Internal Use Only

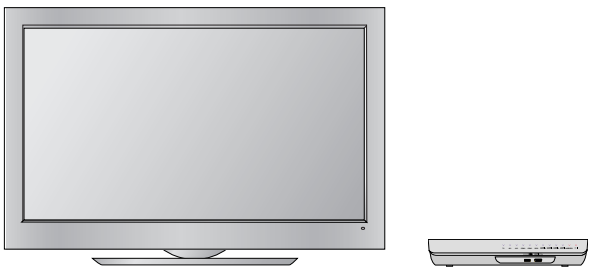
North/Latin America http://aic.lgservice.com
Europe/Africa http://eic.lgservice.com
Asia/Oceania http://biz.lgservice.com

LED LCD TV
SERVICE MANUAL

CHASSIS : LA92E

MODEL : 55LHX 55LH95-UA

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



P/NO : MFL41946836 (0910-REV01)

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,

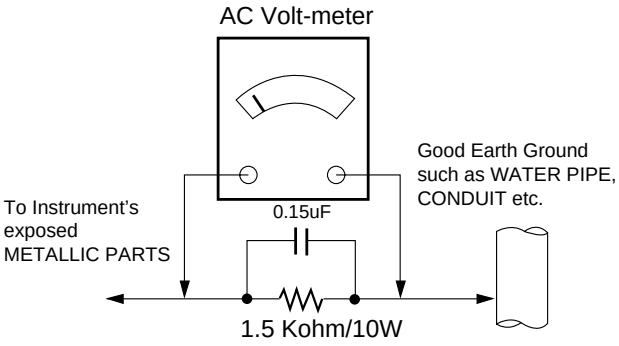
always perform an **AC leakage current check** on the exposed metallic parts of the cabinet, such as antennas, terminals, etc., to be sure the set is safe to operate without damage of electrical shock.

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 specification sheet is applied to the LCD TV used LA92E chassis.

2. Specification

Each part is tested as below without special appointment

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

3. Test method

1) Performance : LGE TV test method followed.
2) Demanded other specification
   - Safety : UL, CSA, IEC specification
   - EMC : FCC, ICE, IEC specification

4. General Specification(TV)

No	Item	Specification		Remark
1.	Receiving System	1) ATSC / NTSC-M		
2.	Available Channel	1) VHF : 02~13 2) UHF : 14~69 3) DTV : 02-69 4) CATV : 01~135 5) CADTV : 01~135		
3.	Input Voltage	1) AC 100 ~ 240V 50/60Hz		Mark : 110V, 60Hz (N.America) Mark : 220V,60Hz (Korea)
4.	Market	NORTH AMERICA		55LH95-UA
		KOREA		55LH95QD-NB/55LH93QD-NA
5.	Screen Size	55 inch Wide(1920 ◊ 1080)	FHD	55LH95-UA/55LH95QD-NB/55LH93QD-NA
6.	Aspect Ratio	16:9		
7.	Tuning System	FS		
8.	Module	LC550WUL-SBT1	LGD	55LH95-UA/55LH95QD-NB/55LH93QD-NA
9.	Operating Environment	1) Temp : 0 ~ 40 deg 2) Humidity : ~ 80 %		
10.	Storage Environment	1) Temp : -20 ~ 60 deg 2) Humidity : ~ 85 %		

5. Chroma & Brightness

No	Item			Min	Typ	Max	Unit		Remark
1.	Max Luminance (Center 1-point / Full White Pattern)			400	500		cd/m		55LH95-UA / 55LH95QD-NB / 55LH93QD-NA
2.	Luminance uniformity			77			%		Full white
3.	Color coordinate	RED	X	Typ. -0.03	0.644	Typ. +0.03			
4.			Y		0.332				
5.		GREEN	X		0.284				
6.			Y		0.630				
7.		BLUE	X		0.148				
8.			Y		0.060				
9.		WHITE	X		0.279				
10.			Y		0.292				
11.	Color coordinate uniformity								N/A
12.	Contrast ratio			900	1300				Local Dimming ON
				1,800,000	2,000,000				DCR
13.	Color Temperature	Cool	x	0.254	0.269	0.284		13000K	<Test Condition> 85% Full white pattern
			y	0.258	0.273	0.288			
		Medium	x	0.270	0.285	0.300		9300K	
			y	0.278	0.293	0.308			
		Warm	x	0.298	0.313	0.328		6500K	
			y	0.314	0.329	0.344			
14.	Color Distortion, DG					10.0	%		
15.	Color Distortion, DP					10.0	deg		
16.	Color S/N, AM/FM			43.0			dB		
17.	Color Killer Sensitivity			-80			dBm		

