LED TV
SERVICE MANUAL

CHASSIS : LA33B
MODEL : 50LN5750/5710
50LN5750-UH/5710-UI

CAUTION
BEFORE SERVICING THE CHASSIS,
READ THE SAFETY PRECAUTIONS IN THIS MANUAL.
Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by △ in the Schematic Diagram and Exploded View.

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

Do not modify the original design without permission of manufacturer.

**General Guidance**

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

It will also protect the receiver and 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 MΩ and 5.2 MΩ.

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

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

**Leakage Current Hot Check circuit**

Plug the AC cord directly into the AC outlet.

Do not use a line Isolation Transformer during this check.

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

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

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

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

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

Plug the AC cord directly into the AC outlet.

Do not use a line Isolation Transformer during this check.

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

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

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

In case any measurement is out of the limits specified, there is possibility of shock hazard and the set must be checked and repaired before it is returned to the customer.
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 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 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
1) This spec sheet is applied all of the 32", 42", 47", 50", 55", 60" LED TV with LA33B chassis.

2. Test condition
Each part is tested as below without special notice.

1) Temperature : 25 °C ± 5 °C(77 ± 9 °F) , CST : 40 °C±5 °C
2) Relative Humidity: 65 % ± 10 %
3) Power Voltage

<table>
<thead>
<tr>
<th>Market</th>
<th>Input voltage</th>
<th>Frequency</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>110~240V</td>
<td>50/60Hz</td>
<td>Standard Voltage of each product is marked by models</td>
</tr>
</tbody>
</table>

4) Specification and performance of each parts are followed each drawing and specification by part number in accordance with BOM
5) The receiver must be operated for about 20 minutes prior to the adjustment

3. Test method
1) Performance: LGE TV test method followed
2) Demanded other specification
   - Safety : UL, CSA, IEC specification
   - EMC: FCC, ICES, IEC specification
### 4. General Specification

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<thead>
<tr>
<th>No</th>
<th>Item</th>
<th>Specification</th>
<th>Remark</th>
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<td>Television System</td>
<td>NTSC-M, ATSC, 64 &amp; 256 QAM</td>
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<td>3</td>
<td>Program Coverage</td>
<td>VHF 2-13, UHF 14-69, CATV 1-135</td>
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<td>DTV 2-69, CADTV 1-135</td>
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<td>Input Voltage</td>
<td>AC 100 ~ 240V 50/60Hz</td>
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<td>Available Channel</td>
<td>1) VHF : 02~13</td>
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<td>4) CATV : 01~135</td>
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<td>5) CADTV : 01~135</td>
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<td>Aspect Ratio</td>
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<td>LC420DUE-SFU1 LGD 42LA6200-UA, 42LA6205-UA</td>
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<td>LC470DUE-SFU1 LGD 47LA6200-UA, 47LA6205-UA</td>
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<td>LC550DUJ-SEK1 LGD 55LA6200-UA, 55LA6205-UA</td>
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<td>9</td>
<td>Operating Environment</td>
<td>1) Temp : 0 ~ 40 deg</td>
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<td>2) Humidity : ~ 80 %</td>
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<td>Storage Environment</td>
<td>1) Temp : -20 ~ 60 deg</td>
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<td></td>
<td></td>
<td>2) Humidity : ~ 85 %</td>
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*Only for training and service purposes*
5. Supported video resolutions

5.1. Component 2D input(Y, CB/PB, CR/PR)

<table>
<thead>
<tr>
<th>No</th>
<th>Resolution</th>
<th>H-freq(kHz)</th>
<th>V-freq.(Hz)</th>
<th>Pixel clock(MHz)</th>
<th>Proposed</th>
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<tbody>
<tr>
<td>1</td>
<td>720*480</td>
<td>15.73</td>
<td>60</td>
<td>13.5135</td>
<td>SDTV, DVD 480I</td>
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<td>2</td>
<td>720*480</td>
<td>15.73</td>
<td>59.94</td>
<td>13.5</td>
<td>SDTV, DVD 480I</td>
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<td>720*480</td>
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<td>60</td>
<td>27.027</td>
<td>SDTV 480P</td>
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<td>59.94</td>
<td>27.0</td>
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<td>5</td>
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<td>45.00</td>
<td>60.00</td>
<td>74.25</td>
<td>HDTV 720P</td>
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<tr>
<td>6</td>
<td>1280*720</td>
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<td>59.94</td>
<td>74.176</td>
<td>HDTV 720P</td>
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<td>7</td>
<td>1920*1080</td>
<td>33.75</td>
<td>60.00</td>
<td>74.25</td>
<td>HDTV 1080I</td>
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<td>8</td>
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<td>148.50</td>
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<td>1920*1080</td>
<td>67.432</td>
<td>59.94</td>
<td>148.352</td>
<td>HDTV 1080P</td>
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5.2. Component 3D input(Y, CB/PB, CR/PR)

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<thead>
<tr>
<th>No</th>
<th>Resolution</th>
<th>H-freq(kHz)</th>
<th>V-freq(kHz)</th>
<th>Pixel clock</th>
<th>3D input proposed mode</th>
<th>Proposed</th>
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<tbody>
<tr>
<td>1</td>
<td>1280*720</td>
<td>45.00</td>
<td>60.00</td>
<td>74.25</td>
<td>2D to 3D, Side by Side, Top and Bottom</td>
<td>HDTV 720P</td>
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<tr>
<td>2</td>
<td>1280*720</td>
<td>44.96</td>
<td>59.94</td>
<td>74.176</td>
<td>2D to 3D, Side by Side, Top and Bottom</td>
<td>HDTV 720P</td>
</tr>
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<td>3</td>
<td>1920*1080</td>
<td>33.75</td>
<td>60.00</td>
<td>74.25</td>
<td>2D to 3D, Side by Side, Top and Bottom</td>
<td>HDTV 1080I</td>
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<tr>
<td>4</td>
<td>1920*1080</td>
<td>33.72</td>
<td>59.94</td>
<td>74.176</td>
<td>2D to 3D, Side by Side, Top and Bottom</td>
<td>HDTV 1080I</td>
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</table>
### 5.3. HDMI Input (PC/DTV)

<table>
<thead>
<tr>
<th>No.</th>
<th>Resolution</th>
<th>H-freq(kHz)</th>
<th>V-freq.(kHz)</th>
<th>Pixel clock(MHz)</th>
<th>Proposed</th>
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<td>PC</td>
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<td>70.08</td>
<td>28.32</td>
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<td>31.469</td>
<td>59.94</td>
<td>25.17</td>
<td>VESA(VGA)</td>
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<td>800*600</td>
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<td>60.31</td>
<td>40.00</td>
<td>VESA(SVGA)</td>
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<td>5</td>
<td>1024*768</td>
<td>48.363</td>
<td>60.00</td>
<td>65.00</td>
<td>VESA(XGA)</td>
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<td>6</td>
<td>1152*864</td>
<td>54.348</td>
<td>60.053</td>
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<td>VESA</td>
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<td>7</td>
<td>1360*768</td>
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<tr>
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<td>60.00</td>
<td>74.25</td>
<td>HDTV 1080I</td>
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<td>33.72</td>
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<td>7</td>
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<td>10</td>
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<td>33.716</td>
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### 5.4. 3D HDMI Input (1.4b)

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<th>No.</th>
<th>Resolution</th>
<th>H-freq(kHz)</th>
<th>V-freq.(kHz)</th>
<th>Pixel clock(MHz)</th>
<th>3D input proposed mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>640*480</td>
<td>62.938 / 63</td>
<td>59.94 / 60</td>
<td>50.35/50.4</td>
<td>Side-by-side, Top-and-Bottom, Checkerboard, Row Interleaving, Column Interleaving, Frame Sequential</td>
</tr>
<tr>
<td></td>
<td></td>
<td>31.469 / 31.5</td>
<td>50.35/50.4</td>
<td>25.175/25.2</td>
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</tr>
<tr>
<td>2</td>
<td>720*480</td>
<td>62.938 / 63</td>
<td>59.94 / 60</td>
<td>54.001/54.054</td>
<td>Side-by-side, Top-and-Bottom, Checkerboard, Row Interleaving, Column Interleaving, Frame Sequential</td>
</tr>
<tr>
<td></td>
<td></td>
<td>31.469 / 31.5</td>
<td>54.001/54.054</td>
<td>27.00/27.027</td>
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<tr>
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<td>59.94 / 60</td>
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<tr>
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<td></td>
<td>44.96 / 45</td>
<td>148.351/148.5</td>
<td>74.17/74.25</td>
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<tr>
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<td>1920*1080</td>
<td>67.432 / 67.5</td>
<td>59.94 / 60</td>
<td>148.35/148.5</td>
<td>Side-by-side, Top-and-Bottom, Checkerboard, Row Interleaving, Column Interleaving, Frame Sequential</td>
</tr>
<tr>
<td></td>
<td></td>
<td>33.72 / 33.75</td>
<td>148.35/148.5</td>
<td>74.17/74.25</td>
<td></td>
</tr>
<tr>
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<td>1920*1080</td>
<td>53.946 / 54</td>
<td>23.976 / 24</td>
<td>148.351/148.5</td>
<td>Side-by-side, Top-and-Bottom, Checkerboard, Row Interleaving, Column Interleaving, Frame Sequential</td>
</tr>
<tr>
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<td>26.973 / 27</td>
<td>148.351/148.5</td>
<td>74.176/74.25</td>
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</tr>
<tr>
<td>6</td>
<td>1920*1080</td>
<td>67.432 / 67.5</td>
<td>29.97 / 30.00</td>
<td>148.35/148.5</td>
<td>Side-by-side, Top-and-Bottom, Checkerboard, Row Interleaving, Column Interleaving, Frame Sequential</td>
</tr>
<tr>
<td></td>
<td></td>
<td>33.716 / 33.75</td>
<td>148.35/148.5</td>
<td>74.175/74.25</td>
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### 5.5. 3D HDMI-PC Input

