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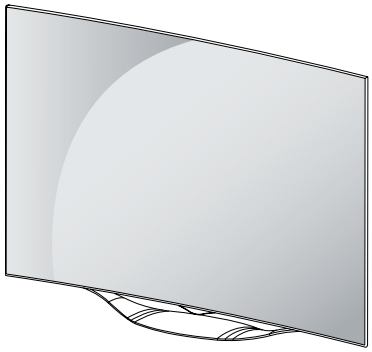
OLED TV
SERVICE MANUAL

CHASSIS : ED42D

MODEL : 55EC93*V 55EC930V-ZA/935V-ZB
55EC940V 55EC940V-ZB

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



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SAFETY PRECAUTIONS

IMPORTANT SAFETY NOTICE

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

General Guidance

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

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

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

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

Keep wires away from high voltage or high temperature parts.

Before returning the receiver to the customer,

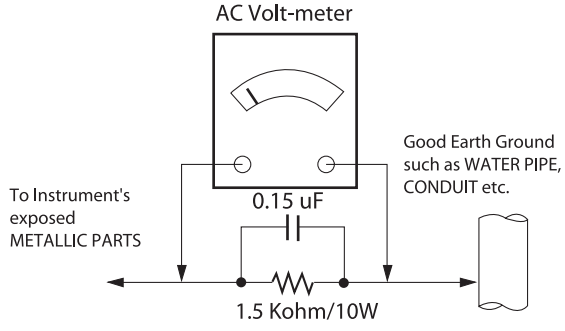
always perform an **AC leakage current check** on the exposed metallic parts of the cabinet, such as antennas, terminals, etc., to be sure the set is safe to operate without damage of electrical shock.

Leakage Current Cold Check(Antenna Cold Check)
With the instrument AC plug removed from AC source, connect an electrical jumper across the two AC plug prongs. Place the AC switch in the on position, connect one lead of ohm-meter to the AC plug prongs tied together and touch other ohm-meter lead in turn to each exposed metallic parts such as antenna terminals, phone jacks, etc.
If the exposed metallic part has a return path to the chassis, the measured resistance should be between 1 MΩ and 5.2 MΩ.
When the exposed metal has no return path to the chassis the reading must be infinite.
An other abnormality exists that must be corrected before the receiver is returned to the customer.

Leakage Current Hot Check (See below Figure)
Plug the AC cord directly into the AC outlet.

Do not use a line Isolation Transformer during this check.
Connect 1.5 K / 10 watt resistor in parallel with a 0.15 uF capacitor between a known good earth ground (Water Pipe, Conduit, etc.) and the exposed metallic parts.
Measure the AC voltage across the resistor using AC voltmeter with 1000 ohms/volt or more sensitivity.
Reverse plug the AC cord into the AC outlet and repeat AC voltage measurements for each exposed metallic part. Any voltage measured must not exceed 0.75 volt RMS which is corresponds to 0.5 mA.
In case any measurement is out of the limits specified, there is possibility of shock hazard and the set must be checked and repaired before it is returned to the customer.

Leakage Current Hot Check circuit



When 25A is impressed between Earth and 2nd Ground for 1 second, Resistance must be less than 0.1 Ω
*Base on Adjustment standard

SERVICING PRECAUTIONS

CAUTION: Before servicing receivers covered by this service manual and its supplements and addenda, read and follow the *SAFETY PRECAUTIONS* on page 3 of this publication.
NOTE: If unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions on page 3 of this publication, always follow the safety precautions. Remember: Safety First.

General Servicing Precautions

1. Always unplug the receiver AC power cord from the AC power source before;
   a. Removing or reinstalling any component, circuit board module or any other receiver assembly.
   b. Disconnecting or reconnecting any receiver electrical plug or other electrical connection.
   c. Connecting a test substitute in parallel with an electrolytic capacitor in the receiver.
   CAUTION: A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.
2. Test high voltage only by measuring it with an appropriate high voltage meter or other voltage measuring device (DVM, FETVOM, etc) equipped with a suitable high voltage probe. Do not test high voltage by "drawing an arc".
3. Do not spray chemicals on or near this receiver or any of its assemblies.
4. Unless specified otherwise in this service manual, clean electrical contacts only by applying the following mixture to the contacts with a pipe cleaner, cotton-tipped stick or comparable non-abrasive applicator; 10 % (by volume) Acetone and 90 % (by volume) isopropyl alcohol (90 % - 99 % strength)
   CAUTION: This is a flammable mixture.
   Unless specified otherwise in this service manual, lubrication of contacts in not required.
5. Do not defeat any plug/socket B+ voltage interlocks with which receivers covered by this service manual might be equipped.
6. Do not apply AC power to this instrument and/or any of its electrical assemblies unless all solid-state device heat sinks are correctly installed.
7. Always connect the test receiver ground lead to the receiver chassis ground before connecting the test receiver positive lead.
   Always remove the test receiver ground lead last.
8. Use with this receiver only the test fixtures specified in this service manual.
   CAUTION: Do not connect the test fixture ground strap to any heat sink in this receiver.

Electrostatically Sensitive (ES) Devices

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

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

General Soldering Guidelines

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

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

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

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

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

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

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

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

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

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

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

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

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

SPECIFICATION

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

1. Application range

This specification is applied to the OLED TV used ED42D chassis.

2. Requirement for Test

Each part is tested as below without special appointment.

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

3. Test method

1) Performance: LGE TV test method followed
2) Demanded other specification
- Safety : CE, IEC specification
- EMC : CE, IEC

4. Model General Specification

No.	Item	Specification	Remarks
1	Market	EU(PAL Market-37Countries)	**DTV & Analog (Total 37 countries)** **DTV (MPEG2/4, DVB-T) : 26 countries** Germany, Netherland, Switzerland, Hungary, Austria, Slovenia, Bulgaria, France, Spain, Belgium, Luxemburg, Greece, Czech, Croatia, 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, ASIASAT3S 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, EUROBIRD 9A 9.0E, EUROBIRD3 33.0E, EUTELSAT 36 A/B 36.0E, EUTELSAT W2A 10.0E, EUTELSAT W3A 7.0E, EUTELSAT7WA 7.3W, EUTELSAT 16.0E, EXPRESS AM1 40.0E, EXPRESS AM3 140.0E, EXPRESS AM33 96.5E, HELLASSAT 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) Digital TV - DVB-T/T2 - DVB-C - DVB-S/S2 2) Analogue TV - PAL/SECAM B/G/I/D/K - SECAM L/L'	
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 (Model : *L*V*-Z* (T2 only Model)) - 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-C - 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	Scart (1EA)	PAL, SECAM	Scart Jack is Full scart and support ATV/DTV-OUT (not support DTV Auto AV)
6	Video Input RCA(1EA)	PAL, SECAM, NTSC4.43	4 System : PAL, SECAM, NTSC4.43, PAL60
7	Component Input (1EA)	Y/Cb/Cr, Y/Pb/Pr	480i /576i/480p/576p/720p/1080i/1080p
8	HDMI Input (4EA)	HDMI1-DTV, HDMI2-DTV, HDMI3-DTV, HDMI4-DTV	HDMI1: PC support(HDMI version 1.4) Support HDCP
9	Audio Input (1EA)	DVI Audio, AV1/AV2/Component	L/R Input.
10	Head phone out (1EA)	Antenna, AV1, AV2, Component, HDMI1, HDMI2, HDMI3, HDMI4, USB1, USB2, USB3	
11	SDPIF out (1EA)	SPDIF out	
12	USB (3EA)	EMF, DivX HD, For SVC (download)	JPEG, MP3, DivX HD
13	Ethernet Connect(1EA)	Ethernet Connect	
14	PCMCIA Card slot (1EA)	PCMCIA slot	
15	RS-232C(1EA)	For SVC only	Side, Phone type

5. Component Video Input (Y, P_B, P_R)

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

6. HDMI Input

6.1. DTV mode

No.	Resolution	H-freq(kHz)	V-freq.(Hz)	Proposed
1.	640*480	31.469 / 31.5	59.94/60	SDTV 480P
2.	720*480	31.469 / 31.5	59.94 / 60	SDTV 480P
3.	720*576	31.25	50	SDTV 576P
4.	720*576	15.625	50	SDTV 576I
5.	1280*720	37.500	50	HDTV 720P
6.	1280*720	44.96 / 45	59.94 / 60	HDTV 720P
7.	1920*1080	33.72 / 33.75	59.94 / 60	HDTV 1080I
8.	1920*1080	28.125	50.00	HDTV 1080I
9.	1920*1080	26.97 / 27	23.97 / 24	HDTV 1080P
10.	1920*1080	28.125	25	HDTV 1080P
11.	1920*1080	33.716 / 33.75	29.976 / 30.00	HDTV 1080P
12.	1920*1080	56.250	50	HDTV 1080P
13.	1920*1080	67.43 / 67.5	59.94 / 60	HDTV 1080P

6.2. PC mode

No.	Resolution	H-freq(kHz)	V-freq.(Hz)	Proposed
1	640 x 350 @70Hz	31.468	70.09	EGA
2	720 x 400 @70Hz	31.469	70.08	DOS
3	640 x 480 @60Hz	31.469	59.94	VESA(VGA)
4	800 x 600 @60Hz	37.879	60.31	VESA(SVGA)
5	1024 x 768 @60Hz	48.363	60.00	VESA(XGA)
6	1152 x 864 @60Hz	54.348	60.053	VESA
7	1280 x 1024 @60Hz	63.981	60.020	VESA(SXGA)
8	1360 x 768 @60Hz	47.712	60.015	VESA(WXGA)
9	1920 x 1080 @60Hz	67.5	60.00	WUXGA(Reduced Blanking))

7. 3D Mode

7.1. HDMI 1.4b (3D supported mode automatically)

No.	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	VIC	3D input proposed mode	Proposed
1	640*480	31.469 / 31.5	59.94/ 60	25.175/25.2	1	Top-and-Bottom Side-by-side(half)	Secondary(SDTV 480P) Secondary(SDTV 480P)
2		62.938 / 63	59.94/ 60	50.35/50.4	1	Frame packing Line alternative	Secondary(SDTV 480P) (SDTV 480P)
3		31.469 / 31.5	59.94/ 60	50.35/50.4	1	Side-by-side(Full)	(SDTV 480P)
4	720*480	31.469 / 31.5	59.94 / 60	27.00/27.03	2,3	Top-and-Bottom Side-by-side(half)	Secondary(SDTV 480P) Secondary(SDTV 480P)
5		62.938 / 63	59.94 / 60	54/54.06	2,3	Frame packing Line alternative	Secondary(SDTV 480P) (SDTV 480P)
6		31.469 / 31.5	59.94 / 60	54/54.06	2,3	Side-by-side(Full)	(SDTV 480P)
7	720*576	31.25	50	27	17,18	Top-and-Bottom Side-by-side(half)	Secondary(SDTV 576P) Secondary(SDTV 576P)
8		62.5	50	54	17,18	Frame packing Line alternative	Secondary(SDTV 576P) (SDTV 576P)
9		31.25	50	54	17,18	Side-by-side(Full)	(SDTV 576P)
10	1280*720	37.5	50	74.25	19	Top-and-Bottom Side-by-side(half)	Primary(HDTV 720P) Primary(HDTV 720P)
11		75	50	148.5	19	Frame packing Line alternative	Primary(HDTV 720P) (HDTV 720P)
12		37.5	50	148.5	19	Side-by-side(Full)	(HDTV 720P)
13		44.96 / 45	59.94 / 60	74.18/74.25	4	Top-and-Bottom Side-by-side(half)	Primary(HDTV 720P) Primary(HDTV 720P)
14		89.91 / 90	59.94 / 60	148.35/148.5	4	Frame packing Line alternative	Primary(HDTV 720P) (HDTV 720P)
15		44.96 / 45	59.94 / 60	148.35/148.5	4	Side-by-side(Full)	(HDTV 720P)
16	1920*1080	33.72 / 33.75	59.94 / 60	74.18/74.25	5	Top-and-Bottom Side-by-side(half)	Secondary(HDTV 1080I) Primary(HDTV 1080I)
17		67.432 / 67.5	59.94 / 60	148.35/148.5	5	Frame packing Field alternative	Primary(HDTV 1080I) (HDTV 1080I)
18		33.72 / 33.75	59.94 / 60	148.35/148.5	5	Side-by-side(Full)	(HDTV 1080I)
19		28.125	50.00	74.25	20	Top-and-Bottom Side-by-side(half)	Secondary(HDTV 1080I) Primary(HDTV 1080I)
20		56.25	50.00	148.5	20	Frame packing Field alternative	Primary(HDTV 1080I) (HDTV 1080I)
21		28.125	50.00	148.5	20	Side-by-side(Full)	(HDTV 1080I)
22		26.97 / 27	23.97 / 24	74.18/74.25	32	Top-and-Bottom Side-by-side(half)	Primary(HDTV 1080P) Primary(HDTV 1080P)
23		43.94 / 54	23.97 / 24	148.35/148.5	32	Frame packing Line alternative	Primary(HDTV 1080P) (HDTV 1080P)
24		26.97 / 27	23.97 / 24	148.35/148.5	32	Side-by-side(Full)	(HDTV 1080P)
25		28.125	25	74.25	33	Top-and-Bottom Side-by-side(half)	Secondary(HDTV 1080P) Secondary(HDTV 1080P)
26		56.25	25	148.5	33	Frame packing Line alternative	Secondary(HDTV 1080P) (HDTV 1080P)
27		28.125	25	148.5	33	Side-by-side(Full)	(HDTV 1080P)
28		33.716 / 33.75	29.976 / 30.00	74.18/74.25	34	Top-and-Bottom Side-by-side(half)	Primary(HDTV 1080P) Secondary(HDTV 1080P)
29		67.432 / 67.5	29.976 / 30.00	148.35/148.5	34	Frame packing Line alternative	Primary(HDTV 1080P) (HDTV 1080P)
30		33.716 / 33.75	29.976 / 30.00	148.35/148.5	34	Side-by-side(Full)	(HDTV 1080P)
31		56.25	50	148.5	31	Top-and-Bottom Side-by-side(half)	Primary(HDTV 1080P) Secondary(HDTV 1080P)
32		67.43 / 67.5	59.94 / 60	148.35/148.50	16	Top-and-Bottom Side-by-side(half)	Primary(HDTV 1080P) Secondary(HDTV 1080P)

7.2. HDMI Input(1.3)

No.	Resolution	H-freq(kHz)	V-freq.(kHz)	Pixel clock(MHz)	Proposed	3D input proposed mode
1	720*480	31.5	60	27.03	SDTV 480P	2D to 3D, Side by Side(Half), Top & Bottom, Checker Board, Frame Sequential, Row Interleaving, Column Interleaving
2	720*576	31.25	50	27	SDTV 576P	
3	1280*720	45.00	60.00	74.25	HDTV 720P	
4	1280*720	37.500	50	74.25	HDTV 720P	
5	1920*1080	33.75	60.00	74.25	HDTV 1080I	2D to 3D, Side by Side(Half), Top & Bottom
6	1920*1080	28.125	50.00	74.25	HDTV 1080I	
7	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
8	1920*1080	28.12	25	74.25	HDTV 1080P	
9	1920*1080	33.75	30.00	74.25	HDTV 1080P	
10	1920*1080	67.50	60.00	148.5	HDTV 1080P	2D to 3D, Side by Side(Half), Top & Bottom, Checker Board, Single Frame Sequential, Row Interleaving, Column Interleaving
11	1920*1080	56.250	50	148.5	HDTV 1080P	

7.3. RF Input(3D supported mode manually)

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

7.4. RF Input (3D supported mode automatically)

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

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

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

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

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

* USB, DNLA Input (3D supported mode automatically)

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

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

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

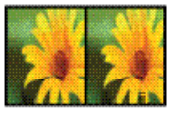
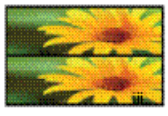
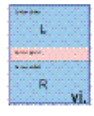
7.8. Component Input(3D) (3D supported mode manually)

No.	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock	Proposed	3D input proposed mode
1	1280*720	45.00	60.00	74.25	HDTV 720P	2D to 3D, Side by Side(Half), Top & Bottom
2	1280*720	37.500	50	74.25	HDTV 720P	
3	1920*1080	33.75	60.00	74.25	HDTV 1080I	
4	1920*1080	28.125	50.00	74.25	HDTV 1080I	
5	1920*1080	27.00	24.00	74.25	HDTV 1080P	
6	1920*1080	28.12	25	74.25	HDTV 1080P	
7	1920*1080	33.75	30.00	74.25	HDTV 1080P	
8	1920*1080	67.50	60.00	148.5	HDTV 1080P	
9	1920*1080	56.250	50	148.5	HDTV 1080P	
10	Others	-	-	-	SDTV	

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

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

7.10. 3D Input mode

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

ADJUSTMENT INSTRUCTION

1. Application Range

This specification sheet is applied to ED42D 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 °C ± 5 °C of temperature and 65 % ± 10 % of relative humidity if there is no specific designation.
(4) The input voltage of the receiver must keep 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. MAIN PCBA Adjustments

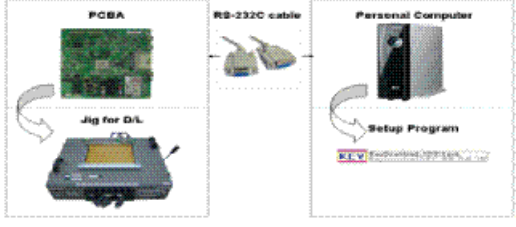
3.1. ADC Calibration

- An ADC calibration is not necessary because MAIN SoC (LGE1311) is already calibrated from IC Maker.

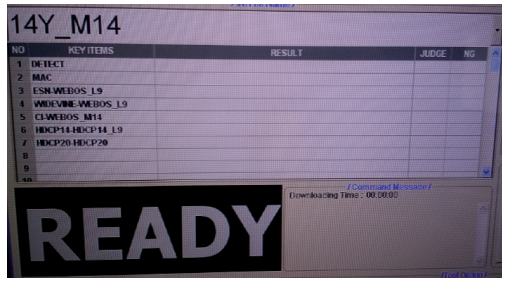
3.2. MAC Address, ESN, Widevine, HDCP2.0 key download

* CI+ key : only for ED42D
(1) Equipment & Condition
1) Play file: keydownload.exe

(2) Communication Port connection
1) Key Write: Com 1,2,3,4 and 115200 (Baudrate)
2) Barcode: Com 1,2,3,4 and 9600 (Baudrate)
3) Connect
: PCBA Jig → RS-232C Port == PC → RS-232C Port



(3) Download process
1) Select the download items.
2) Mode check: Online Only
3) Check the test process
: DETECT → MAC_WRITE → ESN → WIDEVINE_WRITE → CI+ → HDCP14 → HDCP20
4) Play: START
5) Check of result: Ready, Test, OK or NG



(4) Inspection
- In INSTART menu, check these keys.

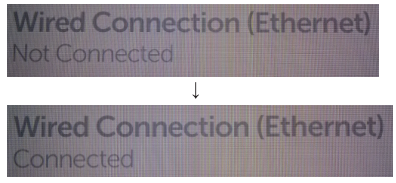
3.3. LAN port Inspection

3.3.1. Equipment and Condition

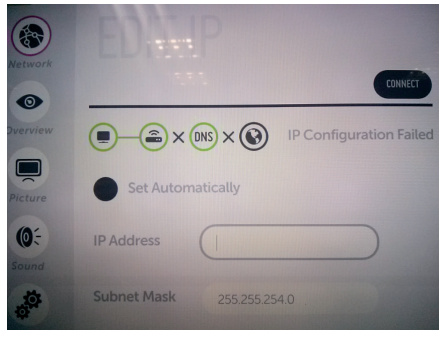
Each other connection to LAN Port of IP Hub and Jig.

3.3.2. LAN inspection solution

▪ LAN Port connection with PCB
▪ Setting automatic IP

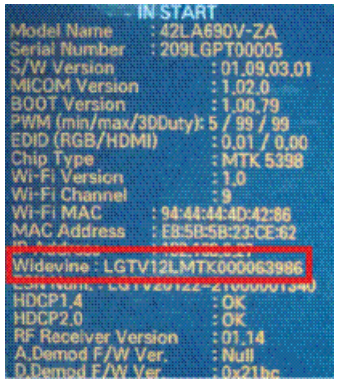


▪ If you want manual connection, enter Network connection at MENU Mode of TV. Press Start connection key, then Network will be connected.



3.2.3. Widevine, ESN, HDCP1.4, HDCP2.0 key inspection

- Confirm key input data at the "IN START" MENU Mode.



3.3. LAN PORT INSPECTION(PING TEST)

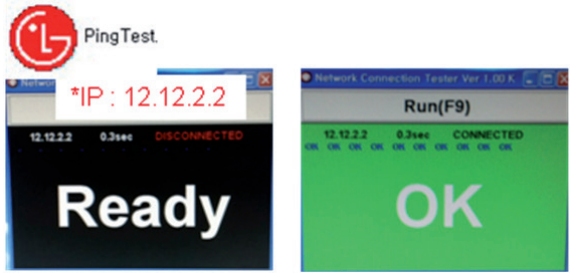
3.3.1. Equipment setting

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

SET —— PC

3.3.2. LAN PORT inspection(PING TEST)

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



3.4. Model name & Serial number Download

3.4.1. 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.

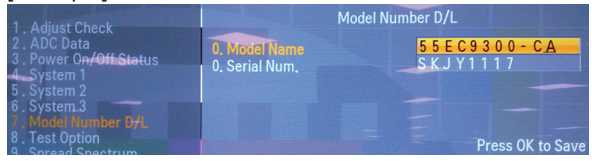
3.4.2. Method & notice

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

*** Manual Download (Model Name and Serial Number)**

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

1) Press the "Instart" key of Adjustment remote control.
2) Go to the menu "7.Model Number D/L" like below photo.
3) Input the Factory model name or Serial number
[Example]



4) Check the model name Instart menu. → Factory name displayed.
[Example]

3.5. CI+ Key checking method

*** Only for ED42D**

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

Check the Download to CI+ Key value in LGset.

3.5.1. Check the method of CI+ Key value

(1) Check the method on Instart menu
(2) Check the method of RS232C Command
1) Into the main ass'y mode(RS232: aa 00 00)

CMD 1	CMD 2	Data 0	
A	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

3.5.2. 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 mothed 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. Manual Adjustment

4.1. ADC adjustment need not. Because of OTP(Auto ADC adjustment)

4.2. EDID DATA

HDMI EDID DATA 3D

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	00	FF	FF	FF	FF	FF	FF	00	1E	6D	ⓐ		ⓑ			
10	ⓒ		01	03	80	A0	5A	78	0A	EE	91	A3	54	4C	99	26
20	0F	50	54	A1	8	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	ⓓ			
70	ⓓ														01	ⓔ1
80	02	03	3A	F1	4E	10	9F	04	13	05	14	03	02	12	20	21
90	22	15	01	29	3D	06	C0	15	07	50	09	57	07	ⓕ		
A0	ⓕ															
B0	ⓕ						ⓖ				02	3A	80	18	71	38
C0	2D	40	58	2C	45	00	40	84	63	00	00	1E	01	1D	80	18
D0	71	1C	16	20	58	2C	25	00	40	84	63	00	00	9E	01	1D
E0	00	72	51	D0	1E	20	6E	28	55	00	40	84	63	00	00	1E
F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	ⓔ2

- HDMI1 ~ HDMI4
- In the data of EDID, bellows may be different by Input mode.

ⓐ Product ID

HEX	EDID Table	DDC Function
0001	0100	Analog
0001	0100	Digital

ⓑ Serial No: Controlled on production line.

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

ⓓ Model Name(Hex): LGTV

Chassis	MODEL NAME(HEX)
ED42D	00 00 00 FC 00 4C 47 20 54 56 0A 20 20 20 20 20 20 20

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

Input	ⓔ1	ⓔ2	ⓔ3
HDMI1	E7	85	X
HDMI2	E7	75	X
HDMI3	E7	65	X
HDMI4	E7	55	X

ⓕ Vendor Specific(HDMI)

INPUT	MODEL NAME(HEX)
HDMI1	78 03 0C 00 10 00 B8 2D 20 C0 0E 01 4F 00 FE 08 10 06 10 18 10 28 10 38 10
HDMI2	78 03 0C 00 20 00 B8 2D 20 C0 0E 01 4F 00 FE 08 10 06 10 18 10 28 10 38 10
HDMI3	78 03 0C 00 30 00 B8 2D 20 C0 0E 01 4F 00 FE 08 10 06 10 18 10 28 10 38 10
HDMI4	78 03 0C 00 40 00 B8 2D 20 C0 0E 01 4F 00 FE 08 10 06 10 18 10 28 10 38 10

ⓖ Colorimetry Data Block(HDMI) : Not supporting XvYcc

INPUT	MODEL NAME(HEX)
HDMI1	E3 05 00 00
HDMI2	E3 05 00 00
HDMI3	E3 05 00 00

5. White Balance Adjustment

5.1. Overview

5.1.1. W/B adj. Objective & How-it-works

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

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

(3) Adjustment condition : normal temperature
1) Surrounding Temperature : 25 °C ± 5 °C
2) Surrounding Humidity : 20 % ~ 80 %
3) Surrounding Humidity: 20% ~ 80%
4) Before White balance adjustment, Keep power on status, don't power off

5.1.2. Adj. condition and cautionary items

(1) Lighting condition in surrounding area surrounding lighting should be lower 10 lux. Try to isolate adj. area into dark surrounding.

(2) Probe location: Color Analyzer(CA-210) probe should be within 10 cm and perpendicular of the module surface (80°~ 100°).

(3) Aging time
1) After Aging Start, Keep the Power ON status during 5 Minutes.
2) In case of OLED, Back-light on should be checked using no signal or Full-white pattern.

5.2. Equipment

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

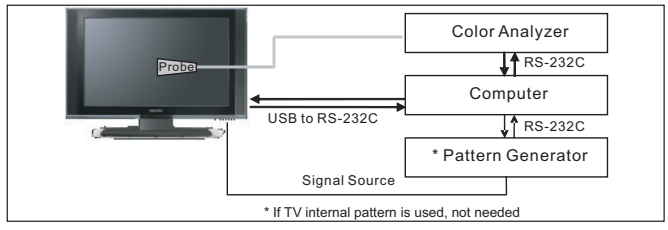
(2) Adjustment Computer(During auto adj., RS-232C protocol is needed)

(3) Adjustment Remote control

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

▪ Color Analyzer Matrix should be calibrated using CS-1000.

5.3. Equipment connection MAP



5.4. Adj. Command (Protocol)

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

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

(2) Adjustment Map

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

5.5. Adjustment method

5.5.1. Auto WB calibration

(1) Set TV in ADJ mode using P-Only key(or POWER ON key).
(2) Place optical probe on the center of the display.
- It need to check probe condition of zero calibration before adjustment.

(3) Connect RS-232C Cable
(4) Select mode in ADJ Program and begin adjustment.
(5) When WB adjustment is completed with OK message, check adjustment status pre-set mode.(Cool, Medium, Warm)
(6) Remove probe and RS-232C cable
▪ W/B Adj. must begin as start command “wb 00 00” , and finish as end command “wb 00 ff”, and Adj. offset if need.

5.5.2. White balance table

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

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

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

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

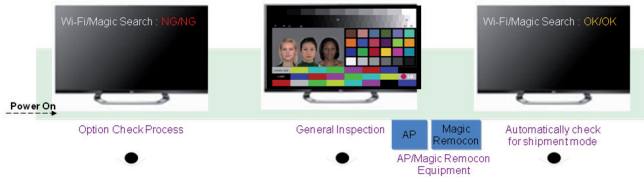
Mode	Coordinate		Temp	Δuv
	x	y		
Cool	0.277	0.278	11,000K	-0.0030
Medium	0.286	0.289	9,300K	0.0000
Warm	0.313	0.329	6,500K	+0.0030

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

Mode	Coordinate		Temp	Δuv
	x	y		
Cool	0.277 ± 0.002	0.278 ± 0.002	11,000 K	-0.0030
Medium	0.286 ± 0.002	0.289 ± 0.002	9,300 K	0.0000
Warm	0.313 ± 0.002	0.329 ± 0.002	6,500 K	+0.0030

6. Magic motion remote control check

Results are automatically marked in Instart OSD after through the AP/Magic Remocon Equipment on the line.

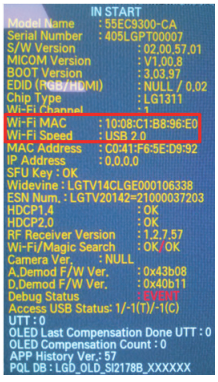


7. WIFI MAC ADDRESS CHECK

(1) Using RS232

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

(2) Check the menu on in-start



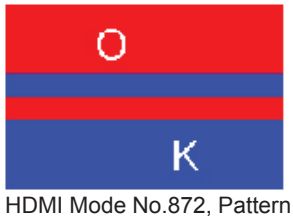
8. 3D pattern test

8.1. Test equipment

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

8.2. Test method

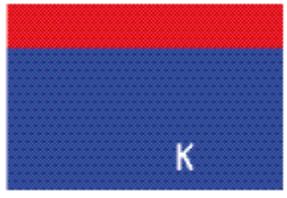
(1) Input 3D test signal as below.



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

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

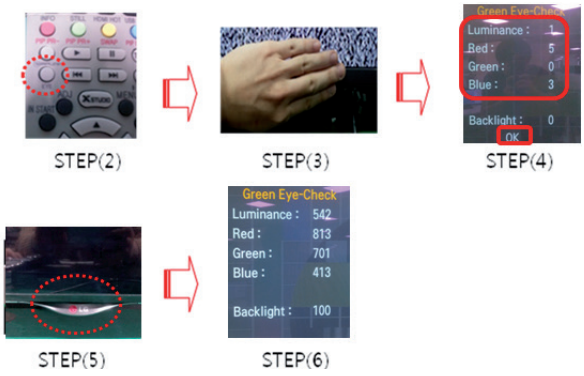
<Fig.2> OK in 3D mode without 3D glasses



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

9. Eye-Q function check

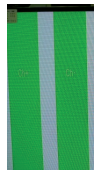
(1) Press 'EYE button' on the adjustment remote-control.
(2) Check each raw data.
(3) Cover 'Eye Q sensor' on the front of set with hand and wait for 6 seconds.
(4) Check each data is lower than 10 and 'OK' message. If data isn't lower than 10 in 6 seconds, replace Eye Q sensor.
(5) Uncover hand from Eye Q sensor and wait for 6 seconds.
(6) Check each data increase or not. If data don't increase, replace Eye Q sensor.



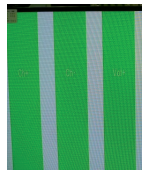
10. Joystick function check

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

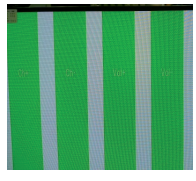
(2) Channel Down Test : Press DOWN KEY OF SET



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



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



(5) Enter Test : Press Enter KEY OF SET

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

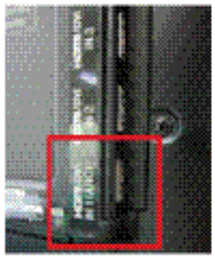
11. HDMI ARC Function Inspection

11.1. Test equipment

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

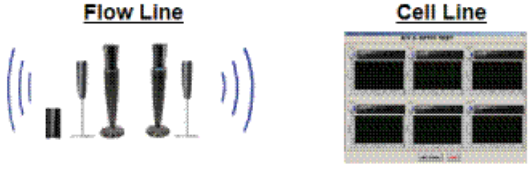
11.2. Test method

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

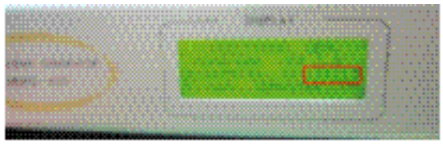


(2) Check the sound from the TV Set

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



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



12. AUDIO output check

12.1. AUDIO output check

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

12.2. Specification

Item	Min	Typ	Max	Unit	Remark
Audio practical max Output, L/R (Distortion=10% max Output)	9.0	10.0	12.0	W	- Condition: EQ/AVL/Clear Voice Off - Speaker (8Ω Impedance)
	8.5	8.9	9.9	Vrms	

12.3. Audio Output Inspection

- Input "Check-S KEY" of adjust remote controller to inspect speaker

(1) When you click the first, the output volume of left &right main speakers must be 50.
(2) When you click the second, the output volume of left &right main speakers must be 80.
(3) When you click the third, the output volume of left &right main speakers must be 100.
(4) When you click the fourth, the output volume of left main speaker must be 50.
(5) When you click the fifth, the output volume of right main speaker must be 50.

13. GND and HI-POT Test

13.1. GND & HI-POT auto-check preparation

- Check the POWER cable and SIGNAL cable insertion condition

13.2. GND & HI-POT auto-check

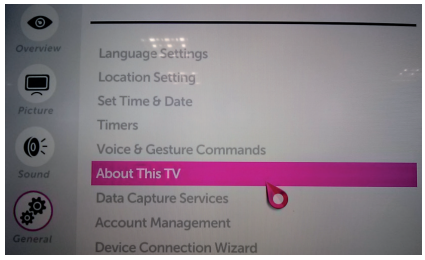
(1) Pallet moves in the station. (POWER CORD / AV CORD is tightly inserted)
(2) Connect the AV JACK Tester.
(3) Controller (GWS103-4) on.
(4) GND Test (Auto)
  - If Test is failed, Buzzer operates.
  - If Test is passed, execute next process (Hi-pot test). (Remove A/V CORD from A/V JACK BOX)
(5) HI-POT test (Auto)
  - If Test is failed, Buzzer operates.
  - If Test is passed, GOOD Lamp on and move to next process automatically.

13.3. Checkpoint

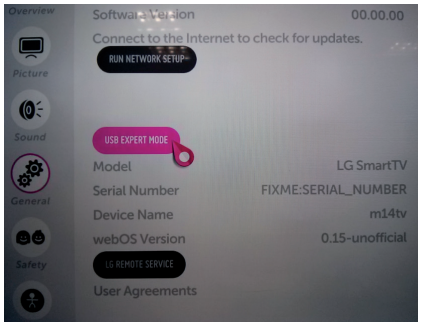
(1) Test voltage
  - GND: 1.5 KV/min at 100 mA
  - SIGNAL: 3 KV/min at 100 mA
(2) TEST time: 1 second
(3) TEST POINT
  - GND Test = POWER CORD GND and SIGNAL CABLE GND.
  - Hi-pot Test = POWER CORD GND and LIVE & NEUTRAL.
(4) LEAKAGE CURRENT: At 0.5 mArms

14. USB S/W download(Service only)

(1) Put the USB Stick to the USB socket.
(2) Go to General menu then enter to About This TV.



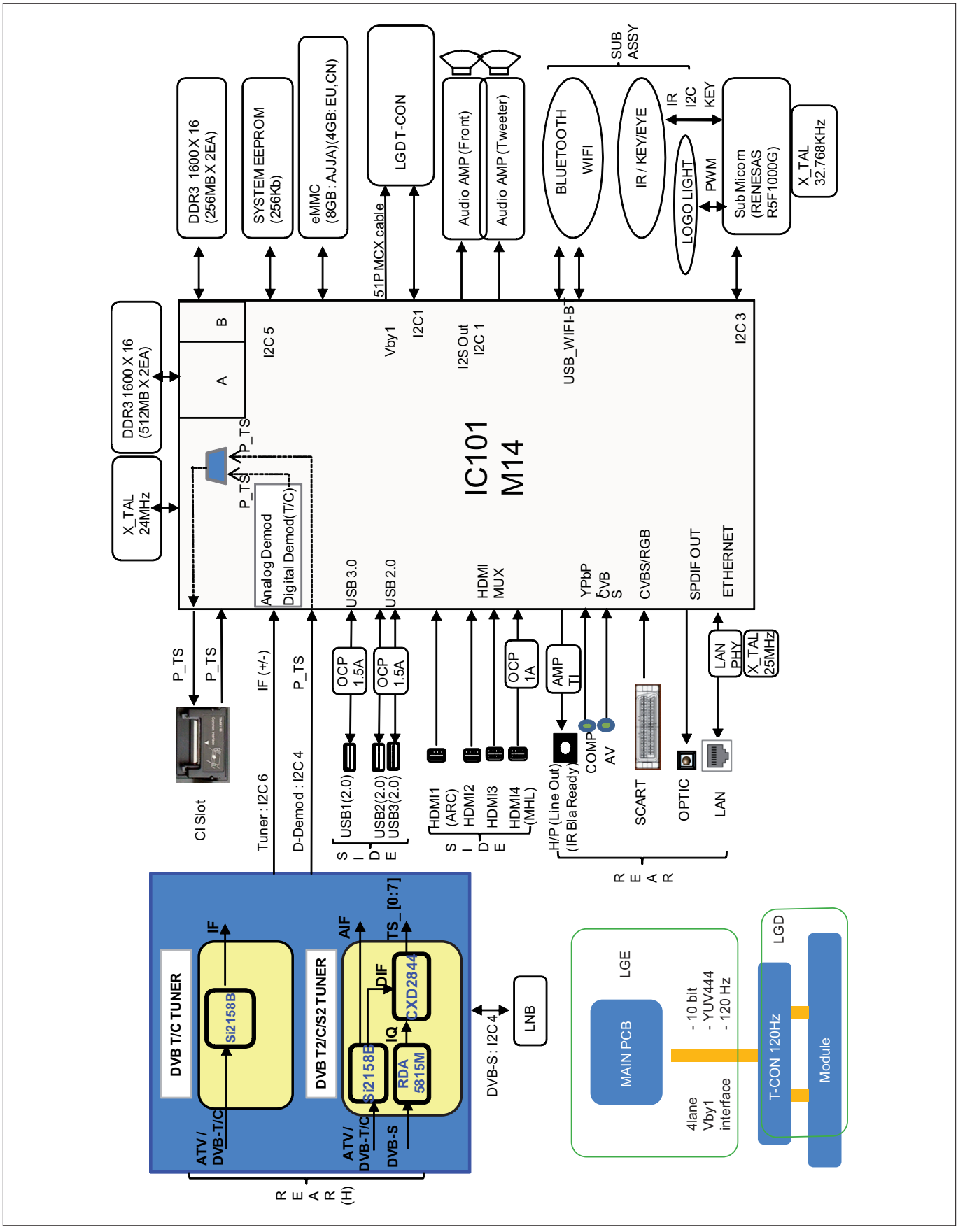
(3) Enter the USB EXPERT MODE.



