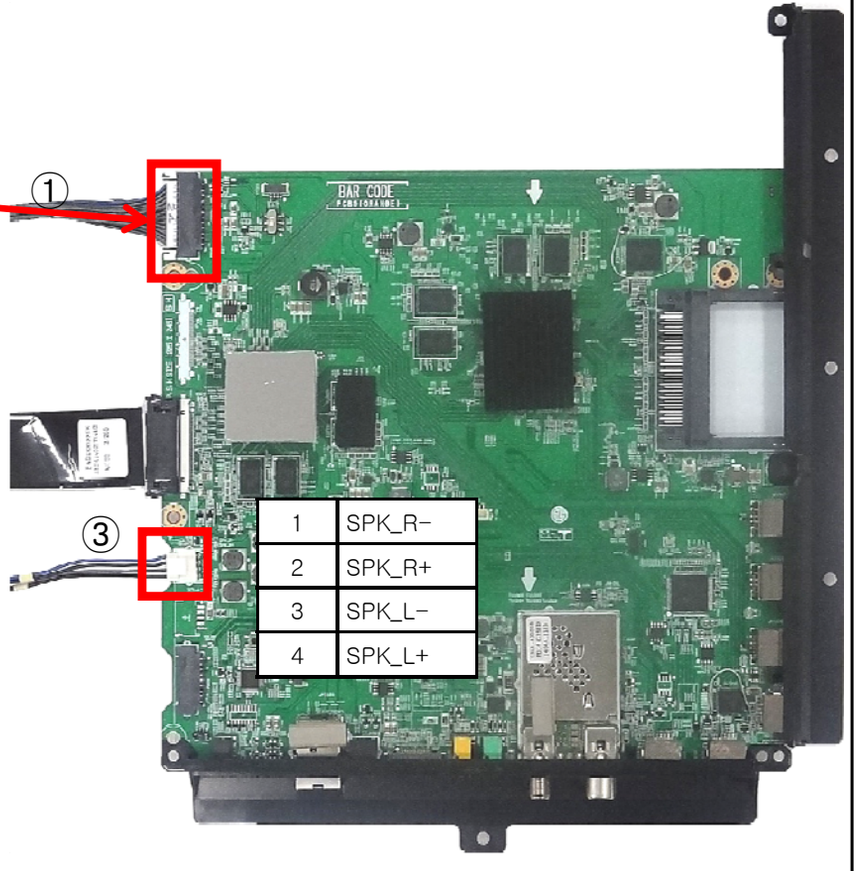
Standard Repair Process Detail Technical Manual

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

<XXUB83/820X-XX>



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



1	SPK_R−
2	SPK_R+
3	SPK_L−
4	SPK_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.

Standard Repair Process Detail Technical Manual

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

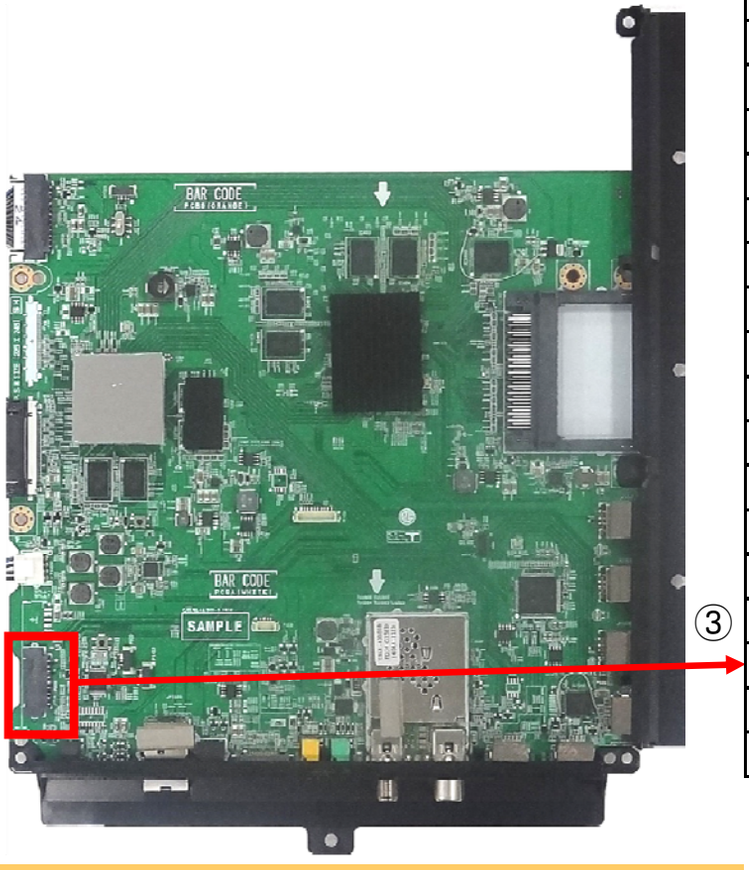
<XXUB83/820X-XX>

Front

Back

① Wifi/ BT Combo

Checking order to check remote controller



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

Checking order

1.Check IR cable condition between IR & Main board.(Check picture number① and ②)
2.Check the standby 3.5V on the terminal 16 pin (③)
3.AS checking the Pre-Amp(IR LED light) , the power is in ON condition, an Analog Tester needle should move slowly, otherwise, it's defective.