<table>
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<th>No.</th>
<th>Resolution</th>
<th>H-freq(kHz)</th>
<th>V-freq.(kHz)</th>
<th>Pixel clock(MHz)</th>
<th>3D input proposed mode</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>1024*768</td>
<td>48.363</td>
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### 5.6. 3D HDMI Input(1.3)

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<th>V-freq.(kHz)</th>
<th>Pixel clock(MHz)</th>
<th>3D input proposed mode</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>640*480</td>
<td>62.938 / 63</td>
<td>59.94 / 60</td>
<td>50.35/50.4</td>
<td>2D to 3D, Side-by-side, Top-and-Bottom, Checkerboard, Row Interleaving, Column Interleaving, Frame Sequential</td>
</tr>
<tr>
<td></td>
<td></td>
<td>31.469 / 31.5</td>
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<td>50.35/50.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>25.175/25.2</td>
<td>2D to 3D, Side-by-side, Top-and-Bottom</td>
</tr>
<tr>
<td>2</td>
<td>720*480</td>
<td>62.938 / 63</td>
<td>59.94 / 60</td>
<td>54.001/54.054</td>
<td>2D to 3D, Side-by-side, Top-and-Bottom, Checkerboard, Row Interleaving, Column Interleaving, Frame Sequential</td>
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<td>31.469 / 31.5</td>
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<td>54.001/54.054</td>
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<td>27.00/27.027</td>
<td>2D to 3D, Side-by-side, Top-and-Bottom</td>
</tr>
<tr>
<td>3</td>
<td>1280*720</td>
<td>89.91 / 90</td>
<td>59.94 / 60</td>
<td>148.35/148.5</td>
<td>2D to 3D, Side-by-side, Top-and-Bottom, Checkerboard, Row Interleaving, Column Interleaving, Frame Sequential</td>
</tr>
<tr>
<td></td>
<td></td>
<td>44.96 / 45</td>
<td></td>
<td>148.35/148.5</td>
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<td></td>
<td></td>
<td>74.17/74.25</td>
<td>2D to 3D, Side-by-side, Top-and-Bottom</td>
</tr>
<tr>
<td>4</td>
<td>1920*1080</td>
<td>67.432 / 67.5</td>
<td>59.94 / 60</td>
<td>148.35/148.5</td>
<td>2D to 3D, Side-by-side, Top-and-Bottom, Checkerboard, Row Interleaving, Column Interleaving, Frame Sequential</td>
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<td></td>
<td></td>
<td>74.17/74.25</td>
<td>2D to 3D, Side-by-side, Top-and-Bottom</td>
</tr>
<tr>
<td>5</td>
<td>1920*1080</td>
<td>53.946 / 54</td>
<td>23.976 / 24</td>
<td>148.35/148.5</td>
<td>2D to 3D, Side-by-side, Top-and-Bottom, Checkerboard, Row Interleaving, Column Interleaving</td>
</tr>
<tr>
<td></td>
<td></td>
<td>26.973 / 27</td>
<td></td>
<td>148.35/148.5</td>
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</tr>
<tr>
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<td></td>
<td></td>
<td>74.176/74.25</td>
<td>2D to 3D, Side-by-side, Top-and-Bottom</td>
</tr>
<tr>
<td>6</td>
<td>1920*1080</td>
<td>67.432 / 67.5</td>
<td>29.97 / 30.00</td>
<td>148.35/148.5</td>
<td>2D to 3D, Side-by-side, Top-and-Bottom, Checkerboard, Row Interleaving, Column Interleaving</td>
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### 5.7. USB/DLNA Input
#### 5.7.1. 3D Auto detection

<table>
<thead>
<tr>
<th>No.</th>
<th>Resolution</th>
<th>H-freq(kHz)</th>
<th>V-freq.(kHz)</th>
<th>Pixel clock(MHz)</th>
<th>3D input proposed mode</th>
<th>Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1920*1080</td>
<td>33.75</td>
<td>30.000</td>
<td>74.25</td>
<td>Side-by-side, Top-and-Bottom, Checkerboard, Row Interleaving, Column Interleaving, Frame Sequential (Photo: Side-by-side, Top-and-Bottom)</td>
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#### 5.7.2. 3D Manual

<table>
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<th>Resolution</th>
<th>H-freq(kHz)</th>
<th>V-freq.(kHz)</th>
<th>Pixel clock(MHz)</th>
<th>3D input proposed mode</th>
<th>Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1920*1080</td>
<td>33.75</td>
<td>30.000</td>
<td>74.25</td>
<td>Side-by-side, Top-and-Bottom, Checkerboard, Row Interleaving, Column Interleaving, Frame Sequential (Photo: Side-by-side, Top-and-Bottom)</td>
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### 5.8. RF 3D Input(DTV)

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<th>V-freq. (Hz)</th>
<th>Pixel clock(MHz)</th>
<th>Proposed</th>
<th>3D input proposed mode</th>
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<tbody>
<tr>
<td>1</td>
<td>1280*720</td>
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<td>60</td>
<td>74.25</td>
<td>HDTV 720P</td>
<td>2D to 3D, Side by Side, Top &amp; Bottom</td>
</tr>
<tr>
<td>2</td>
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<td>33.75</td>
<td>60</td>
<td>74.25</td>
<td>HDTV 1080I</td>
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### 5.9. 2D to 3D Conversion

<table>
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<th>Freq</th>
<th>Resolution</th>
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<tbody>
<tr>
<td>1</td>
<td>Digital TV / Analog TV</td>
<td>2D Support freq</td>
<td>2D Support resolution</td>
</tr>
<tr>
<td>2</td>
<td>HDMI</td>
<td>2D Support freq</td>
<td>2D Support resolution</td>
</tr>
<tr>
<td>3</td>
<td>Component</td>
<td>2D Support freq</td>
<td>2D Support resolution</td>
</tr>
<tr>
<td>4</td>
<td>Composite</td>
<td>2D Support freq</td>
<td>2D Support resolution</td>
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<tr>
<td>5</td>
<td>USB</td>
<td>2D Support freq</td>
<td>2D Support resolution</td>
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### No Side by Side Top & Bottom Checkerboard Single Frame Sequential Frame Packing 2D to 3D

<table>
<thead>
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<th>Side by Side</th>
<th>Top &amp; Bottom</th>
<th>Checkerboard</th>
<th>Single Frame Sequential</th>
<th>Frame Packing</th>
<th>2D to 3D</th>
</tr>
</thead>
<tbody>
<tr>
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<td><img src="image2" alt="Top &amp; Bottom" /></td>
<td><img src="image3" alt="Checkerboard" /></td>
<td><img src="image4" alt="Single Frame Sequential" /></td>
<td><img src="image5" alt="Frame Packing" /></td>
<td><img src="image6" alt="2D to 3D" /></td>
</tr>
</tbody>
</table>
ADJUSTMENT INSTRUCTION

1. Application
This spec. sheet applies to LA33B Chassis applied LED TV all models manufactured in TV factory.

2. Specification
(1) Because this is not a hot chassis, it is not necessary to use an isolation transformer. However, the use of isolation transformer will help protect test instrument.
(2) Adjustment must be done in the correct order.
(3) The adjustment must be performed in the circumstance of 25 ±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 100~240V, 50/60Hz.
(5) At first Worker must turn on the SET by using Power Only key.
(6) The receiver must be operated for about 5 minutes prior to the adjustment when module is in the circumstance of over 15 °C.
In case of keeping module is in the circumstance of 0°C, it should be placed in the circumstance of above 15°C for 2 hours.
In case of keeping module is in the circumstance of below -20°C, it should be placed in the circumstance of above 15°C for 3 hours.
※ Caution
When still image is displayed for a period of 20 minutes or longer (especially where W/B scale is strong. Digital pattern 13ch and/or Cross hatch pattern 09ch), there can some afterimage in the black level area.

3. Adjustment items
3.1. Main PCBA Adjustments
(1) ADC adjustment : ADC adjustment is OTP (Auto ADC)
(2) EDID download : HDMI

※ Remark
- Above adjustment items can be also performed in Final Assembly if needed. Adjustment items in both PCBA and final assembly tages can be checked by using the INSTART Menu -> 1.ADJUST CHECK

3.2. Final assembly adjustment
(1) White Balance adjustment
(2) RS-232C functionality check
(3) Factory Option setting per destination
(4) Shipment mode setting (In-Stop)
(5) GND and HI-POT test

3.3. Appendix
(1) Tool option menu, USB Download (S/W Update, Option and Service only)
(2) Manual adjustment for ADC calibration and White balance.
(3) Shipment conditions, Channel pre-set

4. MAIN PCBA Adjustments
4.1. ADC Calibration
- An ADC calibration is not necessary because MAIN SoC (LGExxxx) is already calibrated from IC Maker.
- If it needs to adjust manually, refer to appendix.

