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 LED TV used UD65S chassis.

2. Requirement for Test

Each part is tested as below without special notice.

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

3. Test method

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

4. Model General Specification

No.	Item	Specification	Remarks
1	Market	EU/CIS(PAL Market-37Countries)	**DTV & Analog (Total 37 countries)** **DTV (MPEG2/4, DVB-T) : 26 countrie** Germany, Netherland, Switzerland, Hungary, Austria, Slovenia, Bulgaria, France, Spain, Belgium, Luxemburg, Greece, Czech, Turkey, Morocco, Ireland, Latvia, Estonia, Lithuania, Poland, Portugal, Romania, Albania, Bosnia, Slovakia, Belarus **DTV (MPEG2/4, DVB-T2) :11 countries** UK(Ireland), Sweden, Denmark, Finland, Norway, Ukraine, Kazakhstan, Russia, Italy, Croatia, Serbia **DTV (MPEG2/4, DVB-C) : 37 countries** Germany, Netherland, Switzerland, Hungary, Austria, Slovenia, Bulgaria, France, Spain, Italy, Belgium, Russia, Luxemburg, Greece, Czech, Croatia, Turkey, Morocco, Ireland, Latvia, Estonia, Lithuania, Poland, Portugal, Romania, Albania, Bosnia, Serbia, Slovakia, Belarus, UK, Sweden, Denmark, Finland, Norway, Ukraine, Kazakhstan **DTV (MPEG2/4,DVB-S) : 37 countries** Germany, Netherland, Switzerland, Hungary, Austria, Slovenia, Bulgaria, France, Spain,Belgium, Luxemburg, Greece, Czech, Turkey, Morocco, Ireland, Latvia, Estonia, Lithuania, Poland, Portugal, Romania, Albania, Bosnia, Slovakia, Belarus, UK(Ireland), Sweden, Denmark, Finland, Norway, Ukraine, Kazakhstan,Russia, Italy, Croatia, Serbia **Supported satellite : 35 satellites** ABS1 75.0E, AMOS 4.0W, 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 7.3WEUTELSAT 16.0E, EXPRESS AM1 40.0E, EXPRESS AM3 140.0E, EXPRESS AM33 96.5E, HELLASSAT 39.0E, HISPASAT 1CDE 30.0WHOTBIRD 13.0E, INTELSAT10&7 68.5E, INTELSAT15 85.2E, INTELSAT1R 50.0W, INTELSAT903 33.5W, INTELSAT904 60.0E, NILESAT 7.0W, NSS12 57.0E, THOR 0.8W, TURKSAT 42.0E,YAMAL201 90.0E, OTHER

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

5. External Input Format

5.1. 2D Mode

(1) Component (Y, C_B/P_B, C_R/P_R)

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

(2) HDMI Input (DTV)

No.	Resolution	H-freq(kHz)	V-freq.(kHz)	Pixel clock(MHz)	Proposed	Remarks
1	640*480	31.46	59.94	25.13	SDTV 480P	
2	640*480	31.50	60.00	25.13	SDTV 480P	
3	720*480	15.73	59.94	13.50	SDTV, DVD 480I(525I)	Spec. out but display
4	720*480	15.75	60.00	13.51	SDTV, DVD 480I(525I)	
5	720*576	15.62	50.00	13.50	SDTV, DVD 576I(625I) 50Hz	
6	720*480	31.47	59.94	27.00	SDTV 480P	
7	720*480	31.50	60.00	27.03	SDTV 480P	
8	720*576	31.25	50.00	27.00	SDTV 576P	
9	1280*720	44.96	59.94	74.18	HDTV 720P	
10	1280*720	45.00	60.00	74.25	HDTV 720P	
11	1280*720	37.50	50.00	74.25	HDTV 720P	
12	1920*1080	28.12	50.00	74.25	HDTV 1080I	
13	1920*1080	33.72	59.94	74.18	HDTV 1080I	
14	1920*1080	33.75	60.00	74.25	HDTV 1080I	
15	1920*1080	26.97	23.97	63.30	HDTV 1080P	
16	1920*1080	27.00	24.00	63.36	HDTV 1080P	
17	1920*1080	33.71	29.97	79.12	HDTV 1080P	
18	1920*1080	33.75	30.00	79.20	HDTV 1080P	
19	1920*1080	56.25	50.00	148.50	HDTV 1080P	
20	1920*1080	67.43	59.94	148.35	HDTV 1080P	
21	1920*1080	67.50	60.00	148.50	HDTV 1080P	
22	3840*2160	53.95	23.98	297.00	UDTV 2160P	UHD only
23	3840*2160	54.00	24.00	297.00	UDTV 2160P	UHD only
24	3840*2160	56.25	25.00	297.00	UDTV 2160P	UHD only
25	3840*2160	61.43	29.97	297.00	UDTV 2160P	UHD only
26	3840*2160	67.50	30.00	297.00	UDTV 2160P	UHD only
27	3840*2160	112.50	50.00	594.00	UDTV 2160P(DVB)	UHD only
28	3840*2160	135.00	59.94	593.41	UDTV 2160P	UHD only
29	3840*2160	135.00	60.00	594.00	UDTV 2160P	UHD only
30	4096*2160	53.95	23.98	297.00	UDTV 2160P	UHD only
31	4096*2160	54.00	24.00	297.00	UDTV 2160P	UHD only
32	4096*2160	56.25	25.00	297.00	UDTV 2160P	UHD only
33	4096*2160	61.43	29.97	297.00	UDTV 2160P	UHD only
34	4096*2160	67.50	30.00	297.00	UDTV 2160P	UHD only
35	4096*2160	112.50	50.00	594.00	UDTV 2160P(DVB)	UHD only
36	4096*2160	135.00	59.94	593.41	UDTV 2160P	UHD only
37	4096*2160	135.00	60.00	594.00	UDTV 2160P	UHD only

(3) HDMI Input (PC)

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

5.2. 3D Mode

(1) RF Input

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

ADJUSTMENT INSTRUCTION

1. Application Range

This specification sheet is applied to all of the LED TV with UD65S chassis.

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.

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.

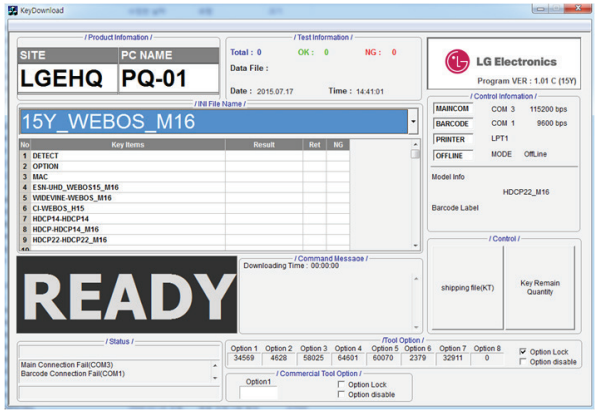
In case of keeping module is in the circumstance of below -20 °C, it should be placed in the circumstance of above 15 °C for 3 hours.

[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. Automatic Adjustment

3.1. MAC address D/L, CI+ key D/L, Widevine key D/L, ESN D/L, HDCP2.0 D/L

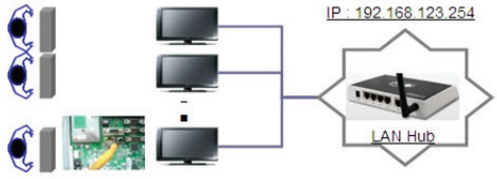
Connect: USB port
Communication Prot connection
- Com 1,2,3,4 and 115200(Baudrate)
  Mode check: Online Only
- Check the test process
  : DETECT → MAC → ESN → Widevine → CI → HDCP20
- Play: Press Enter key
- Result: Ready, Test, OK or NG
- Printer Out (MAC Address Label)



3.2. LAN Inspection

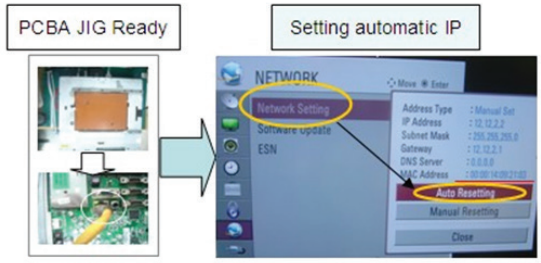
3.2.1. Equipment & Condition

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



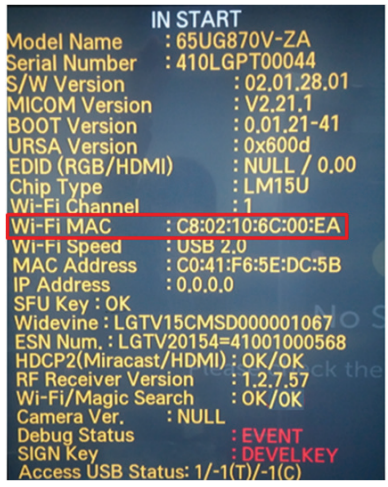
3.2.2. LAN inspection solution

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



3.2.3. WIDEVINE key Inspection

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



3.3. LAN PORT INSPECTION(PING TEST)

Connect SET → LAN port == PC → LAN Port

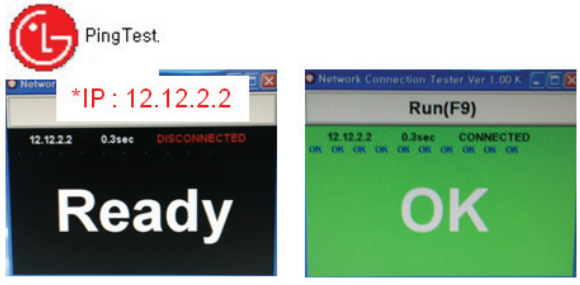
SET —— PC

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

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)
There 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(ex 65UG870V-ZA) or Serial number like photo.

4) Check the model name Instart menu. → Factory name displayed. (ex 65UG870V-ZA)
5) Check the Diagnostics.(DTV country only) → Buyer model displayed. (ex 65UG870V-ZA)

3.5. CI+ Key checking method(Only EU Model)

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

=> Check the Download to CI+ Key value in LGset.

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	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 methed of CI+ key by command (RS232: ci 00 20)

CMD 1	CMD 2	Data 0	
C	I	2	0

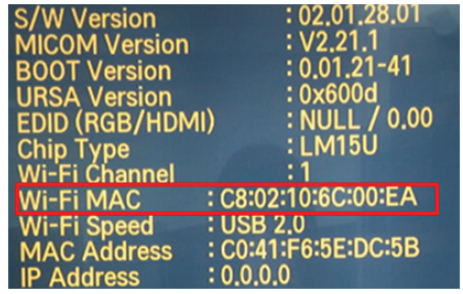
3) Result value
i 01 OK 1d1852d21c1ed5dcx
→ CI+ Key Value

3.6. WIFI MAC ADDRESS CHECK

(1) Using RS232 Command

	H-freq(kHz)	V-freq.(Hz)
Transmission	[A][I][][Set ID][][20][Cr]	[O][K][X] or [NG]

(2) Check the menu on in-start



4. Manual Adjustment

** ADC adjustment is not needed because of OTP(Auto ADC adjustment)*

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

4.1.1. Overview

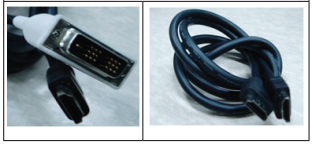
It is a VESA regulation. A PC or a MNT will display an optimal resolution through information sharing without any necessity of user input. It is a realization of "Plug and Play".

4.1.2. Equipment

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

4.1.3. Download method

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

For HDMI EDID
DVI-D to HDMI or HDMI to HDMI


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

4.1.4. EDID DATA

▪ Reference

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

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

ⓐ Product ID
ⓑ Serial No: Controlled on production line.
ⓒ Month, Year: Controlled on production line:
ex) Monthly : '01' → '01', Year : '2016' → '1A'
ⓓ Model Name(Hex): LGTV
ⓔ Checksum(LG TV): Changeable by total EDID data.
ⓕ Vendor Specific(HDMI)

(1) EDID for 2D Model

1) DTS

HDMI 1(C/S : 9F 47) - HDMI UHD Deep On Case

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

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

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

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
80	02	03	4B	F1	58	61	60	10	1F	04	13	05	14	03	02	12
90	20	21	22	15	01	5D	5E	5F	65	66	62	63	64	29	3D	06
A0	C0	15	07	50	09	57	07	6E	03	0C	00	10	00	B8	3C	20
B0	00	80	01	02	03	04	67	D8	5D	C4	01	78	80	03	E3	05
C0	C0	00	E4	0F	03	00	18	E3	06	07	01	01	1D	80	18	71
D0	1C	16	20	58	2C	25	00	40	84	63	00	00	9E	66	21	50
E0	B0	51	00	1B	30	40	70	36	00	40	84	63	00	00	1E	00
F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	47

HDMI 1(C/S : 9F 79) - HDMI UHD Deep Off Case

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

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

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

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
80	02	03	3C	F1	54	5D	10	1F	04	13	05	14	03	02	12	20
90	21	22	15	01	5E	5F	62	63	64	29	3D	06	C0	15	07	50
A0	09	57	07	6E	03	0C	00	10	00	B8	3C	20	00	80	01	02
B0	03	04	E5	0E	60	61	65	66	E3	06	07	01	01	1D	80	18
C0	71	1C	16	20	58	2C	25	00	40	84	63	00	00	9E	66	21
D0	50	B0	51	00	1B	30	40	70	36	00	40	84	63	00	00	1E
E0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	79

HDMI 2(C/S : 9F 37) - HDMI UHD Deep On Case

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

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

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

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
80	02	03	4B	F1	58	61	60	10	1F	04	13	05	14	03	02	12
90	20	21	22	15	01	5D	5E	5F	65	66	62	63	64	29	3D	06
A0	C0	15	07	50	09	57	07	6E	03	0C	00	20	00	B8	3C	20
B0	00	80	01	02	03	04	67	D8	5D	C4	01	78	80	03	E3	05
C0	C0	00	E4	0F	03	00	18	E3	06	07	01	01	1D	80	18	71
D0	1C	16	20	58	2C	25	00	40	84	63	00	00	9E	66	21	50
E0	B0	51	00	1B	30	40	70	36	00	40	84	63	00	00	1E	00
F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	37

HDMI 2(C/S : 9F 69) - HDMI UHD Deep Off Case
EDID Block 0, Bytes 0-127 [00H-7FH]

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

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

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
80	02	03	3C	F1	54	5D	10	1F	04	13	05	14	03	02	12	20
90	21	22	15	01	5E	5F	62	63	64	29	3D	06	C0	15	07	50
A0	09	57	07	6E	03	0C	00	20	00	B8	3C	20	00	80	01	02
B0	03	04	E5	0E	60	61	65	66	E3	06	07	01	01	1D	80	18
C0	71	1C	16	20	58	2C	25	00	40	84	63	00	00	9E	66	21
D0	50	B0	51	00	1B	30	40	70	36	00	40	84	63	00	00	1E
E0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	69

HDMI 3(C/S : 9F 27) - HDMI UHD Deep Off Case
EDID Block 0, Bytes 0-127 [00H-7FH]

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

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

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
80	02	03	4B	F1	58	61	60	10	1F	04	13	05	14	03	02	12
90	20	21	22	15	01	5D	5E	5F	65	66	62	63	64	29	3D	06
A0	C0	15	07	50	09	57	07	6E	03	0C	00	10	00	B8	3C	20
B0	00	80	01	02	03	04	67	D8	5D	C4	01	78	80	03	E3	05
C0	C0	00	E4	0F	03	00	18	E3	06	07	01	01	1D	80	18	71
D0	1C	16	20	58	2C	25	00	40	84	63	00	00	9E	66	21	50
E0	B0	51	00	1B	30	40	70	36	00	40	84	63	00	00	1E	00
F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	27

HDMI 3(C/S : 9F 59) - HDMI UHD Deep Off Case
EDID Block 0, Bytes 0-127 [00H-7FH]

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

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

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
80	02	03	3C	F1	54	5D	10	1F	04	13	05	14	03	02	12	20
90	21	22	15	01	5E	5F	62	63	64	29	3D	06	C0	15	07	50
A0	09	57	07	6E	03	0C	00	30	00	B8	3C	20	00	80	01	02
B0	03	04	E5	0E	60	61	65	66	E3	06	07	01	01	1D	80	18
C0	71	1C	16	20	58	2C	25	00	40	84	63	00	00	9E	66	21
D0	50	B0	51	00	1B	30	40	70	36	00	40	84	63	00	00	1E
E0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	59

* Checksum(HDMI 1/2/3)

Input	HDMI Deep Color On FFh (Checksum)		HDMI Deep Color Off FFh (Checksum)	
HDMI1	9F	47	9F	79
HDMI2	9F	37	9F	69
HDMI3	9F	27	9F	59

2) AC3

HDMI 1(C/S : 9F 50) - HDMI UHD Deep On Case
EDID Block 0, Bytes 0-127 [00H-7FH]

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

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

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
80	02	03	48	F1	58	61	60	10	1F	04	13	05	14	03	02	12
90	20	21	22	15	01	5D	5E	5F	65	66	62	63	64	26	15	07
A0	50	09	57	07	6E	03	0C	00	10	00	B8	3C	20	00	80	01
B0	02	03	04	67	D8	5D	C4	01	78	80	03	E3	05	C0	00	E4
C0	0F	03	00	18	E3	06	07	01	01	1D	80	18	71	1C	16	20
D0	58	2C	25	00	40	84	63	00	00	9E	66	21	50	B0	51	00
E0	1B	30	40	70	36	00	40	84	63	00	00	1E	00	00	00	00
F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	50

HDMI 1(C/S : 9F 82) – HDMI UHD Deep Off Case
EDID Block 0, Bytes 0-127 [00H-7FH]

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

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

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
80	02	03	39	F1	54	5D	10	1F	04	13	05	14	03	02	12	20
90	21	22	15	01	5E	5F	62	63	64	26	15	07	50	09	57	07
A0	6E	03	0C	00	10	00	B8	3C	20	00	80	01	02	03	04	E5
B0	0E	60	61	65	66	E3	06	07	01	01	1D	80	18	71	1C	16
C0	20	58	2C	25	00	40	84	63	00	00	9E	66	21	50	B0	51
D0	00	1B	30	40	70	36	00	40	84	63	00	00	1E	00	00	00
E0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	82

HDMI 2(C/S : 9F 40) - HDMI UHD Deep On Case
EDID Block 0, Bytes 0-127 [00H-7FH]

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

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

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
80	02	03	48	F1	58	61	60	10	1F	04	13	05	14	03	02	12
90	20	21	22	15	01	5D	5E	5F	65	66	62	63	64	26	15	07
A0	50	09	57	07	6E	03	0C	00	20	00	B8	3C	20	00	80	01
B0	02	03	04	67	D8	5D	C4	01	78	80	03	E3	05	C0	00	E4
C0	0F	03	00	18	E3	06	07	01	01	1D	80	18	71	1C	16	20
D0	58	2C	25	00	40	84	63	00	00	9E	66	21	50	B0	51	00
E0	1B	30	40	70	36	00	40	84	63	00	00	1E	00	00	00	00
F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	40

HDMI 2(C/S : 9F 72) - HDMI UHD Deep off Case
EDID Block 0, Bytes 0-127 [00H-7FH]

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

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

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
80	02	03	39	F1	54	5D	10	1F	04	13	05	14	03	02	12	20
90	21	22	15	01	5E	5F	62	63	64	26	15	07	50	09	57	07
A0	6E	03	0C	00	20	00	B8	3C	20	00	80	01	02	03	04	E5
B0	0E	60	61	65	66	E3	06	07	01	01	1D	80	18	71	1C	16
C0	20	58	2C	25	00	40	84	63	00	00	9E	66	21	50	B0	51
D0	00	1B	30	40	70	36	00	40	84	63	00	00	1E	00	00	00
E0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	72

HDMI 3(C/S : 9F 30) - HDMI UHD Deep off Case
EDID Block 0, Bytes 0-127 [00H-7FH]

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

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

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
80	02	03	48	F1	58	61	60	10	1F	04	13	05	14	03	02	12
90	20	21	22	15	01	5D	5E	5F	65	66	62	63	64	26	15	07
A0	50	09	57	07	6E	03	0C	00	30	00	B8	3C	20	00	80	01
B0	02	03	04	67	D8	5D	C4	01	78	80	03	E3	05	C0	00	E4
C0	0F	03	00	18	E3	06	07	01	01	1D	80	18	71	1C	16	20
D0	58	2C	25	00	40	84	63	00	00	9E	66	21	50	B0	51	00
E0	1B	30	40	70	36	00	40	84	63	00	00	1E	00	00	00	00
F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	30

HDMI 3(C/S : 9F 62) - HDMI UHD Deep off Case
EDID Block 0, Bytes 0-127 [00H-7FH]

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

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

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
80	02	03	39	F1	54	5D	10	1F	04	13	05	14	03	02	12	20
90	21	22	15	01	5E	5F	62	63	64	26	15	07	50	09	57	07
A0	6E	03	0C	00	30	00	B8	3C	20	00	80	01	02	03	04	E5
B0	0E	60	61	65	66	E3	06	07	01	01	1D	80	18	71	1C	16
C0	20	58	2C	25	00	40	84	63	00	00	9E	66	21	50	B0	51
D0	00	1B	30	40	70	36	00	40	84	63	00	00	1E	00	00	00
E0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	62

* Checksum(HDMI 1/2/3)

Input	HDMI Deep Color On FFh (Checksum)		HDMI Deep Color Off FFh (Checksum)	
HDMI1	9F	50	9F	82
HDMI2	9F	40	9F	72
HDMI3	9F	30	9F	62

3) PCM

HDMI 1(C/S : 9F C2) - HDMI UHD Deep On Case
EDID Block 0, Bytes 0-127 [00H-7FH]

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

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

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
80	02	03	45	F1	58	61	60	10	1F	04	13	05	14	03	02	12
90	20	21	22	15	01	5D	5E	5F	65	66	62	63	64	23	09	57
A0	07	6E	03	0C	00	10	00	B8	3C	20	00	80	01	02	03	04
B0	67	D8	5D	C4	01	78	80	03	E3	05	C0	00	E4	0F	03	00
C0	18	E3	06	07	01	01	1D	80	18	71	1C	16	20	58	2C	25
D0	00	40	84	63	00	00	9E	66	21	50	B0	51	00	1B	30	40
E0	70	36	00	40	84	63	00	00	1E	00	00	00	00	00	00	00
F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	C2

HDMI 1(C/S : 9F F4) - HDMI UHD Deep off case
EDID Block 0, Bytes 0-127 [00H-7FH]

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

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

□	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
80	02	03	36	F1	54	5D	10	1F	04	13	05	14	03	02	12	20
90	21	22	15	01	5E	5F	62	63	64	23	09	57	07	6E	03	0C
A0	00	10	00	B8	3C	20	00	80	01	02	03	04	E5	0E	60	61
B0	65	66	E3	06	07	01	01	1D	80	18	71	1C	16	20	58	2C
C0	25	00	40	84	63	00	00	9E	66	21	50	B0	51	00	1B	30
D0	40	70	36	00	40	84	63	00	00	1E	00	00	00	00	00	00
E0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	F4

HDMI 2(C/S : 9F B2) - HDMI UHD Deep On Case

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

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

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

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
80	02	03	45	F1	58	61	60	10	1F	04	13	05	14	03	02	12
90	20	21	22	15	01	5D	5E	5F	65	66	62	63	64	23	09	57
A0	07	6E	03	0C	00	20	00	B8	3C	20	00	80	01	02	03	04
B0	67	D8	5D	C4	01	78	80	03	E3	05	C0	00	E4	0F	03	00
C0	18	E3	06	07	01	01	1D	80	18	71	1C	16	20	58	2C	25
D0	00	40	84	63	00	00	9E	66	21	50	B0	51	00	1B	30	40
E0	70	36	00	40	84	63	00	00	1E	00	00	00	00	00	00	00
F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	B2

HDMI 2(C/S : 9F E4) - HDMI UHD Deep off case

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

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

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

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
80	02	03	36	F1	54	5D	10	1F	04	13	05	14	03	02	12	20
90	21	22	15	01	5E	5F	62	63	64	23	09	57	07	6E	03	0C
A0	00	20	00	B8	3C	20	00	80	01	02	03	04	E5	0E	60	61
B0	65	66	E3	06	07	01	01	1D	80	18	71	1C	16	20	58	2C
C0	25	00	40	84	63	00	00	9E	66	21	50	B0	51	00	1B	30
D0	40	70	36	00	40	84	63	00	00	1E	00	00	00	00	00	00
E0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	E4

HDMI 3(C/S : 9F A2) - HDMI UHD Deep off case

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

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

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

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
80	02	03	45	F1	58	61	60	10	1F	04	13	05	14	03	02	12
90	20	21	22	15	01	5D	5E	5F	65	66	62	63	64	23	09	57
A0	07	6E	03	0C	00	30	00	B8	3C	20	00	80	01	02	03	04
B0	67	D8	5D	C4	01	78	80	03	E3	05	C0	00	E4	0F	03	00
C0	18	E3	06	07	01	01	1D	80	18	71	1C	16	20	58	2C	25
D0	00	40	84	63	00	00	9E	66	21	50	B0	51	00	1B	30	40
E0	70	36	00	40	84	63	00	00	1E	00	00	00	00	00	00	00
F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	A2

HDMI 3(C/S : 9F D4) - HDMI UHD Deep off case

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

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

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

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
80	02	03	36	F1	54	5D	10	1F	04	13	05	14	03	02	12	20
90	21	22	15	01	5E	5F	62	63	64	23	09	57	07	6E	03	0C
A0	00	30	00	B8	3C	20	00	80	01	02	03	04	E5	0E	60	61
B0	65	66	E3	06	07	01	01	1D	80	18	71	1C	16	20	58	2C
C0	25	00	40	84	63	00	00	9E	66	21	50	B0	51	00	1B	30
D0	40	70	36	00	40	84	63	00	00	1E	00	00	00	00	00	00
E0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	D4

* Checksum(HDMI 1/2/3)

Input	HDMI Deep Color On FFh (Checksum)		HDMI Deep Color Off FFh (Checksum)	
HDMI1	9F	C2	9F	F4
HDMI2	9F	B2	9F	E4
HDMI3	9F	A2	9F	D4

4.1.5. Green Eye Inspection Guide (Only use Germany and CIS, Spec out other EU country, but UF690 model only for Germany)

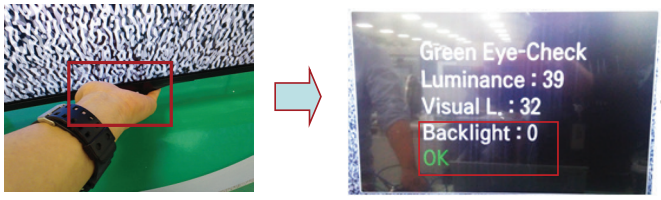
Step 1) Turn on the TV set.

Step 2). Press “EYE” button on the Adjustment remote control.

Step 3) Block the Intelligent Sensor module on the front C/A about 6 seconds. When the “Sensor Data” is lower than 20, you can see the “OK” message

→ If it doesn’t show “OK” message, the Sensor Module is defected one.

You have to replace that with a good one.



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

→ Check “Backlight” value change from “0” to “100” or not. If it doesn’t change the value, the sensor is also defected one. You have to replace it.

4.2. White Balance Adjustment

4.2.1. Overview

▪ W/B adj. Objective & How-it-works

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

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

(3) Adjustment condition : normal temperature

1) Surrounding Temperature : 25 °C ± 5 °C

2) Warm-up time: About 5 Min

3) Surrounding Humidity : 20 % ~ 80 %

4.2.2. Equipment

(1) Color Analyzer: CA-210 (LED Module : CH 14)

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

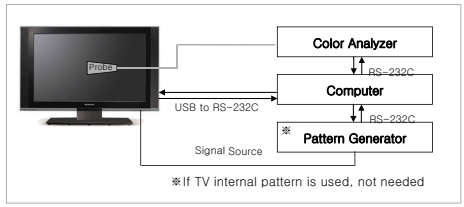
(3) Adjustment Remote control

(4) Video Signal Generator MSPG-925F 720p/216-Gray (Model: 204, Pattern: 49)

→ Only when internal pattern is not available

▪ Color Analyzer Matrix should be calibrated using CS-100.

4.2.3. Equipment connection MAP



4.2.4. Adj. Command (Protocol)

<Command Format>

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

- LEN: Number of Data Byte to be sent
- CMD: Command
- VAL: FOS Data value
- CS: Checksum of sent data
- A: Acknowledge

Ex) [Send: JA_00_DD] / [Ack: A_00_okDDX]

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

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

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

4.2.5. Adj. method

(1) Auto adj. method

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

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

(2) Manual adjustment method

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

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

▪ Adjustment condition and cautionary items

1) Lighting condition in surrounding area
Surrounding lighting should be lower 10 lux. Try to isolate adj. area into dark surrounding.
2) Probe location
- PDP: Color Analyzer (CA-100, CA-100+, CA210) probe should be firmly attached to the Module
- LCD: Color Analyzer (CA-210) probe should be within 10cm and perpendicular of the module surface (80°~ 100°)
3) Aging time
- After Aging Start, Keep the Power ON status during 5 Minutes.
- In case of LCD, Back-light on should be checked using no signal or Full-white pattern.

4.2.6. Reference(White balance adjusmtment coordinate and color temperature)

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

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

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

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

4.2.7. EDGE & IOL LED White balance table

▪ Apply under the color coordinate table, for compensated aging time.

-gumi & Global
Model : (normal line)LGD

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

(*) AUO, INX, Sharp, CSOT, BOE model (Cool spec : 13000K)
– 40UH63**-Z*/55UH65**-Z*

webOS	Cool		Medium		Warm	
	x	y	x	y	x	y
	271	270	285	293	313	329
Target	278	280	293	299	320	339

4.3. Magic Motion Remote control test

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

4.4. Option selection per country

4.4.1. Overview

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

4.4.2.Method

(1) Press ADJ key on the Adj. R/C, then select Country Group Menu.

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

4.5. HDMI ARC Function Inspection

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

(2) Test method

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

2) Check the sound from the TV Set.

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

4.6. Ship-out mode check (In-stop)

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

5. GND and Internal Pressure check

5.1. Method

(1) GND & Internal Pressure auto-check preparation
- Check that Power Cord is fully inserted to the SET. (If loose, re-insert)

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

5.2. Checkpoint

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

▪ TEST time: 1 second

▪ TEST POINT
- GND TEST = POWER CORD GND & SIGNAL CABLE METAL GND
- Internal Pressure TEST = POWER CORD GND & LIVE & NEUTRAL

▪ LEAKAGE CURRENT: At 0.5 mArms

6. Audio

No.	Item	Typ	Max	Unit	
1	Audio practical max Output, L/R (Distortion=10% max Output)	10	12	W	EQ Off AVL Off Clear Voice Off
		8.10	10.8	Vrms	
2	Speaker (6/8Ω Impedance)	10	12	W	EQ On AVL On Clear Voice On

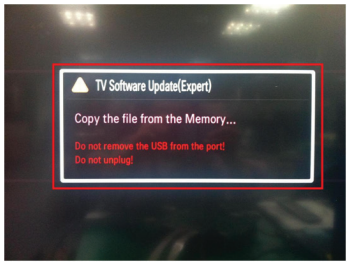
Measurement condition:

(1) RF input: Mono, 1 KHz sine wave signal, 100 % Modulation

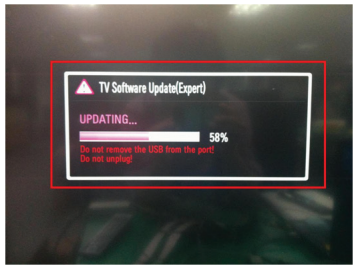
(2) CVBS, Component: 1 KHz sine wave signal 0.5 Vrms

7. USB S/W Download (option, Service only)

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



(4) Updating is starting.



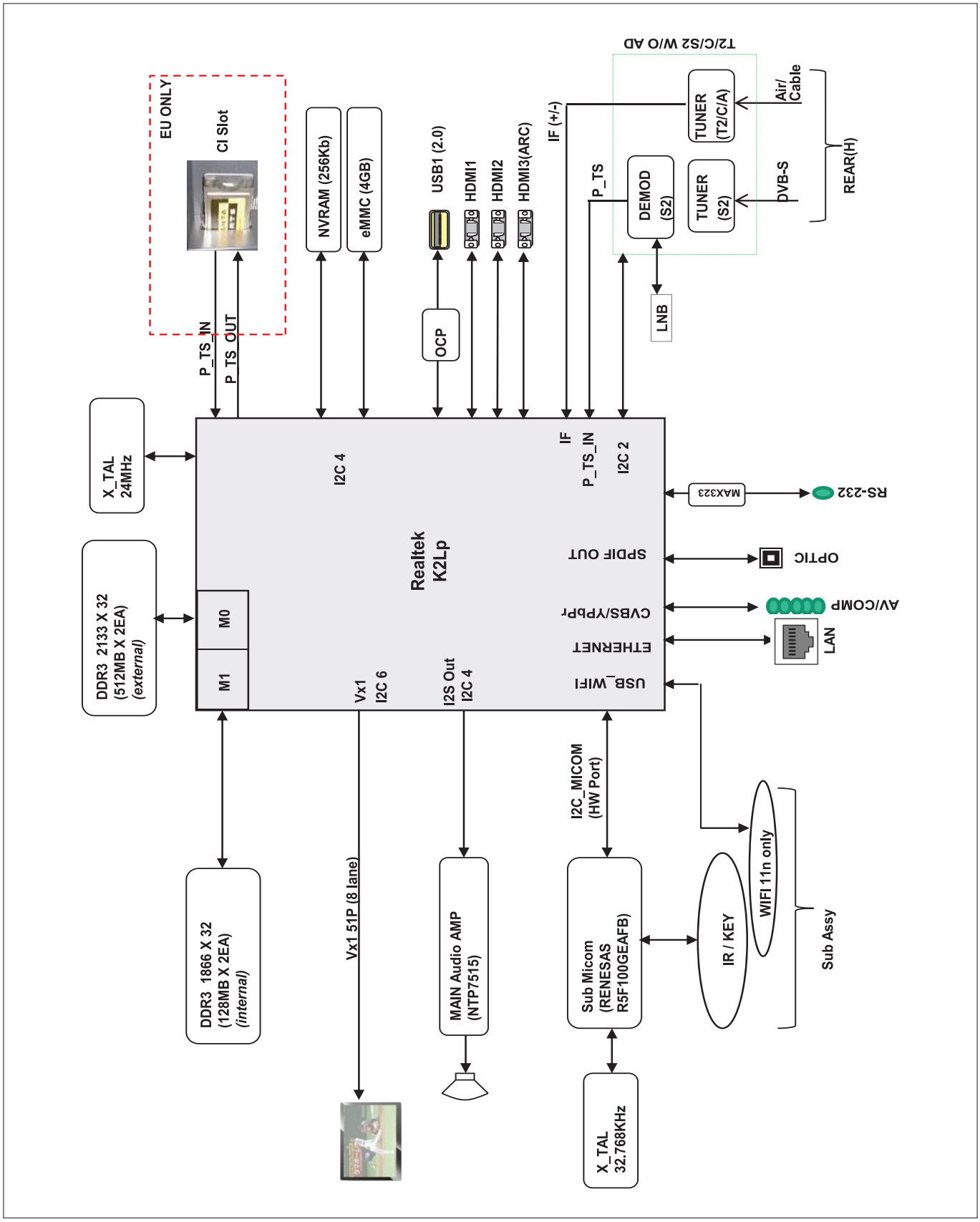
(5) Updating completed, the TV will restart automatically

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

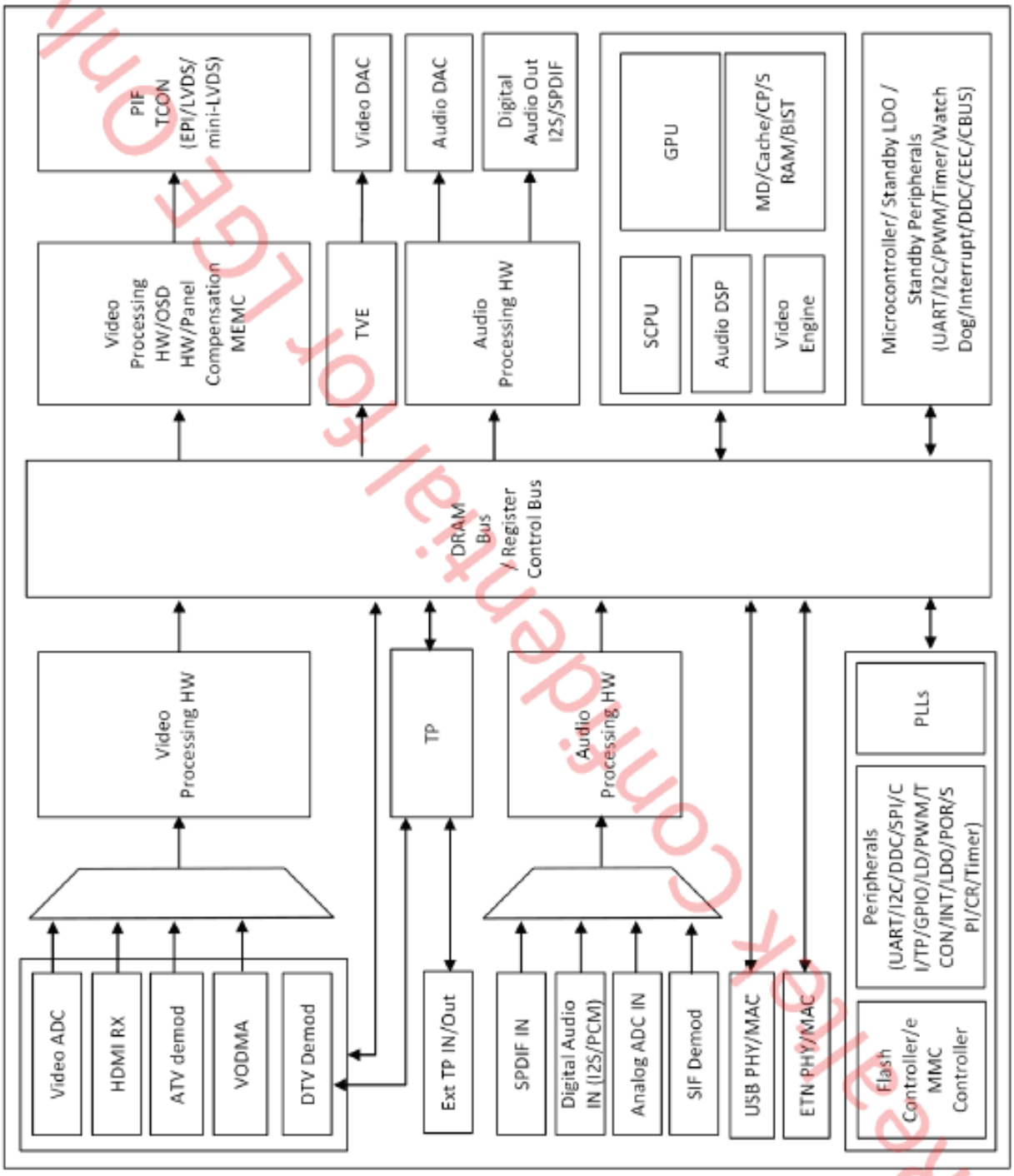
* After downloading, have to adjust Tool Option again.
(1) Push "IN-START" key in service remote control.
(2) Select "Tool Option 1" and push "OK" key.
(3) Punch in the number. (Each model has their number)

BLOCK DIAGRAM

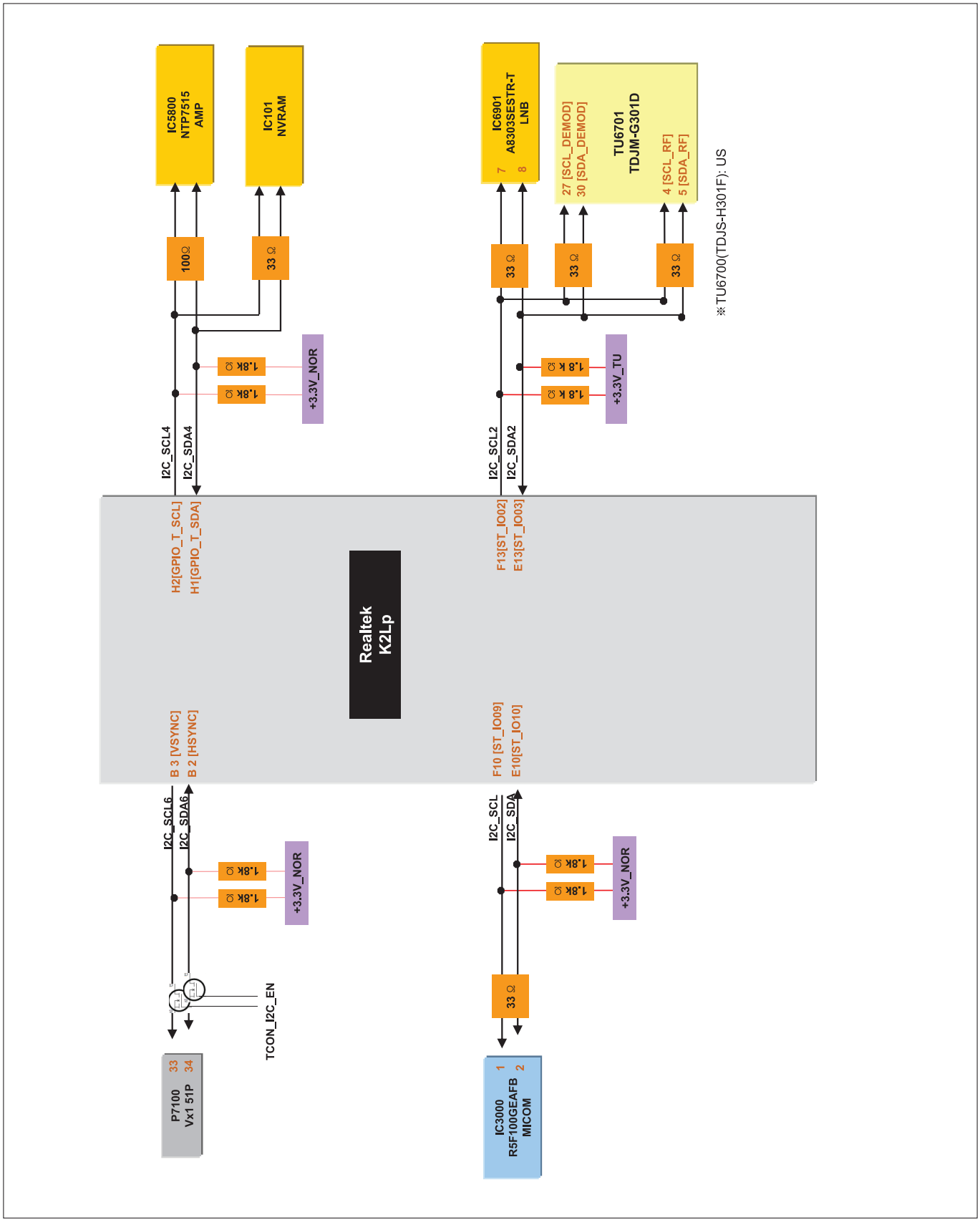
1. K2Lp



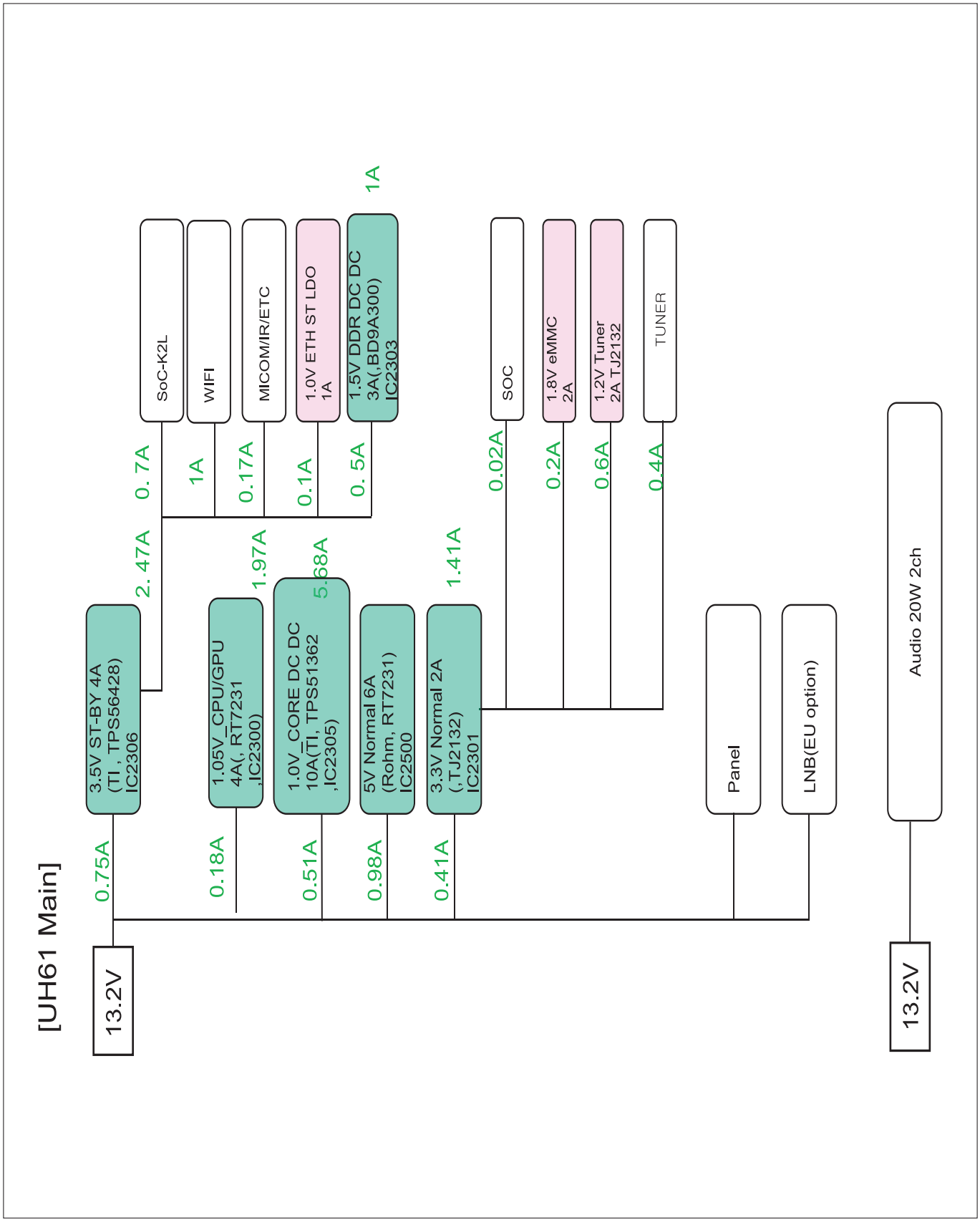
2. K2Lp (Internal)