Standard Repair Process Detail Technical Manual

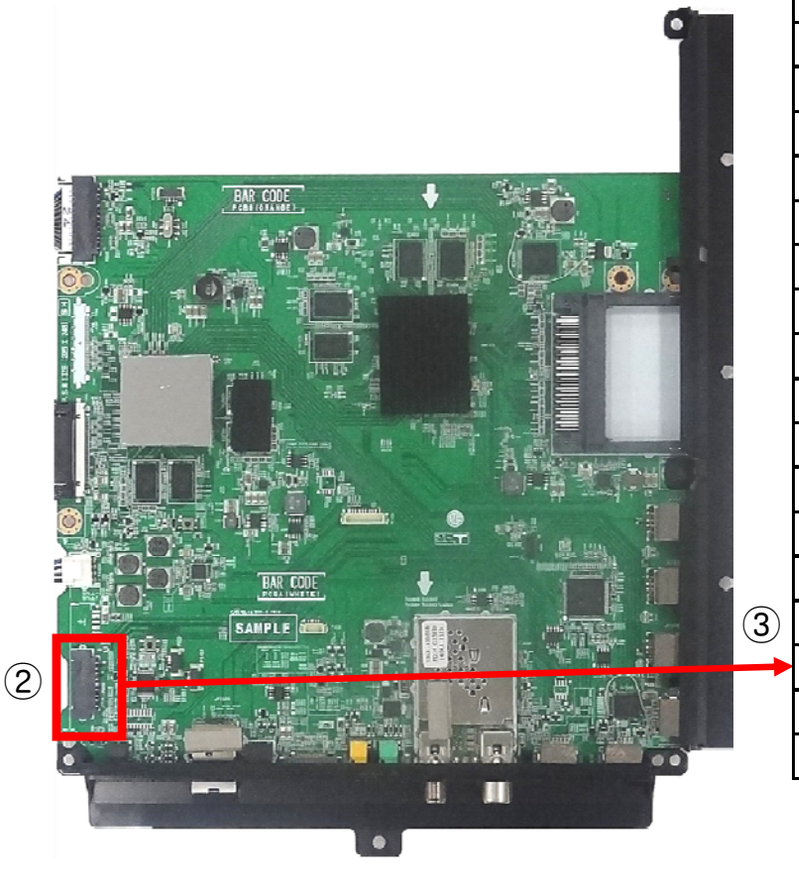
LCD TV	Error symptom	D. Function error	Established date	2014.02.07	
	Content	Motion Remote / Wifi operation checking method	Revised date		A23

