



LG
Life's Good

North/Latin America
Europe/Africa
Asia/Oceania

Internal Use Only

<http://aic.lgservice.com>
<http://eic.lgservice.com>
<http://biz.lgservice.com>

OLED TV

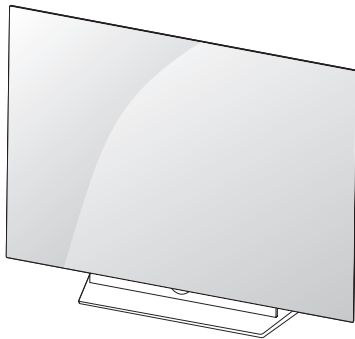
SERVICE MANUAL

CHASSIS : ED59E

MODEL : 65EF950* 65EF950*-ZA

CAUTION

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



CONTENTS

CONTENTS	2
SAFETY PRECAUTIONS	3
SERVICING PRECAUTIONS.....	4
SPECIFICATION	6
ADJUSTMENT INSTRUCTION	15
BLOCK DIAGRAM.....	26
EXPLODED VIEW	36
SCHEMATIC CIRCUIT DIAGRAM	APPENDIX
TROUBLE SHOOTING GUIDE	APPENDIX

SAFETY PRECAUTIONS

IMPORTANT SAFETY NOTICE

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

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

Do not modify the original design without permission of manufacturer.

General Guidance

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

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

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

When replacing a high wattage resistor (Oxide Metal Film Resistor, over 1 W), keep the resistor 10 mm away from PCB.

Keep wires away from high voltage or high temperature parts.

Before returning the receiver to the customer,

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

Leakage Current Cold Check(Antenna Cold Check)

With the instrument AC plug removed from AC source, connect an electrical jumper across the two AC plug prongs. Place the AC switch in the on position, connect one lead of ohm-meter to the AC plug prongs tied together and touch other ohm-meter lead in turn to each exposed metallic parts such as antenna terminals, phone jacks, etc.

If the exposed metallic part has a return path to the chassis, the measured resistance should be between 1 M Ω and 5.2 M Ω .

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.

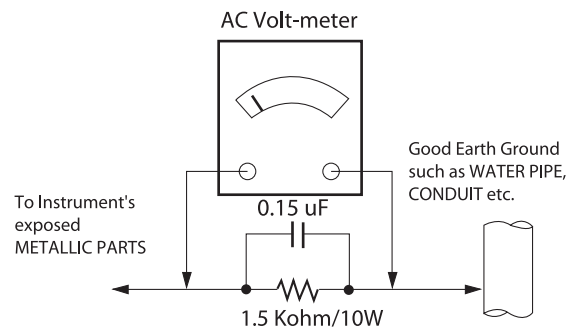
Connect 1.5 K / 10 watt resistor in parallel with a 0.15 μ F capacitor between a known good earth ground (Water Pipe, Conduit, etc.) and the exposed metallic parts.

Measure the AC voltage across the resistor using AC voltmeter with 1000 ohms/volt or more sensitivity.

Reverse plug the AC cord into the AC outlet and repeat AC voltage measurements for each exposed metallic part. Any voltage measured must not exceed 0.75 volt RMS which corresponds to 0.5 mA.

In case any measurement is out of the limits specified, there is possibility of shock hazard and the set must be checked and repaired before it is returned to the customer.

Leakage Current Hot Check circuit



When 25A is impressed between Earth and 2nd Ground for 1 second, Resistance must be less than 0.1 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 is not required.
5. Do not defeat any plug/socket B+ voltage interlocks with which receivers covered by this service manual might be equipped.
6. Do not apply AC power to this instrument and/or any of its electrical assemblies unless all solid-state device heat sinks are correctly installed.
7. Always connect the test receiver ground lead to the receiver chassis ground before connecting the test receiver positive lead.
Always remove the test receiver ground lead last.
8. Use with this receiver only the test fixtures specified in this service manual.
CAUTION: Do not connect the test fixture ground strap to any heat sink in this receiver.

Electrostatically Sensitive (ES) Devices

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

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed to prevent potential shock reasons prior to applying power to the unit under test.

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

General Soldering Guidelines

1. Use a grounded-tip, low-wattage soldering iron and appropriate tip size and shape that will maintain tip temperature within the range of 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 specification is applied to the OLED TV with ED59E chassis.

2. Requirement for Test

Each part is tested as below without special appointment.

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

3. Test method

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

4. Model General Specification

No.	Item	Specification	Remarks
1	Market	EU/CIS(PAL Market-37Countries)	DTV & Analog (Total 37 countries) DTV (MPEG2/4, DVB-T) : 26 countrie Germany, Netherland, Switzerland, Hungary, Austria, Slovenia, Bulgaria, France, Spain, , Belgium, Luxemburg, Greece, Czech, Turkey, Morocco, Ireland, Latvia, Estonia, Lithuania, Poland, Portugal, Romania, Albania, Bosnia, Slovakia, Belarus DTV (MPEG2/4, DVB-T2) :11 countries UK(Ireland), Sweden, Denmark, Finland, Norway, Ukraine, Kazakhstan, Russia, Italy, Croatia, Serbia DTV (MPEG2/4, DVB-C) : 37 countries Germany, Netherland, Switzerland, Hungary, Austria, Slovenia, Bulgaria, France, Spain, Italy, Belgium, Russia, Luxemburg, Greece, Czech, Croatia, Turkey, Morocco, Ireland, Latvia, Estonia, Lithuania, Poland, Portugal, Romania, Albania, Bosnia, Serbia, Slovakia, Belarus, UK, Sweden, Denmark, Finland, Norway, Ukraine, Kazakhstan DTV (MPEG2/4,DVB-S) : 37 countries Germany, Netherland, Switzerland, Hungary, Austria, Slovenia, Bulgaria, France, Spain,Belgium, Luxemburg, Greece, Czech, Turkey, Morocco, Ireland, Latvia, Estonia, Lithuania, Poland, Portugal, Romania, Albania, Bosnia, Slovakia, Belarus, UK(Ireland), Sweden, Denmark, Finland, Norway, Ukraine, Kazakhstan,Russia, Italy, Croatia, Serbia Supported satellite : 35 satellites ABS1 75.0E, AMOS 4.0W, ASIASEAT3S 105.5E, ASTRA 19.2E, ASTRA 23.5E, ASTRA 28.2E, ASTRA 4.8E, ATLANTIC BIRD2 8.0W, ATLANTIC BIRD3 5.0W, BADR 26.0E, DIRECTV-1R 56.0E, EUROBIRO 9A 9.0E, EUROBIRO3 33.0E, EUTELSAT 36 A/B 36.0E, EUTELSAT W2A 10.0E, EUTELSAT W3A 7.0E, EUTELSAT7WA 7.3WEUTELSAT 16.0E, EXPRESS AM1 40.0E, EXPRESS AM3 140.0E, EXPRESS AM33 96.5E, HELLASAT 39.0E, HISPASAT 1CDE 30.0W, HOTBIRD 13.0E, INTELSAT10&7 68.5E, INTELSAT15 85.2E, INTELSAT1R 50.0W, INTELSAT903 33.5W, INTELSAT904 60.0E, NILESAT 7.0W, NSS12 57.0E, THOR 0.8W, TURKSAT 42.0E, YAMAL201 90.0E, OTHER

No.	Item	Specification	Remarks
2	Broadcasting system	1)PAL/SECAM B/G/I/D/K, SECAM L/L' 2)DVB-T/T2, C, S/S2	
3	Program coverage	1) Digital TV - VHF, UHF - C-Band,Ku-Band 2) Analogue TV - VHF : E2 to E12 - UHF : E21 to E69 - CATV : S1 to S20 - HYPER : S21 to S47	
4	Receiving system	Analog : Upper Heterodyne Digital : COFDM, QAM	► DVB-T - Guard Interval(Bitrate_Mbit/s) 1/4, 1/8, 1/16, 1/32 - Modulation : Code Rate QPSK : 1/2, 2/3, 3/4, 5/6, 7/8 16-QAM : 1/2, 2/3, 3/4, 5/6, 7/8 64-QAM : 1/2, 2/3, 3/4, 5/6, 7/8 ► DVB-T2 - Guard Interval(Bitrate_Mbit/s) 1/4, 1/8, 1/16, 1/32, 1/128, 19/128, 19/256, - Modulation : Code Rate QPSK : 1/2, 2/5, 2/3, 3/4, 5/6 16-QAM : 1/2, 2/5, 2/3, 3/4, 5/6 64-QAM : 1/2, 2/5, 2/3, 3/4, 5/6 256-QAM : 1/2, 2/5, 2/3, 3/4, 5/6 ► DVB-T2 - Symbolrate : 4.0Msymbols/s to 7.2Msymbols/s - Modulation : 16QAM, 64-QAM, 128-QAM and 256-QAM ► DVB-S/S2 - symbolrate DVB-S2 (8PSK / QPSK) : 2 ~ 45Msymbol/s DVB-S (QPSK) : 2 ~ 45Msymbol/s - viterbi DVB-S mode : 1/2, 2/3, 3/4, 5/6, 7/8 DVB-S2 mode : 1/2, 2/3, 3/4, 3/5, 4/5, 5/6, 8/9, 9/10
5	Input Voltage	AC 100 ~ 240V 50/60Hz	

5. External Input Support Format

5.1. Component (Y, CPB, PR)

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

5.2. HDMI Input

(1) DTV mode

No	Resolution	H-freq.(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	Proposed
1	640*480	31.46	59.94	25.13	SDTV 480P	
2	640*480	31.50	60.00	25.13	SDTV 480P	
3	720*480	15.73	59.94	13.50	SDTV, DVD 480I(525I)	Spec. out but display
4	720*480	15.75	60.00	13.51	SDTV, DVD 480I(525I)	
5	720*576	15.62	50.00	13.50	SDTV, DVD 576I(625I) 50Hz	
6	720*480	31.47	59.94	27.00	SDTV 480P	
7	720*480	31.50	60.00	27.03	SDTV 480P	
8	720*576	31.25	50.00	27.00	SDTV 576P	
9	1280*720	44.96	59.94	74.18	HDTV 720P	
10	1280*720	45.00	60.00	74.25	HDTV 720P	
11	1280*720	37.50	50.00	74.25	HDTV 720P	
12	1920*1080	28.12	50.00	74.25	HDTV 1080I	
13	1920*1080	33.72	59.94	74.18	HDTV 1080I	
14	1920*1080	33.75	60.00	74.25	HDTV 1080I	
15	1920*1080	26.97	23.97	63.30	HDTV 1080P	
16	1920*1080	27.00	24.00	63.36	HDTV 1080P	
17	1920*1080	33.71	29.97	79.12	HDTV 1080P	
18	1920*1080	33.75	30.00	79.20	HDTV 1080P	
19	1920*1080	56.25	50.00	148.50	HDTV 1080P	
20	1920*1080	67.43	59.94	148.35	HDTV 1080P	
21	1920*1080	67.50	60.00	148.50	HDTV 1080P	

22	3840*2160	53.95	23.98	297.00	UDTV 2160P	UHD only
23	3840*2160	54.00	24.00	297.00	UDTV 2160P	UHD only
24	3840*2160	56.25	25.00	297.00	UDTV 2160P	UHD only
25	3840*2160	61.43	29.97	297.00	UDTV 2160P	UHD only
26	3840*2160	67.50	30.00	297.00	UDTV 2160P	UHD only
27	3840*2160	112.50	50.00	594.00	UDTV 2160P(DVB)	UHDOnly(Port1)
28	3840*2160	135.00	59.94	593.41	UDTV 2160P	UHDOnly(Port1)
29	3840*2160	135.00	60.00	594.00	UDTV 2160P	UHDOnly(Port1)
30	4096*2160	53.95	23.98	297.00	UDTV 2160P	UHD only
31	4096*2160	54.00	24.00	297.00	UDTV 2160P	UHD only
32	4096*2160	56.25	25.00	297.00	UDTV 2160P	UHD only
33	4096*2160	61.43	29.97	297.00	UDTV 2160P	UHD only
34	4096*2160	67.50	30.00	297.00	UDTV 2160P	UHD only
35	4096*2160	112.50	50.00	594.00	UDTV 2160P(DVB)	UHDOnly(Port1)
36	4096*2160	135.00	59.94	593.41	UDTV 2160P	UHDOnly(Port1)
37	4096*2160	135.00	60.00	594.00	UDTV 2160P	UHDOnly(Port1)

(2) HDMI Input (PC)

No	Resolution	H-freq.(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	Proposed
1	640*350	31.46	70.09	25.17	EGA	
2	720*400	31.46	70.08	28.32	DOS	
3	640*480	31.46	59.94	25.17	VESA(VGA)	
4	800*600	37.87	60.31	40.00	VESA(SVGA)	
5	1024*768	48.36	60.00	65.00	VESA(XGA)	
6	1152*864	54.34	60.05	80.00	VESA	
7	1280*1024	63.98	60.02	109.00	VESA(SXGA)	FHD only
8	1360*768	47.71	60.01	85.00	VESA(WXGA)	
9	1920*1080	67.50	60.00	158.40	WUXGA(CEA 861D)	FHD only
10	3840*2160	67.50	30.00	297.00	UDTV 2160P	UHD only
11	3840*2160	56.25	25.00	297.00	UDTV 2160P	UHD only
12	3840*2160	54.00	24.00	297.00	UDTV 2160P	UHD only
13	4096*2160	53.95	23.97	296.703	UDTV 2160P	UHD only
14	4096*2160	54.00	24.00	297.00	UDTV 2160P	UHD only

5.3. 3D Mode - DTV/HDMI/USB

(1) RF Input

No.	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	3D input proposed mode
1	1280*720	37.50	50	74.25	HDTV 720P	2D to 3D, Side by Side, Top & Bottom
2	1920*1080	28.13	50	74.25	HDTV 1080I	2D to 3D, Side by Side, Top & Bottom

(2) HDMI Input(3D supported mode automatically)

No.	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	VIC	3D input proposed mode	Proposed
1	640*480	31.46 / 31.50	59.94/ 60.00	25.13/25.20	1	Top-and-Bottom Side-by-side(half)	Secondary(SDTV 480P) Secondary(SDTV 480P)
		31.46 / 31.50	59.94/ 60.00	50.35/50.40	1	Side-by-side(Full)	(SDTV 480P)
		62.93 / 63.00	59.94/ 60.00	50.35/50.40	1	Frame packing Line alternative	Secondary(SDTV 480P) (SDTV 480P)
2	720*480	31.46 / 31.50	59.94 / 60.00	27.00/27.03	2,3	Top-and-Bottom Side-by-side(half)	Secondary(SDTV 480P) Secondary(SDTV 480P)
		31.46 / 31.50	59.94 / 60.00	27.00/27.03	2,3	Side-by-side(Full)	(SDTV 480P)
		62.93 /63.00	59.94 / 60.00	54.00/54.06	2,3	Frame packing Line alternative	Secondary(SDTV 480P) (SDTV 480P)
3	720*576	15.62	50.00	27.00	21	Top-and-Bottom Side-by-side(half) Side-by-side(Full) Frame packing Field alternative	(SDTV 576I) Secondary(SDTV 576I) (SDTV 576I) Secondary(SDTV 576I) Secondary(SDTV 576I)
4	720*576	31.25	50.00	27.00	17,18	Top-and-Bottom Side-by-side(half) Side-by-side(Full)	Secondary(SDTV 576P) Secondary(SDTV 576P) (SDTV 576P)
		62.50	50.00	54.00	17,18	Frame packing Line alternative	Secondary(SDTV 576P) (SDTV 576P)
5	1280*720	37.50	50.00	74.25	19	Top-and-Bottom Side-by-side(half)	Primary(HDTV 720P) Primary(HDTV 720P)
		37.50	50.00	148.50	19	Side-by-side(Full)	(HDTV 720P)
		44.96 / 45.00	59.94 / 60.00	74.17/74.25	4	Top-and-Bottom Side-by-side(half)	Primary(HDTV 720P) Primary(HDTV 720P)
		44.96 / 45.00	59.94 / 60.00	148.35/148.50	4	Side-by-side(Full)	(HDTV 720P)
		75.00	50.00	148.50	19	Frame packing Line alternative	Primary(HDTV 720P) (HDTV 720P)
		89.91/90.00	59.94 / 60.00	148.35/148.50	4	Frame packing Line alternative	Primary(HDTV 720P) (HDTV 720P)

6	1920*1080	28.12	50.00	74.25	20	Top-and-Bottom Side-by-side(half)	Secondary(HDTV 1080I) Primary(HDTV 1080I)
		28.12	50.00	148.50	20	Side-by-side(Full)	(HDTV 1080I)
		33.72 / 33.75	59.94 / 60.00	74.17/74.25	5	Top-and-Bottom Side-by-side(half)	Secondary(HDTV 1080I) Primary(HDTV 1080I)
		33.72 / 33.75	59.94 / 60.00	148.35/148.50	5	Side-by-side(Full)	(HDTV 1080I)
		56.25	50.00	148.50	20	Frame packing Field alternative	Primary(HDTV 1080I) (HDTV 1080I)
		67.43/67.50	59.94 / 60.00	148.35/148.50	5	Frame packing Field alternative	Primary(HDTV 1080I) (HDTV 1080I)
7	1920*1080	26.97 / 27.00	23.97 / 24.00	74.17 / 74.25	32	Top-and-Bottom Side-by-side(half)	Primary(HDTV 1080P) Primary(HDTV 1080P)
		26.97 / 27.00	23.97 / 24.00	148.35 / 148.50	32	Side-by-side(Full)	(HDTV 1080P)
		28.12	25.00	74.25	33	Top-and-Bottom Side-by-side(half)	Secondary(HDTV 1080P) Secondary(HDTV 1080P)
		28.12	25.00	148.50	33	Side-by-side(Full)	(HDTV 1080P)
		33.71 / 33.75	29.97 / 30.00	74.18/74.25	34	Top-and-Bottom Side-by-side(half)	Primary(HDTV 1080P) Secondary(HDTV 1080P)
		33.71 / 33.75	29.97 / 30.00	148.35/148.50	34	Side-by-side(Full)	(HDTV 1080P)
		43.94/54.00	23.97 / 24.00	148.35/148.50	32	Frame packing Line alternative	Primary(HDTV 1080P) (HDTV 1080P)
		56.25	25.00	148.50	33	Frame packing Line alternative	Secondary(HDTV 1080P) (HDTV 1080P)
		67.43 / 67.5	29.97 / 30.00	148.35/148.50	34	Frame packing Line alternative	Primary(HDTV 1080P) (HDTV 1080P)
		56.25	50.00	148.50	31	Top-and-Bottom Side-by-side(half)	Primary(HDTV 1080P) Secondary(HDTV 1080P)
		67.43 / 67.50	59.94 / 60.00	148.35/148.50	16	Top-and-Bottom Side-by-side(half)	Primary(HDTV 1080P) Secondary(HDTV 1080P)

(3) DTV(3D) (3D supported mode automatically)

No.	Signal	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	3D input proposed mode
1	Frame compatible	-	-	-	-	Side by Side(half) Top & Bottom

(4) DTV/ATV(CVBS/SCART) Input(3D) (3D supported mode manually)

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

(5) Component Input (3D) (3D supported mode manually)

No.	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	3D input proposed mode
1	1280*720	37.50	50.00	74.25	HDTV 720P	2D to 3D, Side by Side(half), Top & Bottom
2	1280*720	45.00	60.00	74.25	HDTV 720P	2D to 3D, Side by Side(half), Top & Bottom
3	1280*720	44.96	59.94	74.18	HDTV 720P	2D to 3D, Side by Side(half), Top & Bottom
4	1920*1080	33.75	60.00	74.25	HDTV 1080I	2D to 3D, Side by Side(half), Top & Bottom
5	1920*1080	33.72	59.94	74.18	HDTV 1080I	2D to 3D, Side by Side(half), Top & Bottom
6	1920*1080	28.12	50.00	74.25	HDTV 1080I	2D to 3D, Side by Side(half), Top & Bottom
7	1920*1080	67.50	60.00	148.50	HDTV 1080P	2D to 3D, Side by Side(half), Top & Bottom
8	1920*1080	67.43	59.94	148.35	HDTV 1080P	2D to 3D, Side by Side(half), Top & Bottom
9	1920*1080	27.00	24.00	74.25	HDTV 1080P	2D to 3D, Side by Side(half), Top & Bottom
10	1920*1080	28.12	25.00	74.25	HDTV 1080P	2D to 3D, Side by Side(half), Top & Bottom
11	1920*1080	56.25	50.00	74.25	HDTV 1080P	2D to 3D, Side by Side(half), Top & Bottom
12	1920*1080	26.97	23.97	74.18	HDTV 1080P	2D to 3D, Side by Side(half), Top & Bottom
13	1920*1080	33.75	30.00	74.25	HDTV 1080P	2D to 3D, Side by Side(half), Top & Bottom
14	1920*1080	33.71	29.97	74.18	HDTV 1080P	2D to 3D, Side by Side(half), Top & Bottom

(6) 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	60.00	65.00	HDTV 768P	2D to 3D, Side by Side(half), Top & Bottom
2	1360*768	47.71	60.00		HDTV 768P	
3	1920*1080	67.50	60.00	148.50	HDTV 1080P	2D to 3D, Side by Side(half), Top & Bottom, Checker Board, Frame Sequential, Row Interleaving, Column Interleaving
4	3840*2160 (Ultra HD model only)	54.00	24.00	296.70	HDTV 2160P	2D to 3D, Top & Bottom(half) Side by Side(half)
		56.25	25.00	297.00		
		67.50	30.00	296.70		
5	4096*2160 (Ultra HD model only)	54	24.00	297.00	HDTV 2160P	
6	Others	-	-	-	640*350 720*400 640*480 800*600 1152*864	2D to 3D, Side by Side(half), Top & Bottom

(7) HDMI-DTV (3D supported mode manually)

No.	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	3D input proposed mode
1	720*480	31.50	60.00	27.03	SDTV 480P	2D to 3D, Side by Side(Half), Top & Bottom, Checker Board, Frame Sequential, Row Interleaving, Column Interleaving
2	720*576	31.25	50.00	27.00	SDTV 576P	
		37.50	50.00	74.25	HDTV 720P	
3	1920*1080	33.75	60.00	74.25	HDTV 1080I	2D to 3D, Side by Side(Half), Top & Bottom
		28.12	50.00	74.25	HDTV 1080I	
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
		28.12	25.00	74.25	HDTV 1080P	
		33.75	30.00	74.25	HDTV 1080P	
		67.50	60.00	148.50	HDTV 1080P	2D to 3D, Side by Side(Half), Top & Bottom, Checker Board, Single Frame Sequential, Row Interleaving, Column Interleaving.
		56.25	50.00	148.50	HDTV 1080P	
5	3840*2160 4096*2160 (Ultra HD model only)	53.95	23.97	297.00	HDTV 2160P	2D to 3D, Top & Bottom(half), Side by Side(half)
		54.00	24.00	296.70		
		56.25	25.00	297.00		
		61.43	29.97	297.00		
		67.50	30.00	296.70		
		112.50	50.00(HDMI1, HDMI2 Only)	594.00	HDTV 2160P	2D to 3D, Side by Side(half) Top & Bottom
		135.00	60.00(HDMI1, HDMI2 Only)	594.00		

(8) USB – Movie (3D) (3D supported mode manually)

No.	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	3D input proposed mode
1	Under 704x480	-	-	-	2D to 3D
2	Over 704x480 Under 1080P interlaced	-	-	-	2D to 3D, Side by Side(Half), Top & Bottom
3	Over 704x480 Under 1080P progressive	-	50 / 60	-	2D to 3D, Side by Side(Half), Top & Bottom, Checker Board, Row Interleaving, Column Interleaving, Column Interleaving, Frame Sequential
4		-	others	-	2D to 3D, Side by Side(Half), Top & Bottom, Checker Board, Row Interleaving, Column Interleaving
5	Over 2160P (Ultra HD model only)	-	24/25/30/50/60	-	2D to 3D, Side by Side(Half), Top & Bottom

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

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

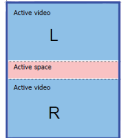
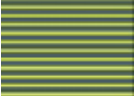
(10) Miracast Intel WIDI (3D supported mode manually)

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	-	30.00 / 60.00	-	
3	1920X1080p		30.00 / 60.00		
4	Others		-		2D to 3D

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

No.	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	3D input proposed mode
1	1080p	33.75	30.00	74.25	Side by Side(Half), Top & Bottom, Checker Board, MPO(Photo), JPS(Photo)
2	2160p	67.50	30.00	297.00	

■ Remark: 3D Input mode

Side by Side	Top & Bottom	Checkerboard	Single Frame Sequential	Frame Packing	Row Inter-leaving	Column Inter-leaving	2D to 3D
							

ADJUSTMENT INSTRUCTION

1. Application Range

This specification sheet is applied to ED59E Chassis applied OLED TV all models manufactured in TV factory.

2. Designation

- (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 $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$ of temperature and $65\% \pm 10\%$ of relative humidity if there is no specific designation.
- (4) The input voltage of the receiver must keep AC 100-240 V~, 50/60 Hz.
- (5) The receiver must be operated for about 5 minutes prior to the adjustment when module is in the circumstance of over 15°C .

In case of keeping module is in the circumstance of 0°C , it should be placed in the circumstance of above 15°C for 2 hours.

In case of keeping module is in the circumstance of below -20°C , it should be placed in the circumstance of above 15°C for 3 hours.

[Caution]

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

3. Adjustment items

3.1. Main PCB check process

- MAC Address Download
 - ADC adjustment : 480i Comp1, 1920*1080 Comp1
 - EDID/DDC download
- Above adjustment items can be also performed in Final Assembly if needed. Both Board-level and Final assembly adjustment items can be check using In-Star Menu 1. ADJUST CHECK.

3.2. Final assembly adjustment

- White Balance adjustment
- RS-232C functionality check
- PING Test
- Factory Option setting per destination
- Ship-out mode setting (In-Stop)

3.3. Etc

- Ship-out mode
- Service Option Default
- USB Download(S/W Update, Option, Service only)
- ISP Download(Option)

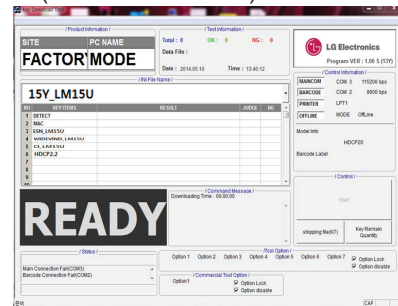
4. Automatic Adjustment

4.1. MAC address D/L , CI+ key D/L , Widevine key D/L, ESN D/L, HDCP14/20 D/L

- Connect: USB port

4.2. Communication Prot connection

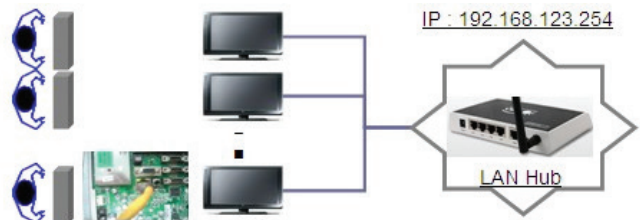
- Com 1,2,3,4 and 115200(Baudrate)
- Mode check: Online Only
- check the test process
DETECT -> MAC -> ESN -> Widevine -> CI -> HDCP14 -> HDCP20
- .Play : Press Enter key
- .Result: Ready, Test, OK or NG
- .Printer Out (MAC Address Label)



4.3. LAN Inspection

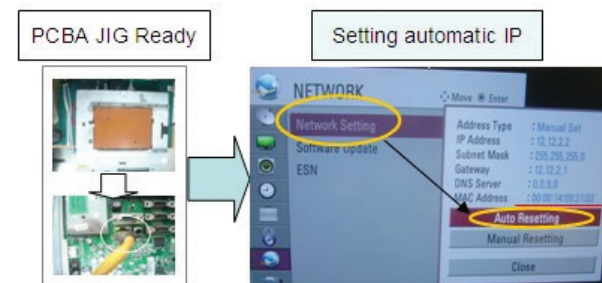
4.3.1. Equipment & Condition

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



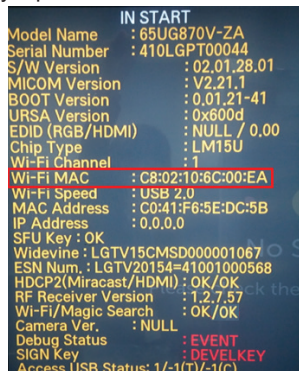
4.3.2. LAN inspection solution

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



4.3.3. WIDEVINE Key Inspection

- Confirm Key input Data at the "IN START" MENU Mode



4.4. LAN PORT INSPECTION(PING TEST)

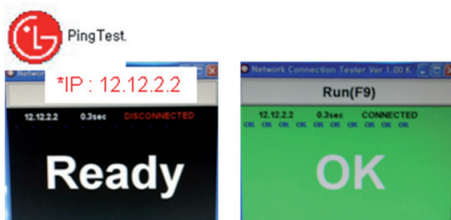
4.4.1. Equipment setting

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



4.4.2. LAN PORT inspection (PING TEST)

- (1) Play the LAN Port Test Program.
- (2) connect each other LAN Port Jack.
- (3) Play Test (F9) button and confirm OK Message.
- (4) remove LAN CABLE



4.5. Model name & Serial number Download

4.5.1 Model name & Serial number D/L

- Press "P-ONLY" key of service remote control.
(Baud rate : 115200 bps)
- Connect RS-232C Signal to USB Cable to USB.
- Write Serial number by use USB port.
- Must check the serial number at Instart menu.

4.5.2 Method & notice

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

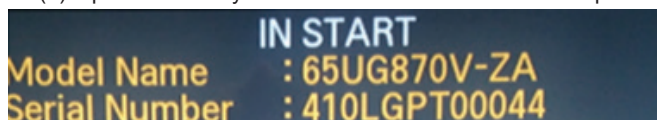
※ Manual Download (Model Name and Serial Number)

If the TV set is downloaded By OTA or Service man, Sometimes model name or serial number is initialized.

(Not always)

There is impossible to download by bar code scan, so It need Manual download.

- (1) Press the 'instart' key of ADJ remote control.
- (2) Go to the menu '7.Model Number D/L' like below photo.
- (3) Input the Factory model name or Serial number like photo.

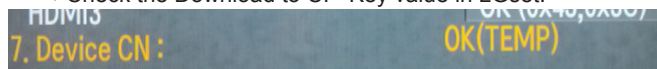


- (4) Check the model name Instart menu
→Factory name displayed
- (5) Check the Diagnostics (DTV country only)
→Buyer model displayed

4.6. CI+ Key checking method(check the Section 4.2) (Only EU Model)

Check whether the key was downloaded or not at 'In Start' menu. (Refer to below).

→ Check the Download to CI+ Key value in LGset.



4.6.1. check the method of CI+ Key value

- check the method on Instart menu
- check the method of RS232C Command
 - into the main ass'y mode (RS232 : aa 00 00)

CMD 1	CMD 2	Data 0	
	A	0	0

- 2) check the key download for transmitted command (RS232 : ci 00 10)

CMD 1	CMD 2	Data 0	
C	I	1	0

3) result value

- normally status for download : OKx
- abnormally status for download : NGx

4.6.2. check the method of CI+ Key value (RS232)

(1) into the main ass'y mode (RS232 : aa 00 00)

CMD 1	CMD 2	Data 0	
A	A	0	0

(2) check the mothod of CI+ key by command
(RS232 : ci 00 20)

CMD 1	CMD 2	Data 0	
C	I	2	0

(3) result value

i 01 OK 1d1852d21c1ed5dcx

CI+ Key Value

4.7. WIFI MAC ADRESS CHECK

4.7.1. Using RS232 Command

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

4.7.2. check the menu on in-start

```

S/W Version      : 02.01.28.01
MICOM Version    : V2.21.1
BOOT Version     : 0.01.21-41
URSA Version     : 0x600d
EDID (RGB/HDMI)  : NULL / 0.00
Chip Type       : LM15U
Wi-Fi Channel    : 1
Wi-Fi MAC       : C8:02:10:6C:00:EA
Wi-Fi Speed     : USB 2.0
MAC Address     : C0:41:F6:5E:DC:5B
IP Address      : 0.0.0.0
  
```

5. Manual Adjustment

5.1. ADC adjustment is not needed because of OTP(Auto ADC adjustment)

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

5.2.1. Overview

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

5.2.2. Equipment

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

5.2.3. Download method

(1) Press Adj. key on the Adj. R/C, then select "12.EDID D/L".
By pressing Enter key, enter EDID D/L menu.



(2) Select [Start] button by pressing Enter key, HDMI1 / HDMI2 / HDMI3 / HDMI4 are Writing and display OK or NG.

5.2.4. Download method

▪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	(a)		(b)			
0x01	(c)		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	(d)			
0x07	(d)														01	(e)1
0x08	02	03	3A	F1	4E	10	9F	04	13	05	14	03	02	12	20	21
0x09	22	15	01	29	3D	06	C0	15	07	50	(f)					
0x0A	(f)			10	28	10	E3	05	03	01	02	3A	80	18	71	38
0x0B	2D	40	58	2C	45	00	40	84	63	00	00	1E	01	1D	80	18
0x0C	71	1C	16	20	58	2C	25	00	40	84	63	00	00	9E	01	1D
0x0D	00	72	51	D0	1E	20	6E	28	55	00	40	84	63	00	00	1E
0x0E	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	(e)2

(a) Product ID

(b) Serial No: Controlled on production line.

(c) Month, Year: Controlled on production line:
ex) Monthly : '01' → '01', Year : '2015' → '19'

(d) Model Name(Hex): LGTV

(e) Checksum(LG TV): Changeable by total EDID data.

(f) Vendor Specific(HDMI)

(1) DTS

HDMI 1(C/S : A0 C8) – HDMI UHD Deep On Case
EDID Block 0, Bytes 0-127 [00H-7FH]

	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	19	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	A0

EDID Block 1, Bytes 128-255 [80H-FFH]

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	02	03	59	F1	58	10	9F	04	13	05	14	03	02	12	20	21
10	22	15	01	60	61	5D	5E	5F	65	66	62	63	64	29	3D	06
20	C0	15	07	50	09	57	07	7C	03	0C	00	10	00	B8	3C	20
30	C0	8E	01	02	03	04	01	4F	3F	FC	08	10	18	10	06	10
40	16	10	28	10	67	D8	5D	C4	01	78	80	03	E3	05	C0	00
50	E4	0F	00	C0	18	E3	06	07	01	36	21	50	B0	51	00	1B
60	30	40	70	36	00	40	84	63	00	00	1E	00	00	00	00	00
70	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	C8

HDMI 1(C/S : E6 1E) – HDMI UHD Deep Off Case
EDID Block 0, Bytes 0-127 [00H-7FH]

	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	19	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	E6

EDID Block 1, Bytes 128-255 [80H-FFH]

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	02	03	4A	F1	54	10	9F	04	13	05	14	03	02	12	20	21
10	22	15	01	5D	5E	5F	62	63	64	29	3D	06	C0	15	07	50
20	09	57	07	7C	03	0C	00	10	00	B8	3C	20	C0	8E	01	02
30	03	04	01	4F	3F	FC	08	10	18	10	06	10	16	10	28	10
40	E5	0E	60	61	65	66	E3	06	07	01	31	1D	80	18	71	1C
50	16	20	58	2C	25	00	40	84	63	00	00	9E	00	00	00	00
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	1E

HDMI 2(C/S : A0 B8) – HDMI UHD Deep On Case
EDID Block 0, Bytes 0-127 [00H-7FH]

	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	19	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	A0

EDID Block 1, Bytes 128-255 [80H-FFH]

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	02	03	59	F1	58	10	9F	04	13	05	14	03	02	12	20	21
10	22	15	01	60	61	5D	5E	5F	65	66	62	63	64	29	3D	06
20	C0	15	07	50	09	57	07	7C	03	0C	00	30	00	B8	3C	20
30	C0	8E	01	02	03	04	01	4F	3F	FC	08	10	18	10	06	10
40	16	10	28	10	67	D8	5D	C4	01	78	80	03	E3	05	C0	00
50	E4	0F	00	C0	18	E3	06	07	01	36	21	50	B0	51	00	1B
60	30	40	70	36	00	40	84	63	00	00	1E	00	00	00	00	00
70	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	B8

HDMI 2(C/S : E6 0E) – HDMI UHD Deep Off Case
EDID Block 0, Bytes 0-127 [00H-7FH]

	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	19	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	E6

EDID Block 1, Bytes 128-255 [80H-FFH]

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	02	03	4A	F1	54	10	9F	04	13	05	14	03	02	12	20	21
10	22	15	01	5D	5E	5F	62	63	64	29	3D	06	C0	15	07	50
20	09	57	07	7C	03	0C	00	20	00	B8	3C	20	C0	8E	01	02
30	03	04	01	4F	3F	FC	08	10	18	10	06	10	16	10	28	10
40	E5	0E	60	61	65	66	E3	06	07	01	31	1D	80	18	71	1C
50	16	20	58	2C	25	00	40	84	63	00	00	9E	00	00	00	00
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	0E

HDMI 3(C/S : A0 A8) – HDMI UHD Deep On Case
EDID Block 0, Bytes 0-127 [00H-7FH]

	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	19	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	A0

EDID Block 1, Bytes 128-255 [80H-FFH]

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	02	03	59	F1	58	10	9F	04	13	05	14	03	02	12	20	21
10	22	15	01	60	61	5D	5E	5F	65	66	62	63	64	29	3D	06
20	C0	15	07	50	09	57	07	7C	03	0C	00	30	00	B8	3C	20
30	C0	8E	01	02	03	04	01	4F	3F	FC	08	10	18	10	06	10
40	16	10	28	10	67	D8	5D	C4	01	78	80	03	E3	05	C0	00
50	E4	0F	00	C0	18	E3	06	07	01	36	21	50	B0	51	00	1B
60	30	40	70	36	00	40	84	63	00	00	1E	00	00	00	00	00
70	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	A8

HDMI 3(C/S : E6 FE) – HDMI UHD Deep Off Case

EDID Block 0, Bytes 0-127 [00H-7FH]

	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	19	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	20	00	00	FC
70	00	4C	47	20	54	56	0A	20	20	20	20	20	20	01	01	E6

HDMI 1(C/S : E6 27) – HDMI UHD Deep Off Case

EDID Block 0, Bytes 0-127 [00H-7FH]

	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	19	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	20	00	00	FC
70	00	4C	47	20	54	56	0A	20	20	20	20	20	20	01	01	E6

EDID Block 1, Bytes 128-255 [80H-FFH]

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	02	03	4A	F1	54	10	9F	04	13	05	14	03	02	12	20	21
10	22	15	01	5D	5E	5F	62	63	64	29	3D	06	C0	15	07	50
20	09	57	07	7C	03	0C	00	30	00	B8	3C	20	C0	8E	01	02
30	03	04	01	4F	3F	FC	08	10	18	10	06	10	16	10	28	10
40	E5	0E	60	61	65	66	E3	06	07	01	11	1D	80	18	71	1C
50	16	20	58	2C	25	00	40	84	63	00	00	9E	00	00	00	00
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	FE	

EDID Block 1, Bytes 128-255 [80H-FFH]

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	02	03	47	F1	54	10	9F	04	13	05	14	03	02	12	20	21
10	22	15	01	5D	5E	5F	62	63	64	26	15	07	50	09	57	07
20	7C	03	0C	00	10	00	B8	3C	20	C0	8E	01	02	03	04	01
30	4F	3F	FC	08	10	18	10	06	10	16	10	28	10	E5	0E	60
40	61	65	66	E3	06	07	01	11	1D	80	18	71	1C	16	20	58
50	2C	25	00	40	84	63	00	00	9E	00	00	00	00	00	00	00
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	27

※ Checksum(HDMI 1/2/3)

Input	HDMI Deep Color On FFh (Checksum)		HDMI Deep Color Off FFh (Checksum)	
HDMI1	A0	C8	E6	1E
HDMI2	A0	B8	E6	0E
HDMI3	A0	A8	E6	FE

HDMI 2(C/S : A0 C1) – HDMI UHD Deep On Case

EDID Block 0, Bytes 0-127 [00H-7FH]

	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	19	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	20	00	00	FC
70	00	4C	47	20	54	56	0A	20	20	20	20	20	20	01	01	A0

(2) AC3

HDMI 1(C/S : A0 D1) – HDMI UHD Deep On Case

EDID Block 0, Bytes 0-127 [00H-7FH]

	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	19	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	20	00	00	FC
70	00	4C	47	20	54	56	0A	20	20	20	20	20	20	01	01	A0

EDID Block 1, Bytes 128-255 [80H-FFH]

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	02	03	58	F1	58	10	9F	04	13	05	14	03	02	12	20	21
10	22	15	01	60	61	5D	5E	5F	65	66	62	63	64	26	15	07
20	50	09	57	07	7C	03	0C	00	20	00	B8	3C	20	C0	8E	01
30	02	03	04	01	4F	3F	FC	08	10	18	10	06	10	16	10	28
40	10	67	D8	5D	C4	01	78	80	03	E3	05	C0	00	E4	0F	00
50	C0	18	E3	06	07	01	11	1D	80	18	71	1C	16	20	58	
60	36	00	40	84	63	00	00	1E	00	00	00	00	00	00	00	00
70	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	C1

EDID Block 1, Bytes 128-255 [80H-FFH]

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	02	03	58	F1	58	10	9F	04	13	05	14	03	02	12	20	21
10	22	15	01	60	61	5D	5E	5F	65	66	62	63	64	26	15	07
20	50	09	57	07	7C	03	0C	00	10	00	B8	3C	20	C0	8E	01
30	02	03	04	01	4F	3F	FC	08	10	18	10	06	10	16	10	28
40	10	67	D8	5D	C4	01	78	80	03	E3	05	C0	00	E4	0F	00
50	C0	18	E3	06	07	01	11	1D	80	18	71	1C	16	20	58	
60	36	00	40	84	63	00	00	1E	00	00	00	00	00	00	00	00
70	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	D1

HDMI 2(C/S : E6 17) – HDMI UHD Deep off Case

EDID Block 0, Bytes 0-127 [00H-7FH]

	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	19	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	20	00	00	FC
70	00	4C	47	20	54	56	0A	20	20	20	20	20	20	01	01	E6

EDID Block 1, Bytes 128-255 [80H-FFH]

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	02	03	47	F1	54	10	9F	04	13	05	14	03	02	12	20	21
10	22	15	01	5D	5E	5F	62	63	64	26	15	07	50	09	57	07
20	7C	03	0C	00	20	00	B8	3C	20	C0	8E	01	02	03	04	01
30	4F	3F	FC	08	10	18	10	06	10	16	10	28	10	E5	0E	60
40	61	65	66	E3	06	07	01	01	1D	80	18	71	1C	16	20	58
50	2C	25	00	40	84	63	00	00	9E	00	00	00	00	00	00	00
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	17

※ Checksum(HDMI 1/2/3)

Input	HDMI Deep Color On FFh (Checksum)		HDMI Deep Color Off FFh (Checksum)	
HDMI1	A0	D1	E6	27
HDMI2	A0	C1	E6	17
HDMI3	A0	B1	E6	07

