



**LG**

Life's Good

# LED TV **SERVICE MANUAL**

CHASSIS : LT43B

**MODEL : 32LB620D 32LB620D-DJ**

## **CAUTION**

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



P/NO : MFL68024105 (1402-REV00)

Printed in Korea

**Internal Use Only**

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# SAFETY PRECAUTIONS

## IMPORTANT SAFETY NOTICE

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

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

Do not modify the original design without permission of manufacturer.

### General Guidance

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

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

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

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

Keep wires away from high voltage or high temperature parts.

### Before returning the receiver to the customer,

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

### Leakage Current Cold Check(Antenna Cold Check)

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

If the exposed metallic part has a return path to the chassis, the measured resistance should be between  $1\text{ M}\Omega$  and  $5.2\text{ M}\Omega$ .

When the exposed metal has no return path to the chassis the reading must be infinite.

An other abnormality exists that must be corrected before the receiver is returned to the customer.

### Leakage Current Hot Check (See below Figure)

Plug the AC cord directly into the AC outlet.

#### Do not use a line Isolation Transformer during this check.

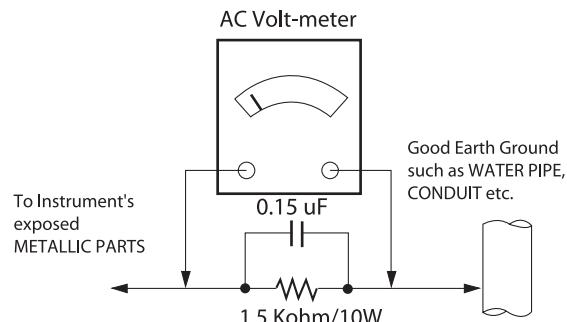
Connect 1.5 K / 10 watt resistor in parallel with a 0.15 uF capacitor between a known good earth ground (Water Pipe, Conduit, etc.) and the exposed metallic parts.

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

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

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

### Leakage Current Hot Check circuit



When 25A is impressed between Earth and 2nd Ground for 1 second, Resistance must be less than  $0.1\ \Omega$

\*Base on Adjustment standard

# SERVICING PRECAUTIONS

**CAUTION:** Before servicing receivers covered by this service manual and its supplements and addenda, read and follow the **SAFETY PRECAUTIONS** on page 3 of this publication.

**NOTE:** If unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions on page 3 of this publication, always follow the safety precautions. Remember: Safety First.

## General Servicing Precautions

1. Always unplug the receiver AC power cord from the AC power source before:
  - a. Removing or reinstalling any component, circuit board module or any other receiver assembly.
  - b. Disconnecting or reconnecting any receiver electrical plug or other electrical connection.
  - c. Connecting a test substitute in parallel with an electrolytic capacitor in the receiver.

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

## Electrostatically Sensitive (ES) Devices

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

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

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

## General Soldering Guidelines

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

## **IC Remove/Replacement**

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

### *Removal*

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

### *Replacement*

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

## **"Small-Signal" Discrete Transistor**

### **Removal/Replacement**

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

## **Power Output, Transistor Device**

### **Removal/Replacement**

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

### **Diode Removal/Replacement**

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

## **Fuse and Conventional Resistor**

### **Removal/Replacement**

1. Clip each fuse or resistor lead at top of the circuit board hollow stake.
2. Securely crimp the leads of replacement component around notch at stake top.

### **3. Solder the connections.**

**CAUTION:** Maintain original spacing between the replaced component and adjacent components and the circuit board to prevent excessive component temperatures.

## **Circuit Board Foil Repair**

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

### *At IC Connections*

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

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

### *At Other Connections*

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

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

**CAUTION:** Be sure the insulated jumper wire is dressed so the it does not touch components or sharp edges.

# SPECIFICATION

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

## 1. Application range

This spec sheet is applied all of the 32", 39", 42", 47", 50", 55"  
LED TV with LT43B chassis

## 2. Test condition

Each part is tested as below without special notice.

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

## 3. Test method

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

## 4. General Specification

No	Item	Specification	Measurement	Result	Remark
1.	Receiving System	NTSC-M, PAL-M/N, DVB-T			Colombia / Panama
		NTSC-M, DVB-T			Only Taiwan
		NTSC-M, DTMB			Only Cuba
2.	Available Channel	1) VHF : 2~13 2) UHF : 14~69 3) CATV : 1~125 4) DTV : 14~69			
3.	Input Voltage	1) AC 100 ~ 240V 50/60Hz			
4.	Market	Colombia / Panama / Taiwan			
5.	Screen Size	32 inch Wide (1366 × 768)			32LB550D-DF 32LB561B-DC 32LB561D-DC 32LB620D-DD/DJ 32LB560D-DA
		32 inch Wide (1920 × 1080)			32LB5610-DC
		39 inch Wide (1920 × 1080)			39LB5610-DC 39LB561T-DC
		42 inch Wide (1920 × 1080)			42LB550T-DF 42LB5610-DC 42LB561T-DC 42LB620T-DF
		47 inch Wide (1920 × 1080)			47LB5610-DC 47LB561T-DC
		49 inch Wide (1920 × 1080)			49LB550T-DF 49LB620T-DD
		50 inch Wide (1920 × 1080)			50LB5610-DC 50LB561T-DC
		55 inch Wide (1920 × 1080)			55LB5610-DC 55LB561T-DC 55LB620T-DC

No	Item	Specification	Measurement	Result	Remark
6.	Aspect Ratio	16:9			
7.	Tuning System	FS			
8.	Module	LC320DXE-FGA3 HC320DXN-ABHS1 NC320DXN-VSBP1	HD, 60Hz	LGD BOE SHARP	32LB561D-DC 32LB561B-DC 32LB560D-DA
		LC320DXE-FGA5 NC320DXN-VSBP2	HD, 60Hz	LGD SHARP	32LB550D-DF
		LC320DXE-FGP1	HD, 60Hz	LGD	32LB620D-DD
		LC320DXE-FGA3	FHD, 60Hz	LGD	32LB5610-DC
		NC390DUN-VXBP1	FHD, 60Hz	INX	39LB5610-DC 39LB561T-DC
		LC420DUE-FGA3 T420HVF07.0	FHD, 60Hz	LGD AUO	42LB5610-DC 42LB561T-DC
		LC420DUE-FGA5	FHD, 60Hz	LGD	42LB550T-DF
		LC420DUE-FGP1	FHD, 60Hz	LGD	42LB620T-DD
		LC470DUE-FGA3	FHD, 60Hz	LGD	47LB561T-DC 47LB5610-DC
		LC490DUE-FGA5	FHD, 60Hz	LGD	49LB550T-DF
		LC490DUE-FGP1	FHD, 60Hz	LGD	49LB620T-DD
9.	Operating Environment	1) Temp : 0 ~ 40 deg 2) Humidity : ~ 80 %			
10.	Storage Environment	1) Temp : -20 ~ 60 deg 2) Humidity : ~ 85 %			

## 5. External Input Support Format

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

No	Resolution	H-freq(kHz)	V-freq.(kHz)	Pixel clock	Proposed
1.	720*576	15.625	50.000	13.5	SDTV 576I
2.	720*480	15.73	60	13.5135	SDTV ,DVD 480I
3.	720*480	15.73	59.94	13.5	SDTV ,DVD 480I
4.	720*480	31.50	60	27.027	SDTV 480P
5.	720*480	31.47	59.94	27.0	SDTV 480P
6.	720*576	31.250	50.000	27.000	SDTV 576P
7.	1280*720	37.500	50.000	74.25	HDTV 720P
8.	1280*720	45.00	60.00	74.25	HDTV 720P
9.	1280*720	44.96	59.94	74.176	HDTV 720P
10.	1920*1080	28.125	50.00	74.250	HDTV 1080I
11.	1920*1080	33.75	60.00	74.25	HDTV 1080I
12.	1920*1080	33.72	59.94	74.176	HDTV 1080I
13.	1920*1080	56.250	50.00	148.50	HDTV 1080P
14.	1920*1080	67.500	60.00	148.50	HDTV 1080P
15.	1920*1080	67.432	59.939	148.352	HDTV 1080P
16.	1920*1080	27.000	24.000	74.25	HDTV 1080P
17.	1920*1080	26.97	23.976	74.176	HDTV 1080P
18.	1920*1080	33.75	30.000	74.25	HDTV 1080P
19.	1920*1080	33.71	29.97	74.176	HDTV 1080P

## 5.2. HDMI Input (PC/DTV)

\*HDMI PC support only Rear HDMI Input

\*If use DVI to HDMI cable for PC, you have to use external SPK for PC audio sound.

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed
	PC				
1.	640*350	31.468	70.09	25.17	EGA X
2.	720*400	31.469	70.08	28.32	DOS O
3.	640*480	31.469	59.94	25.17	VESA(VGA) O
4.	800*600	37.879	60.31	40.00	VESA(SVGA) O
5.	1024*768	48.363	60.00	65.00	VESA(XGA) O
6.	1152*864	54.348	60.053	80.00	VESA O
7.	1360*768	47.712	60.015	85.50	VESA (WXGA) O
8.	1280*1024(FHD Only)	63.981	60.02	108.00	VESA (SXGA) O
9.	1920*1080(FHD Only)	67.5	60	148.5	HDTV 1080P O
	DTV				
1.	720*480	31.469	59.940	27.000	SDTV 480P
2.	720*480	31.500	60.000	27.027	SDTV 480P
3.	720*576	31.250	50.000	27.000	SDTV 576P
4.	1280*720	37.500	50.000	74.25	HDTV 720P
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	28.125	50.000	74.25	HDTV 1080I
8.	1920*1080	33.75	60.00	74.25	HDTV 1080I
9.	1920*1080	33.72	59.94	74.176	HDTV 1080I
10.	1920*1080	56.250	50.000	148.50	HDTV 1080P
11.	1920*1080	67.500	60.00	148.50	HDTV 1080P
12.	1920*1080	67.432	59.94	148.352	HDTV 1080P
13.	1920*1080	27.000	24.000	74.25	HDTV 1080P
14.	1920*1080	26.97	23.976	74.176	HDTV 1080P
15.	1920*1080	33.75	30.00	74.25	HDTV 1080P
16.	1920*1080	33.71	29.97	74.176	HDTV 1080P

※ HDMI Monitor Range Limits

Min Vertical Freq - 58 Hz

Max Vertical Freq - 62 Hz

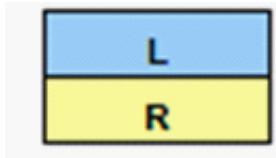
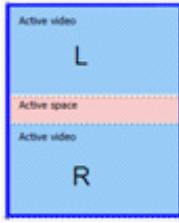
Min Horiz. Freq - 30 kHz

Max Horiz. Freq - 83 kHz

Pixel Clock - 160 MHz

## 6. 3D Mode – DTV/HDMI/USB/DLNA/RGB/etc (Only LB620 Series)

### 6.1. 3D Mode

No	Side by Side (HDMI 1.3)	Top & Bottom (HDMI 1.3)	Frame Packing (HDMI 1.4a)
1			

### 6.2. 3D Input Mode

#### 6.2.1. HDMI Input

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	3D input proposed mode
1	1920x1080p	67.432/67.5	59.94/60	148.35/148.5	1080p	Top-and-Bottom, Side-by-Side(Half),
2	1920x1080p	56.25	50	148.5	1080p	Top-and-Bottom, Side-by-Side(Half)
3	1280x720p	89.9/90	59.94/60	148.35/148.5	720p	Frame packing
4	1280x720p	44.96/45	59.94/60	74.17/74.25	720p	Top-and-Bottom, Side-by-Side(Half)
5	1280x720p	75	50	148.5	720p	Frame packing
6	1280x720p	37.5	50	74.25	720p	Top-and-Bottom, Side-by-Side(Half)
7	1920x1080i	28.125	50	74.25	1080i	Side-by-Side(Half)
8	1920x1080p	53.95/54	23.978/24	148.5	1080p	Frame packing
9	1920x1080p	26.97/27	23.978/24	74.25	1080p	Top-and-Bottom, Side-by-Side(Half)
10	1920x1080p	33.716/33.75	29.97/30	74.17/74.25	1080p	Top-and-Bottom, Side-by-Side(Half)

#### 6.2.2. HDMI Input

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	3D input proposed mode
1	1920*1080	33.75	30.00	74.25	HDTV 1080P	Side by Side, Top & Bottom

# ADJUSTMENT INSTRUCTION

## 1. Application

This spec sheet is applied all of the LED TV with LT43B, chassis.

## 2. Designation

- (1) The adjustment is according to the order which is designated and which must be followed, according to the plan which Unit: Product Specification Standard.
- (2) Power adjustment : Free Voltage.
- (3) Magnetic Field Condition: Nil.
- (4) Input signal Unit: Product Specification Standard.
- (5) Reserve after operation: Above 5 Minutes (Heat Run).  
Temperature : at 25 °C±5 °C  
Relative humidity : 65 ± 10%  
Input voltage : 100~220V, 50/60Hz
- (6) Adjustment equipments : Color Analyzer (CA-210 or CA-110), SVC remote controller
- (7) Push The "IN STOP KEY" – For memory initialization.

Case1 : Software version up

- 1) After downloading S/W by USB , TV set will reboot automatically
- 2) Push "In-stop" key
- 3) Push "Power on" key
- 4) Function inspection
- 5) After function inspection, Push "In-stop" key.

Case2 : Function check at the assembly line

- 1) When TV set is entering on the assembly line, Push "In-stop" key at first.
- 2) Push "Power on" key for turning it on.  
=> If you push "Power on" key, TV set will recover channel information by itself.
- 3).After function inspection, Push "In-stop" key.

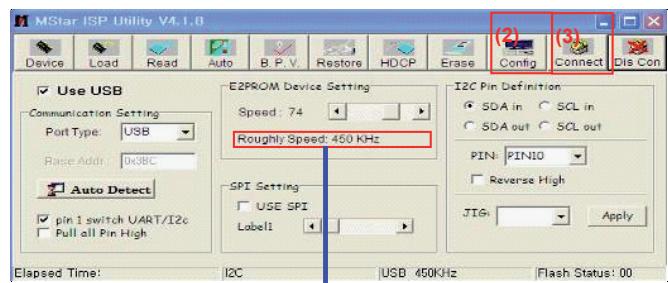
## 3. Main PCB check process

- \* APC – After Manual-Insert, executing APC
- \* Boot file Download

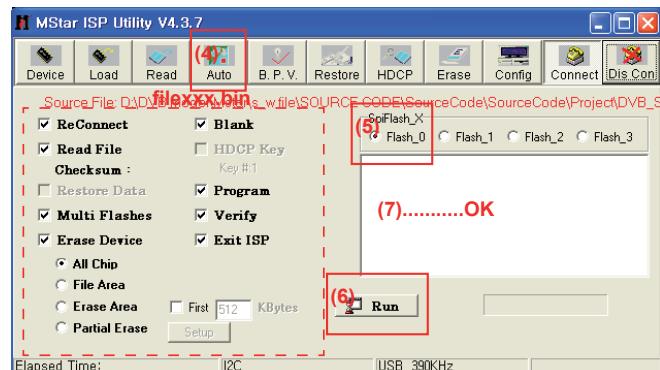
- (1) Execute ISP program "Mstar ISP Utility" and then click "Config" tab.
- (2) Set as below, and then click "Auto Detect" and check "OK" message.  
If "Error" is displayed, Check connection between computer, jig, and set.
- (3) Click "Read" tab, and then load download file (XXXX.bin) by clicking "Read"



- (4) Click "Connect" tab. If "Can't " is displayed, Check connection between computer, jig, and set.

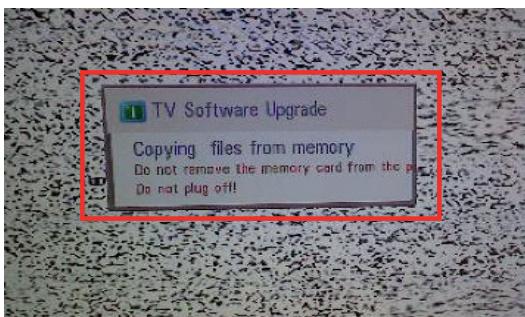


- (5) Click "Auto" tab and set as below.
- (6) Click "Run".
- (7) After downloading, check "OK" message.

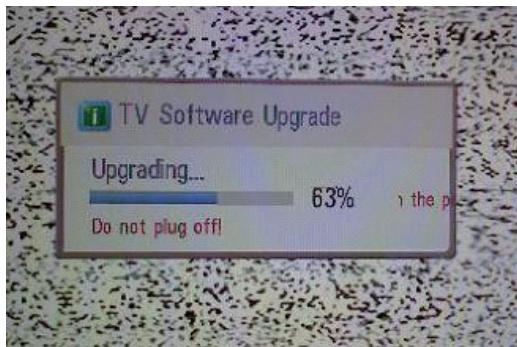


## \* USB DOWNLOAD(\*.epk file download)

- (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 Low, it didn't work. But your downloaded version is High, USB data is automatically detecting
- (3) Show the message "Copying files from memory"



- (4) Updating is staring.



- (5) After updating is complete, The TV will restart automatically.
- (6) If TV turns on, check your updated version and Tool option.  
(refer to the next page about tool option)
  - \* If downloading version is higher 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 controller.
- (2) Select "Tool Option 1" and Push "OK" button.
- (3) Punch in the number. (Each model has their number.)
- (4) Completed selecting Tool option.

Model	Module	BLU Type	Tool option1	Tool option2	Tool option3	Tool option4	Tool option5	Tool option6
32LB550D-DF	LGD / SHARP	POLA	20 / 6164	2440	16129	14184	55298 / 51202	273
42LB550T-DF	LGD	POLA	23	2440	16129	14184	55298	273
49LB550T-DF	LGD	POLA		2440	16129	14184	55298	273
32LB561B-DC	LGD / BOE / Sharp	POLA	4 / 6148 / 12292	2440	16129	14184	55298 / 51202 / 51202	273
32LB560D-DA 32LB561D-DC	LGD / BOE / Sharp	POLA	4 / 12292 / 6148	2406	16129	13136	52226	273
32LB5610-DC	LGD	POLA	4	2406	16129	13136	52226	273
39LB5600-DA	INX	POLA	2054	2406	16129	13144	52234	273
39LB560T-DA	INX	POLA	2054	2406	16129	13144	52226	273
42LB5610-DC	LGD / AUO	POLA	7 / 4103	2406	16129	13136	55298	273
42LB561T-DC	LGD / AUO	POLA	7 / 4103	2406	16129	13144	52226	273
47LB5610-DC	LGD	POLA	8	2406	16129	13136	52226	273
47LB561T-DC	LGD	POLA	8	2406	16129	13144	52226	273
50LB5610-DC	INX	POLA	2057	2406	16129	13136	52226	273
50LB561T-DC	INX	POLA	2057	2406	16129	13144	52226	273
55LB5610-DC	LGD	POLA	10	2406	16129	13136	52226	273
55LB561T-DC	LGD	POLA	10	2406	16129	13144	52226	273
60LB5610-DC	Sharp	POLA				13136		
32LB620D-DD/DJ	LGD	POLA		2406	16129	13144	52226	273
42LB620T-DD	LGD	POLA		2406	16129	13144	52226	273
49LB620T-DD	LGD	POLA		2406	16129	13144	52226	273
55LB620T-DD	LGD	POLA		2406	16129	13144	52226	273

### \* RS-232C Connection Method

Connection : PCBA (USB Port) -> USB to Serial Adapter (UC-232A) -> RS-232C cable -> PC(RS-232C port)

- Product name of USB to Serial Adapter is UC-232A.



※ Caution: LT43\* chassis support only UC-232A driver. (only use this one. )

## 4. Total Assembly line process

### 4.1. Adjustment Preparation

- W/B Equipment condition  
CA210 : CH14, Test signal : Inner pattern (80IRE) – in case of LED back light
- Above 5 minutes H/run in the inner pattern. (“power on” key of adjust remote control)

#### ► The spec of color temperature and coordinate

Model	Mode	Color Temp	Color coordinate	Remark
All	Cool (C50)	13,000k	x = 0.271 ( $\pm 0.002$ ) y = 0.270 ( $\pm 0.002$ )	※ Test signal - Inner pattern for W/B adjust - External white pattern (80IRE, 204gray)
	Medium (0)	9,300k	x = 0.286 ( $\pm 0.002$ ) y = 0.289 ( $\pm 0.002$ )	
	Warm (W50)	6,500k	x = 0.313 ( $\pm 0.002$ ) y = 0.329 ( $\pm 0.002$ )	

#### ► CA210 : CH 14, Test signal : Inner pattern (80IRE)

- Standard color coordinate and temperature using CA-1000 (by H/R time)

- L14 LGD, INX Module

March to December & Global  
Normal line (LB5500, LB5600)

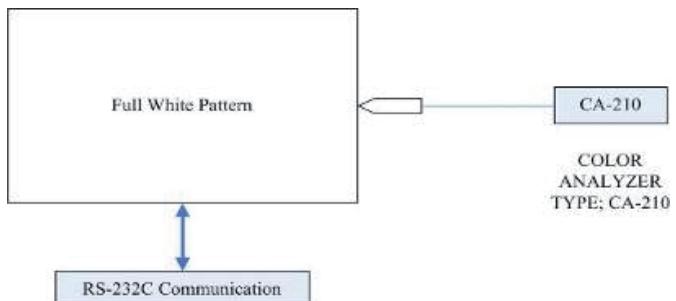
H/R Time(Min)		Cool		Medium		Warm	
		x	y	x	x	y	x
1	0-2	271	270	285	293	313	329
2	3-5	280	284	294	307	322	343
3	6-9	279	282	293	305	321	341
4	10-19	277	279	291	302	319	338
5	20-35	275	275	289	298	317	334
6	36-49	273	273	287	296	315	332
7	50-79	272	272	286	295	314	331
8	80-119	271	270	285	293	313	329
9	Over 120	271	270	285	293	313	329

- Aging chamber line (LB5500, LB5600)

H/R Time(Min)		Cool		Medium		Warm	
		x	y	x	x	y	x
1	0-5	280	285	294	308	319	340
2	6-10	276	280	290	303	315	335
3	11-20	272	275	286	298	311	330
4	21-30	269	272	283	295	308	327
5	31-40	267	268	281	291	306	323
6	41-50	266	265	280	288	305	320
7	51-80	265	263	279	286	304	318
8	81-119	264	261	278	284	303	316
9	Over 120	264	260	278	283	303	315

#### \* Connecting picture of the measuring instrument (On Automatic control)

Inside PATTERN is used when W/B is controlled. Connect to auto controller or push Adjustment R/C POWER-ON -> Enter the mode of White-Balance, the pattern will come out.



[Fig.5] connecting picture (On Automatic Control)

#### • Auto-control interface and directions

- (1) Adjust in the place where the influx of light like floodlight around is blocked. (Illumination is less than 10ux).
- (2) Adhere closely the Color Analyzer ( CA210 ) to the module less than 10cm distance, keep it with the surface of the Module and Color Analyzer's Prove vertically.(80~100°).
- (3) Aging time
  - After aging start, keep the power on (no suspension of power supply) and heat-run over 5 minutes.
  - Using 'no signal' or 'full white pattern' or the others, check the back light on.

#### • Auto adjustment Map(RS-232C)

##### RS-232C COMMAND

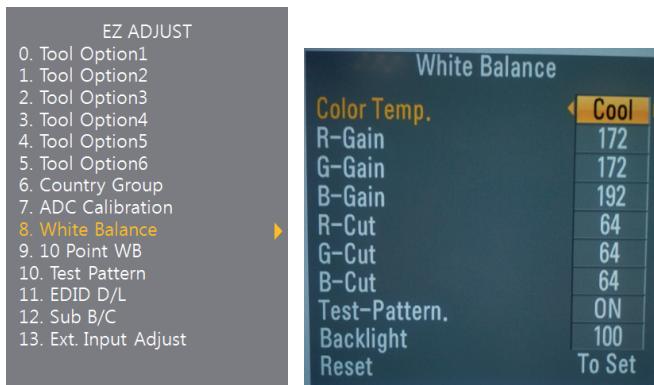
[ CMD ID DATA ]

Wb 00 00 White Balance Start

Wb 00 ff White Balance End

	RS-232C COMMAND [CMD ID DATA]			MIN	CENTER (DEFAULT)			MAX
	Cool	Mid	Warm		Cool	Mid	Warm	
R Gain	jg	Ja	jd	00	172	192	192	192
G Gain	jh	Jb	je	00	172	192	192	192
B Gain	ji	Jc	jf	00	192	192	172	192
R Cut					64	64	64	128
G Cut					64	64	64	128
B Cut					64	64	64	128

- \*Manual W/B process using adjusts Remote control.(TBD)
- Color analyzer(CA100+, CA210) should be used in the calibrated ch by CS-1000
  - Operate the zero-calibration of the CA100+ or CA-210, then stick sensor to the module when adjusting.
  - After enter Service Mode by pushing "ADJ" key,
  - Enter White Balance by pushing "►" key at "8. White Balance".