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

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

7. RGB input (PC)

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	
	PC					DDC
1.	640*350	31.468	70.09	25.17	EGA	O
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	79.5	CVT(WXGA)	O
7.	1360*768	47.712	60.015	85.50	VESA (WXGA)	O
8.	1280*1024	63.981	60.020	108.00	VESA (SXGA)	O
9.	1600*1200	75.00	60.00	162	VESA (UXGA)	O
10	1920*1080	66.587	59.934	148.5	HDTV 1080P	O

8. HDMI input (PC/DTV)

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	
	PC					DDC
1.	640*350	31.468	70.09	25.17	EGA	O
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	79.5	CVT(WXGA)	O
7.	1360*768	47.712	60.015	85.50	VESA (WXGA)	O
8.	1280*1024	63.981	60.020	108.00	VESA (SXGA)	O
9.	1600*1200	75.00	60.00	162	VESA (UXGA)	O
10.	1920*1080	67.5	60	148.5	HDTV 1080P	O
	DTV					
1	720*480	31.47	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. Mechanical Specification

1) Media Box

No	Item		CONTENT		Unit	REMARK
1	Protrusion		TBD			
2	Appearance quality		Satisfy appearance inspection			LG(56)-G3-1002
3	Product Dimension	Before Packing	426(W) X 234.5(D) X 68.6(H)		mm	
		After Packing	432(W) X 249(D) X 76(H)		mm	
4	Product Weight	Media-Box ONLY	2.6		Kg	
		With BOX	3.1		Kg	
5	Test SPEC	GAP	SPEC	MAX 1mm	mm	
		TOP COVER & BOTTOM	Measure(DQA)			
		단차	SPEC	MAX 1mm	mm	
		TOP COVER & BOTTOM	Measure(DQA)			
		단차	SPEC	MAX 1mm	mm	
		REAR SHIELD & BOTTOM SHIELD	Measure(DQA)			
		GAP	SPEC	MAX 1mm	mm	
		BOTTOM COVER & REAR SHIELD	Measure(DQA)			
		GAP	SPEC	MAX 1.2mm	mm	
		TOP COVER & REAR SHIELD	Measure(DQA)			

2) 55LH95-UA

NO	ITEM		CONTENT			UNIT	REMARK
1	Product Dimension	W/O Packing	Width	Depth	Height		
			1295.7	378	879	mm	With Stand
			1295.7	37.5	798	mm	W/O Stand
			426	234.5	68.6	mm	
		With Packing	1455	540	1020	mm	With Stand
			1456	331	964	mm	W/O Stand
2	Product Weight	W/O Packing (CCFL Module)			-	Kg	With Stand
					-	Kg	W/O Stand
		W/O Packing (LED Module)			36.8	Kg	With Stand
					30	Kg	W/O Stand
		Only Media BOX			2.6	Kg	
		With Packing (CCFL Module)			-	Kg	With Stand
					-	Kg	W/O Stand
					-	Kg	
		Packing		7.2		Kg	Box
				5.6		Kg	Packing
3	Container Loading Quantity	Individual	40ft (Normal)	64		Set	With Stand
				114		Set	W/O Stand
			40ft (H-Cubic)	64		Set	With Stand
				195		Set	
4	Stand Assy	Funchion	Swivel	YES/NO			
			Angle	–20¡		Degree	
			Tilt	YES/NO			
			Angle	Front( )/Back( )		Degree	
		Dimension (W/O Packing)	Width	Depth	Height		
			655	378	365.7	mm	With Neck
						mm	W/O Neck
		Dimension(With Packing)	843	531	438	mm	Commercial
		Weight(W/O Packing)	--	--	6.8	Kg	With Neck
		Weight(With Packing)	--	--	9.2		

ADJUSTMENT INSTRUCTION

1. Application Object

This specification sheet applied to LA92E Chassis applied LCD TV all models manufactured in TV factory.

2. Notes

1) Because this is not a hot chassis, it is not necessary to use an isolation transformer. However, the use of isolation transformer will help protect test instrument.
2) Adjustment must be done in the correct order.
3) The adjustment must be performed in the circumstance of 25±5°C of temperature and 65±10% of relative humidity if there is no specific designation.
4) The input voltage of the receiver must keep 100~240V, 50/60Hz.
5) The receiver must be operated for about 5 minutes prior to the adjustment when module is in the circumstance of over 15°C.

In case of keeping module is in the circumstance of 0°C, it should be placed in the circumstance of above 15°C for 2 hours.
In case of keeping module is in the circumstance of below -20°C, it should be placed in the circumstance of above 15°C for 3 hours.

