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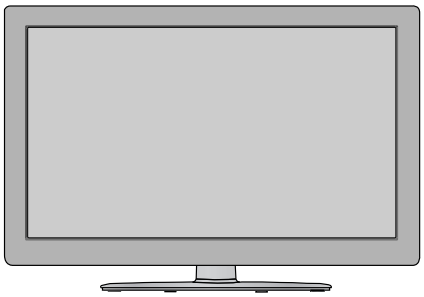
LED LCD TV
SERVICE MANUAL

CHASSIS : LA02R

MODEL : 55LX6500 55LX6500-UB

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



P/NO : MFL63727203 (1005-REV00)

Printed in Korea

CONTENTS

SAFETY PRECAUTIONS

IMPORTANT SAFETY NOTICE

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

General Guidance

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

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

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

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

Keep wires away from high voltage or high temperature parts.

Before returning the receiver to the customer,

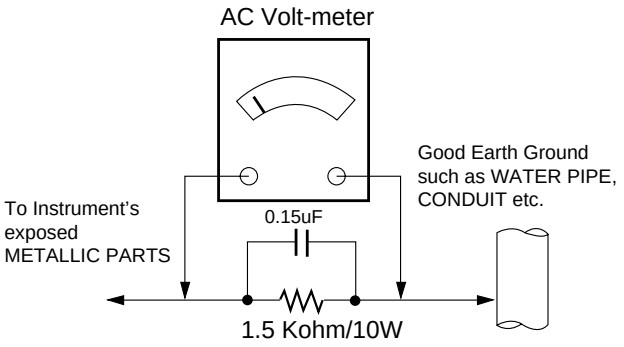
always perform an **AC leakage current check** on the exposed metallic parts of the cabinet, such as antennas, terminals, etc., to be sure the set is safe to operate without damage of electrical shock.

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 1MΩ and 5.2MΩ.
When the exposed metal has no return path to the chassis the reading must be infinite.
An other abnormality exists that must be corrected before the receiver is returned to the customer.

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

Do not use a line Isolation Transformer during this check.
Connect 1.5K/10watt resistor in parallel with a 0.15uF 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 0.5mA.
In case any measurement is out of the limits specified, there is possibility of shock hazard and the set must be checked and repaired before it is returned to the customer.

Leakage Current Hot Check circuit



SERVICING PRECAUTIONS

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

General Servicing Precautions

1. Always unplug the receiver AC power cord from the AC power source before;
   a. Removing or reinstalling any component, circuit board module or any other receiver assembly.
   b. Disconnecting or reconnecting any receiver electrical plug or other electrical connection.
   c. Connecting a test substitute in parallel with an electrolytic capacitor in the receiver.
   CAUTION: A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.

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

Electrostatically Sensitive (ES) Devices

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

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

General Soldering Guidelines

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

IC Remove/Replacement

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

Removal

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

Replacement

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

"Small-Signal" Discrete Transistor Removal/Replacement

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

Power Output, Transistor Device Removal/Replacement

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

Diode Removal/Replacement

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

Fuse and Conventional Resistor Removal/Replacement

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

Circuit Board Foil Repair

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

At IC Connections

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

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

At Other Connections

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

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

SPECIFICATION

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

1. Application range

This spec sheet is applied LCD TV with LA02R chassis.

2. Requirement for Test

Each part is tested as below without special appointment.

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

3. Test method

1) Performance: LGE TV test method followed
2) Demanded other specification
   - Safety : UL, CSA, IEC specification
   - EMC: FCC, ICES, IEC specification
   - Wireless : WirelessHD Specification (Option)

Model	Market	Appliance
42/47/55LXLE6500-UB 47/55LX9500-UA	North America	Safety : UL1492, CSA C22.2.No.1, EMC : FCC Class B, IEC Class B

4. General Specification(TV)

No	Item	Specification		Remark
1	Receivable System	1) ATSC / NTSC-M		
2	Available Channel	VHF : 02 ~ 13 UHF : 14 ~ 69 DTV : 02 ~ 69 CATV : 01 ~ 135 CADTV : 01 ~ 135		
3	Input Voltage	1) AC 100 ~ 240V 50/60Hz		
4	Market	North America		
5	Aspect Ratio	16:9		
6	Tuning System	FS		
7	LCD Module	LC420EUS-SCA1		42LX6500-UB
		LC470EUS-SCA1		47LX6500-UB
		LC550EUC-SCA1		55LX6500-UB
		LC470MUT-SCA1		47LX9500-UA
		LC550MUT-SCA1		55LX9500-UA
8	Operating Environment	Temp : 0 ~ 40 deg Humidity : ~ 80 %		
9	Storage Environment	Temp : -20 ~ 50 deg Humidity : -85 %		

5. Chrominance & Luminance

5.1. 42/47/55LX6500-UB

No	Item			Min	Typ	Max	Unit	Remark
1	Max Luminance (Center 1-point / Full White Pattern)		2D	350	430		cd/m²	42LX6500-UB(2D)
			3D	48	61		cd/m²	42LX6500-UB(3D)
			2D	350	430		cd/m²	47LX6500-UB(2D)
			3D	48	61		cd/m²	47LX6500-UB(3D)
			2D	350	430		cd/m²	55LX6500-UB(2D)
			3D	48	61		cd/m²	55LX6500-UB(3D)
2	Color coordinate	RED	X	Typ. -0.03	0.642	Typ. +0.03		42LX6500-UB
			Y		0.335			
		GREEN	X		0.308			
			Y		0.602			
		BLUE	X		0.156			
			Y		0.061			
		WHITE	X		0.279			
			Y		0.292			
		RED	X	Typ. -0.03	0.642	Typ. +0.03		47LX6500-UB
			Y		0.333			
		GREEN	X		0.307			
			Y		0.605			
		BLUE	X		0.149			
			Y		0.058			
		WHITE	X		0.279			
			Y		0.292			
		RED	X	Typ. -0.03	0.644	Typ. +0.03		55LX6500-UB
			Y		0.333			
		GREEN	X		0.308			
			Y		0.605			
		BLUE	X		0.149			
			Y		0.059			
		WHITE	X		0.279			
			Y		0.292			
3	Luminance Uniformity(2D)			77			%	5 point
4	3D Grosstalk				14	18	%	
5	Contrast ratio			1000	1300			Only 2D
6	Response Time(Gray to Gray)				6		ms	
	Response Time(MPRT)				6		ms	
	Response Time(Uniformity MPRT)					1		
	Response Time(Uniformity G to G)					1		
7	Dynamic CR			4,500,000	5,000,000			
8	Color Temperature			Cool	Typ. -0.015	0.269 0.273	Typ. +0.015	42/47/55LX6500-UB <Test Condition> 85% Full white pattern The W/B Tolerance is ±0.015 for picture quality by DQA
				Medium	Typ. -0.015	0.285 0.293	Typ. +0.015	
				Warm	Typ. -0.015	0.313 0.329	Typ. +0.015	

6. Component Video Input (Y, C_B/P_B, C_R/P_R)

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

7. RGB Input (PC)

No	Resolution	H-freq(kHz)	V-freq.(kHz)	Pixel clock	Proposed	
	PC					DDC
1.	640*350	31.468	70.09	25.17	EGA	X
2.	720*400	31.469	70.08	28.32	DOS	O
3.	640*480	31.469	59.94	25.17	VESA(VGA)	O
4 .	800*600	37.879	60.31	40.00	VESA(SVGA)	O
5.	1024*768	48.363	60.00	65.00	VESA(XGA)	O
6.	1280*768	47.776	59.87	79.50	CVT(WXGA)	X
7.	1360*768	47.712	60.015	85.50	VESA(WXGA)	X
8.	1280*1024	63.981	60.020	108.00	VESA(SXGA)	O
9.	1920*1080	66.587	59.934	148.5	HDTV 1080P	O

8. HDMI input (PC/DTV)

No	Resolution	H-freq(kHz)	V-freq.(kHz)	Pixel clock	Proposed	
	PC					DDC
1.	640*350	31.468	70.09	25.17	EGA	X
2.	720*400	31.469	70.08	28.32	DOS	O
3.	640*480	31.469	59.94	25.17	VESA(VGA)	O
4 .	800*600	37.879	60.31	40.00	VESA(SVGA)	O
5.	1024*768	48.363	60.00	65.00	VESA(XGA)	O
6.	1280*768	47.776	59.870	79.50	CVT(WXGA)	X
7.	1360*768	47.712	60.015	85.50	VESA(WXGA)	X
8.	1280*1024	63.981	60.020	108.00	VESA(SXGA)	O
9.	1920*1080	67.5	60	148.5	HDTV 1080P	O
	DTV					
1	720*480	31.5	60	27.027	SDTV 480P	
2	720*480	31.47	59.94	27.00	SDTV 480P	
3	1280*720	45.00	60.00	74.25	HDTV 720P	
4	1280*720	44.96	59.94	74.176	HDTV 720P	
5	1920*1080	33.75	60.00	74.25	HDTV 1080I	
6	1920*1080	33.72	59.94	74.176	HDTV 1080I	
7	1920*1080	67.500	60	148.50	HDTV 1080P	
8	1920*1080	67.432	59.939	148.352	HDTV 1080P	
9	1920*1080	27.000	24.000	74.25	HDTV 1080P	
10	1920*1080	26.97	23.976	74.176	HDTV 1080P	
11	1920*1080	33.75	30.000	74.25	HDTV 1080P	
12	1920*1080	33.71	29.97	74.176	HDTV 1080P	

9. 3D Mode

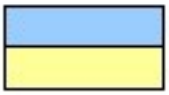
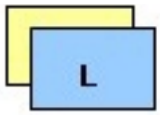
9.1. HDMI Input

No	Resolution	H-freq(kHz)	V-freq.(kHz)	Pixel clock	Proposed	Remark
1	1280x720	45.00	60.00	74.25	HDTV 720P	Side by Side Top&Bottom HDMI1.4 Frame Packing
2	1920x1080	33.75	60.00	74.25	HDTV 1080I	Side by Side Top&Bottom
3	1920x1080	67.500	60	148.50	HDTV 1080P	Side by Side Top&Bottom Checkerboard Single Frame Sequential HDMI1.4 Frame Packing
4	1920x1080	27.00	24.000	74.25	HDTV 1080P	Side by Side Top&Bottom Checkerboard HDMI1.4 Frame Packing
5	1920x1080	33.75	30.000	74.25	HDTV 1080P	Side by Side Top&Bottom Checkerboard

9.2. USB Input

No	Resolution	H-freq(kHz)	V-freq.(kHz)	Pixel clock	Proposed	Remark
5	1920x1080	33.75	30.000	74.25	HDTV 1080P	Side by Side Top&Bottom Checkerboard

9.3. 3D Input mode

No	Side by Side	Top&Bottom	Checkerboard	Single Frame Sequential	Frame Packing
1					

ADJUSTMENT INSTRUCTION

1. Application range

This spec sheet is applied to LA02R Chassis applied LCD TV all models manufactured in TV factory

2. Specification

2.1 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.

2.2 Adjustment must be done in the correct order.

2.3 The adjustment must be performed in the circumstance of 25±5°C of temperature and 65±10% of relative humidity

2.4 The input voltage of the receiver must keep 100~240V, 50/60Hz.

2.5 The receiver must be operated for about 5 minutes prior to the adjustment when module is in the circumstance of over 15. In case of keeping module is in the circumstance of 0°C, it should be placed in the circumstance of above 15°C for 2 hours In case of keeping module is in the circumstance of below -20°C, it should be placed in the circumstance of above 15°C for 3 hours.

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

3. Adjustment items

3.1. Main PCB check process

• Adjust 480i Comp1

Remark) Above adjustment items can be also performed in Final Assembly if needed. Adjustment items in both PCBA and final assembly stages can be checked by using the INSTART Menu 1.ADJUST CHECK.
Component 1080p and RGB-PC Adjust will be calculated by 480i adjust value.

3.2 Final assembly adjustment

•EDID/DDC download
•White Balance adjustment
•RS-232C functionality check
•Factory Option setting per destination
•Ship-out mode setting (In-Stop)

3.3 ETC

• Ship-out mode
• Tool option menu
• USB Download(S/W Update, Option, Service only)

4. Automatic Adjustments

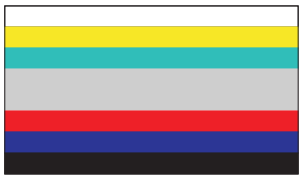
4.1. ADC Calibration(GP2 BCM3549)

(1) Overview

ADC adjustment is needed to find the optimum black level and gain in Analog-to-Digital device and to compensate RGB deviation.

(2) Equipment & Condition

1) Jig (RS-232C protocol)
2) MSPG-925 Series Pattern Generator(MSPG-925FA)
- Resolution : 480i Comp1 (MSPG-925FA: model-209, pattern-65)
- Resolution : 1080p Comp1 (MSPG-925FA: model-225, pattern-65)
- Resolution : 1920x1080 RGB (MSPG-925FA: model-225, pattern-65)
- Pattern: Horizontal 100% Color Bar Pattern
- Pattern level: 0.7±0.1 Vp-p
- Image



(3) Adjustment

1) Adjustment method
- Using RS-232, adjust items listed in 3.1 in the other shown in “4.1.3.3”

2) Adj. protocol

Protocol	Command	Set ACK
Enter adj. mode	aa 00 00	a 00 OK00x
Source change	xb 00 40 xb 00 60	b 00 OK40x (Adjust 480i/1080p Comp1) b 00 OK60x (Adjust 1920*1080 RGB)
Begin adj.	ad 00 10	
Return adj. result		OKx (Case of Success) NGx (Case of Fail)
Read adj. data	(main) ad 00 20 (sub) ad 00 21	(main) 0000000000000000000000000007c007b006dx (Sub) 0000000700000000000000000007c003300f7x
Confirm adj.	ad 00 99	NG 03 00x (Fail) NG 03 01x (Fail) NG 03 02x (Fail) OK 03 03x (Success)
End adj.	aa 00 90	a 00 OK90x

Ref.) ADC Adj. RS232C Protocol_Ver1.0

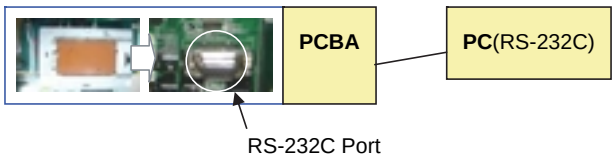
3) Adj. order
- aa 00 00 [Enter ADC adj. mode]
- xb 00 40 [Change input source to Component1 (480i/1080p)]
- ad 00 10 [Adjust 480i/1080p Comp1]
- ad 00 10 [Adjust 1080p Comp1]
- xb 00 60 [Change input source to RGB(1920x1080)]
- ad 00 10 [Adjust 1920x1080 RGB]
- ad 00 90 End adj.

5. Manual Adjustments

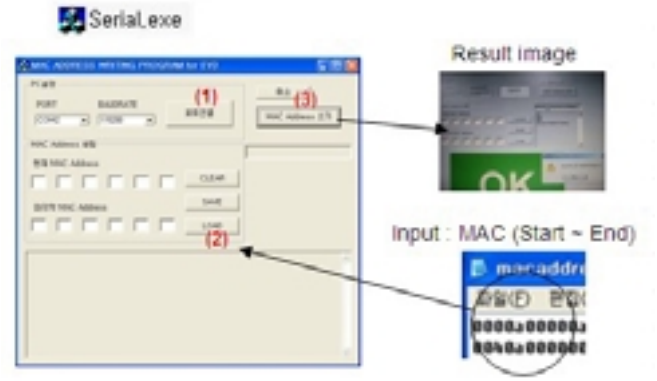
5.1. Download MAC address and ESN key

5.1.1 Communication Port connection

1 Connect : PCBA Jig-> RS-232C Port== PC-> RS-232C Port



2 Mac Address Input



1) Equipment setting
- Play file : Serial.exe
- MAC Address edit
  Srart / End MAC address input
- Communication port connection
- Com 1,2,3,4 and 115200(Baudrate)
- Port connection button click(1)
  Load button click(2) for MAC Address write.

2) Start MAC Address write button(3)

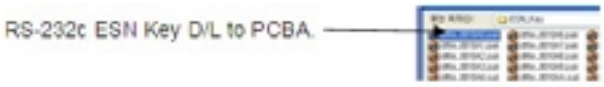
3) Check the OK Or NG

5.1.2 Download ESN Key

1. Input the ESN Key

• Download Model sending Key file

• input by 1 by SET so as not to be duplicated



5.2 LAN PORT + ESN INSPECTION (Automatic IP)

5.2.1 Equipment & Condition

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

5.2.2 LAN inspection solution

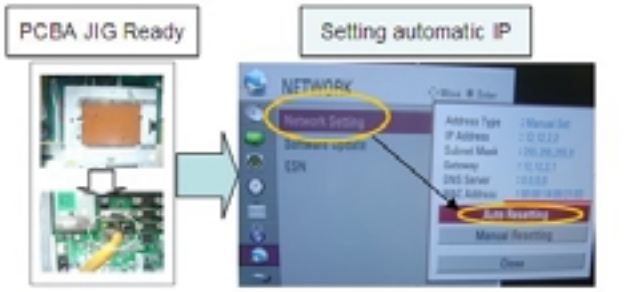
• LAN Port connection with PCB

• Network setting at MENU Mode of TV

• setting automatic IP

• Setting state confirmation

- If automatic setting is finished, you confirm IP and MAC Address.



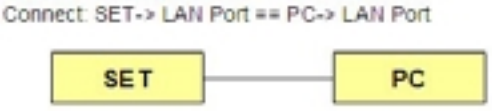
5.2.3 ESN Key confirmation

• confirm Key input Data at ESN MENU Mode

5.3 LAN PORT INSPECTION(PING TEST)

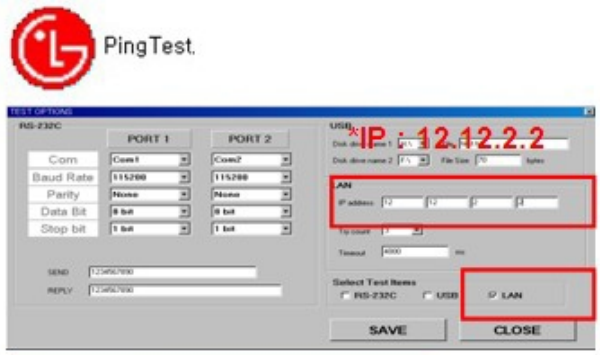
5.3.1. Equipment setting

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



5.3.2. LAN PORT inspection (PING TEST)

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



5.4 EDID/DDC Download

(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”.

(2) Equipment

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

(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) EDID DATA

HDMI 1(C/S : 0422)

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

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	00	FF	FF	FF	FF	FF	FF	00	1E	6D	01	00	01	01	01	01
10	01	14	01	03	80	10	09	78	0A	EE	91	A3	54	4C	99	26
20	0F	50	54	A1	08	00	81	80	61	40	45	40	31	40	01	01
30	01	01	01	01	01	01	02	3A	80	18	71	38	2D	40	58	2C
40	45	00	A0	5A	00	00	00	1E	01	1D	00	72	51	D0	1E	20
50	6E	28	55	00	A0	5A	00	00	00	1E	00	00	00	FD	00	39
60	3F	1F	52	10	00	0A	20	20	20	20	20	20	00	00	00	FC
70	00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	01	04

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

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	02	03	2D	F1	47	10	22	20	05	84	03	02	23	09	07	07
10	78	03	0C	00	10	00	B8	2D	20	C0	0E	01	40	00	14	08
20	20	18	20	28	20	38	20	48	20	E3	05	03	01	02	3A	80
30	18	71	38	2D	40	58	2C	04	05	A0	5A	00	00	00	1E	01
40	1D	80	18	71	1C	16	20	58	2C	25	00	A0	5A	00	00	00
50	9D	01	1D	00	72	51	D0	1E	20	6E	28	55	00	A0	5A	00
60	00	00	1E	26	36	80	A0	70	38	1F	40	30	20	25	00	A0
70	5A	00	00	00	1A	00	00	00	00	00	00	00	00	00	00	22

HDMI 2(C/S : 0412)

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

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	00	FF	FF	FF	FF	FF	FF	00	1E	6D	01	00	01	01	01	01
10	01	14	01	03	80	10	09	78	0A	EE	91	A3	54	4C	99	26
20	0F	50	54	A1	08	00	81	80	61	40	45	40	31	40	01	01
30	01	01	01	01	01	01	02	3A	80	18	71	38	2D	40	58	2C
40	45	00	A0	5A	00	00	00	1E	01	1D	00	72	51	D0	1E	20
50	6E	28	55	00	A0	5A	00	00	00	1E	00	00	00	FD	00	39
60	3F	1F	52	10	00	0A	20	20	20	20	20	20	00	00	00	FC
70	00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	01	04

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

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	02	03	2D	F1	47	10	22	20	05	84	03	02	23	09	07	07
10	78	03	0C	00	20	00	B8	2D	20	C0	0E	01	40	00	14	08
20	20	18	20	28	20	38	20	48	20	E3	05	03	01	02	3A	80
30	18	71	38	2D	40	58	2C	04	05	A0	5A	00	00	00	1E	01
40	1D	80	18	71	1C	16	20	58	2C	25	00	A0	5A	00	00	00
50	9E	01	1D	00	72	51	D0	1E	20	6E	28	55	00	A0	5A	00
60	00	00	1E	26	36	80	A0	70	38	1F	40	30	20	25	00	A0
70	5A	00	00	00	1A	00	00	00	00	00	00	00	00	00	00	12

HDMI 3(C/S : 0402)

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

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	00	FF	FF	FF	FF	FF	FF	00	1E	6D	01	00	01	01	01	01
10	01	14	01	03	80	10	09	78	0A	EE	91	A3	54	4C	99	26
20	0F	50	54	A1	08	00	81	80	61	40	45	40	31	40	01	01
30	01	01	01	01	01	01	02	3A	80	18	71	38	2D	40	58	2C
40	45	00	A0	5A	00	00	00	1E	01	1D	00	72	51	D0	1E	20
50	6E	28	55	00	A0	5A	00	00	00	1E	00	00	00	FD	00	39
60	3F	1F	52	10	00	0A	20	20	20	20	20	20	00	00	00	FC
70	00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	01	04

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

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	02	03	2D	F1	47	10	22	20	05	84	03	02	23	09	07	07
10	78	03	0C	00	30	00	B8	2D	20	C0	0E	01	40	00	14	08
20	20	18	20	28	20	38	20	48	20	E3	05	03	01	02	3A	80
30	18	71	38	2D	40	58	2C	04	05	A0	5A	00	00	00	1E	01
40	1D	80	18	71	1C	16	20	58	2C	25	00	A0	5A	00	00	00
50	9E	01	1D	00	72	51	D0	1E	20	6E	28	55	00	A0	5A	00
60	00	00	1E	26	36	80	A0	70	38	1F	40	30	20	25	00	A0
70	5A	00	00	00	1A	00	00	00	00	00	00	00	00	00	00	02

HDMI 4(C/S : 04F2)

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

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	00	FF	FF	FF	FF	FF	FF	00	1E	6D	01	00	01	01	01	01
10	01	14	01	03	80	10	09	78	0A	EE	91	A3	54	4C	99	26
20	0F	50	54	A1	08	00	81	80	61	40	45	40	31	40	01	01
30	01	01	01	01	01	01	02	3A	80	18	71	38	2D	40	58	2C
40	45	00	A0	5A	00	00	00	1E	01	1D	00	72	51	D0	1E	20
50	6E	28	55	00	A0	5A	00	00	00	1E	00	00	00	FD	00	39
60	3F	1F	52	10	00	0A	20	20	20	20	20	20	00	00	00	FC
70	00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	01	04

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

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	02	03	2D	F1	47	10	22	20	05	84	03	02	23	09	07	07
10	78	03	0C	00	40	00	B8	2D	20	C0	0E	01	40	00	14	08
20	20	18	20	28	20	38	20	48	20	E3	05	03	01	02	3A	80
30	18	71	38	2D	40	58	2C	04	05	A0	5A	00	00	00	1E	01
40	1D	80	18	71	1C	16	20	58	2C	25	00	A0	5A	00	00	00
50	9E	01	1D	00	72	51	D0	1E	20	6E	28	55	00	A0	5A	00
60	00	00	1E	26	36	80	A0	70	38	1F	40	30	20	25	00	A0
70	5A	00	00	00	1A	00	00	00	00	00	00	00	00	00	00	F2

RGB(C/S : 1D)

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

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	00	FF	FF	FF	FF	FF	FF	00	1E	6D	01	00	01	01	01	01
10	01	14	01	03	68	10	09	78	0A	EE	91	A3	54	4C	99	26
20	0F	50	54	A1	08	00	81	80	61	40	45	40	31	40	01	01
30	01	01	01	01	01	01	02	3A	80	18	71	38	2D	40	58	2C
40	45	00	A0	5A	00	00	00	1E	01	1D	00	72	51	D0	1E	20
50	6E	28	55	00	A0	5A	00	00	00	1E	00	00	00	FD	00	3A
60	3E	1E	53	10	00	0A	20	20	20	20	20	20	00	00	00	FC
70	00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	00	1D

5.5. White Balance Adjustment

(1) Overview

• W/B adj. Objective & How-it-works

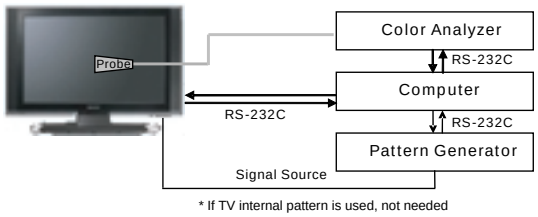
- Objective: To reduce each Panel's W/B deviation
- How-it-works: When R/G/B gain in the OSD is at 192, it means the panel is at its Full Dynamic Range. In order to prevent saturation of Full Dynamic range and data, one of R/G/B is fixed at 192, and the other two is lowered to find the desired value.
- Adj. condition : normal temperature
  1) Surrounding Temperature: 25±5ºC
  2) Warm-up time: About 5 Min
  3) Surrounding Humidity: 20% ~ 80%

(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)
   -> Only when internal pattern is not available

• Color Analyzer Matrix should be calibrated using CS-1000

(3) Equipment connection MAP



Connection Diagram of Automatic Adjustment

(4) Adj. Command (Protocol)

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

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

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

• Adjustment Map

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

(5) Adj. method

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

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

(6) Manual adj. method

1) Set TV IN Adj. mode using POWER ON
2) Zero Calibrate the probe of Color Analyzer, then place in 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 th the right (KEY G), When Key(G) 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 selection OFF, you can adjust using RF signal in 216 Gray pattern.

• Adj. condition and cautionary items

1) Lighting cndition in surrounding area.
Surrounding lighting should be lower 10 lux. Try to isolate adj. area into dark surrounding.
2) Probe location : Color Snalyzer (CA-210) probe should be within 10cm and perpendicular of the module surface (80º~100º)
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.

(7) Reference (White Balance Adj. coordinate and color temperature)
- Luminance: 216 Gray
- Standard color coordinate and temperature using CS-1000

Mode	Color Coordination		Temp	ΔUV
	x	y		
COOL	0.269	0.273	13000K	0.0000
MEDIUM	0.285	0.293	9300K	0.0000
WARM	0.313	0.329	6500K	0.0000

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

Mode	Color Coordination		Temp	ΔUV
	x	y		
COOL	0.269±0.002	0.273±0.002	13000K	0.0000
MEDIUM	0.285±0.002	0.293±0.002	9300K	0.0000
WARM	0.313+0.002	0.329±0.002	6500K	0.0000

- Standard color coordinate and temperature using CA-210(CH 14) – by aging time

1) Edge/IOP LED models : 42/47/55LX6500-UB

GP2	Aging time (Min)	Cool		Medium		Warm	
		x	y	x	y	x	y
		269	273	285	293	313	329
1	0-2	280	291	296	311	319	340
2	3-5	278	288	294	308	317	338
3	6-9	276	285	292	305	315	335
4	10-19	274	282	290	302	313	332
5	20-35	273	279	289	299	312	329
6	36-49	270	276	287	296	310	326
7	50-79	269	273	286	293	308	323
8	Over 80	269	273	285	293	308	323

2) IOP LED models : 47/55LX9500-UA

GP2	Aging time (Min)	Cool		Medium		Warm	
		x	y	x	y	x	y
		269	273	285	293	313	329
1	0-2	287	301	303	321	326	351
2	3-5	286	299	302	319	325	349
3	6-9	285	297	301	317	324	347
4	10-19	283	295	299	315	322	345
5	20-35	281	291	297	311	320	341
6	36-49	277	285	293	305	316	335
7	50-79	273	281	289	301	312	331
8	80-149	271	277	287	297	310	327
9	Over 150	269	273	285	293	308	323

(8) THX Adjustment (THX certified model only)
Several THX certified model have to adjust White Balance 5 point at warm mode only.
1) Adjust 100 IRE White Balance
2) Adjust Max Brightness of Back Light Unit to approach 120cd.
3) Adjust Gamma 2.2 IRE(80,60,40,20) with Max Brightness.
4) Set R,G,B Gain at 10 IRE to 0,0,0
5) Complete 5 point Gamma and White Balance Adjustment.

5.6. Option selection per countries

(1) Overview

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

(3) Tool Option Inspection
- Press Adj. key on the Adj. R/C, and then check Tool option.

Model	Tool1	Tool2	Tool3	Tool4	Tool5
47LX9500-UA	33792	30291	56636	4588	1963
55LX9500-UA	46080	30291	56636	4588	1963
42LX6500-UB	25568	30291	56364	4524	1578
47LX6500-UB	33760	30291	56364	4524	1578
55LX6500-UB	46048	30291	56364	4524	1579

5.7. Local dimming inspection (Optional)

5.7.1. Edge LED models with local dimming

(1) Press 'TILT" key of the Adj. R/C and check moving patterns. The black bar patterns moves from left to right. If local dimming function does not work, a whole screen shows full white.

5.7.2. IOP LED models with local dimming

(1) Press 'TILT" key of the Adj. R/C and check moving patterns. The black cross-bar patterns moves from top-left to Bottom-right. If local dimming function does not work, a whole screen shows full white.

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.
- After final inspection, Always turn on the Mechanical S/W.

6. GND and Hi-pot Test

6.1. Method

6.1.1. GND & HI-POT auto-check preparation

(1) Check the POWER CABLE and SIGNAL CABE insertion condition (If loose, re-insert)

6.1.2. Perform GND & Internal Pressure auto-check

- Unit fully inserted POWER cord, Antenna cable and A/V arrive to the auto-check process.
- Connect D-terinal to AV JACK TESTER
- Auto CONTROLLER(GWS103-4) ON
- Perform GND Test
- If NG, Buzzer will sound to inform the operator.
- If OK, change over to I/P check auto matically.

(Remove CORD, A/V form AV Jack Box)

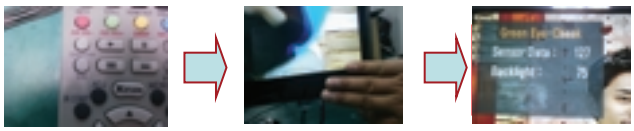
- Perform I/P test
- If NG, Buzzer will sound to inform the operator.
- If OK, Good lamp will lit up and the stopper will allow the pallet to move on to next process.

6.2. Checkpoint

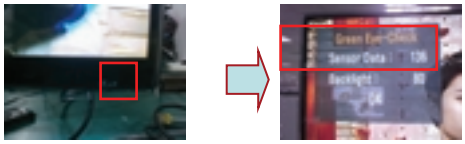
- TEST voltage
  - GND: 1.5KV/min at 100mA
  - SIGNAL: 3KV/min at 100mA
- TEST time: 1 second
- TEST POINT
  - GND TEST = POWER CORD GND & SIGNAL CABLE METAL GND
  - Internal Pressure TEST = POWER CORD GND & LIVE & NEUTRAL
- LEAKAGE CURRENT: At 0.5mArms

7. EYE-Q function check

1) Turn on TV
2) Press EYE button on the adjustable R/C
3) Hide the Eye Q sensor on the front of the set for approximately 6 seconds.
4) Check the “Sensor Data” whether it is under 10. If it is not under 10, Eye Q sensor is faulty. And change a new sensor.
5) Detach the hand from Eye Q II sensor for 6 seoconds.
6) Check the value of “Back Light(xxx)” on the display. If its value does not increase after 6 senconds, Eye Q sensor is faulty.



<Step2> <Step3> <Step4>



<Step5> <Step6>

8. Check the R/C

- Required Equipments: RF-controller, IR-KEY-CODE controller
- Check that AA Battery of RF-Remote controller is enough before the test.

(Recommend that change the battery each LOT)

- Test Method

a) Press the START button on Controller for pairing with the set

b) Check whether cursor is showed on a display of the set after pressing the OK button.

c) Press the STOP button to pair off with the set.

9. Audio

No	Item	Min	Typ	Max	Unit	
1.	Audio practical max Output, L/R (Distortion=10% max Output)	4.5 8.49	5 6.33	6 9.80	W Vrms	Measurement condition EQ Off AVL Off Clear Voice Off
2.	Speaker (8Ω Impedance)	5	7		W	Measurement condition EQ On AVL On Clear Voice On

Measurement 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

10. 3D Performance Test

(Pattern Generator MSPG-3233, HDMI mode No.371, pattern No. 81)

1) Input the below pattern for 3D test.
(HDMI mode No.371, Pattern No. 81)

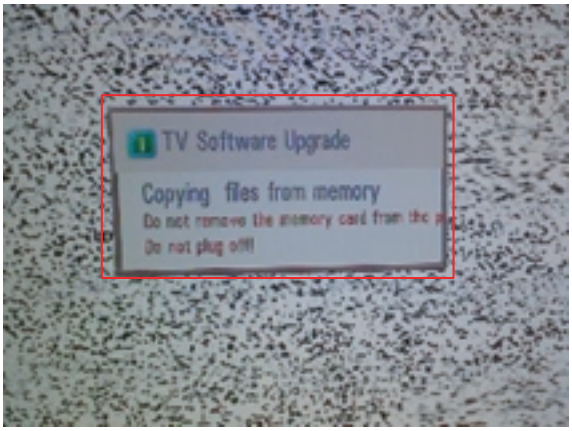
2) Enter 3D mode, then select °∞side by side°±.
It is shown like the below example without wearing 3D glasses.

3) It is a normal screen if the middle section is red checked by the left side of 3D glass like the below example.

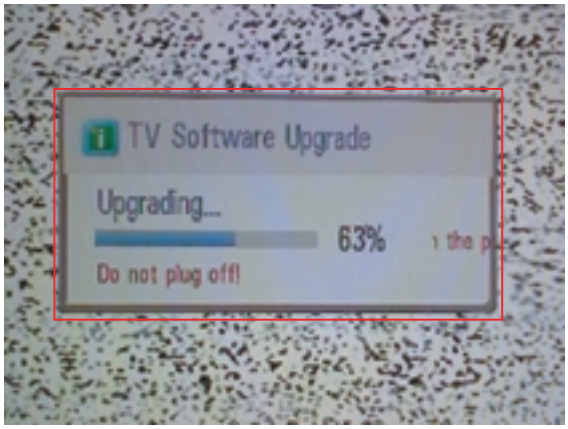
4) It is a normal screen if the middle section is blue checked by the right side of 3D glass like the below example.

11. USB S/W Download (option)

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



(4) Updating is staring.



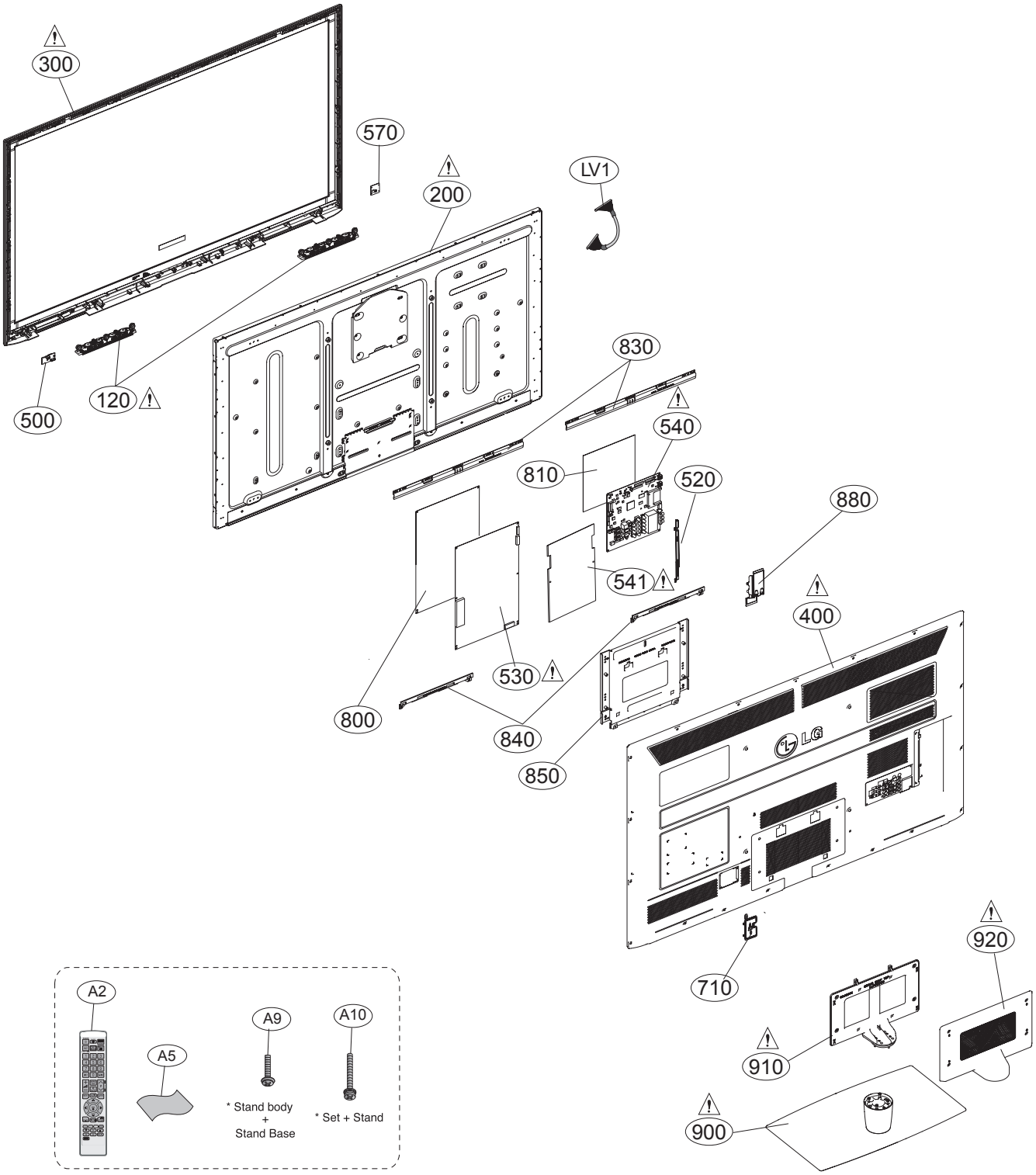
(5) Updating Completed, The TV will restart automatically
(6) If your TV is turned on, check your updated version and Tool option. (explain the Tool option, next stage)
  * If downloading version is more high than your TV have, TV can lost all channel data. In this case, you have to channel recover.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

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

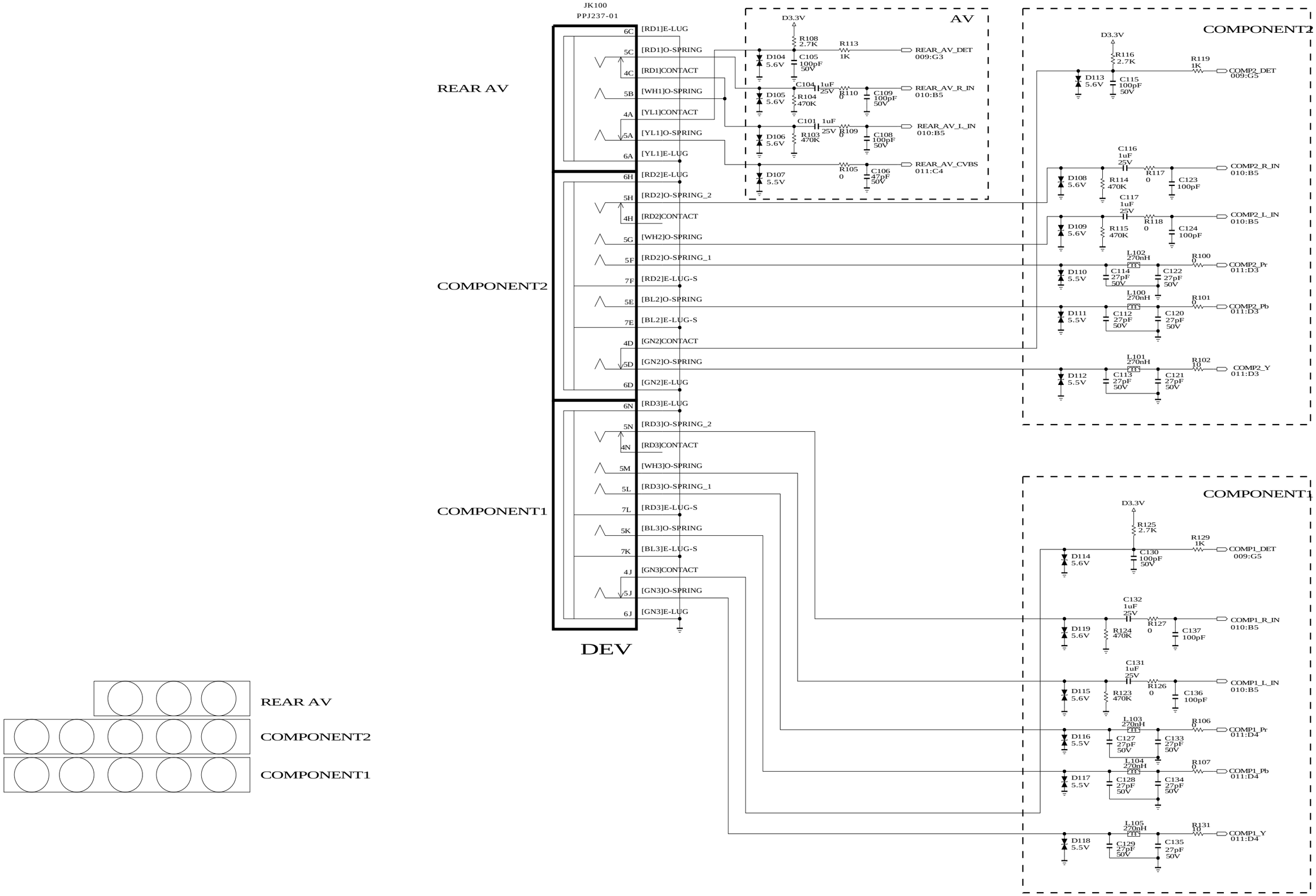
EXPLODED VIEW

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.