- For manual adjustment, it is also possible by the following sequence.

- (1) Set TV in Adj. mode using POWER ON
  - (2) Zero Calibrate the probe of Color Analyzer, then place it on the center of LCD module within 10cm of the surface
  - (3) Press ADJ key -> EZ adjust using adj. R/C -> 8. White-Balance then press the cursor to the right (KEY►). When KEY(►) is pressed 206 Gray internal pattern will be displayed.
  - (4) Adjust Cool modes
    - (i). Fix the one of R/G/B gain to 192 (default data) and decrease the others  
(If G gain is adjusted over 172 and R and B gain less than 192, increase G gain to 192 and increase R gain and B gain same amount of increasing G gain.)
    - (ii). If G gain is less than 172,  
Increase G gain by up to 172, and then increase R gain and G gain same amount of increasing G gain.
    - (iii). If R gain or B gain is over 255,  
Readjust G gain less than 172, Conform to R gain is 255 or B gain is 255
  - (5) Adjust two modes (Medium / Warm) Fix the one of R/G/B gain to 192 (default data) and decrease the others.
  - (6) Adj. is completed, Exit adjust mode using "EXIT" key on Remote controller.
- If internal pattern is not available, use RF input. In EZ Adj. menu 8. 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 206 Gray pattern.

#### ※ CASE Cool

First adjust the coordinate far away from the target value(x, y).

- (1) x, y > target
  - i) Decrease the R, G.
- (2) x, y < target
  - i) First decrease the B gain,
  - ii) Decrease the one of the others.
- (3) x > target , y< target
  - i) First decrease B, so make y a little more than the target.
  - ii) Adjust x value by decreasing the R
- (4) x < target , y >target
  - i) First decrease B, so make x a little more than the target.
  - ii) Adjust x value by decreasing the G

#### How to adjust

- (1) . If G gain is adjusted over 172 and R gain and B gain less than 192, increase G gain to 192 and increase R gain and B gain DAmE amount of increasing G gain
- (2) If G gain is less than 172 , increase G gain by up to 172, and then increase R gain and B gain DAmE amount of increasing G gain.
- (3) If R gain or B gain is over 255 , Readjust G gain less than 172, Conform to R gain is 255 or B gain is 255

#### ※ CASE Medium / Warm

First adjust the coordinate far away from the target value(x, y).

- (1) x, y > target
  - i) Decrease the R, G.
- (2) x, y < target
  - i) First decrease the B gain,
  - ii) Decrease the one of the others.
- (3) x > target , y< target
  - i) First decrease B, so make y a little more than the target.
  - ii) Adjust x value by decreasing the R
- (4) x < target , y >target
  - i) First decrease B, so make x a little more than the target.
  - ii) Adjust x value by decreasing the G

- After You finish all adjustments, Press "In-start" button and compare Tool option and Area option value with its BOM, if it is correctly same then unplug the AC cable. If it is not same, then correct it same with BOM and unplug AC cable. For correct it to the model's module from factory JIG model.

- Push the "IN STOP KEY" after completing the function inspection.

## 4.2. DPM operation confirmation

### (Only Apply for MNT Model)

Check if Power LED Color and Power Consumption operate as standard.

- Set Input to RGB and connect D-sub cable to set
- Measurement Condition: (100~240V@ 50/60Hz)
- Confirm DPM operation at the state of screen without Signal

## 4.3. EDID DATA

1) All Data : HEXA Value

2) Changeable Data :

\*: Serial No : Controlled / Data:01

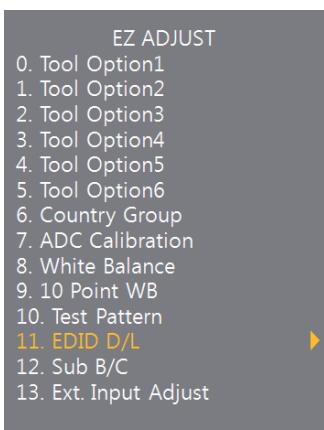
\*\*: Month : Controlled / Data:00

\*\*\*:Year : Controlled

\*\*\*\*:Check sum

- Auto Download

- After enter Service Mode by pushing "ADJ" key,
- Enter EDID D/L mode.
- Enter "START" by pushing "OK" key.



※ Edid data and Model option download (RS232C)

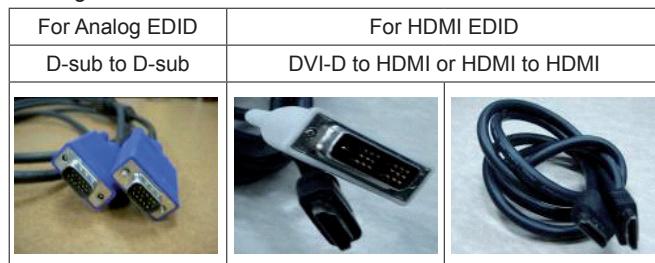
NO	Item	CMD 1	CMD 2	Data 0		
Enter download MODE	Download 'Mode In'	A	A	0	0	When transfer the 'Mode In', Carry the command
Edid data and Model option download	Download	A	E	00	10	Automatically download (The use of a internal Data)

### ※ Caution

\* Use the proper signal cable for EDID Download

- Analog EDID : Pin3 exists

- Digital EDID : Pin3 exists



No.	Item	Condition	Hex Data
1	Manufacturer ID	GSM	1E6D
2	Version	Digital : 1	01
3	Revision	Digital : 3	03

### • EDID DATA

(1) HD 2D EDID Data (LB550B/560B) => TBD  
Before S/W version 3.03.02

	CheckSum(0xFF)	Physical Address (0x1E)
HDMI 1	75 5B	10
HDMI 2	75 4B	20

### HDMI1 (128/256)

0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	00	FF	FF	FF	FF	FF	00	1E	6D	01	00	01	01	01	01
10	01	18	01	03	80	A0	5A	78	0A	EE	91	A3	54	4C	99
20	0F	50	54	A1	08	00	31	40	45	40	61	40	71	40	01
30	01	01	01	01	01	66	21	50	B0	51	00	1B	30	40	70
40	36	00	40	84	63	00	00	1E	64	19	00	40	41	00	26
50	18	68	36	00	40	84	63	00	00	18	00	00	00	FD	00
60	3E	1E	53	10	00	0A	20	20	20	20	20	20	00	00	FC
70	00	4C	47	20	54	56	0A	20	20	20	20	20	20	01	75

0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	02	03	22	F1	4E	10	1F	04	93	05	14	03	02	12	21
10	22	15	01	26	15	07	50	09	57	07	67	03	0C	00	10
20	80	1E	01	1D	80	18	71	1C	16	20	58	2C	25	00	A0
30	00	00	9E	01	1D	00	72	51	D0	1E	20	6E	28	55	00
40	20	C2	31	00	00	1E	8C	0A	D0	8A	20	E0	2D	10	3E
50	96	00	A0	5A	00	00	00	18	02	3A	80	18	71	38	2D
60	58	2C	45	00	A0	5A	00	00	00	1E	00	00	00	00	00
70	00	00	00	00	00	00	00	00	00	00	00	00	00	00	5B

### HDMI1 (128(same))/256

0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	02	03	22	F1	4E	10	1F	04	93	05	14	03	02	12	21
10	22	15	01	26	15	07	50	09	57	07	67	03	0C	00	20
20	80	1E	01	1D	80	18	71	1C	16	20	58	2C	25	00	A0
30	00	00	9E	01	1D	00	72	51	D0	1E	20	6E	28	55	00
40	20	C2	31	00	00	1E	8C	0A	D0	8A	20	E0	2D	10	3E
50	96	00	A0	5A	00	00	00	18	02	3A	80	18	71	38	2D
60	58	2C	45	00	A0	5A	00	00	00	1E	00	00	00	00	00
70	00	00	00	00	00	00	00	00	00	00	00	00	00	00	4B

## (2) FHD 2D EDID Data (LB5500/550T, LB5600/560T)

	CheckSum(0xFF)	Physical Address (0x1E)
HDMI 1	41 / 25	10
HDMI 2	41 / 15	20

HDMI1 (128/256)

0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	00	FF	FF	FF	FF	00	1E	6D	01	00	01	01	01	01	01
10	01	18	01	03	80	A0	5A	78	0A	EE	91	A3	54	4C	99
20	0F	50	54	A1	08	00	31	40	45	40	61	40	71	40	81
30	01	01	01	01	01	02	3A	80	18	71	38	2D	40	58	2C
40	45	00	A0	5A	00	00	00	1E	66	21	50	B0	51	00	1B
50	40	70	36	00	A0	5A	00	00	00	1E	00	00	00	FD	00
60	3E	1E	53	10	00	0A	20	20	20	20	20	20	00	00	FC
70	00	4C	47	20	54	56	0A	20	20	20	20	20	20	01	41

0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	02	03	22	F1	4E	10	9F	04	13	05	14	03	02	12	20
10	22	15	01	26	15	07	50	09	57	07	67	03	0C	00	10
20	80	1E	01	1D	80	18	71	1C	16	20	58	2C	25	00	20
30	31	00	00	9E	01	1D	00	72	51	D0	1E	20	6E	28	55
40	20	C2	31	00	00	1E	02	3A	80	18	71	38	2D	40	58
50	45	00	A0	5A	00	00	00	1E	01	1D	00	BC	52	D0	1E
60	B8	28	55	40	C4	8E	21	00	00	1E	00	00	00	00	00
70	00	00	00	00	00	00	00	00	00	00	00	00	00	00	25

HDMI1 (128(same)/256)

0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	02	03	22	F1	4E	10	9F	04	13	05	14	03	02	12	20
10	22	15	01	26	15	07	50	09	57	07	67	03	0C	00	10
20	80	1E	01	1D	80	18	71	1C	16	20	58	2C	25	00	20
30	31	00	00	9E	01	1D	00	72	51	D0	1E	20	6E	28	55
40	20	C2	31	00	00	1E	02	3A	80	18	71	38	2D	40	58
50	45	00	A0	5A	00	00	00	1E	01	1D	00	BC	52	D0	1E
60	B8	28	55	40	C4	8E	21	00	00	1E	00	00	00	00	00
70	00	00	00	00	00	00	00	00	00	00	00	00	00	00	15

## 4.4. Outgoing condition Configuration

- When pressing IN-STOP key by SVC remocon, Red LED are blinked alternatively. And then automatically turn off. (Must not AC power OFF during blinking)

## 4.5. GND & Hi-pot test

### 4.5.1. GND & HI-POT auto-check preparation

- Check the POWER CABLE and SIGNAL CABE insertion condition

### 4.5.2. GND & HI-POT auto-check

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

### 4.5.3. Checkpoint

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

## 5. Local Dimming Function Check

### (Not require)

Step1) Turn on TV.

Step2) Press "P-only" key, enter to power only mode and escape the "P-only" Mode by pressing "Exit" key

Step3) Press "Tilt" key, entrance to Local Dimming mode.

Step4) At the Local Dimming mode, module Edge Backlight moving Top to bottom Back light of module moving

Step5) confirm the Local Dimming mode

Step6) Press "Exit" key

## 6. 3D Function Test (Only LB620)

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

\* HDMI mode NO. 872 , pattern No.83

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

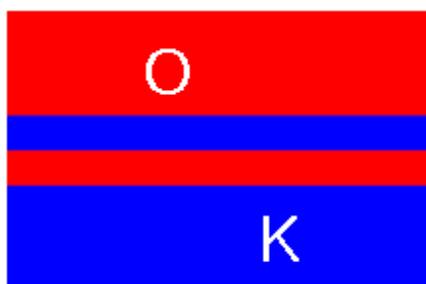


Fig.1  
<HDMI Mode 872번, Pattern No. 83>

2) When 3D OSD appear automatically , then select OK button.



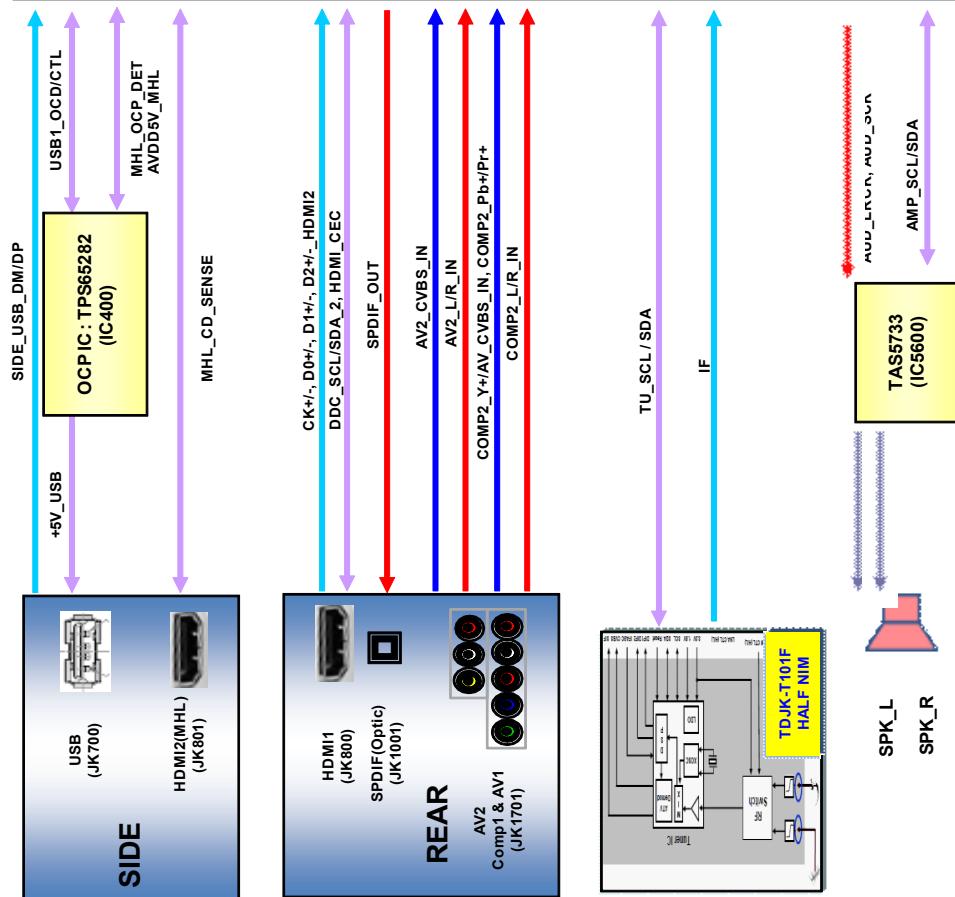
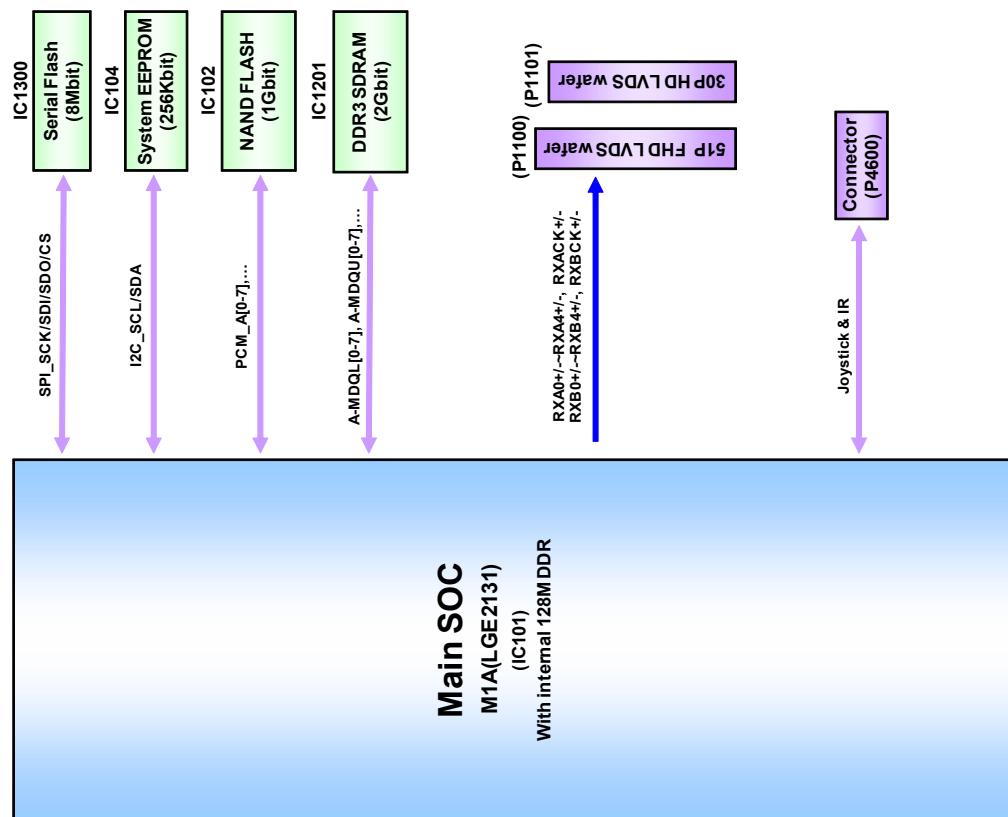
Fig.3  
<OK Key>

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



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

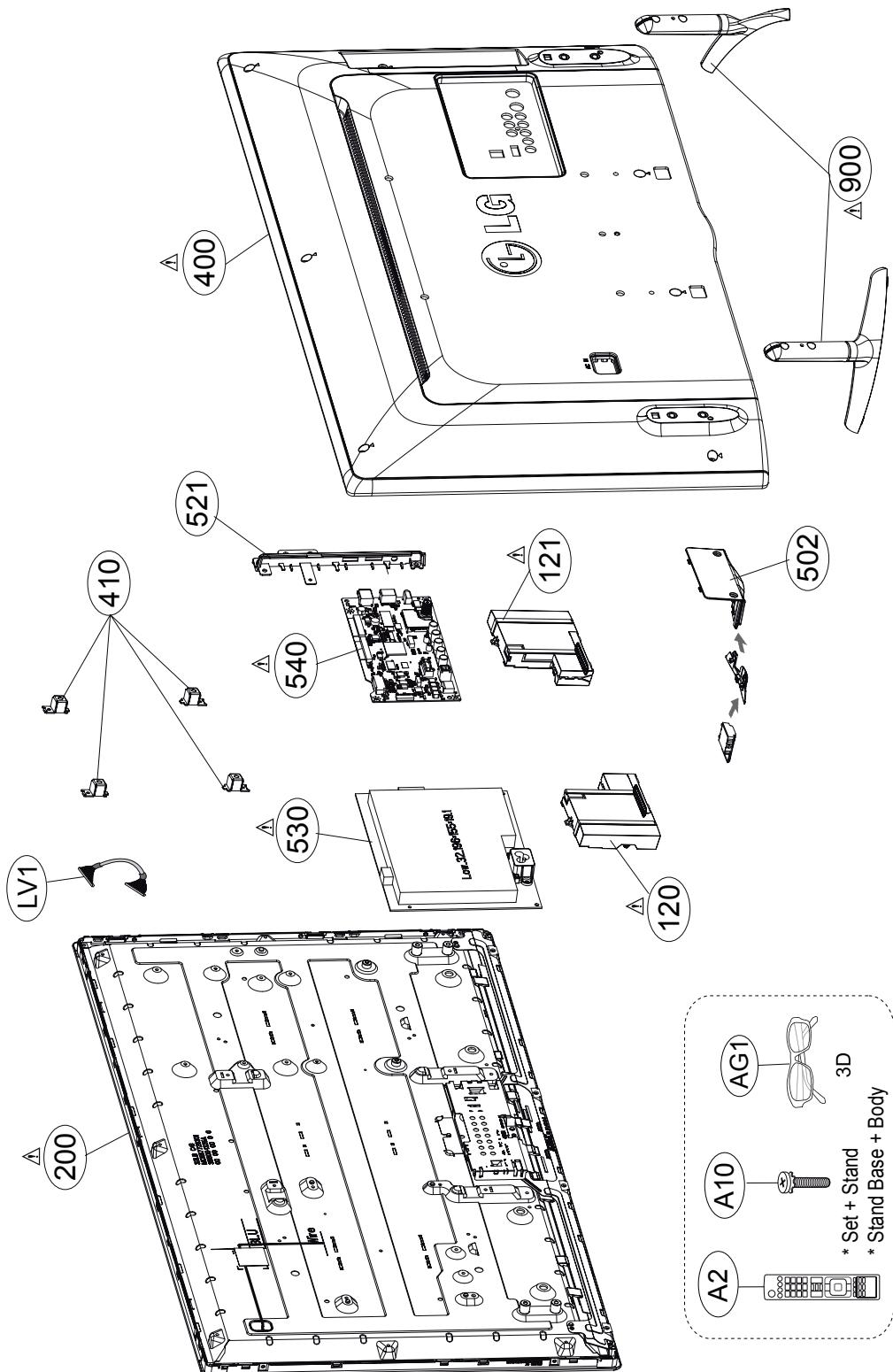
# BLOCK DIAGRAM



# EXPLODED VIEW

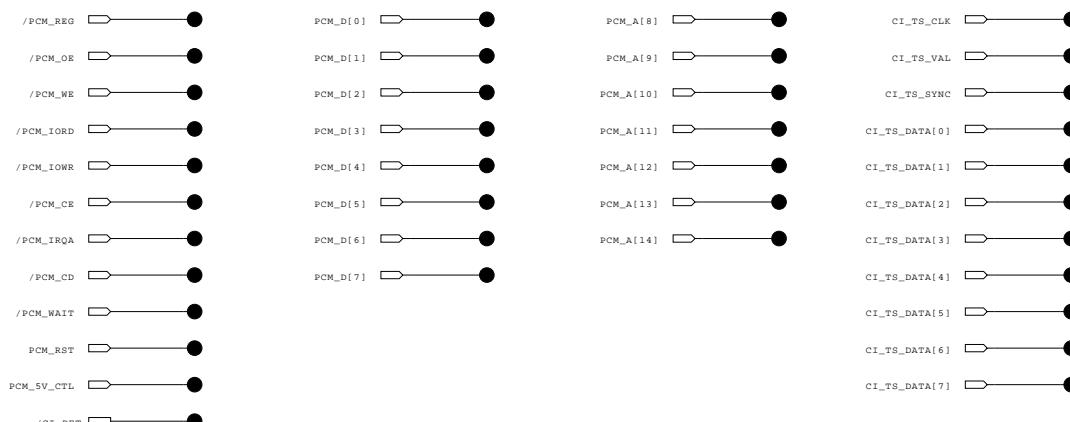
## IMPORTANT SAFETY NOTICE

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

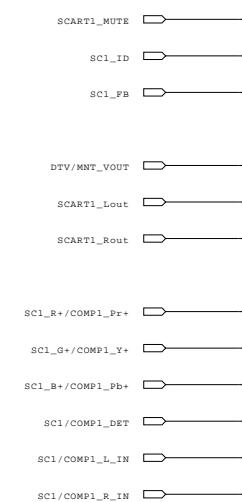


# TP for NON-EU models(except EU and China)

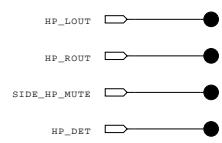
TP for CI slot



TP for SCART

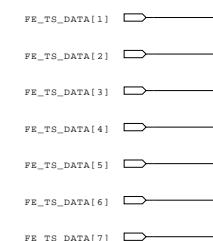


TP for Headphone



TP for S2

TP for FE\_TS\_DATA



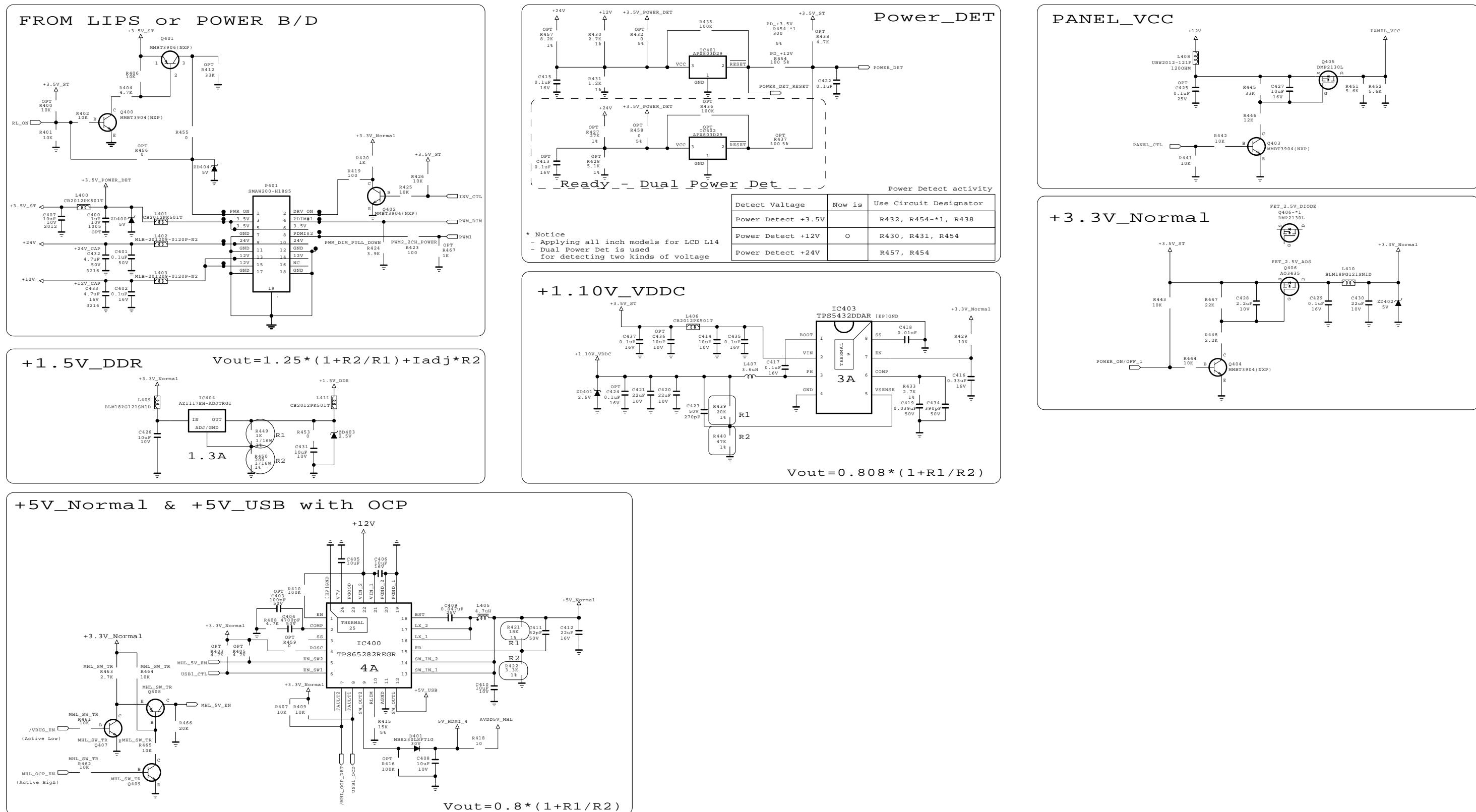
THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.