4.2. MAC Address, ESN Key and Widevine Key download
4.2.1. Equipment & Condition
1) Play file: keydownload.exe

4.2.2. Communication Port connection
1) Key Write: Com 1,2,3,4 and 115200 (Baudrate)
2) Barcode: Com 1,2,3,4 and 9600 (Baudrate)

4.2.3. Download process
1) Select the download items.
2) Mode check: Online Only
3) Check the test process
   - US, Canada models: DETECT -> MAC_WRITE -> WIDEVINE_WRITE
   - Korea, Mexico models: DETECT -> MAC_WRITE -> WIDEVINE_WRITE
4) Play : START
5) Check of result: Ready, Test, OK or NG
6) Printer out (MAC Address Label)

4.2.4. Communication Port connection
1) Connect: PCBA Jig -> RS-232C Port == PC -> RS-232C Port

4.2.5. Download
1) US, Canada models (13Y LCD TV + MAC + Widevine + ESN Key + DTCP Key + HDCP1.4 and HDCP2.0)

4.2.6. Inspection
- In INSTART menu, check these keys.
4.3. LAN port Inspection (Ping Test)

4.3.1. 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

4.3.2. LAN PORT inspection (PING TEST)
1) Play the LAN Port Test Program.
2) Connect each other LAN Port Jack.
3) Play Test (FS) button and confirm OK Message.
4) Remove LAN CABLE

4.4. EDID Download

4.4.1. 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”.

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

4.4.3. Download method
1) Press Adj. key on the Adj. R/C,
2) Select EDID D/L menu.
3) By pressing Enter key, EDID download will begin
4) If Download is successful, OK is display, but If Download is failure, NG is displayed.
5) If Download is failure, Re-try downloads.

※ Caution) When EDID Download, must remove RGB/HDMI Cable.
### 4.4.4.2. 2D_10bit_PCM(US) _ xvYCC : off

**HDMI EDID 2D_10bit_PCM(US)_xvYCC : off**

- **Reference**
  - HDMI1 ~ HDMI3
  - In the data of EDID, bellows may be different by S/W or Input mode.

<table>
<thead>
<tr>
<th>Product ID</th>
<th>HEX</th>
<th>EDID Table</th>
<th>DDC Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>0001</td>
<td>0100</td>
<td>Analog</td>
<td></td>
</tr>
<tr>
<td>0001</td>
<td>0100</td>
<td>Digital</td>
<td></td>
</tr>
</tbody>
</table>

- **Serial No:** Controlled on production line.
- **Month, Year:** Controlled on production line:
  - ex) Monthly: '01' -> '01'
  - Year: '2013' -> '17'
- **Model Name(Hex):** LGTV

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

- HDMI1: 43 7D X
- HDMI2: 43 6D X
- HDMI3: 43 5D X

<table>
<thead>
<tr>
<th>Vendor Specific(HDMI)</th>
<th>INPUT</th>
<th>MODEL NAME(HEX)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDMI1</td>
<td>67 03 0C 00 10 00 B8 2D</td>
<td></td>
</tr>
<tr>
<td>HDMI2</td>
<td>67 03 0C 00 20 00 B8 2D</td>
<td></td>
</tr>
<tr>
<td>HDMI3</td>
<td>67 03 0C 00 30 00 B8 2D</td>
<td></td>
</tr>
</tbody>
</table>

### 4.4.4.3. 3D_8bit_PCM(US) _ xvYCC : off

**HDMI EDID 3D_8bit_PCM(US)_xvYCC : off**

- **Reference**
  - HDMI1 ~ HDMI3
  - In the data of EDID, bellows may be different by S/W or Input mode.

<table>
<thead>
<tr>
<th>Product ID</th>
<th>HEX</th>
<th>EDID Table</th>
<th>DDC Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>0001</td>
<td>0100</td>
<td>Analog</td>
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</tr>
<tr>
<td>0001</td>
<td>0100</td>
<td>Digital</td>
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</tr>
</tbody>
</table>

- **Serial No:** Controlled on production line.
- **Month, Year:** Controlled on production line:
  - ex) Monthly: '01' -> '01'
  - Year: '2013' -> '17'
- **Model Name(Hex):** LGTV

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

- HDMI1: 43 E8 FC X
- HDMI2: E8 EC X
- HDMI3: E8 DC X

<table>
<thead>
<tr>
<th>Vendor Specific(HDMI)</th>
<th>INPUT</th>
<th>MODEL NAME(HEX)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDMI1</td>
<td>78 03 0C 00 10 00 80 1E 20 CO 0E 01 4F 00 FE 08 10 06 10 18 10 28 10 38 10</td>
<td></td>
</tr>
<tr>
<td>HDMI2</td>
<td>78 03 0C 00 20 00 80 1E 20 CO 0E 01 4F 00 FE 08 10 06 10 18 10 28 10 38 10</td>
<td></td>
</tr>
<tr>
<td>HDMI3</td>
<td>78 03 0C 00 30 00 80 1E 20 CO 0E 01 4F 00 FE 08 10 06 10 18 10 28 10 38 10</td>
<td></td>
</tr>
</tbody>
</table>
5. Final Assembly Adjustment

5.1. White Balance Adjustment

5.1.1. Overview

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

(1) Objective: To reduce each Panel’s W/B deviation
(2) How-it-works: When R/G/B gain in the OSD is at 192, it means the panel is at its Full Dynamic Range. In order to prevent saturation of Full Dynamic range and data, one of R/G/B is fixed at 192, and the other two is lowered to find the desired value.
(3) Adj. condition: normal temperature
- Surrounding Temperature: 25±5 °C
- Warm-up time: About 5 Min
- Surrounding Humidity: 20% ~ 80%
- Before White balance adjustment, Keep power on status, don’t power off

5.1.1.2. Adj. condition and cautionary items

(1) Lighting condition in surrounding area surrounding lighting should be lower 10 lux. Try to isolate adj. area into dark surrounding.
(2) Probe location: Color Analyzer (CA-210) probe should be within 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.

5.1.2. Equipment

(1) Color Analyzer: CA-210 (NCG: CH 9 / WCG: CH12 / LED: CH14)
(2) Adj. Computer (During auto adj., RS-232C protocol is needed)
(3) Adjust Remocon
(4) Video Signal Generator MSPG-925F 720p/204-Gray (Model: 217, Pattern: 49)
※ Color Analyzer Matrix should be calibrated using CS-1000

5.1.3. Equipment connection

- Color Analyzer
- RS-232C
- Computer
- RS-232C
- Signal Source
- Pattern Generator

※ If TV internal pattern is used, not needed

5.1.4.1. Overview

5.1.4.2. Equipment

5.1.4.3. Equipment connection

※ If TV internal pattern is used, not needed
5.1.4. Adjustment Command (Protocol)

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

<table>
<thead>
<tr>
<th>RS-232C COMMAND</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMD  DATA  ID</td>
<td></td>
</tr>
<tr>
<td>Wb  00  00</td>
<td>Begin White Balance adj.</td>
</tr>
<tr>
<td>Wb  00  ff</td>
<td>End White Balance adj. (internal pattern disappears)</td>
</tr>
</tbody>
</table>

(2) Adjustment Map

<table>
<thead>
<tr>
<th>Adj. item</th>
<th>Command (lower caseASCII)</th>
<th>Data Range (Hex.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cool</td>
<td>R Gain j</td>
<td>g 00 C0</td>
</tr>
<tr>
<td></td>
<td>G Gain j</td>
<td>h 00 C0</td>
</tr>
<tr>
<td></td>
<td>B Gain j</td>
<td>i 00 C0</td>
</tr>
<tr>
<td>Medium</td>
<td>R Gain j</td>
<td>a 00 C0</td>
</tr>
<tr>
<td></td>
<td>G Gain j</td>
<td>b 00 C0</td>
</tr>
<tr>
<td></td>
<td>B Gain j</td>
<td>c 00 C0</td>
</tr>
<tr>
<td>Warm</td>
<td>R Gain j</td>
<td>d 00 C0</td>
</tr>
<tr>
<td></td>
<td>G Gain j</td>
<td>e 00 C0</td>
</tr>
<tr>
<td></td>
<td>B Gain j</td>
<td>f 00 C0</td>
</tr>
</tbody>
</table>

5.1.5. Adjustment method

5.1.5.1. Auto WB calibration

(1) Set TV in Adj. mode using P-ONLY key (or POWER ON key).
(2) Place optical probe on the center of the display.
   - It need to check probe condition of zero calibration before adjustment.
(3) Connect RS-232C Cable.
(4) Select mode in ADJ Program and begin a adjustment.
(5) When WB adjustment is completed with OK message, check adjustment status of pre-set mode (Cool, Medium, Warm).
(6) Remove probe and RS-232C cable.
   - W/B Adj. must begin as start command “wb 00 00”, and finish as end command “wb 00 ff”, and Adj. offset if need.

5.1.5.2. Manual adjustment

(1) Set TV in Adj. mode using POWER ON.
(2) Zero Calibrate the probe of Color Analyzer, then place it on the center of LCD module within 10cm of the surface.
(3) Press ADJ key -> EZ adjust using adj. R/C à 9. 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 , Adjust is O.K.)
   (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, 6.White Balance, you can select one of 2 Test-pattern: ON, OFF. Default is inner (ON). By selecting OFF, you can adjust using RF signal in 206 Gray pattern.