<XXUB83/820X-XX>

Front

Back

① Wifi/ BT Combo



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

Checking order to check motion remote/wifi

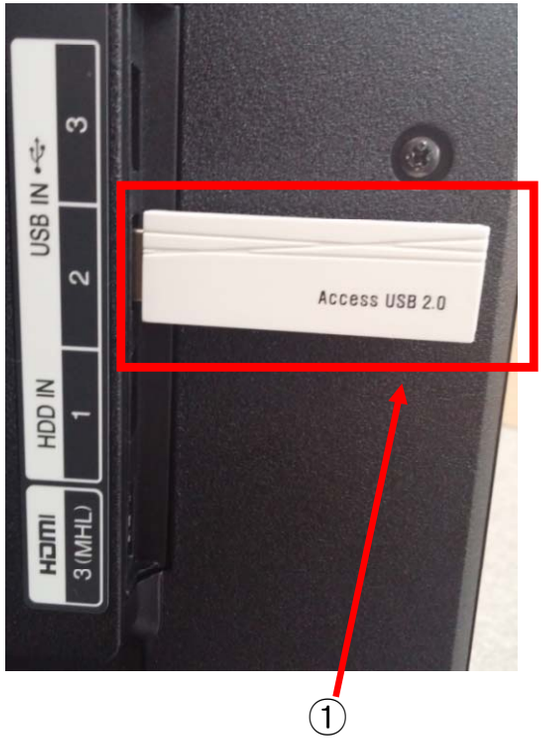
Checking order

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

Standard Repair Process Detail Technical Manual

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

<XXUB83/820X-XX>

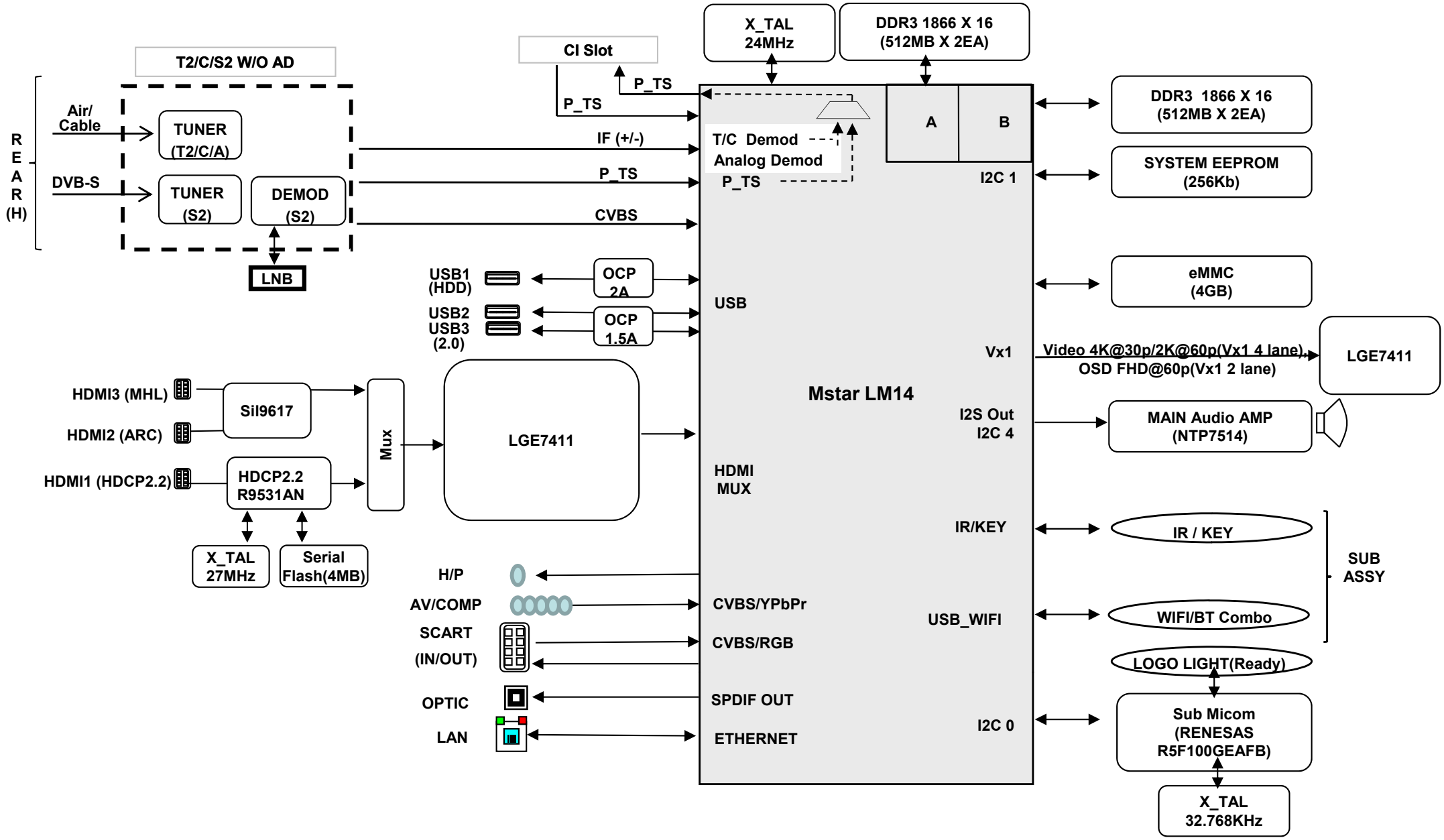


Changing method

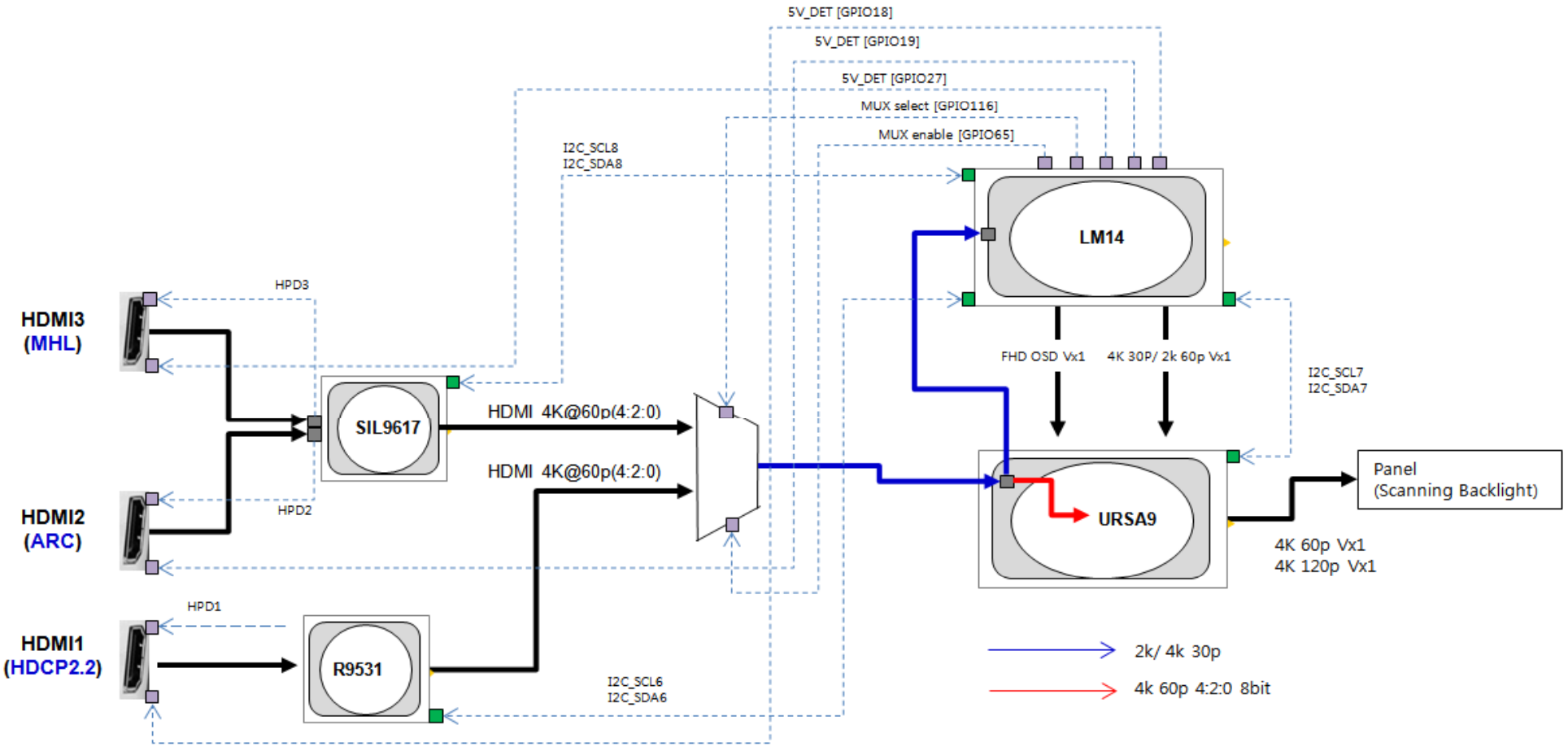
1. Contact the USB memory. (USB 1,2,3 jack)
2. Enter the password. (ex. 000000)

* Access USB Memory has each password.