(3) PCM

HDMI 1(C/S : A0 43- HDMI UHD Deep On Case

EDID Block 0, Bytes 0-127 [00H-7FH]

	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	19	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	20	00	00	FC
70	00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	01	A0

HDMI 3(C/S : A0 B1) – HDMI UHD Deep On Case

EDID Block 0, Bytes 0-127 [00H-7FH]

	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	19	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	20	00	00	FC
70	00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	01	A0

EDID Block 1, Bytes 128-255 [80H-FFH]

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	02	03	58	F1	58	10	9F	04	13	05	14	03	02	12	20	21
10	22	15	01	60	61	5D	5E	5F	65	66	62	63	64	26	15	07
20	50	09	57	07	7C	03	0C	00	30	00	B8	3C	20	C0	8E	01
30	02	03	04	01	4F	3F	FC	08	10	18	10	06	10	16	10	28
40	10	67	D8	5D	C4	01	78	80	03	E3	05	C0	00	E4	0F	00
50	C0	18	E3	06	07	01	01	58	21	50	B0	51	00	1B	30	40
60	36	00	40	84	63	00	00	1E	00	00	00	00	00	00	00	00
70	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	81

EDID Block 1, Bytes 128-255 [80H-FFH]

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	02	03	53	F1	58	10	9F	04	13	05	14	03	02	12	20	21
10	22	15	01	60	61	5D	5E	5F	65	66	62	63	64	23	09	57
20	07	7C	03	0C	00	10	00	B8	3C	20	C0	8E	01	02	03	04
30	01	4F	3F	FC	08	10	18	10	06	10	16	10	28	10	67	D8
40	5D	C4	01	78	80	03	E3	05	C0	00	E4	0F	00	C0	18	E3
50	06	07	01	66	21	50	B0	51	00	1B	30	40	70	36	00	40
60	84	63	00	00	1E	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	43

HDMI 3(C/S : E6 07) – HDMI UHD Deep off Case

EDID Block 0, Bytes 0-127 [00H-7FH]

	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	19	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	20	00	00	FC
70	00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	01	E6

HDMI 1(C/S : E6 99) – HDMI UHD Deep off case

EDID Block 0, Bytes 0-127 [00H-7FH]

	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	19	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	20	00	00	FC
70	00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	01	E6

EDID Block 1, Bytes 128-255 [80H-FFH]

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	02	03	47	F1	54	10	9F	04	13	05	14	03	02	12	20	21
10	22	15	01	5D	5E	5F	62	63	64	26	15	07	50	09	57	07
20	7C	03	0C	00	30	00	B8	3C	20	C0	8E	01	02	03	04	01
30	4F	3F	FC	08	10	18	10	06	10	16	10	28	10	E5	0E	60
40	61	65	66	E3	06	07	01	01	1D	80	18	71	1C	16	20	58
50	2C	25	00	40	84	63	00	00	9E	00	00	00	00	00	00	00
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	07

EDID Block 1, Bytes 128-255 [80H-FFH]

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	02	03	44	F1	54	10	9F	04	13	05	14	03	02	12	20	21
10	22	15	01	5D	5E	5F	62	63	64	23	09	57	07	7C	03	0C
20	00	10	00	B8	3C	20	C0	8E	01	02	03	04	01	4F	3F	FC
30	08	10	18	10	06	10	16	10	28	10	E5	0E	60	61	65	66
40	E3	06	07	01	01	1D	80	18	71	1C	16	20	58	2C	25	00
50	40	84	63	00	00	9E	00	00	00	00	00	00	00	00	00	00
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	99

HDMI 2(C/S : A0 33– HDMI UHD Deep On Case
EDID Block 0, Bytes 0-127 [00H-7FH]

	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	19	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	A0

EDID Block 1, Bytes 128-255 [80H-FFH]

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	02	03	53	F1	58	10	9F	04	13	05	14	03	02	12	20	21
10	22	15	01	60	61	5D	5E	5F	65	66	62	63	64	23	09	57
20	07	7C	03	0C	00	30	00	B8	3C	20	C0	8E	01	02	03	04
30	01	4F	3F	FC	08	10	18	10	06	10	16	10	28	10	67	D8
40	5D	C4	01	78	80	03	E3	05	C0	00	E4	0F	00	C0	18	E3
50	06	07	01	66	21	50	B0	51	00	1B	30	40	70	36	00	40
60	84	63	00	00	1E	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	23

EDID Block 1, Bytes 128-255 [80H-FFH]

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	02	03	53	F1	58	10	9F	04	13	05	14	03	02	12	20	21
10	22	15	01	60	61	5D	5E	5F	65	66	62	63	64	23	09	57
20	07	7C	03	0C	00	30	00	B8	3C	20	C0	8E	01	02	03	04
30	01	4F	3F	FC	08	10	18	10	06	10	16	10	28	10	67	D8
40	5D	C4	01	78	80	03	E3	05	C0	00	E4	0F	00	C0	18	E3
50	06	07	01	66	21	50	B0	51	00	1B	30	40	70	36	00	40
60	84	63	00	00	1E	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	33

HDMI 3(C/S : E6 79) – HDMI UHD Deep off case
EDID Block 0, Bytes 0-127 [00H-7FH]

	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	19	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	01	02	3A	80	18	71	38	2D	40	58
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	E6

HDMI 2(C/S : E6 89) – HDMI UHD Deep off case
EDID Block 0, Bytes 0-127 [00H-7FH]

	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	19	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	E6

EDID Block 1, Bytes 128-255 [80H-FFH]

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	02	03	44	F1	54	10	9F	04	13	05	14	03	02	12	20	21
10	22	15	01	5D	5E	5F	62	63	64	23	09	57	07	7C	03	0C
20	00	30	00	B8	3C	20	C0	8E	01	02	03	04	01	4F	3F	FC
30	08	10	18	10	06	10	16	10	28	10	E5	0E	60	61	65	66
40	E3	06	07	01	01	1D	80	18	71	1C	16	20	58	2C	25	00
50	40	84	63	00	00	9E	00	00	00	00	00	00	00	00	00	00
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	79

EDID Block 1, Bytes 128-255 [80H-FFH]

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	02	03	44	F1	54	10	9F	04	13	05	14	03	02	12	20	21
10	22	15	01	5D	5E	5F	62	63	64	23	09	57	07	7C	03	0C
20	00	30	00	B8	3C	20	C0	8E	01	02	03	04	01	4F	3F	FC
30	08	10	18	10	06	10	16	10	28	10	E5	0E	60	61	65	66
40	E3	06	07	01	01	1D	80	18	71	1C	16	20	58	2C	25	00
50	40	84	63	00	00	9E	00	00	00	00	00	00	00	00	00	00
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	89

HDMI 3(C/S : A0 23– HDMI UHD Deep On Case
EDID Block 0, Bytes 0-127 [00H-7FH]

	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	19	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	A0

* Checksum(HDMI 1/2/3)

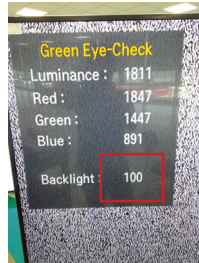
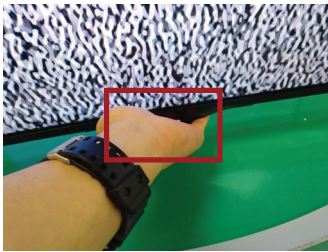
Input	HDMI Deep Color On FFh (Checksum)	HDMI Deep Color Off FFh (Checksum)
HDMI1	A0	43
HDMI2	A0	33
HDMI3	A0	23

6. Green Eye Inspection Guide

- (1) Turn on the TV set.
- (2) Press "EYE" button on the Adjustment remote control.



- (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.



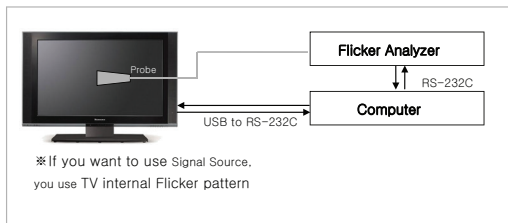
- (4) After check the "OK" message come out, take out your hand from the Sensor module.
→ Check "Sensor Data" value change from "0" to "100" or not. If it doesn't change the value, the sensor is also defected one. You have to replace it.

7. Equipment

7.1.1. Equipment

- (1) Color Analyzer: CA-310 (LED Module : CH 14) or CM-H505
- (2) Adj. Computer (During auto adj., RS-232C protocol is needed)
- (3) Adjustment Remote control
- (4) Signal : internal flicker Pattern in SET
* Color Analyzer Matrix should be calibrated using CS-100.

7.1.2. Equipment connection MAP



7.1.3. Adj. Command (Protocol)

- (1) Command Format

CMD ID DATA CR RF

- CMD: Command

- ID : Command

- Data : Command

Ex) [Send: va 00 00\r\n]

▪ RS-232C Command used during auto-adj.

RS-232C COMMAND			Explanation
CMD	ID	DATA	
`va	00	00	V-com pattern
`vb	00	00 ~ FE	V-com adj. (internal Flicker pattern)
`wb	00	FF	V-com adj. completed

7.1.4. Adj. method

- 7.1.4.1. Auto Adj. method

- 1) Set TV in POWER-ONLY mode using POWER ONLY key
- 2) Zero calibrate probe then place it on the center of the Display
- 3) Connect Cable (RS-232C to USB)
- 4) Select Model in "V-com adj. Program" and begin "V-com adj."
- 5) When V-com adj. is complete (OK)
- 6) Remove probe and RS-232C to USB cable to complete adj.

▪ V-com Adj. must begin as start command "va 00 00" , and finish as end command "wb 00 ff"

▪ V-com adjust data

	V-com Data	
	hex	dec
Max	85	133
Default	68	104
Min	4 9	73

8. White Balance Adjustment

8.1. White Balance Adjustment

8.1.1. Overview

- (1) W/B adj. Objective & How-it-works

1) Objective: To reduce each Panel's W/B deviation

2) How-it-works : When R/G/B gain in the OSD is at 192, it means the panel is at its Full Dynamic Range. In order to prevent saturation of Full Dynamic range and data, one of R/G/B is fixed at 192, and the other two is lowered to find the desired value.

3) Adjustment condition : normal temperature

① Surrounding Temperature : 25 °C ± 5 °C

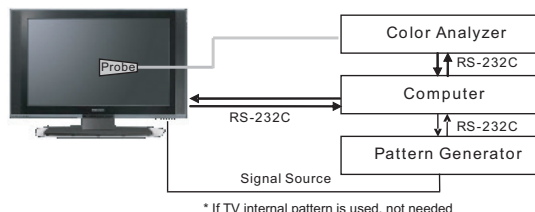
② Warm-up time: About 5 Min

③ Surrounding Humidity : 20 % ~ 80 %

8.1.2. Equipment

- (1) Analyzer: CA-210 (LED Module : CH 14)
 - (2) Adj. Computer (During auto adj., RS-232C protocol is needed)
 - (3) Adjustment Remote control
 - (4) Video Signal Generator MSPG-925F 720p/216-Gray (Model:204, Pattern:49)
→ Only when internal pattern is not available
- * Color Analyzer Matrix should be calibrated using CS-100.

8.1.3. Equipment connection MAP



8.1.4. Adj. Command (Protocol)

- (1) Command Format
START 6E A 50 A LEN A 03 A CMD A 00 A VAL A CS A STOP
 - LEN: Number of Data Byte to be sent
 - CMD: Command
 - VAL: FOS Data value
 - CS: Checksum of sent data
 - A: Acknowledge
- Ex) [Send: JA_00_DD] / [Ack: A_00_okDDX]

• RS-232C Command used during auto-adj.

RS-232C COMMAND			Explanation
CMD	ID	DATA	
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)

Ex) wb 00 00 → Begin white balance auto-adj.
wb 00 10 → Gain adj.
ja 00 ff → Adj. data
jb 00 c0

wb 00 1f → Gain adj. complete
*(wb 00 20(start), wb 00 2f(endc)) → Off-set adj.
wb 00 ff → End white balance auto adj.

8.1.5. Adjustment method

8.1.5.1. Auto adj. method

- (1) Set TV in adj. mode using POWER ON key
- (2) Zero calibrate probe then place it on the center of the Display
- (3) Connect Cable (RS-232C to USB)
- (4) Select mode in adj. Program and begin adj.

- (5) When adj. is complete (OK Sing), check adj. status pre mode (Warm, Medium, Cool)
 - (6) Remove probe and RS-232C to USB cable to complete adj.
- W/B Adj. must begin as start command "wb 00 00" , and finish as end command "wb 00 ff", and Adj. offset if need

8.1.5.2 Manual adj. method

- (1) Set TV in Adj. mode using POWER ON
- (2) Zero Calibrate the probe of Color Analyzer, then place it on the center of LCD module within 10cm of the surface..
- (3) Press ADJ key à EZ adjust using adj. R/C à 7. 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.

** G-fix adjustment

- Adjust modes (Cool), Fix the G gain to 172 (default data) and change the others (G/B Gain).
- Adjust two modes(Medium / Warm), Fix the one of R/G/B gain to 192 (default data) and decrease the others.
- If internal pattern is not available, use RF input. In EZ Adj. menu 7.White Balance, you can select one of 2 Test-pattern: ON, OFF. Default is inner(ON). By selecting OFF, you can adjust using RF signal in 216 Gray pattern.

▪ 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
 - PDP: Color Analyzer (CA-100, CA-100+, CA210) probe should be firmly attached to the Module
 - LCD: Color Analyzer (CA-210) probe should be within 10cm and perpendicular of the module surface (80°~100°)
- 3) Aging time
 - After Aging Start, Keep the Power ON status during 5 Minutes.
 - In case of LCD, Back-light on should be checked using no signal or Full-white pattern.

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

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

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

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

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

8.1.7. EDGE & IOL LED White balance table

- Edge&ALEF LED module change color coordinate because of aging time
- apply under the color coordinate table, for compensated aging time.
- (Normal line) Edge & ALEF LED White balance table.
Model : (normal line)LGD

	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

- (*) AUO, INX, Sharp, CSOT, BOE model (Cool : 13000K Spec.) : DV

webOS	Cool		Medium		Warm	
	x	y	x	y	x	y
	271	270	286	289	313	329
Target	278	280	293	299	320	339

8.2. Magic Motion Remote control test

- Equipment : RF Remote control for test, IR-KEY-Code Remote control for test
- You must confirm the battery power of RF-Remote control before test(recommend that change the battery per every lot)
- Sequence (test)
 - If you select the 'start key(OK)' on the Adjustment remote control, you can pairing with the TV SET.
 - You can check the cursor on the TV Screen, when select the "OK" key on the Adjustment remote control.
 - You must remove the pairing with the TV Set by select 'Mute + OK Key' on the Adjustment remote control.

8.3. 3D function test

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

* HDMI mode NO. 872 , pattern No.83

- Please input 3D test pattern like below.



- When 3D OSD appear automatically, then select green key.



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



8.4. Option selection per country

8.4.1. Overview

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

8.4.2.Method

- Press ADJ key on the Adj. R/C, then select Country Group Menu
- Depending on destination, select Country Group Code or Country Group then on the lower Country option, select US, CA, MX. Selection is done using +, - or ►◄KEY

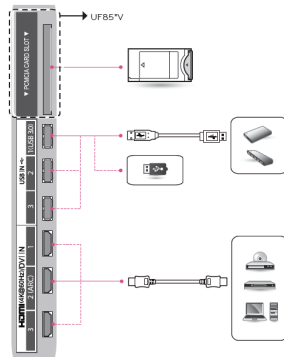
8.5. HDMI ARC Function Inspection

8.5.1. Test equipment

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

8.5.2. Test method

- (1) Insert the HDMI Cable to the HDMI ARC port from the master equipment (HDMI 2)



- (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)

9. GND and Internal Pressure check

9.1. Method

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

9.2. Checkpoint

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

10. Audio

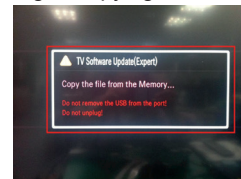
No	Item	Min	Typ	Max	Unit	Remark
1	Audio practical max Output, L/R (Distortion=10% max Output)		10	12	W	EQ Off AVL Off Clear Voice Off
			8.10	10.8	Vrms	
2	Speaker (8 Ω Impedance)		10	12	W	EQ On AVL On Clear Voice On

Measurement condition:

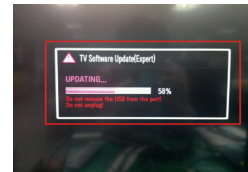
- (1) RF input: Mono, 1 KHz sine wave signal, 100 % Modulation
- (2) CVBS, Component: 1 KHz sine wave signal 0.5 Vrms

11. USB S/W Download(Service only)

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



- (4) Updating is starting.



- (5) Updating completed, the TV will restart automatically



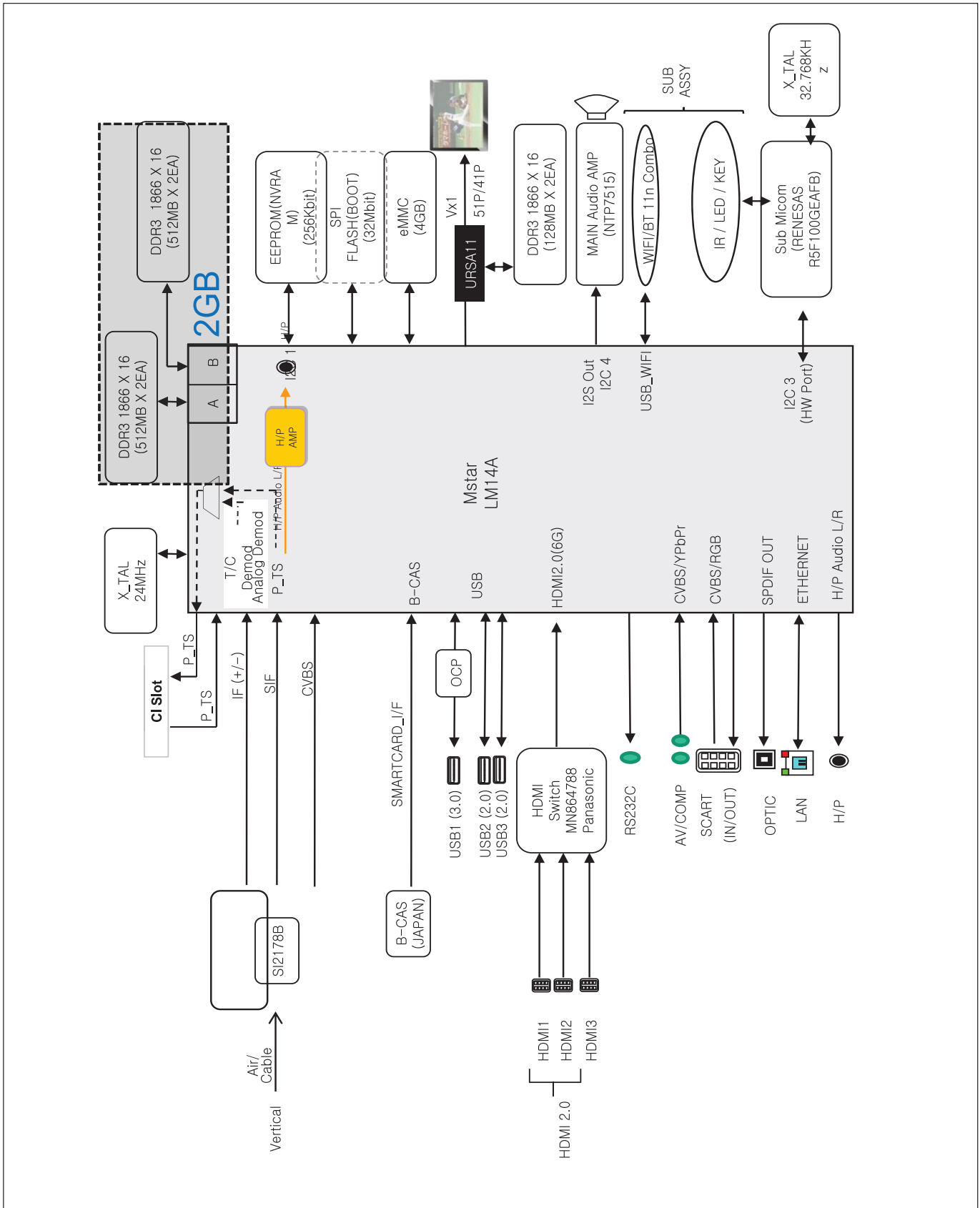
- (6) If your TV is turned on, check your updated version and Tool option. (explain the Tool option, next stage)
 - * If downloading version is more new than your TV have, TV can lost all channel data. In this case, you have to channel recover. if all channel data is cleared, you didn't have a DTV/ATV test on production line.

* After downloading, have to adjust Tool Option again.

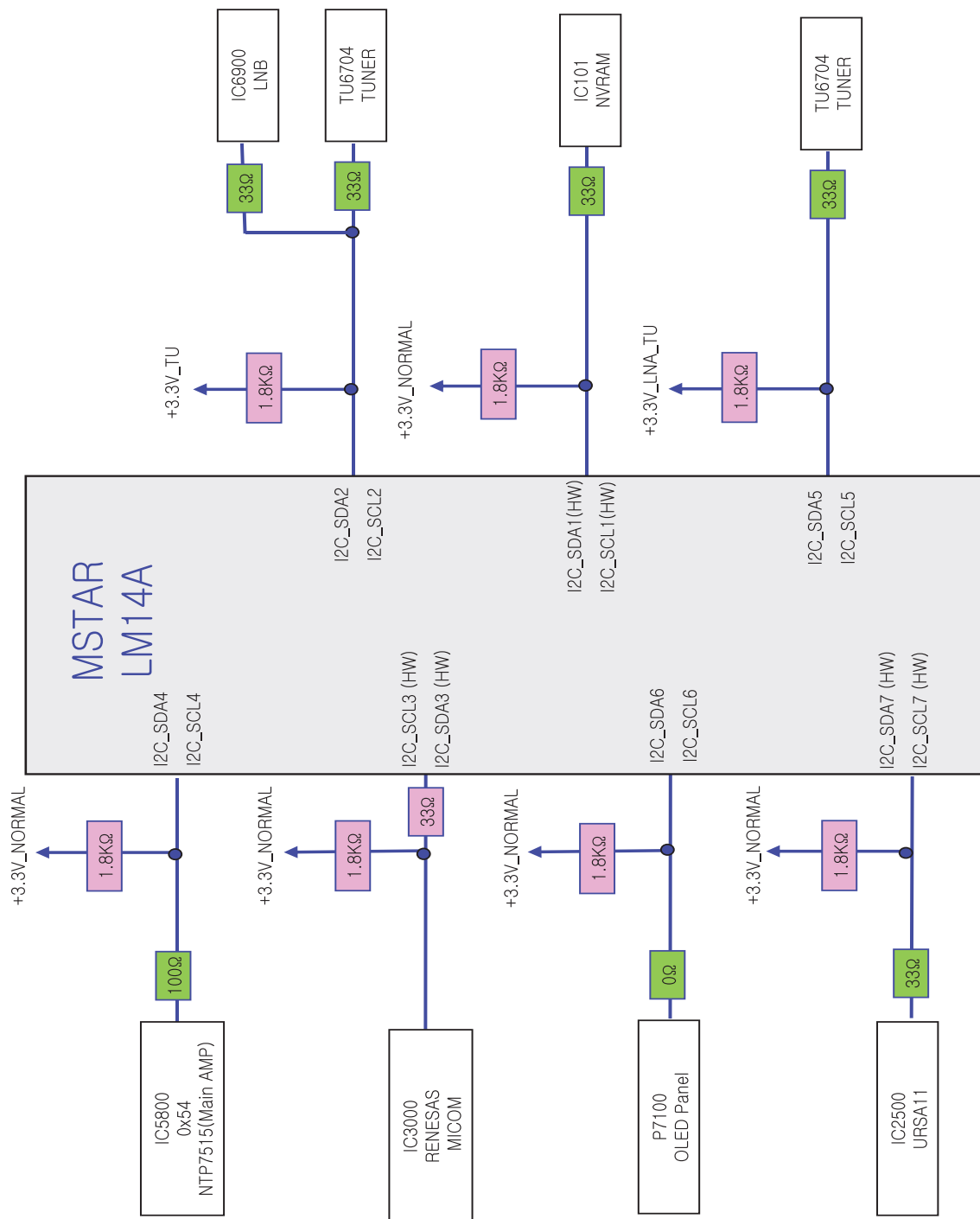
- (1) Push "IN-START" key in service remote control.
- (2) Select "Tool Option 1" and push "OK" key.
- (3) Punch in the number. (Each model has their number)

BLOCK DIAGRAM

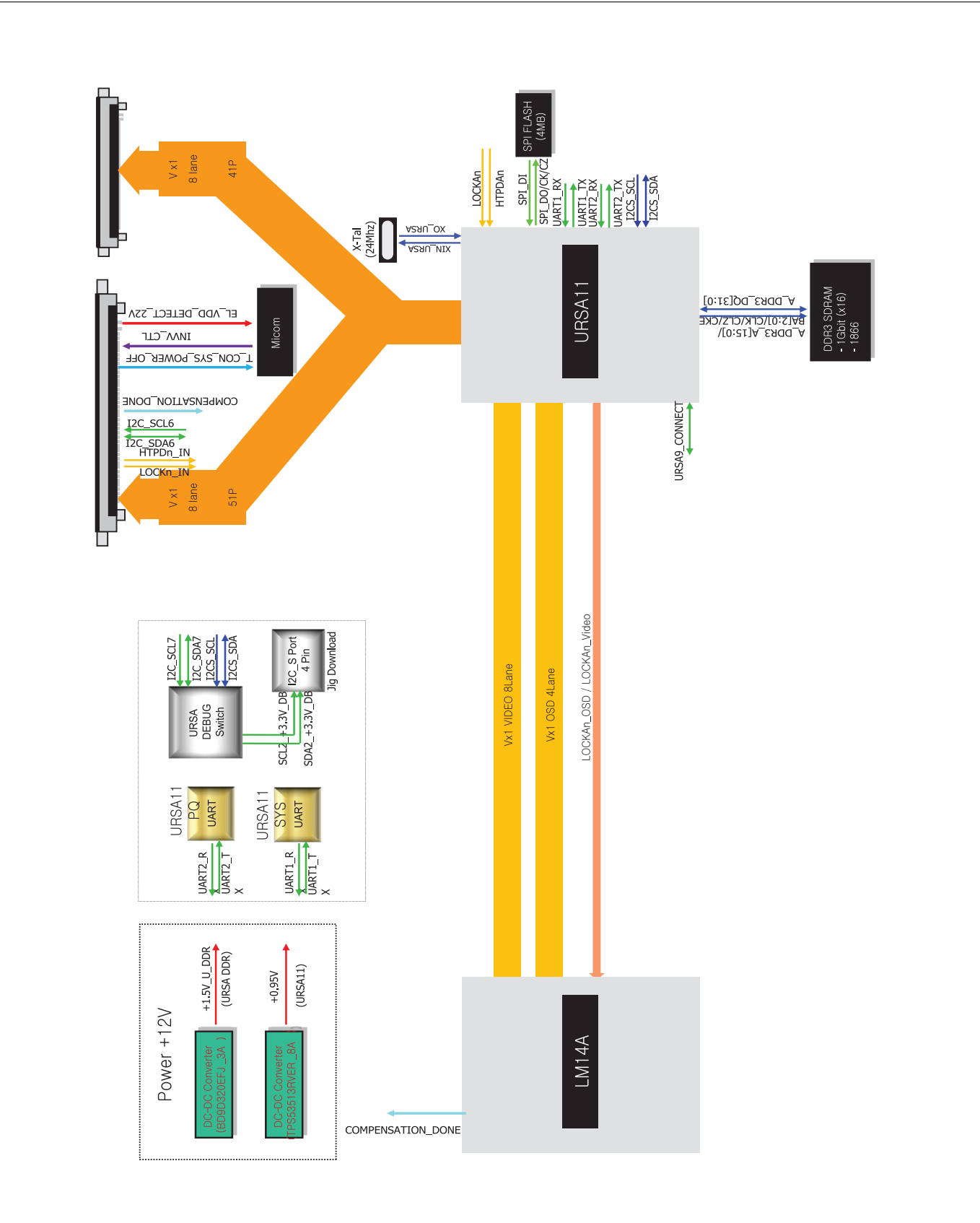
1. LM14A + URSA9 Circuit



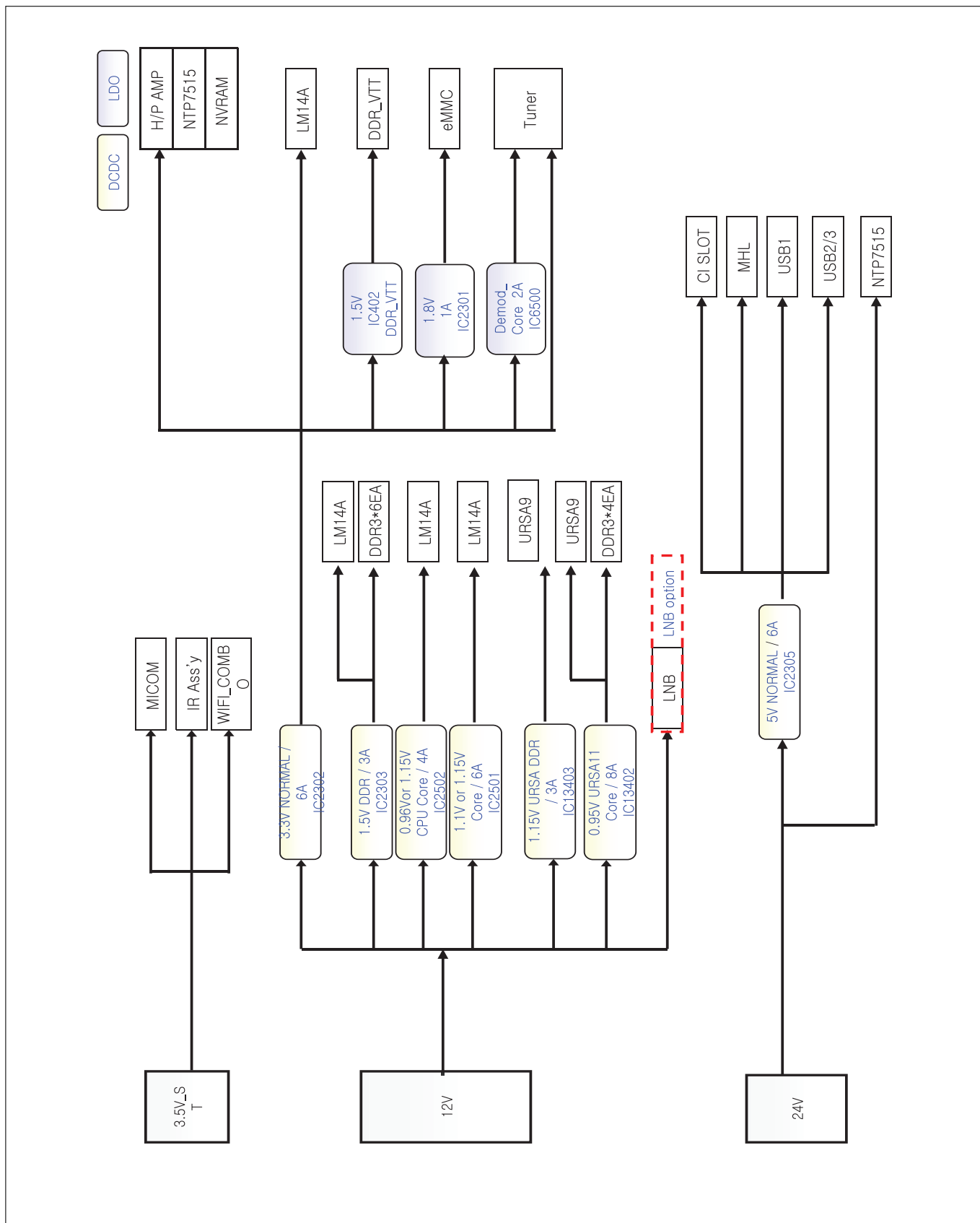
2. LM14A + URSA11 I2C



3. URSA11



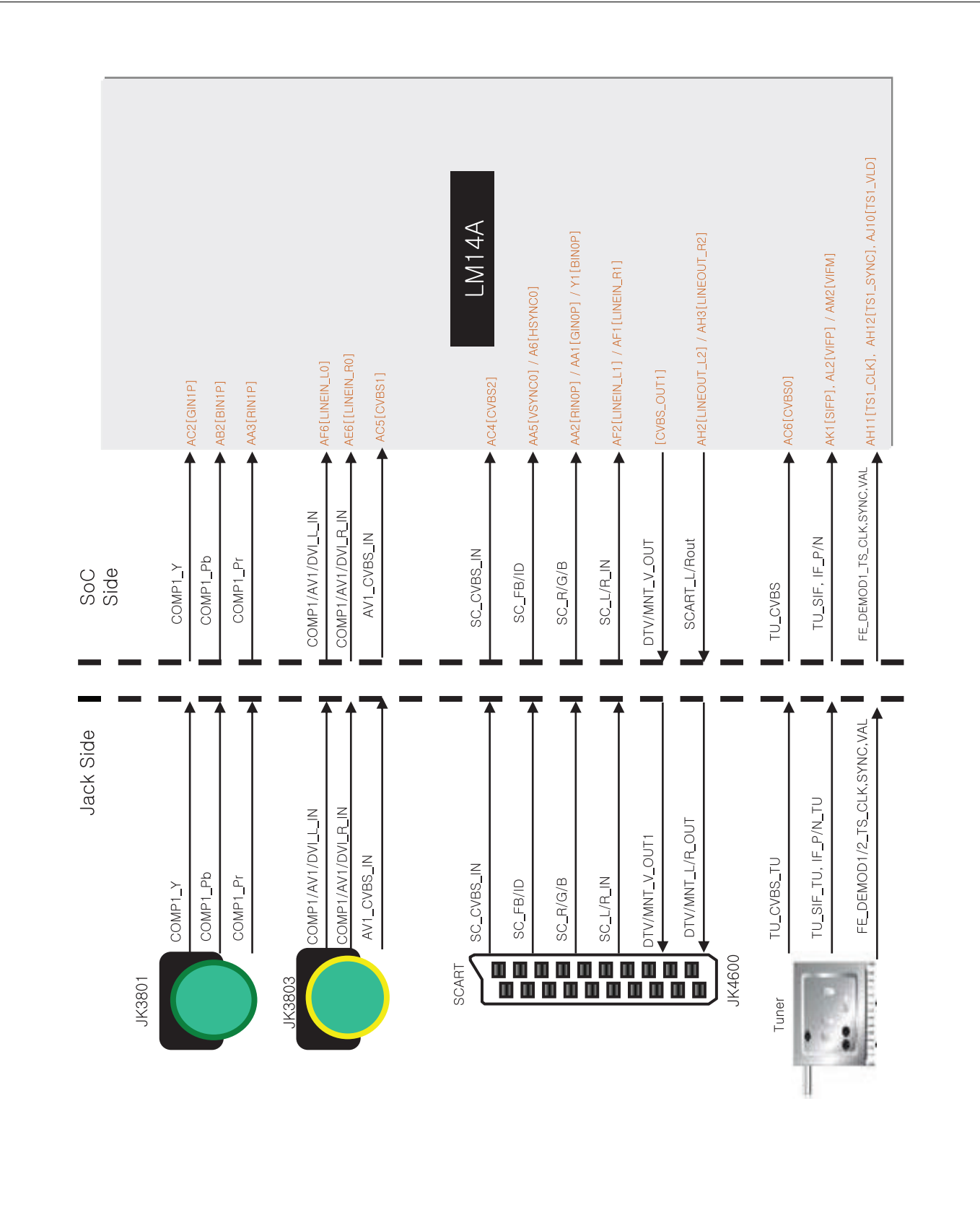
4. LM14A + URSA11 Power



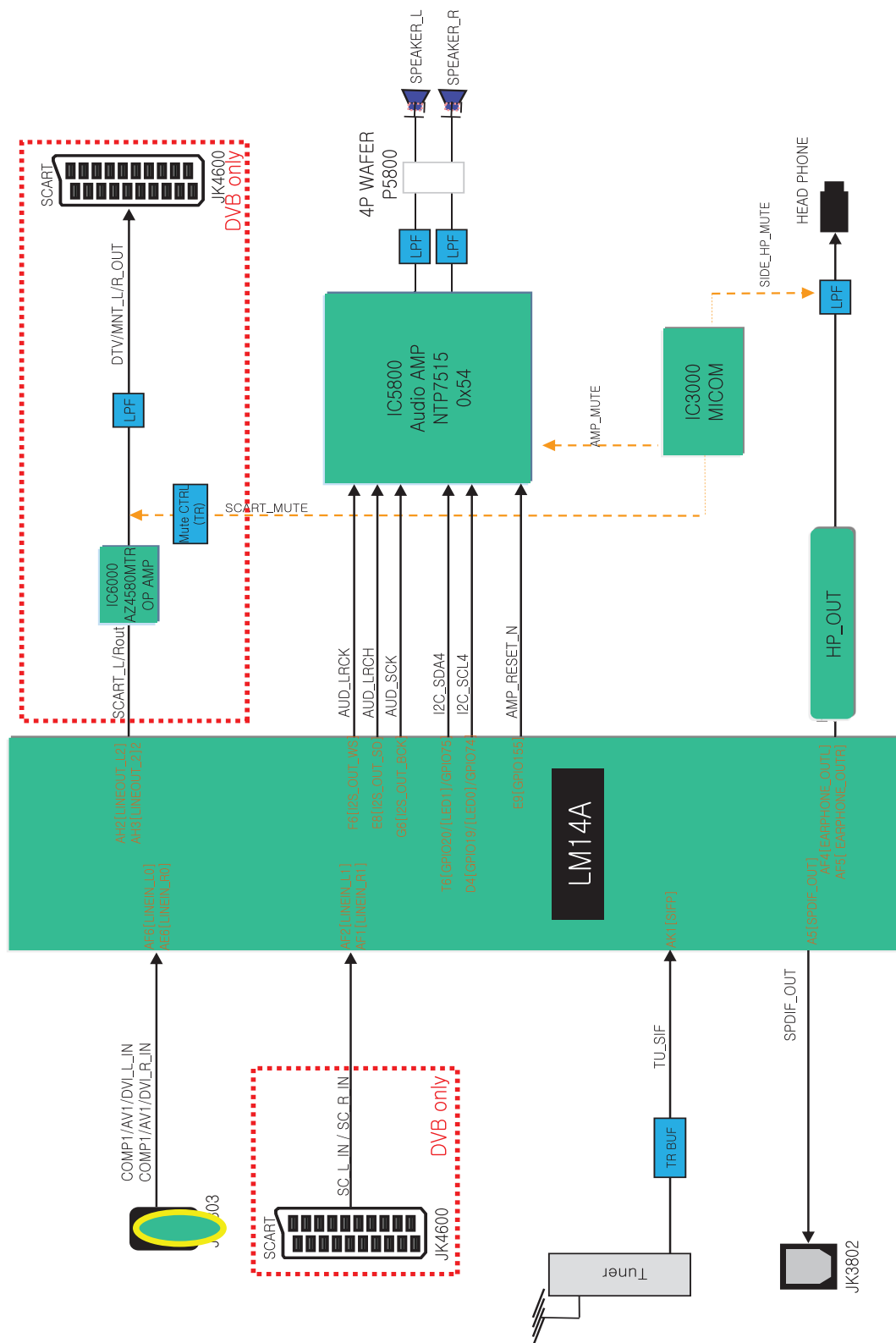
Copyright © 2015 LG Electronics, Inc. All rights reserved.
Only for training and service purposes