SECRET  
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LG ELECTRONICS

MODEL	NC5_L14	DATE	2013.05.09
BLOCK	TP_NON_EN	SHEET	3 /

# L14 POWER BLOCK (POWER DETECT 2)



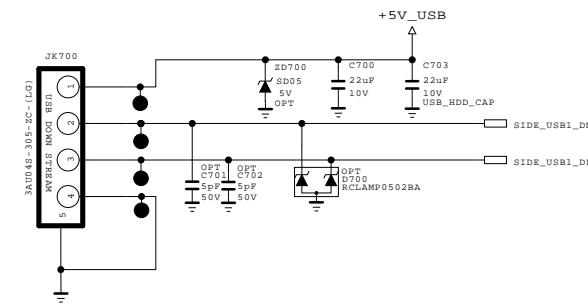
The SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.

SECRET  
LG Electronics

LG ELECTRONICS

MODEL	L14_M1A	DATE	2013.10.28
BLOCK	Power_PD2	SHEET	4

# USB ( SIDE )



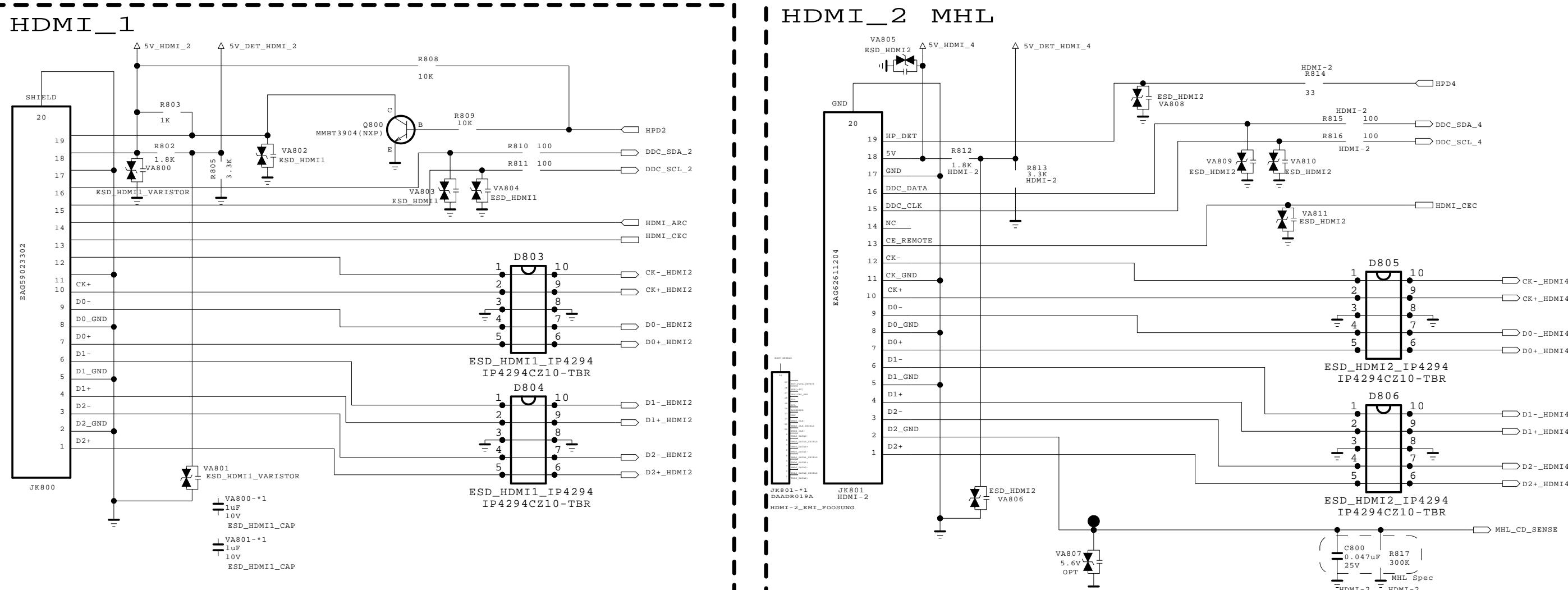
THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.

SECRET
LG Electronics

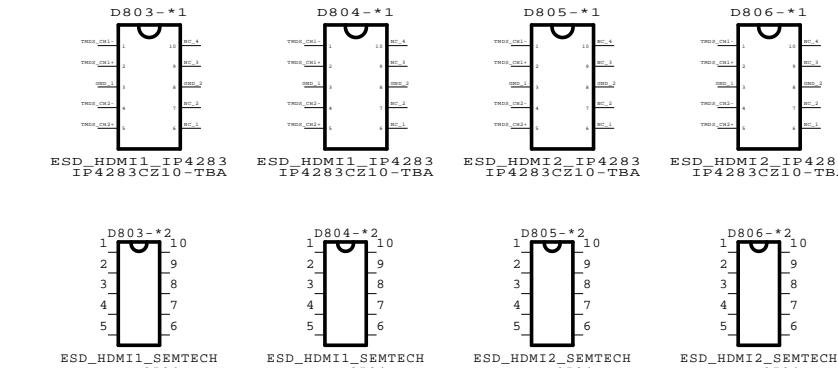
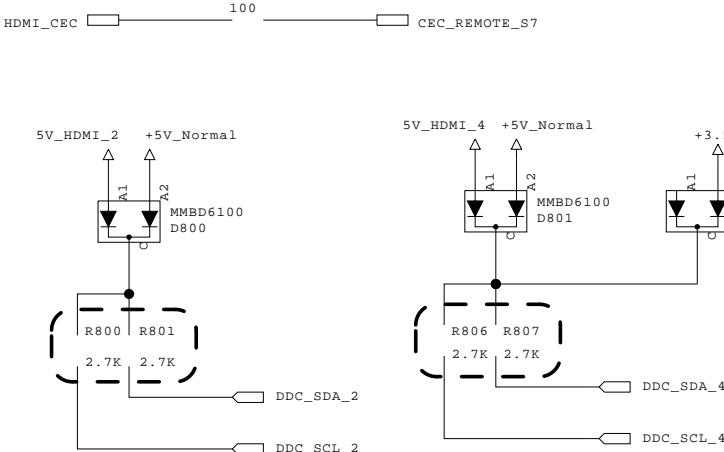
LG ELECTRONICS

MODEL	L14_M1A	DATE	13/04/30
BLOCK	USB_S1	SHEET	7 /

# HDMI (REAR 1 / SIDE 1 MHL)



## CEC



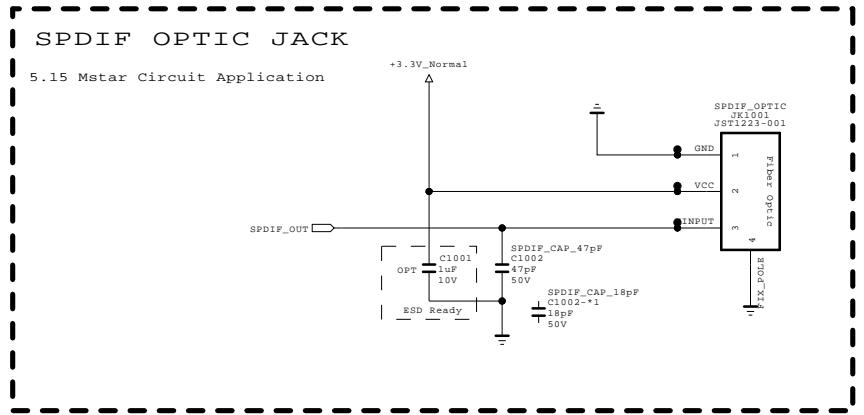
THE ! SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ! SYMBOL MARK OF THE SCHEMATIC.

SECRET  
LG Electronics

LG ELECTRONICS

MODEL BLOCK	L14_M1A HDMI_R1_S1	DATE SHEET	2013/08/15 8
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# SPDIF



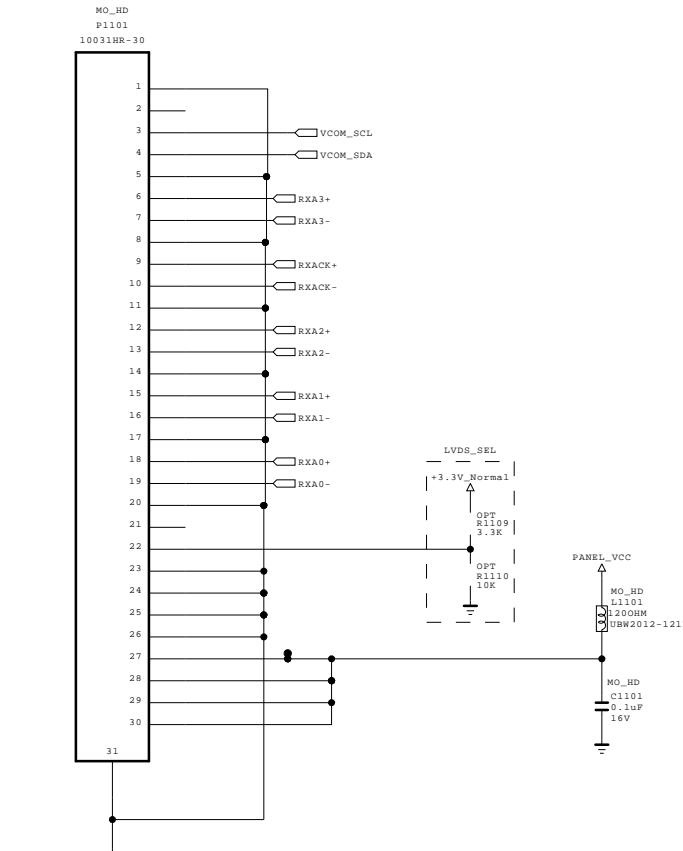
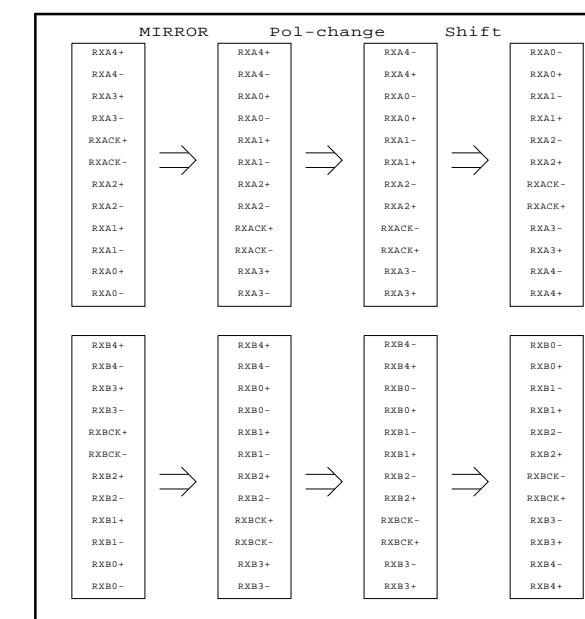
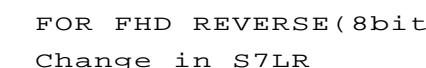
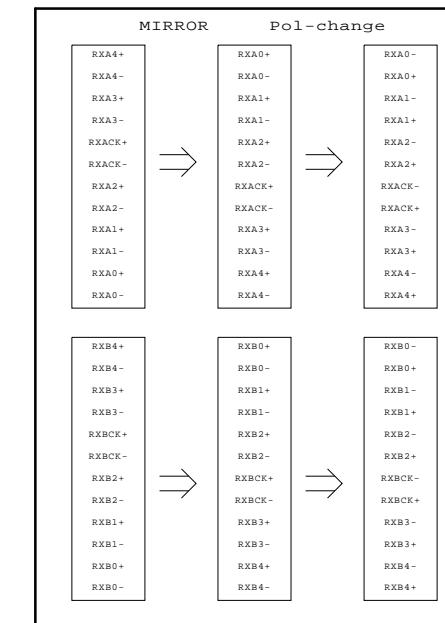
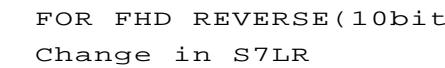
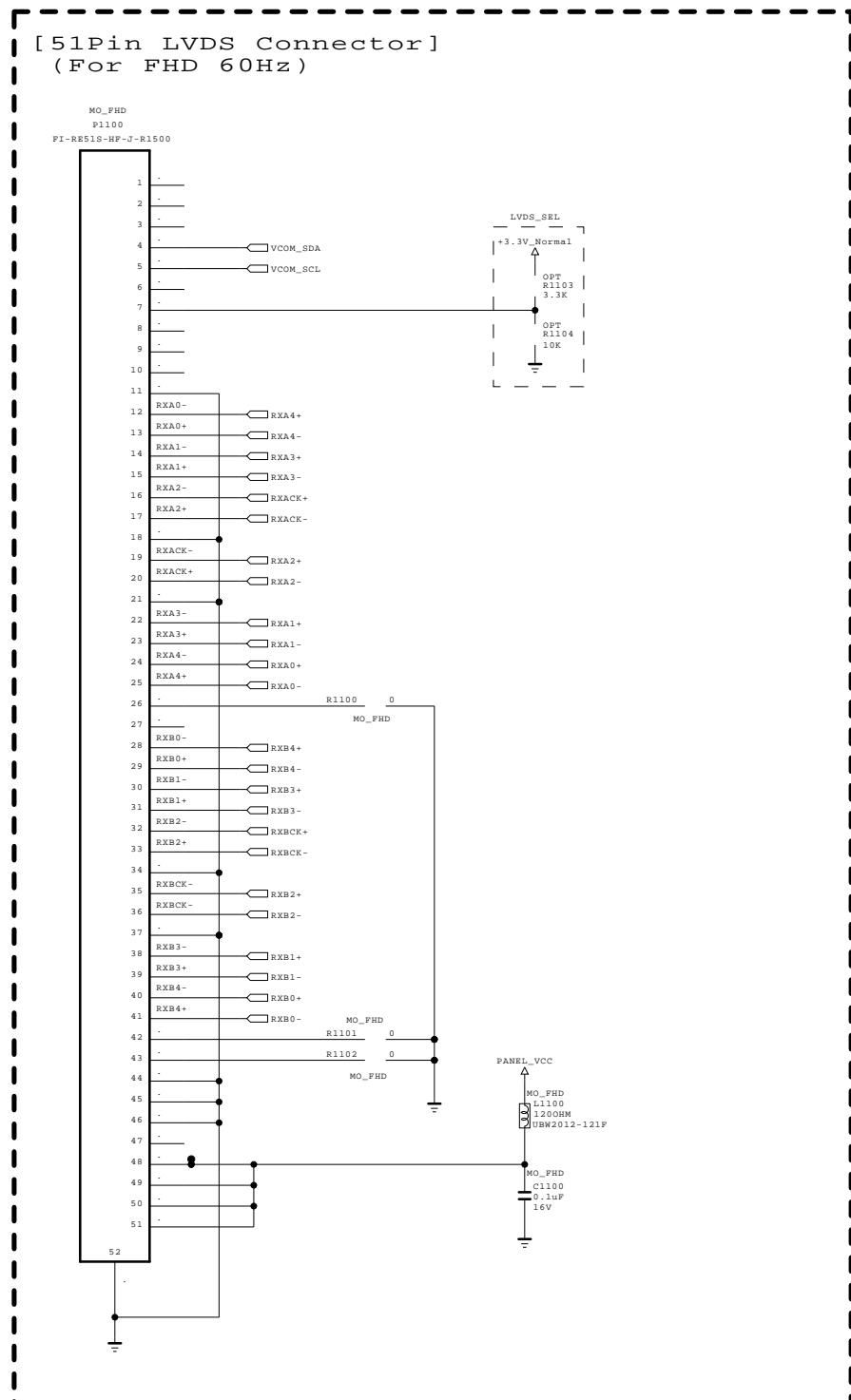
THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.

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LG Electronics

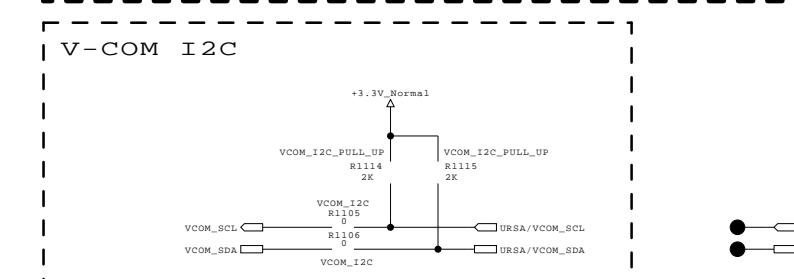
LG ELECTRONICS

MODEL	NC5_L14	DATE	2013/10/29
BLOCK	SPDIF	SHEET	10 /

## LVDS ( NON EU )



EU pin assign is different from NON EU.  
Because of position of HD wafer.

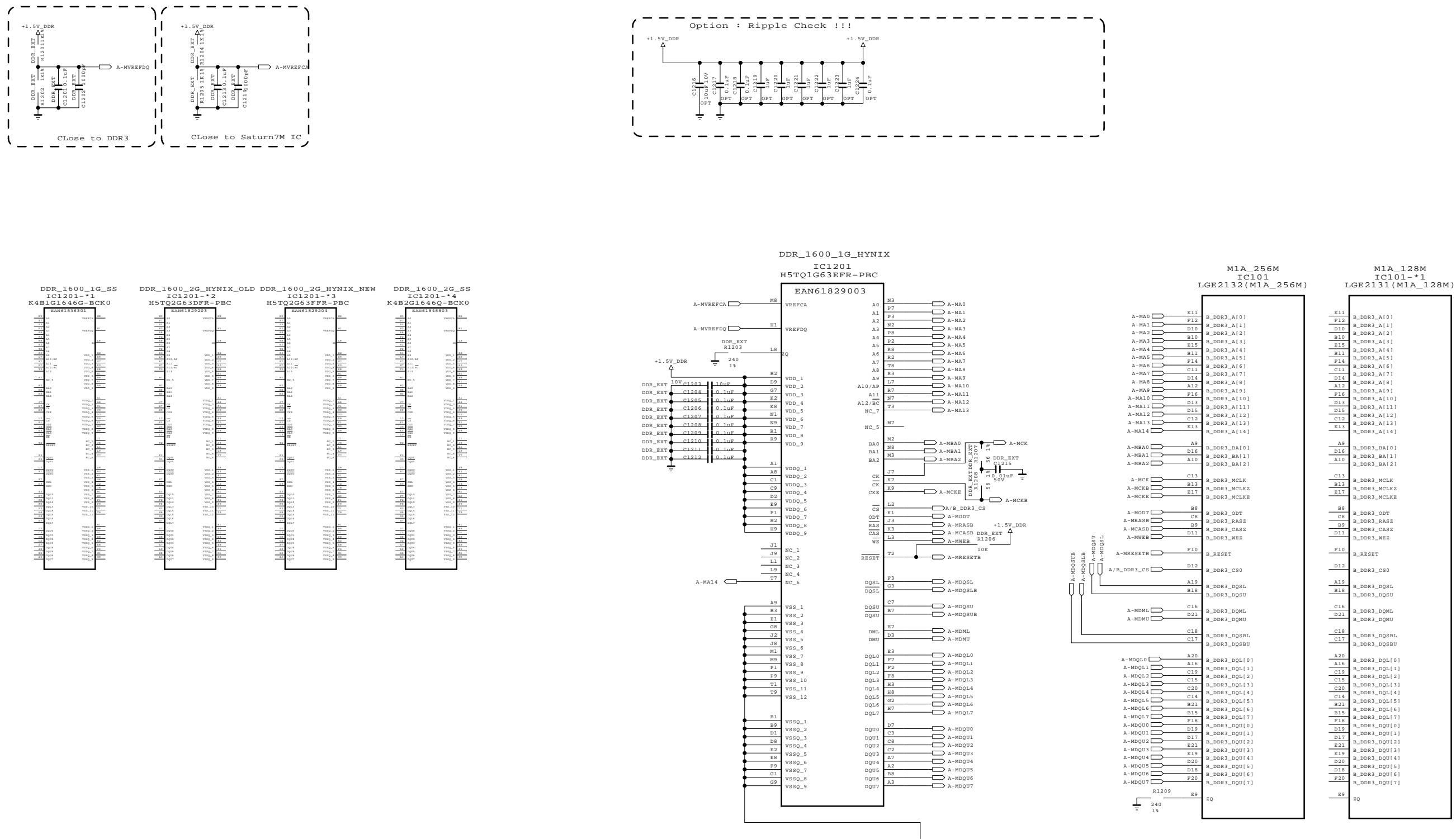


THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.

SECRET



MODEL	L14_S7LR(M1A)	DATE	2013/05/22
BLOCK	LVDS_NON_EU	SHEET	11 /



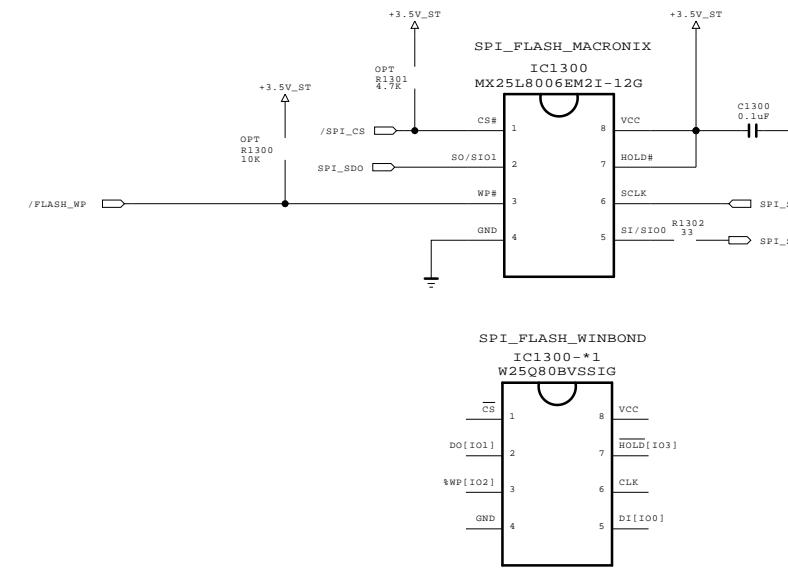
THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.