6) The TV and the Media-box must be connected by Wireless or Wire. : Even if there is only the TV set, it is possible to adjust the White balance.

• Entry process of White Pattern
1) Press the POWER ON key on R/C for adjustment.
2) Press the ADJ key on R/C and enter EZ ADJUST.
3) Select '7. Test Pattern' by using CH +/- key and select "White" by using VOL +/-.

* Set is activated HEAT RUN without signal generator in this mode.
* Single color pattern (RED/BLUE/GREEN) of HEAT RUN mode uses to check panel.

Caution) If the still image is displayed more than 20 minutes (Especially digital pattern, cross hatch pattern), an after-image may occur in the black level area of the screen.

3. Adjustment list

• Check the TOOL OPTION prior to adjustment. If the TOOL OPTION is incorrect, correct it then execute the power off/on to apply the modification (refer to 7.3 TOOL OPTION)
• In case of this chassis,
Set the Media-box option in connection with Wireless or Wire.
Set the TV option in HDMI5 mode. (remove the wired HDMI cable)

3.1 Board-level adjustment

•ADC adjustment (Media-Box ONLY)
•EDID/DDC download

* Manual ADC Confirmation : [IN-START] -> [1.Adjust Check]
•After Board level adjustment, set volume setting value 0

3.2 Final assembly adjustment

•White Balance adjustment
•RS-232C functionality check
•EYE-Q TEST
•Wireless Pairing (it is worked in the Wired status)
•Shipment mode setting (In-Stop)

3.3 Etc

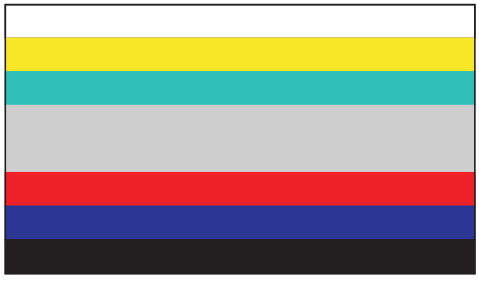
•Shipment mode
•Service Option

4. Board-level adjustment

4.1 ADC(LGE3369) adjustment

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

4.1.2 Equipment & Condition
1) Jig (RS-232C protocol)
2) External/Internal PATTERN
- Adjustment : ADC Comp Comp 480i
=> Using a Pattern Generator(MSPG-925FA - Model:209, Pattern:65 or etc), enter component signals like below image into the Media-box.
- Adjustment : ADC Comp 1080p / RGB
=> Use the Internal Pattern
* External input Image



4.1.3 Adjustment
4.1.3.1 Method
•Using RS-232C, adjust items listed in 3.1 in the order shown in"4.1.3.3".

4.1.3.2 Adj. protocol

Protocol	Command	Set ACK
Enter adj. mode	aa 00 00	a 00 OK00x
Source change	xb 00 40	b 00 OK40x (Adjust 480i Comp1)
	xb 00 60	b 00 OK60x (Adjust 1024*768 RGB)
Begin adj.	ad 00 10	
Return adj. result		OKx (Case of Success)
		NGx (Case of Fail)
Read adj. data	(main)	(main)
	ad 00 20	00000000000000000000000007c007b006dx
	(sub)	(Sub)
	ad 00 21	00000007000000000000000007c00830077x
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 adjustment RS232C Protocol_Ver1.0

4.1.3.3 Adj. order
•ad 00 00 [Enter ADC adj. mode]
•kb 00 04 [Component1 input mode]
•ad 00 10 [Adjust 480i Comp1]
•kb 00 06 [RGB-DTV input mode]
•ad 00 10 [Adjust 1080p Comp1/RGB]
•ad 00 90 [End adj.]

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

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

4.2.2 Equipment
•Adj. R/C
•Since embedded EDID data is used, EDID download jig, HDMI cable and D-sub cable are not need.

4.2.3 Download method
1) Press Adj. key on the Adj. R/C, then select “8.EDID D/L”. By pressing Enter key, enter EDID D/L menu.
2) Select [Start] button by pressing Enter key, HDMI1 / HDMI2 / HDMI3 / HDMI4 / RGB are Writing and display OK or NG.