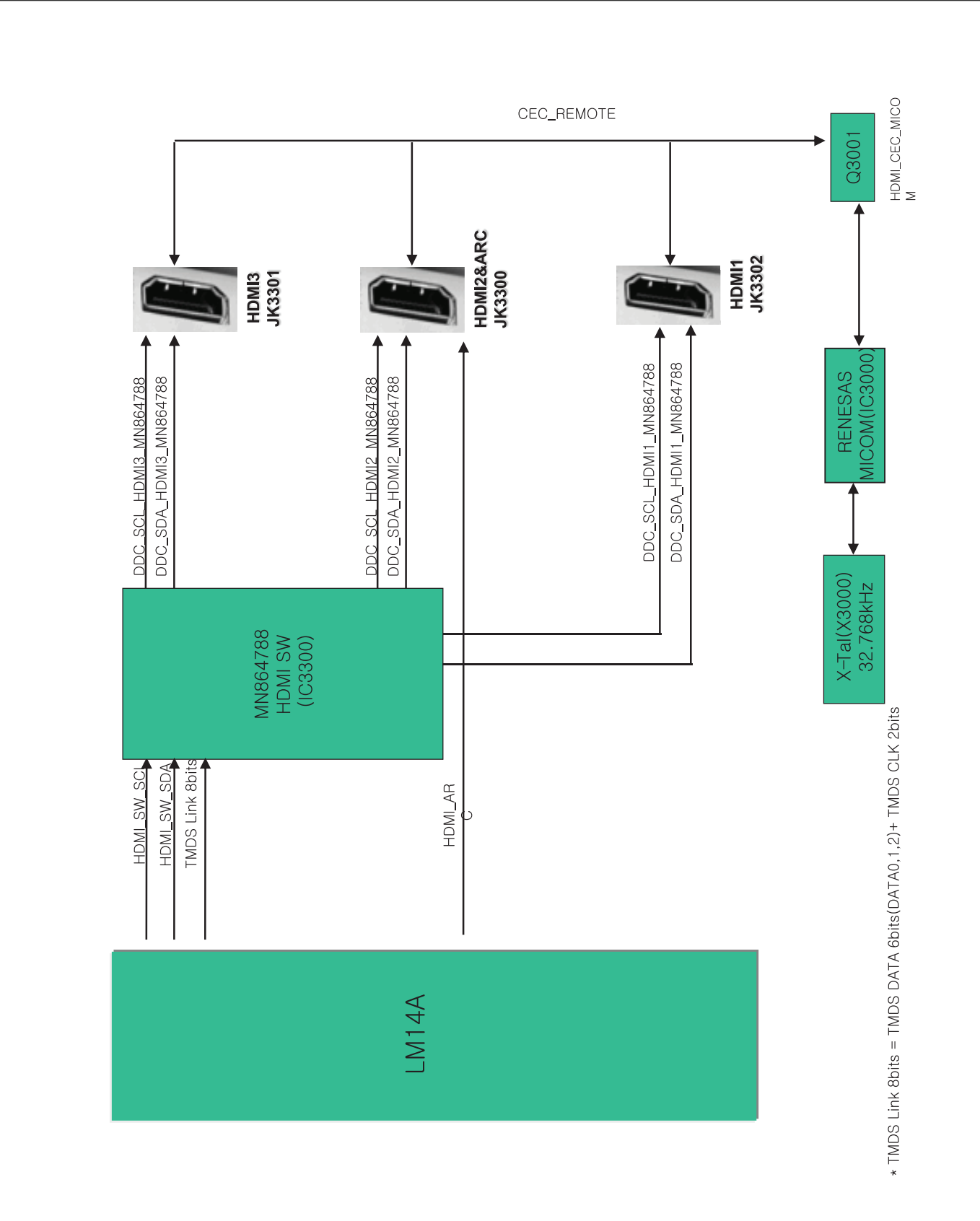
6. Video & Audio IN



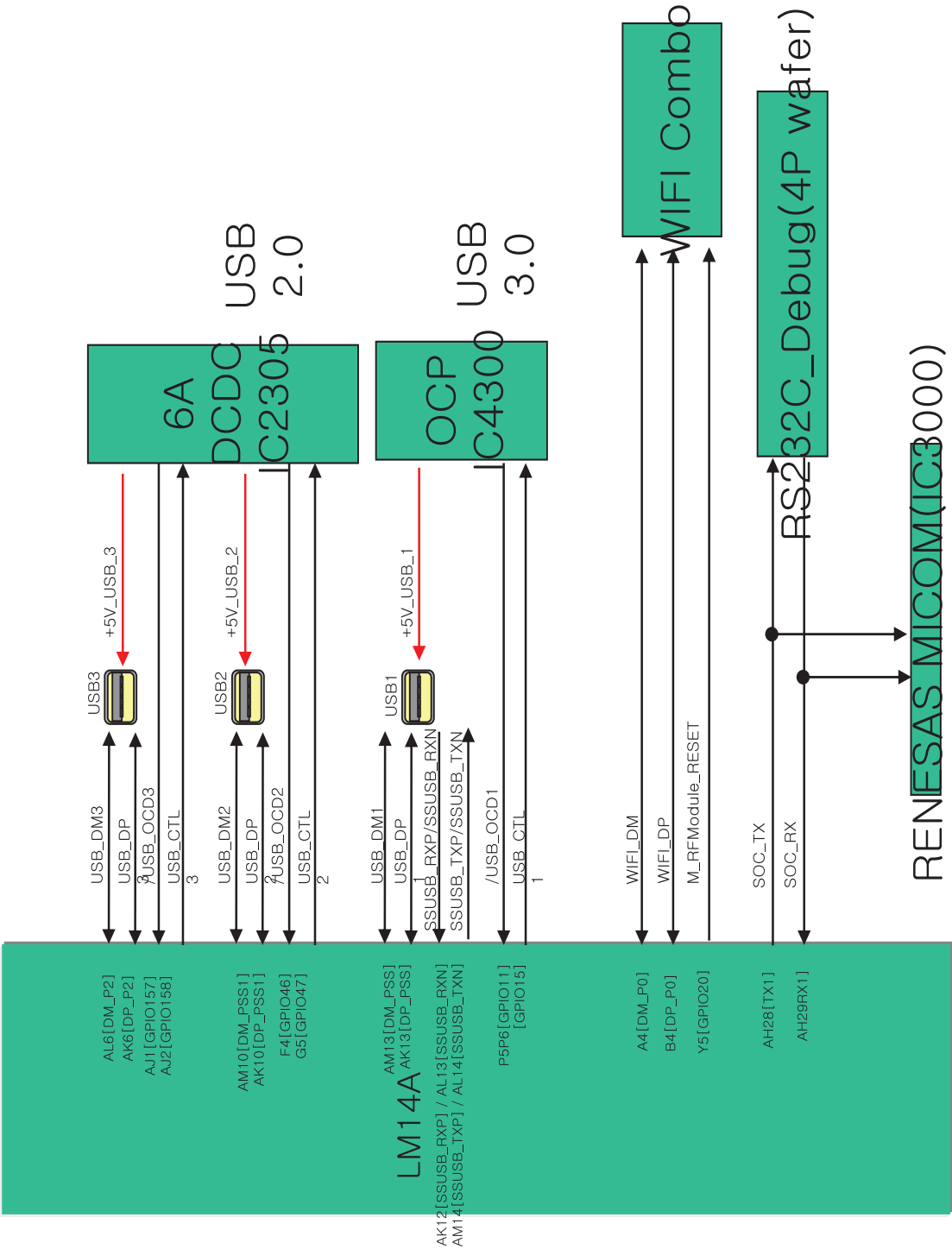
7. AUDIO OUT



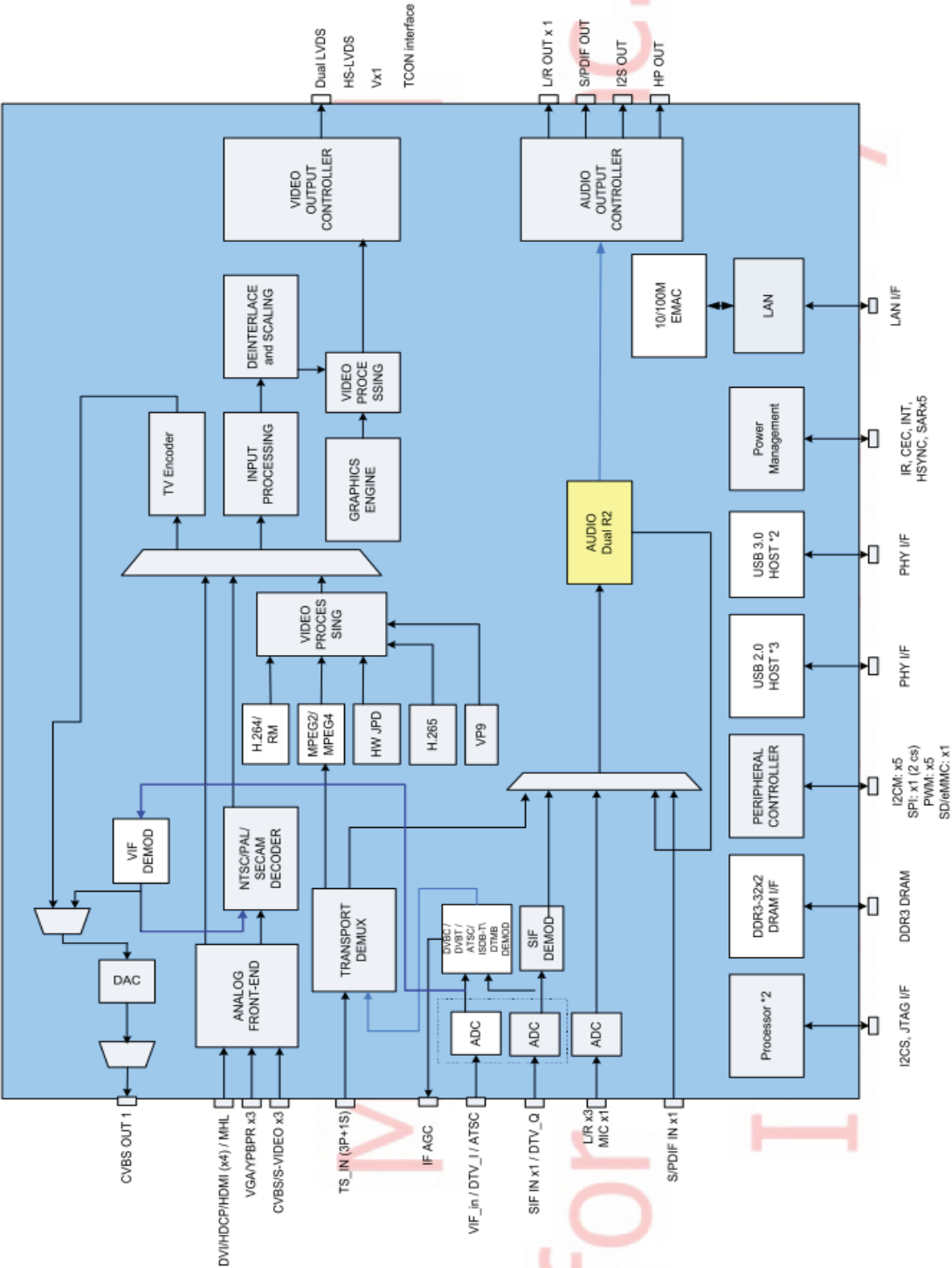
8. HDMI



9. USB / Wi-Fi / M-REMOTE / UART



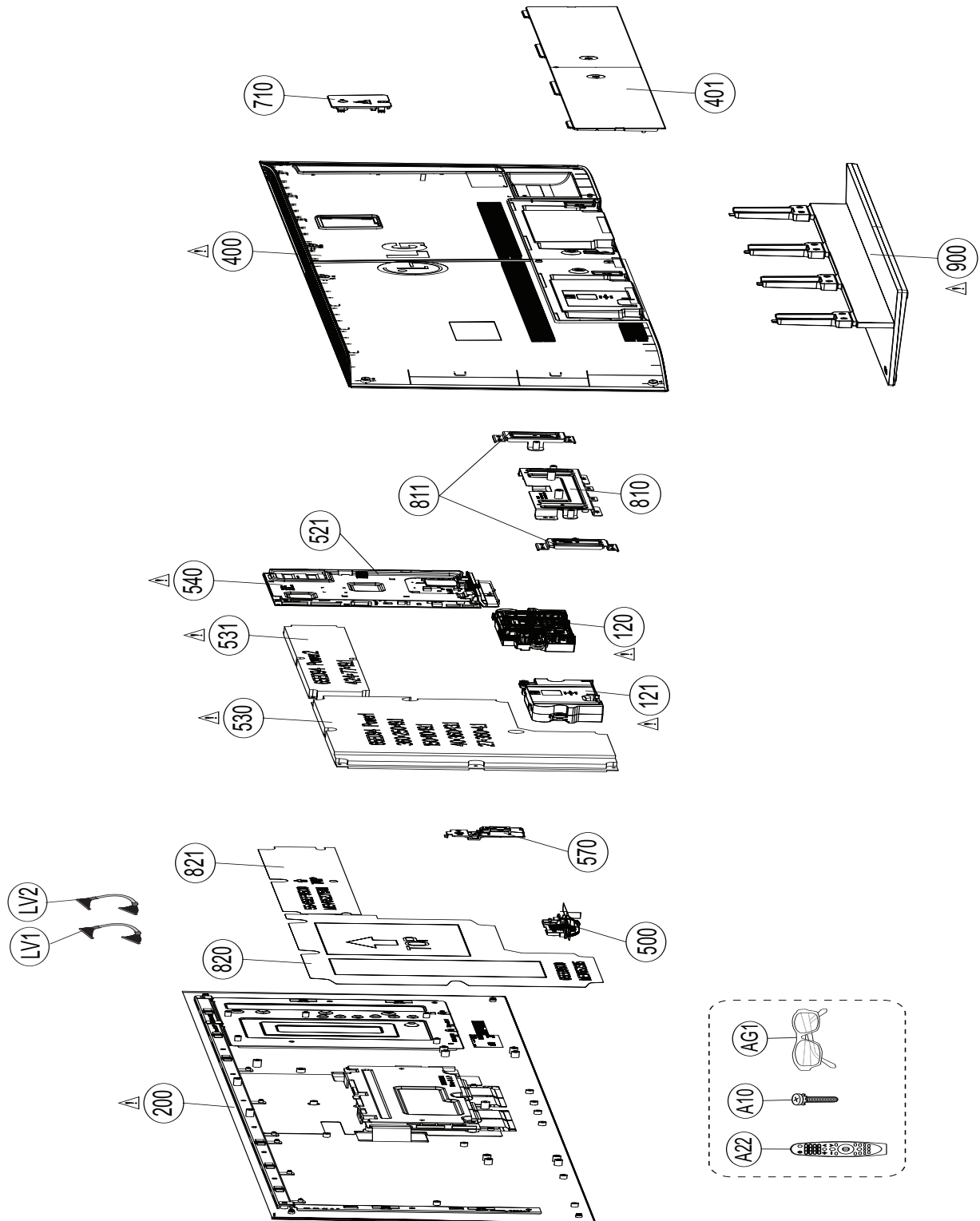
10. LM14A Internal Block

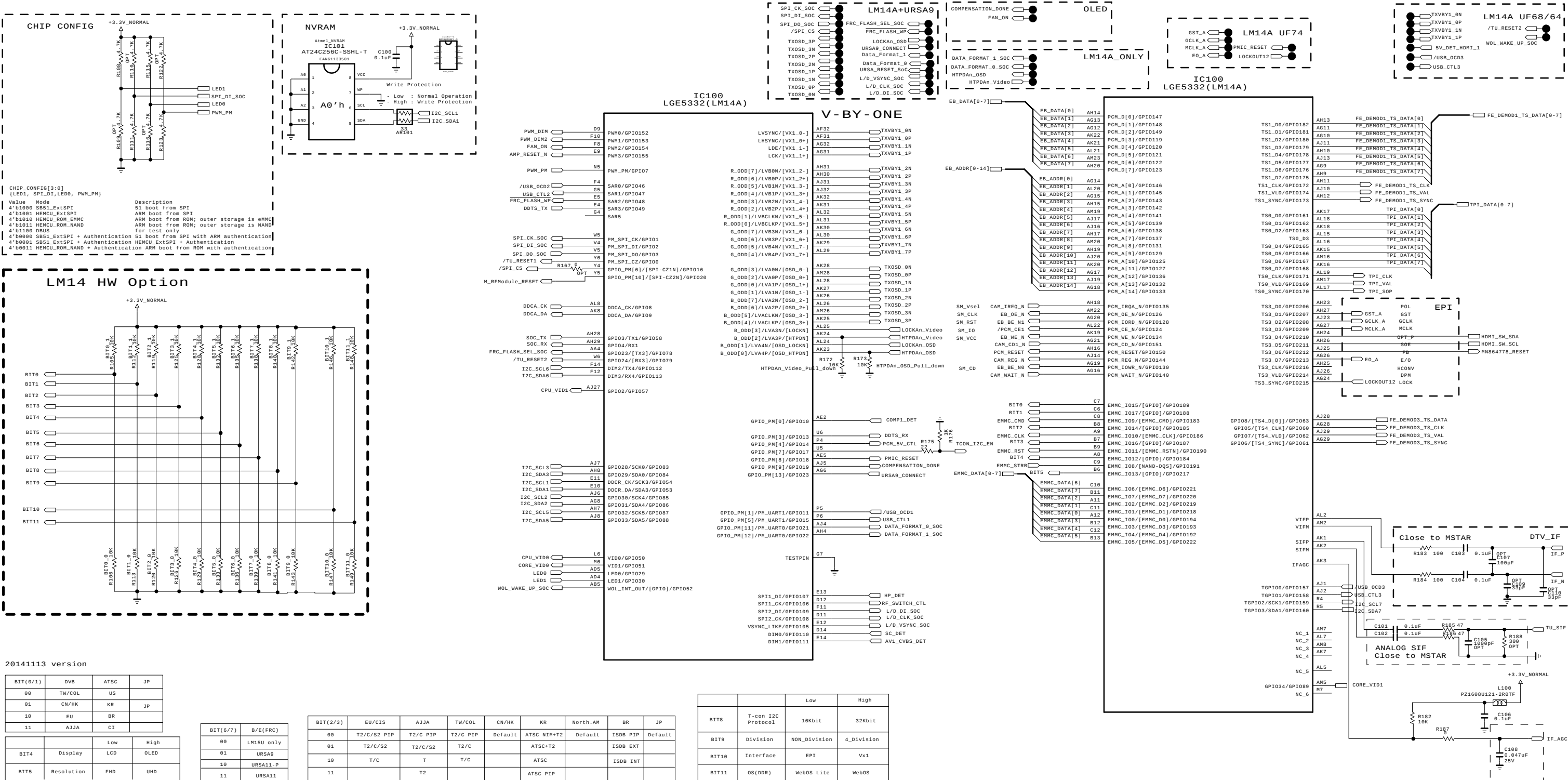


EXPLODED VIEW

IMPORTANT SAFETY NOTICE

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



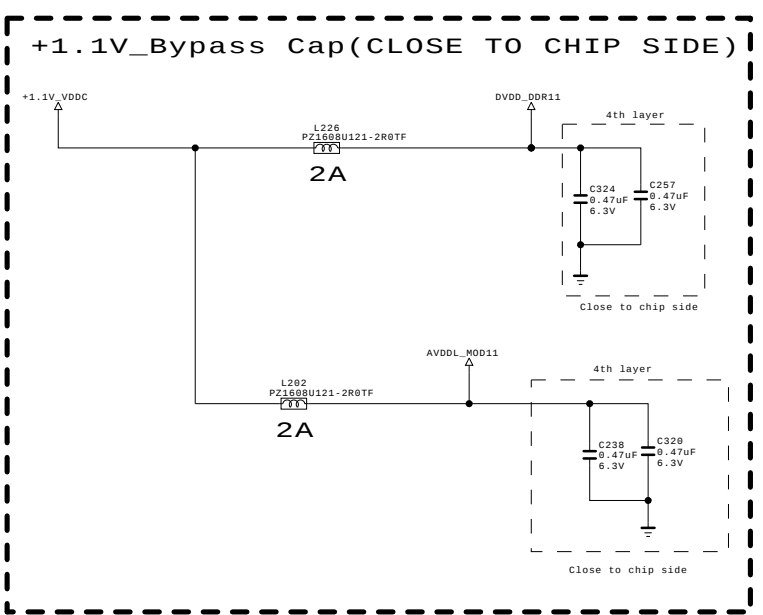
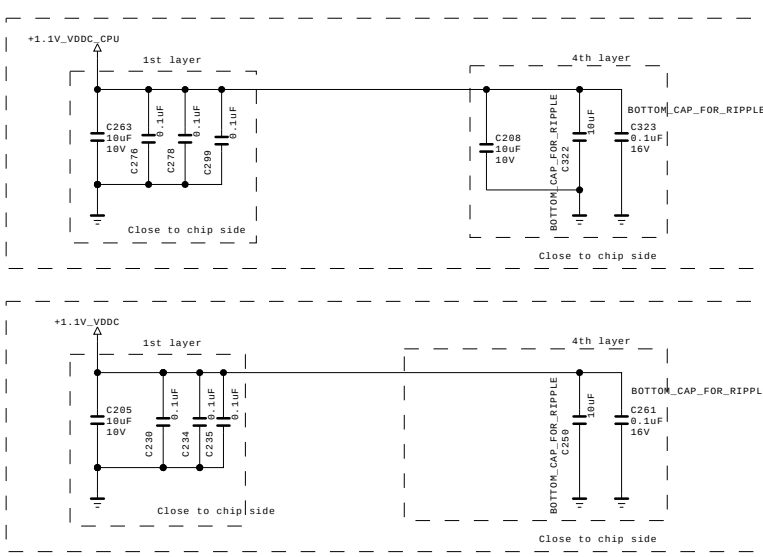
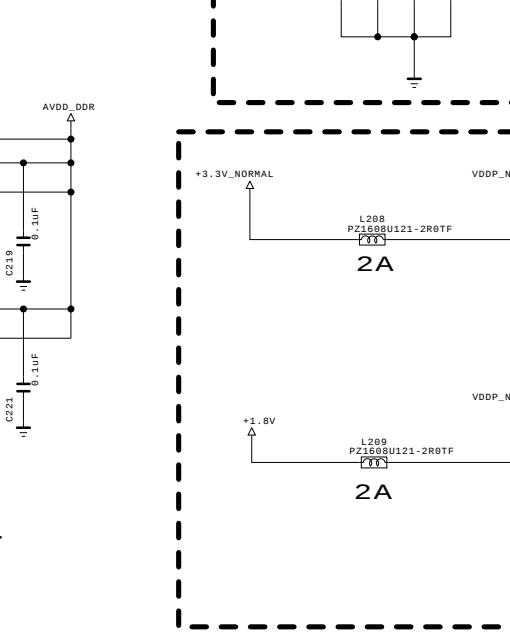
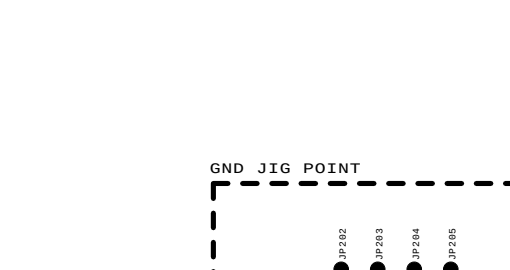
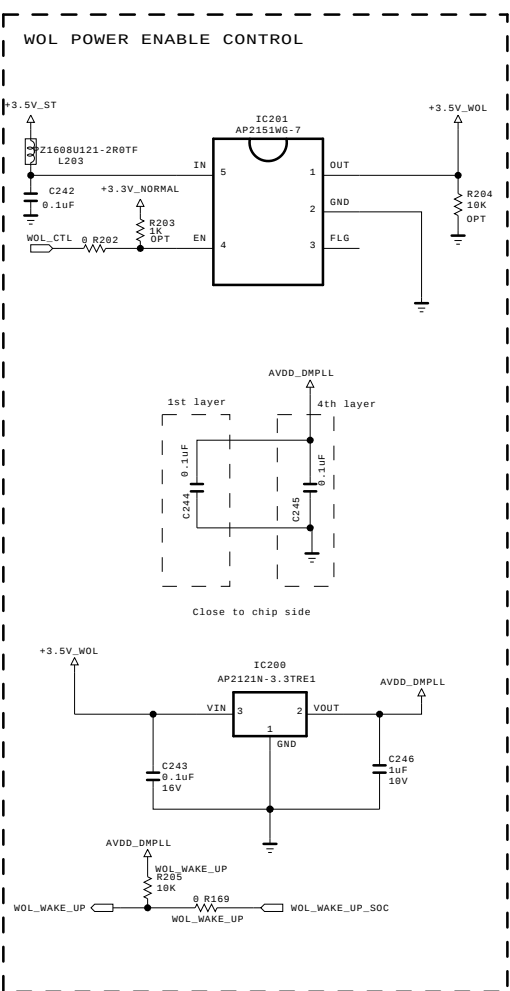
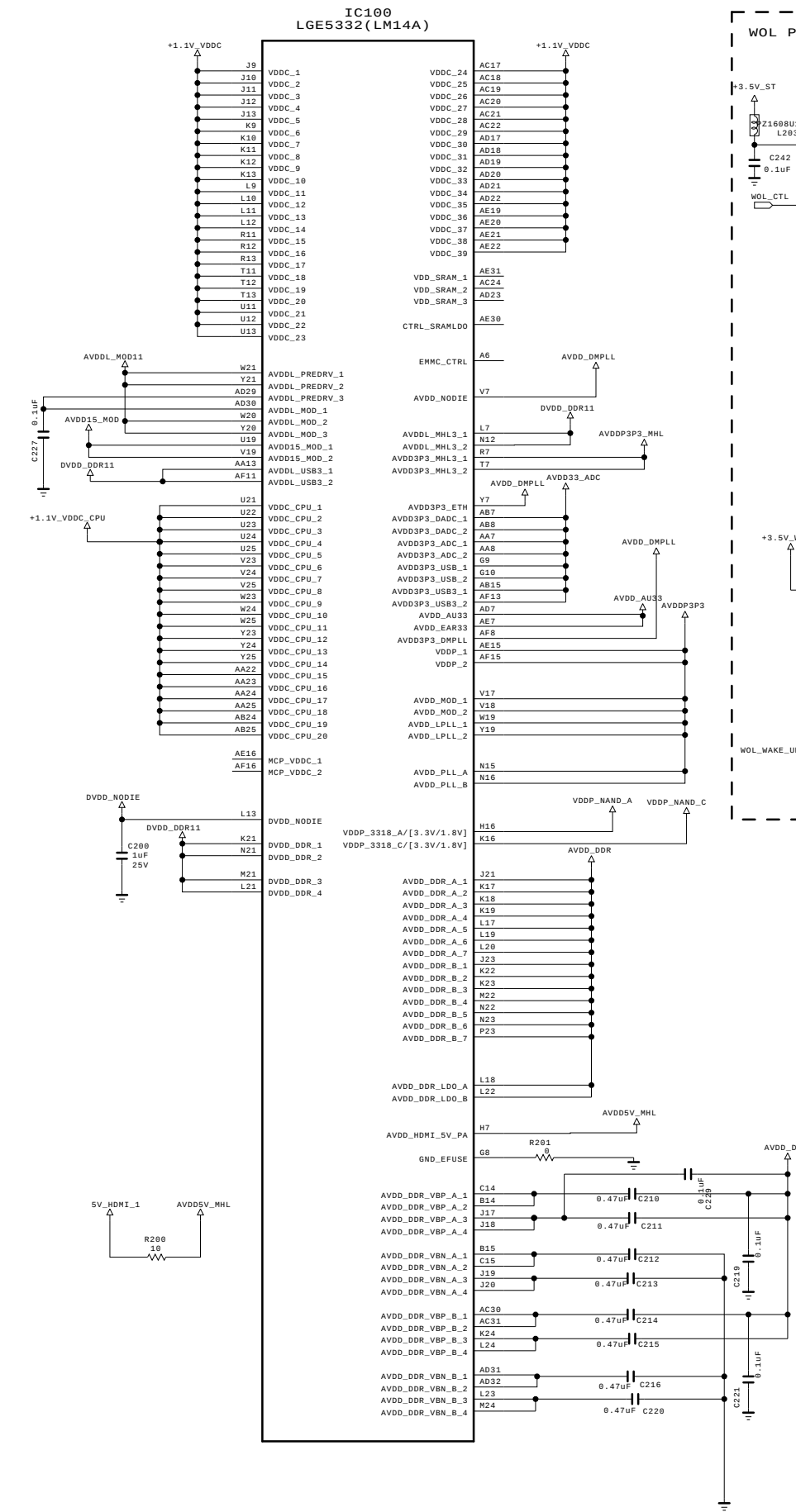


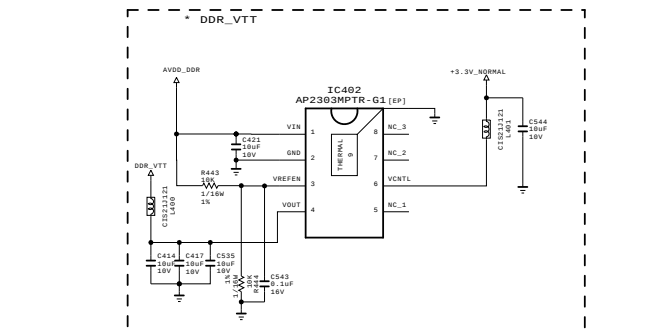
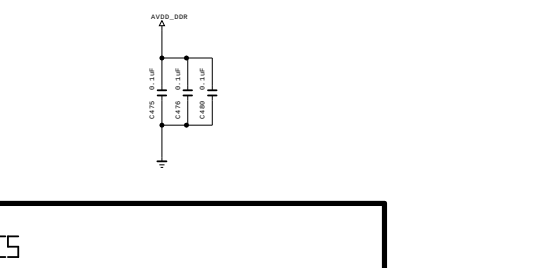
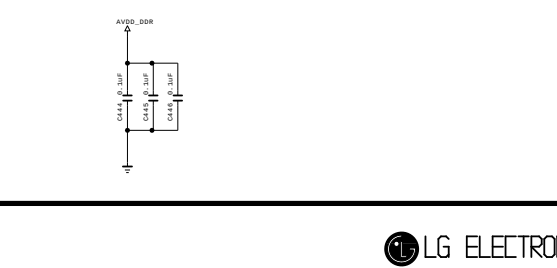
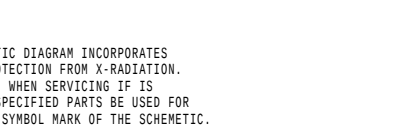
THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.

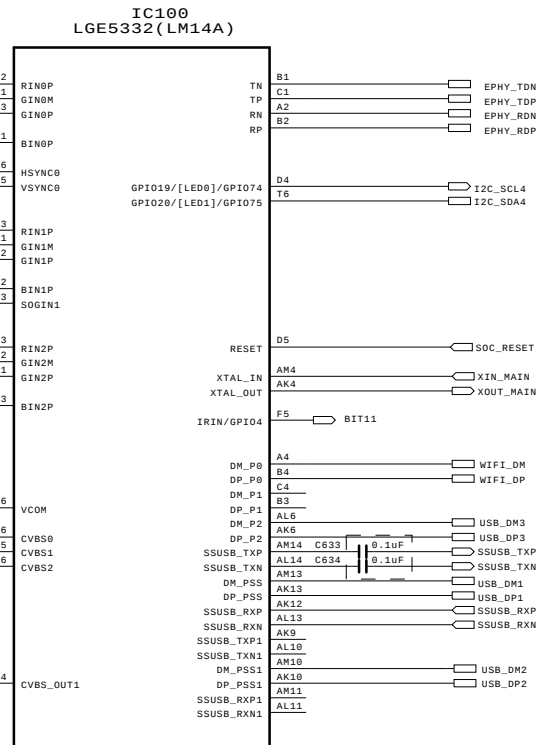
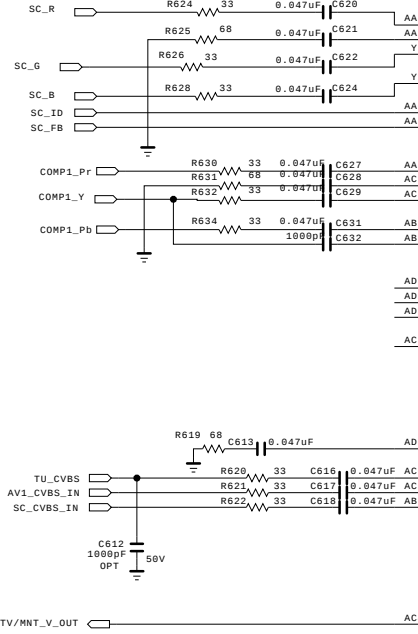
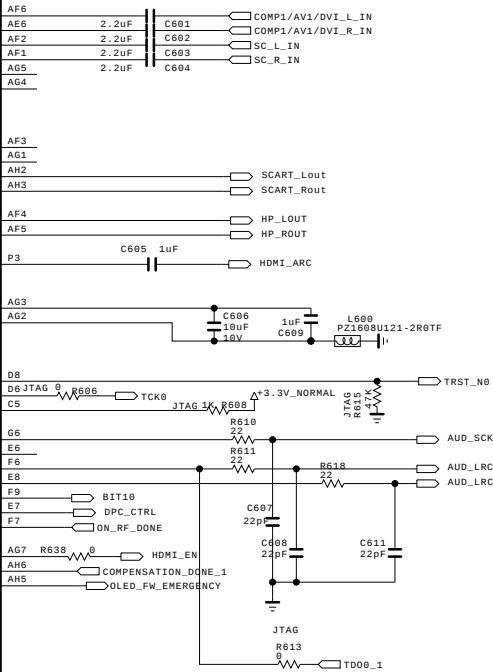
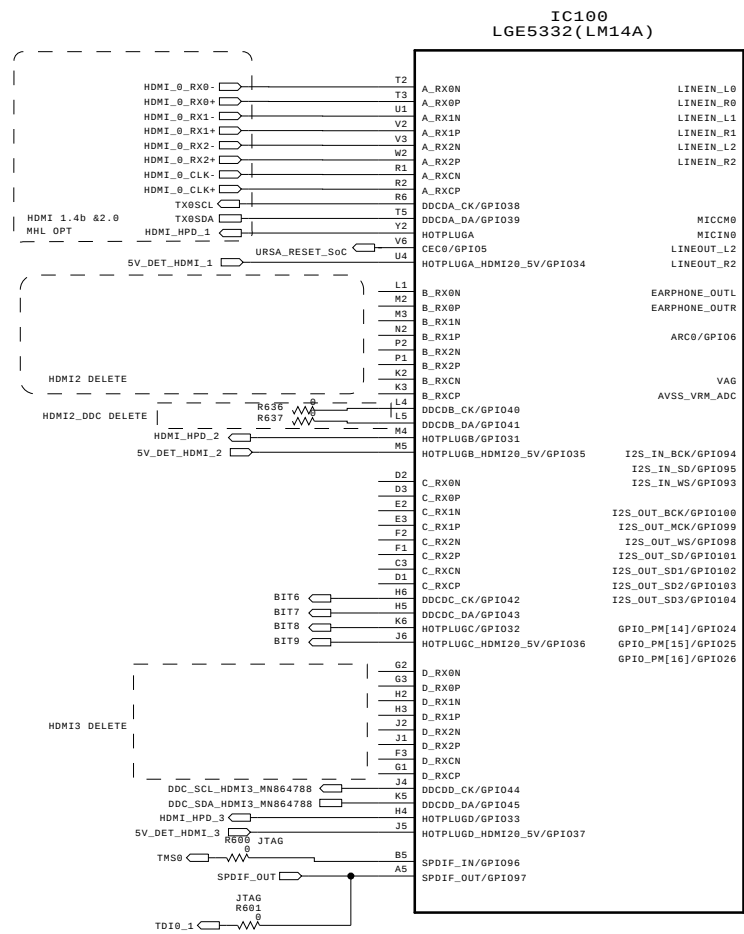
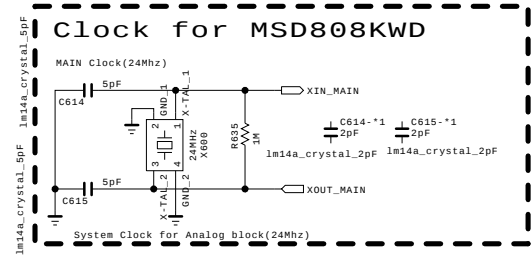
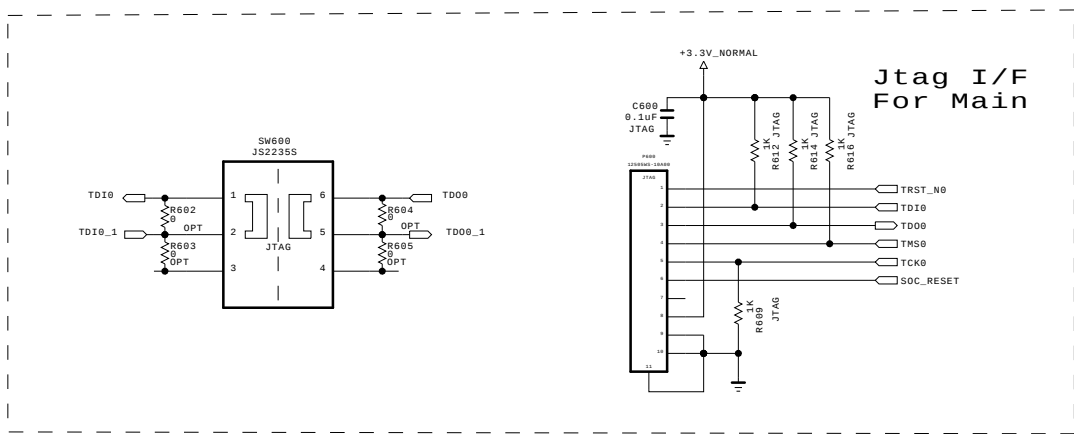
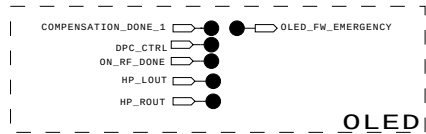
SECRET
LGElectronics



MODEL	LM15U	DATE	2014-11-22
BLOCK	MAIN1_SYSTEM	SHEET	1

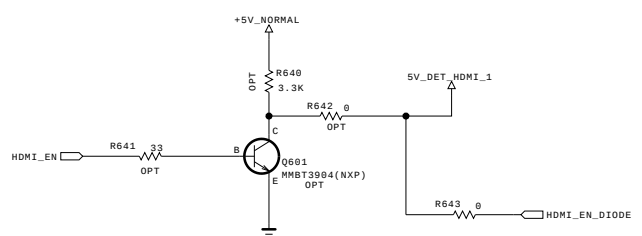






AC-coupling CAP
Place near by HST

HDMI 5V DET : Select TR or DIODE

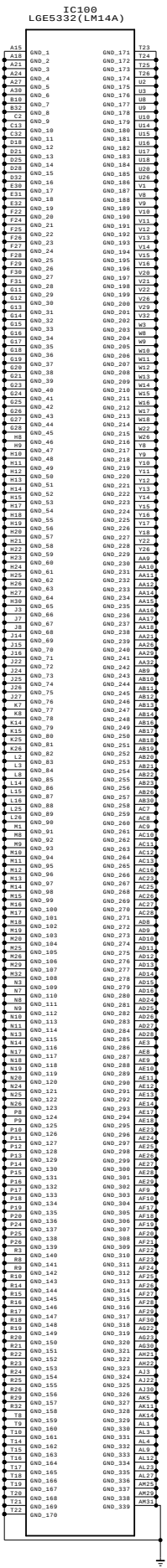


THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.

SECRET
LGElectronics

LG ELECTRONICS

MODEL	LM14A	DATE	2014-11-20
BLOCK	MAIN4_EXT_IN/OUTPUT	SHEET	04



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

SECRET
LGElectronics

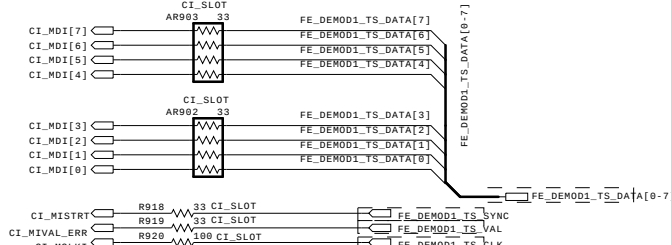


BSD-15Y-LM14A-007_00-HD			
MODEL	LM14A	DATE	2014-11-13
BLOCK	LM14A_GND	SHEET	07

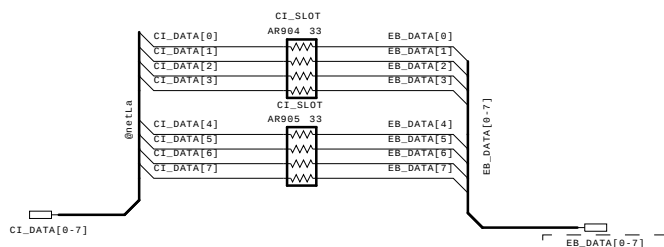
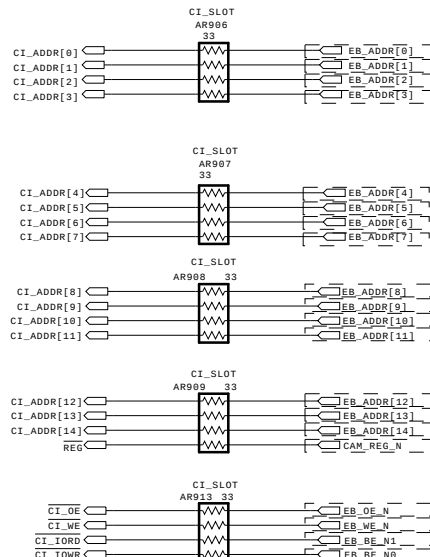
CI Region