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

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

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

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

<table>
<thead>
<tr>
<th>Mode</th>
<th>Coordinate</th>
<th>Temp</th>
<th>△uv</th>
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<tr>
<td></td>
<td>X  Y</td>
<td></td>
<td></td>
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<tr>
<td>Cool</td>
<td>0.271</td>
<td>0.270</td>
<td>13,000K</td>
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<tr>
<td>Medium</td>
<td>0.285</td>
<td>0.293</td>
<td>9,300K</td>
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<tr>
<td>Warm</td>
<td>0.313</td>
<td>0.329</td>
<td>6,500K</td>
</tr>
</tbody>
</table>
5.2. Option selection per country

5.2.1. Overview

(1) Tool option selection is only done for models in Non-USA North America due to rating
(2) Applied model: LA32B Chassis applied to CANADA and MEXICO

5.2.2. Country Group selection

(1) Press ADJ key on the Adj. R/C, and then select Country Group Menu
(2) Depending on destination, select US, then on the lower Country option, select US, CA, MX.
   Selection is done using +, - KEY

5.2.3. Tool Option inspection

<table>
<thead>
<tr>
<th>Model</th>
<th>Tool 1</th>
<th>Tool 2</th>
<th>Tool 3</th>
<th>Tool 4</th>
<th>Tool 5</th>
<th>Tool 6</th>
<th>Tool 7</th>
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<td>32LN5700-UA/UH</td>
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<td>5193</td>
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<td>1353</td>
<td>42539</td>
</tr>
</tbody>
</table>

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5.3. Local Dimming Inspection
(1) Press ‘TILT’ key of the Adj. R/C and check moving patterns. The black bar patterns moves from top to bottom. If a local dimming function does not work, a whole screen shows full white.

<Local dimming All model except for 32LA6600-NE>

5.4. Magic Motion remote controller Check
5.4.1. Test equipment
- RF-remote controller for check, IR-KEY-CODE remote controller.
- Check AA battery before test. A recommendation is that a tester change battery every lots.

5.4.2. Test
(1) Make pairing with TV set by pressing “Start key(Wheel key)” on RCU.
(2) Check a cursor on screen by pressing “Wheel key” of RCU
(3) Stop paring with TV set by pressing “Back+ Home” key of RCU

5.4.3. Applied models

<table>
<thead>
<tr>
<th>Chassis</th>
<th>Model Name</th>
<th>Magic RF receiver</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA33B</td>
<td>42/47/50/55LA6650-UA</td>
<td>Built-in</td>
</tr>
<tr>
<td></td>
<td>47/55LA6900-UD</td>
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<tr>
<td></td>
<td>50LA6900-UE</td>
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</tr>
<tr>
<td></td>
<td>32/39/42/47/50/55/60LN5700-UA/UH</td>
<td>Dongle</td>
</tr>
<tr>
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<td></td>
</tr>
<tr>
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</tr>
<tr>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>47/55LA6450-UA</td>
<td></td>
</tr>
</tbody>
</table>

※ Dongle Model : An USB dongle-type receiver will be supplied in form of accessory. So this pairing test is not necessary for these models

5.5. Wi-Fi MAC Address Check
5.5.1. Using RS232 Command

<table>
<thead>
<tr>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmission</td>
</tr>
</tbody>
</table>

5.5.2. Check the menu on in-start
5.6. 3D pattern test (Only for 3D models)

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

5.6.2. Test method
(1) Input 3D test signal as Fig.1.

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

5.7. HDMI ARC Function Inspection

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

5.7.2. Test method
(1) Insert the HDMI Cable to the HDMI ARC port from the master equipment (HDMI1)

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

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

5.8. Ship-out mode check (In-stop)
- After final inspection, press In-Stop key of the Adj. R/C and check that the unit goes to Stand-by mode
6. AUDIO output check

6.1. Audio input condition

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

6.2. Specification

<table>
<thead>
<tr>
<th>No</th>
<th>Item</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Audio practical max Output, L/R</td>
<td>9.0</td>
<td>10.0</td>
<td>12.0</td>
<td>W</td>
<td>(1) Measurement condition</td>
</tr>
<tr>
<td></td>
<td>(Distortion=10% max Output)</td>
<td>8.5</td>
<td>8.9</td>
<td>9.9</td>
<td>Vrms</td>
<td>- EQ/AVL/Clear Voice: Off</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(2) Speaker (8Ω Impedance)</td>
</tr>
</tbody>
</table>

7. GND and HI-POT Test

7.1. GND & HI-POT auto-check preparation

(1) Check the POWER CABLE and SIGNAL CABE insertion condition

7.2. GND & HI-POT auto-check

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

7.3. Checkpoint

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

8. USB S/W Download (optional, 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 than that of TV set, it didn't work. Otherwise USB data is automatically detected.
(3) Show the message “Copying files from memory”

(4) Updating is staring.

(5) Updating Completed, The TV will restart automatically
(6) If your TV is turned on, check your updated version and Tool option.
   * If downloading version is more high than your TV have, TV can lost all channel data. In this case, you have to channel recover. If all channel data is cleared, you didn't have a DTV/ATV test on production line.
   * After downloading, TOOL OPTION setting is needed again.
(1) Push "IN-START" key in service remote controller.
(2) Select "Tool Option 1" and Push "OK" button.
(3) Punch in the number. (Each model has their number.)
9. Optional adjustments

9.1. Manual ADC Calibration

9.1.1. Equipment & Condition

(1) Adjustment Remocon
(2) 801GF (802B, 802F, 802R) or MSPG925FA Pattern Generator
- Resolution : 480i Comp1 (MSPG-925FA: model-209, pattern-65)
- Resolution : 1080p Comp1 (MSPG-925FA: model-225, pattern-65)
- Resolution : 1080p RGB (MSPG-925FA: model-225, pattern-65)
- Pattern : Horizontal 100% Color Bar Pattern
- Pattern level : 0.7±0.1 Vp-p

9.1.2. Adjust method

8.1.2.1 ADC 480i/1080p Comp1, RGB
(1) Check connected condition of Comp1/RGB cable to the equipment
(2) Give a 480i Mode, Horizontal 100% Color Bar Pattern to Comp1. (MSPG-925FA -> Model: 209, Pattern: 65)
(3) Change input mode as Component1 and picture mode as "Standard"
(4) Press the In-start Key on the ADJ remote after at least 1 min of signal reception. Then, select 7.External ADC. And Press OK or Right Button for going to sub menu.
(5) Press OK in Comp 480i menu
(6) Give a 1080p Mode, Horizontal 100% Color Bar Pattern to Comp1. (MSPG-925FA -> Model: 225, Pattern: 65)
(7) Press OK in Comp 1080p menu
(8) Perform (6) and (7) in RGB-PC
(9) If ADC Comp is successful, “ADC Component Success” is displayed. If ADC calibration is failure, “ADC Component Fail” is displayed.
(10) If ADC calibration is failure, after rechecking ADC pattern or condition, retry calibration
(11) If ADC RGB calibration is successful, “ADC RGB Success” is displayed. If ADC calibration is failure, “ADC RGB Fail” is displayed.
(12) If ADC calibration is failure, after recheck ADC pattern or condition, retry calibration


9.2.1. Adj. condition and cautionary items

(1) Lighting condition in surrounding area surrounding lighting should be lower 10 lux. Try to isolate adj. area into dark surrounding.
(2) Probe location: Color Analyzer (CA-210) probe should be within 10cm and perpendicular of the module surface (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.

9.2.2. Equipment

(1) Color Analyzer: CA-210 (NCG: CH 9 / WCG: CH12 / LED: CH14)
(2) Adj. Computer (During auto adj., RS-232C protocol is needed)
(3) Adjust Remocon
(4) Video Signal Generator MSPG-925F 720p/216-Gray (Model: 217, Pattern: 78)

9.2.3. Adjustment

(1) Set TV in Adj. mode using POWER ON
(2) Zero Calibrate the probe of Color Analyzer, then place it on the center of LCD module within 10cm of the surface.
(3) Press ADJ key -> EZ adjust using adj. R/C -> 6. White-Balance then press the cursor to the right (KEY►). When KEY► is pressed 216 Gray internal pattern will be displayed.
(4) One of R Gain / G Gain / B Gain should be fixed at 192, and the rest will be lowered to meet the desired value.
(5) Adj. is performed in COOL, MEDIUM, WARM 3 modes of color temperature.

- If internal pattern is not available, use RF input. In EZ Adj. menu 6.White Balance, you can select one of 2 Test-pattern: ON, OFF. Default is inner(ON). By selecting OFF, you can adjust using RF signal in 216 Gray pattern.
EXPLODED VIEW

IMPORTANT SAFETY NOTICE

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

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

Do not modify the original design without permission of manufacturer.
SPDIF
The symbol mark of this schematic diagram incorporates special features important for protection from X-radiation. Fire and electrical shock hazards, when servicing, is essential that only manufacturers specified parts be used for the critical components in the symbol mark of the schematic.

R3700
10K
HP_LOUT
HP_ROUT
+3.3V_NORMAL
HP_DET
JK3700
PEJ034-01
6BT_TERMINAL2
7BB_TERMINAL2
5T_SPRING
4R_SPRING
3E_SPRING
R3701
1K
The symbol mark of this schematic diagram incorporates special features important for protection from radiation, fire, and electrical shock hazards. When servicing the device, it is essential that only manufacturer-specified parts be used for the critical components in the symbol mark of the schematic.
THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. TO AVOID AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURERS SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.
Ethernet Block
THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IT IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.
THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FIRE, AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING, IT IS ESSENTIAL THAT ONLY MANUFACTURED SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.
THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FIRE AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING IT IS ESSENTIAL THAT ONLY MANUFACTURED SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.
<POWER BLOCK>

THIS IS REVERSE PATTERN !!!!