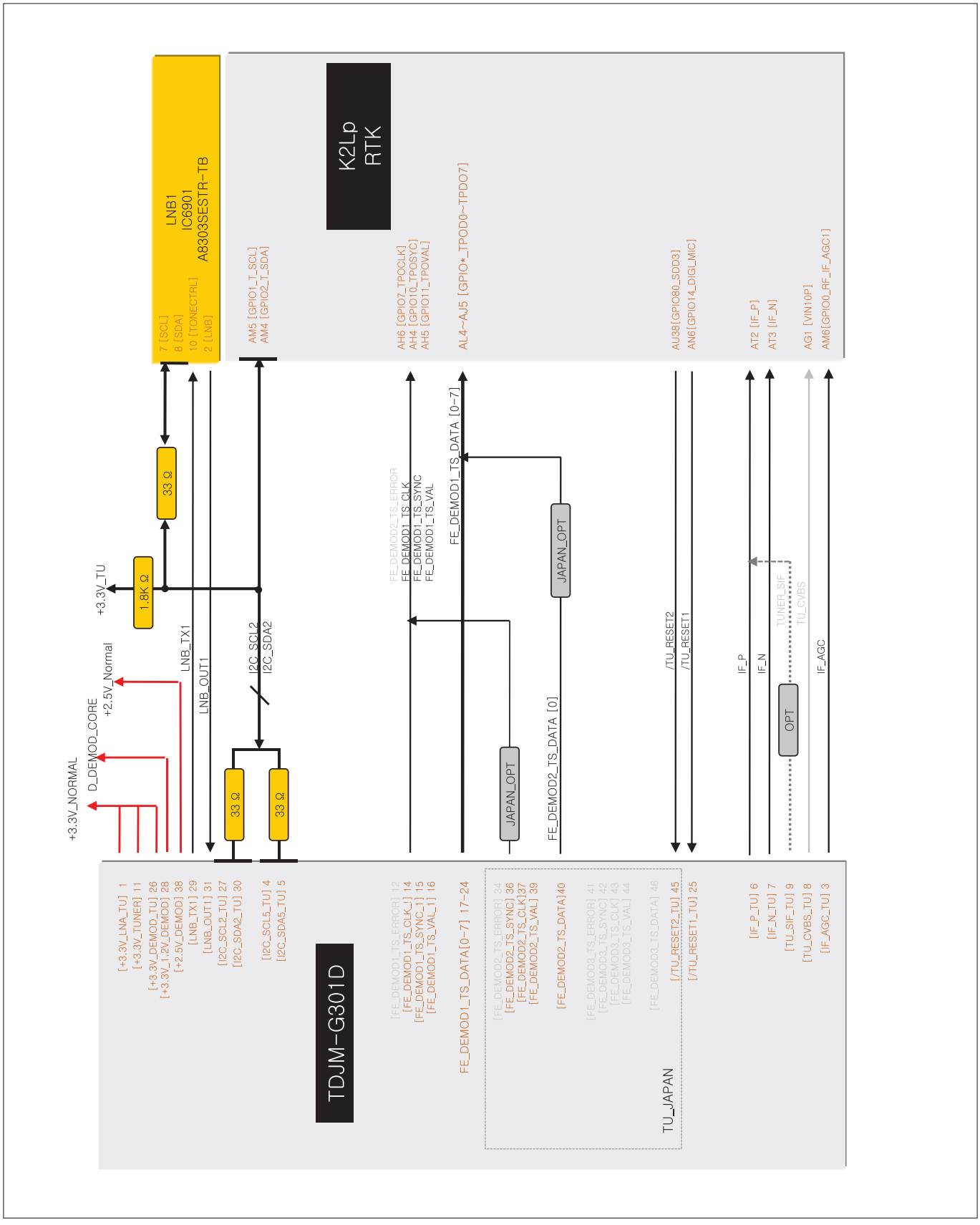
3. K2Lp I2C



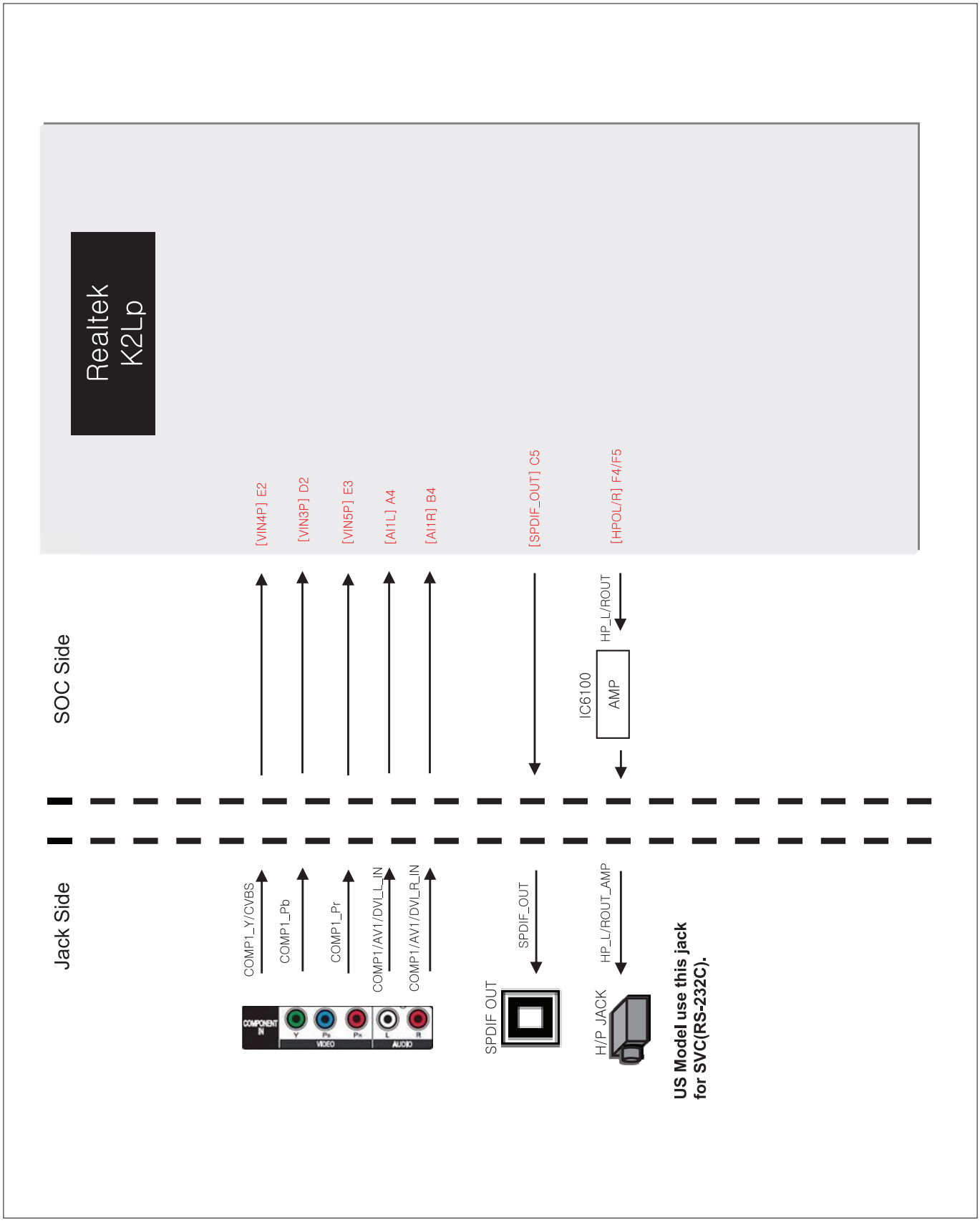
4. K2Lp Power



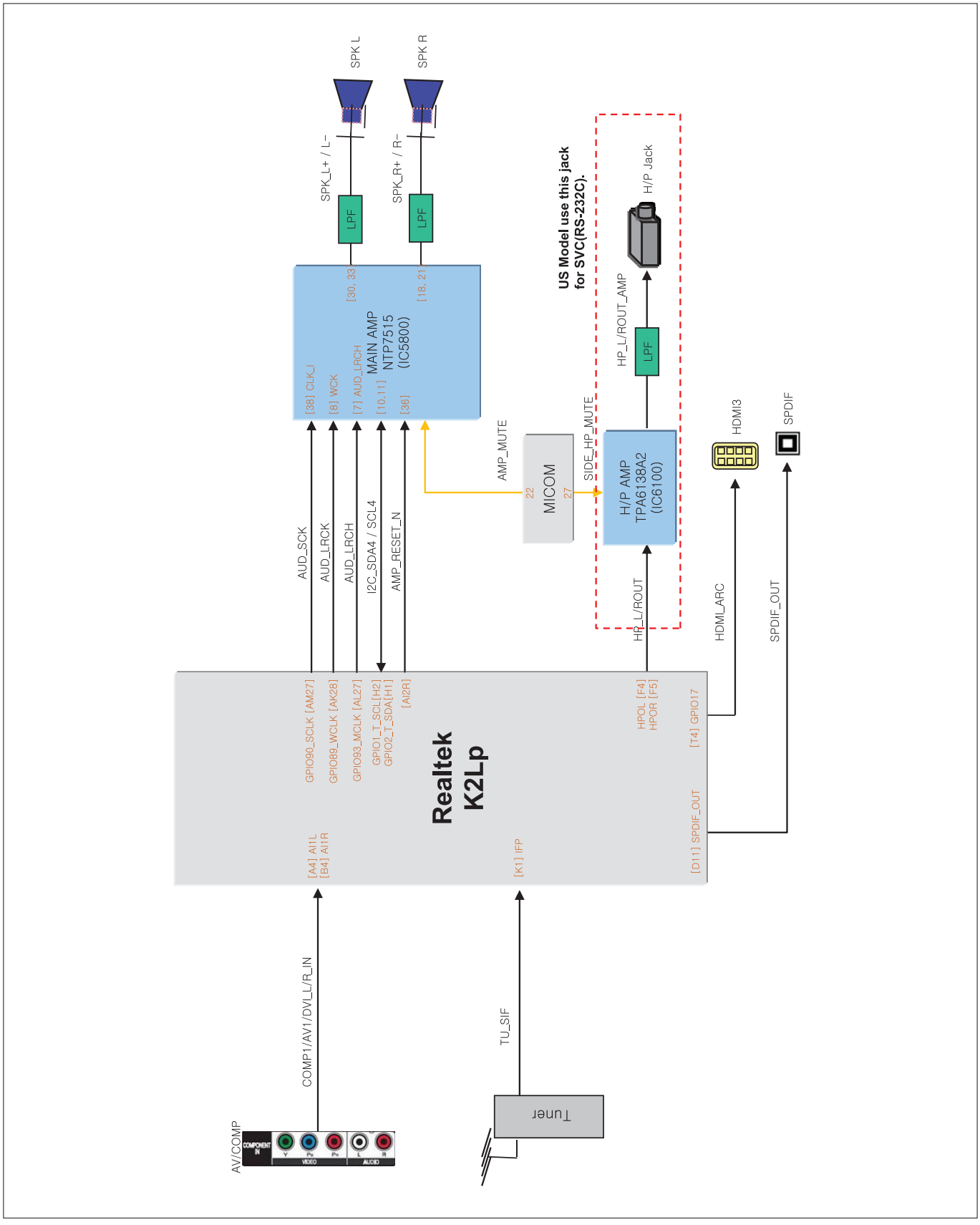
5. Tuner/CI



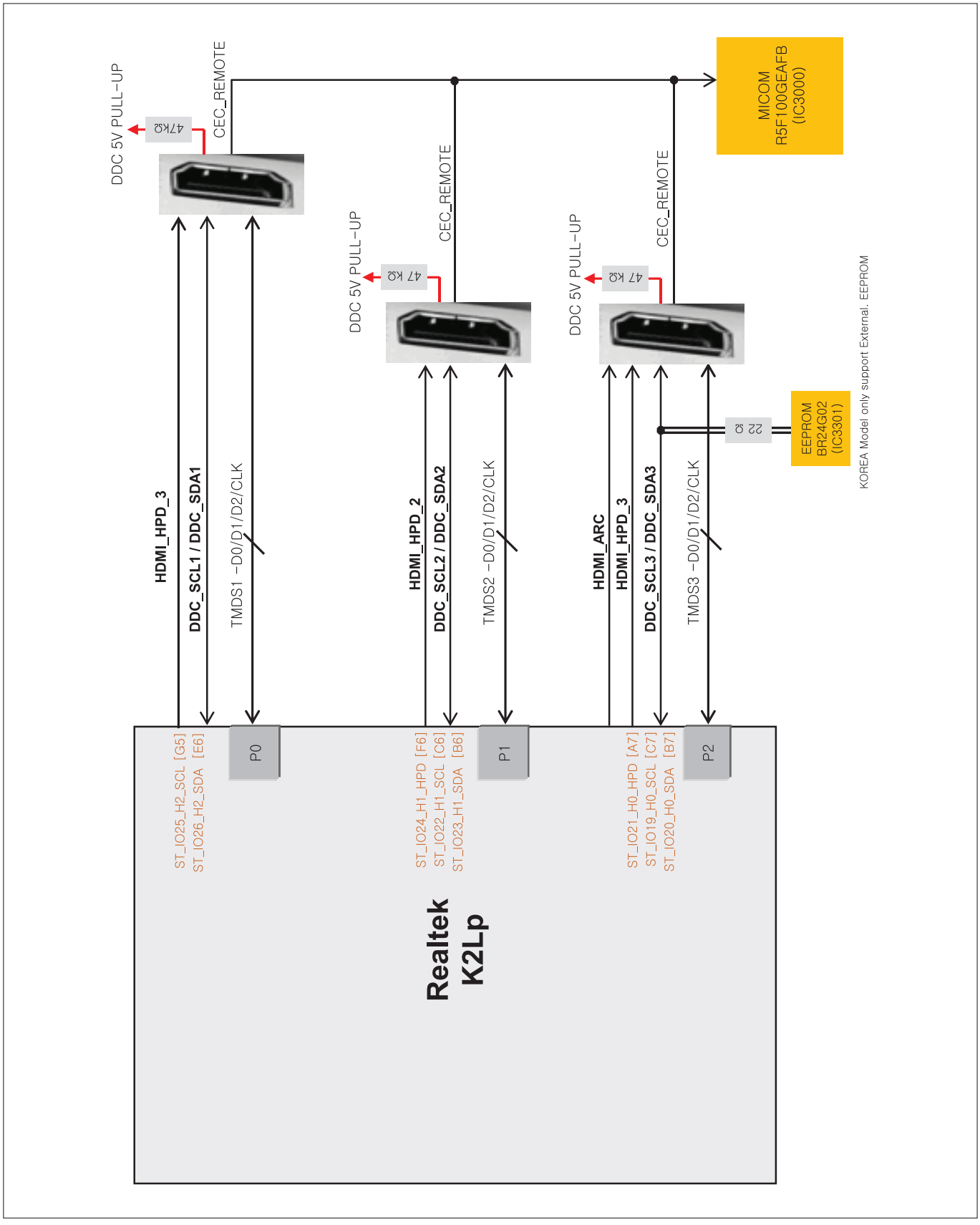
6. Video/Audio In



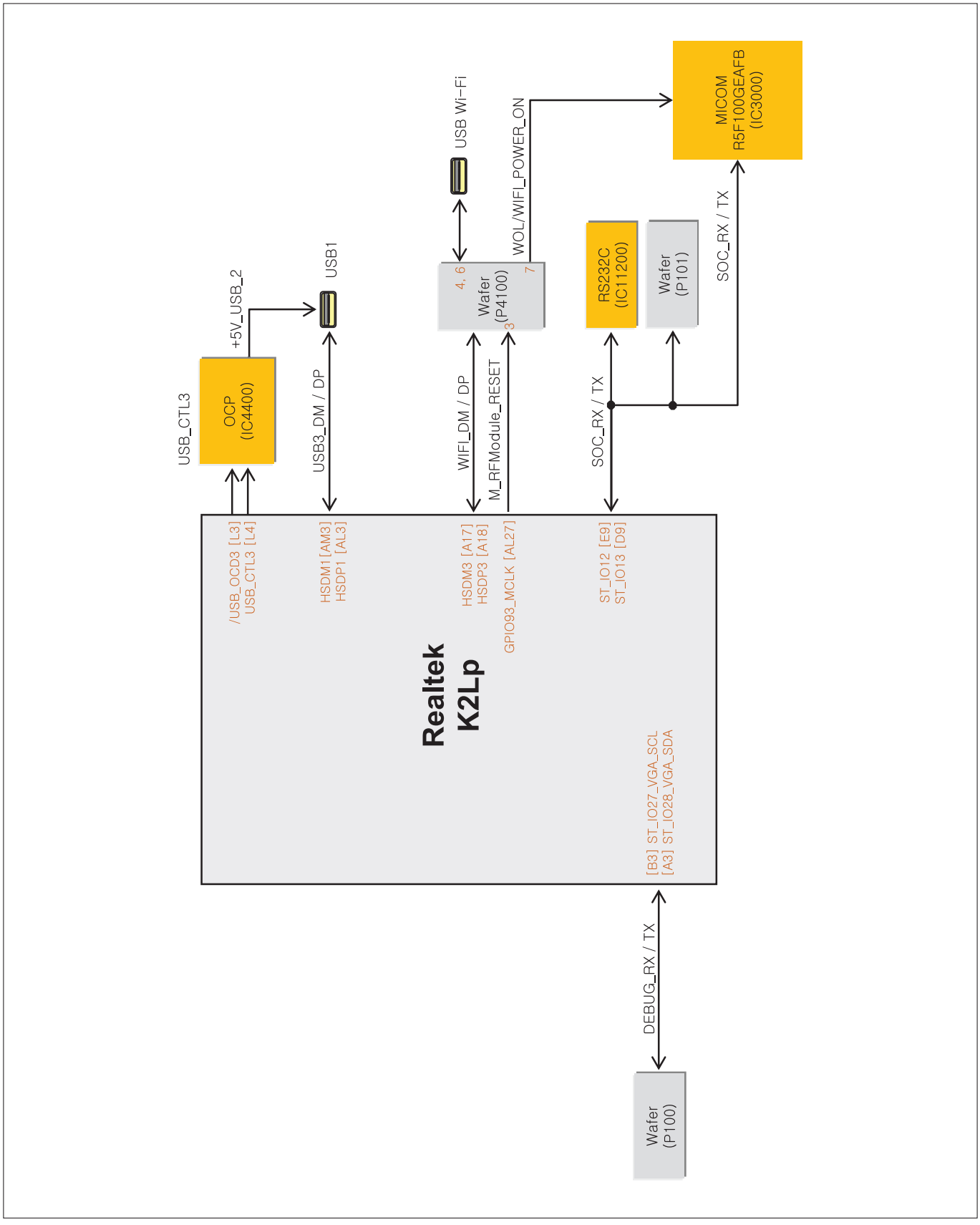
7. Audio Out



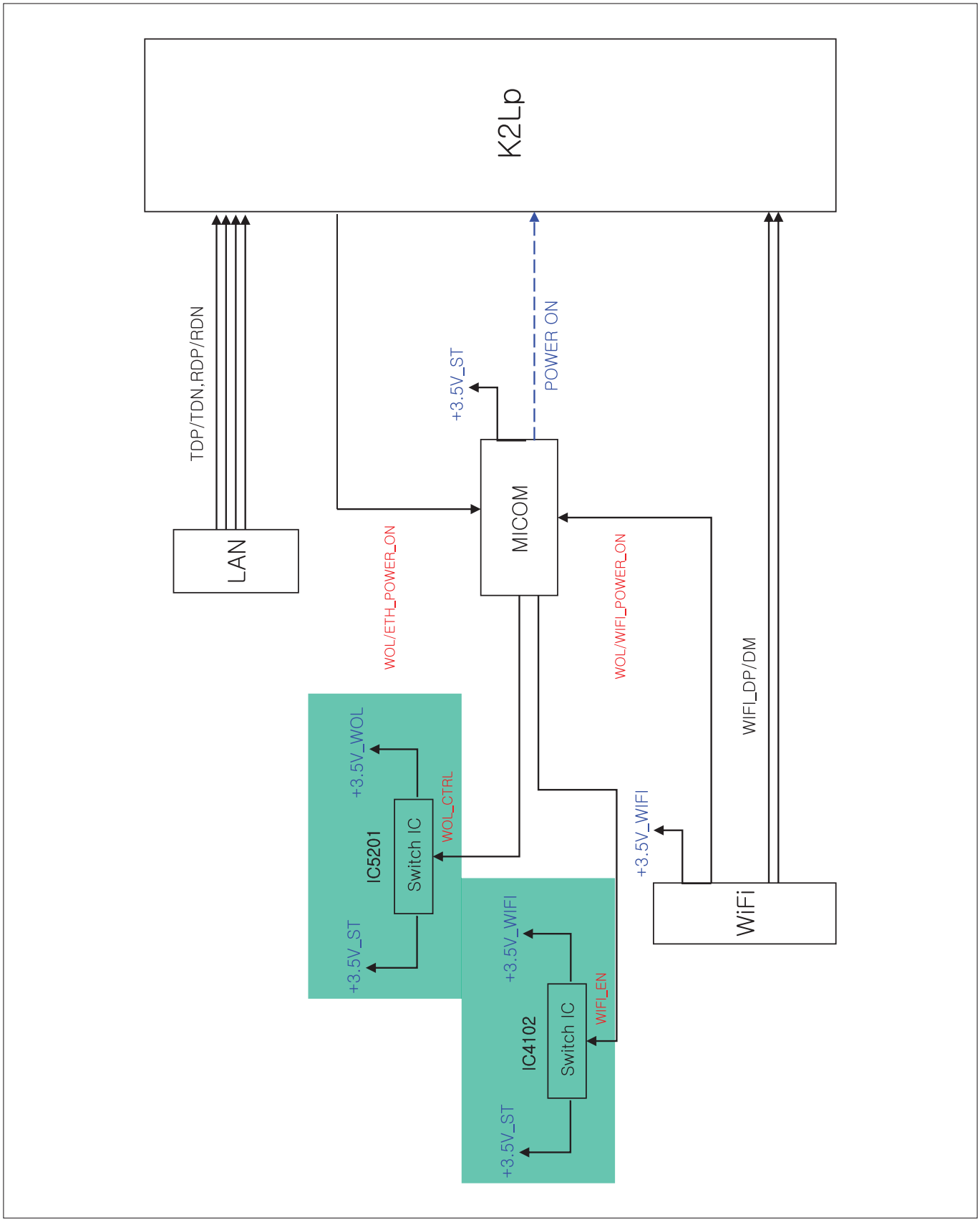
8. HDMI



9. USB / WIFI / UART



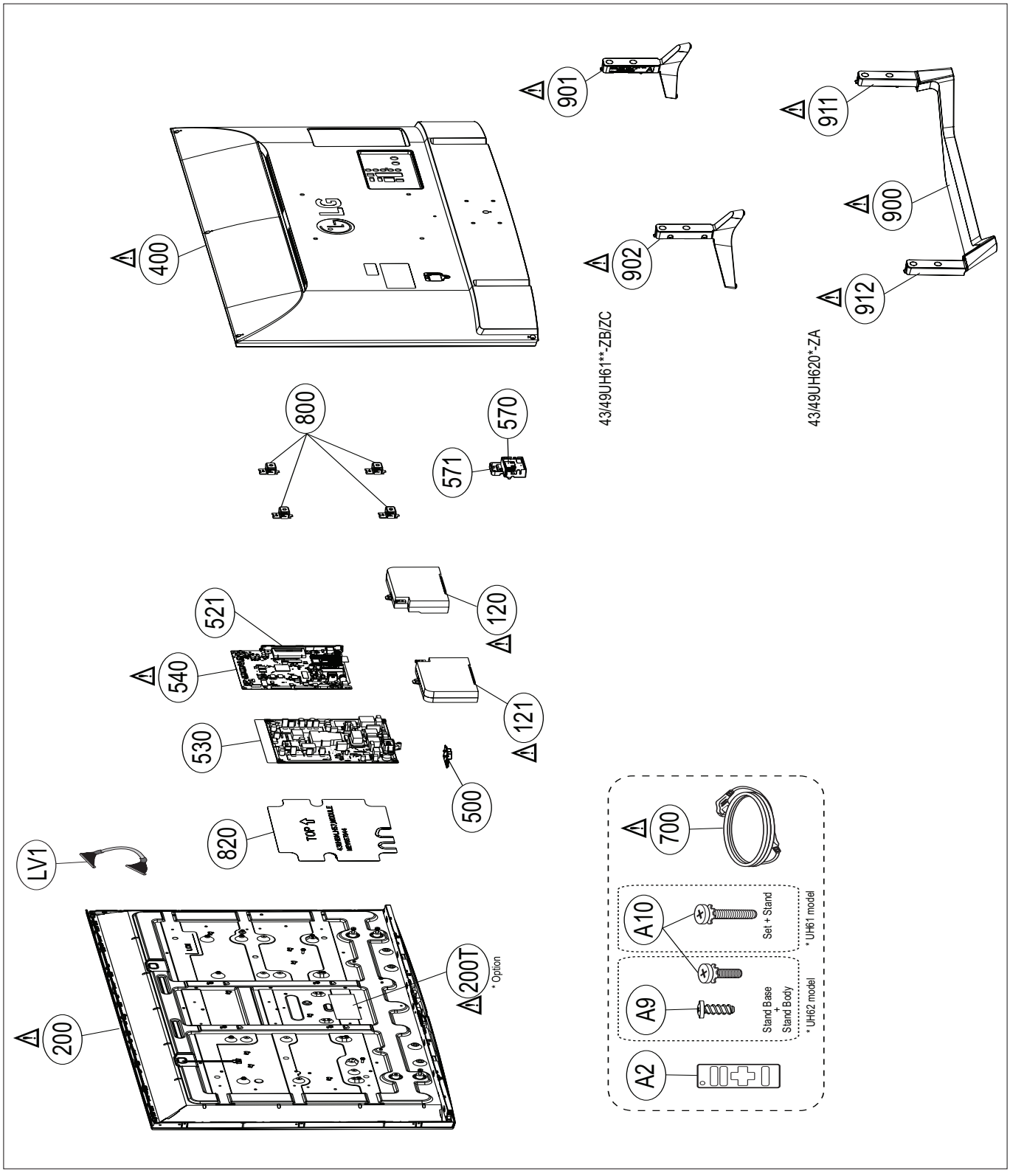
10. WOL



EXPLODED VIEW

IMPORTANT SAFETY NOTICE

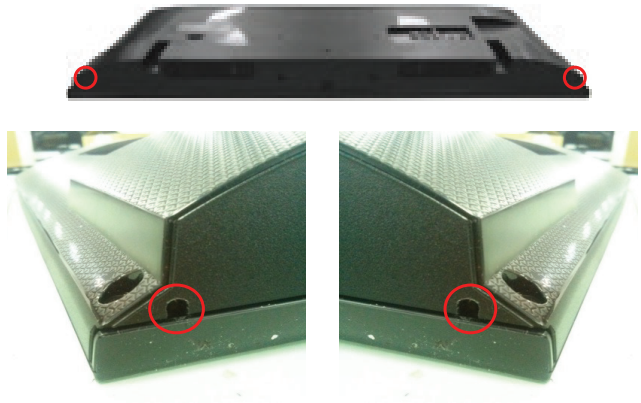
Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by ⚠ in the Schematic Diagram and EXPLODED VIEW.
It is essential that these special safety parts should be replaced with the same components as recommended in this manual to prevent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



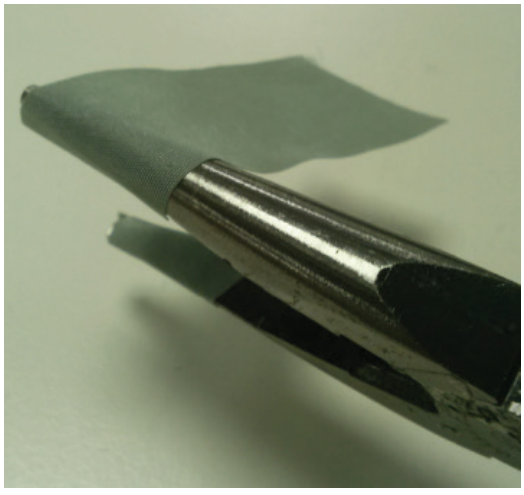
DISASSEMBLY

1. Disassembly of Back cover

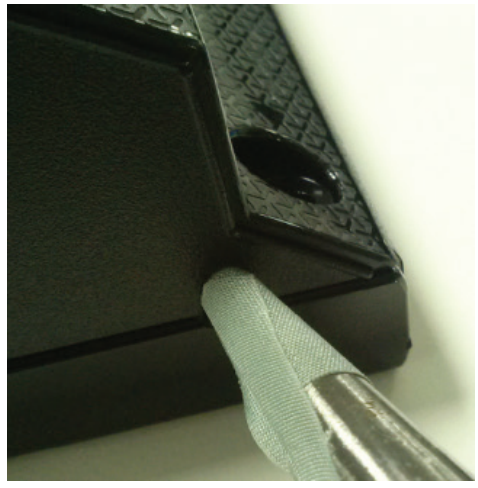
(1) Remove screw in the set



(2) Check both right/left hole



(3) Attach tape to ‘Long nose pliers’



(4) Put ‘long nose’ into the hole

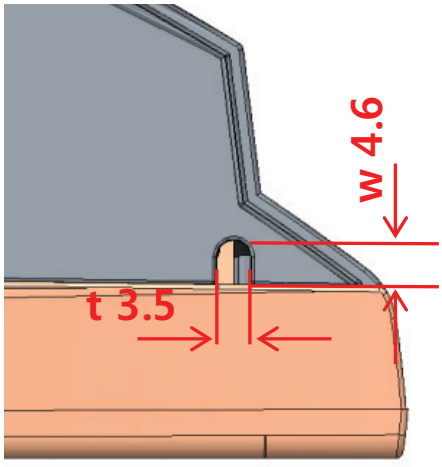
(5) Open B/C with push/pulling long nose to upper and lower sides.

(6) Disassemble Back cover

* Disassemble it from left to right for top side hook on Back cover

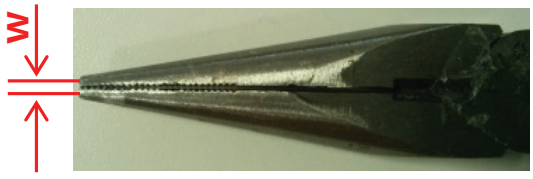
2. Back cover hole size & Long nose spec

▸ **B/C Hole size**
- **w : 4.6 mm**
- **t : 3.5 mm**

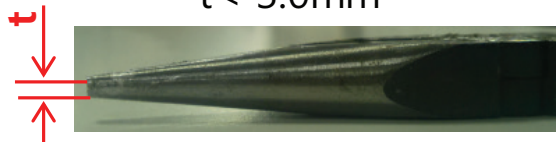


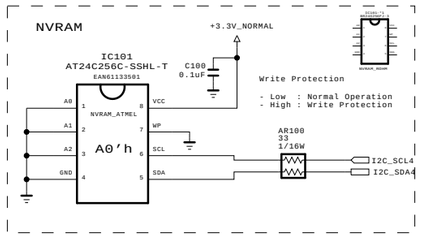
▸ **Tool spec**
- **Long nose pliers**
- **Needle nose pliers**

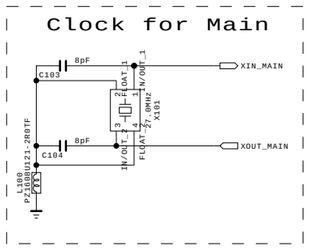
W < 4.0mm

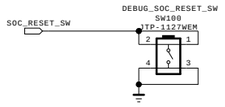


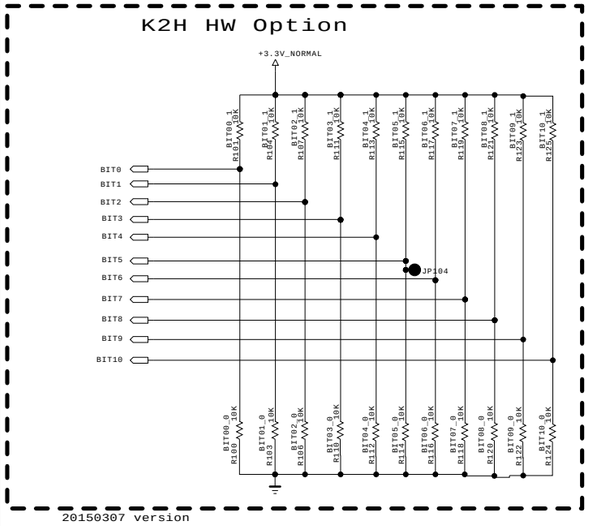
t< 3.0mm











20150307 version

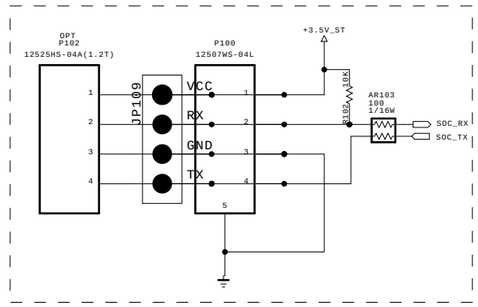
BIT(0/1)	DVB	ATSC	JP
00	TW/COL	US	
01	CN/HK	KR	JP
10	EU	BR	
11	AJJA	CI	

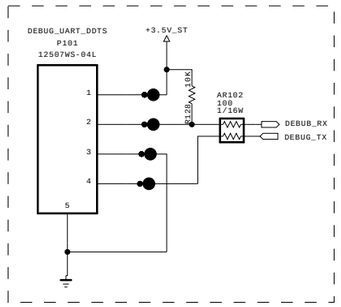
BIT(6/7/8)	B/E(FRC)
000	Vx1_60Hz
001	Reserved
010	EPI_V16_RGBW
011	EPI_V16_RGB
100	EPI_V15_RGBW
101	EPI_V15_RGB

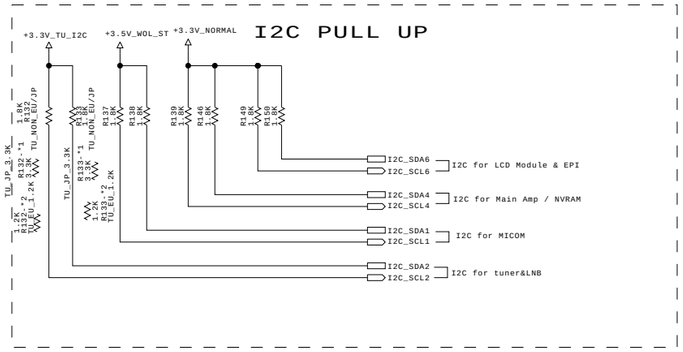
		Low	High
BIT4	Display	LCD	OLED
BIT5	15/16 Tuner	15_Tuner	16_Tuner

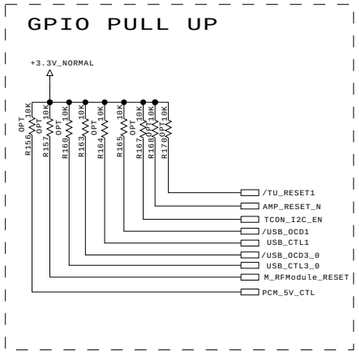
BIT(2/3)	EU/CIS	AJJA	TW/COL	CN/HK	KR	North.AM	BR	JP
00	T2/C/S2 PIP_EX_ATV	T_IN_ATV		EXT_ATV		IN_ATV		Default
01	T2/C/S2_IN_ATV	T2/C/S2_IN_ATV	T2_IN_ATV	IN_ATV	ATSC+T2_IN_ATV			
10	T2/C/S2_EX_ATV	T2/C/S2_EX_ATV					ISDB_IN_ATV	
11		T2_EX_ATV						

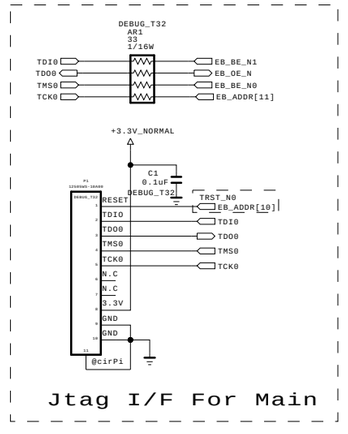
BIT9	Support EXTERNAL EDID FOR HDMI2.0	EXTERNAL	NON_EXTERNAL
BIT10	Division	NON_Division	4_Division











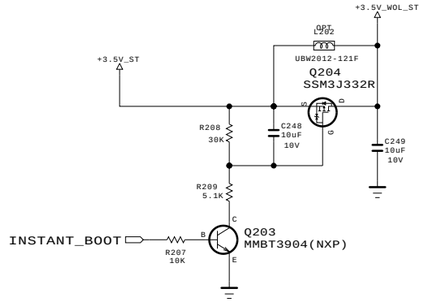
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

SECRET
LGElectronics

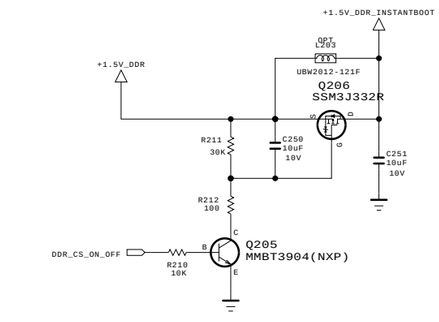
LG ELECTRONICS

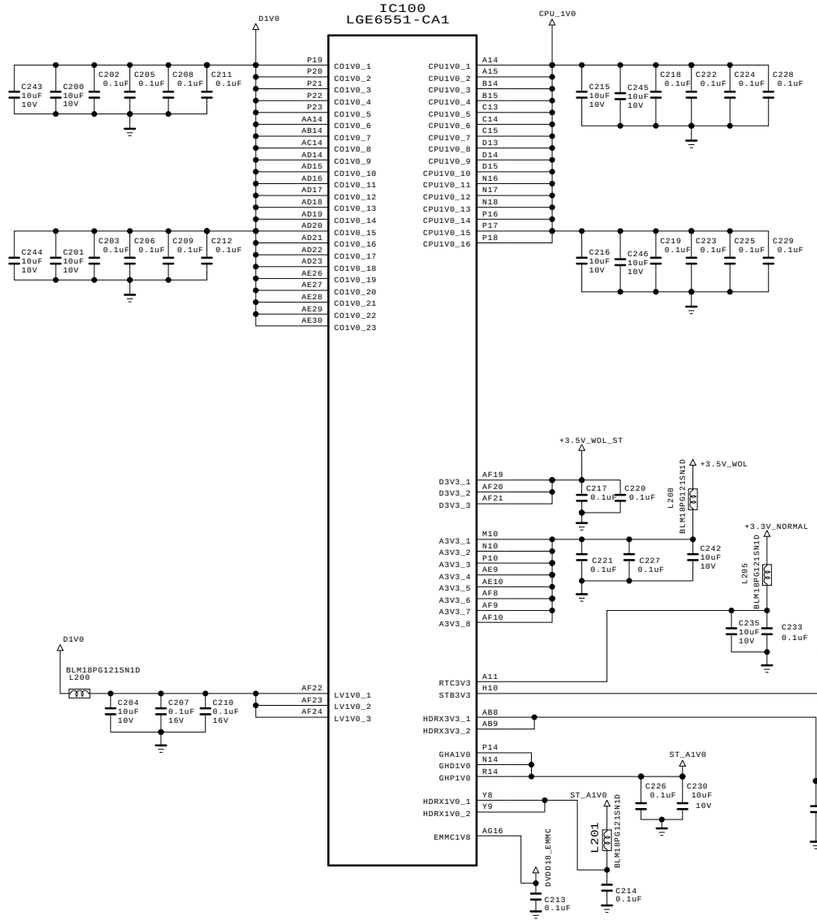
MODEL	K2L	DATE	2015-01-08
BLOCK	MAIN1_SYSTEM	SHEET	01

WOL&Instant ON

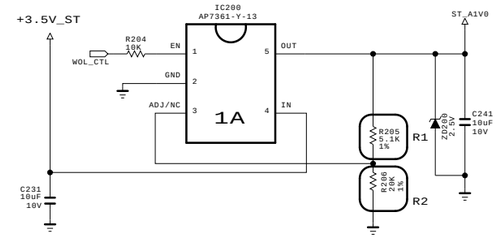


DDR power for Instant ON



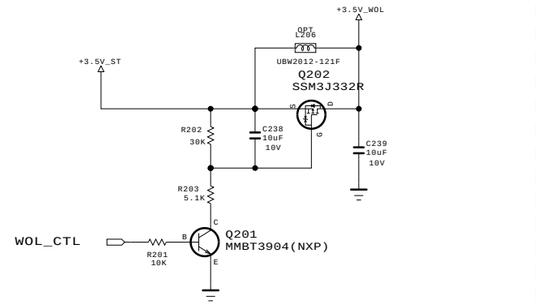


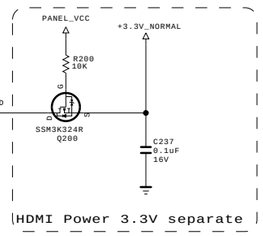
+1.0V LDO Eth STDBY



Vout=0.8*(1+R1/R2)=1.004V

WOL switch





HDMI Power 3.3V separate

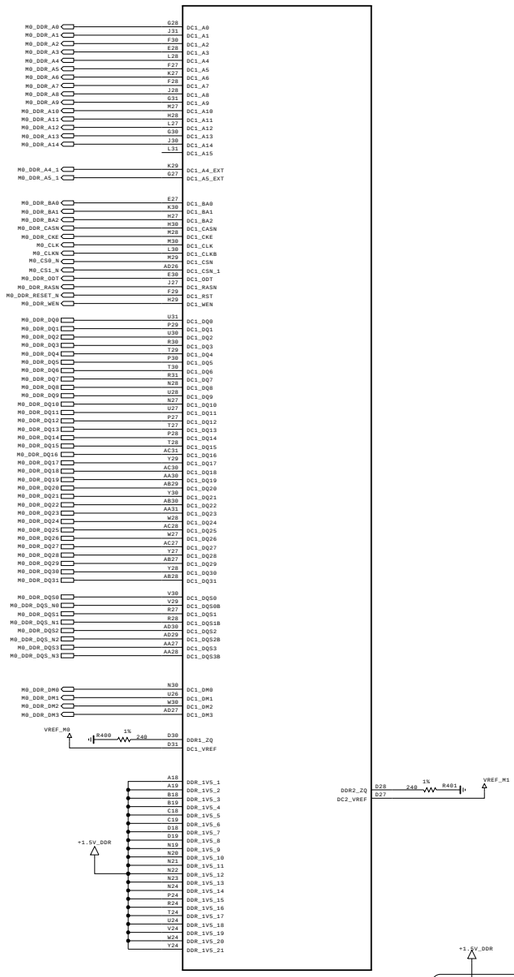
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

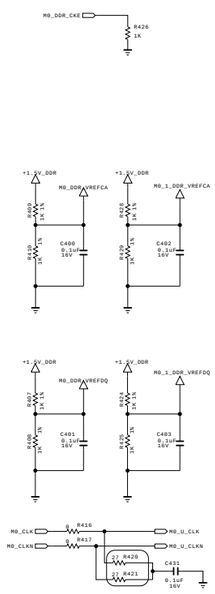
SECRET
LGElectronics

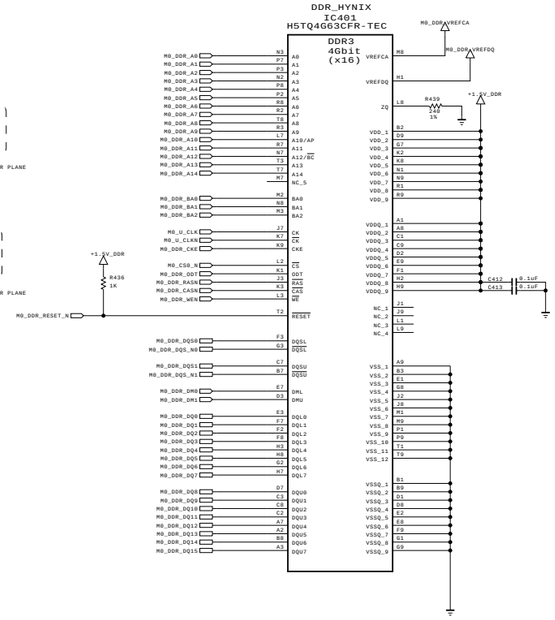
LG ELECTRONICS

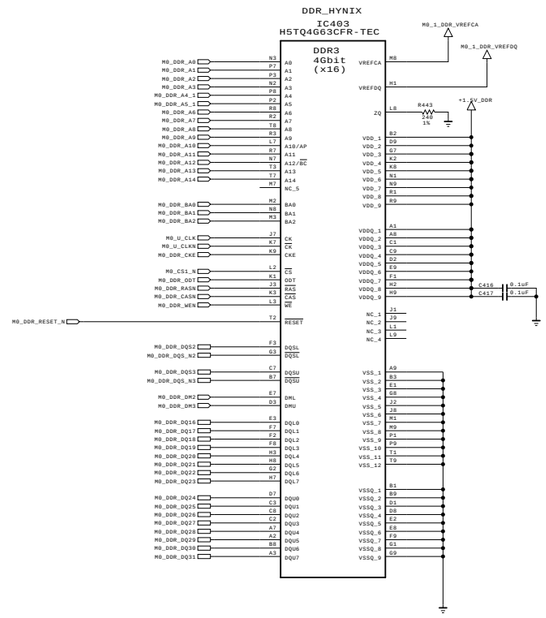
MODEL	K2L	DATE	2015-01-08
BLOCK	K2L POWER	SHEET	02