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

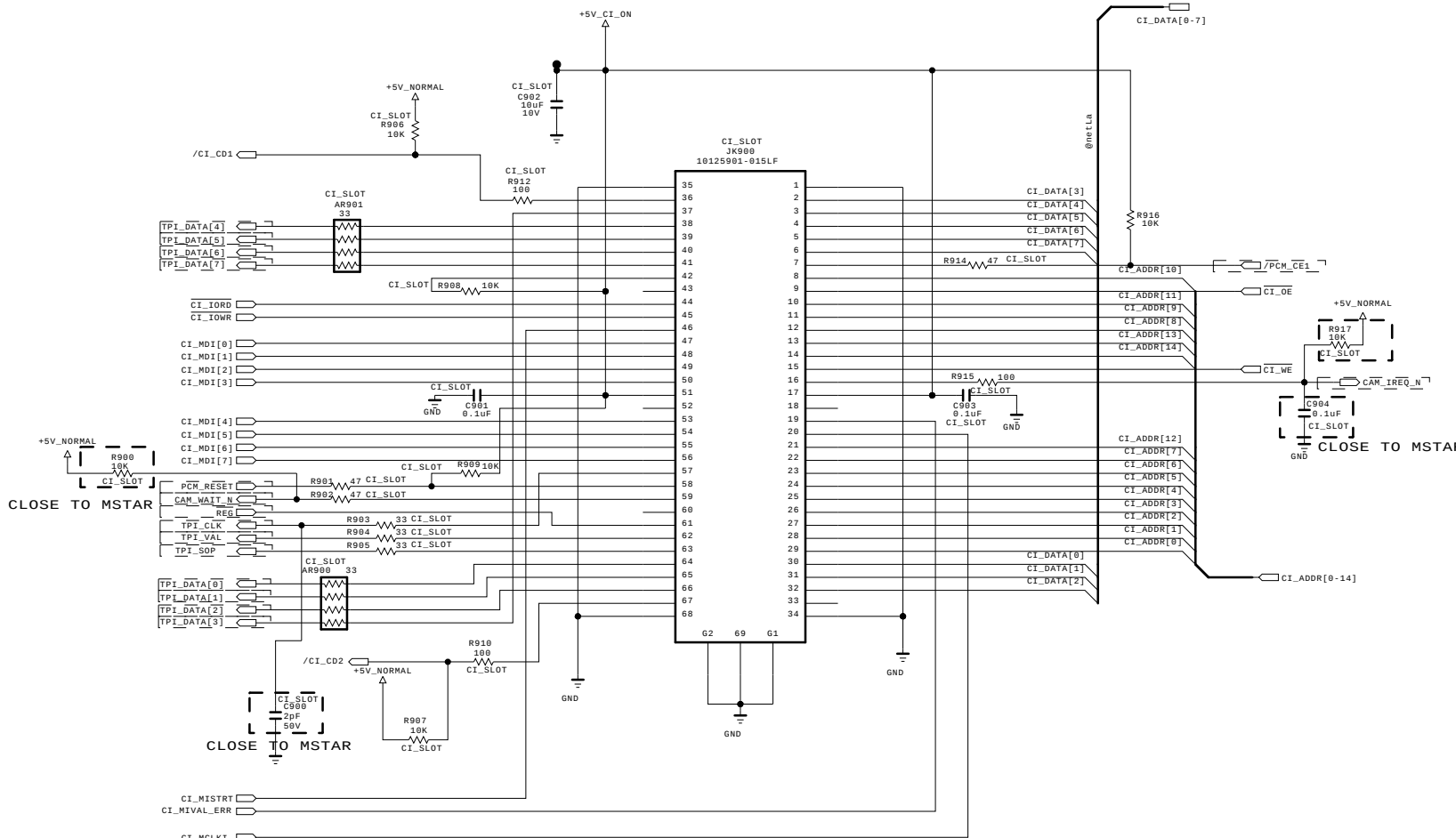
CI TS INPUT



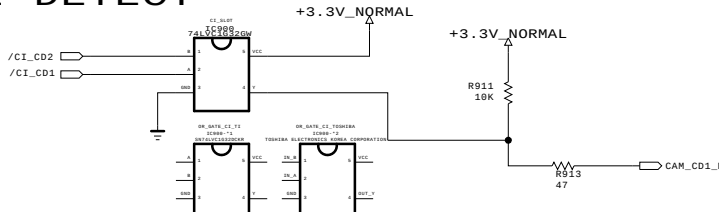
CI HOST I/F



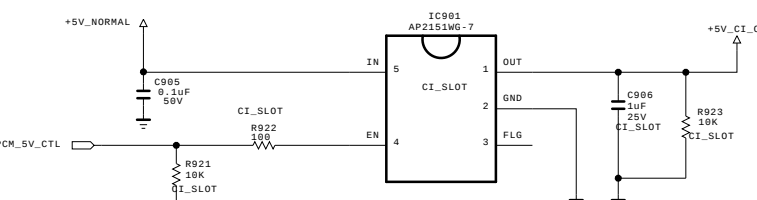
ICI SLOT



CI DETECT



CI POWER ENABLE CONTROL

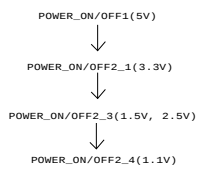
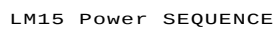
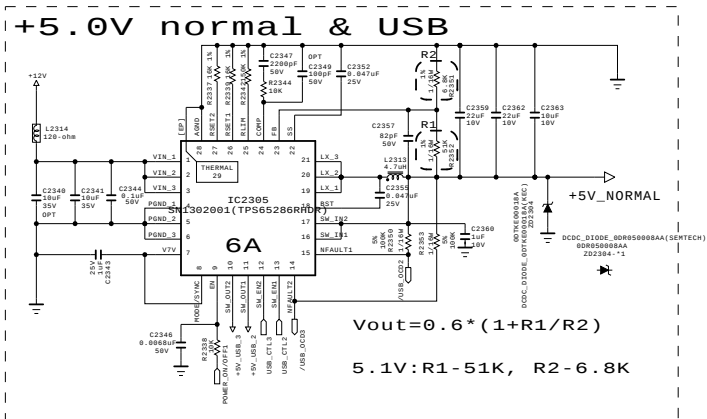
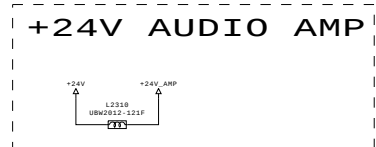
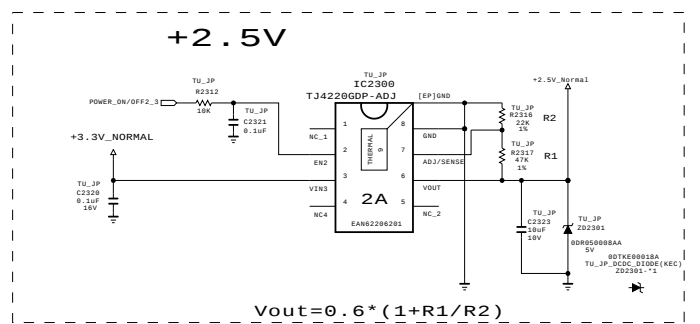
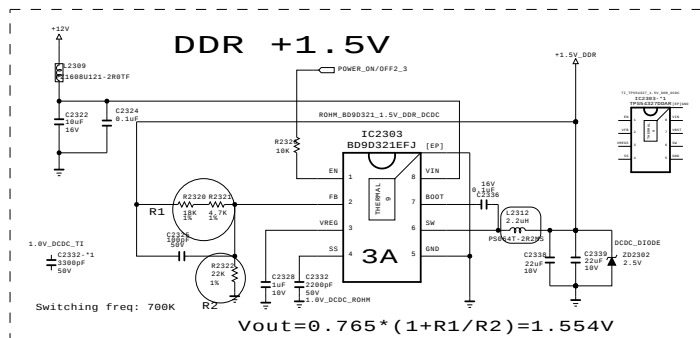
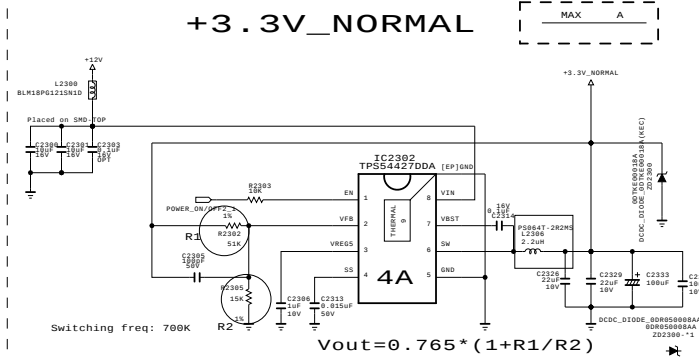
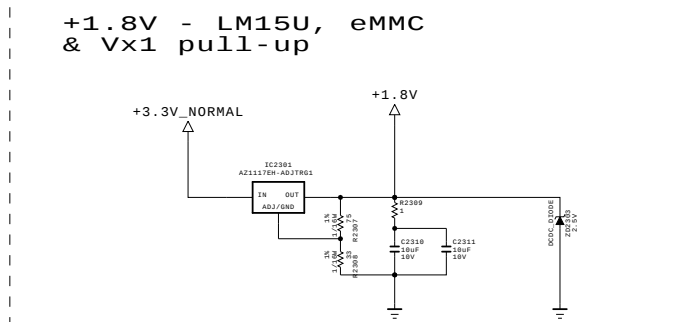
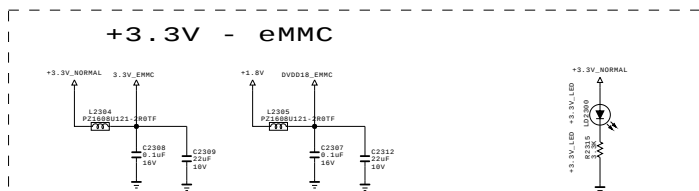
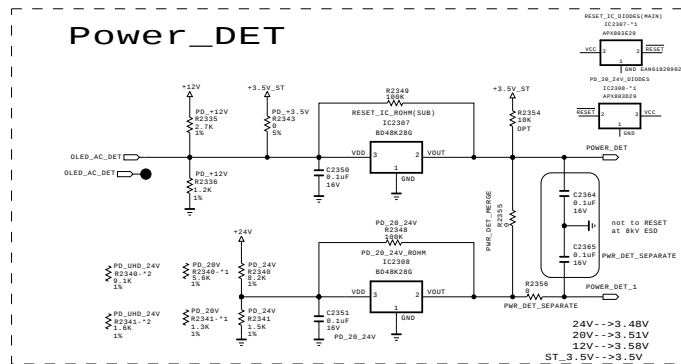


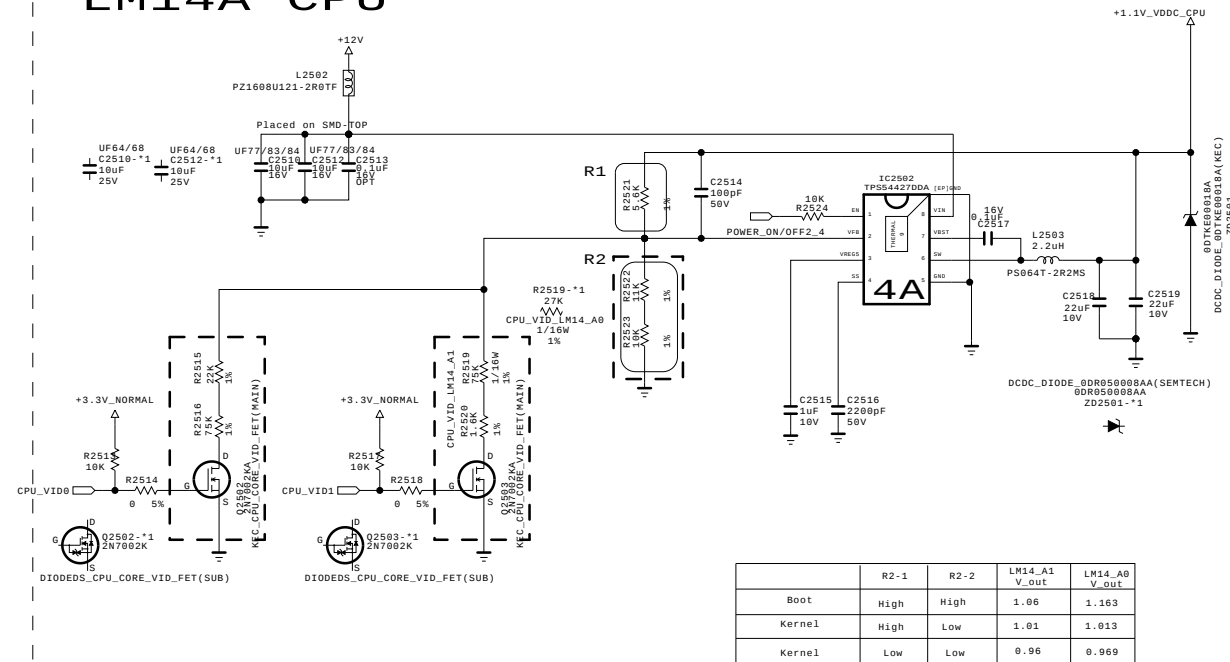
THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.

SECRET
G Electronics

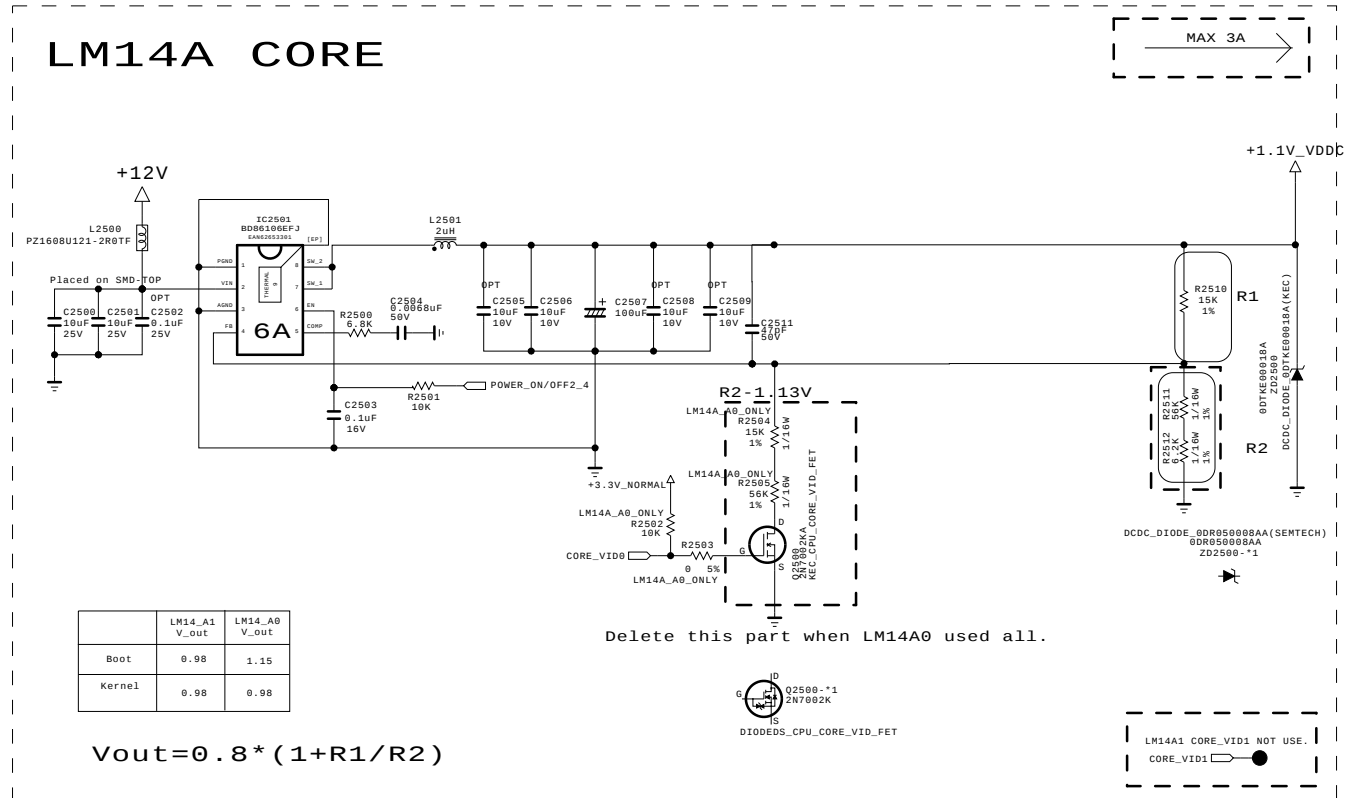


MODEL	UF71/7500	DATE	2014-07-24
FIGK	PCMC1	SHEET	9 /





$$V_{out} = 0.765 * (1 + R1/R2)$$



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

SECRET
G Electronics



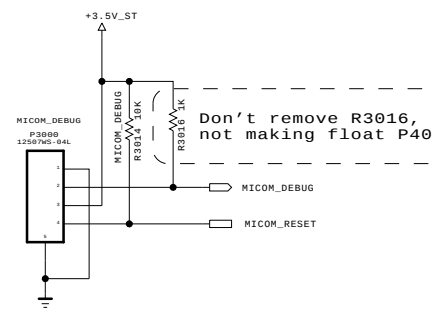
BSD-15Y-LM14A-025_00-HD

MODEL	LM14A	DATE	2015-01-21
BLOCK	LM15U_PWR_2_ALL	SHEET	25 /

```

- - - - -
For Debug

```

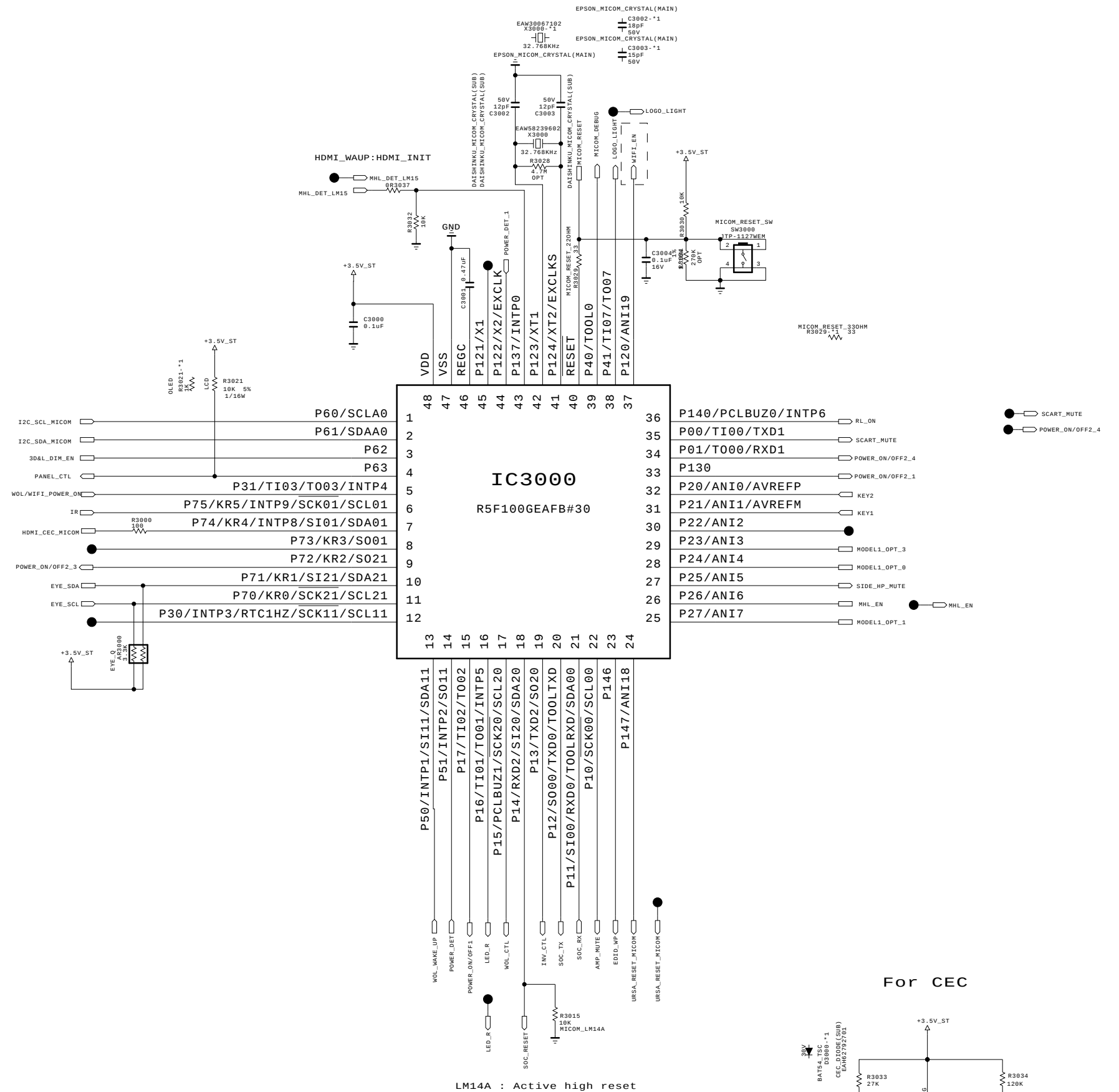


```

graph TD
    A[POWER_ON/OFF1 (5V)] --> B[POWER_ON/OFF2_1 (3.3V)]
    B --> C[POWER_ON/OFF2_3 (1.5V)]
    C --> D[POWER_ON/OFF2_4 (1.1V)]
    D --> E[SOC_RESET]
  
```

[illegible]

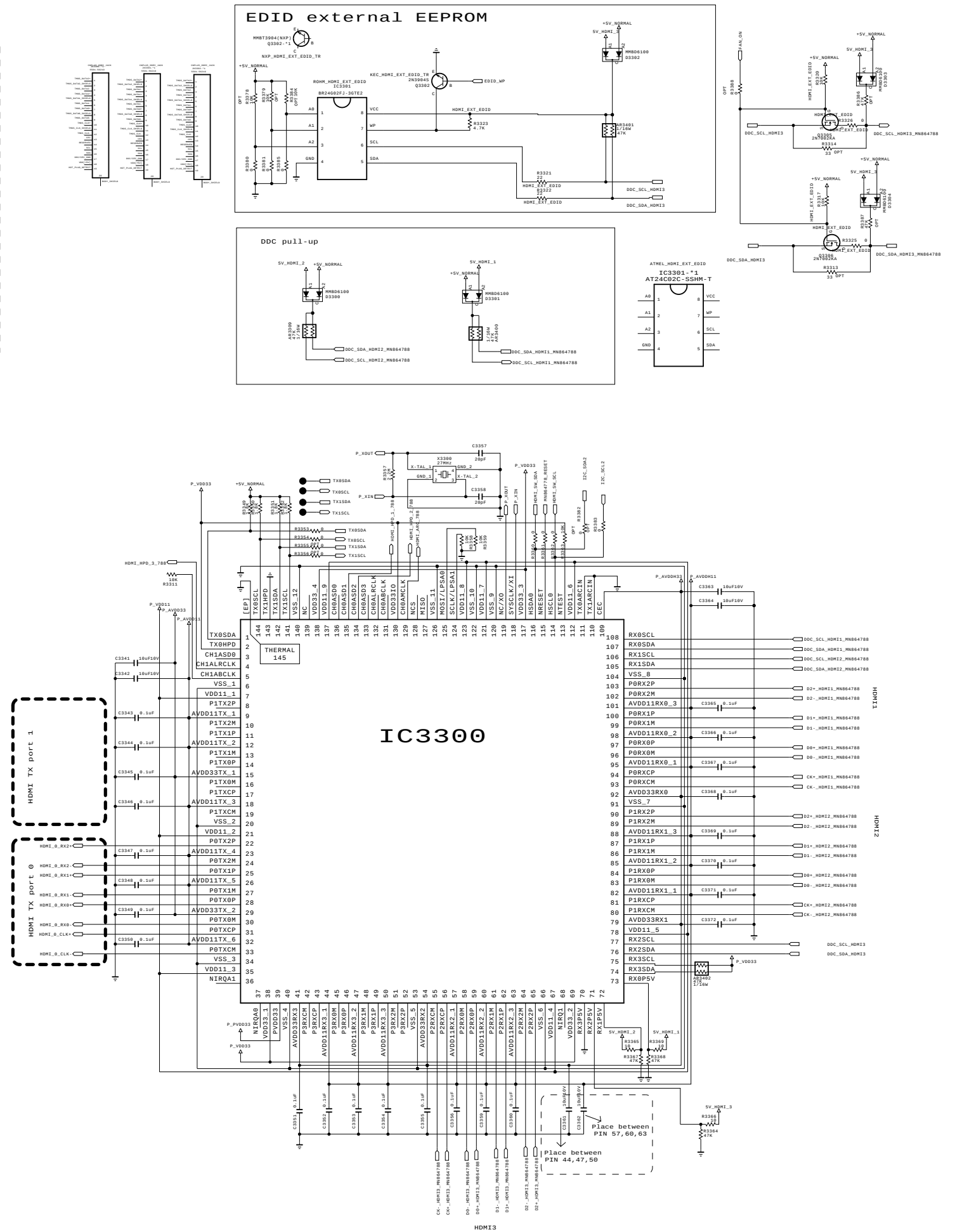
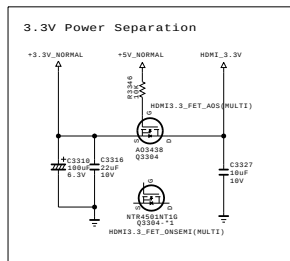
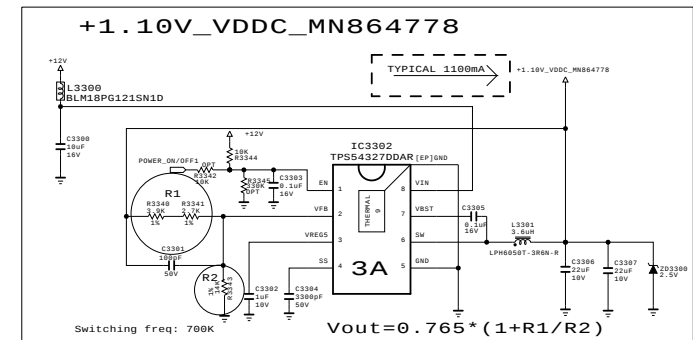
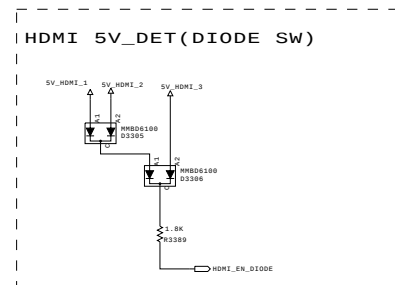
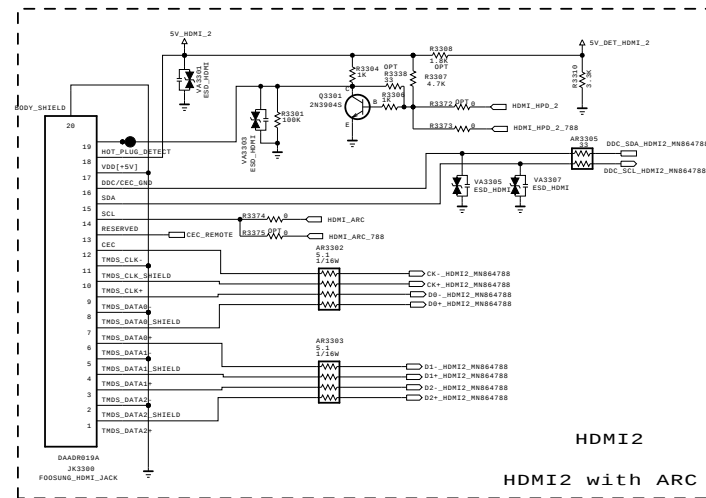
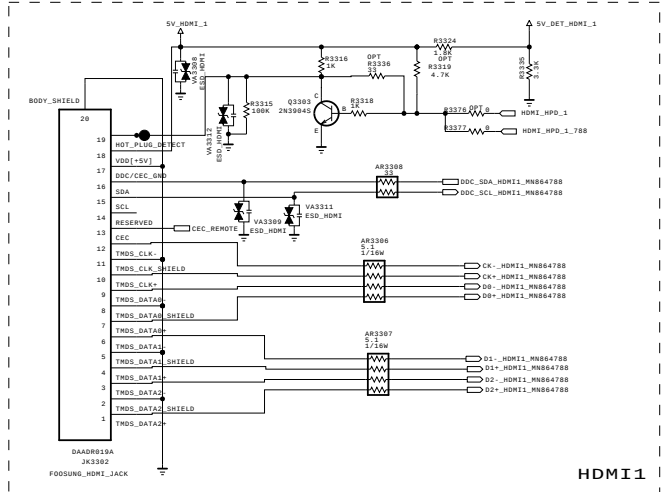
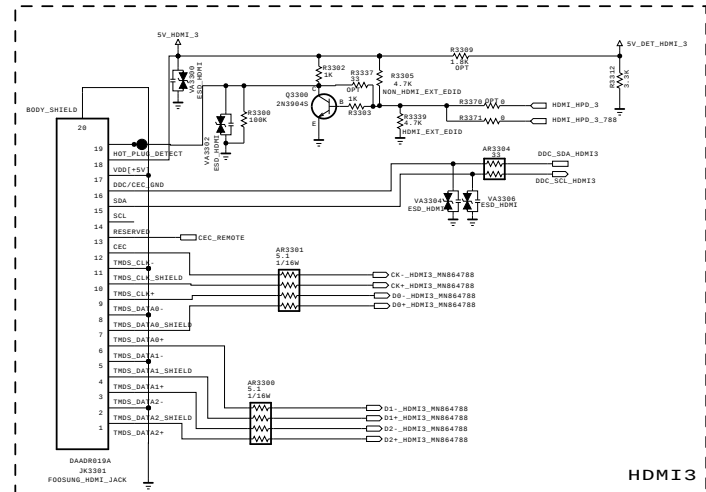
	0	1	
MODEL_OPT_0	NON LOGO	LOGO	
MODEL_OPT_1	LCD	OLED	
MODEL_OPT_3	LM15U/LM14A	H15	

[illegible]

SECRET
LGElectronics



MODEL	LM14A	DATE	2015-01-21
BLOCK	MICOM	SHEET	30 /

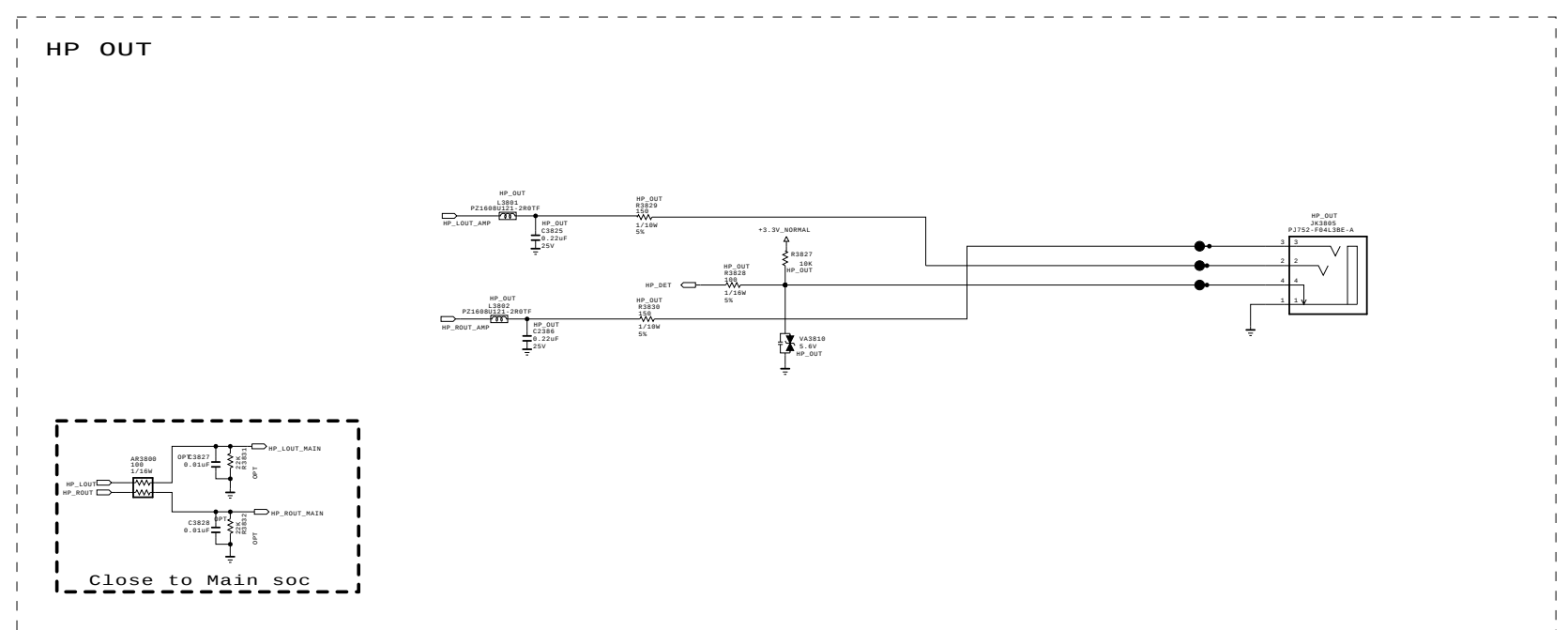
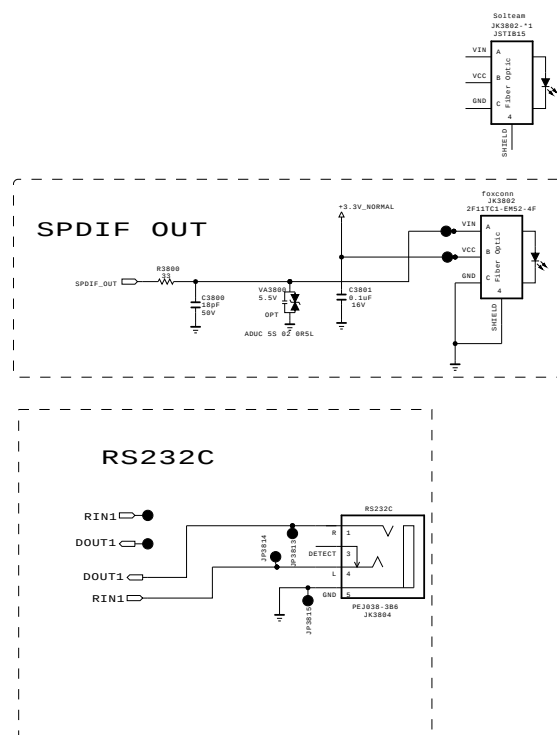
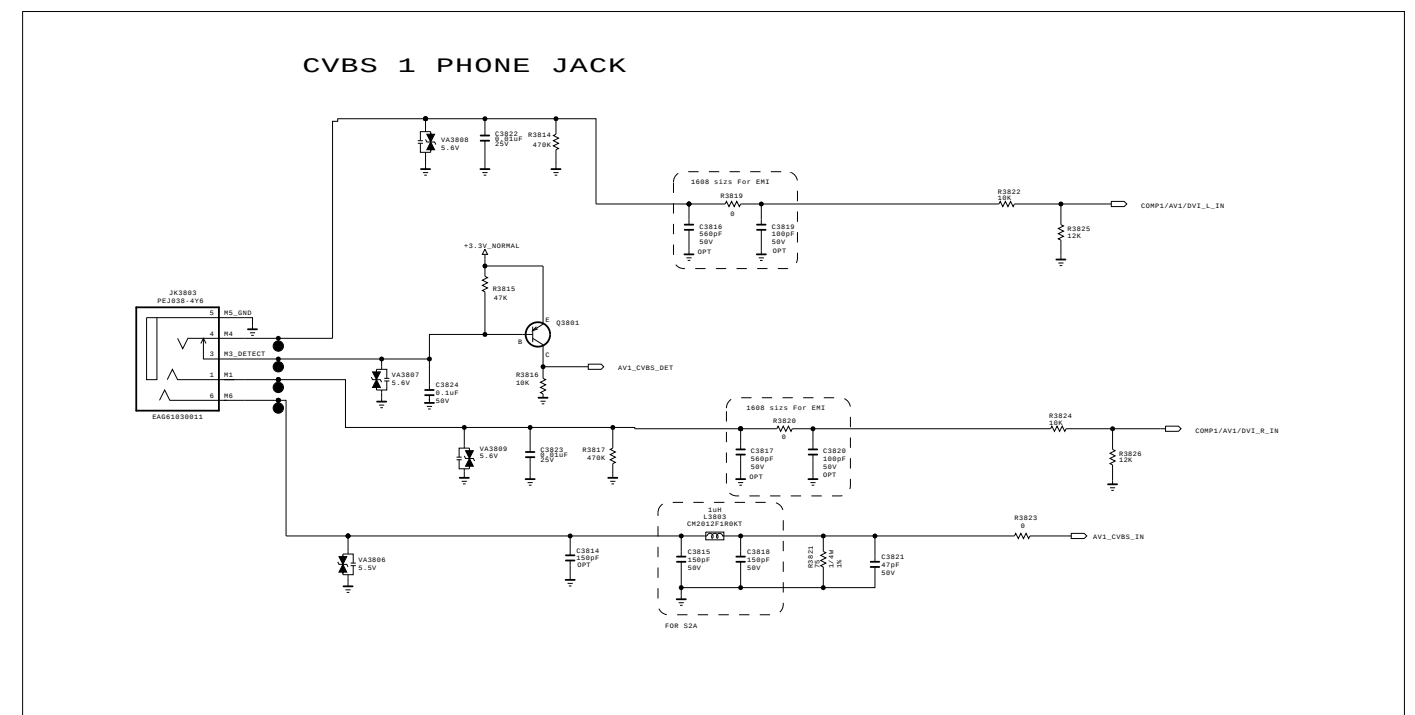
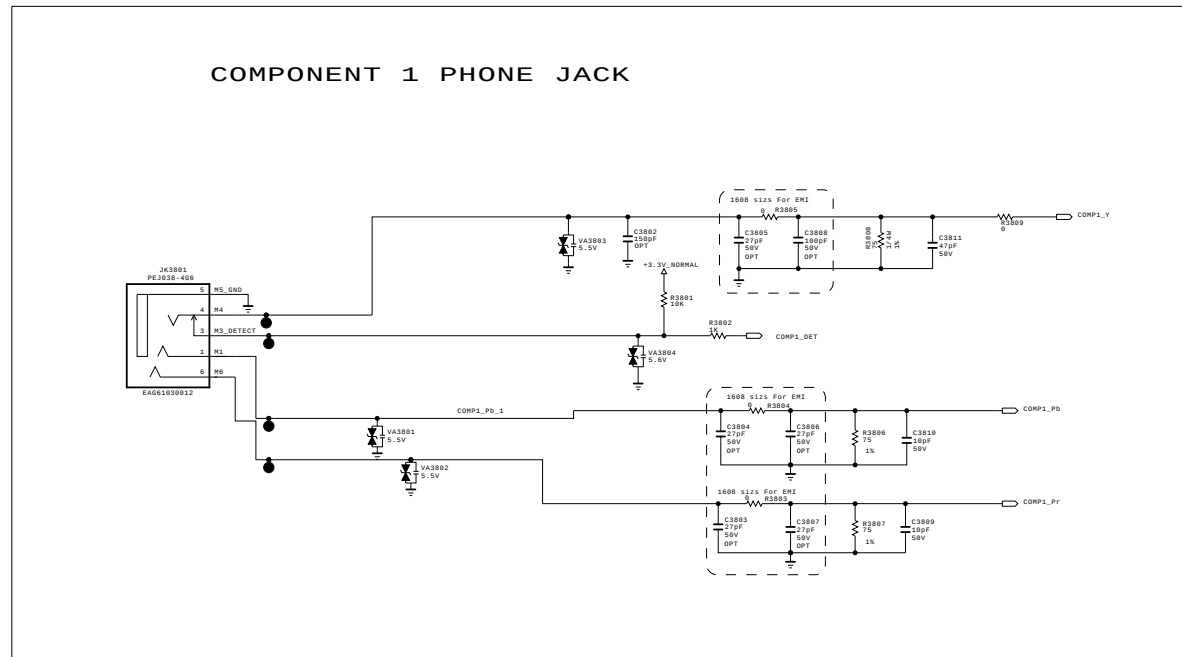


THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.

SECRET
LGElectronics

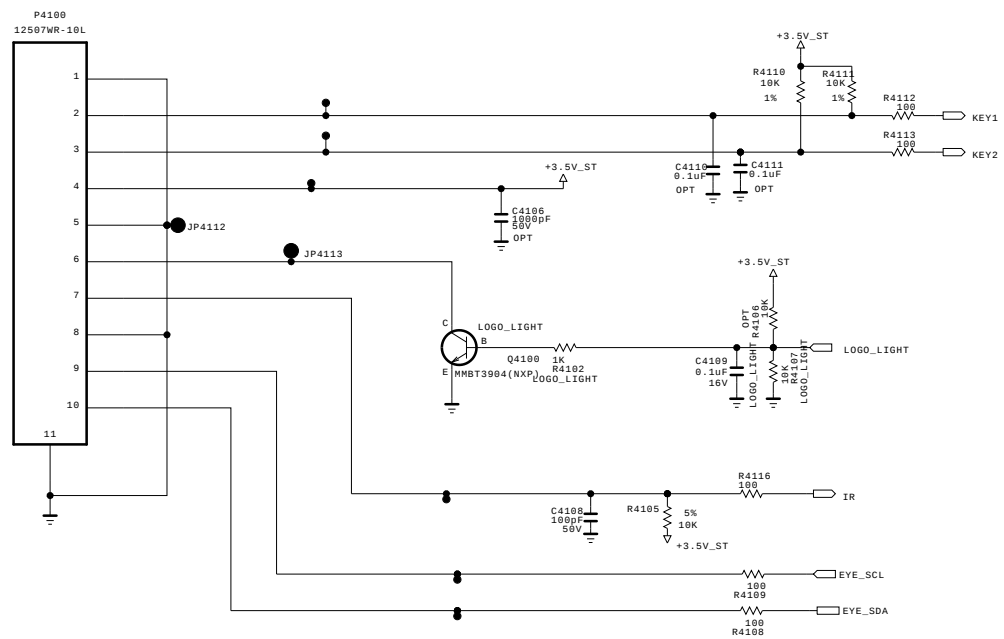
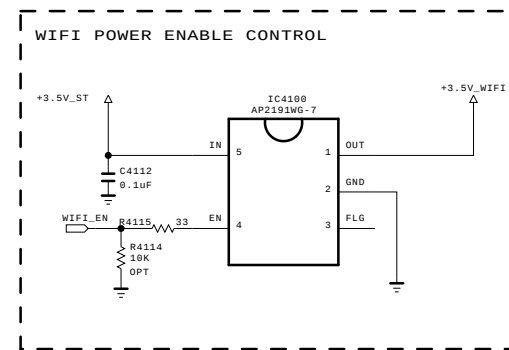
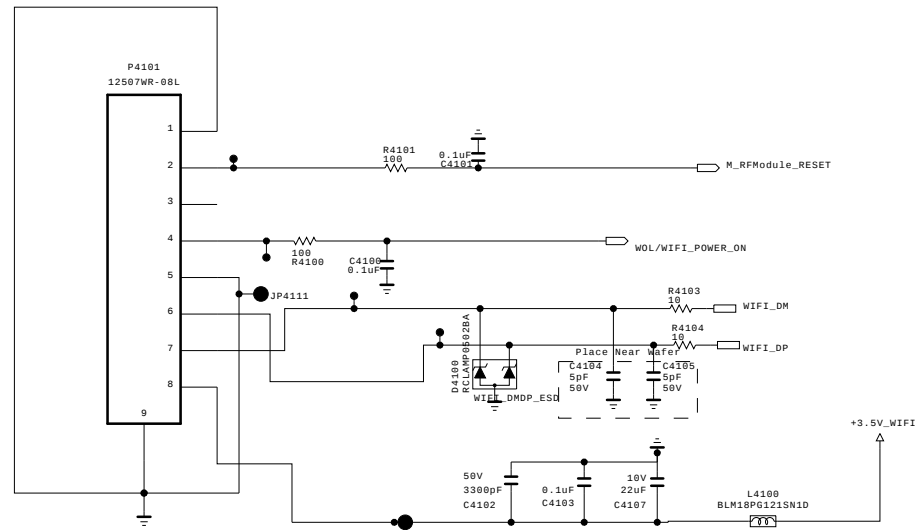
LG ELECTRONICS

MODEL	LM15U	DATE	2014-11-04
BLOCK	HDMI	SHEET	10



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

[EF95 ONLY] IR/COMBO



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

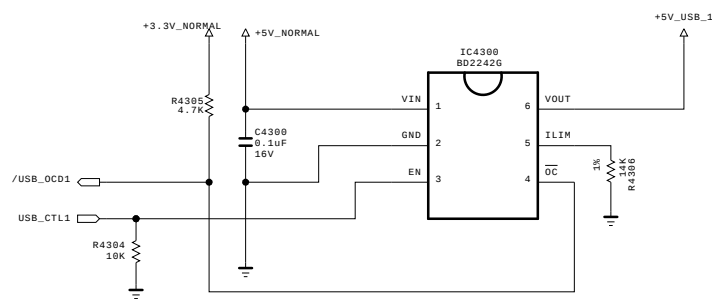
SECRET
LG Electronics



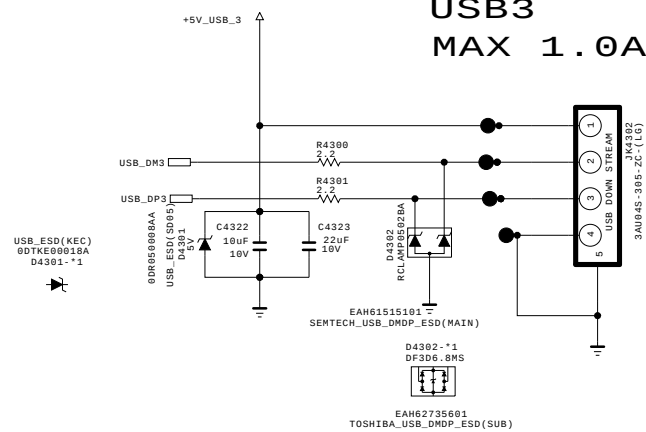
MODEL		DATE	
BLOCK		SHEET	/

+5V_USB FOR USB1

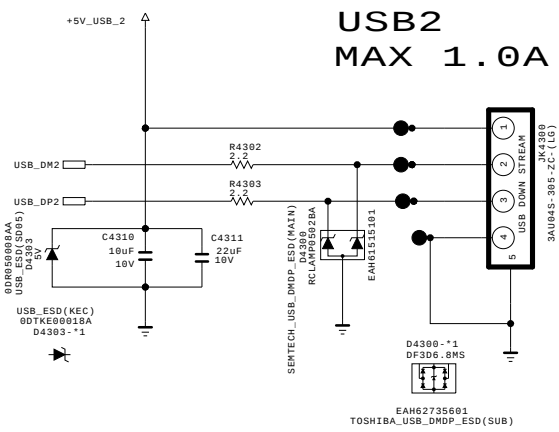
OCP USB1



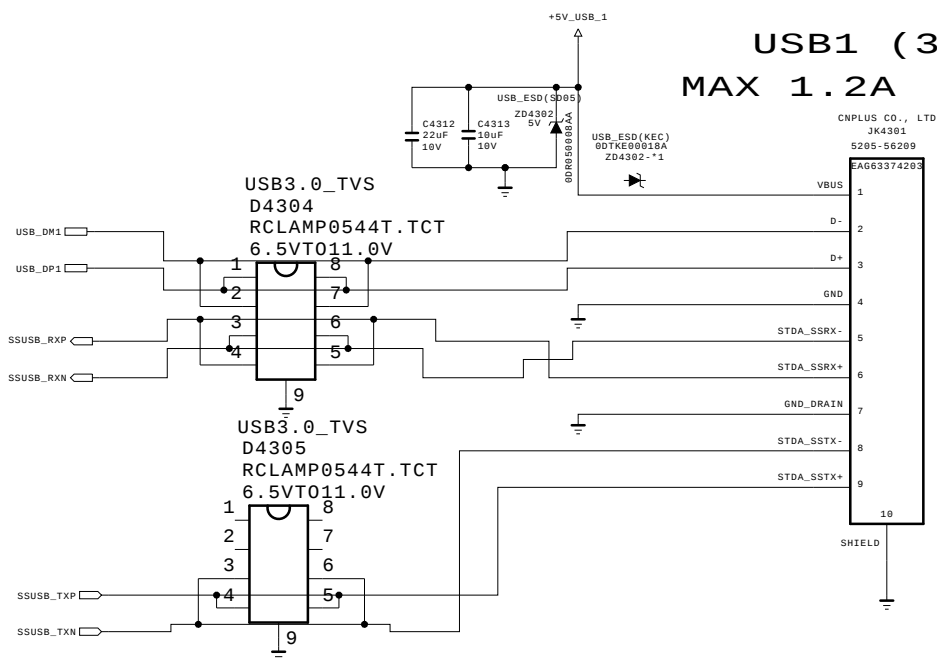
USB3
MAX 1.0A



USB2
MAX 1.0A



USB1 (3.0)
MAX 1.2A



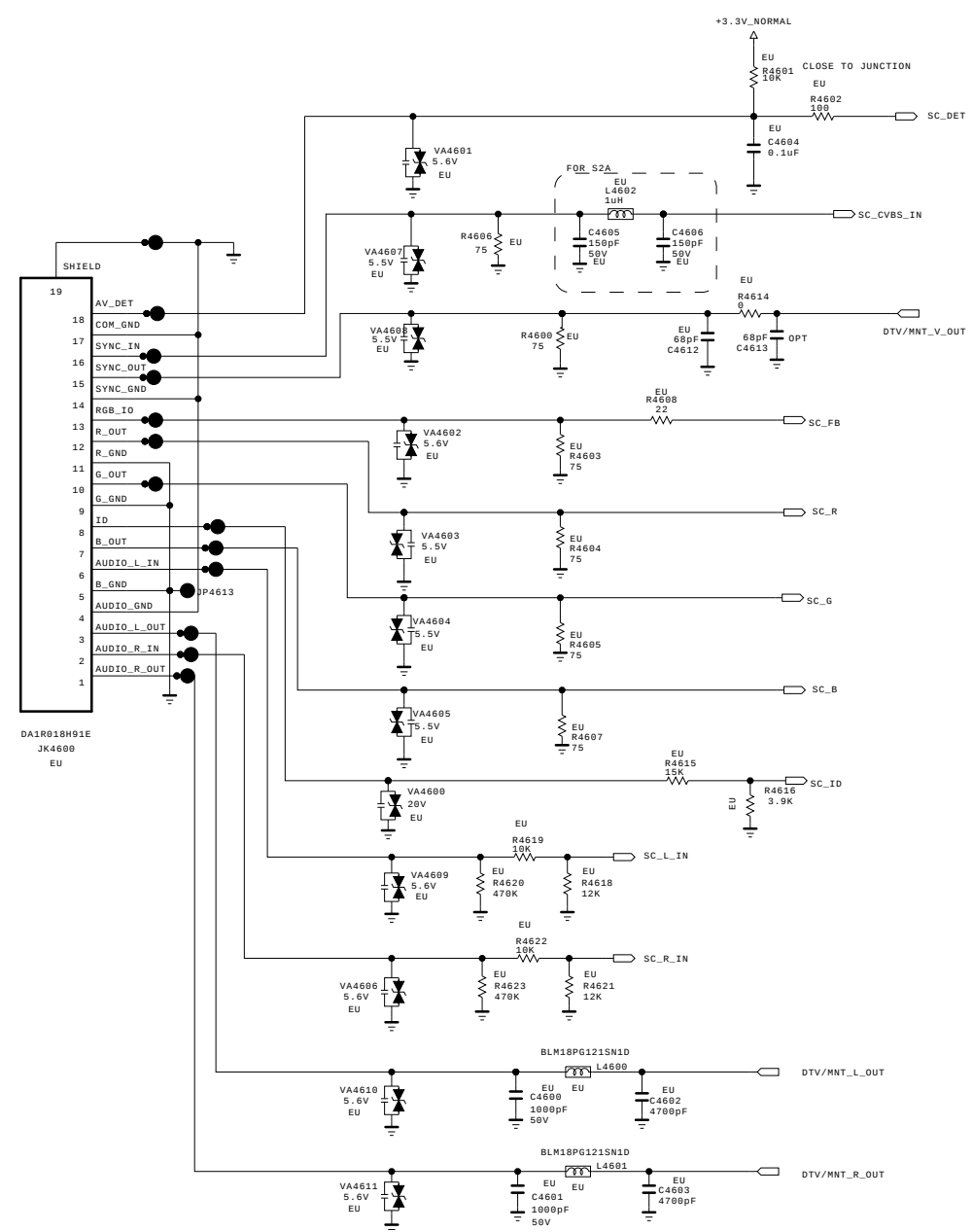
THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.