[Left Source: pin location] [Right Source: pin location]

<LEVEL SHIFTER BLOCK>
THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FIRE AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING IT IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.
Don't Connect Power At VDDI
(Just Internal LDO Capacitor)
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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<th>Description of Tool Options</th>
</tr>
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<tr>
<td>13년 모델명 변경</td>
<td>Tool option</td>
</tr>
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</table>
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**EPI Interface**

**EPI(Embedded Point-Point Interface)**

**Features**
- Point-Point topology (support 2 Pair option)
- CDR (Clock Data Recovery)
- Bandwidth up to 1.85Gbps/pair at FHD 120Hz 10 bit application
- Lock signal cascading and feedback to T-Con
- Embedded Control Data

**Merits**
- Better reliability on common noise
- No data skew and better EMI margin
- Fewer lines than mini-LVDS
- Slim PCB design

---

**Table 1. Example of FHD 120Hz TV**

<table>
<thead>
<tr>
<th></th>
<th>EPI</th>
<th>FHD (10bit) @ 960Ch</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>60Hz</td>
</tr>
<tr>
<td>Transmission Line</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Bandwidth</td>
<td>0.84Gbps</td>
<td>1.68Gbps</td>
</tr>
</tbody>
</table>
EPI Interface (mini-LVDS vs. EPI)

### Comparison

<table>
<thead>
<tr>
<th>HF mini-LVDS</th>
<th>FHD (10bit)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>60Hz</td>
</tr>
<tr>
<td>No. of Signal</td>
<td>36</td>
</tr>
<tr>
<td>Connector</td>
<td>60pin (2ea)</td>
</tr>
</tbody>
</table>

- Difficult to upgrade bandwidth limit
- Multiple number of wires needed for higher bandwidth

<table>
<thead>
<tr>
<th>EPI (Embedded clock P-to-P Interface)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FHD (10bit)</td>
</tr>
<tr>
<td>60Hz</td>
</tr>
<tr>
<td>960ch</td>
</tr>
<tr>
<td>No. of Signal</td>
</tr>
<tr>
<td>Connector</td>
</tr>
</tbody>
</table>

- Better reliability on common noise
- No data skew. Better EMI margin
- Lower cost (Cable, Connector)
- Slim S-PCB design (14mm → 10mm) helps slimmer TV

### What to change

<table>
<thead>
<tr>
<th>LCM (T-con to S-Driver IC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HF mini-LVDS</td>
</tr>
<tr>
<td>EPI</td>
</tr>
<tr>
<td>TCON</td>
</tr>
</tbody>
</table>

*Bandwidth Capability*
- FHD 120Hz 10Bit : 594Mbps@36Lines → 1.65Gbps@12Lines
- FHD 240Hz 10Bit : 594Mbps@72Lines → 1.25Gbps@32Lines
### EPI Interface (mini-LVDS vs. EPI)

<table>
<thead>
<tr>
<th></th>
<th>HF mini-LVDS</th>
<th>EPI</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Topology</strong></td>
<td><img src="https://via.placeholder.com/150x150" alt="Diagram" /></td>
<td><img src="https://via.placeholder.com/150x150" alt="Diagram" /></td>
</tr>
<tr>
<td><strong>Protocol</strong></td>
<td><img src="https://via.placeholder.com/150x150" alt="Diagram" /></td>
<td><img src="https://via.placeholder.com/150x150" alt="Diagram" /></td>
</tr>
</tbody>
</table>
| **Features**                   | • Multi Drop  
• Data rate: 660Mbps  
• External clock             | • Point to Point  
• Data rate: 1.8Gbps  
• Embedded clock, Control |
| **Merit**                      | • Simple structure  
• Standardization               | • Fewer Lines: 12  
• Embedded clock: low EMI, Clock skew free  
• Easy to PCB design            |
| **Demerit**                    | • Too many lines: 36  
• Clock skew  
• EMI due to clock lines  
• Bandwidth limit            | • Transmission Overhead: 4bit delimiter                           |
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Main PCB for Broadband

xxLA6900-NA

To PSU

To module

WIFI + RF

Key + IR

Front Spk

Chassis : LA33B
PCB P/No : EAX64872101

1. Main processor, DDR Memory
2. eMMC Memory
3. Micom for Key/IR sensing
4. Audio AMP (12W+12W)
5. LVDS or EPI Wafer
6. PSU
7. WiFi + RF(Magic Remocon receiver)

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LGE Internal Use Only
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Introductions of 13Y RF assy + Magic Remote control

목차

1. System
2. Block diagram
3. Paring method
1. System

- **Pairing Information Transmission (Send to TV after Paired)**
  - Static Calibration Data (Bypass only)
  - Remote FW ver. (Save also in Receiver)
  - BD_ADDR (Save also in Receiver)
- **Pairing Information Transmission Sequence**
  - When it is paired, the remote sends packets (pairing success, F/W version, BD_ADDR) to the receiver.
  - The receiver sends the pairing success packet to TV directly.
  - F/W version and BD_ADDR packets are just saved on the receiver.
  - The receiver sends F/W version or BD_ADDR packet to TV when it is required.

- **Motion Data Transmission**
  - Period: 7.5msec
  - Motion Data: gyro, accelerometer

- **Voice Data Transmission**
  - Period: 10msec
  - Voice sampling: 16khz 16bit
2. MR13 Block Diagram

- **Bluetooth Receiver**
- **BCM20702M** (BROADCOM) Bluetooth 4.0
- Antenna
  - IR Emitter1
  - IR Emitter2
- 1Mbit (Serial Flash)
  - SPI
- **WM8950** (Wolfson) Codec (ADC)
  - MIC. (Knowles)
  - I2S
  - I2C ch2
- **X-tal 20 MHz**
- **Power Management**
  - AA x 2 Battery
  - DC-DC Boost TI TPS61097 SOT23-5
  - 2.8V LDO uP018NEC5-28 SC70
  - 2.8V LDO uP018NEC5-28 SC70
- **Bluetooth Remote control**
- **Connector**
# 3. RF Pairing / Un-pairing Method

<table>
<thead>
<tr>
<th>Method</th>
<th>Description</th>
</tr>
</thead>
</table>
| RF Pairing      | • When do pairing, the remote should make pairing request IR signal(0x29) to TV.  
                  | • When TV receive the IR signal, it should send "pairing request packet" to the RF receiver.  
                  | • After pairing success, the remote should blink LED for some time and TV send "pairing success packet" back to TV.  
                  | • When remote try to unpairing, it doesn’t care about state of receiver(stand alone). |
| Method 1        | - If unpaired, just press Wheel key.                                        |
|                 | - If paired, press Wheel key after unpairing.                               |
| Method 2 (Repairing) | - Press “BACK" button for 5 sec.                        |
| RF Unpairing    | • When remote try to unpairing, it doesn’t care about state of receiver(stand alone).  
                  | • After unpairing, all pairing information should be erased.  
                  | • After unpairing, LED should be blinked for 3sec.  
                  | • The remote just becomes to IR mode.                                      |
|                 | Press “HOME" button and “BACK" button at the same time for 5 sec.          |
Introductions of 13Y WIFI built in assy

목차

1. Block diagram
2. Specification
WIFI Built in assy feature

Block diagram

- BCM43236B
- Wafer 6pin 1.25mm
- DCDC EUP301 0
- Switch DM3030
- Antenna 2.4G/5G
- Switch DM3030
- Antenna 2.4G/5G
- Crystal 20MHz
- 3.3V
- USB DP, DN
- GND
- WOL
- USB DP, DN
- Power 3.3V
- Power 1.2V
- Power 3.3V
- Power 1.2V
- RX/TX

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WIFI Built in ass’y Specification

- Frequency Band:
  Draft 802.11n Radio: 2.4 GHz
  802.11g Radio: 2.4 GHz
  802.11b Radio: 2.4 GHz
  
  USA – FCC: 2412–2462MHz (Ch1–Ch11)
  Canada – IC: 2412–2462MHz (Ch1–Ch11)
  Europe – ETSI: 2412–2472MHz (Ch1–Ch13)
  Japan – STD-T66/STD-33: 2412–2484MHz (Ch1–Ch14)

  802.11a Radio: 5 GHz
  5.150–5.250GHz
  5.725–5.850GHz

- Operating Channels:
  IEEE 802.11b/g/n compliant:
  11 channels (US, Canada)
  13 channels (ETSI)
  14 channels (Japan)

- Transmit Power and Sensitivity:
  TX Output Power:(Typical) (Meet emission standard)
  11b  17  +/-2 dBm
  11g  14  +/-2 dBm@54Mbps (Each chain)
  11n  13  +/-2 dBm (Each chain)

  Rx Sensitivity:(Typical)
  -69dBm at HT20 m7 2.4GHz
  -87dBm at HT20 m0 2.4GHz
  -69dBm at HT20 m7 5.0GHz
  -87dBm at HT20 m0 5.0GHz

- Modulation
  DBPSK @1Mbps
  DQPSK@2Mbps
  CCK@5.5/11Mbps

- Current consumption(5V DC):
  Full load: 430mA

- Operating Temperature: 0 ~ 60 °C ambient
- Storage Temperature: -20 ~ 60 °C ambient
- Humidity: under 85% and must be non-condensing

- Regulation and certification compliance available:
  • CE
  • FCC
  • WiFi

- WPS
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12Y Widevine & HDCP 2.0 & NETFLIX

Contents

1. Widevine?
2. HDCP 2.0 & NETFLIX?
3. DTCP?
1. Widevine?

[Widevine]

Widevine is the Solution/Library offering Adaptive Streaming and DRM. In BBTV, when special CP do service, this module is required key. Currently CP which is requested to widevine, is typically Australian Bigpond Live and North American CinemaNow. Furthermore, because the future will be the spread of CP, widevine key download for the global model should be applied to production. (Because operation unique key should be downloaded for Widevine, Widevine key download by NSU is impossible.)