(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.
* If downloading version is more high than your TV have, TV can lost all channel data. In this case, you have to channel recover. if all channel data is cleared, you didn't have a DTV/ATV test on production line.

* After downloading, Tool option setting is needed again.
(1) Push "IN-START" key in service remote control.
(2) Select "Tool Option 1" and push "OK" key.
(3) Punch in the number. (Each model has their number)

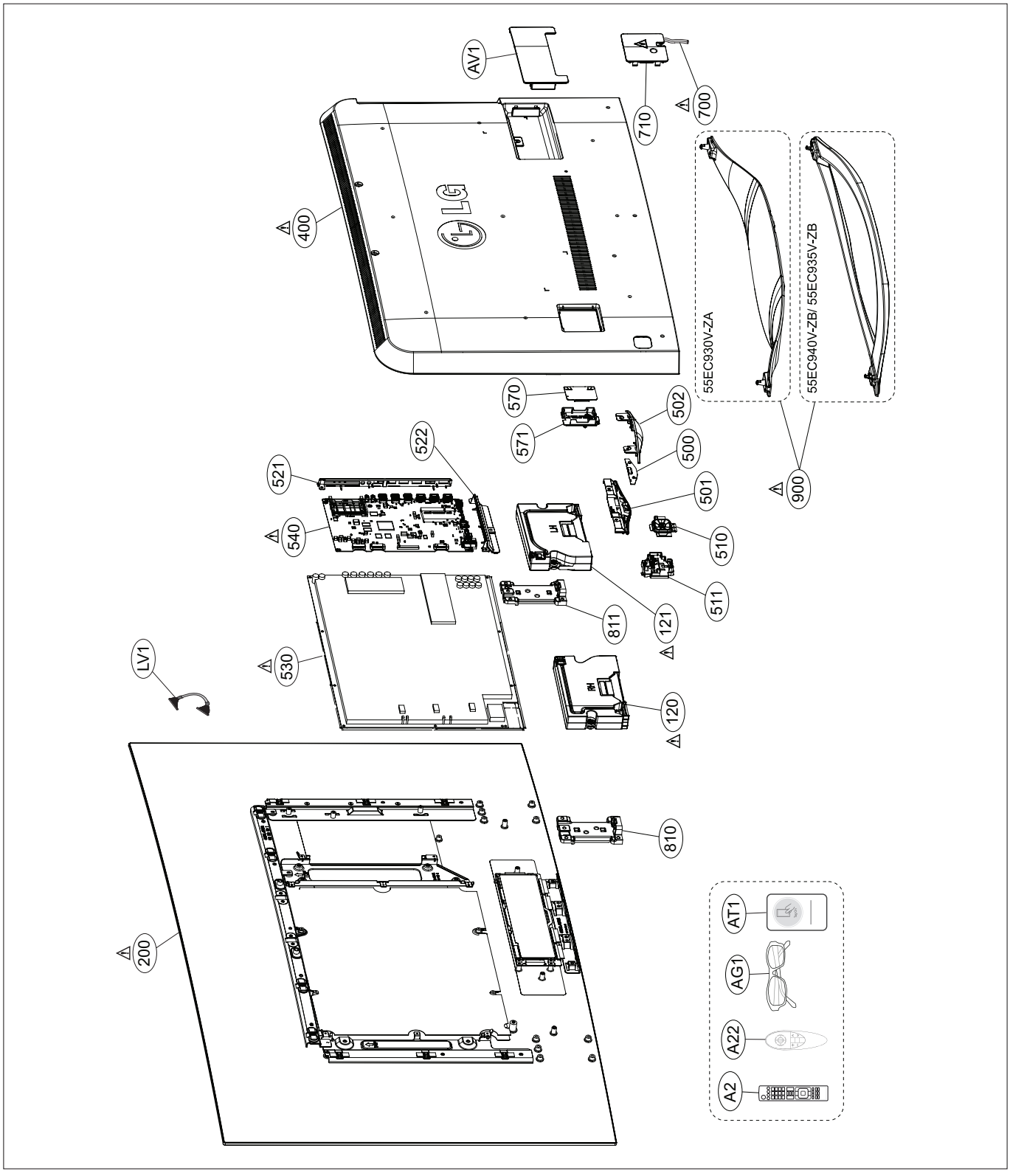
BLOCK DIAGRAM



EXPLODED VIEW

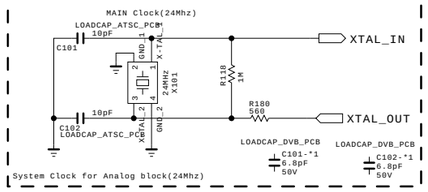
IMPORTANT SAFETY NOTICE

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

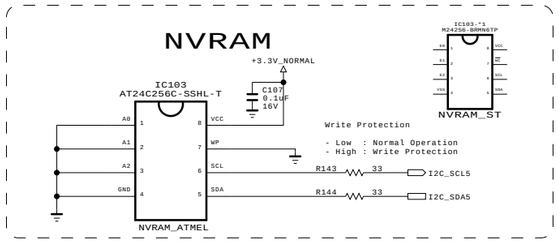


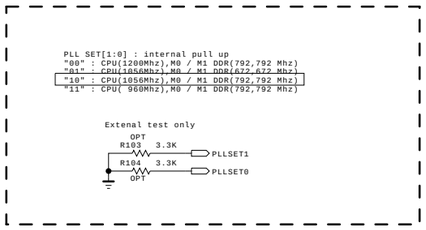
System Configuration

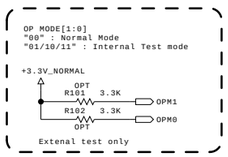
Clock for M14-A0

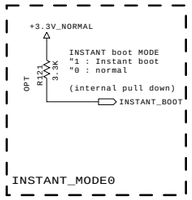


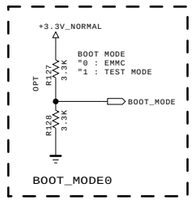
NVRAM



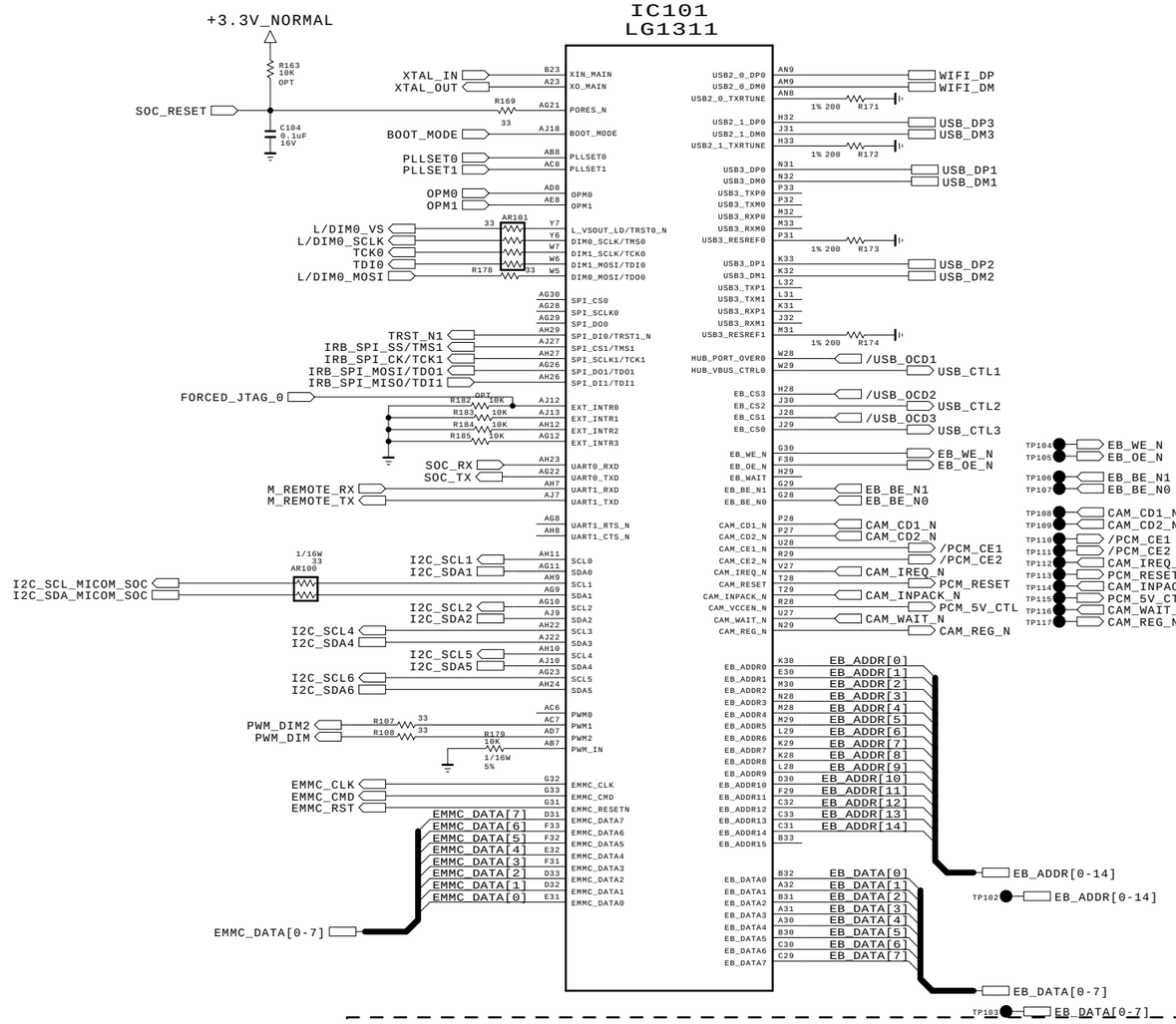




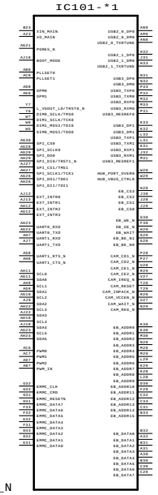


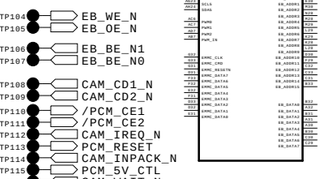


M14_LCD
IC101
LG1311

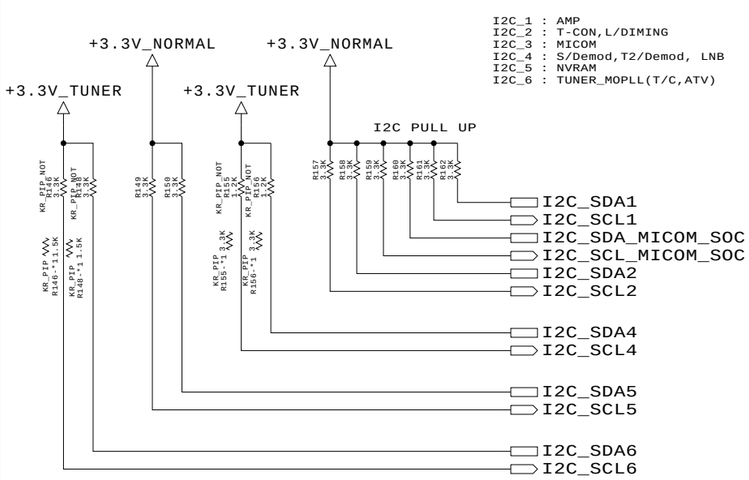


M14_OLED_VBY1
LG1311V-B1
IC101-*1

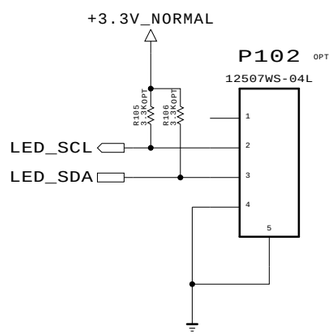


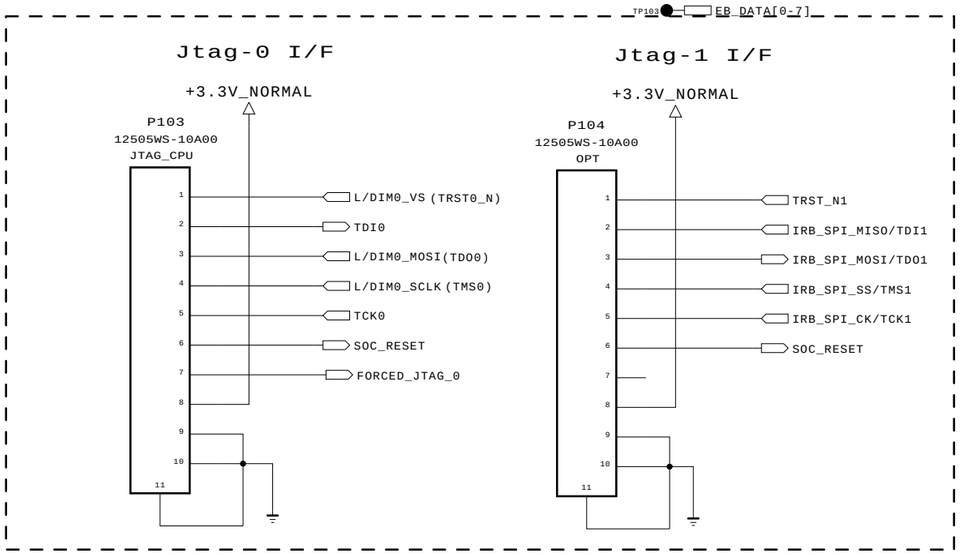


I2C



LOCAL DIMMING I2C CONTROL





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

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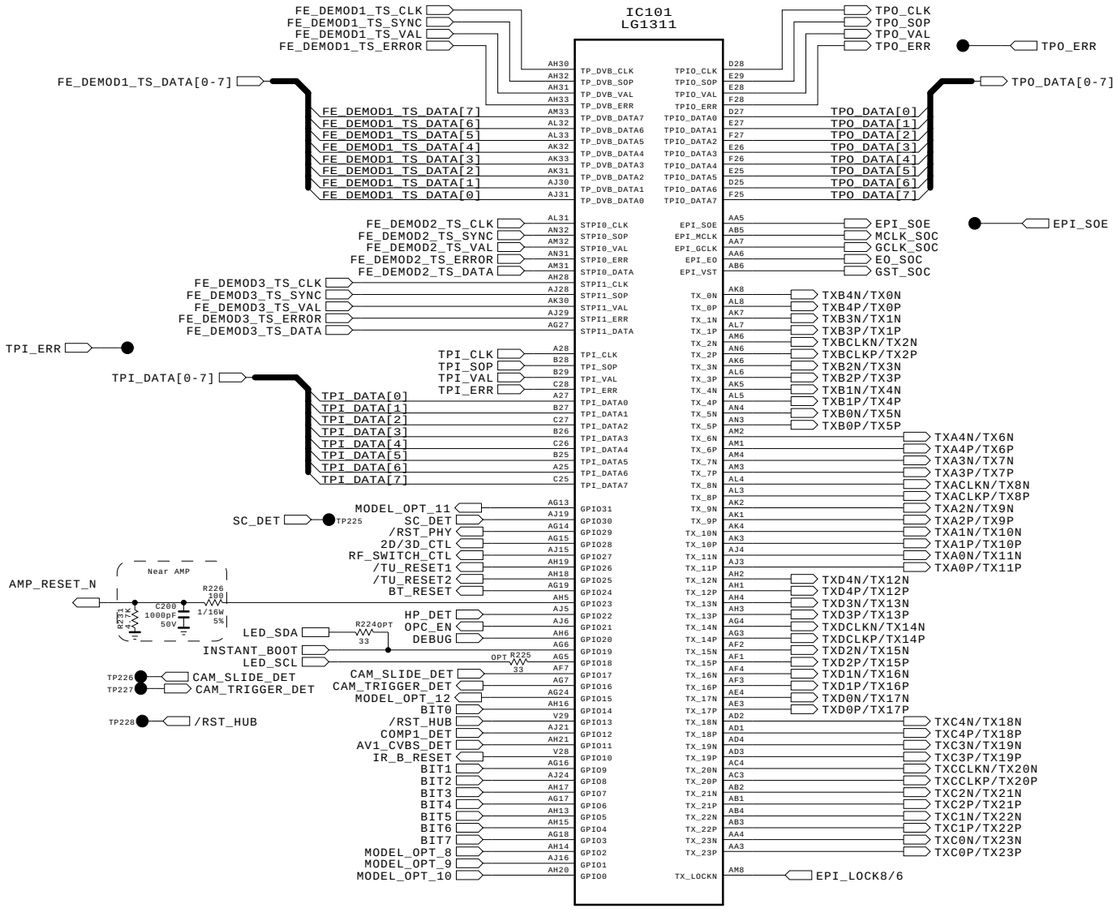
LG ELECTRONICS

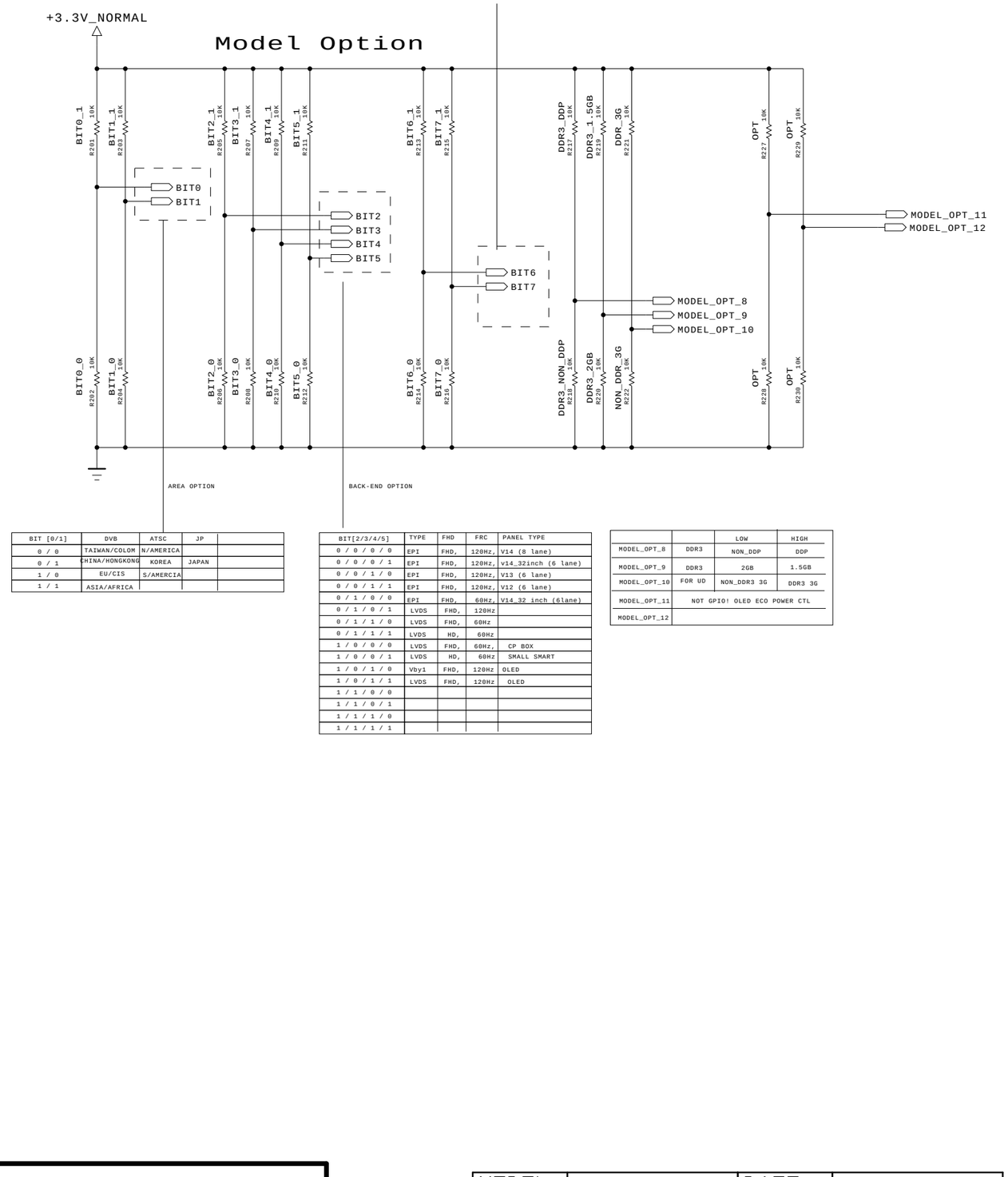
MODEL	MID_LG1311	DATE	2013.04.04
BLOCK	M14 Symbol A	SHEET	1 / 31

M14-Peripheral



BIT [6/7]	EU/CIS	AJJA	TAIWAN/COL	CHINA/HONG	KOREA	NORTH AMERICA	BRAZIL	JAPAN	
0 / 0	T/C	T/C	T/C	Default	ATSC PIP	ATSC PIP	ISDB PIP	Default	
0 / 1	T2/C/S2/ATV_EXT	T2/C/ATV_EXT	T2/C PIP		ATV_SOC	ATV_SOC	ISDB		
1 / 0	T2/C	T2/C/ATV_SOC	T2/C		ATV_EXT	ATV_EXT			
1 / 1	T2/C/S2/ATV_SOC	T2/C/S2							

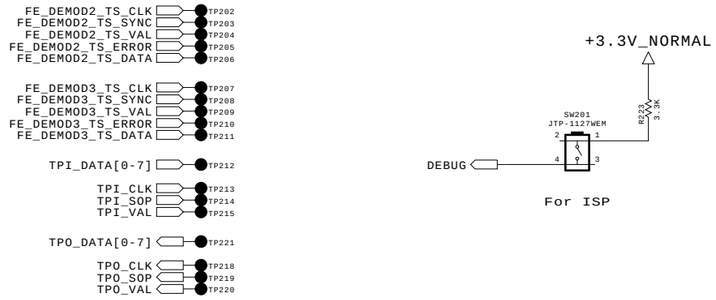
Model Option



BIT [0/1]	DVB	ATSC	JP	
0 / 0	TAIWAN/COLOM	N/AMERICA		
0 / 1	CHINA/HONGKONG	KOREA	JAPAN	
1 / 0	EU/CIS	S/AMERCIA		
1 / 1	ASIA/AFRICA			

BIT[2/3/4/5]	TYPE	FHD	FRC	PANEL TYPE
0 / 0 / 0 / 0	EPI	FHD,	120Hz,	V14 (8 lane)
0 / 0 / 0 / 1	EPI	FHD,	120Hz,	v14_32inch (6 lane)
0 / 0 / 1 / 0	EPI	FHD,	120Hz,	V13 (6 lane)
0 / 0 / 1 / 1	EPI	FHD,	120Hz,	V12 (6 lane)
0 / 1 / 0 / 0	EPI	FHD,	60Hz,	V14_32 inch (61ane)
0 / 1 / 0 / 1	LVDS	FHD,	120Hz	
0 / 1 / 1 / 0	LVDS	FHD,	60Hz	
0 / 1 / 1 / 1	LVDS	HD,	60Hz	
1 / 0 / 0 / 0	LVDS	FHD,	60Hz,	CP BOX
1 / 0 / 0 / 1	LVDS	HD,	60Hz	SMALL SMART
1 / 0 / 1 / 0	Vby1	FHD,	120Hz	OLED
1 / 0 / 1 / 1	LVDS	FHD,	120Hz	OLED
1 / 1 / 0 / 0				
1 / 1 / 0 / 1				
1 / 1 / 1 / 0				
1 / 1 / 1 / 1				

		LOW	HIGH
MODEL_OPT_8	DDR3	NON_DDP	DDP
MODEL_OPT_9		2GB	1.5GB
MODEL_OPT_10	FOR UD	NON_DDR3 3G	DDR3 3G
MODEL_OPT_11	NOT GPIO! OLED ECO POWER CTL		
MODEL_OPT_12			



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MODEL	MID_LG1311	DATE	2013.04.04
BLOCK	M14 Symbol B	SHEET	2 / 31

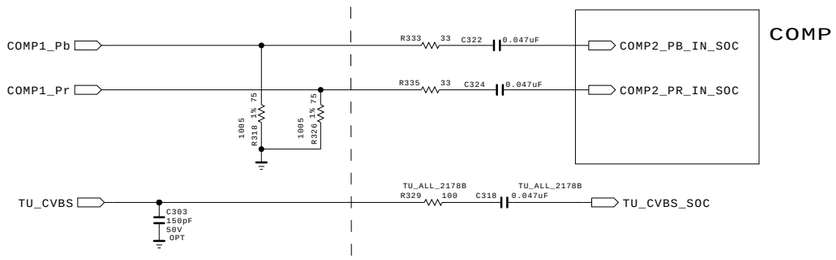
M14-Display Io/Out

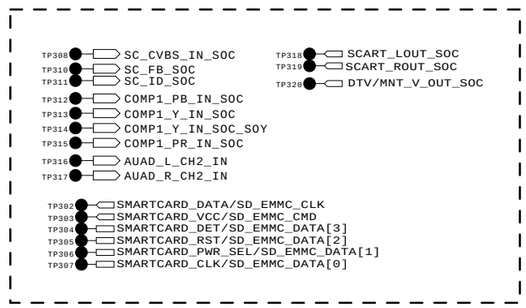
PLACE AT JACK SIDE

Place JACK Side

Place SOC Side

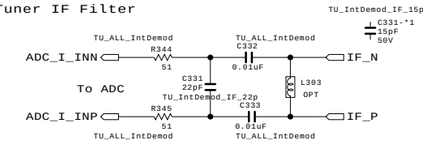
AV1_CVBS/COMP1_Y Circuit was moved to 34Page





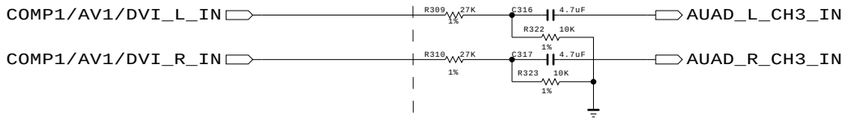
Placed as close as possible to LG1311

Tuner IF Filter

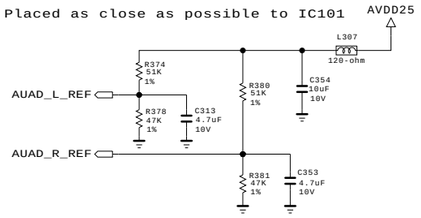


C331 option
- TU_IntDemod_IF_22p -> EU/AJ All_IndDemod, US/KR/BR/TW/CO 2tuner All
- TU_IntDemod_IF_15p -> US/KR/BR/TW/CO 1tuner All

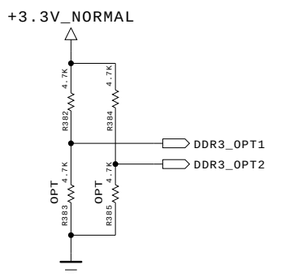
AUDIO IN



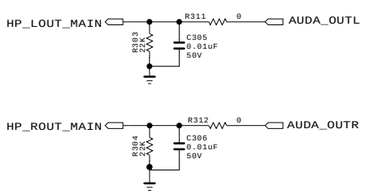
Placed as close as possible to IC101

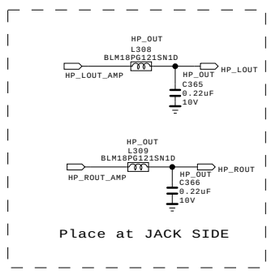


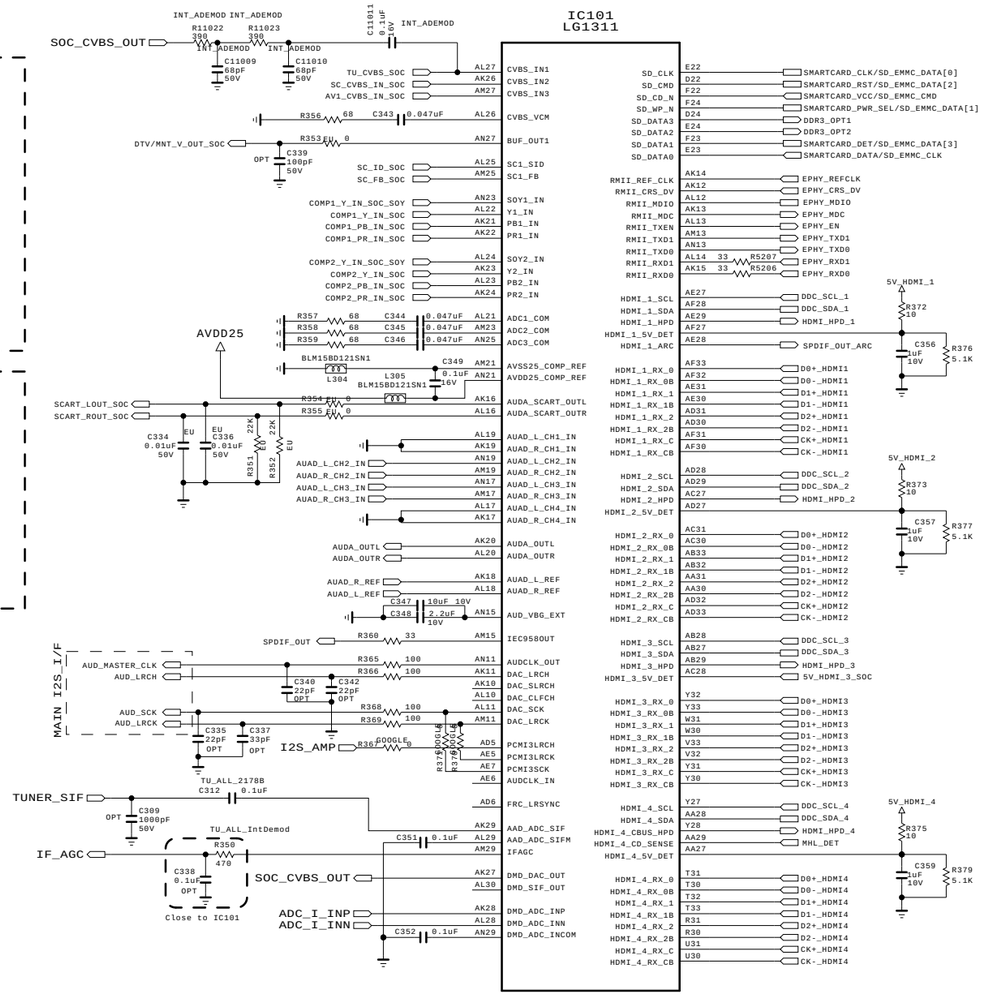
DDR3 VENDOR OPTION

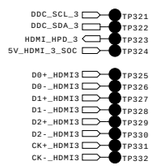


AUDIO OUT









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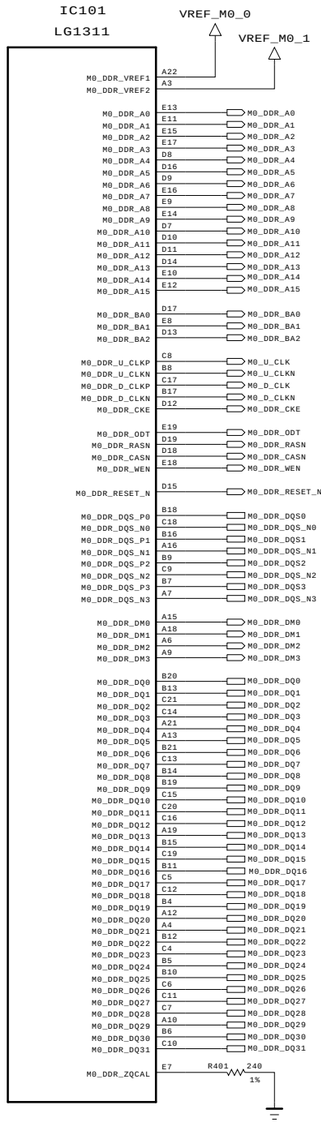
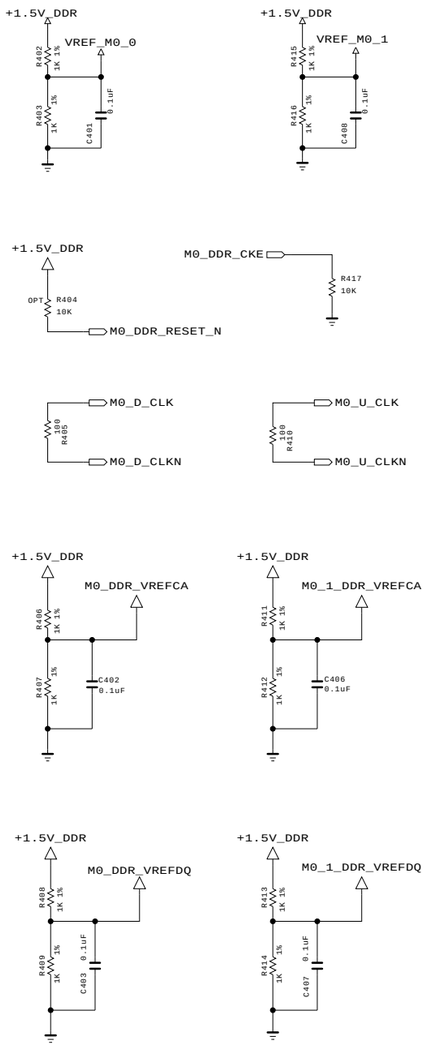
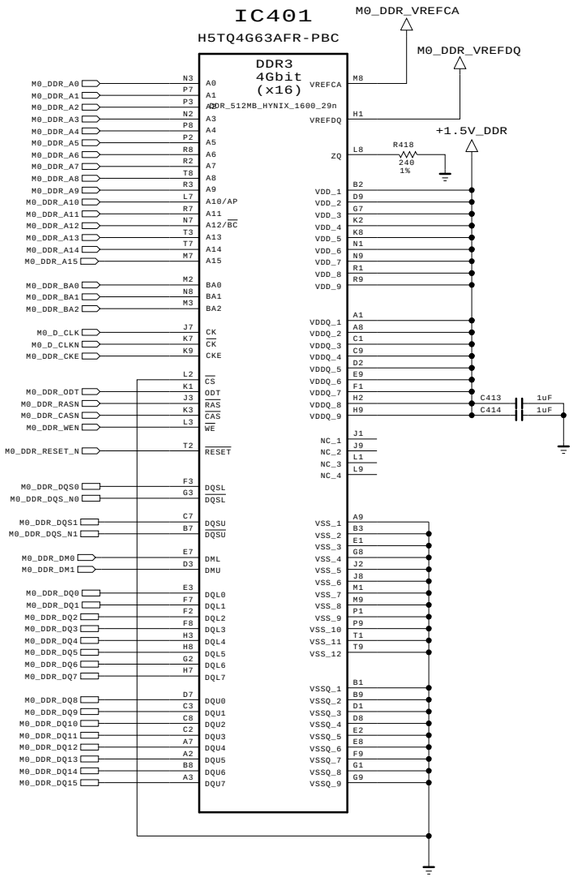
LG ELECTRONICS