SECRET
LGElectronics



MODEL	LM14A	DATE	2014-11-12
BLOCK	USB	SHEET	43 /

Full Scart(18 Pin Gender)



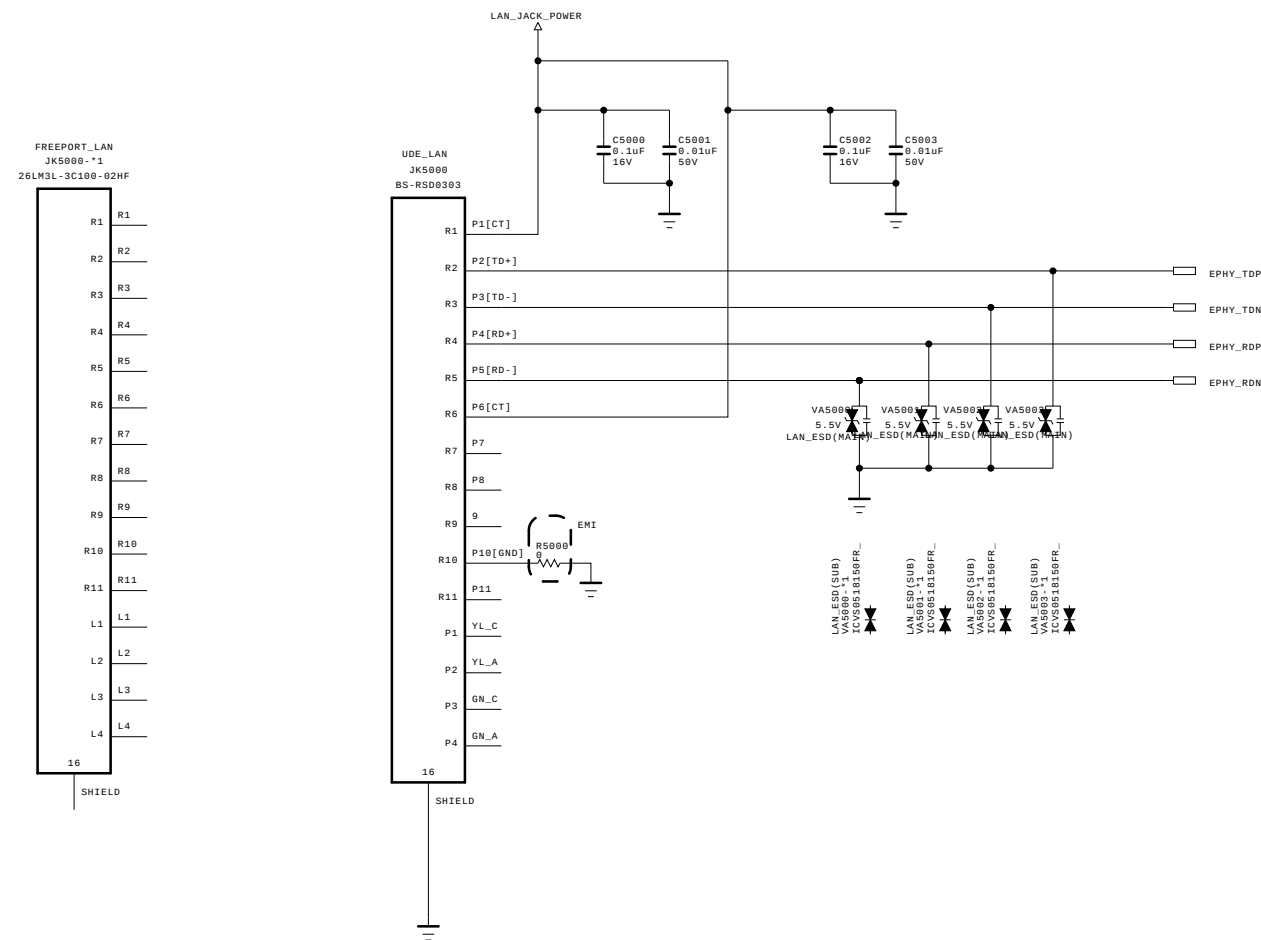
THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.

SECRET
LGElectronics



MODEL	LM15U	DATE	2014-09-18
BLOCK	SCART_JACK_V	SHEET	46 / 01

Ethernet Block



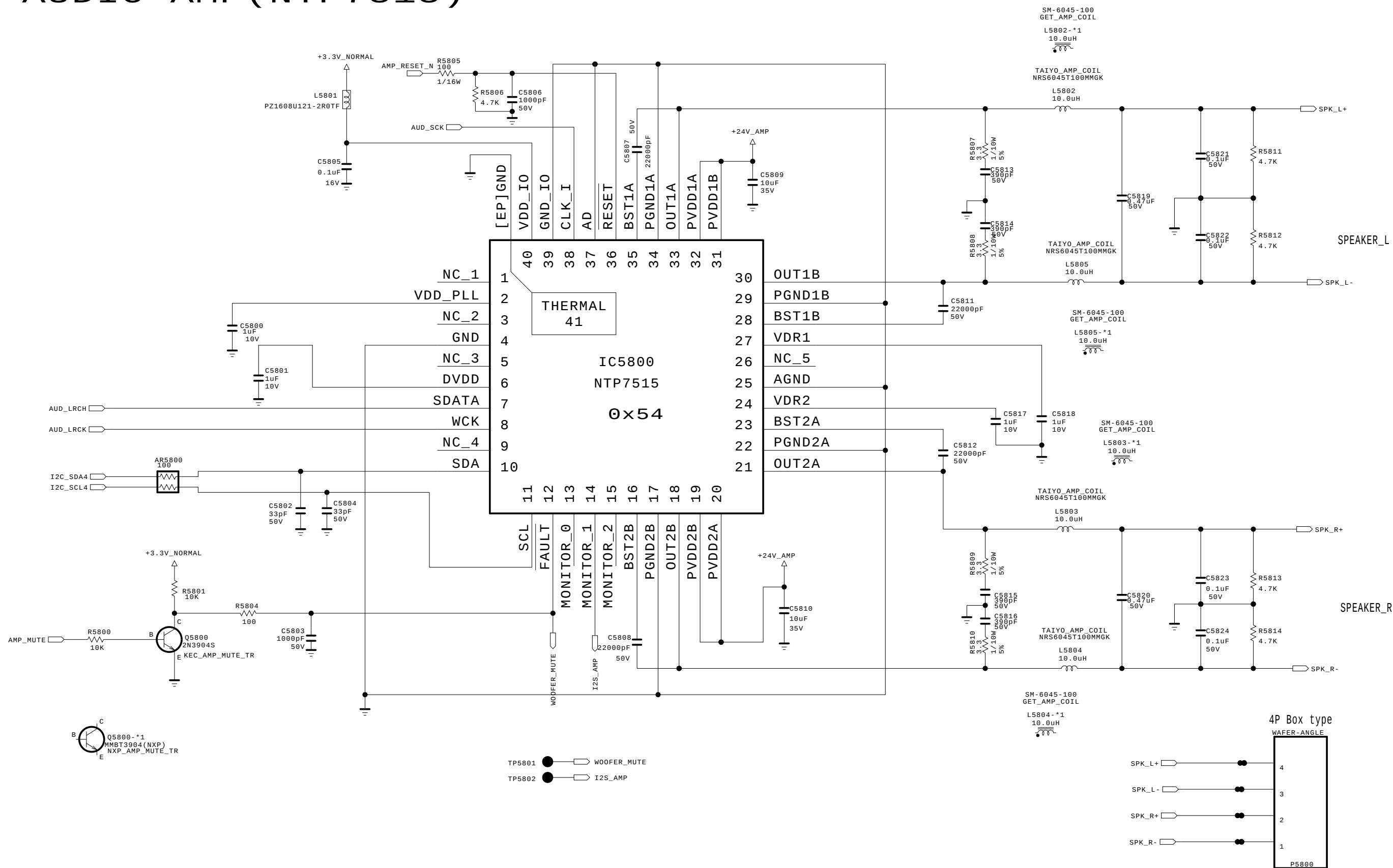
THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.

SECRET
LG Electronics



MODEL	LM15U	DATE	2014-09-10
BLOCK	LAN_V	SHEET	50 / 01

AUDIO AMP(NTP7515)



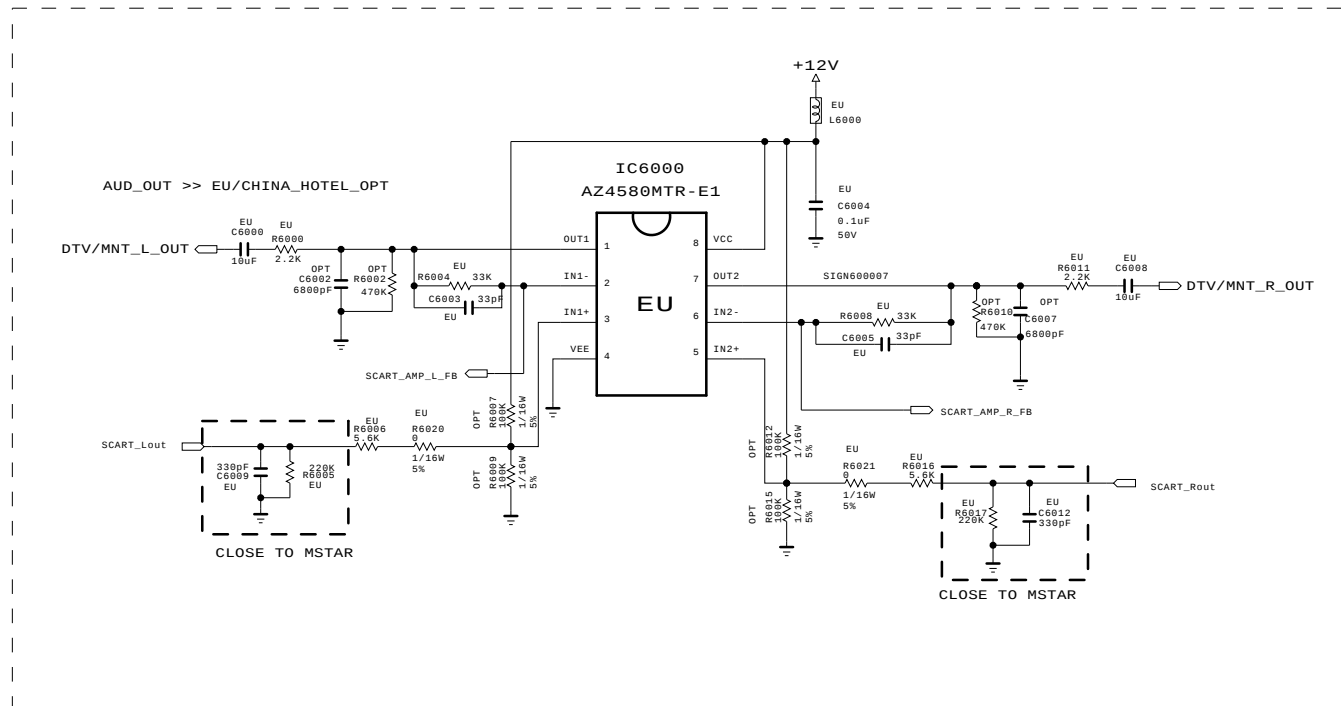
THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.

SECRET

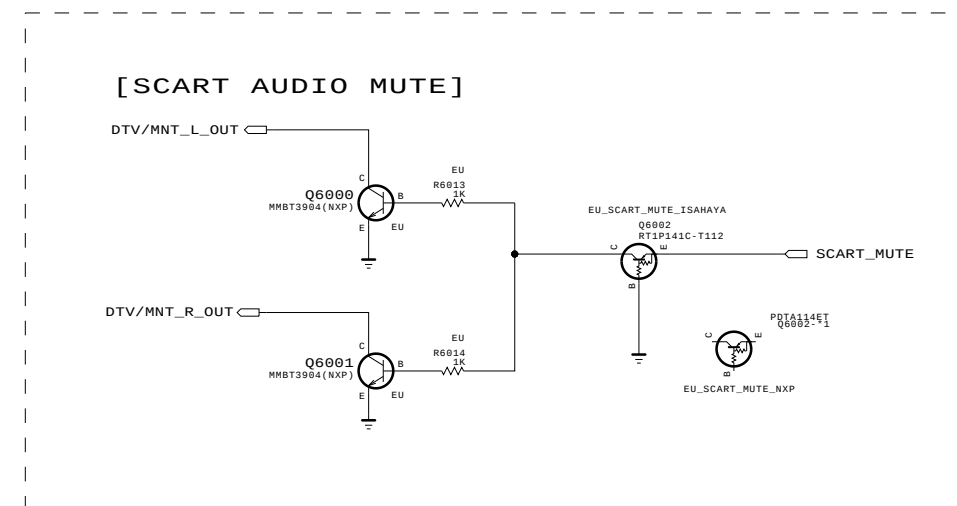
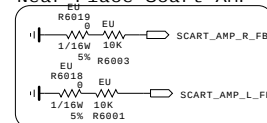
LG Electronics

 LG ELECTRONICS

BSD-15Y-LM14A-058_00-HD			
MODEL	LM14A	DATE	2015-01-08
BLOCK	NTP_AMP	SHEET	58 /



Near Place Scart AMP



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

SECRET
LGElectronics

 LG ELECTRONICS

BSD-15Y-LM14A-060_00-HD

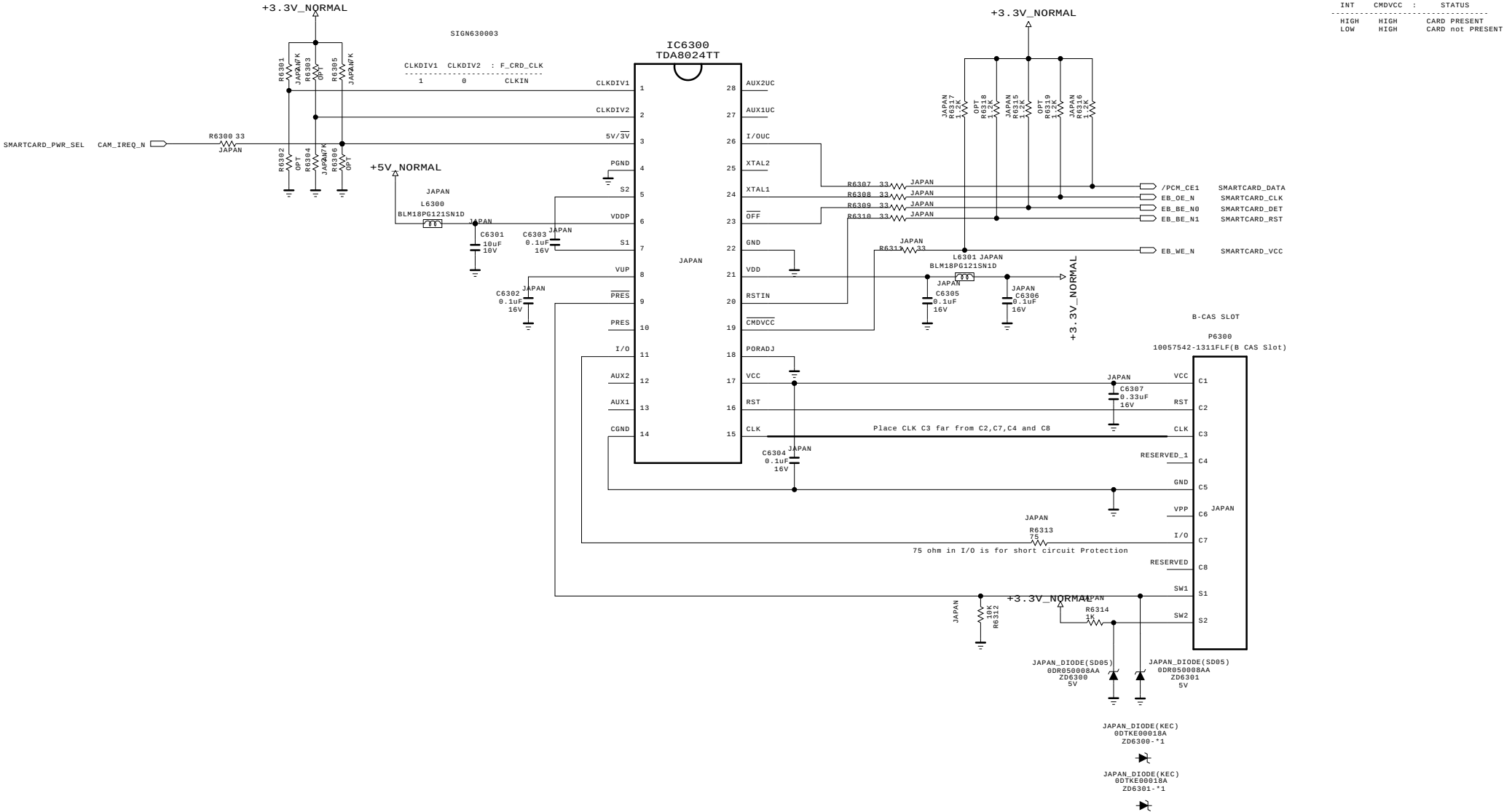
MODEL		DATE	
BLOCK	SCART AMP	SHEET	/

[illegible]

SECRET	 LG ELECTRONICS
LG Electronics	

MODEL	HEADPHONE AMP	DATE	
BLOCK		SHEET	/

B-CAS (SMART CARD) INTERFACE



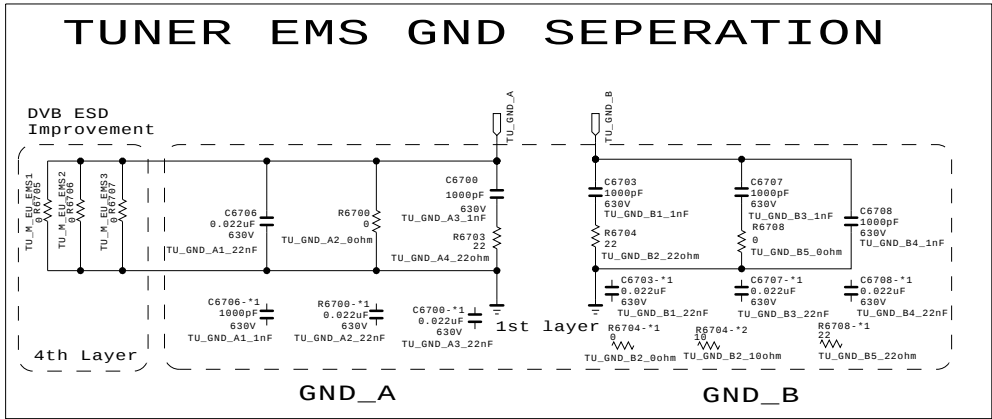
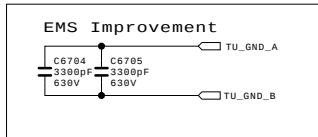
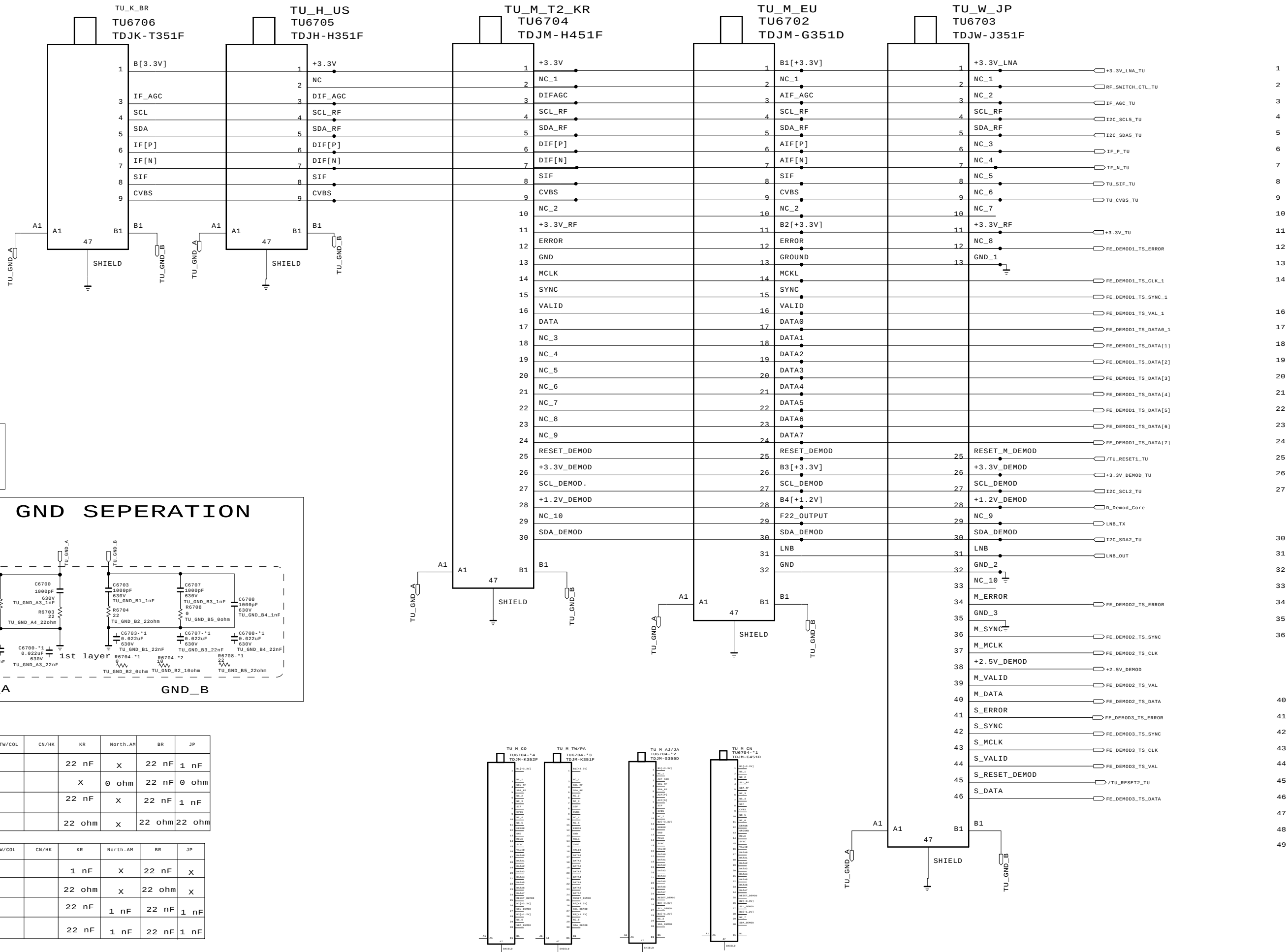
THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.

SECRET
LGElectronics



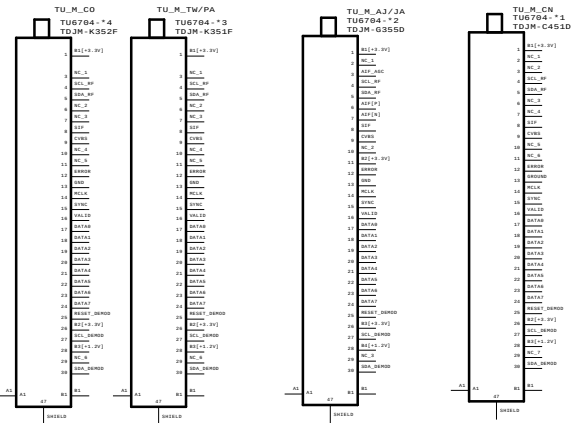
MODEL	JAPAN B-CAS	DATE	
BLOCK		SHEET	63

BSD-15Y-LM14A-063_00-HD



TU_GND_A	EU/CIS	AJJA	TW/COL	CN/HK	KR	North_AM	BR	JP
GND_A_1	X	X			22 nF	X	22 nF	1 nF
GND_A_2	0 ohm	0 ohm			X	0 ohm	22 nF	0 ohm
GND_A_3	1 nF	X			22 nF	X	22 nF	1 nF
GND_A_4	22 ohm	X			22 ohm	X	22 ohm	22 ohm

TU_GND_B	EU/CIS	AJJA	TW/COL	CN/HK	KR	North_AM	BR	JP
GND_B_1	1 nF	X			1 nF	X	22 nF	X
GND_B_2	10 ohm	X			22 ohm	X	22 ohm	X
GND_B_3	1 nF	1 nF			22 nF	1 nF	22 nF	1 nF
GND_B_4	1 nF	1 nF			22 nF	1 nF	22 nF	1 nF



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

SECRET
LGElectronics



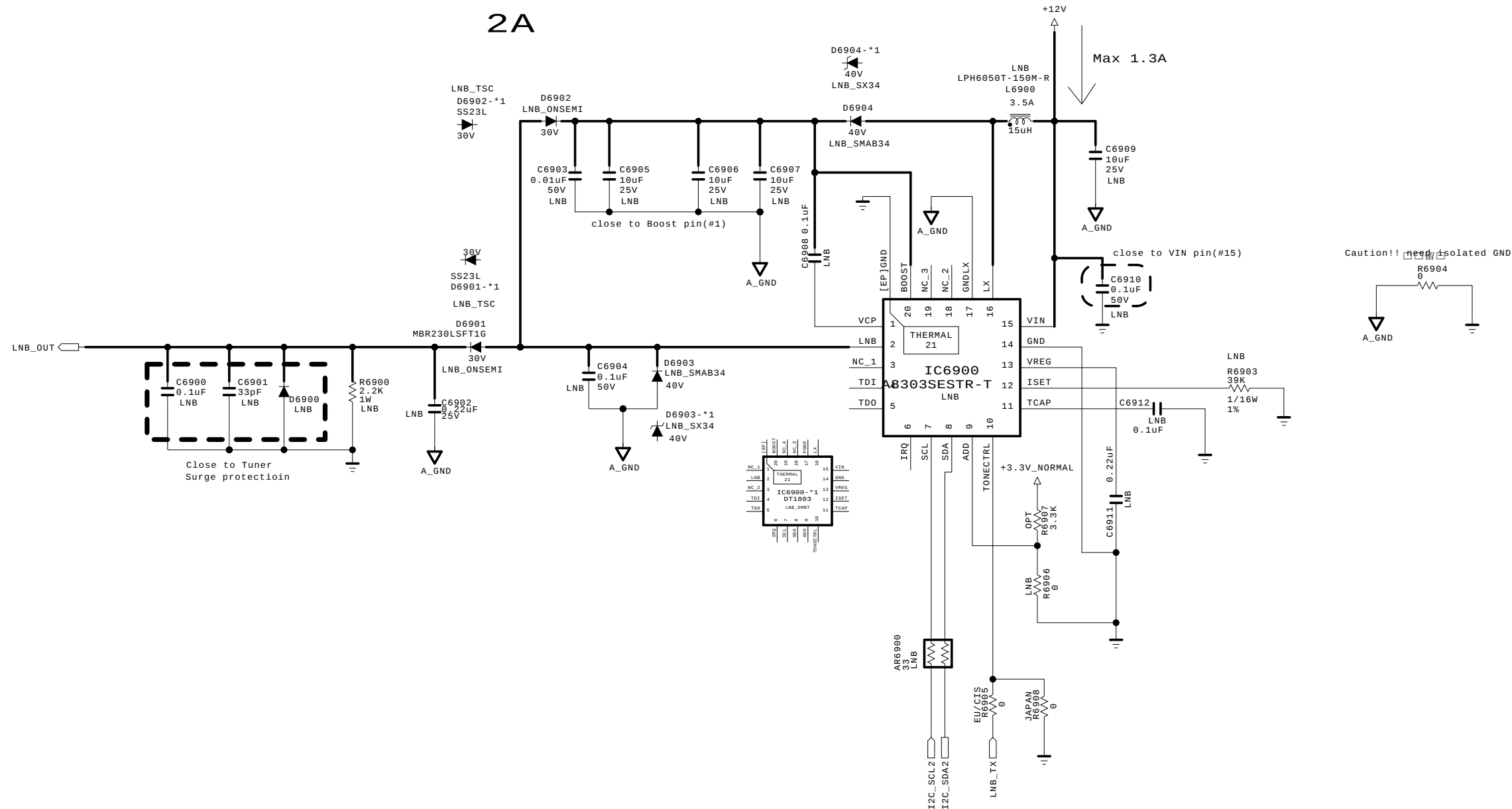
MODEL		DATE	2014-08-11
BLOCK	TU_SYMBOL_V_DVB	SHEET	67_01

DVB-S2 LNB Part Allegro

(Option:LNB)

3A

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



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

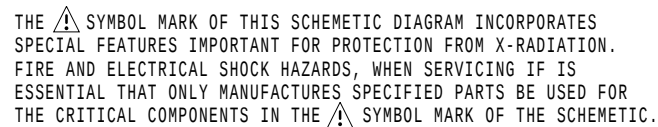
SECRET

LG Electronics

 LG ELECTRONICS

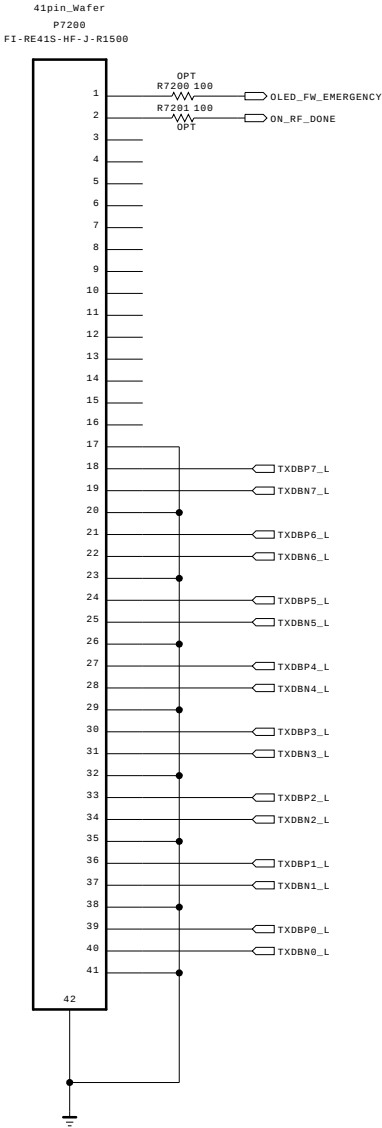
MODEL	LM14A	DATE	
BLOCK	LNB	SHEET	69 /

51pin_Wafer
P7100
FI-RE51S-HF-J-R1500



LGE Internal Use Only

[41P Vx1
output wafer]



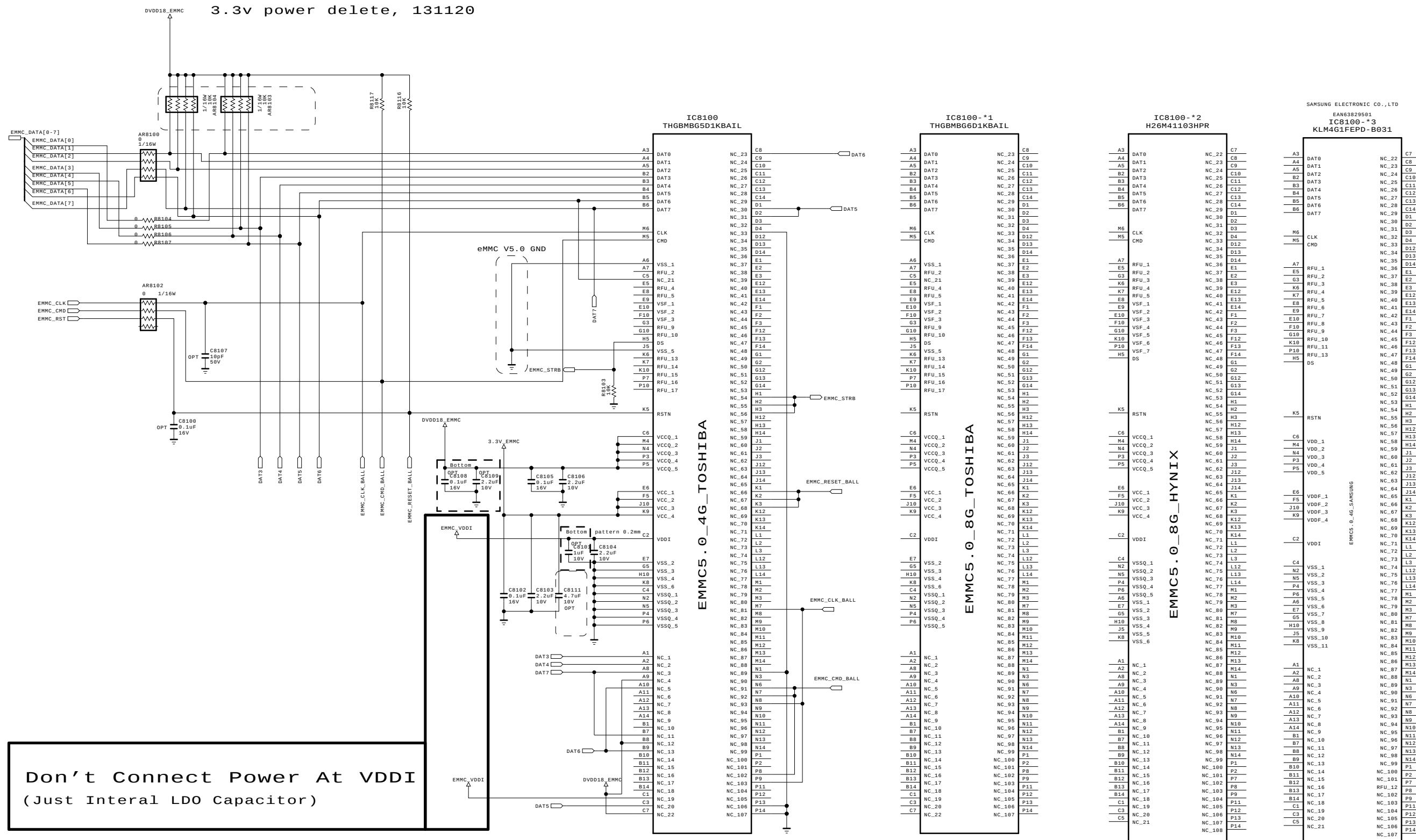
THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.

SECRET
LGElectronics



MODEL	UF71/7500	DATE	14/07/19
BLOCK	Vx1 41P	SHEET	22 /

eMMC I/F



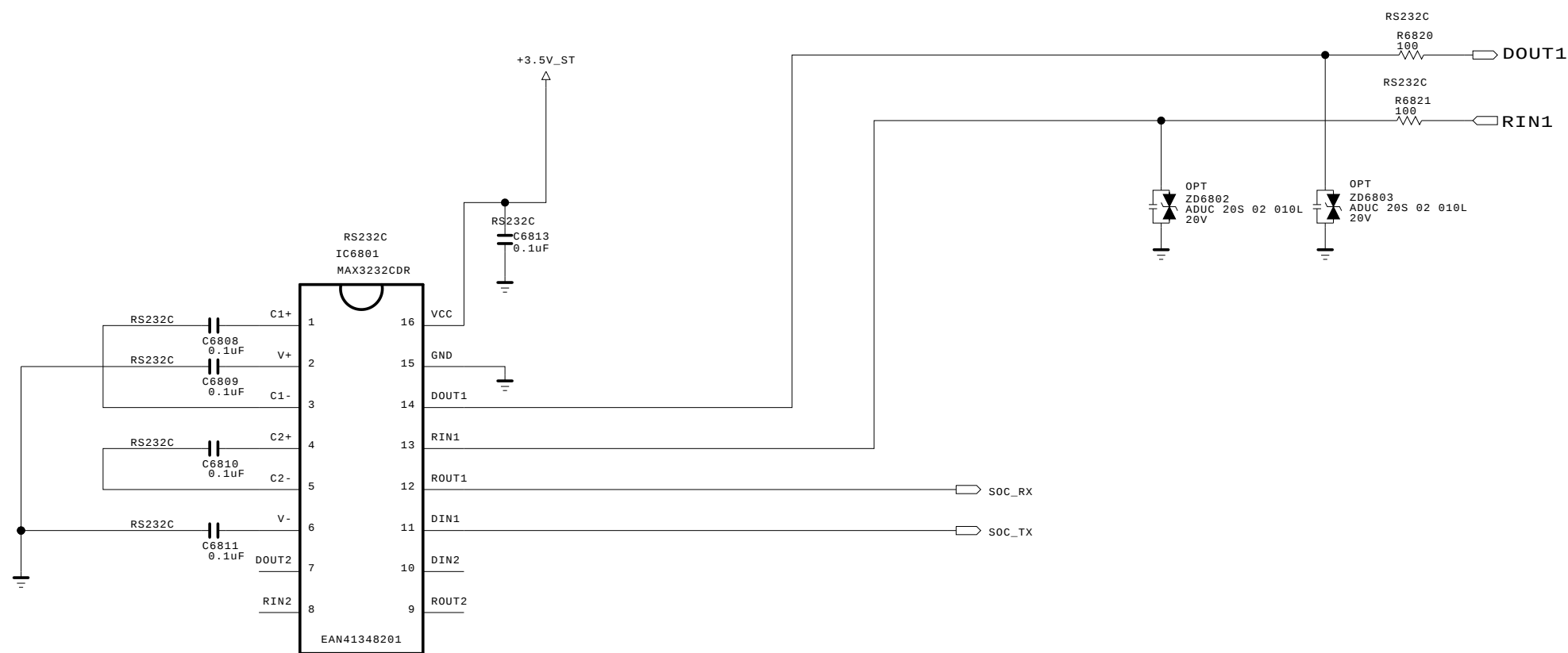
THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURERS SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.