1. Circuit Block Diagram



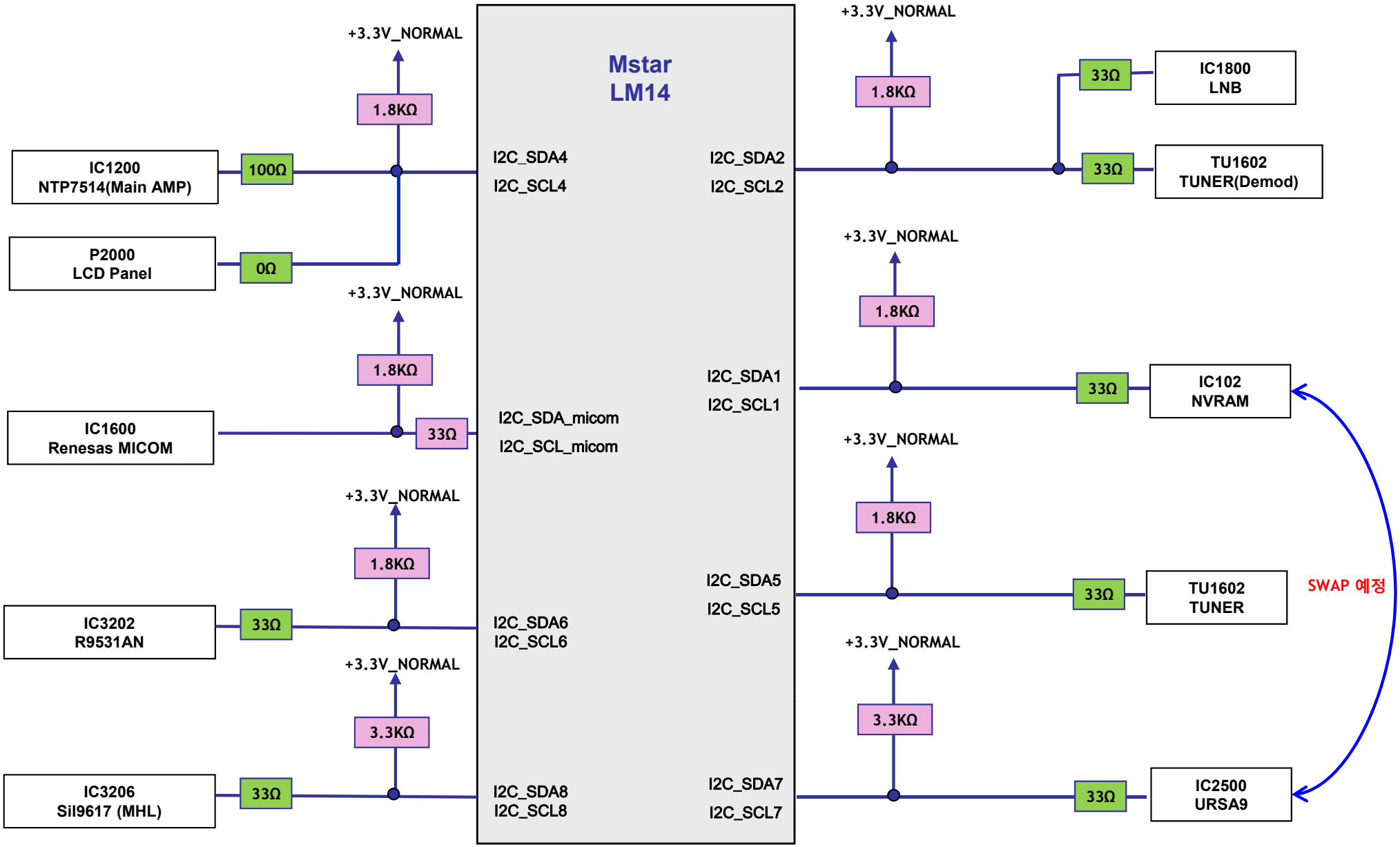
LM14 + URSA9 block diagram



EDID table은 모두 동일한 값을 사용하고, 최종 Spec은 아래와 같음.