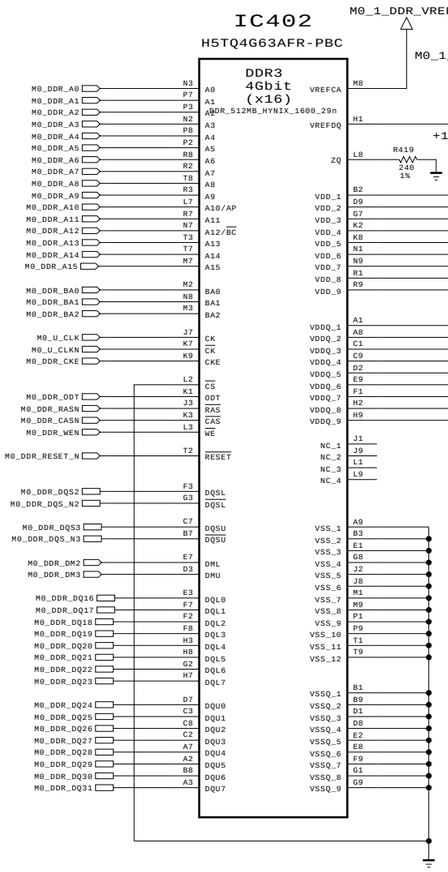
MODEL	MID_LG1311	DATE	2013.04.04
BLOCK	M14 Symbol C	SHEET	3 / 31

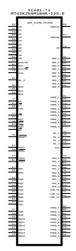
M14-A\ In/Out

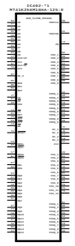












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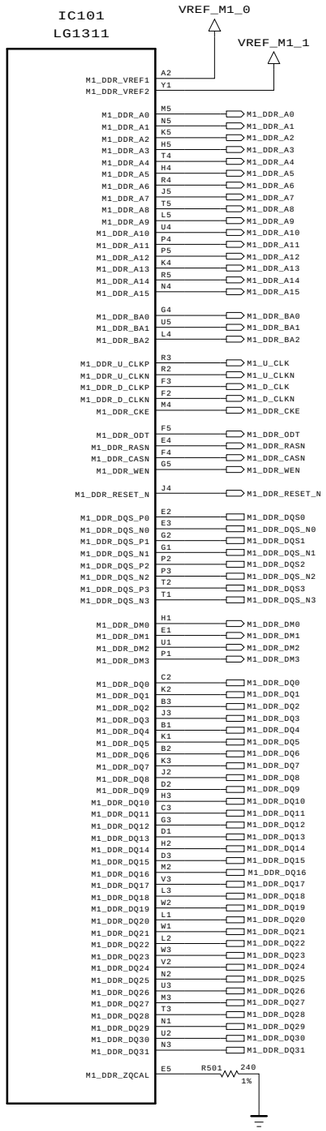
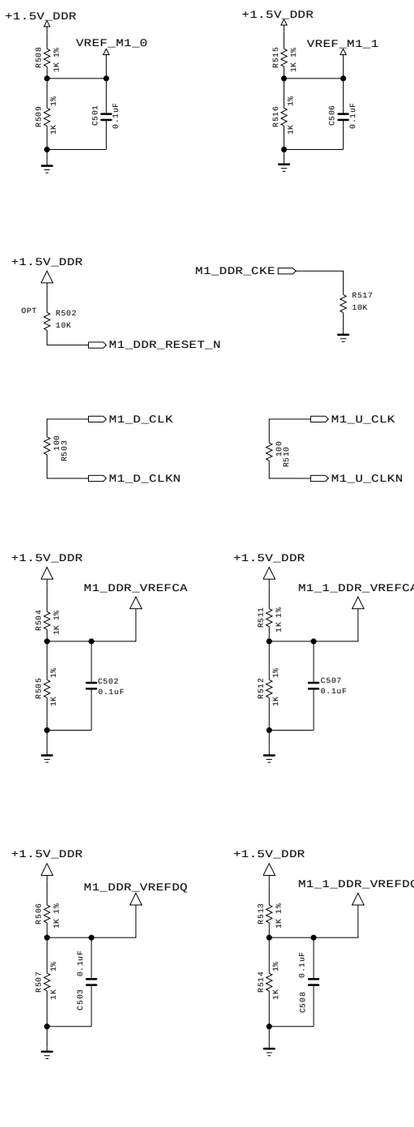
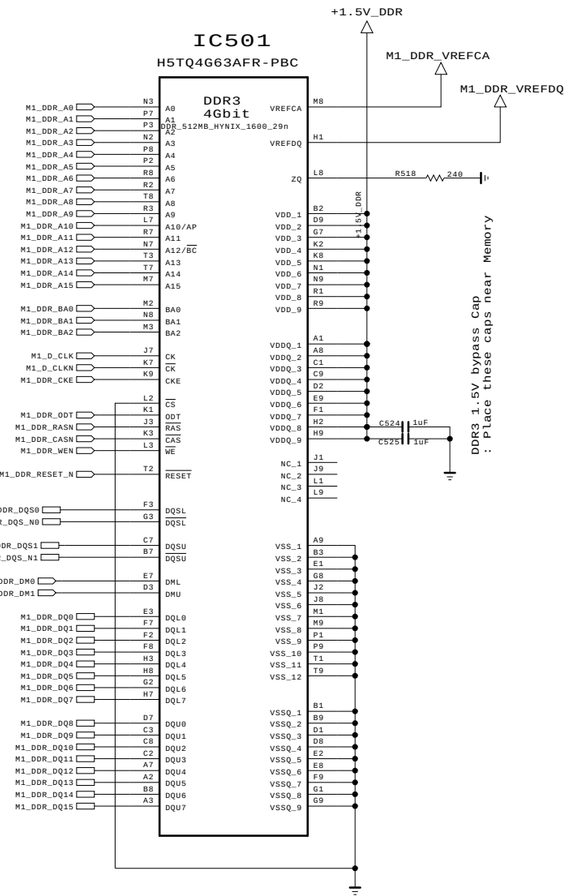
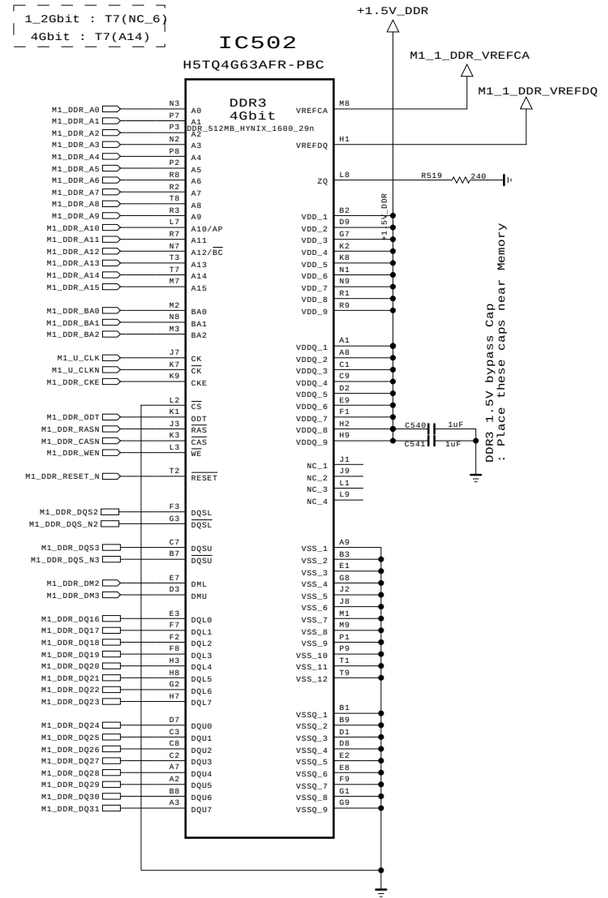
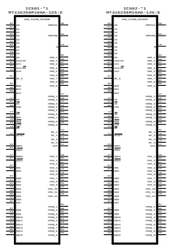
MODEL	MID_LG1311	DATE	2013.04.04
BLOCK	M14 DDR3-M0	SHEET	4 / 31

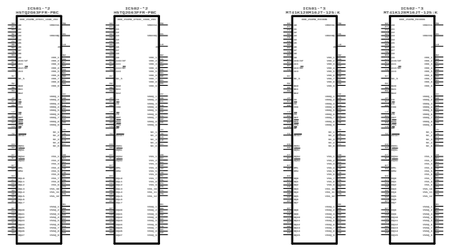










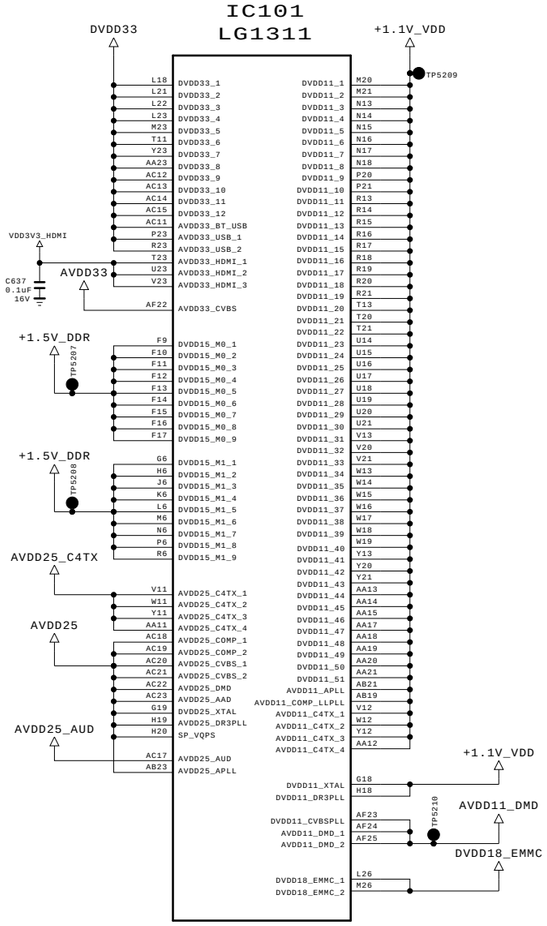


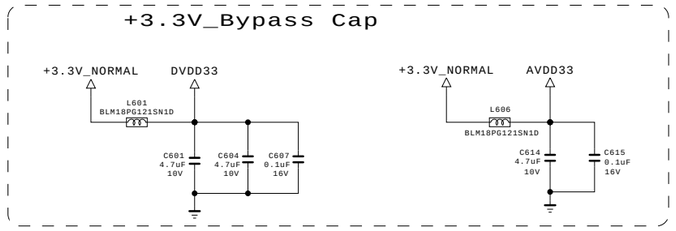
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

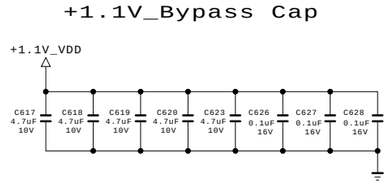
SECRET
LGElectronics

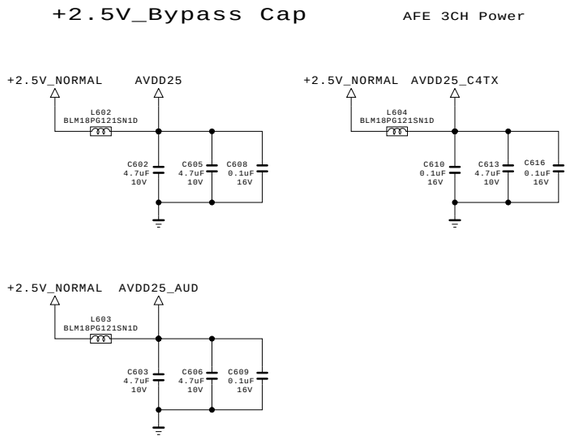
LG ELECTRONICS

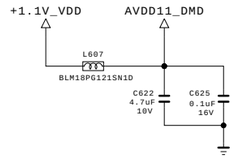
MODEL	MID_LG1311	DATE	2013.04.04
BLOCK	M14 DDR3-M1	SHEET	5 / 31

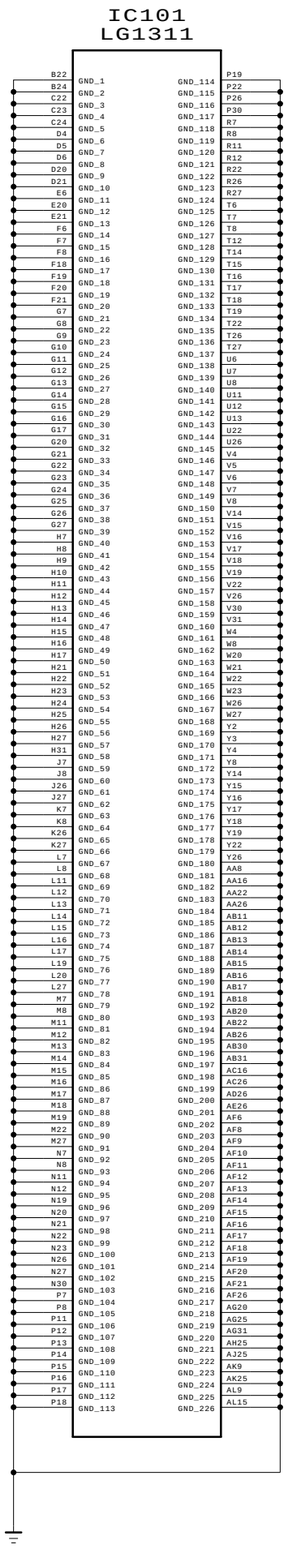


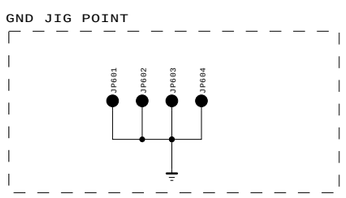












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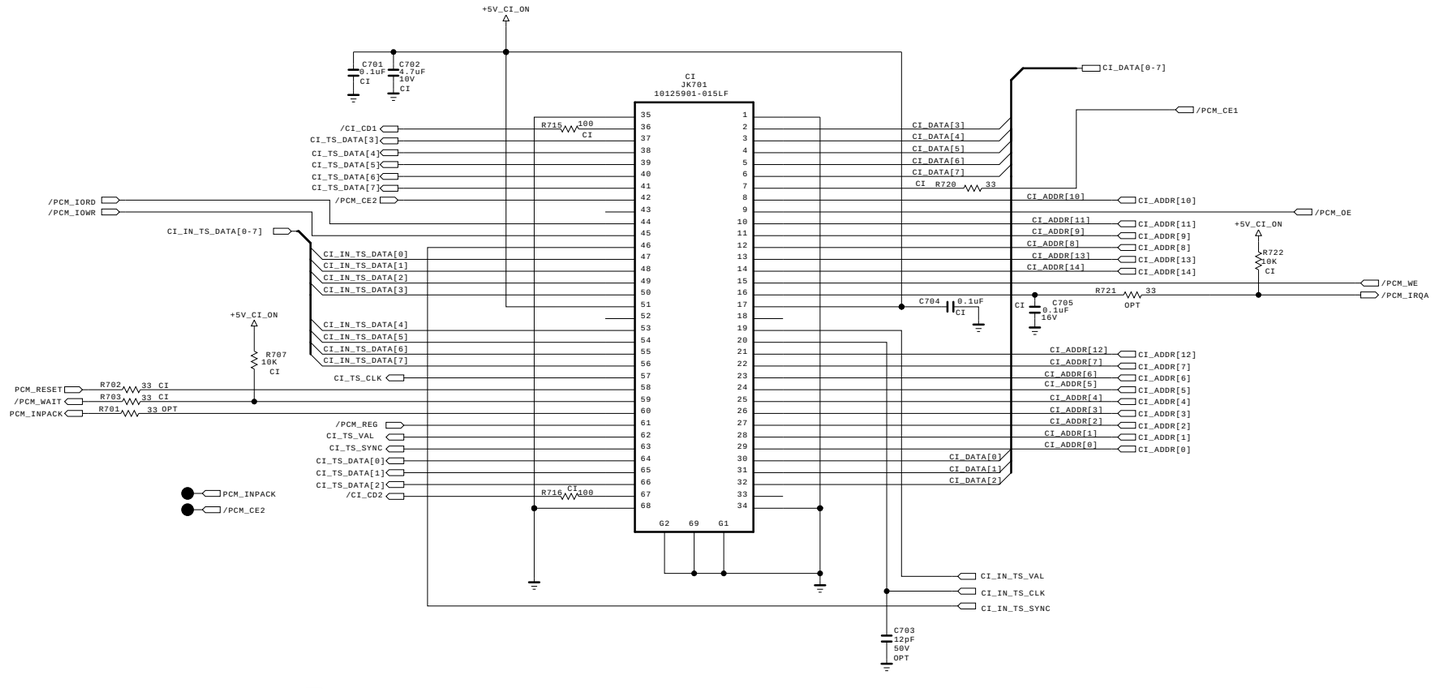
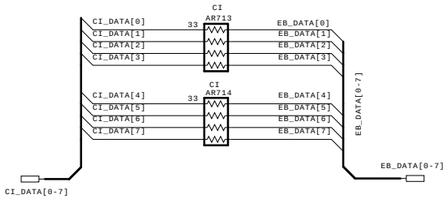
SECRET
LGElectronics

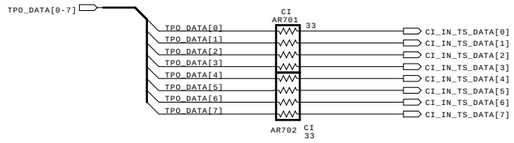
LG ELECTRONICS

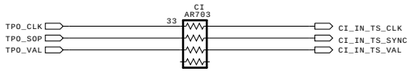
MODEL	MID_LG1311	DATE	2013.04.04
BLOCK	VCC & GND	SHEET	6 / 31

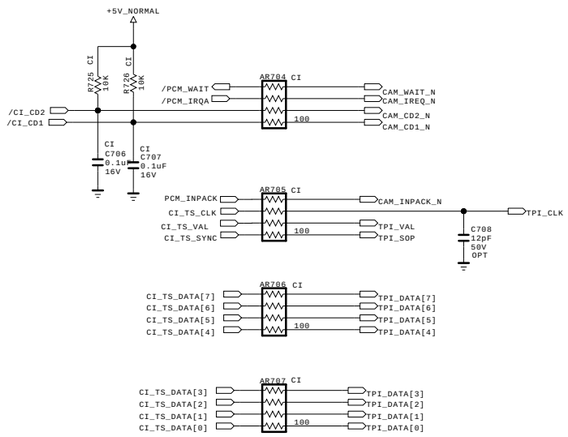
11/05/31

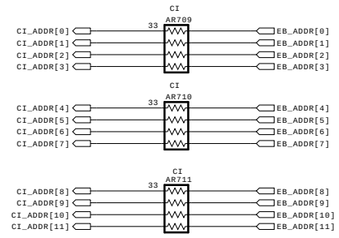


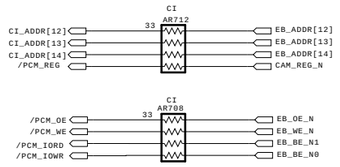












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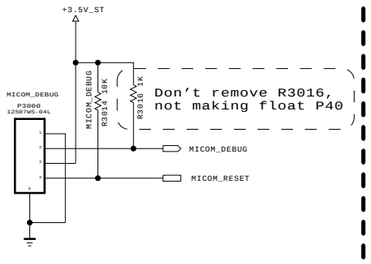
SECRET
LGElectronics

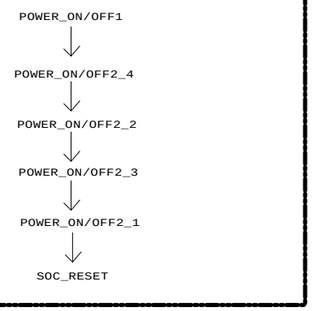
LG ELECTRONICS

MODEL	MID_LG1311	DATE	2013.03.22
BLOCK	PCMCIA	SHEET	7 / 31

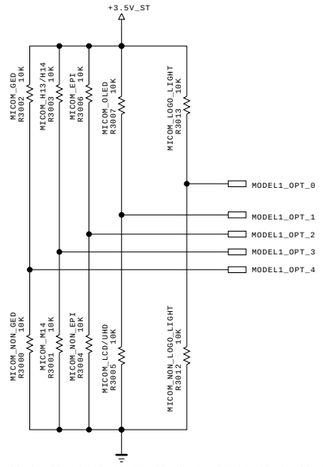
For Debug



M14 Power SEQUENCE

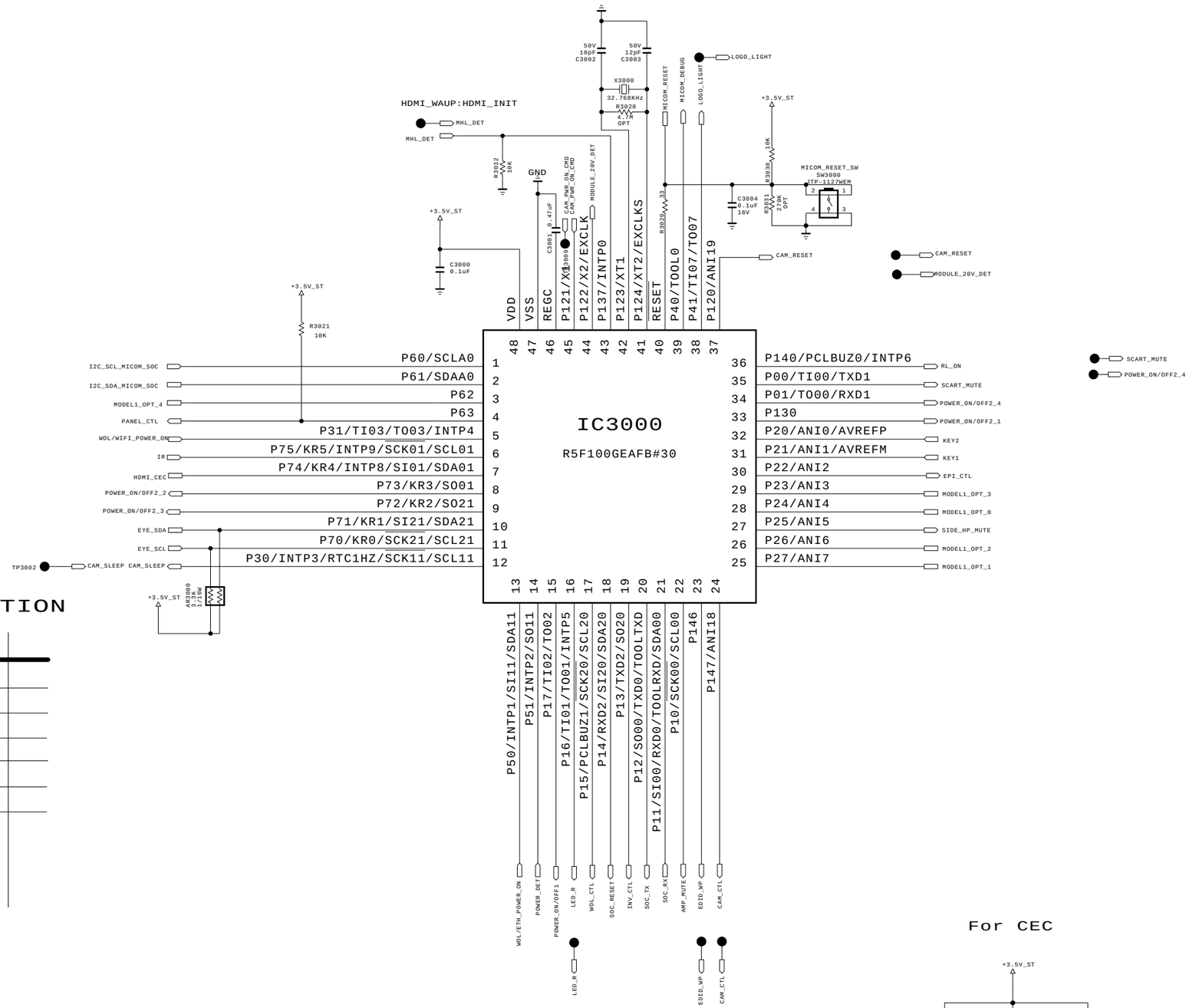


MICOM MODEL OPTION

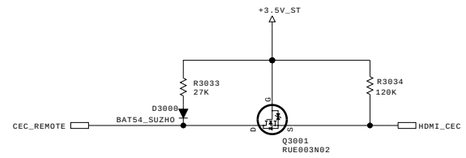


MICOM MODEL OPTION

	0	1	
MODEL_OPT_0	NON LOGO	LOGO	
MODEL_OPT_1	LCD/UHD	OLED	
MODEL_OPT_2	NON_EPI	EPI	
MODEL_OPT_3	M14	H13/H14	
MODEL_OPT_4	NON_GED	GED	



For CEC



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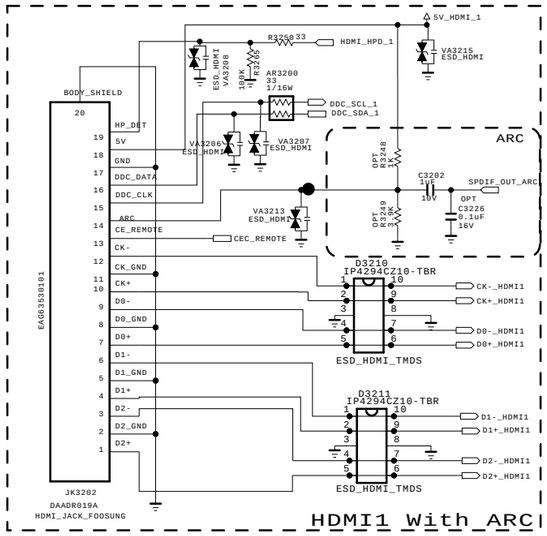
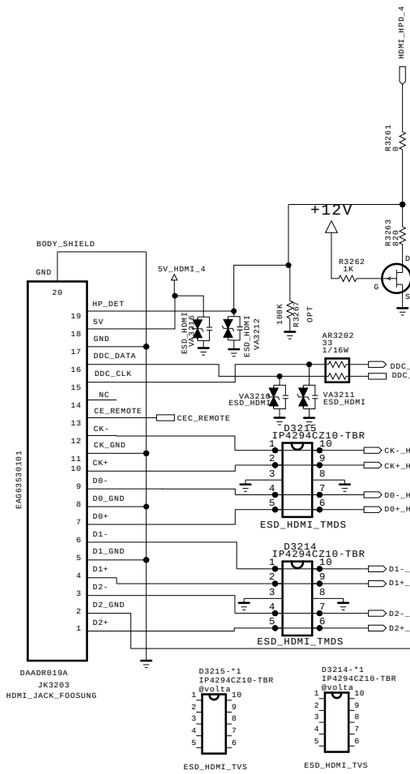
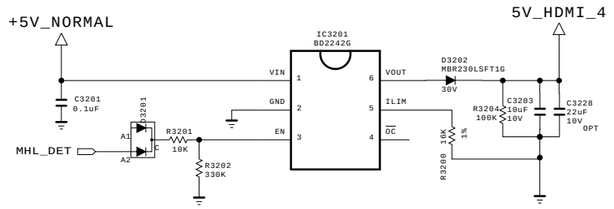
SECRET
LGElectronics

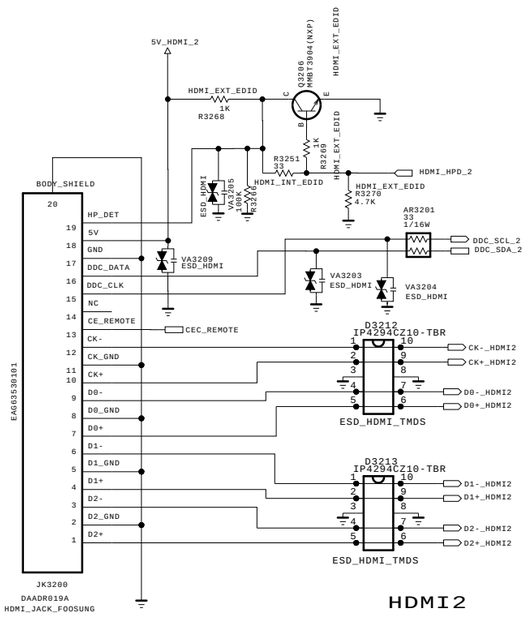
LG ELECTRONICS

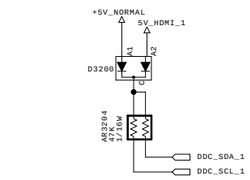
MODEL	MID_LG1311	DATE	2013.03.22
BLOCK	MICOM	SHEET	9 / 31

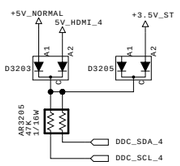


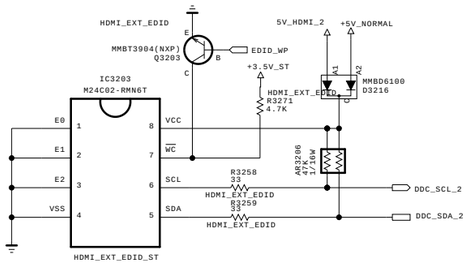


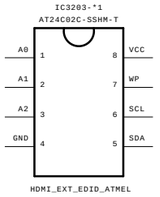


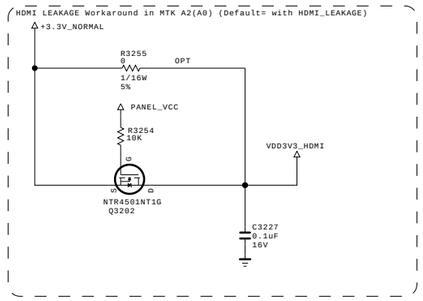












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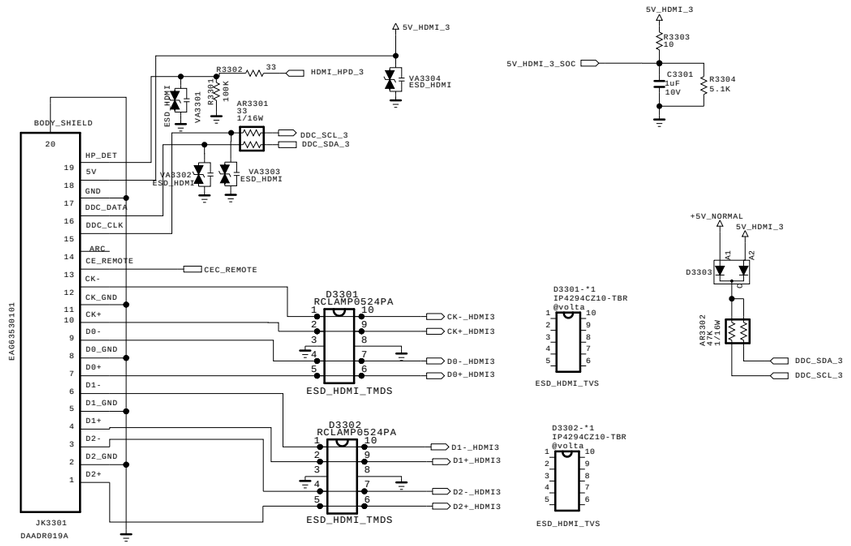
SECRET
LGElectronics

LG ELECTRONICS

MODEL	MID_LG1311	DATE	2013.03.22
BLOCK	HDMI	SHEET	32

LGE Internal Use Only

This Ciruit is used as HDMI Input2 of LB87 Series over(HDMI 4ea)



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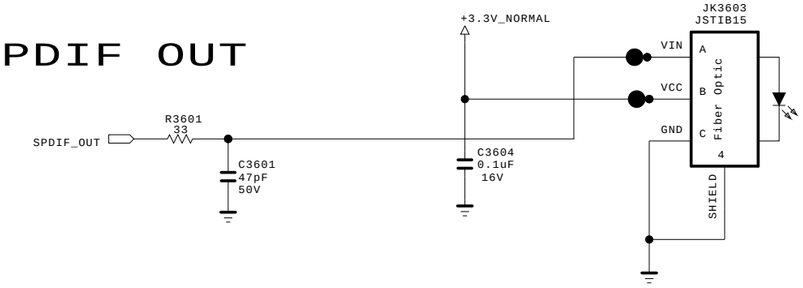
SECRET

LGElectronics

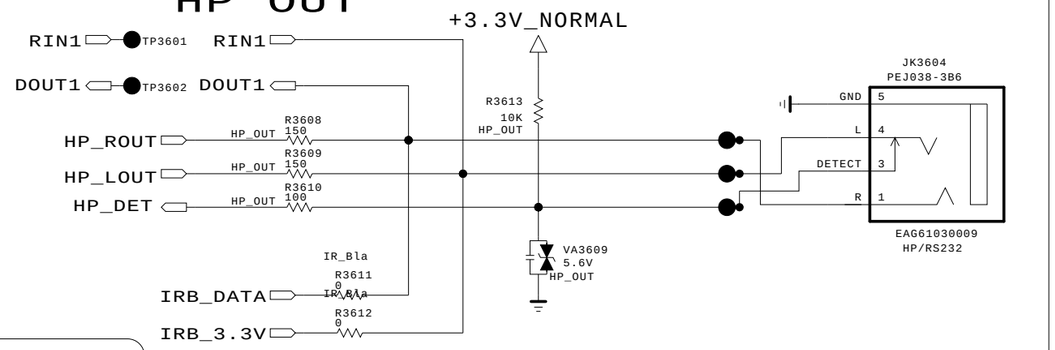
LG ELECTRONICS

MODEL	MID_LG1311	DATE	2013.07.25
BLOCK	HDMI4	SHEET	33 /

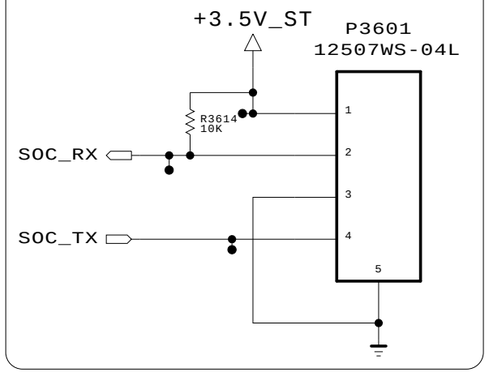
SPDIF OUT



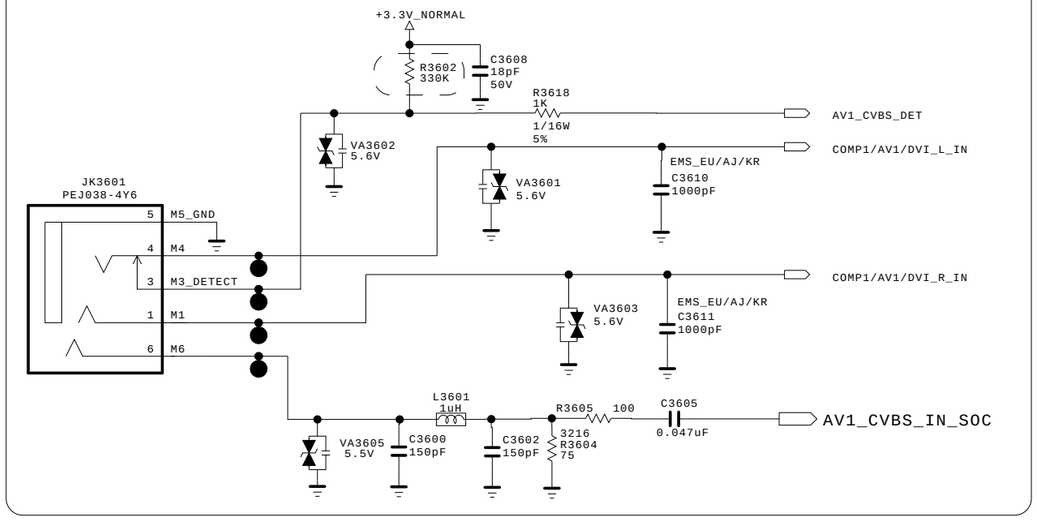
HP OUT



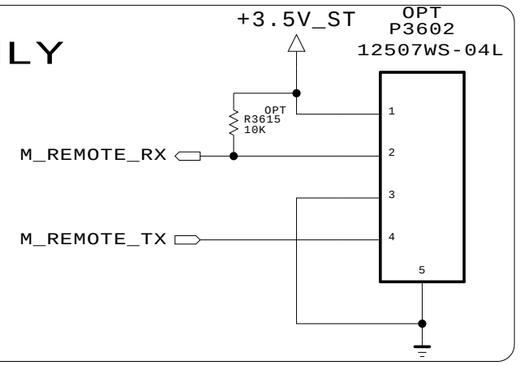
UART FOR DEBUG



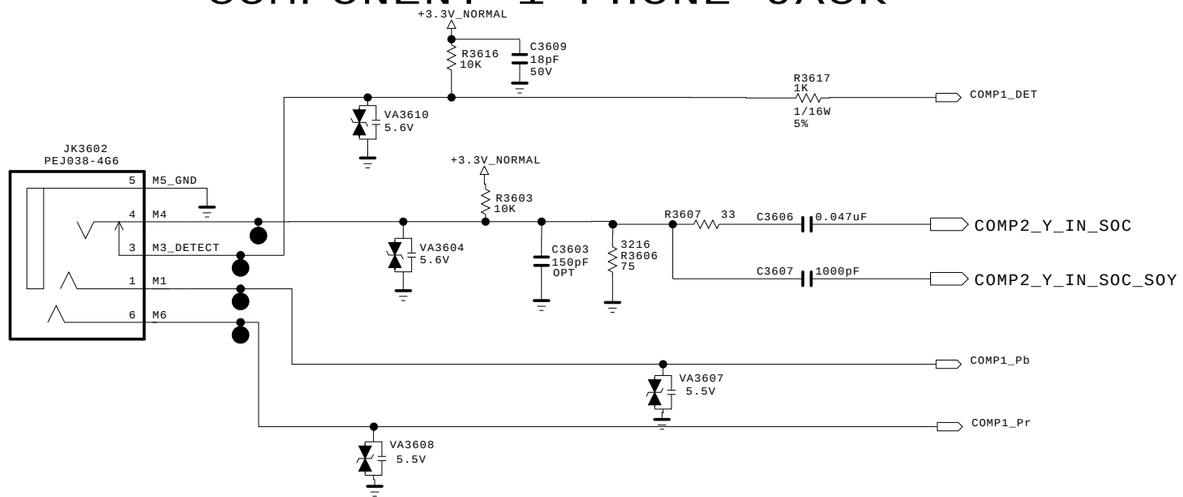
CVBS 1 PHONE JACK



DDTS TEST ONLY



COMPONENT 1 PHONE JACK



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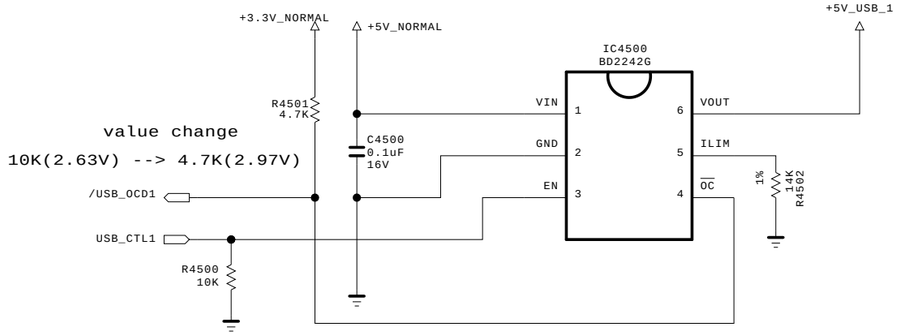
SECRET