**SECRET**  
LG Electronics

LG ELECTRONICS

<b>MODEL</b>	NC5_S7LR (M1A)	<b>DATE</b>	2013/05/20
<b>BLOCK</b>	1_DDR	<b>SHEET</b>	12

# Serial Flash for SPI boot



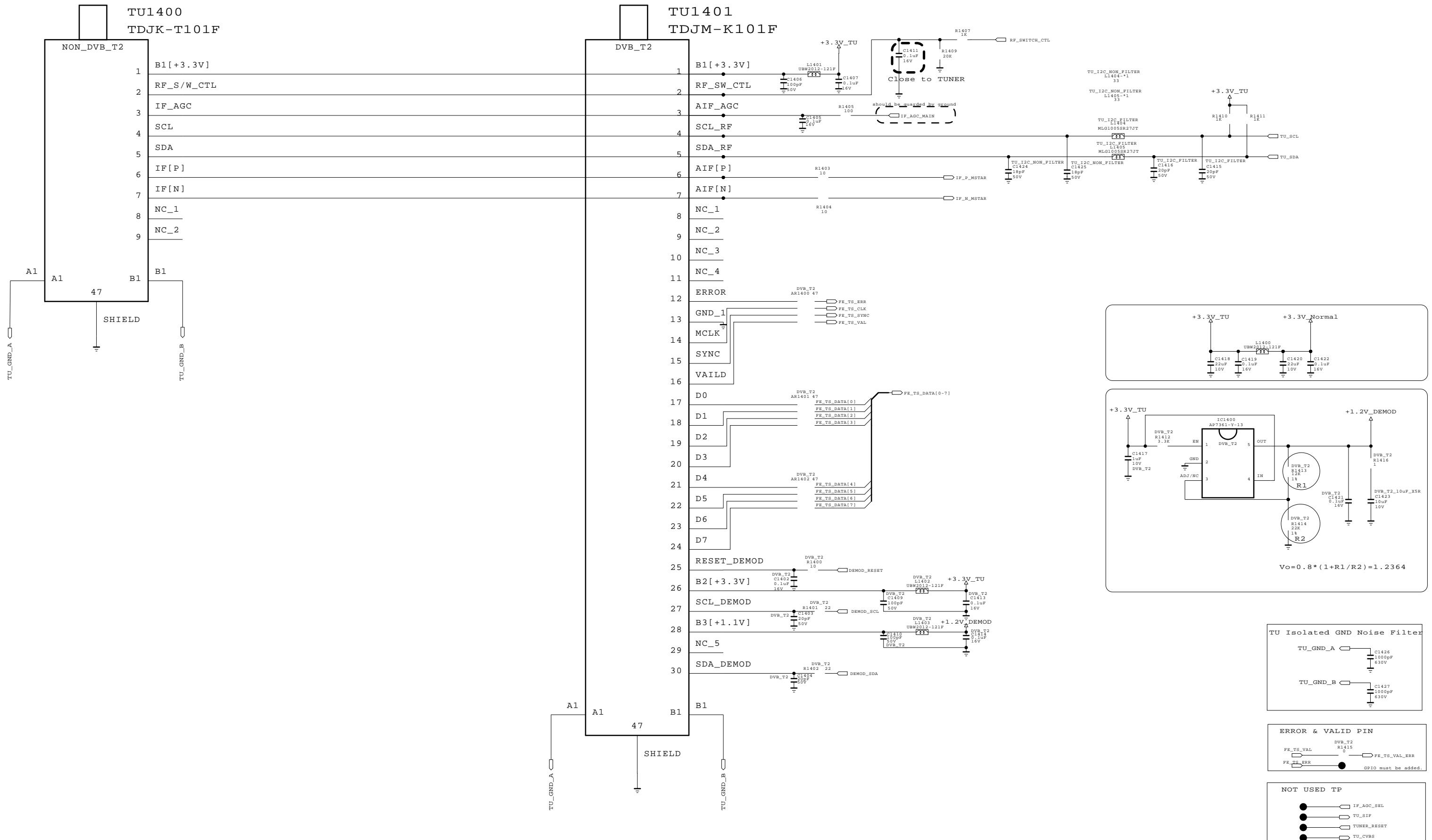
THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.

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LG Electronics

LG ELECTRONICS

MODEL	NC5_S7LR(M1A)	DATE	2013/04/29
BLOCK	S_FLASH	SHEET	13 /

# Central and South Americatuner block



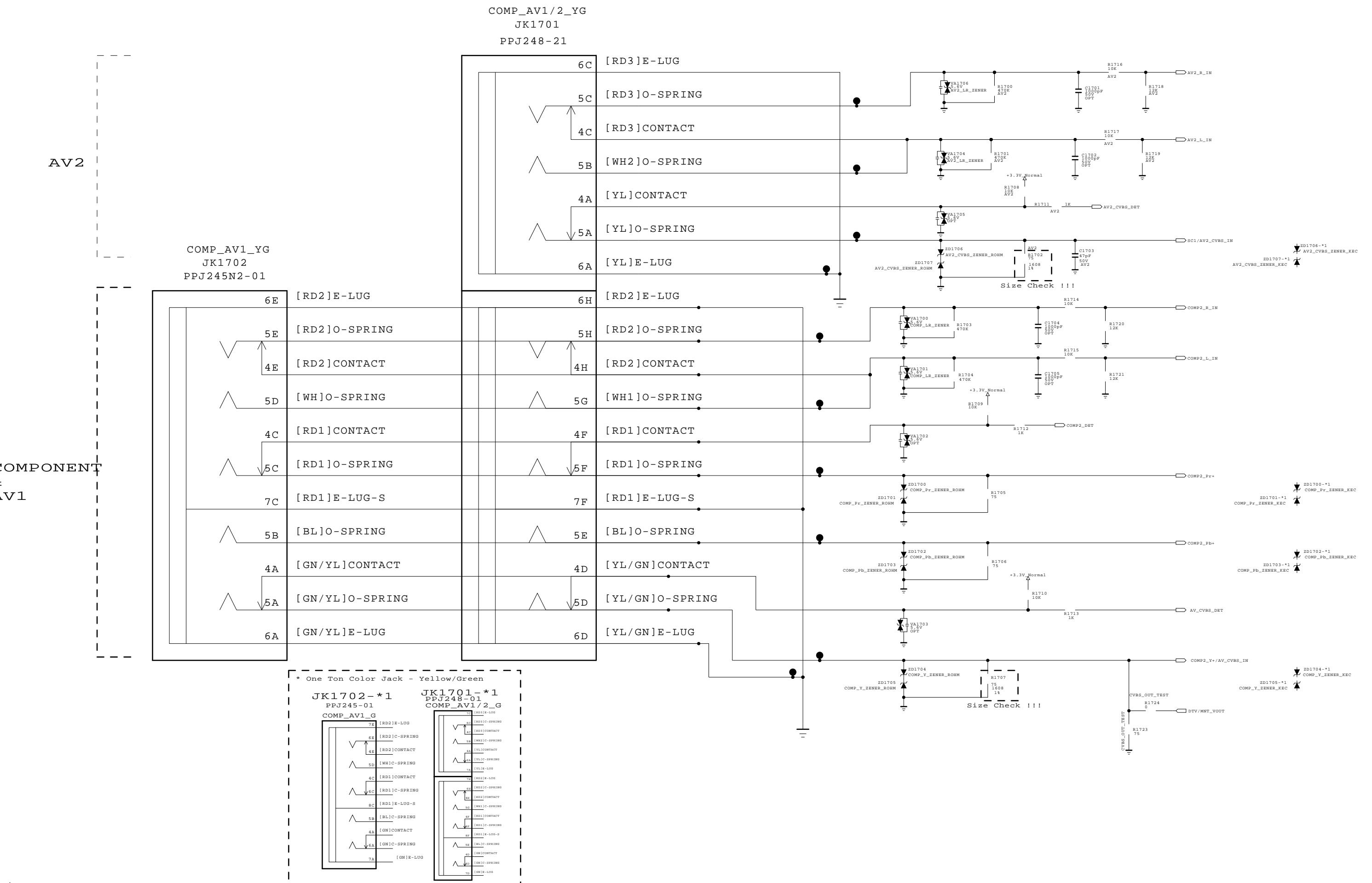
THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.

SECRET

 LG ELECTRONICS

MODEL	L14_S7LR(M1A)	DATE	2013.05.06
BLOCK	TUNER_CSA	SHEET	14 /

## COMPONENT & AV1 (COMMON), AV2



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

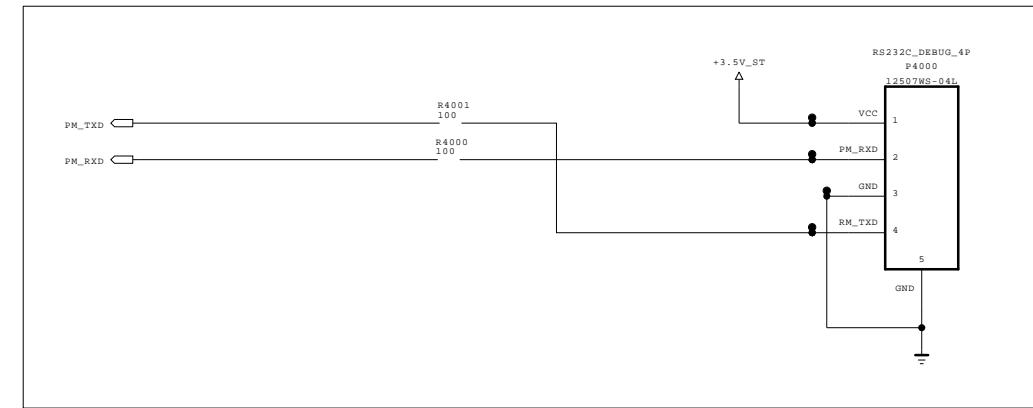
SECRET



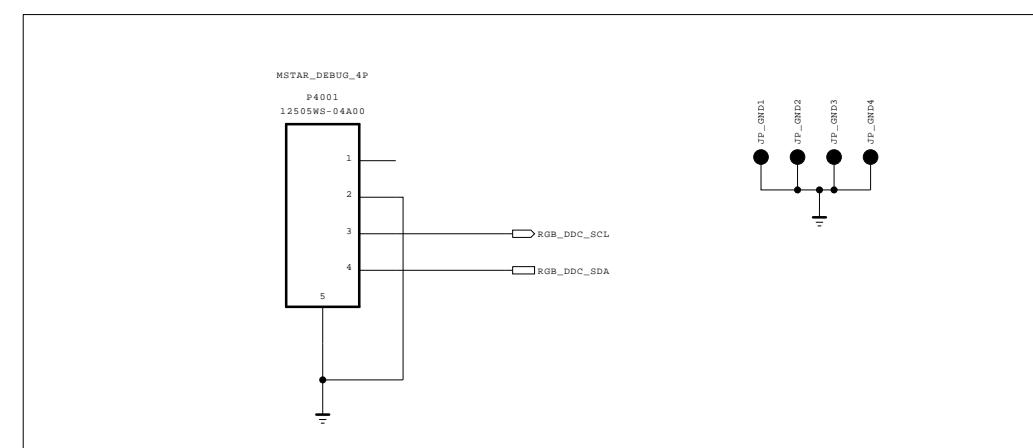
MODEL	L14_S7LR(M1A)	DATE	2013.08.15
BLOCK	REAR_JACK_NON_EU	SHEET	17 /

# RS-232C 4PIN & MSTAR DEBUG 4PIN

RS-232C 4PIN



MSTAR DEBUG 4PIN



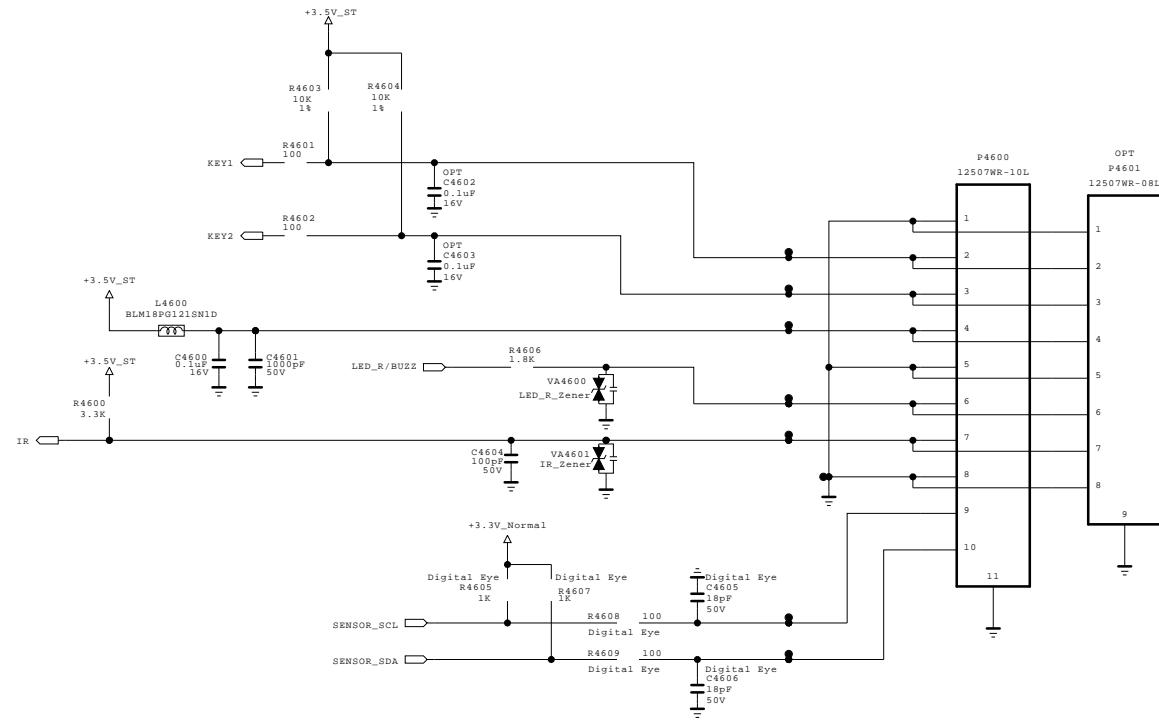
THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.

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LG Electronics

LG ELECTRONICS

MODEL	L14_S7LR(M1A)	DATE	2013/04/30
BLOCK	RS232C_MSTAR_DEBUG_4P	SHEET	40 /

# IR/LED + Digital Eye + Control

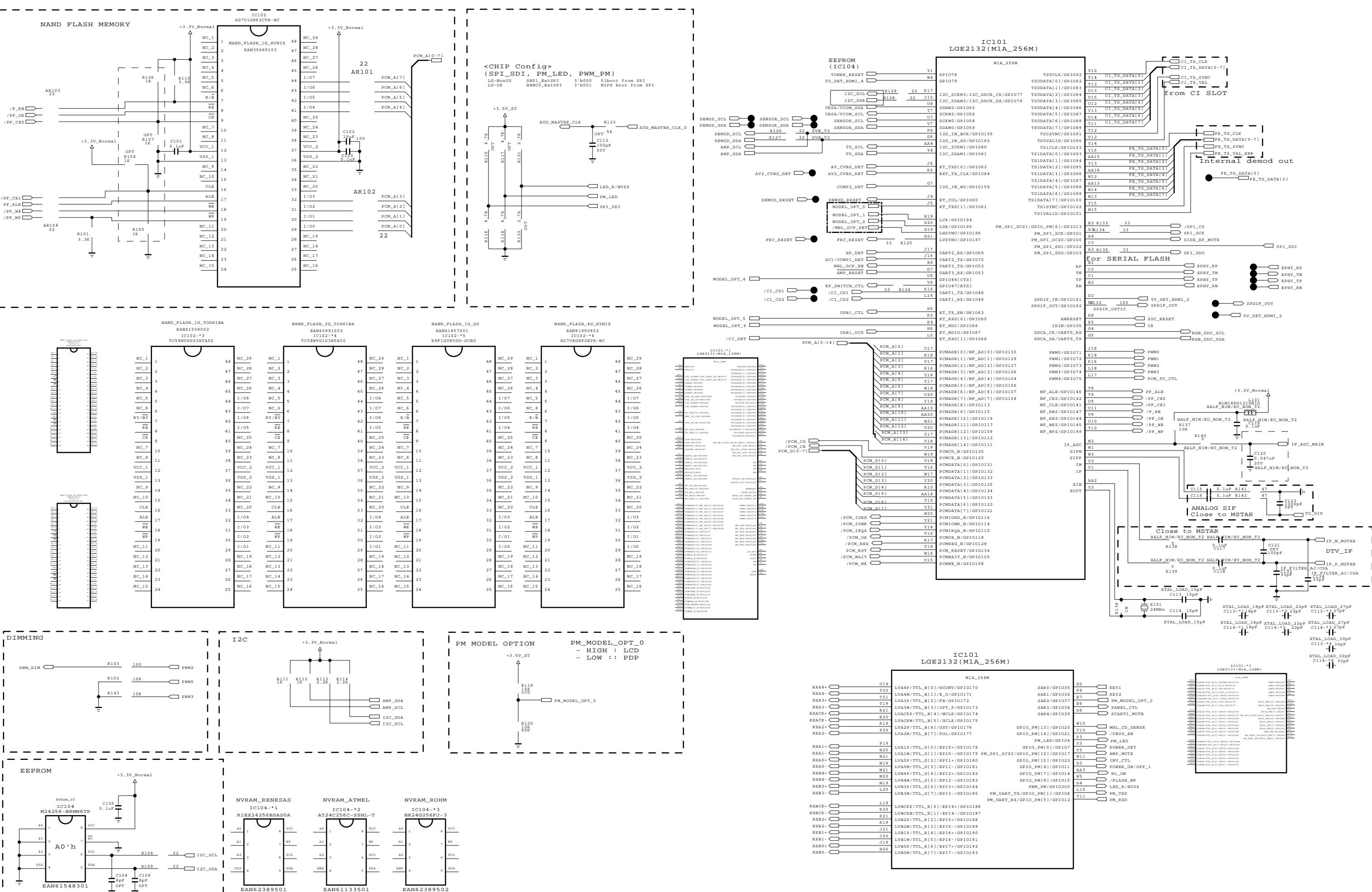


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LG Electronics

LG ELECTRONICS

MODEL	L14_M1A	DATE	2013/09/03
BLOCK	IR_EYE_SENSOR	SHEET	46 /

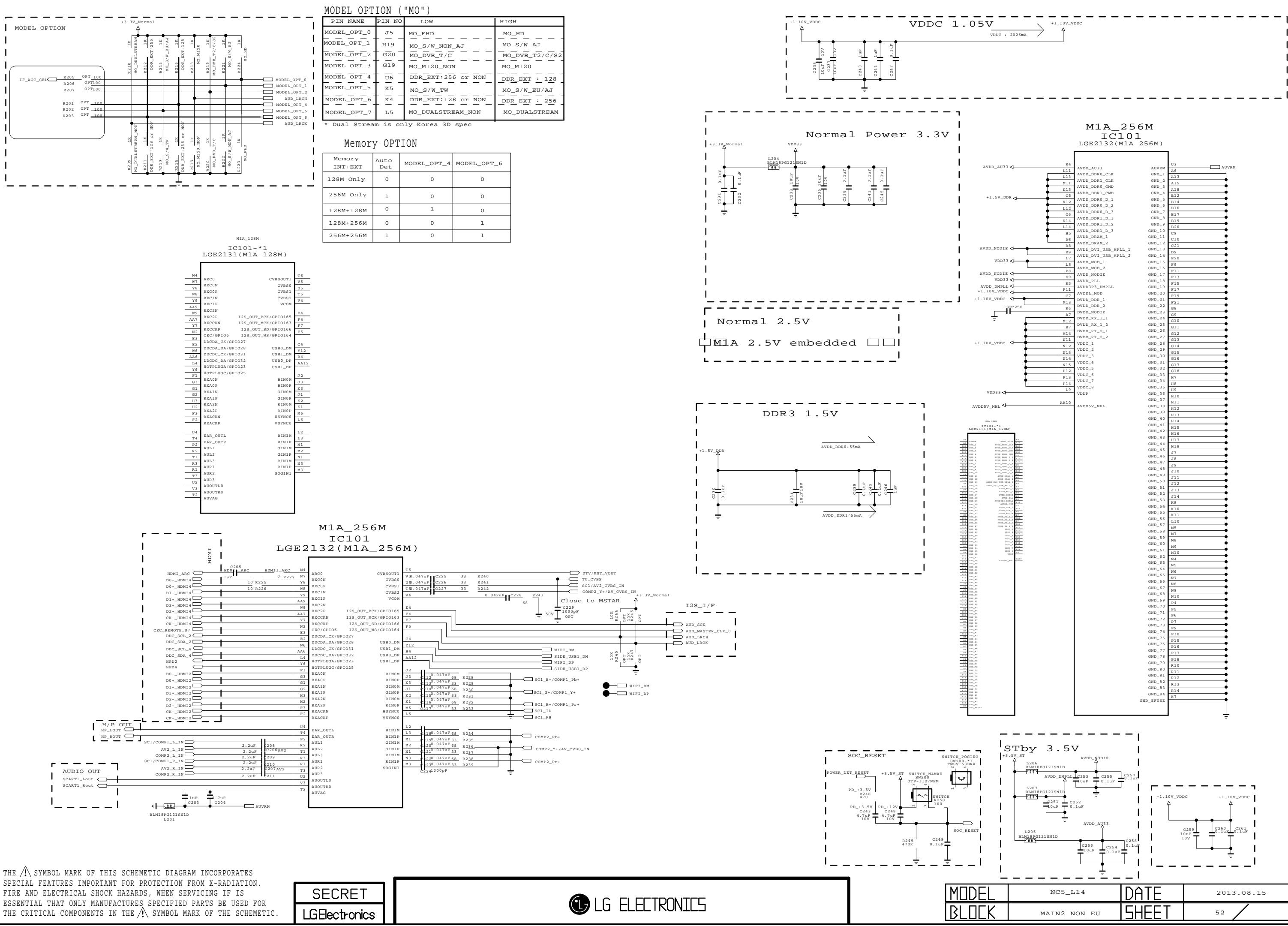


THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.