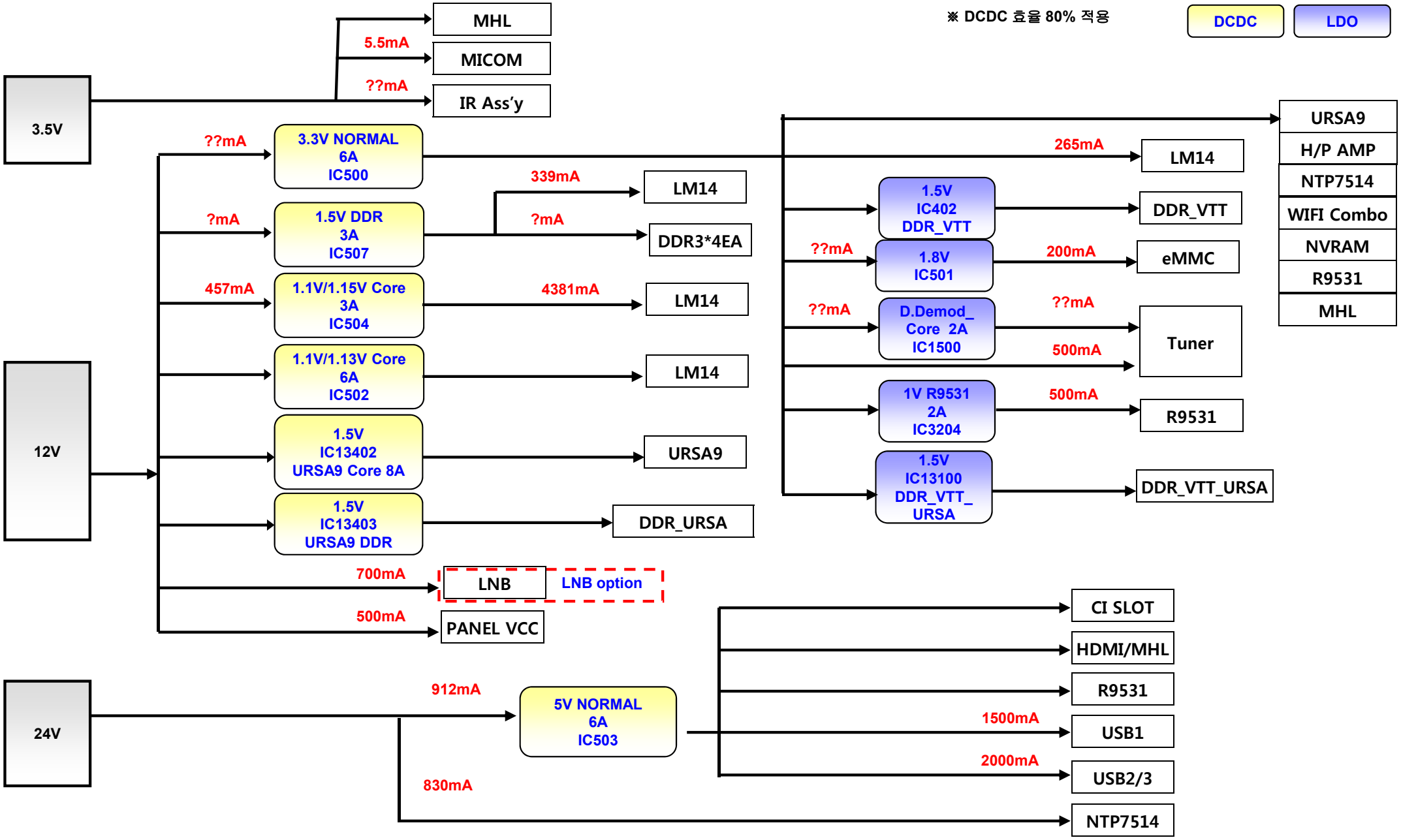
HDMI1 : HDMI2.0 (3G, 4k@60p 4:2:0 8bit/ 4K@30Hz 4:2:2 10bit), HDCP2.2
HDMI2 : HDMI2.0 (3G, 4k@60p 4:2:0 8bit/ 4K@30Hz 4:2:2 10bit), ARC
HDMI3 : HDMI2.0 (3G, 4k@60p 4:2:0 8bit/ 4K@30Hz 4:2:2 10bit), MHL