COMPONENT/AV REAR JACK



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

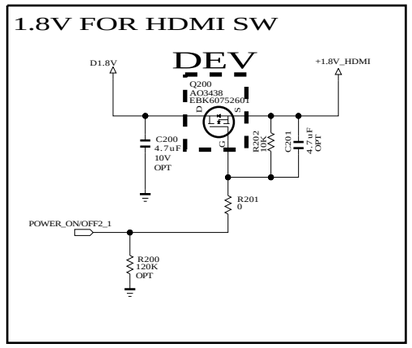
SECRET

LGElectronics

LG ELECTRONICS

MODEL	GP2_BCM_ATSC	DATE	09/10/xx
BLOCK	COMPONENT / AV REAR	SHEET	1 / 100

HDMI SWITCH 1.8V POWER



Seperated from Common sheet83
N.America & Korea only use 1.8V control

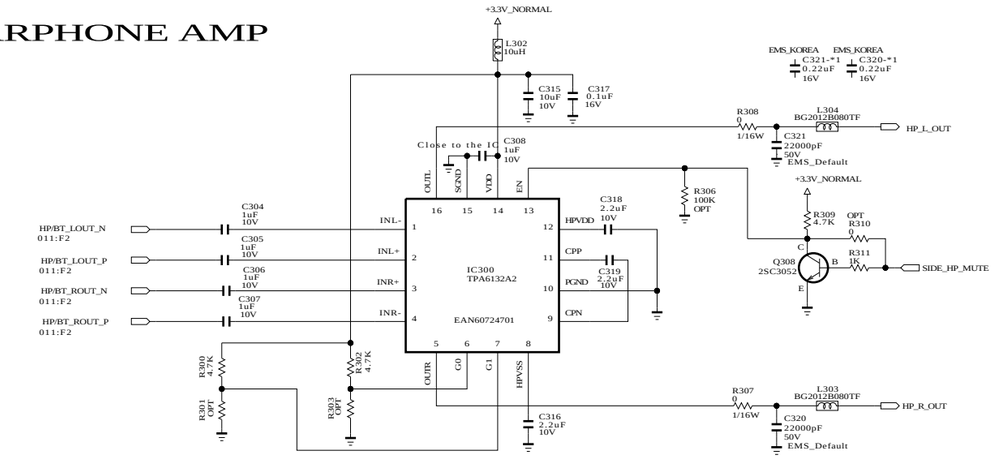
SECRET
LGElectronics

LG ELECTRONICS

MODEL	GP2_BCM_ATSC	DATE	09/10/xx
BLOCK	HDMI_POWER	SHEET	2 / 100

EARPHONE BLOCK

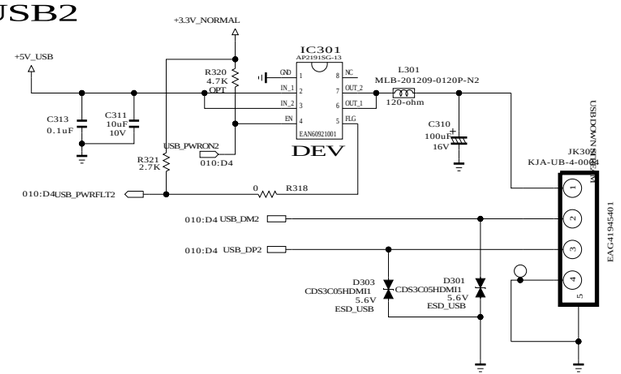
EARPHONE AMP



EARPHONE JACK SIDE

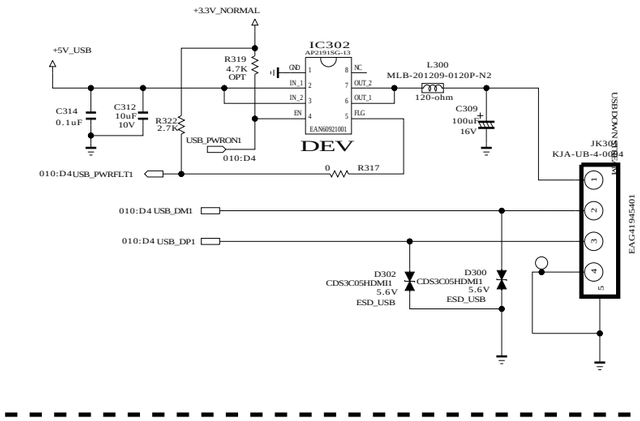
USB BLOCK

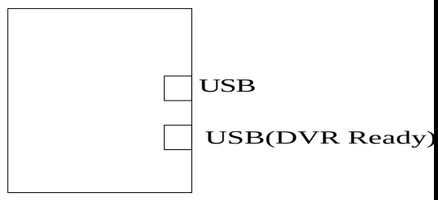
USB2



CHANGE USB_PWRFLT PULL-UP FROM 5V TO 3.3V

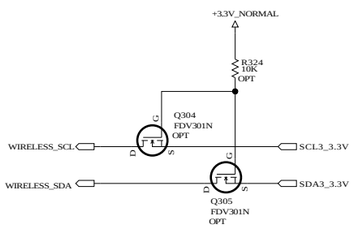
USB1 (DVR Ready)





WIRELESS I2C LEVEL SHIFTER

LEVEL SHIFTER



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SECRET
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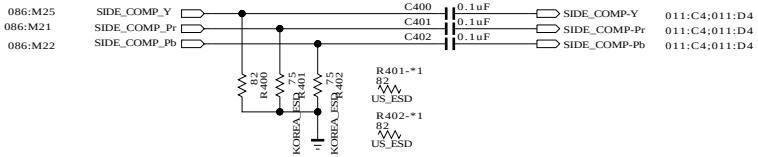
LG ELECTRONICS

MODEL	GP2_BCM_ATSC	DATE	09/10/xx
BLOCK	USB/EAR-PHONE	SHEET	3 / 100

SIDE COMPONENT LINE



CLOSE TO MAIN IC

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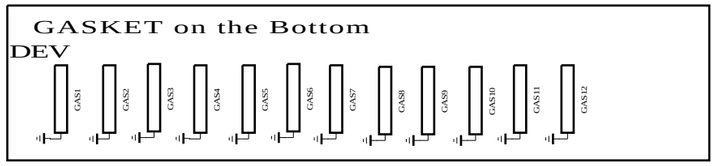
SECRET

LGElectronics

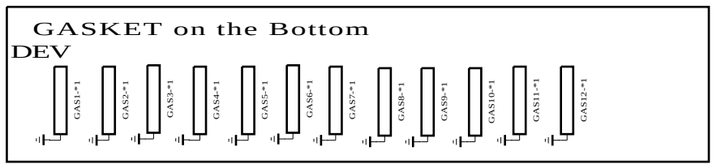
LG ELECTRONICS

MODEL	SIDE GENDER LINE	DATE	09/10/xx
BLOCK	SIDE_GENDER_LINE	SHEET	4 / 100

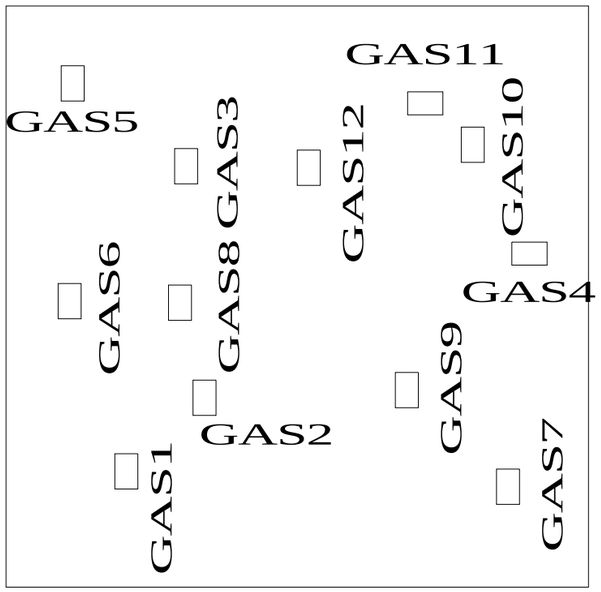
SMD GASKET FOR EMI (8*6*5.5 FOR LE5400/5500/7500)



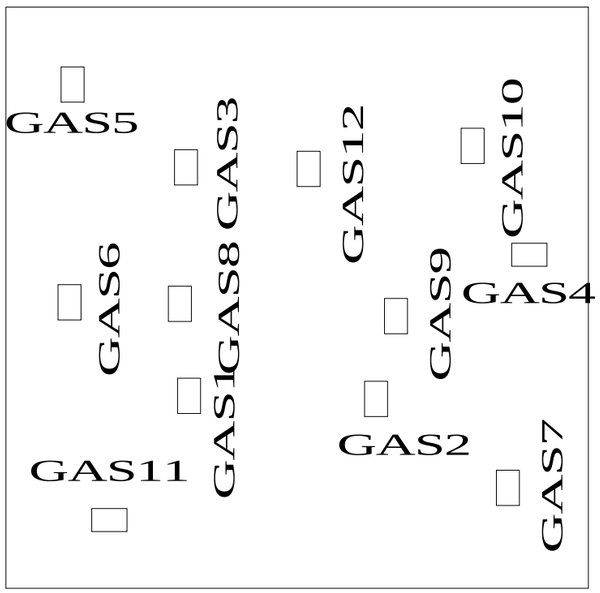
SMD GASKET FOR EMI (8*6*7.5 FOR LE8500)



Draw bottom location when make a new pcb

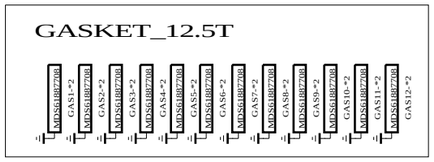


EAX61538101

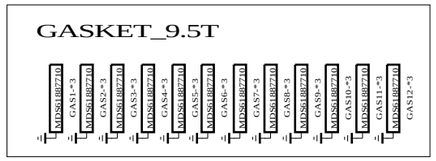


EAX61746401

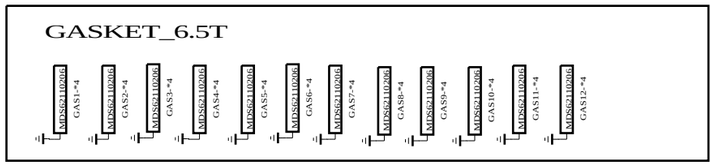
SMD GASKET FOR EMI (8*6*12.5T)



SMD GASKET FOR EMI (8*6* 9.5T)



SMD GASKET FOR EMI (8*6*6.5 FOR 32LE7500)



MODEL	GP2_BCM_ATSC	DATE	09/10/xx
BLOCK	SMD_GASKET	SHEET	5 / 100

BCM-DDR

IC900
LGE3549XQ (B2 VERSION)

DEV

EAN60345904

IC603
NT5TU128M8DE_BD
NANYA DDR

EAN60992101

IC604
NT5TU128M8DE_BD
NANYA DDR

EAN60992101

IC605
NT5TU128M8DE_BD
NANYA DDR

EAN60992101

IC606
NT5TU128M8DE_BD
NANYA DDR

EAN60992101

K4T1G084QE-HCF8
IC603-*1 DDR SS

K4T1G084QE-HCF8
IC604-*1 DDR SS

K4T1G084QE-HCF8
IC605-*1 DDR SS

K4T1G084QE-HCF8
IC606-*1 DDR SS

Place Caps close to DRAM pin

* DDR2 1.8V By CAP - Place these Caps near Memory

SI

DDR VTT

IC602
BD35331F-E2
EAN52430901

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SECRET
LGElectronics

LG ELECTRONICS

MODEL	GP2_BCM_ATSC	DATE	09/10/xx
BLOCK	BCM-DDR	SHEET	6 / 100

ATSC TUNER

TUNER TYPE

Vertical

Horizon

TU700
TDVJ-H031F

TUNER_NON_CHB_V

DEV

1	N.C
2	N.C
3	+5V
4	N.C
5	N.C
6	SCL
7	SDA
8	N.C
9	S1F
10	N.C
11	CVBS
12	GND
13	1.2V
14	3.3V
15	RESET
16	IF_AGC
17	IF_N
18	IF_P
19	SHIELD

TU701
TDTD-V055F

TUNER_CHB_V

DEV

1	1.8V
2	SCL[SUB]
3	SDA[SUB]
4	RESET[SUB]
5	IF_N[SUB]
6	IF_P[SUB]
7	IF_AGC[SUB]
8	CVBS[SUB]
9	SCL[MAIN]
10	SDA[MAIN]
11	5V
12	32V
13	S1F
14	CVBS[MAIN]
15	GND
16	1.2V[MAIN]
17	3.3V[MAIN]
18	RESET[MAIN]
19	IF_AGC[MAIN]
20	IF_N[MAIN]
21	IF_P[MAIN]
22	SHIELD

CHB OPTION

+3.3V_TU

CHB R712 3.3K, R713 3.3K

R705 100 CHB → SCL0_3.3V

R706 100 CHB → SDA0_3.3V

C710 47pF 50V CHB, C714 47pF 50V CHB

+1.8V_TU

+3.3V_TU

R703 100 CHB, R704 100K OPT, C713 0.1uF 16V CHB → TUNER_SUB_RESET 009:G5

R715 300 CHB → IF_N_CHB 015:A3

R716 300 CHB → IF_P_CHB 015:A3

C727 10pF 50V CHB, C726 10pF 50V CHB

+5V_TU

R714 0 NON_CHB

C719 0.1uF 16V OPT

R717 0 CHB → IF_AGC_CHB 015:A2

CHB OPTION

+5V_TU

R738 200 OPT, R739 200 OPT → CVBS_CHB_SEARCH 011:C4;007:A16

Q703 ISA1530AC1 OPT

+5V_TU

R731 200 CHB, R735 200 CHB

R726 1K OPT, R727 1K OPT

R724 0 CHB

Q700 ISA1530AC1 CHB

CVBS_CHB 015:B5;007:A17

+5V_TU

R734 470, R737 82 → TU_SIF 011:C5

C725 100pF 50V, R728 4.7K

Q701 ISA1530AC1

+5V_TU

R729 1K OPT, R733 220 TU_CVBS_TR, R736 220 TU_CVBS_TR

TU_CVBS_BYPASS

R741 0, R725 0 TU_CVBS_TR

Q702 ISA1530AC1

R730 1K OPT

TU_CVBS 011:C4

+3.3V_TU

R722 3.3K, R723 3.3K

R719 100 → SCL0_3.3V

R720 100 → SDA0_3.3V

C720 47pF 50V, C721 47pF 50V

+5V_TU

R701 0 CHB

C700 100pF 50V CHB, C706 0.1uF 16V CHB

R702 0

+1.26V_TU

+3.3V_TU

C703 100pF 50V, C709 0.1uF 16V

+3.3V_TU

R707 100, R711 100K OPT → TUNER_MAIN_RESET 009:G4

C716 0.1uF 16V

R710 0 → M_IF_AGC 011:D1

C715 0.1uF 16V OPT

R708 0 → M_IF_N 011:D2

R709 0 → M_IF_P 011:D2

TU700-*1
TDVJ-H001F

TUNER_NON_CHB_H

DEV

1	ANT_PWR[OPT]
2	BST_CNTL
3	+B
4	NC[RF_AGC]
5	AS
6	SCL
7	SDA
8	NC[IF_TP]
9	S1F
10	NC
11	VIDEO
12	GND
13	1.2V
14	3.3V
15	RESET
16	IF_AGC_CNTL
17	DIF_1
18	DIF_2
19	SHIELD

TU701-*1
TDTD-V035F

TUNER_CHB_H

DEV

1	+B1[1.8V]
2	SCL[SUB]
3	SDA[SUB]
4	RESET[SUB]
5	DIF_2[SUB]
6	DIF_1[SUB]
7	IF_AGC[SUB]
8	CVBS[SUB]
9	SCL[MAIN]
10	SDA[MAIN]
11	+B2[5V]
12	+B3[32V]
13	S1F
14	CVBS[MAIN]
15	GND
16	+B4[1.2V][MAIN]
17	+B5[3.3V][MAIN]
18	RESET[MAIN]
19	IF_AGC[MAIN]
20	DIF_1[MAIN]
21	DIF_2[MAIN]
22	SHIELD

TU701-*2
TDTD-V056F

1	+B1[1.8V]
2	SCL[SUB]
3	SDA[SUB]
4	RESET[SUB]
5	DIF_2[SUB]
6	DIF_1[SUB]
7	IF_AGC[SUB]
8	CVBS[SUB]
9	SCL[MAIN]
10	SDA[MAIN]
11	+B2[5V]
12	+B3[32V]
13	S1F
14	CVBS[MAIN]
15	GND
16	+B4[1.2V][MAIN]
17	+B5[3.3V][MAIN]
18	RESET[MAIN]
19	IF_AGC[MAIN]
20	DIF_1[MAIN]
21	DIF_2[MAIN]
22	SHIELD

+5V_TU → +5V_NORMAL

200mA

L700 BLM18PG121SN1D

C702 22uF 16V OPT, C704 22uF 16V, C707 0.1uF 16V, C711 0.1uF 16V

+3.3V_NORMAL

+3.3V_TU

60mA

L701 BLM18PG121SN1D

C701 22uF 16V OPT, C705 22uF 16V, C708 0.1uF 16V, C712 0.1uF 16V

IC700
AP1117EG-13

+3.3V_TU

L702 500

C717 2.2uF 16V, C718 2.2uF 16V

IN OUT ADJ/GND

R718 120 1%

R1

R2

R721

C722 22uF

L703 BLM18PG121SN1D

C723 22uF 16V, C724 0.1uF 50V

+1.26V_TU

$$VOUT = VREF * (1 + R2/R1)$$

NON CHB OPTION

NON_CHB R734 0 → CVBS_CHB

NON_CHB R740 0 → CVBS_CHB_SEARCH

LE5500 EXCEPT DTV Measure OPTION

LE5500 EXCEPT DTV Measure R742 0

LE5500 EXCEPT DTV Measure R743 0

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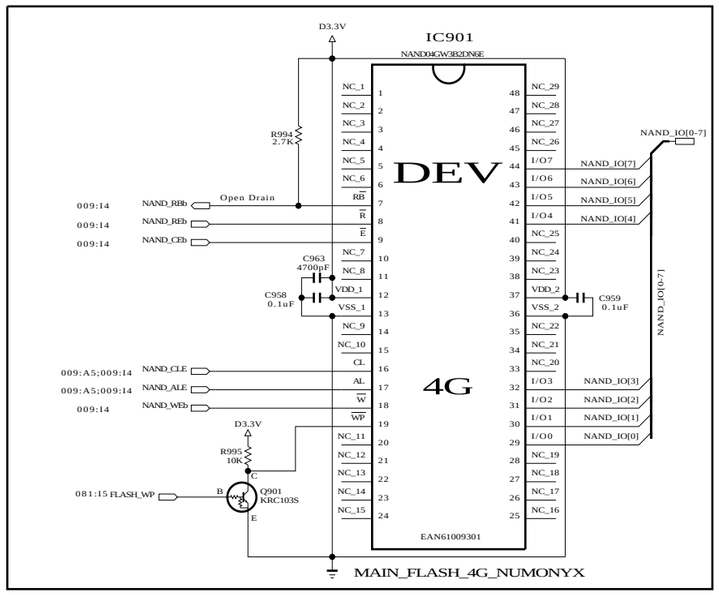
SECRET

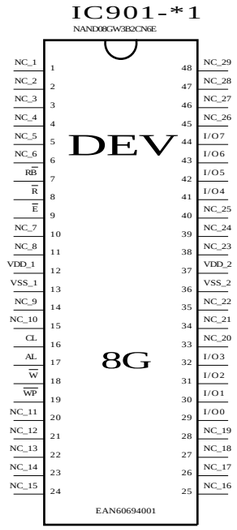
LGElectronics

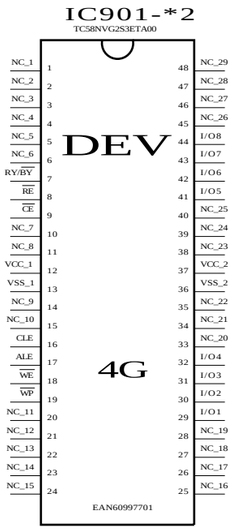
LG ELECTRONICS

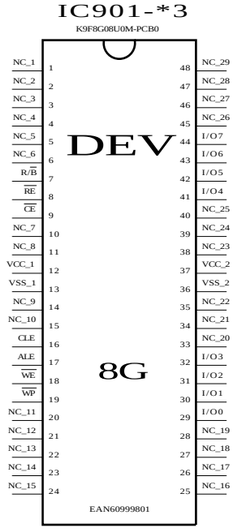
MODEL	GP2_BCM_ATSC	DATE	09/10/xx
BLOCK	ATSC_TUNER	SHEET	7 / 100

NAND FLASH MEMORY



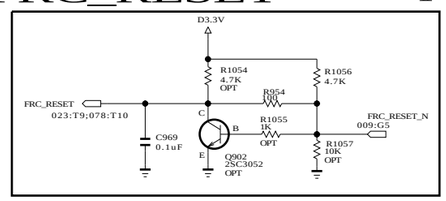




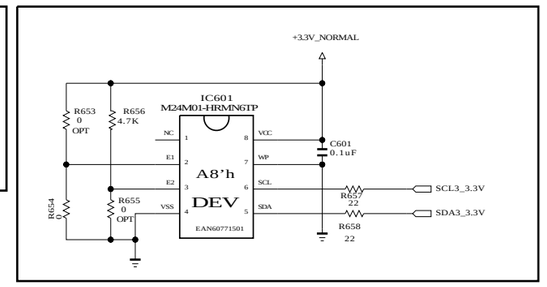


#CAUTION
Location numer is mixed
600 & 900 & 1000

FRC_RESET

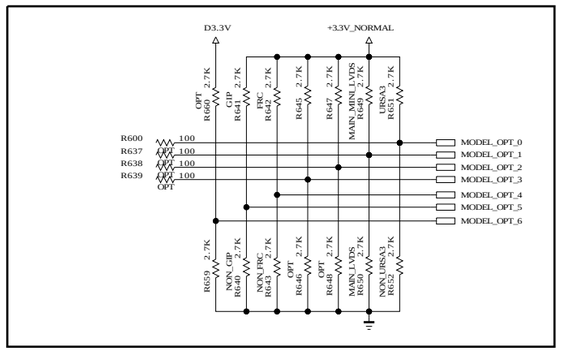


NVRAM



BCM3549 Boot Strap

MODEL OPTION



PIN NAME	PIN NO.	HIGH	LOW
MODEL_OPT_0	G26	URSA3	NON_URSA3
MODEL_OPT_1	R24	MAIN_MINI_LVDS	MAIN_LVDS
MODEL_OPT_2	K22	DDR-512M	DDR-256M
MODEL_OPT_3	K1	FHD	HD
MODEL_OPT_4	E23	FRC	NON_FRC
MODEL_OPT_5	D26	GIP	NON-GIP
MODEL_OPT_6	G25	OLED	NON_OLED

*MODEL_OPT_0 & MODEL_OPT_4 REFER TO THIS OPTION

MODEL_OPT_0	MODEL_OPT_4	
LOW	LOW	NO FRC
HIGH	LOW	URSA3 Internal
HIGH	HIGH	URSA3 External
LOW	HIGH	PWIZ Pannel T-con with LG FRC

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3DTV
DSB_PWRFLT3
DSB_PWRON3
L/R_SYNC

Motion Remote
DD
DC
M_RFModule_RESET
M_REMOTE_RX
M_REMOTE_TX

5V_HDMI_4 5V_HDMI_3 5V_HDMI_2 5V_HDMI_1
083:Q15;083:S27;083:A19
083:I9;083:L15;083:AA15
083:I27;083:L19;083:B14
083:I28;083:Q10;083:AC7
009:F3;020:H23
R1002 2K
R1003 2K
FOR HDMI STANDARD
APPLY ONLY WHEN CONNECT TO PULL-UP GPIO

EN2

SIDE_COMP_DET

WIRELESS UART LINE
087:N15 WIRELESS_DL_RX R966 OPT 0
087:S13 WIRELESS_DL_TX R967 0 OPT
L/R_SYNC R960 3DTV0

I2C MAP

* I2C_0: AT TUNER(C2,10) / CHB TUNER
* I2C_1: MICOM(52) / NTP7000(54) / URSA3(B4)
* I2C_2: HDMI SW(C0) / VIDEO ENC. / VSB DEMOD.CH BLOWSER, SUB AMP
* I2C_3: NVRAM(A8) / LG5111(1E) / P-GAMMA(E8) / WIRELESS / MEMC_240

Wireless I2C connection with I2C_3
Address : 0X20
WIRELESS_SCL 003:C5;087:U20 R622 0 WIRELESS SCL3_3.3V
WIRELESS_SDA 003:C5;087:U20 R623 0 WIRELESS SDA3_3.3V

BCM3549 GIPO

IC900

LGE3549XQ (B2 VERSION)

IC900-*2
LGE3549P(B2 VERSION)

IC900-*1
LGE3549XSP P22(3D PIP)

MODEL	GP2_BCM_ATSC	DATE	09/10/xx
BLOCK	BCM-BOOT/FLASH/GPIO	SHEET	9 / 100

SECRET
LGElectronics

LG ELECTRONICS

BCM3549 LVDS/AUDIO

IC900
LGE3549XQ (B2 VERSION)

DEV

CHB Interface

Place close to BCM

015:F7;015:G8 CHB_CLK_OUT
015:F7;015:G8 CHB_DATA_OUT
015:F7;015:G8 CHB_SOP_OUT

R1015 22 C25
R1007 22 C24
R1008 22 B26
OPT R1016 22 A25
OPT R1017 22 A26
OPT R1018 0 B25

C1006 100pF 50V
C1007 100pF 50V

PKT0_CLK
PKT0_DATA
PKT0_SYNC
RMX0_CLK
RMX0_DATA
RMX0_SYNC

BCM LVDS

023:T19;097:E18;097:I24
023:T20;097:D18;097:I24

LVDS_TX_0_DATA0_P	B4	LVDS_TX_1_DATA4_N	
LVDS_TX_0_DATA0_N	A4	LVDS_TX_1_DATA4_P	
LVDS_TX_0_DATA1_P	C6	LVDS_TX_1_DATA3_N	
LVDS_TX_0_DATA1_N	B6	LVDS_TX_1_DATA3_P	
LVDS_TX_0_DATA2_P	B3	LVDS_TX_1_DATA2_N	
LVDS_TX_0_DATA2_N	A3	LVDS_TX_1_DATA2_P	
LVDS_TX_0_DATA3_P	A1	LVDS_TX_1_DATA1_N	
LVDS_TX_0_DATA3_N	A2	LVDS_TX_1_DATA1_P	
LVDS_TX_0_DATA4_P	D5	LVDS_TX_1_DATA0_N	
LVDS_TX_0_DATA4_N	D6	LVDS_TX_1_DATA0_P	
LVDS_TX_0_CLK_P	C5	LVDS_TX_1_CLK_N	
LVDS_TX_0_CLK_N	B5	LVDS_TX_1_CLK_P	
LVDS_TX_1_DATA0_P	B1	LVDS_TX_0_DATA4_N	
LVDS_TX_1_DATA0_N	B2	LVDS_TX_0_DATA4_P	
LVDS_TX_1_DATA1_P	C2	LVDS_TX_0_DATA3_N	
LVDS_TX_1_DATA1_N	C3	LVDS_TX_0_DATA3_P	
LVDS_TX_1_DATA2_P	D1	LVDS_TX_0_DATA2_N	
LVDS_TX_1_DATA2_N	D2	LVDS_TX_0_DATA2_P	
LVDS_TX_1_DATA3_P	E1	LVDS_TX_0_DATA1_N	
LVDS_TX_1_DATA3_N	E2	LVDS_TX_0_DATA1_P	
LVDS_TX_1_DATA4_P	E3	LVDS_TX_0_DATA0_N	
LVDS_TX_1_DATA4_N	D3	LVDS_TX_0_DATA0_P	
LVDS_TX_1_CLK_P	D4	LVDS_TX_0_CLK_N	
LVDS_TX_1_CLK_N	D4	LVDS_TX_0_CLK_P	

A1.2V
A2.5V

F5 C1035 10uF OPT
C1039 0.1uF
C1045 0.1uF
C1046 4.7uF
C1047 0.1uF
C1048 4.7uF
C1044 0.1uF
C1044 4.7uF

LVDS_PLL_VREG
LVDS_TX_AVDDC1P2
LVDS_TX_AVDD2P5_1
LVDS_TX_AVDD2P5_2
LVDS_TX_AVSS_1
LVDS_TX_AVSS_2
LVDS_TX_AVSS_3
LVDS_TX_AVSS_4
LVDS_TX_AVSS_5
LVDS_TX_AVSS_6
LVDS_TX_AVSS_7
LVDS_TX_AVSS_8
LVDS_TX_AVSS_9
LVDS_TX_AVSS_10
LVDS_TX_AVSS_11
LVDS_TX_AVSS_12
LVDS_TX_AVSS_13

D3.3V A1.2V A2.5V

L1003 BLM18PG121SN1D
C1017 4.7uF
C1017 0.1uF
C1023 0.1uF
C1028 0.1uF
C1032 0.1uF

AA20 VDAC_AVDD2P5
AD22 VDAC_AVDD1P2
AE22 VDAC_AVDD3P3_1
AE23 VDAC_AVDD3P3_2
W16 VDAC_AVSS_1
Y17 VDAC_AVSS_2
Y18 VDAC_AVSS_3
Y19 VDAC_AVSS_4
AD21 VDAC_AVSS_5

C1024 0.1uF
C1020 0.01uF
R1019 560
AF24 VDAC_RBIAS
AF22 VDAC_1
AE21 VDAC_2
AF23 VDAC_VREG

BBS CONNECT

P1000
TJC2508-4A

D3.3V
C1002 4.7uF
R1001 1.5K
R1004 1.5K

1 VCC
2 SCL
3 SDA
4 GND

F23 BSC_S_SCL
F22 BSC_S_SDA

R6
R7
USB_AVSS_1
USB_AVSS_2

D3.3V
L1001 BLM18PG121SN1D
A1.2V
A2.5V
L1000 BLM18PG121SN1D
C1003 100pF
R1009 3.9K
R1010 120

R3 USB_AVDD1P2
U3 USB_AVDD1P2PLL
T4 USB_AVDD2P5
T3 USB_AVDD2P5REF
R4 USB_AVDD3P3
U4 USB_RREF
V1 USB_DM1
V2 USB_DP1
U1 USB_DP2
U2 USB_DM2
T5 USB_MONCDR
R5 USB_MONPLL
R1 USB_PWRFLT_1
R2 USB_PWRFLT_2
T2 USB_PWRON_1
T1 USB_PWRON_2

C1004 0.1uF
C1005 0.1uF
C1012 0.1uF
C1013 4.7uF
C1014 0.1uF

003:Y14 USB_DM1
003:Y14 USB_DP1
003:AA24 USB_DM2
003:AA24 USB_DP2

USB1 is inserted

003:Y15 USB_PWRFLT1
003:X25 USB_PWRFLT2
003:Z13 USB_PWRON1
003:Z12 USB_PWRON2

R1011 240
R1014 1K

P6 EPHY_VREF
P5 EPHY_RDAC
P3 EPHY_RDN
P2 EPHY_RDP
N3 EPHY_TDN
N2 EPHY_TDP
P1 EPHY_AVDD1P2
P4 EPHY_AVDD2P5
N4 EPHY_PLL_VDD1P2
N1 EPHY_AGND_1
N5 EPHY_AGND_2
P7 EPHY_AGND_3

082:AF16 EPHY_RDN
082:AF17 EPHY_RDP
082:AF17 EPHY_TDN
082:AF18 EPHY_TDP

A2.5V A1.2V
L1002 BLM18PG121SN1D
C1033 0.1uF
C1034 4.7uF
C1025 0.1uF
C1027 4.7uF
C1029 0.1uF
C1030 4.7uF

AUDIO INCM

Route INCM between associated left and right signals of same channel

The INCM trace ends at the same point where the connector ground connects to the board ground (thru-hole connector pin).

SIDE_LR_INCM
R164 5.1
REAR_AV_LR_INCM
R165 5.1
COMP2_LR_INCM
R166 5.1
COMP1_LR_INCM
R167 5.1
PC_LR_INCM
R168 5.1

Place this test point near connector

BCM AUDIO

001:AB24	REAR_AV_L_IN	R154 49.9	C150 0.015uF	AC8	AUDMX_LEFT1
001:AB25	REAR_AV_R_IN	R155 49.9	C151 0.015uF	AB9	AUDMX_RIGHT1
010:B4	REAR_AV_LR_INCM		C159 0.15uF	AD8	AUDMX_INCM1
001:AK22	COMP2_L_IN	R161 49.9	C152 0.015uF	AF6	AUDMX_LEFT2
001:AK23	COMP2_R_IN	R162 49.9	C153 0.015uF	AE7	AUDMX_RIGHT2
010:B4	COMP2_LR_INCM		C160 0.15uF	AE6	AUDMX_INCM2
001:AK8	COMP1_L_IN	R156 49.9	C154 0.015uF	AE8	AUDMX_LEFT3
001:AK10	COMP1_R_IN	R157 49.9	C155 0.015uF	AD9	AUDMX_RIGHT3
010:B4	COMP1_LR_INCM		C161 0.15uF	AC9	AUDMX_INCM3
086:M12	SIDE_AV_L_IN	R158 49.9	C156 0.015uF	AF7	AUDMX_LEFT4
086:M10	SIDE_AV_R_IN	R159 49.9	C157 0.015uF	AE9	AUDMX_RIGHT4
010:B4	SIDE_LR_INCM		C162 0.15uF	AF8	AUDMX_INCM4
084:H3	PC_L_IN	R160 49.9	C158 0.015uF	AB10	AUDMX_LEFT5
084:H4	PC_R_IN	R163 49.9	C163 0.015uF	AD10	AUDMX_RIGHT5
010:B5	PC_LR_INCM		C164 0.15uF	AC10	AUDMX_INCM5
				AF9	AUDMX_LEFT6
				AF10	AUDMX_RIGHT6
				AE10	AUDMX_INCM6
				AD7	AUDMX_AVSS_1
				Y10	AUDMX_AVSS_2

C165 0.047uF
C166 0.047uF
C167 0.047uF
C168 0.047uF
C169 0.047uF
C170 0.047uF
C171 0.047uF
C172 0.047uF
C173 0.047uF
C174 0.47uF
C175 0.47uF
C176 0.47uF
C177 0.47uF
C178 0.47uF
C179 0.47uF

A2.5V C1031 0.1uF
C1026 10uF
AA10 AUDMX_LDO_CAP
AC7 AUDMX_AVDD2P5

EAN60345904

RESET

RESET_OUTB

R1027 OPT 0
ALL RESET READY
RESET_OUTB

RESET_OUTB 010:15
SOC_RESET 081:E4

H22 RESET_OUTB
F6 RESETB
G23 NMIB
1K R1020

3rd Ovretone Crystal

C1001 12pF
R1045 22
R1047 604
X1005 54MHz
2.7uH L1005
6212A2600E
50V 33pF C1008
C1000 12pF
R1046 22

54MHz_XTAL_P 010:E3
54MHz_XTAL_N 010:E3

CLK54_AVDD1P2	U22		
CLK54_AVDD2P5	U23		
CLK54_AVSS_1	T20		
CLK54_AVSS_2	T23		
CLK54_AVSS_3	U24		
CLK54_XTAL_N	U25	54MHz_XTAL_N 010:H3	
CLK54_XTAL_P	U26	54MHz_XTAL_P 010:H3	
CLK54_MONITOR	T21		
PM_OVERRIDE	P21		

A1.2V A2.5V
C1049 0.1uF
C1050 0.1uF
A1.2V
L1004 BLM18PG121SN1D

VCXO_AVDD1P2	Y25		
VCXO_PLL_AUDIO_TESTOUT	W23	C1036 0.1uF	C1037 4.7uF
VCXO_AGND	U21		

D3.3V

EJTAG_TCK	H4		E_TCK
EJTAG_TDI	H3		E_TDI
EJTAG_TDO	H2		E_TDO
EJTAG_TMS	H1		E_TMS
EJTAG_TRSTB	G1		
EJTAG_CE0	H6	OPT R1025 2.7K	
EJTAG_CE1	H5	R1026 2.7K	

D3.3V
1K R1030
1K R1031
1K R1032
1K R1033
OPT 1K R1034
SIGNALS PULLED UP ON MAIN BOARD
R1065 0 OPT
R1066 0 OPT
R1067 0 OPT
R1068 0 OPT

A1.2V C1011 0.1uF
A2.5V
C1038 10uF
C1042 0.1uF
D3.3V
R1023 4.7K
R1024 2.7K OPT

PLL_MAIN_AVDD1P2	T22		
PLL_MAIN_AGND	T25	C1040 0.1uF	C1044 4.7uF
PLL_MAIN_MIPS_EREF_TESTOUT	T24		
PLL_RAP_AVD_TESTOUT	M6		
PLL_RAP_AVD_AVDD1P2	N6	L1006 BLM18PG121SN1D	A1.2V
PLL_RAP_AVD_AGND	N7	C1041 0.1uF	C1045 4.7uF
PLL_DS_AGND_1	V22		
PLL_DS_AGND_2	V23		

L1005 BLM18PG121SN1D A1.2V

BYP_CPU_CLK	R22		
BYP_DS_CLK	P22		
BYP_SYS216_CLK	V25	2.7K R1021	
BYP_SYS175_CLK	V26	2.7K R1022	

#CAUTION
Location numer is mixed
100 & 1000

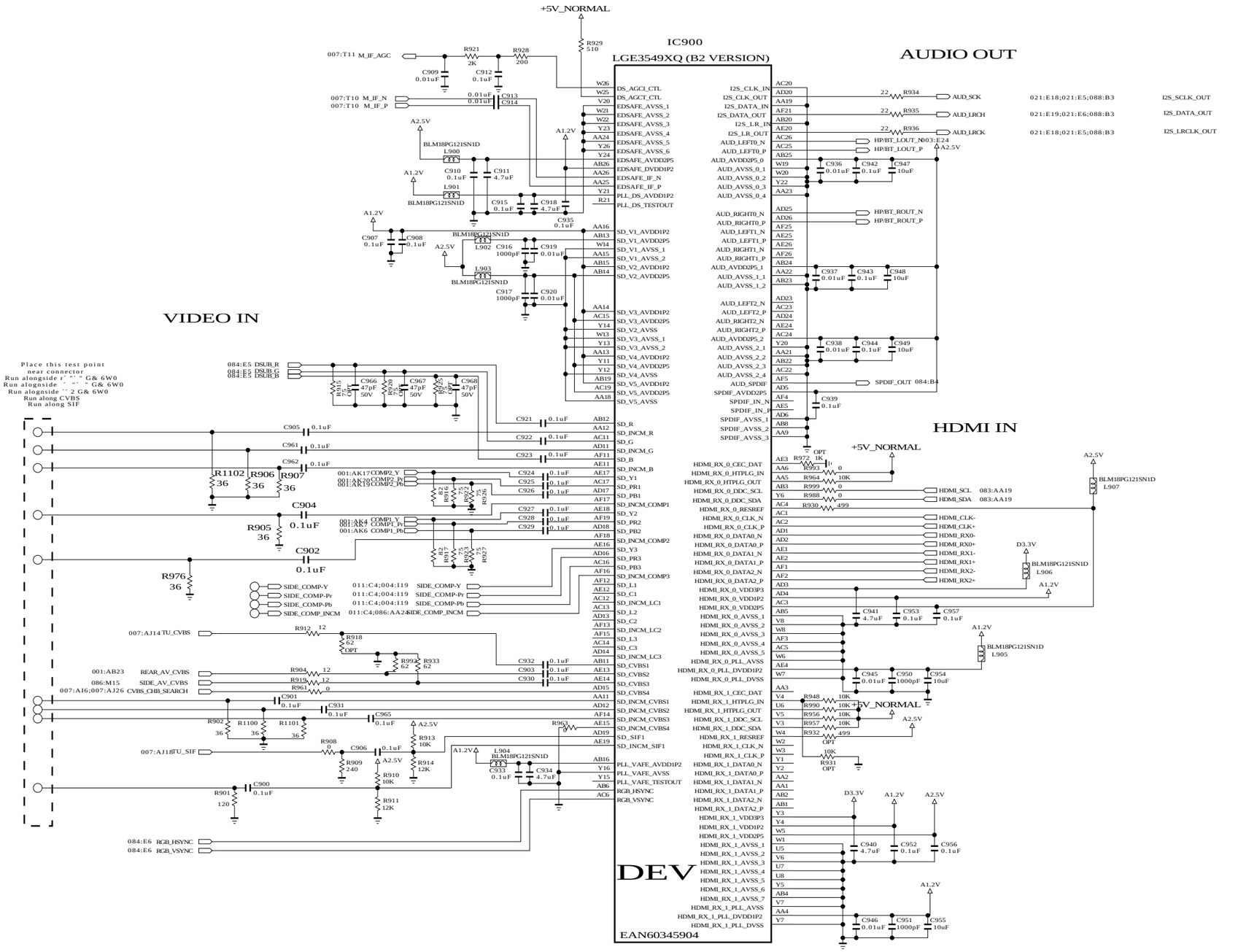
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

SECRET
LGElectronics

LG ELECTRONICS

MODEL	GP2_BCM_ATSC	DATE	09/10/xx
BLOCK	BCM-LVDS/AUDIO	SHEET	10 / 100

BCM3549 VIDEO



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

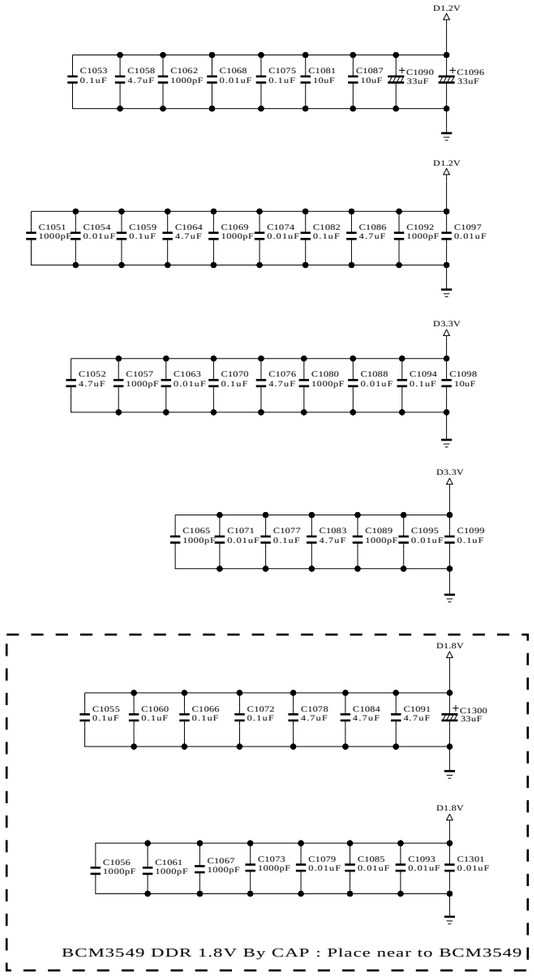
SECRET

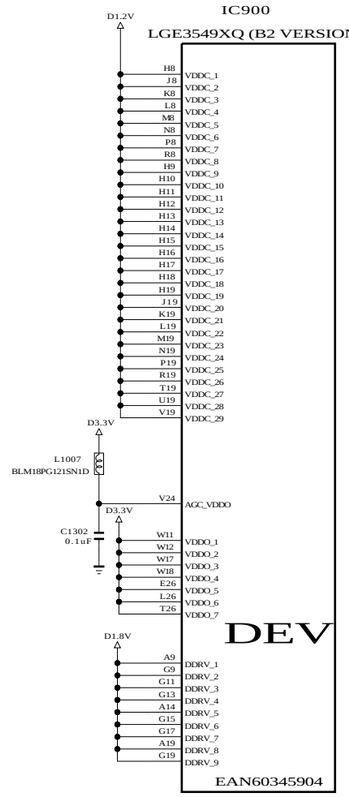
LGElectronics

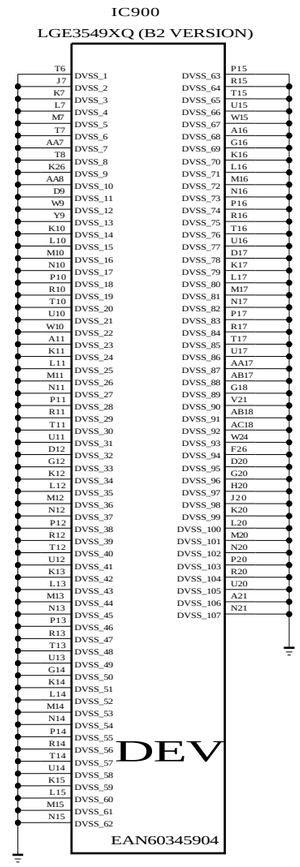
LG ELECTRONICS

MODEL	GP2_BCM_ATSC	DATE	09/10/xx
BLOCK	BCM-VIDEO	SHEET	11 / 100

BCM3549 POWER







JANG JAE HO

LG ELECTRONICS

MODEL	GP2_BCM_ATSC	DATE	09/04/xx
BLOCK	BCM-POWER	SHEET	13 / 100

Channel Browser

#ALL CHB OPTION#

Put near to IC1504

Put near to IC900

015:E1;015:C2 VSB_SOP
015:E1;015:C3 VSB_CLK
015:E1;015:C2 VSB_DATA
015:E1;015:C2 VSB_VALID

OPT AR1505 0

OPT AR1506 0

CHB_SOP_OUT 010:C1;015:I3
CHB_CLK_OUT 010:C1;015:I3
CHB_DATA_OUT 010:C1;015:I3
CHB_VALID 009:G5;015:I3

+1.8V_TU
+1.8V_ADC
+1.8V_CHB
+3.3V_NORMAL
+3.3V_CHB
+3.3V_VSB
+3.3V_ADC
+3.3V_TU
+1.2V_VSB

R1514 0 1/10W 5%
R1517 0 1/10W 5%
C1501 10uF 10V
C1510 10uF 10V
C1512 0.1uF
C1554 0.1uF