LGElectronics

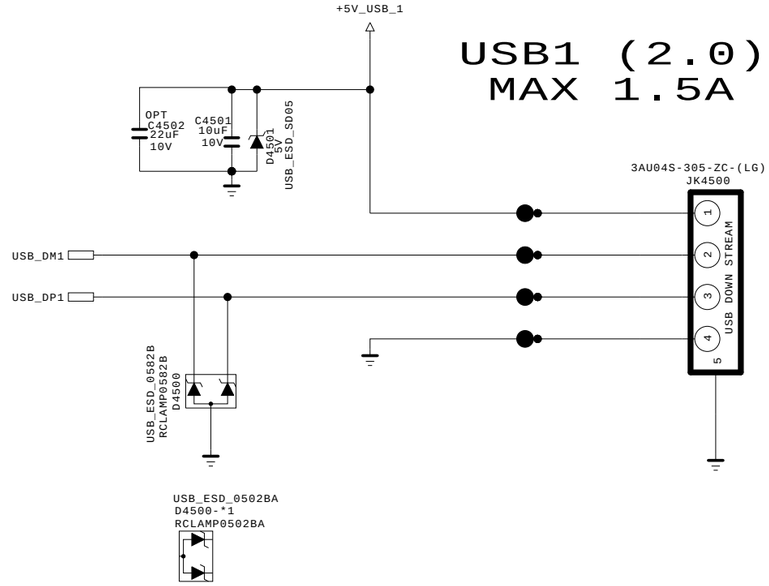
LG ELECTRONICS

MODEL	MID_LG1311	DATE	2013.04.03
BLOCK	Vertical_Common	SHEET	11 / 31

OCP USB1



USB1 (2.0) MAX 1.5A



EAX6536390* : Use RClamp0582B, SD05
EAX6538400* : Use RClamp0502BA

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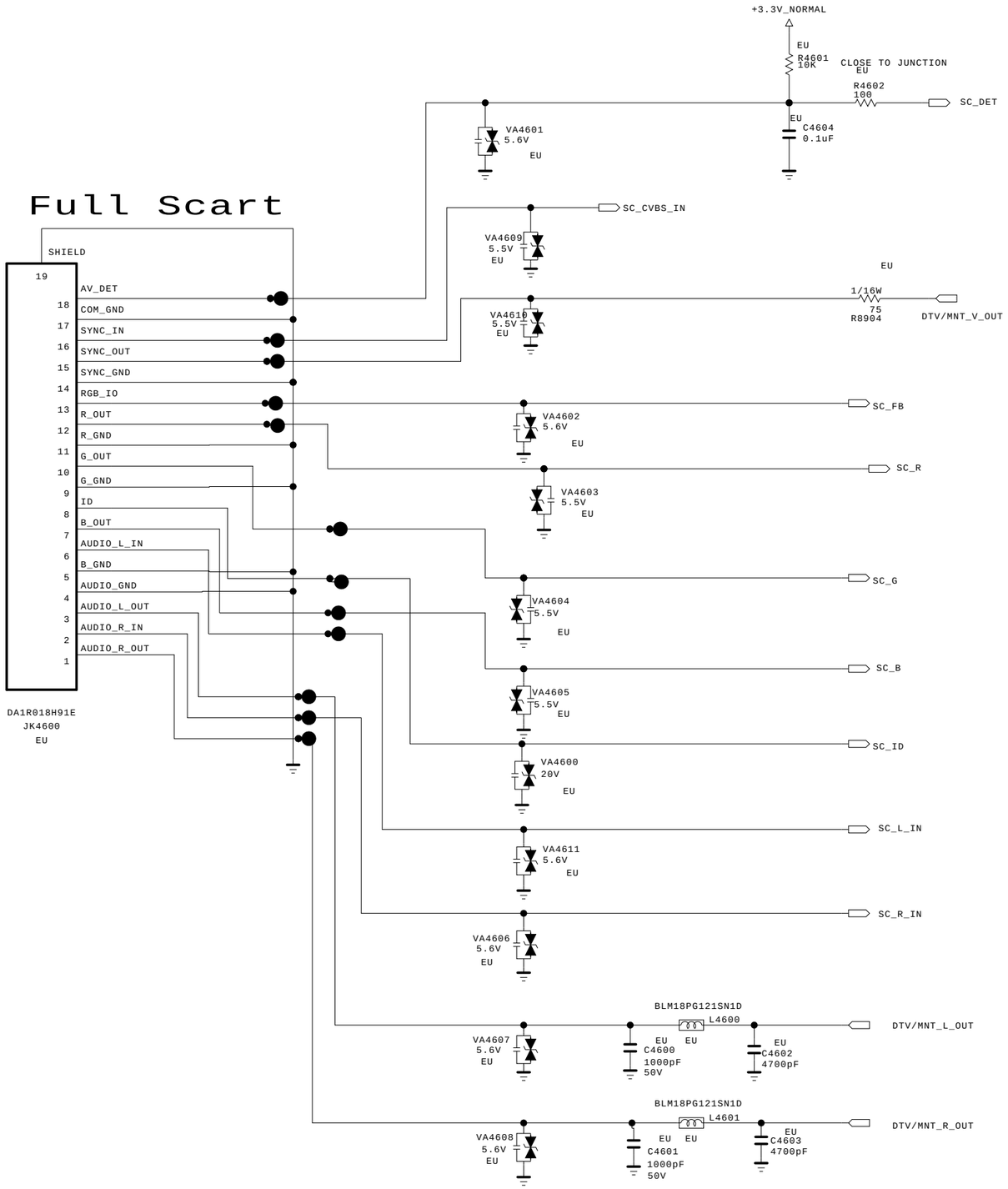
SECRET
LGElectronics

LG ELECTRONICS

MODEL	MID_LG1311	DATE	2013.04.03
BLOCK	USB 1(DVR)	SHEET	1 /



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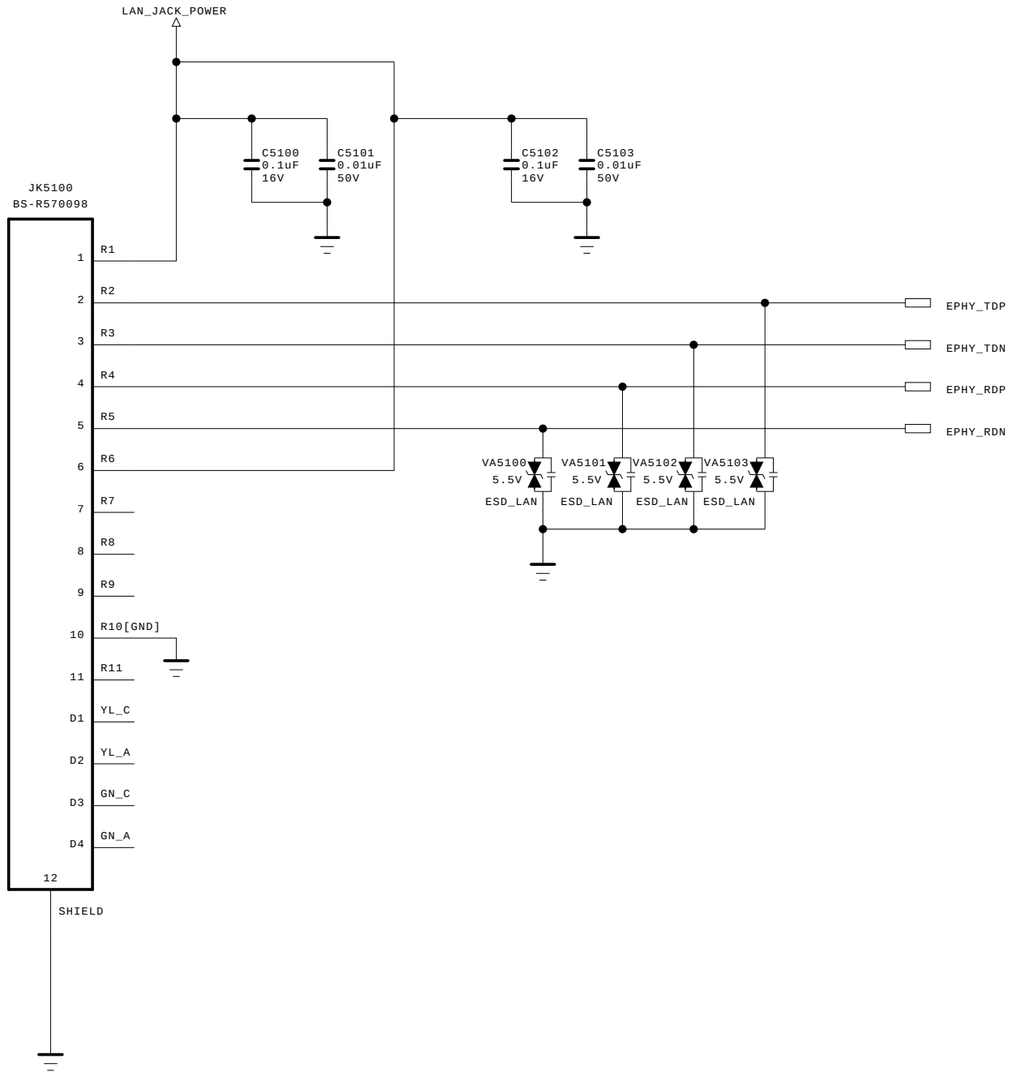
SECRET

LGElectronics

LG ELECTRONICS

MODEL		DATE	
BLOCK		SHEET	/

Ethernet Block



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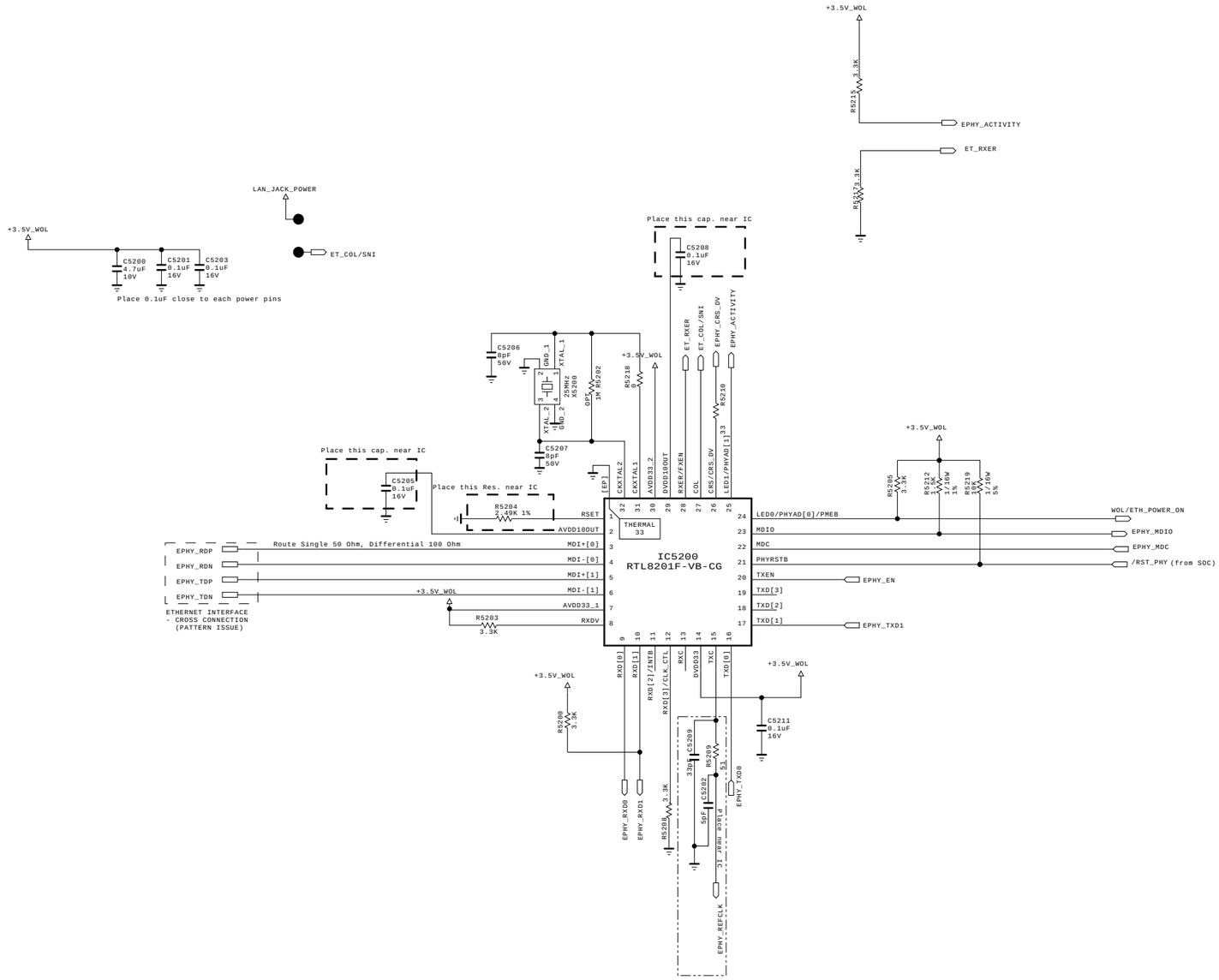
SECRET

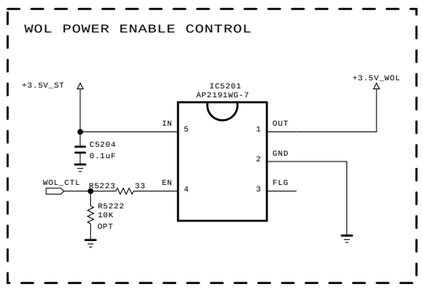
LGElectronics

LG ELECTRONICS

MODEL		DATE	
BLOCK		SHEET	/

Ethernet Block





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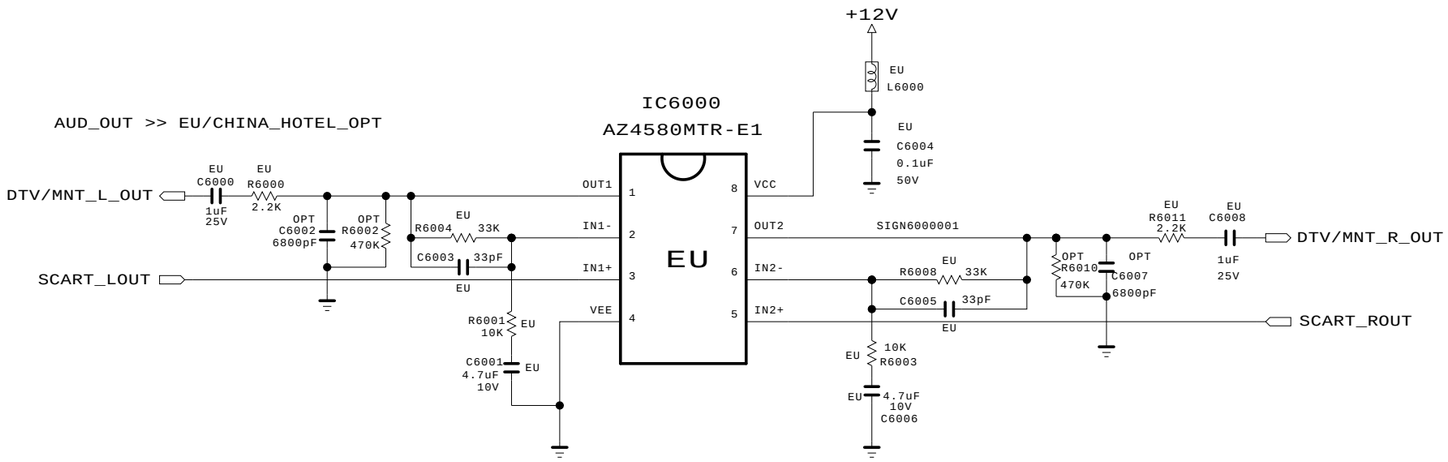
LGElectronics

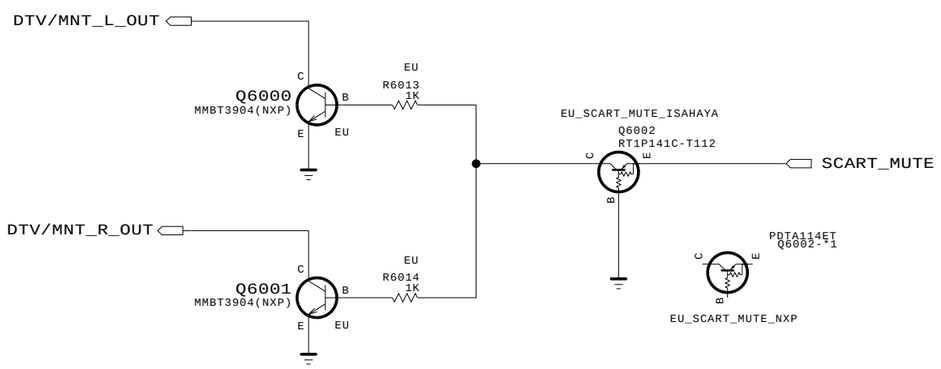
LG ELECTRONICS

BSD-NC4_H052-HD

MODEL		DATE	2012-09-12
BLOCK	ETHERNET	SHEET	/



[SCART AUDIO MUTE]



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SECRET

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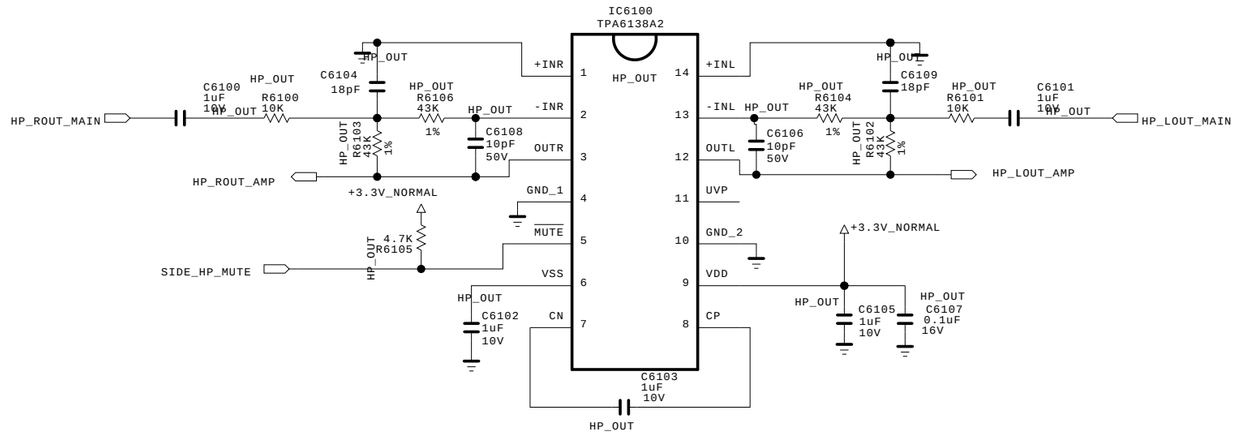
LG ELECTRONICS

MODEL	MID_MAIN	DATE	2013.03.19
BLOCK	SCART AMP	SHEET	3 / 25

EARPHONE AMP



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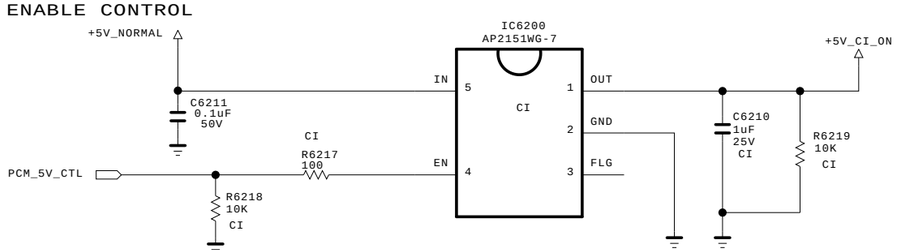
LG ELECTRONICS

MODEL	HEADPHONE AMP	DATE	2011.09.29
BLOCK		SHEET	61

CI POWER ENABLE CONTROL



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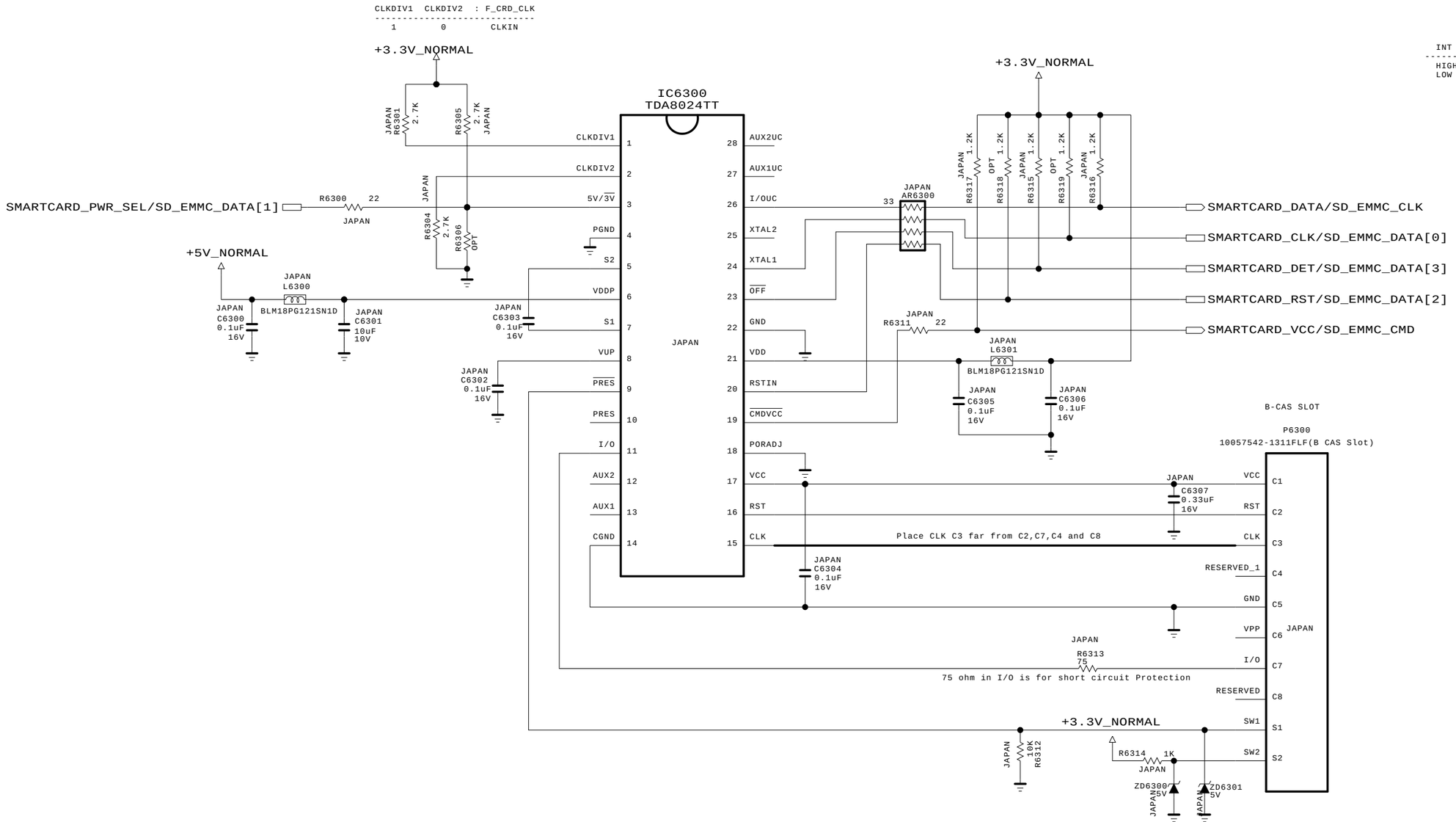
MODEL		DATE	
BLOCK		SHEET	/

B-CAS (SMART CARD) INTERFACE



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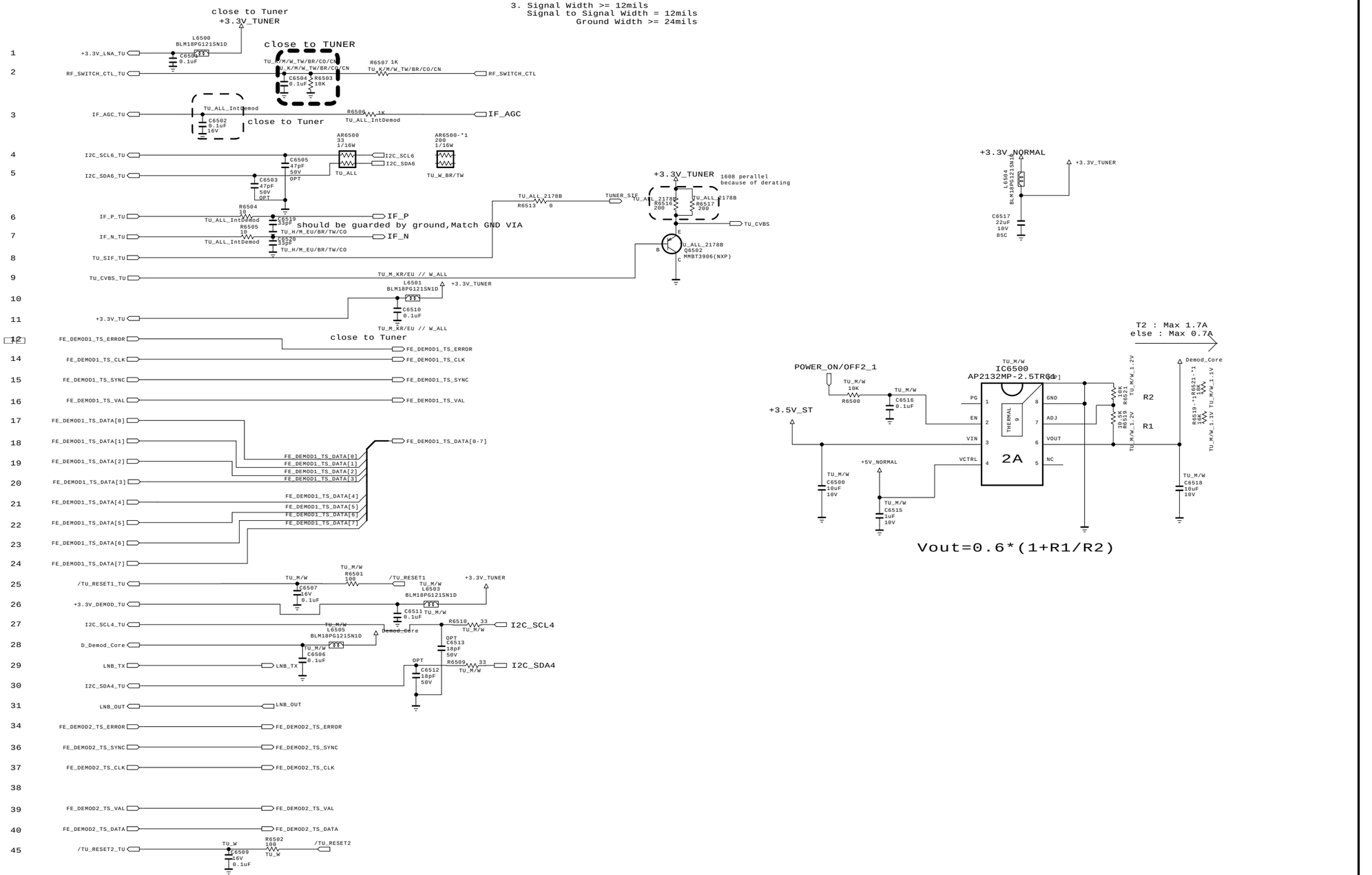
MODEL	MID_LG1311	DATE	2013.04.03
BLOCK	B-CAS I/F	SHEET	/

Global F/E Option Name
1. TU
2. Tuner Name = TDJ'H',TDj'M'...
3. Country Name = KR,US,BR,EU ...

Example of Option name
TU_ALL_IntDemod = All Tuner type for Internal demod
TU_M/W = apply TDSM&TDSW Type Tuner

14' Tuner Type for Global
TDJ'H'-G101D : Half NIM for EU,AJJA
TDJ'H'-H101F : Half NIM for US, KR
TDJ'K'-T101F : Half NIM for TW
TDJ'M'-C301D,F : FULL NIM for China
TDJ'M'-B101F : Brazil NIM with Isolater Type
TDJ'M'-K101F : colombia NIM
TDJ'M'-G101D,G105D,G151D : EU Combo&Full NIM
TDJ'M'-H101F,H151F : Korea PIP tuner
TDJ'W'-A151D : AJJA T2 PIP

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



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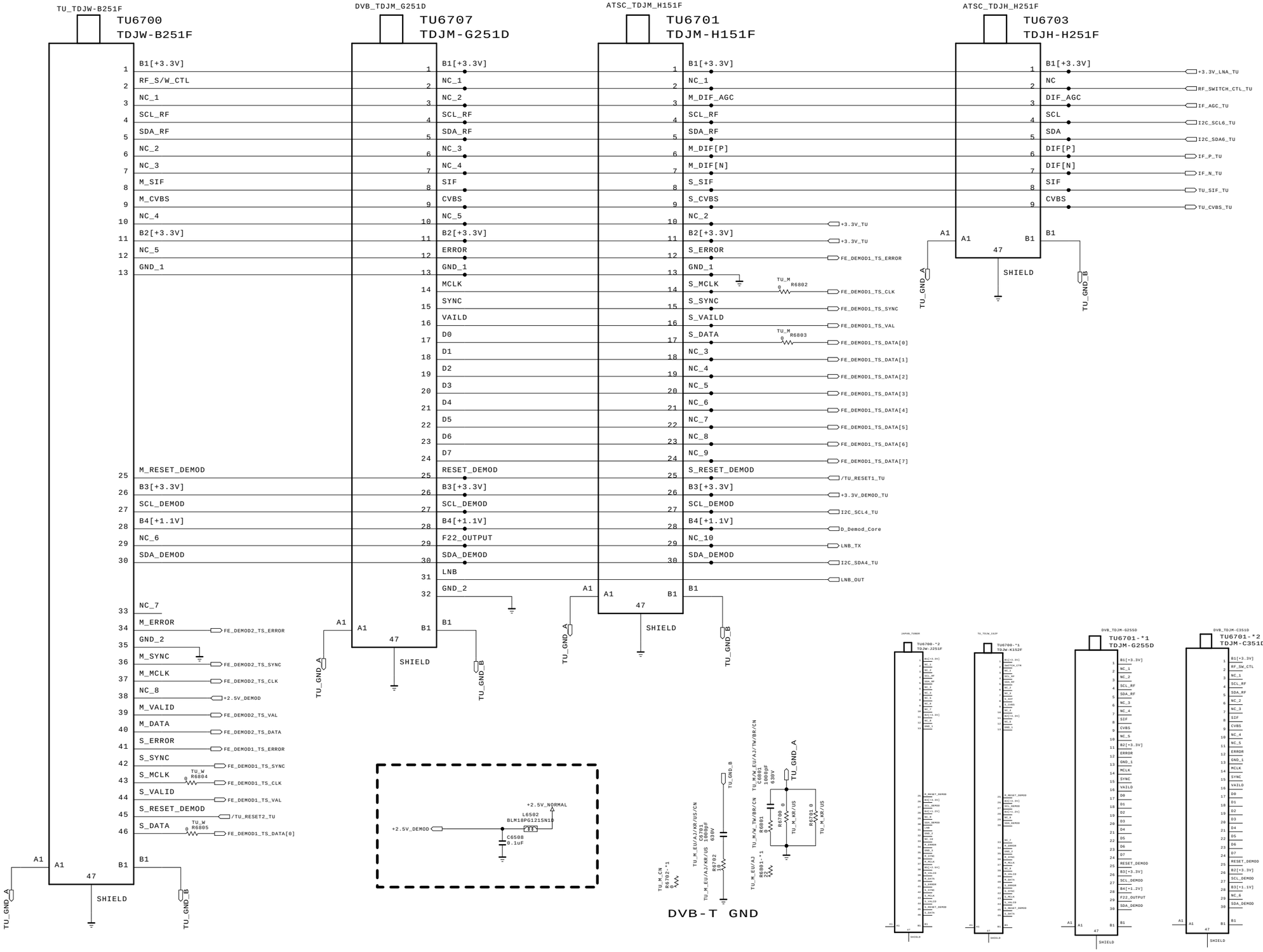
LG ELECTRONICS