SECRET
L Electronics

BSD-15Y-LM14A-081_00-HD

MODEL	LM14A	DATE	
BLOCK	eMMC	SHEET	/

RS-232C Control INTERFACE



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

SECRET

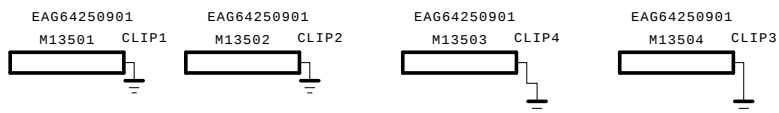
LG Electronics

 LG ELECTRONICS

MODEL	UF71/7500	DATE	2014-05-19
BLOCK	RS232C	SHEET	22 /

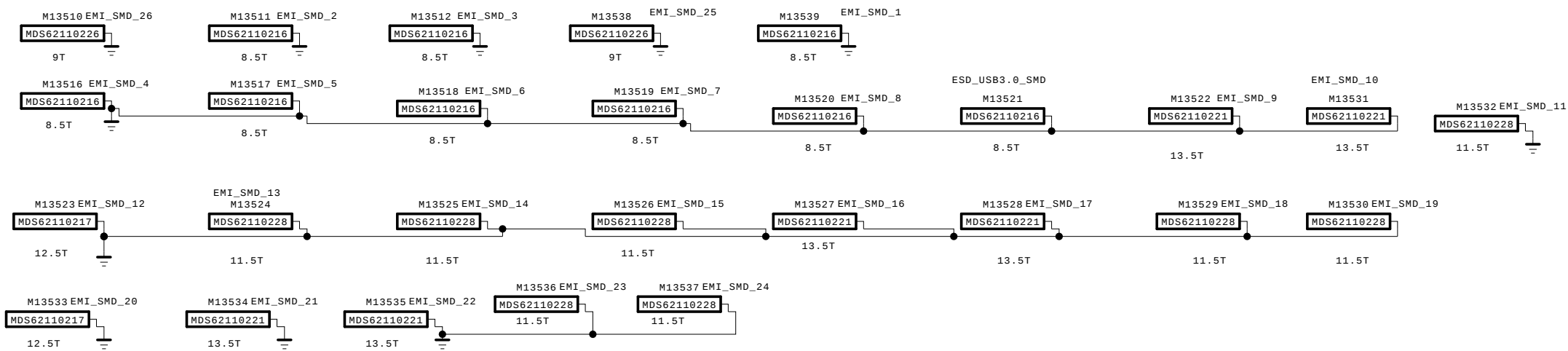
LM14A+URSA

CLIP Top Side for Covershield



CLIP 1 - PUSH TYPE

SMD Top Side for Covershield 7.5T



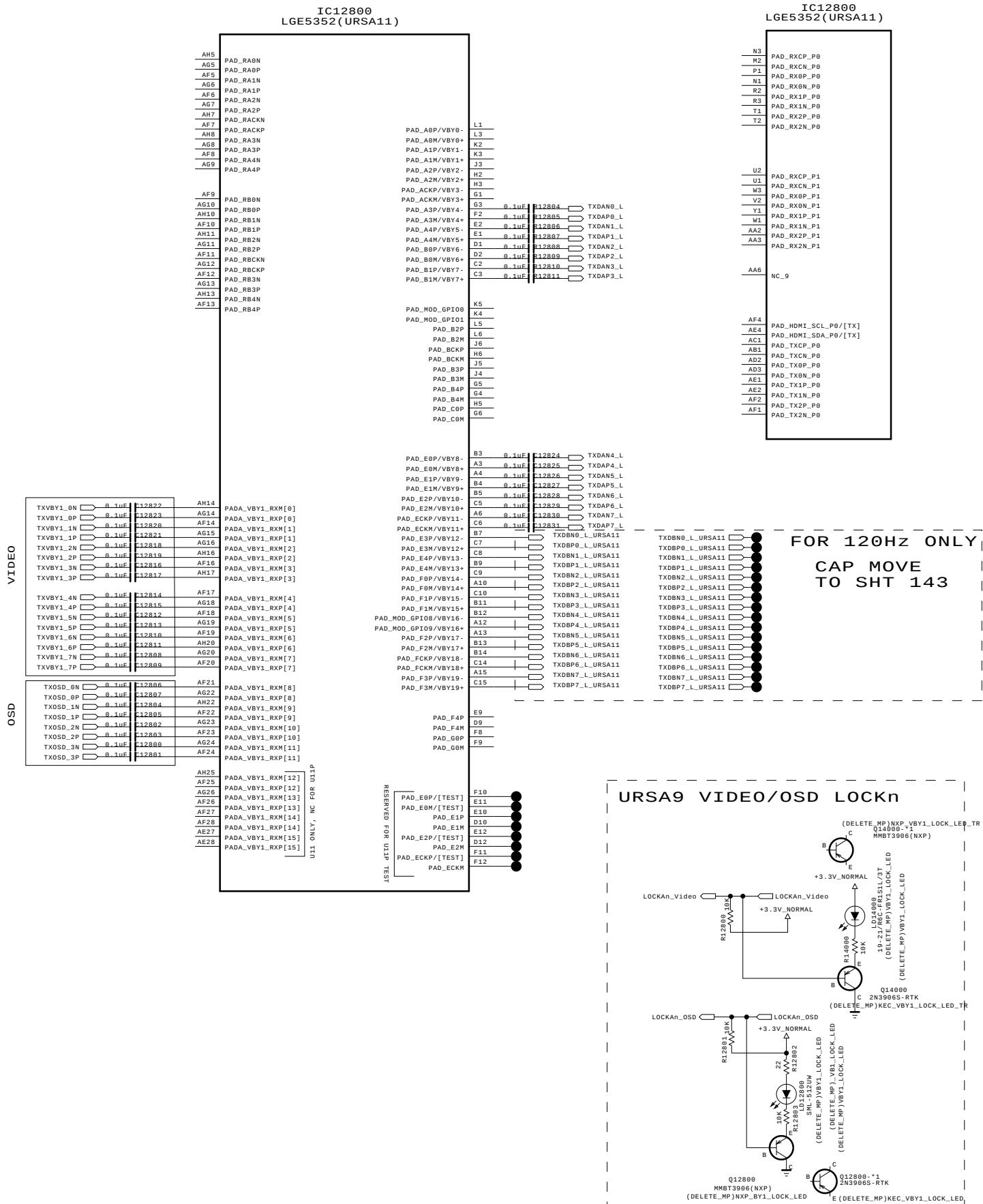
THE ⚠ SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMATIC.

SECRET

LGElectronics

LG ELECTRONICS

MODEL		DATE	14.06.10
BLOCK	CLIP TYPE	SHEET	/

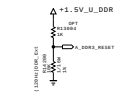
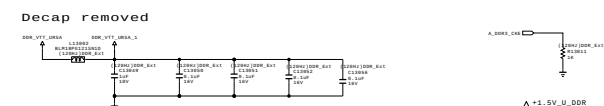
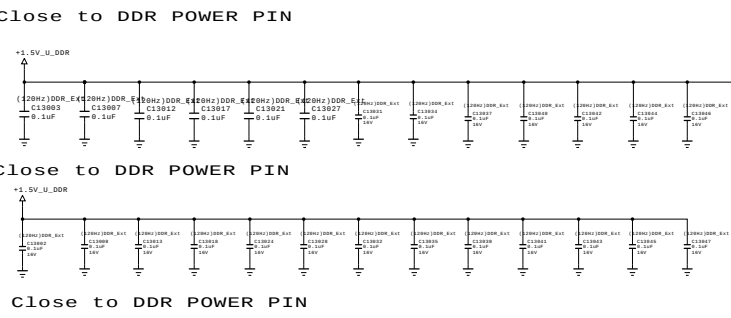
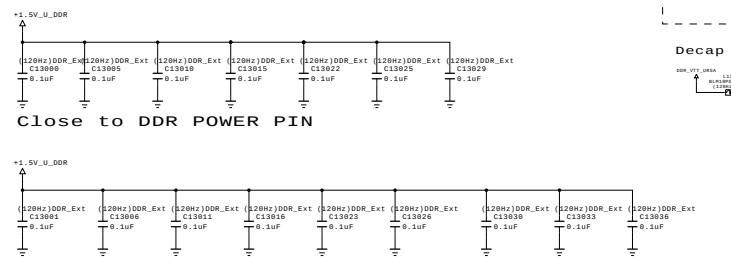
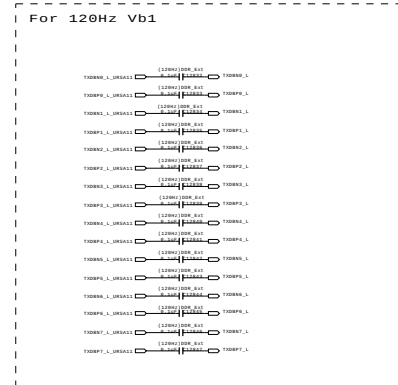
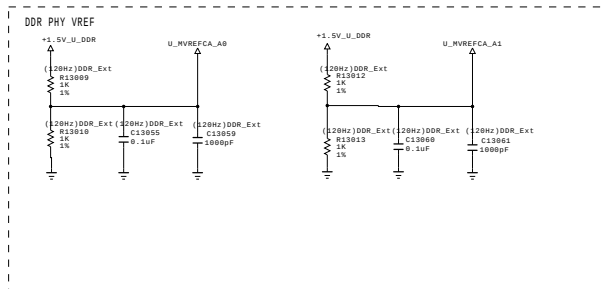
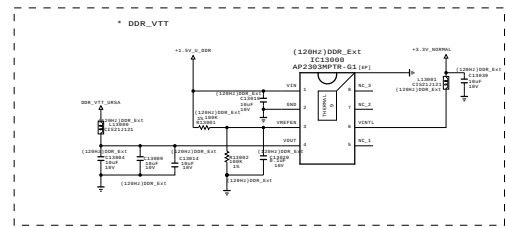
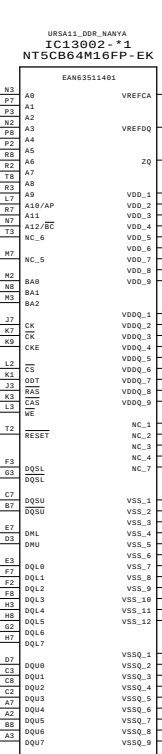
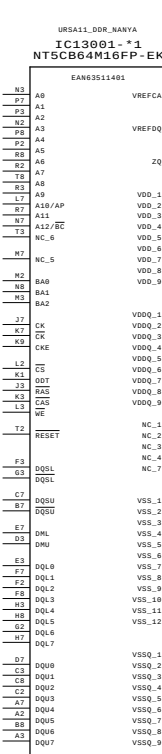
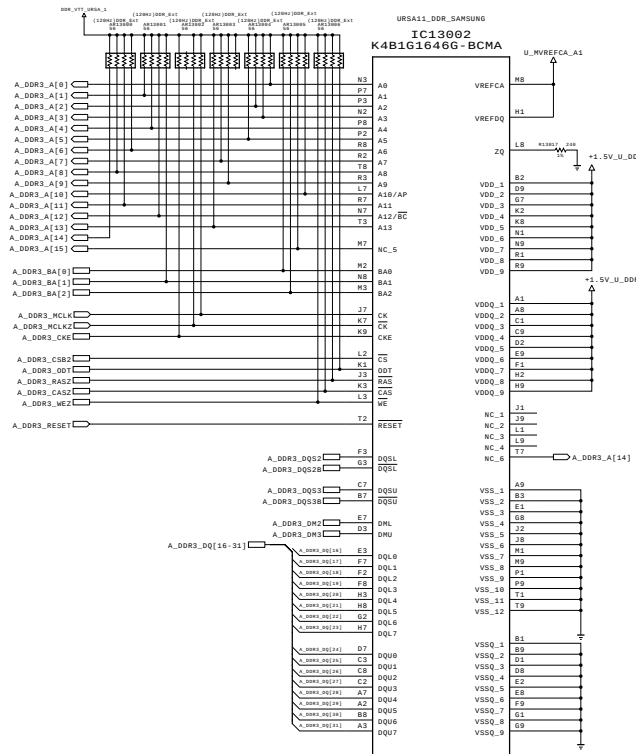
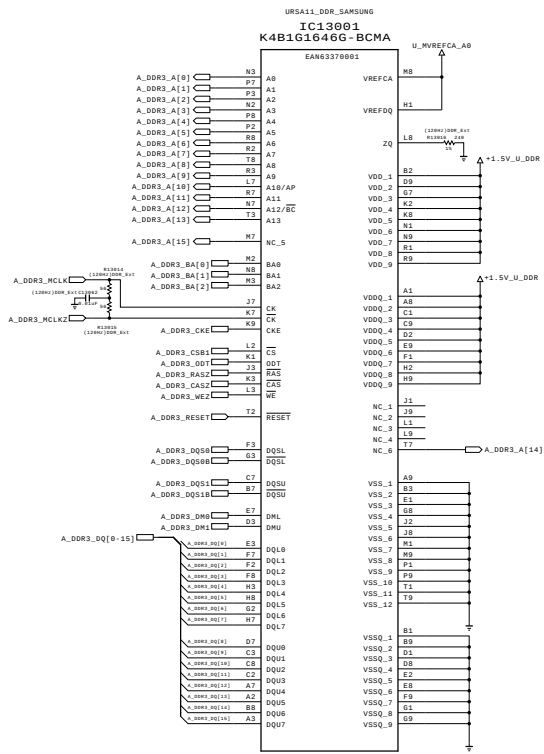


THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.

SECRET
LGElectronics

LG ELECTRONICS

MODEL		DATE	
BLOCK	URSA11 INPUT	SHEET	



BSD-15Y-LM14A-143_00-00

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

MODEL	UF77 ONLY	DATE	
BLOCK	URSA11_DDR	SHEET	



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

SECRET
LGElectronics



BSD-15Y-LM14A-144_00-HD

MODEL		DATE	
BLOCK	URSA11_GPIO	SHEET	/

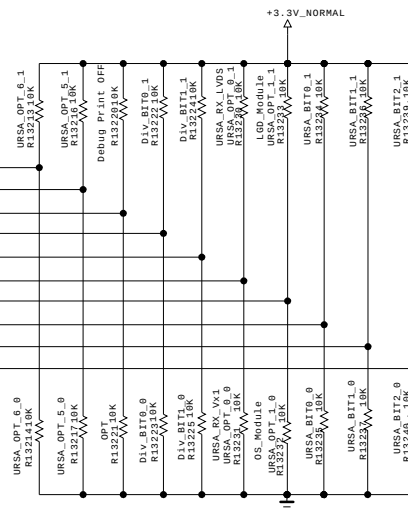
URSA Option

	Low	High
URSA_OPT_0	Rx_Vx1	Rx_LVDS
URSA_OPT_1	OS_Module	LGD_Module
URSA_OPT_4	PRINT_ON	PRINT_OFF
URSA_OPT_5	Reserved	Reserved
URSA_OPT_6	Reserved	Reserved

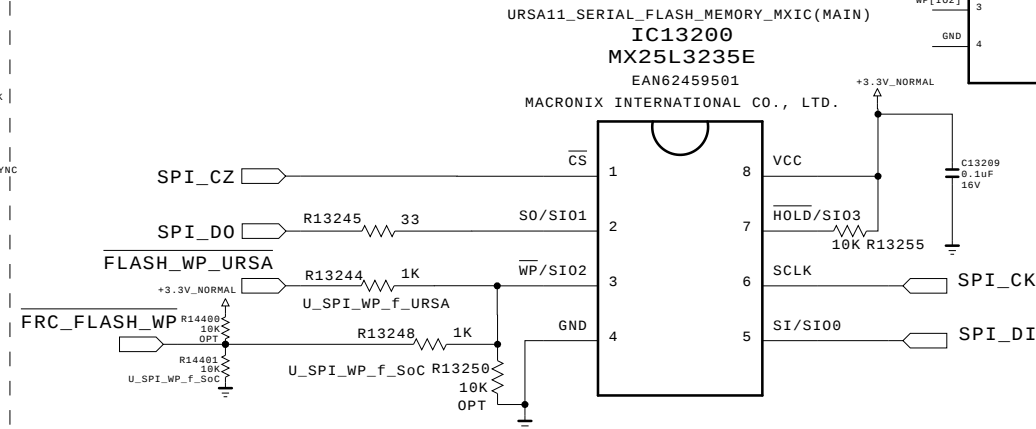
BIT [2:1/0]	Tx Lane
0/0/0	4K@120 (4 DDR)
0/0/1	4K@60 (2 DDR)
0/1/0	4K@120 8K(9BUX 4DDR)
0/1/1	OLED 4K@120(4 DDR)
1/0/0	FHD@120 (4 DDR)
1/0/1	FHD@60 (2 DDR)
1/1/0	FHD@60 (4 DDR)
1/1/1	Reserved 4K@60(4 DDR)

URSA_OPT_6	Reserved
URSA_OPT_5	Reserved
URSA_OPT_4	
Div_BIT0	Division Type
Div_BIT1	
URSA_OPT_0	
URSA_OPT_1	Rx Interface
URSA_BIT0	Module Type
URSA_BIT1	
URSA_BIT2	
URSA_BIT2	

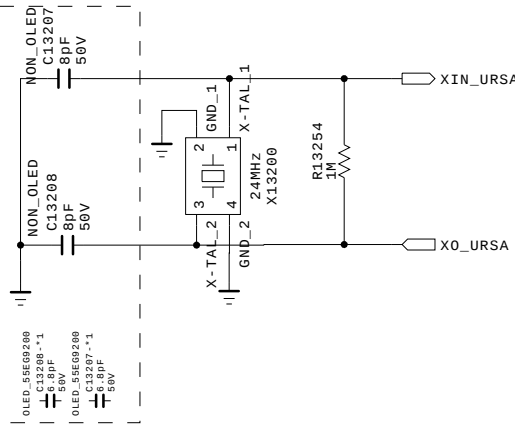
BIT [1/0]	Module Division
0/0	Non Division
0/1	2 Division
1/0	4 Division
1/1	8 Division



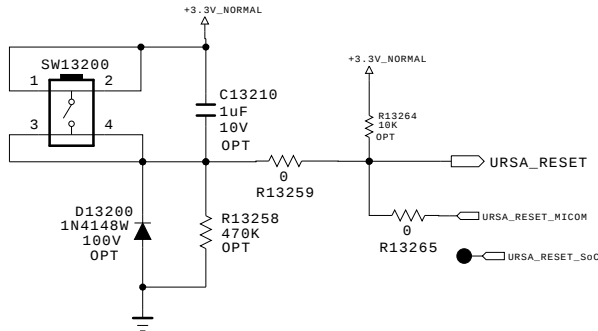
SPI Flash



Clock for URSA11

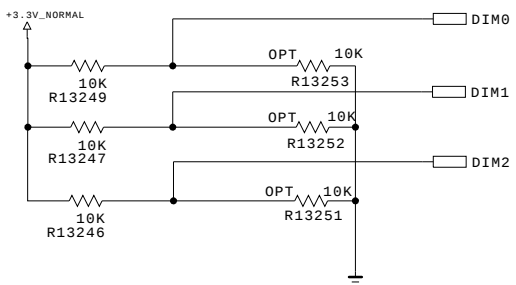


URSA Reset



Chip Config

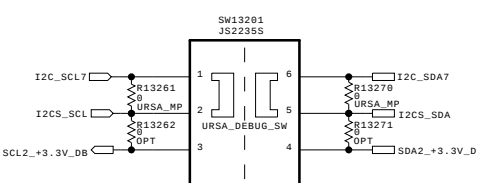
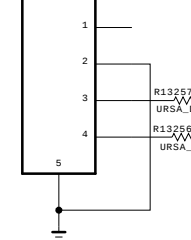
Debug/ISP ADDR
Slave (Debug Port:0XB4, ISP:0X98)
CHIP_CONF:{DIM2,DIM1,DIM0}
CHIP_CONF=3'd7:111:boot from SPI Flash

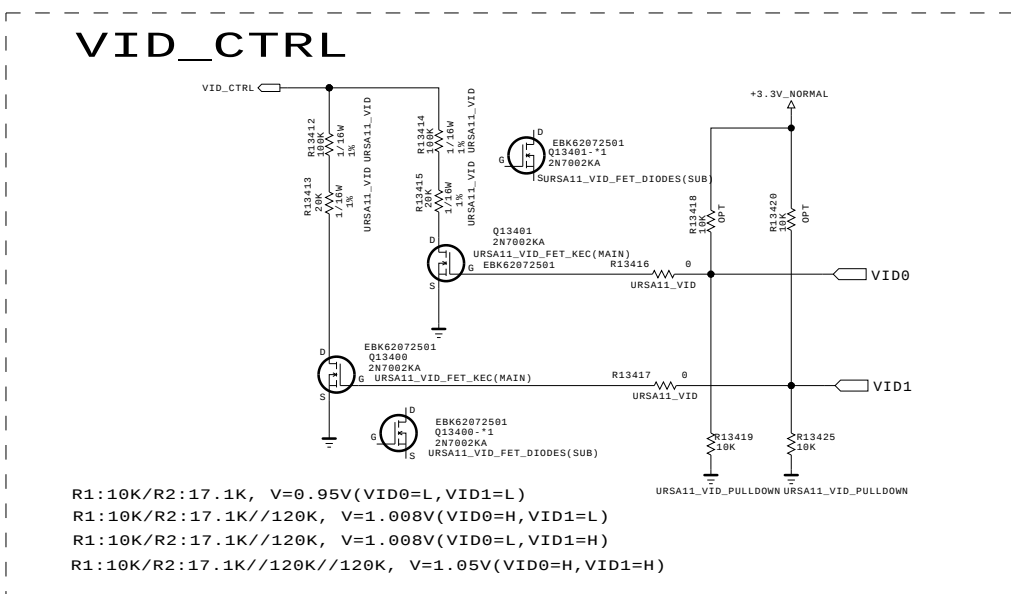
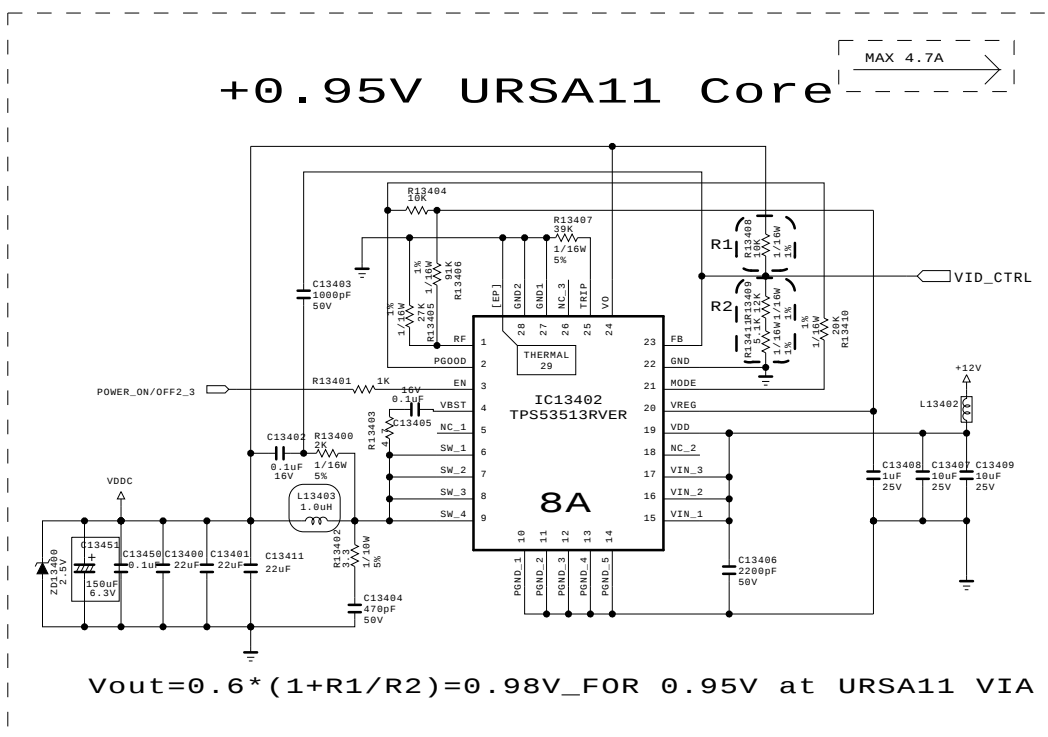
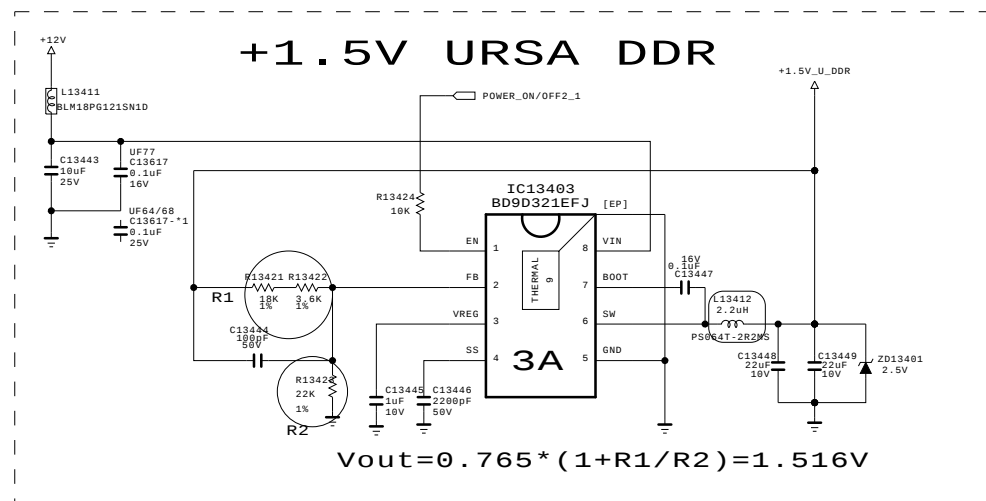


Debugging for URSA11

I2C_S Port

URSA_DEBUG_WAFER
P13200
12507WS-04L





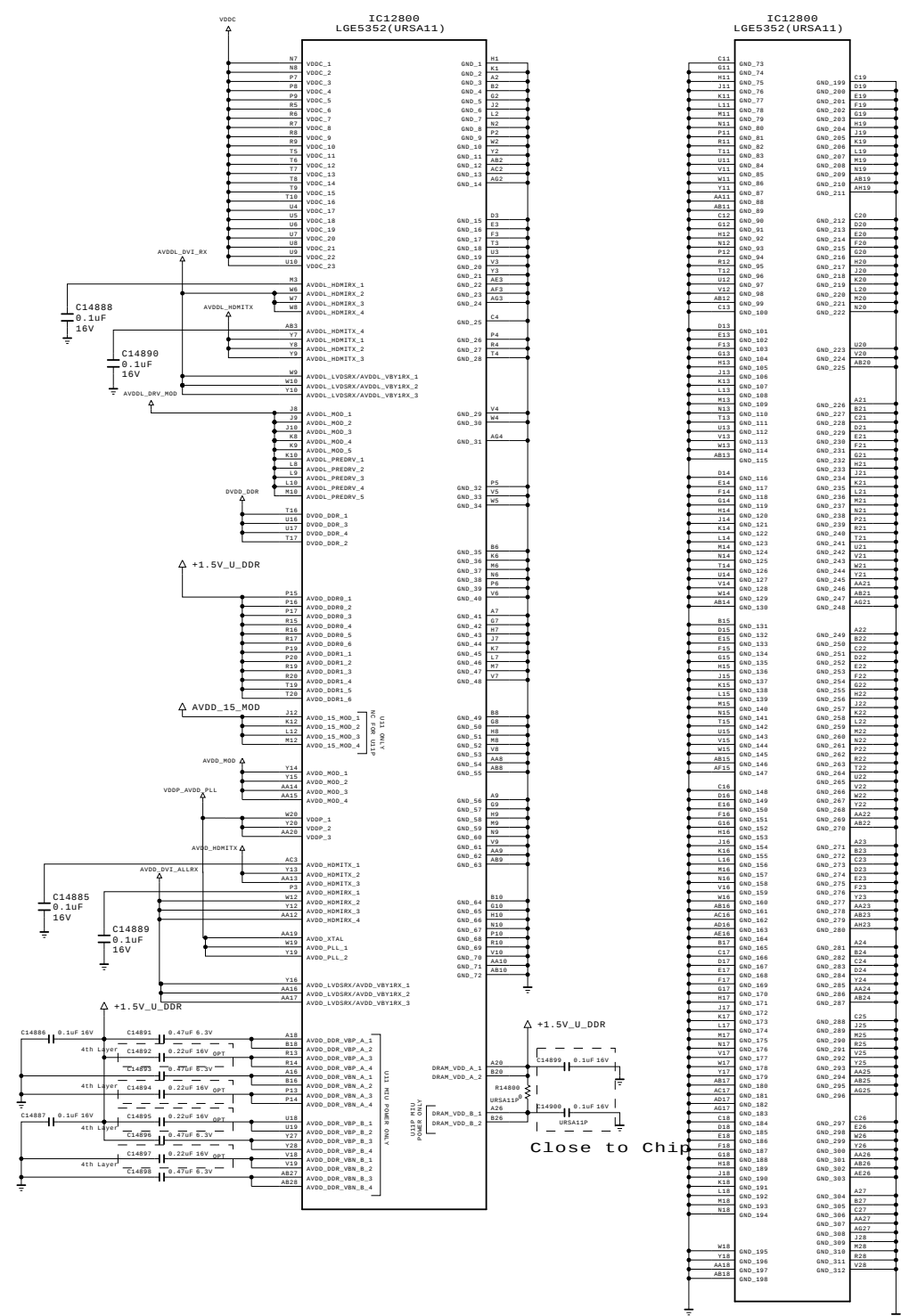
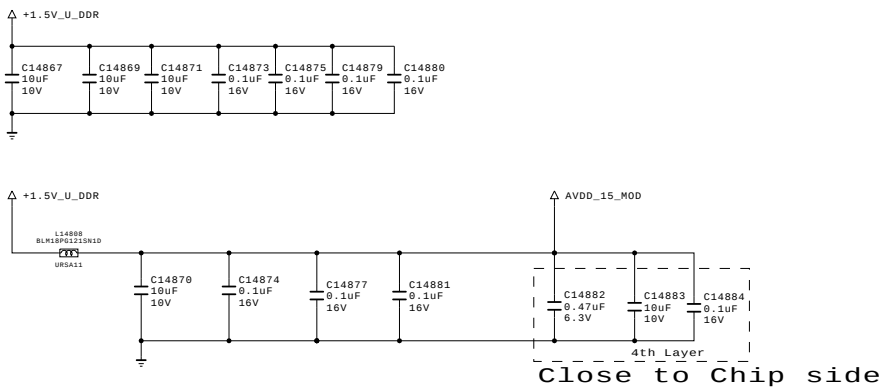
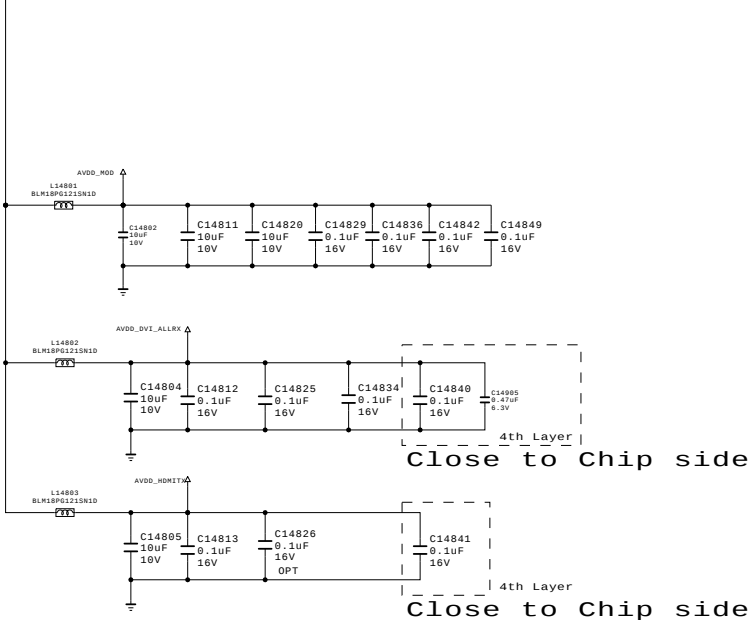
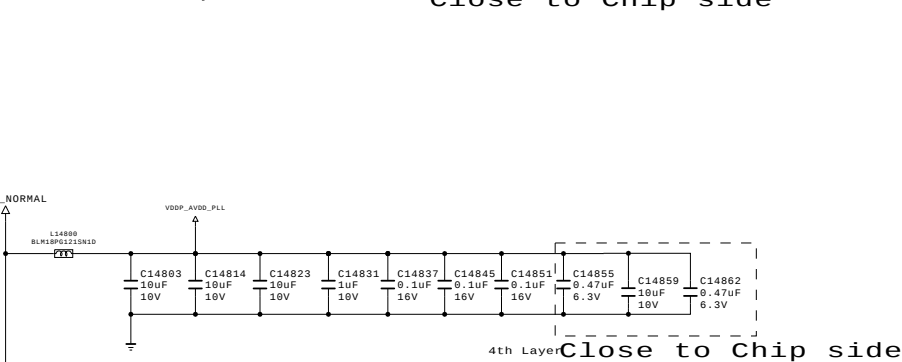
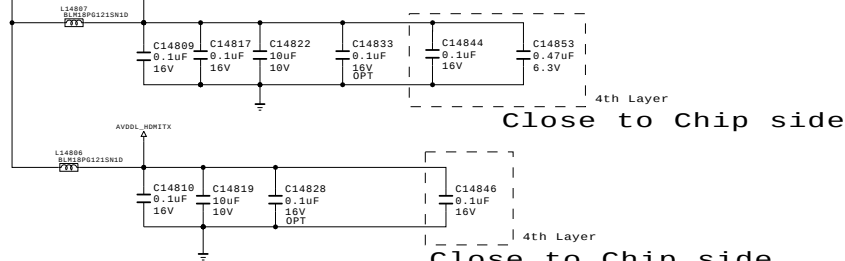
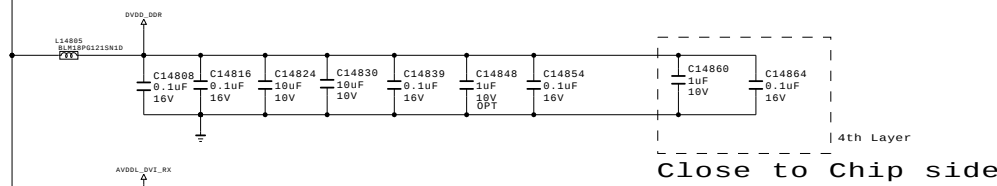
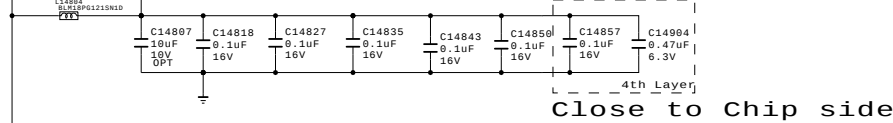
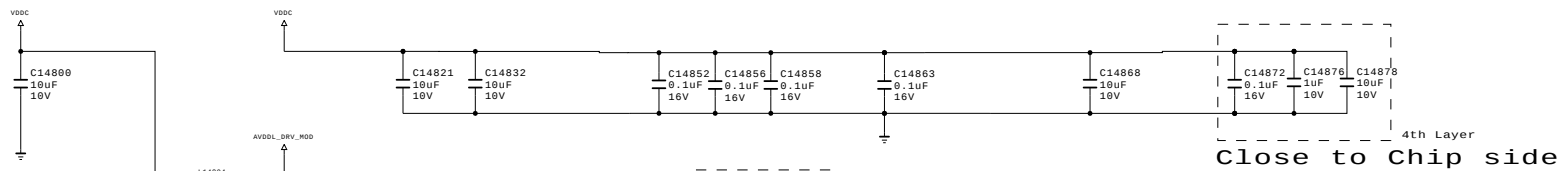
THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.

SECRET
LG Electronics



BSD-15Y-LM14A-146_00-HD

MODEL		DATE	
BLANK	URSA11_DCDC	SHEET	/



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

SECRET
LGElectronics

LG ELECTRONICS

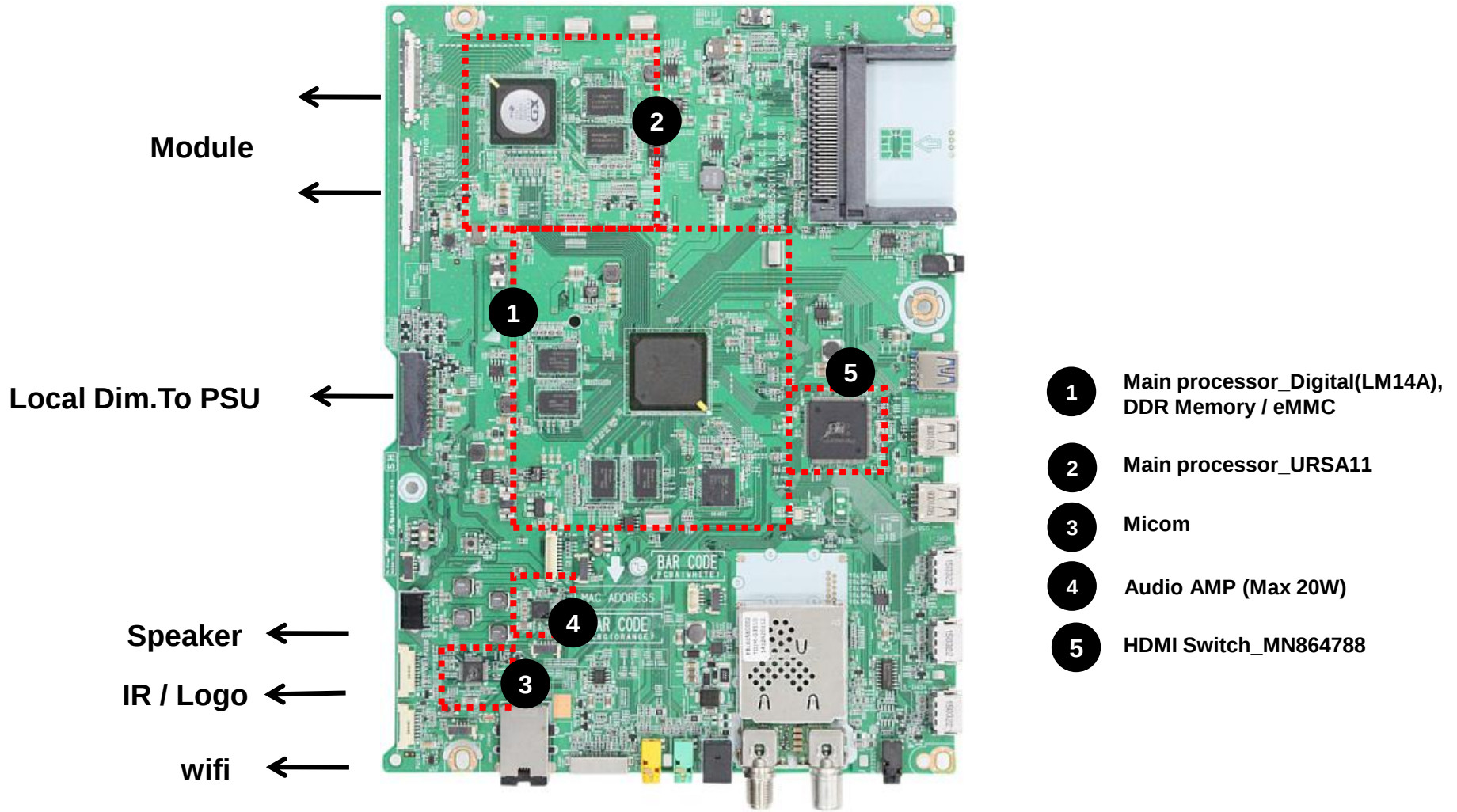
MODEL	URSA11_Power	DATE	
BLOCK		SHEET	

BSD-15Y-LM14A-148_00-HD



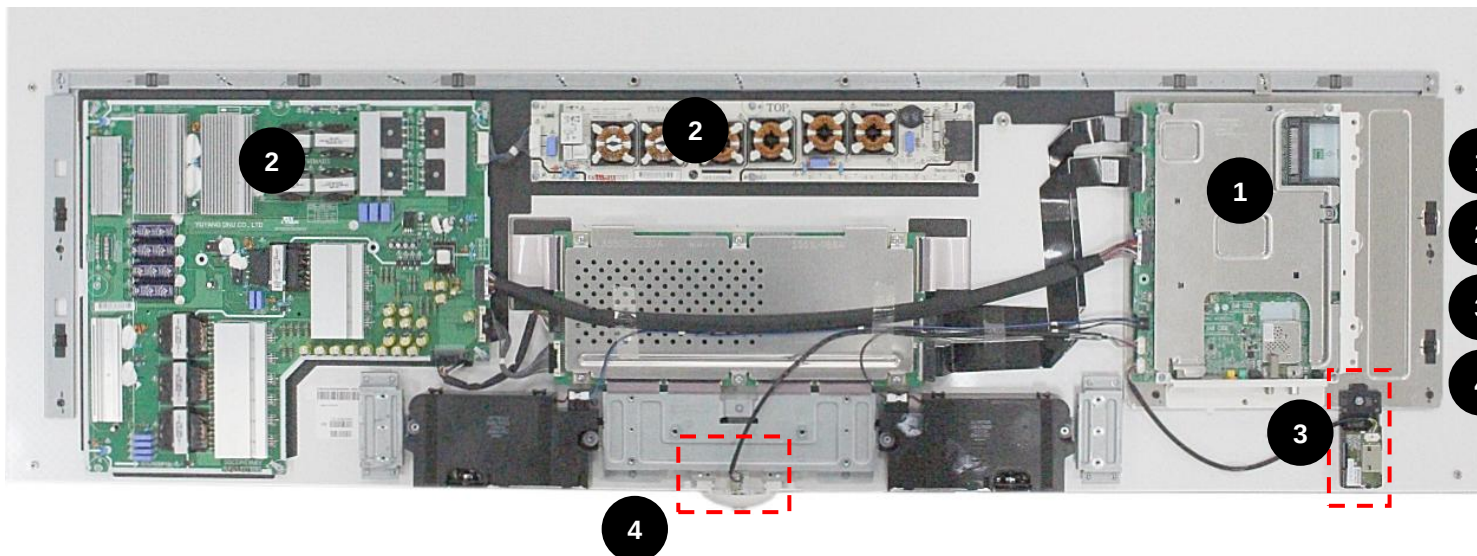
Main PCB for Broadband

EF9500



Interconnection - 1

EF9500



[PCBs]