L1502 BLM18PG121SN1D
L1503 BLM18PG121SN1D
L1501 BLM18PG121SN1D
L1506 BLM18PG121SN1D
L1507 BLM18PG121SN1D

C1504 10uF 10V
C1505 10uF 10V
C1506 10uF 10V
C1507 0.1uF
C1508 0.1uF
C1509 0.1uF

C1525 27pF
C1526 27pF
X1501 27MHz
R1513 1M
R1515 100

IC1505
TW9910DANB2-GR
0x88
01PRP00630E

XTO XTI VSSE_2 VD[0]/SIAD0 VD[1] NC_4 VSS_2 VD[2] VD[3] VD[4] VD[5] VD[6]
VDDE_1 SCLK SDAT PDN RSTB TMODE NC_1 AVD_1 YMUX3 YMUX2 YGND YMUX1
VD[7] VD[8] VD[9] VD[10] VDD NC_3 VD[11] VD[12] VD[13] VD[14] VD[15] VDDE_2
YMUX0 AVS_1 CIN0 AVD_2 AVS_2 NC_2 VSS_1 VS HS MCLKIN CLKX2 VSSE_1

SCL2_3.3V
SDA2_3.3V
TW9910_RESET 009:G3
R1504 100
R1505 100
R1502 100
R1506 4.7K

C1520 0.1uF
C1521 0.1uF
C1522 0.1uF
C1523 0.1uF
C1524 0.1uF
C1535 0.1uF
C1536 0.1uF
C1531 0.1uF

AR1501 22
AR1502 22
TW9910_DATA[0-7] 015:F4
TW9910_DATA[0] TW9910_DATA[1] TW9910_DATA[2] TW9910_DATA[3] TW9910_DATA[4] TW9910_DATA[5] TW9910_DATA[6] TW9910_DATA[7]

CVBS_CHB 007:A17;007:AJ21
R1507 0
C1519 0.1uF
C1527 0.1uF
R1523 22
TW9910_CLK 015:F3

CHB OPTION

IC7001
AP1117E18G-13
IN ADJ/GND OUT
R7004 1
C7007 10uF 10V
C7009 0.1uF 16V

IC7002
NCP1406SNT1G
DEV
EAN61013901
CE LX FB VDD GND

L7000 10uH
D7000 MMSD4148T1G 100V
D7001 MMSD4148T1G 100V
D7002 MMSD4148T1G 100V
C7015 0.1uF 50V
C7018 0.1uF 50V
C7019 0.1uF 50V
C7020 100pF 50V
C7021 0.1uF 50V
C7012 10uF 10V
R7026 20K
R7025 10K 1/10W 1%
R7023 10K 1/10W 1%
+32V_TU

IC1500
AZ1117H-1.2TRE1
CHB_1.2_BCD
IN OUT ADJ/GND
EAN38974501
L1500 500
C1500 2.2uF 16V
C1502 2.2uF 16V
C1503 22uF
L1510 BLM18PG121SN1D
C1511 0.1uF 50V

IC1500-*1
KIA1112ST
INPUT 3 2 OUTPUT 1 GND[ADJ]
CHB_1.2_KEC

IC1504
LGDT3305
0x1C
EAN58270401

VCCAADJ0A VSSADJ0 VDD_3 XM VSS_3 XTAL0 XTAL1 VSSS3_3 NC_2 VDD33_3 OPM NRST
PLLAVSS PLLAVDD VSS33_2 VSS_2 VDD_2 VSS_1 SCL VDD33_2 SDA NIRQ TPSOP TPCLK
TPERR VDD33_1 TPVALID TPDATA0 VSS33_1 TPDATA1 TPDATA2 TPDATA3 TPDATA4 TPDATA5 TPDATA6 TPDATA7

C1532 30pF 50V
C1533 30pF 50V
X1502 25MHz
R1516 1M
R1517 100
R1521 22
VSB_RESET 009:G4

C1528 0.1uF
C1529 0.1uF OPT
C1530 0.1uF
C1534 0.1uF
C1537 0.1uF
C1540 0.1uF
C1538 0.1uF
C1539 0.1uF
R1518 1K
R1512 5.1K
R1511 1K I2CSEL
R1508 OPT 22
R1509 OPT 22
R1501 1K
R1503 1K
C1513 0.1uF
C1516 0.1uF
C1517 0.1uF
C1518 0.1uF

007:Y20IF_N_CHB
007:Y20IF_P_CHB
C1514 0.01uF
C1515 0.01uF
NC_1 VINA2 VINA1 INCAP VSSAAD10A ANTCON VDD_1 I2CRPT_SCL I2CRPT_SDA IFOUT RFOUT
007:Y18IF_AGC_CHB

R1524 100 SCL2_3.3V
R1525 100 SDA2_3.3V
C1541 22pF
C1542 22pF

AR1503 22
VSB_SOP 015:E7;015:G2
VSB_CLK 015:E7;015:G2
VSB_DATA 015:E7;015:G2
VSB_VALID 015:E7;015:G2

R1510 1K
LD1501 SAM2333 C A1[GN] A2[RD]

015:E6 TW9910_DATA[0-7]
009:G4 CHB_RESET

C1549 30pF
C1552 30pF
X1503 27MHz
R1534 1M

IC1506
LG1140
0xF2
EAN60750501

D1_DATA5 D1_DATA6 D1_DATA7 TCK TRST EXT_RESET_N MOD VSSCORE_3 VDDCORE_4 XTAL0 XTAL1 VDDIO_4 PLL_AVDD PLL_AVSS
VDDIO_1 D1_DATA4 D1_DATA3 D1_DATA2 VSSIO_1 D1_CLK D1_DATA1 VDDCORE_1 VSSCORE_1 D1_DATA0 C10_CLK C0_DATA C10_VALID C10_SOP
IRQ_CHB_N TSVO0_DATA TSVO0_SOP VSSIO_3 TSVO0_CLK PA4/FIFOADR0 VSSCORE_2 VDDCORE_3 PA1/INT1# PA0/INT0# VCC_4 CTL2/FLAGC SPI_MODE[1] VDDIO_3
VDDIO_2 C1_DATA C1_VALID C1_CLK C1_SOP SDA0 SCL0 VDDCORE_2 SCK SS MISO MOSI SPI_MODE[0] VSSIO_2

TW9910_DATA[4] TW9910_DATA[3] TW9910_DATA[2] TW9910_DATA[1] TW9910_DATA[0]
015:E5 TW9910_CLK
R1526 0
015:E7;015:E8 VSB_CLK
015:E7;015:E9 VSB_DATA
015:E7;015:E9 VSB_VALID
015:E7;015:E8 VSB_SOP

C1544 0.1uF
C1543 0.1uF
C1547 0.1uF
C1548 0.1uF
C1550 0.1uF
C1551 0.1uF
C1555 0.1uF
C1556 0.1uF

AR1504 22
CHB_DATA_OUT 010:C1;015:F7
CHB_SOP_OUT 010:C1;015:F7
CHB_CLK_OUT 010:C1;015:F7
CHB_VALID 009:G5;015:F7

R1533 100
R1533 100
SDA2_3.3V
SCL2_3.3V

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

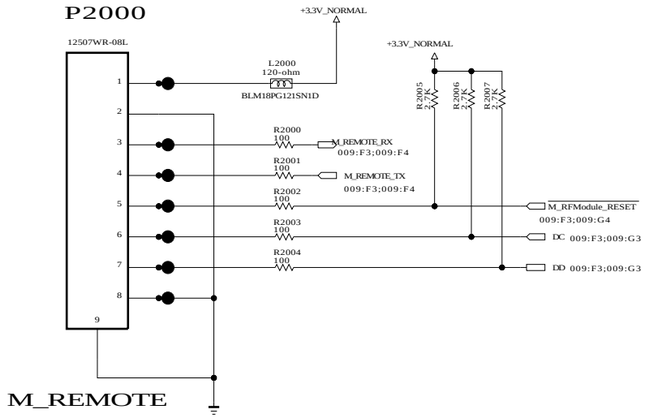
SECRET
LGElectronics

LG ELECTRONICS

MODEL	GP2_BCM_ATSC	DATE	09.10
BLOCK	CHB	SHEET	15 / 100

Motion Remote controller

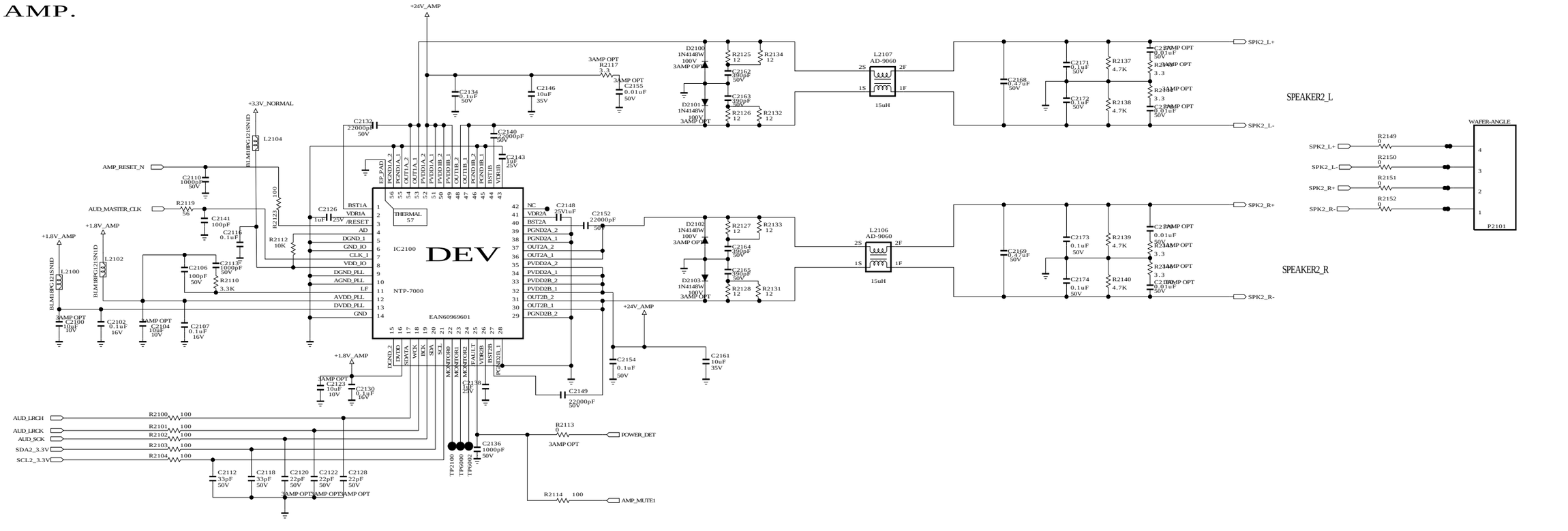
Motion Remocon Interface



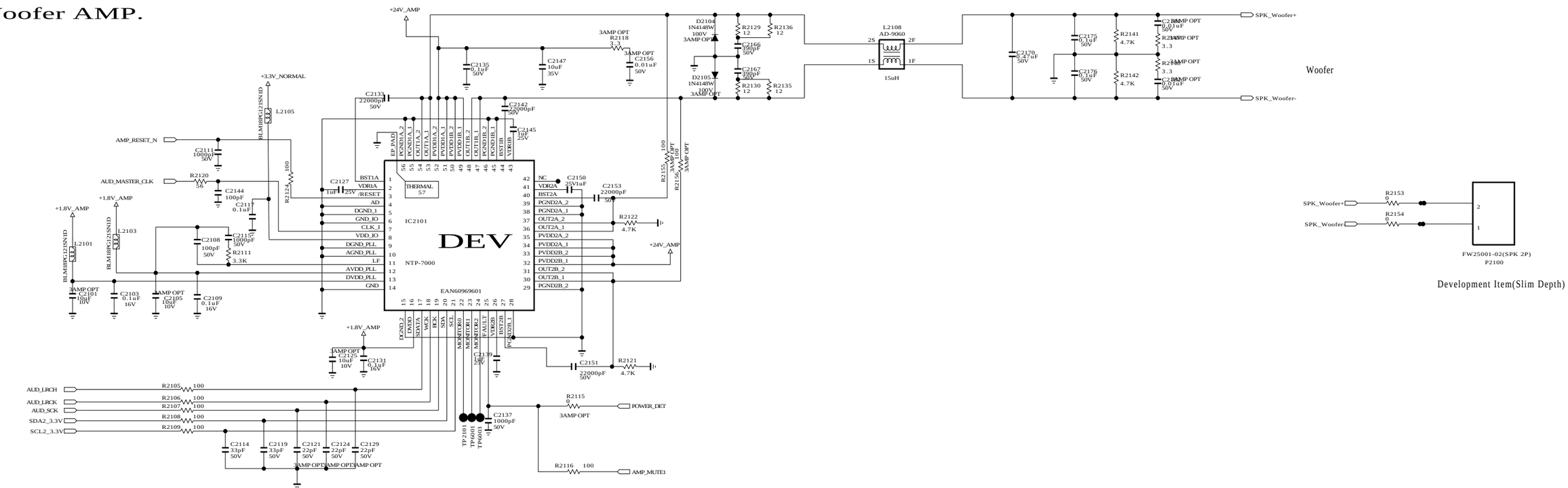
ALL M_REMOTE OPTION

MODEL	GP2_BCM_ATSC	DATE	09/10/xx
BLOCK	MOTION_REMOCON	SHEET	20 / 100

Sub AMP.



Woofer AMP.



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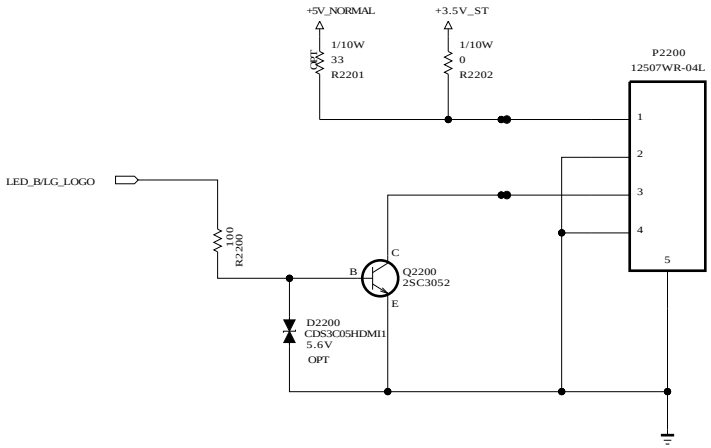
LG ELECTRONICS

MODEL	GP2_BCM_ATSC	DATE	09.10
BLOCK	AMP_SUB_NTP	SHEET	21 / 100

LG LOGO FOR LE9500



THE ⚠5 SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

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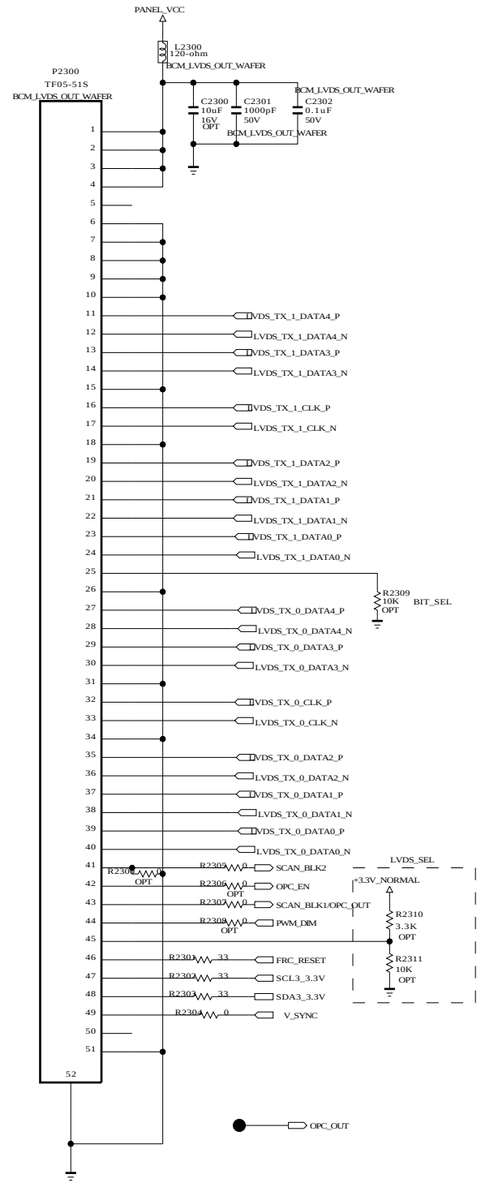
LG ELECTRONICS

MODEL	GP2_BCM_ATSC	DATE	09/10/xx
BLOCK	LG_LOGO_LE9500	SHEET	22 / 100

LVDS FOR 9500

[51Pin LVDS Connector]
(For FHD 60Hz)



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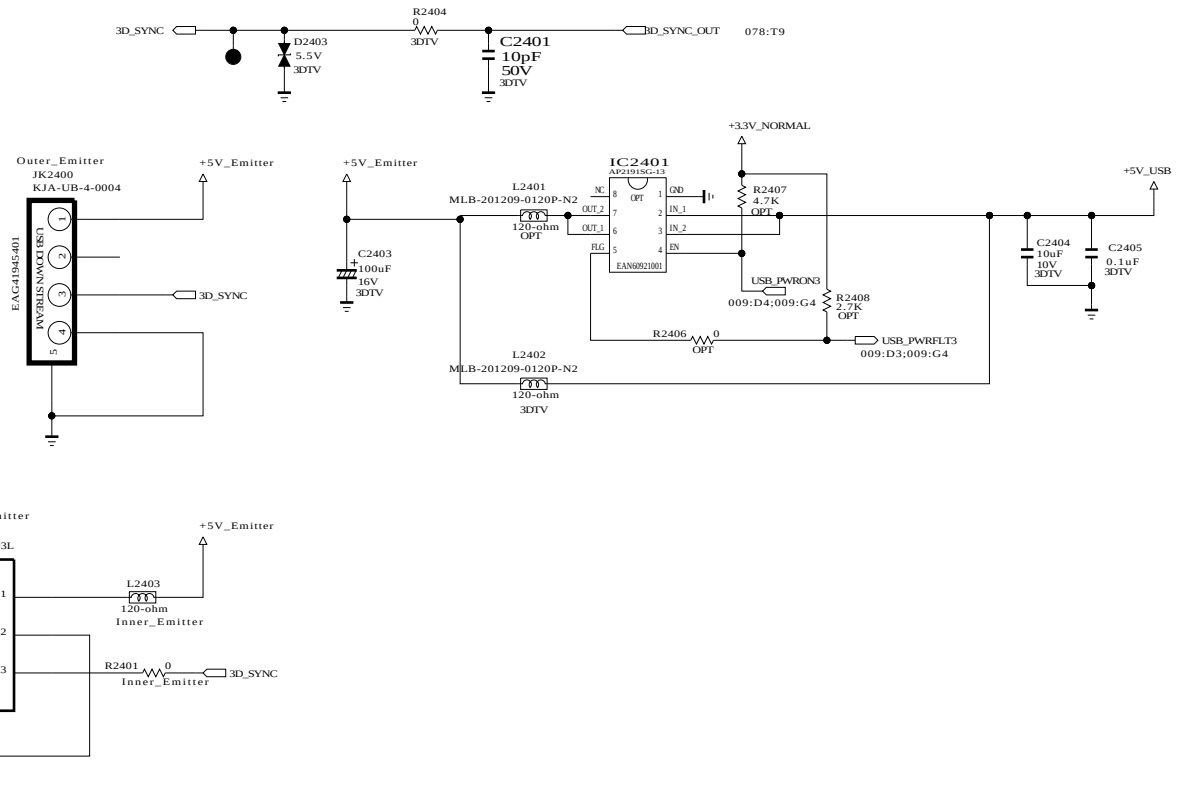
LGElectronics

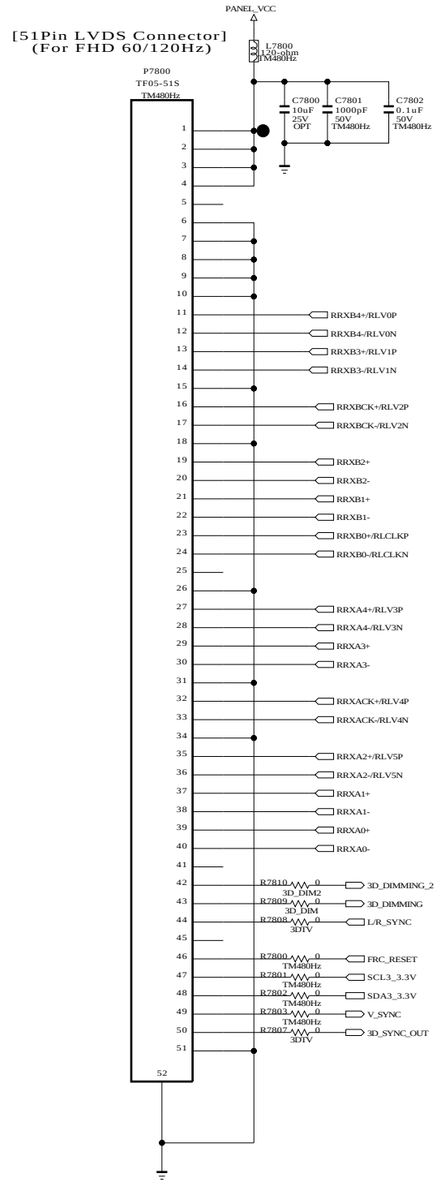
LG ELECTRONICS

MODEL	GP2_BCM_ATSC	DATE	09.10
BLOCK	LVDS_LE9500	SHEET	23 / 100

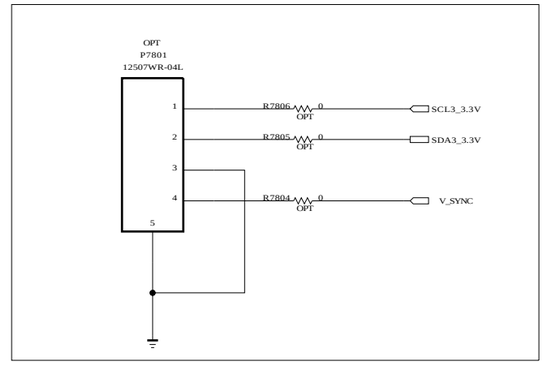
SIDE IR Emitter sync USB JACK

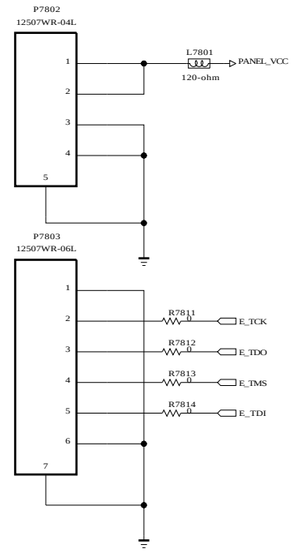


MODEL	GP2_BCM_ATSC	DATE	09/11/18
BLOCK	3D_IR_GENDER	SHEET	24 / 100



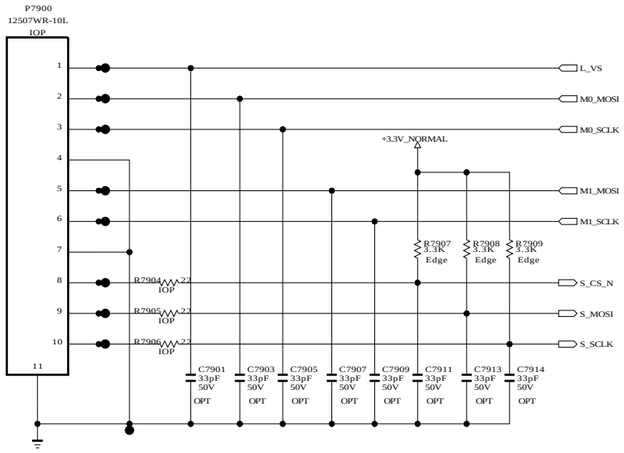
I2C_#3 Check(LG5111,LG1120,etc)



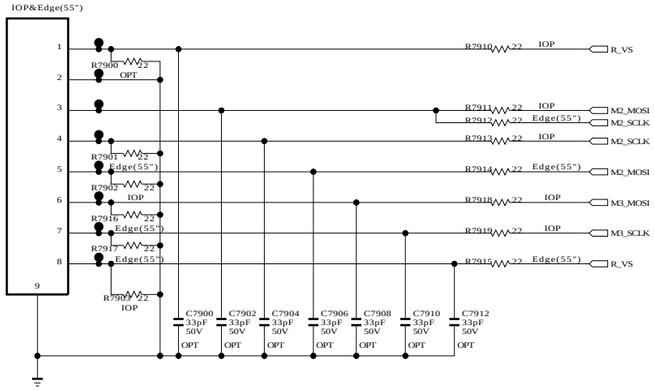


MODEL	COMMON	DATE	09/10/xx
BLOCK	LG5111 60Hz LVDS	SHEET	78 / 100

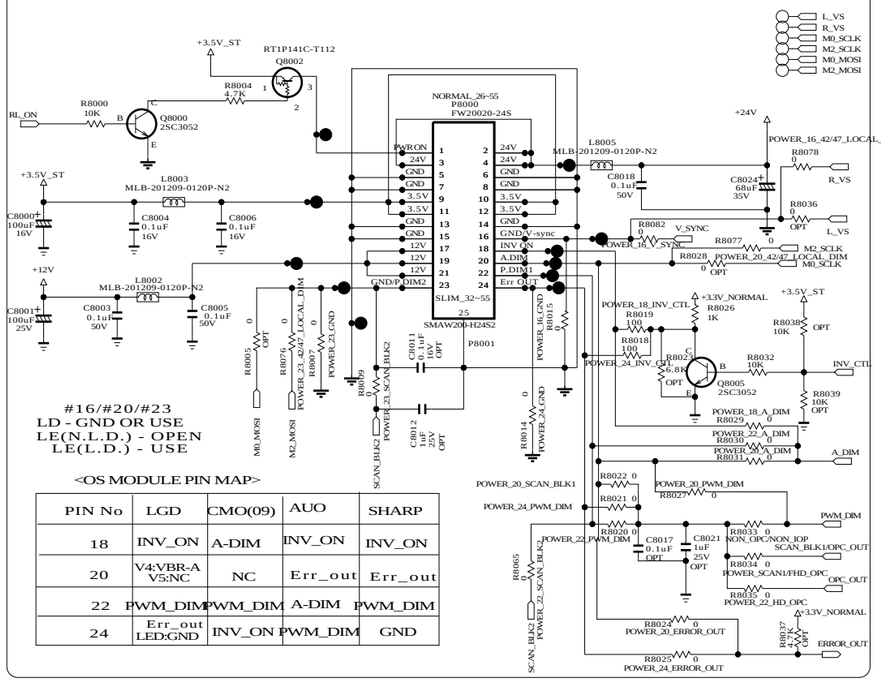
[To MASTER LED DRIVER]



[To SLAVE LED DRIVER]



FROM LIPS & POWER B/D



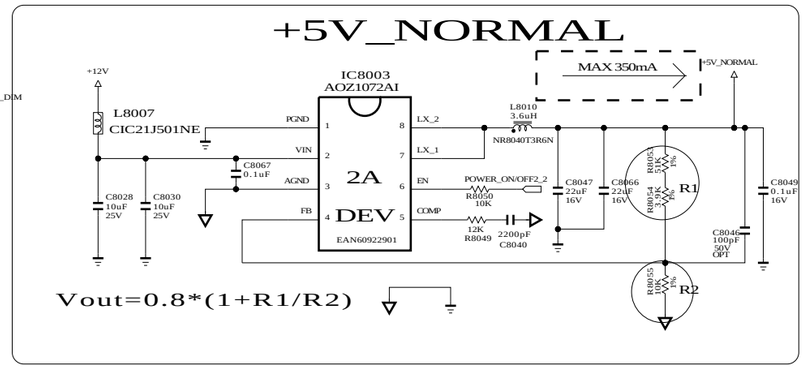
#16/#20/#23
LD - GND OR USE
LE(N.L.D.) - OPEN
LE(L.D.) - USE

<OS MODULE PIN MAP>

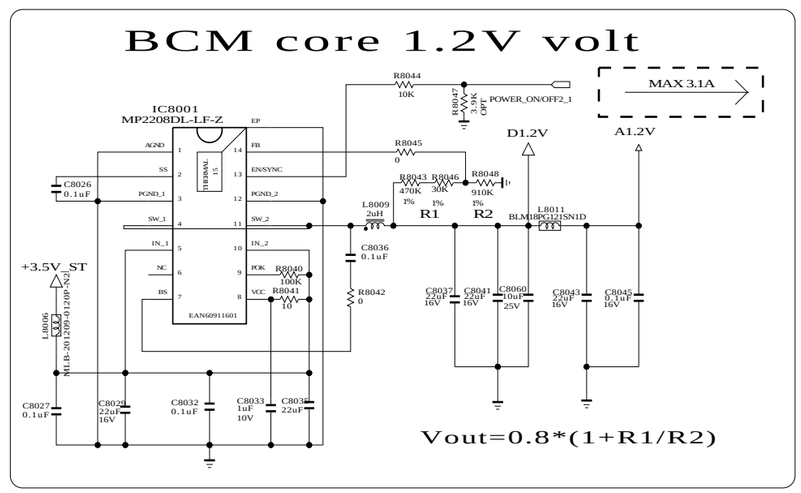
PIN No	LGD	CMO(09)	AUO	SHARP
18	INV_ON	A-DIM	INV_ON	INV_ON
20	V4:VBR-A V5:NC	NC	Err_out	Err_out
22	PWM_DIM	PWM_DIM	A-DIM	PWM_DIM
24	Err_out LED:GND	INV_ON	PWM_DIM	GND

CHECK PWR/MODULE PIN MAP

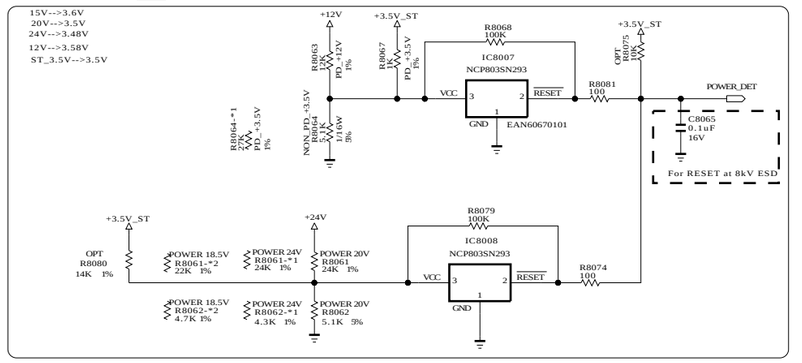
+5V_NORMAL



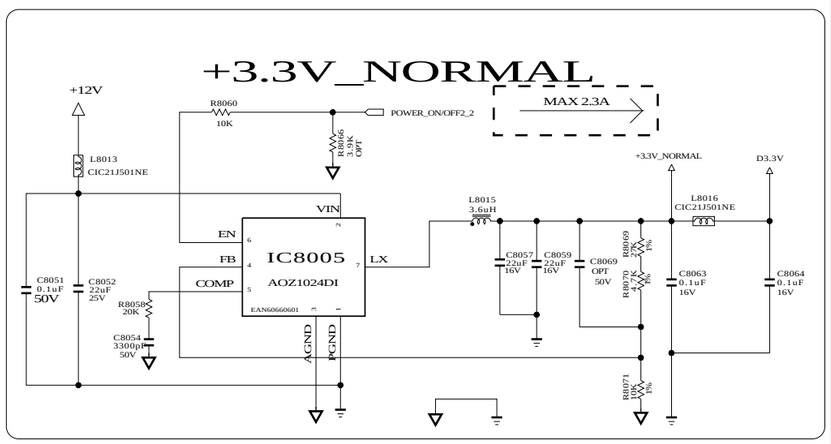
BCM core 1.2V volt



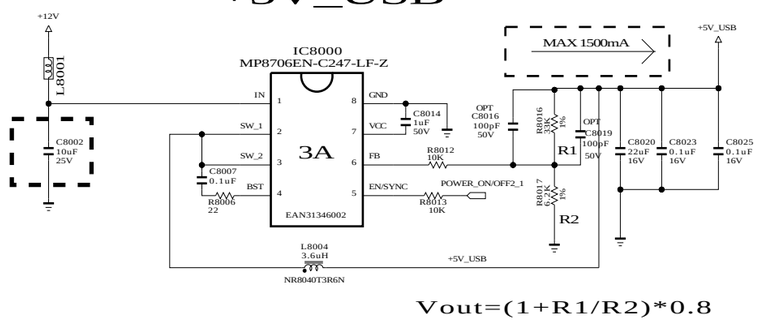
Power_DET



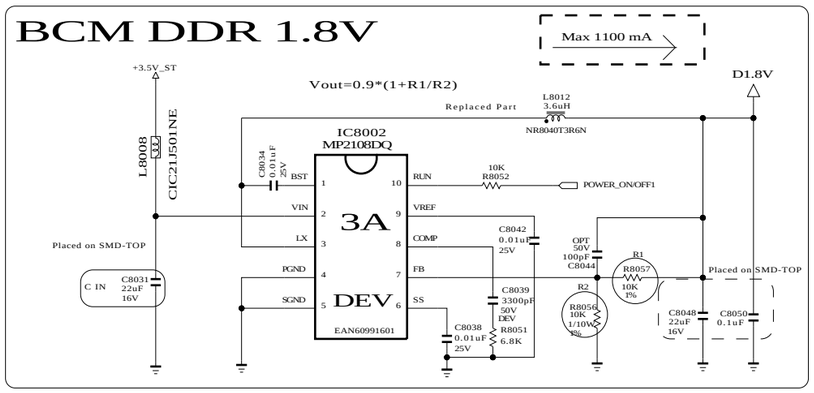
+3.3V_NORMAL



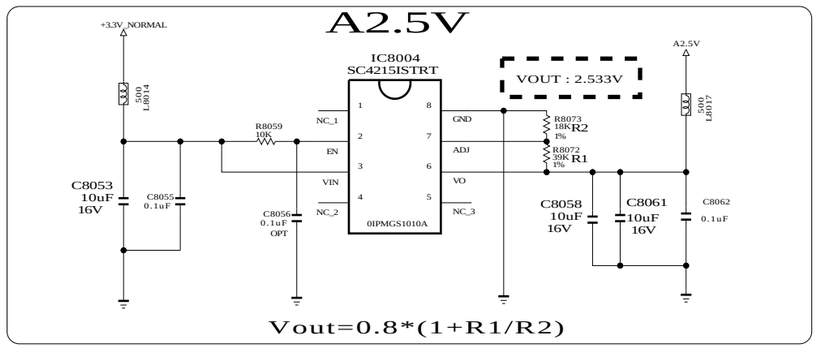
+5V_USB

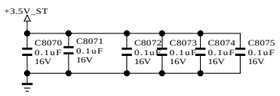


BCM DDR 1.8V



A2.5V





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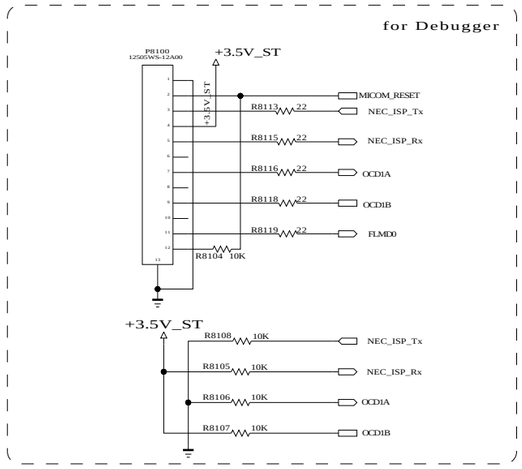
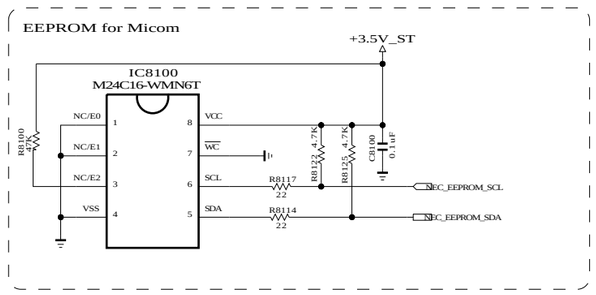
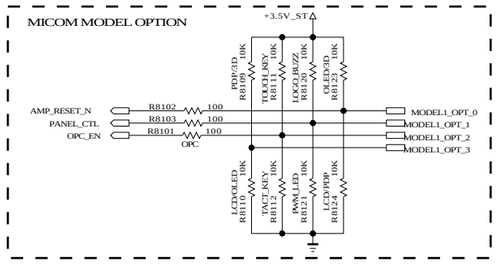
SECRET
LGElectronics

LG ELECTRONICS

MODEL	COMMON	DATE	09/10/xx
BLOCK	POWER	SHEET	80 / 100





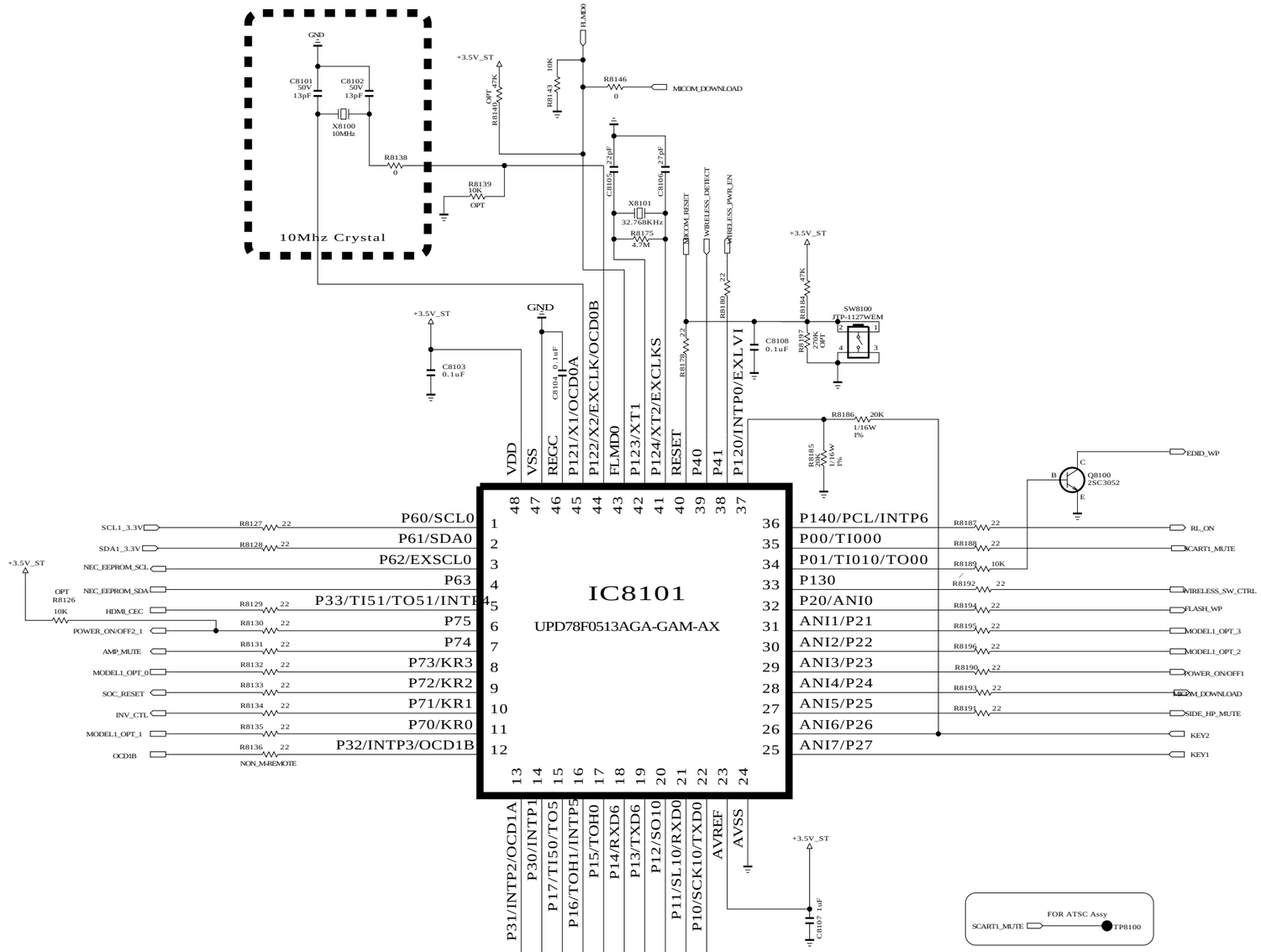


MODEL OPTION

PIN NAME	PIN NO.	HIGH	LOW
MODEL_OPT_0	8	OLED/3D	LCD/PDP
MODEL_OPT_1	11	LOGO_BUZZ	PWM_LED
MODEL_OPT_2	30	TOUCH_KEY	TACT_KEY
MODEL_OPT_3	31	PDP/3D	LCD/OLED

	LCD	PDP	OLED	3D
MODEL_OPT_0	0	0	1	1
MODEL_OPT_3	0	1	0	1

	LOW	LOW_SMALL	TBD	HIGH
MODEL_OPT_1	0	0	1	1
MODEL_OPT_2	0	1	0	1



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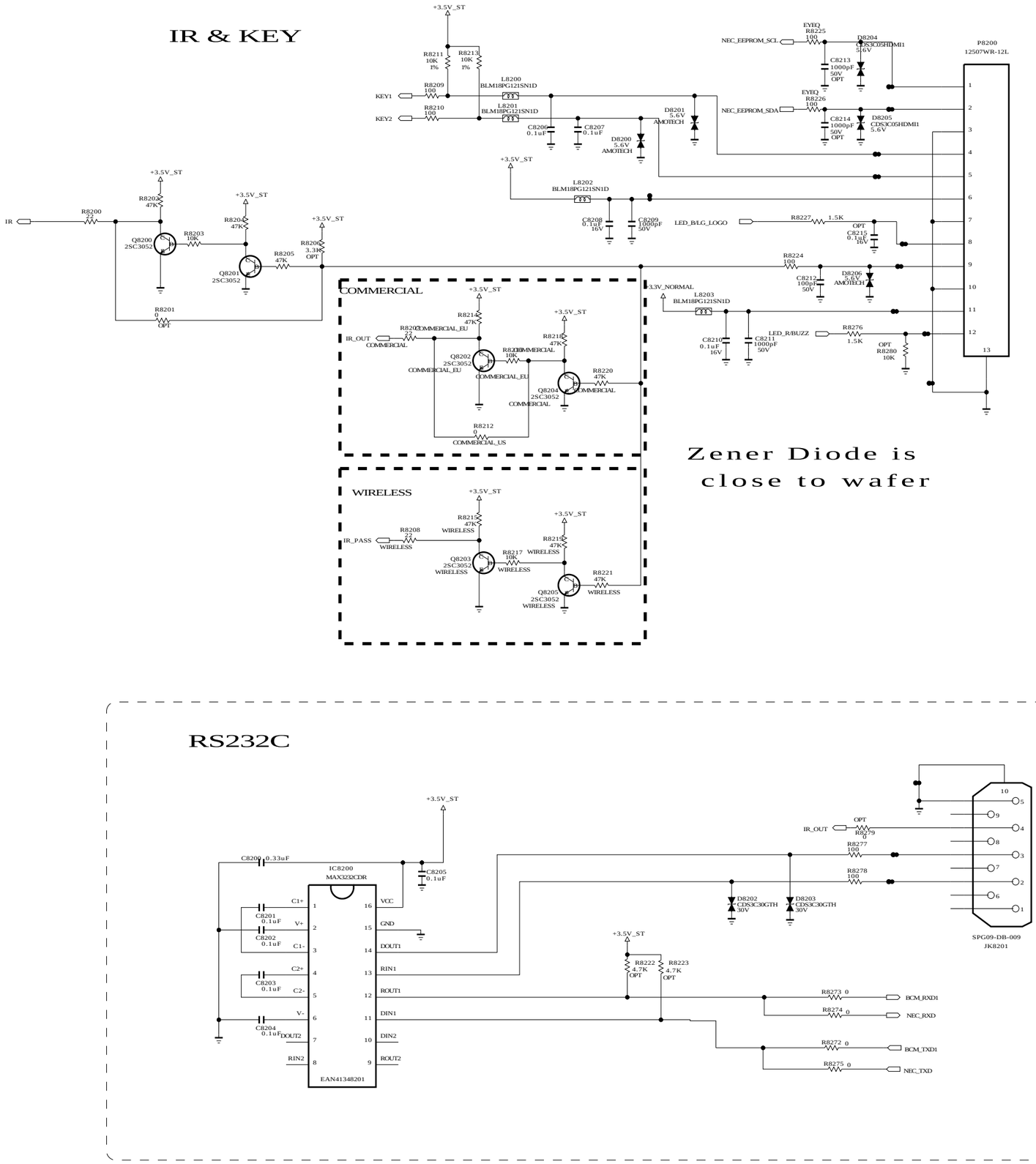
LG ELECTRONICS