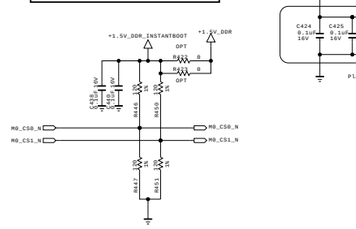
11/05/31

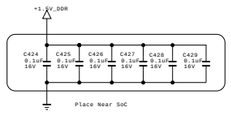


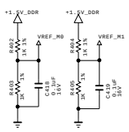










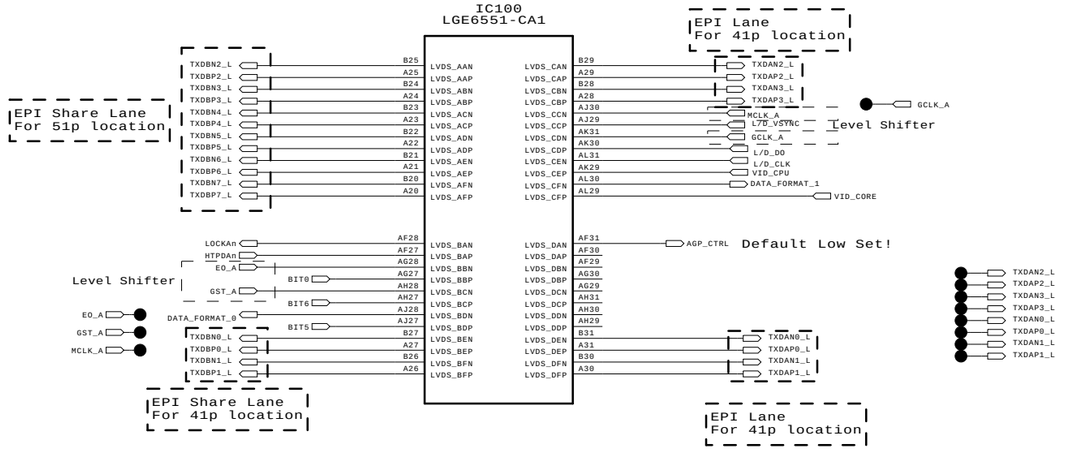


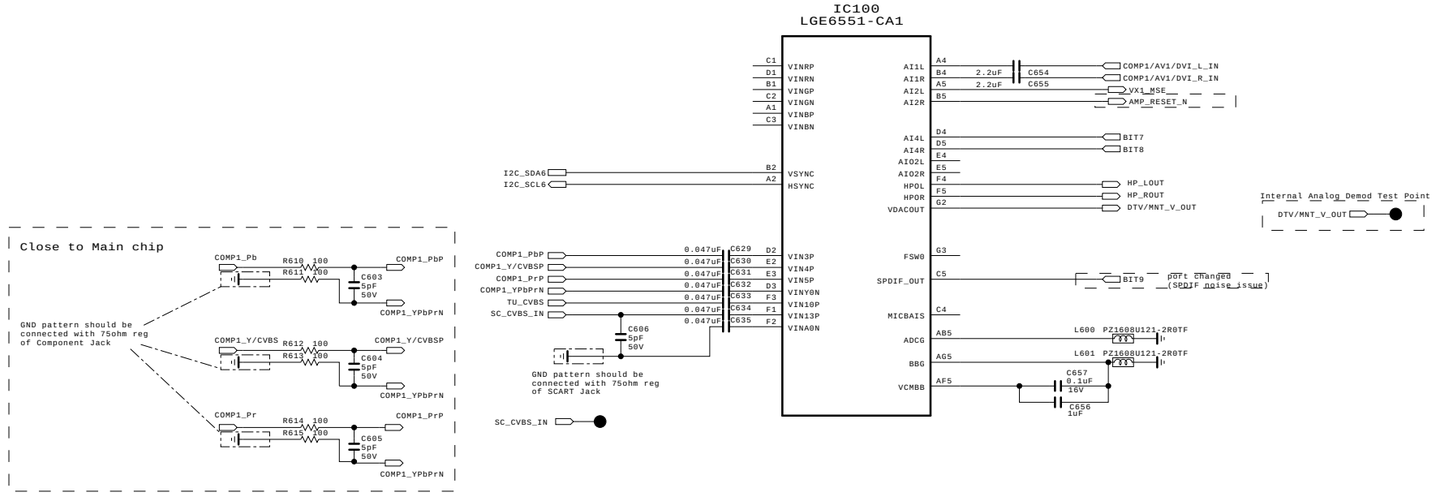
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

SECRET
LGElectronics

LG ELECTRONICS

MODEL	K2L	DATE	2015-04-27
BLOCK	K2L DDR	SHEET	03





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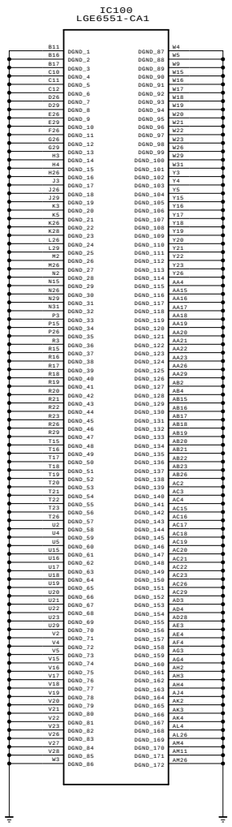
SECRET
LGElectronics

LG ELECTRONICS

MODEL	K2L	DATE	15/04/27
BLOCK	MAIN4_EXT_IN/OUTPUT	SHEET	04



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SECRET
LGElectronics

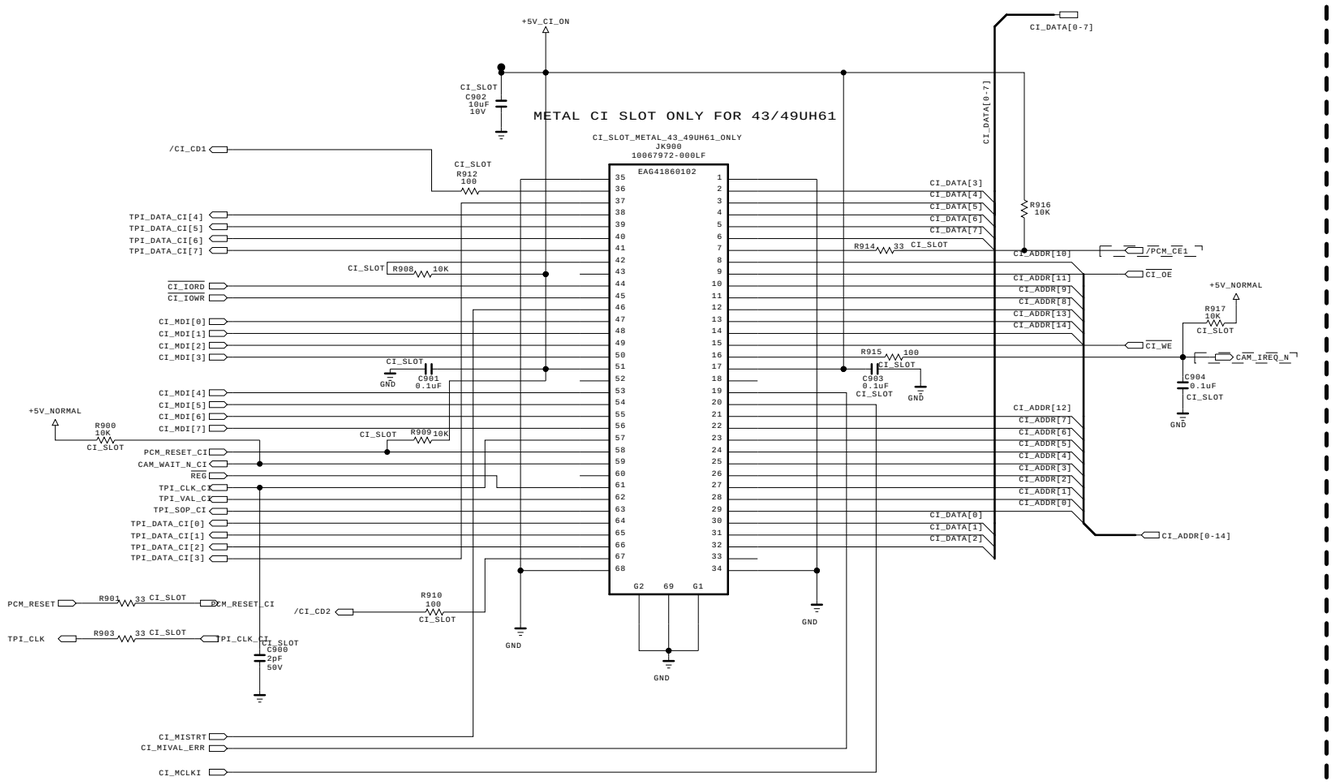
LG ELECTRONICS

MODEL	K2L	DATE	2015-01-18
BLOCK	K2L_GND	SHEET	07

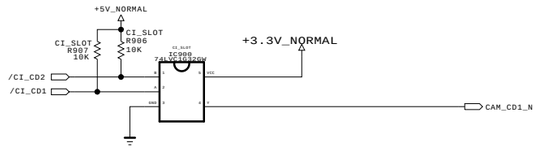
CI Region

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

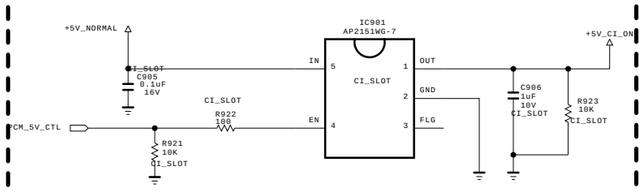
CI SLOT

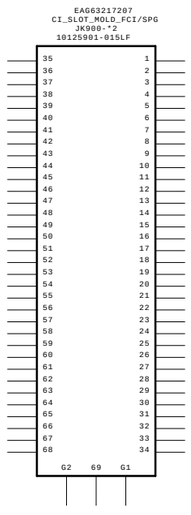


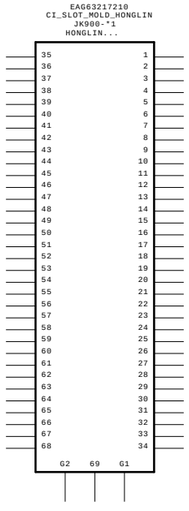
CI DETECT



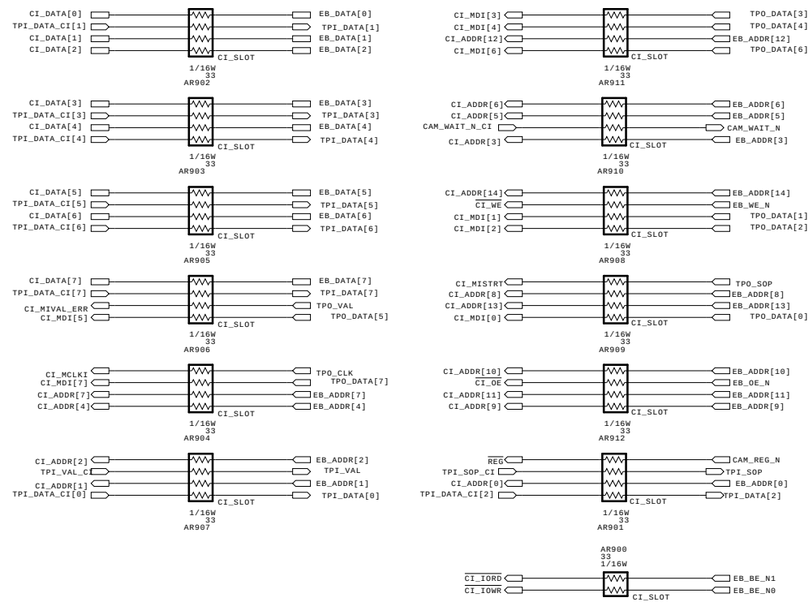
CI POWER ENABLE CONTROL







CI HOST I/F



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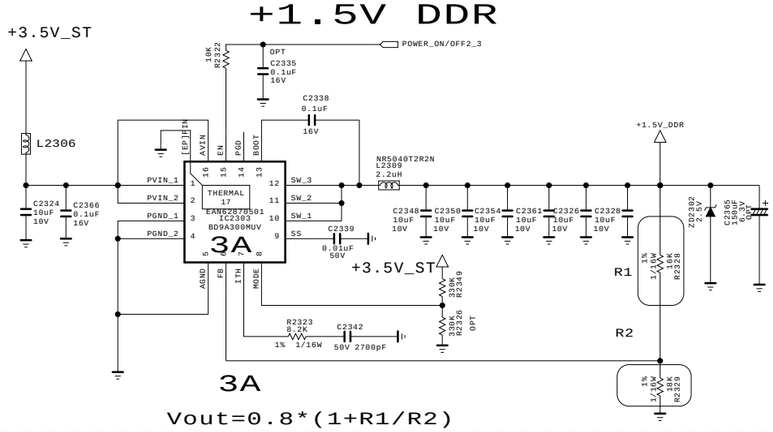
SECRET
LGElectronics

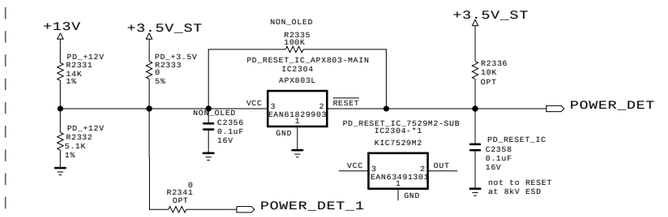
LG ELECTRONICS

MODEL	K2L / K2Lp	DATE	2015-01-10
BLOCK	PCMCI	SHEET	9

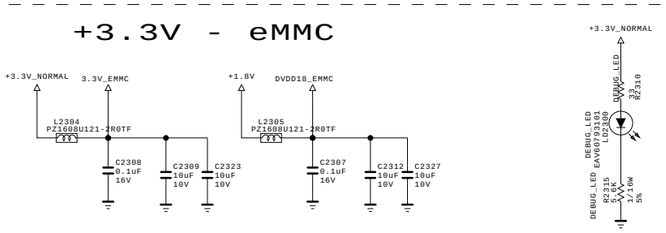
+1.5V DDR



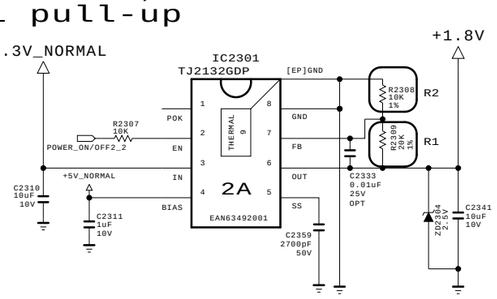
Power_DET



+3.3V - eMMC

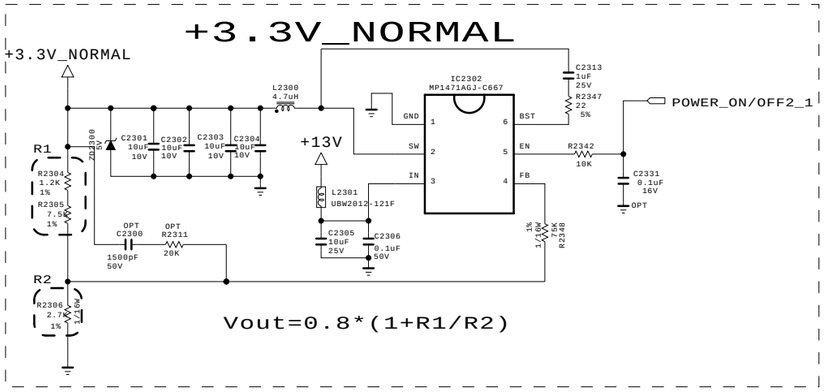


+1.8V - K2L, eMMC & Vx1 pull-up



Vout=0.6*(1+R1/R2)=1.8V

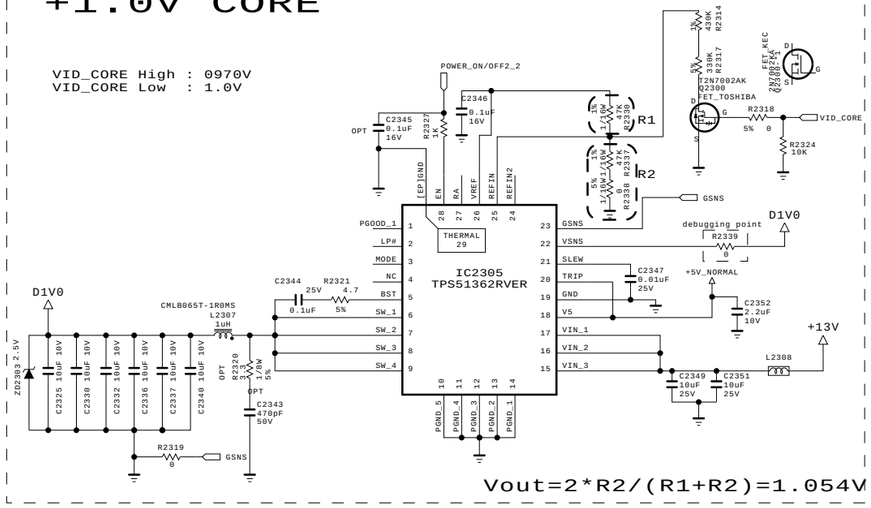
+3.3V_NORMAL



Vout=0.8*(1+R1/R2)

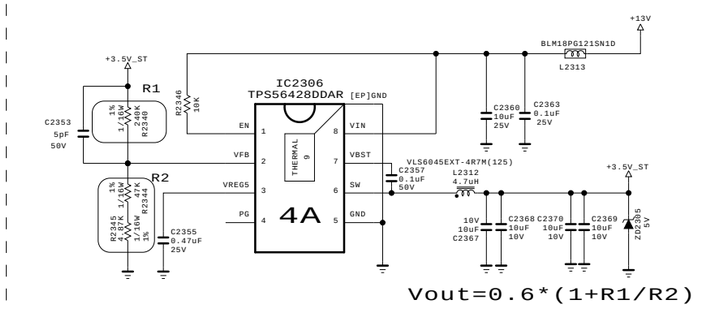
+1.0V CORE

VID_CORE High : 0970V
VID_CORE Low : 1.0V



Vout=2*R2/(R1+R2)=1.054V

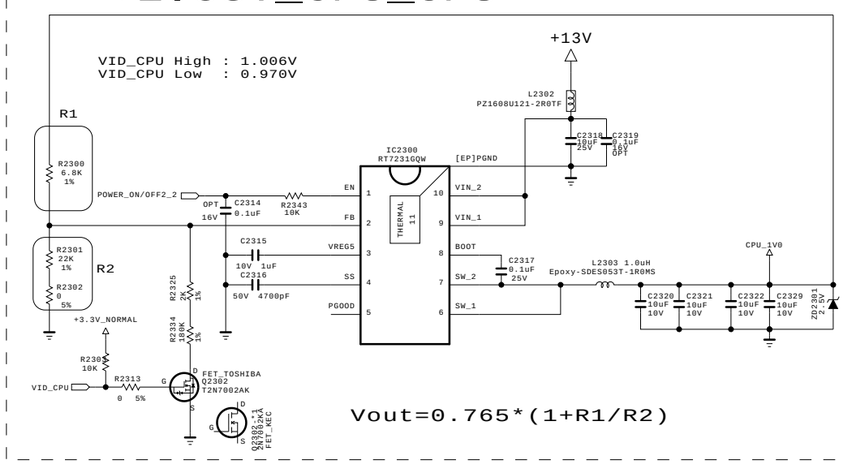
+3.5V_ST



Vout=0.6*(1+R1/R2)

+1.05V_CPU_GPU

VID_CPU High : 1.006V
VID_CPU Low : 0.970V



Vout=0.765*(1+R1/R2)

K2H Power SEQUENCE

POWER_ON/OFF1(5V)

↓

POWER_ON/OFF2_1(3.3V)

↓

POWER_ON/OFF2_2(1.0V, 1.8V)

↓

POWER_ON/OFF2_3(1.5V)

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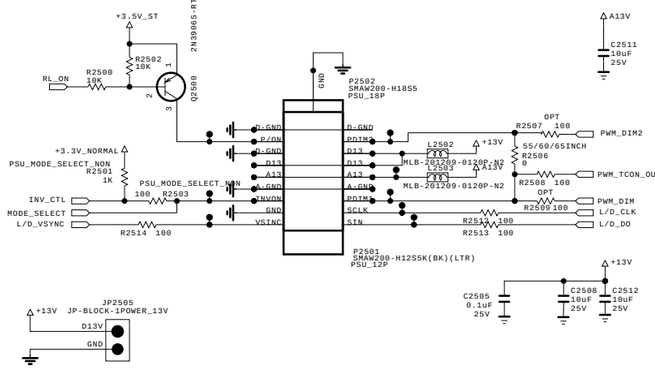
SECRET
LGElectronics

LG ELECTRONICS

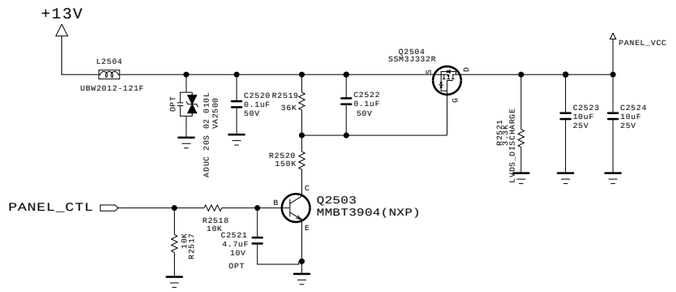
MODEL	K2H	DATE	2015-01-10
BLOCK	PWR_1	SHEET	07



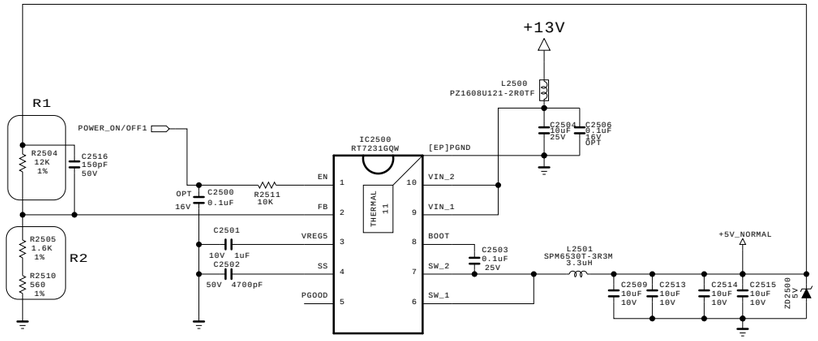
'15 UHD 12.5V sole out power
'Net name +12V means 12.5V power output

PANEL_POWER

Q2302 Change: Diodes --> NXP, 131118



+5.0V normal & USB



Vout=0.765*(1+R1/R2)

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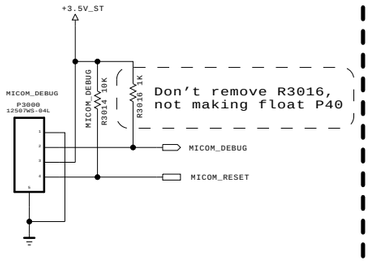
SECRET
LGElectronics

LG ELECTRONICS

MODEL	K2H	DATE	2015-01-10
BLOCK	PWR_2	SHEET	08

Renesas MICOM

For Debug



LM15 Power SEQUENCE

POWER_ON/OFF1(5V)

↓

POWER_ON/OFF2_1(3.3V)

↓

POWER_ON/OFF2_3(1.5V)

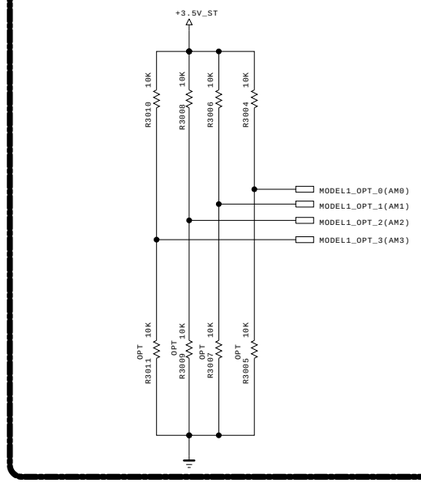
↓

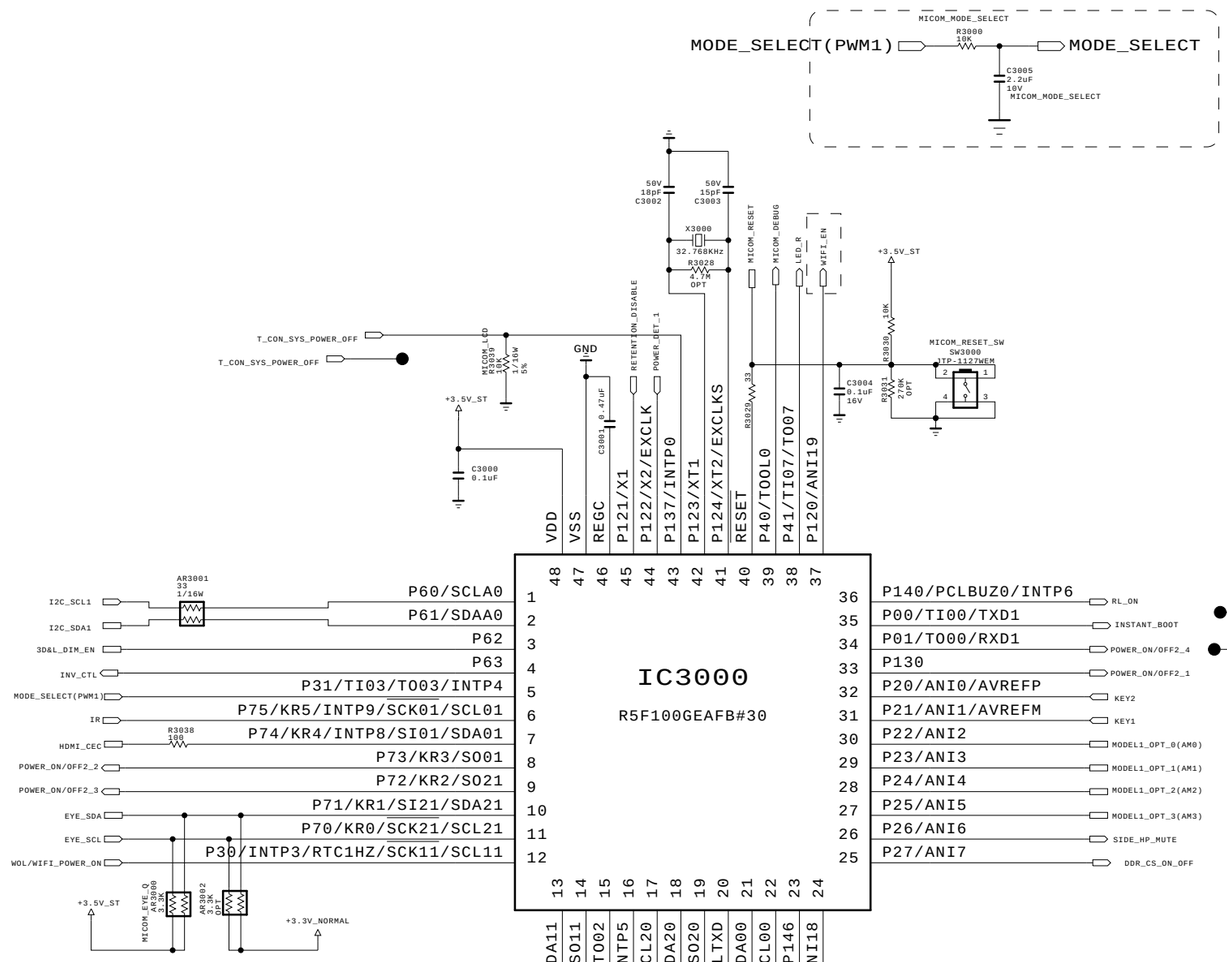
POWER_ON/OFF2_4(1.1V)

↓

SOC_RESET

MICOM MODEL OPTION

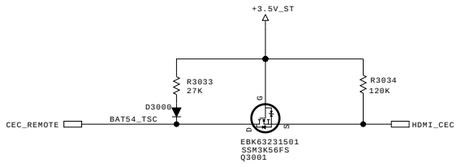




MICOM MODEL OPTION

	0.72V	1.53V	2.27V	3.0V	
MODEL_OPT_0	NON LOGO / LCD	LOGO / LCD	NON LOGO / OLED	LOGO / OLED	
MODEL_OPT_1	TV	BOX	TV	BOX	
MODEL_OPT_2	FHD		UHD	8K	
MODEL_OPT_3 (FHD)	M16		A5LR	M2	
MODEL_OPT_3 (UHD)	M16	RTK	H15		

For CEC



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SECRET
LGElectronics

LG ELECTRONICS

MODEL	K2L / K2Lp	DATE	2015-06-13
BLOCK	MICOM	SHEET	30

MICOM MODEL OPTION

	0.72V (2.7K)	1.53V (8.2K)	2.27V (20K)	3.0V (75K)
MODEL_OPT_0(AM0)	NON LOGO / LCD	LOGO / LCD	NON LOGO / OLED	LOGO / OLED
MODEL_OPT_1(AM1)	TV_NON_EPI	BOX_NON_EPI	TV_EPI	BOX_NON_EPI
MODEL_OPT_2(AM2)	FHD		UHD	8K
MODEL_OPT_3(AM3) (FHD)	M16		A5LR	M2
MODEL_OPT_3(AM3) (UHD)	M16	RTK	H15	

	0.72V (2.7K)	1.53V (8.2K)	2.27V (20K)	3.0V (75K)
MODEL_OPT_0(AM0)	MICOM_NON_LOGO/LCD R3005-*1 2.7K	MICOM_LOGO/LCD R3005-*2 8.2K	MICOM_NON_LOGO/OLED R3005-*3 20K	MICOM_LOGO/OLED R3005-*4 75K
MODEL_OPT_1(AM1)	MICOM_TV_NON_EPI R3007-*1 2.7K		MICOM_TV_EPI R3007-*3 20K	
MODEL_OPT_2(AM2)	MICOM_FHD R3009-*1 2.7K		MICOM_UHD R3009-*3 20K	MICOM_8K R3009-*4 75K
MODEL_OPT_3(AM3) (FHD) MODEL_OPT_3(AM3) (UHD)	MICOM_M16 R3011-*1 2.7K	MICOM_RTK R3011-*2 8.2K	MICOM_H15/A5LR R3011-*3 20K	MICOM_M2 R3011-*4 75K

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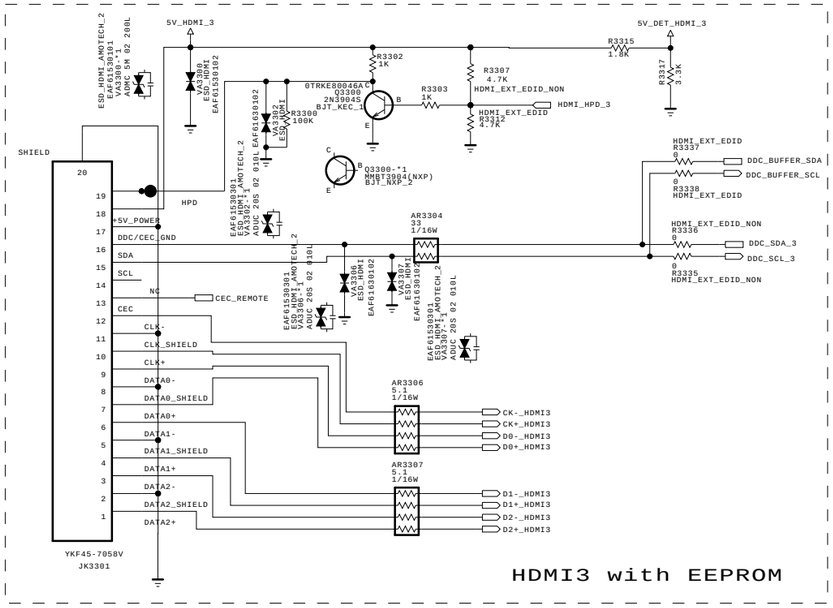
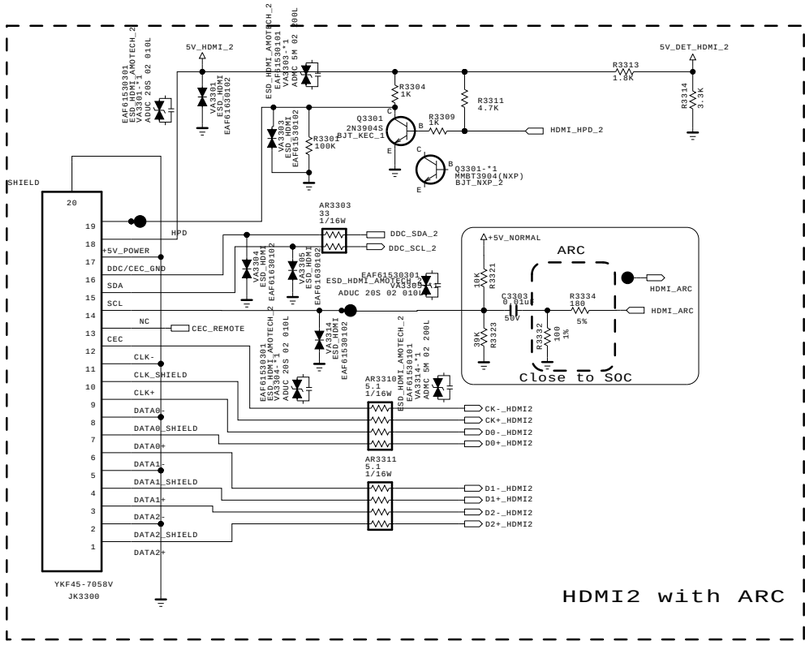
SECRET
LGElectronics

LG ELECTRONICS

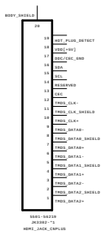
MODEL	K2H	DATE	2015-01-10
BLOCK	MODEL OPTION	SHEET	30

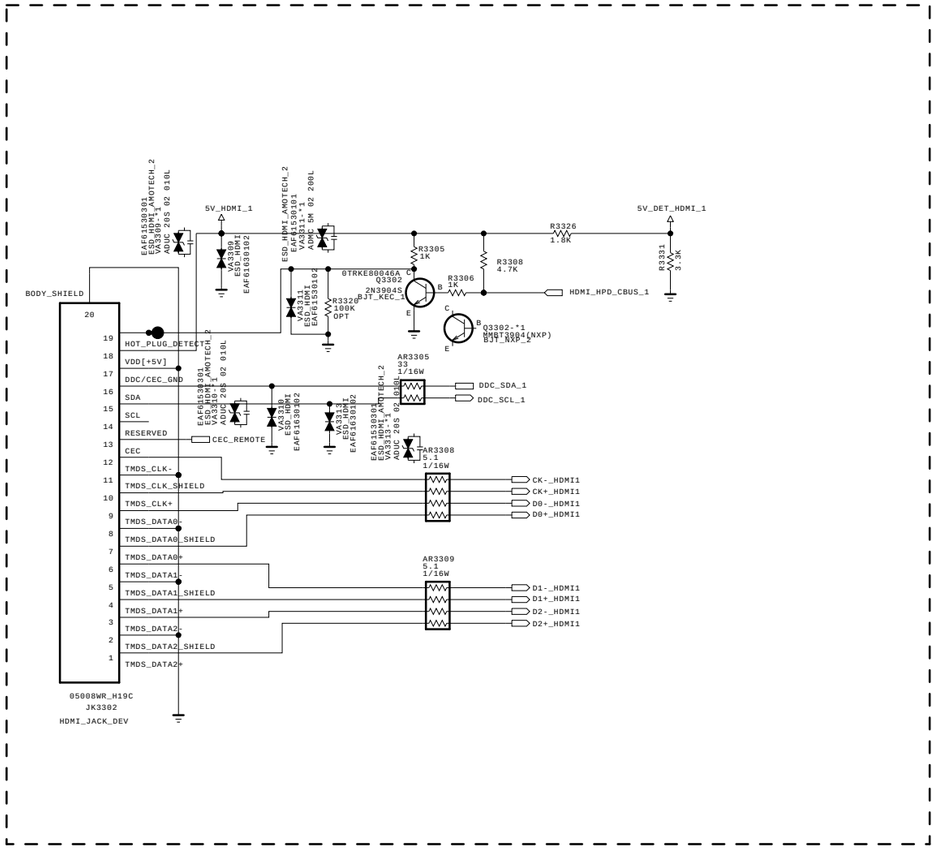


HDMI3 with EEPROM

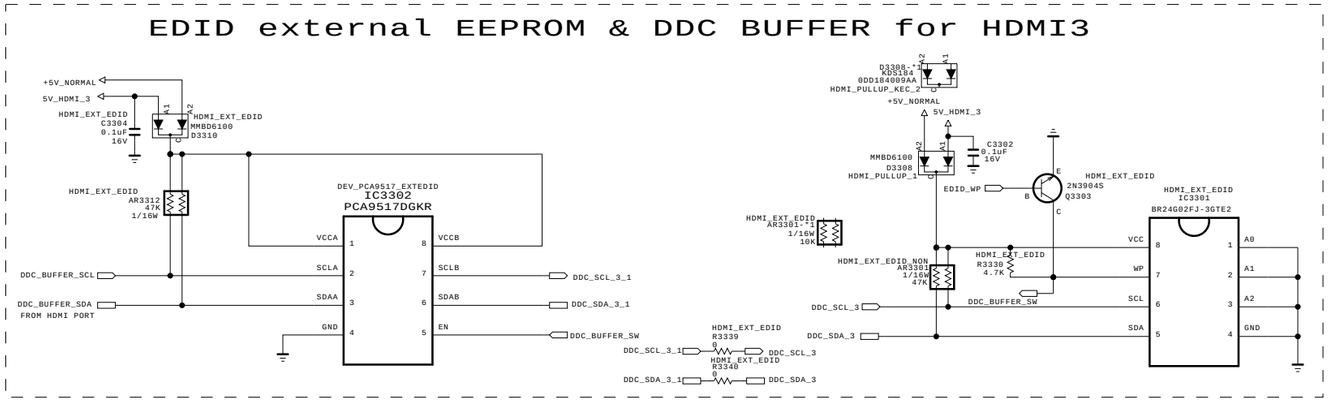


HDMI2 with ARC

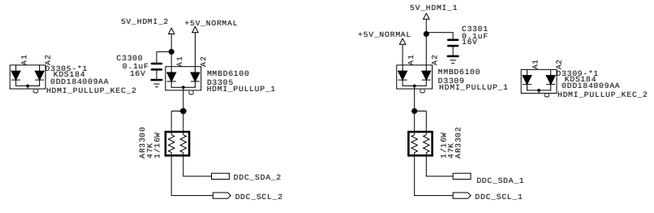




EDID external EEPROM & DDC BUFFER for HDMI3



DDC pull-up



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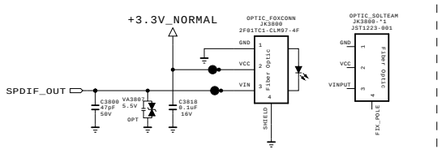
SECRET
LGElectronics

LG ELECTRONICS

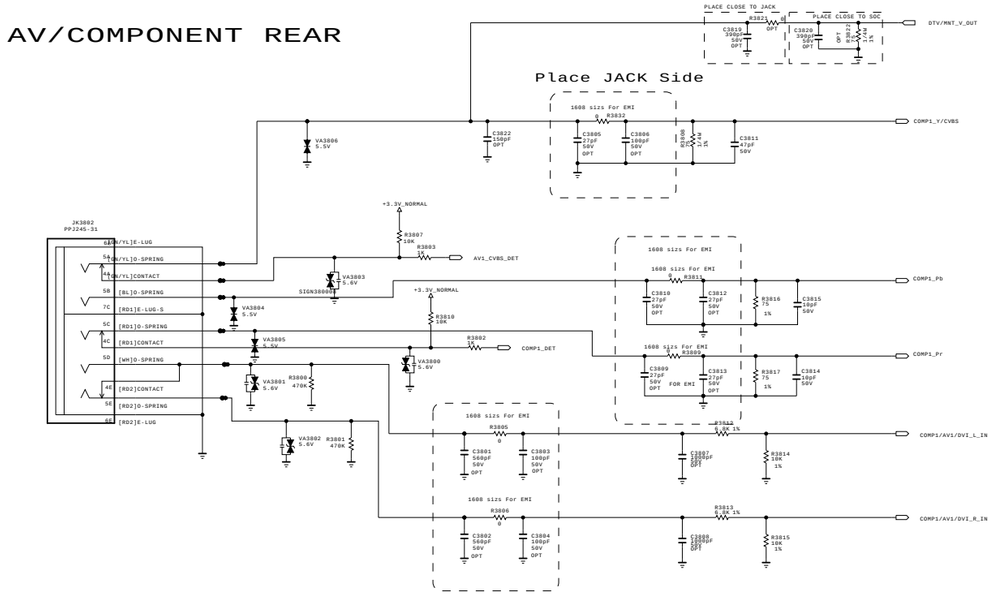
MODEL	K2L	DATE	2015-01-10
BLOCK	HDMI	SHEET	33

LGE Internal Use Only

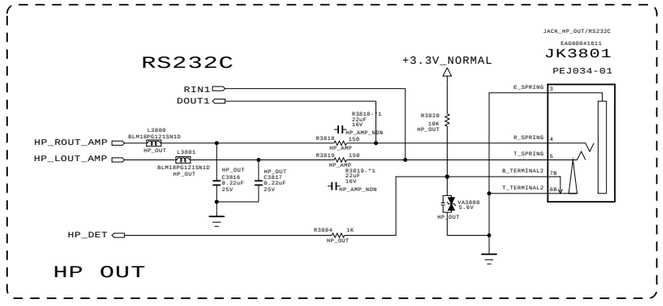
SPDIF OUT



AV/COMPONENT REAR



HP OUT



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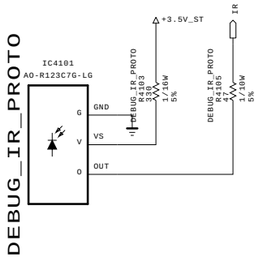
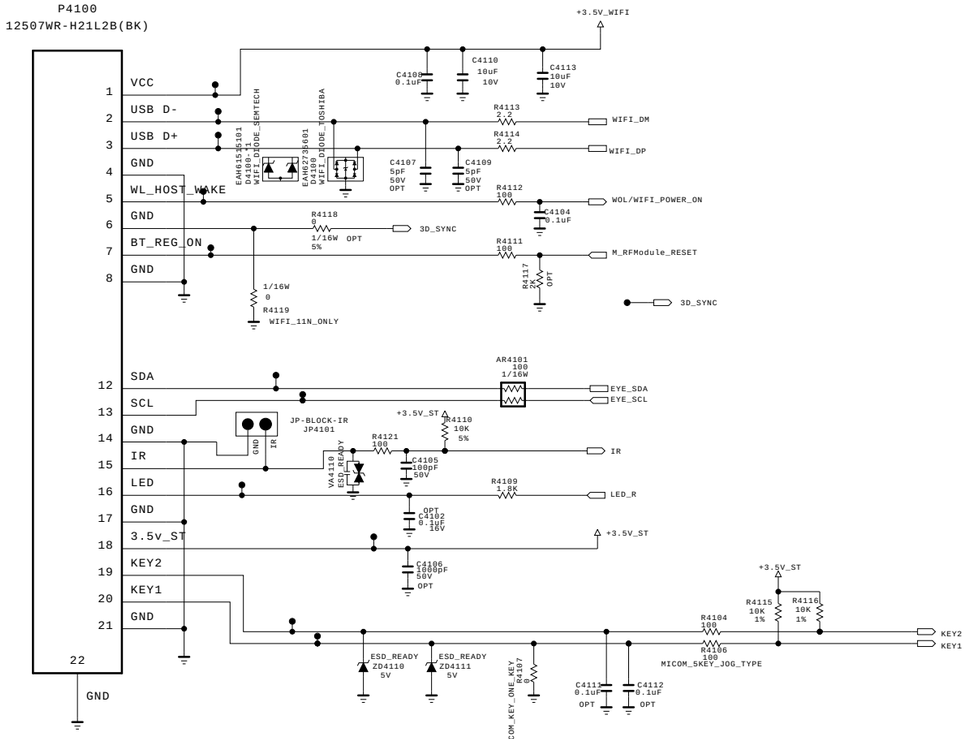
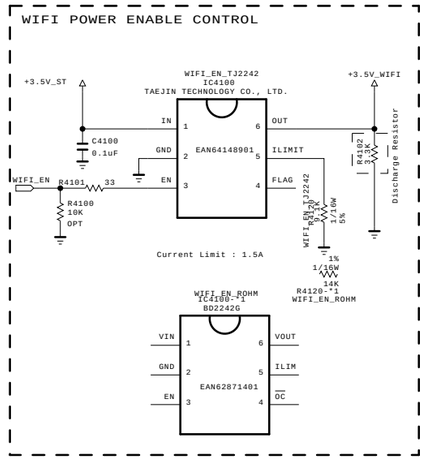
SECRET
LGElectronics