[Widevine Key]

Widevine Key is unique data stored TV for using Widevine.
2. HDCP 2.0 & NETFLIX?

- **HDCP**
  - High-bandwidth Digital Content Protection
  - Protect high-value digital motion pictures, television programs and audio against unauthorized interception and copying between a digital set top box or digital video recorder and a digital TV or PC.
  - Specification developed by Intel Corporation to protect digital entertainment across the DVI/HDMI interface.

- **Why HDCP2.0?**
  - HDCP revision 2.0 supports a broader range of wired and wireless interfaces.

- **Netflix**
  - the services maintain a huge selection of movies and latest releases and offer DVD rentals via mail & online streaming.
The Digital Transmission Content Protection Specification defines a cryptographic protocol for protecting audio/video entertainment content from unauthorized copying, intercepting, and tampering as it traverses digital transmission mechanisms such as a high-performance serial bus that conforms to the IEEE 1394-1995 standard. Only legitimate entertainment content delivered to a source device via another approved copy protection system (such as the DVD Content Scrambling System) will be protected by this protection system.

[Three cryptographic Keys]

• Authentication Key which is formed as a result of authentication and used to protect the exchange keys.

• Exchange Key which is used to set up and protect content streams.

• Content Key which is used to encrypt the content being exchanged.
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10. The latest issue and concerning issue
## Contents of LCD TV Standard Repair Process

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<th>Error symptom (Mid category)</th>
<th>Page</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A. Video error</td>
<td>No video/Normal audio</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>No video/No audio</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Video error, video lag/stop, fail tuning</td>
<td>3, 4</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Color error</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>Vertical/Horlizontal bar, residual image, light spot, external device color error</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>B. Power error</td>
<td>No power</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>Off when on, off while viewing, power auto on/off</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>C. Audio error</td>
<td>No audio/Normal video</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>Wrecked audio/discontinuation/noise</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>D. Function error</td>
<td>No response in remote controller, key error, recording error, memory error</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>External device recognition error</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>E. Noise</td>
<td>Circuit noise, mechanical noise</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>F. Exterior error</td>
<td>Exterior defect</td>
<td>14</td>
<td></td>
</tr>
</tbody>
</table>

First of all, Check whether there is SVC Bulletin in GCSC System for these model.
<table>
<thead>
<tr>
<th>No.</th>
<th>Error symptom</th>
<th>Content</th>
<th>Page</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
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<td>1</td>
<td>A. Video error_ No video/Normal audio</td>
<td>Check LCD back light with naked eye</td>
<td>A1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>LED driver  B+ 24V measuring method</td>
<td>A2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Check White Balance value</td>
<td>A3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Power Board voltage measuring method</td>
<td>A4</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>A. Video error_ No video/Video lag/stop</td>
<td>TUNER input signal strength checking method</td>
<td>A6</td>
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<tr>
<td>7</td>
<td></td>
<td>LCD-TV Version checking method</td>
<td>A7</td>
<td></td>
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<tr>
<td>9</td>
<td></td>
<td>LCD TV connection diagram</td>
<td>A8</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>Tuner Checking Part</td>
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<td></td>
</tr>
<tr>
<td>11</td>
<td>A. Video error_Color error</td>
<td>Check Link Cable (LVDS) reconnection condition</td>
<td>A10</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>A11</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Adjustment Test pattern - ADJ Key</td>
<td>A12</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td></td>
<td>LCD TV connection diagram</td>
<td>A8</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>A. Video error_Vertical/Horizontal bar, residual image, light spot</td>
<td>Check Link Cable (LVDS) reconnection condition</td>
<td>A10</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>A11</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Adjustment Test pattern - ADJ Key</td>
<td>A12</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td></td>
<td>Exchange T-Con Board (1)</td>
<td>A-1/5</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td></td>
<td>Exchange T-Con Board (2)</td>
<td>A-2/5</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>&lt;Appendix&gt;</td>
<td>Exchange LED driver Board (PSU)</td>
<td>A-3/5</td>
<td>55&quot; : driver board Other : PSU</td>
</tr>
<tr>
<td></td>
<td>Defected Type caused by T-Con/ Inverter/ Module</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td></td>
<td>Exchange Module itself (1)</td>
<td>A-4/5</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td>Exchange Module itself (2)</td>
<td>A-5/5</td>
<td></td>
</tr>
</tbody>
</table>
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,..)

1. No video/Normal audio → Normal audio
   - Y: Check Back Light On with naked eye
     - On: Check Power Board 12v, 3.5v etc.
       - Y: Replace T-con Board or module and Adjust VCOM
       - N: Repair Power Board or parts
     - N: Move to No video/No audio
2. Check Power Board 24v output
   - Y: Replace Inverter or module
   - N: Repair Power Board or parts

※Precaution: A7 & A3
- Always check & record S/W Version and White Balance value before replacing the Main Board
  - Replace Main Board → Re-enter White Balance value
### A. Video error

<table>
<thead>
<tr>
<th>Error symptom</th>
<th>Established date</th>
<th>Revised date</th>
</tr>
</thead>
<tbody>
<tr>
<td>No video/ No audio</td>
<td>2012.11.30</td>
<td>2/13</td>
</tr>
</tbody>
</table>

**Standard Repair Process**

- **No Video/ No audio**
  - Check various voltages of Power Board (3.5V, 12V, 20V or 24V...)
  - Normal voltage?
    - Y: Check and replace MAIN B/D
    - N: Replace Power Board and repair parts
  - End
**A. Picture Problem**

**Picture broken/Freezing**

<table>
<thead>
<tr>
<th>LCD TV</th>
<th>Error symptom</th>
<th>Established date</th>
<th>Revised date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Picture broken/Freezing</td>
<td>2012.11.30</td>
<td>3/13</td>
</tr>
</tbody>
</table>

- **A6**
  - 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%)

- **Check RF Signal level**
  - Normal Signal?
    - Y: Check RF Cable Connection
      1. Reconnection
      2. Install Booster
    - N: Contact with signal distributor or broadcaster (Cable or Air)
  - N: Normal Picture?
    - Y: Close
    - N: Check S/W Version
      - SVC Bulletin?
        - Y: Booster menu On→Off: Check Off→On: Check
        - N: S/W Upgrade
          - SVC Bulletin?
            - Y: Booster menu On→Off: Check Off→On: Check
            - N: Normal Picture?
              - Y: Close
              - N: Check Tuner soldering
                - Replace Main B/D

- **Close**
**A. Picture Problem (DVB-S/S2)**

**Error symptom:** Tuning fail, Picture broken/ Freezing

<table>
<thead>
<tr>
<th>LCD TV</th>
<th>Established date</th>
<th>Revised date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2012. 11 .30</td>
<td>3/13</td>
</tr>
</tbody>
</table>

**A6**

**Check RF Signal level**

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

**Normal Signal?**

- Y: Check satellite setting.
  - Check LNB frequency.
  - Check satellite
  - Check Satellite connection (DiSEqC, motor, etc…)
- N: Normal setting?

  - Y: Check S/W Version
    - SVC Bulletin?
      - Y: Check Tuner soldering
        - N: Replace Main B/D
      - N: S/W Upgrade
        - N: Normal Picture?
          - Y: Close
          - N: Close
        - Y: Close
  - N: Contact with signal distributor or broadcaster (Cable or Air)

**Normal Picture?**

- Y: Close
- N: Close
A. Video error

<table>
<thead>
<tr>
<th>Error symptom</th>
<th>Established date</th>
<th>Revised date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color error</td>
<td>2012.11.30</td>
<td>4/13</td>
</tr>
</tbody>
</table>

**A8**
Check color by input
- External Input
- COMPONENT
- RGB
- HDMI/DVI

- **A10/ A11**
  - Color error?
    - Y: Check and replace Link Cable (LVDS) and contact condition
    - Replace Main B/D
    - Color error?
      - Y: Replace module
      - N: End
    - N: Check error color input mode

**A12**
Check Test pattern

- **A10/ A11**
  - Check external device and cable
    - Y: Replace Main B/D
    - N: Request repair for external device/cable

- **A12**
  - Check Test pattern
    - RGB/ HDMI/DVI error
      - Check external device and cable
        - Y: Replace Main B/D
        - N: Replace module
**Vertical/Horizontal bar, residual image, light spot**

**A8**
- Check color condition by input
  - External Input
  - Component
  - RGB
  - HDMI/DVI

Screen normal? Y → Check external device connection condition
N → Replace module

Normal? Y → Check and replace Link Cable
N → Request repair for external device

**A10/A11**
- Replace Main B/D (adjust VCOM)
  - For LGD panel
  - For other panel

**A28**
- Check Test pattern

**External device screen error-Color error**

Check S/W Version
- Y → S/W Upgrade
- N → Screen normal?
  - Y → Replace Main B/D
  - N → Screen normal?
    - Y → Replace Main B/D
    - N → Screen normal?
      - Y → Replace Main B/D
      - N → Replace Main B/D

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

External Input error
- Y → Component error
- N → RGB error
- N → HDMI/DVI error
  - 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?
    - Y → Replace Main B/D
    - N → Replace Main B/D
  - Request repair for external device
B. Power error

**No power**

- DC Power on by pressing Power Key On Remote control
- **Normal operation?**
  - Y: Check Power On "High"
  - N: Replace Main B/D

**Check Power LED**
- Power LED On?
  - Y: No power
  - N: Power LED On?
    - Y: Check Power cord was inserted properly
    - N: Normal?
      - Y: Close
      - N: Replace Power B/D

**Check ST-BY 3.5V**
- Normal voltage?
  - Y: Replace Main B/D
  - N: Replace Power B/D

**Measure voltage of each output of Power B/D**
- Normal voltage?
  - Y: Replace Main B/D
  - N: Replace Power B/D

- Check Power LED
  - Power LED On?
    - Y: Replace Power B/D
    - N: Normal?
      - Y: Replace Power B/D
      - N: Close

- Stand-By: Red
- Operating: white

---

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B. Power error

Off when on, off while viewing, power auto on/off

Check outlet

Check A/C cord

Check for all 3-phase power out

Fix A/C cord & Outlet and check each 3 phase out

Error?