SECRET  
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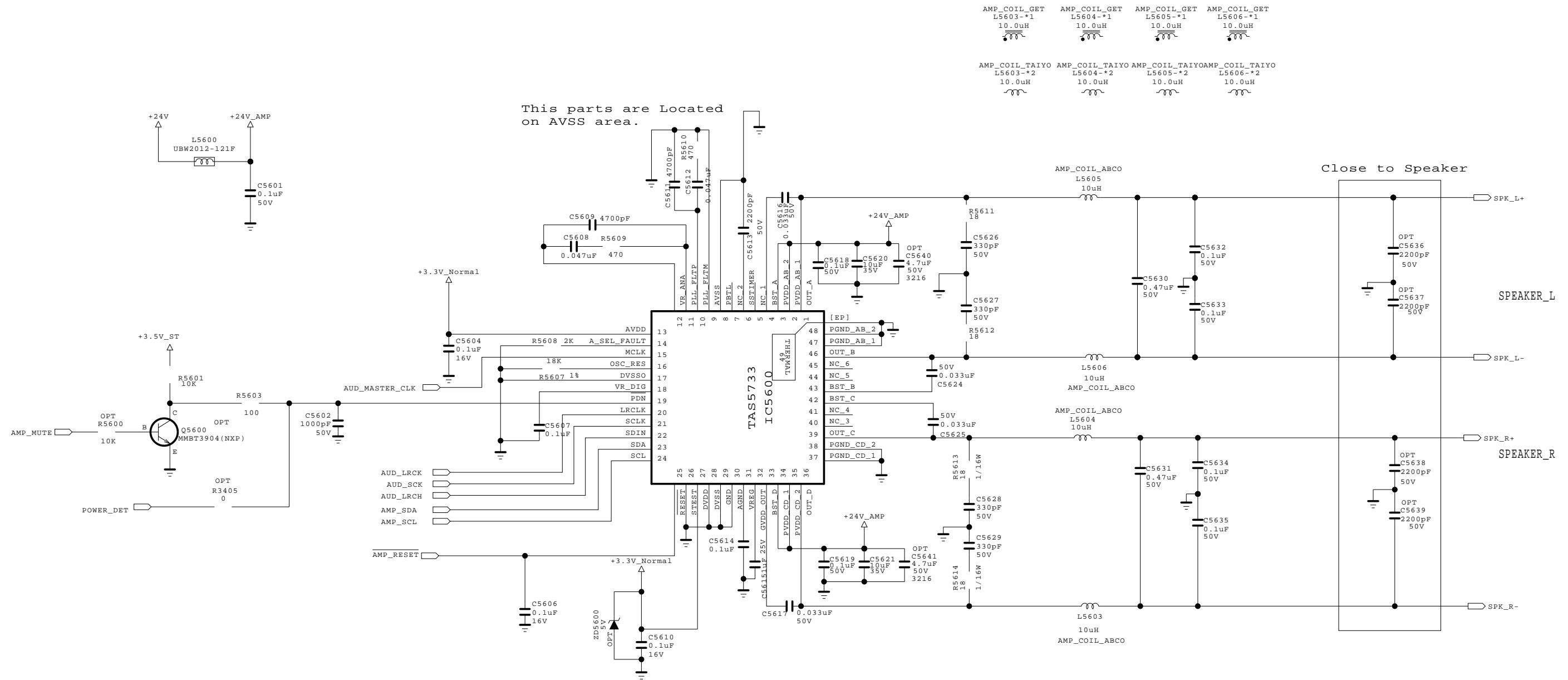
LG ELECTRONICS

MODEL	M1A_L14	DATE	2013/09/16
BLOCK	MAIN1_NON_EU	SHEET	51 /



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

# AUDIO AMP (TI)



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

**SECRET**  
LG Electronics

LG ELECTRONICS

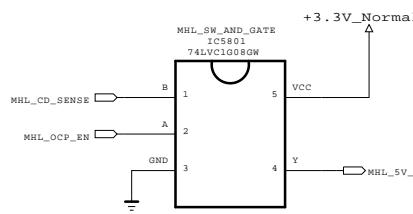
**MODEL**  
**BLOCK**

L14  
AUDIO[TI]

**DATE**  
**SHEET**

2013.10.06  
56

## L14 MHL SW AND GATE



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

SECRET
LG Electronics

LG ELECTRONICS

MODEL	L14_M1A	DATE	2013.09.01
BLOCK	MHL_SW_AND	SHEET	58 /



# Contents of LCD TV Standard Repair Process

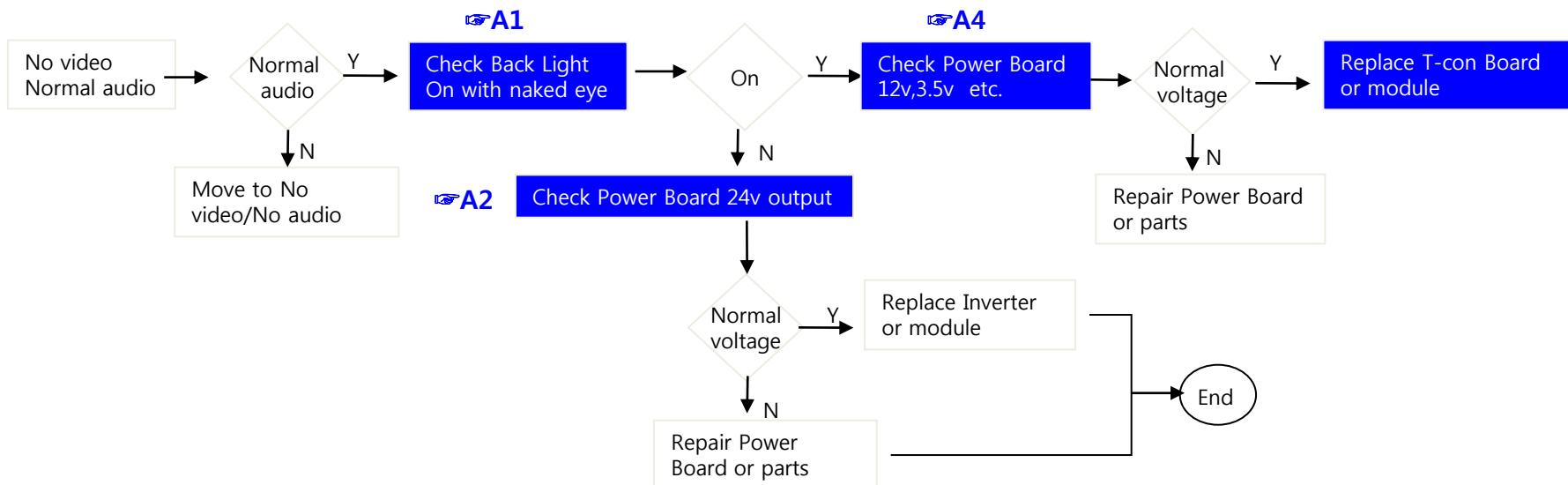
No.	Error symptom (High category)	Error symptom (Mid category)	Page	Remarks
1	A. Video error	No video/Normal audio	1	
2		No video/No audio	2	
3		Tuning fail, Picture broken/ Freezing	3, 4	
4		Color error	5	
5		Vertical/Horizontal bar, residual image, light spot, external device color error	6	
6	B. Power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

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

## Standard Repair Process

LCD TV	Error symptom	A. Video error	Established date	2012. 01 .14	
		No video/ Normal audio	Revised date		1/14

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



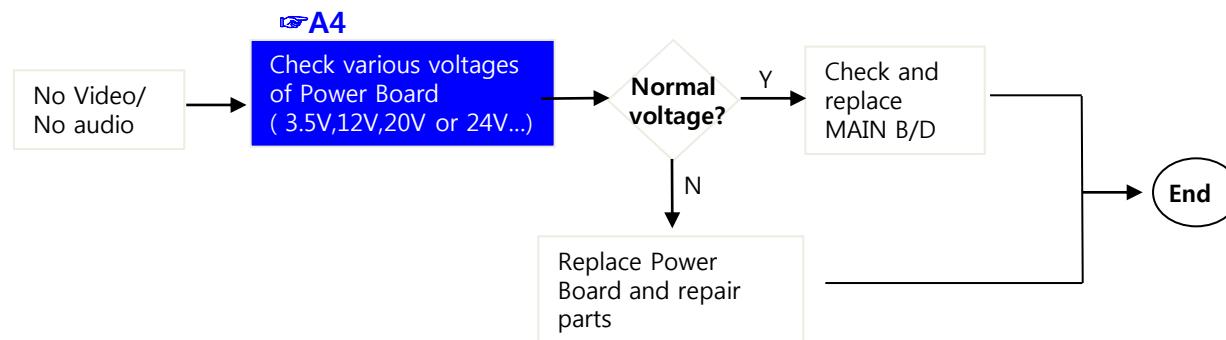
### ※Precaution ☞A6 & A3

Always check & record S/W Version and White Balance value before replacing the Main Board

→ Replace Main Board → Re-enter White Balance value

## Standard Repair Process

LCD TV	Error symptom	A. Video error No video/ No audio	Established date 2012 . 01 .14	
			Revised date	2/14



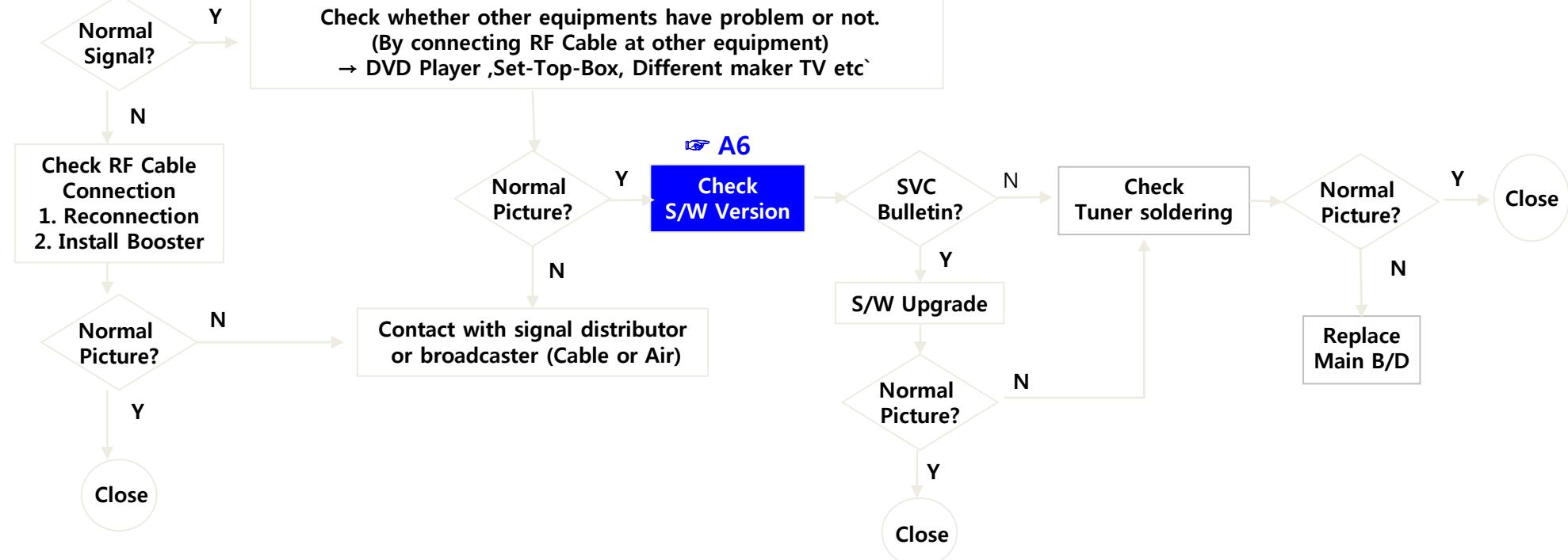
## Standard Repair Process

LCD TV	Error symptom	A. Video error Picture broken/ Freezing	Established date 2012. 01 .14	Revised date	3/14
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☞ A5

### Check RF Signal level

- . By using Digital signal level meter
- . By using Diagnostics menu on OSD  
( Menu→ Set up→ Support → Signal Test )
- Signal strength (Normal : over 50%)
- Signal Quality (Normal: over 50%)



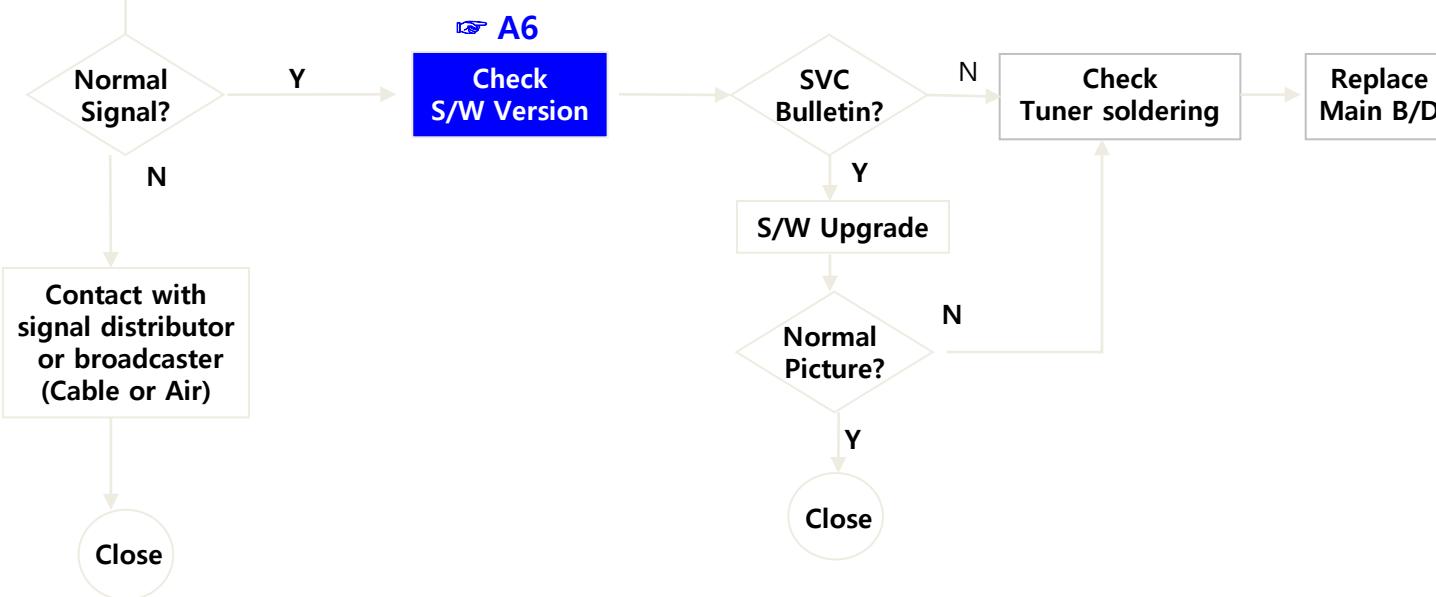
## Standard Repair Process

LCD TV	Error symptom	A. Video error Tuning fail, Picture broken/ Freezing	Established date	2012. 01 .14	
			Revised date		4/14

☞ A5

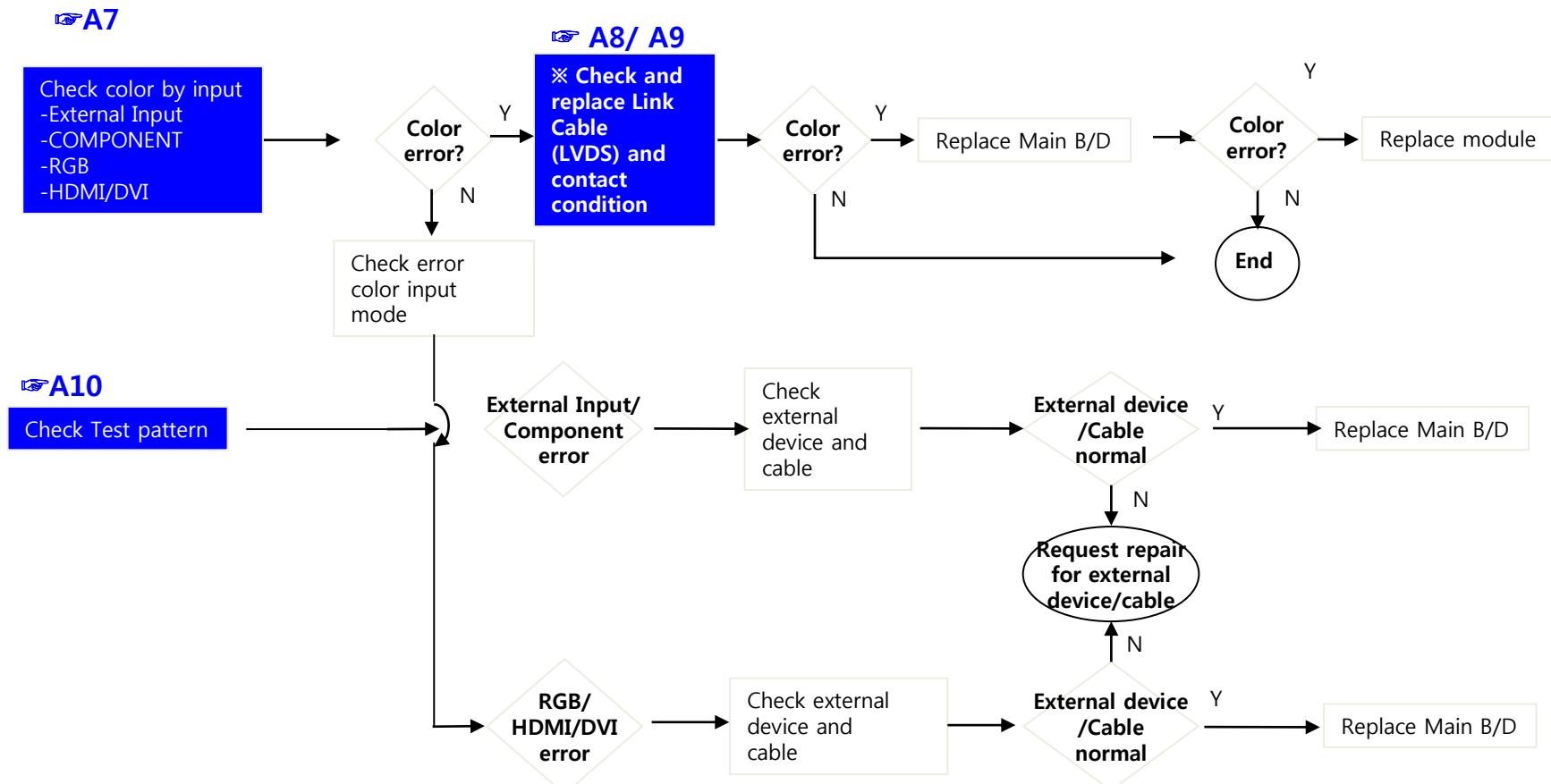
Check RF Signal level

Check RF signal cable  
 Check whether other equipments have problem or not.  
 (By connecting RF Cable at other equipment)  
 → Set-Top-Box, Different maker TV etc



## Standard Repair Process

LCD TV	Error symptom	A. Video error	Established date	2012. 01 .14	
		Color error	Revised date		5/14



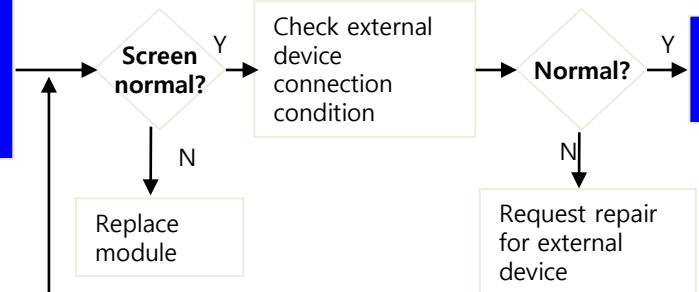
## Standard Repair Process

LCD TV	Error symptom	A. Video error Vertical / Horizontal bar, residual image, light spot, external device color error	Established date	2012. 01 .14	
			Revised date		6/14

Vertical/Horizontal bar, residual image, light spot

☞ A7

Check color condition by input  
-External Input  
-Component  
-RGB  
-HDMI/DVI



☞ A8/ A9

Check and replace Link Cable

Screen normal?

Replace Main B/D

Replace Module

N

Screen normal?

End

Y

☞ A10

Check Test pattern

External device screen error-Color error

Check S/W Version

Check version

N

S/W Upgrade

Normal screen?

N

End

Check screen condition by input  
-External Input  
-Component  
-RGB  
-HDMI/DVI

External Input error

Component error

RGB error

HDMI/ DVI

Connect other external device and cable  
(Check normal operation of External Input, Component, RGB and HDMI/DVI by connecting Jig, pattern Generator ,Set-top Box etc.

Connect other external device and cable  
(Check normal operation of External Input, Component, RGB and HDMI/DVI by connecting Jig, pattern Generator ,Set-top Box etc.

Screen normal?

Replace Main B/D

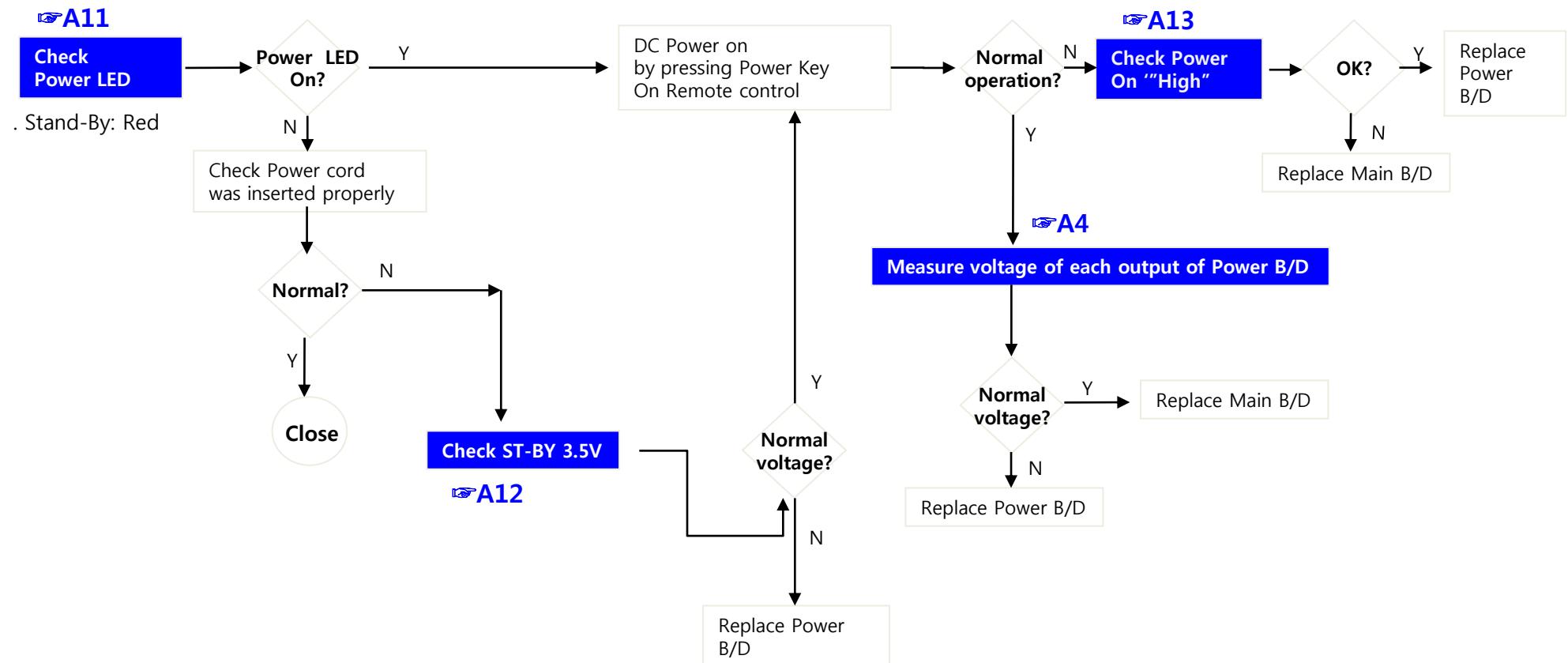
Request repair for external device

Screen normal?