MODEL	TUNER	DATE	2012.07.10
BLOCK		SHEET	65

LGE Internal Use Only



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LG ELECTRONICS

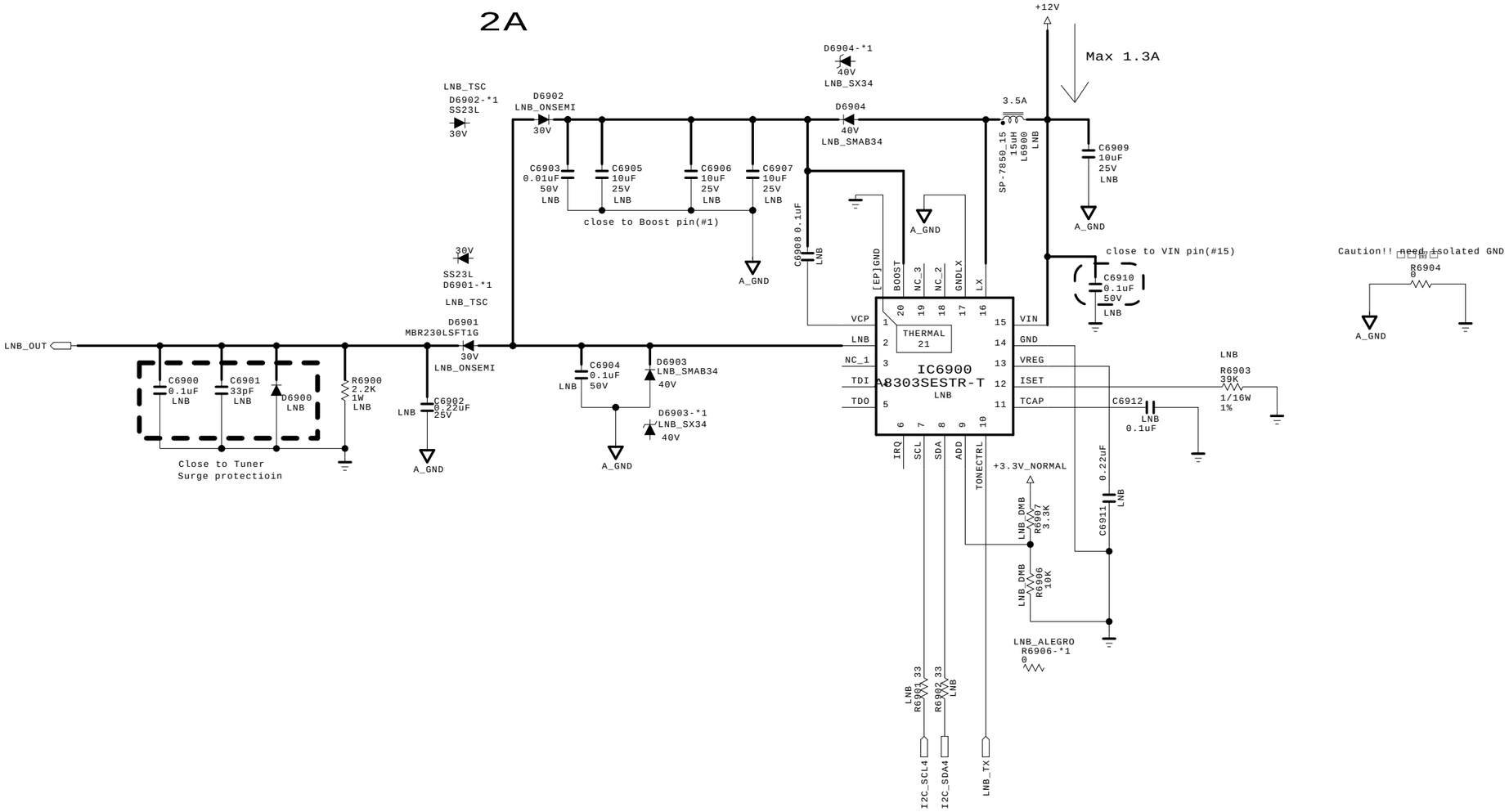
MODEL	TU_SYMBOL	DATE	2012.09.14
BLOCK		SHEET	/

DVB-S2 LNB Part Allegro

(Option:LNB)

3A

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



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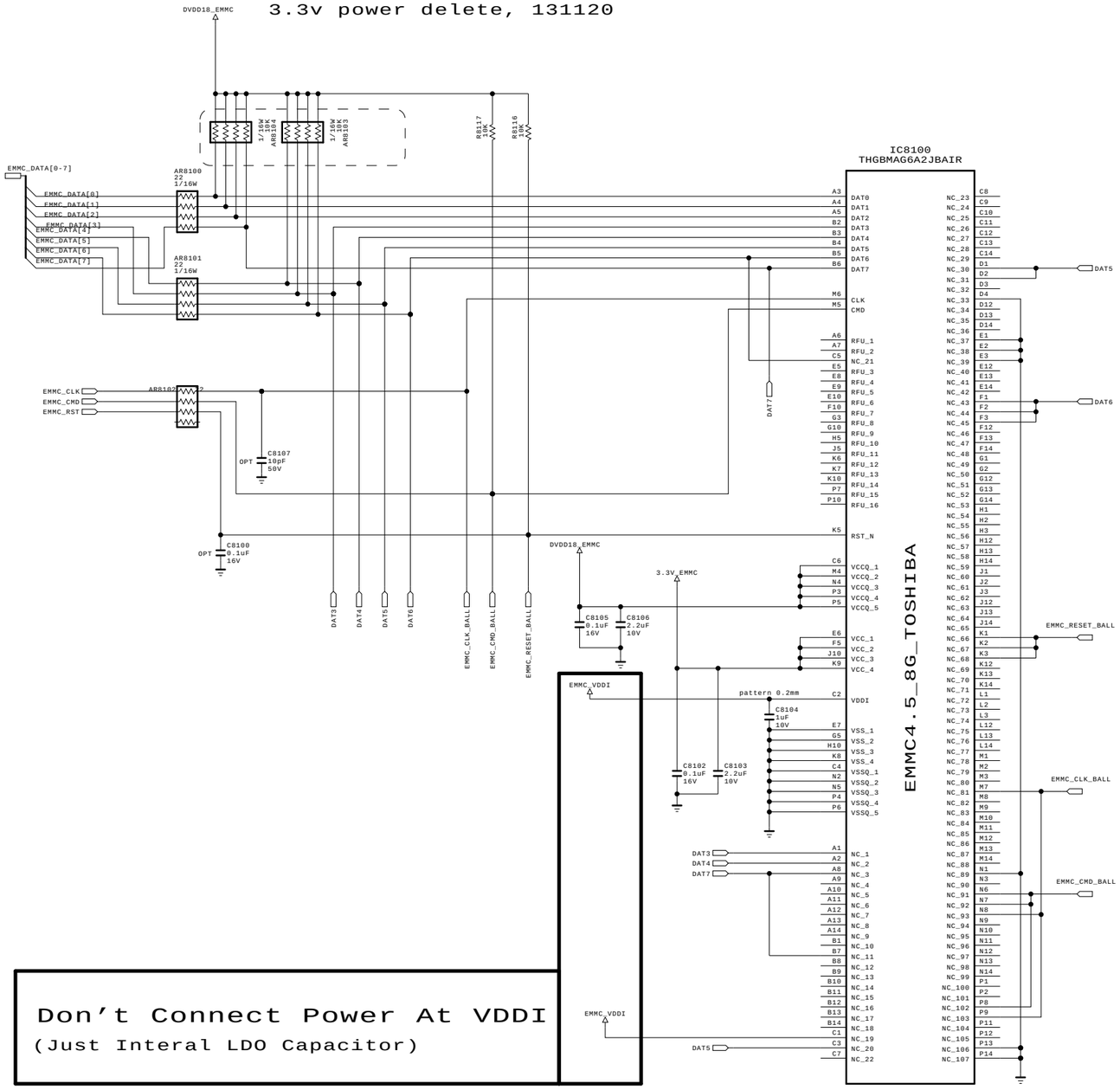
LG ELECTRONICS

MODEL	LNB	DATE	2012.03.08
BLOCK		SHEET	69

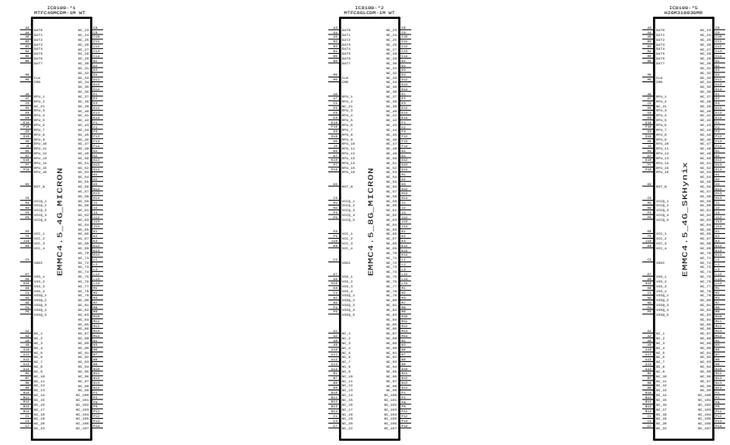
eMMC I/F

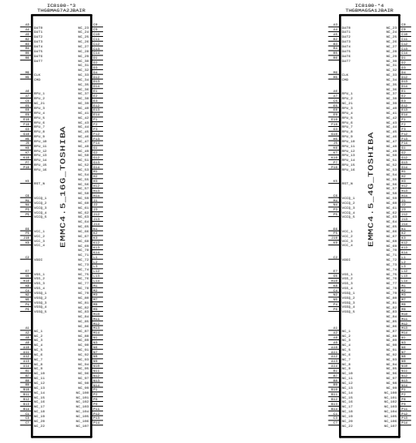
* A0 / A1 : Use EMMC_4.41
* B0 : Use EMMC_4.5
(130923_Jihwan Hyun)

3.3v power delete, 131120



Don’t Connect Power At VDDI
(Just Interal LDO Capacitor)





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LG ELECTRONICS

MODEL	eMMC	DATE	11.09.29
BLOCK		SHEET	81

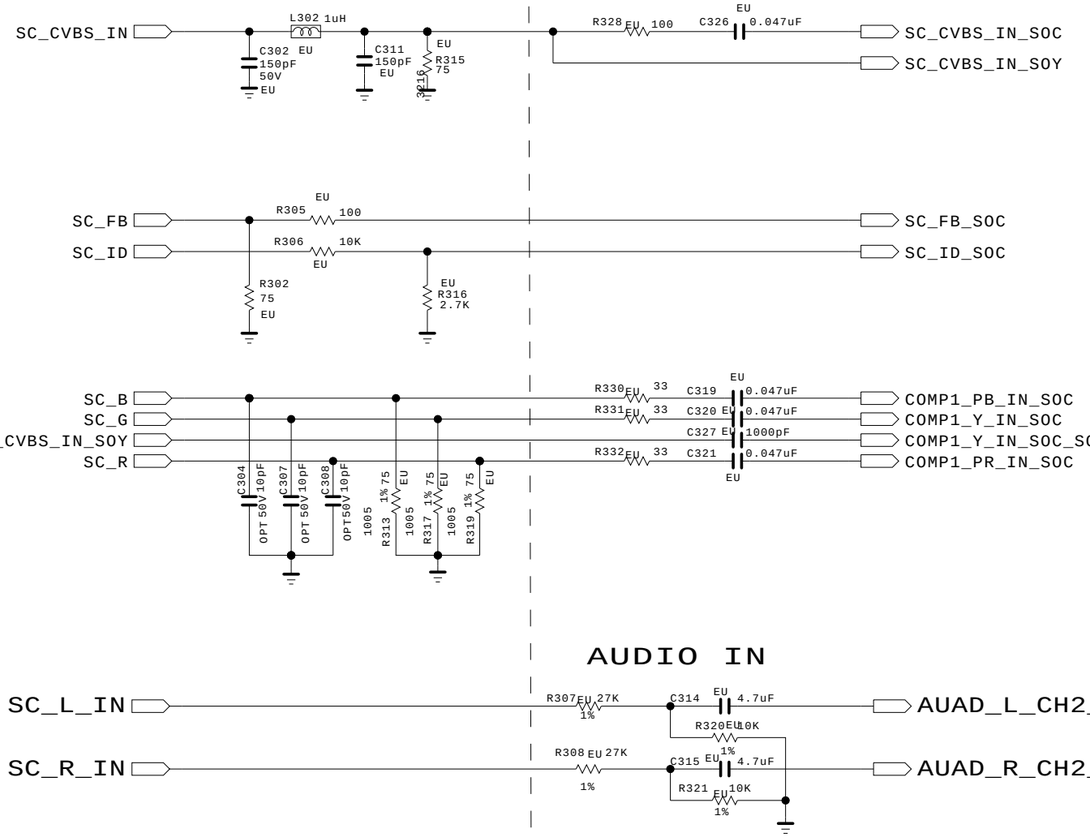
PLACE AT JACK SIDE

SCART SIGNAL

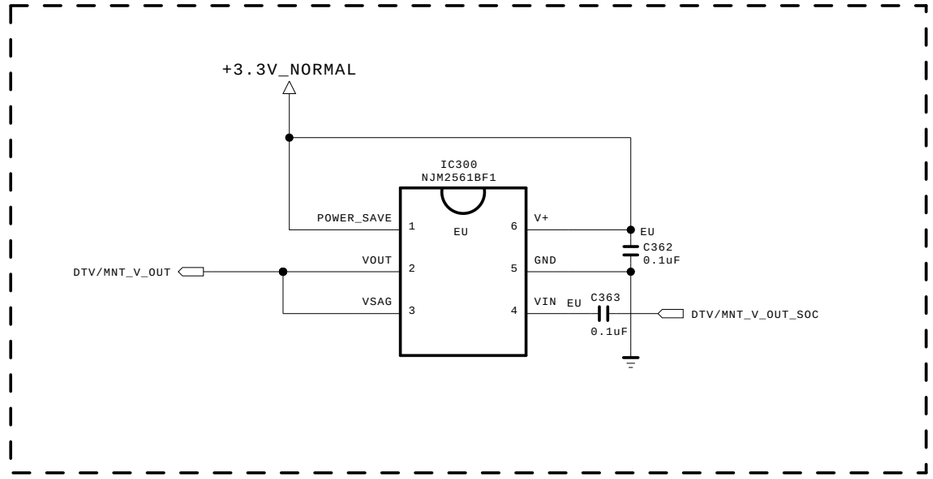
(Use only EU/CIS Model)

Place JACK Side

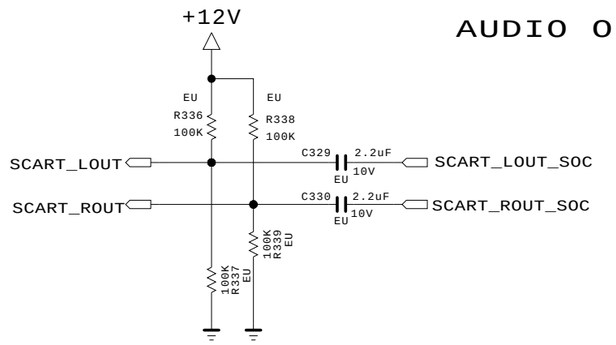
Place SOC Side



AUDIO IN



AUDIO OUT



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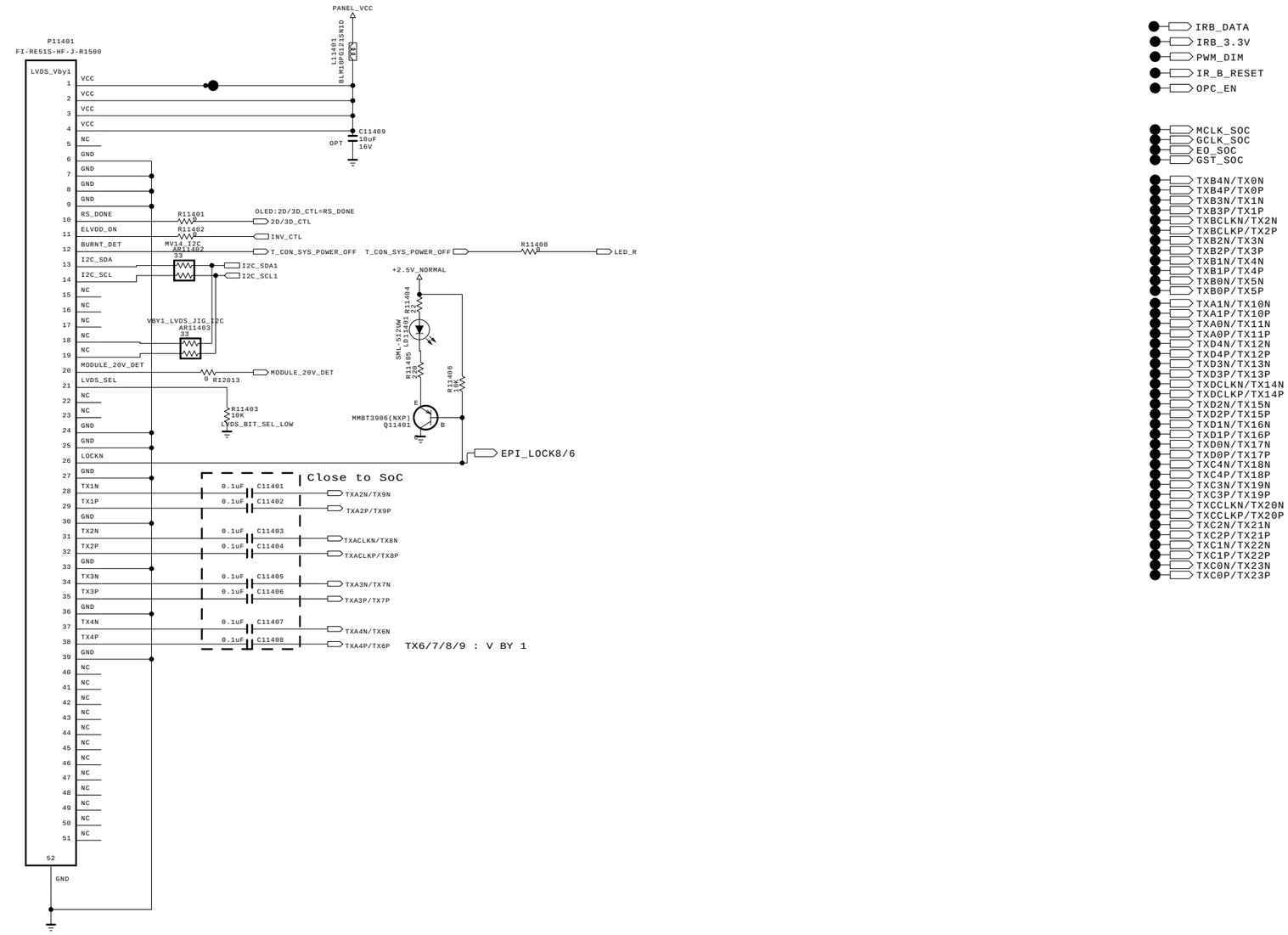
LG ELECTRONICS

MODEL		DATE	
BLOCK		SHEET	/

LGE Internal Use Only



EPI_CTL

IRB_DATA
IRB_3.3V
PWM_DIM
IR_B_RESET
OPC_EN

MCLK_SOC
GCLK_SOC
EO_SOC
GST_SOC

TXB4N/TX0N
TXB4P/TX0P
TXB3N/TX1N
TXB3P/TX1P
TXBCLKN/TX2N
TXBCLKP/TX2P
TXB2N/TX3N
TXB2P/TX3P
TXB1N/TX4N
TXB1P/TX4P
TXB0N/TX5N
TXB0P/TX5P

TXA1N/TX10N
TXA1P/TX10P
TXA0N/TX11N
TXA0P/TX11P
TXD4N/TX12N
TXD4P/TX12P
TXD3N/TX13N
TXD3P/TX13P
TXDCLKN/TX14N
TXDCLKP/TX14P
TXD2N/TX15N
TXD2P/TX15P
TXD1N/TX16N
TXD1P/TX16P
TXD0N/TX17N
TXD0P/TX17P
TXC4N/TX18N
TXC4P/TX18P
TXC3N/TX19N
TXC3P/TX19P
TXCCLKN/TX20N
TXCCLKP/TX20P
TXC2N/TX21N
TXC2P/TX21P
TXC1N/TX22N
TXC1P/TX22P
TXC0N/TX23N
TXC0P/TX23P

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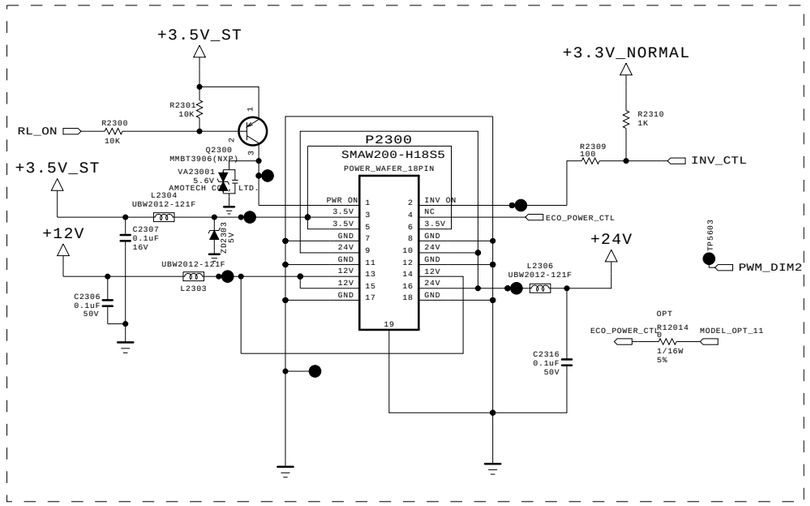
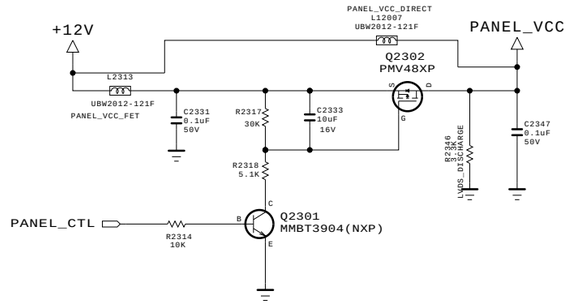
LG ELECTRONICS

BSD-NC4_H072-HD

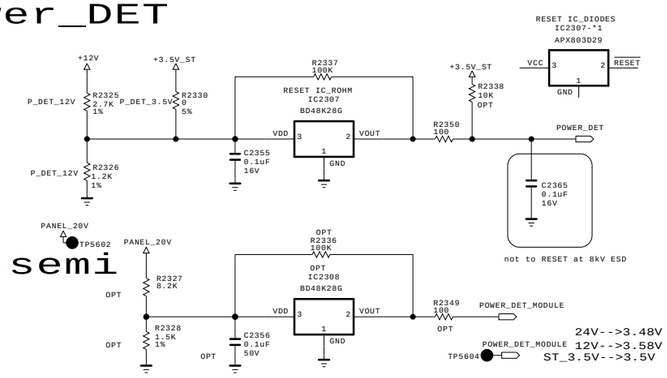
MODEL	MID_LG1311	DATE	2013.04.03
BLOCK	Vx1 LVDS INTERFACE	SHEET	/



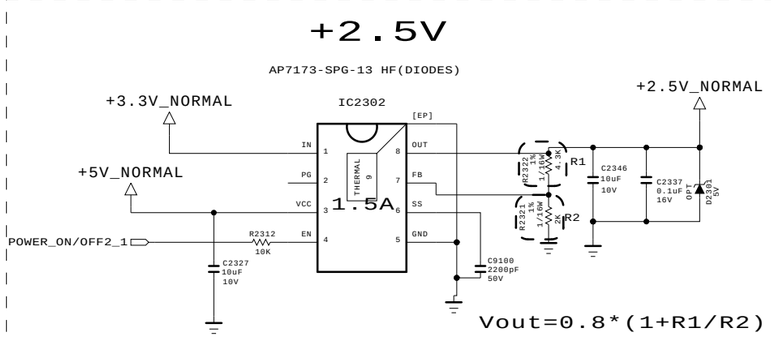
PANEL_POWER



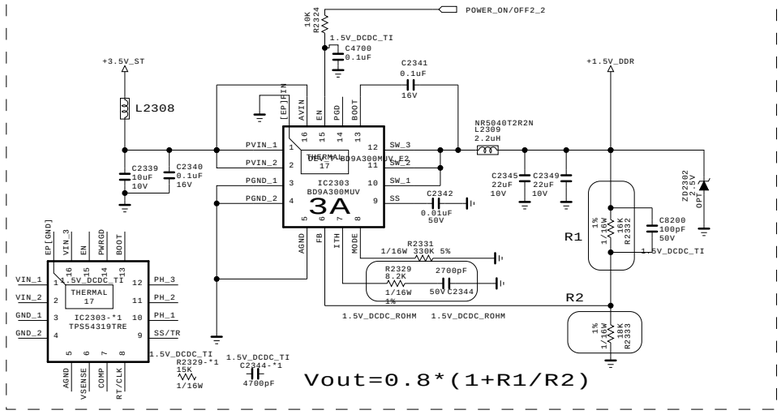
Power_DET



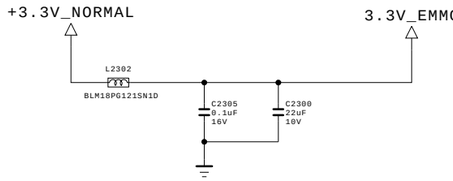
+2.5V



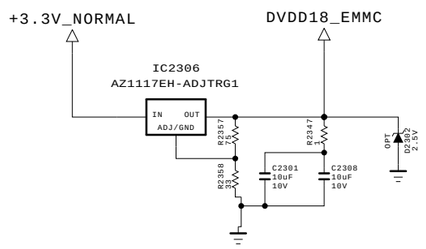
DDR MAIN 1.5V



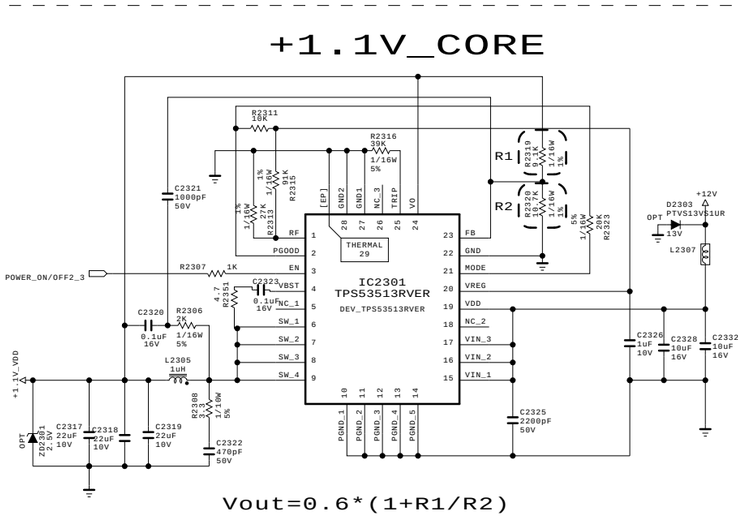
+3.3V - eMMC 4.41(LG1311-A0)



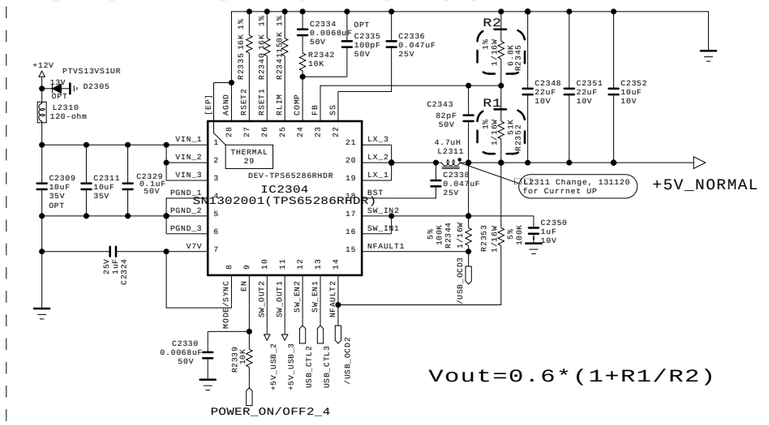
+1.8V - eMMC 4.51(LG1311-B0)



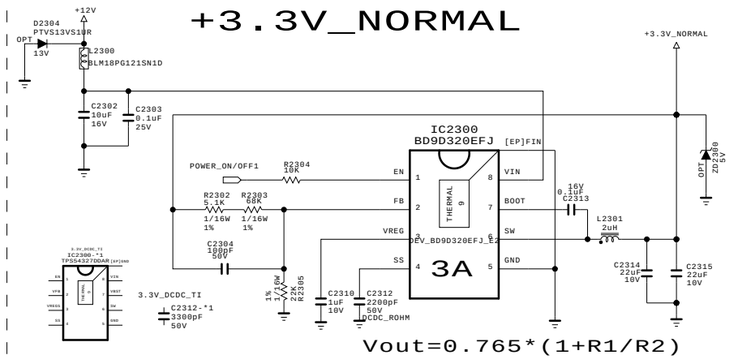
+1.1V_CORE



+5.0V normal & USB



+3.3V_NORMAL



POWER UP SEQUENCE

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

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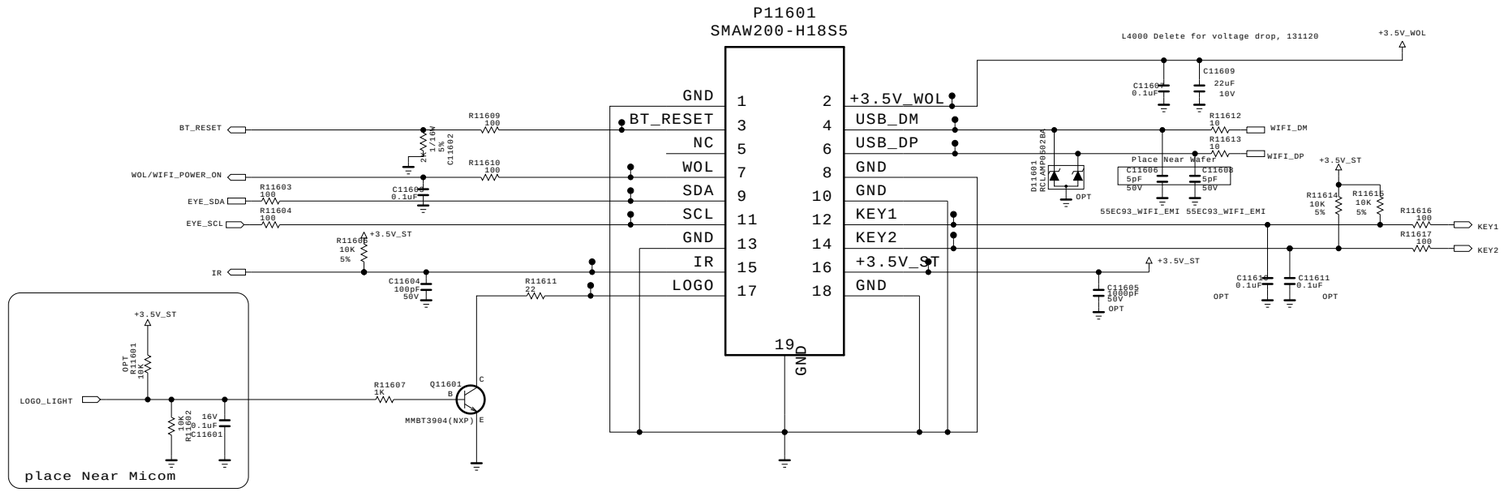
LG ELECTRONICS

MODEL	MID_LG1311	DATE	2013.03.22
BLOCK	POWER	SHEET	8 / 31



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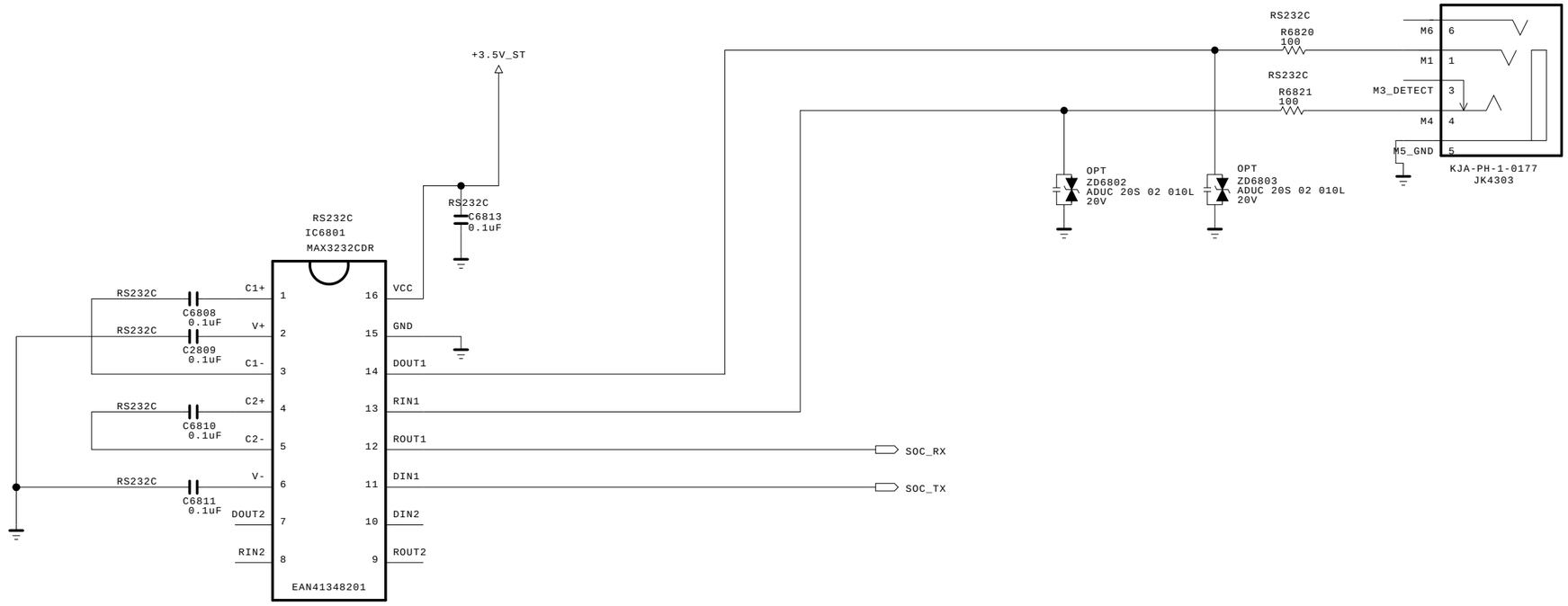
LG ELECTRONICS

MODEL	MID_LG1311	DATE	2013.03.22
BLOCK	IR / KEY	SHEET	12 / 31

RS-232C Control INTERFACE(NORTH AMERICA)



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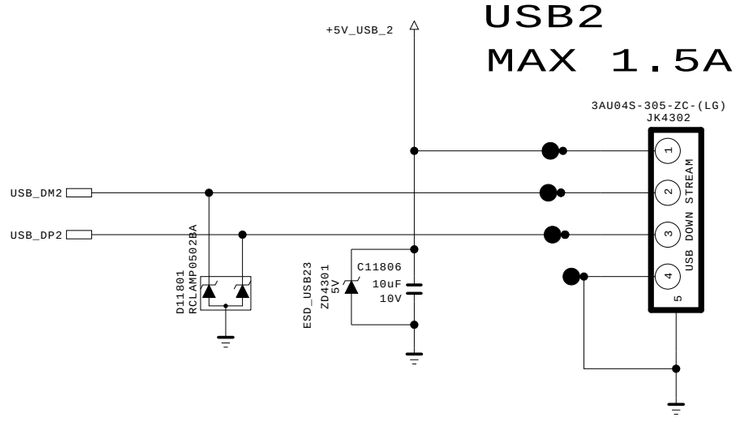
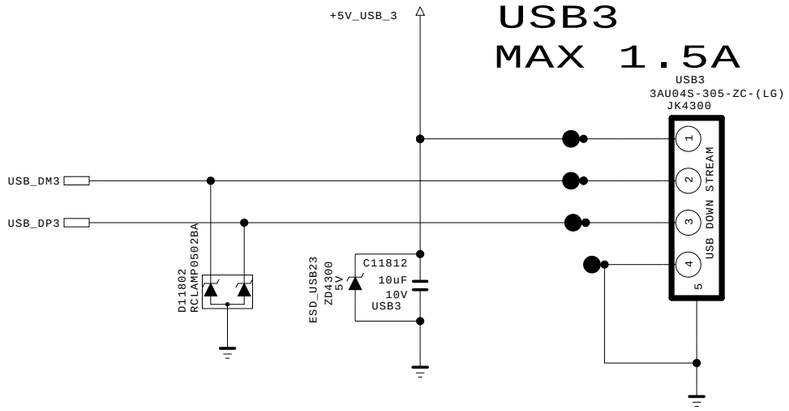
LG ELECTRONICS