LG ELECTRONICS

MODEL	UF71/7500	DATE	2014-07-24
BLOCK	JACK_COMMON_H	SHEET	38







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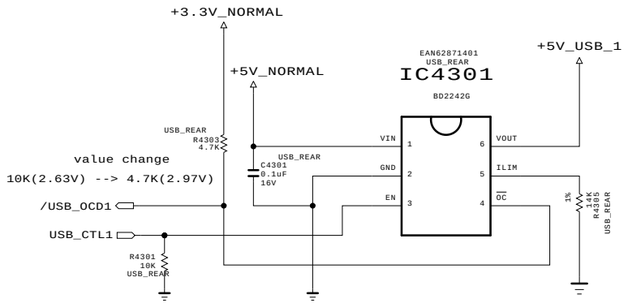
SECRET
LGElectronics

LG ELECTRONICS

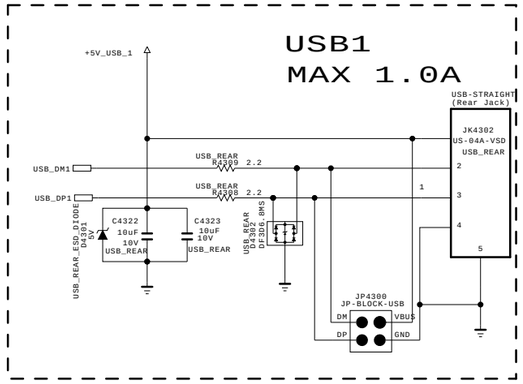
MODEL	UF71/7500	DATE	2014-05-19
BLOCK	IR/KEY	SHEET	12

USB2.0 2Port

OCP USB2_2.0



USB1
MAX 1.0A



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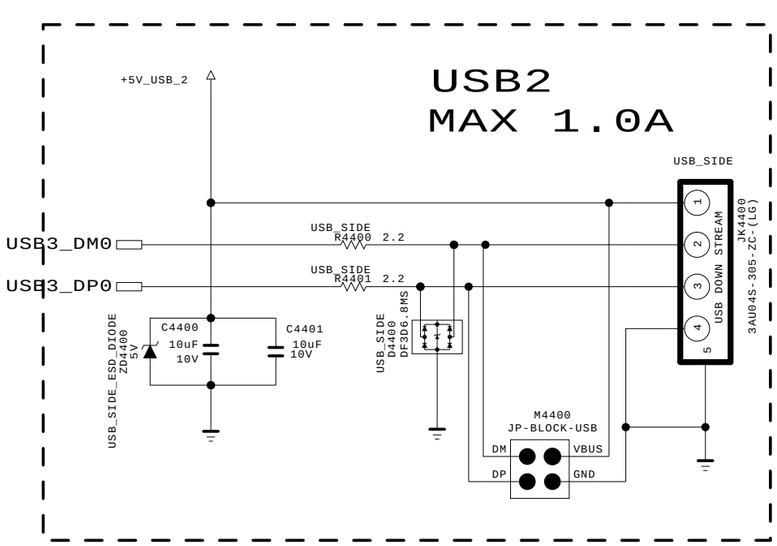
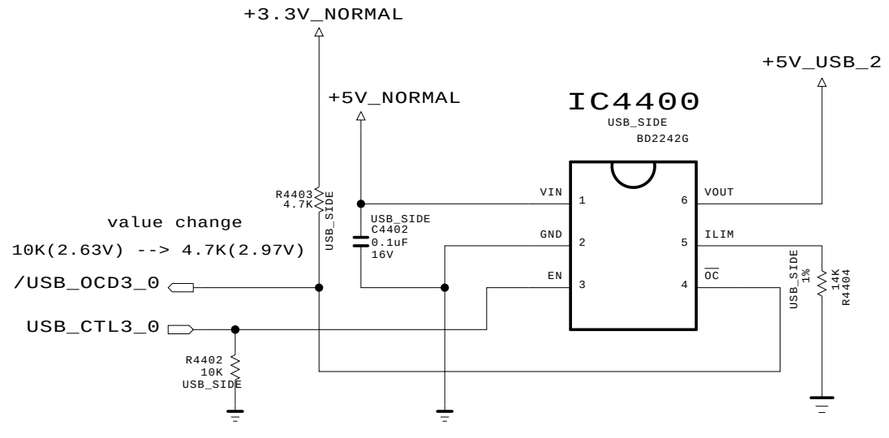
LG ELECTRONICS

MODEL	K2L	DATE	2015-04-27
BLOCK	USB2.0 jack	SHEET	13 /





USB3_RXM0
USB3_RXP0
USB3_TXM0
USB3_TXP0
/USB_OCD1
USB_CTL1
USB_DM1
USB_DP1

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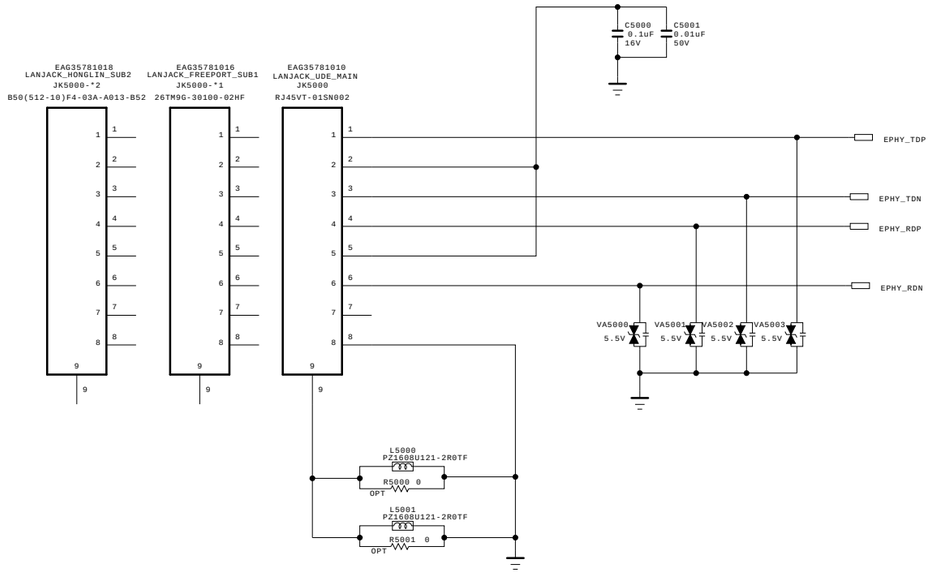
LGElectronics

LG ELECTRONICS

043.sht

MODEL	K2H	DATE	2015.02.11
BLOCK	USB 2 & 3	SHEET	15 / 26

Ethernet Block



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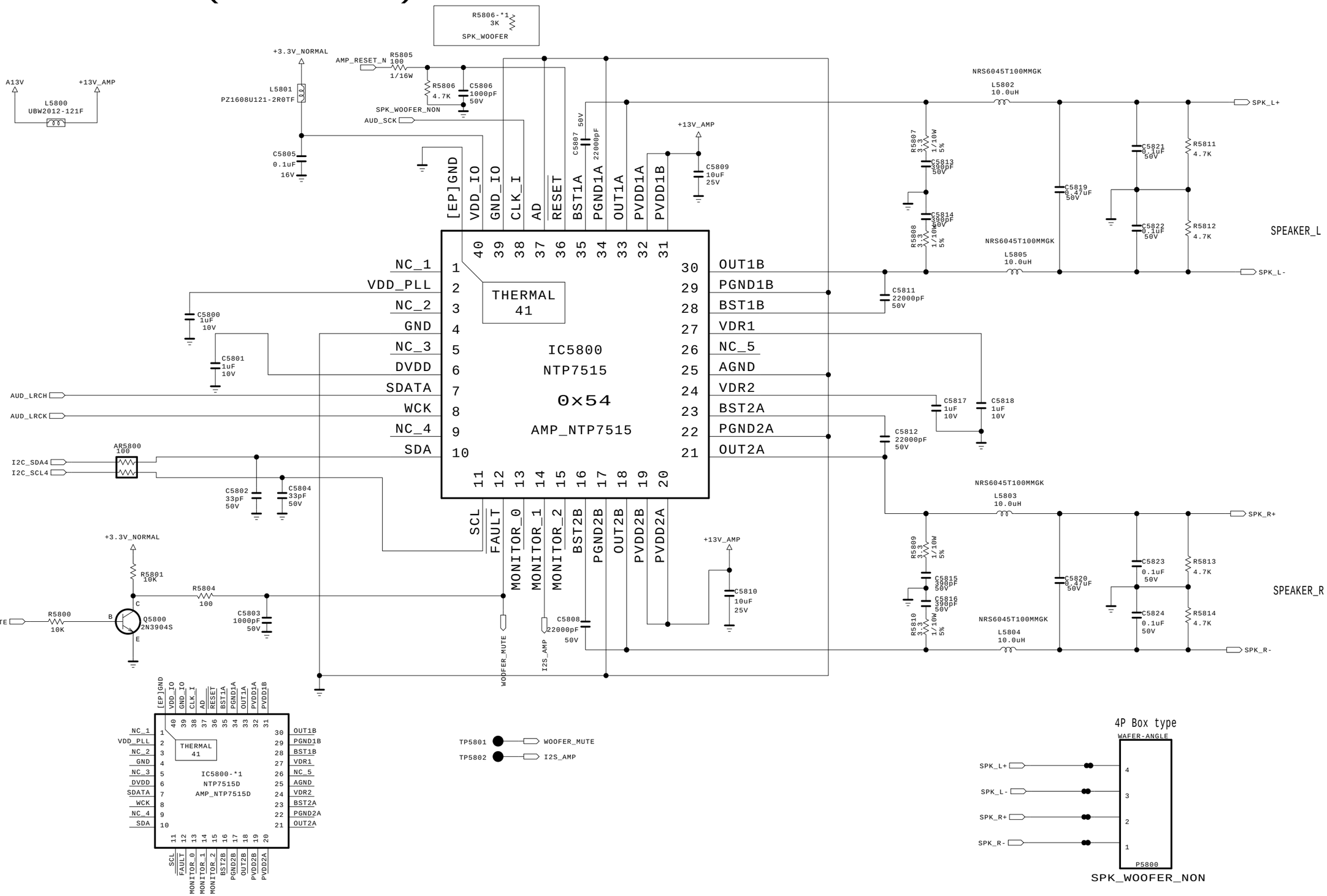
LG ELECTRONICS

MODEL	K2H	DATE	2014-12-15
BLOCK	LAN_H	SHEET	50

AUDIO AMP(NTP7515)



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SECRET

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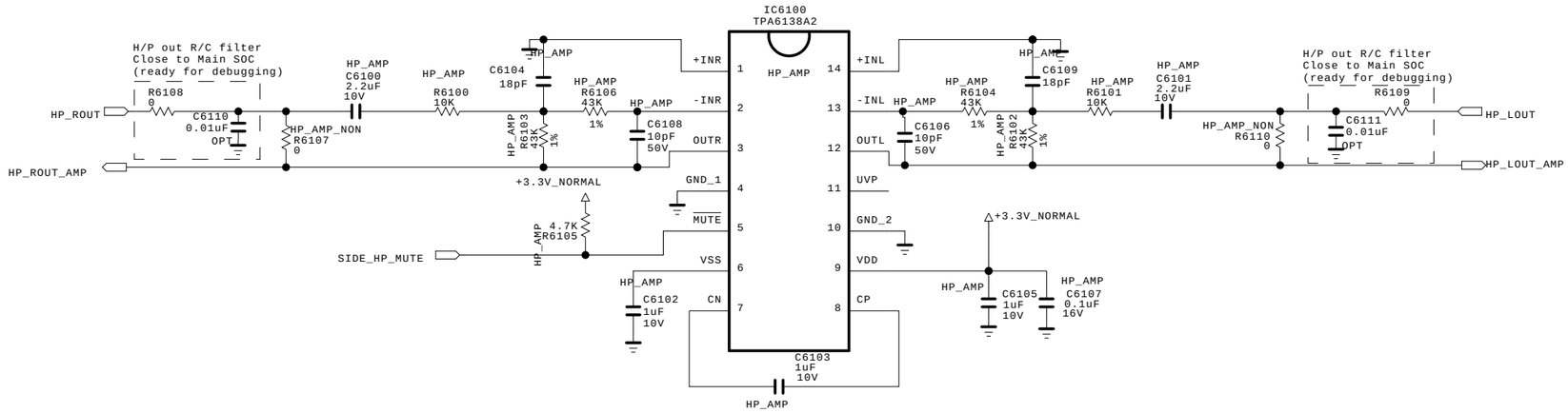
LG ELECTRONICS

MODEL		DATE	2014-10-17
BLOCK	MAIN_AMP	SHEET	58

EARPHONE AMP



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LGElectronics

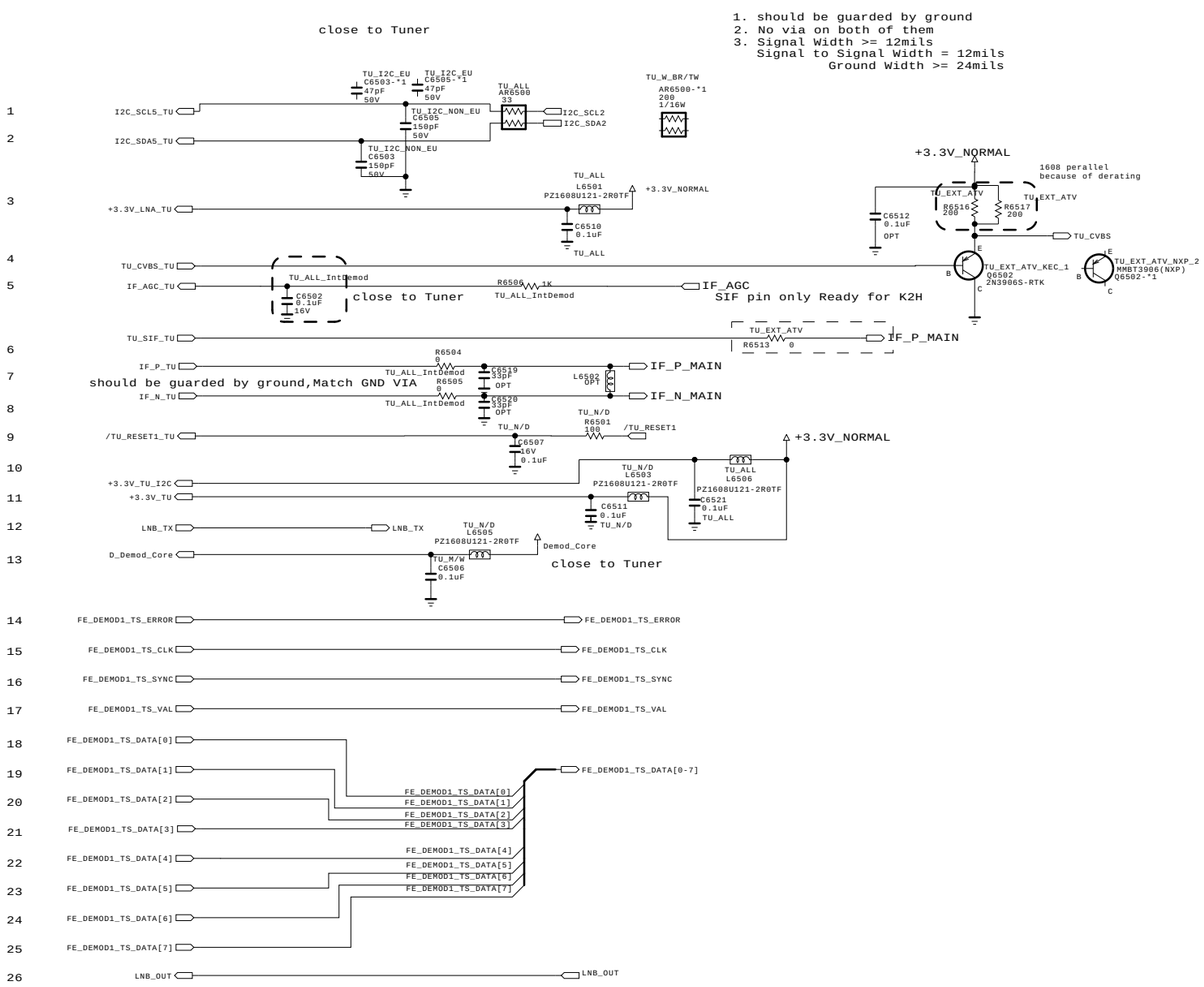
LG ELECTRONICS

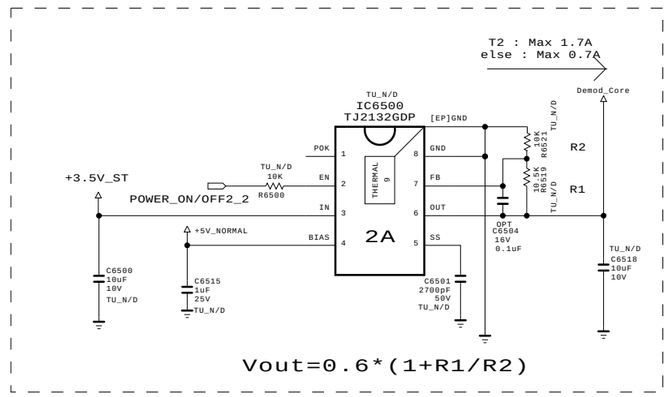
MODEL	K2H	DATE	2014-11-22
BLOCK	HP_AMP	SHEET	61

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





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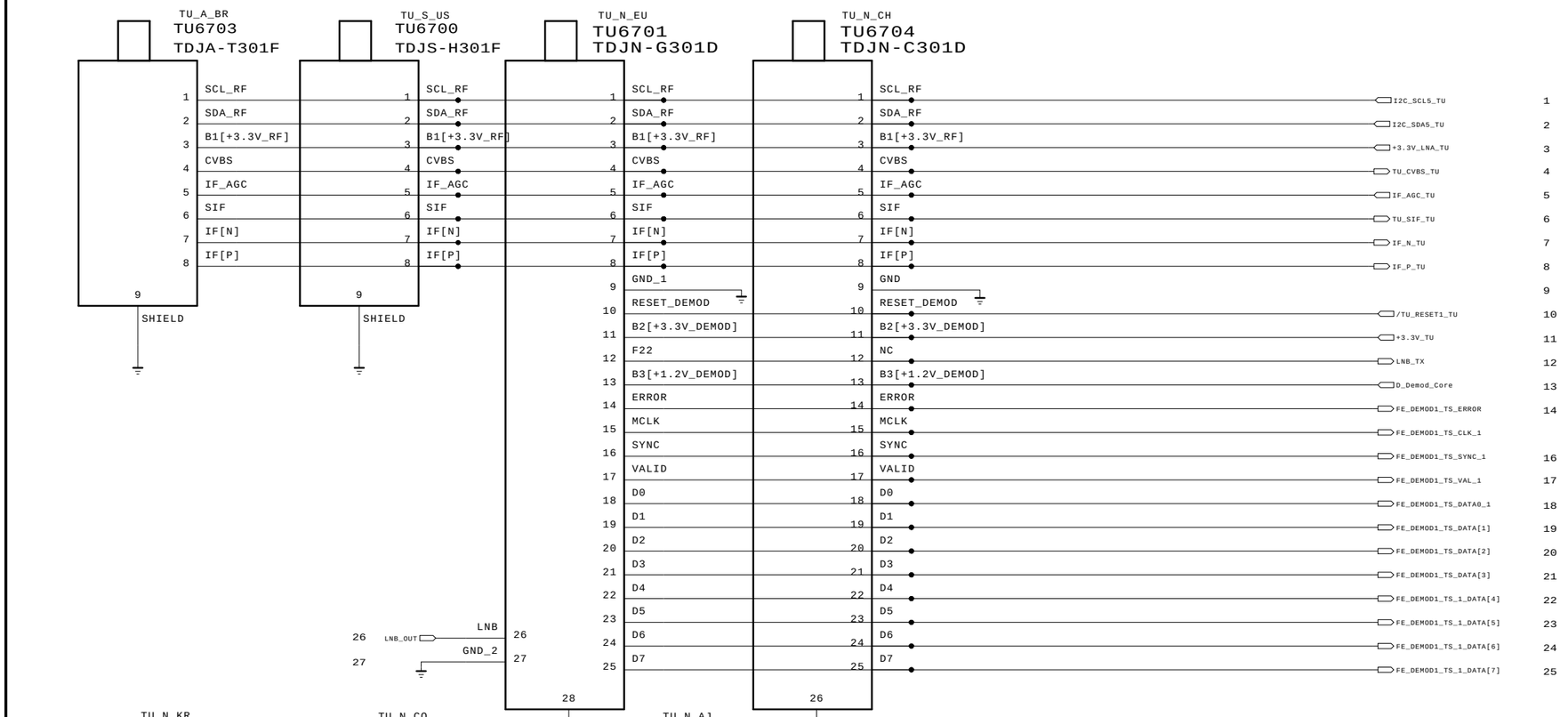
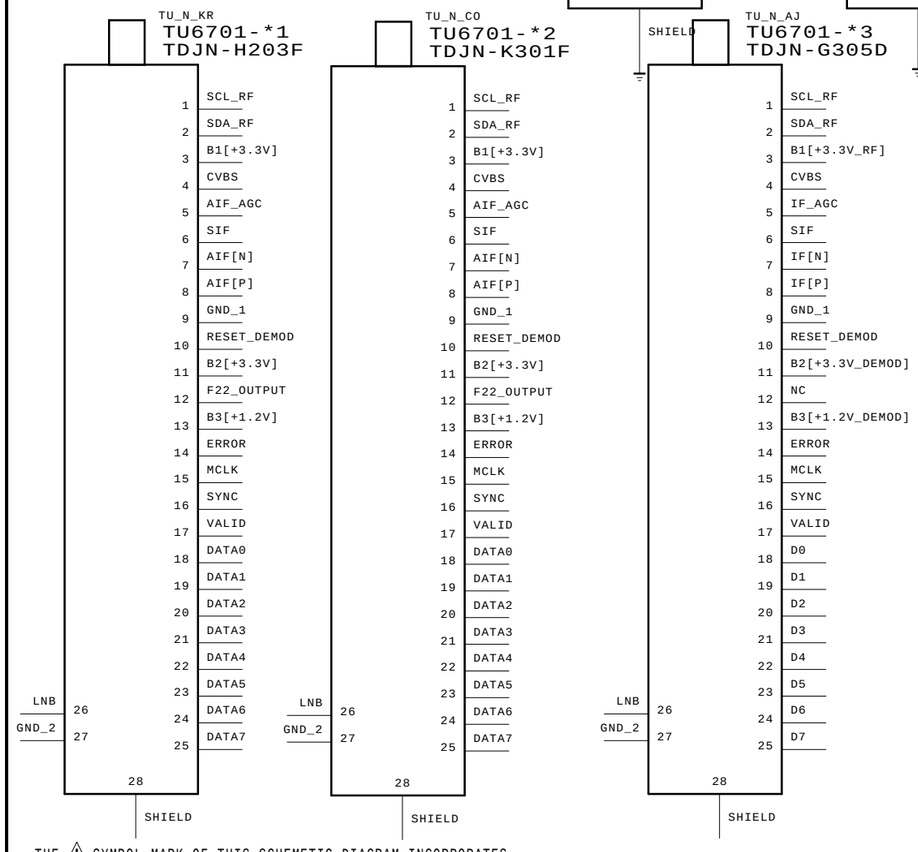
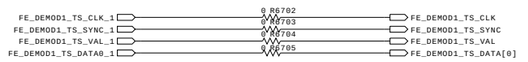
LGElectronics

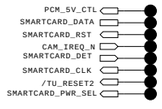
LG ELECTRONICS

MODEL	K2H	DATE	2014-10-17
BLOCK	TU_CIRCUIT	SHEET	18









Close to Tuner

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LGElectronics

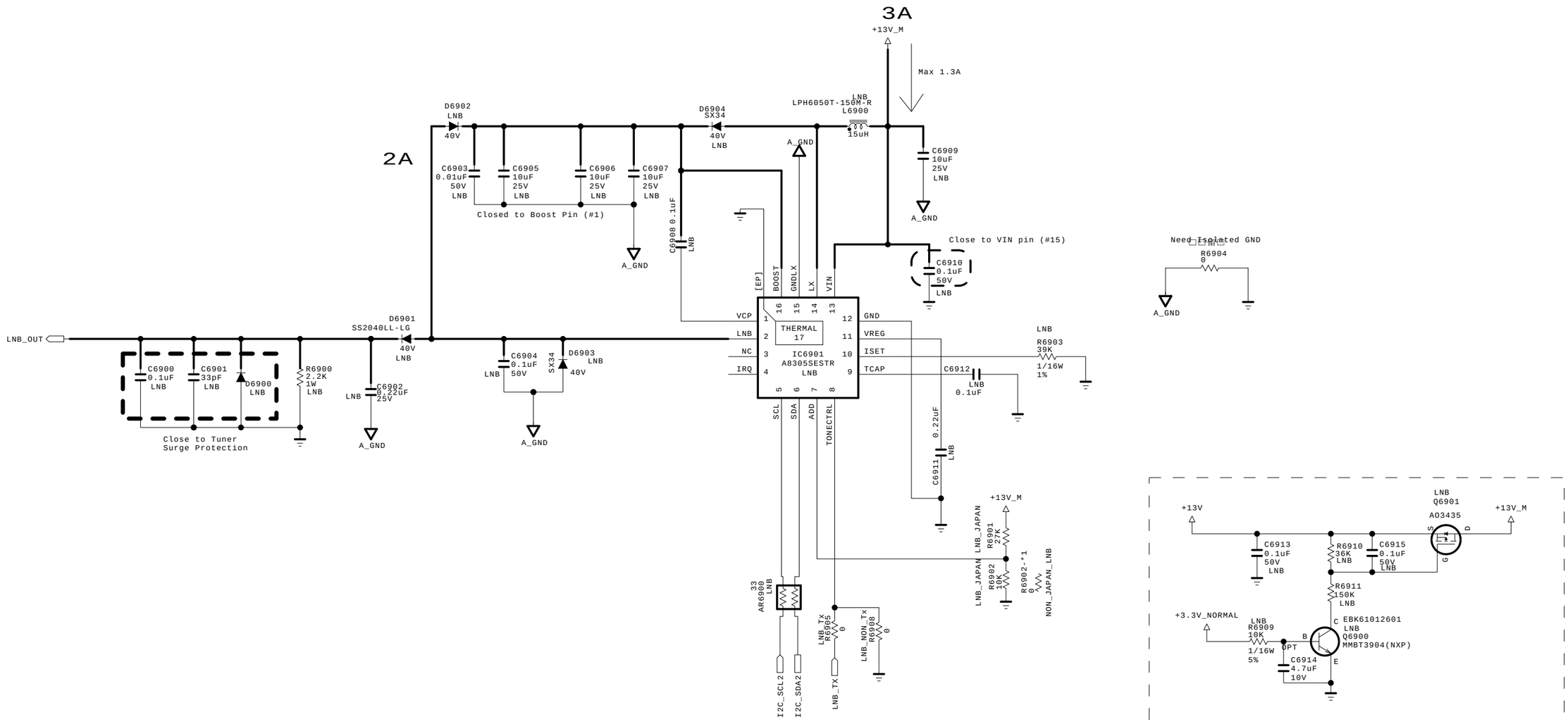
LG ELECTRONICS

MODEL	K2H	DATE	2014-09-11
BLOCK	TU_SYMBOL_H	SHEET	19

LNB PART (DVB-S2)

OPTION ; LNB

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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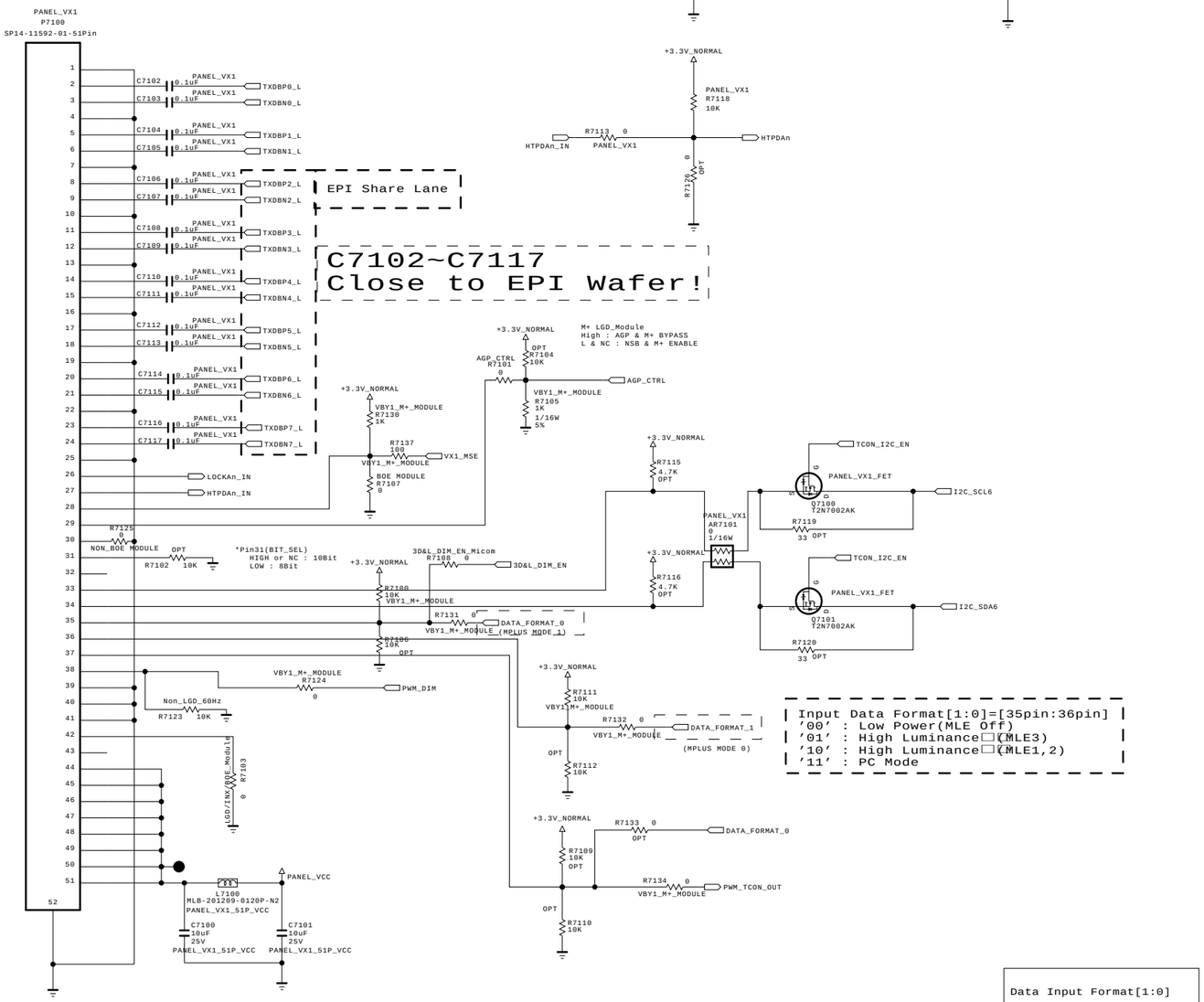
LG ELECTRONICS