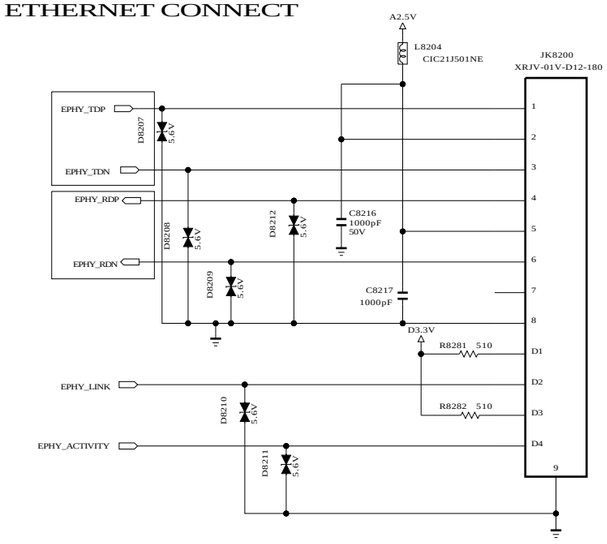
MODEL	GP2_Saturn7M	DATE	Ver. 1.4
BLOCK	MICOM	SHEET	5

IR & KEY



Zener Diode is close to wafer

ETHERNET CONNECT



Trace impedance : 100 ohm differenctial impedance to GND plane
5 mils trace width with 7 mils air gap on P/N pair.
Adjacent TX/RX differential pairs should be separated by more than 15 mils to each other

RS232C

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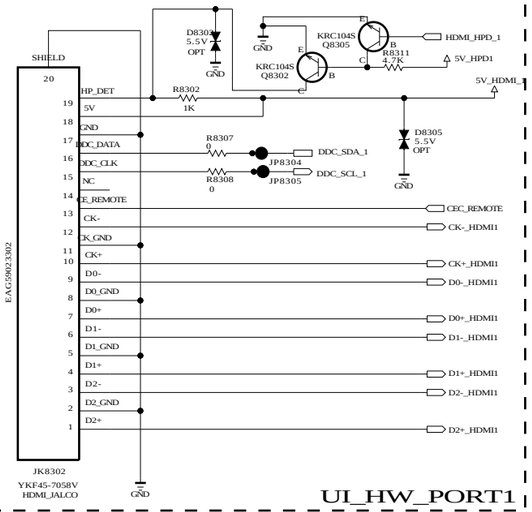
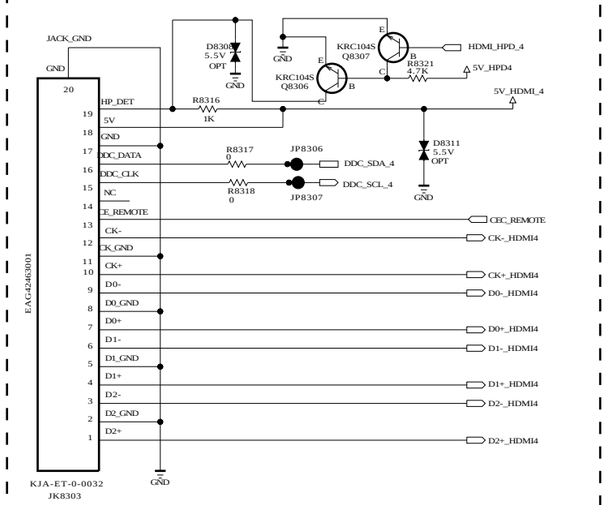
LGElectronics

LG ELECTRONICS

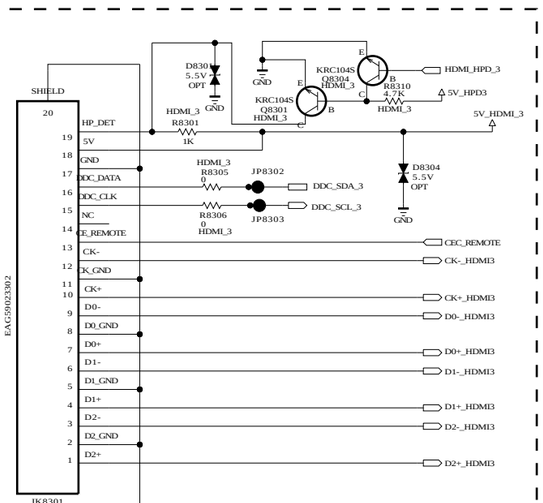
MODEL		DATE	
BLOCK		SHEET	/



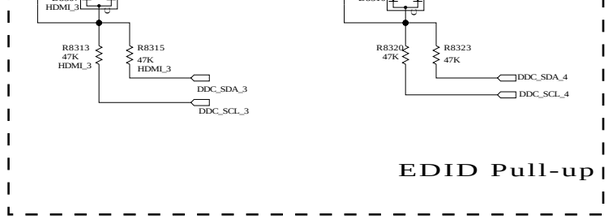
UI_HW_PORT1



SIDE_HDMI_PORT4

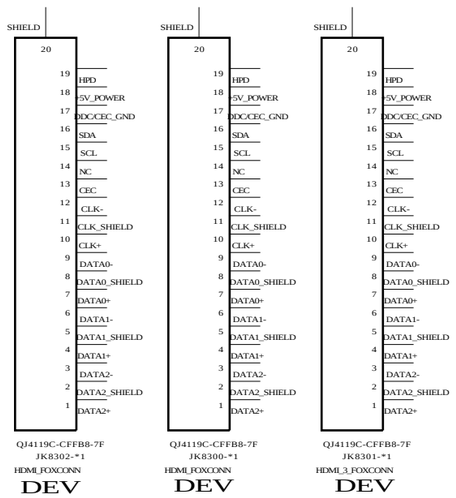


UI_HW_PORT2

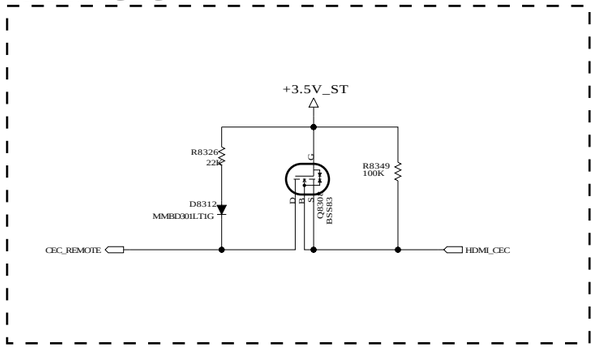


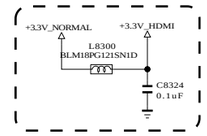
EDID Pull-up

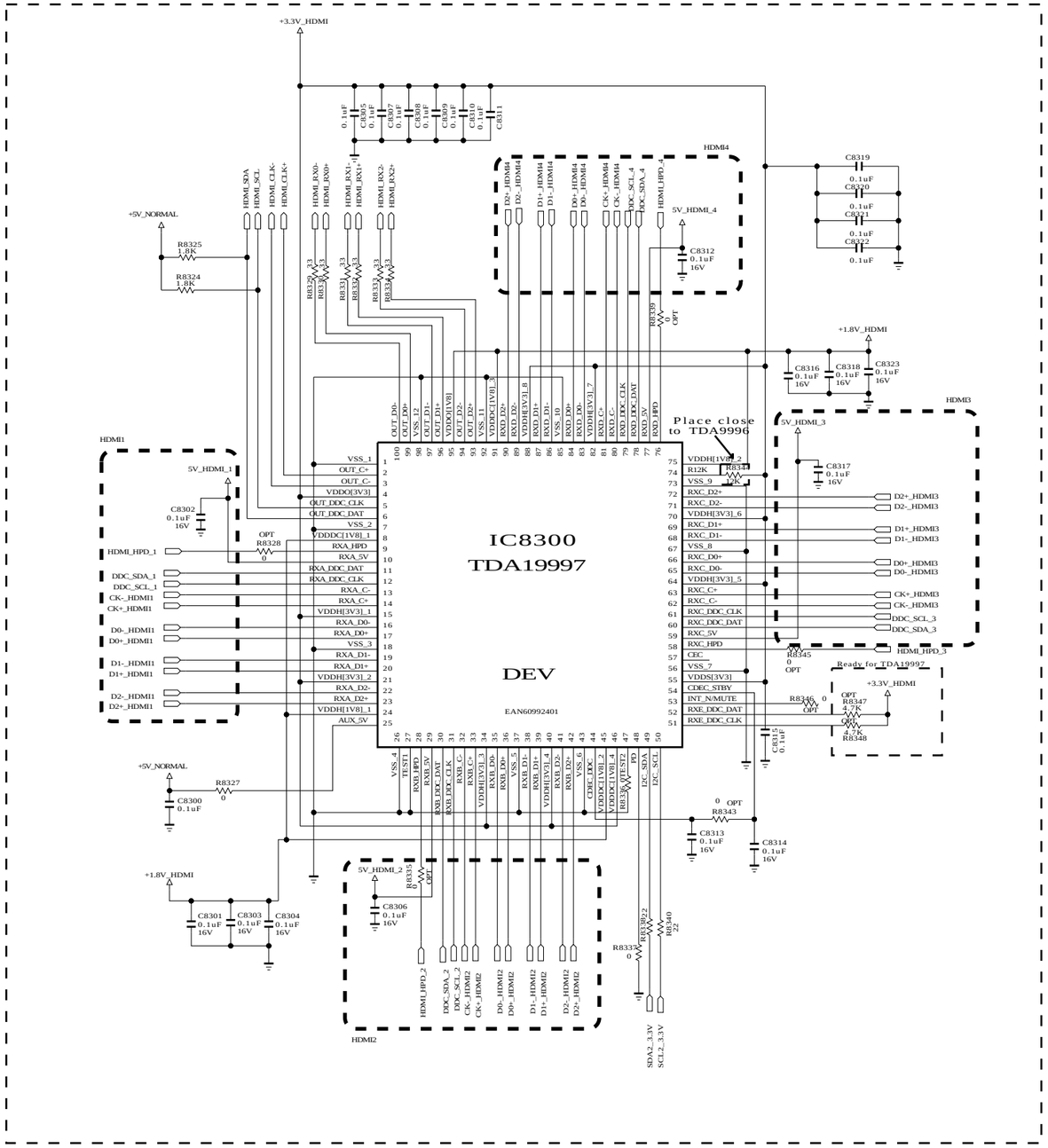
UI_HW_PORT3



* HDMI CEC







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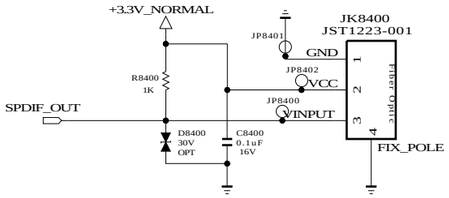
SECRET

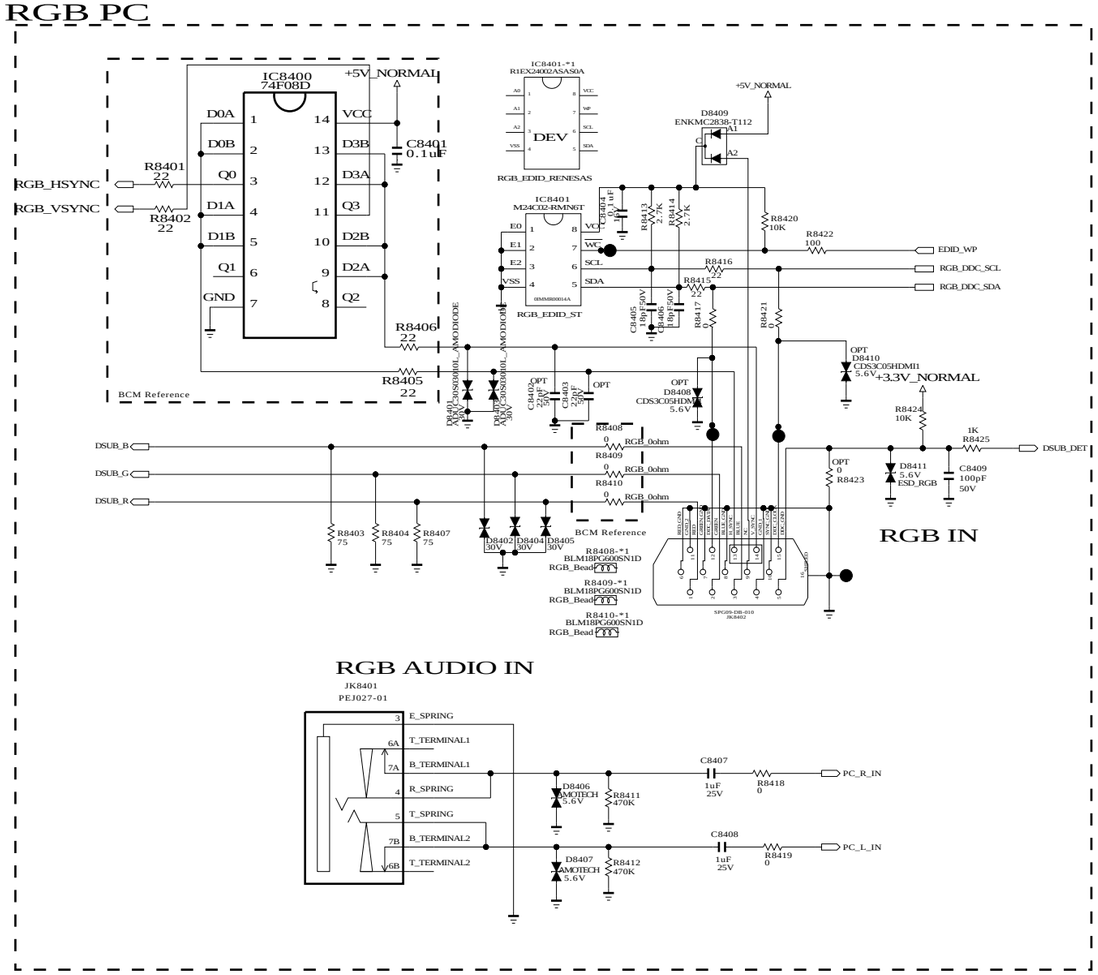
LGElectronics

LG ELECTRONICS

MODEL	COMMON	DATE	09/10/xx
BLOCK	HDMI	SHEET	83 / 100



RGB PC



RGB AUDIO IN

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SECRET

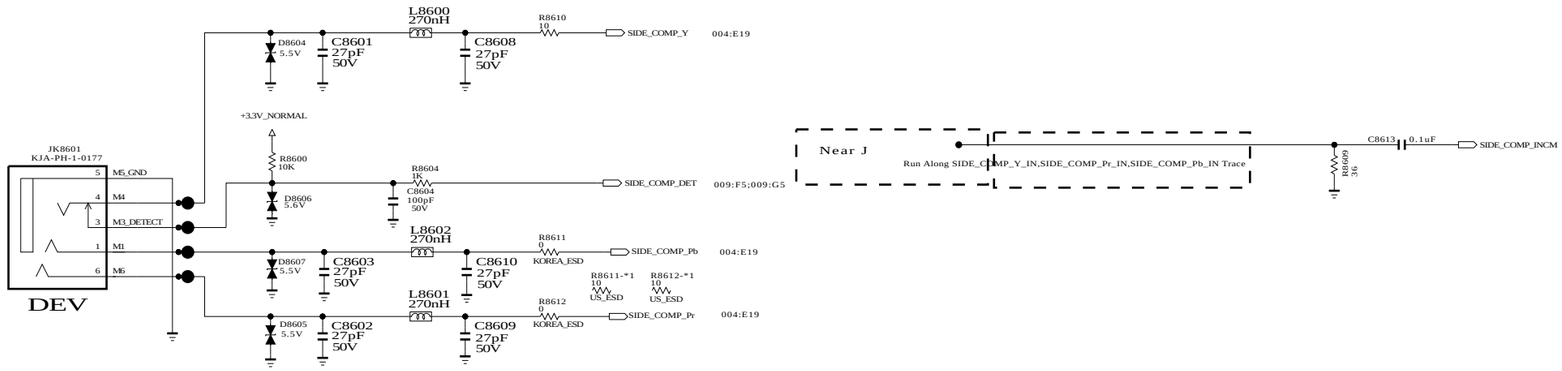
LGElectronics

LG ELECTRONICS

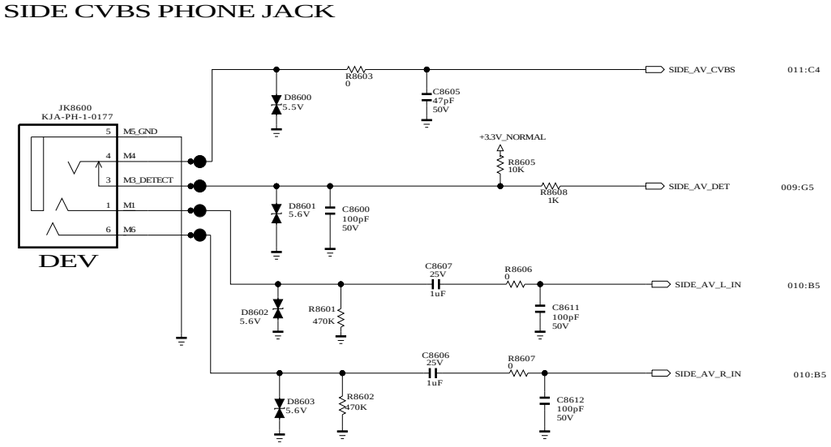
MODEL	COMMON	DATE	09/10/xx
BLOCK	RGB/SPDIF	SHEET	84 / 100

SIDE_GENDER

SIDE COMPONENT PHONE JACK



SIDE CVBS PHONE JACK



SIDE_COMPONENT_PHONE_JACK
SIDE_CVBS_PHONE_JACK
SIDE_HEAD_PHONE_JACK

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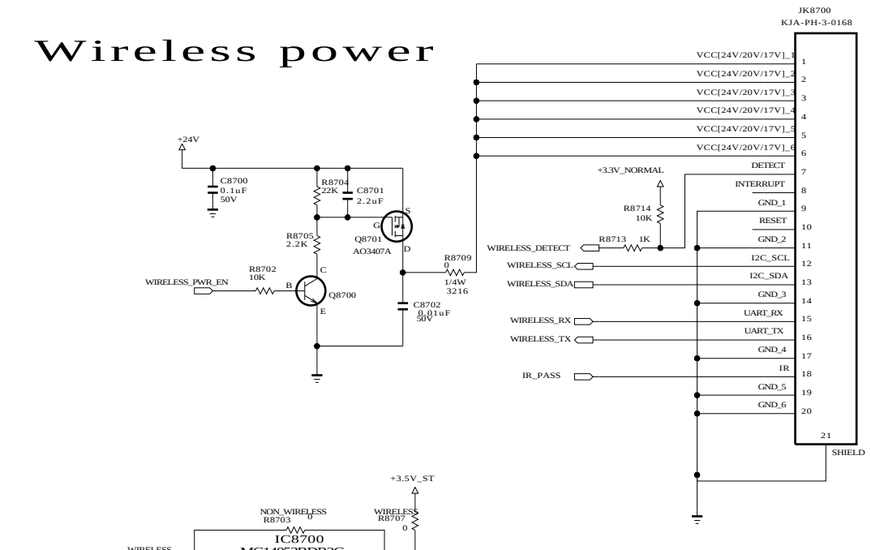
LGElectronics

LG ELECTRONICS

MODEL	COMMON	DATE	09/10/xx
BLOCK	SIDE_GENDER	SHEET	86 / 100

WIRELESS READY

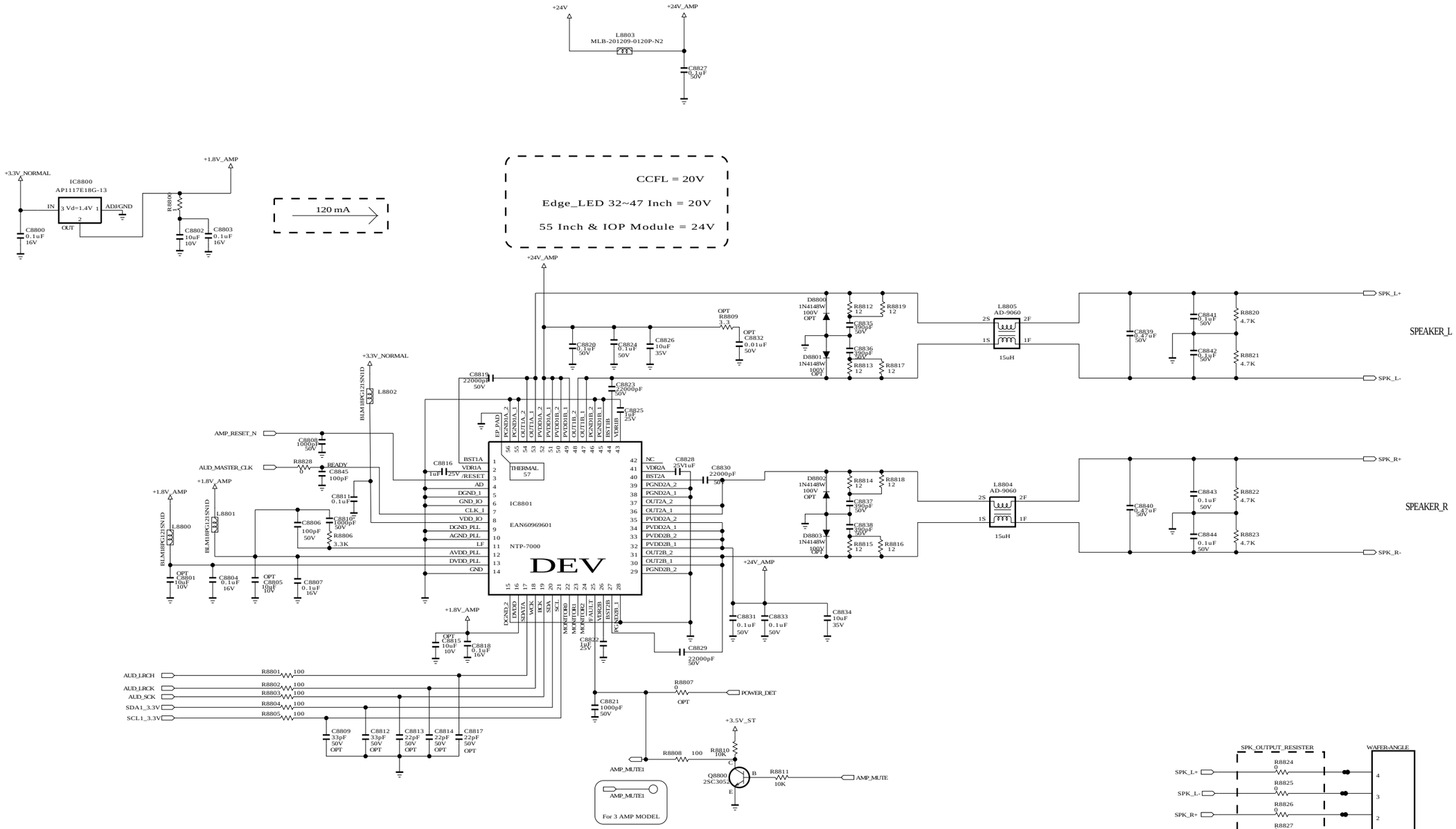
Wireless power



RS232C & Wireless

WIRELESS_SW_CTRL	SELECT PIN	STATUS
HIGH	X1/Y1/Z1	WIRELESS Dongle connect --> WIRELESS RS232
LOW	X0/Y0/Z0	WIRELESS Dongle Dis_con --> S7 RS232

MODEL	COMMON	DATE	09/10/xx
BLOCK	WIRELESS	SHEET	87 / 100



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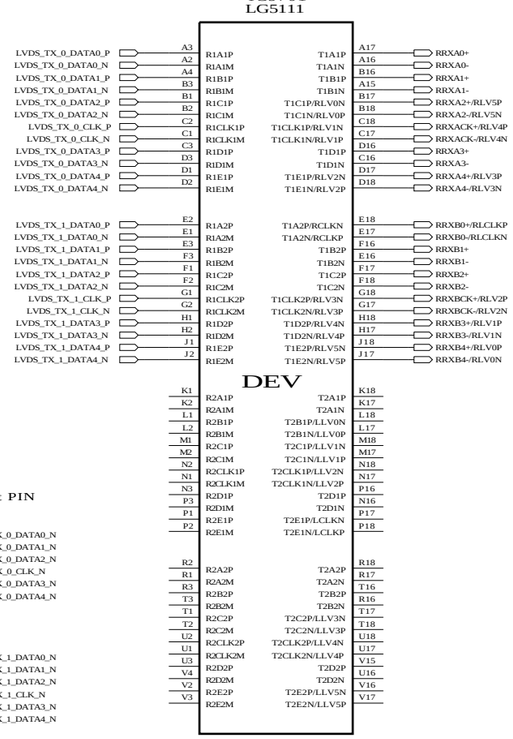
SECRET

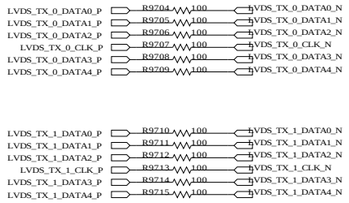
LGElectronics

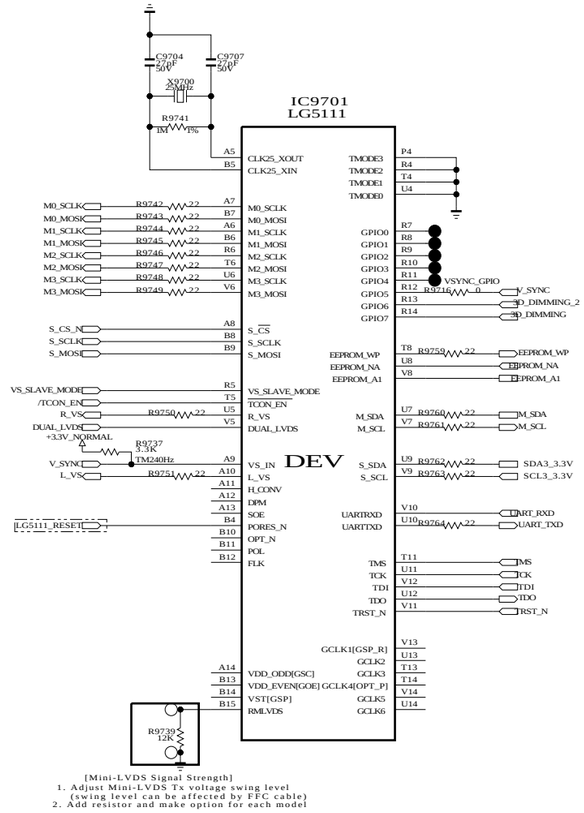
LG ELECTRONICS

MODEL	COMMON	DATE	09/10/xx
BLOCK	NTP7000	SHEET	88 / 100

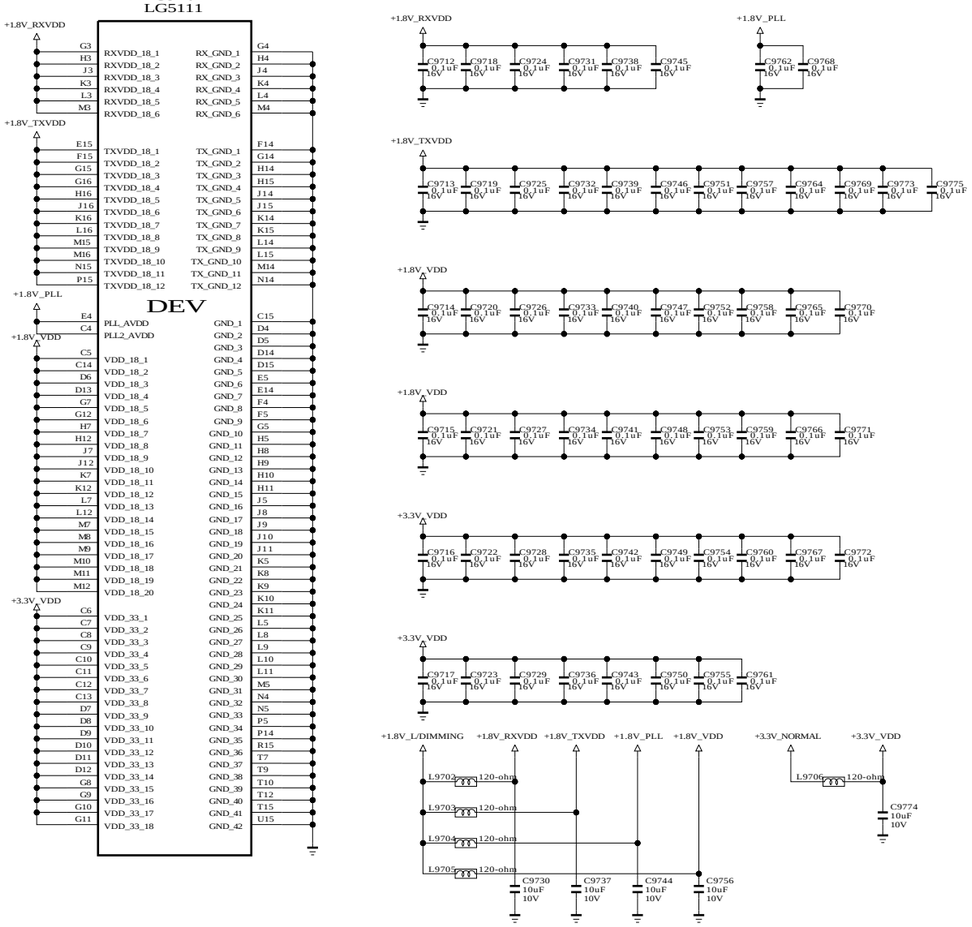


Close to LG5111 LVDS Input PIN

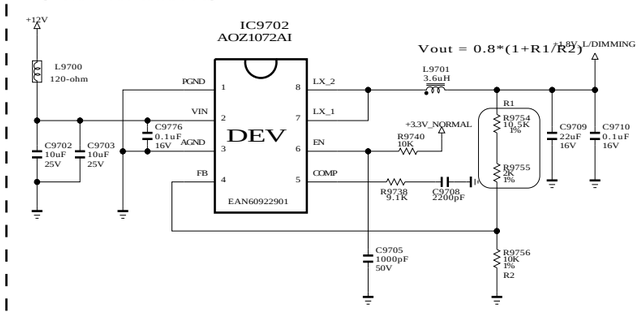




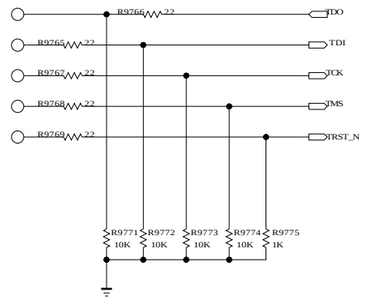
[Mini-LVDS Signal Strength]
1. Adjust Mini-LVDS Tx voltage swing level
(swing level can be affected by FFC cable)
2. Add resistor and make option for each model



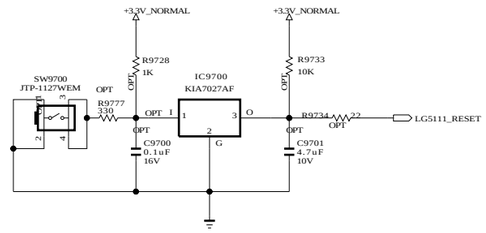
[+1.8V for LG5111]



[JTAG for LG5111]



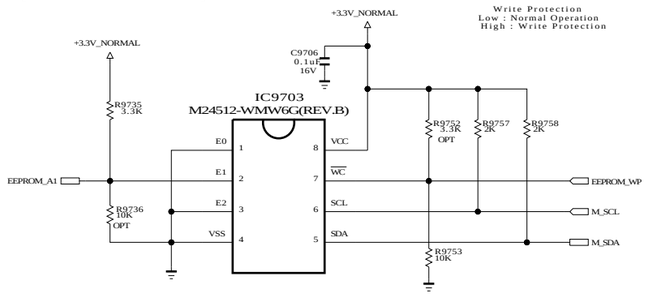
[RESET for LG5111]



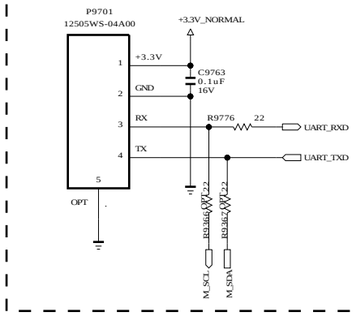
[EEPROM for LG5111]

I2C Slave Address : 0xA4

Write Protection
Low : Normal Operation
High : Write Protection



[UART for LG5111]



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

SECRET

LGElectronics

LG ELECTRONICS

MODEL	COMMON_LD_400/480HZ	DATE	09/10/13
BLOCK	LG5111 (L.D.) from BCM	SHEET	97

INDEX

SECRET

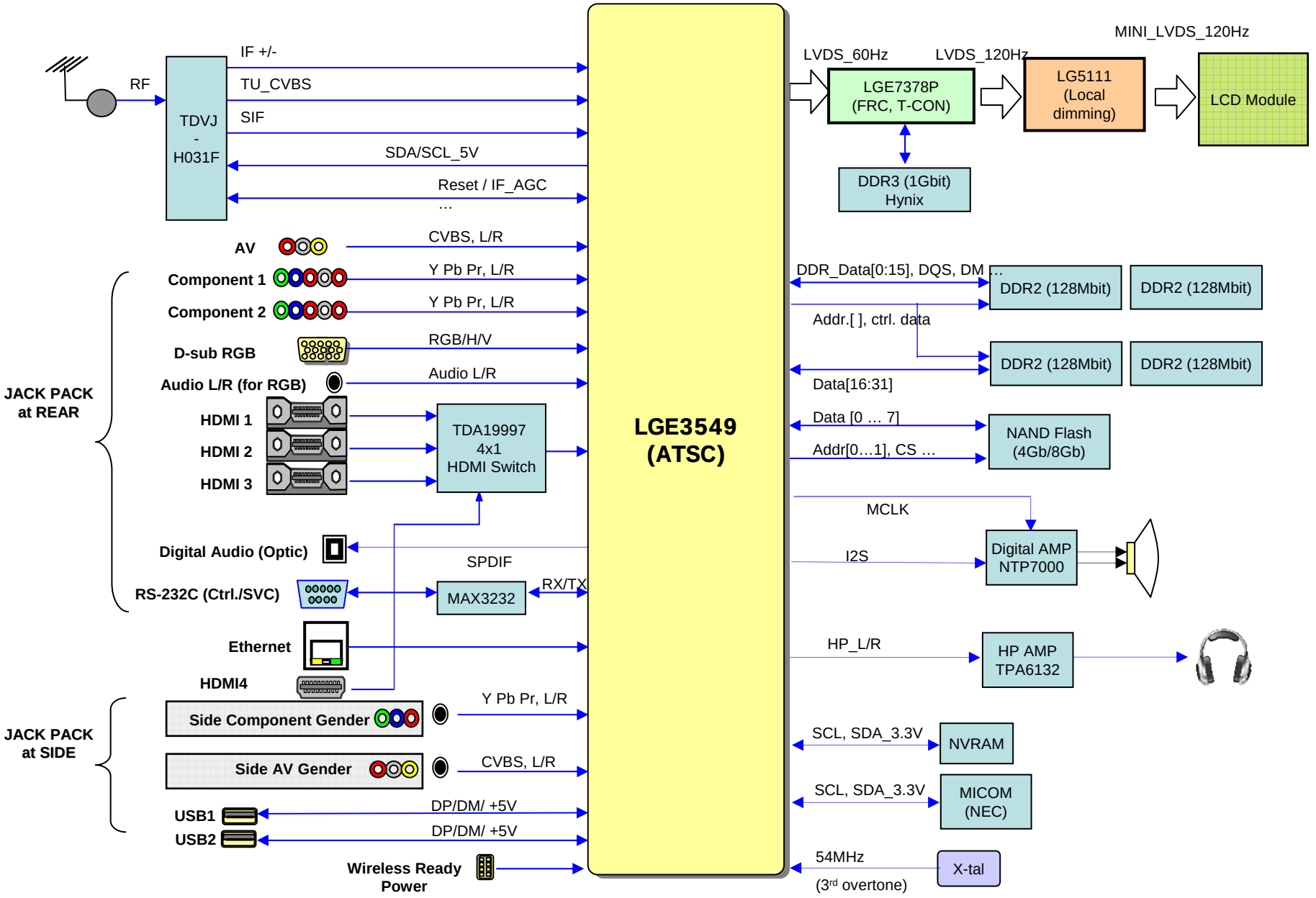
LGElectronics

LG ELECTRONICS

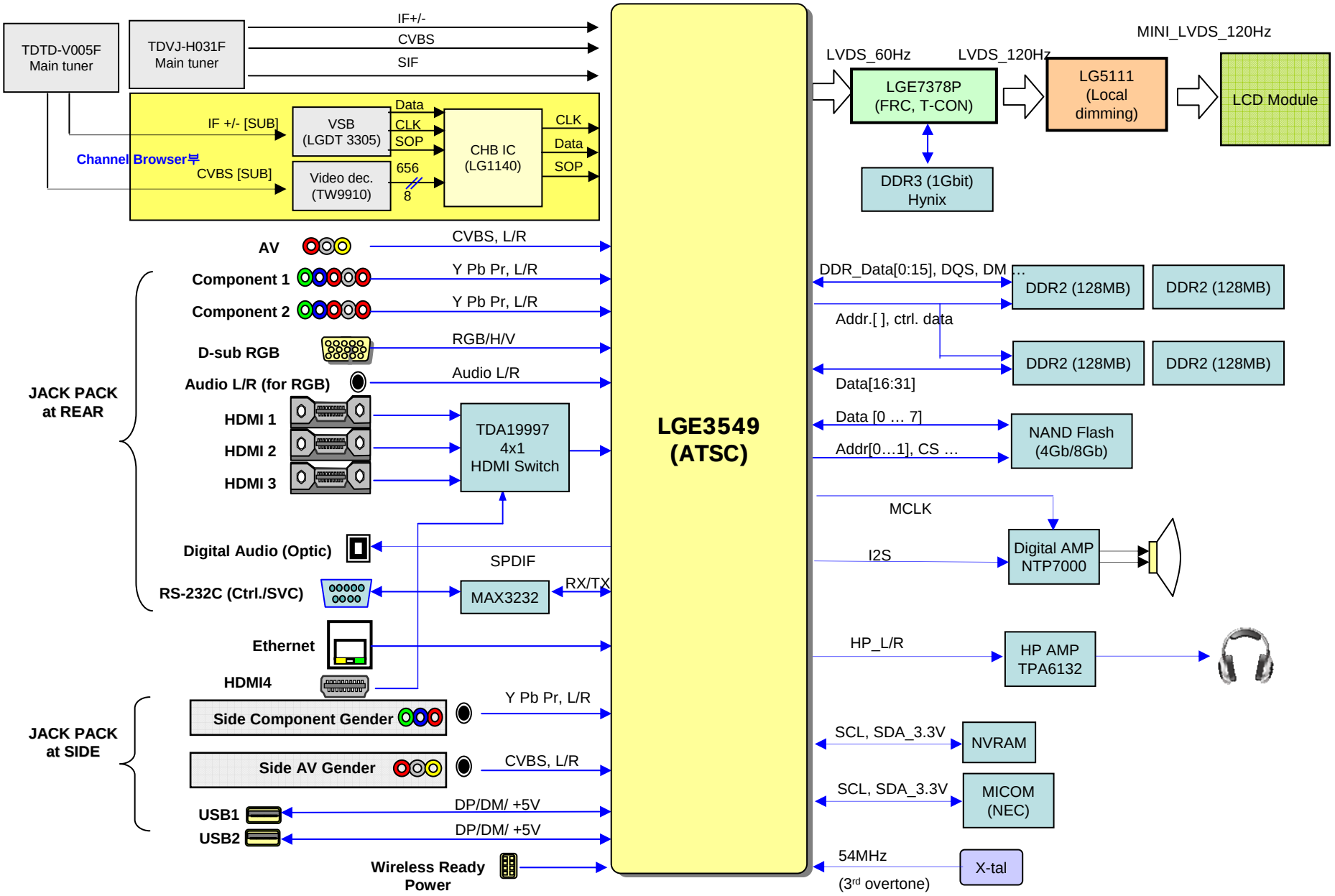
MODEL	GP2_BCM_ATSC	DATE	09/10/xx
BLOCK	INDEX	SHEET	100 / 100


LG Electronics Inc.