3. LM14 + URSA9 I2C Block Diagram

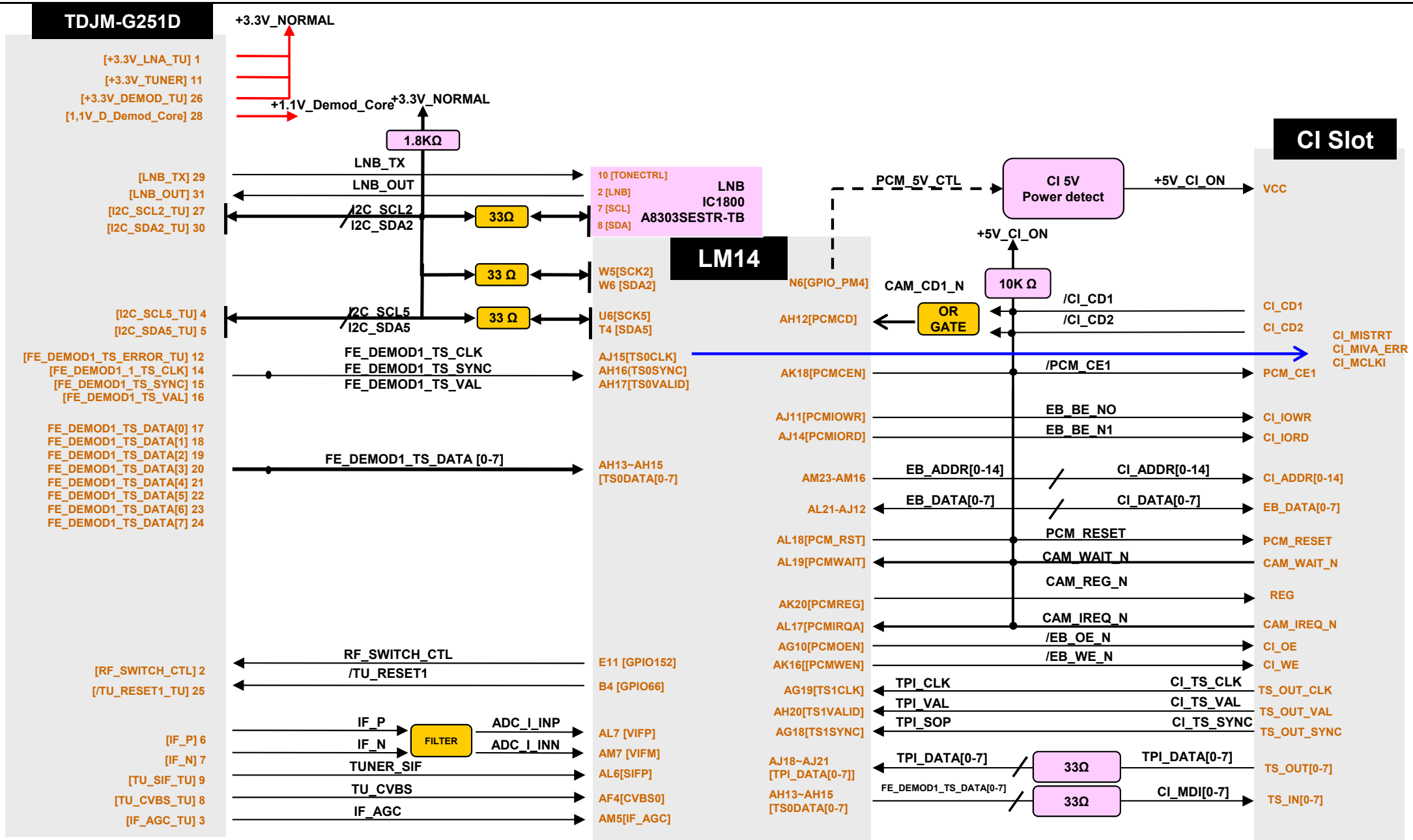


※ I2C CH 6,7,8 S/W I2C 임

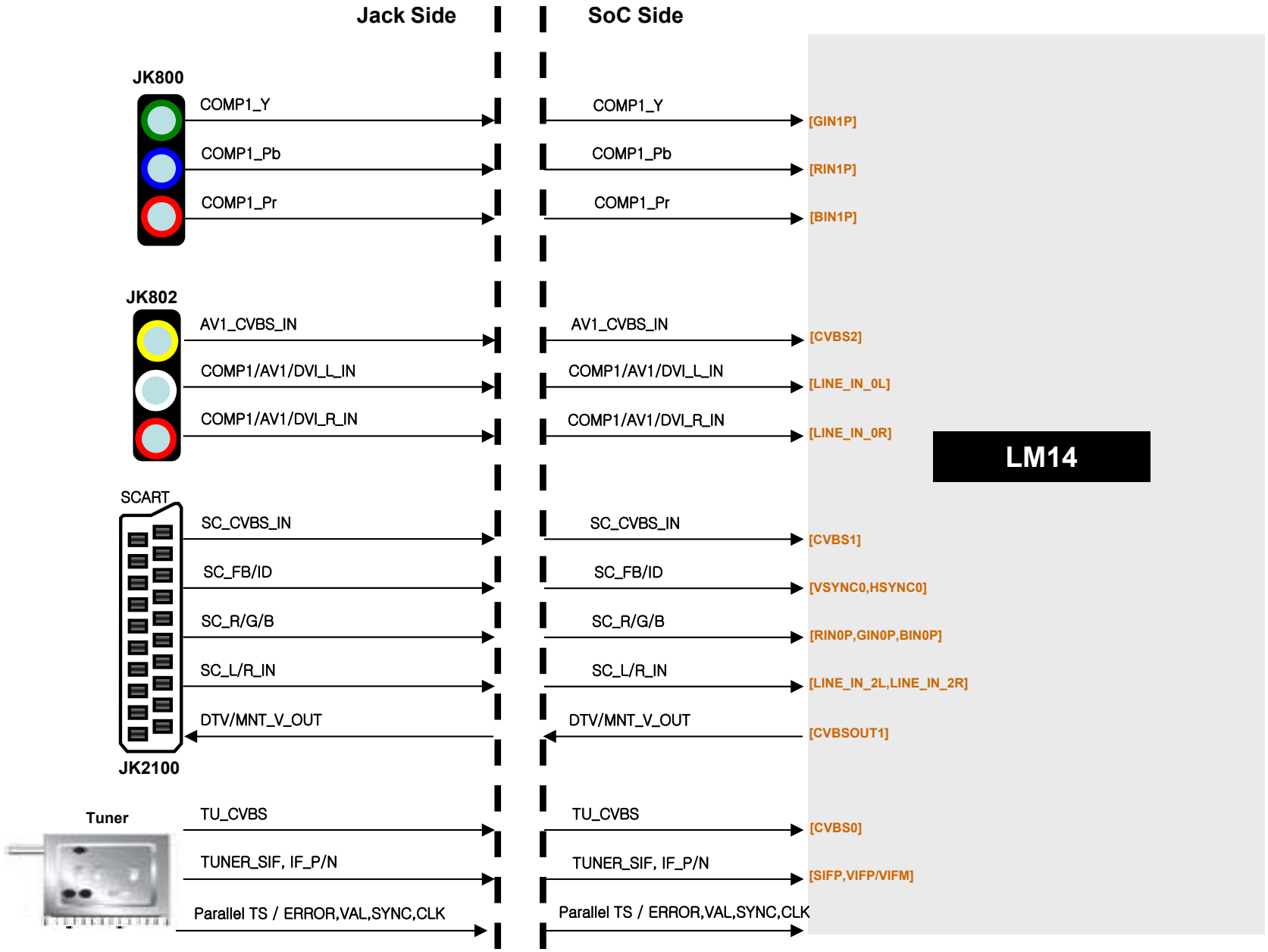