MODEL	K2H	DATE	2014-08-25
BLOCK	LNB	SHEET	20

[51P Vx1 output wafer]




```
Input Data Format[1:0]=[35pin:36pin]
'00' : Low Power(MLE Off)
'01' : High Luminance (MLE3)
'10' : High Luminance (MLE1,2)
'11' : PC Mode
```

```
Data Input Format[1:0]

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

Must be assigned at Vx1 51p wafer !!!

PWM_TCON_OUT

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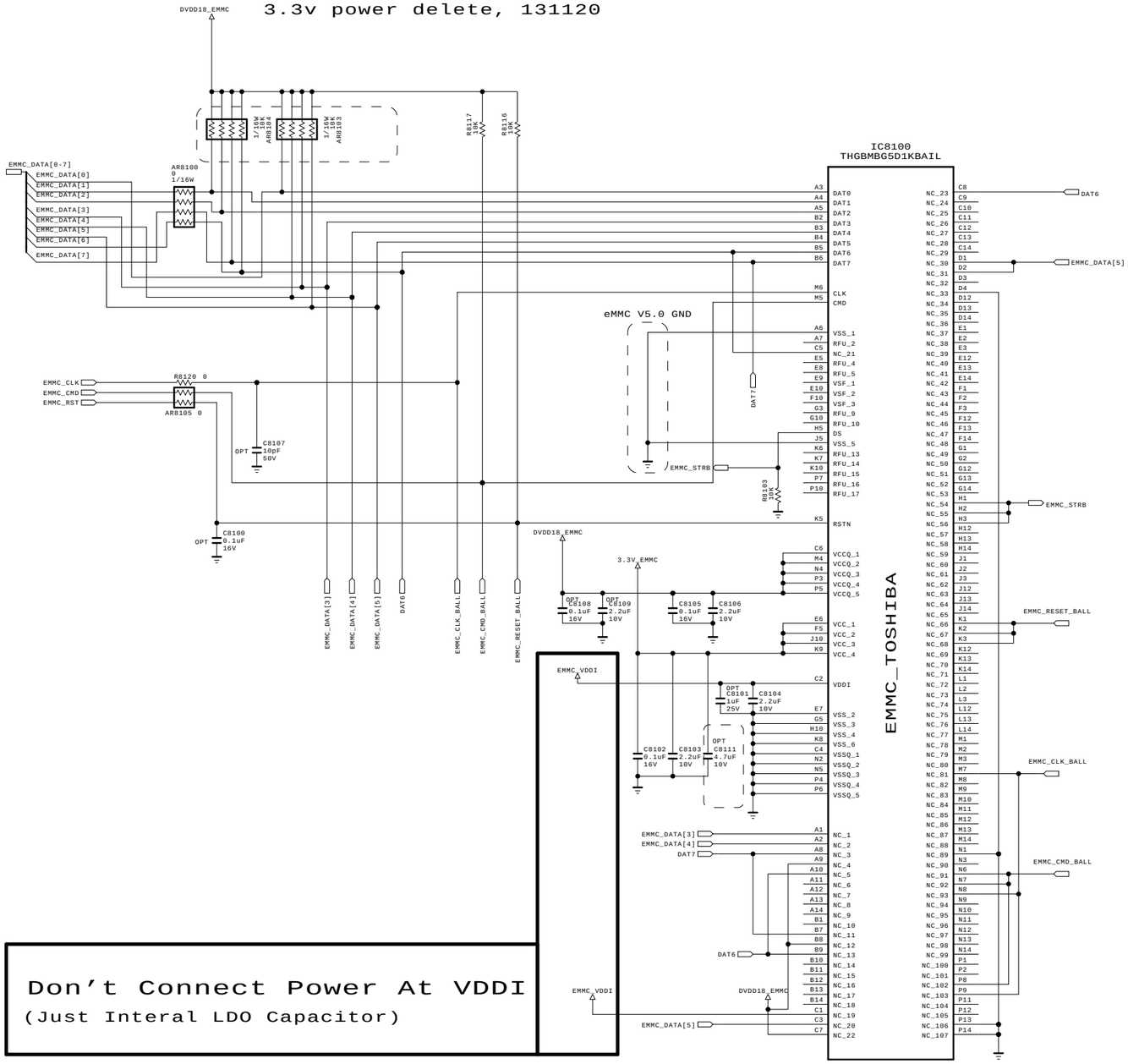
LG ELECTRONICS

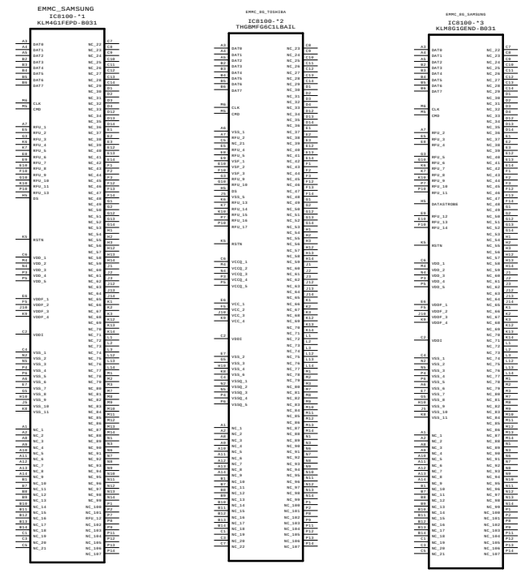
MODEL	K2H	DATE	2014-08-27
BLOCK	Vx1 51P	SHEET	21

eMMC I/F

3.3v power delete, 131120



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



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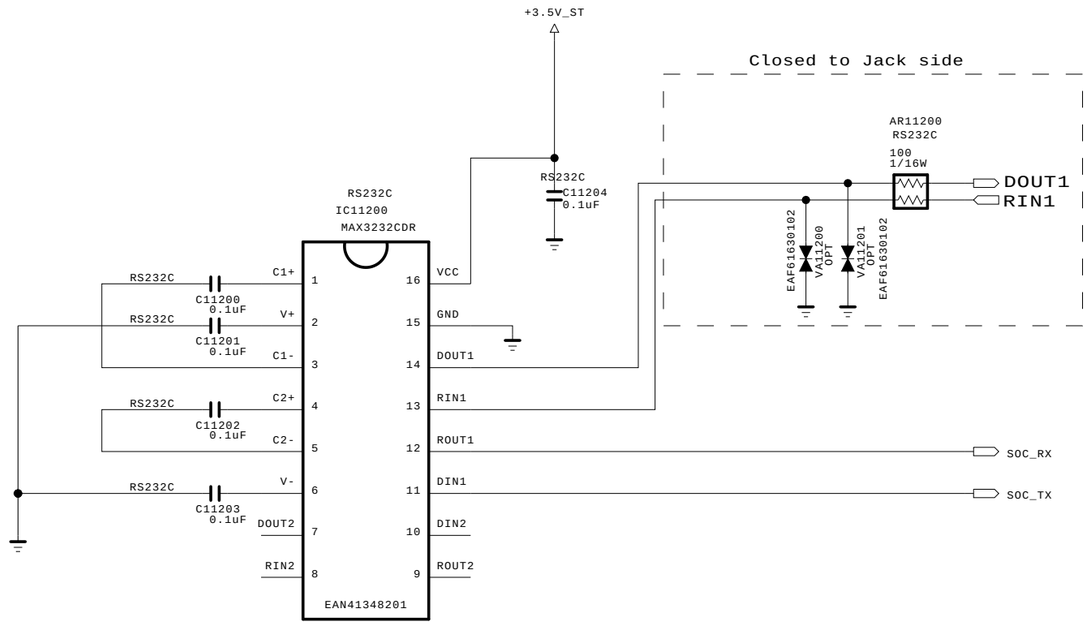
LG ELECTRONICS

MODEL	K2H	DATE	2014-11-17
BLOCK	eMMC	SHEET	81

RS-232C Control INTERFACE



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SECRET

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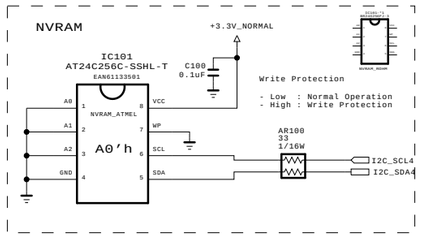
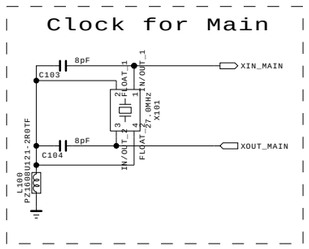
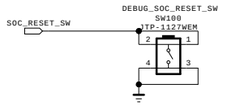
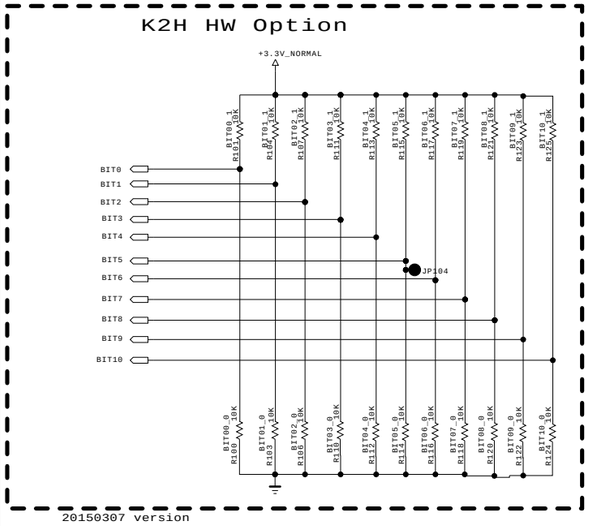
LG ELECTRONICS

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









20150307 version

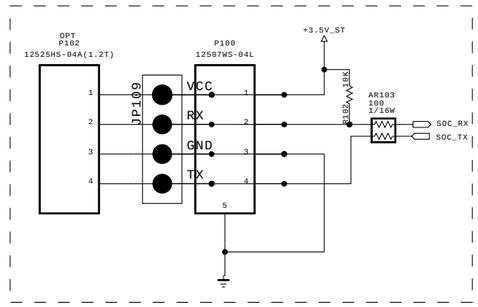
BIT(0/1)	DVB	ATSC	JP
00	TW/COL	US	
01	CN/HK	KR	JP
10	EU	BR	
11	AJJA	CI	

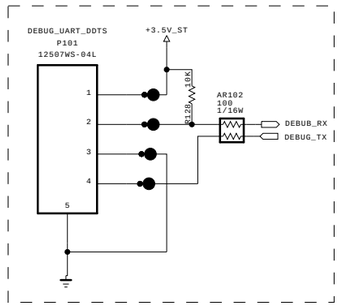
BIT(6/7/8)	B/E(FRC)
000	Vx1_60Hz
001	Reserved
010	EPI_V16_RGBW
011	EPI_V16_RGB
100	EPI_V15_RGBW
101	EPI_V15_RGB

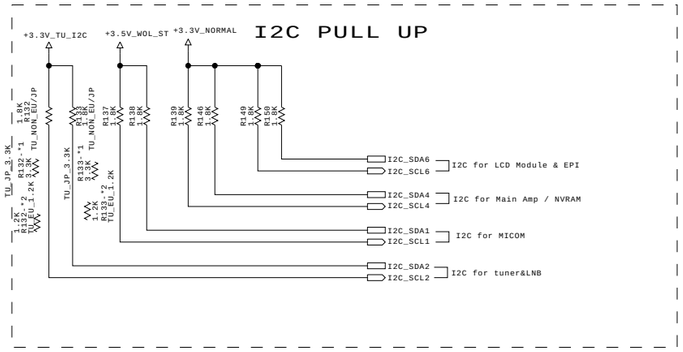
		Low	High
BIT4	Display	LCD	OLED
BIT5	15/16 Tuner	15_Tuner	16_Tuner

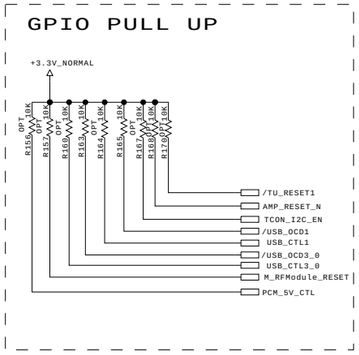
BIT(2/3)	EU/CIS	AJJA	TW/COL	CN/HK	KR	North.AM	BR	JP
00	T2/C/S2 PIP_EX_ATV	T_IN_ATV		EXT_ATV		IN_ATV		Default
01	T2/C/S2_IN_ATV	T2/C/S2_IN_ATV	T2_IN_ATV	IN_ATV	ATSC+T2_IN_ATV			
10	T2/C/S2_EX_ATV	T2/C/S2_EX_ATV					ISDB_IN_ATV	
11		T2_EX_ATV						

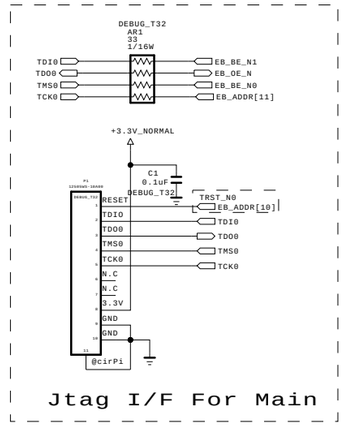
BIT9	Support EXTERNAL EDID FOR HDMI2.0	EXTERNAL	NON_EXTERNAL
BIT10	Division	NON_Division	4_Division











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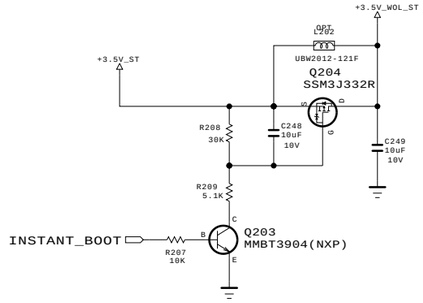
SECRET
LGElectronics

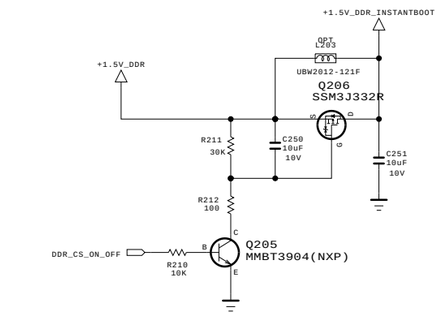
LG ELECTRONICS

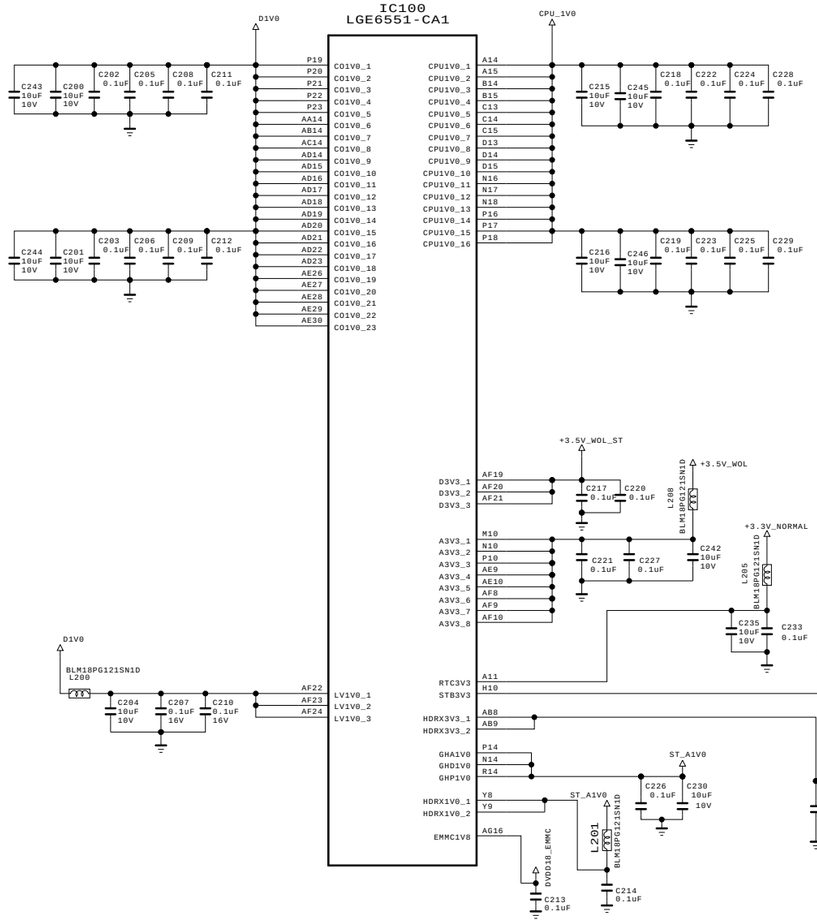
MODEL	K2L	DATE	2015-01-08
BLOCK	MAIN1_SYSTEM	SHEET	01

WOL&Instant ON

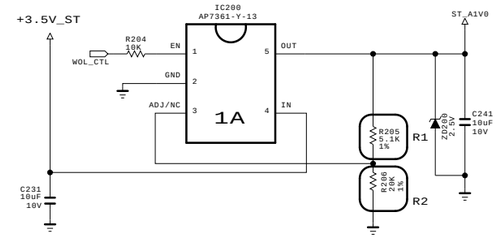


DDR power for Instant ON



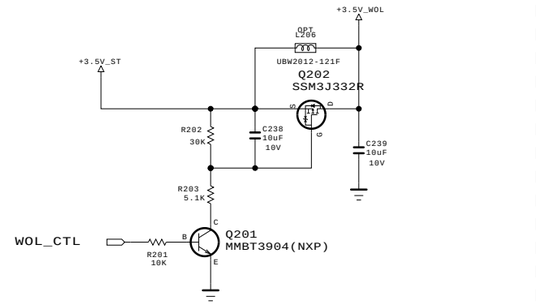


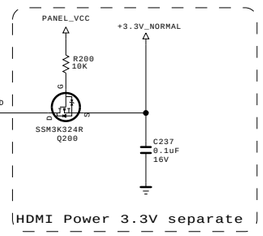
+1.0V LDO Eth STDBY



Vout=0.8*(1+R1/R2)=1.004V

WOL switch





HDMI Power 3.3V separate

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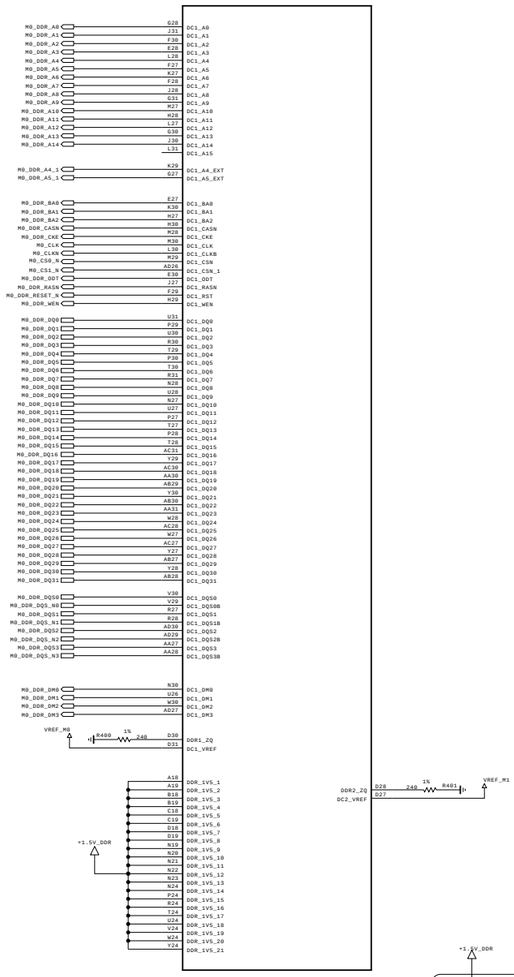
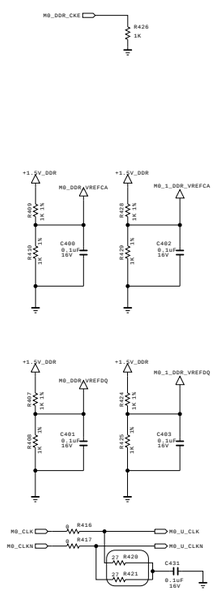
SECRET
LGElectronics

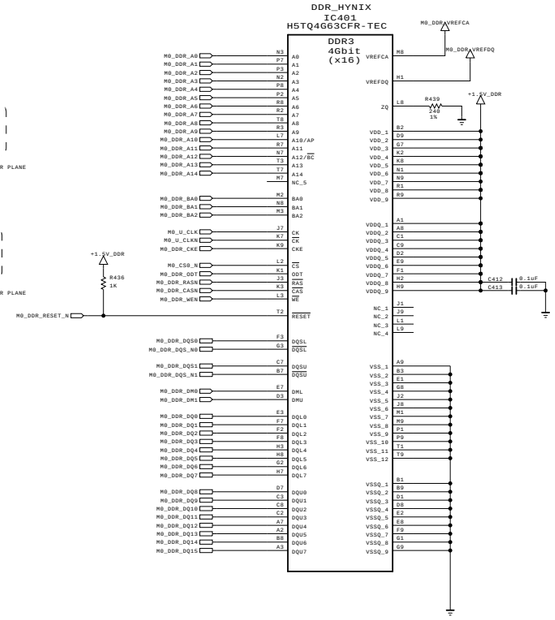
LG ELECTRONICS

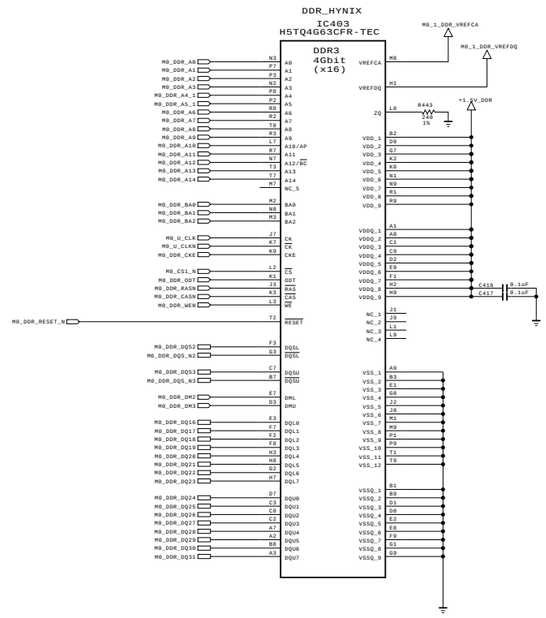
MODEL	K2L	DATE	2015-01-08
BLOCK	K2L POWER	SHEET	02

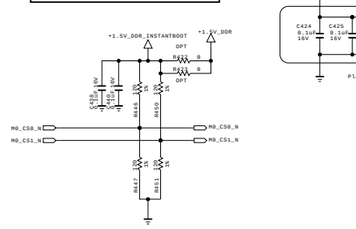
11/05/31

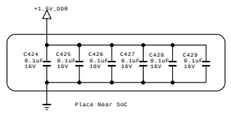


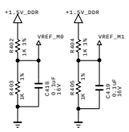










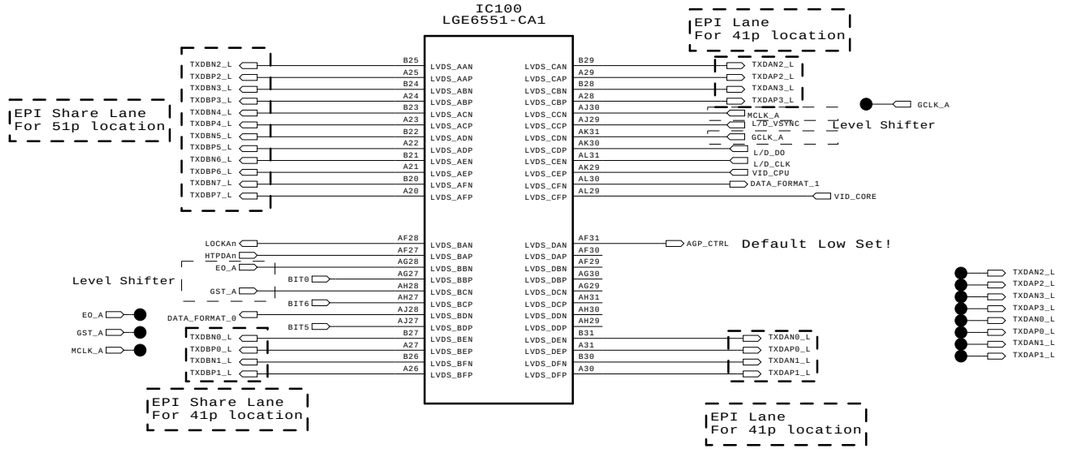


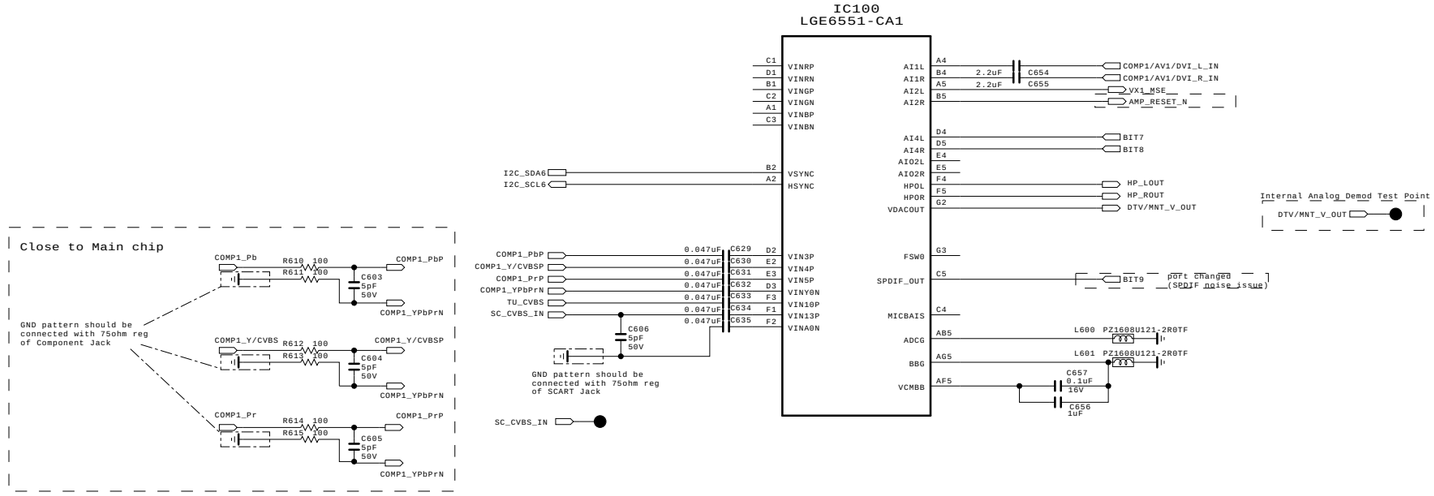
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

SECRET
LGElectronics

LG ELECTRONICS

MODEL	K2L	DATE	2015-04-27
BLOCK	K2L DDR	SHEET	03





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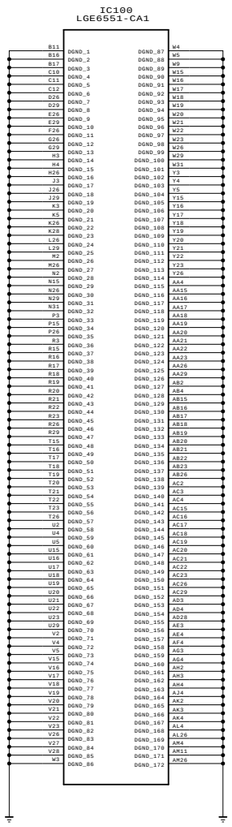
SECRET
LGElectronics

LG ELECTRONICS

MODEL	K2L	DATE	15/04/27
BLOCK	MAIN4_EXT_IN/OUTPUT	SHEET	04



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SECRET
LGElectronics

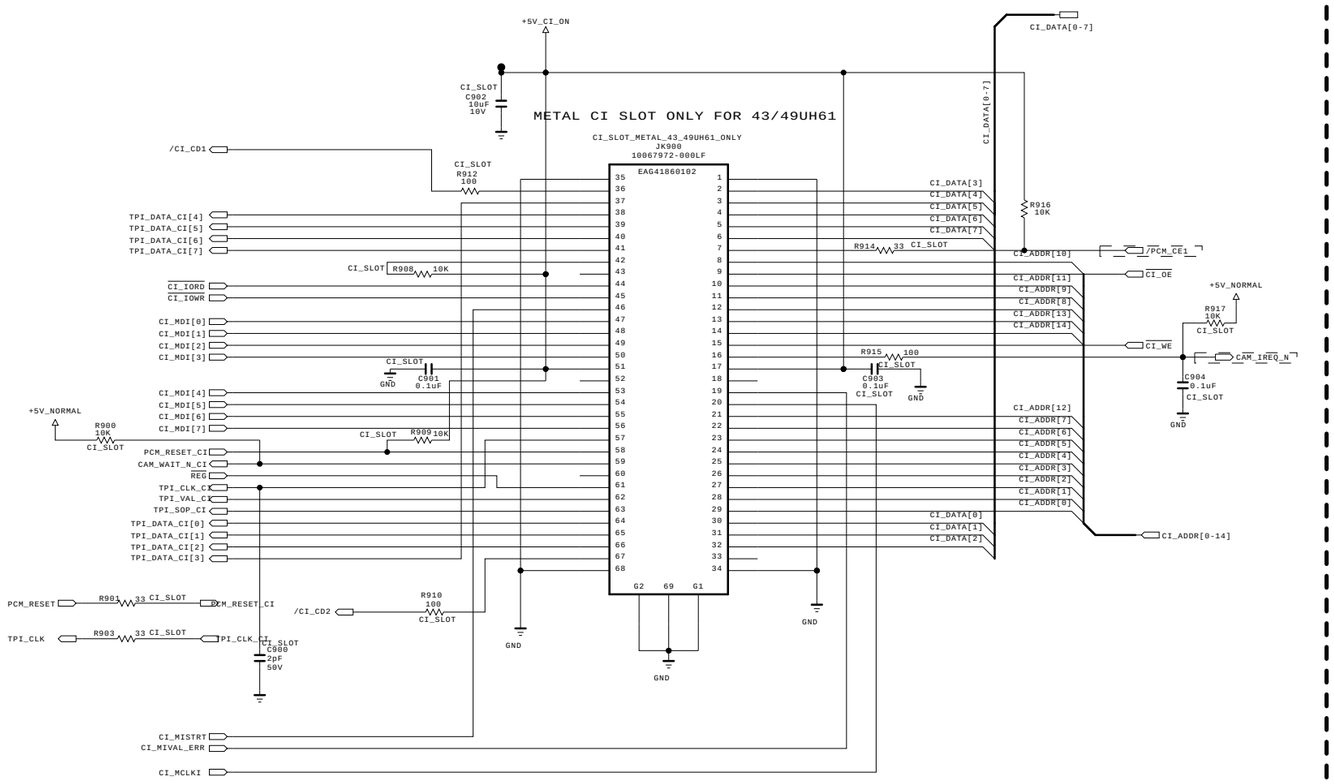
LG ELECTRONICS

MODEL	K2L	DATE	2015-01-18
BLOCK	K2L_GND	SHEET	07

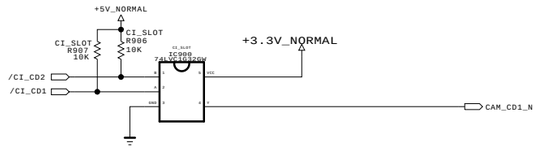
CI Region

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

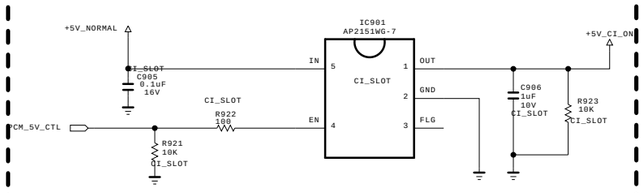
CI SLOT

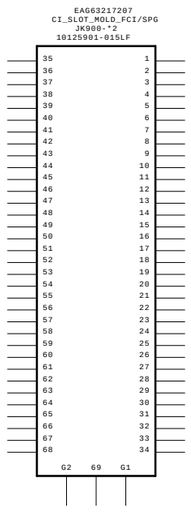


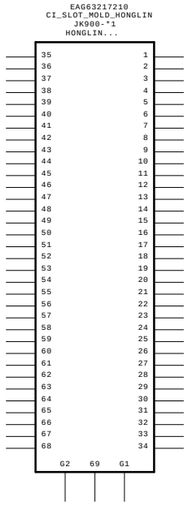
CI DETECT



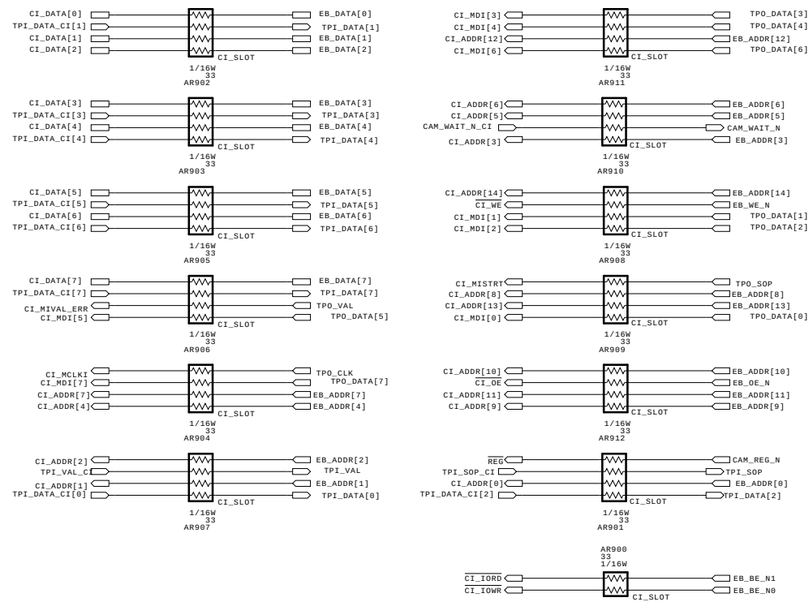
CI POWER ENABLE CONTROL







CI HOST I/F



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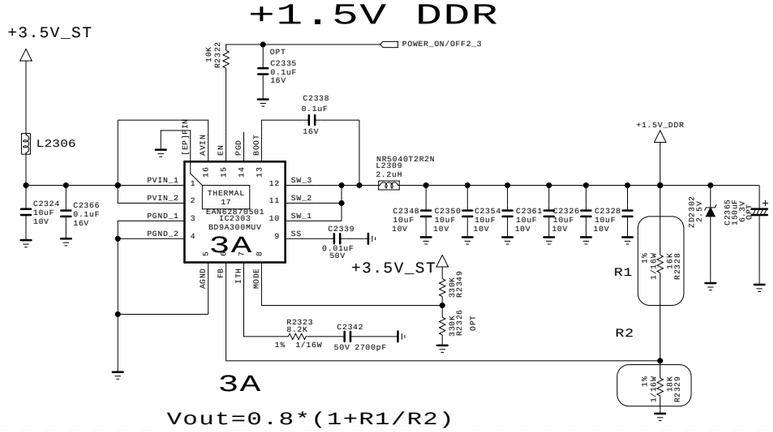
SECRET
LGElectronics

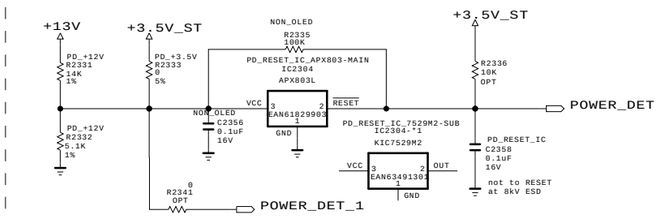
LG ELECTRONICS

MODEL	K2L / K2Lp	DATE	2015-01-10
BLOCK	PCMCI	SHEET	9

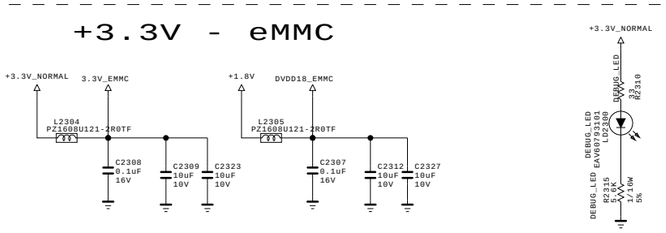
+1.5V DDR



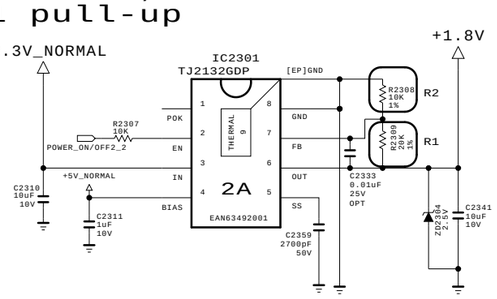
Power_DET



+3.3V - eMMC

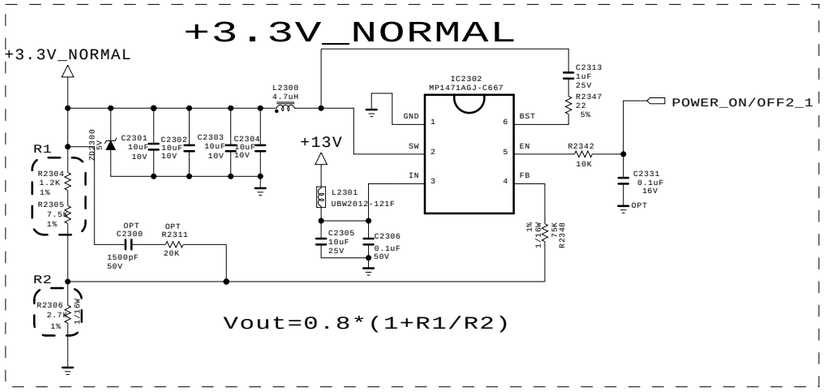


+1.8V - K2L, eMMC & Vx1 pull-up



Vout=0.6*(1+R1/R2)=1.8V

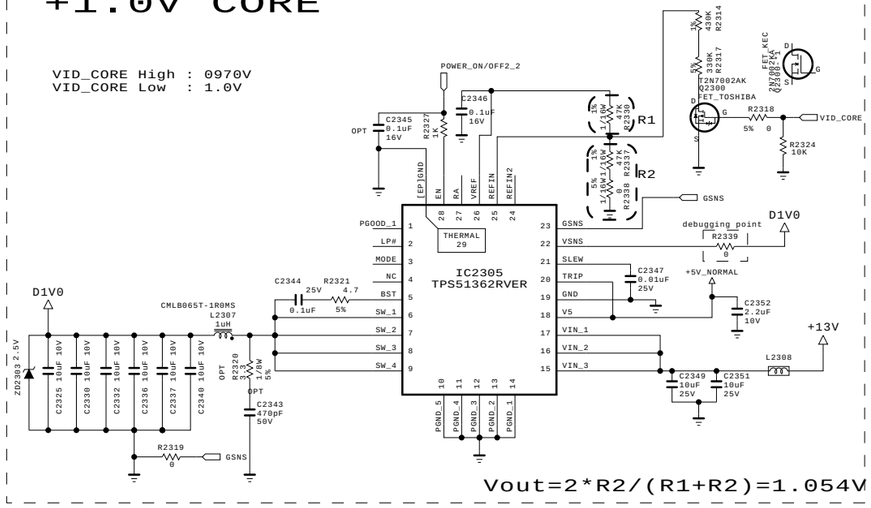
+3.3V_NORMAL



Vout=0.8*(1+R1/R2)

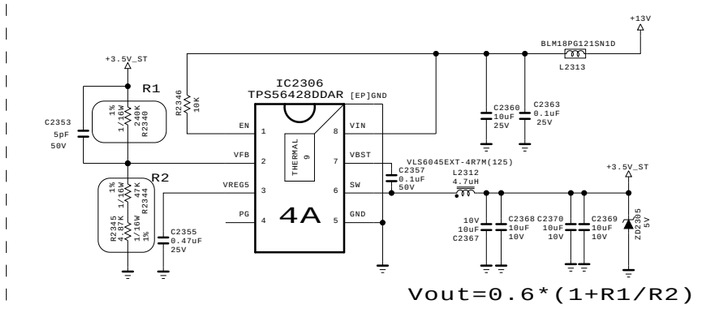
+1.0V CORE

VID_CORE High : 0970V
VID_CORE Low : 1.0V



Vout=2*R2/(R1+R2)=1.054V

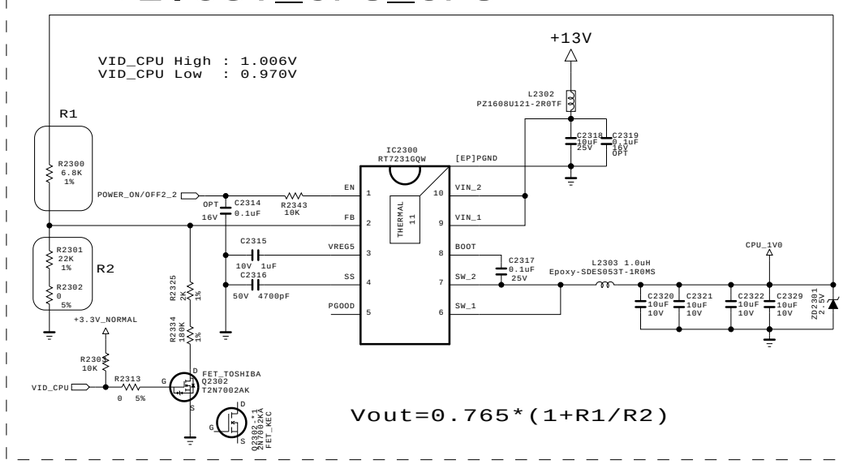
+3.5V_ST



Vout=0.6*(1+R1/R2)

+1.05V_CPU_GPU

VID_CPU High : 1.006V
VID_CPU Low : 0.970V



Vout=0.765*(1+R1/R2)

K2H Power SEQUENCE

POWER_ON/OFF1(5V)

↓

POWER_ON/OFF2_1(3.3V)

↓

POWER_ON/OFF2_2(1.0V, 1.8V)

↓

POWER_ON/OFF2_3(1.5V)

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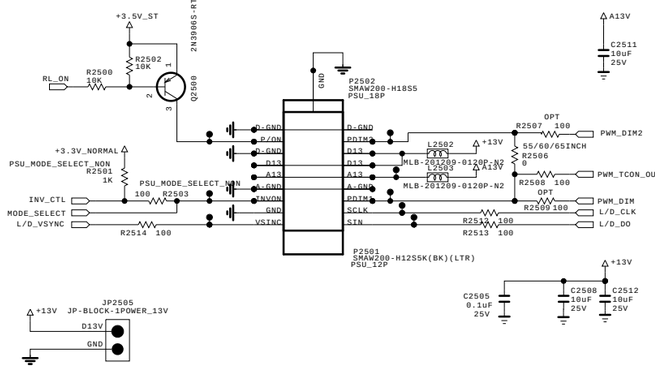
SECRET
LGElectronics

LG ELECTRONICS

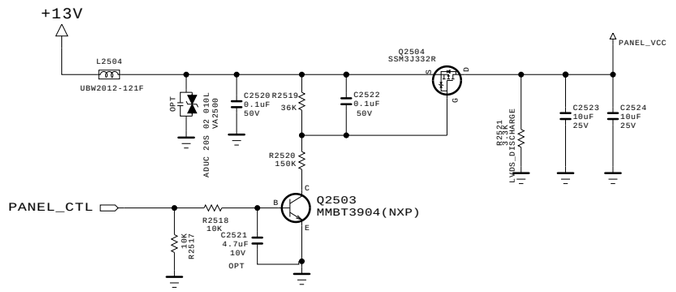
MODEL	K2H	DATE	2015-01-10
BLOCK	PWR_1	SHEET	07



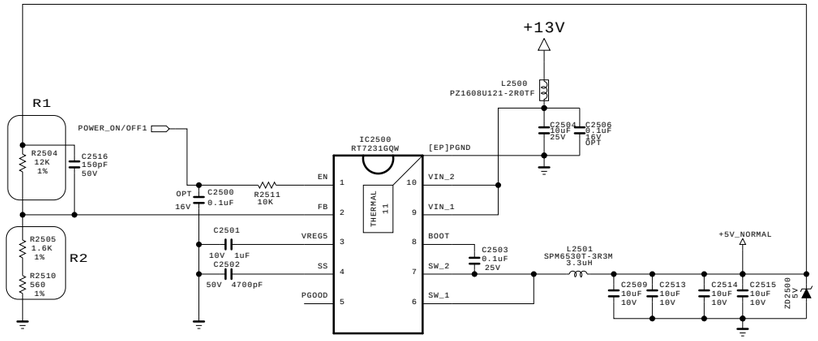
'15 UHD 12.5V sole out power
'Net name +12V means 12.5V power output

PANEL_POWER

Q2302 Change: Diodes --> NXP, 131118



+5.0V normal & USB



Vout=0.765*(1+R1/R2)

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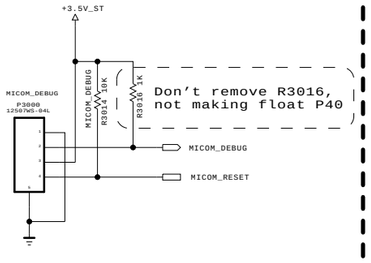
SECRET
LGElectronics

LG ELECTRONICS

MODEL	K2H	DATE	2015-01-10
BLOCK	PWR_2	SHEET	08

Renesas MICOM

For Debug



LM15 Power SEQUENCE

POWER_ON/OFF1(5V)

↓

POWER_ON/OFF2_1(3.3V)

↓

POWER_ON/OFF2_3(1.5V)

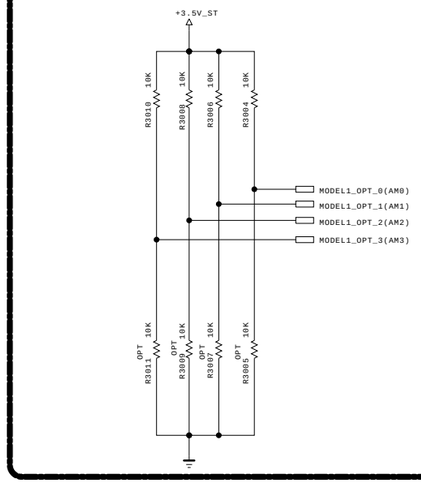
↓

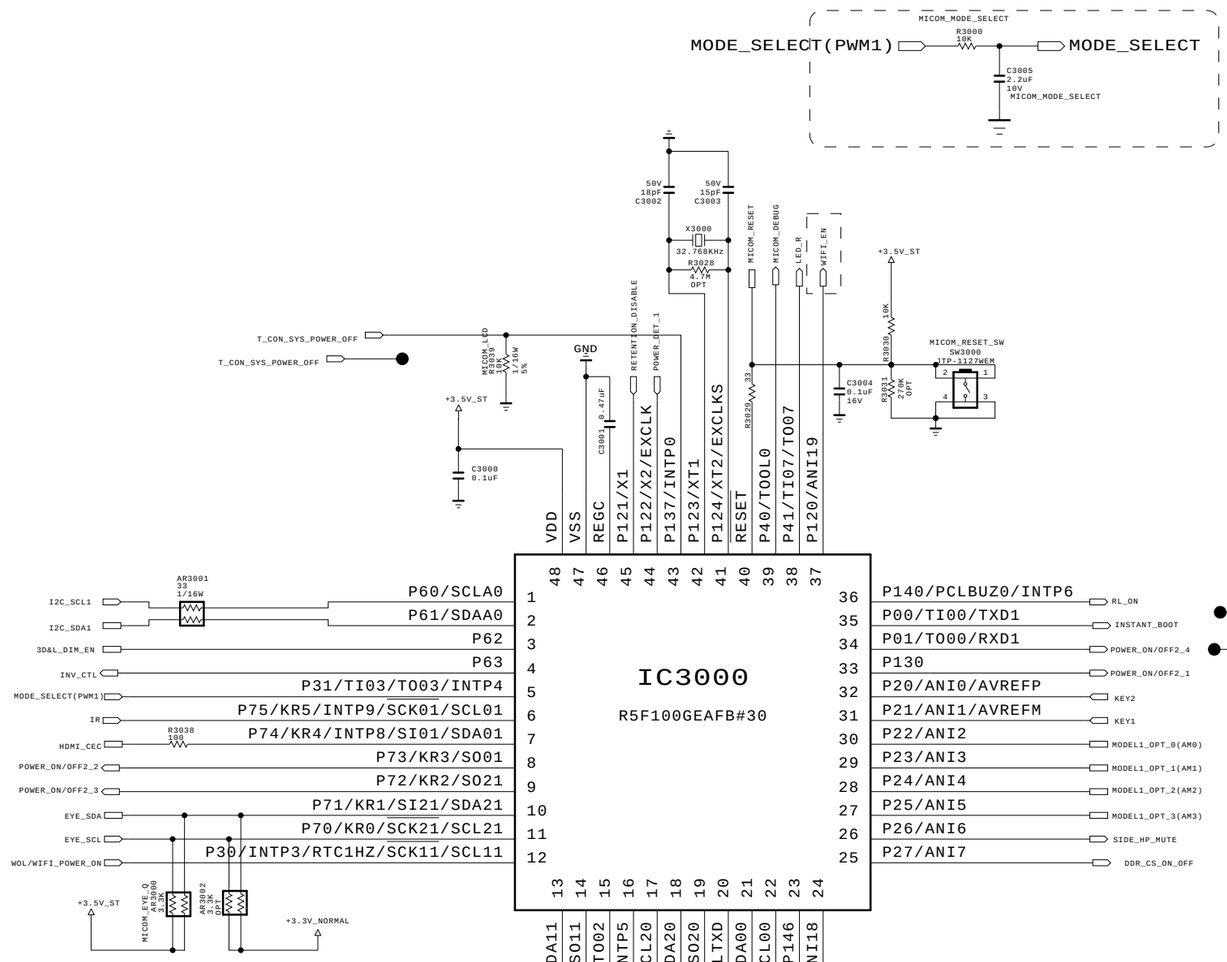
POWER_ON/OFF2_4(1.1V)

↓

SOC_RESET

MICOM MODEL OPTION

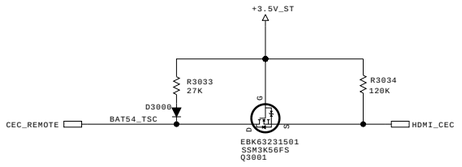




MICOM MODEL OPTION

	0.72V	1.53V	2.27V	3.0V	
MODEL_OPT_0	NON LOGO / LCD	LOGO / LCD	NON LOGO / OLED	LOGO / OLED	
MODEL_OPT_1	TV	BOX	TV	BOX	
MODEL_OPT_2	FHD		UHD	8K	
MODEL_OPT_3 (FHD)	M16		A5LR	M2	
MODEL_OPT_3 (UHD)	M16	RTK	H15		

For CEC



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SECRET
LGElectronics

LG ELECTRONICS

MODEL	K2L / K2Lp	DATE	2015-06-13
BLOCK	MICOM	SHEET	30

MICOM MODEL OPTION

	0.72V (2.7K)	1.53V (8.2K)	2.27V (20K)	3.0V (75K)
MODEL_OPT_0(AM0)	NON LOGO / LCD	LOGO / LCD	NON LOGO / OLED	LOGO / OLED
MODEL_OPT_1(AM1)	TV_NON_EPI	BOX_NON_EPI	TV_EPI	BOX_NON_EPI
MODEL_OPT_2(AM2)	FHD		UHD	8K
MODEL_OPT_3(AM3) (FHD)	M16		A5LR	M2
MODEL_OPT_3(AM3) (UHD)	M16	RTK	H15	

	0.72V (2.7K)	1.53V (8.2K)	2.27V (20K)	3.0V (75K)
MODEL_OPT_0(AM0)	MICOM_NON_LOGO/LCD R3005-*1 2.7K	MICOM_LOGO/LCD R3005-*2 8.2K	MICOM_NON_LOGO/OLED R3005-*3 20K	MICOM_LOGO/OLED R3005-*4 75K
MODEL_OPT_1(AM1)	MICOM_TV_NON_EPI R3007-*1 2.7K		MICOM_TV_EPI R3007-*3 20K	
MODEL_OPT_2(AM2)	MICOM_FHD R3009-*1 2.7K		MICOM_UHD R3009-*3 20K	MICOM_8K R3009-*4 75K
MODEL_OPT_3(AM3) (FHD) MODEL_OPT_3(AM3) (UHD)	MICOM_M16 R3011-*1 2.7K	MICOM_RTK R3011-*2 8.2K	MICOM_H15/A5LR R3011-*3 20K	MICOM_M2 R3011-*4 75K

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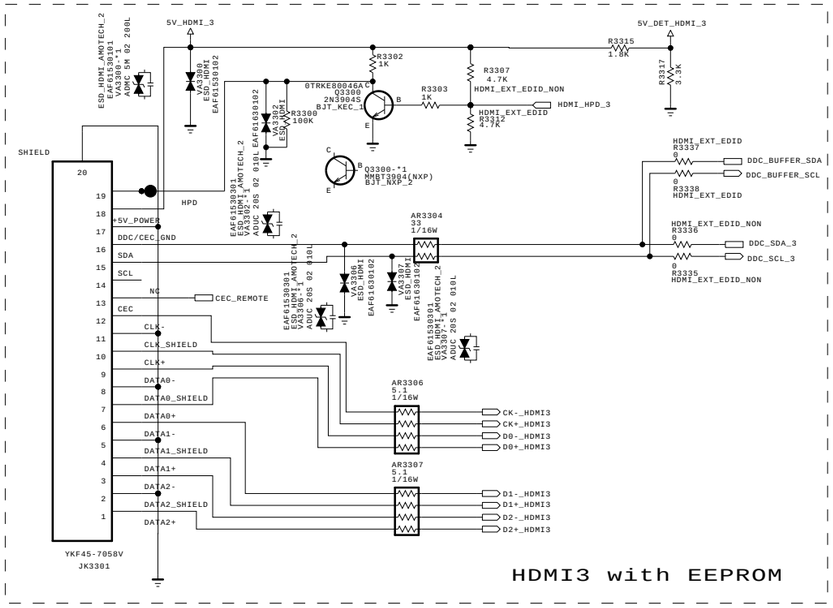
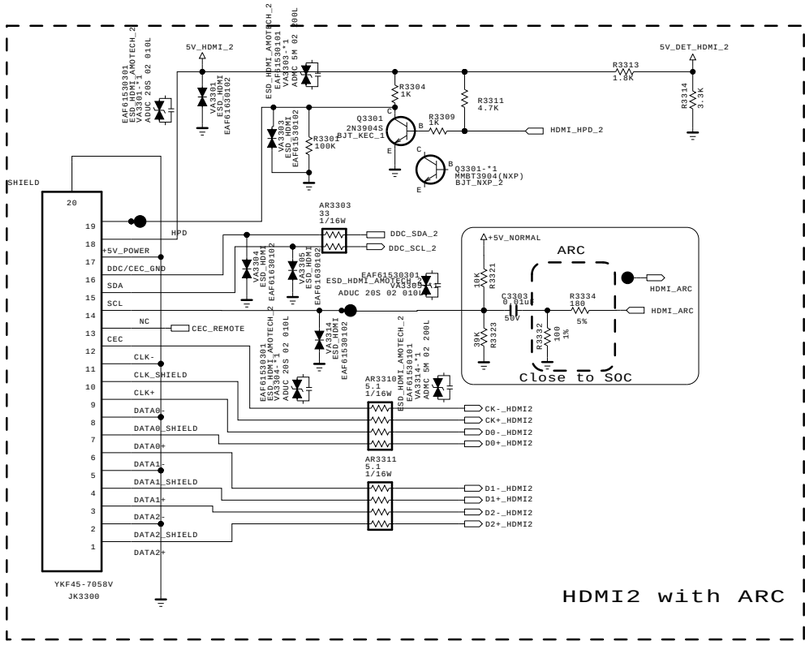
SECRET
LGElectronics

LG ELECTRONICS

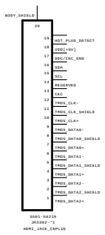
MODEL	K2H	DATE	2015-01-10
BLOCK	MODEL OPTION	SHEET	30

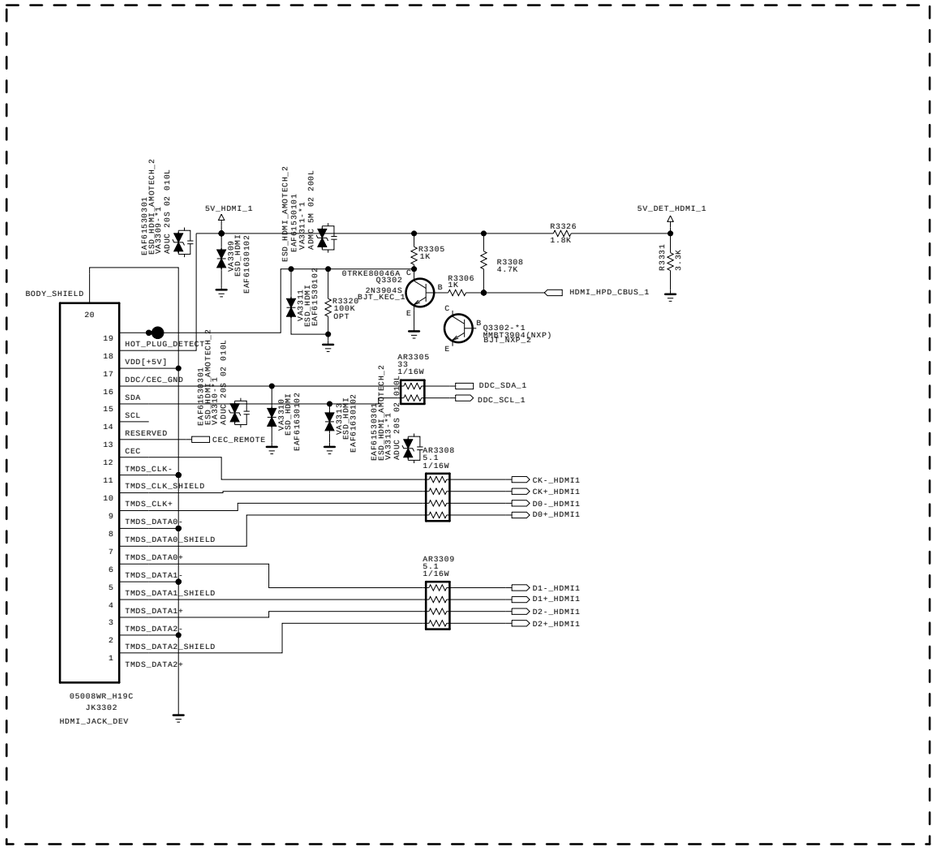


HDMI3 with EEPROM

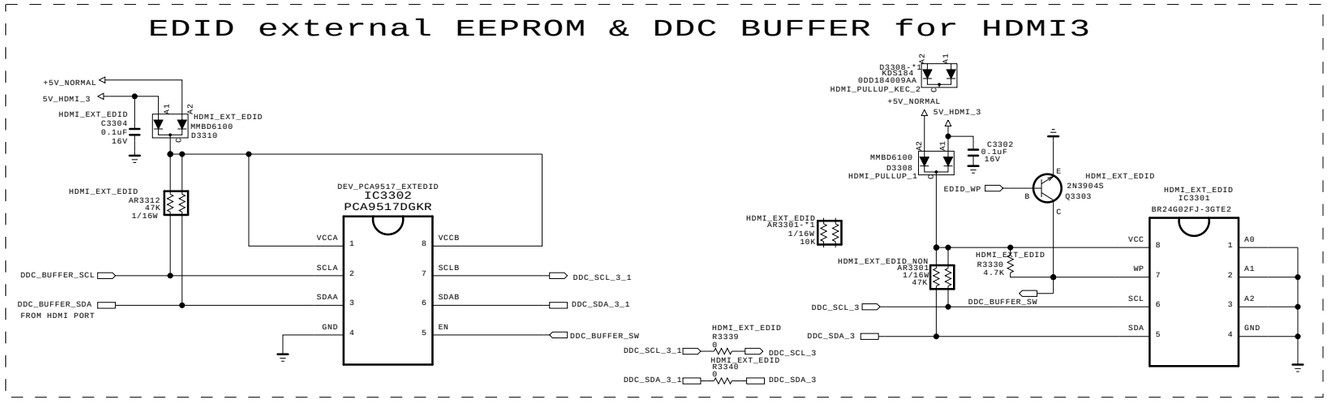


HDMI2 with ARC

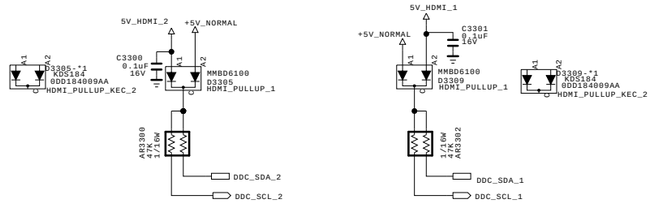




EDID external EEPROM & DDC BUFFER for HDMI3



DDC pull-up



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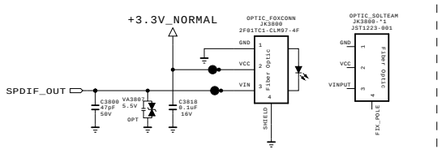
SECRET
LGElectronics

LG ELECTRONICS

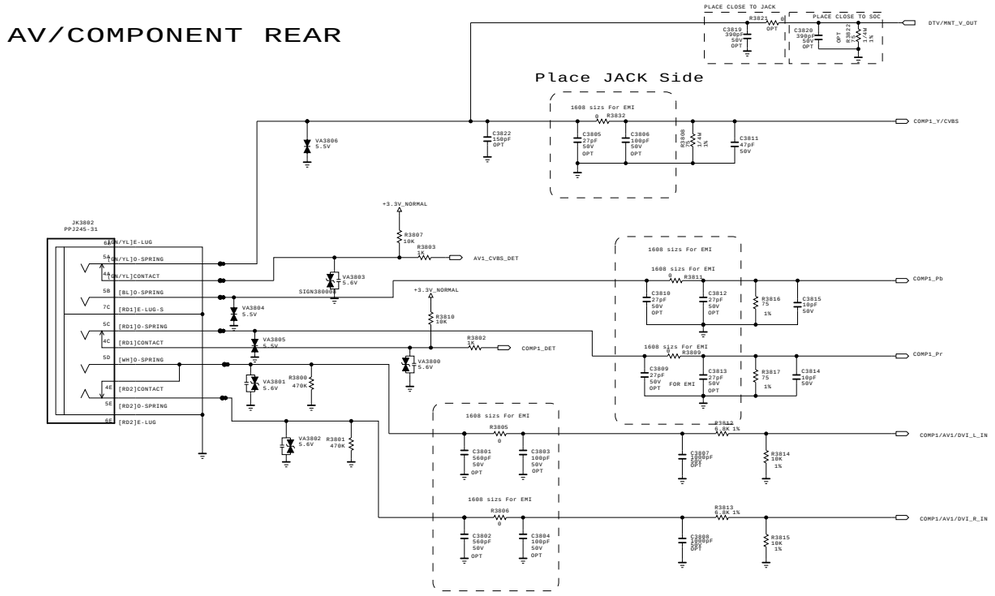
MODEL	K2L	DATE	2015-01-10
BLOCK	HDMI	SHEET	33

LGE Internal Use Only

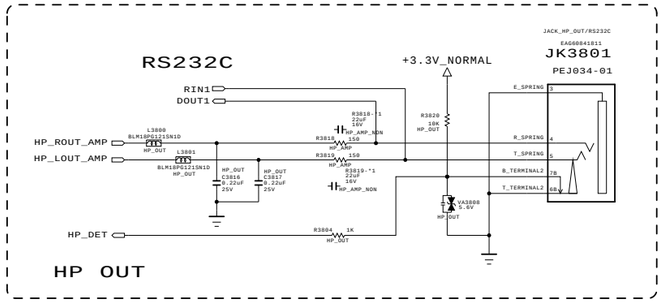
SPDIF OUT



AV/COMPONENT REAR



HP OUT



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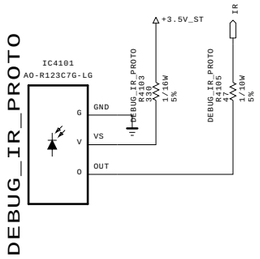
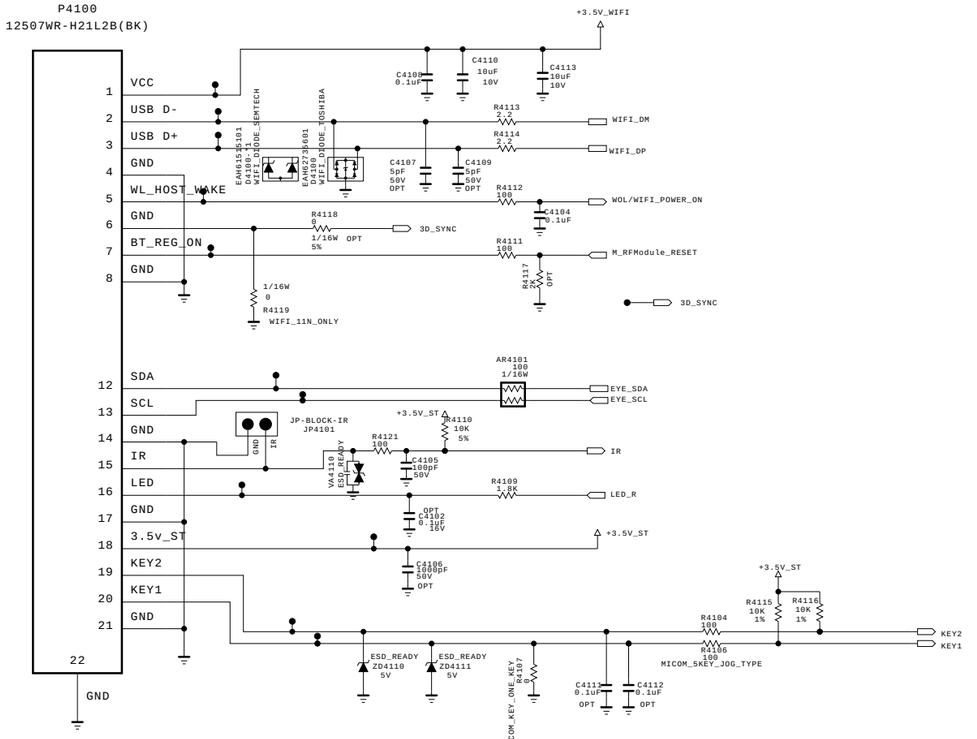
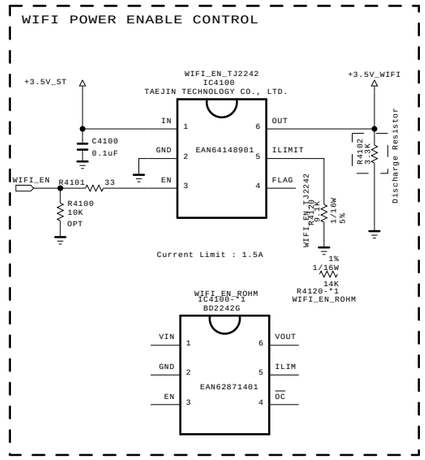
SECRET
LGElectronics

LG ELECTRONICS

MODEL	UF71/7500	DATE	2014-07-24
BLOCK	JACK_COMMON_H	SHEET	38







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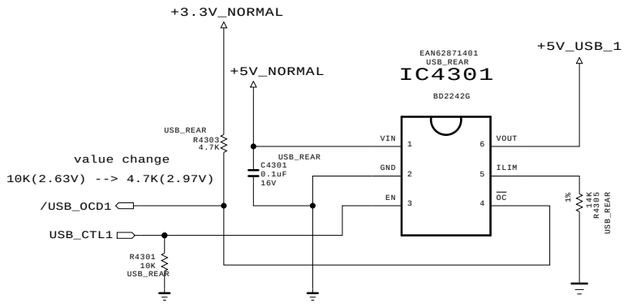
LG ELECTRONICS

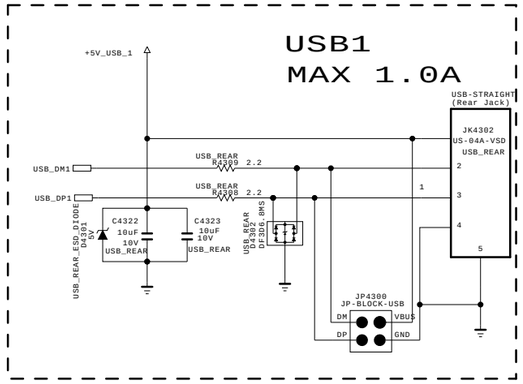
MODEL	UF71/7500	DATE	2014-05-19
BLOCK	IR/KEY	SHEET	12

USB2.0 2Port

OCP USB2_2.0



USB1
MAX 1.0A



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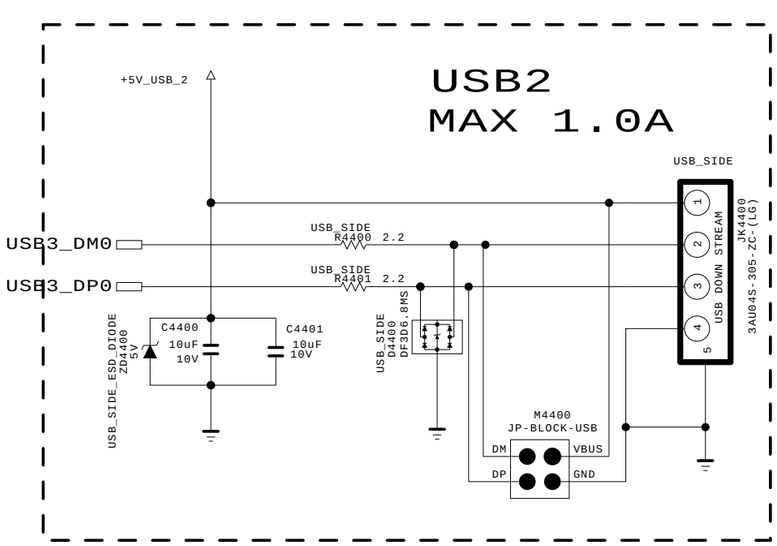
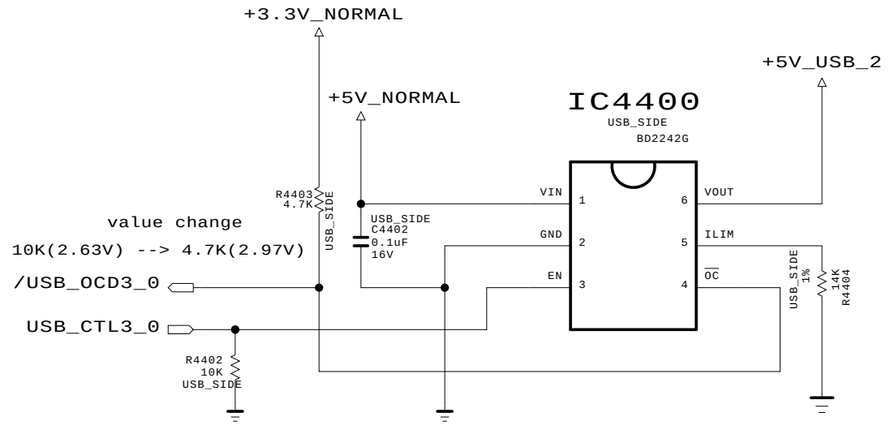
MODEL	K2L	DATE	2015-04-27
BLOCK	USB2.0 jack	SHEET	13 /





USB3_RXM0
USB3_RXP0
USB3_TXM0
USB3_TXP0
/USB_OCD1
USB_CTL1
USB_DM1
USB_DP1

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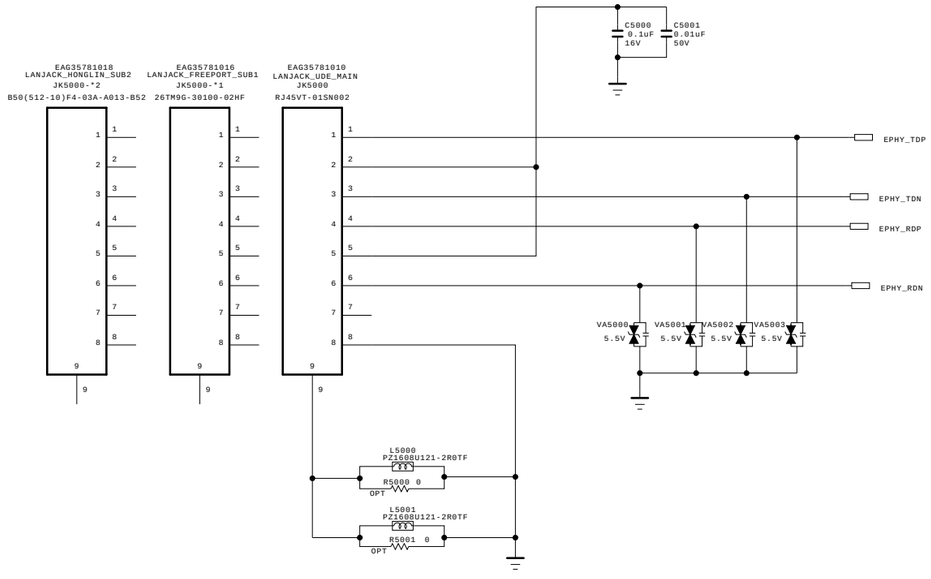
043.sht

MODEL	K2H	DATE	2015.02.11
BLOCK	USB 2 & 3	SHEET	15 / 26

Ethernet Block



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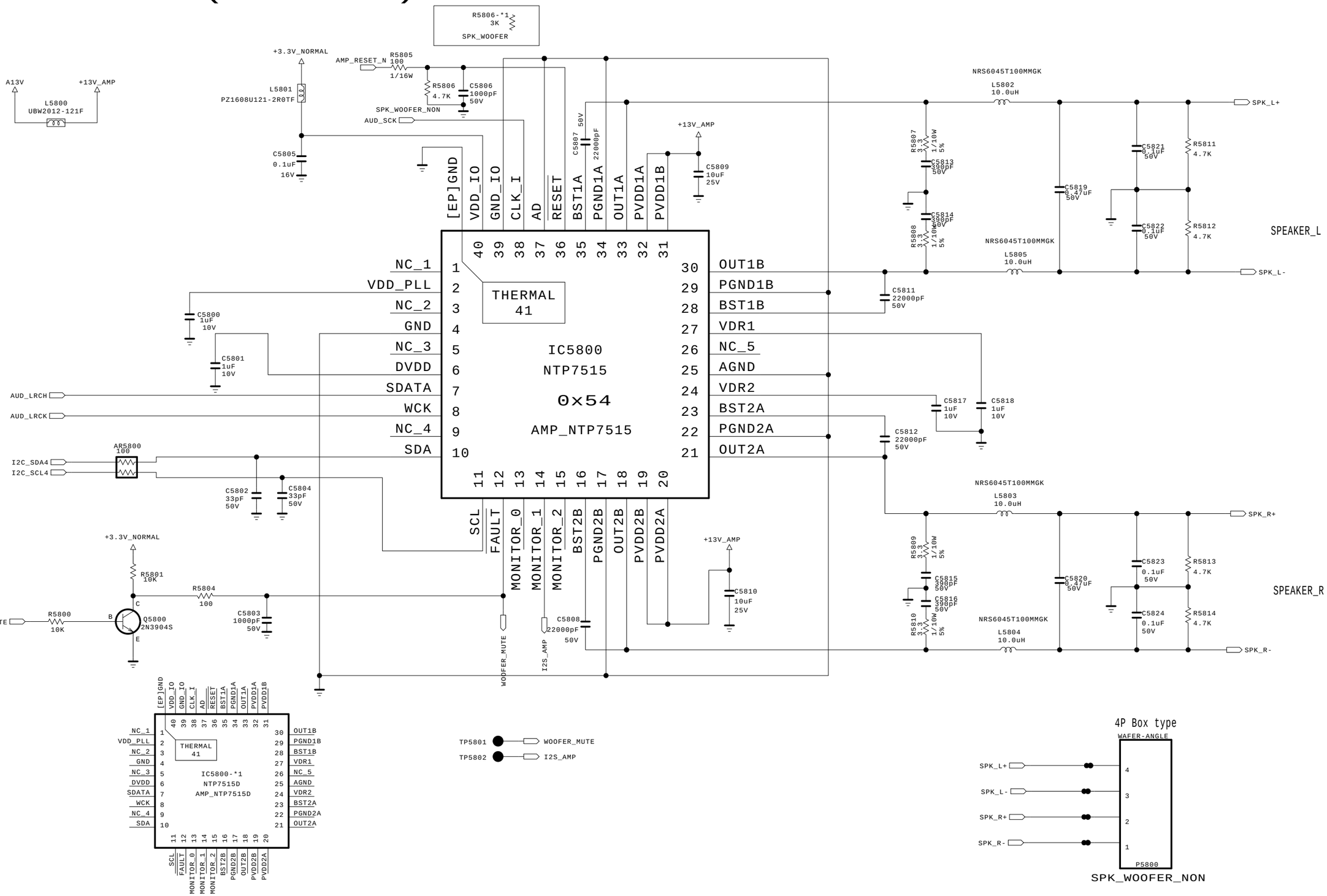
MODEL	K2H	DATE	2014-12-15
BLOCK	LAN_H	SHEET	50

AUDIO AMP(NTP7515)



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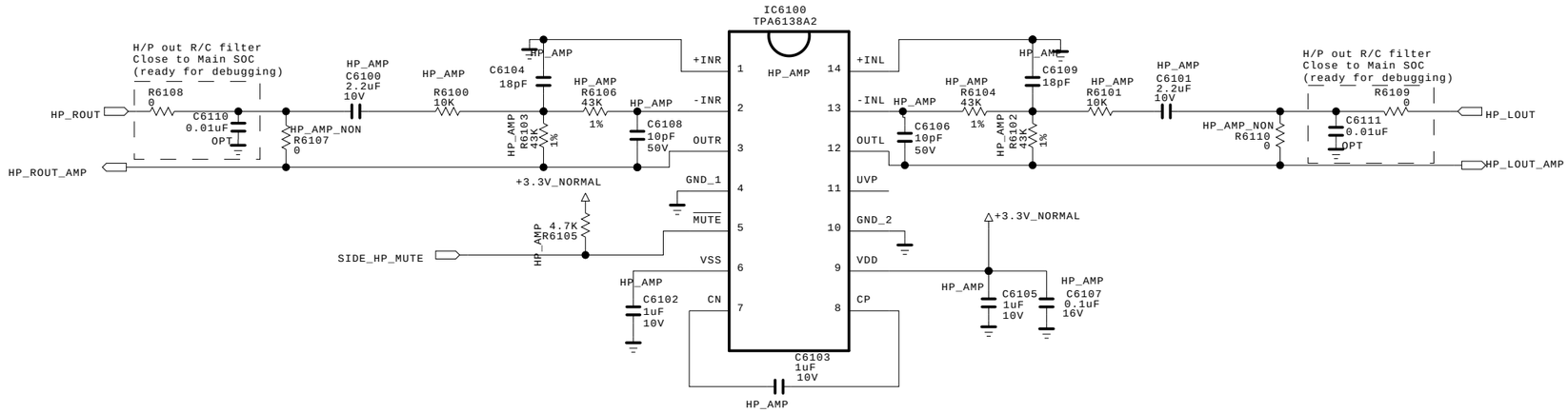
LG ELECTRONICS

MODEL		DATE	2014-10-17
BLOCK	MAIN_AMP	SHEET	58

EARPHONE AMP



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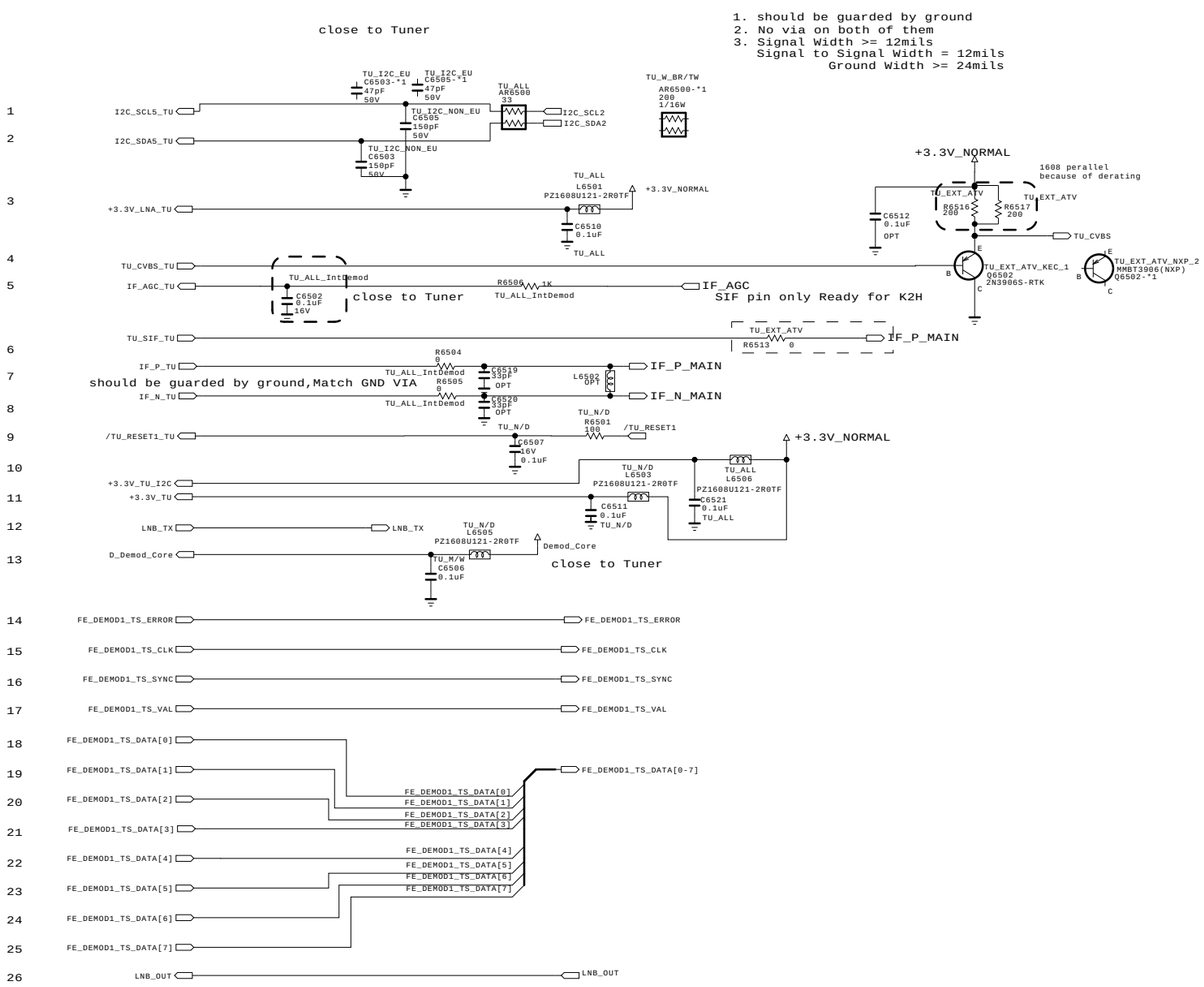
LG ELECTRONICS

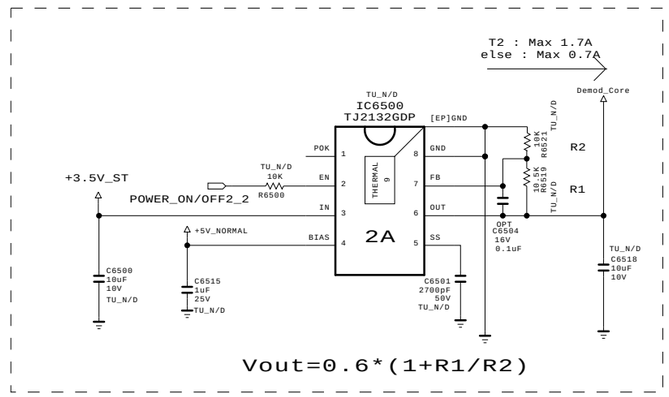
MODEL	K2H	DATE	2014-11-22
BLOCK	HP_AMP	SHEET	61

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





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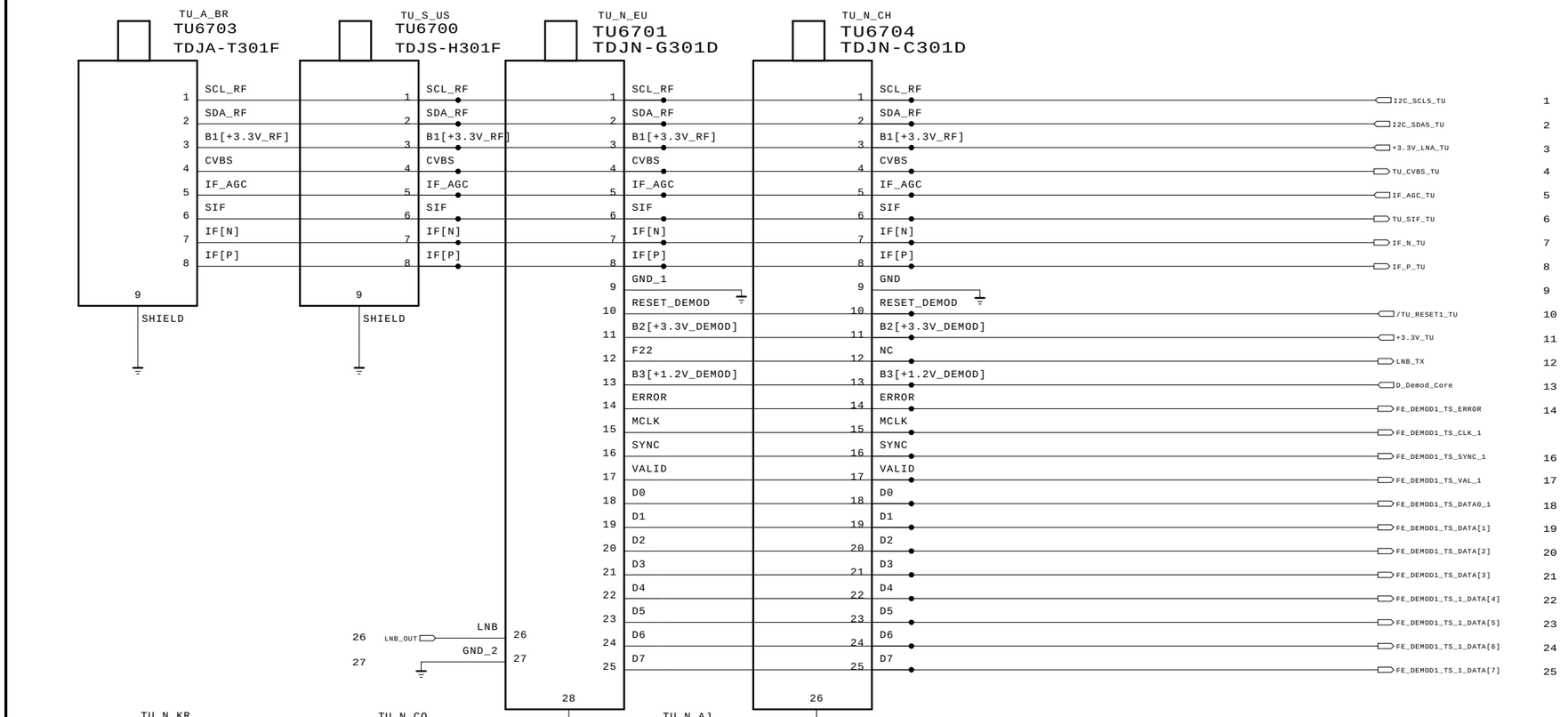
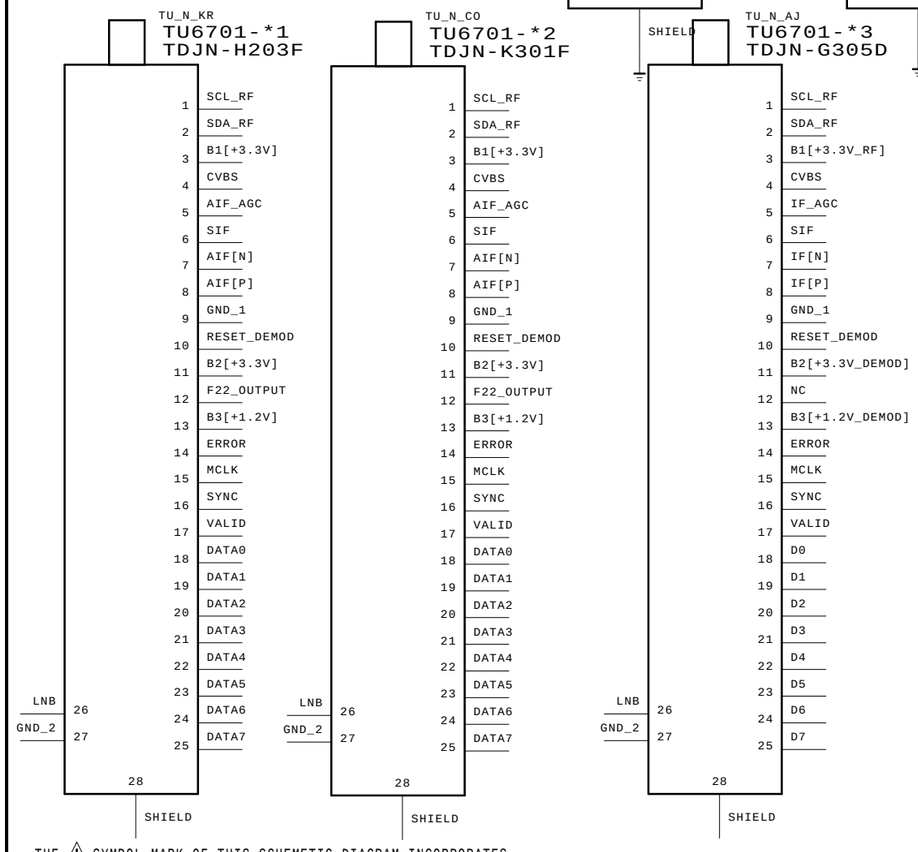
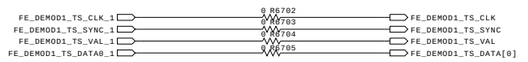
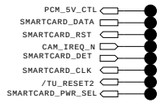
MODEL	K2H	DATE	2014-10-17
BLOCK	TU_CIRCUIT	SHEET	18









Close to Tuner

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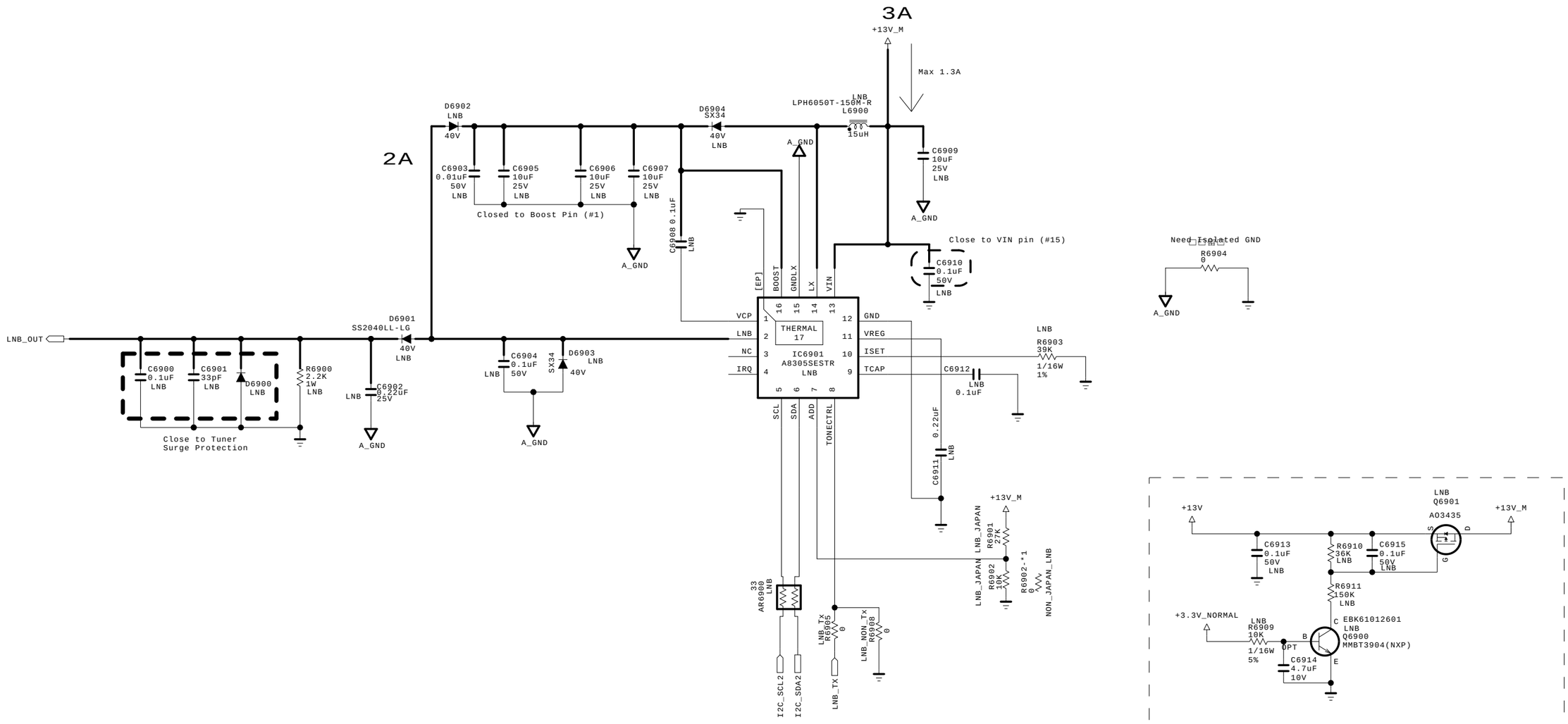
MODEL	K2H	DATE	2014-09-11
BLOCK	TU_SYMBOL_H	SHEET	19

LNB PART (DVB-S2)

OPTION ; LNB

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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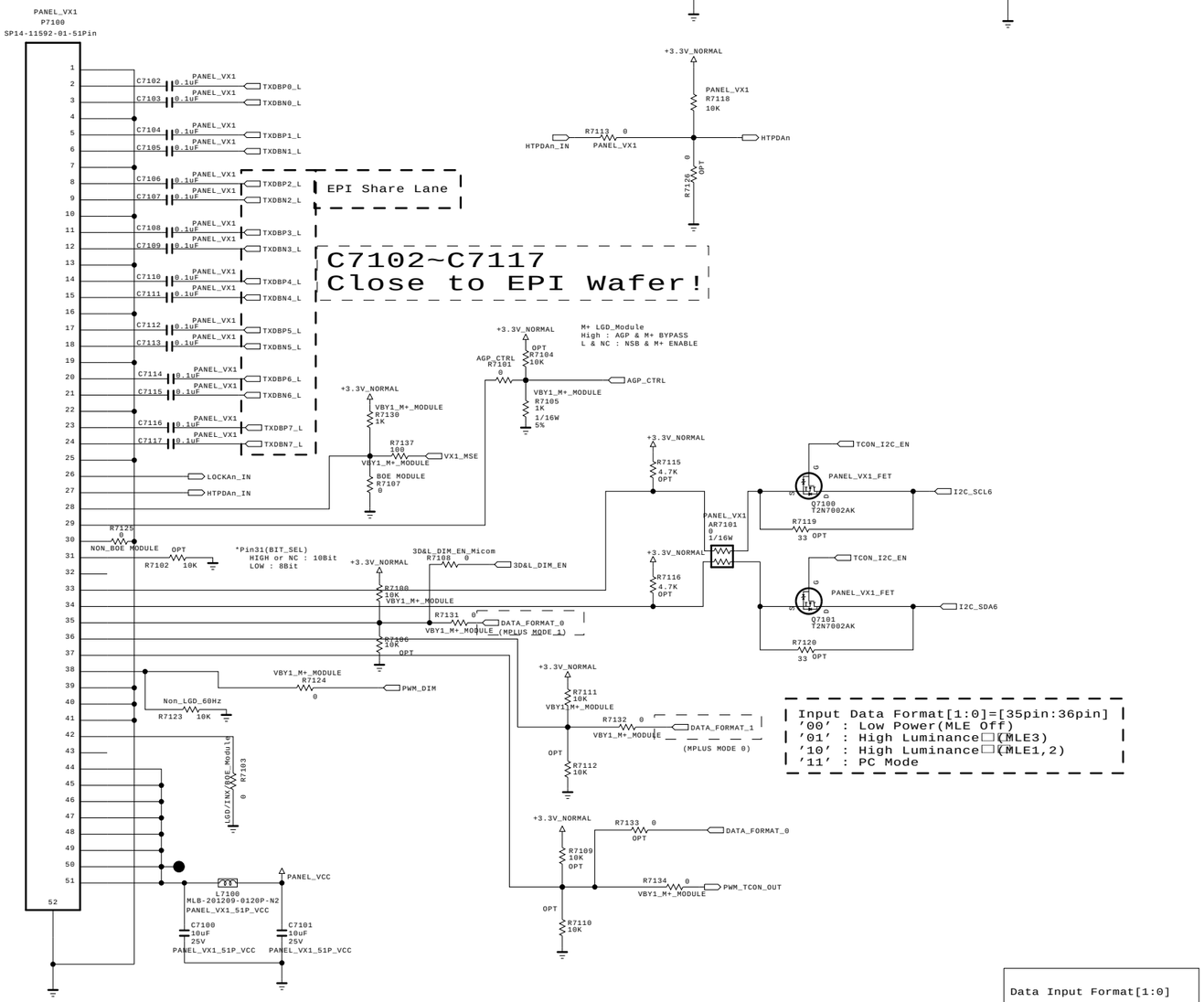
MODEL	K2H	DATE	2014-08-25
BLOCK	LNB	SHEET	20

[51P Vx1 output wafer]