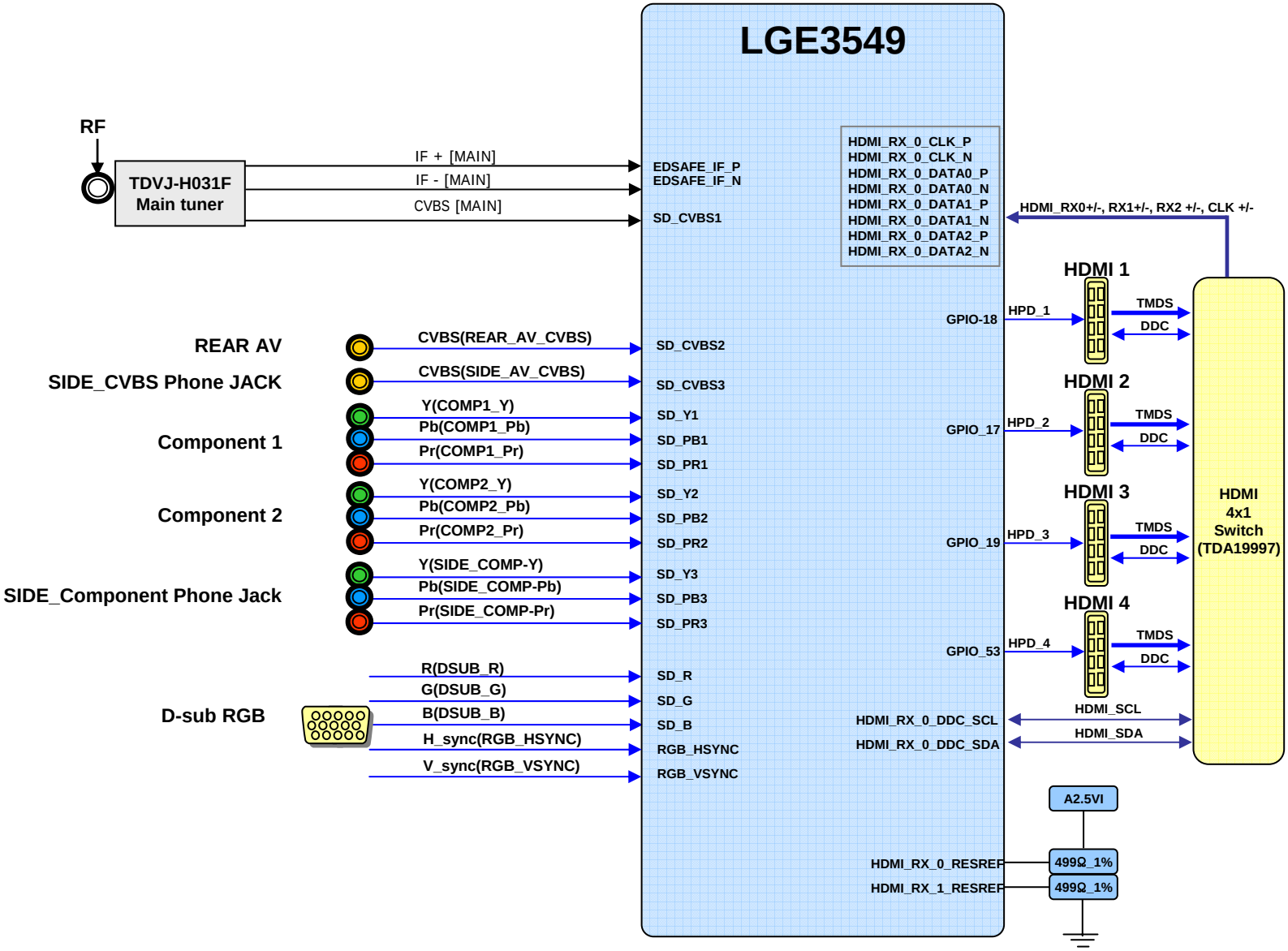
1. Overview for LGE3549 (ATSC) – US & LX6500-NB



1. Overview for BCM3549 (ATSC) - 한국

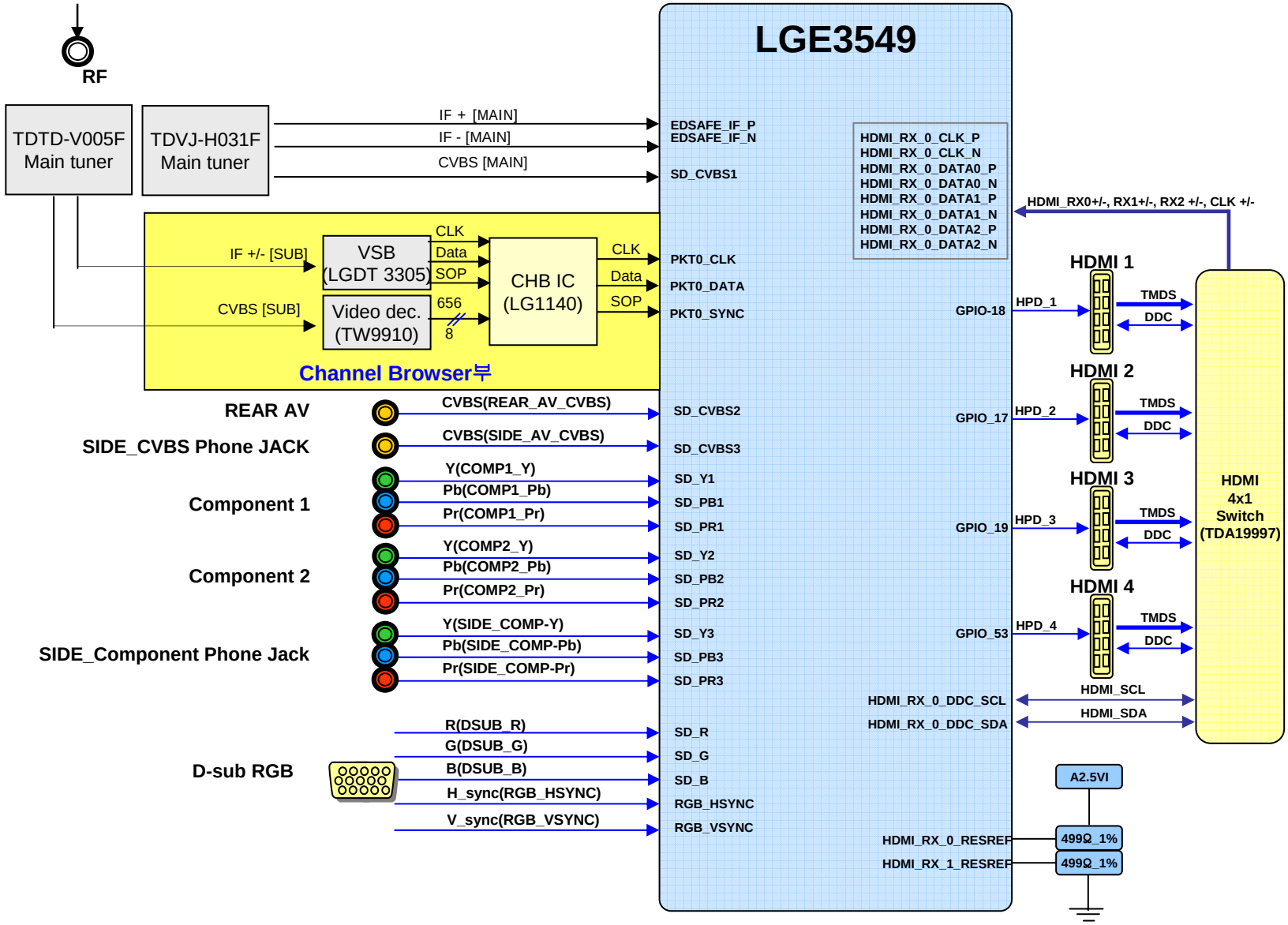


2. Video Signal block



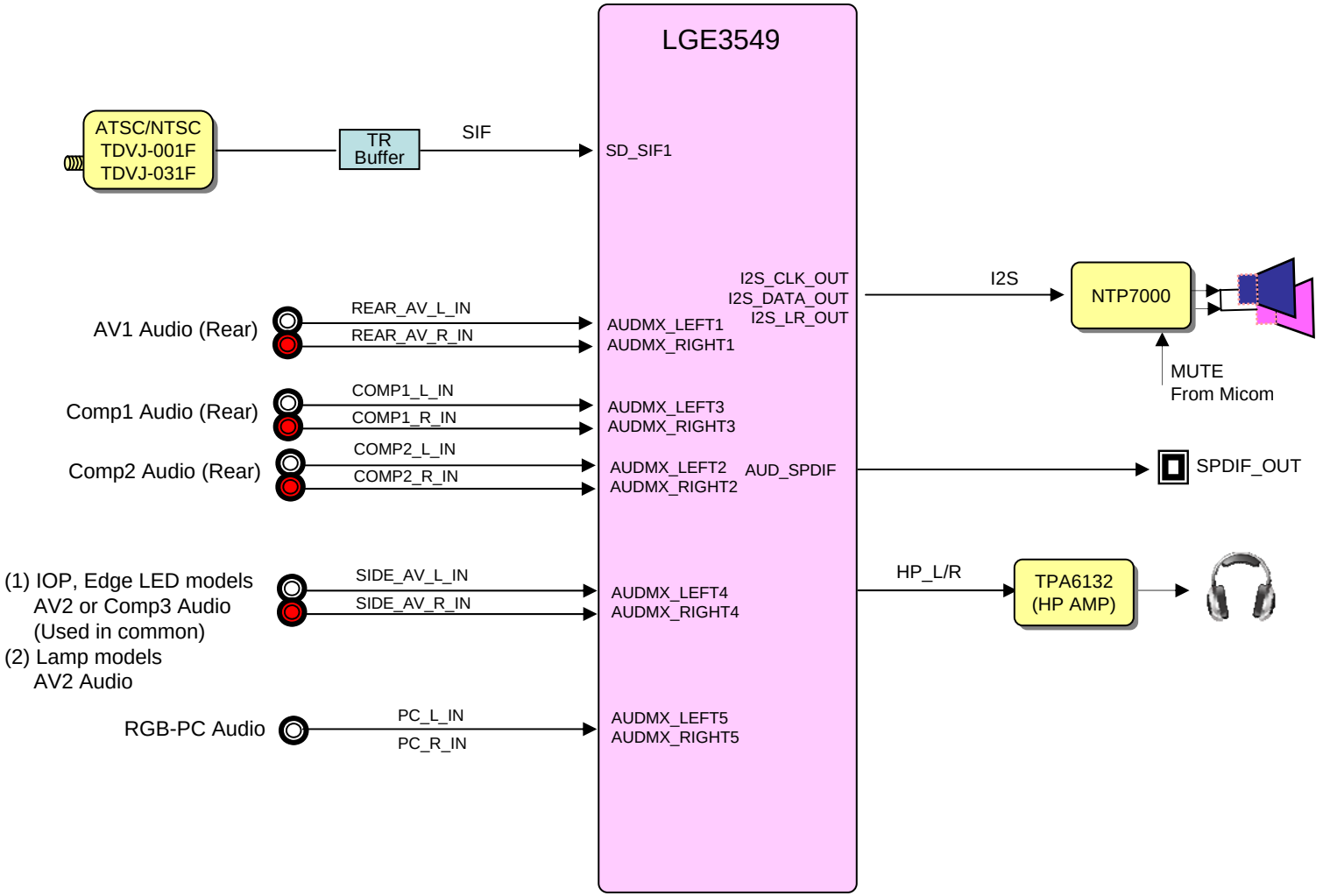
*** Each of analog audio signals shall be designed with “Common Mode (INCM) signal ”**

2. Video Signal block (With Channel browser block)



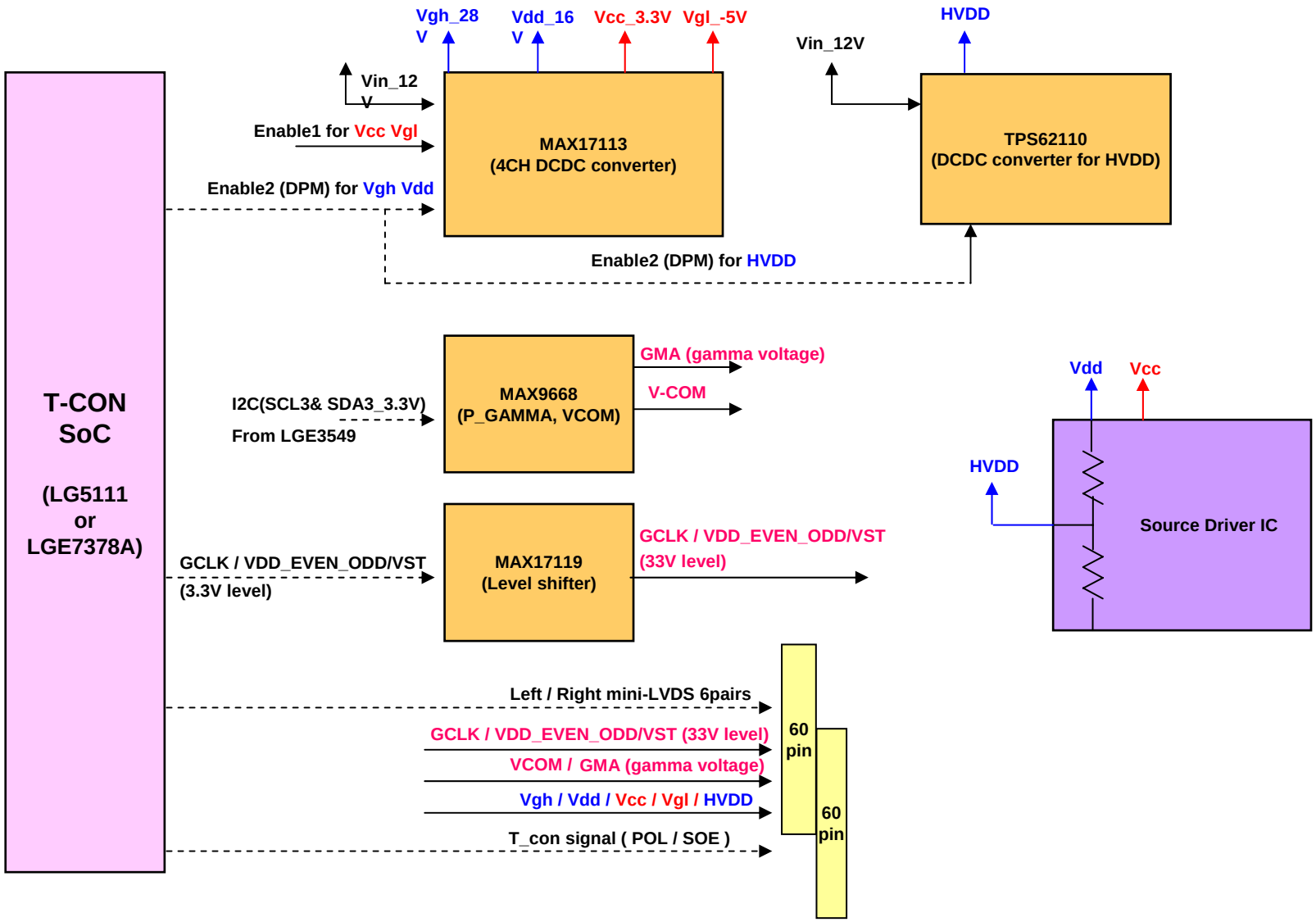
*** Each of analog audio signals shall be designed with “Common Mode (INCM) signal ”**

3. Audio Signal block

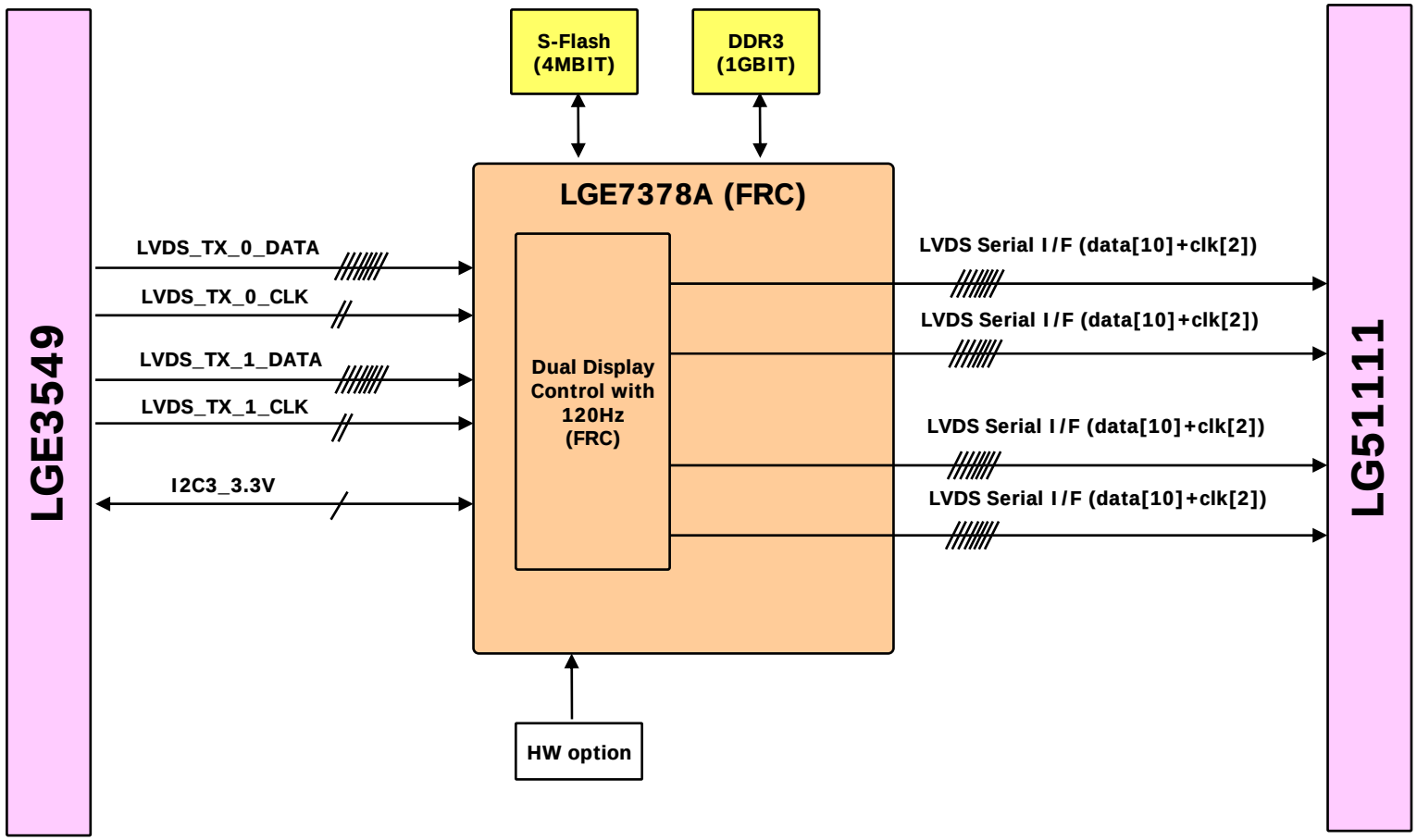


*** Each of analog signals shall be designed with “Common Mode (INCM) signal ”**

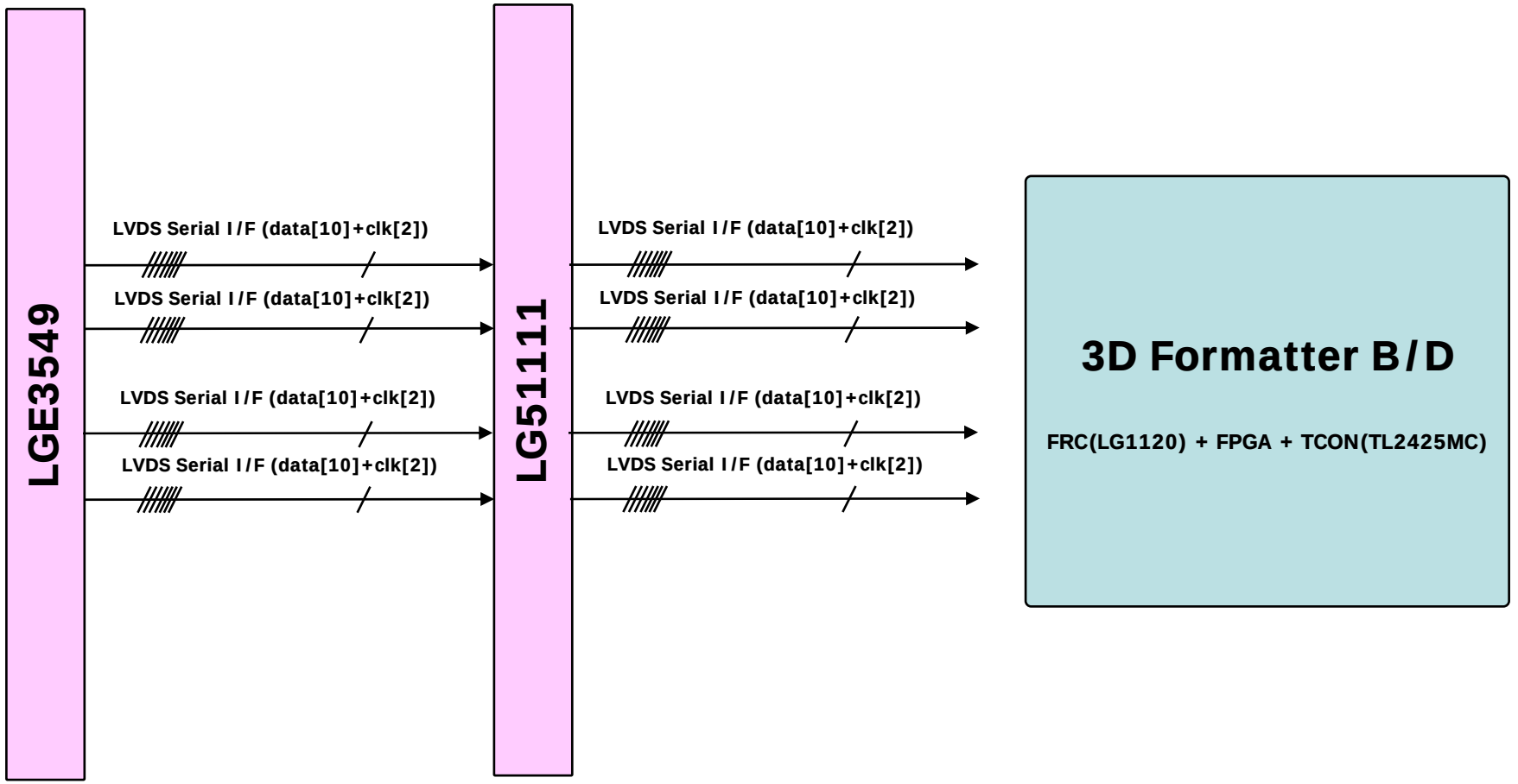
4. M+S block



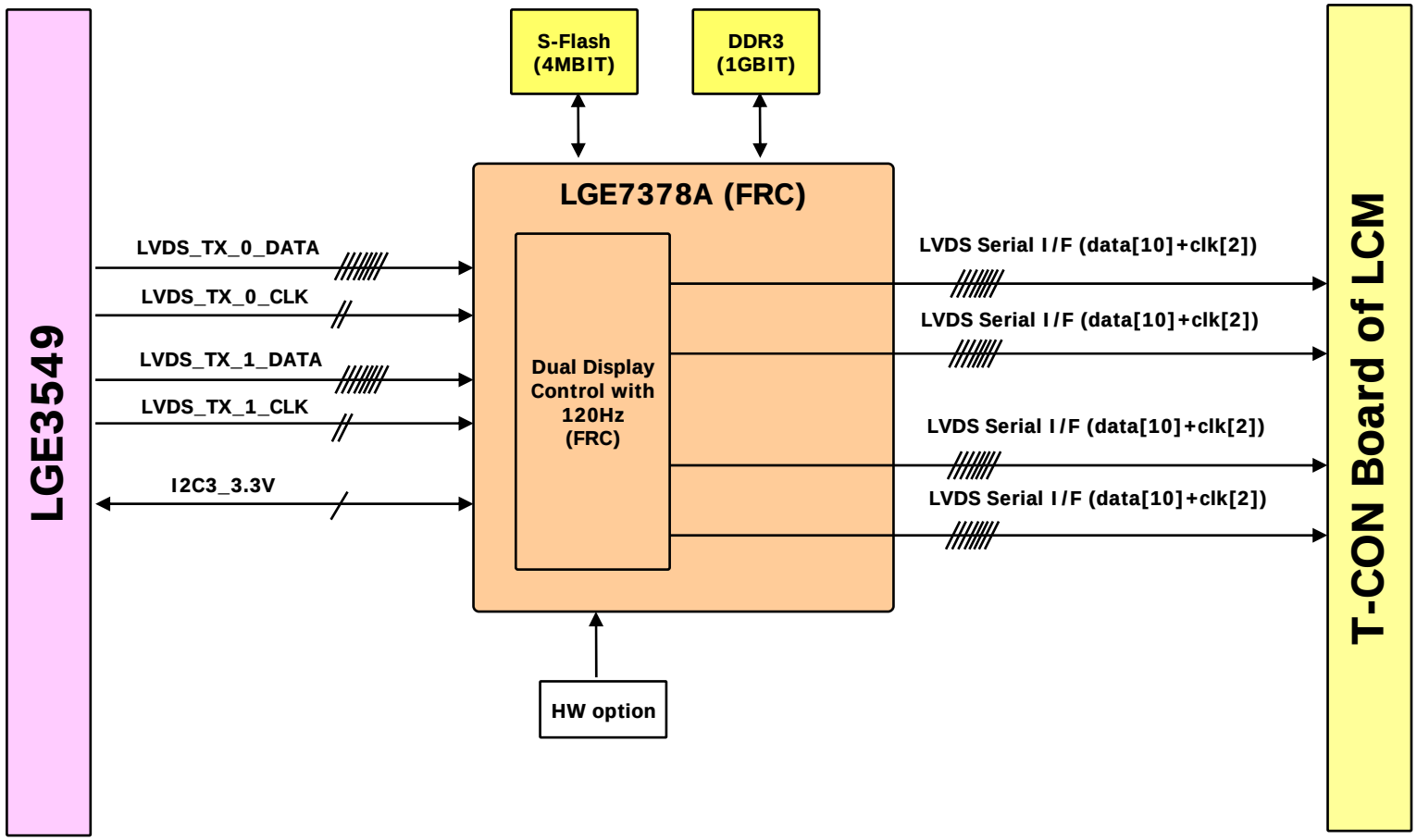
5. FRC (URSA3 – LGE7378A) block with LG5111



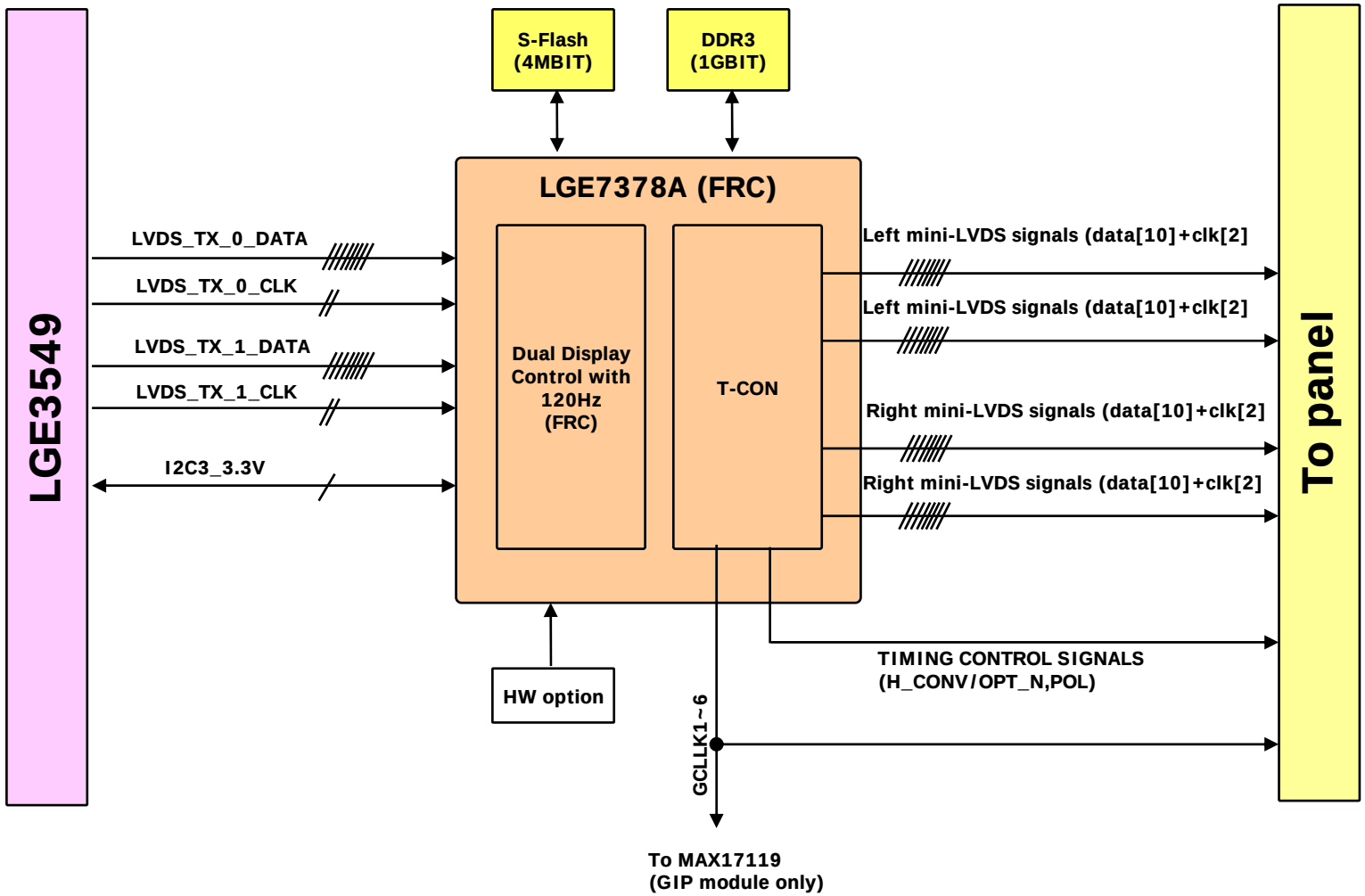
5. 3D Block with FRC(LG1120), FPGA, TCON(TL2425MC)



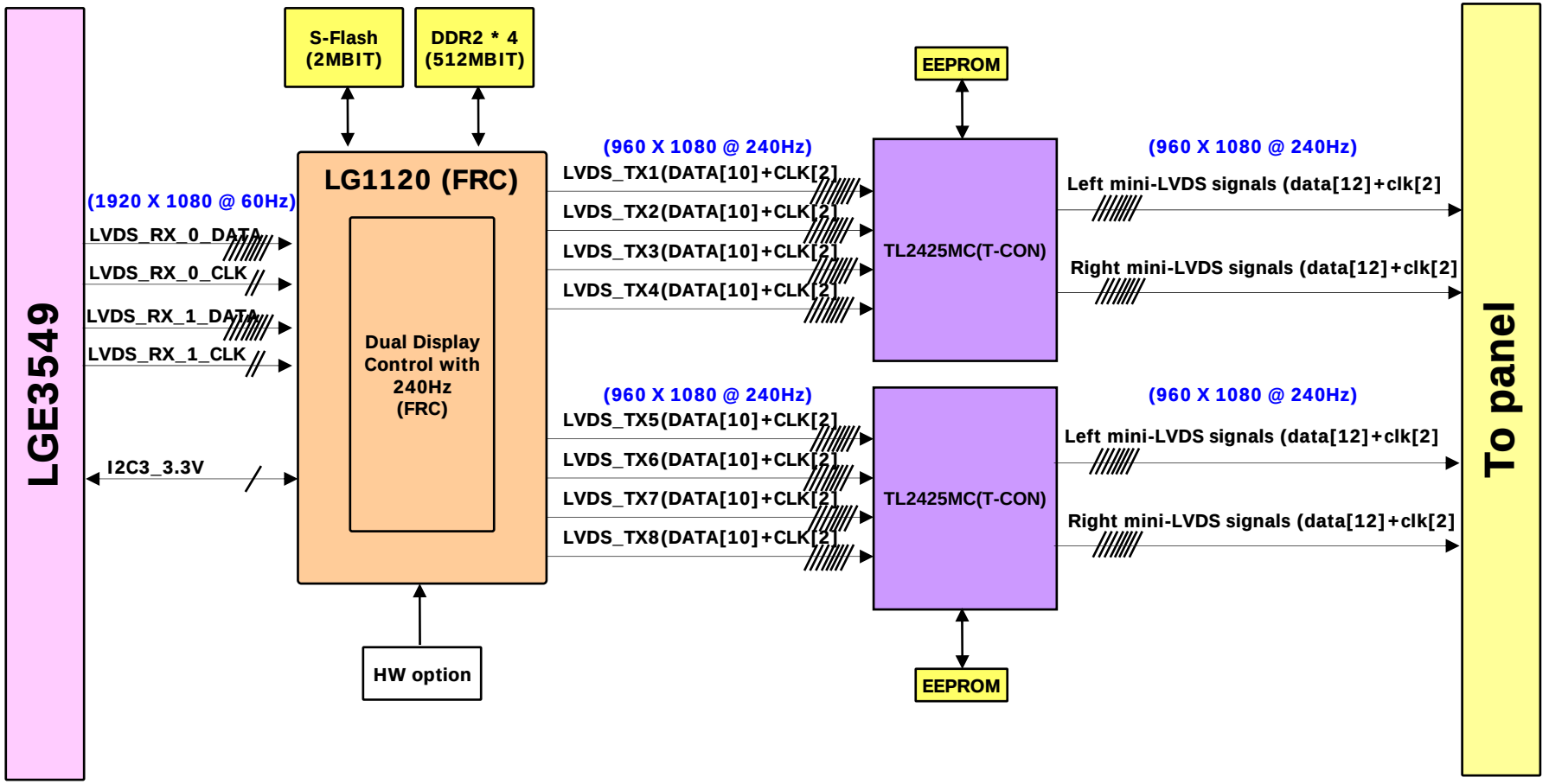
5. FRC (URSA3 – LGE7378A) block with T-CON board



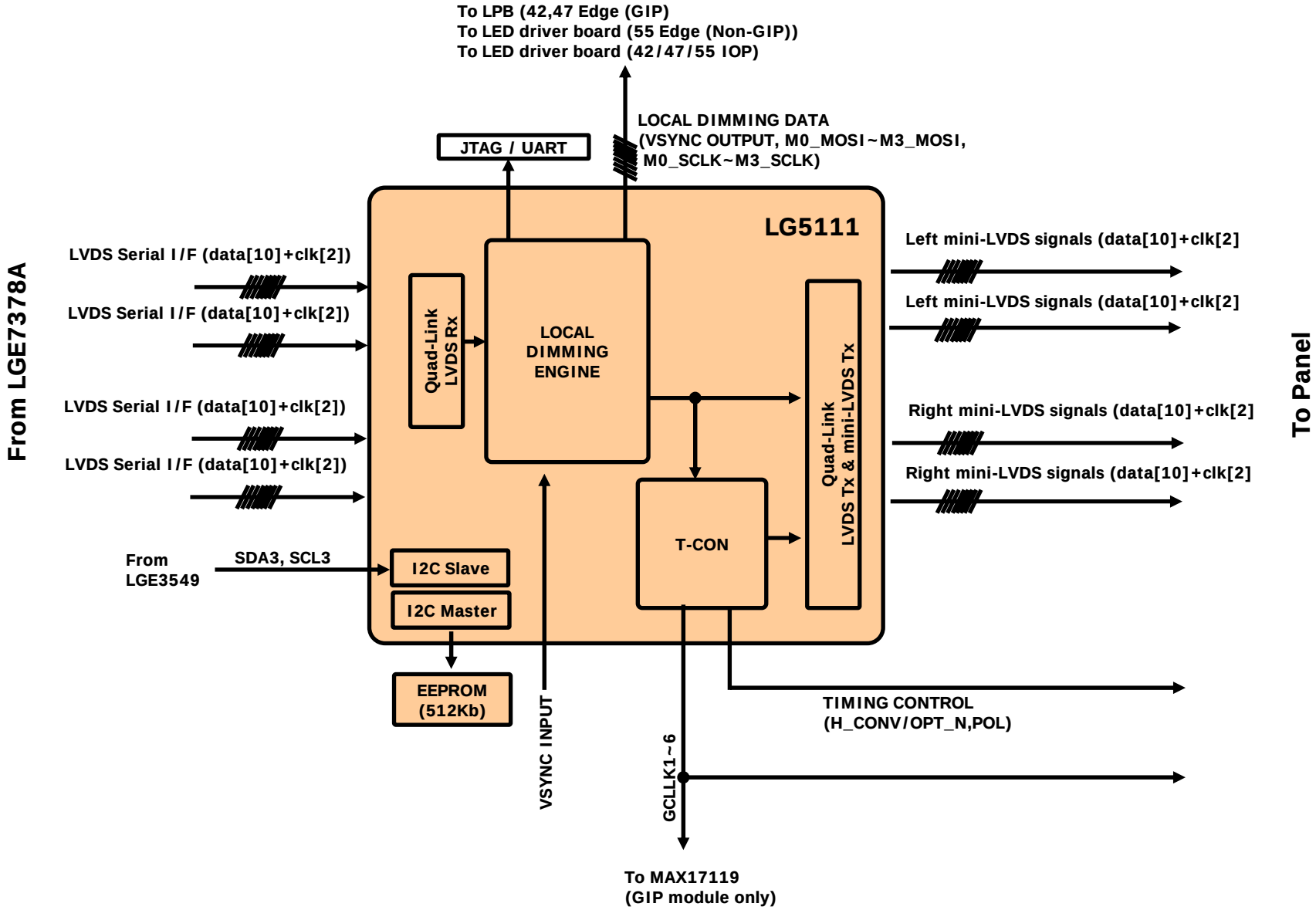
5. FRC (URSA3 – LGE7378A) block with mini-LVDS interface



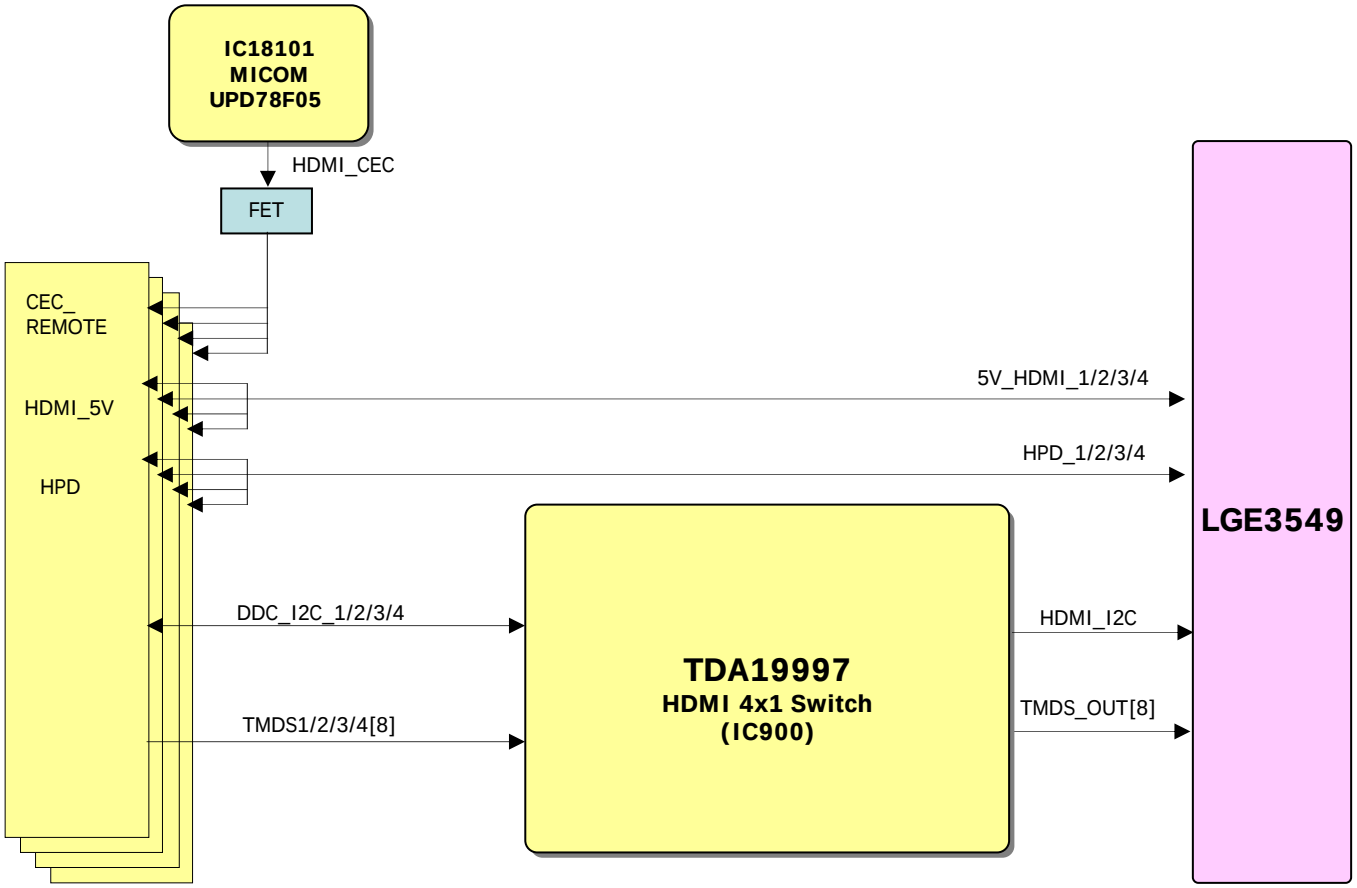
5. FRC (Piwz – LG1120) block with mini-LVDS interface