Replace Main B/D

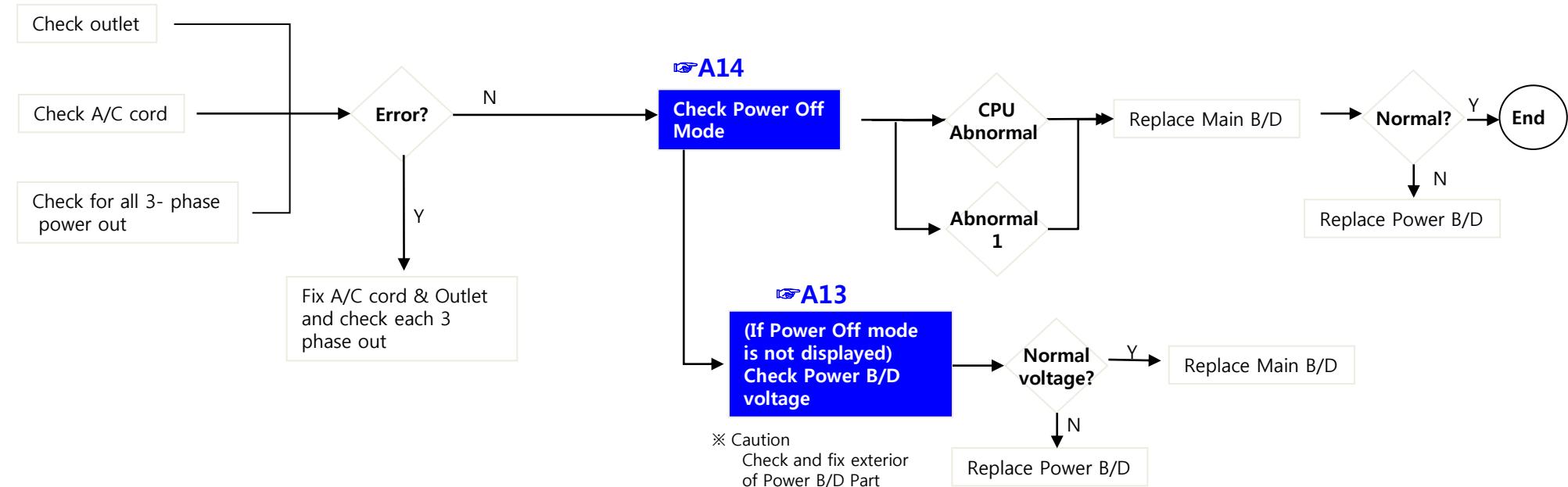
## Standard Repair Process

LCD TV	Error symptom	B. Power error	Established date	2012. 01 .14	
		No power	Revised date		7/14



## Standard Repair Process

LCD TV	Error symptom	B. Power error	Established date	2012. 01 .14	
		Off when on, off while viewing, power auto on/off	Revised date		8/14

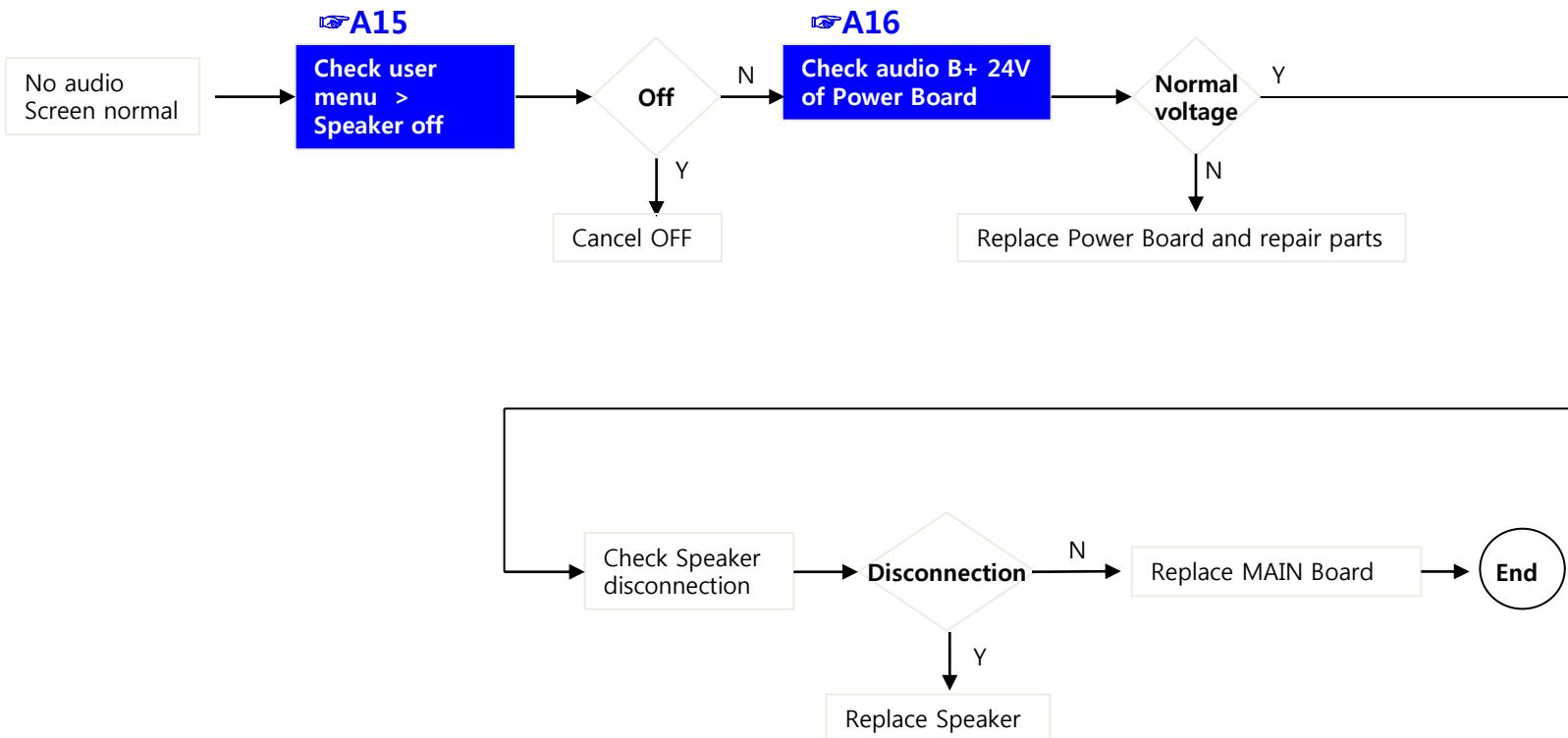


\* Please refer to the all cases which can be displayed on power off mode.

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

## Standard Repair Process

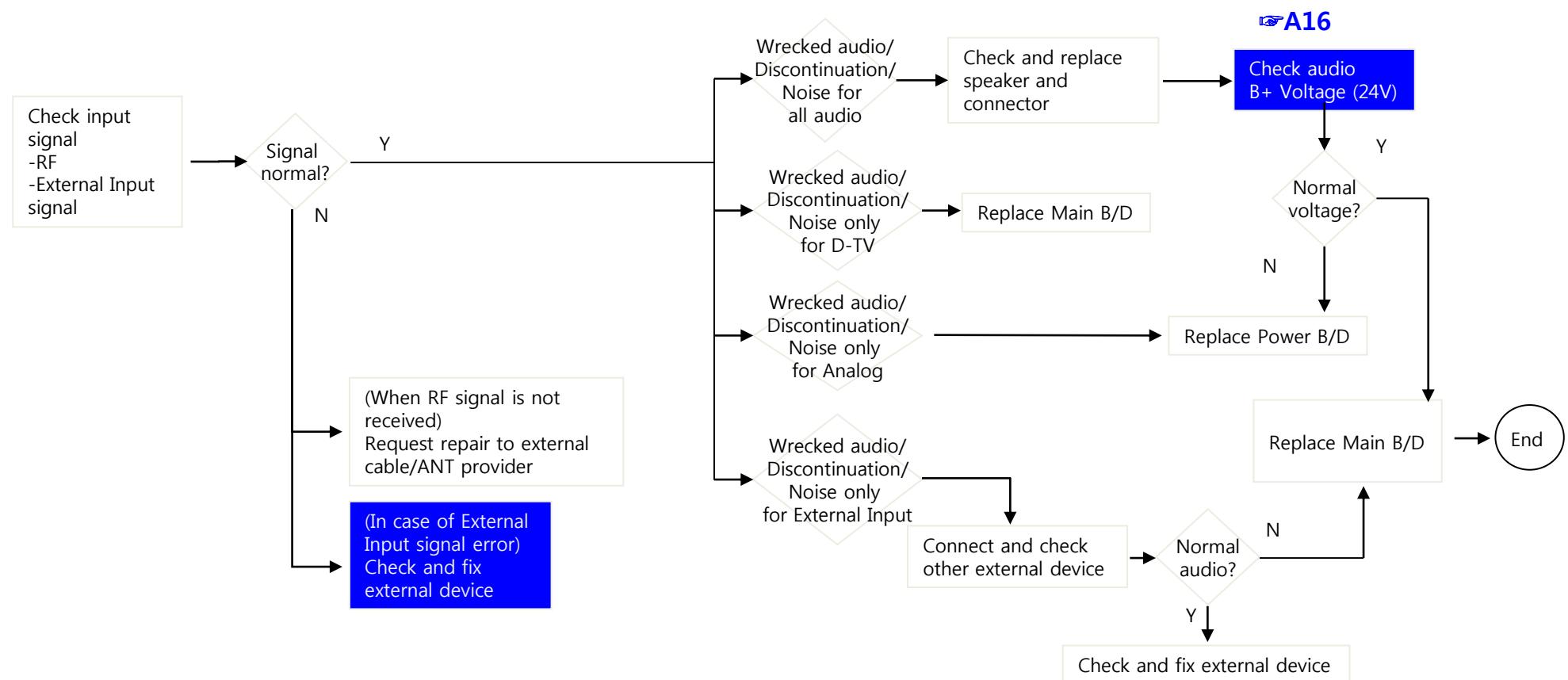
LCD TV	Error symptom	C. Audio error	Established date	2012. 01 .14	
		No audio/ Normal video	Revised date		9/14



## Standard Repair Process

LCD TV	Error symptom	C. Audio error	Established date	2012. 01 .14	
		Wrecked audio/ discontinuation/noise	Revised date		10/14

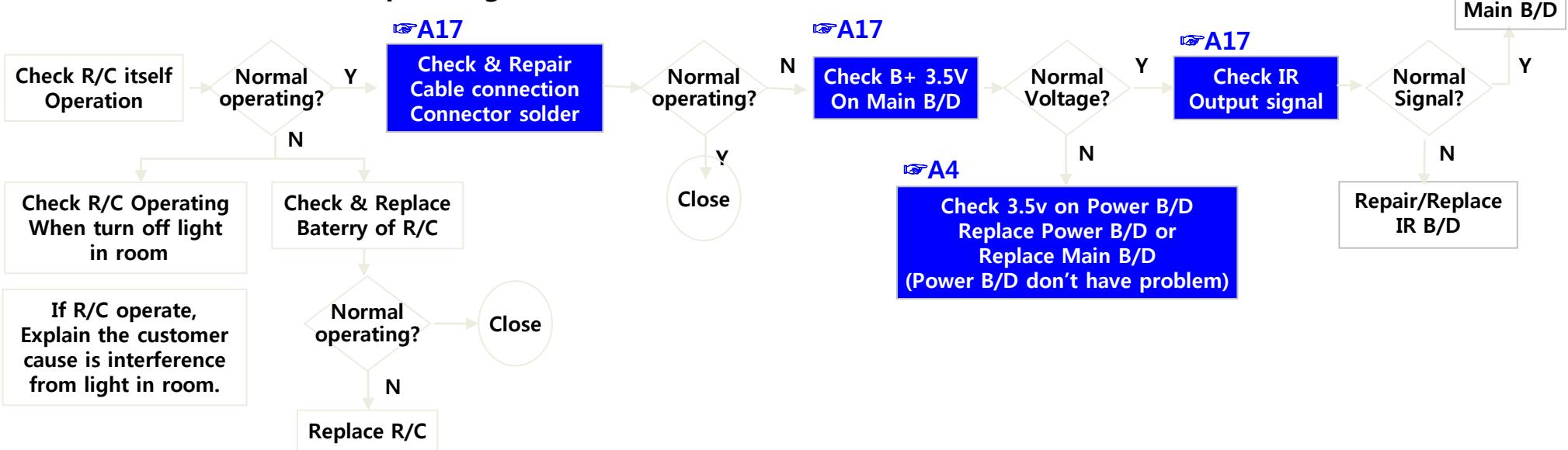
→ abnormal audio/discontinuation/noise is same after "Check input signal" compared to No audio



## Standard Repair Process

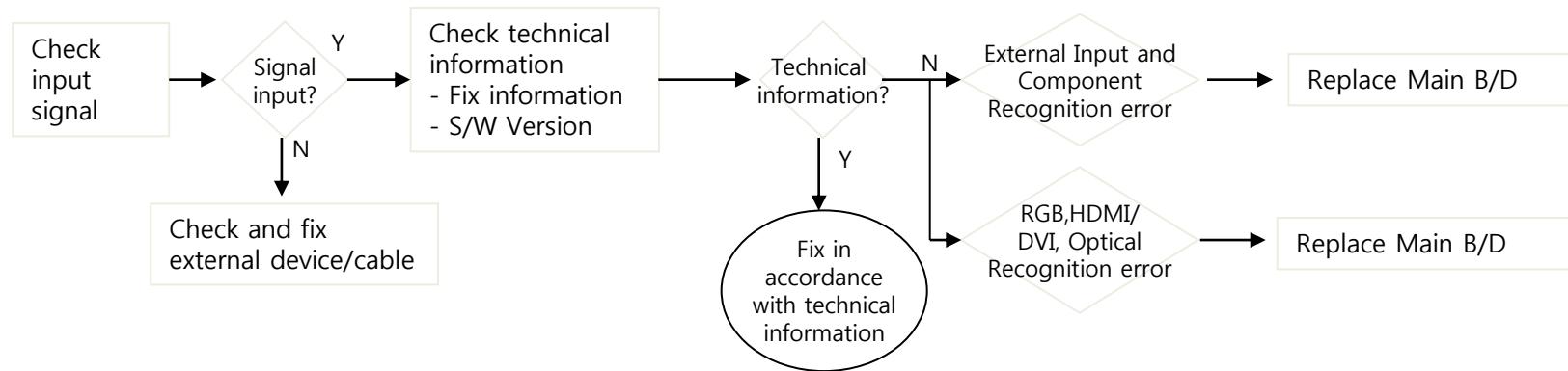
LCD TV	Error symptom	D. Function error	Established date	2012. 01 .14	
		Remote control & Local switch checking	Revised date		11/14

### 1. Remote control(R/C) operating error



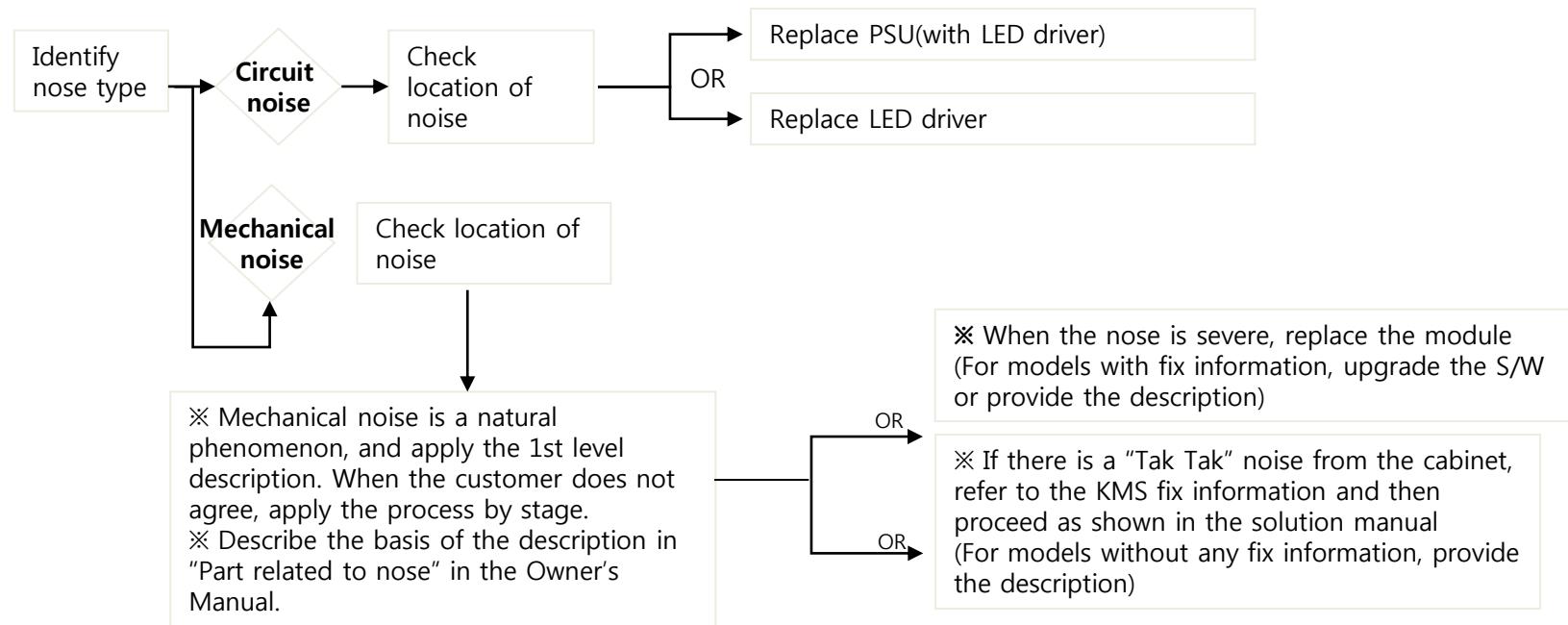
## Standard Repair Process

LCD TV	Error symptom	D. Function error External device recognition error	Established date 2012. 01 .14	Revised date 12/14
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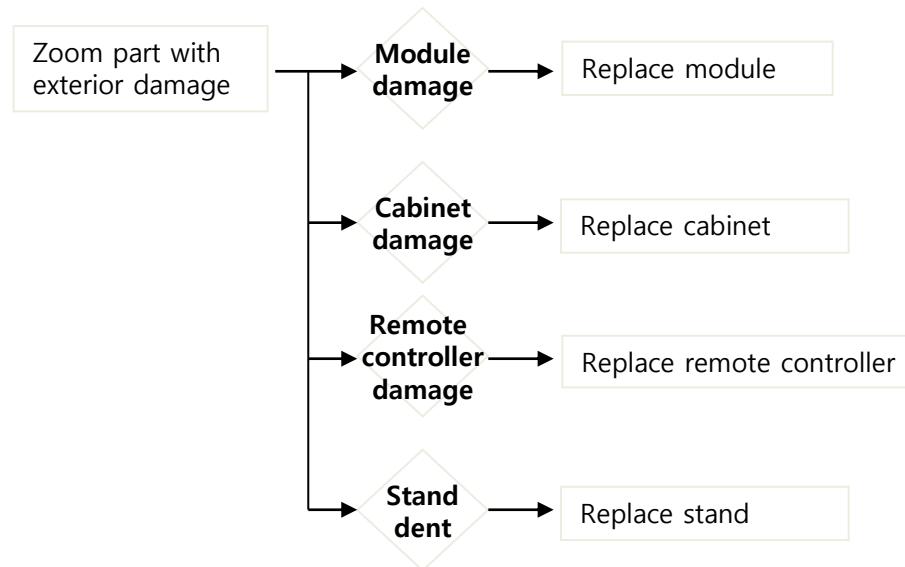
## Standard Repair Process

LCD TV	Error symptom	E. Noise Circuit noise, mechanical noise	Established date 2012. 01 .14	Revised date 13/14
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## Standard Repair Process

LCD TV	Error symptom	F. Exterior defect	Established date	2012. 01 .14	
		Exterior defect	Revised date		14/14



# Contents of LCD TV Standard Repair Process Detail Technical Manual

No.	Error symptom	Content	Page	Remarks
1	A. Video error_ No video/Normal audio	Check LCD back light with naked eye	A1	
2		LED driver B+ 24V measuring method	A2	
3		Check White Balance value	A3	
4		Power Board voltage measuring method	A4	
6	A. Video error_ No video/Video lag/stop	TUNER input signal strength checking method	A5	
7		LCD-TV Version checking method	A6	
9	A. Video error_Color error	LCD TV connection diagram	A7	
10		Check Link Cable (LVDS) reconnection condition	A8 A9	
11		Adjustment Test pattern - ADJ Key	A10	
12		LCD TV connection diagram	A8	
13	A. Video error_Vertical/Horizontal bar, residual image, light spot	Check Link Cable (LVDS) reconnection condition	A8 A9	
14		Adjustment Test pattern - ADJ Key	A10	
15		Exchange T-Con Board (1)	A-1/5	
16	<Appendix> Defected Type caused by T-Con/ Inverter/ Module	Exchange T-Con Board (2)	A-2/5	
17		Exchange LED driver Board (PSU)	A-3/5	55" : driver board Other : PSU
18		Exchange Module itself (1)	A-4/5	
19		Exchange Module itself (2)	A-5/5	
20				

Continue to the next page

# Contents of LCD TV Standard Repair Process Detail Technical Manual

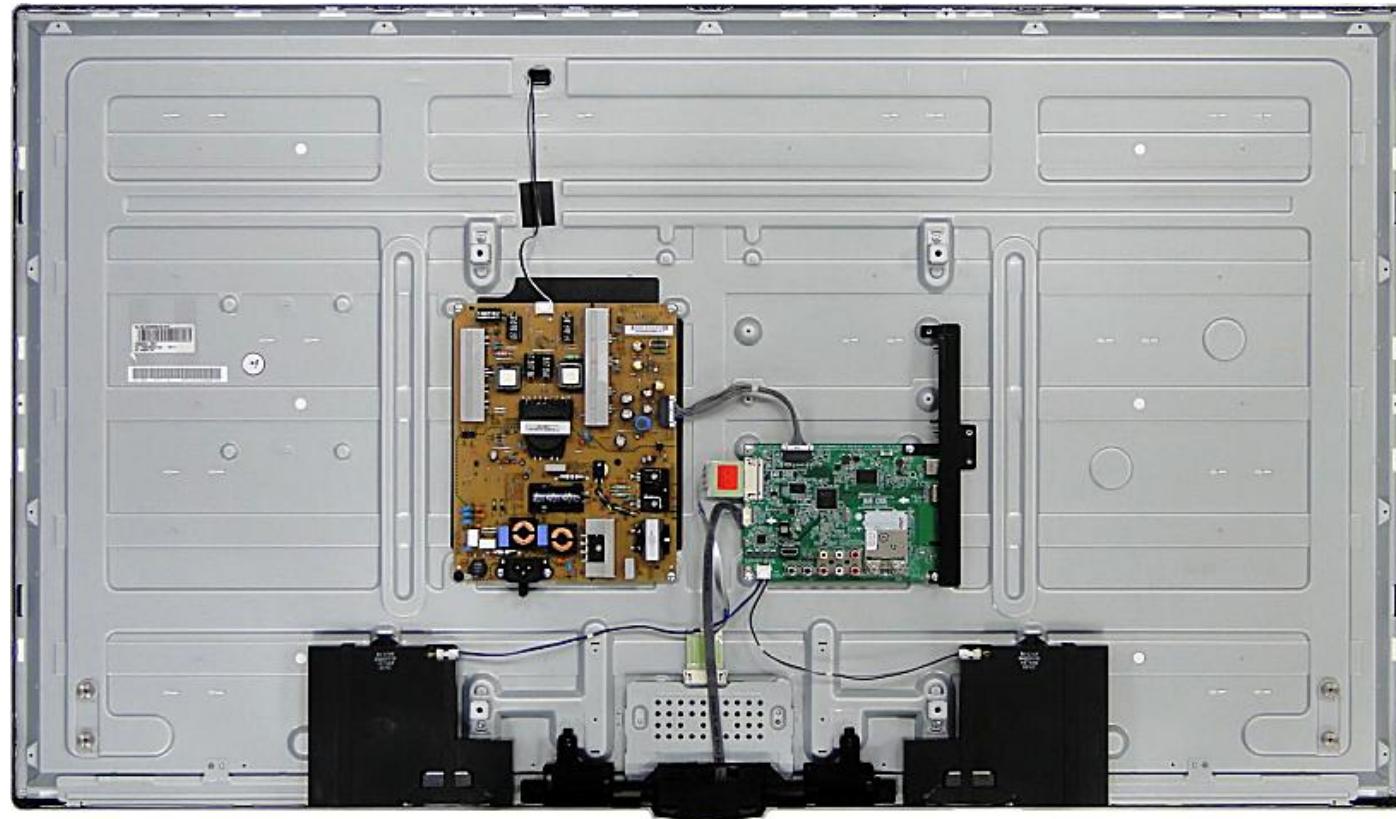
Continued from previous page

No.	Error symptom	Content	Page	Remarks
21	B. Power error_No power	Check front display LED	A11	
22		Check power input Voltage & ST-BY 3.5V	A12	
23		Checking method when power is ON	A13	
24		POWER BOARD voltage measuring method	A4	
25				
26	B. Power error_Off when on, off while viewing	POWER OFF MODE checking method	A14	
28	C. Audio error_No audio/Normal video	Checking method in menu when there is no audio	A15	
29		Voltage and speaker checking method when there is no audio	A16	
30	C. Audio error_Wrecked audio/discontinuation	Voltage and speaker checking method in case of audio error	A16	
31	D. Function error_ No response in remote controller, key error	Remote controller operation checking method	A17	

# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error_No video/Normal audio	Established date	2012. 01.14	
	Content	Check Back Light On with naked eye	Revised date		A1