```
Input Data Format[1:0]=[35pin:36pin]
'00' : Low Power(MLE Off)
'01' : High Luminance (MLE3)
'10' : High Luminance (MLE1,2)
'11' : PC Mode
```

```
Data Input Format[1:0]

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

Must be assigned at Vx1 51p wafer !!!

PWM_TCON_OUT

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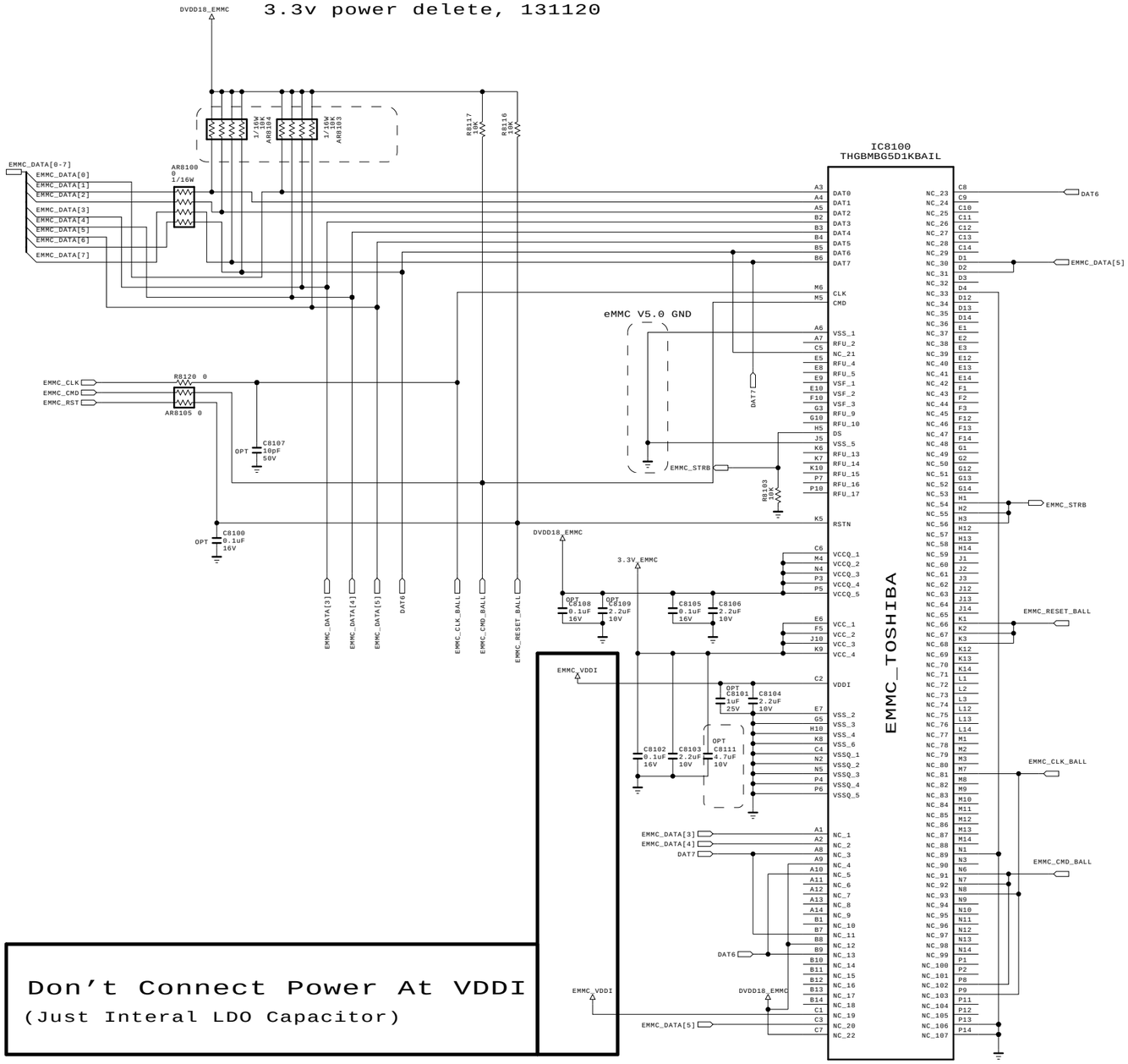
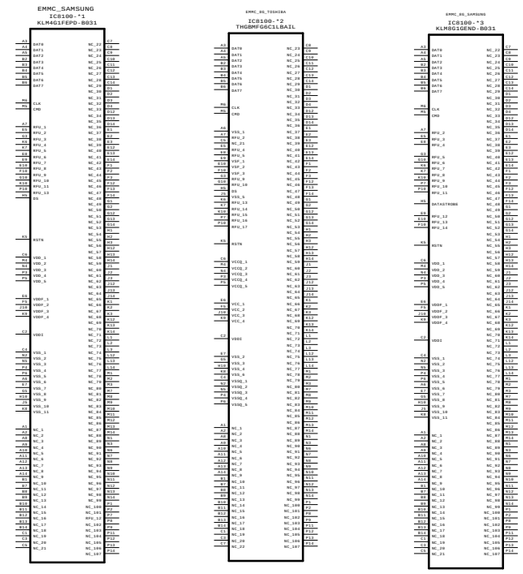
MODEL	K2H	DATE	2014-08-27
BLOCK	Vx1 51P	SHEET	21

eMMC I/F

3.3v power delete, 131120



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



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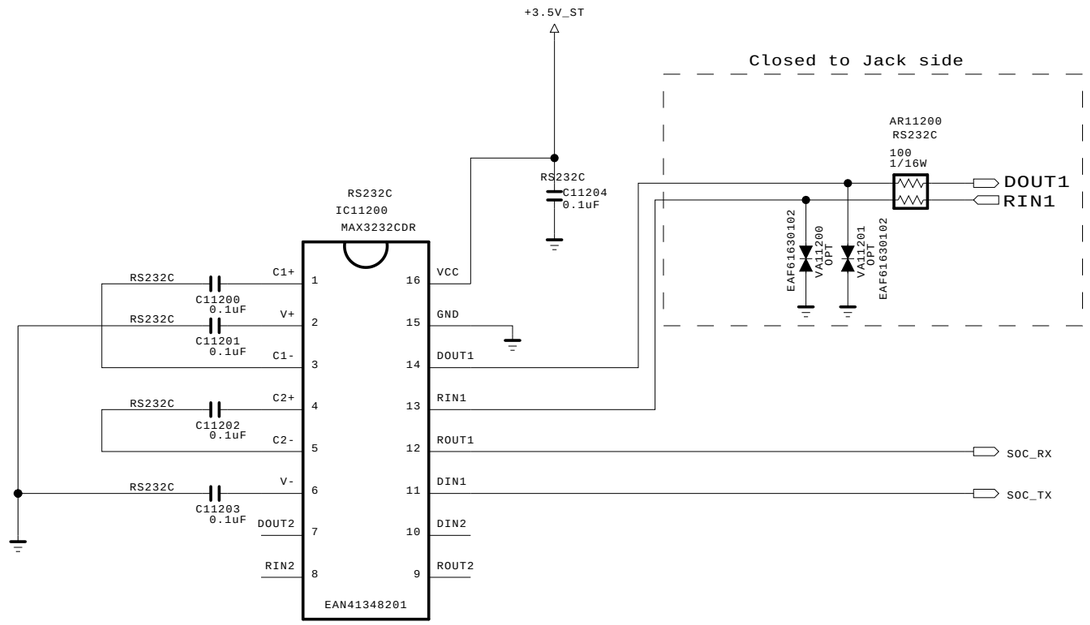
MODEL	K2H	DATE	2014-11-17
BLOCK	eMMC	SHEET	81

RS-232C Control INTERFACE



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


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TROUBLE SHOOTING GUIDE

Contents of Standard Repair Process

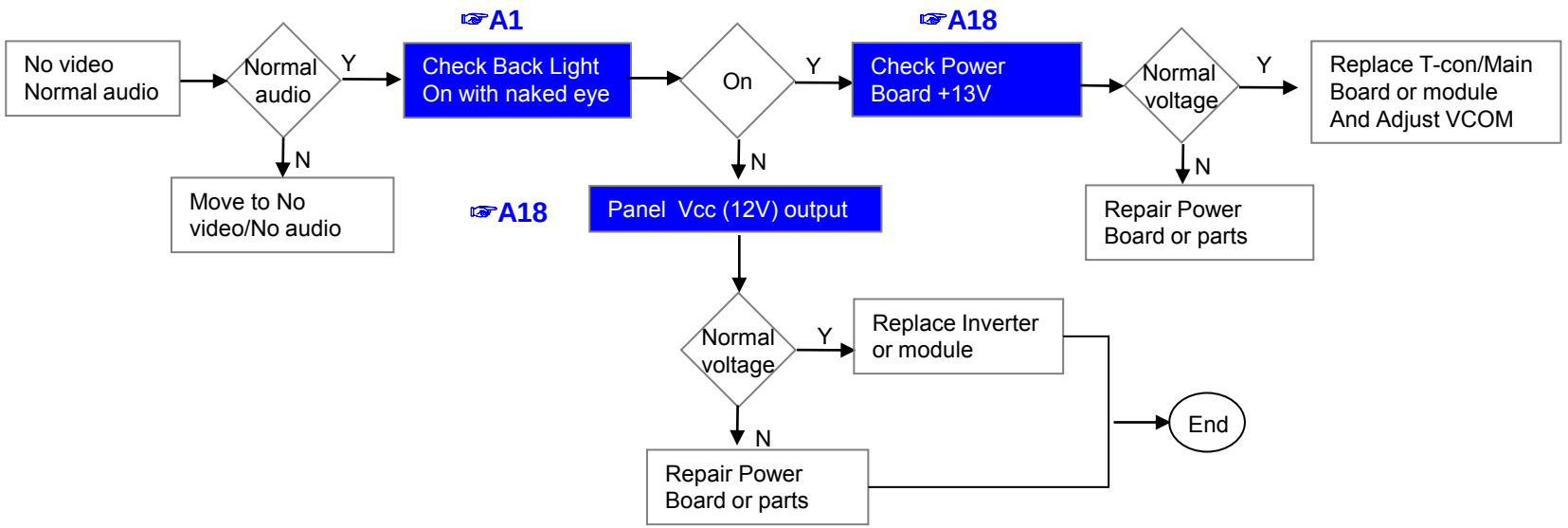
No.	Error symptom (High category)	Error symptom (Mid category)	Page	Remarks
1	A. Video error	No video/Normal audio	1	
2		No video/No audio	2	
3		Picture broken/ Freezing	3	
4		Color error	4	
5		Vertical/Horizontal bar, residual image, light spot, external device color error	5	
6	B. Power error	No power	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		MR15 operating checking	11	Not used
12		Wifi operating checking	12	
13		Camera operating checking	13	Not used
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 GSCS 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.