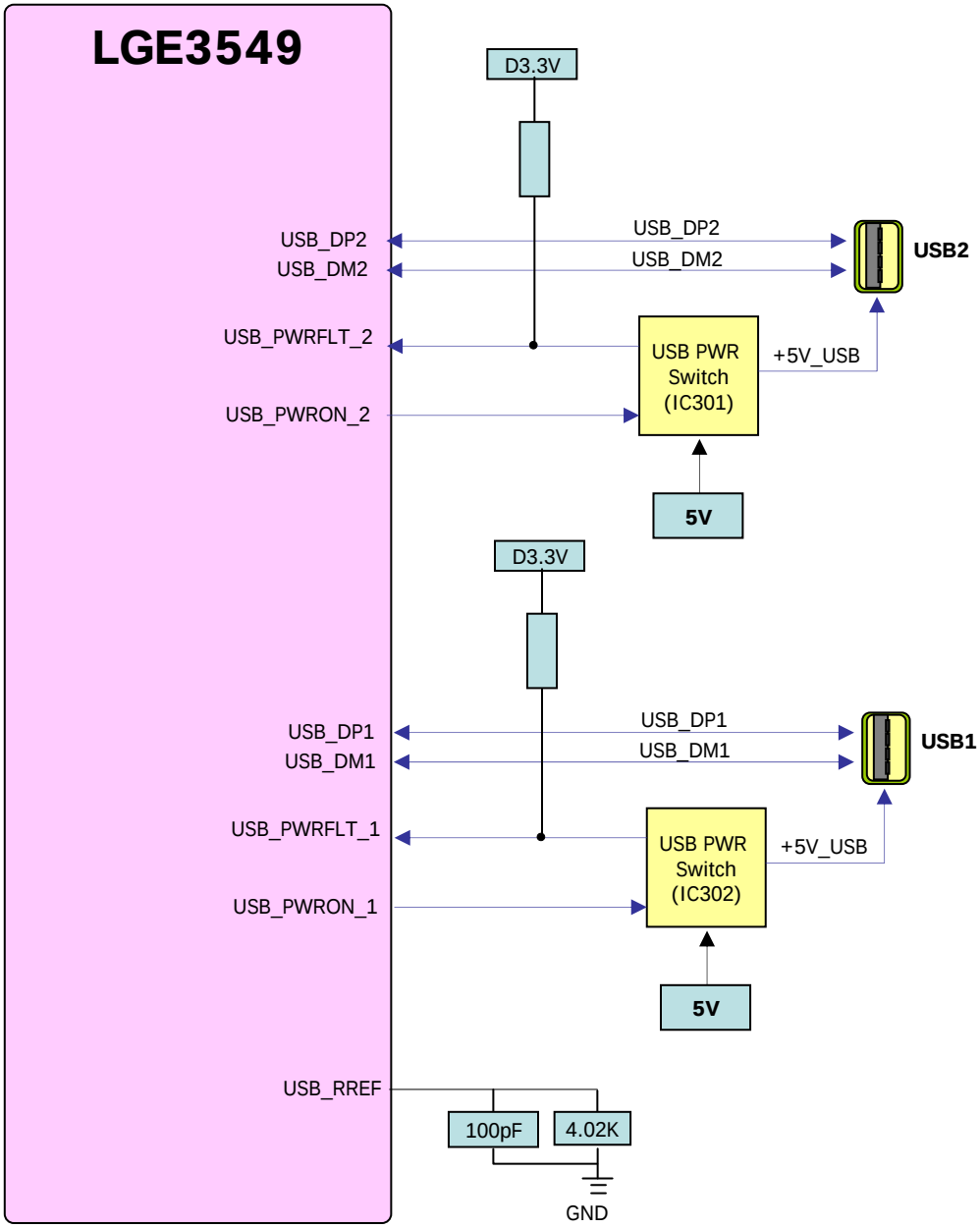
6. LG5111 Block



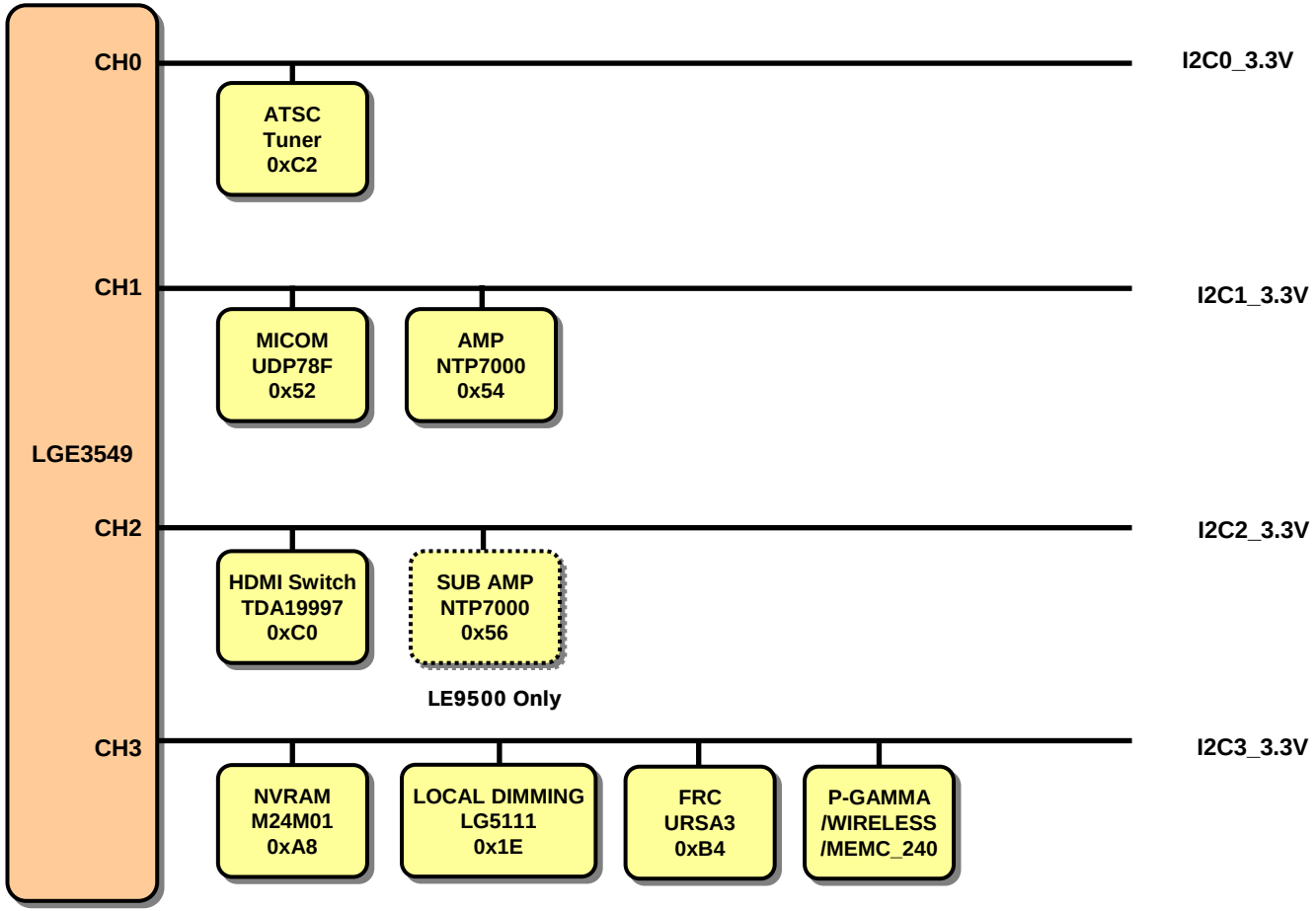
7. HDMI block



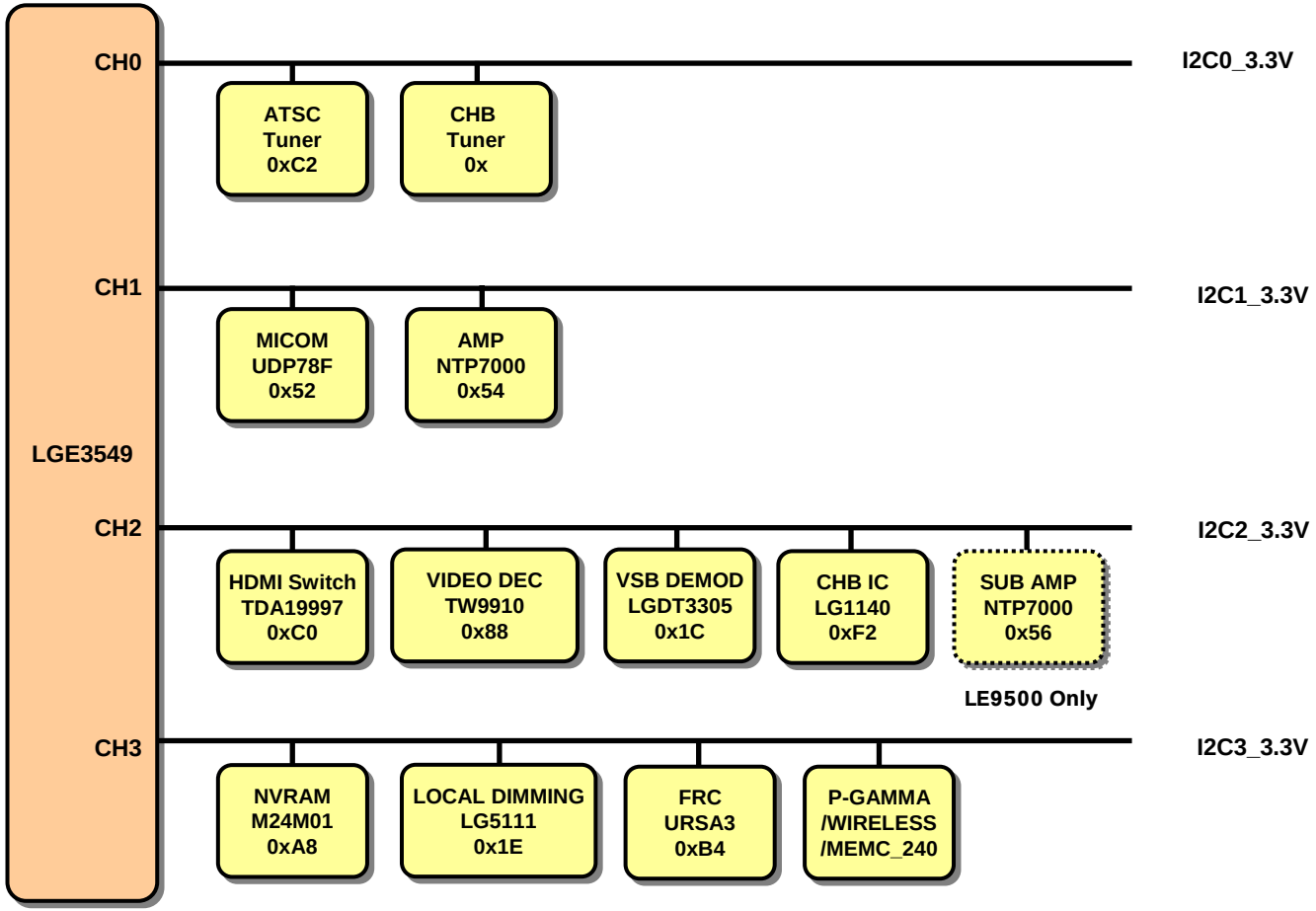
8. USB block



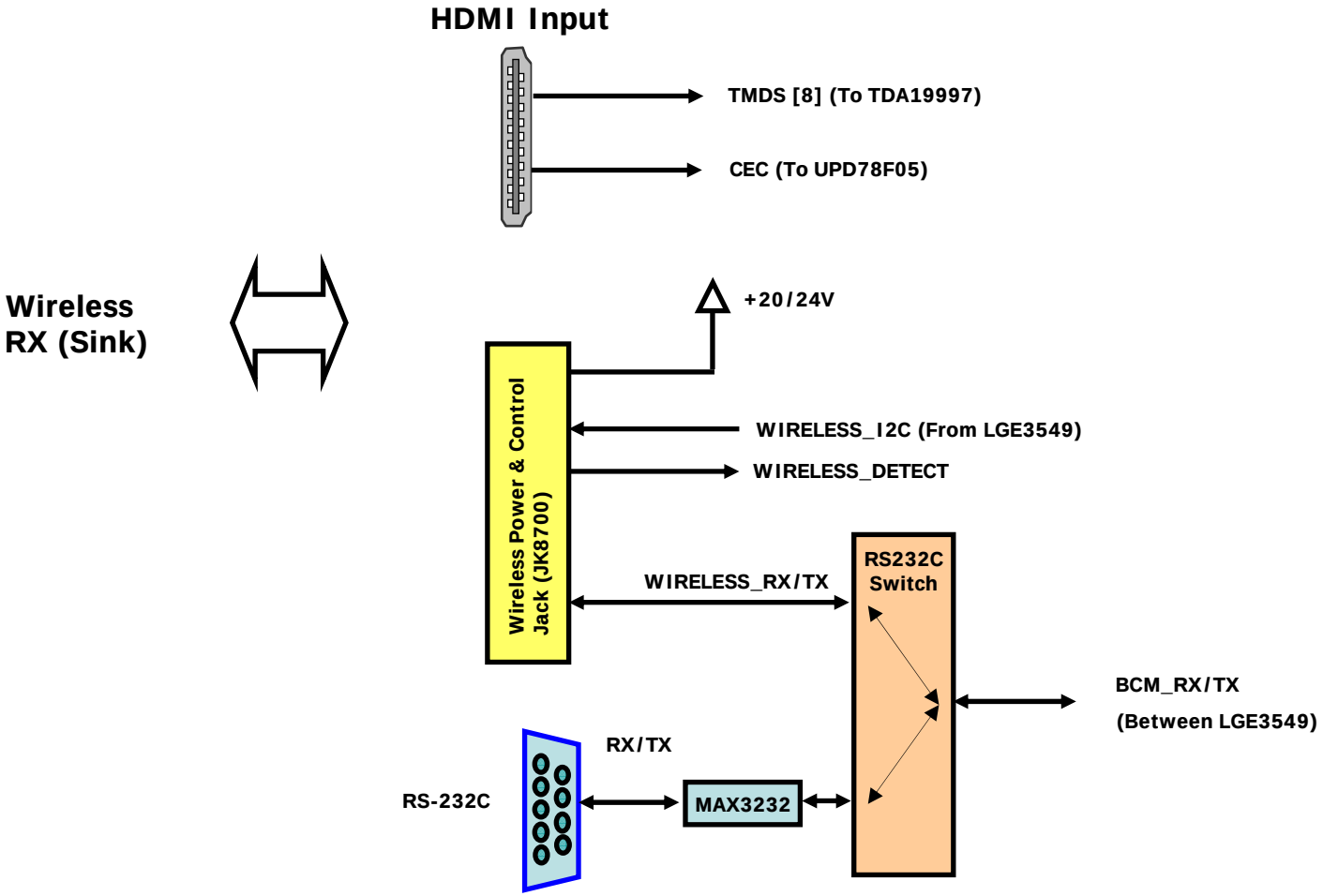
9. I²C Connections



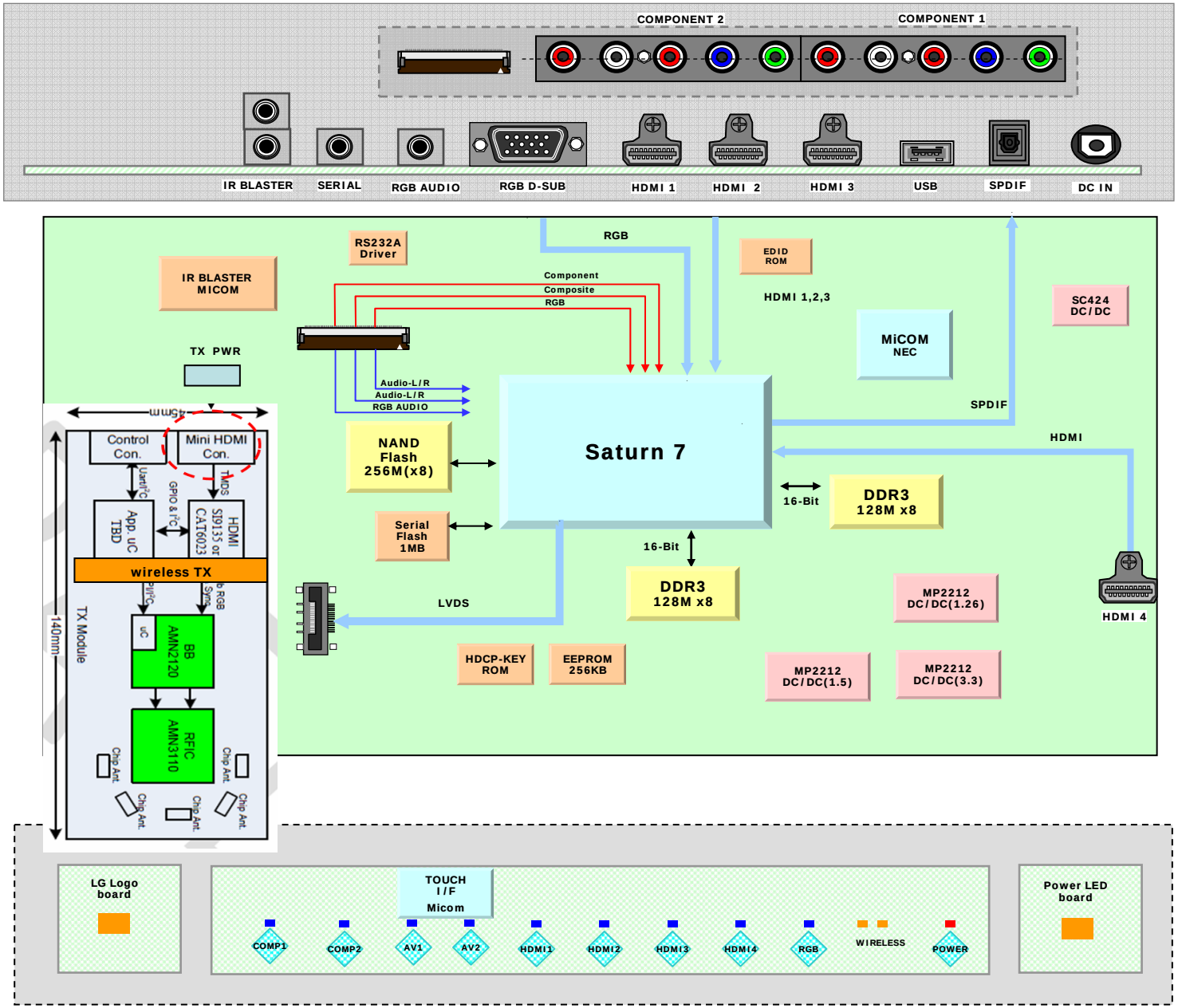
9. I²C Connections (with Channel browser)



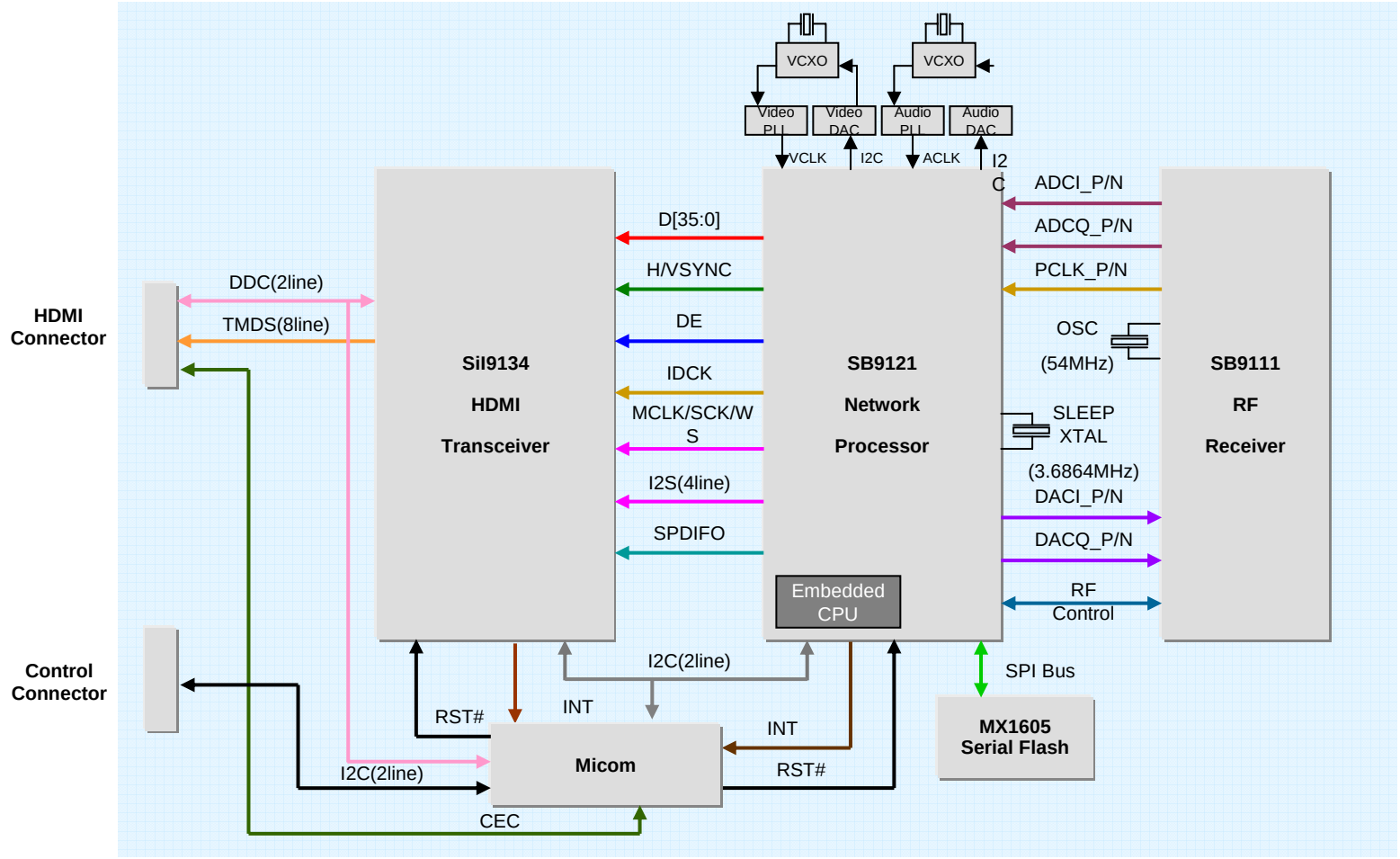
10. Wireless ready



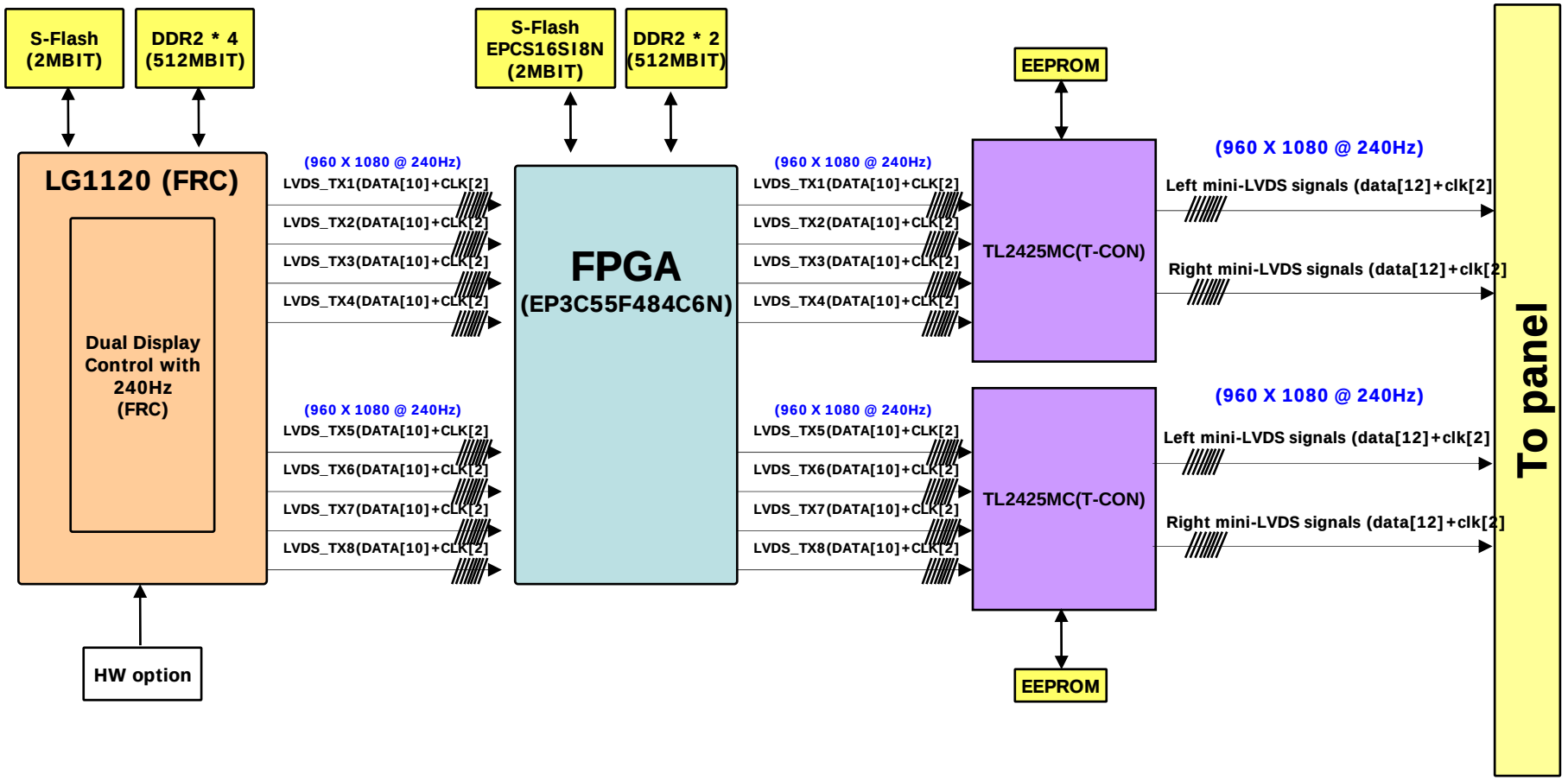
11. Wireless TX (Source) – AV BOX



12. Wireless RX (Sink)

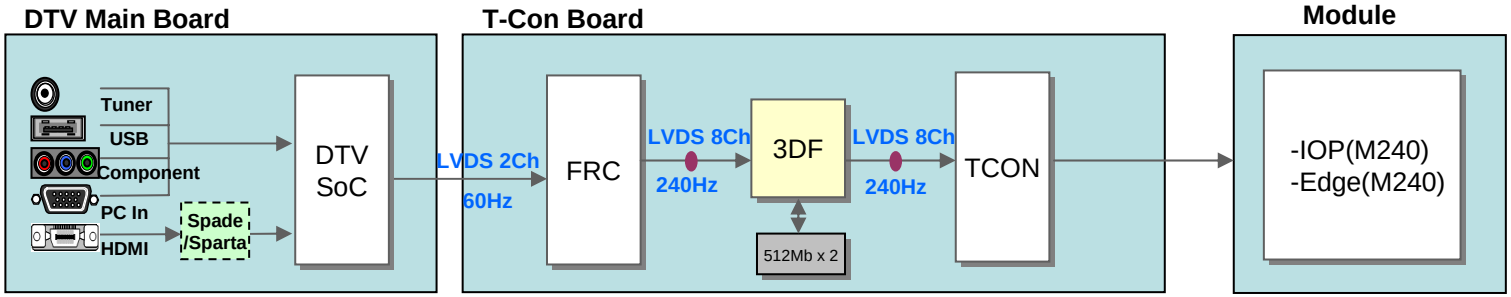


13. 3D Formatter B/D

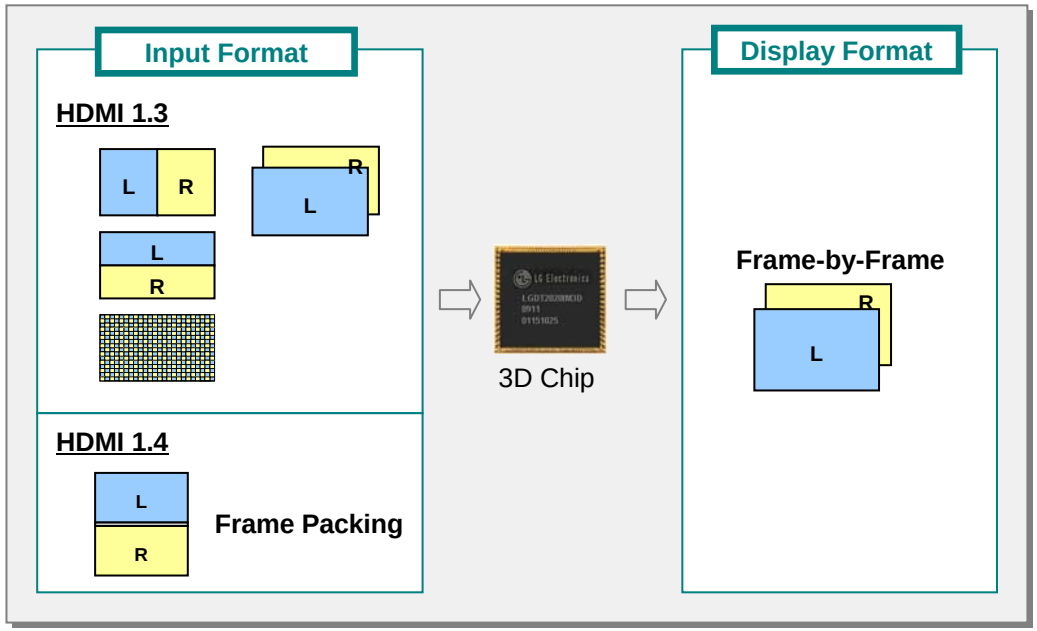


13-1. System Configuration : 3D LCD TV

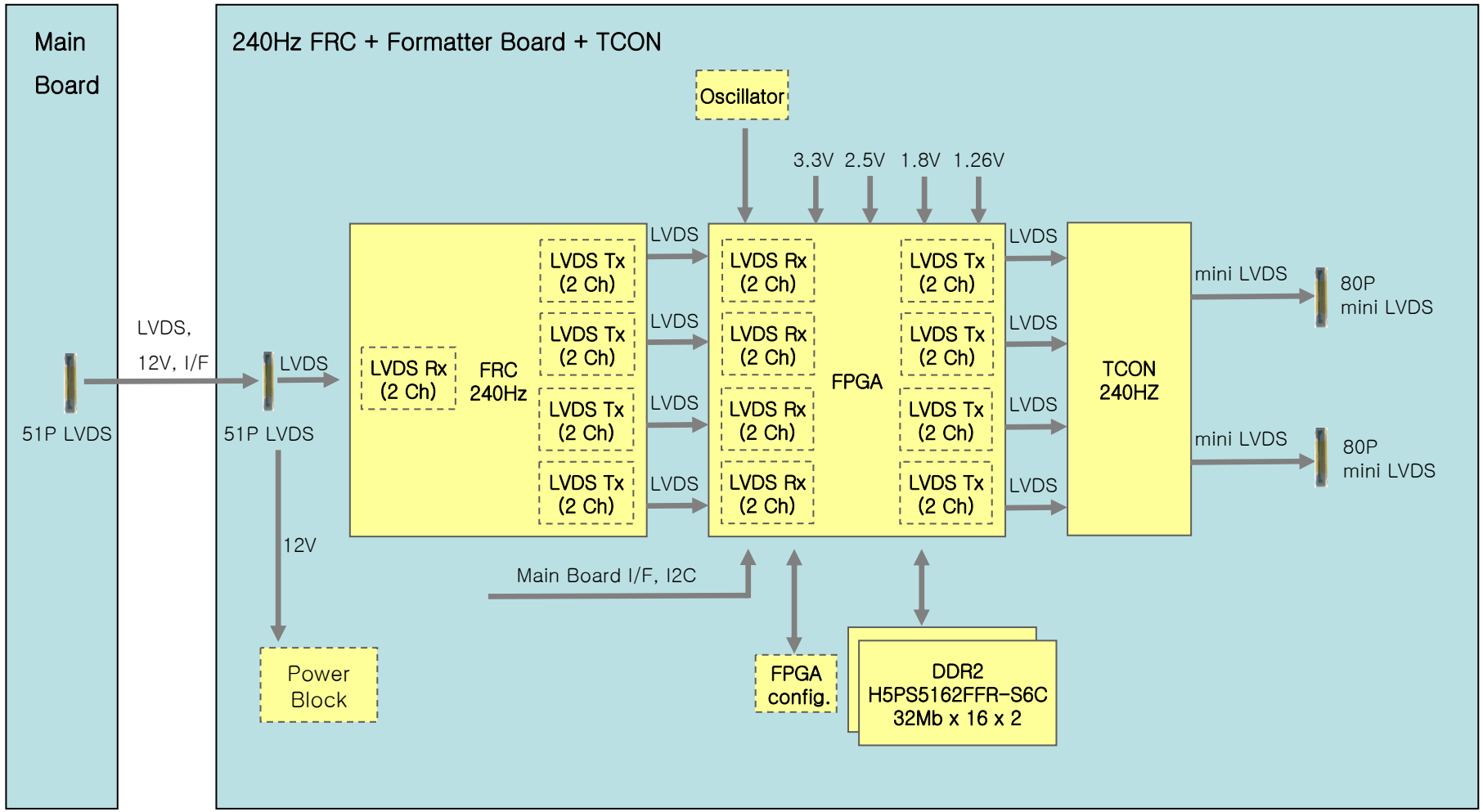
Active 240Hz LCD TV



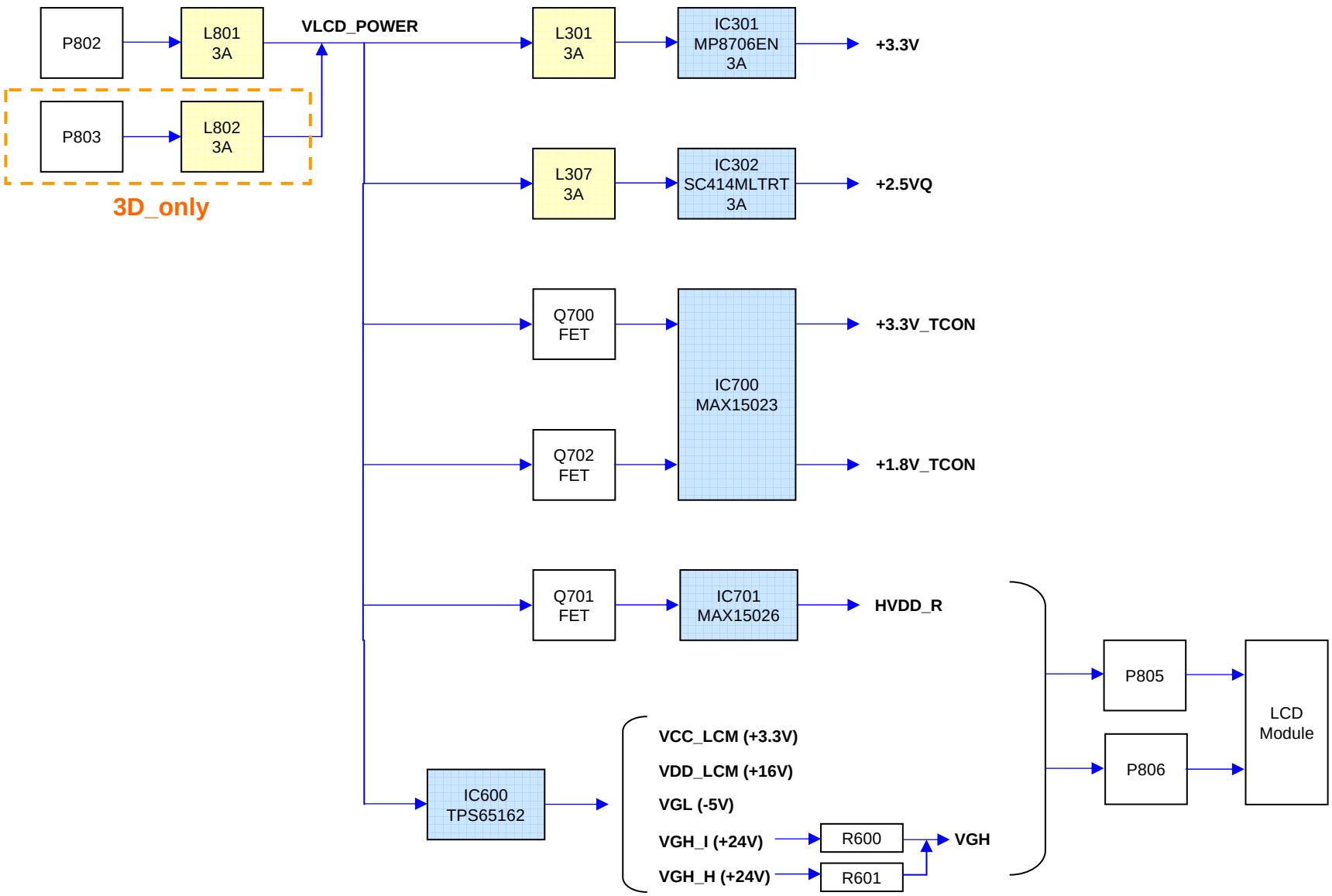
3D Formatter In/Out type



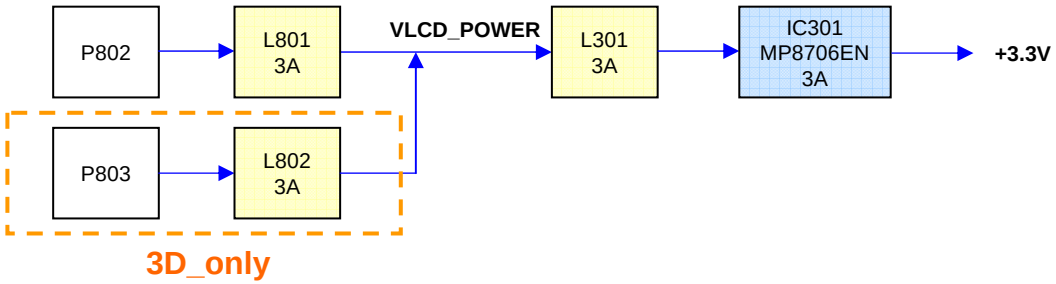
13-2. 240Hz + 3D Formatter + T-Con Block Diagram

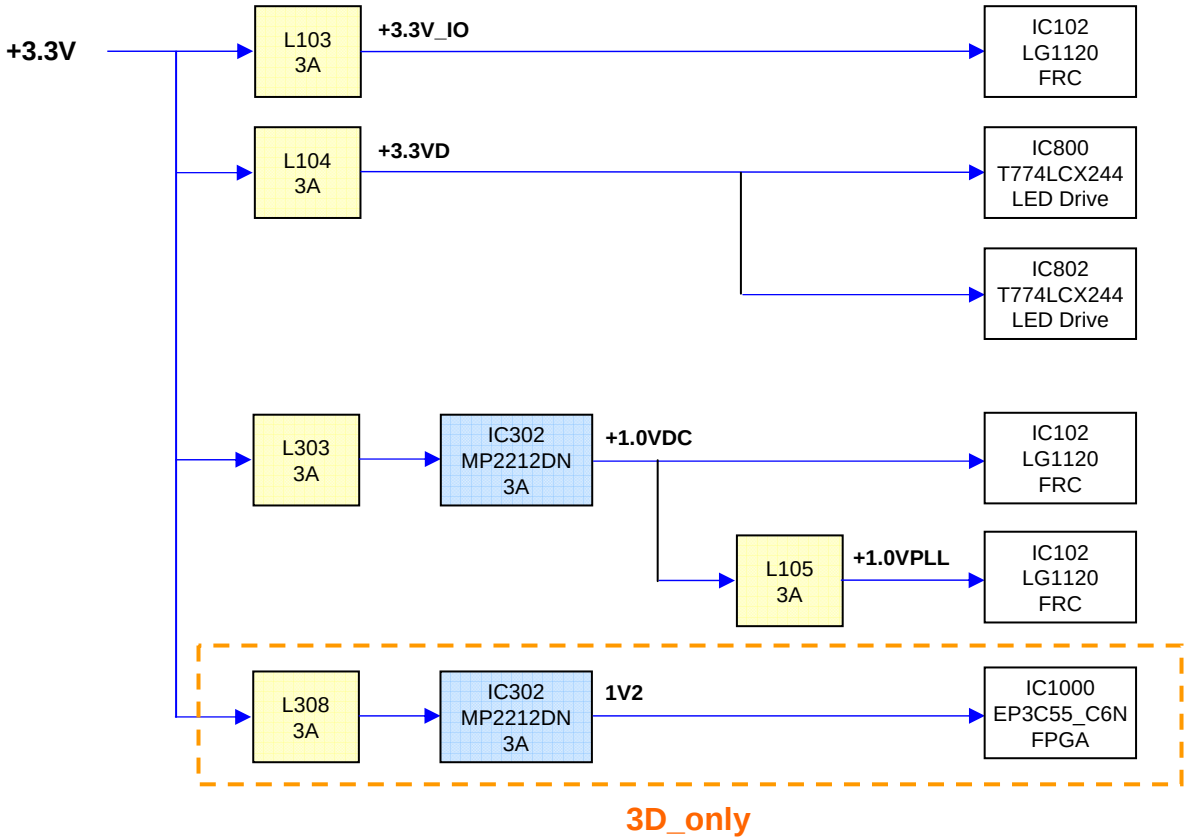


13-3. 전원 계통도:12V (VLCD_POWER)