<ALL MODELS>

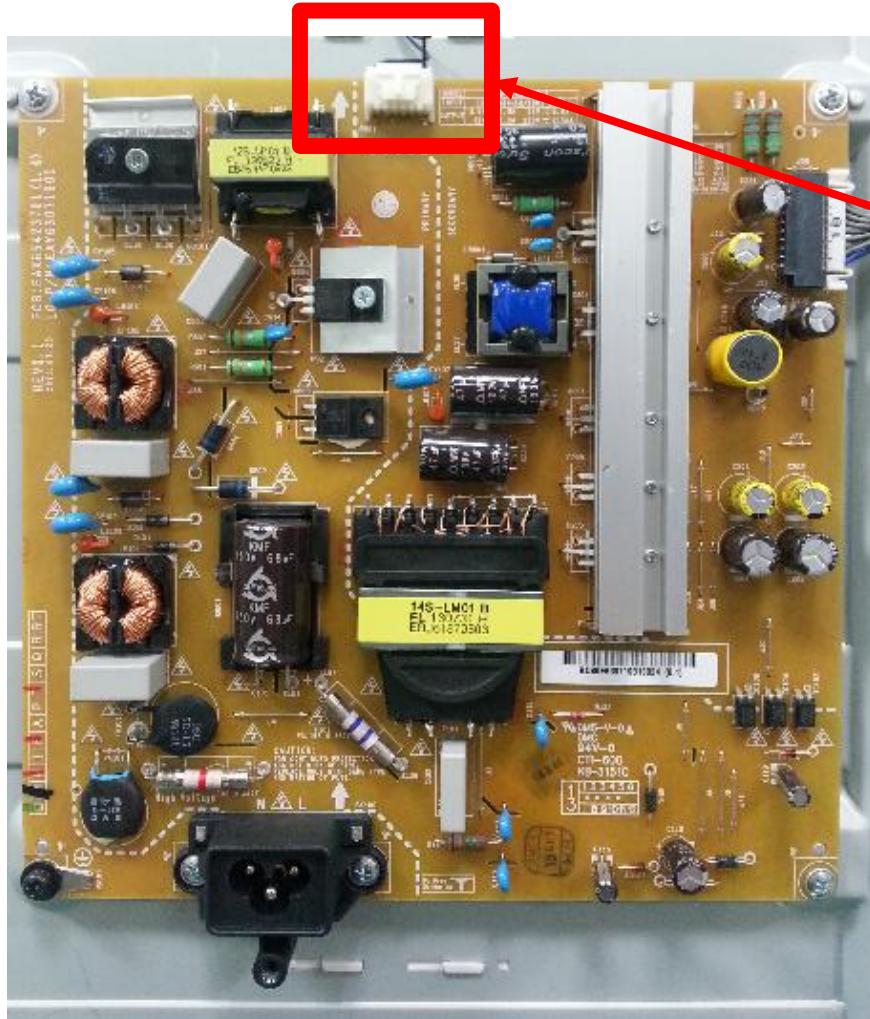


Power On -> disjoint back case -> check lighting at any point

# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error_No video/Normal audio	Established date	2012. 11 .17	
	Content	Inverter B+ 24V measuring method	Revised date		A2

<LPB MODELS>



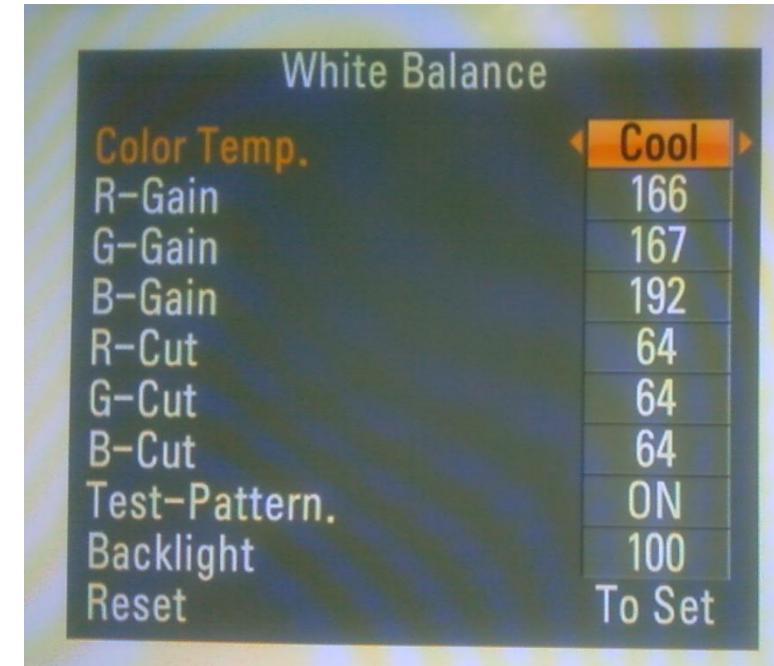
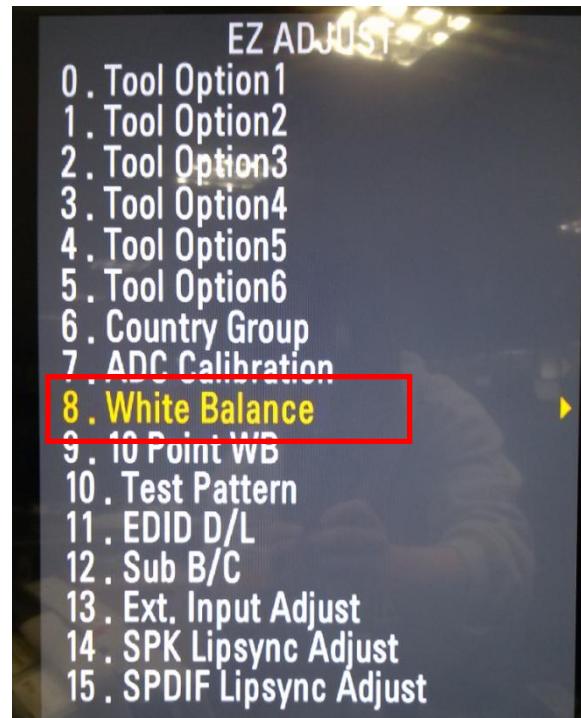
Measure LED+ applying to LED Back Light from Power Board.

Output LED+ from Power Board -> supply to LED B/L.  
Check Pin contacting statement and connection statement.

# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error_No video/Normal audio	Established date	2012. 11 .17	
	Content	Check White Balance value	Revised date		A3

<ALL MODELS>

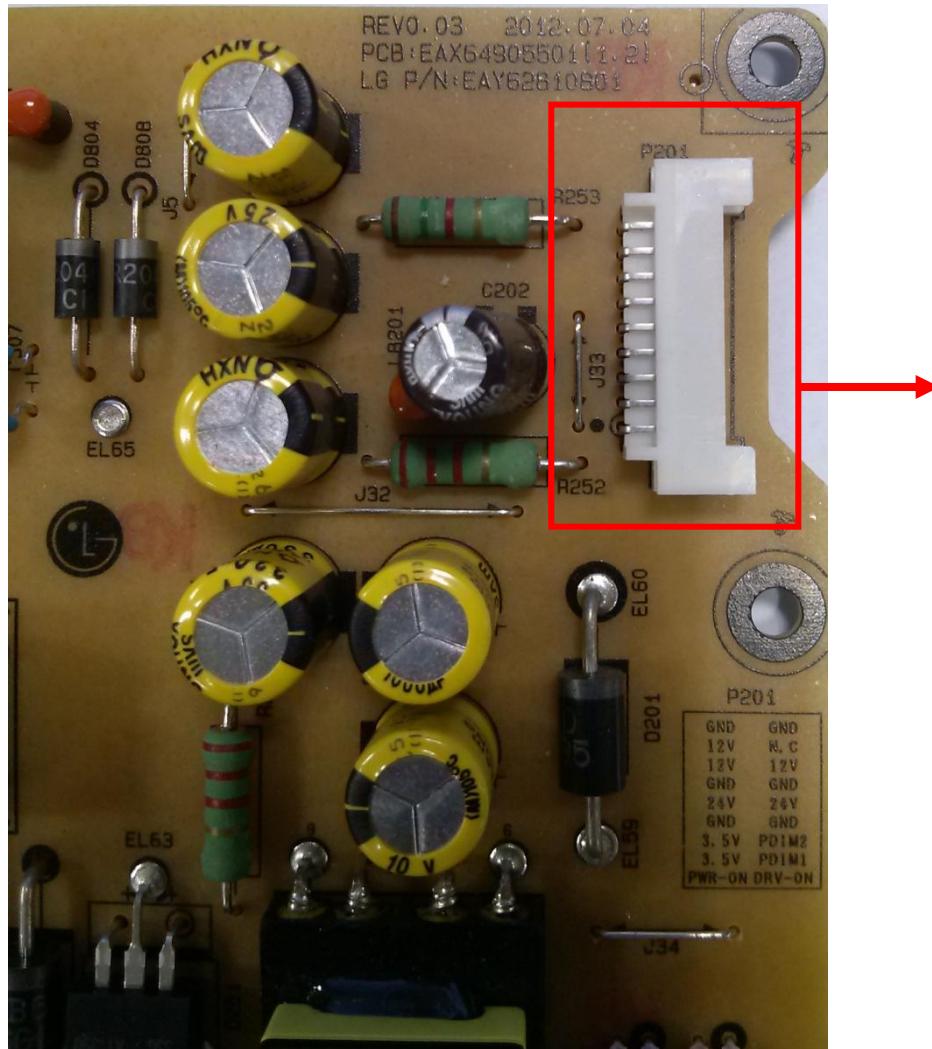


## Entry method

1. Press the ADJ button on the remote controller for adjustment.
2. Enter into White Balance of item 8.
3. After recording the R, G, B (GAIN, Cut) value of Color Temp (Cool/Medium/Warm), re-enter the value after replacing the MAIN BOARD.

# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error_No video/ Audio	Established date	2012. 11 .17	
	Content	Power Board voltage measuring method	Revised date		A4



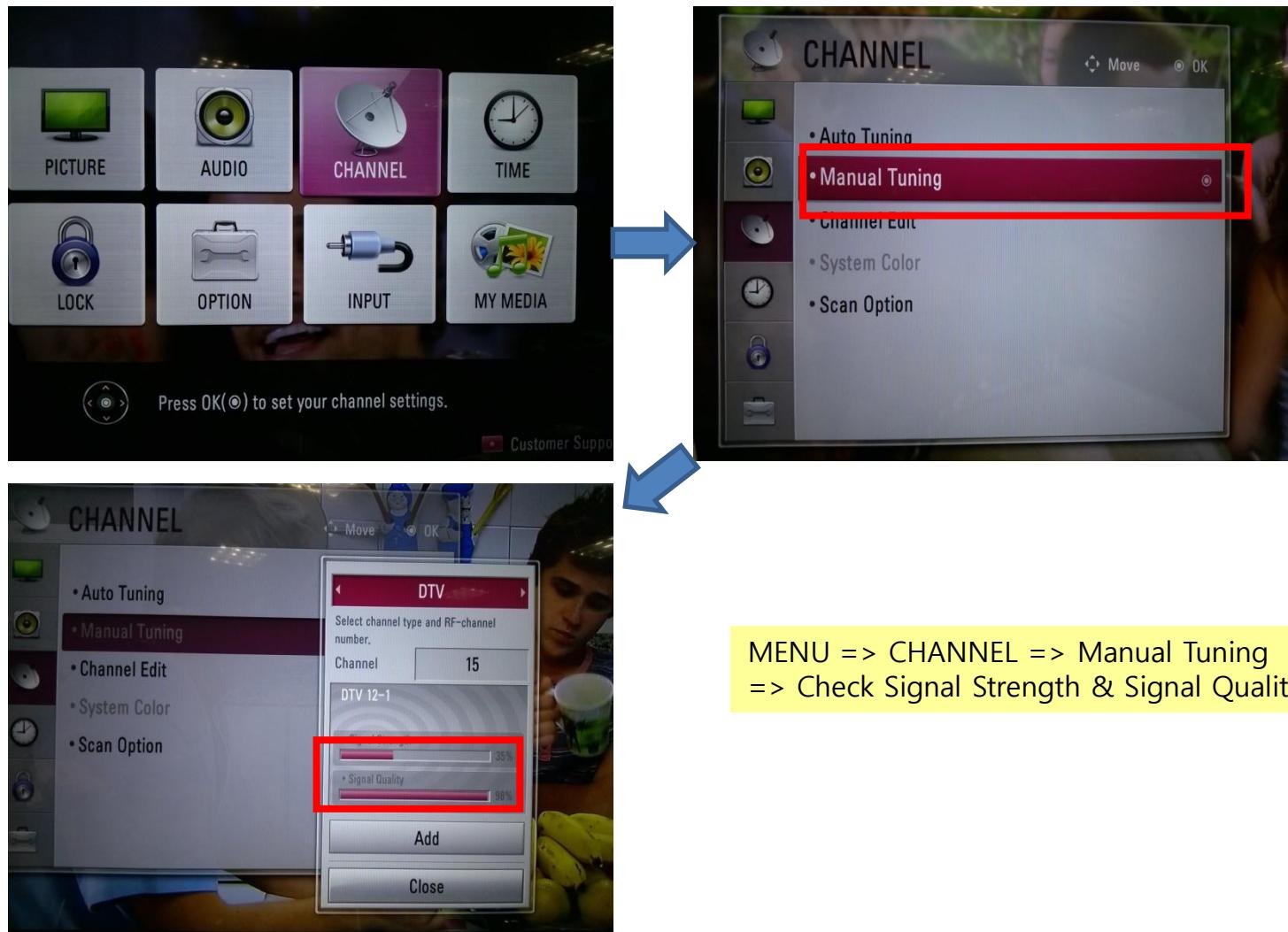
Check the DC 24V, 12V, 3.5V.

Power Board <-> Main Board			
1	PWR_ON	2	DRV_ON
3	3.5V	4	PDIM1
5	3.5V	6	3.5V
7	GND	8	PDIM2
9	24V	10	24V
11	GND	12	GND
13	12V	14	12V
15	12V	16	NC
17	GND	18	GND

# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error_Video error, video lag/stop	Established date	2012. 01 .14	
	Content	TUNER input signal strength checking method	Revised date		A5

<ALL MODELS>



MENU => CHANNEL => Manual Tuning  
=> Check Signal Strength & Signal Quality

# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error_Video error, video lag/stop	Established date	2012. 11 .17	
	Content	LCD-TV Version checking method	Revised date		A6

<ALL MODELS>

## 1. Checking method for remote controller for adjustment



Press the IN-START with the remote controller for adjustment

# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error _Vertical/Horizontal bar, residual image, light spot	Established date	2012. 11 .17	
	Content	LCD TV connection diagram (1)	Revised date		A7

<ALL MODELS>

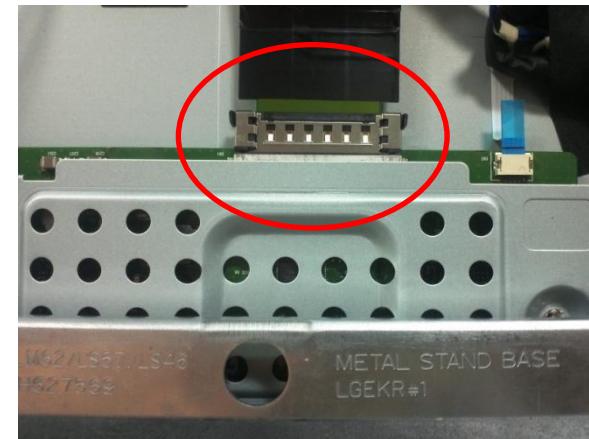
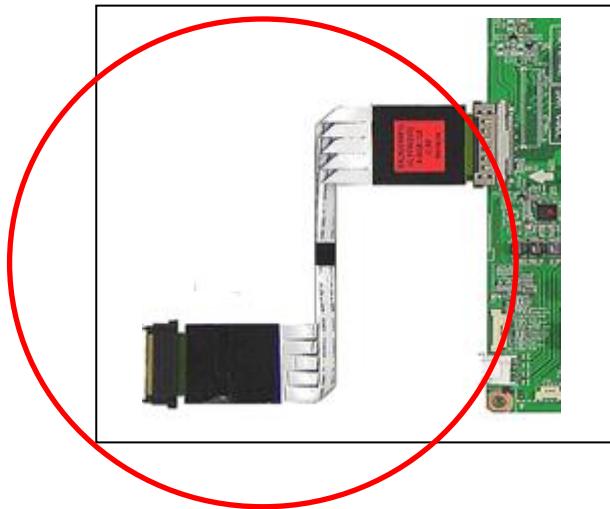


As the part connecting to the external input, check the screen condition by signal

# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error_Color error	Established date	2012. 01 .14	
	Content	Check and replace Link Cable(LVDS) and contact condition	Revised date		A8/A9

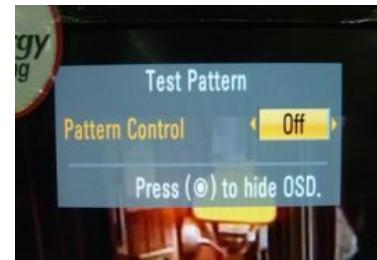
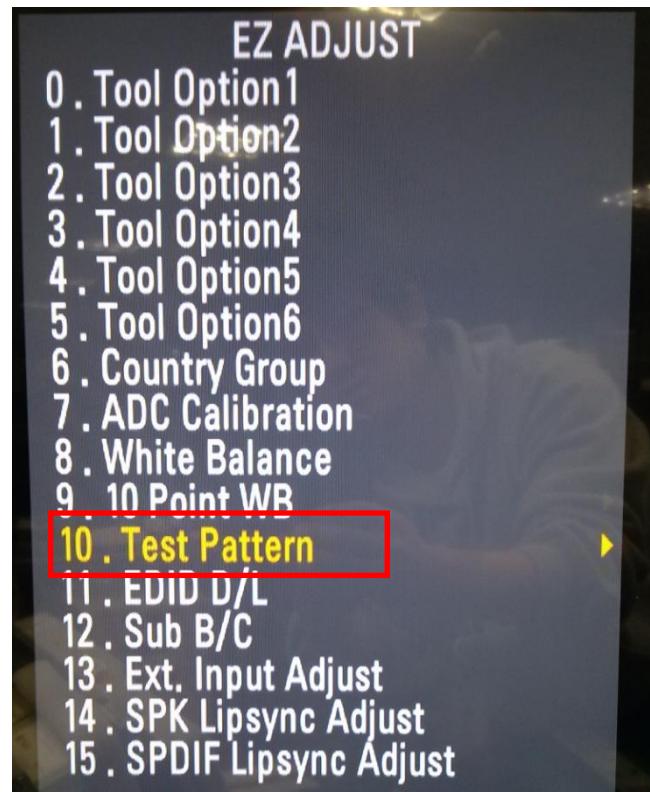
<ALL MODELS>



1. Check and replace LVDS Cable
2. Check LVDS connection condition

# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error_Color error	Established date	2012. 11 .17	
	Content	Adjustment Test pattern - ADJ Key	Revised date		A10



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!)

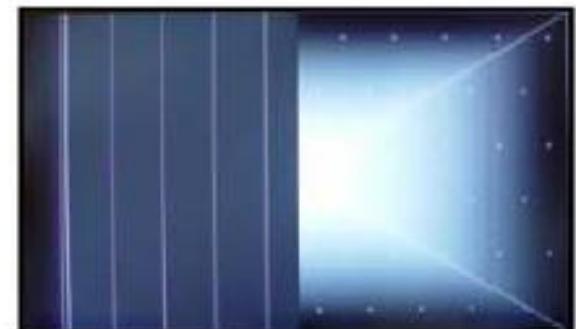
## Appendix : Exchange T-Con Board (1)



Solder defect, CNT Broken



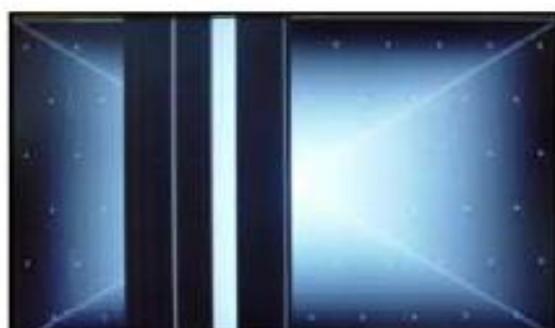
Solder defect, CNT Broken



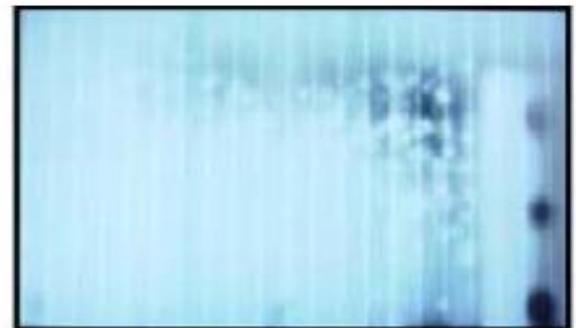
Solder defect, CNT Broken



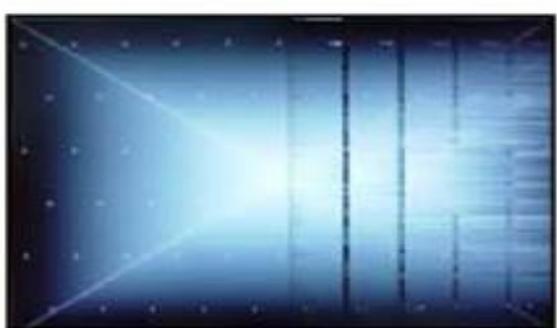
Solder defect, CNT Broken



Solder defect, CNT Broken



Abnormal Power Section



Solder defect, Short/Crack

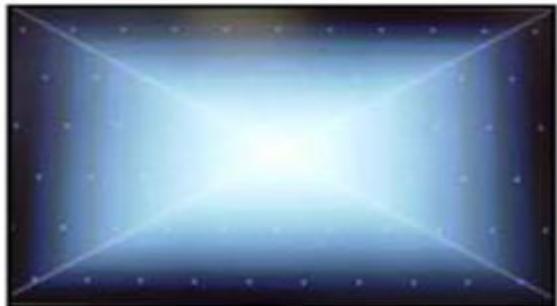


Abnormal Power Section



Solder defect, Short/Crack

## Appendix : Exchange T-Con Board (2)



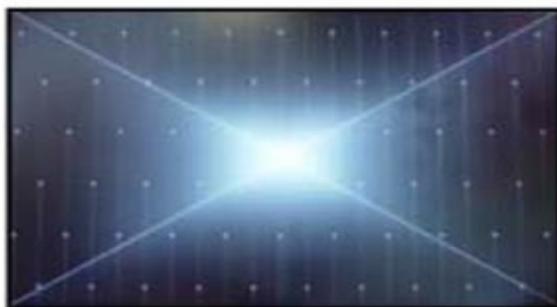
Abnormal Power Section



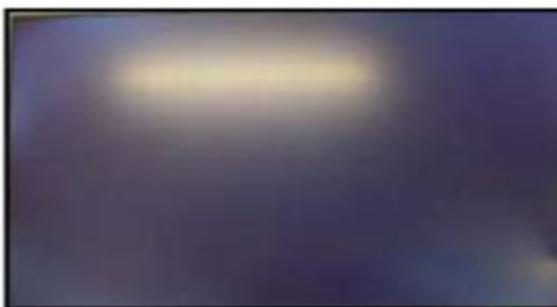
Abnormal Power Section



Solder defect, Short/Crack



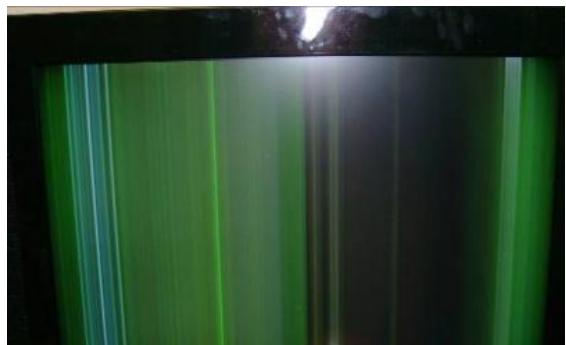
Solder defect, Short/Crack



Fuse Open, Abnormal power section



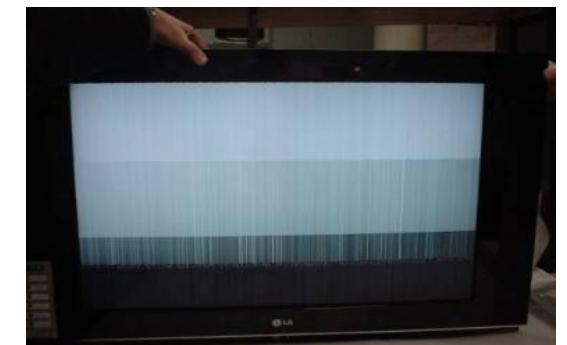
Abnormal Display



GRADATION



Noise



GRADATION

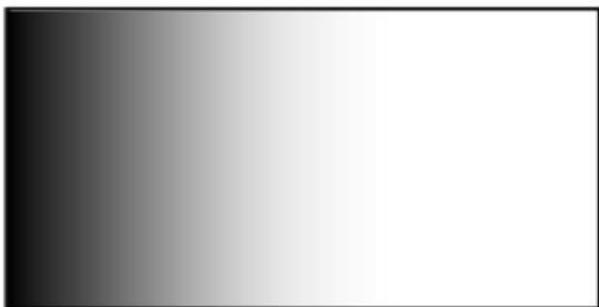
## Appendix : Exchange PSU(LED driver)



No Light



Dim Light



Dim Light



Dim Light



No picture/Sound Ok

## Appendix : Exchange the Module (1)



Panel Mura, Light leakage



Panel Mura, Light leakage



Press damage



Crosstalk



Press damage



Crosstalk

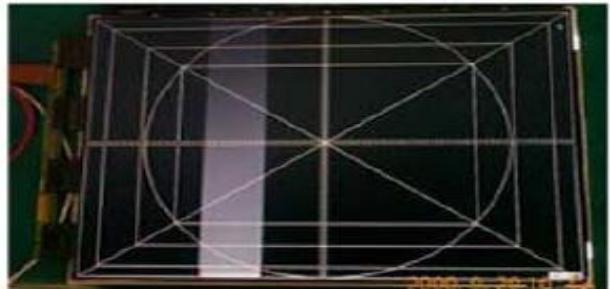


Press damage

### Un-repairable Cases

In this case please exchange the module.