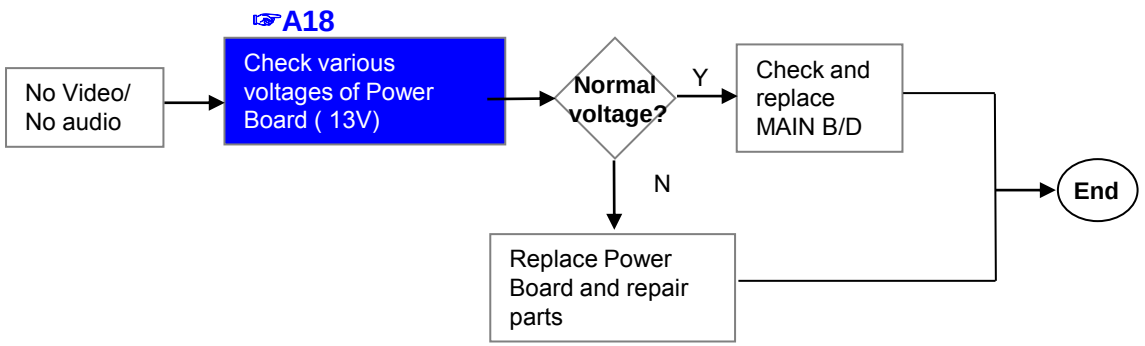
(Main B/D↔ Power B/D, VX1 Cable, Speaker Cable, IR B/D Cable,,,)



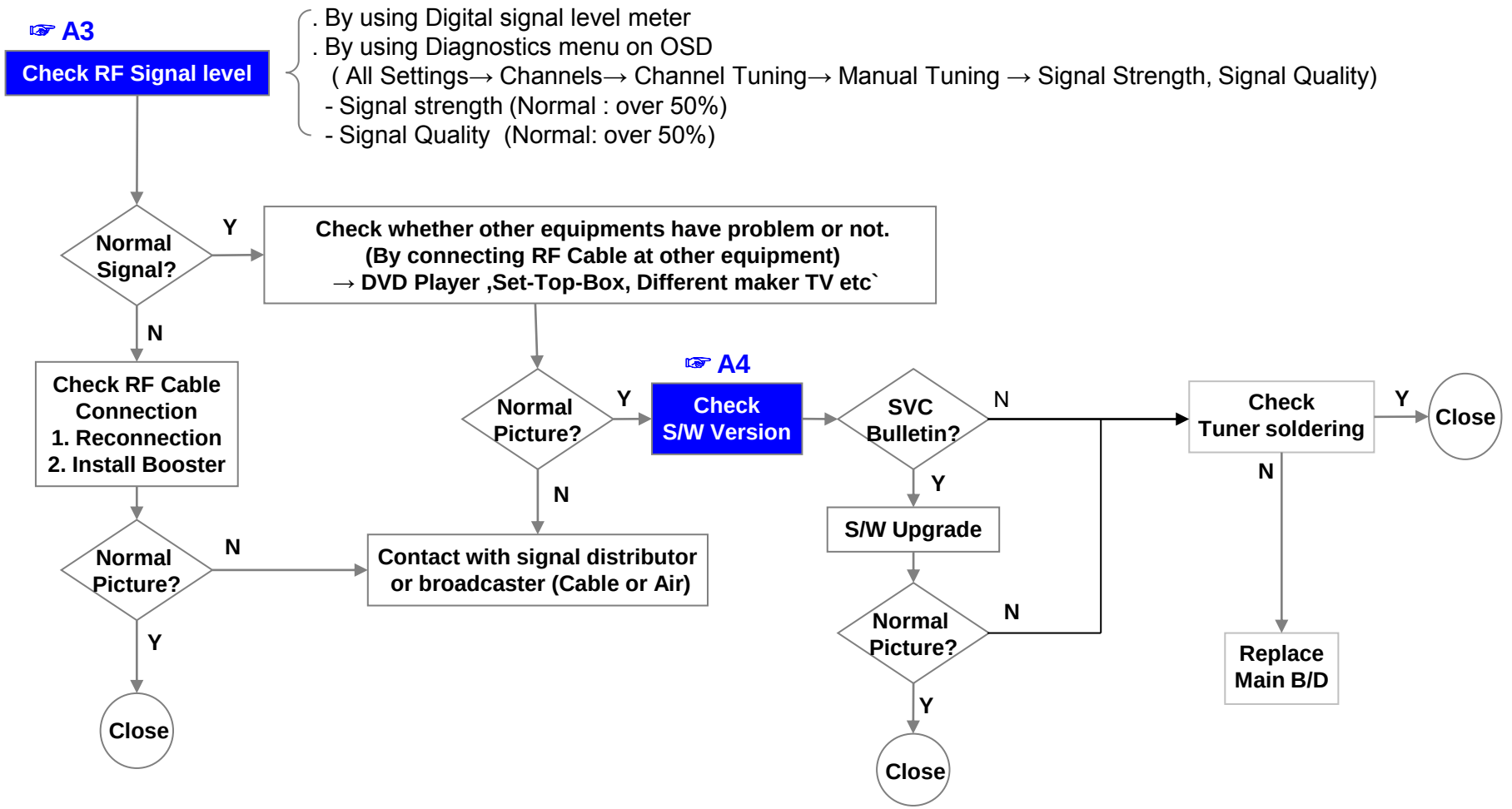
※Precaution ☞A4 & A2

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

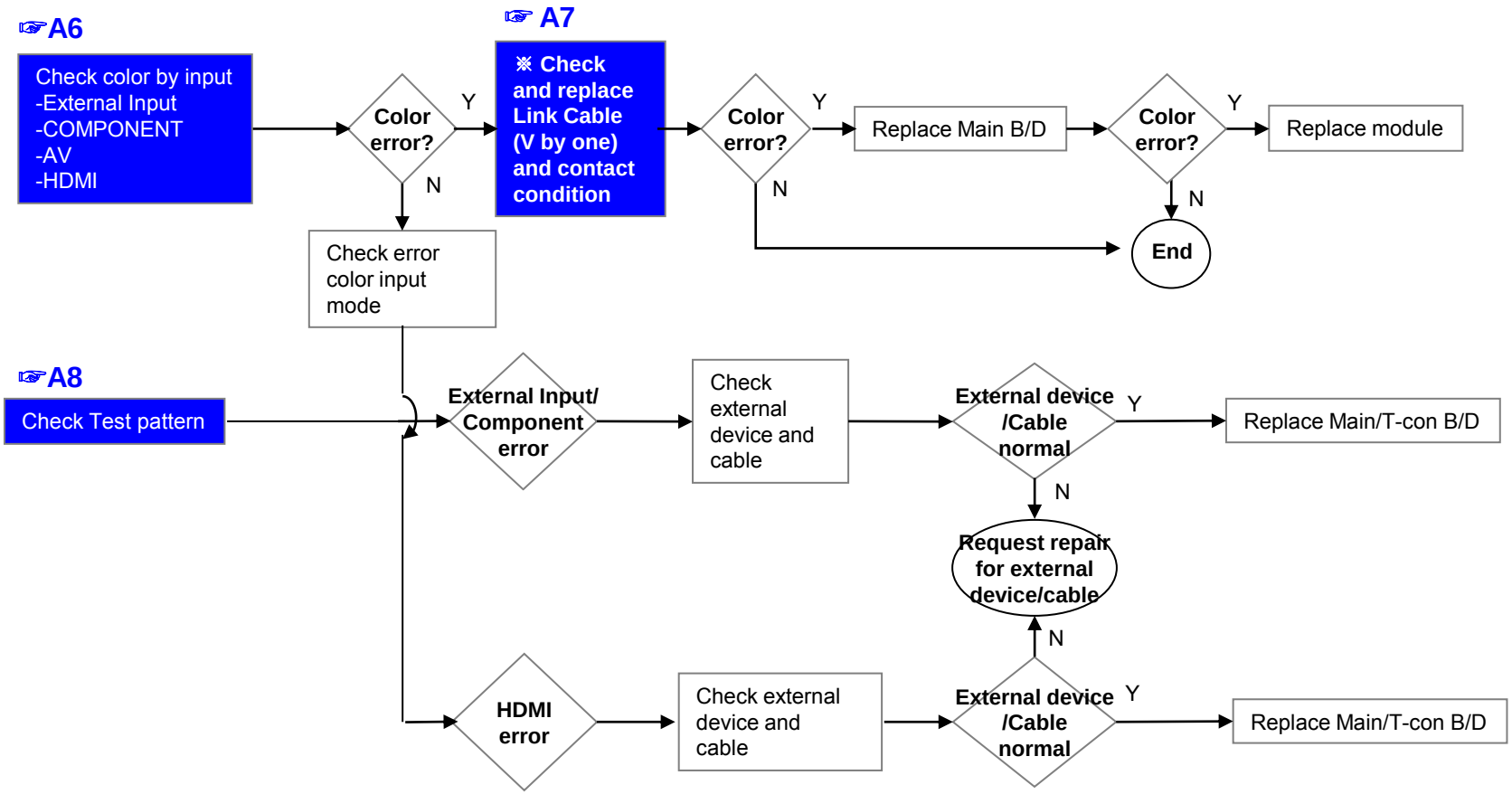
	Error symptom	A. Video error	Established date		
		No video/ No audio	Revised date		2/16



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

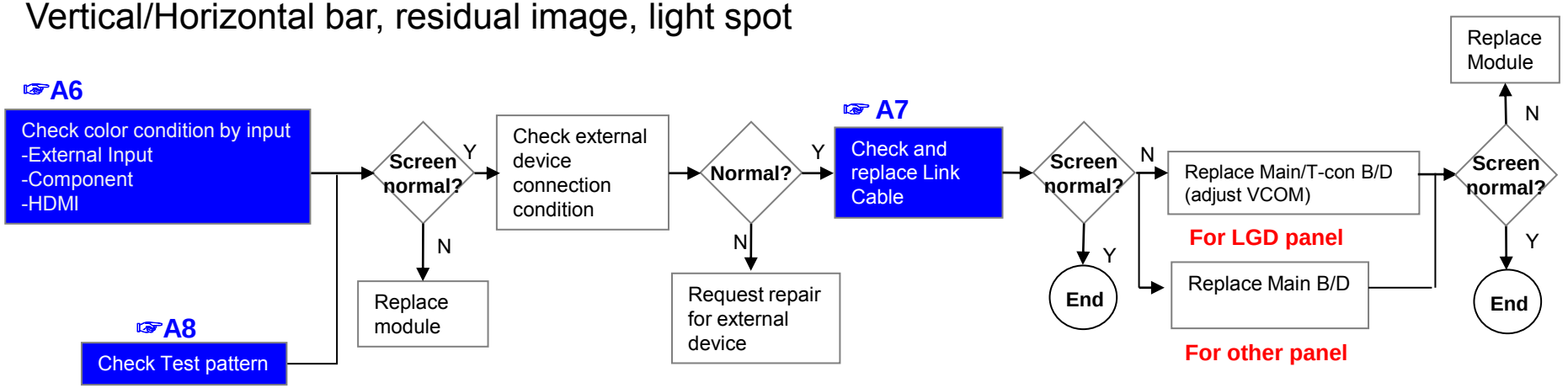


	Error symptom	A. Video error	Established date		
		Color error	Revised date		4/16

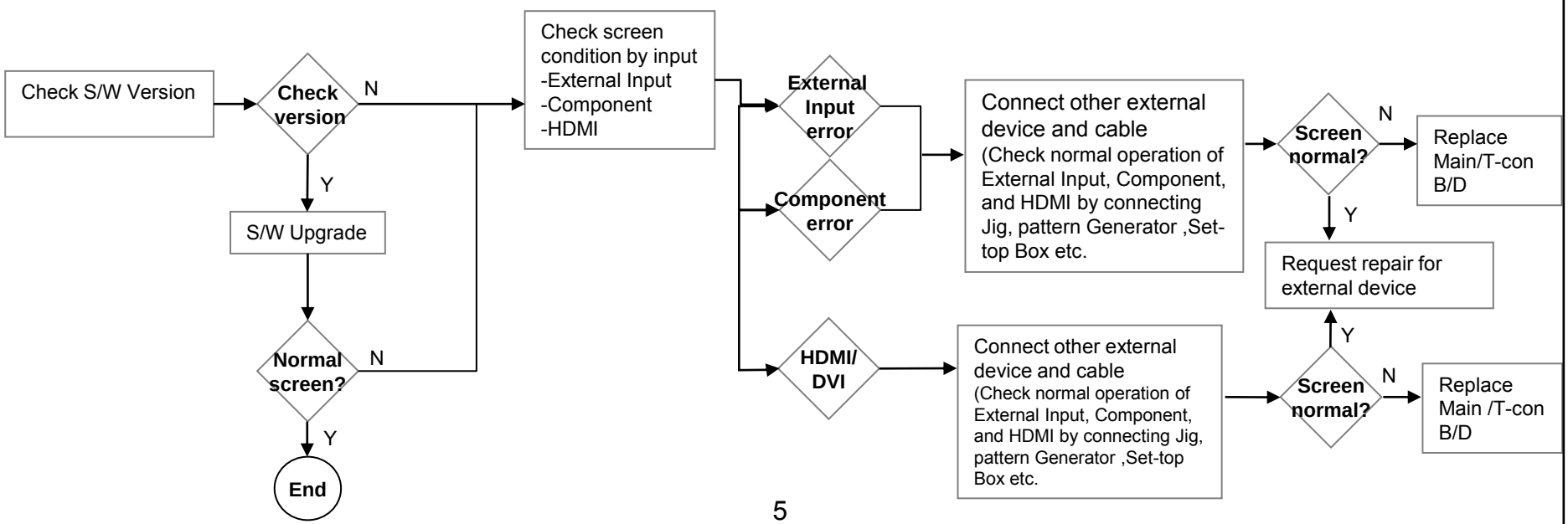


	Error symptom	A. Video error	Established date		
		Vertical / Horizontal bar, residual image, light spot, external device color error	Revised date		5/16

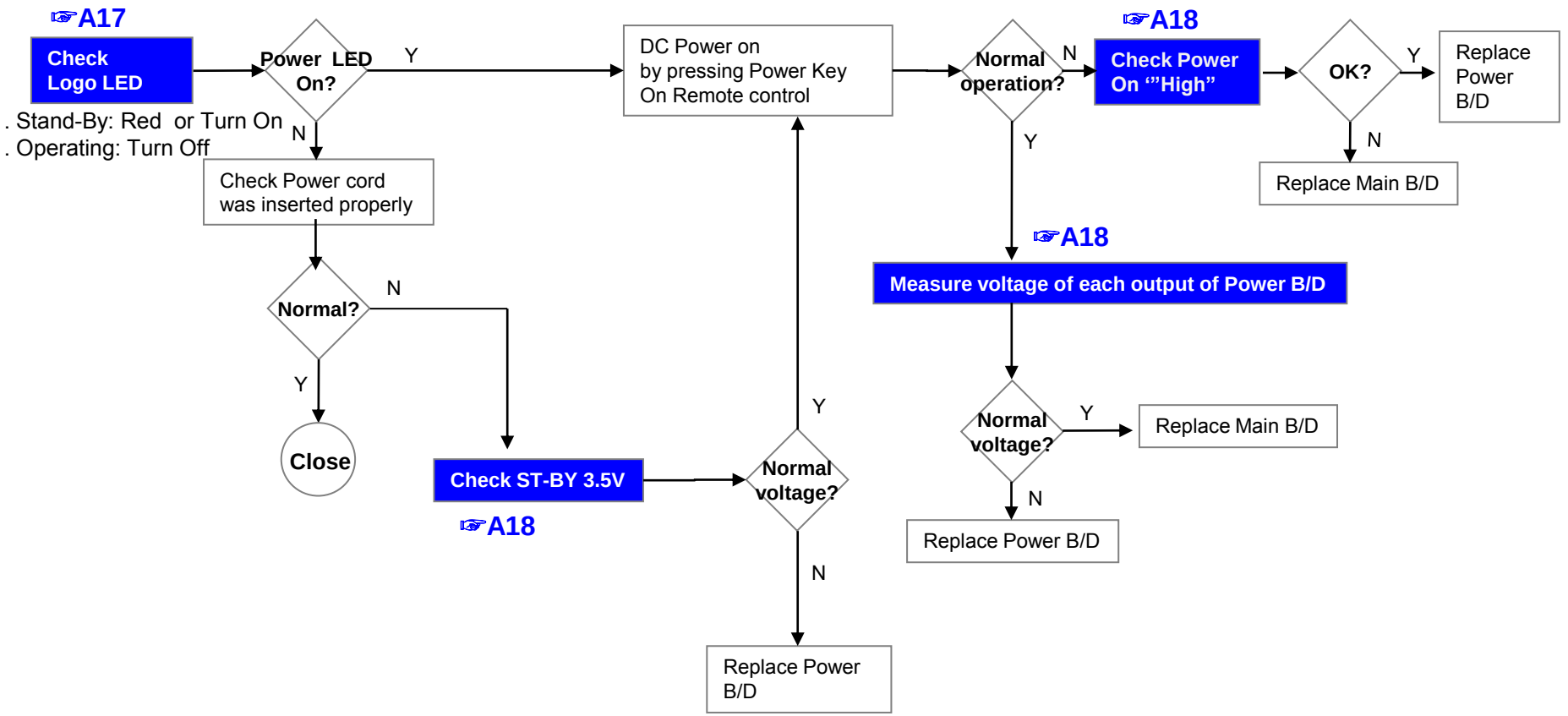
Vertical/Horizontal bar, residual image, light spot



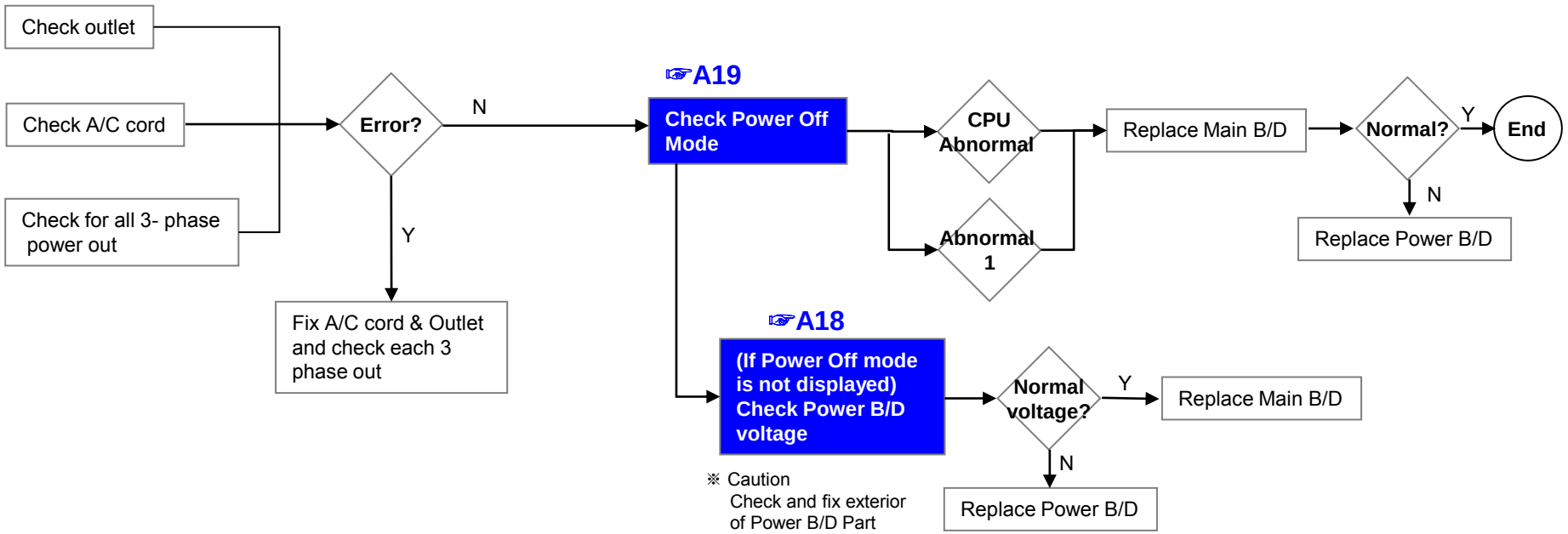
External device screen error-Color error



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



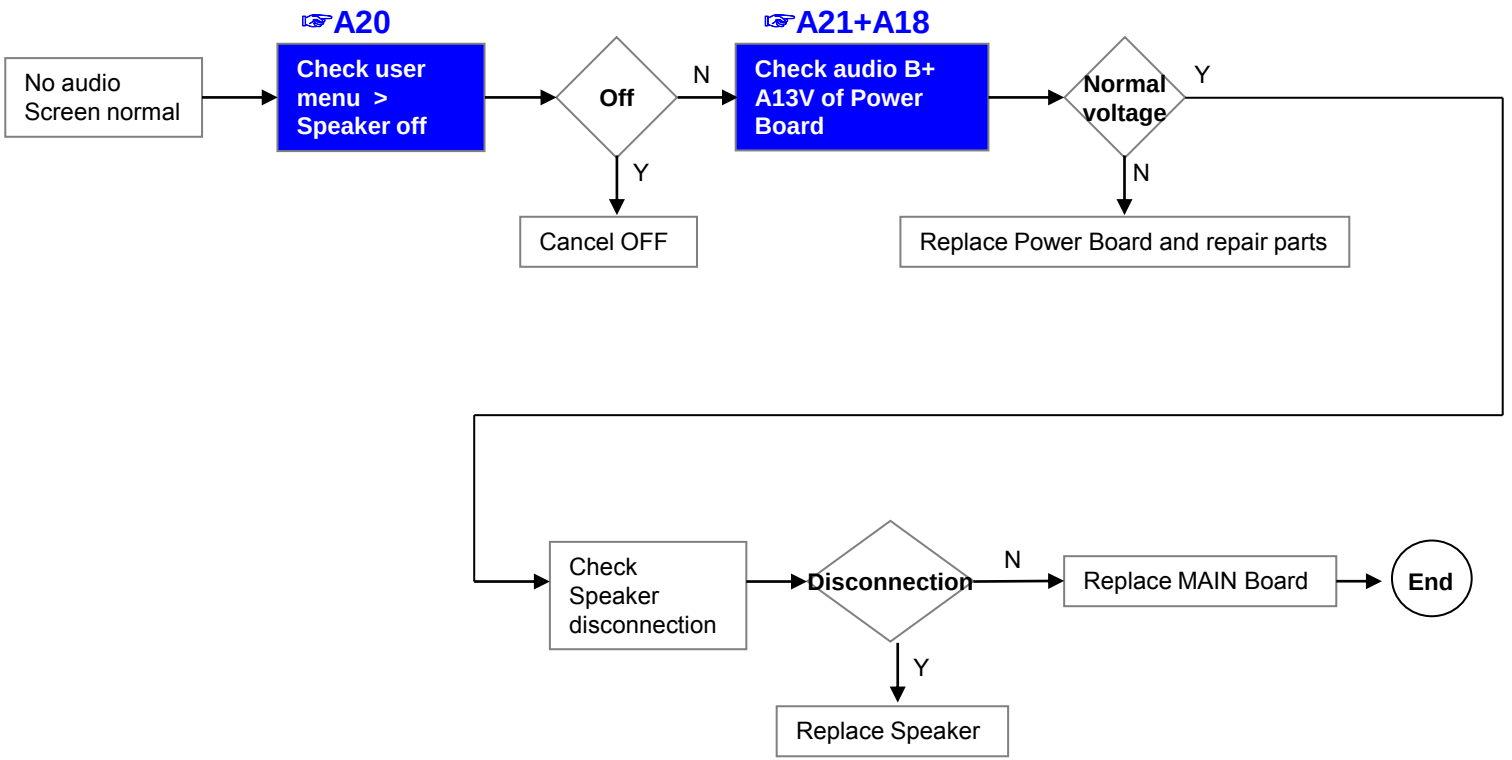
	Error symptom	B. Power error	Established date		
		Off when on, off while viewing, power auto on/off	Revised date		7/16



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

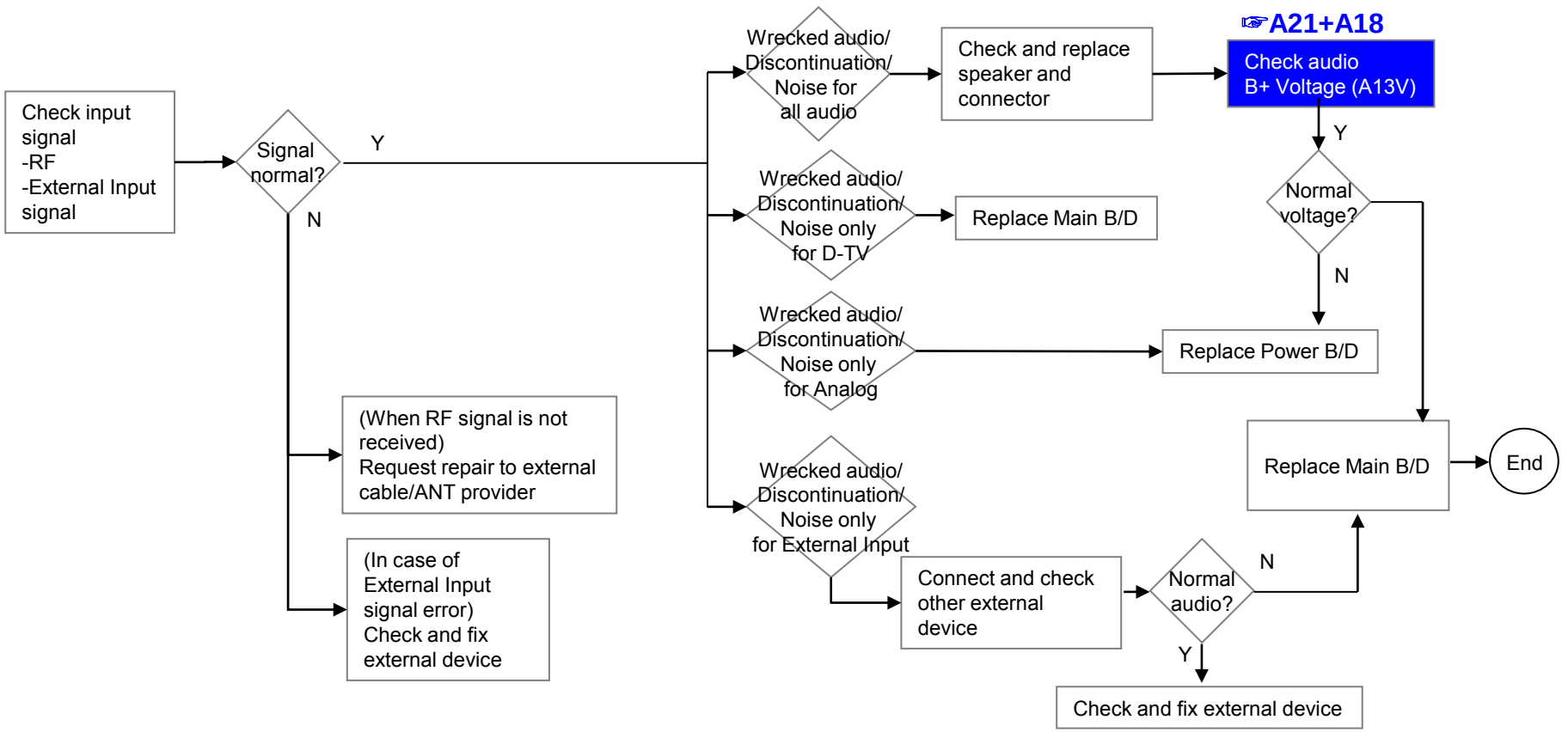
Status	Power off List	Explanation
Normal	"POWEROFF_REMOTEKEY"	Power off by REMOTE CONTROL
	"POWEROFF_OFFTIMER"	Power off by OFF TIMER
	"POWEROFF_SLEEPTIMER"	Power off by SLEEP TIMER
	"POWEROFF_INSTOP"	Power off by INSTOP KEY
	"POWEROFF_AUTOOFF"	Power off by AUTO OFF
	"POWEROFF_ONTIMER"	Power off by ON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

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



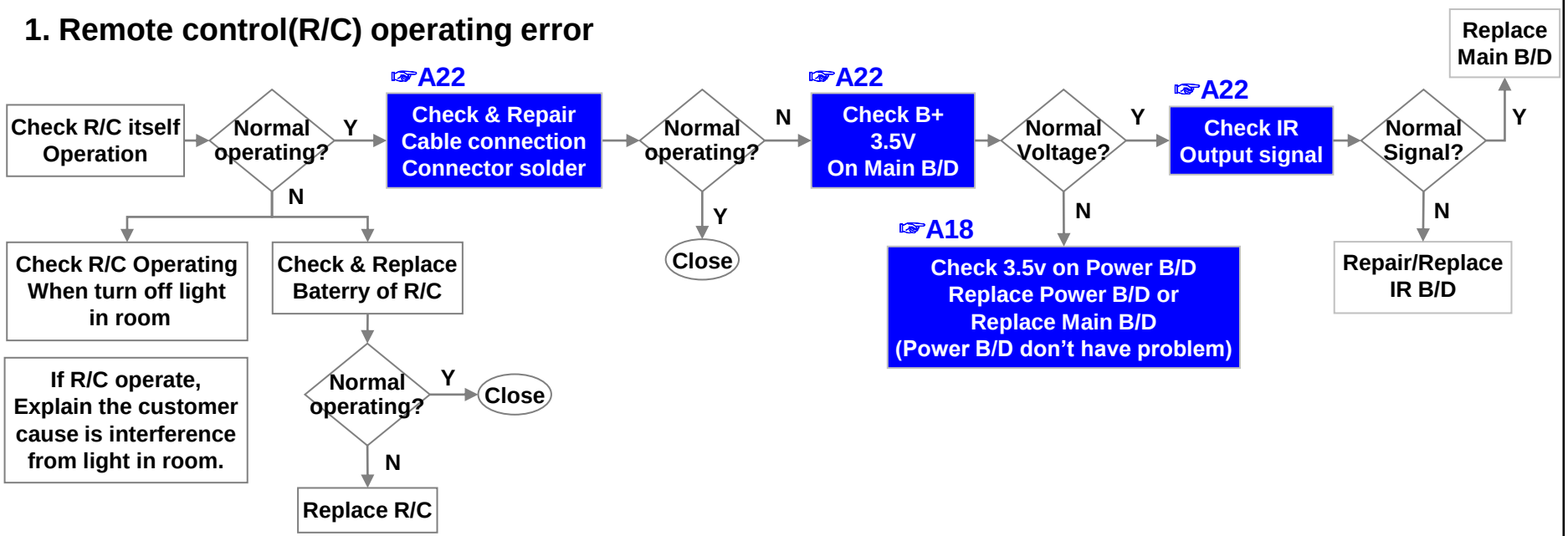
	Error symptom	C. Audio error	Established date		
		Wrecked audio/ discontinuation/noise	Revised date		9/16

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

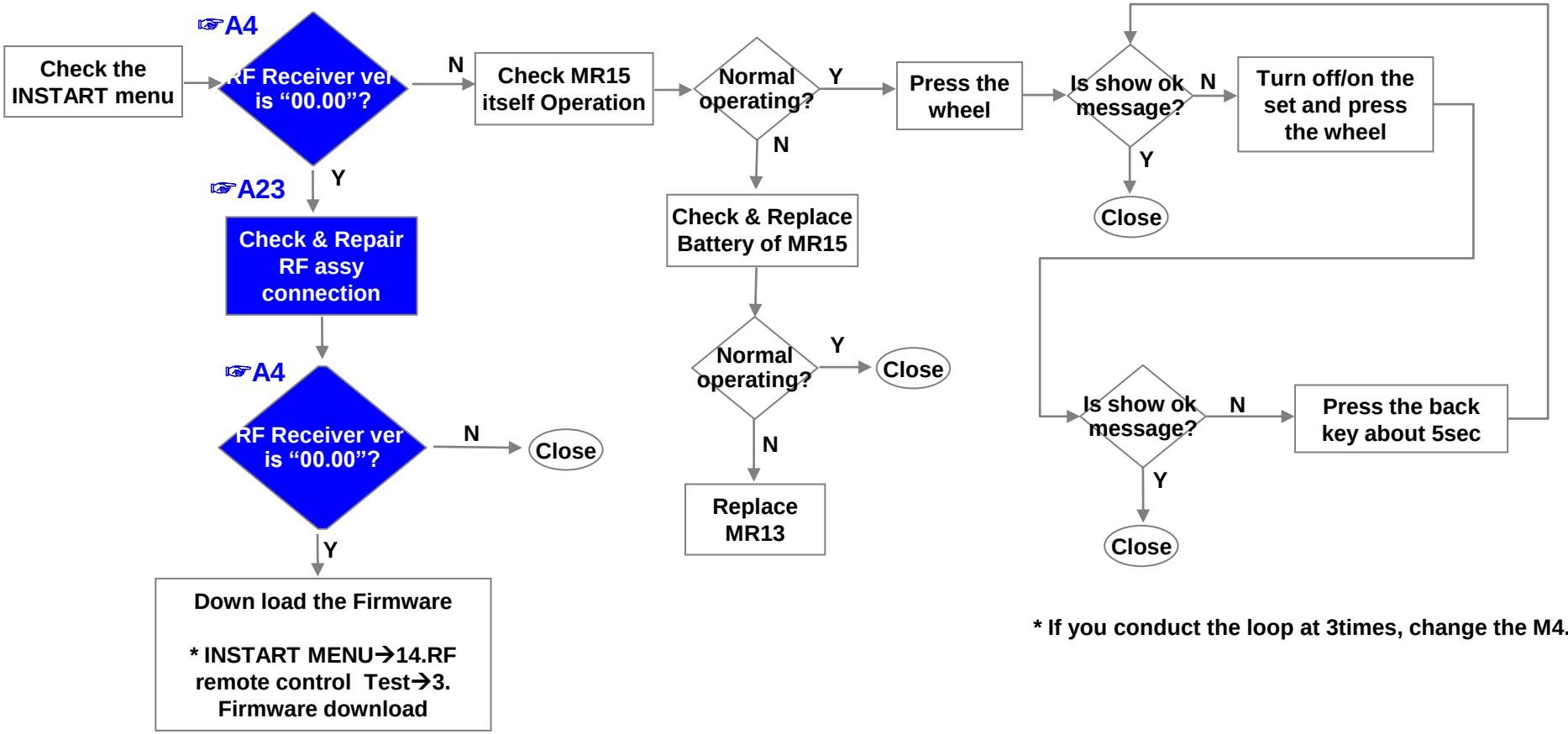


	Error symptom	D. Function error	Established date		
		Remote control & Local switch checking	Revised date		10/16

1. Remote control(R/C) operating error

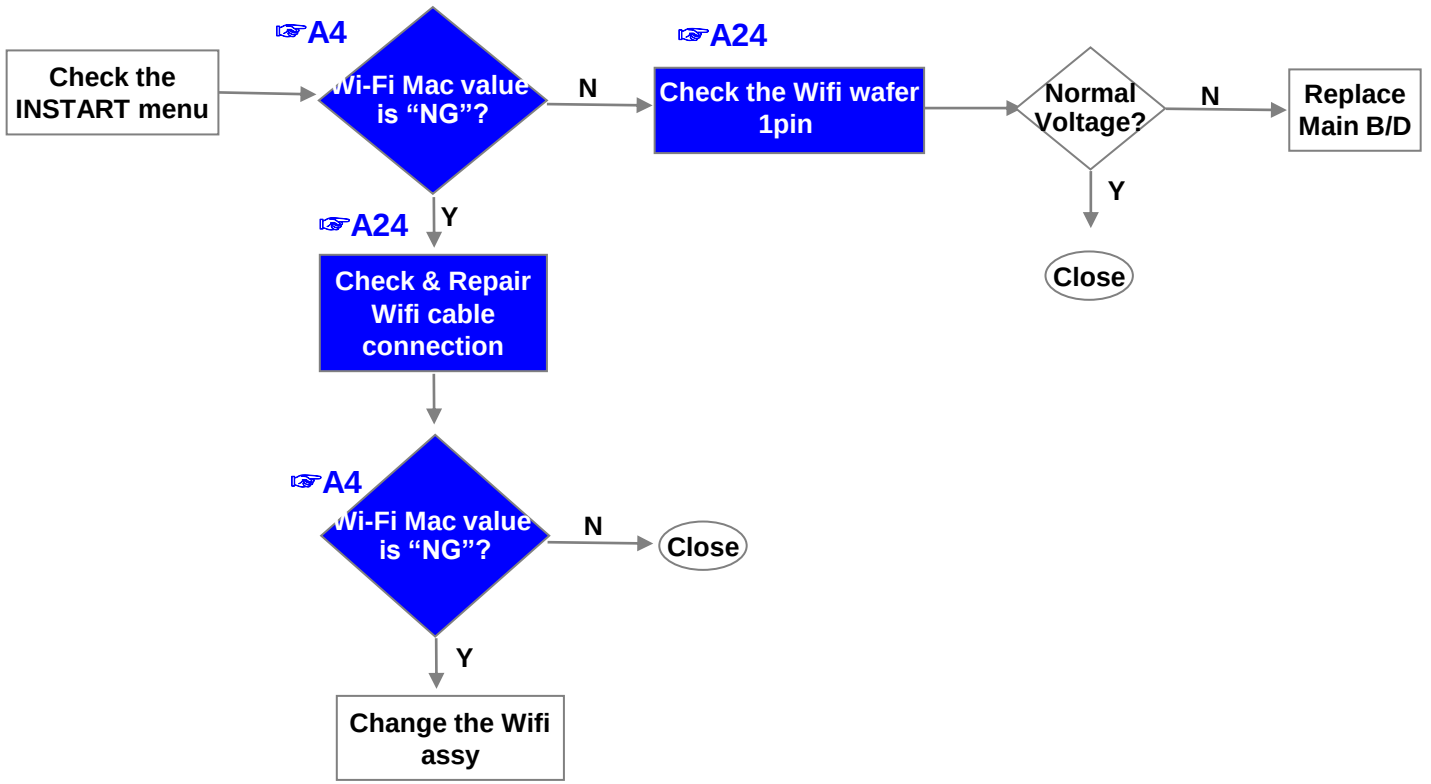


2. MR15(Magic remote control) operating error (*UH61 Model doesn`t support Magic remote control)*

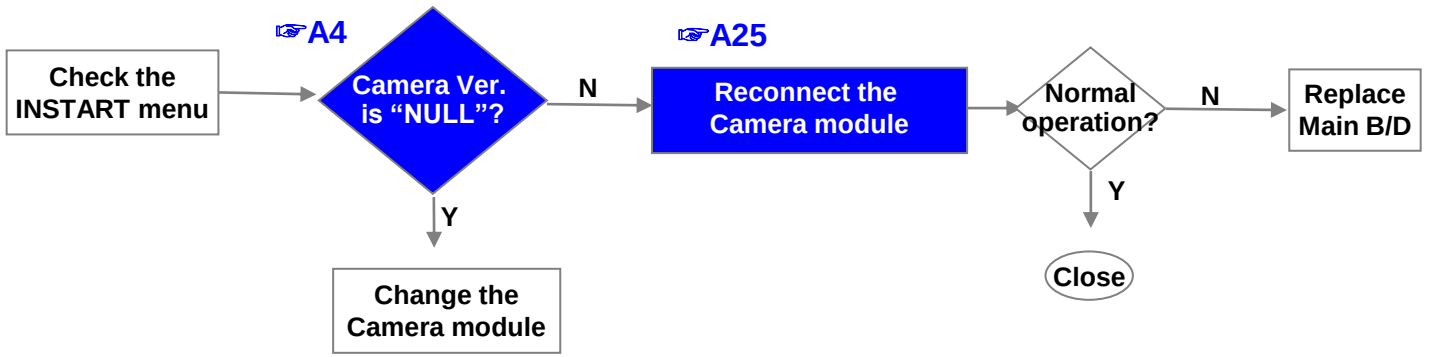


*** If you conduct the loop at 3times, change the M4.**

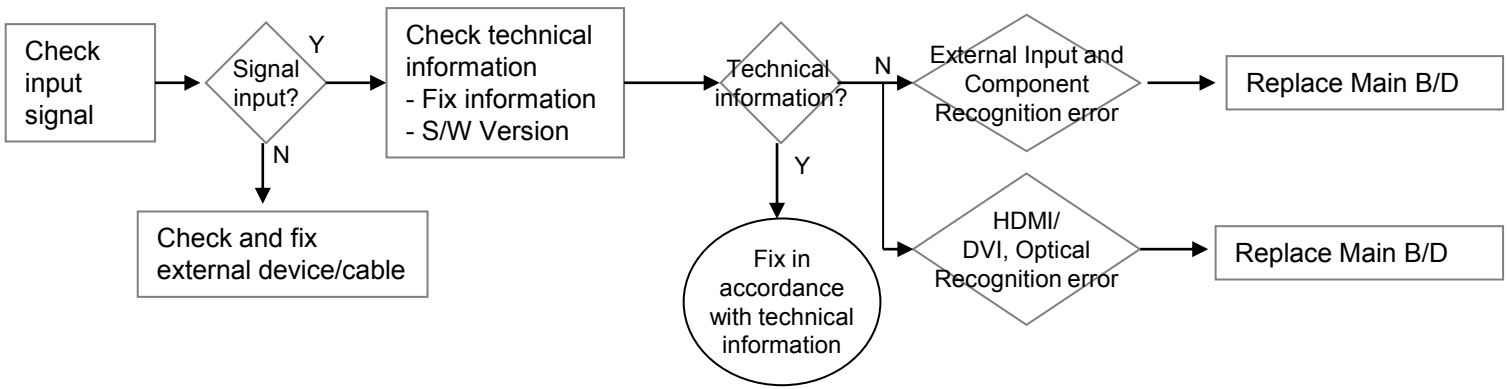
3.Wifi operating error



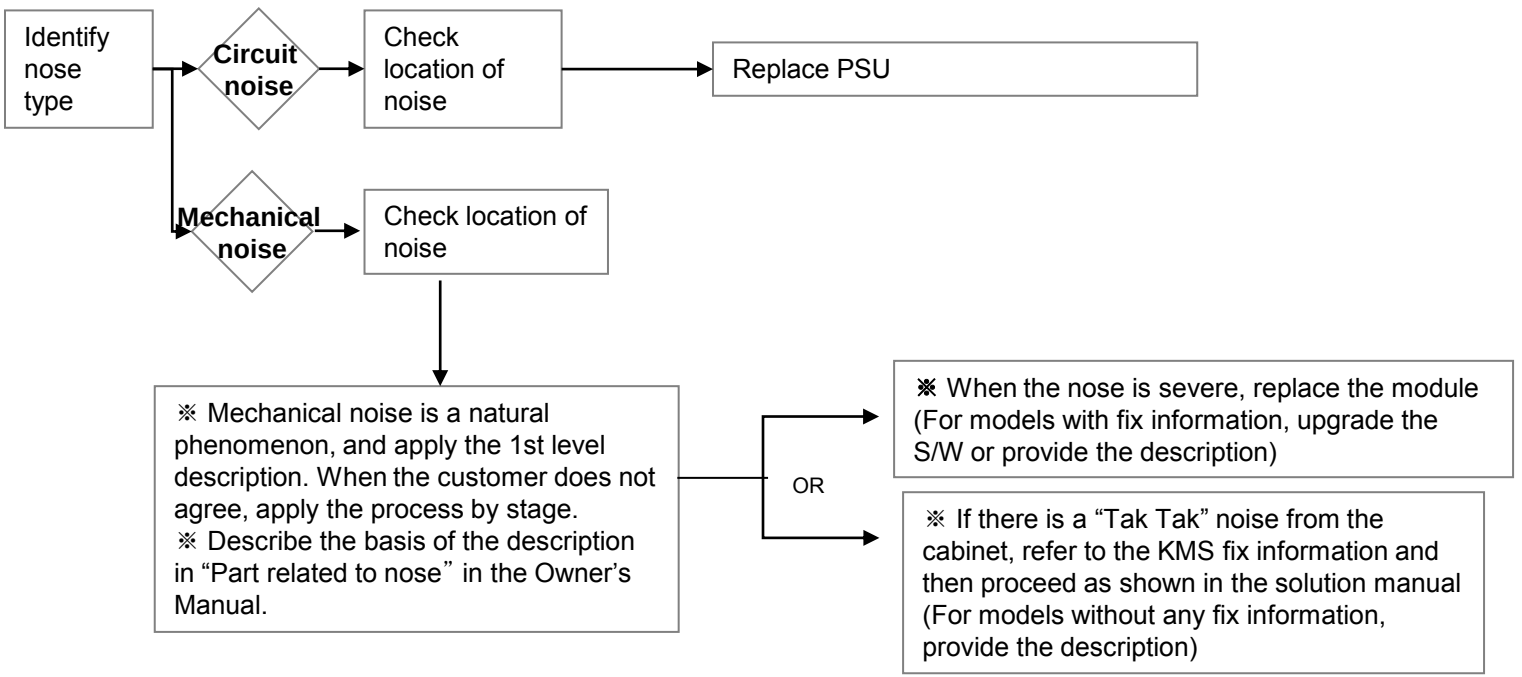
4.Camera operating error (*Camera operation is not support)*