4. LM14 Power Block Diagram



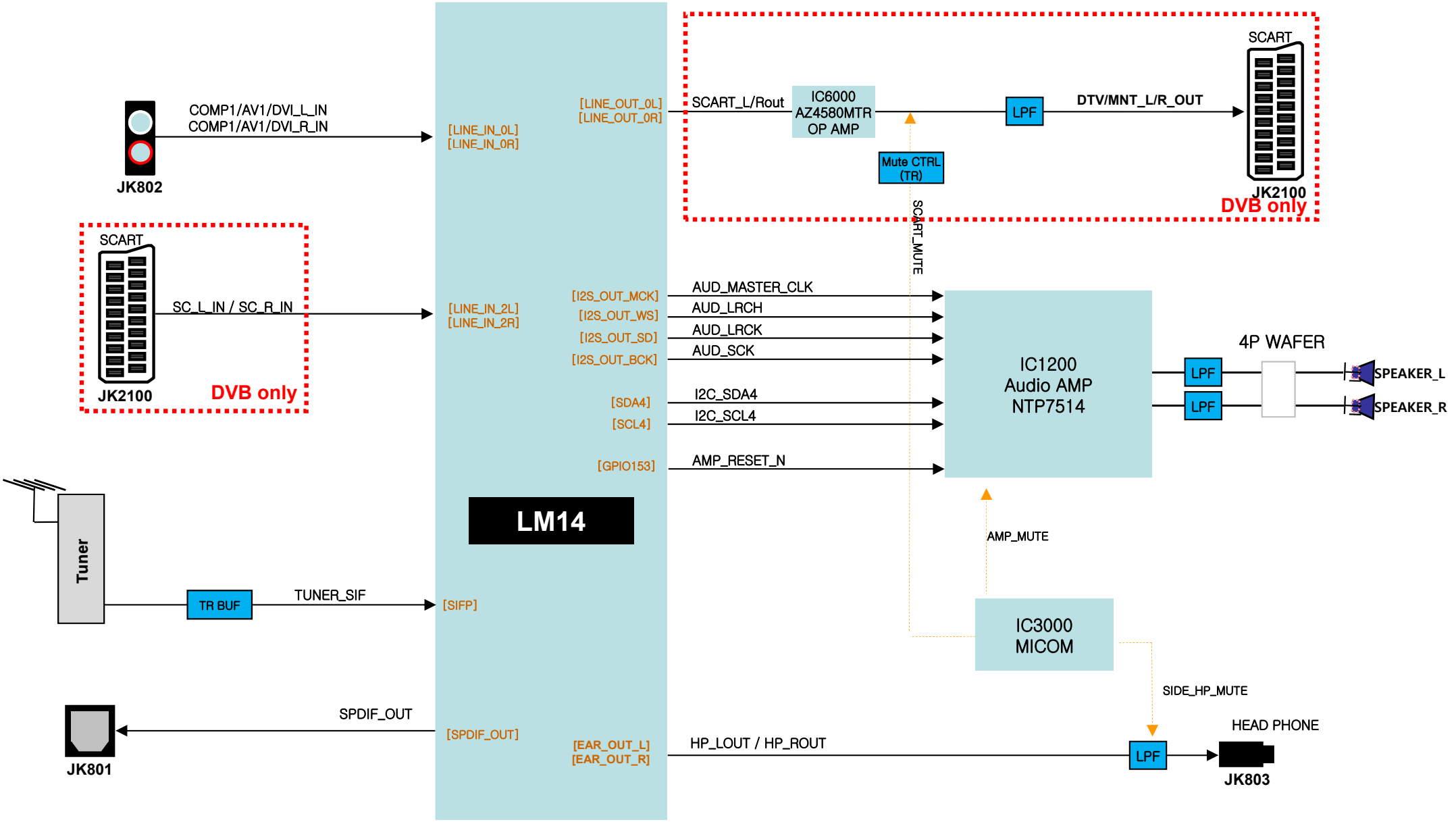
5. Tuner/CI Block Diagram



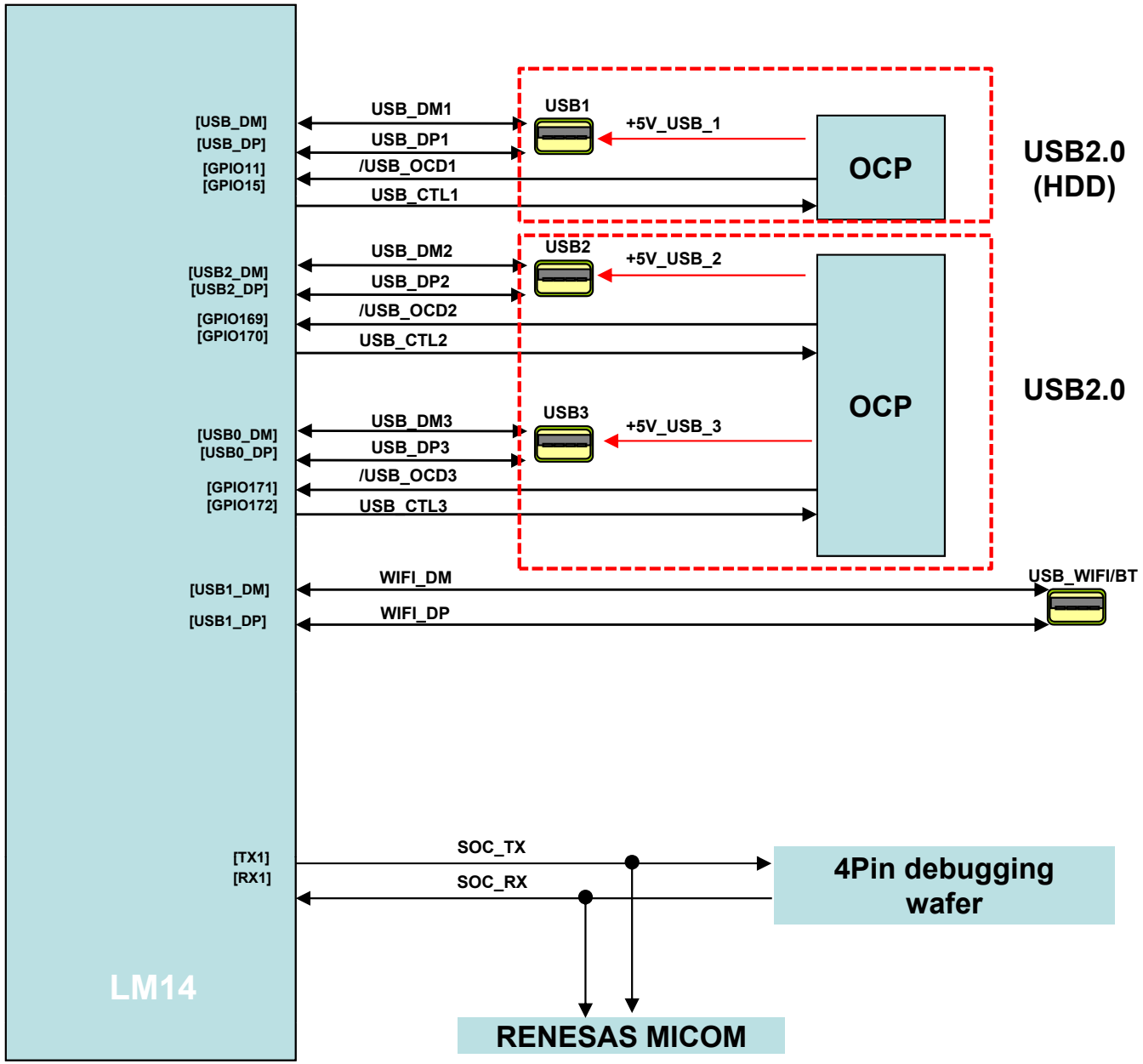
6. Video/Audio In Block Diagram