## Appendix : Exchange the Module (2)



Vertical Block  
Source TAB IC Defect



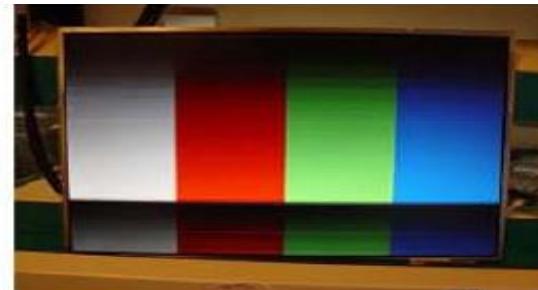
Vertical Line  
Source TAB IC Defect



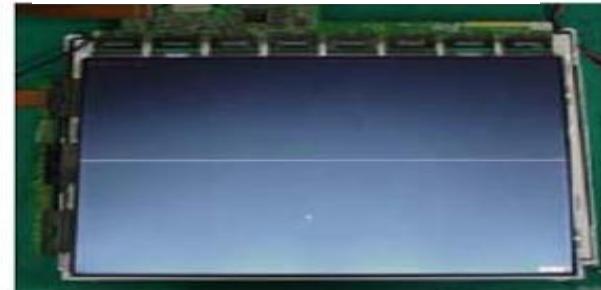
Vertical Block  
Source TAB IC Defect



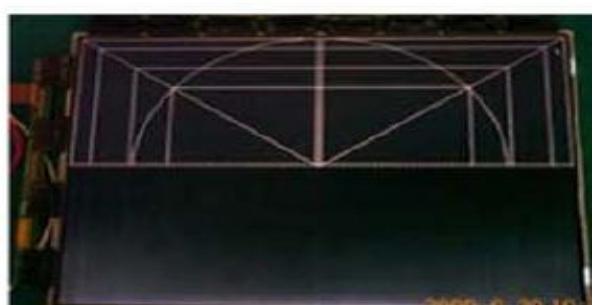
Horizontal Block  
Gate TAB IC Defect



Horizontal Block  
Gate TAB IC Defect



Horizontal line  
Gate TAB IC Defect

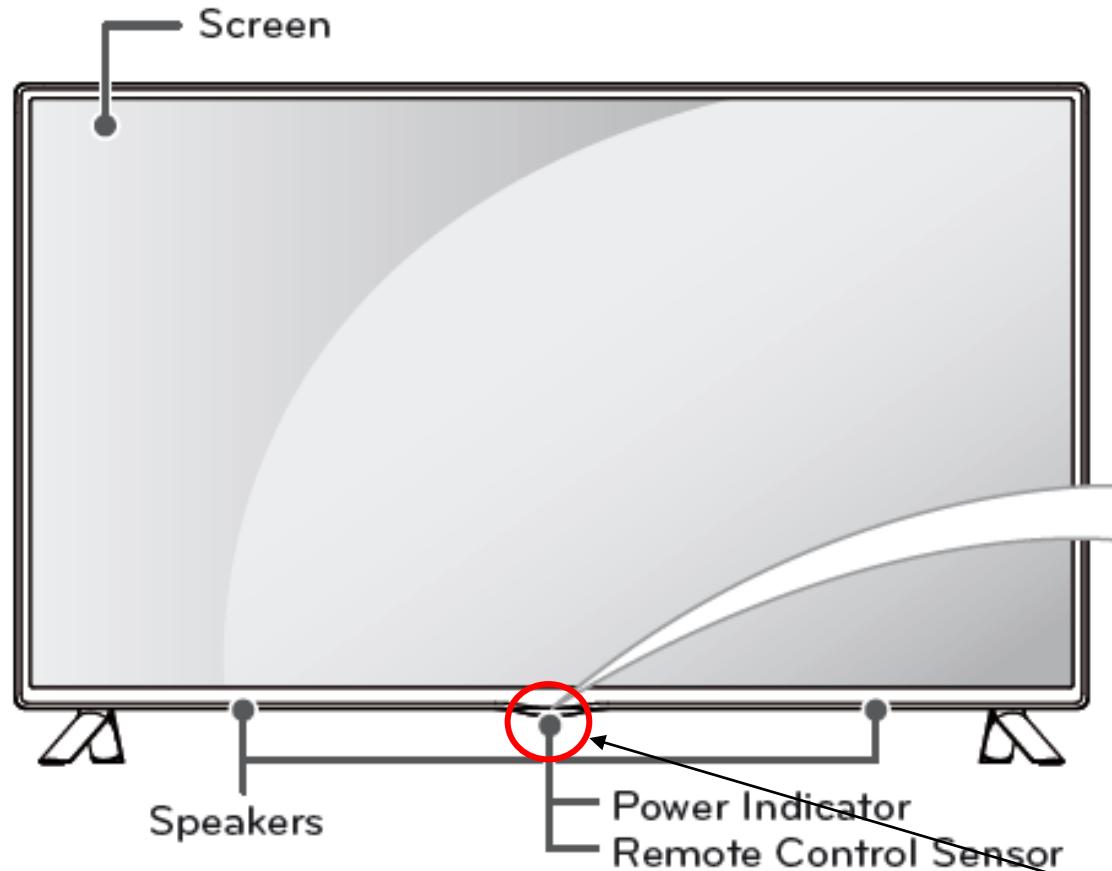


Horizontal Block  
Gate TAB IC Defect

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

# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	B. Power error _No power	Established date	2012. 11.17	
	Content	Check front display LED	Revised date		A11

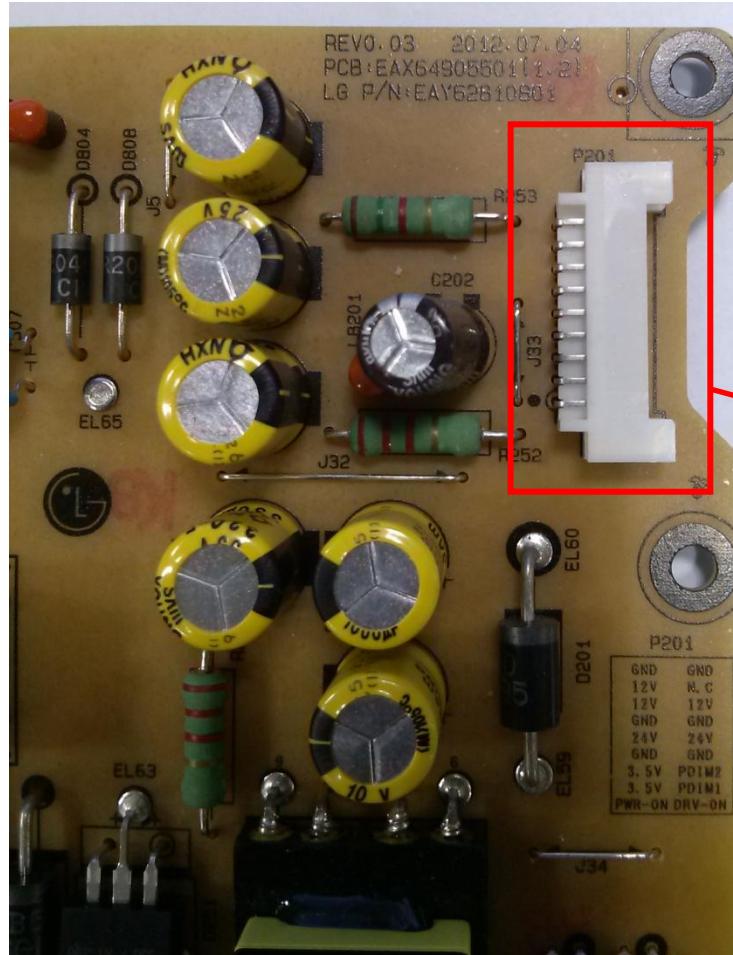


Front LED control :  
Menu → Option → Power Indicator  
→ Standby light ON

ST-BY condition: Red

# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	B. Power error _No power	Established date	2012. 11 .17	
	Content	Check power input voltage and ST-BY 3.5V	Revised date		A12

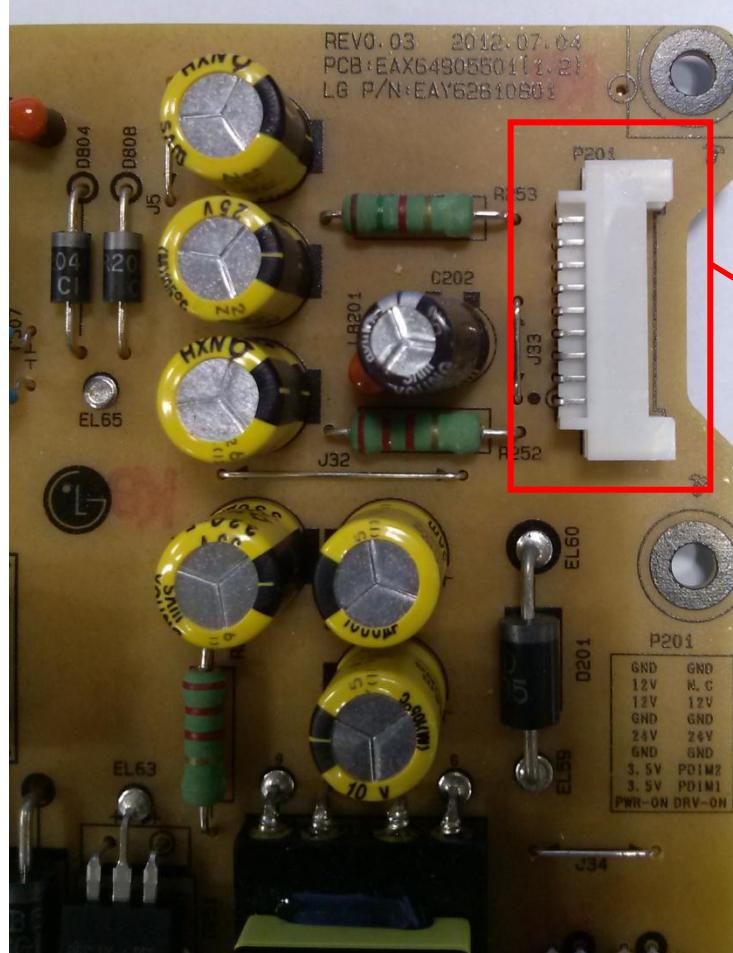


Check the DC 20V/24V, 12V, 3.5V.

18 Pin (Power Board ↔ Main Board) - 공통 (SMAW200-H18S5K) YEONHO			
Pin No.	Assignment	Pin No.	Assignment
1	Power on	2	DRV-ON
3	3.5V	4	P-DIM1
5	3.5V	6	3.5V
7	GND	8	P-DIM2
9	24V	10	24V
11	GND	12	GND
13	12V	14	12V
15	12V	16	N.C
17	GND	18	GND

# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	B. Power error _No power	Established date	2012. 11 .17	
	Content	Checking method when power is ON	Revised date		A13



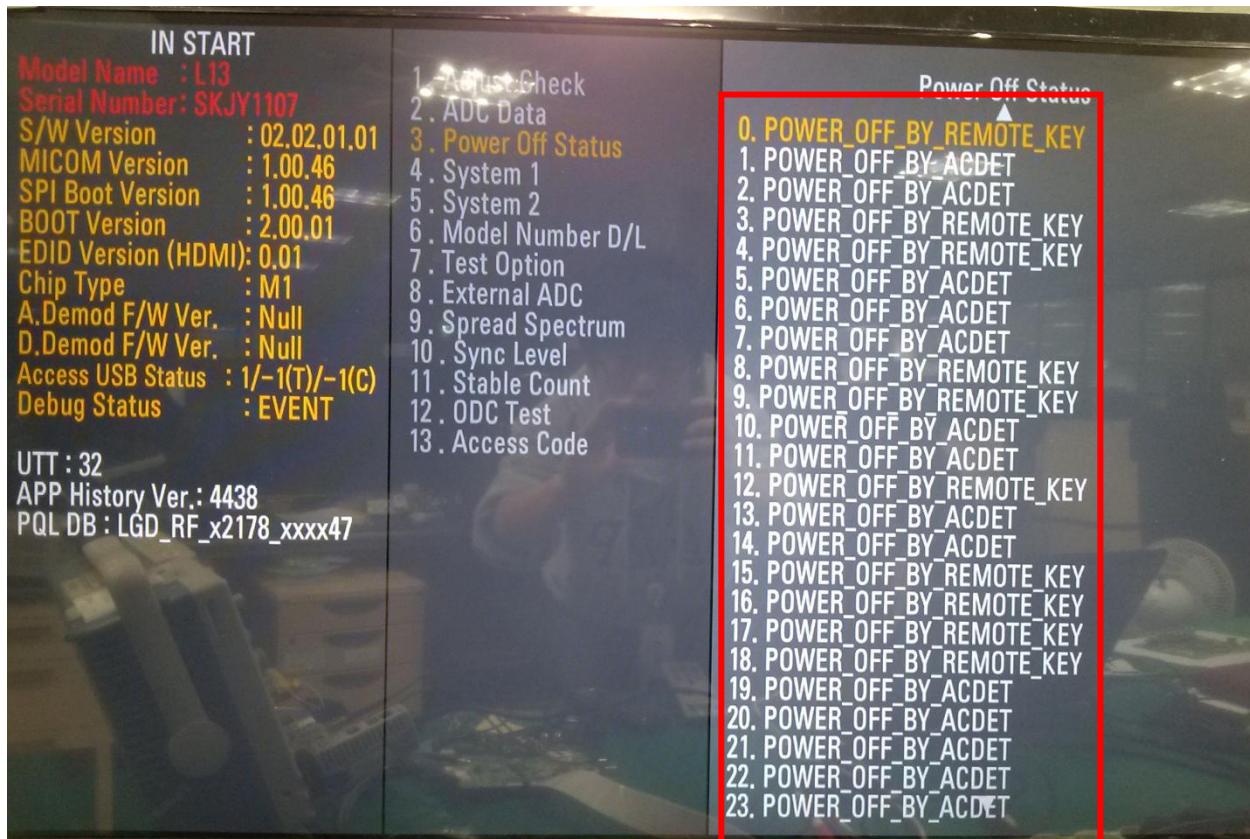
Check "power on(Pin 1)" pin is high(about 3.3V)

18 Pin (Power Board ↔ Main Board) - 공통 (SMAW200-H18S5K) YEONHO			
Pin No.	Assignment	Pin No.	Assignment
1	Power on	2	DRV-ON
3	3.5V	4	P-DIM1
5	3.5V	6	3.5V
7	GND	8	P-DIM2
9	24V	10	24V
11	GND	12	GND
13	12V	14	12V
15	12V	16	N.C
17	GND	18	GND

# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	B. Power error _Off when on, off whiling viewing	Established date	2012. 11 .17	
	Content	POWER OFF MODE checking method	Revised date		A14

< Low models >



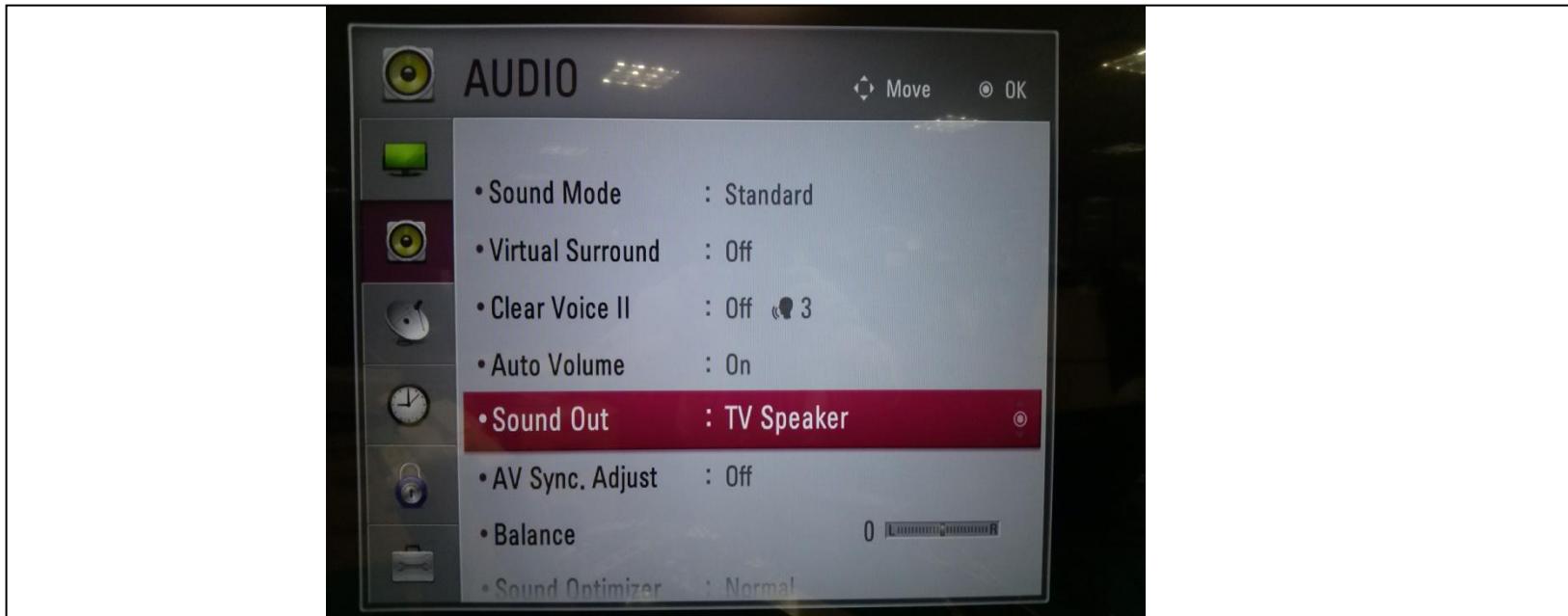
## Entry method

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

# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	C. Audio error_No audio/Normal video	Established date	2012. 01 .14	
	Content	Checking method in menu when there is no audio	Revised date		A15

<LA613x>



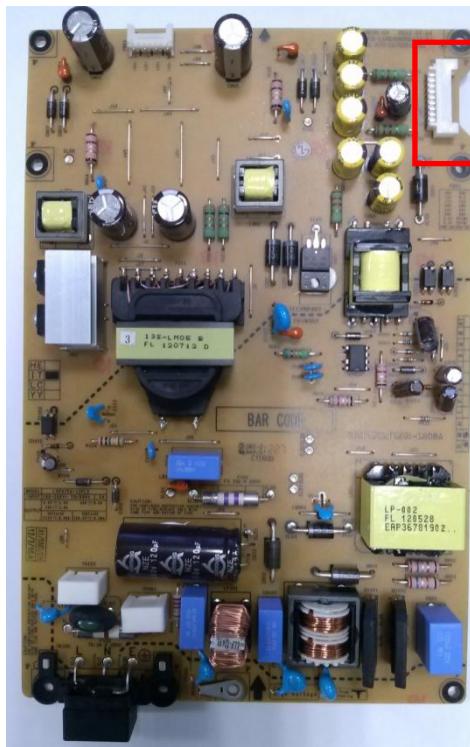
## Checking method

1. Press the MENU button on the remote controller
2. Select the AUDIO function of the Menu
3. Select TV Speaker from Off to On

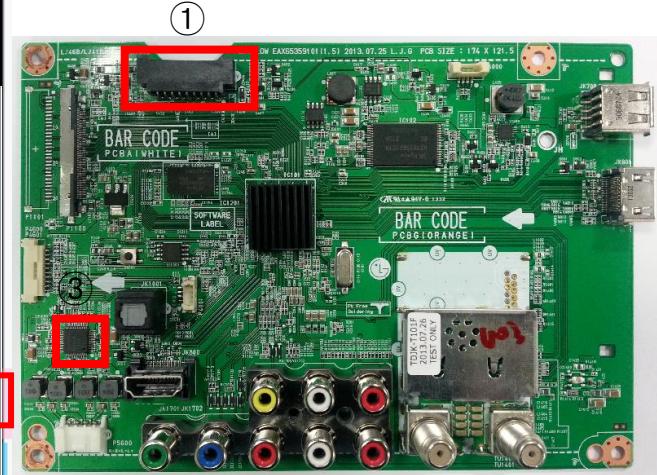
# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	C. Audio error_No audio/Normal video	Established date	2012. 11 .17	
	Content	Voltage and speaker checking method when there is no audio	Revised date		A16

<Low models>



18 Pin (Power Board ↔ Main Board) - 공통 (SMAW200-H18S5K) YEONHO			
Pin No.	Assignment	Pin No.	Assignment
1	Power on	2	DRV-ON
3	3.5V	4	P-DIM1
5	3.5V	6	3.5V
7	GND	8	P-DIM2
9	24V	10	24V
11	GND	12	GND
13	12V	14	12V
15	12V	16	N.C
17	GND	18	GND



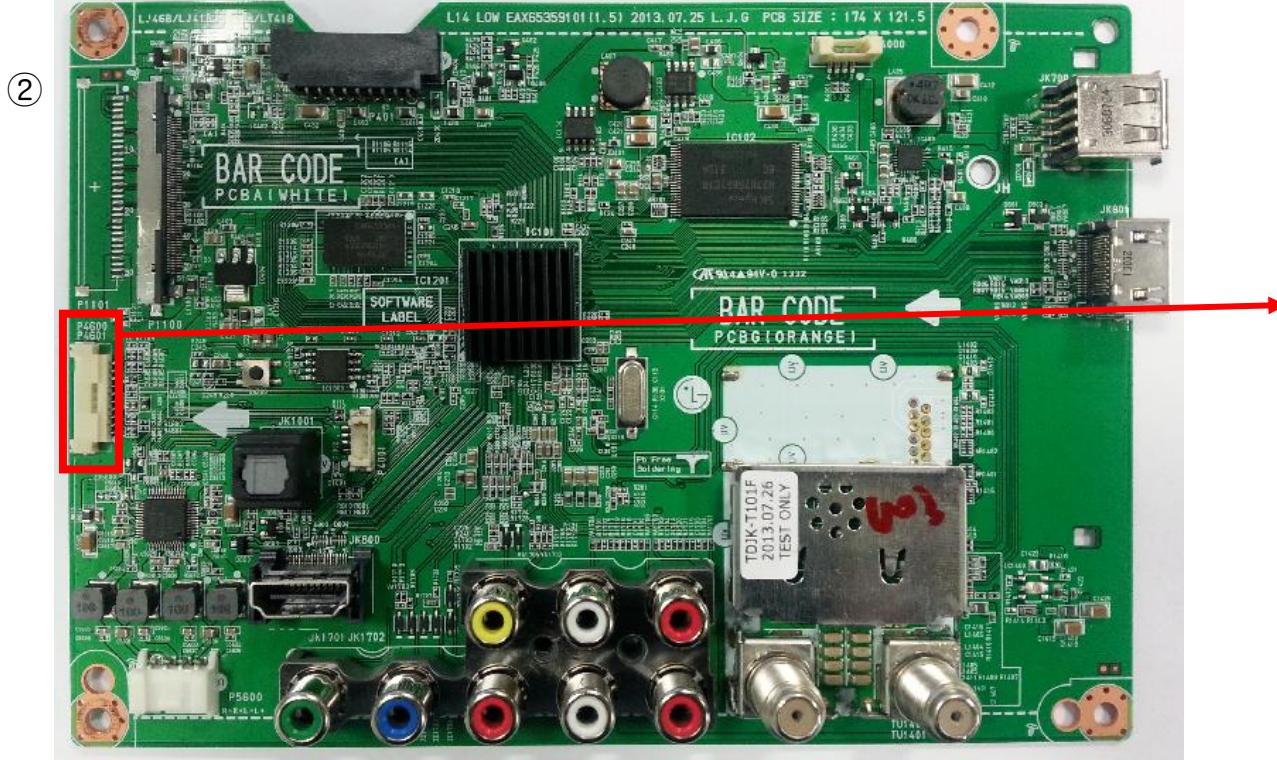
## Checking order when there is no audio

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

# Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	D. Function error_ No response in remote controller, key error	Established date	2012. 01 .14	
	Content	Remote controller operation checking method	Revised date		A17

< Low models >



P600	
1	GND
2	KEY1
3	KEY2
4	St 3.5V
5	GND
6	RED_LED
7	IR
8	GND

## Checking order

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