MODEL		DATE	
BLOCK		SHEET	/





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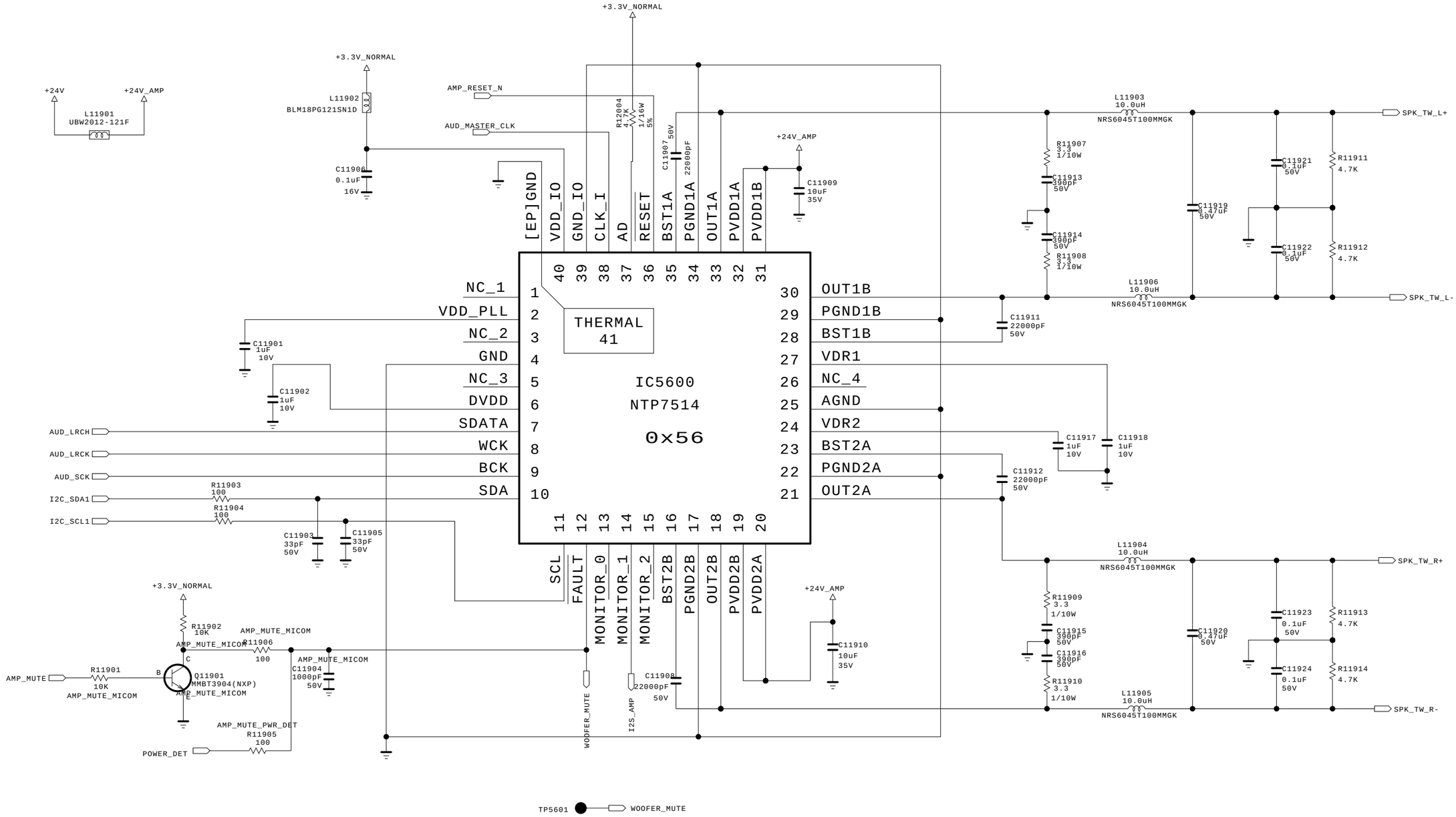
LG ELECTRONICS

MODEL	MID_LG1311	DATE	2013.04.03
BLOCK	USB 2 & 3	SHEET	1 /

AUDIO AMP(NTP7514) TWEETER



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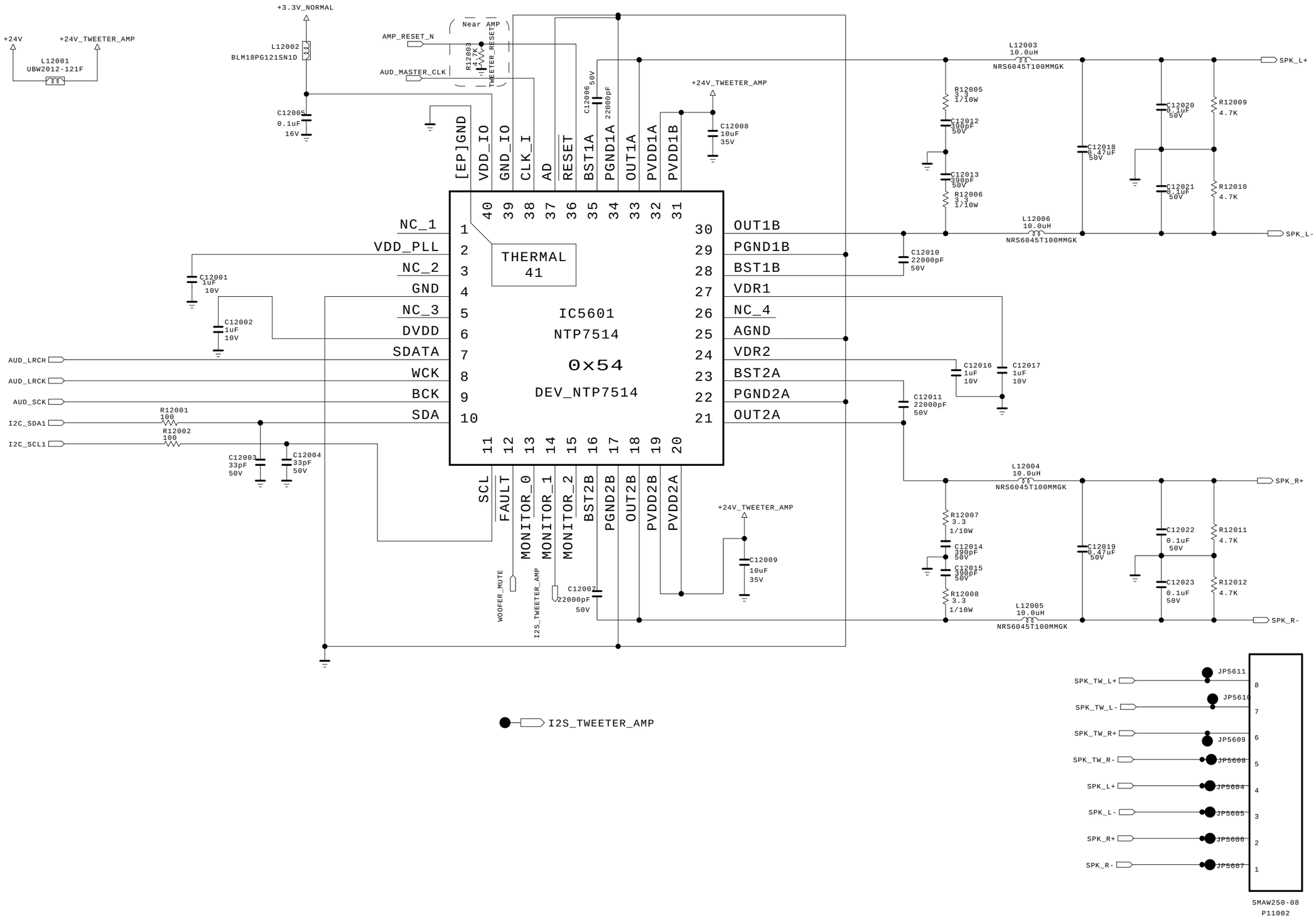
LG ELECTRONICS

MODEL	GP4_MT5369	DATE	2011.11.21
BLOCK	AUDIO[ST]	SHEET	58

FRONT AMP(NTP7514)



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LG ELECTRONICS

MODEL		DATE	
BLOCK		SHEET	/


LG
Life's Good

Trouble Shooting Guide

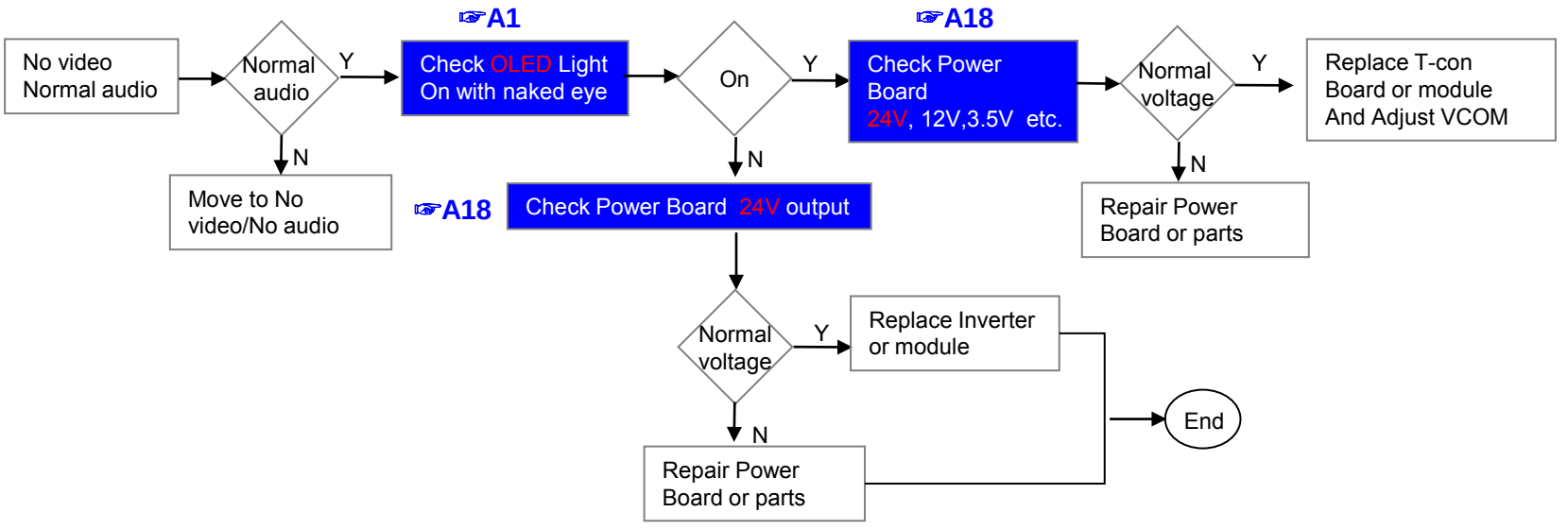
Contents of Standard Repair Process

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	
13		Camera operating checking	13	
14		External device recognition error	14	
15	E. Noise	Circuit noise, mechanical noise	15	
16	F. Exterior error	Exterior defect	16	

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

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

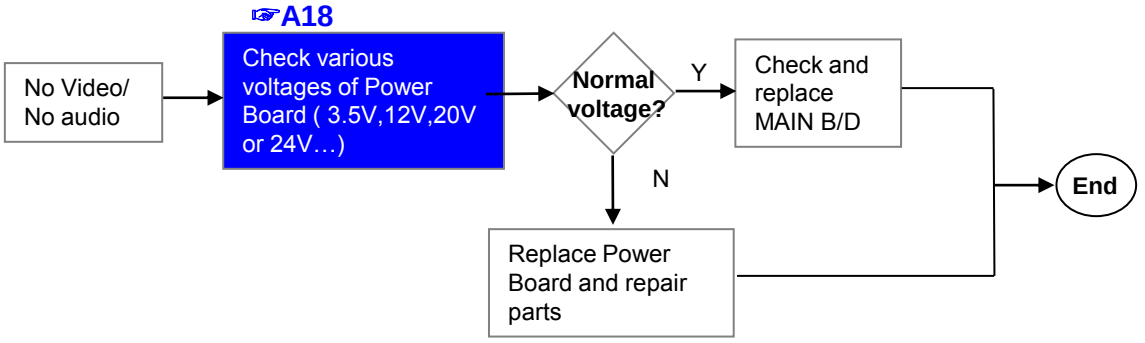
First of all, Check whether all of cables between board is inserted properly or not.
(Main B/D↔ Power B/D, EPI Cable,Speaker Cable,IR B/D Cable,,,)



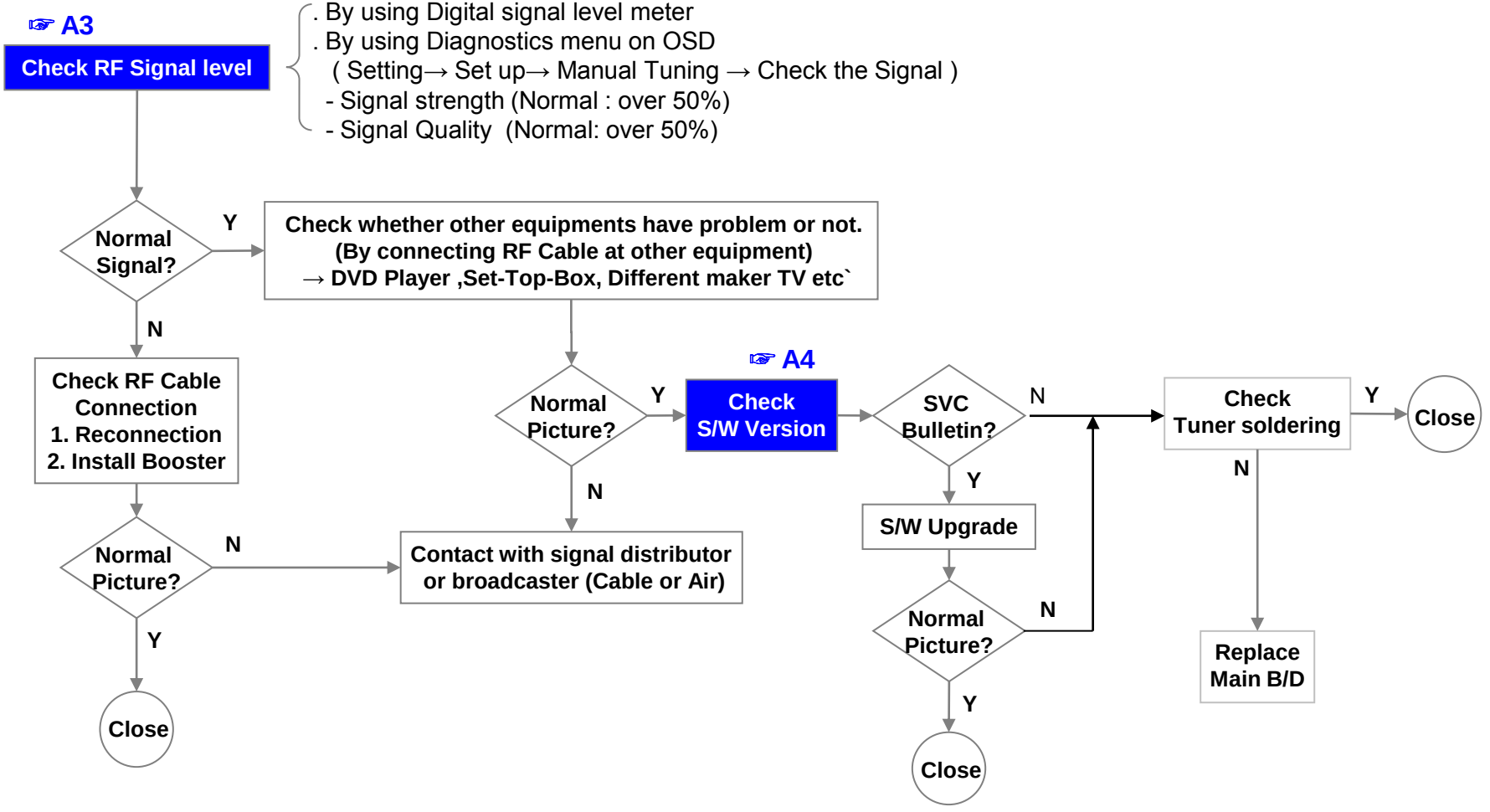
※Precaution ☞A4 & A2

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

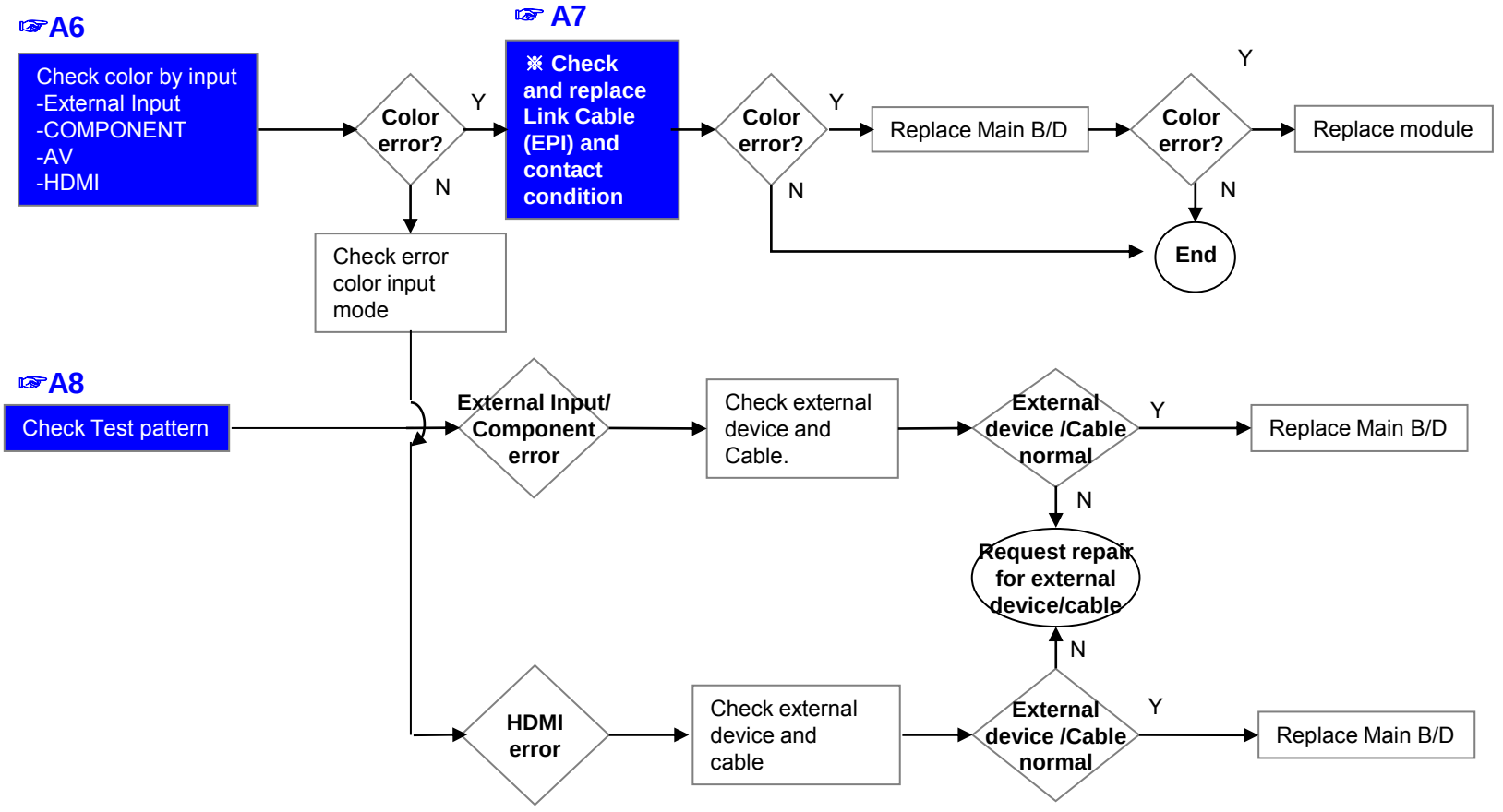
	Error symptom	A. Video error	Established date		
		No video/ No audio	Revised date		2/16



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

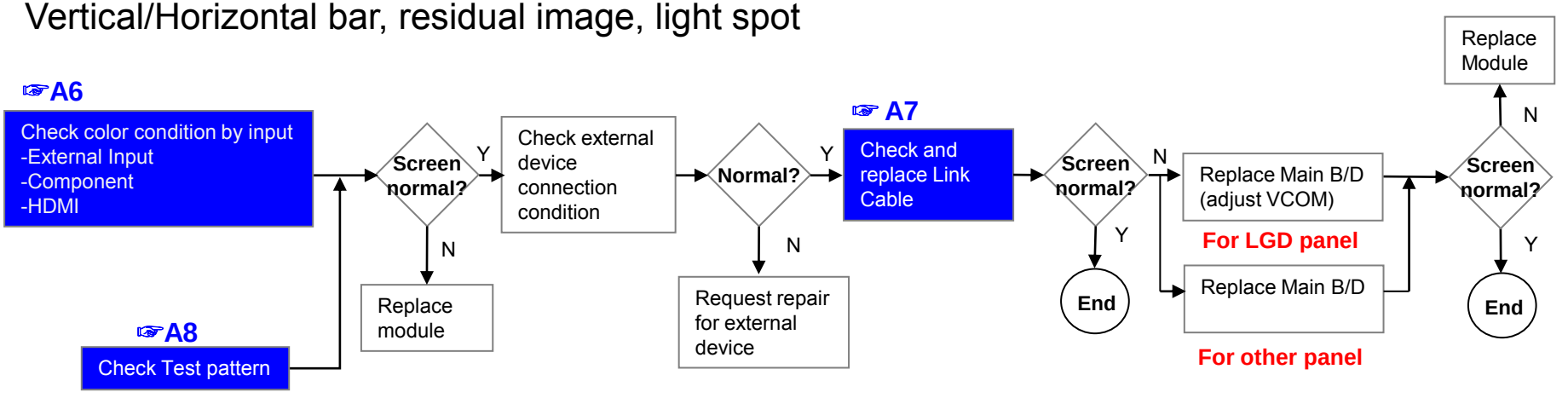


	Error symptom	A. Video error	Established date		
		Color error	Revised date		4/16

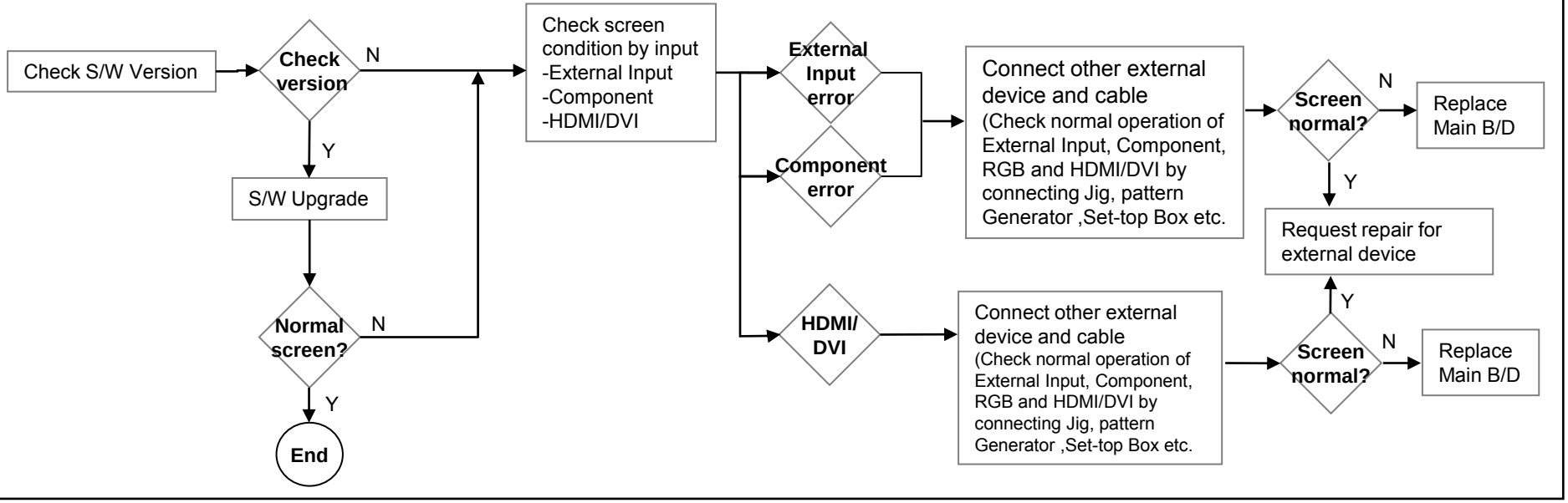


	Error symptom	A. Video error	Established date		
		Vertical / Horizontal bar, residual image, light spot, external device color error	Revised date		5/16

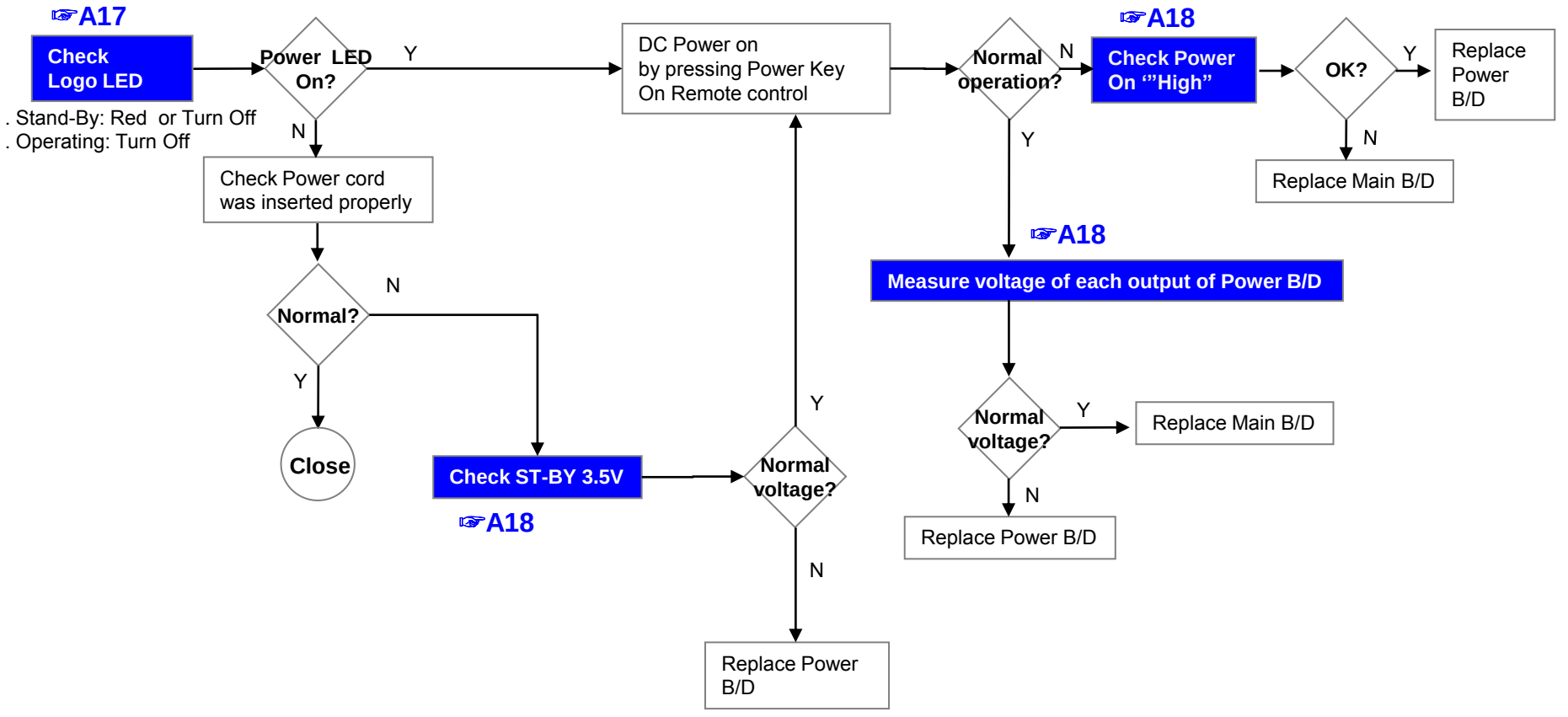
Vertical/Horizontal bar, residual image, light spot



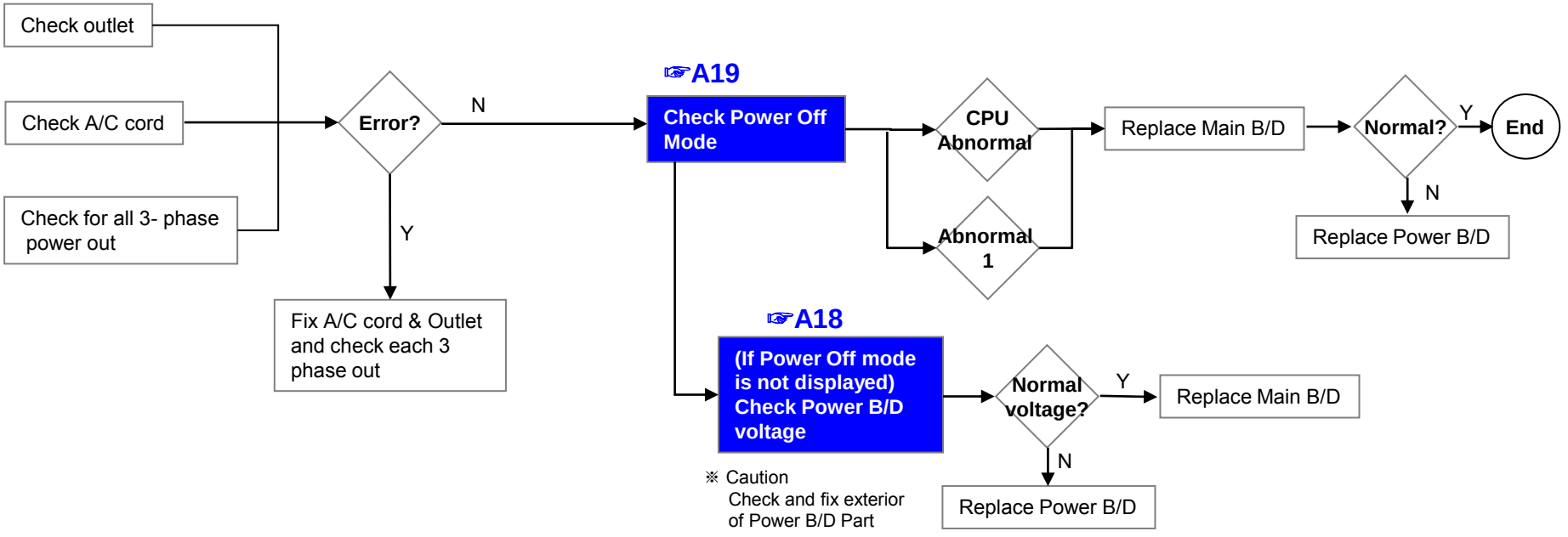
External device screen error-Color error



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



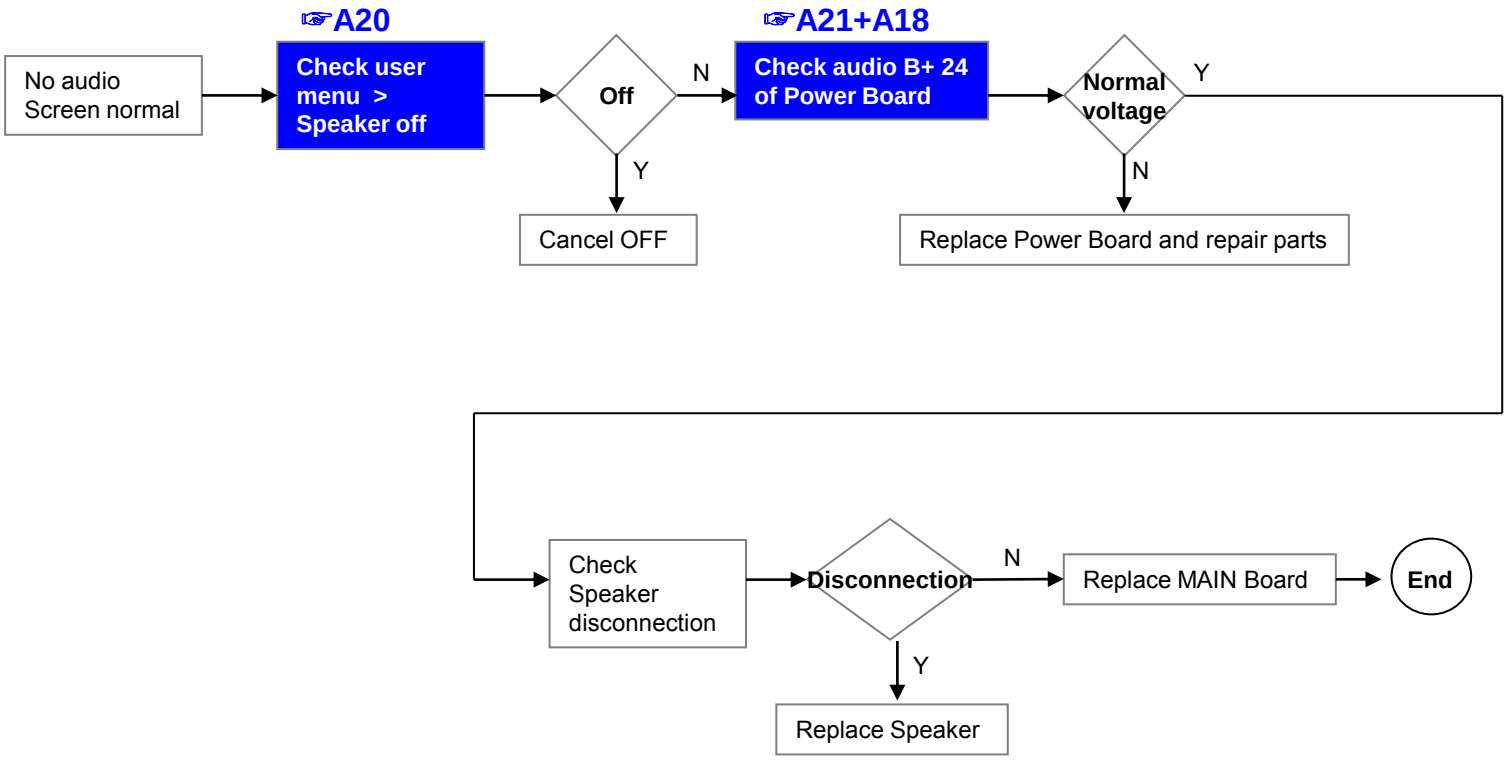
	Error symptom	B. Power error	Established date		
		Off when on, off while viewing, power auto on/off	Revised date		7/16



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

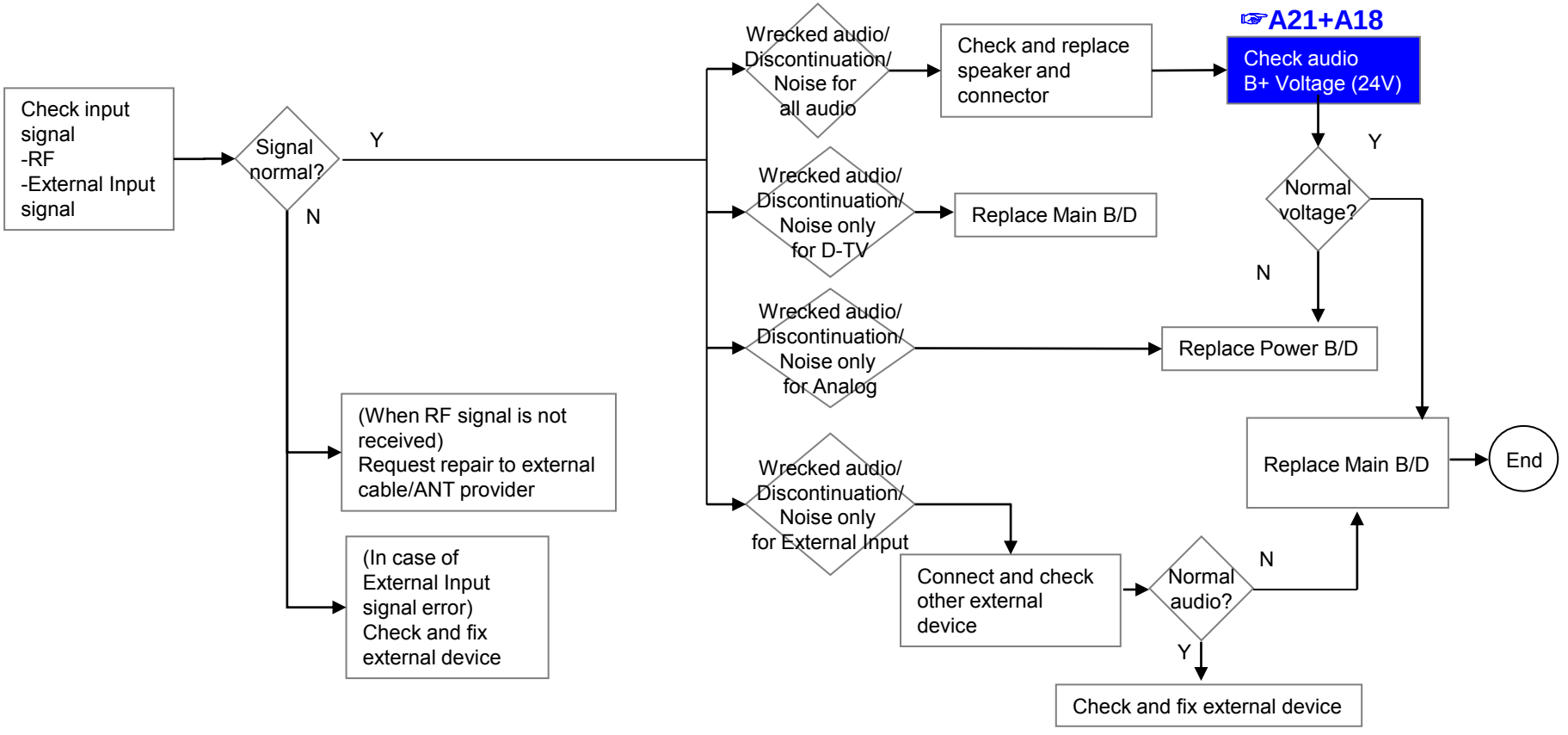
Status	Power off List	Explanation
Normal	"POWEROFF_REMOTEKEY"	Power off by REMOTE CONTROL
	"POWEROFF_OFFTIMER"	Power off by OFF TIMER
	"POWEROFF_SLEEPTIMER"	Power off by SLEEP TIMER
	"POWEROFF_INSTOP"	Power off by INSTOP KEY
	"POWEROFF_AUTOOFF"	Power off by AUTO OFF
	"POWEROFF_ONTIMER"	Power off by ON TIMER
	"POWEROFF_20V_DET"	Power off by AC OFF
	"POWEROFF_RESREC"	Power off by Reservated Record
	"POWEROFF_RECEND"	Power off by End of Recording
	"POWEROFF_SWDOWN"	Power off by S/W Download
	"POWEROFF_UNKNOWN"	Power off by unknown status except listed case
Abnormal	"POWEROFF_ABNORMAL1"	Power off by abnormal status except CPU trouble
	"POWEROFF_CPUABNORMAL"	Power off by CPU Abnormal