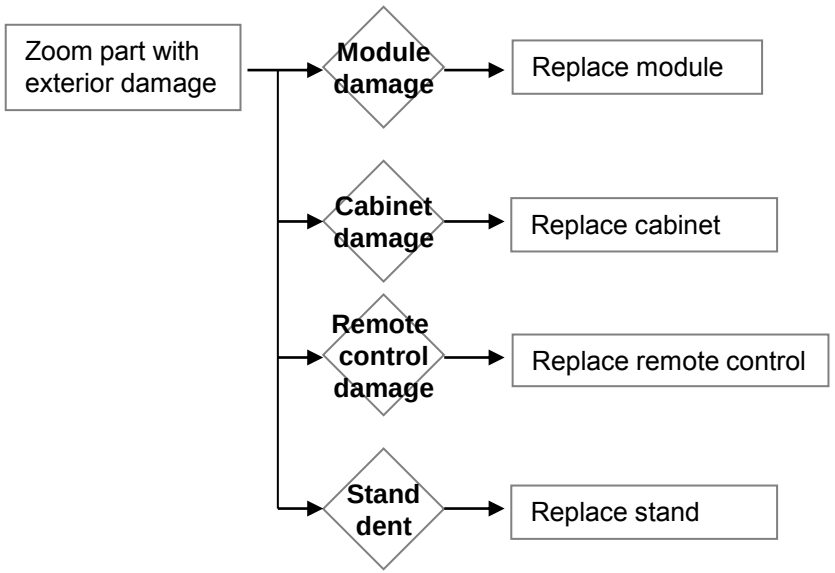
	Error symptom	D. Function error	Established date		
		External device recognition error	Revised date		14/16



	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 Standard Repair Process Detail Technical Manual

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Contents of Standard Repair Process Detail Technical Manual

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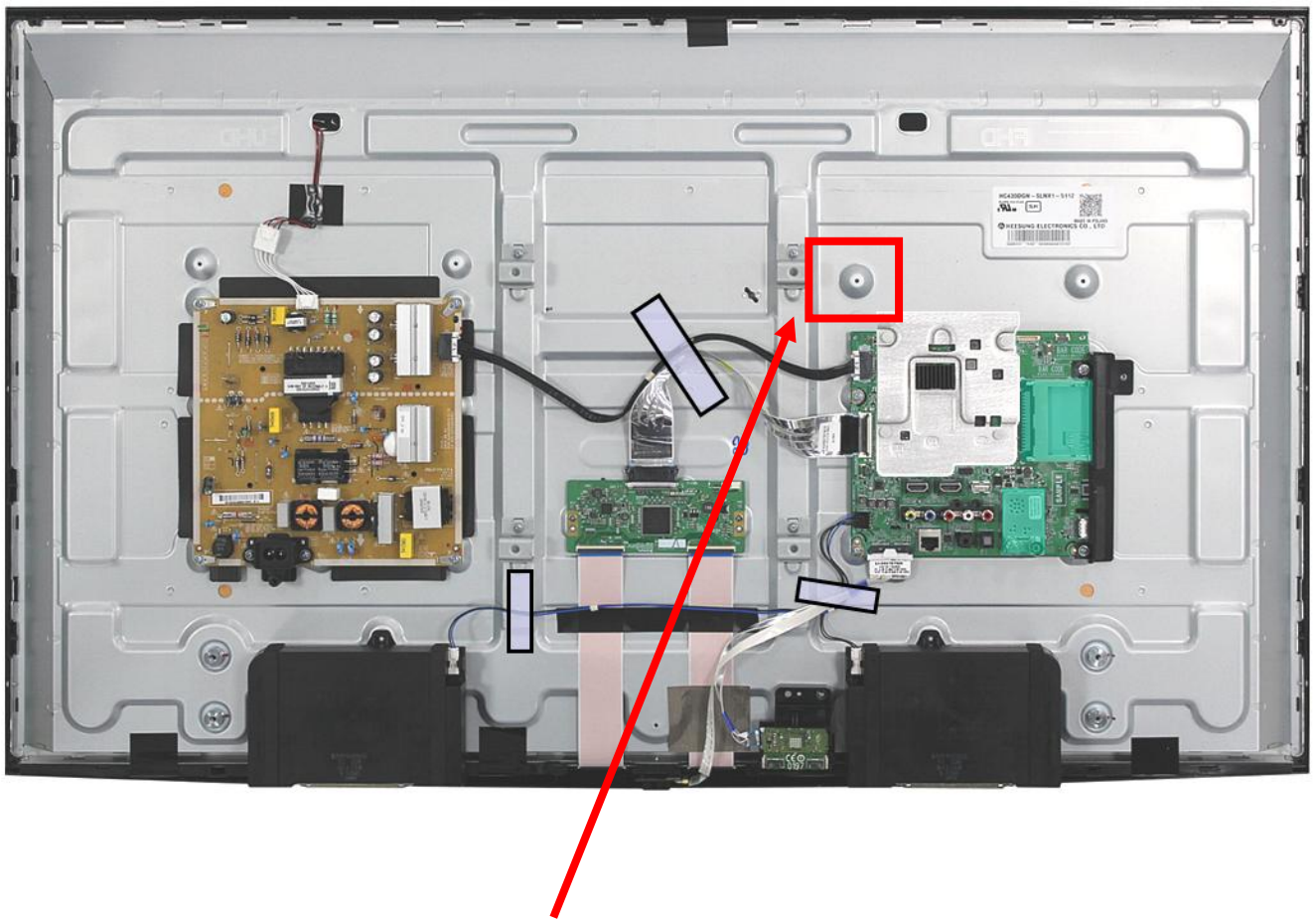
Standard Repair Process Detail Technical Manual

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

<43UH61>



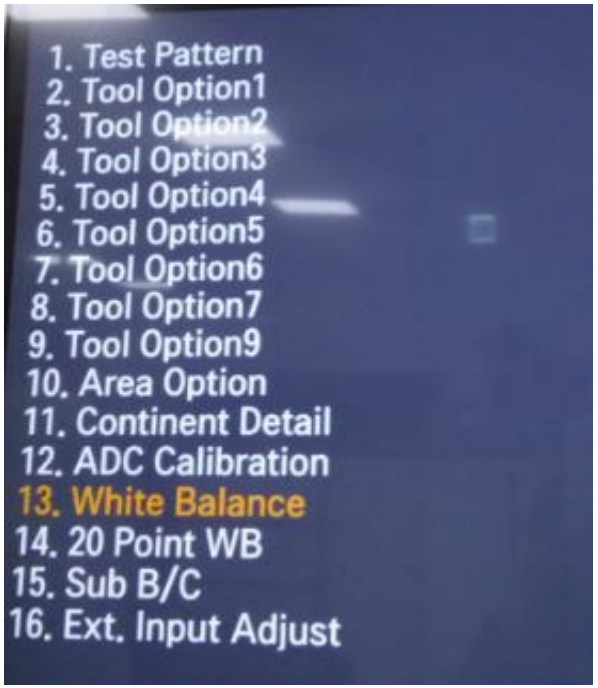
After turning on the power and disassembling the case, check with the naked eye, whether you can see light from locations.

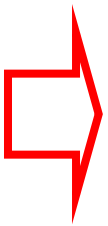
A1

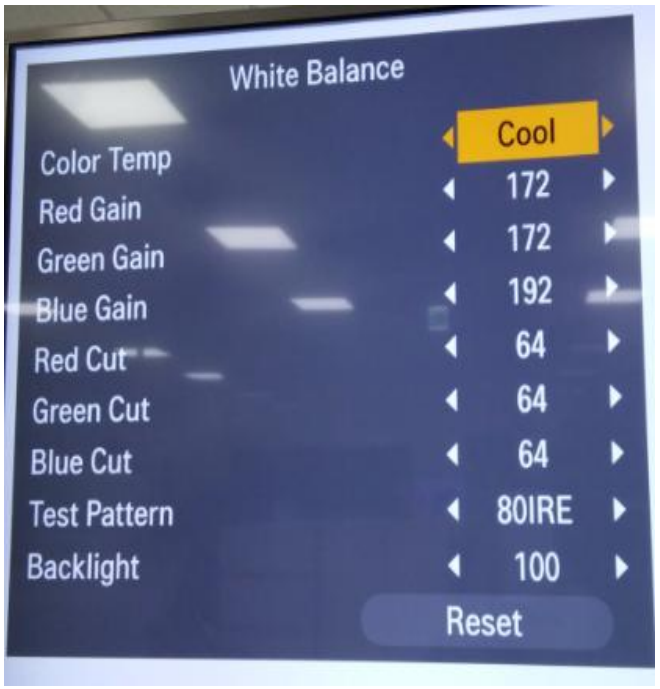
Standard Repair Process Detail Technical Manual

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

<ALL MODELS>







Entry method

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

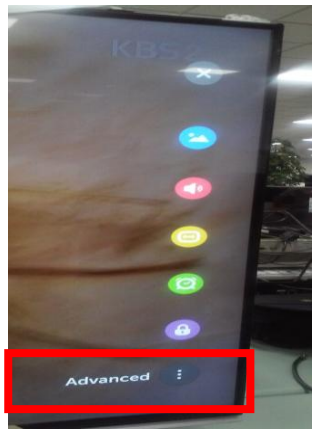
2. Enter into White Balance of item 13.

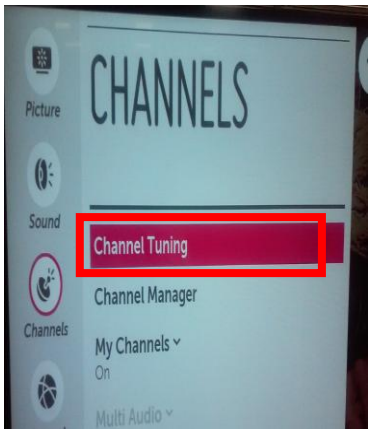
3. After recording the R, G, B (GAIN, Cut) value of Color Temp (Cool/Medium/Warm), re-enter the value after replacing the MAIN BOARD.

Standard Repair Process Detail Technical Manual

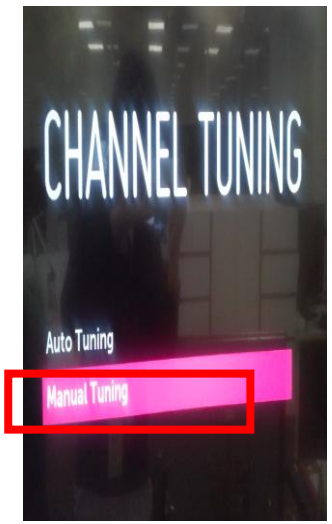
	Error symptom	A. Video error_Video error, video lag/stop	Established date		
	Content	TUNER input signal strength checking method	Revised date		A3

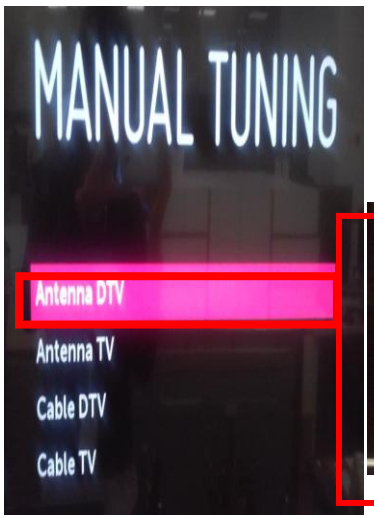
<ALL MODELS>

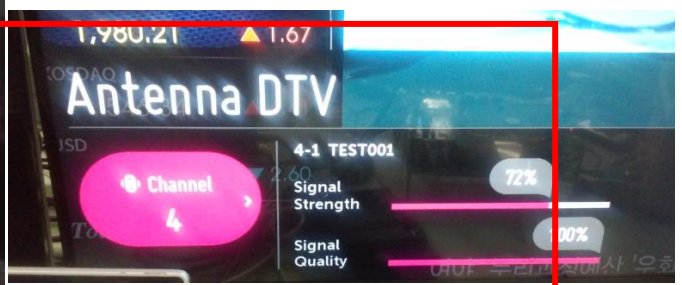




Advanced→ Channels → Channel Tuning→ Manual Tuning







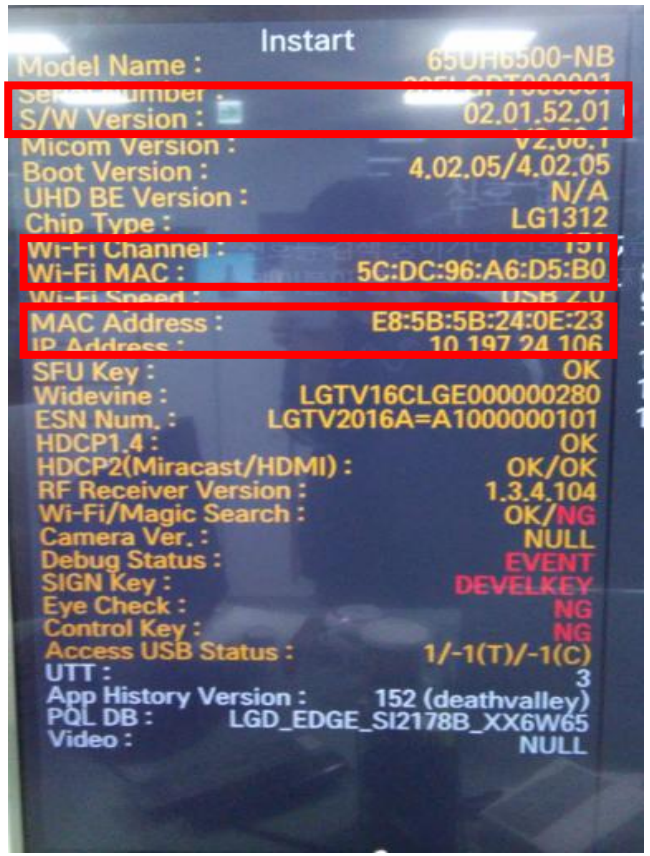
When the signal is strong, use the attenuator (-10dB, -15dB, -20dB etc.)

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

<ALL MODELS>

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

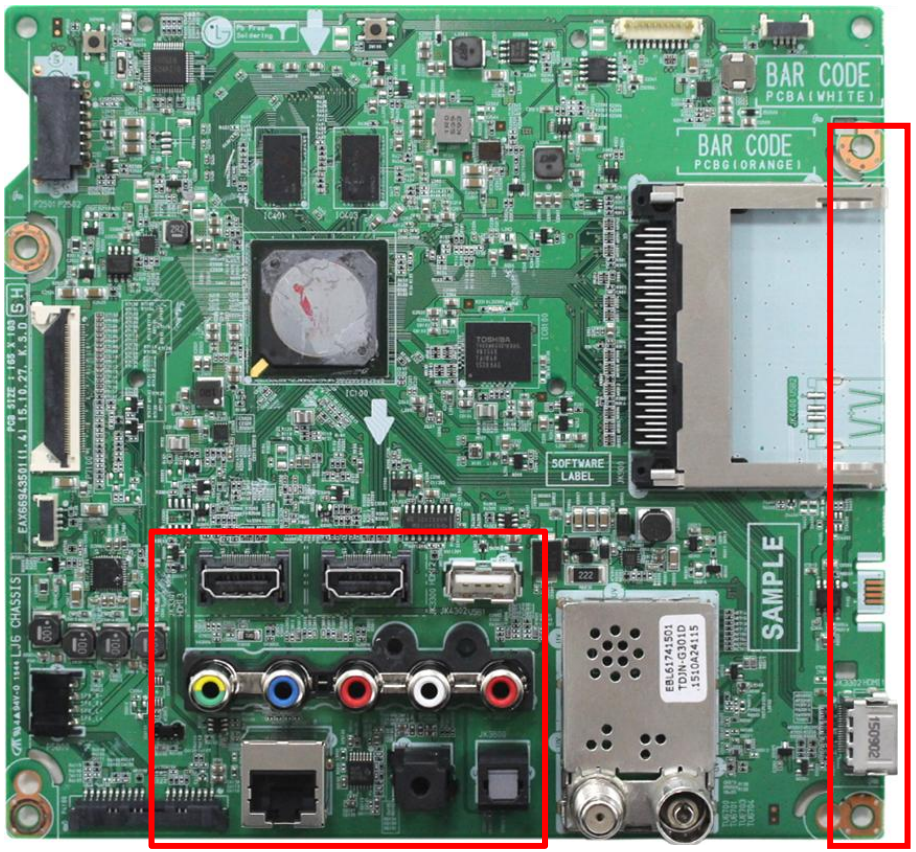
<ALL MODELS>

Checking method:
1. Check the signal strength or check whether the screen is normal when the external device is connected.
2. After measuring each voltage from power supply, finally replace the MAIN BOARD.
3. If you can`t see the UHD live TV, please connect signal at left side of jack. (Korea model only)

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

<ALL MODELS>

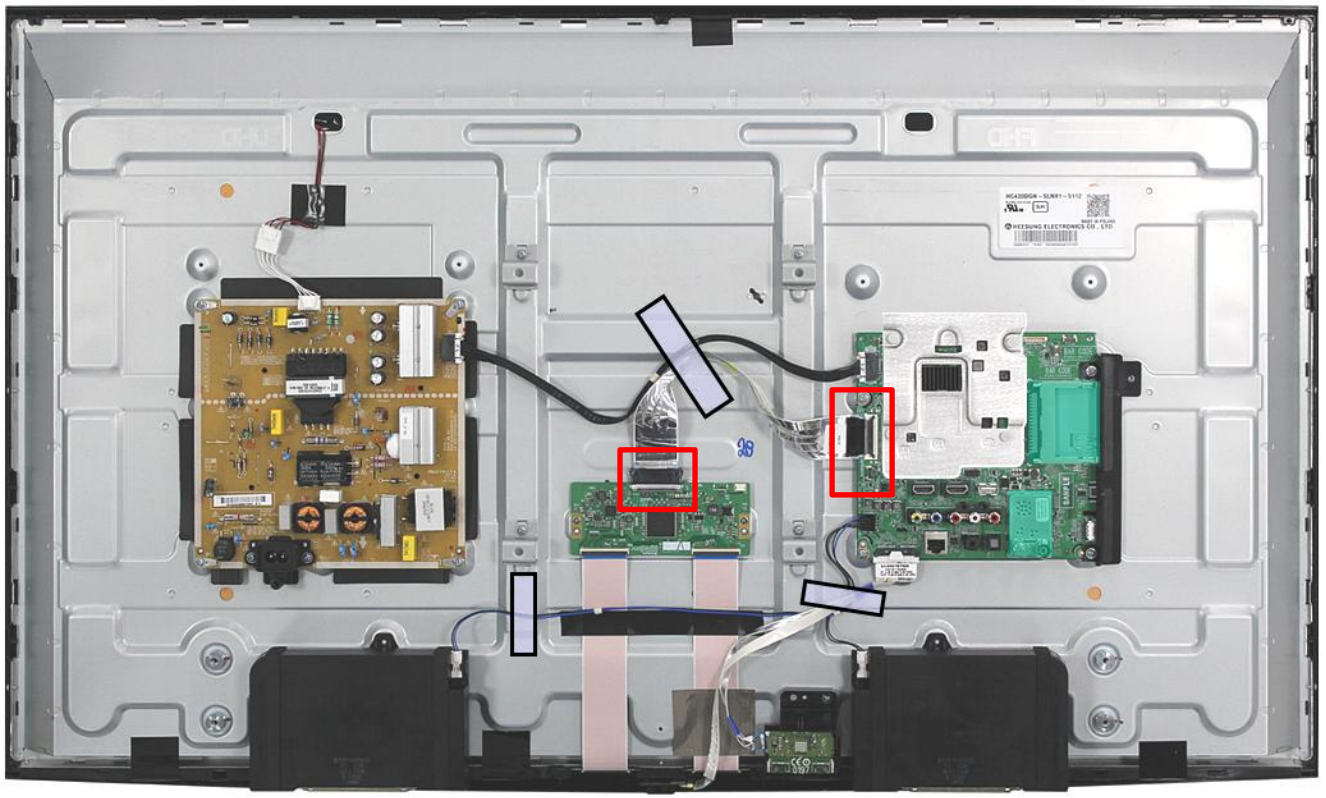


As the part connecting to the external input, check the screen condition by signal

Standard Repair Process Detail Technical Manual

	Error symptom	A. Video error_Color error	Established date		
	Content	Check Link Cable(VX1) reconnection condition	Revised date		A7

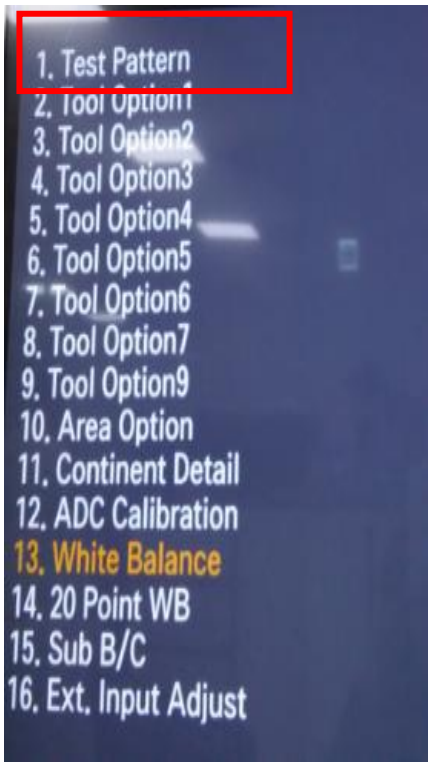
<ALL MODELS>

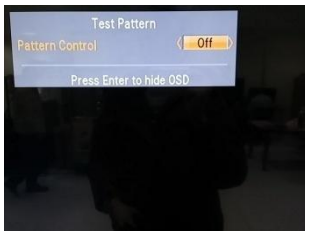


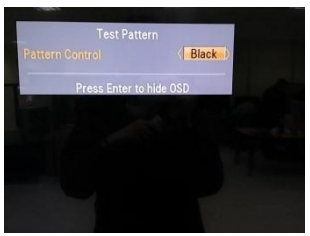
Check the contact condition of the Link Cable, especially dust or mis insertion.

Standard Repair Process Detail Technical Manual

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





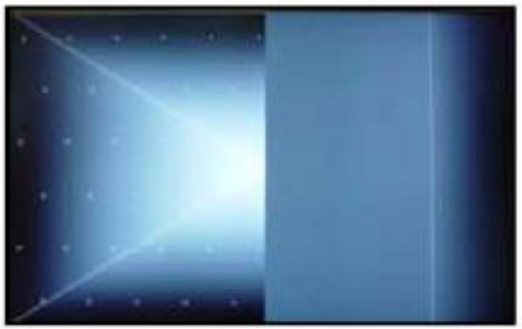


You can view 6 types of patterns using the ADJ Key

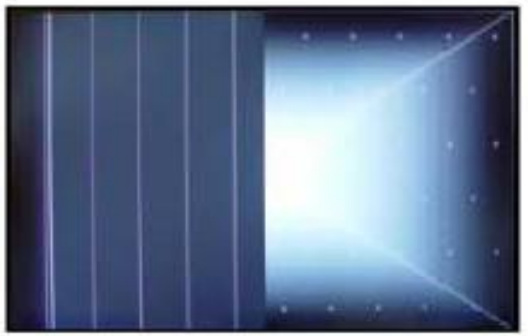
Checking item : 1. Defective pixel 2. Residual image 3. MODULE error (ADD-BAR,SCAN BAR..)
4.Video error (Classification of MODULE or Main-B/D!)

Appendix : Exchange Main Board (1)

Solder defect, CNT Broken

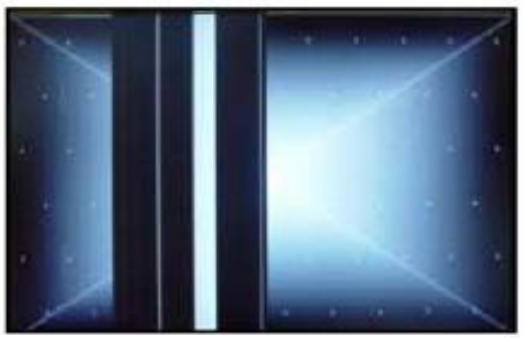


Solder defect, CNT Broken



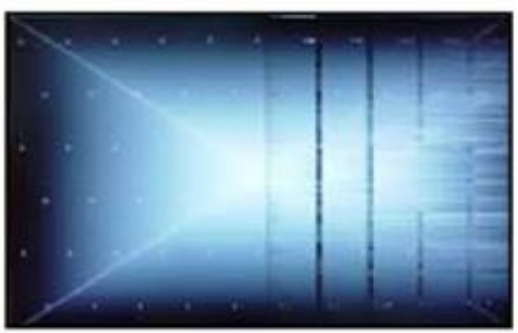
Solder defect, CNT Broken

Solder defect, CNT Broken



Solder defect, CNT Broken

Abnormal Power Section

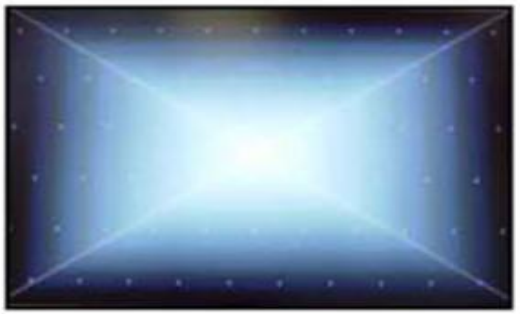


Solder defect, Short/Crack

Abnormal Power Section

Solder defect, Short/Crack

Appendix : Exchange Main Board (2)



Abnormal Power Section

Abnormal Power Section

Solder defect, Short/Crack

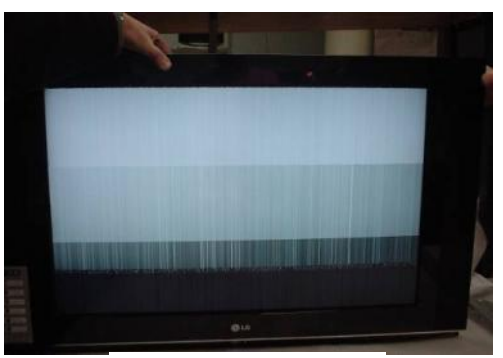
Solder defect, Short/Crack

Fuse Open, Abnormal power section

Abnormal Display

GRADATION

Noise



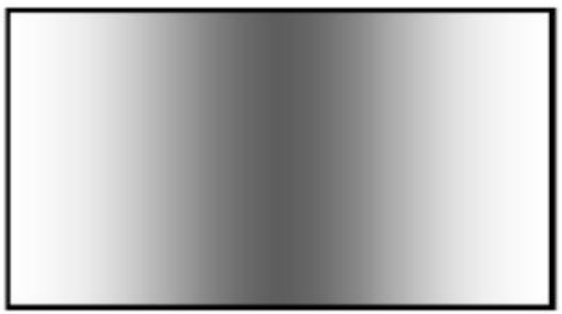
GRADATION

Appendix : Exchange Power Board (PSU)

No Light

Dim Light

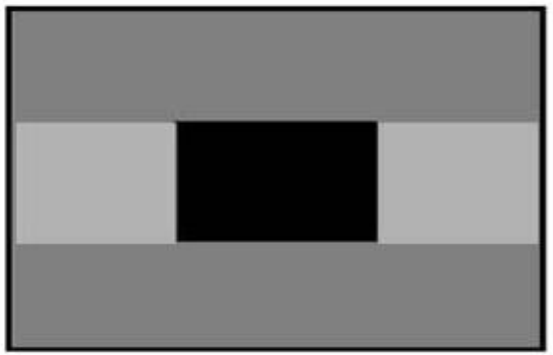
Dim Light



Dim Light

No picture/Sound Ok

Appendix : Exchange the Module (1)



Crosstalk

Press damage

Crosstalk

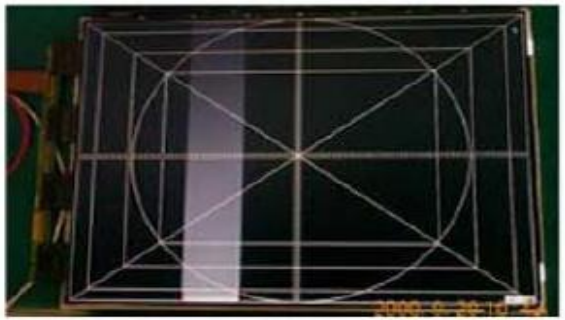
Press damage

Press damage

Un-repairable Cases

In this case please exchange the module.

Appendix : Exchange the Module (2)



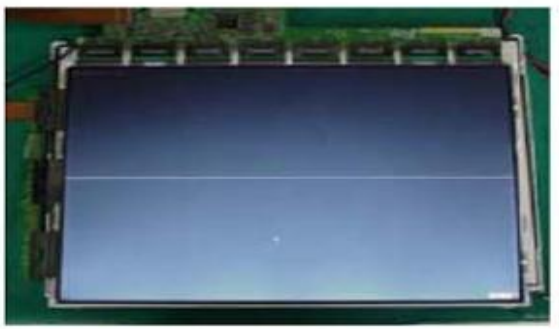
Vertical Block
Source TAB IC Defect

Vertical Line
Source TAB IC Defect

Vertical Block
Source TAB IC Defect

Horizontal Block
Gate TAB IC Defect

Horizontal Block
Gate TAB IC Defect



Horizontal line
Gate TAB IC Defect

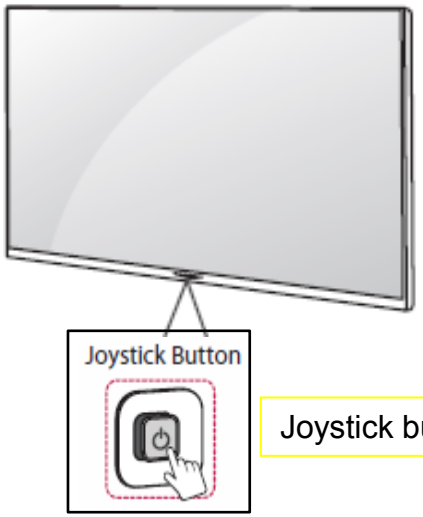
Horizontal Block
Gate TAB IC Defect

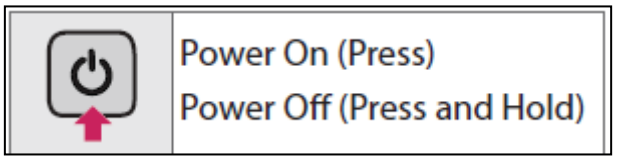
Un-repairable Cases

In this case please exchange the module.

	Error symptom	B. Power error _No power	Established date		
	Content	Check front Power Indicator	Revised date		A17

<43UH610V-ZB>





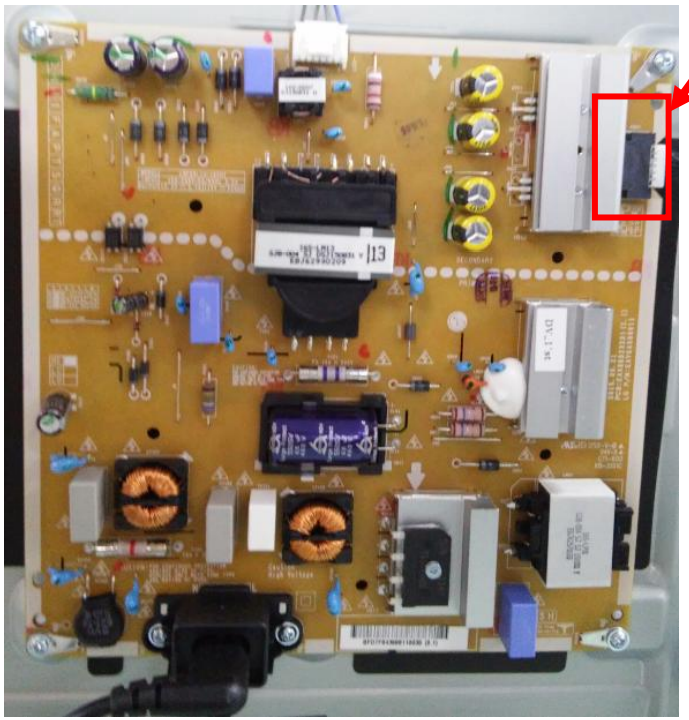
Joystick button

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

North America model doesn`t use lum.sensor

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

Check the DC 13.2V

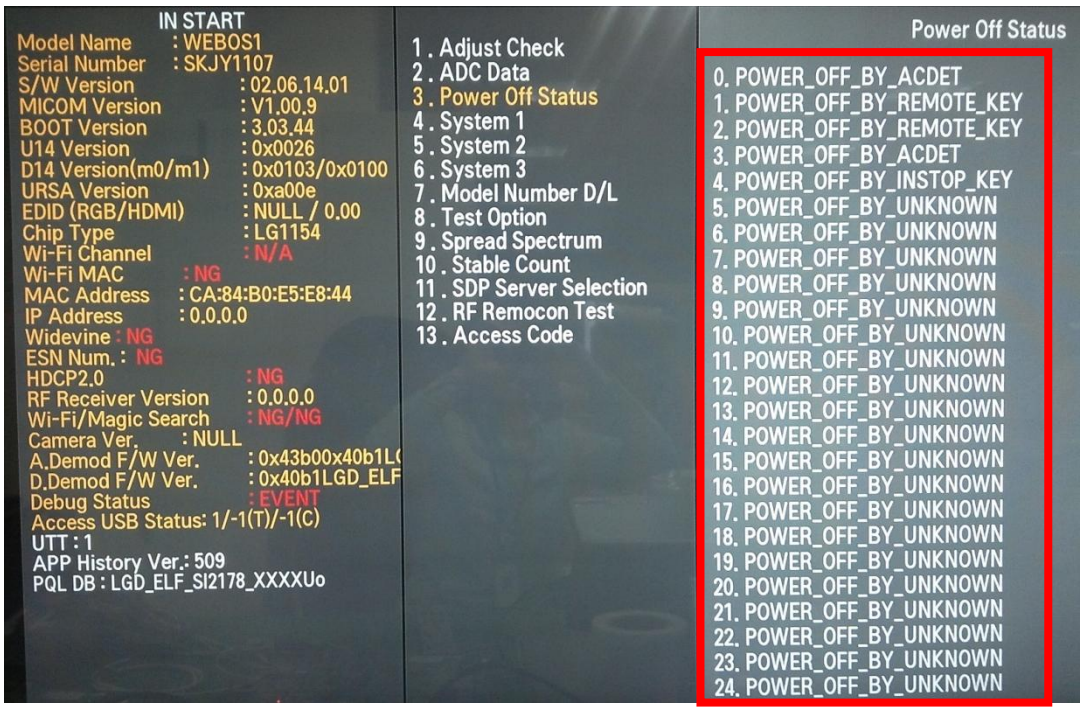


P201 YEONHO (SMAW200-H12S5K)			
Pin No.	Assignment	Pin No.	Assignment
1	PWR-ON	2	N.C
3	GND	4	13.2V
5	13.2V	6	13.2V
7	13.2V	8	13.2V
9	GND	10	GND
11	MS	12	P-DIM1

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		A19

<ALL MODELS>



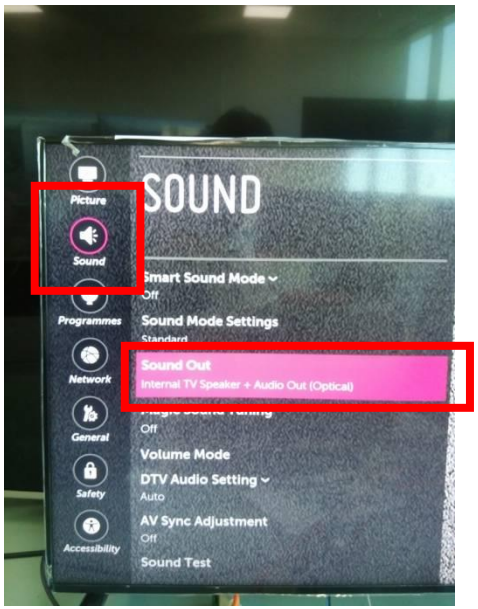
Entry method

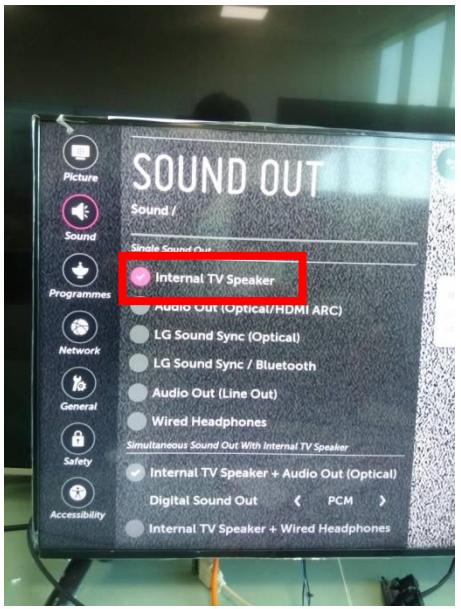
1. Press the IN-START button of the remote control for adjustment

2. Check the entry into adjustment item 3

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

<ALL MODELS>





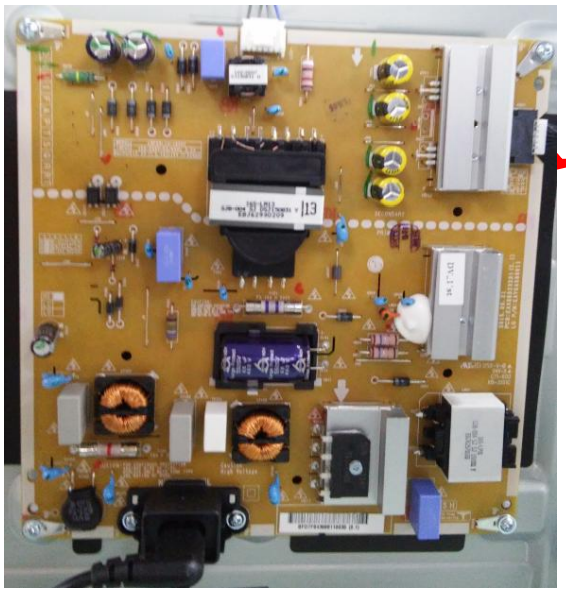
Checking method

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

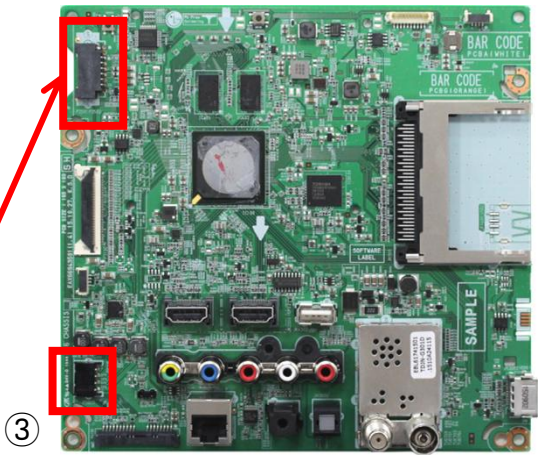
Standard Repair Process Detail Technical Manual

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

<43UH610V-ZB>



P201 YEONHO (SMAW200-H12S5K)			
Pin No.	Assignment	Pin No.	Assignment
1	PWR-ON	2	N.C
3	GND	4	13.2V
5	13.2V	6	13.2V
7	13.2V	8	13.2V
9	GND	10	GND
11	MS	12	P-DIM1



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

Checking order when there is no audio

1.Check the contact condition of or 13V connector of Main Board

2. Measure the 13V input voltage supplied from Power Board
(If there is no input voltage, remove and check the connector)

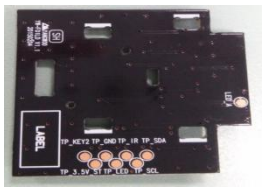
3.Connect the tester RX1 to the speaker terminal and if you hear the Chik Chik sound when you touch the GND and output terminal, the speaker is normal.

	Error symptom	D. Function error	Established date		
	Content	remote control operation checking method	Revised date		A22

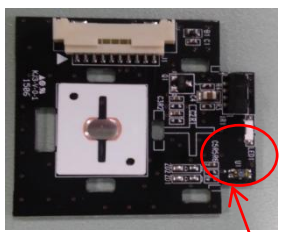
<43UH610V-ZB>

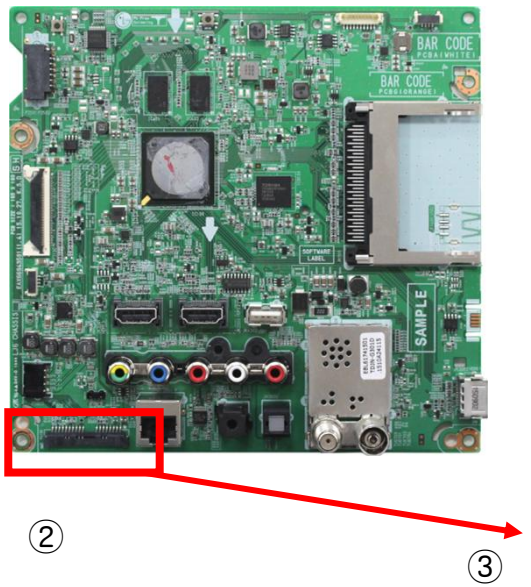
①

IR & Control Key front



IR & Control Key Rear





1	+3.5V_WIFI
2	WIFI_DM_JACK
3	WIFI_DP_JACK
4	GND
5	WOL/WIFI_POWER_ON_JACK
6	GND
7	M-Moudle_RESET
8	GND
12	EYE_SDA
13	EYE_SCL
14	GND
15	IR
16	LED_R_JACK
17	GND
18	+3.5V_ST
19	KEY2_JACK
20	GND
21	GND

Checking order to check remote control

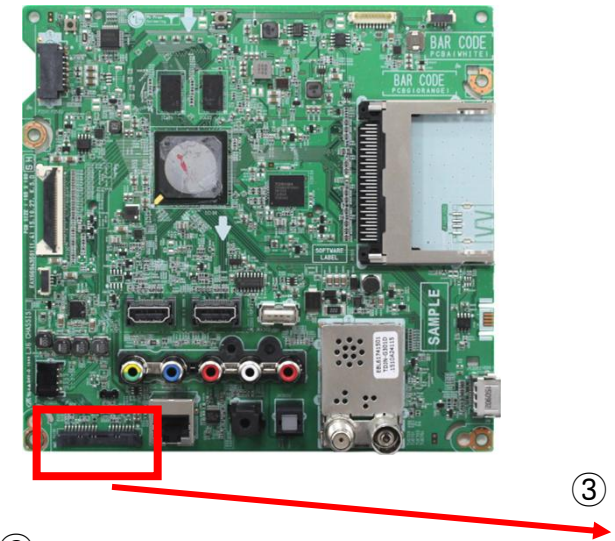
Checking order

1.Check IR cable condition between IR & Main board.(Check picture number① and ②)
2.Check the standby 3.5V on the terminal 18 pin (③)
3.AS checking the Pre-Amp(IR LED light) , the power is in ON condition, an Analog Tester needle should move slowly, otherwise, it's defective.

<43UH610V-ZB>

① Wifi Front

Wifi Rear



1	+3.5V_WIFI
2	WIFI_DM_JACK
3	WIFI_DP_JACK
4	GND
5	WOL/WIFI_POWER_ON_JACK
6	GND
7	M-Moudle_RESET
8	GND
12	EYE_SDA
13	EYE_SCL
14	GND
15	IR
16	LED_R_JACK
17	GND
18	+3.5V_ST
19	KEY2_JACK
20	GND
21	GND

Checking order to check wifi

Checking order

1.Check BT/Wifi cable condition between BT/Wifi assy & Main board.
2.Check the 3.5V on the terminal 1 (+3.5V_WIFI)