Y

N

Check Power Off Mode

CPU

Abnormal

Replace Main B/D

Normal?

Y

End

N

Replace Power B/D

Abnormal

Replace Main B/D

Normal voltage?

Y

Replace Main B/D

N

Replace Power B/D

※ Caution
Check and fix exterior of Power B/D Part

☞ A22

☞ A19

(If Power Off mode is not displayed)
Check Power B/D voltage

"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

Normal

Abnormal

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

Established date 2012. 11.30
Revised date 7/13

LCD TV

Error symptom

 표준수리과정

상태 Power off List

Normal

Abnormal

"POWEROFF_ABNORMAL1" Power off by abnormal status except CPU trouble
"POWEROFF_CPUABNORMAL" Power off by CPU Abnormal

※  Please refer to the all cases which can be displayed on power off mode.
No audio/ Normal video

A24
Check user menu > Speaker off

N
Off

Y
Cancel OFF

A25
Check audio B+ 24V of Power Board

Y
Normal voltage

N
Replace Power Board and repair parts

Disconnection

N
Replace MAIN Board

End

Y
Replace Speaker

Check Speaker disconnection
C. Audio error

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

Check input signal
- RF
- External Input signal

Signal normal?

Y

N

(WHEN RF signal is not received)
Request repair to external cable/ANT provider

(IN CASE OF EXTERNAL INPUT SIGNAL ERROR)
Check and fix external device

Wrecked audio/ Discontinuation/ Noise for all audio

Check and replace speaker and connector

Wrecked audio/ Discontinuation/ Noise only for D-TV

Replace Main B/D

Wrecked audio/ Discontinuation/ Noise only for Analog

(WHEN RF signal is not received)
Request repair to external cable/ANT provider

Wrecked audio/ Discontinuation/ Noise only for External Input

Connect and check other external device

Normal audio?

Y

N

Check and fix external device

Replace Power B/D

Check audio B+ Voltage (24V)

Normal voltage?

Y

N

Replace Main B/D

A25

End
### D. General Function Problem

**Remote control & Local switch checking**

1. **Remote control (R/C) operating error**
   - Check R/C itself Operation
     - Normal operating?
       - **Y**: Check & Repair Cable connection Connector solder
         - Normal operating?
           - **Y**: Check B+ 3.5V On Main B/D
             - Normal Voltage?
               - **Y**: Check IR Output signal
                 - Normal Signal?
                   - **Y**: Replace Main B/D
                   - **N**: Repair/Replace IR B/D
               - **N**: Replace IR B/D
             - **N**: Replace Main B/D
           - **N**: Check 3.5v on Power B/D Replace Power B/D or Replace Main B/D (Power B/D don’t have problem)
         - **N**: Check B+ 3.5V On Main B/D
           - Normal Voltage?
             - **Y**: Check IR Output signal
               - Normal Signal?
                 - **Y**: Replace Main B/D
                 - **N**: Repair/Replace IR B/D
             - **N**: Replace Main B/D
       - **N**: Check R/C Operating When turn off light in room
         - Normal operating?
           - **Y**: Close
           - **N**: If R/C operate, Explain the customer cause is interference from light in room.
         - **N**: Replace R/C
   - Check R/C Operating When turn off light in room
     - Normal operating?
       - **Y**: Close
       - **N**: Replace R/C

---

**Error symptom**

<table>
<thead>
<tr>
<th>LCD TV</th>
<th>D. General Function Problem</th>
<th>Established date</th>
<th>Revised date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Remote control &amp; Local switch checking</td>
<td>2012. 11 .30</td>
<td>10/13</td>
</tr>
</tbody>
</table>

---

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### D. Function error

<table>
<thead>
<tr>
<th>Error symptom</th>
<th>Established date</th>
<th>Revised date</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCD TV</td>
<td>2012.11.30</td>
<td>11/13</td>
</tr>
</tbody>
</table>

#### External device recognition error

- **Signal input?**
  - **Y**: Check technical information
    - Fix information
    - S/W Version
  - **N**: Check and fix external device/cable

- **Technical information?**
  - **Y**: Fix in accordance with technical information
  - **N**: External Input and Component Recognition error
    - RGB, HDMI, DVI, Optical Recognition error
      - Replace Main B/D
### E. Noise

#### Standard Repair Process

<table>
<thead>
<tr>
<th>LCD TV</th>
<th>Error symptom</th>
<th>E. Noise</th>
<th>Established date</th>
<th>Revised date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Circuit noise, mechanical noise</td>
<td>2012. 11.30</td>
<td>12/13</td>
</tr>
</tbody>
</table>

#### Circuit Noise

- **Identify noise type**
- **Check location of noise**
- **Replace PSU (with LED driver)**

#### Mechanical Noise

- **Check location of noise**
- **Replace LED driver**

#### Additional Instructions

- **※** When the noise is severe, replace the module (For models with fix information, upgrade the S/W or provide the description)
- **※** If there is a "Tak Tak" noise from the cabinet, refer to the KMS fix information and then proceed as shown in the solution manual (For models without any fix information, provide the description)

---

**※ Mechanical noise is a natural phenomenon, and apply the 1st level description. When the customer does not agree, apply the process by stage.**

**※ Describe the basis of the description in "Part related to noise" in the Owner's Manual.**
Standard Repair Process

F. Exterior defect

<table>
<thead>
<tr>
<th>Error symptom</th>
<th>Established date</th>
<th>Revised date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exterior defect</td>
<td>2012. 11.30</td>
<td>13/13</td>
</tr>
</tbody>
</table>

- **Zoom part with exterior damage**: Replace module → Adjust VCOM
- **Cabinet damage**: Replace cabinet
- **Remote controller damage**: Replace remote controller
- **Stand dent**: Replace stand
<table>
<thead>
<tr>
<th>No.</th>
<th>Error symptom</th>
<th>Content</th>
<th>Page</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>B. Power error_No power</td>
<td>Check front display LED</td>
<td>A17</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td></td>
<td>Check power input Voltage &amp; ST-BY 5V</td>
<td>A18</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td></td>
<td>Checking method when power is ON</td>
<td>A19</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td></td>
<td>POWER BOARD voltage measuring method</td>
<td>A4</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>B. Power error_Off when on, off while</td>
<td>POWER OFF MODE checking method</td>
<td>A22</td>
<td></td>
</tr>
<tr>
<td></td>
<td>viewing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>B. Power error_Off when on, off while</td>
<td>POWER BOARD PIN voltage checking method</td>
<td>A19</td>
<td></td>
</tr>
<tr>
<td></td>
<td>viewing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>C. Audio error_No audio/Normal video</td>
<td>Checking method in menu when there is no audio</td>
<td>A24</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>C. Audio error_Wrecked audio/discontinuation</td>
<td>Voltage and speaker checking method when there is no audio</td>
<td>A25</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>C. Audio error_Wrecked audio/discontinuation</td>
<td>Voltage and speaker checking method in case of audio error</td>
<td>A25</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>D. Function error_No response in remote controller, key error</td>
<td>Remote controller operation checking method</td>
<td>A27</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>D. VCOM Adjustment</td>
<td>Sequence of the Vcom adjustment</td>
<td>A28</td>
<td></td>
</tr>
</tbody>
</table>
LCD TV | A. Video error_No video/Normal audio | Check White Balance value
---|---|---
Content | Entry method

**Entry method**

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

2. Enter into White Balance of item 9.

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

**Error symptom**: No video/Audio

**Content**: Establish date - 2012.11.30  
Revised date - A5

### LCD TV

<table>
<thead>
<tr>
<th>Error symptom</th>
<th>A. Video error_No video/Audio</th>
<th>Established date</th>
<th>2012.11.30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Content</td>
<td>Power Board voltage measuring method</td>
<td>Revised date</td>
<td>A5</td>
</tr>
</tbody>
</table>