- 1 Main PCB
- 2 PSU
- 3 WIFI / BT Combo Ass'y
- 4 IR /Logo PCB

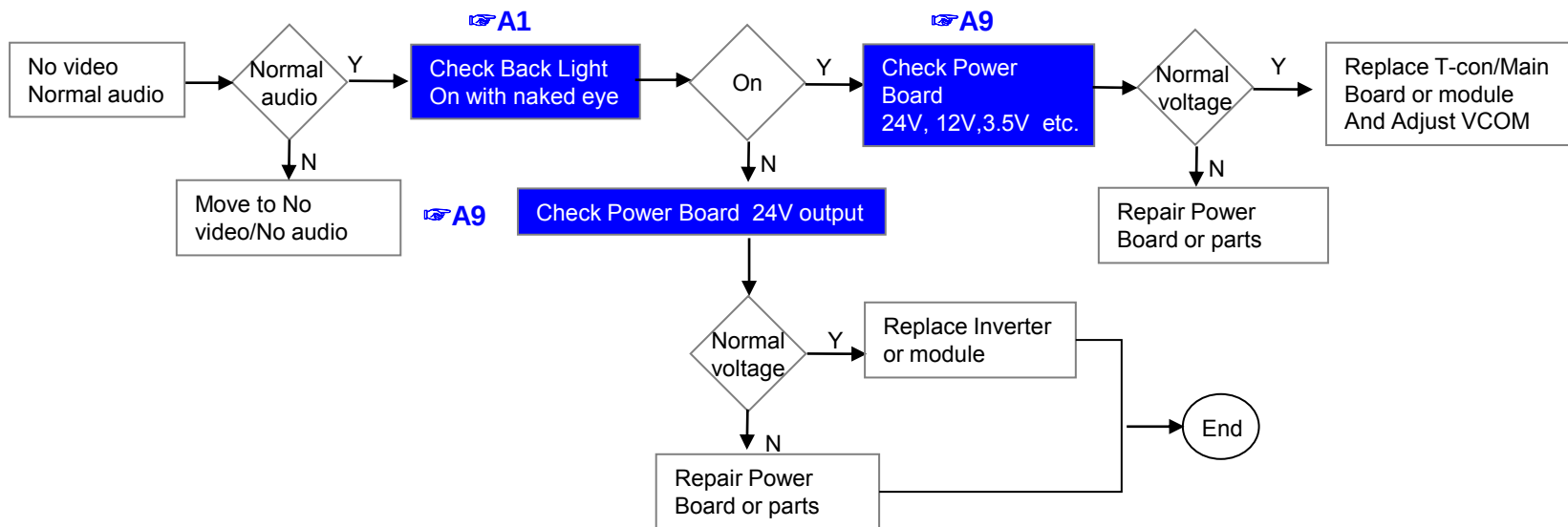
Contents of Standard Repair Process

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

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

	Error symptom	A. Video error	Established date		
		No video/ Normal audio	Revised date		1/15

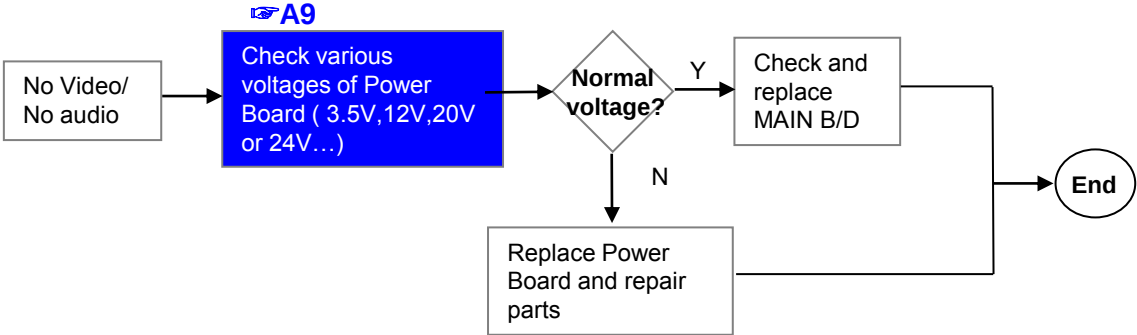
**First of all, Check whether all of cables between board is inserted properly or not.
(Main B/D↔ Power B/D, LVDS Cable, Speaker Cable, IR B/D Cable,,)**



※Precaution A4 & A2



	Error symptom	A. Video error	Established date		
		No video/ No audio	Revised date		2/15

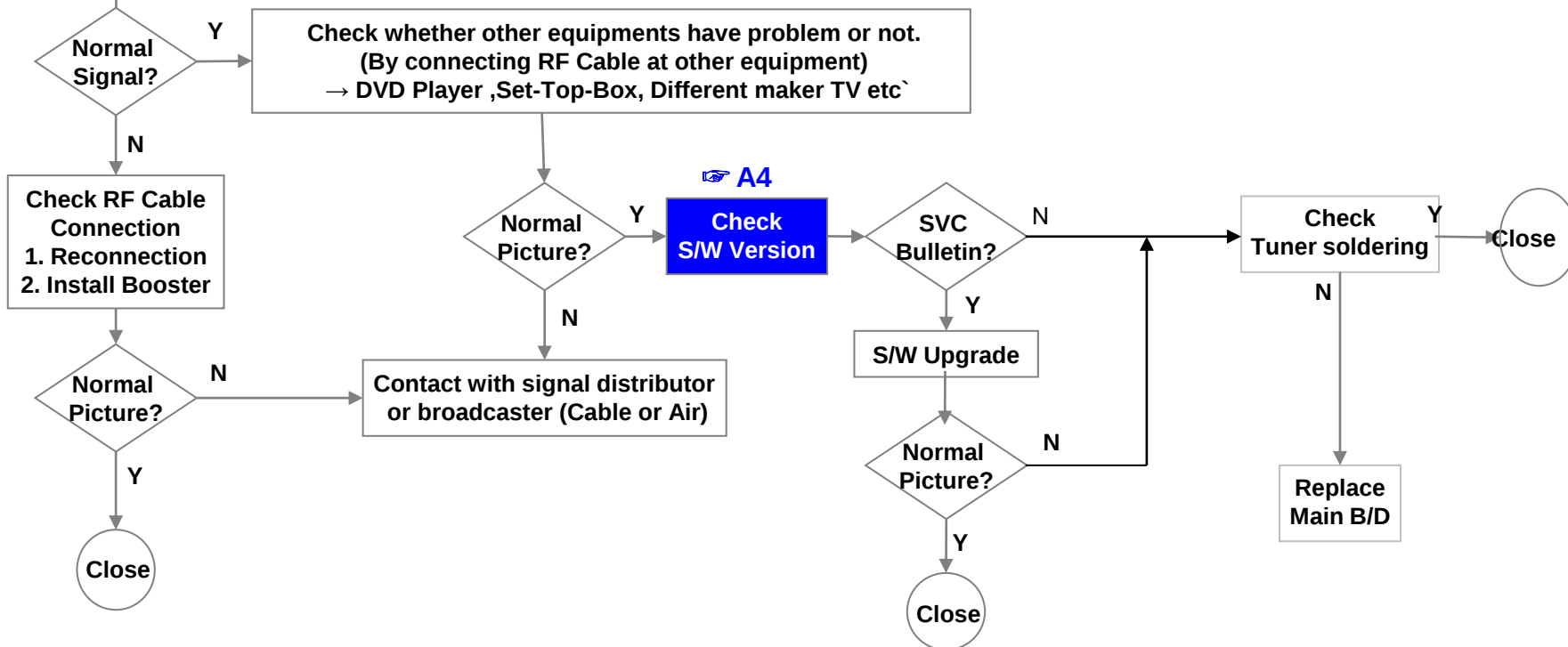


	Error symptom	A. Video error	Established date		
		Picture broken/ Freezing	Revised date		3/15

☞ A3

Check RF Signal level

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



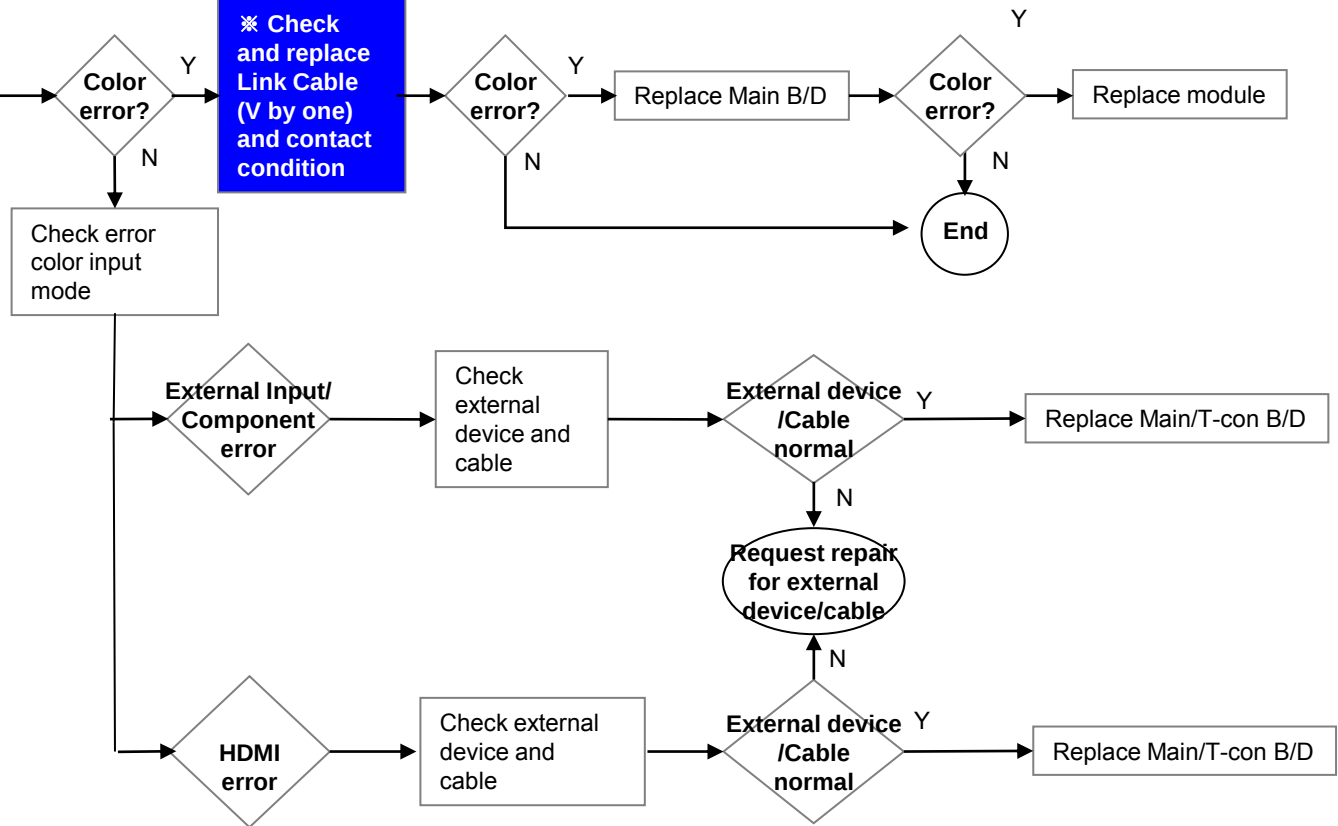
	Error symptom	A. Video error	Established date		
		Color error	Revised date		4/15

A6

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

A7

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

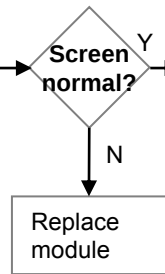


	Error symptom	A. Video error	Established date		
		Vertical / Horizontal bar, residual image, light spot, external device color error	Revised date		5/15

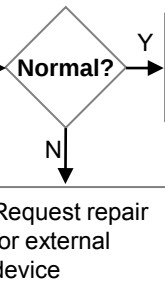
Vertical/Horizontal bar, residual image, light spot

A6

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

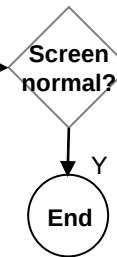


Check external device connection condition



A7

Check and replace Link Cable

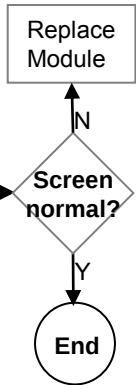


Replace Main/T-con B/D (adjust VCOM)

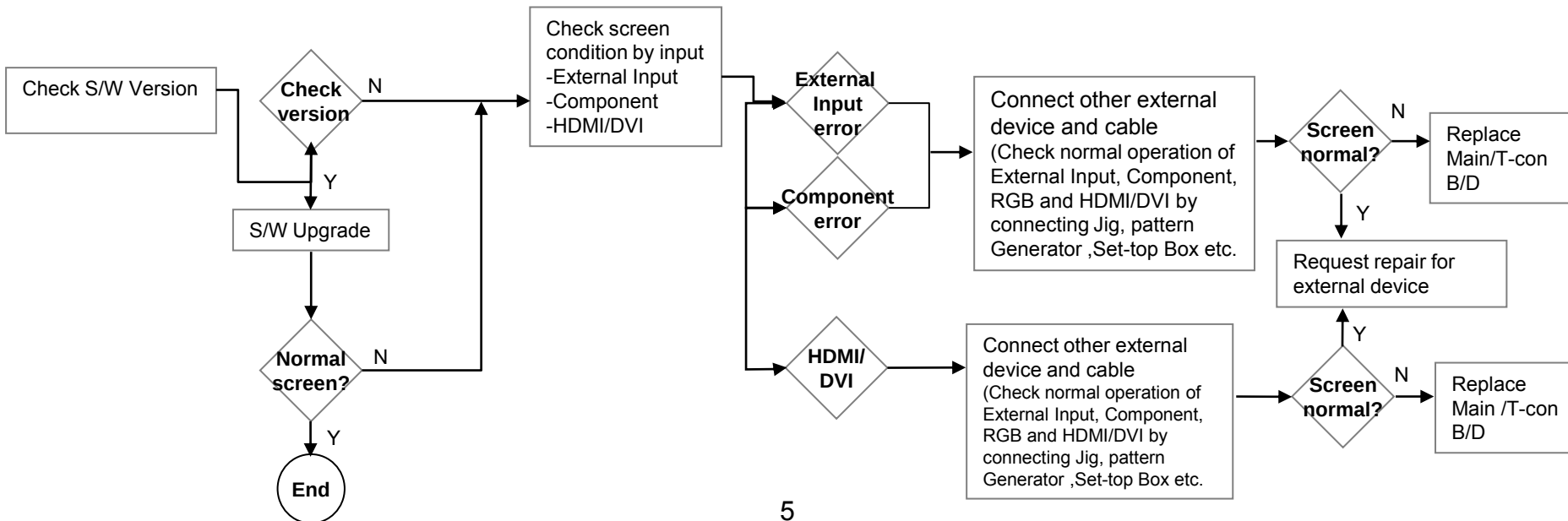
For LGD panel

Replace Main B/D

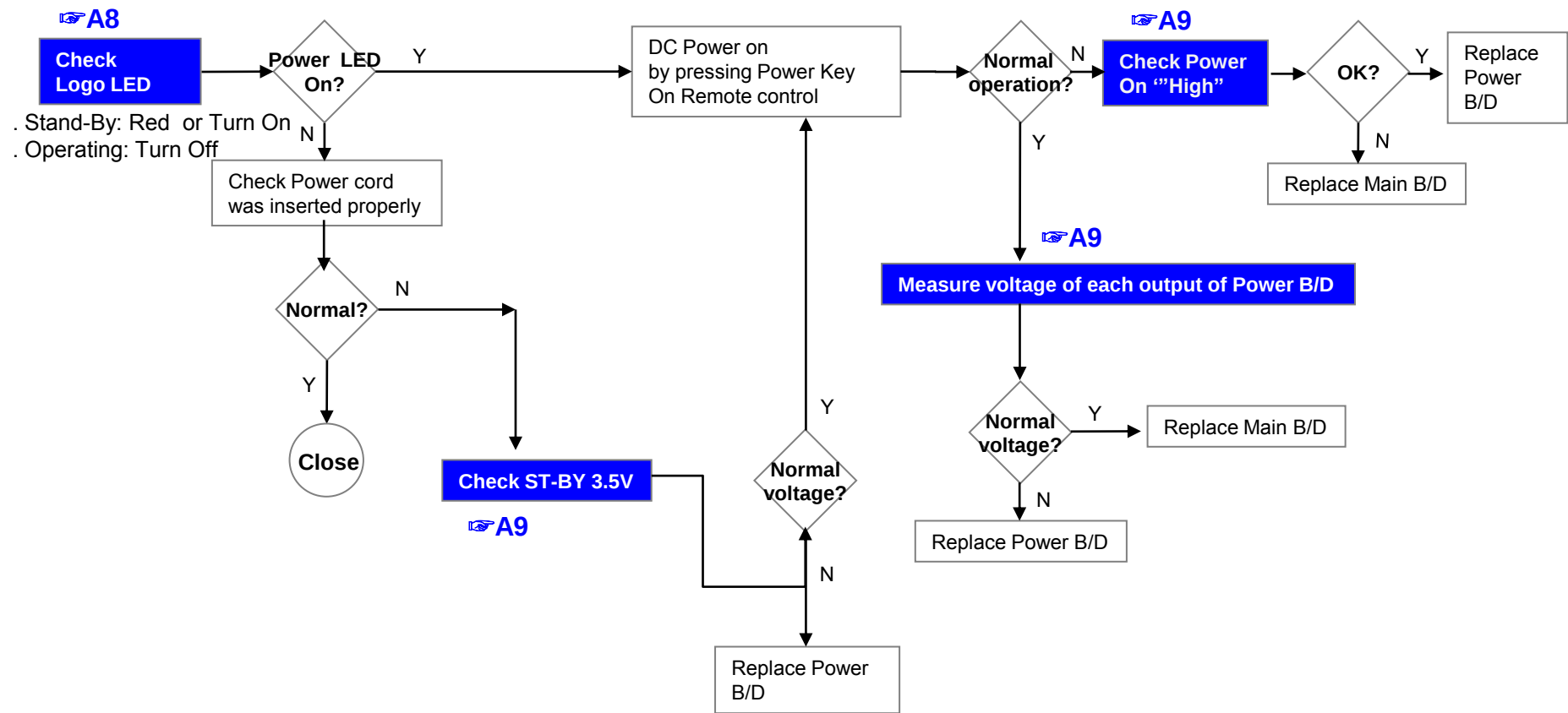
For other panel



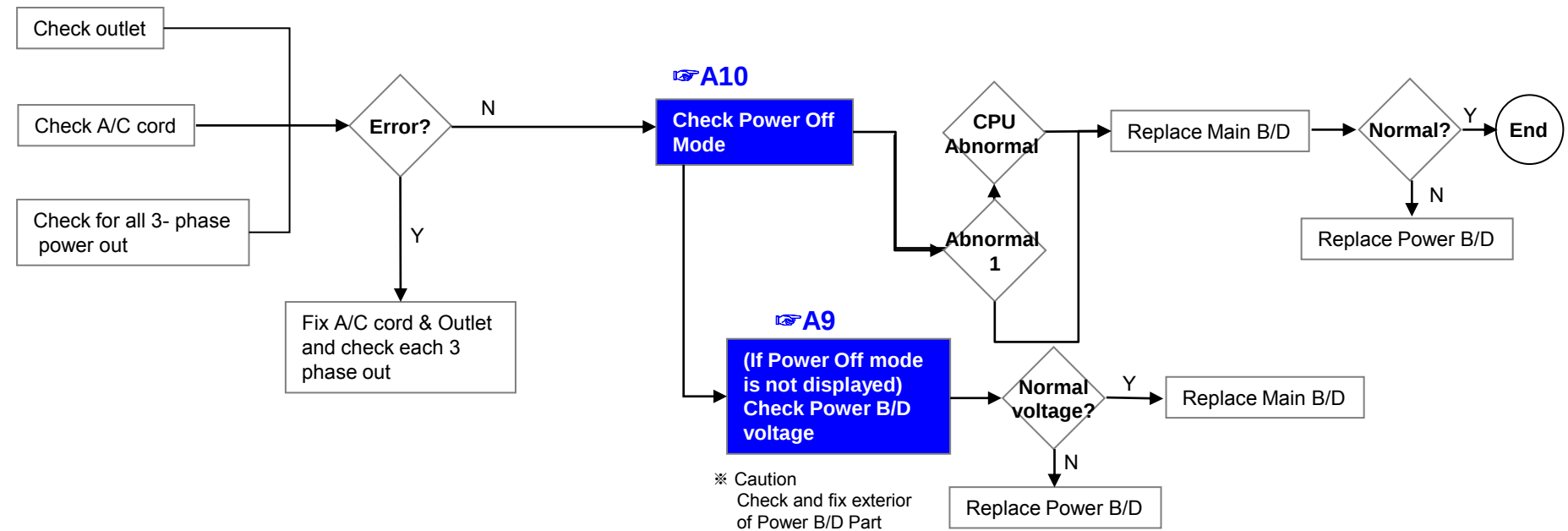
External device screen error-Color error



	Error symptom	B. Power error	Established date		
		No power	Revised date		6/15



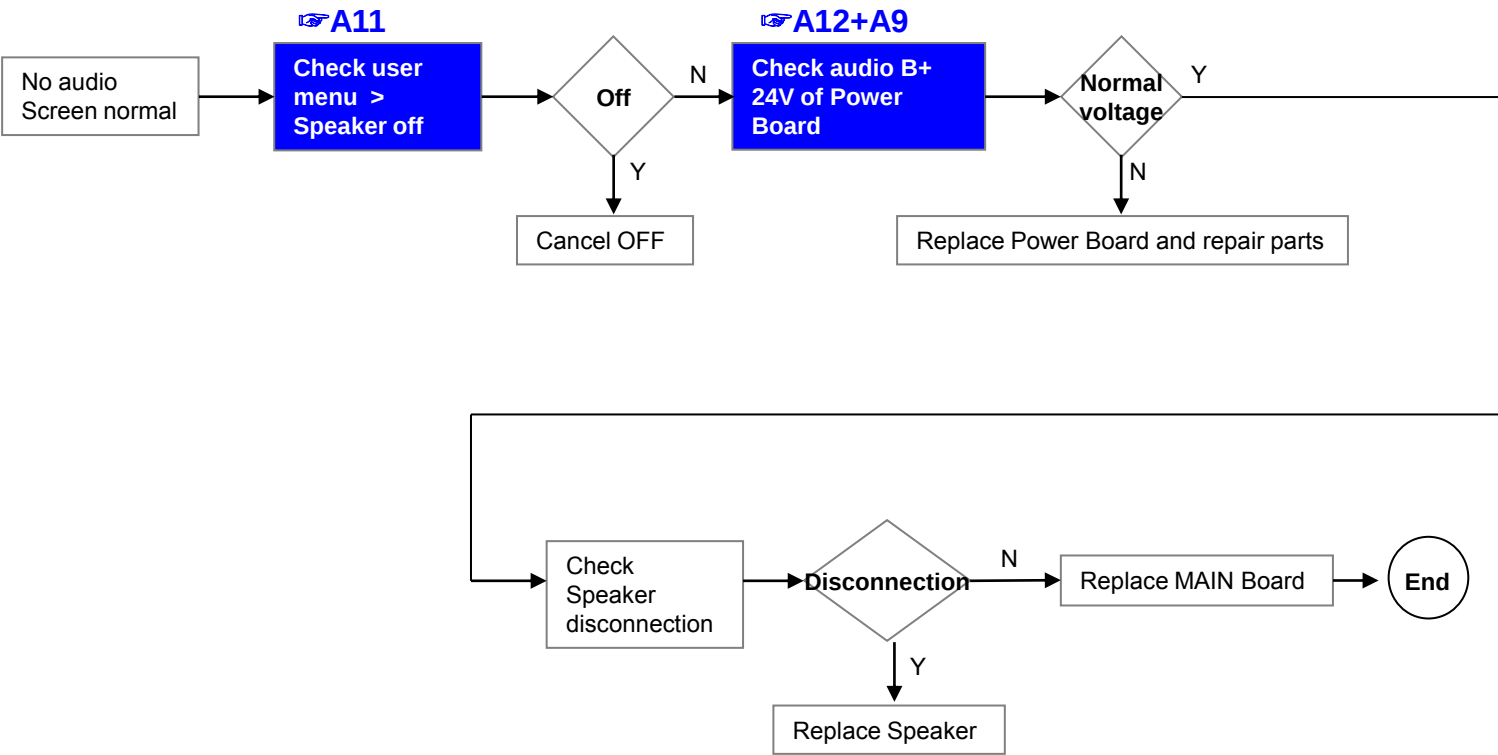
	Error symptom	B. Power error	Established date		
		Off when on, off while viewing, power auto on/off	Revised date		7/15



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

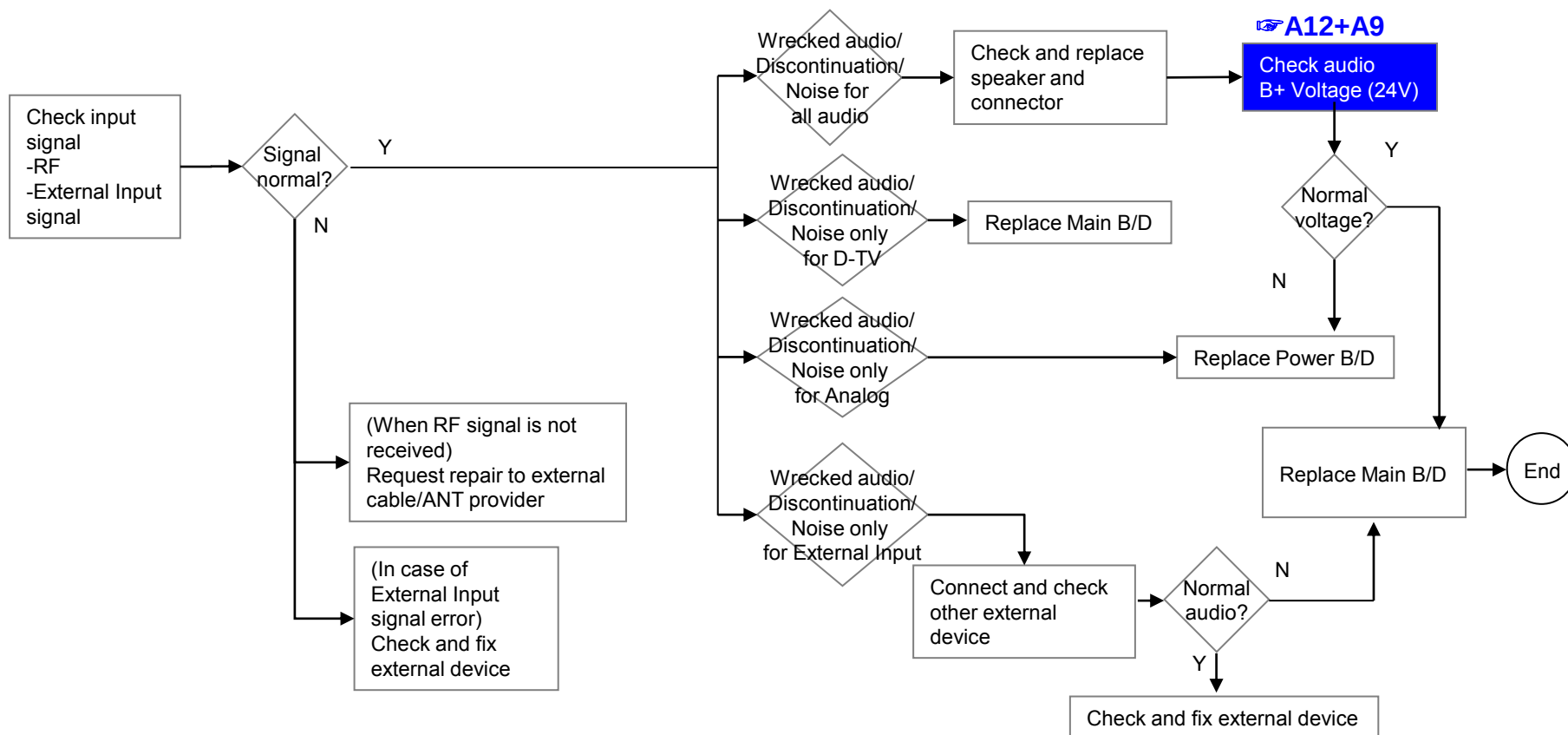
Status	Power off List	Explanation
Normal	"POWEROFF_REMOTEKEY"	Power off by REMOTE CONTROL
	"POWEROFF_OFFTIMER"	Power off by OFF TIMER
	"POWEROFF_SLEEPTIMER"	Power off by SLEEP TIMER
	"POWEROFF_INSTOP"	Power off by INSTOP KEY
	"POWEROFF_AUTOOFF"	Power off by AUTO OFF
	"POWEROFF_ONTIMER"	Power off by ON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

	Error symptom	C. Audio error	Established date		
		No audio/ Normal video	Revised date		8/15



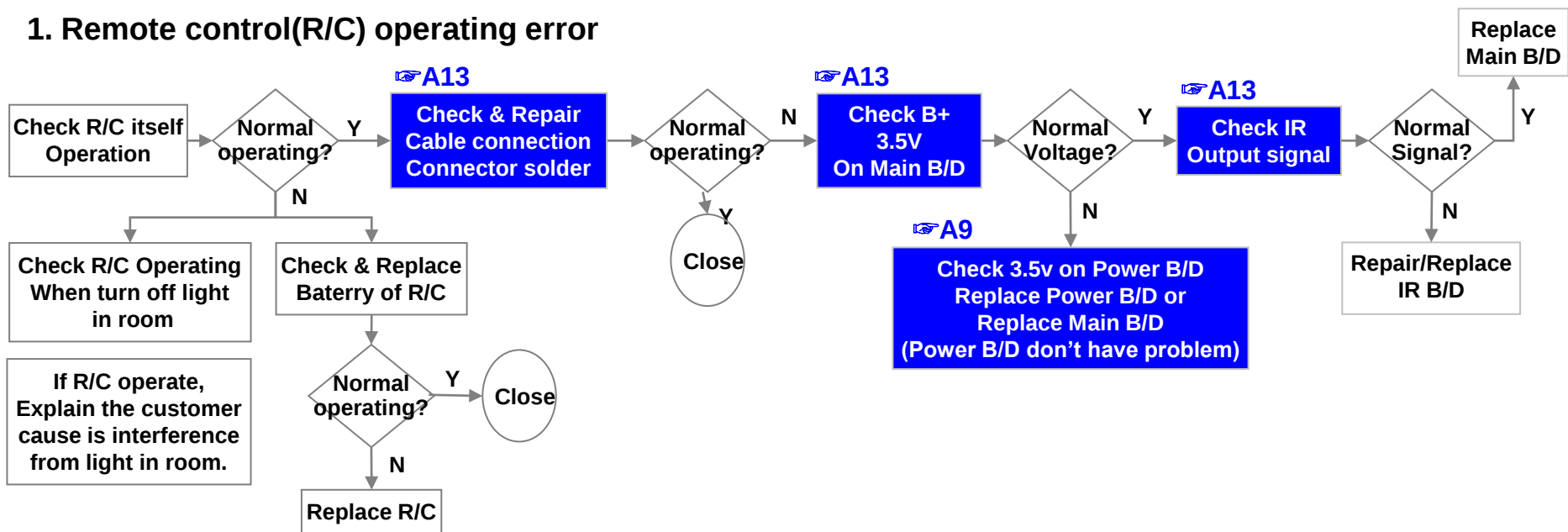
	Error symptom	C. Audio error	Established date		
		Wrecked audio/ discontinuation/noise	Revised date		9/15

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



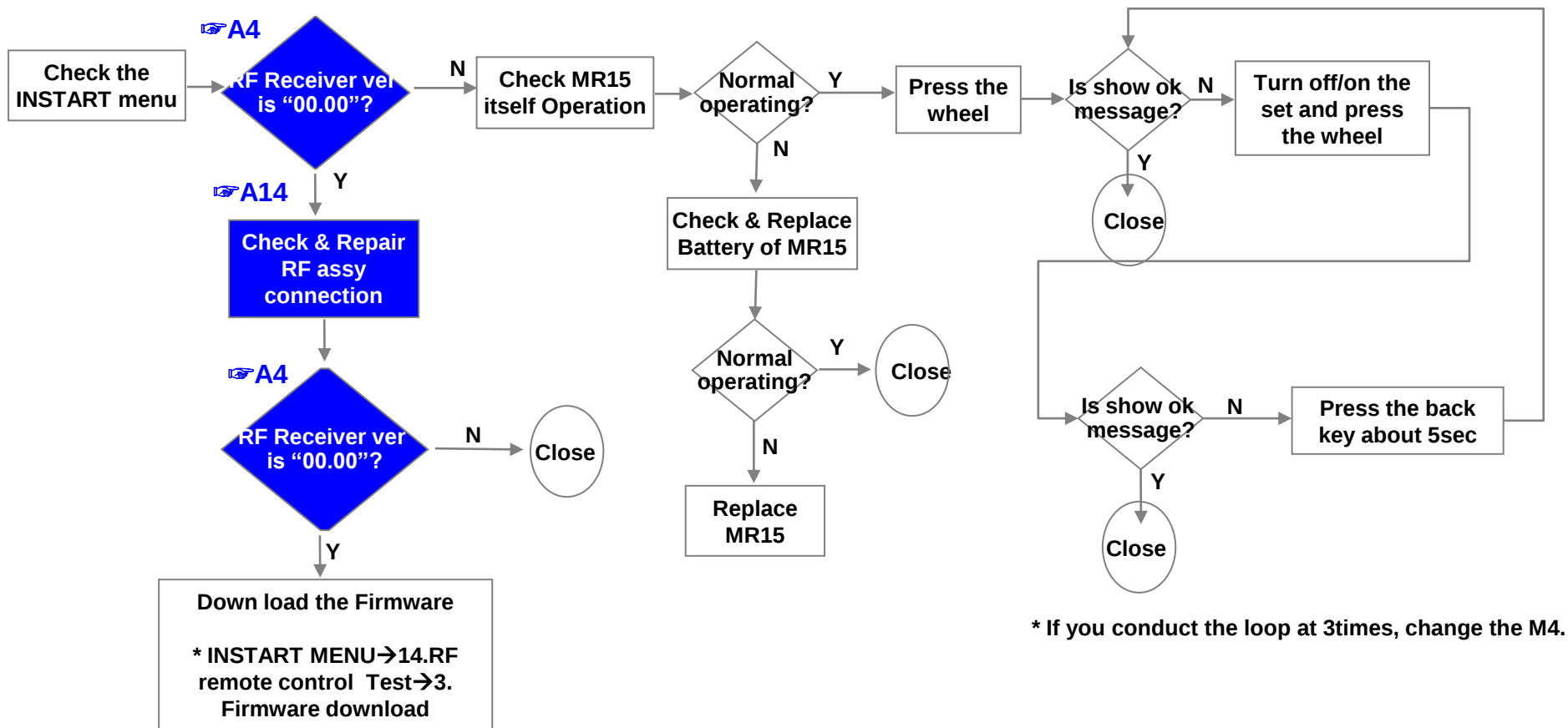
	Error symptom	D. Function error	Established date		
		Remote control & Local switch checking	Revised date		10/15

1. Remote control(R/C) operating error



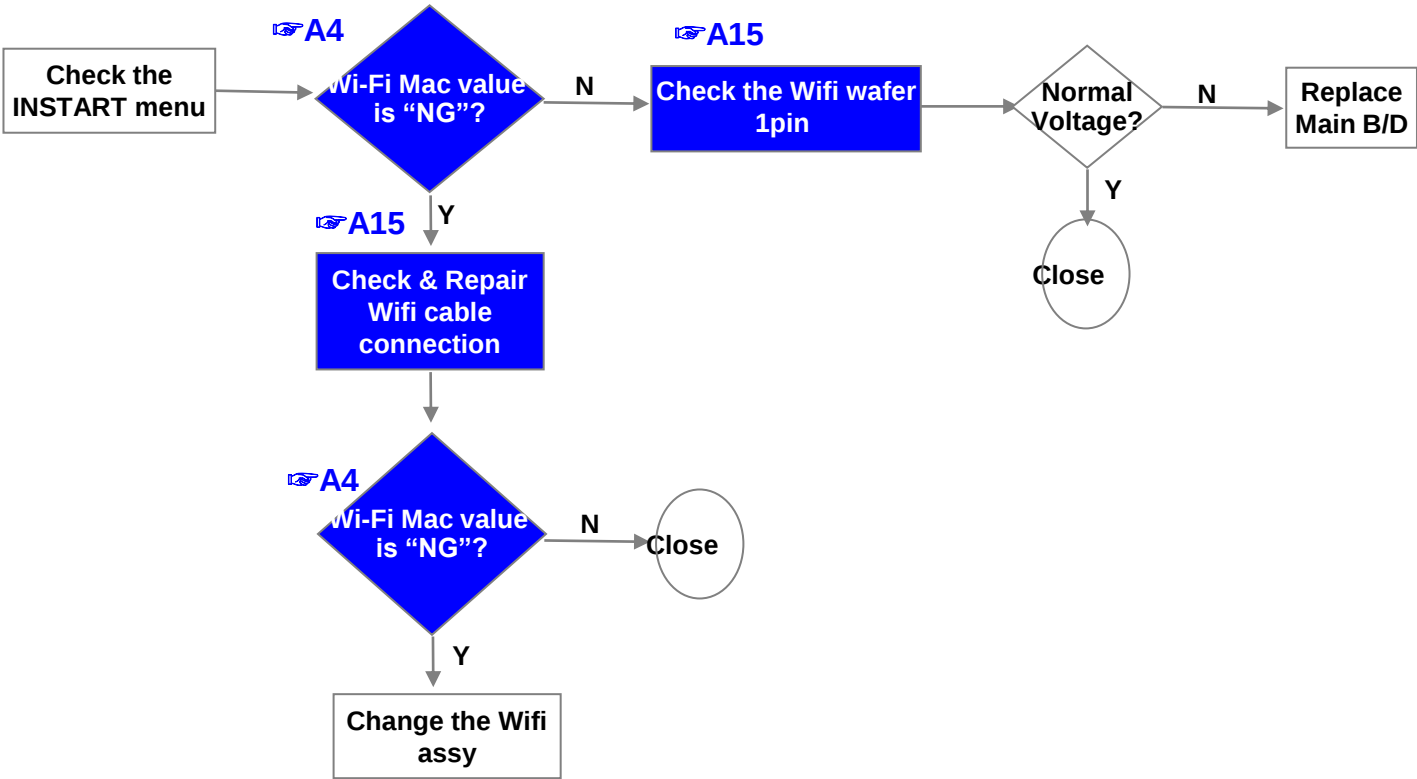
	Error symptom	D. Function error	Established date		
		MR15/P operating checking	Revised date		11/15

2. MR15 (Magic remote control) operating error

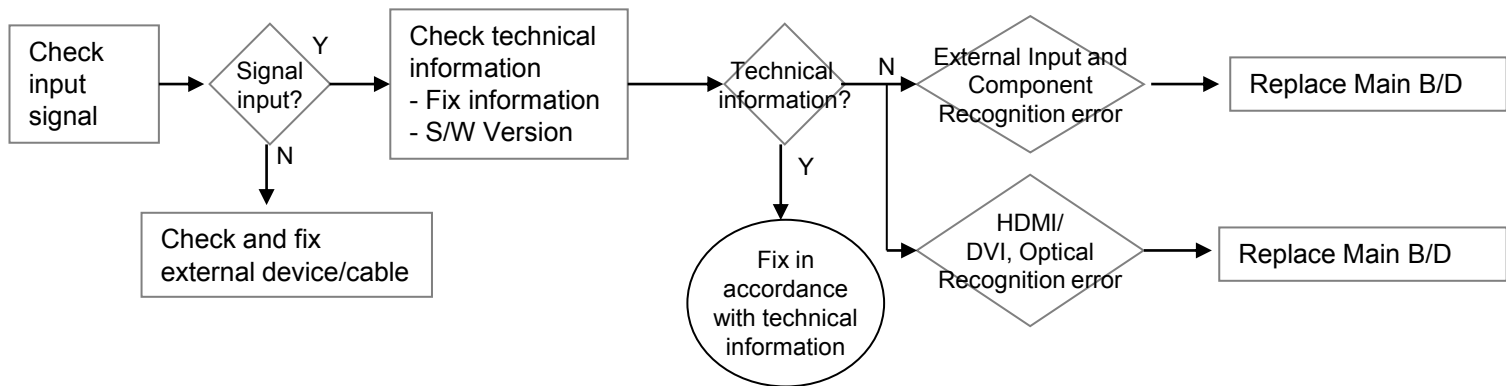


	Error symptom	D. Function error	Established date		
		Wifi operating checking	Revised date		12/15

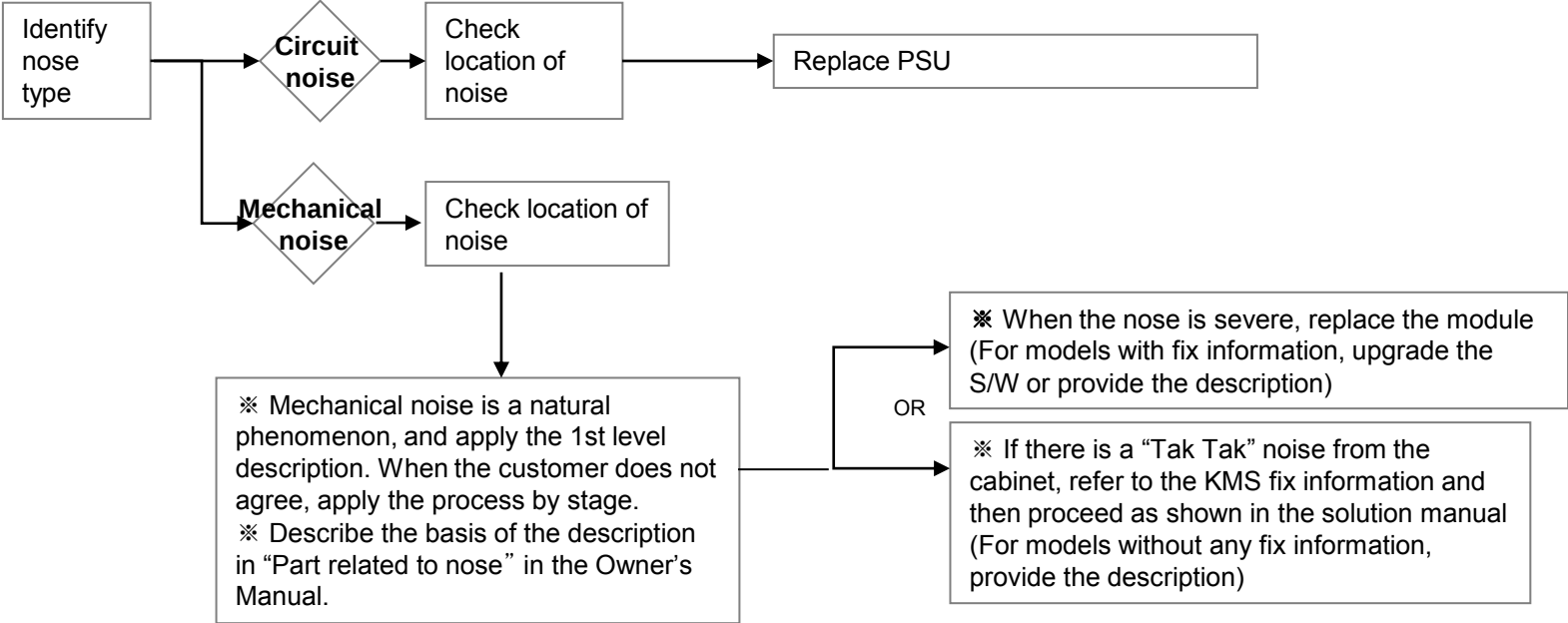
3.Wifi operating error



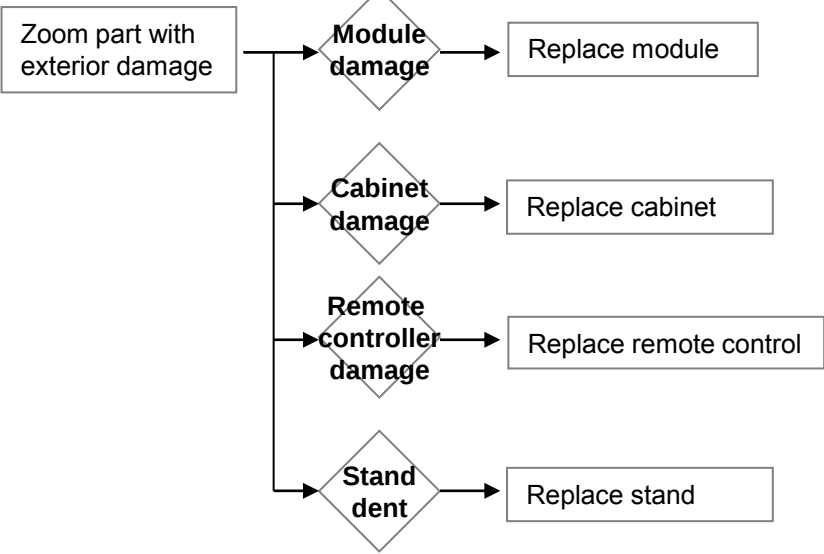
	Error symptom	D. Function error	Established date		
		External device recognition error	Revised date		13/15