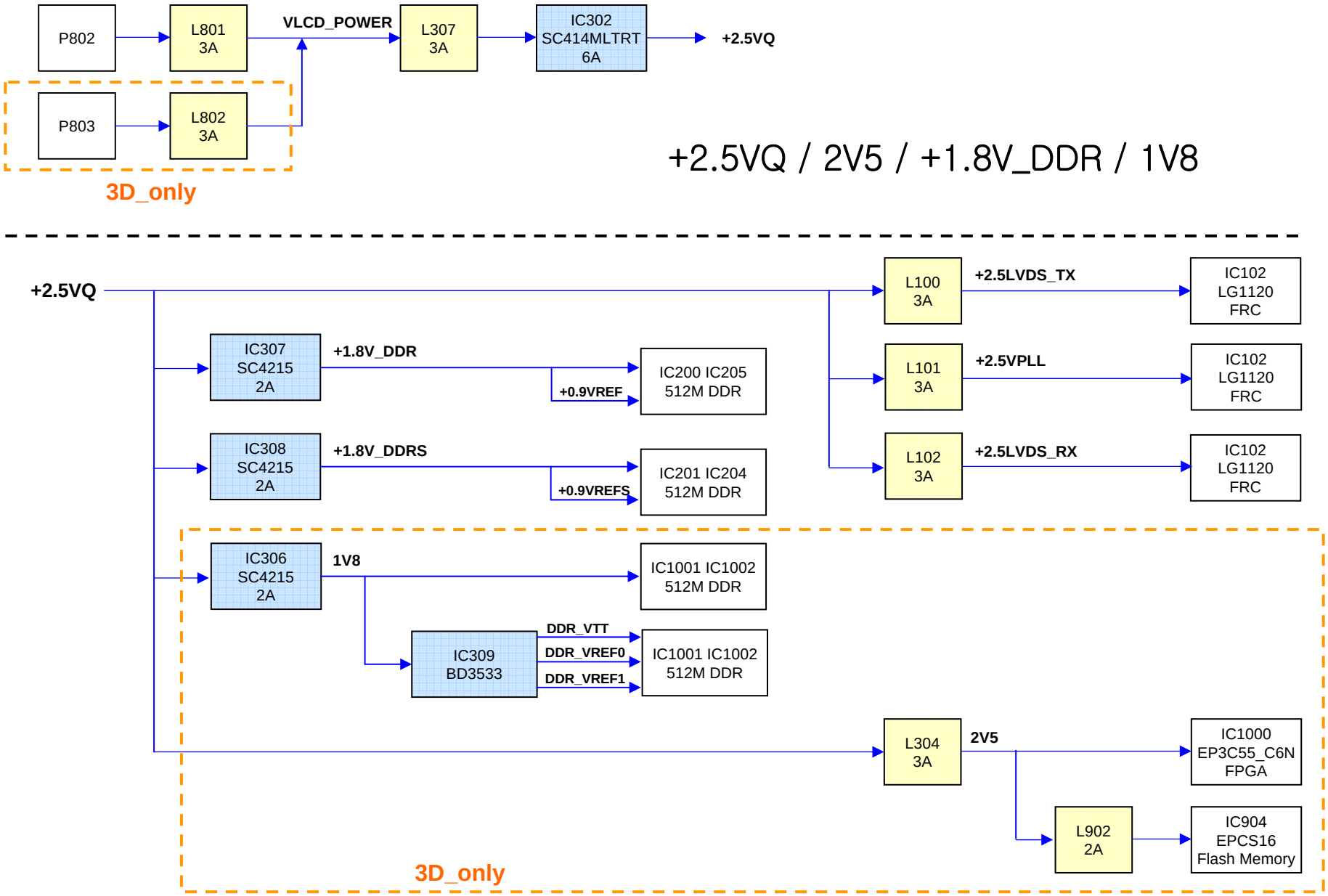


13-4. 전원 계통도: +3.3V / +1.0VDC / 1V2

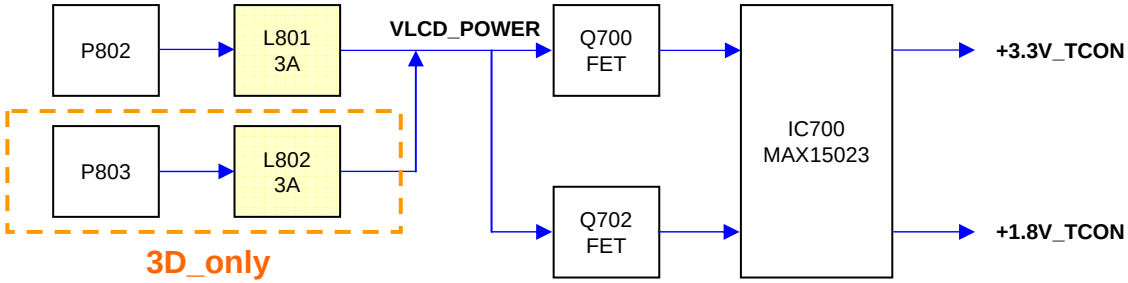


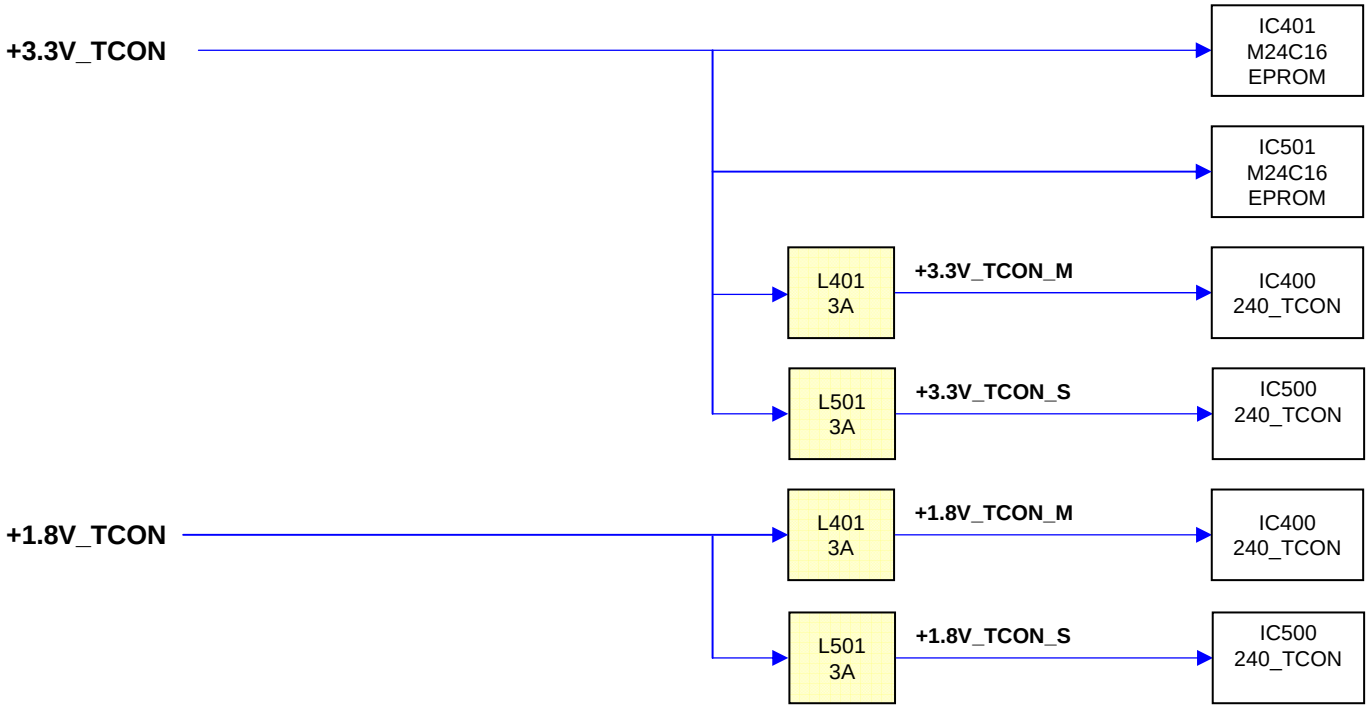


13-5. 전원 계통도: +2.5VQ / 2V5 / +1.8V_DDR / 1V8

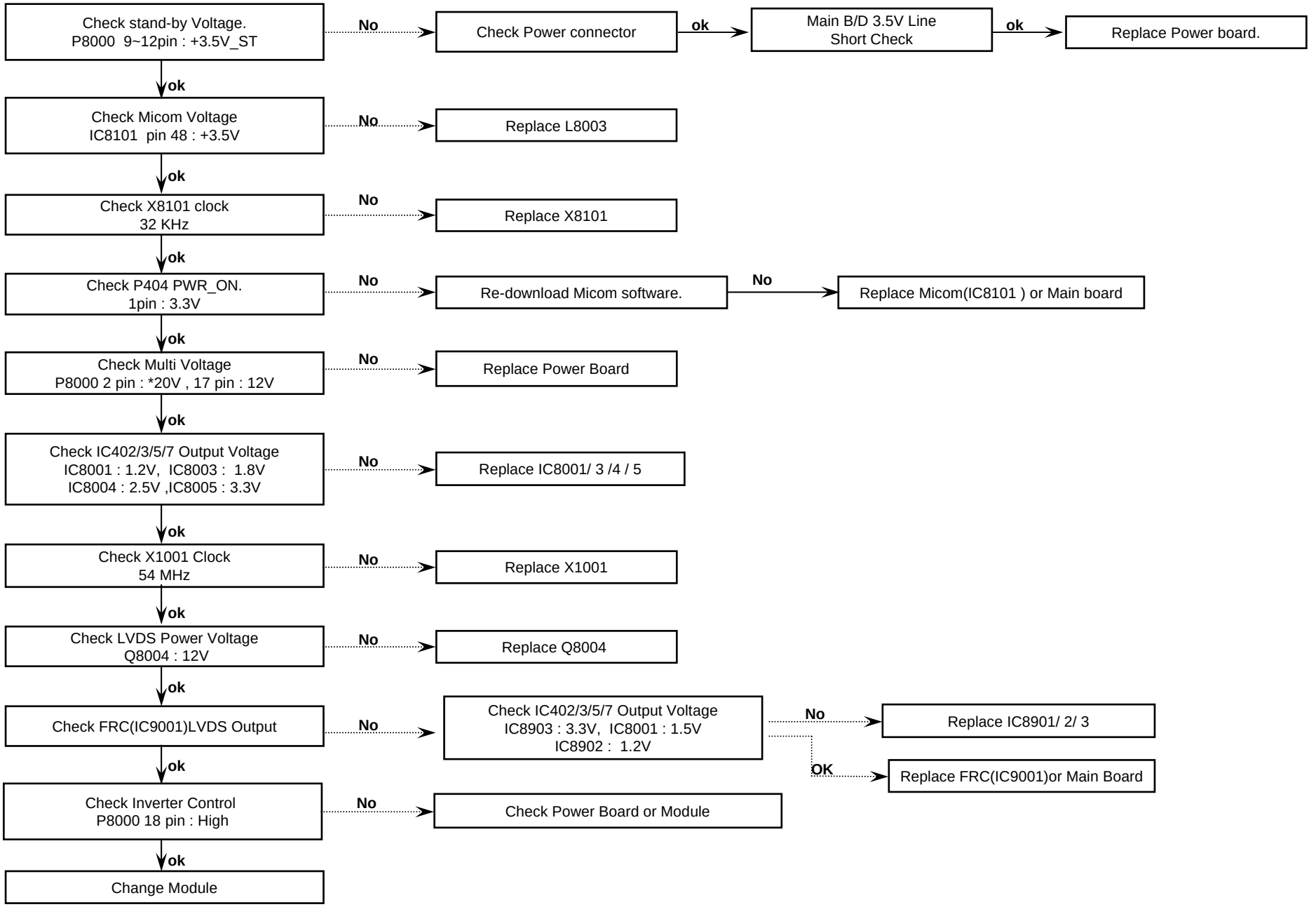


13-6. 전원 계통도: +3.3V_TCON / +1.8V_TCON

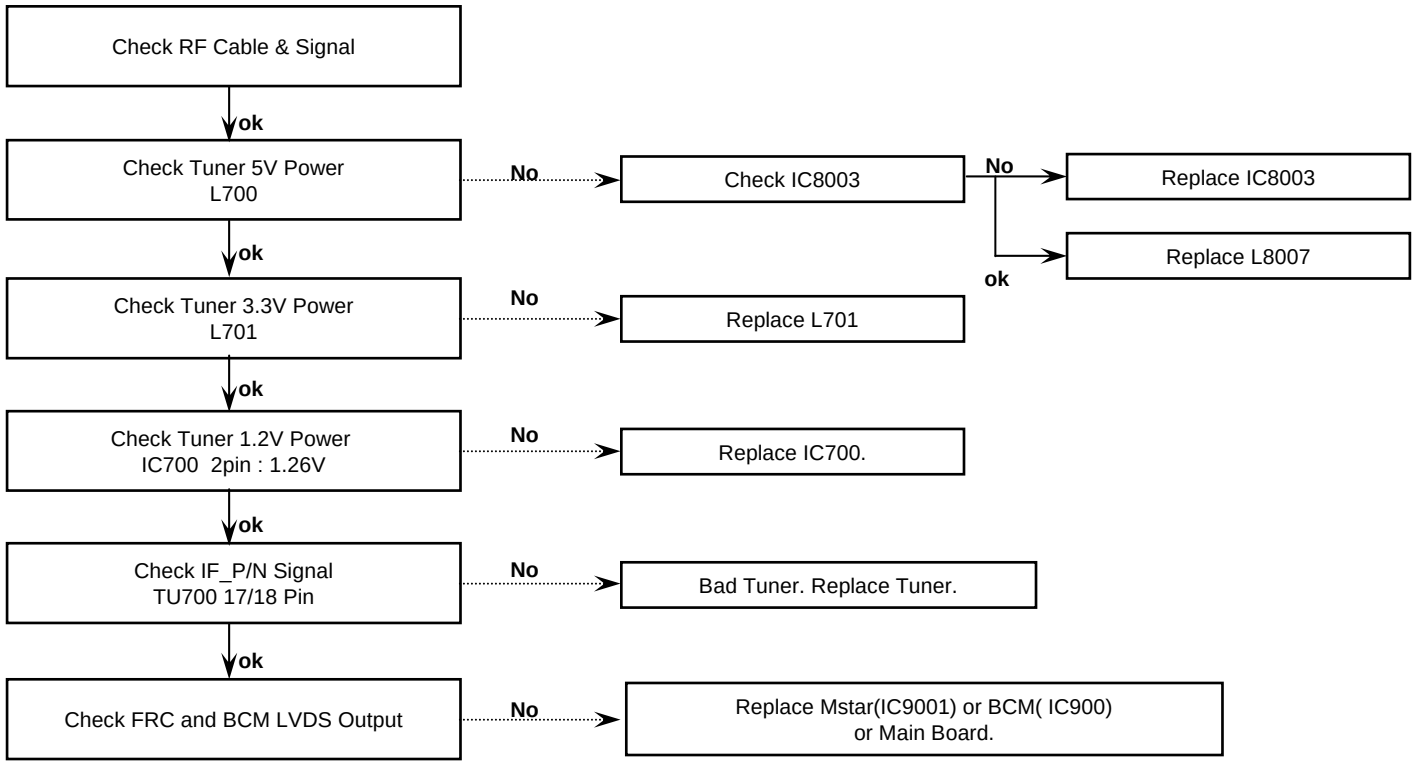




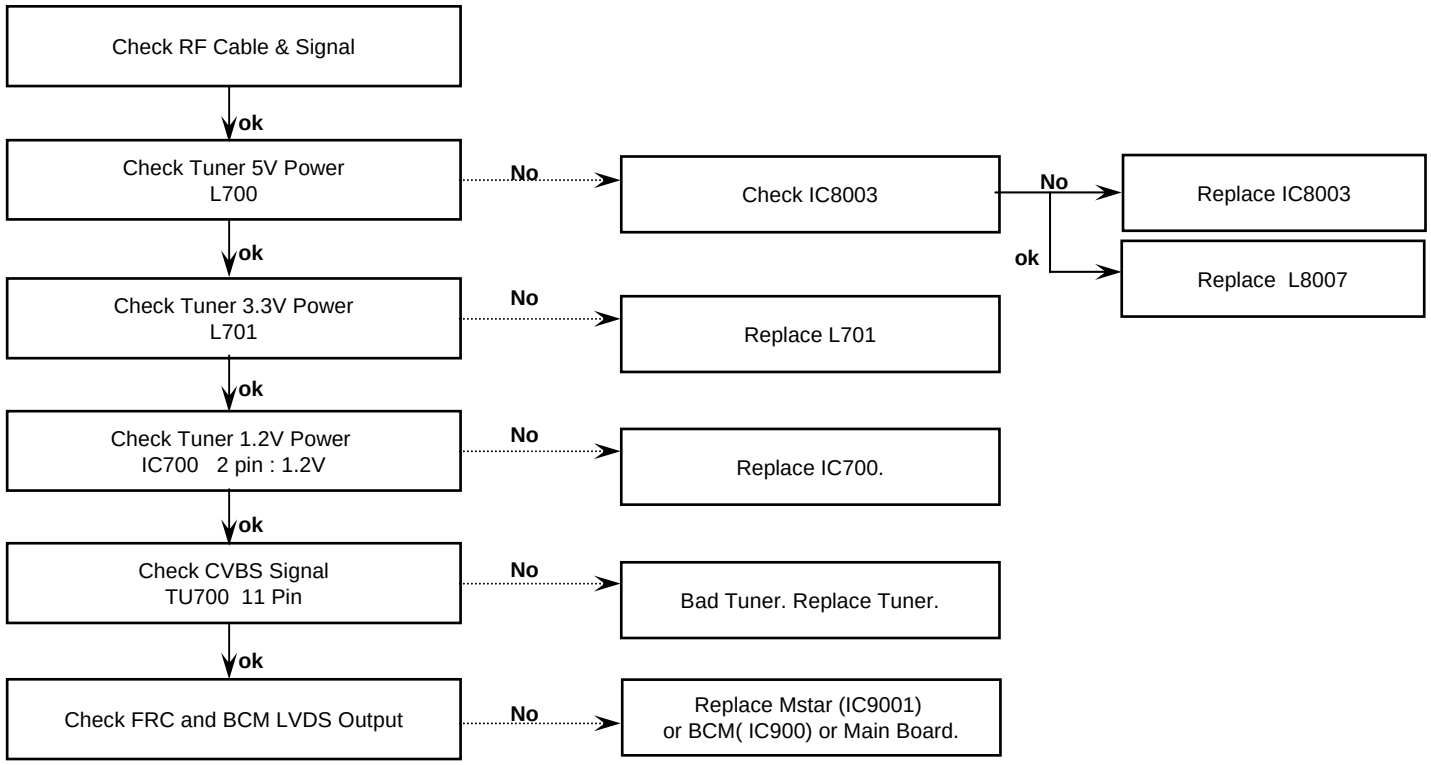
1. Trouble shooting - No power



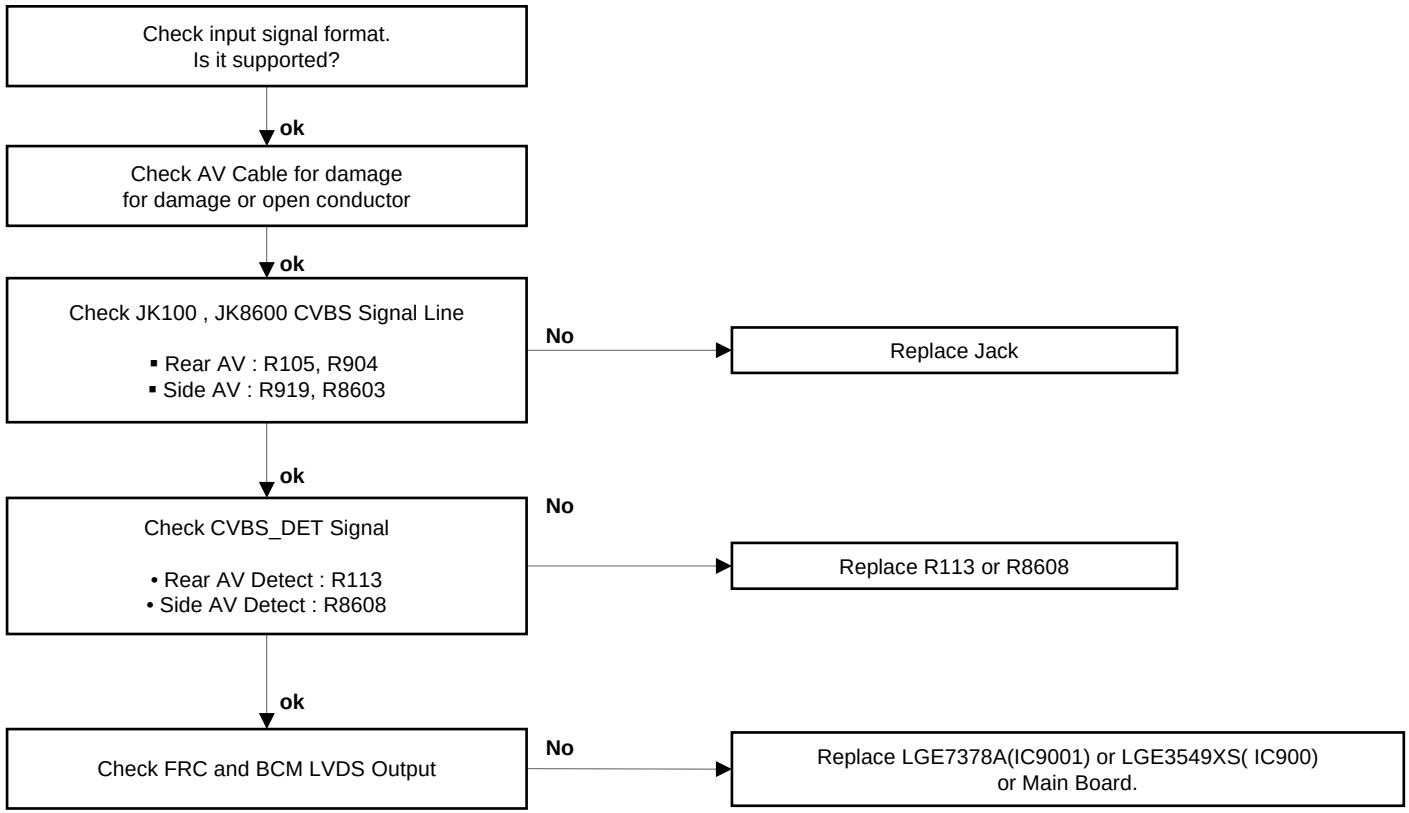
2. Trouble shooting - No video (Digital TV video)



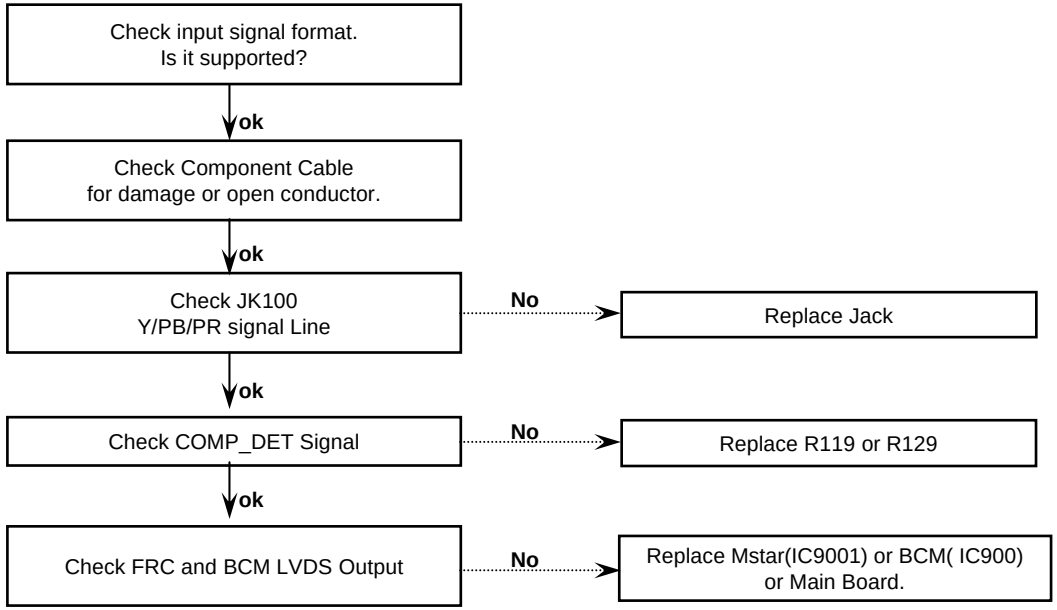
3. Trouble shooting - No video (Analog TV video)



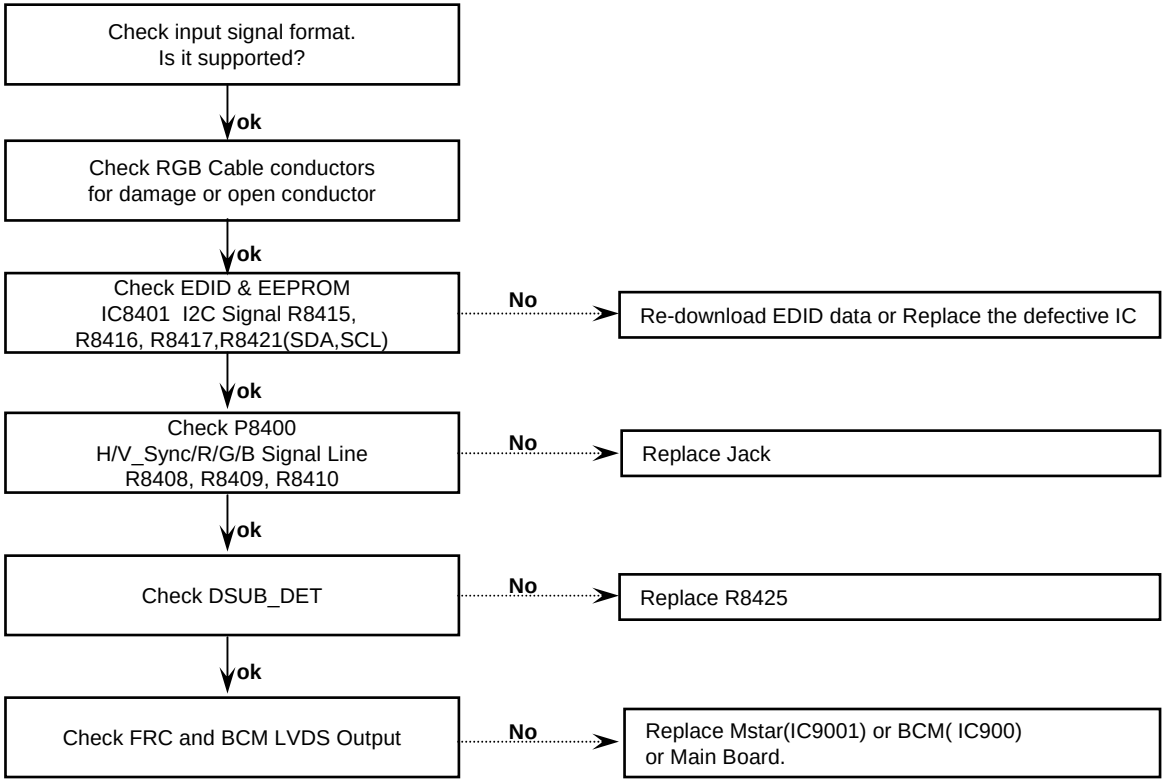
4. Trouble shooting - No video (AV)



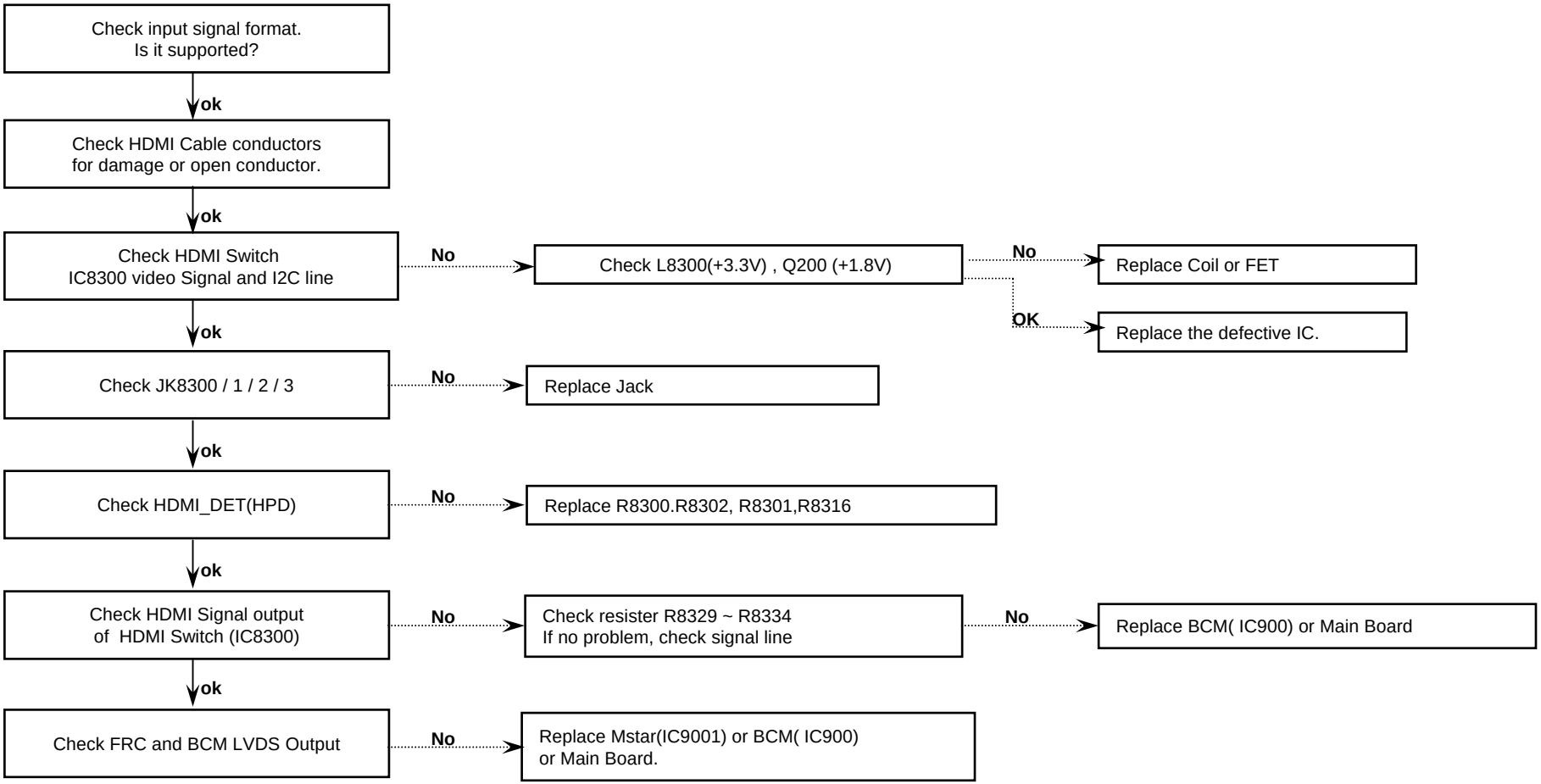
5. Trouble shooting - No video (Component)



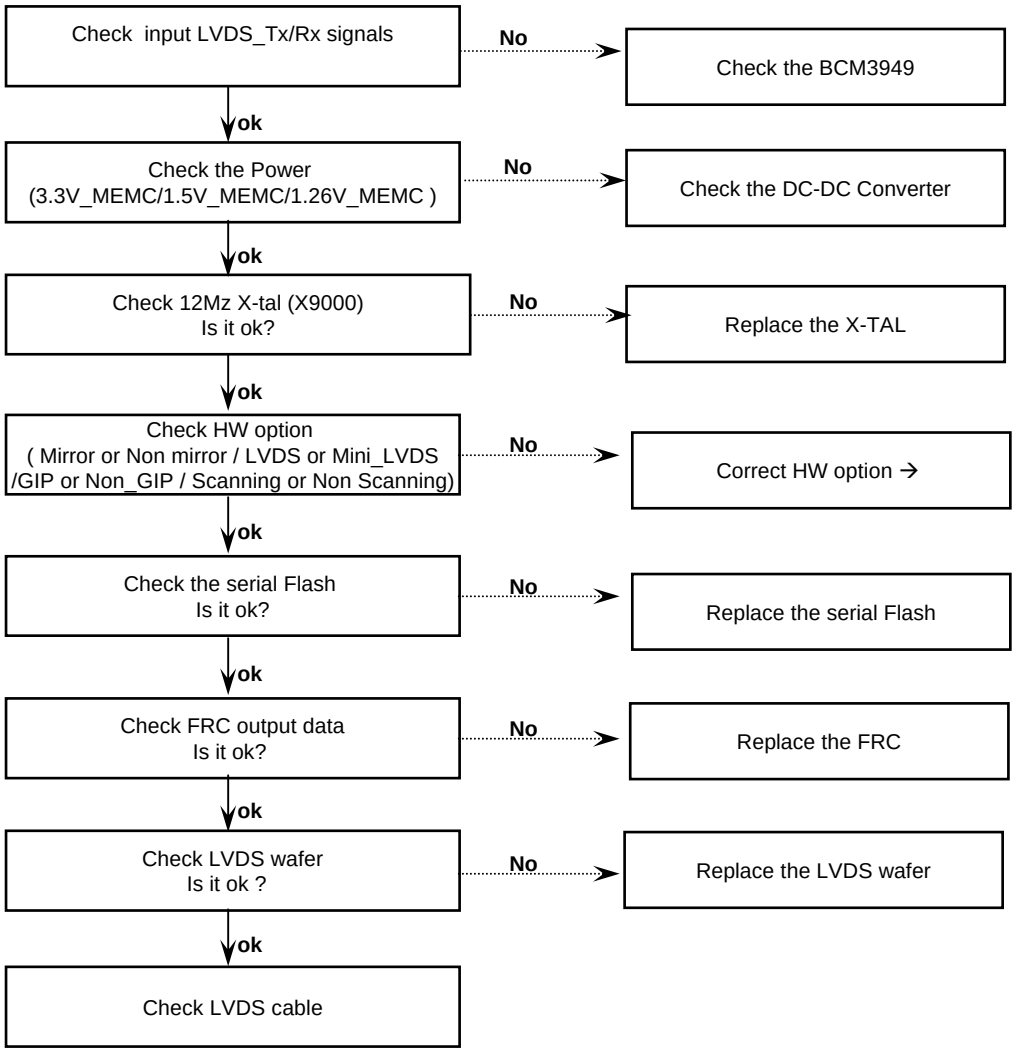
6. Trouble shooting - No video (RGB-PC)



7. Trouble shooting - No video (HDMI)

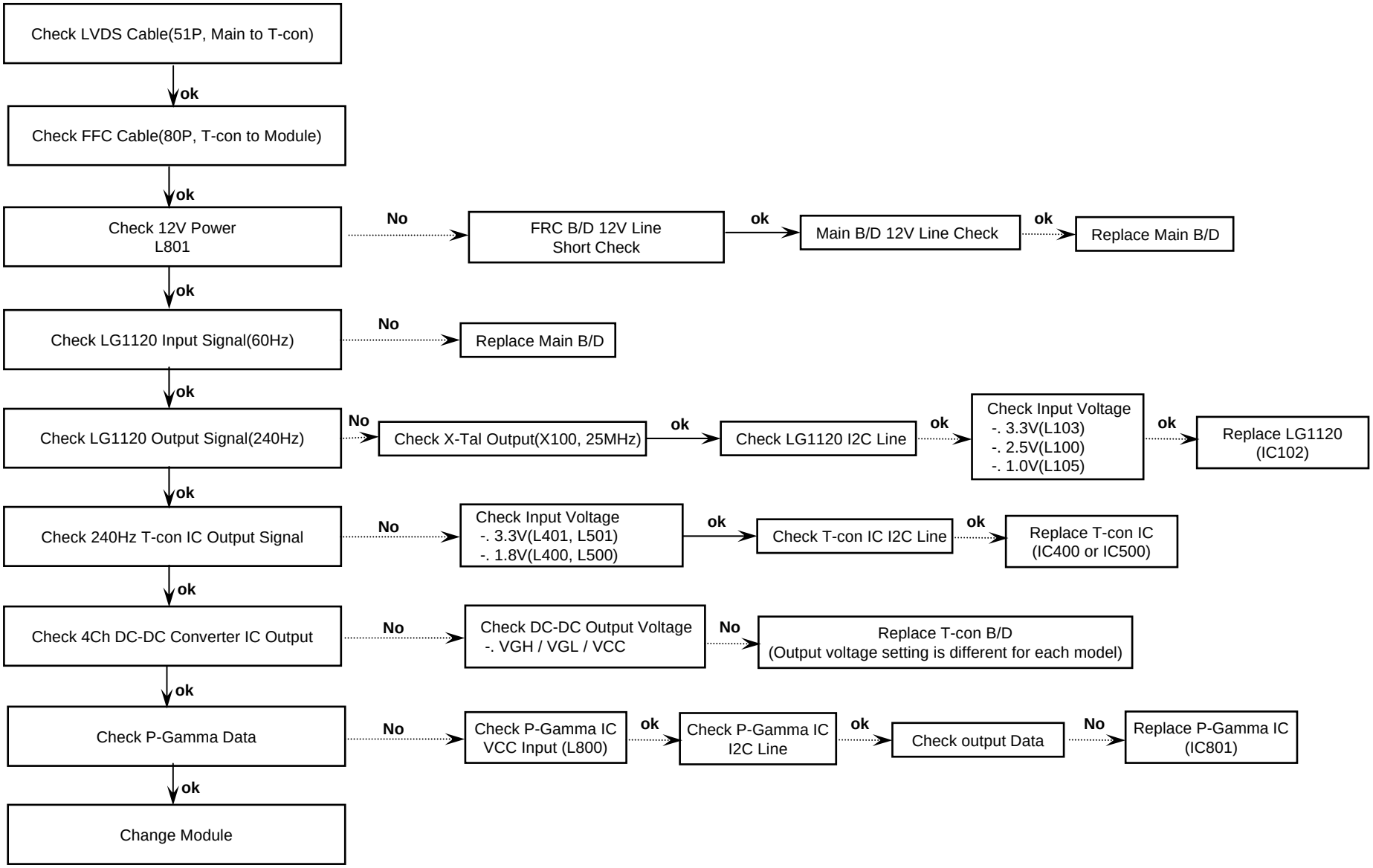


8. Trouble shooting - No video (FRC - M120Hz/TM240Hz)

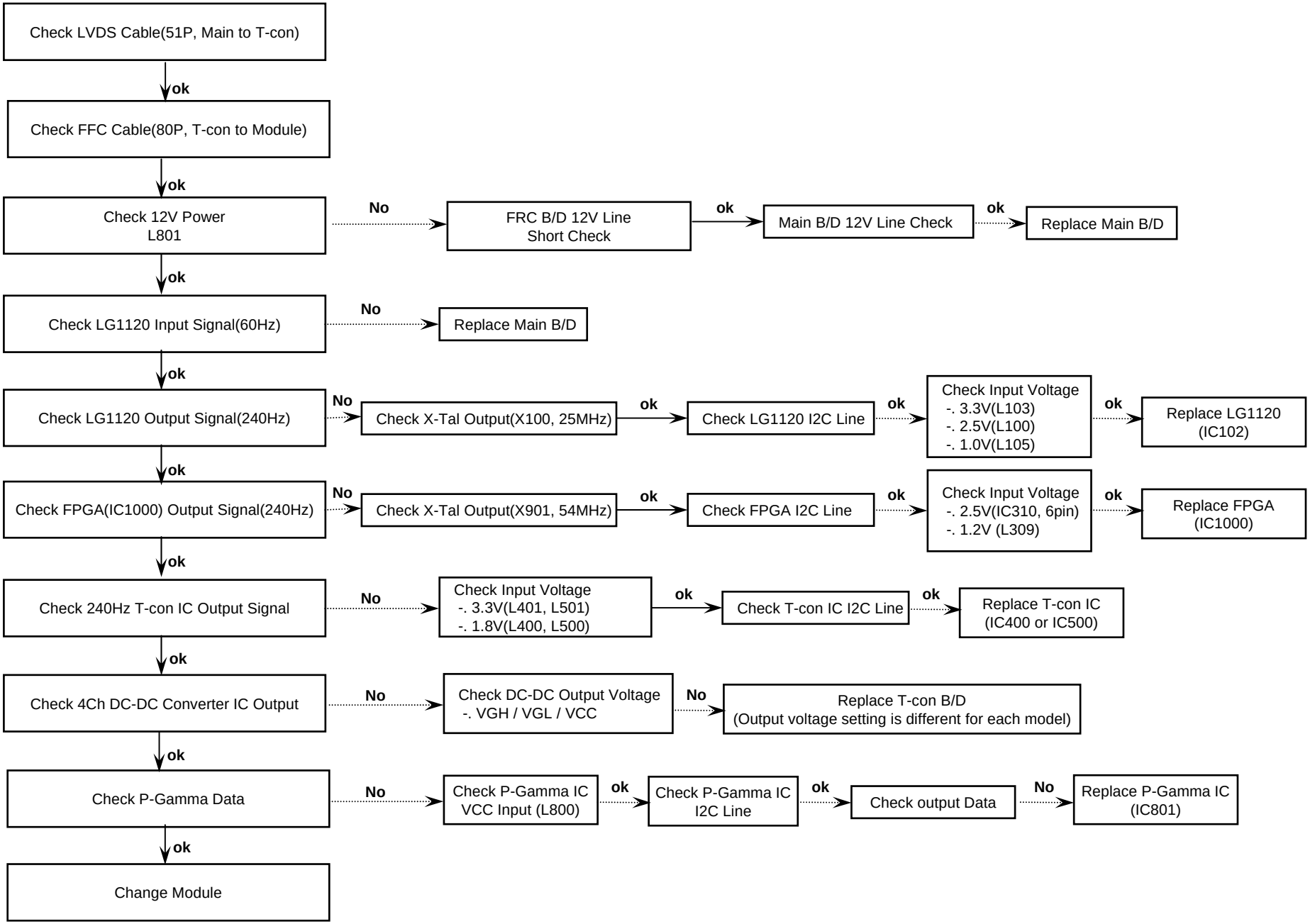


FRC OPTION	K14	T10	R10	R9	U10
HIGH	MIRROR	MINI_LVDS	NON_GIP	SCANNING	NON_L.D.
LOW	NON_MIRROR	LVDS	GIP	NON_SCANNING	L.D.

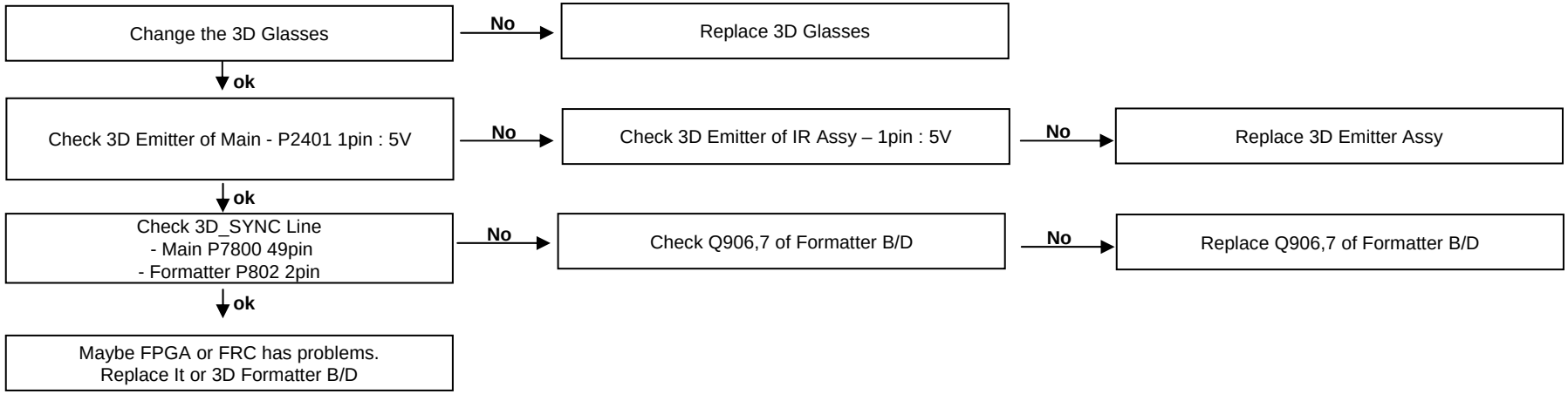
8. Trouble shooting - No video (FRC - TM480Hz)



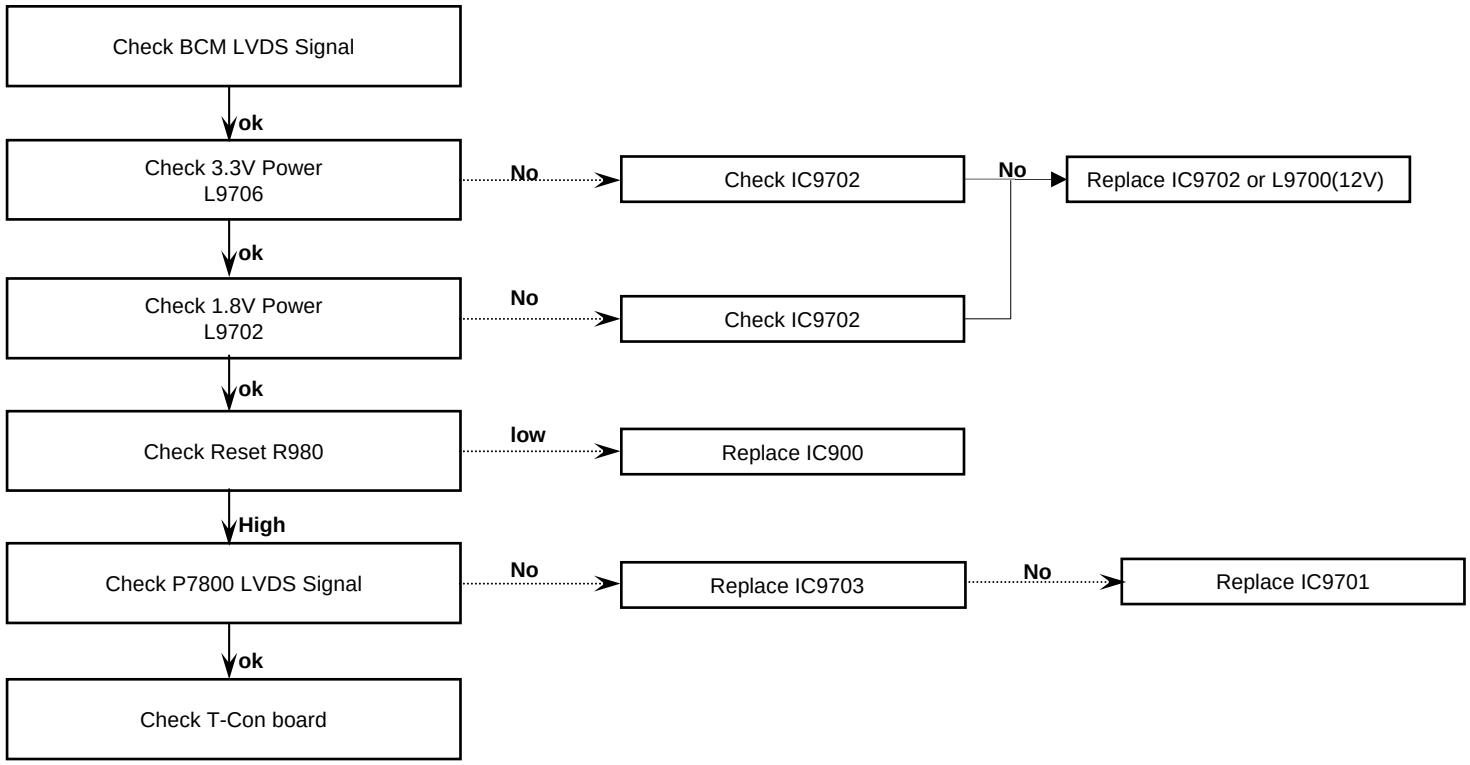
9. Trouble shooting - No video (FRC - TM480Hz with 3D FPGA)



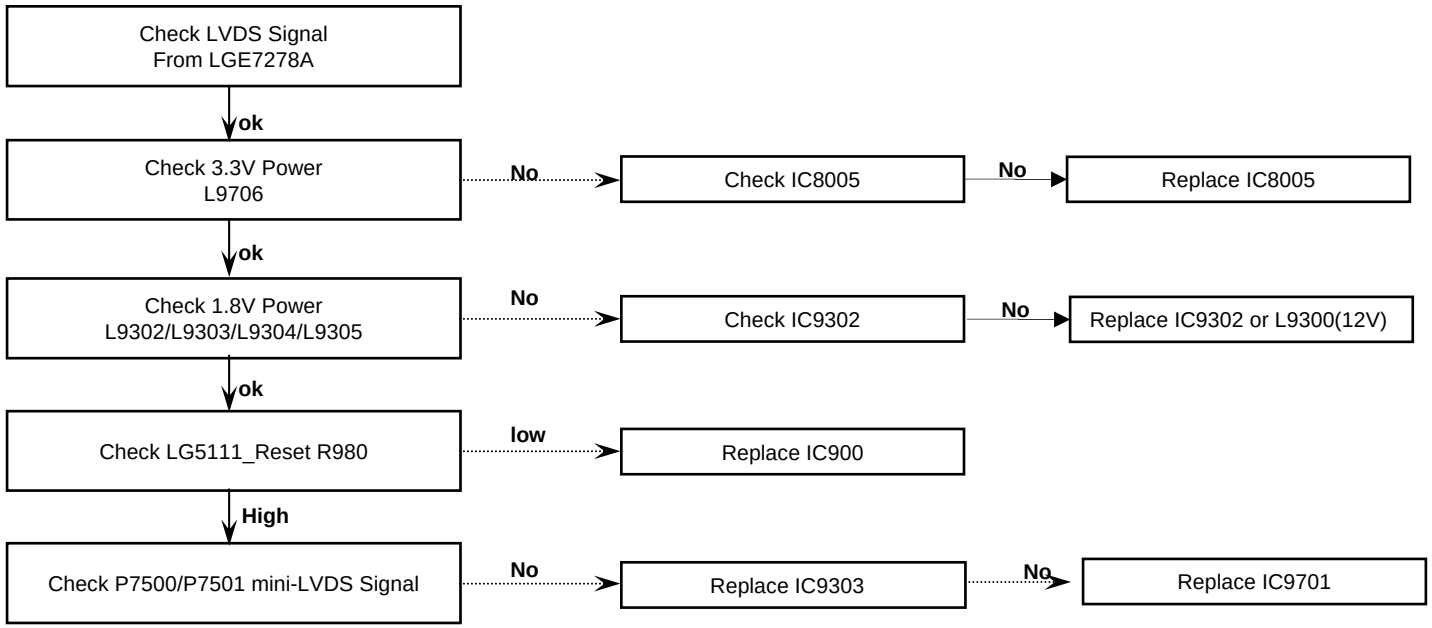
9.(2) Trouble shooting – 3D Mode view error (no Depth, like 2D mode)