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



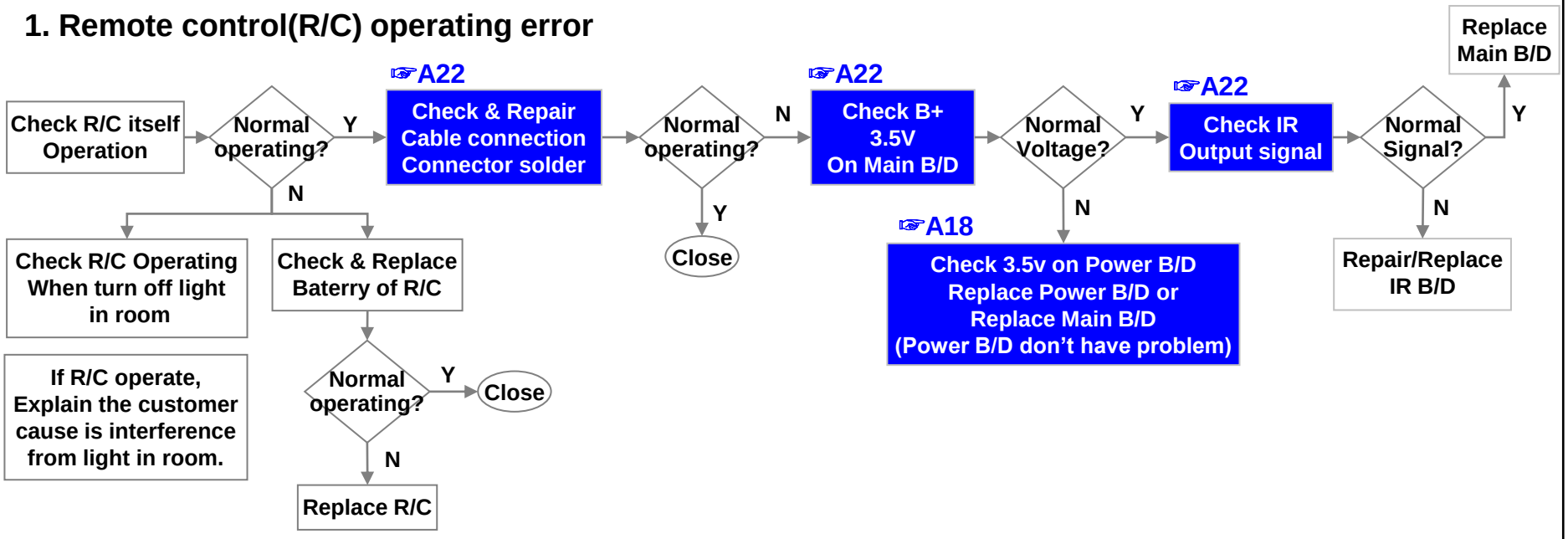
	Error symptom	C. Audio error	Established date		
		Wrecked audio/ discontinuation/noise	Revised date		9/16

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



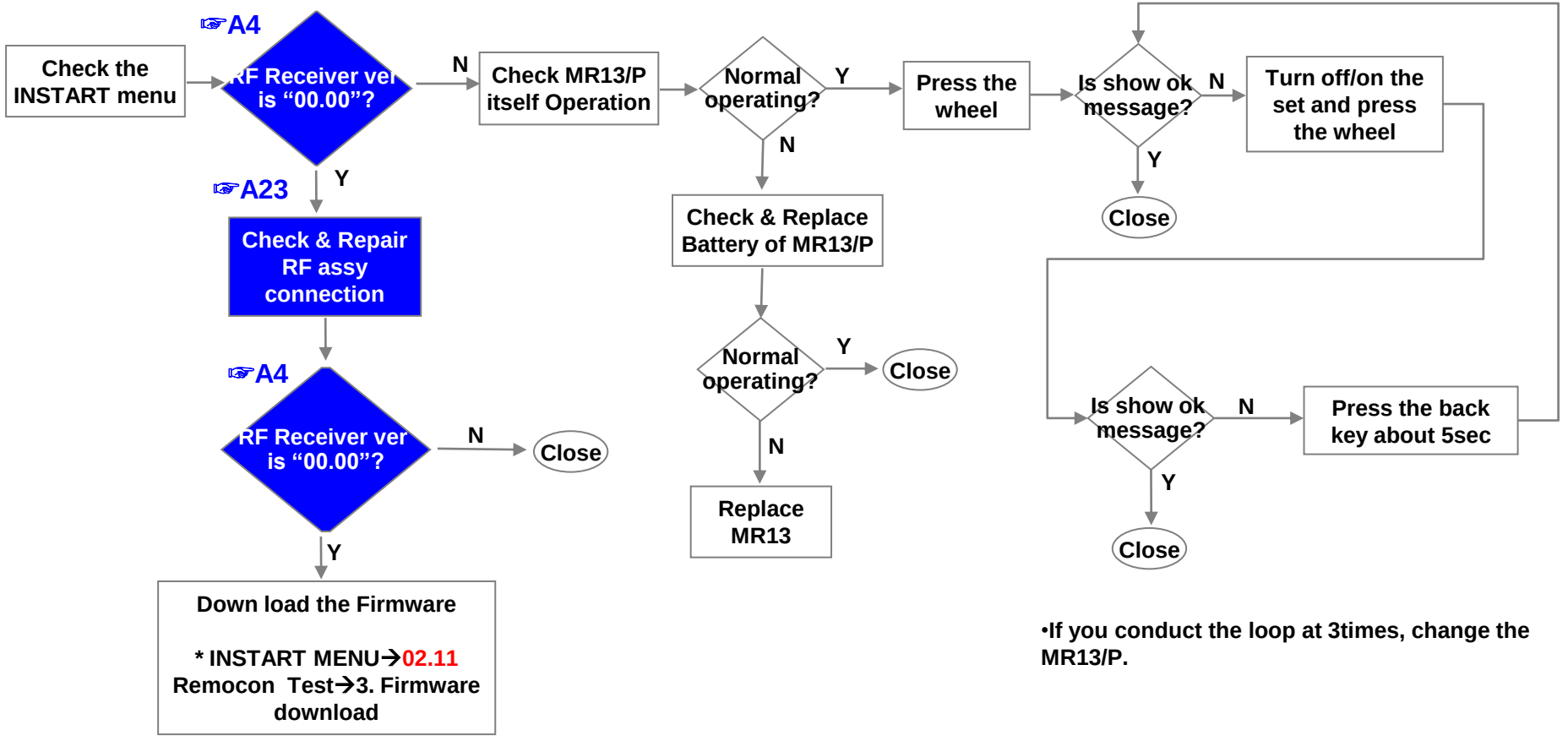
	Error symptom	D. Function error	Established date		
		Remote control & Local switch checking	Revised date		10/16

1. Remote control(R/C) operating error



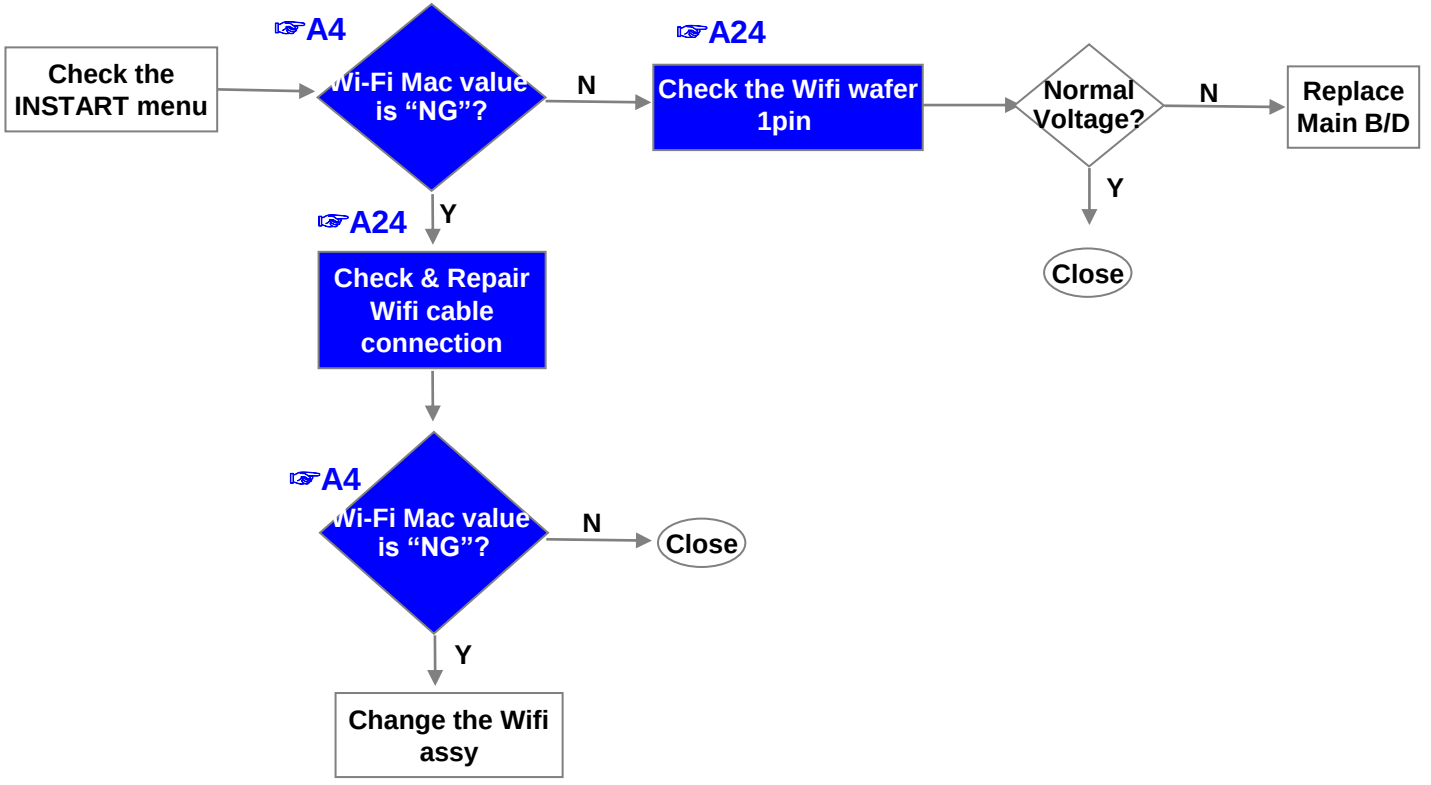
	Error symptom	D. Function error	Established date		
		MR13/P operating checking	Revised date		11/16

2. MR13/P (Magic Remocon) operating error

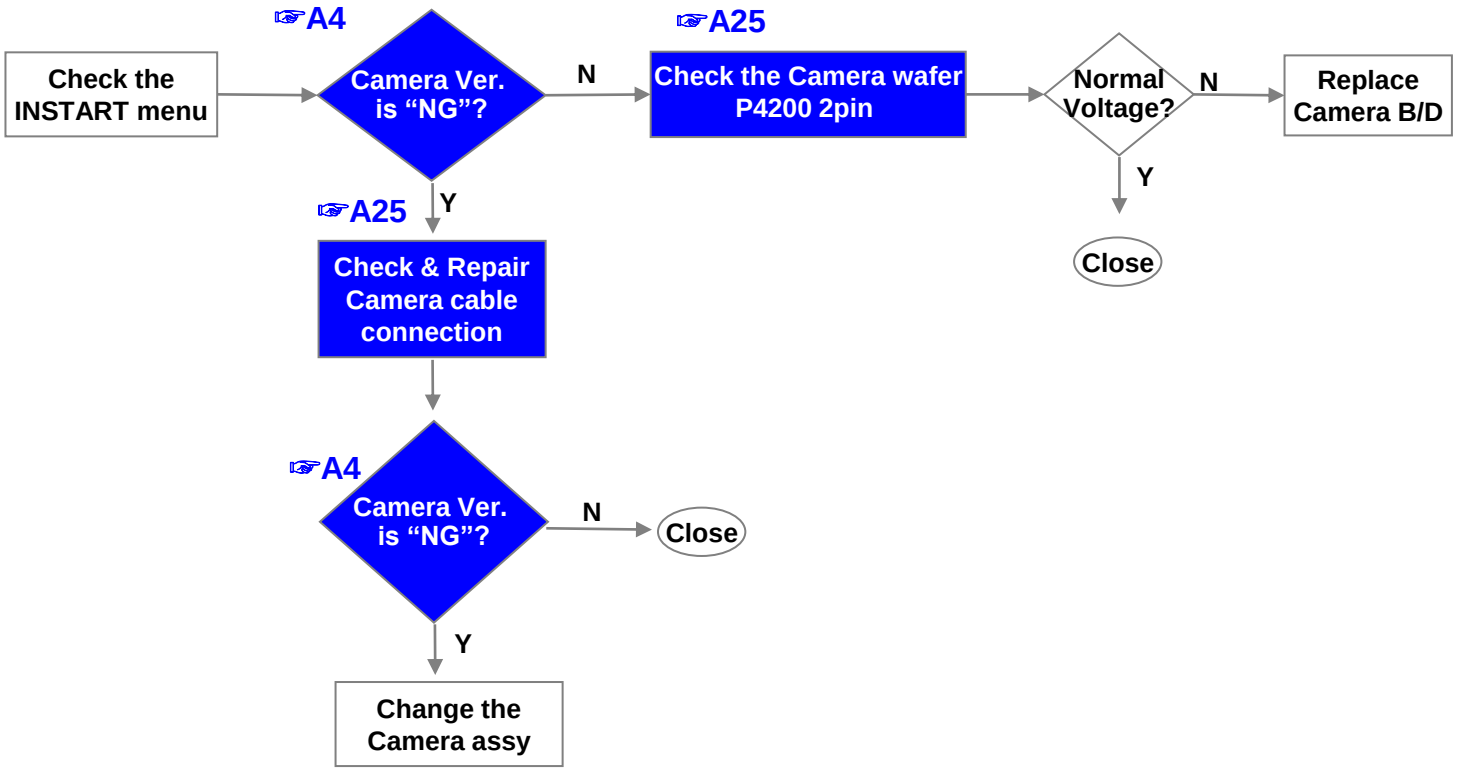


•If you conduct the loop at 3times, change the MR13/P.

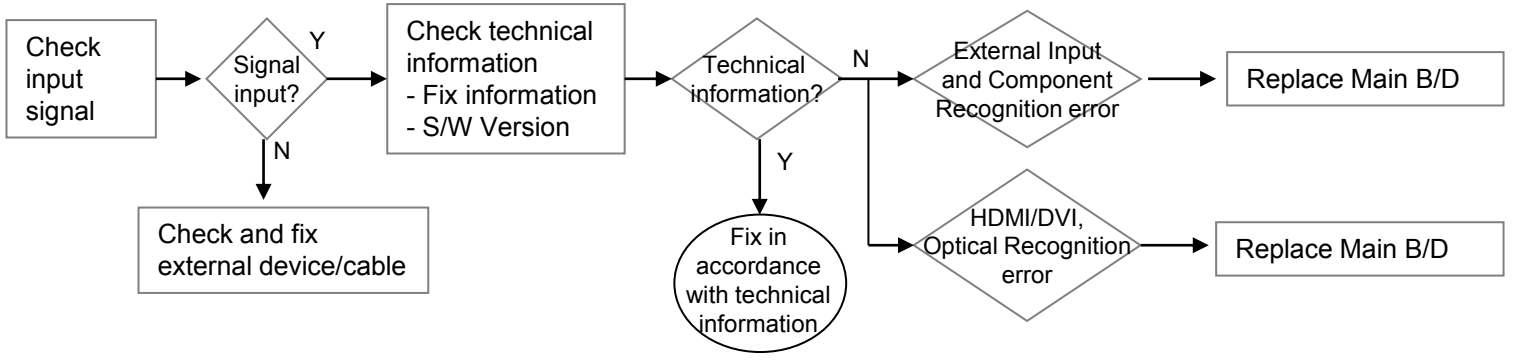
3.Wifi operating error



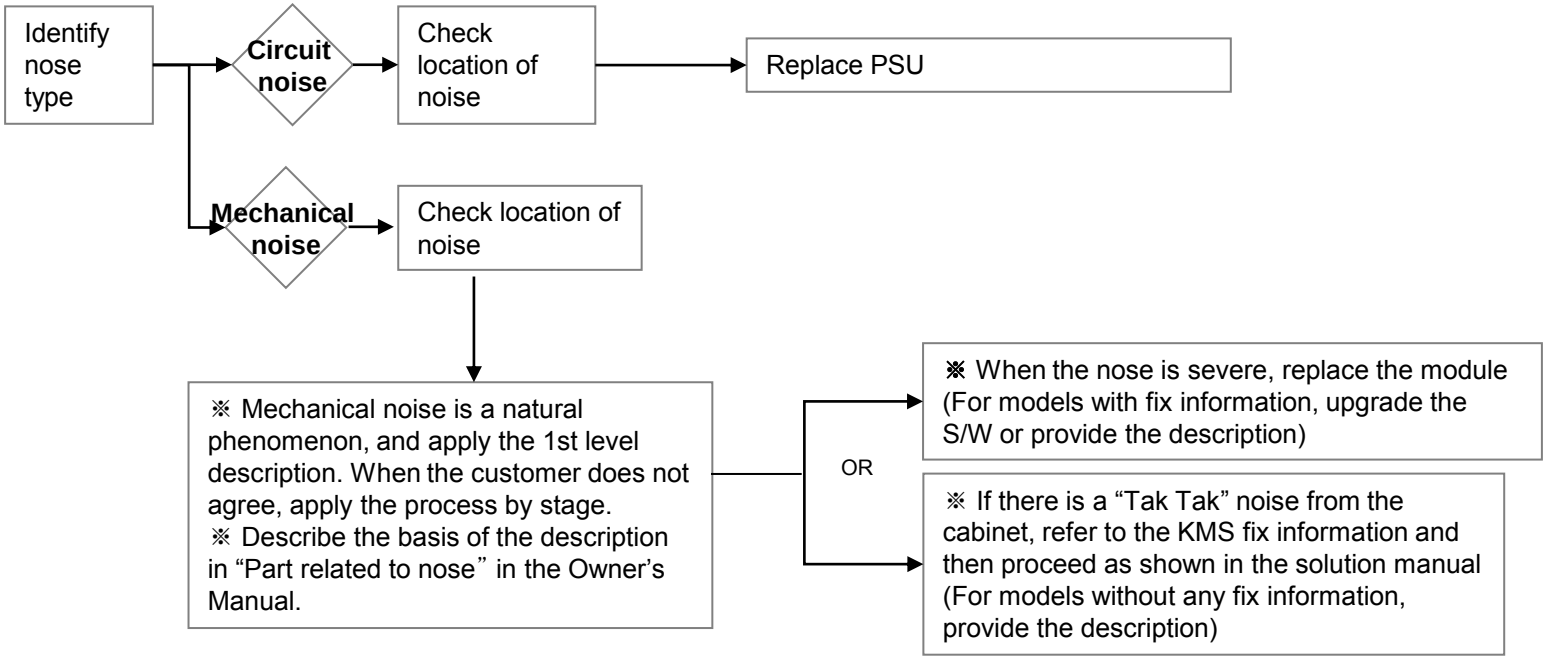
4.Camera operating error



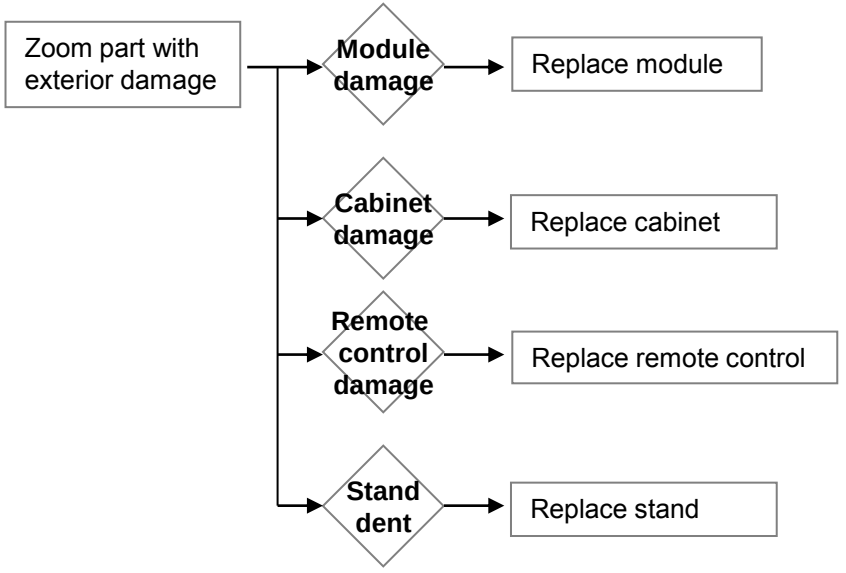
	Error symptom	D. Function error	Established date		
		External device recognition error	Revised date		14/16



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



	Error symptom	F. Exterior defect	Established date		
		Exterior defect	Revised date		16/16



Contents of OLED TV Standard Repair Process Detail Technical Manual

No.	Error symptom	Content	Page	Remarks
1	A. Video error_ No video/Normal audio	Check vby1 lock LED and Module supply voltage	A1	
2		Check White Balance value	A2	
4	A. Video error_ video error /Video lag/stop	TUNER input signal strength checking method	A3	
5		Version checking method	A4	
6		Tuner Checking Part	A5	
7	A. Video error _Vertical/Horizontal bar, residual image, light spot	connection diagram	A6	
8	A. Video error_ Color error	Check Link Cable (EPI) reconnection condition	A7	
9		Adjustment Test pattern - ADJ Key	A8	
10	<Appendix> Defected Type caused by T-Con/ Inverter/ Module	Exchange Main Board (1)	A-1/2	
11		Exchange Main Board (2)	A-2/2	
12		Exchange Power Board (PSU)	A-3/5	
13		Exchange Module (1)	A-4/5	
14		Exchange Module (2)	A-5/5	

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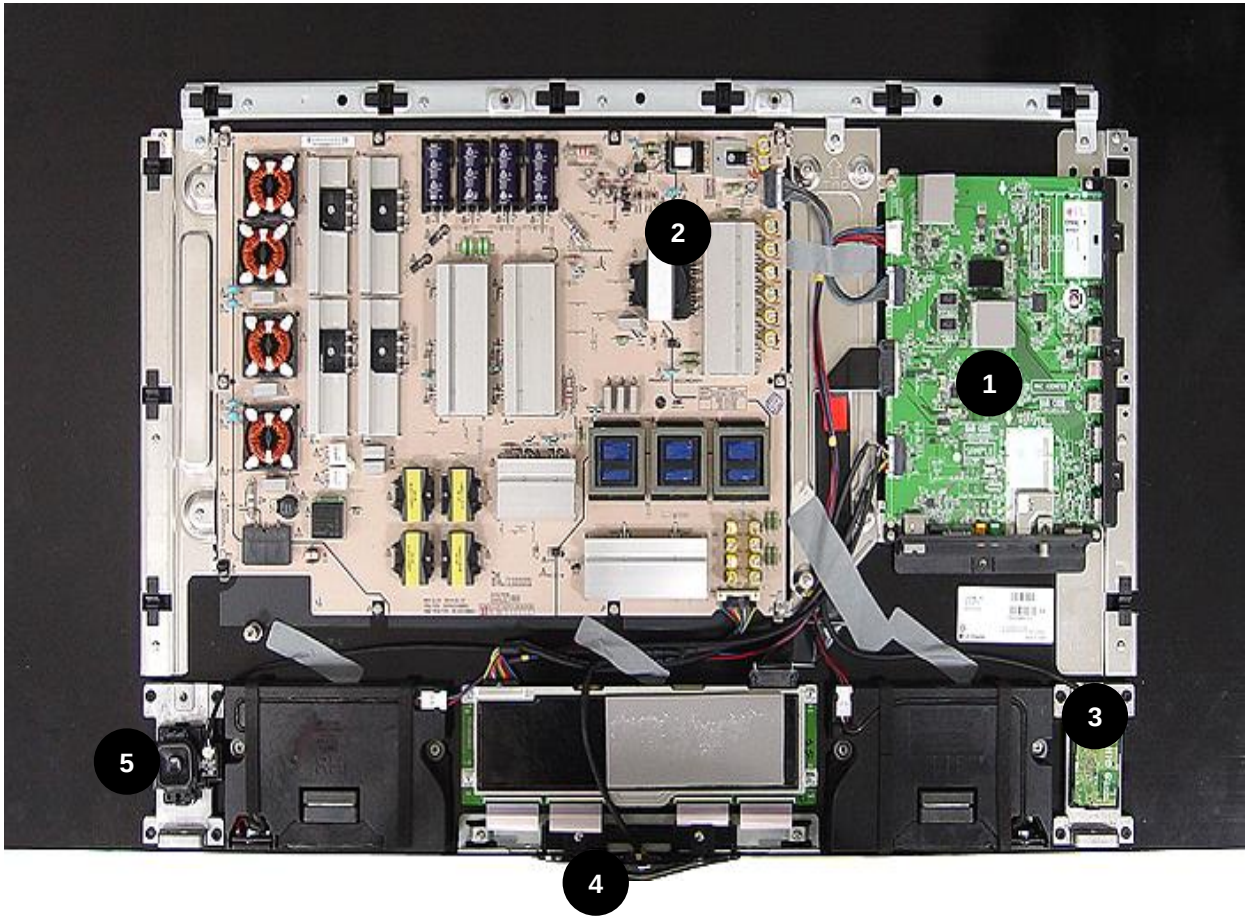
No.	Error symptom	Content	Page	Remarks
15	B. Power error_ No power	Check front display LED	A14	
16		Check power input Voltage & ST-BY 3.5V	A15	
17	B. Power error_Off when on, off while viewing	POWER OFF MODE checking method	A16	
18	C. Audio error_ No audio/Normal video	Checking method in menu when there is no audio	A17	
19		Voltage and speaker checking method when there is no audio	A18	
20	D. Function error	remote control operation checking method	A19	
21		Motion Remote operation checking method	A20	
22		Wifi operation checking method	A21	
23		Camera operation checking method	A22	

Interconnection - 1

55EC9300

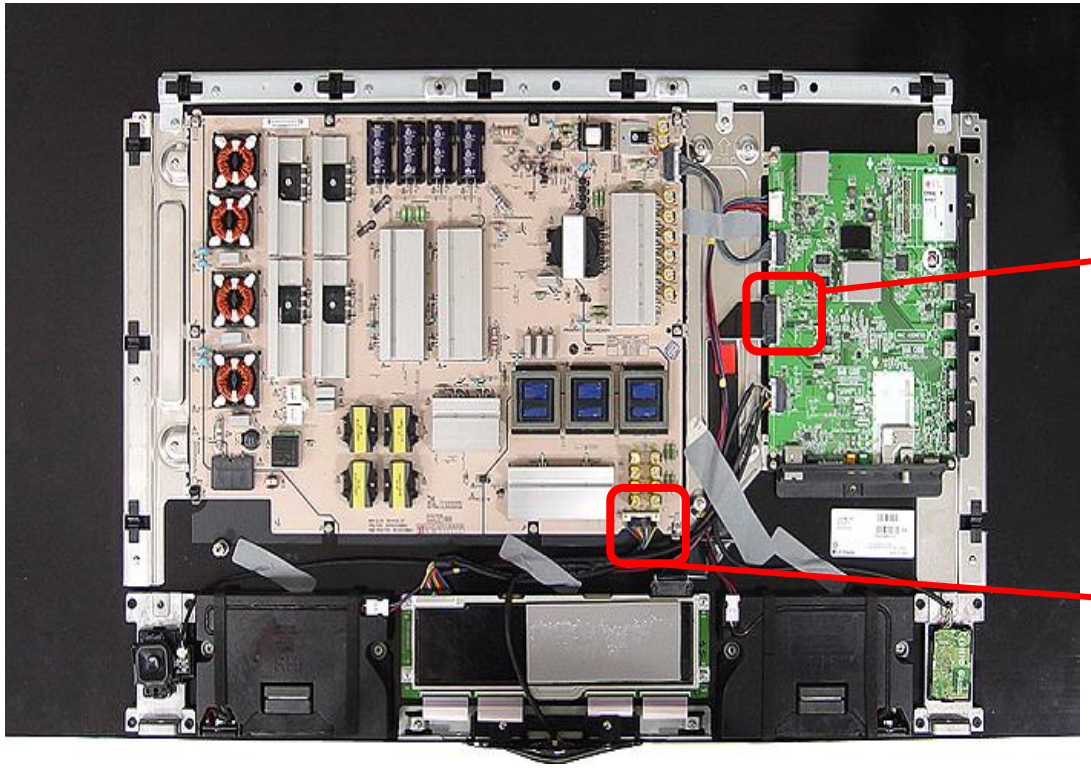


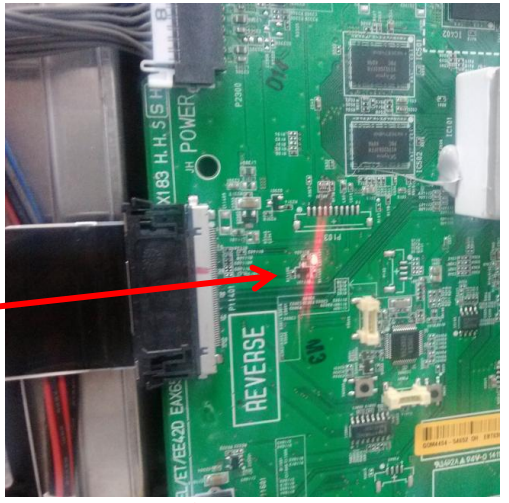
[PCBs]

1. Main PCB
2. PSU
3. WIFI + BT Combo ASSY
4. IR / Logo PCB
5. Joystick

Standard Repair Process Detail Technical Manual

	Error symptom	A. Video error_No video/Normal audio	Established date		
	Content	CHECK the vby1 LED and Module supply voltage	Revised date		A1



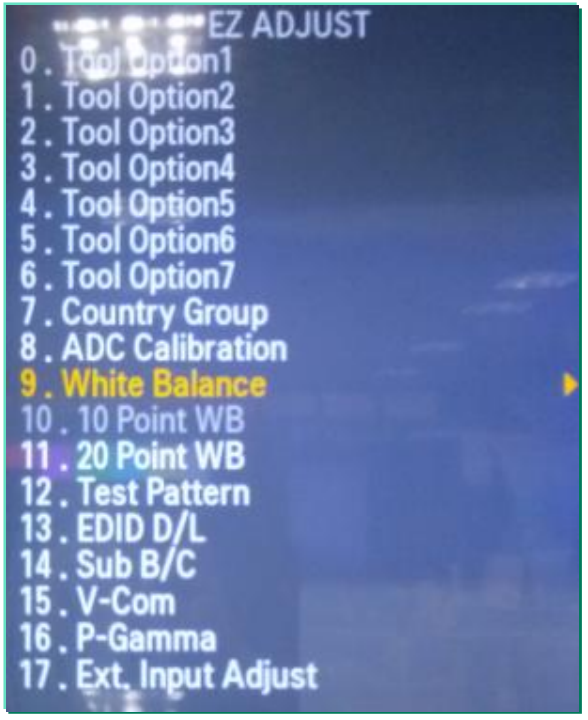


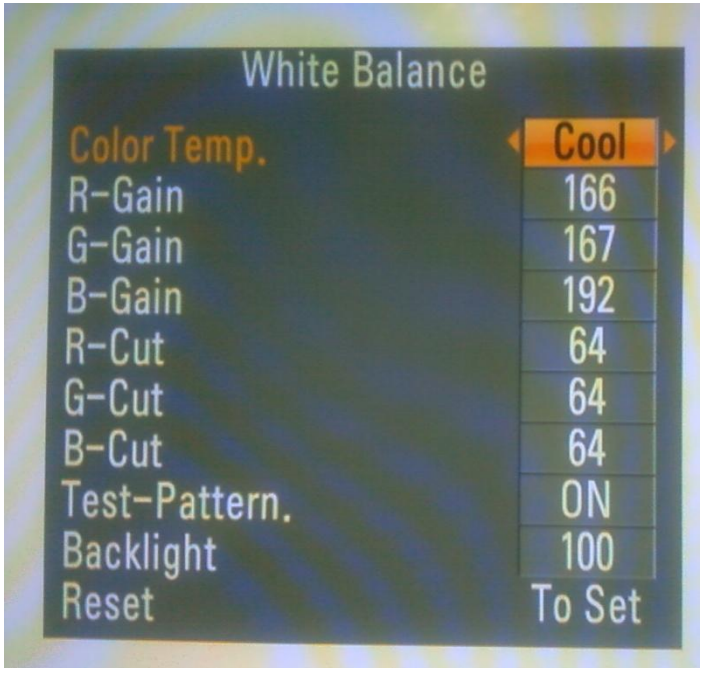
'Red LED signal ' means video output is good

Check the Module supply voltage '24V'

Standard Repair Process Detail Technical Manual

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



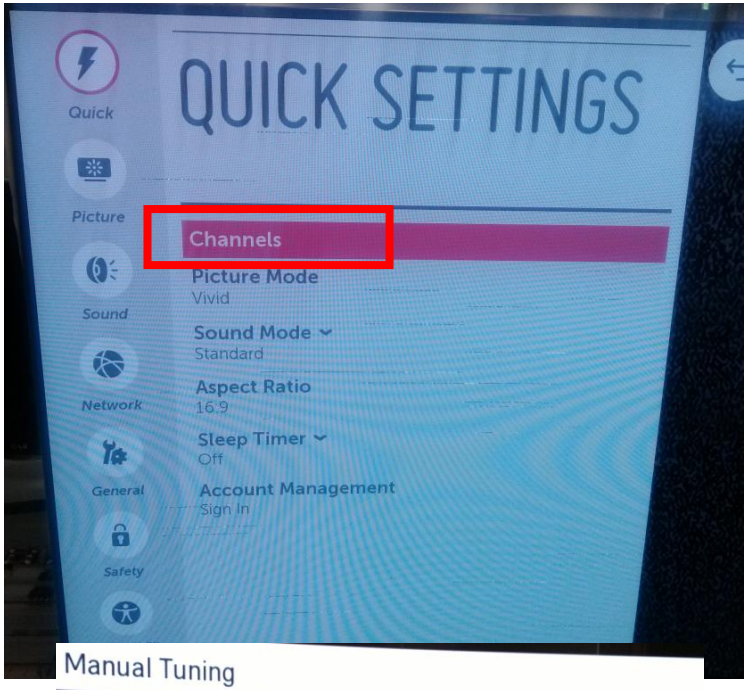


Entry method

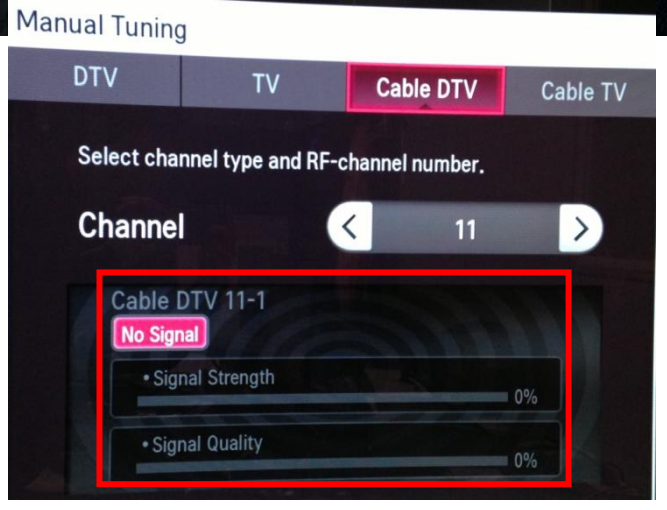
1. Press the ADJ button on the remote control for adjustment.
2. Enter into White Balance of item 9.
3. After recording the R, G, B (GAIN, Cut) value of Color Temp (Cool/Medium/Warm), re-enter the value after replacing the MAIN BOARD.