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

### Edge LED

**24 Pin (Power Board ↔ Main Board) - 공통**

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Power on</td>
<td>2</td>
<td>INV_ON</td>
</tr>
<tr>
<td>3</td>
<td>3.5V</td>
<td>4</td>
<td>PDIM #1(PWM Dim #1)</td>
</tr>
<tr>
<td>5</td>
<td>3.5V</td>
<td>6</td>
<td>PDIM #2(PWM Dim #2)</td>
</tr>
<tr>
<td>7</td>
<td>GND</td>
<td>8</td>
<td>GND</td>
</tr>
<tr>
<td>9</td>
<td>24V</td>
<td>10</td>
<td>24V</td>
</tr>
<tr>
<td>11</td>
<td>GND</td>
<td>12</td>
<td>GND</td>
</tr>
<tr>
<td>13</td>
<td>12V</td>
<td>14</td>
<td>12V</td>
</tr>
<tr>
<td>15</td>
<td>12V</td>
<td>16</td>
<td>12V</td>
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<tr>
<td>17</td>
<td>GND</td>
<td>18</td>
<td>GND</td>
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<tr>
<td>19</td>
<td>GND</td>
<td>20</td>
<td>GND</td>
</tr>
<tr>
<td>21</td>
<td>GND</td>
<td>22</td>
<td>L/DIM0_VS</td>
</tr>
<tr>
<td>23</td>
<td>L/DIM0_MOSI</td>
<td>24</td>
<td>L/DIM0_SCLK</td>
</tr>
<tr>
<td>LCD TV</td>
<td>Error symptom</td>
<td>A. Video error_Video error, video lag/stop</td>
<td>Established date</td>
</tr>
<tr>
<td>--------</td>
<td>---------------</td>
<td>--------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TUNER input signal strength checking method</td>
<td>2012. 11 .30</td>
</tr>
</tbody>
</table>

**<ALL MODELS>**

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

MENU -> Channel -> Manual -> select channel
<ALL MODELS>

1. Checking method for remote controller for adjustment

Press the IN-START with the remote controller for adjustment

---

### LCD TV

<table>
<thead>
<tr>
<th>Error symptom</th>
<th>Content</th>
<th>Established date</th>
<th>Revised date</th>
<th>A7</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCD TV Version checking method</td>
<td></td>
<td>2012.11.30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LCD TV</td>
<td>Error symptom</td>
<td>Content</td>
<td>Established date</td>
<td>Revised date</td>
</tr>
<tr>
<td>-----------------</td>
<td>-----------------------------------------------------------</td>
<td>-------------------------------------------------------</td>
<td>------------------</td>
<td>--------------</td>
</tr>
<tr>
<td></td>
<td>A. Video error _Vertical/Horizontal bar, residual image, light spot</td>
<td>LCD TV connection diagram (1)</td>
<td>2012.11.30</td>
<td>A8</td>
</tr>
</tbody>
</table>

<ALL MODELS>

As the part connecting to the external input, check the screen condition by signal
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.
<table>
<thead>
<tr>
<th>LCD TV</th>
<th>Error symptom</th>
<th>A. Video error_Color error</th>
<th>Established date</th>
<th>Revised date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Content</td>
<td>Adjustment Test pattern - ADJ Key</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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!)

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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
Solder defect, CNT Broken
Solder defect, CNT Broken
Solder defect, CNT Broken
Abnormal Power Section
Abnormal Power Section
Solder defect, Short/Crack
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
Un-repairable Cases
In this case please exchange the module.
Appendix : Exchange the Module (2)

Un-repairable Cases
In this case please exchange the module.
<table>
<thead>
<tr>
<th>LCD TV</th>
<th>Error symptom</th>
<th>B. Power error _No power</th>
<th>Established date</th>
<th>Revised date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Content</td>
<td>Check front display LED</td>
<td>2012. 11 .30</td>
<td>A17</td>
</tr>
</tbody>
</table>

Front LED control:
Menu → Option → LG Logo indicator → Bright / Time

ST-BY condition: On
Power ON condition: Off (but you can select On by menu)
For '10 models, there is no voltage out for ST-BY purpose. When ST-by, only 3.5V is normally on.

**Edge LED**

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

**24 Pin (Power Board ↔ Main Board) - 공통**

<table>
<thead>
<tr>
<th>SMAW200-H18S1 (YEONHO)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1</strong></td>
</tr>
<tr>
<td><strong>3</strong></td>
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<tr>
<td><strong>7</strong></td>
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<td><strong>9</strong></td>
</tr>
<tr>
<td><strong>11</strong></td>
</tr>
<tr>
<td><strong>13</strong></td>
</tr>
<tr>
<td><strong>15</strong></td>
</tr>
<tr>
<td><strong>17</strong></td>
</tr>
<tr>
<td><strong>19</strong></td>
</tr>
<tr>
<td><strong>21</strong></td>
</tr>
<tr>
<td><strong>23</strong></td>
</tr>
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</table>
### 24 Pin (Power Board ↔ Main Board) - 공통

**SMAW200-H18S1 (YEONHO)**

<table>
<thead>
<tr>
<th>Pin</th>
<th>Description</th>
<th>Value</th>
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<tbody>
<tr>
<td>1</td>
<td>Power on</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>INV_ON</td>
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</tr>
<tr>
<td>3</td>
<td>PDIM #1 (PWM Dim #1)</td>
<td>3.5V</td>
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<tr>
<td>4</td>
<td>PDIM #2 (PWM Dim #2)</td>
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<tr>
<td>5</td>
<td>GND</td>
<td>3.5V</td>
</tr>
<tr>
<td>6</td>
<td>GND</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>24V</td>
<td>GND</td>
</tr>
<tr>
<td>8</td>
<td>GND</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>12V</td>
<td>24V</td>
</tr>
<tr>
<td>10</td>
<td>12V</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>GND</td>
<td>12V</td>
</tr>
<tr>
<td>12</td>
<td>GND</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>12V</td>
<td>12V</td>
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<td>14</td>
<td>12V</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>GND</td>
<td>12V</td>
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<tr>
<td>16</td>
<td>GND</td>
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<td>17</td>
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<td>12V</td>
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<td>18</td>
<td>GND</td>
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<td>12V</td>
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<td>20</td>
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<td>21</td>
<td>L/DIM0_VS</td>
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<tr>
<td>22</td>
<td>L/DIM0_MOSI</td>
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<tr>
<td>23</td>
<td>L/DIM0_SCLK</td>
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</table>

**Checking method when power is ON**

- Check “power on” pin is high

---

**Error symptom**

- LCD TV

**Content**

- Checking method when power is ON

**Established date**

- 2012. 11.30

**Revised date**

- A19
## Standard Repair Process Detail Technical Manual

### LCD TV

<table>
<thead>
<tr>
<th>Error symptom</th>
<th>B. Power error _Off when on, off while viewing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Content</td>
<td>POWER OFF MODE checking method</td>
</tr>
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#### Established date: 2012.11.30

#### Revised date: A22

### <ALL MODELS>

#### Error symptom: LCD TV

<table>
<thead>
<tr>
<th>Model Name</th>
<th>Global-PLAT4</th>
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</thead>
<tbody>
<tr>
<td>Serial Number</td>
<td>SKJY1107</td>
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<tr>
<td>SW Version</td>
<td>02.04.01.01</td>
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<tr>
<td>MICOM Version</td>
<td>2.00.0</td>
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<tr>
<td>BOOT Version</td>
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<tr>
<td>PWM (min/max/StrDuty)</td>
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</tr>
<tr>
<td>EDID (RGB/HDMI)</td>
<td>0.01/0.00</td>
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<tr>
<td>Chip Type</td>
<td>MTK 5398</td>
</tr>
<tr>
<td>Wi-Fi Version</td>
<td>1.0</td>
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<td>Wi-Fi Channel</td>
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<td>MAC Address</td>
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</tr>
<tr>
<td>IP Address</td>
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<tr>
<td>Widevine</td>
<td>NG</td>
</tr>
<tr>
<td>ESN NUM</td>
<td>NG</td>
</tr>
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<td>HDCP1.4</td>
<td>NG</td>
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<tr>
<td>HDCP2.0</td>
<td>NG</td>
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<tr>
<td>RF Receiver Version</td>
<td>02.11</td>
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<td>Wi-Fi/Magic Search</td>
<td>NG, NG</td>
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<tr>
<td>Camera Ver</td>
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<tr>
<td>A.Demod F/W Ver</td>
<td>Null</td>
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<tr>
<td>D.Demod F/W Ver</td>
<td>Null</td>
</tr>
<tr>
<td>Debug Status</td>
<td>Event</td>
</tr>
<tr>
<td>Access USB Status</td>
<td>1/10/1/10</td>
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<td>UTT : 25</td>
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<td>APP History Ver</td>
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<tr>
<td>POL DB</td>
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</table>

#### Entry method

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

<table>
<thead>
<tr>
<th>Error symptom</th>
<th>C. Audio error_No audio/Normal video</th>
<th>Established date</th>
<th>Revised date</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Checking method in menu when there is no audio</td>
<td>2012.11.30</td>
<td>A24</td>
<td></td>
</tr>
</tbody>
</table>

<ALL MODELS>

**Checking method**

1. Press the MENU button on the remote controller
2. Select the AUDIO function of the Menu
3. Select TV Speaker Or Other
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.
Checking order

1. 2. Check IR cable condition between IR & Main board.
3. Check the st-by 3.3V 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.
1. Case
- LCD module change
- T-Con board change

2. Equipment
- Service Remote controller

3. Adjust sequence
- Press the ‘adj’ key
- select V-COM
- As pushing the right or the left button on the remote controller, And find the V-COM value Which is no or minimized the Flicker.

*(If there is no flicker at default value, Press the exit key and finish the VCOM adjustment.)*
- Push the OK key to store the value. Then the message “Saving OK” is pop.
- Press the exit key to finish V-COM adjustment.