	Error symptom	E. Noise	Established date		
		Circuit noise, mechanical noise	Revised date		14/15



	Error symptom	F. Exterior defect	Established date		
		Exterior defect	Revised date		15/15



Contents of Standard Repair Process Detail Technical Manual

No.	Error symptom	Content	Page	Remarks
1	A. Video error_ No video/Normal audio	Check back light with naked eye	A1	
2		Check White Balance value	A2	
3	A. Video error_ video error /Video lag/stop	TUNER input signal strength checking method	A3	
4		Version checking method	A4	
5		Tuner Checking Part	A5	
6	A. Video error _Vertical/Horizontal bar, residual image, light spot	connection diagram	A6	
7	A. Video error_ Color error	Check Link Cable (EPI) reconnection condition	A7	
8	<Appendix> Defected Type caused by T-Con/ Inverter/ Module	Exchange Module (1)	A-1/2	
		Exchange Module (2)	A-2/2	

Continue to the next page

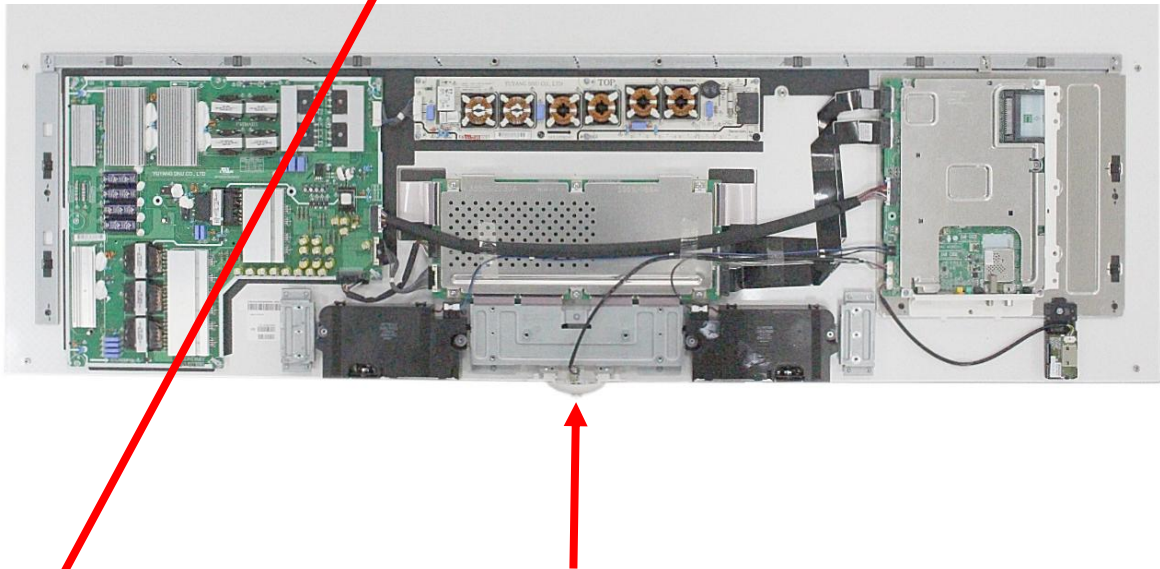
Contents of Standard Repair Process Detail Technical Manual

Continued from previous page

No.	Error symptom	Content	Page	Remarks
9	B. Power error_ No power	Check front display Logo	A8	
10		Check power input Voltage & ST-BY 3.5V	A9	
11	B. Power error_Off when on, off while viewing	POWER OFF MODE checking method	A10	
12	C. Audio error_ No audio/Normal video	Checking method in menu when there is no audio	A11	
13		Voltage and speaker checking method when there is no audio	A12	
14	D. Function error	remote control operation checking method	A13	
15		Motion Remote operation checking method	A14	
16		Wifi operation checking method	A15	

Standard Repair Process Detail Technical Manual

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

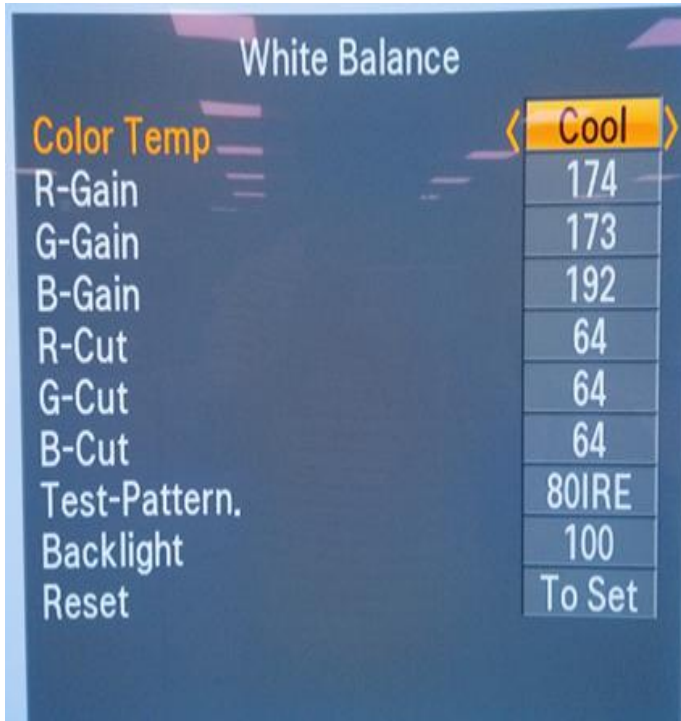
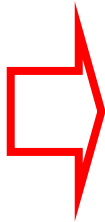
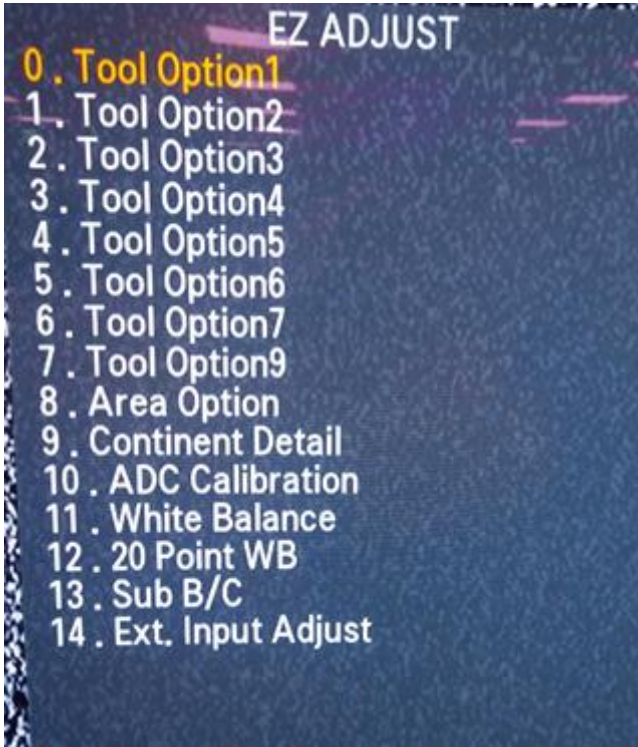


After Remove the Rear Cover, turning on the power and check with the naked eye, Whether you can see video

A1

Standard Repair Process Detail Technical Manual

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

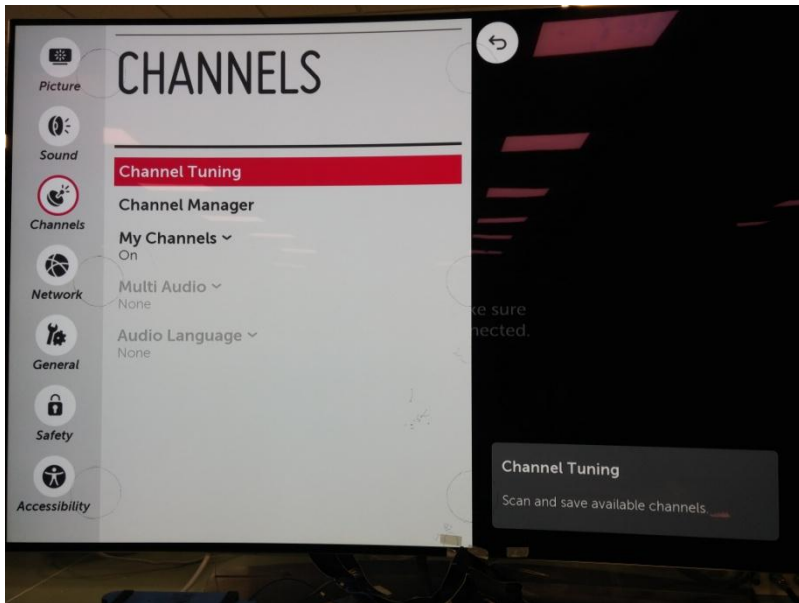


Entry method

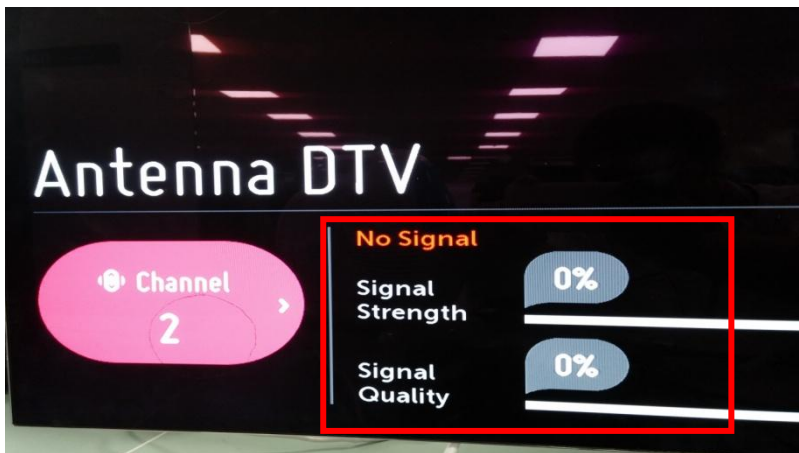
1. Press the ADJ button on the remote control for adjustment.
2. Enter into White Balance of item 10.
3. After recording the R, G, B (GAIN, Cut) value of Color Temp (Cool/Medium/Warm), re-enter the value after replacing the MAIN BOARD.

Standard Repair Process Detail Technical Manual

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



Quick Settings → Programmes → Programme Tunning
→ Manual Tuning



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



Standard Repair Process Detail Technical Manual

	Error symptom	A. Video error_Video error, video lag/stop	Established date		
	Content	Version checking method	Revised date		

1. Checking method for remote control for adjustment

Version

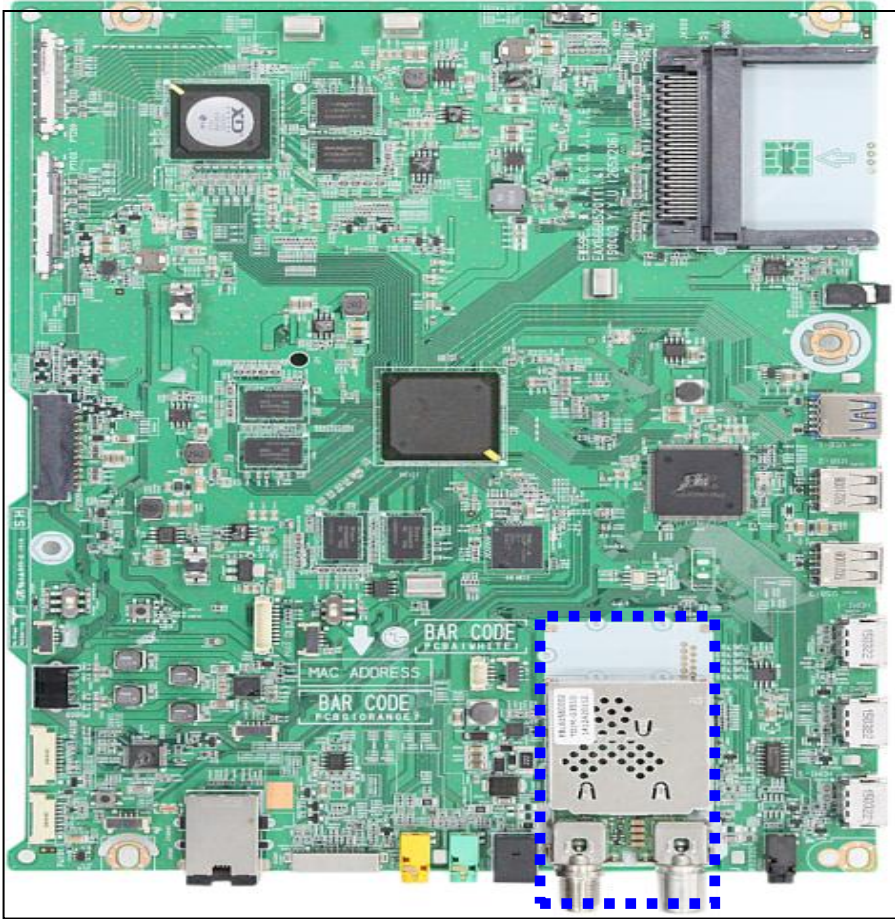


```
IN START
Model Name      : 65EG9600-NA
Serial Number   : 412K0A38R328
S/W Version     : 02.05.37.01
MICOM Version   : V3.20.1
BOOT Version    : 57/3.00.57-57
URSA Version     : 0x6014
EDID (RGB/HDMI) : NULL / 0.00
Chip Type       : LM15U
Wi-Fi Channel    : 1
Wi-Fi MAC       : C4:36:6C:0A:55:EC
Wi-Fi Speed     : USB 2.0
MAC Address     : 3C:CD:93:A5:0E:C8
IP Address      : 0.0.0.0
SFU Key : OK
Widevine : LGTV15CMSD000105621
ESN Num. : LGTV20154=41001016287
HDCP2(Miracast/HDMI) : OK/OK
RF Receiver Version : 1.2.7.57
Wi-Fi/Magic Search : OK OK
Camera Ver.      : NULL
Debug Status     : EVENT
SIGN Key         : DEVELKEY
Access USB Status: 1/-1(T)/-1(C)
UTT : 1
OLED Last Compensation Done UTT : 0
OLED Compensation Count : 0
APP History Ver.: 37
PQL DB : LGDN_EG_ATVSOC_XXXXXX
Video : NULL
```

Press the IN-START with the remote control for adjustment

Standard Repair Process Detail Technical Manual

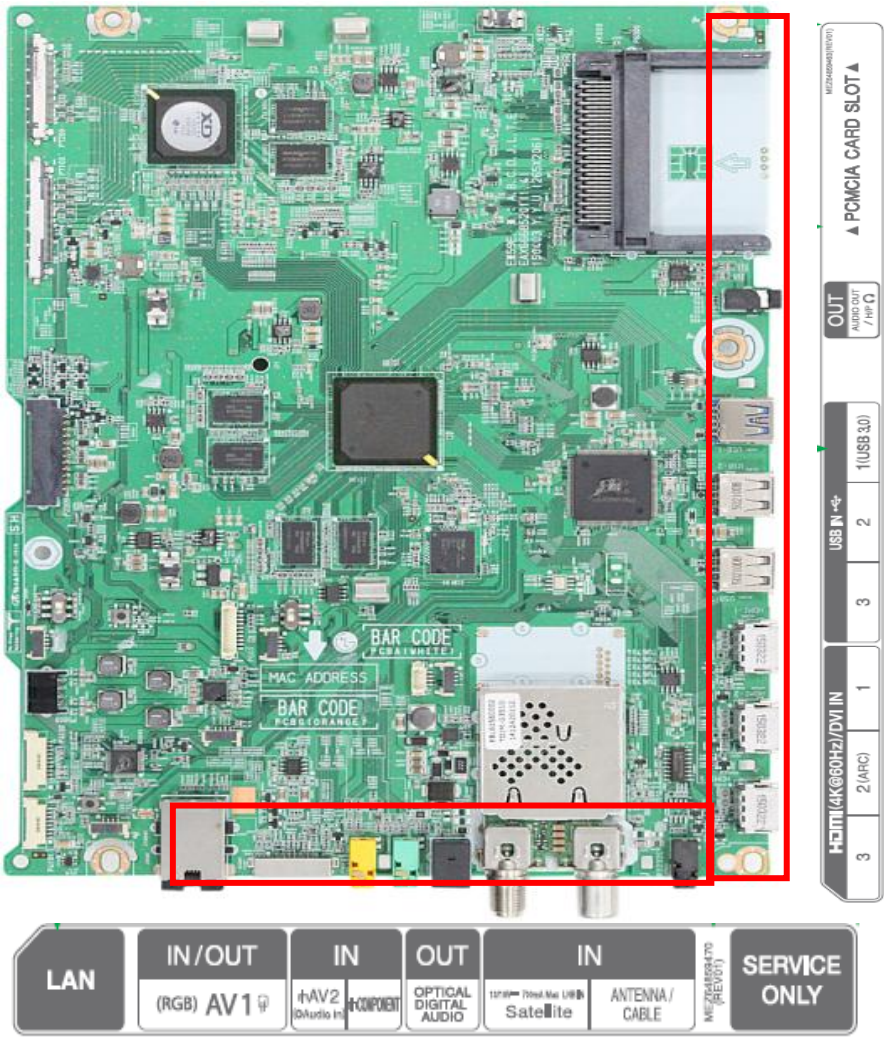
	Error symptom	A. Video error_Video error, video lag/stop	Established date		
	Content	TUNER checking part	Revised date		



- 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

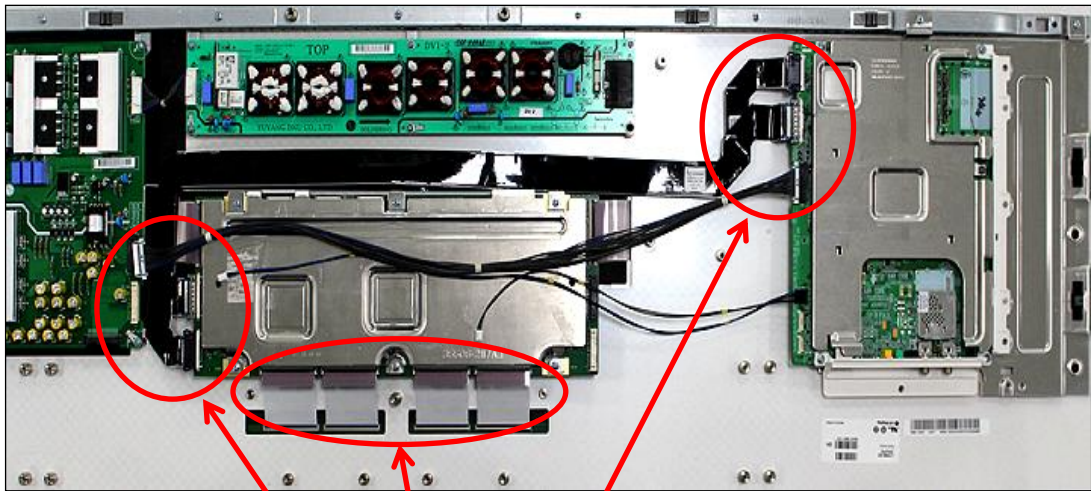
	Error symptom	A. Video error _Vertical/Horizontal bar, residual image, light spot	Established date		
	Content	connection diagram	Revised date		



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

Standard Repair Process Detail Technical Manual

	Error symptom	A. Video error_Color error	Established date		
	Content	Check Link Cable (EPI) reconnection condition	Revised date		



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

Appendix : Exchange the Module (1)



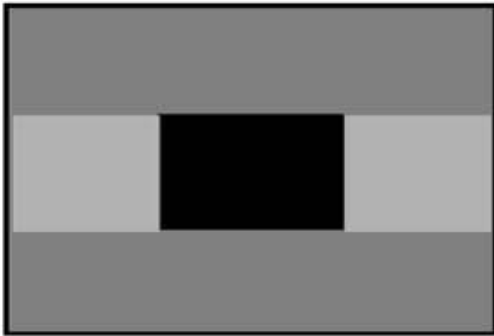
Vertical abnormal display



Brightness difference



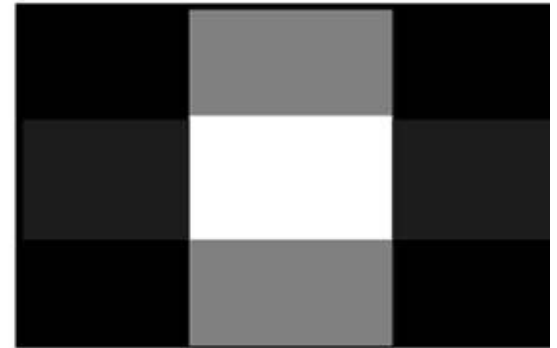
Line Dim



Crosstalk



Press damage



Crosstalk



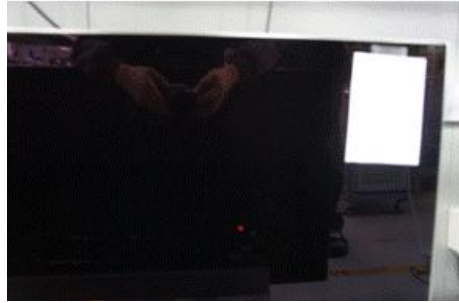
Burnt

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

Appendix : Exchange the Module (2)



Angle view Color difference



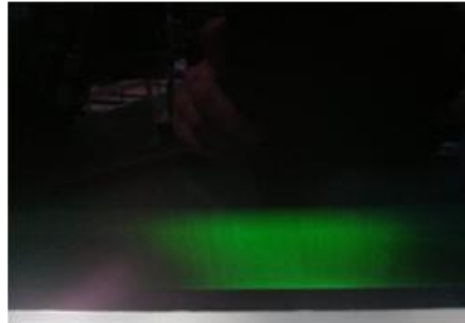
Brightness dot noise



Half dead



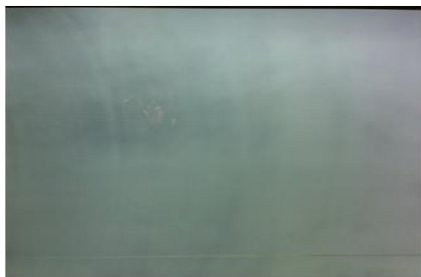
Brightness difference



Green Noise on power on/off time



Line Defect

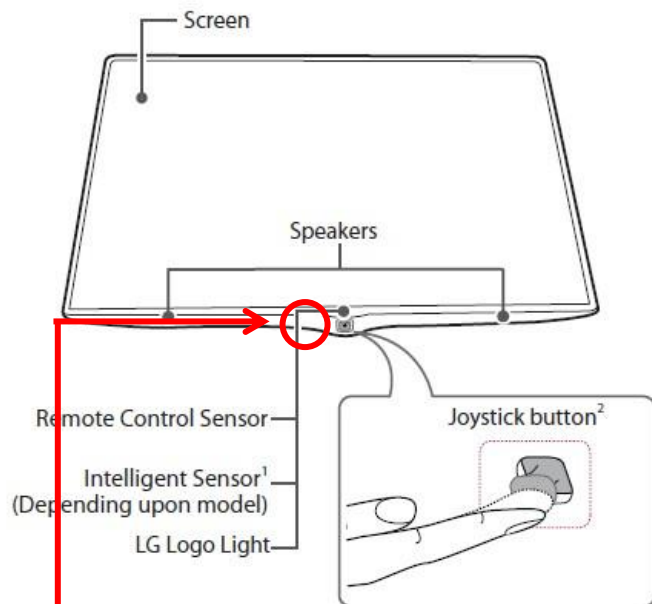


Mura

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

Standard Repair Process Detail Technical Manual

	Error symptom	B. Power error _No power	Established date		
	Content	Check front display Logo	Revised date		



NOTE

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

Using the Joystick button

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

Basic functions

	Power On	When the TV is turned off, place your finger on the joystick button, press it once, and release it.
	Power Off	When the TV is turned on, place your finger on the joystick button, press it once for a few seconds, and release it. All running apps will close and any recording in progress will stop.
	Volume Control	Place your finger on the joystick button and move it left or right to adjust the volume level.
	Channels Control	Place your finger on the joystick button and move it up or down to adjust the channels.

NOTE

- Move the joystick button up, down, left, or right. Be careful not to press it. If you press it first, you may not be able to adjust the volume or scroll through the channels.

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.

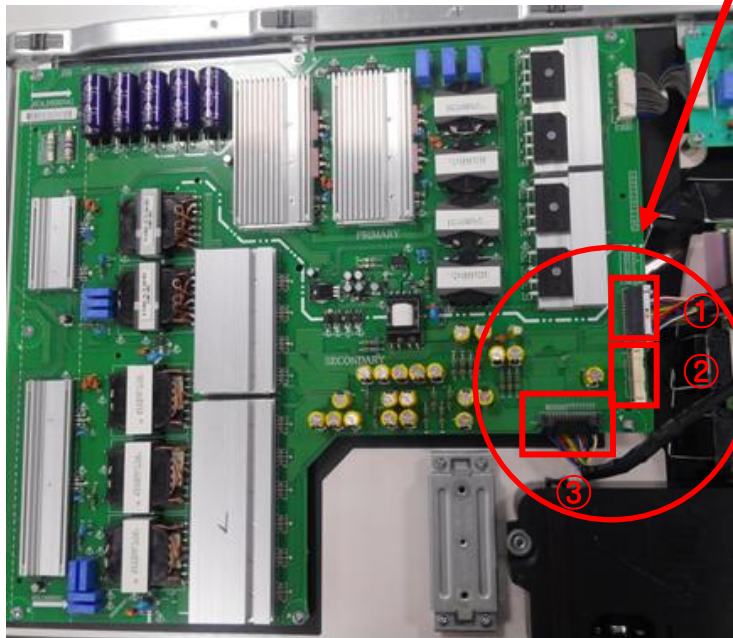
		POWER OFF	Turns the power off.
		SETTINGS	Accesses the quick settings.
		CLOSE	Clears on-screen displays and returns to TV viewing.
		INPUTS	Changes the input source.

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

Standard Repair Process Detail Technical Manual

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

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



24Pin(Power Board ↔ Main Board)			
1	PWR ON	2	INV CTL
3	DPC	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	12V_ON
19	24V	20	24V
21	24V	22	24V
23	GND	24	GND

Standard Repair Process Detail Technical Manual

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

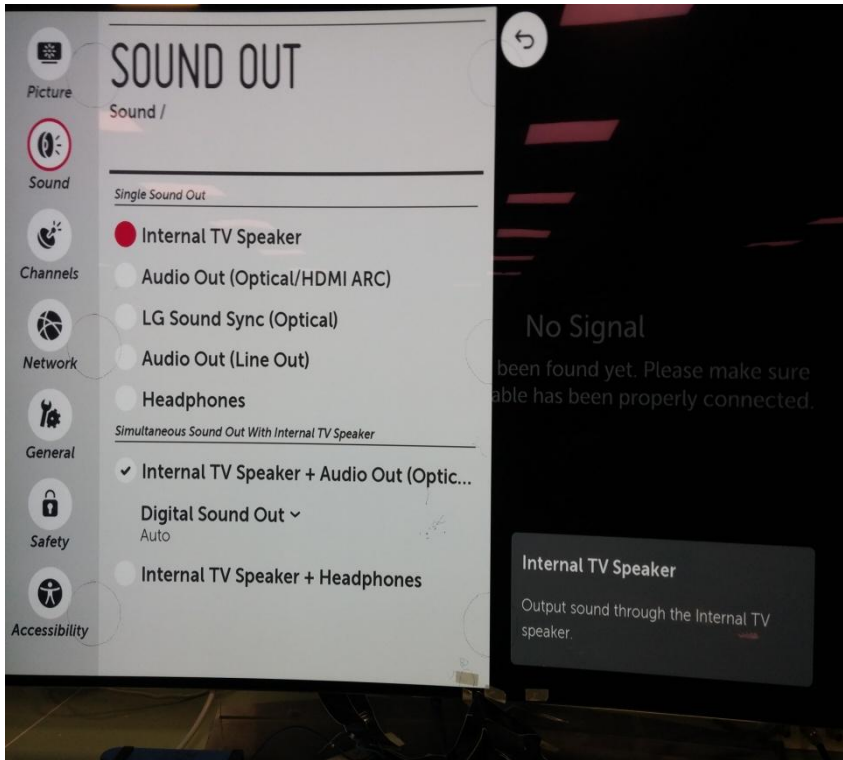
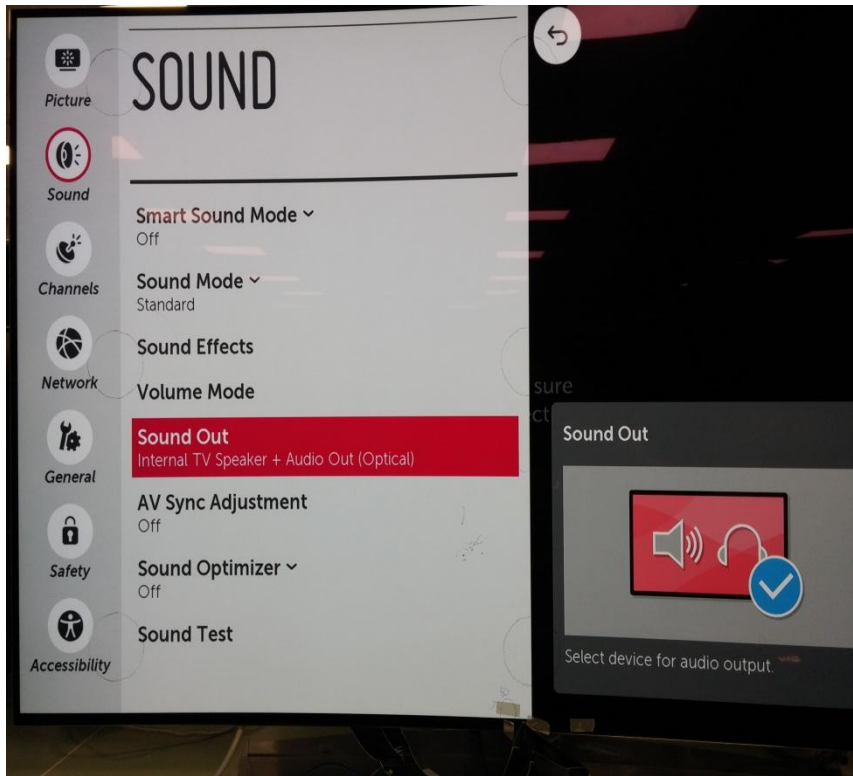


Entry method

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

Standard Repair Process Detail Technical Manual

	Error symptom	C. Audio error_No audio/Normal video	Established date	2015.12.31	
	Content	Checking method in menu when there is no audio	Revised date		

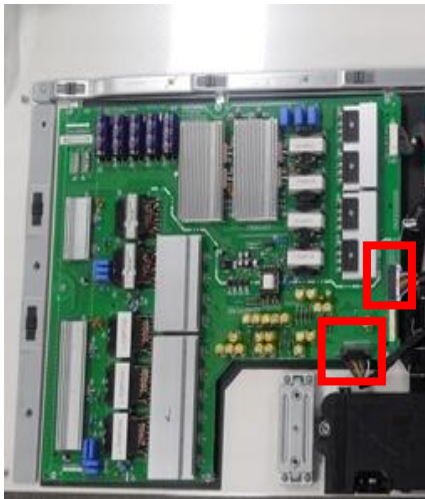


Checking method

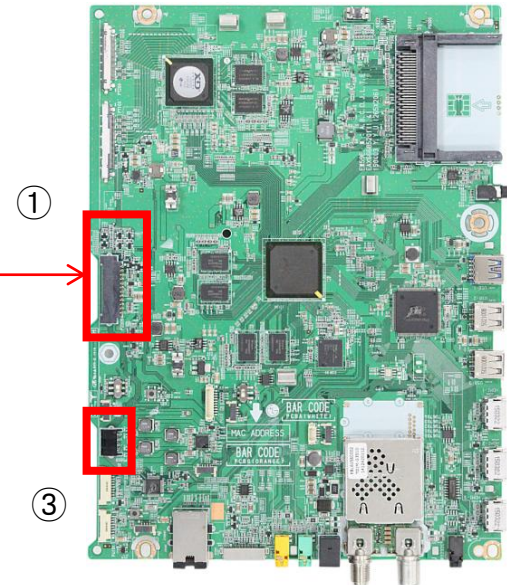
1. Press the Setting button on the remote control
2. Select the Sound function of the Menu
3. Select the Sound Out
4. Select TV Speaker

Standard Repair Process Detail Technical Manual

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



24Pin(Power Board ↔ Main Board)			
1	PWR ON	2	INV CTL
3	DPC	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	12V_ON
19	24V	20	24V
21	24V	22	24V
23	GND	24	GND



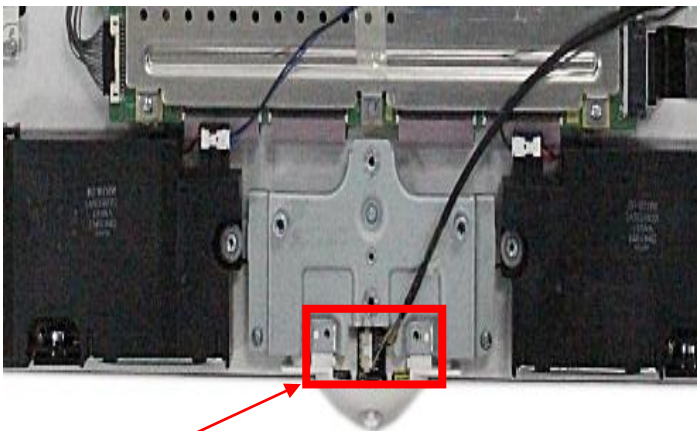
1	SPK_R-	1	SPK_R+
3	SPK_L-	4	SPK_L+

Checking order when there is no audio

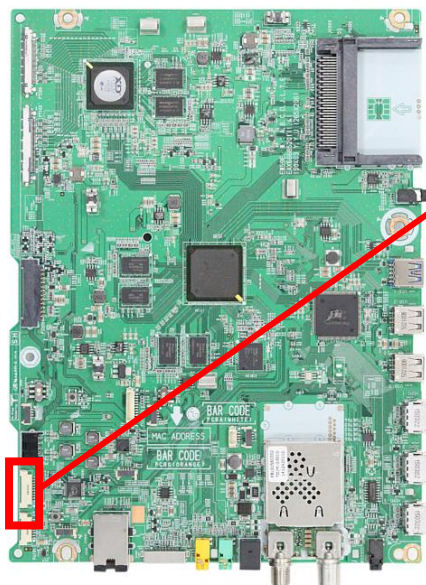
- ① Check the contact condition of or 24V connector of Main Board
- ② Measure the 24V input voltage supplied from Power Board
(If there is no input voltage, remove and check the connector)
- ③ Connect the tester RX1 to the speaker terminal and if you hear the Chik Chik sound when you touch the GND and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

Standard Repair Process Detail Technical Manual

	Error symptom	D. Function error	Established date		
	Content	remote control operation checking method	Revised date		



①



②

③

P4100	
1	GND
2	KEY1
3	KEY2
4	3.5V_ST
5	GND
6	LOGO_LIGHT
7	IR
8	GND
9	EYE_SCL
10	EYE_SDA

Checking order

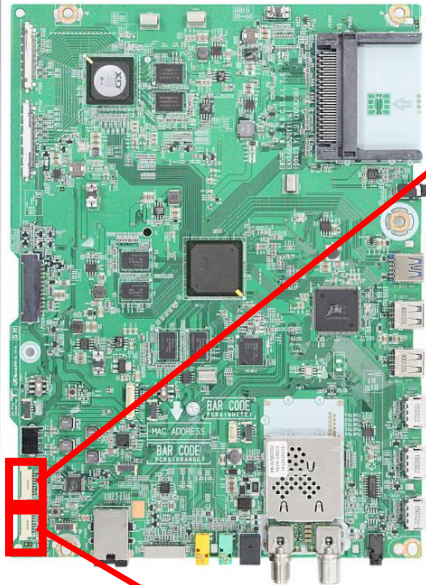
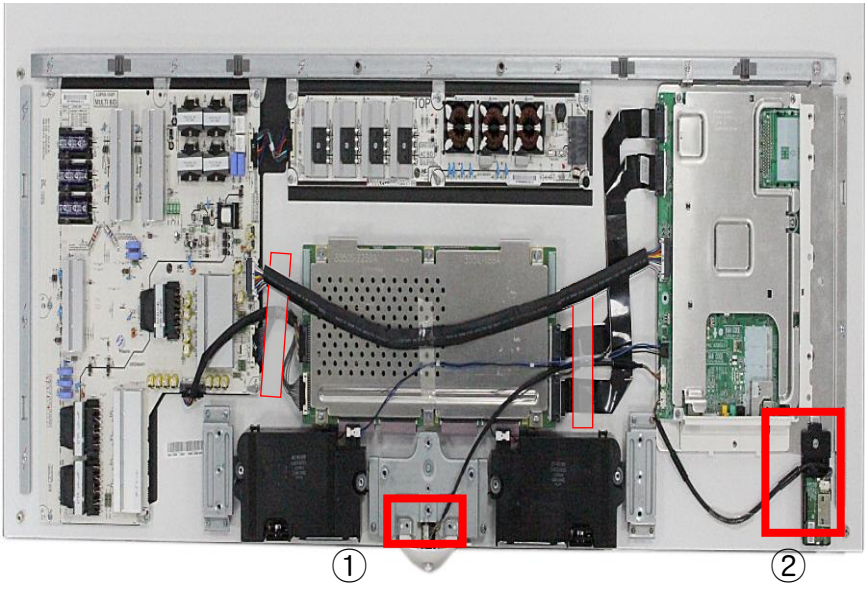
1, 2. Check IR cable condition between IR & Main board.

3. Check the st-by 3.5V on the terminal 4.

4. When checking the Pre-Amp when the power is in ON condition, it is normal when the Analog Tester needle moves slowly, and defective when it does not move at all.

Standard Repair Process Detail Technical Manual

	Error symptom	D. Function error	Established date		
	Content	Motion Remote operation checking method	Revised date		



P4100	
1	GND
2	KEY1
3	KEY2
4	3.5V_ST
5	GND
6	LOGO_LIGHT
7	IR
8	GND
9	EYE_SCL
10	EYE_SDA

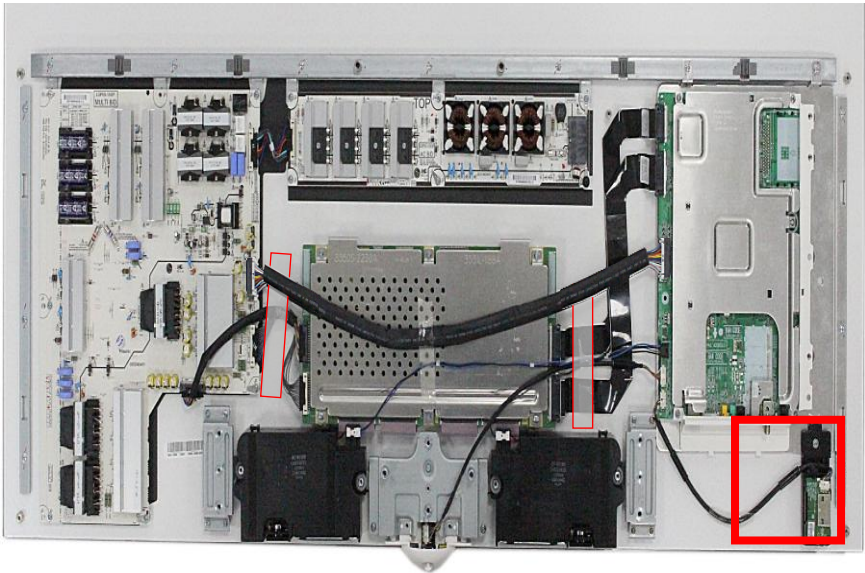
P4101	
1	GND
2	M_RFModule_RESET
3	NOT USE
4	WOL/WIFI_POWER_ON
5	GND
6	WIFI_DP
7	WIFI_DM
8	3.5V_WIFI

Checking order

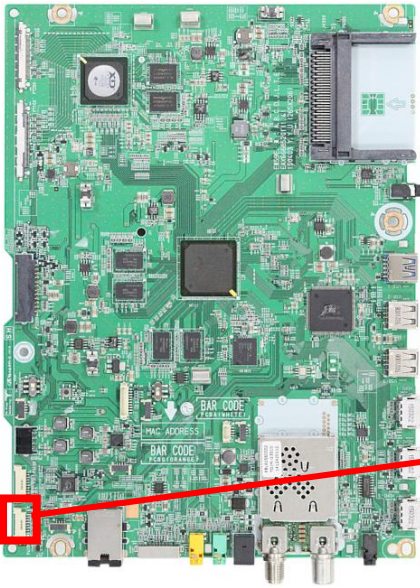
1. Check IR cable condition between IR & Main board.
2. Check WIFI Combo cable condition between WIFI Combo Assy & Main board.
3. Check the st-by 3.5V P4100 on the terminal 4
4. Check the 3.5V_WIFI P4101 on the terminal 8

Standard Repair Process Detail Technical Manual

	Error symptom	D. Function error	Established date		
	Content	Wifi operation checking method	Revised date		



①



②

③

P4101	
1	GND
2	M_RFModule_RESET
3	NOT USE
4	WOL/WIFI_POWER_ON
5	GND
6	WIFI_DP
7	WIFI_DM
8	3.5V_WIFI

Checking order

- 1, 2. Check Wifi cable condition between Wifi assy & Main board.
- 3. Check the 3.3V on the terminal 8.