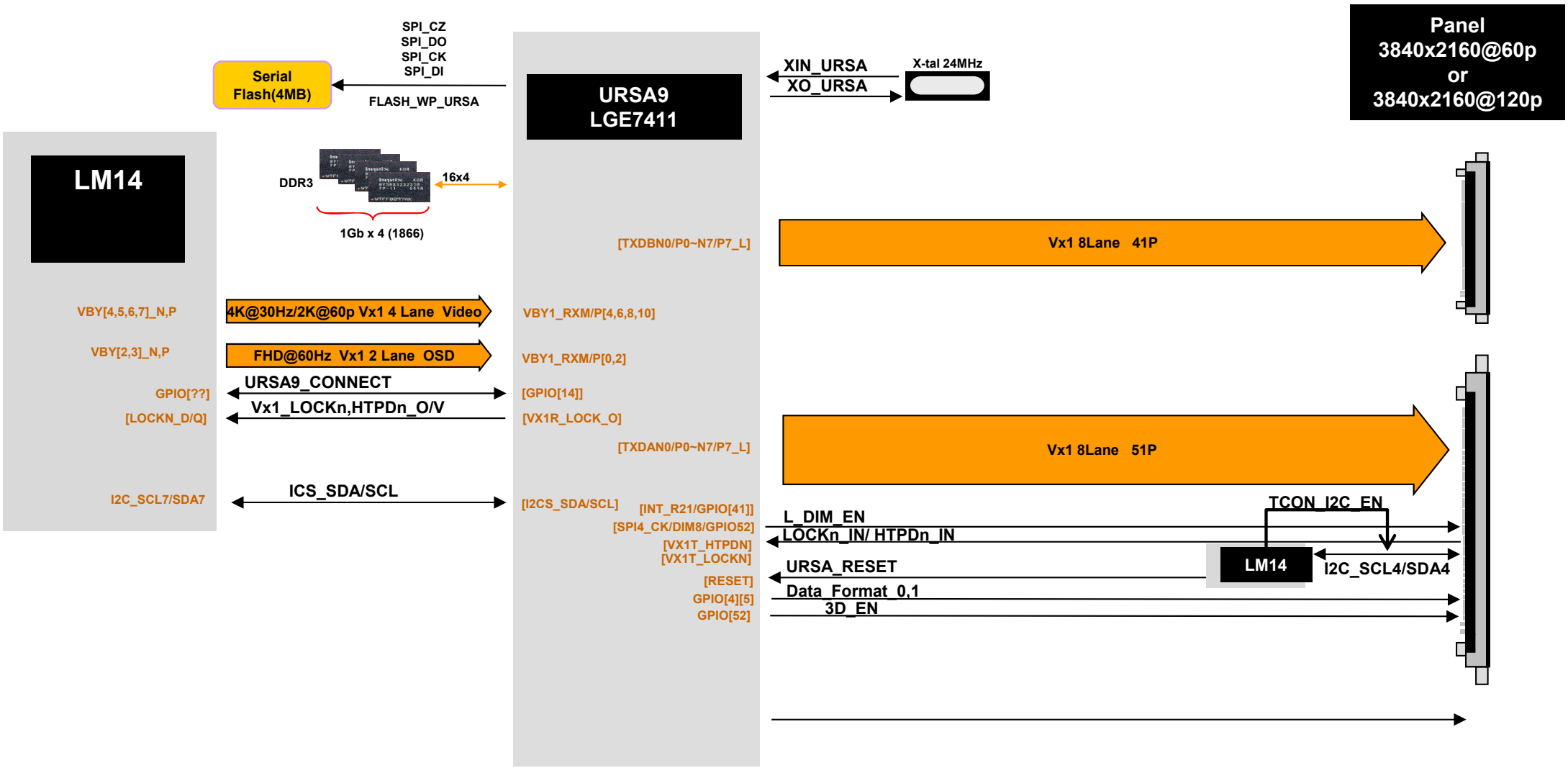
7. Audio Out Block Diagram



8. USB / WIFI / M-REMOTE / UART



9. Back End



10. LM14 Internal Block

Block Diagram