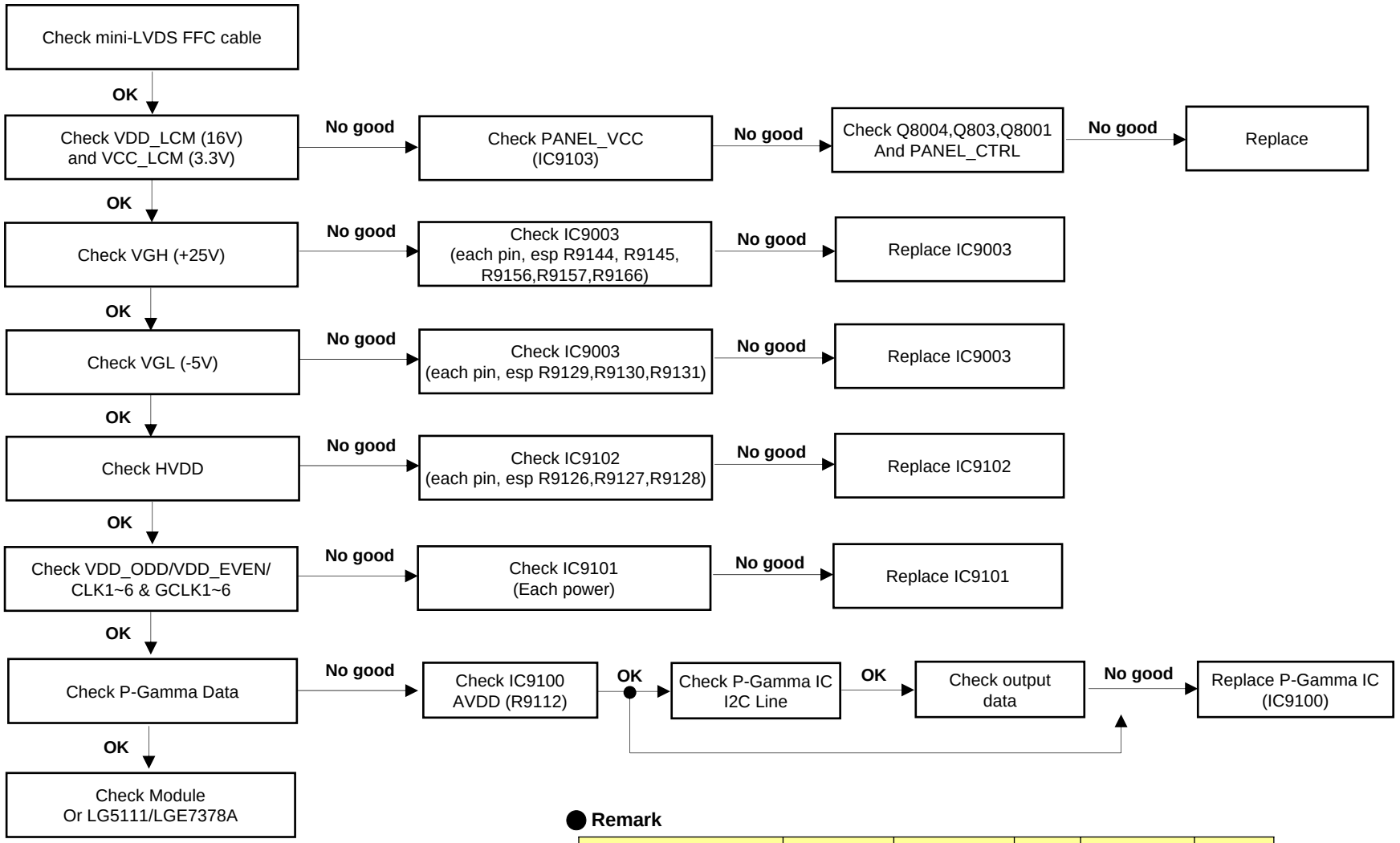
10. Trouble shooting - No video (LG5111 for TM480Hz)



11. Trouble shooting - No video (LG5111 for M120Hz/TM240Hz)



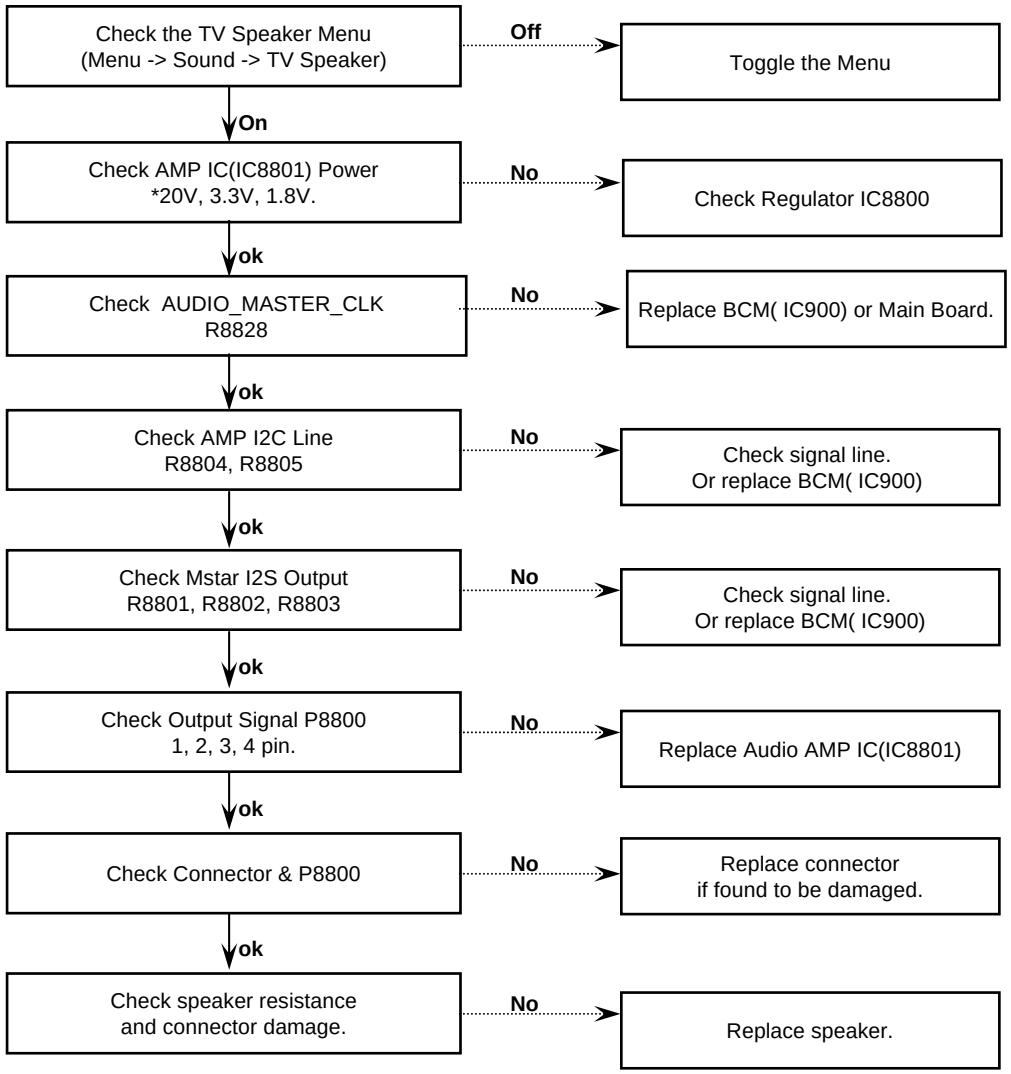
12. Trouble shooting - No video or Abnormal image (M+S block)



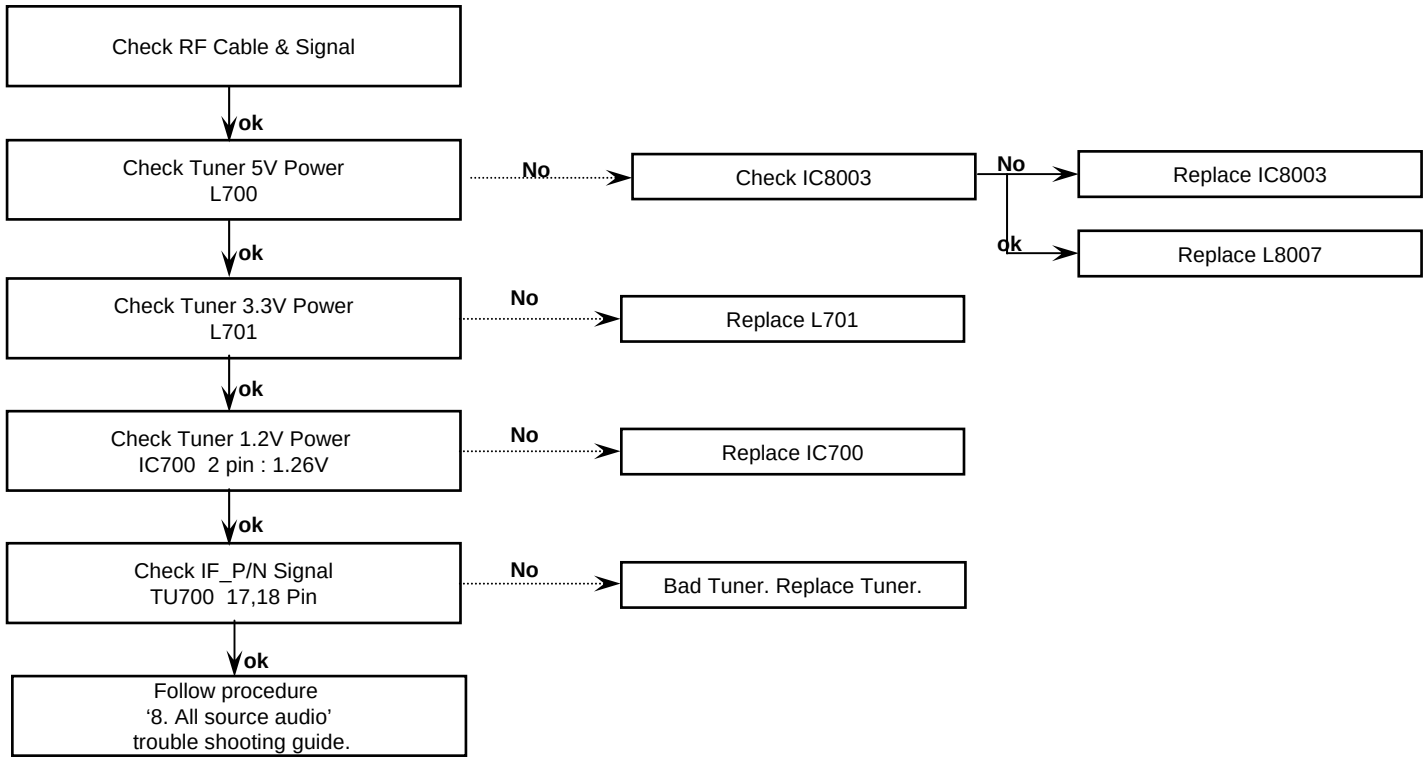
● **Remark**

Module			VGH (0℃)	VGH (25℃)	VGL	VDD_LCM	HVDD
42	Edge	120Hz	29.15	27.69	-5	16.25	8
47	Edge	120Hz	29	28	-5	15.5	7.7
55	Edge	120Hz	N/A	28	-5.3	16.2	7.9

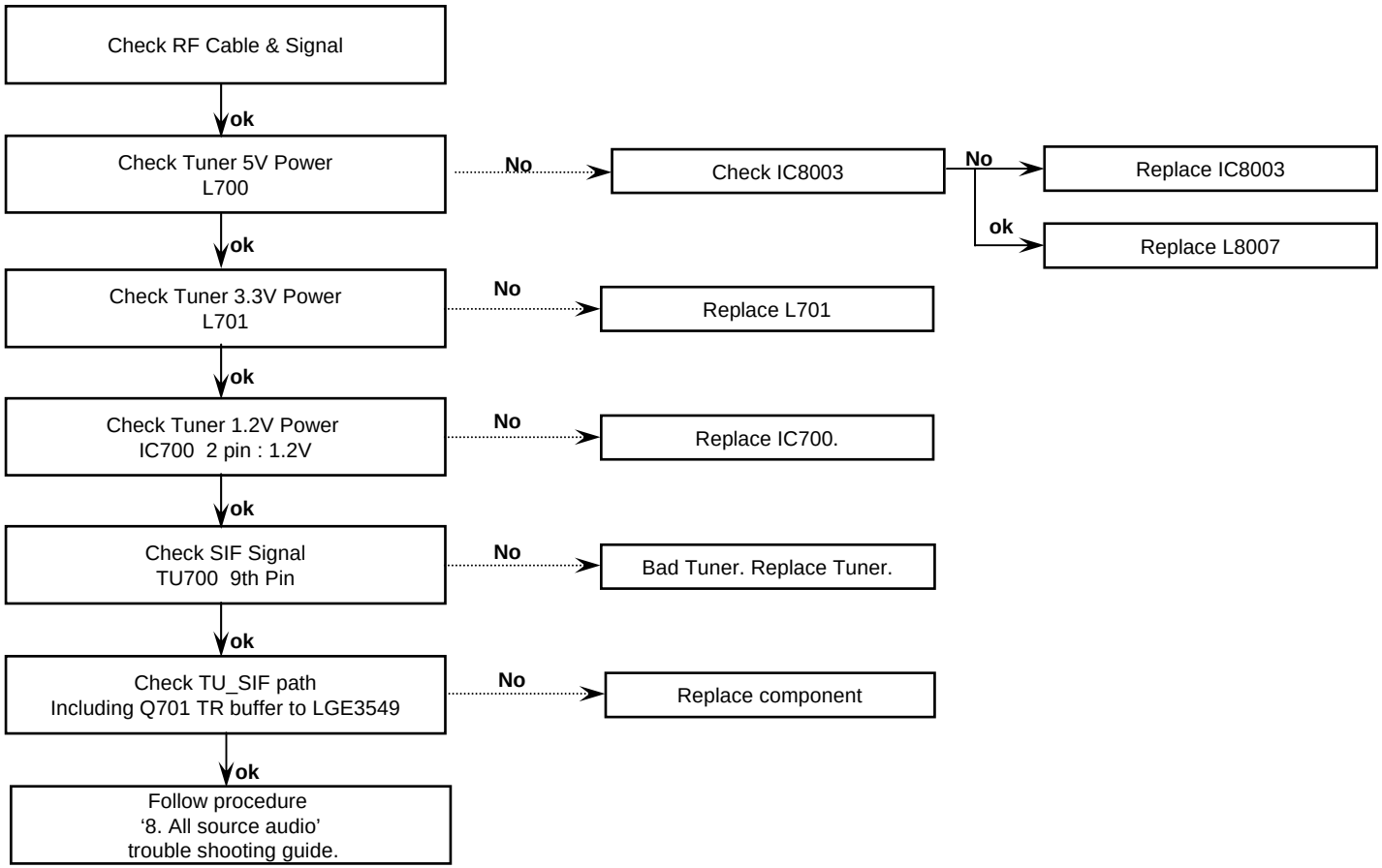
13. Trouble shooting - No Audio (all audio source)



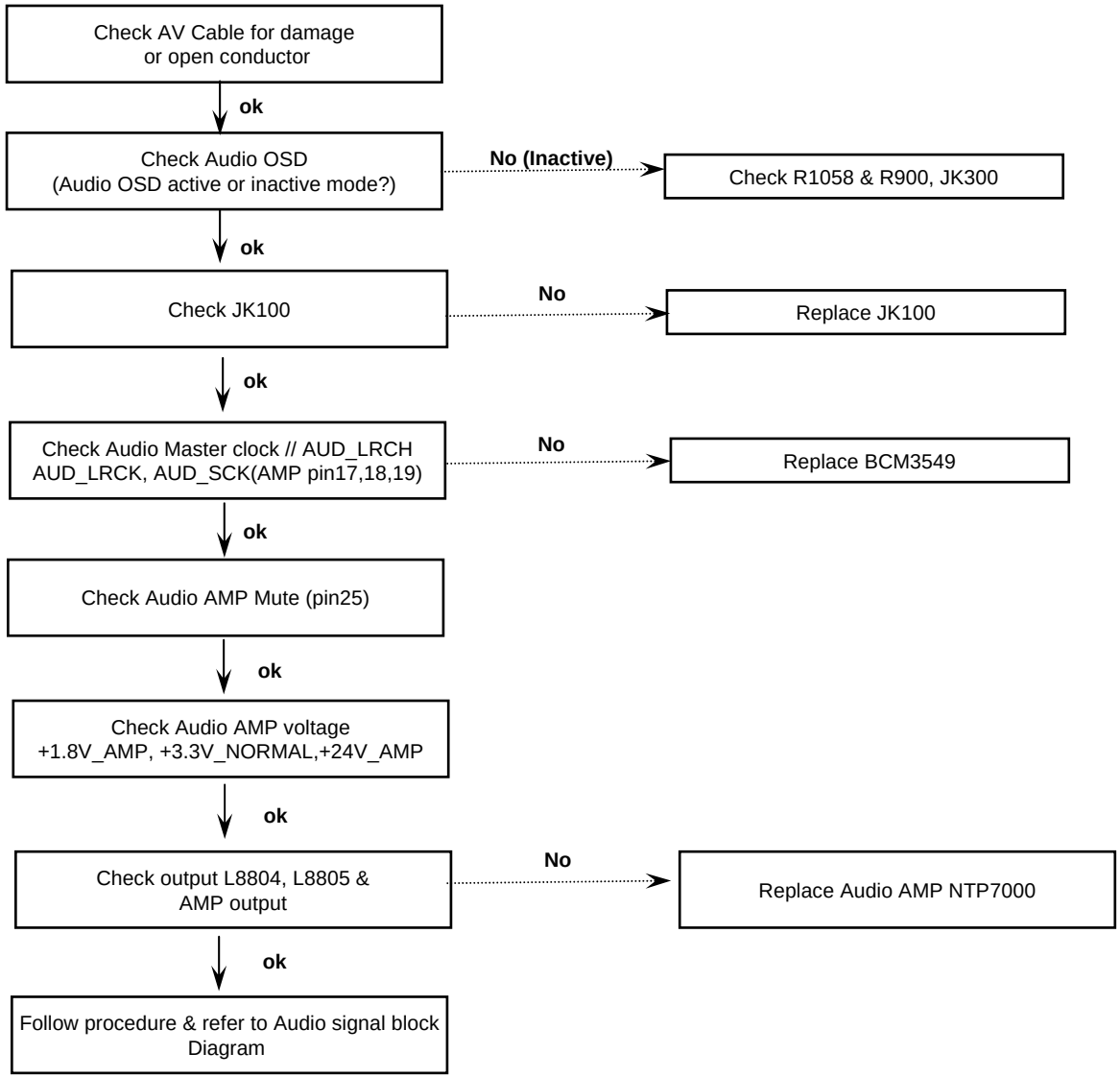
14. Trouble shooting - No audio (Digital TV audio)



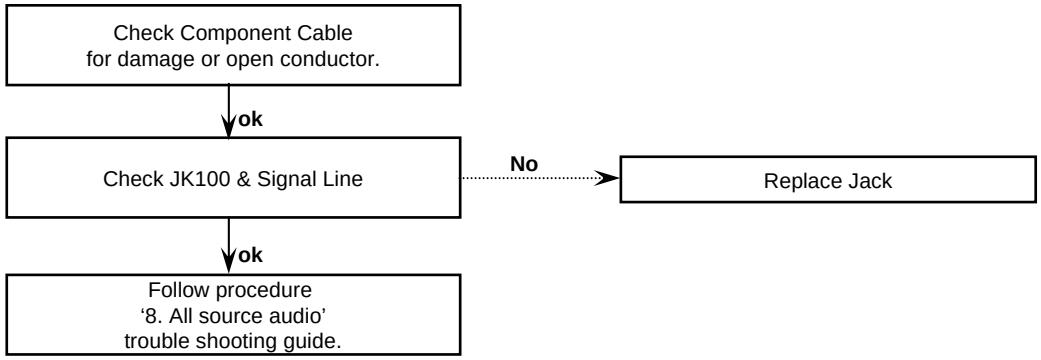
15. Trouble shooting - No audio (Analog TV audio)



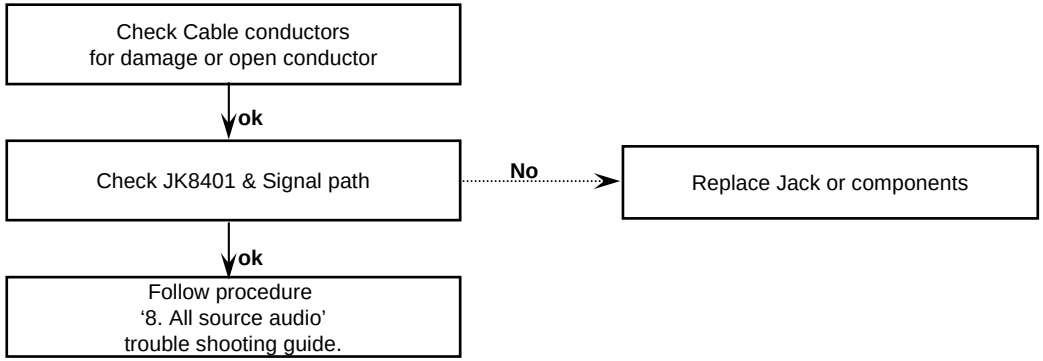
16. Trouble shooting - No audio (AV)



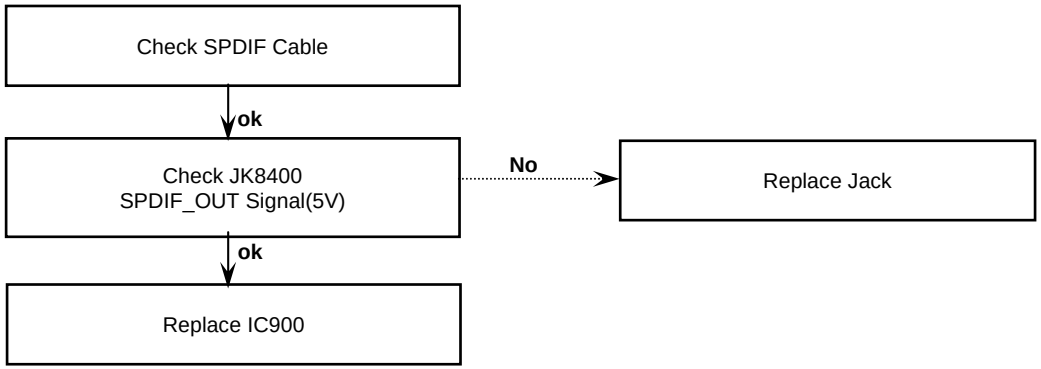
17. Trouble shooting - No audio (Component)



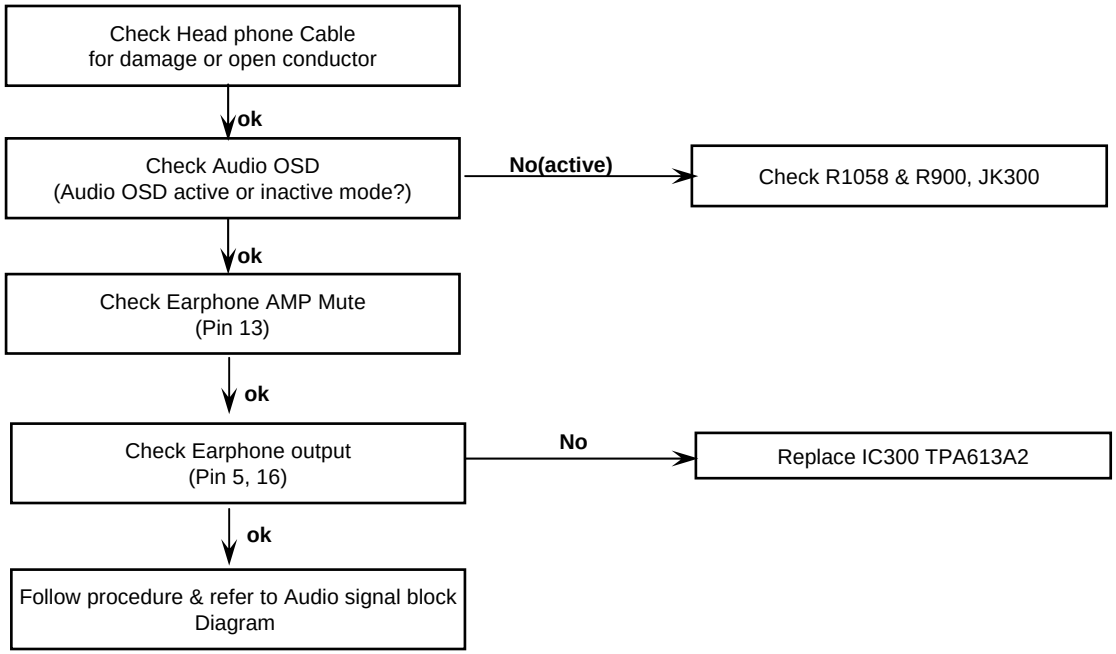
18. Trouble shooting - No audio (RGB-PC)



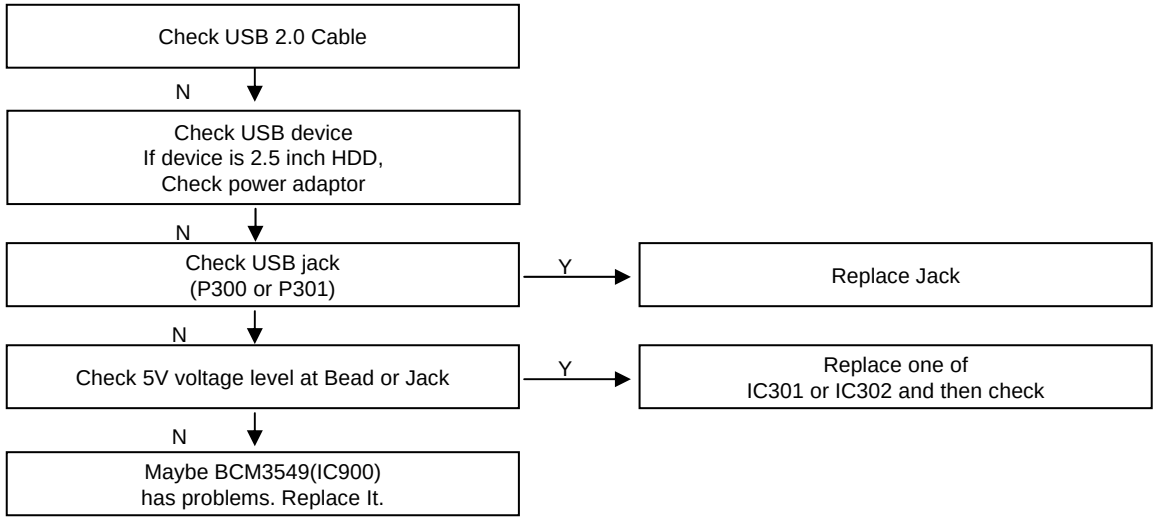
19. Trouble shooting - No audio (SPDIF)



20. Trouble shooting - No audio (Head phone audio out)



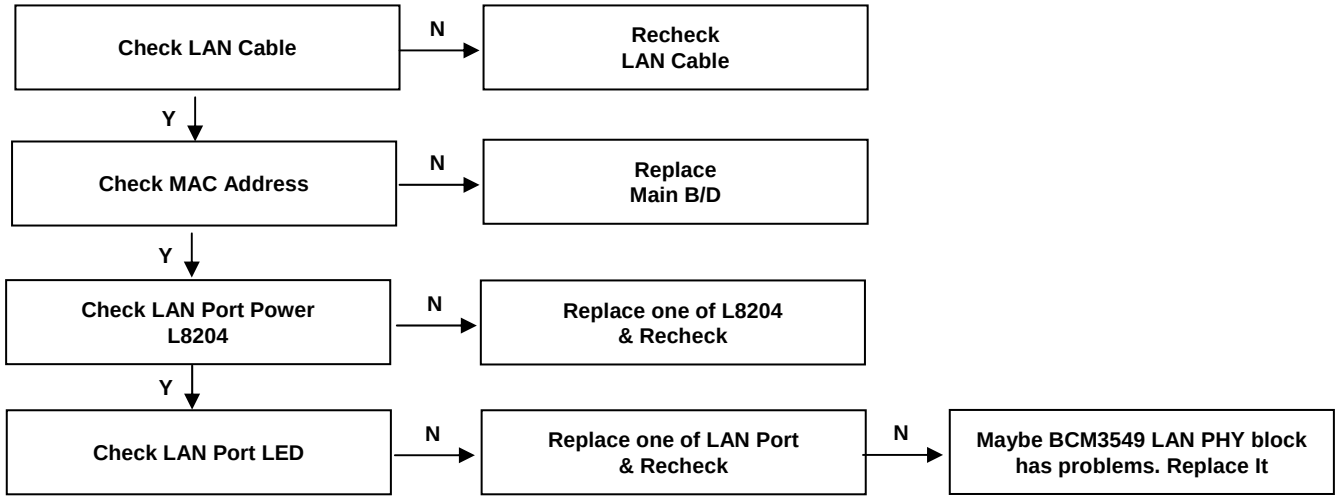
21. Trouble shooting - USB connection error



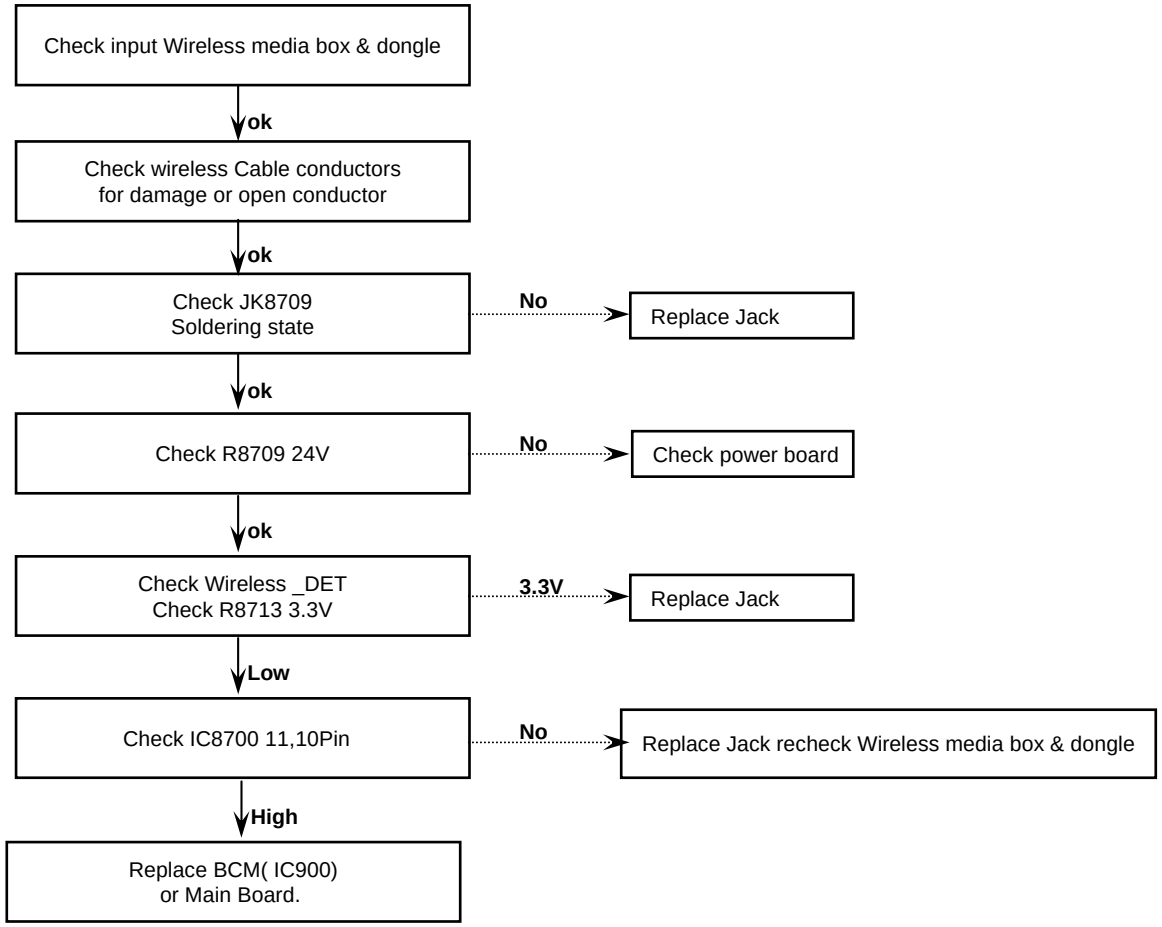
• Exception

- USB power could be disabled by inrushing current
- In this case, remove the device and try to reboot the TV (AC power off/on)

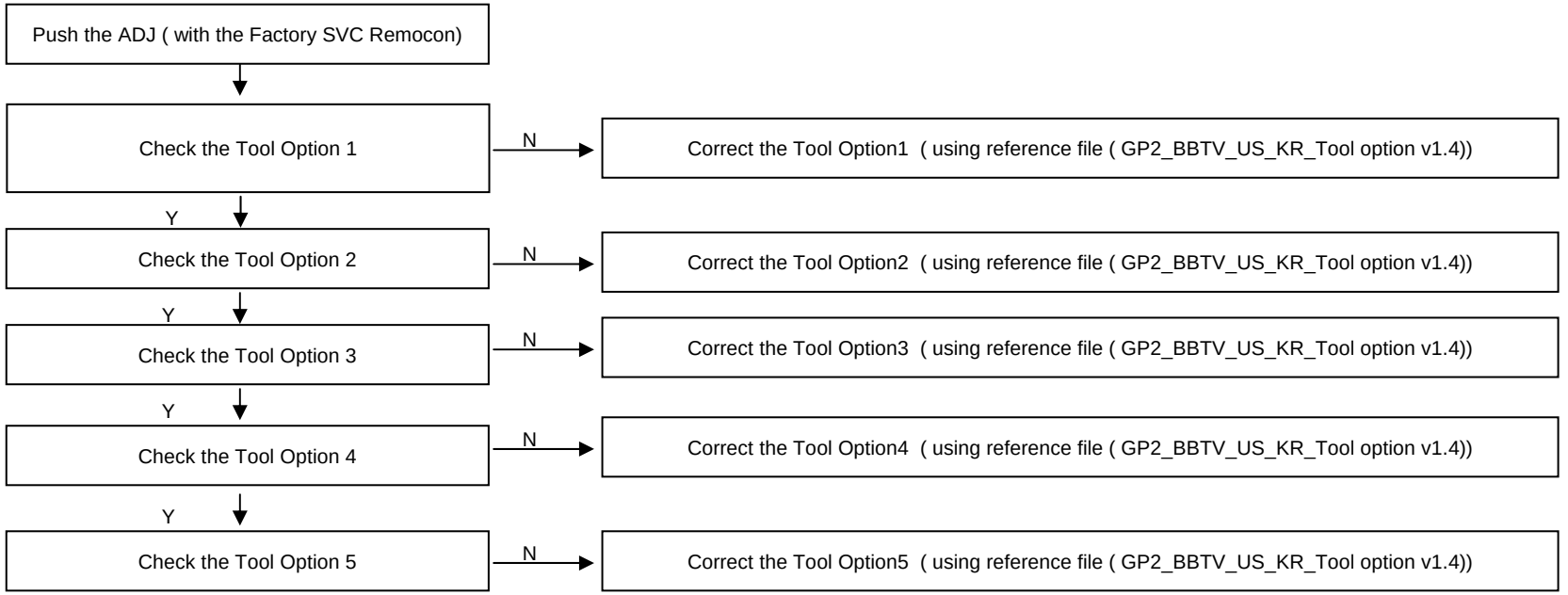
22. Trouble shooting - Ethernet connection error



23. Trouble shooting - Wireless media box - connection error



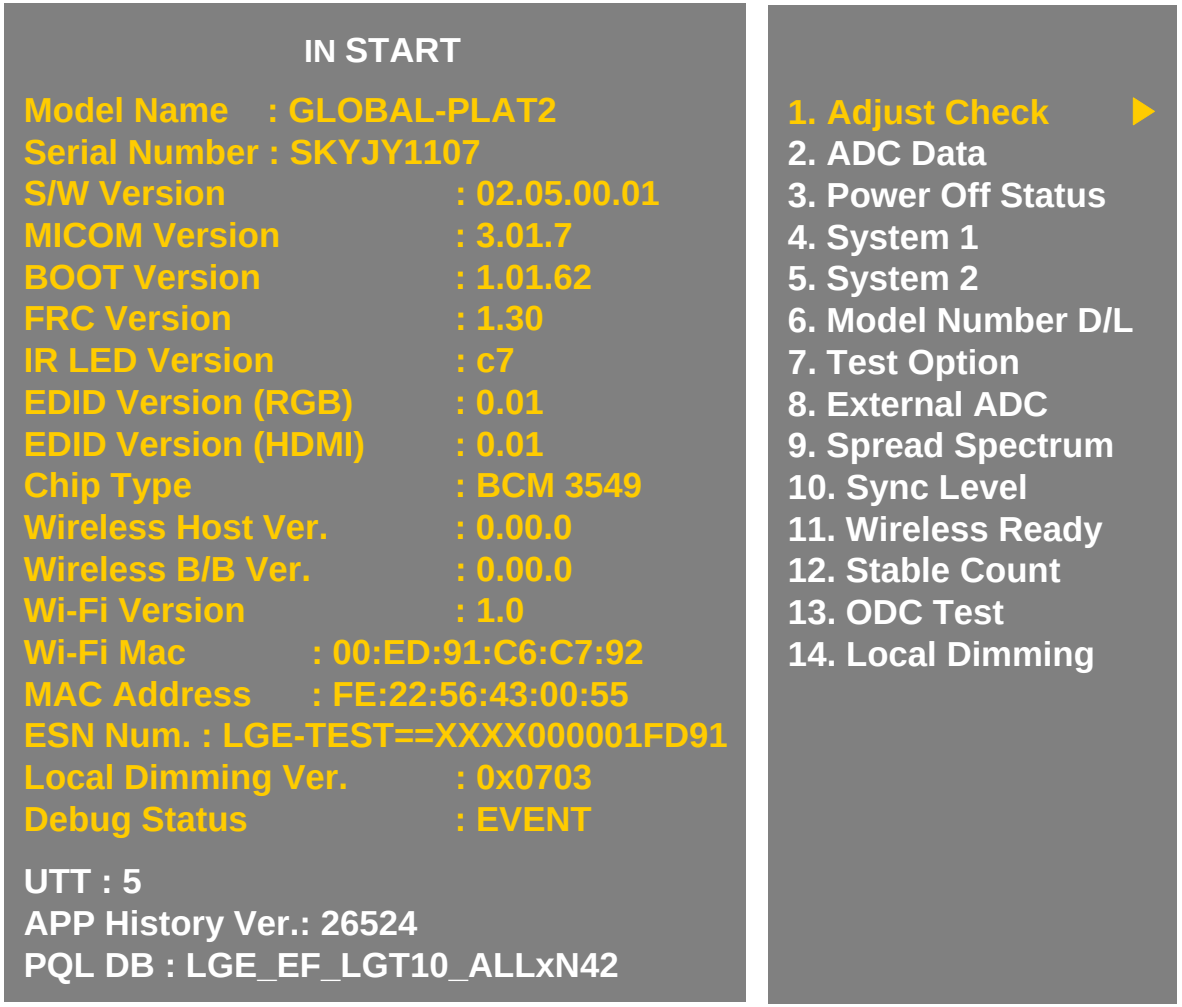
24. Trouble shooting - Tool option



Reference file :

GP2_BBTV_US_
KR_Tool Option V1.4

25. Trouble shooting - Service Mode (INSTART)



• IN-START mode displays various TV system information and supports useful functions for engineer.

• Each of menu has sub-menus for detail set-up

1. Adjust Check
: Refer to next page.

2. ADC Data
: This menu supports manual ADC adjustment for COMP 480i/COMP 1080P/RGB.

3. Power Off Status
: You can check previous power-off history with this menu.

4 & 5 . System
: There are various sub-menus for TV system setting.

6. Model Number D/L
: You can change TV System's model name & Serial Number manually.

7. Test Option

8. External ADC
: You can adjust external Analog-to-Digital Converting Level when you have external devices as Master.

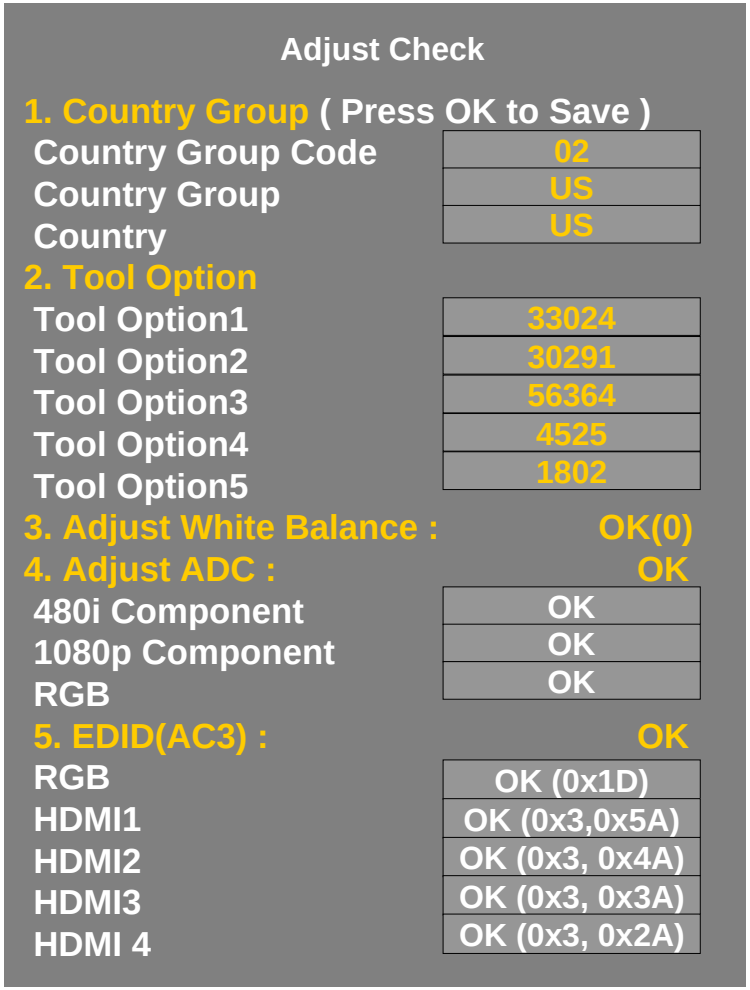
9. Spread Spectrum
: To enable FRC spread spectrum function and set detail value as spreading percent, period.

10. Sync Level
: You can control sync level of Component, HDMI input source. (Range is from 0 to 31)

11. Wireless Ready
: You can set RF Group, Media-box type and get some information about Wireless Diagnostics.

14. Local Dimming
: You can check current Local Dimming binary file version. When you upgrade latest F/W, you can re-download with using this menu.
If TV system doesn't support Local Dimming Function, you can't see this menu.

26. Trouble shooting - Service Mode (INSTART – Adjust Check)



1. Adjust Check
: This menu displays Country Group, Tool Option and Adjust Result Information. This is very useful when you want to know about TV systems adjustment as White Balance, ADC.

1) Country Group
- You can change Country Group and Tool Option only. This change is saved real-time.

2) Tool Option
- You can change Tool Option value. Move a cursor to dialog box and push some numbers with remote-controller.

3) Adjust White Balance
- This dialog box shows the result of White Balance adjustment. OK/NG

4) Adjust ADC
- This dialog box shows the result of ADC. OK/NG
If you have external device as master, you can adjust ADC at 'External ADC' menu.

5) EDID
- This dialog box shows the status of EDID Download.

27. Trouble shooting - SW download