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		A3



Settings → Channel → Manual Tuning → select channel



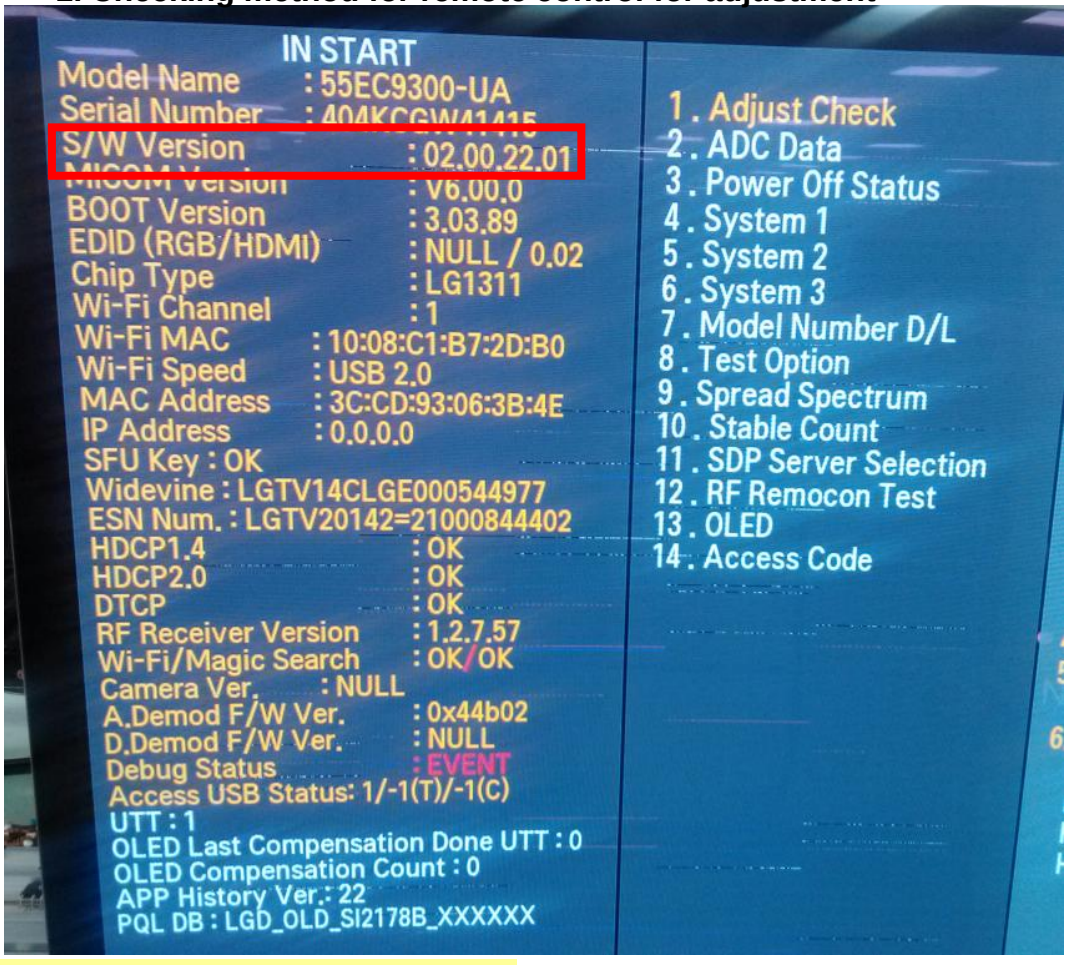
When the signal is strong, use the attenuator (-10dB, -15dB, -20dB etc.)

Standard Repair Process Detail Technical Manual

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

1. Checking method for remote control for adjustment

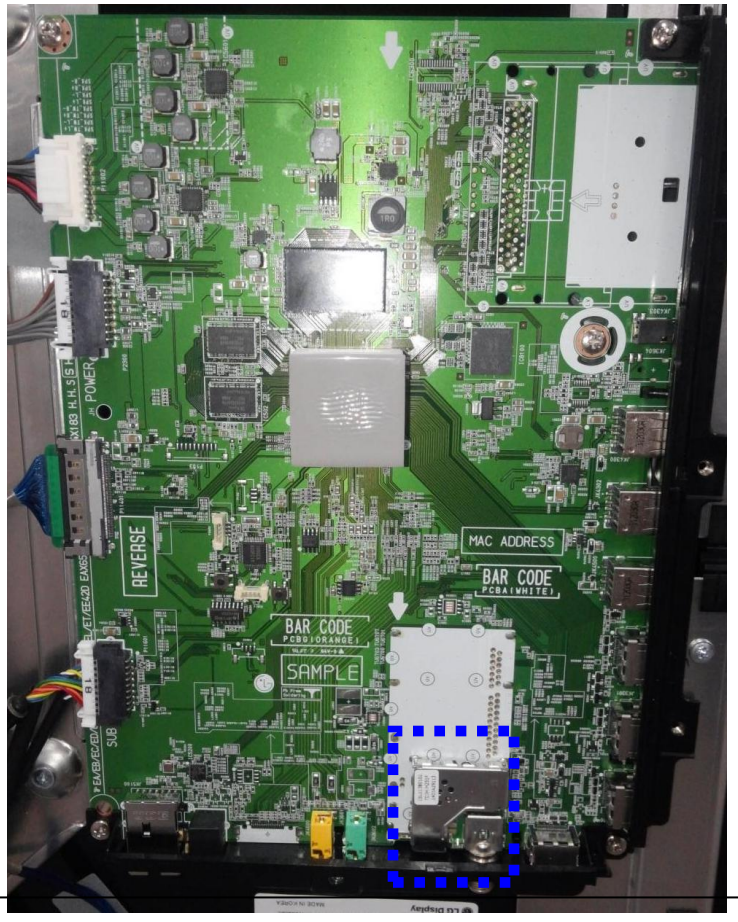
Version



Press the IN-START with the remote control for adjustment

Standard Repair Process Detail Technical Manual

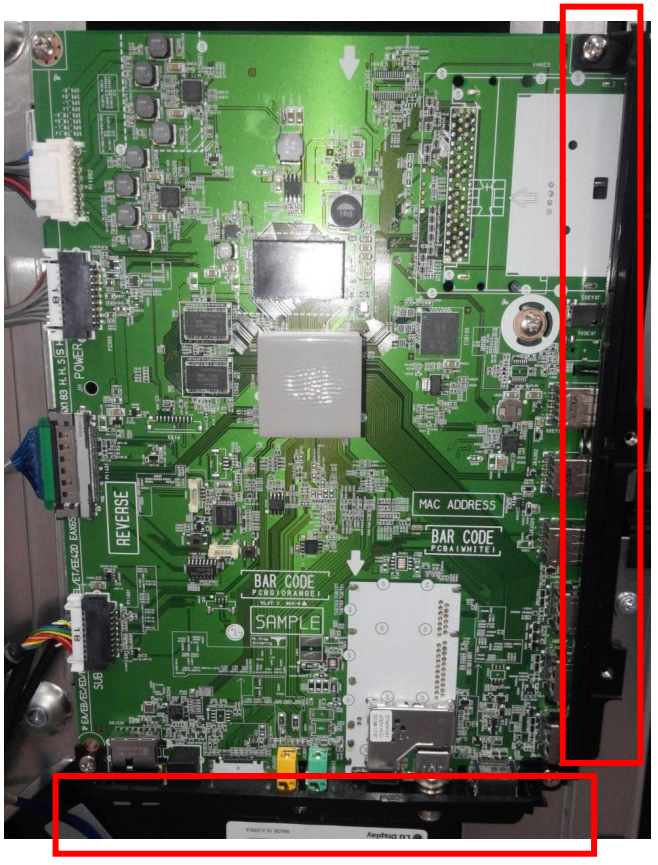
	Error symptom	A. Video error_Video error, video lag/stop	Established date		
	Content	TUNER checking part	Revised date		A5



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

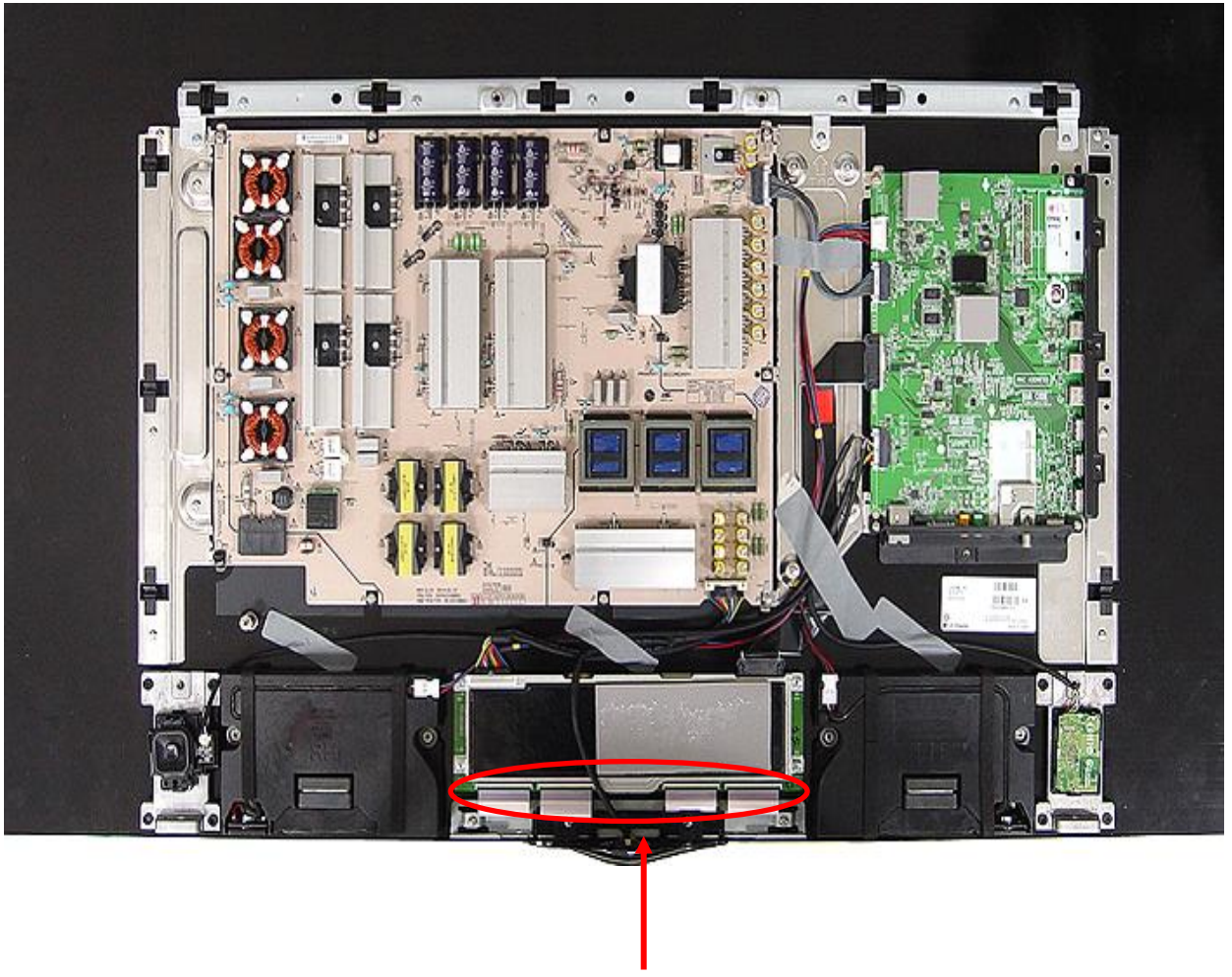
	Error symptom	A. Video error _Vertical/Horizontal bar, residual image, light spot	Established date		
	Content	connection diagram (1)	Revised date		A6



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

Standard Repair Process Detail Technical Manual

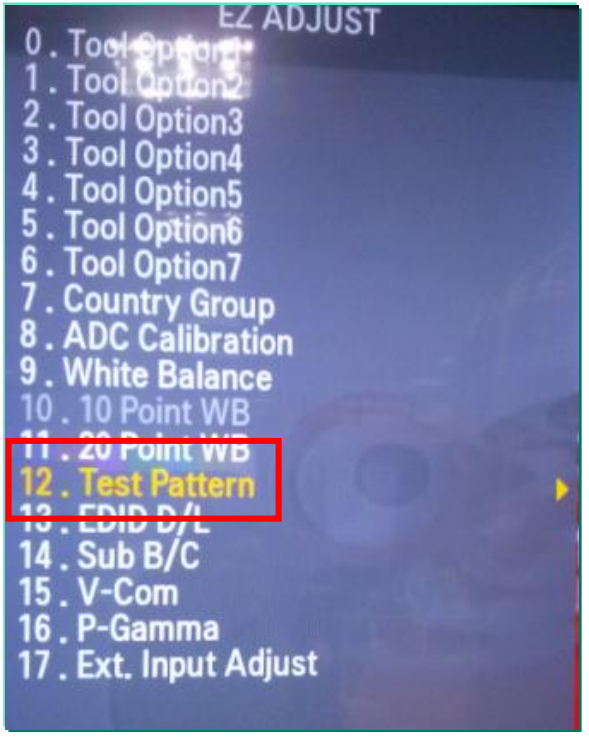
	Error symptom	A. Video error_Color error	Established date		
	Content	Check Link Cable (EPI) reconnection condition	Revised date		A7



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

Standard Repair Process Detail Technical Manual

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

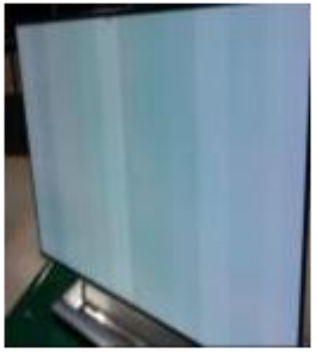


You can view 6 types of patterns using the ADJ Key

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

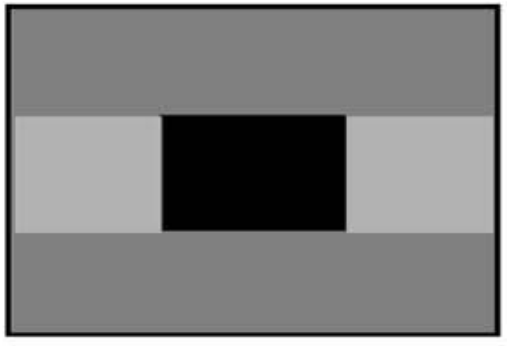
Appendix : Exchange the Module (1)

Vertical bar



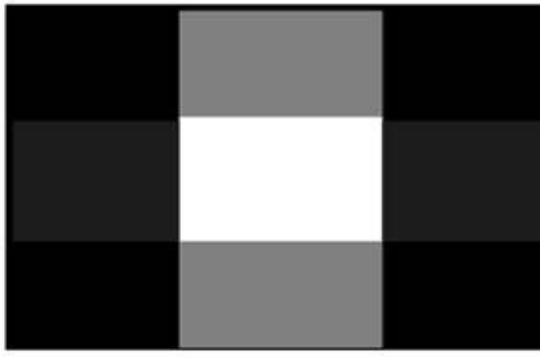
Brightness difference

Line Dim



Crosstalk

Press damage



Crosstalk

Burnt

Un-repairable Cases

In this case please exchange the module.

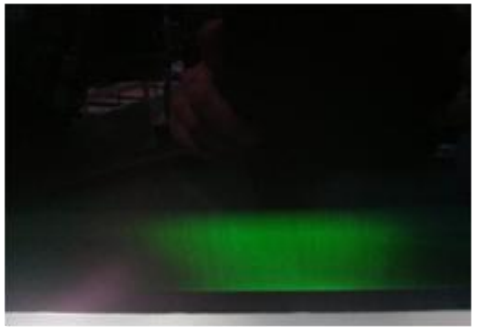
Appendix : Exchange the Module (2)

Angle view Color difference

Brightness dot noise

Half dead

Brightness difference



Green Noise on power on/off time

Line Defect

Mura

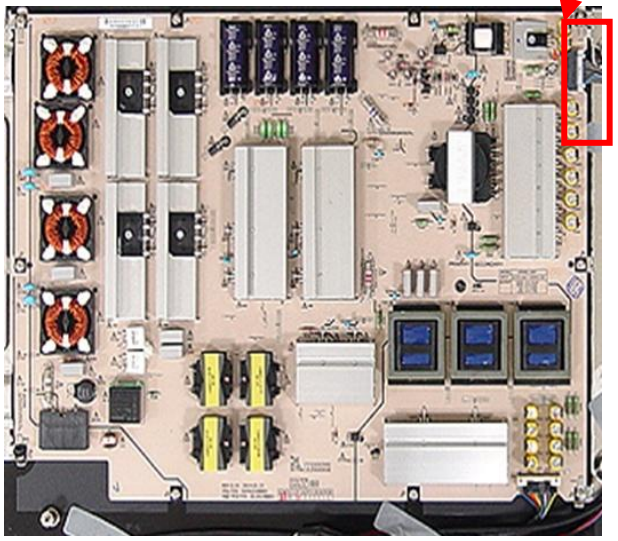
Un-repairable Cases

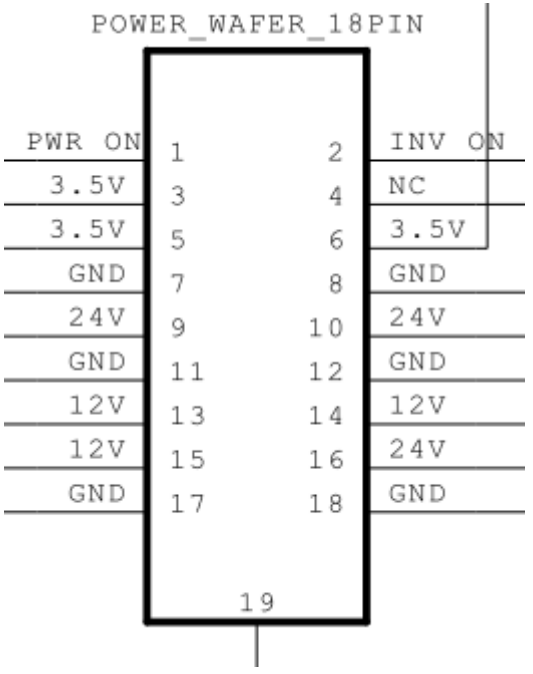
In this case please exchange the module.

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		A15

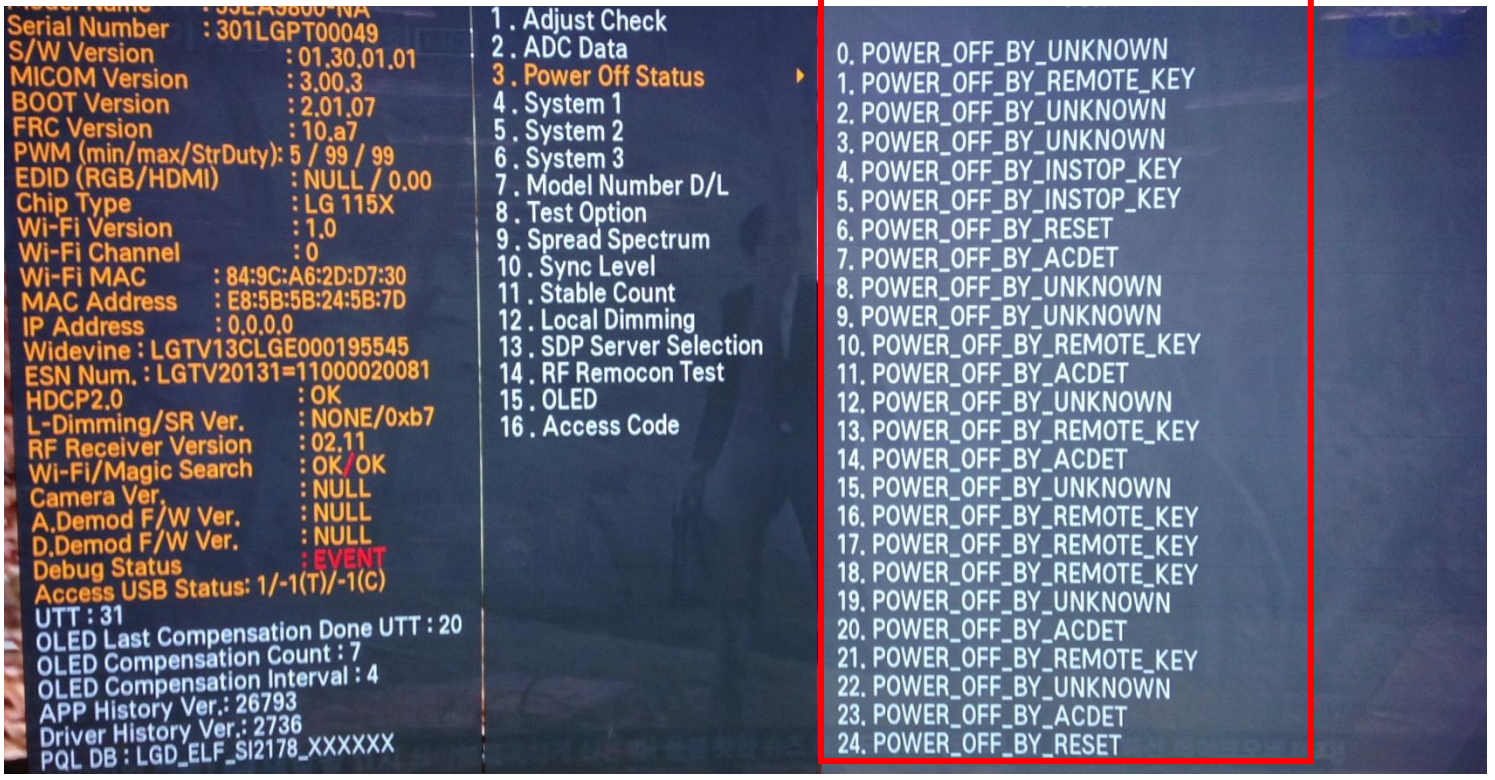
Check the DC 24V, 12V, 3.5V.





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		A16



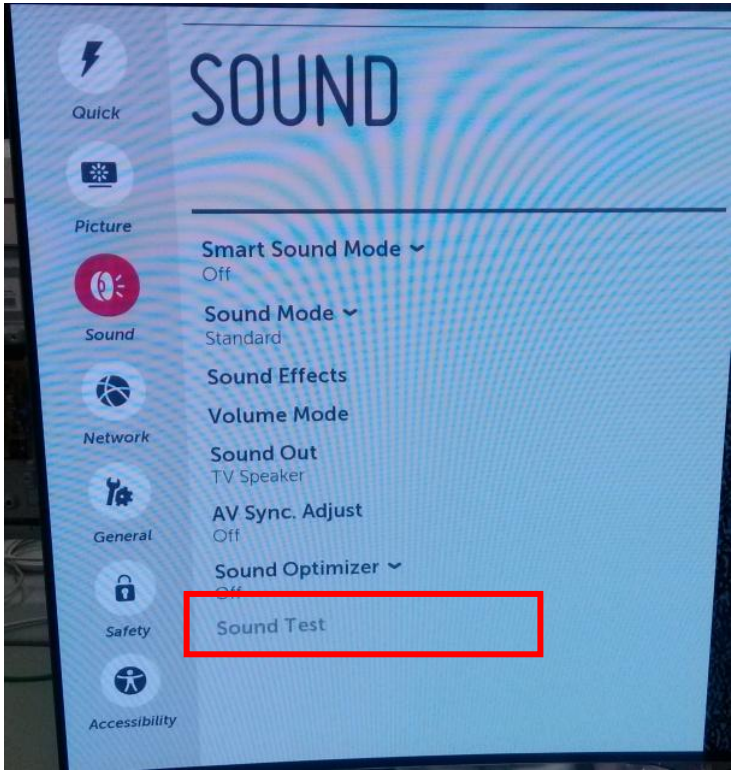
Entry method

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		
	Content	Checking method in menu when there is no audio	Revised date		A17

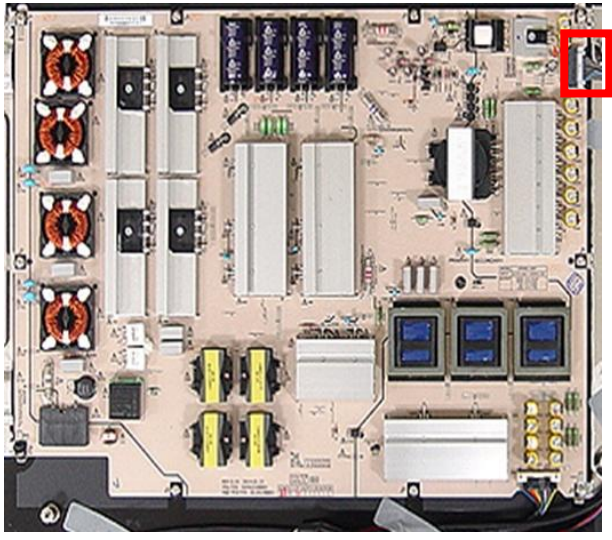


Checking method

1. Press the Setting button on the remote control
2. Select the Sound function of the Menu
3. Select the Sound Setting
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		A18



Checking order when there is no audio

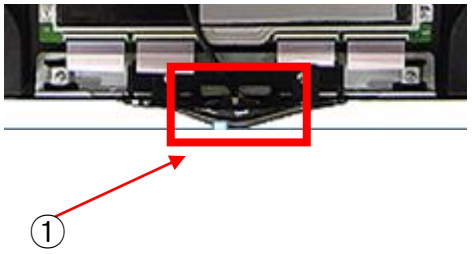
① Check the contact condition of or 24V connector of Main Board

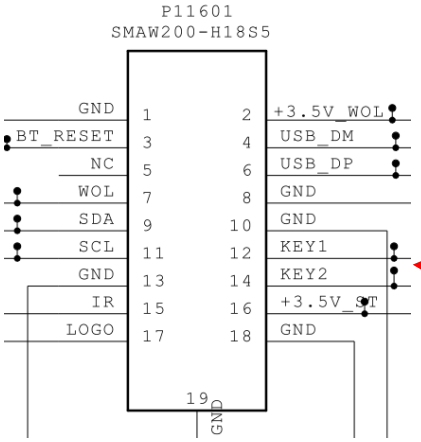
② Measure the 24V input voltage supplied from Power Board
(If there is no input voltage, remove and check the connector)

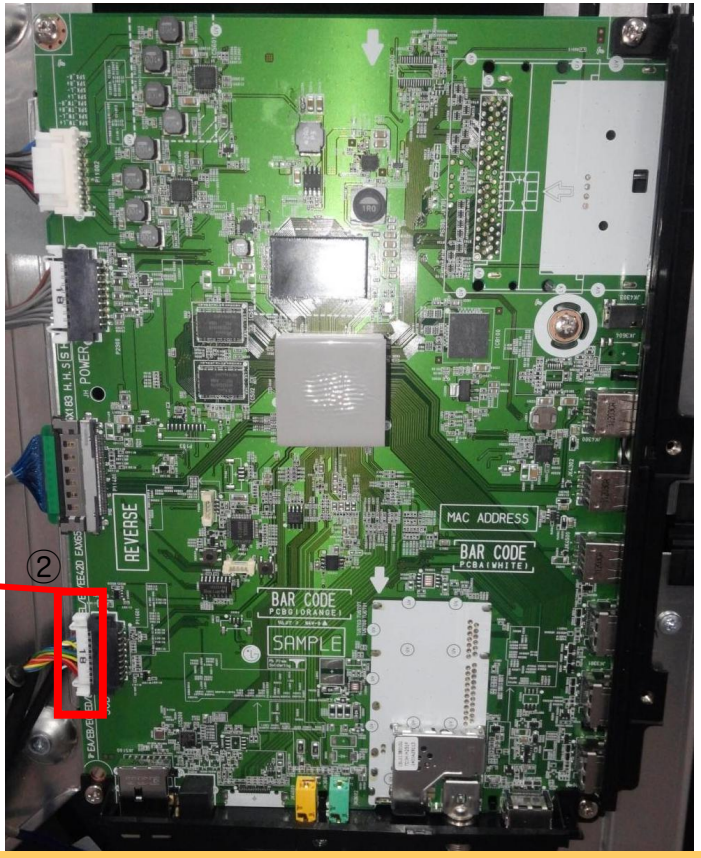
③ Connect the tester RX1 to the speaker terminal and if you hear the Chik Chik sound when you touch the GND and output terminal, the speaker is normal.

Standard Repair Process Detail Technical Manual

	Error symptom	D. Function error	Established date		
	Content	Remote control operation checking method	Revised date		A19







③

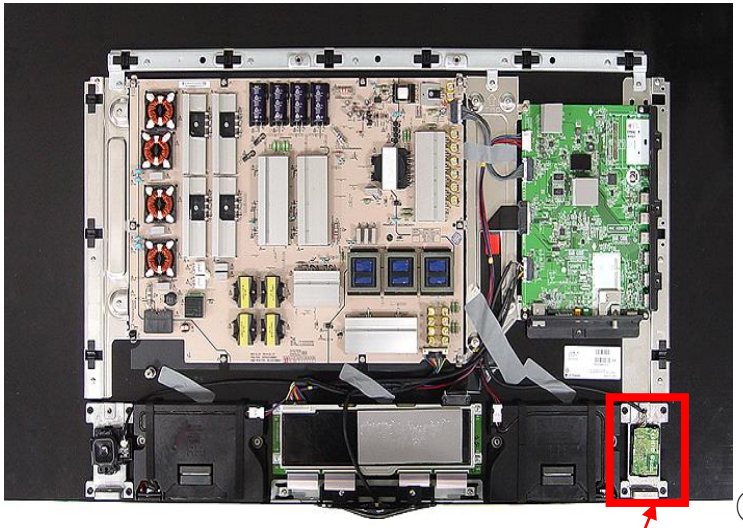
P4000	
1	GND
2	+3.5V_WOL
3	BT_RESET
4	WIFI_DM
5	NC
6	WIFI_DP
7	WIFI_POWER_ON
8	GND
9	EYE_SDA
10	GND
11	EYE_SCL
12	KEY1
13	GND
14	KEY2
15	IR
16	+3.5V_ST
17	LED_R
18	GND

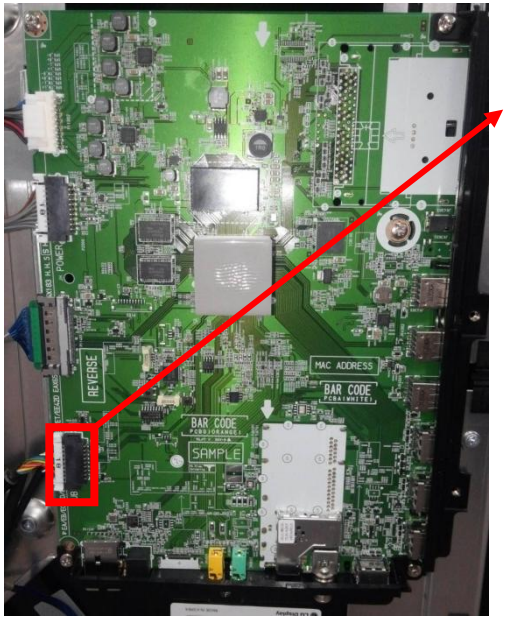
Checking order

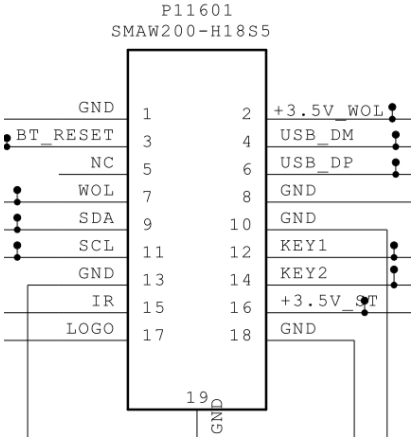
1, 2. Check Touch cable condition between IR & Main board.
3. Check the st-by 3.5V on the terminal 16.

Standard Repair Process Detail Technical Manual

	Error symptom	D. Function error	Established date		
	Content	Motion Remote operation checking method	Revised date		A20





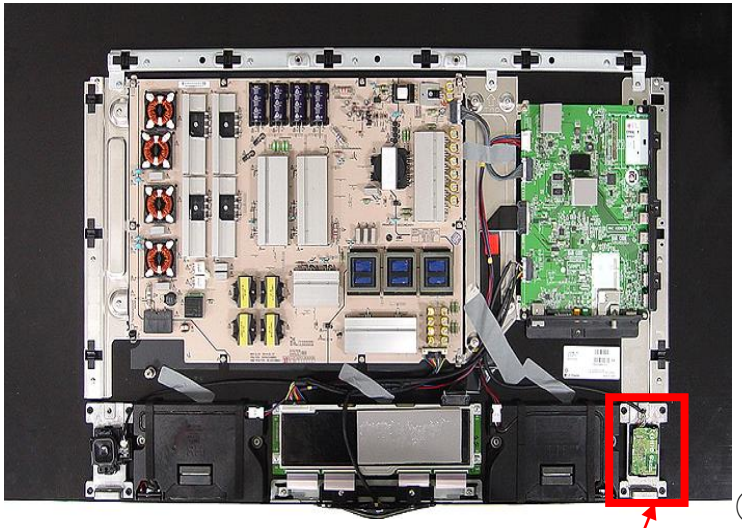


Checking order

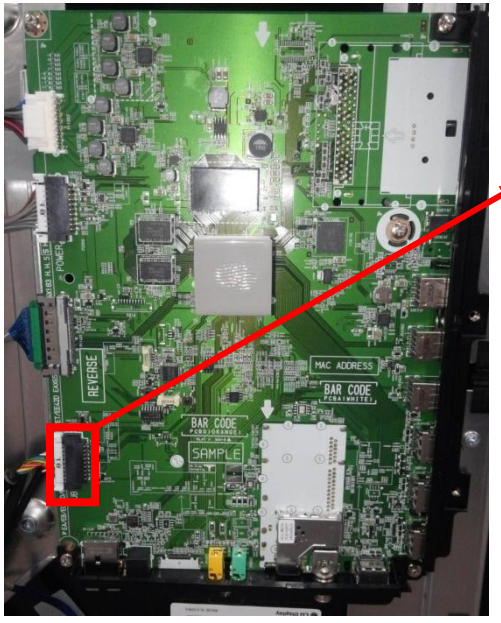
1, 2. Check Motion cable condition between Motion assy & Main board.
3. Check the 3.5V_WOL on the terminal 2.

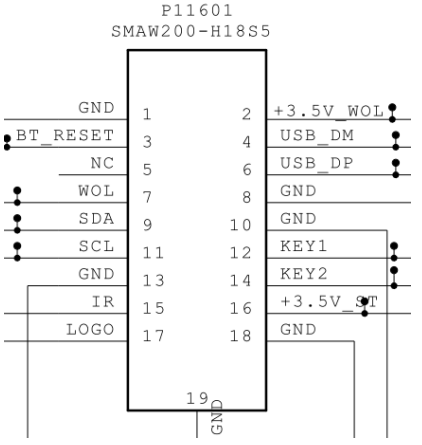
Standard Repair Process Detail Technical Manual

	Error symptom	D. Function error	Established date		
	Content	Wifi operation checking method	Revised date		A21

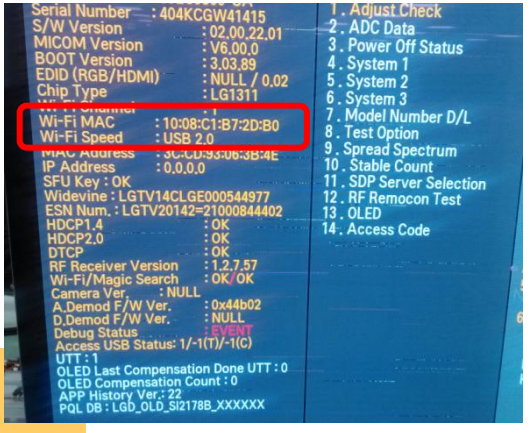


②





③



Checking order

1, 2 Check the 3.5V_WOL on the terminal 2.
3. Check the WIFI Channel , WIFI SPEED -> MAC , USB2.0(PASS) (USB1.0 ->FAIL)