* For HDMI5 EDID D/L, Change the TV input mode into HDMI5 mode then using Adj. R/C, download the HDMI5 EDID.
* HDMI5 / RGB can be downloaded by JIG and cable

4.2.4 EDID DATA
• HDMI

EDID Block 0 table =

	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	02	00	01	01	01	01
10	VV	WW	01	03	80	73	41	78	0A	CF	74	A3	57	4C	B0	23
20	09	48	4C	A1	08	00	A9	40	81	80	61	40	45	40	31	40
30	01	01	01	01	01	01	02	3A	80	18	71	38	2D	40	58	2C
40	45	00	7E	8A	42	00	00	1E	01	1D	00	72	51	D0	1E	20
50	6E	28	55	00	7E	8A	42	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	XX

EDID Block 1 table =

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	02	03	1F	F1	47	10	22	20	05	84	03	02	26	15	07	50
10	09	07	07	67	03	0C	00	YY	YY	B8	2D	E3	05	03	01	02
20	3A	80	18	71	38	2D	40	58	2C	04	05	7E	8A	42	00	00
30	1E	01	1D	80	18	71	1C	16	20	58	2C	25	00	7E	8A	42
40	00	00	9E	01	1D	00	72	51	D0	1E	20	6E	28	55	00	7E
50	8A	42	00	00	1E	66	21	50	B0	51	00	1B	30	40	70	36
60	00	7E	8A	42	00	00	1E	26	36	80	A0	70	38	1F	40	30
70	20	25	00	7E	8A	42	00	00	1A	00	00	00	00	00	00	XX

•HDMI 1
- VV: 01
- WW: 13
- XX: 1D (Block 0) / CC (Block1)
- YY: 10 00

•HDMI 2
- VV: 01
- WW: 13
- XX: 1D (Block 0) / BC (Block1)
- YY: 20 00

•HDMI 3
- VV: 01
- WW: 13
- XX: 1D (Block 0) / AC (Block1)
- YY: 30 00

•HDMI 4
- VV: 01
- WW: 13
- XX: 1D (Block 0) / 9C (Block1)
- YY: 40 00

•HDMI 5
- VV: 01
- WW: 13
- XX: 1D (Block 0) / 8C (Block1)
- YY: 50 00

• RGB
EDID Block 0 table =

	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	02	00	01	01	01	01
10	01	13	01	03	68	73	41	78	0A	CF	74	A3	57	4C	B0	23
20	09	48	4C	A1	08	00	A9	40	81	80	61	40	45	40	31	40
30	01	01	01	01	01	01	02	3A	80	18	71	38	2D	40	58	2C
40	45	00	7E	8A	42	00	00	1E	01	1D	00	72	51	D0	1E	20
50	6E	28	55	00	7E	8A	42	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	00	36

• Reference
- HDMI1 ~ HDMI4 / RGB: Media-Box, HDMI5: TV
- In the data of EDID, bellows may be different by S/W or Input mode.
=> VV: Week Manufacture
=> WW: Year Manufacture
=> XX: C/S
=> YY: Physical address
(Generally, HDMI1 : 10 00, HDMI2 : 20 00 ...)

5. Final assembly adjustment

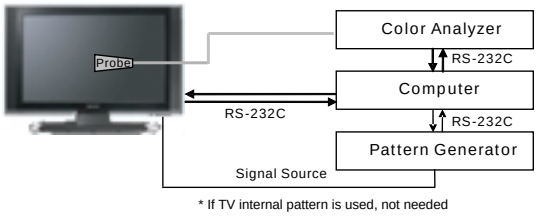
5.1 White Balance adjustment

5.1.1 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.

5.1.2 Equipment
1) Color Analyzer : CA-210 (NCG: CH9 / WCG: CH12 / LED Module: CH14)
2) Adj. Computer(During auto adj., RS-232C protocol is needed)
3) Adj. R/C
4) Video Signal Generator MSPG-925F 720p/216Gray (Model:217, Pattern:78) -> Only when internal pattern is not available.

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

5.1.3 Equipment connection map



Connection Diagram of Automatic Adjustment

5.1.4 Adj. Command (Protocol)
•Protocol
<Command Format>

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

- LEN : Number of Data Byte to be sent
- CMD : Command
- VAL : FOS Data value
- CS : Checksum of sent data
- A : Acknowledge
Ex) [Send: JA_00_DD] / [Ack: A_00_okDDX}

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

RS-232C COMMAND [CMD ID DATA]			Meaning
wb	00	00	White Balance adjustment start.
wb	00	10	Start of adjust gain (Inner white pattern)
wb	00	1f	End of gain adjust
wb	00	20	Start of offset adjust(Inner white pattern)
wb	00	2f	End of offset adjust
wb	00	ff	End of White Balance adjust(Inner pattern disappeared)

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. completed
*(wb 00 20(Start), wb 00 2f(completed)) -> Off-set adj.
wb 00 ff -> End white balance auto-adj.

•Adj. Map

	ITEM	Command		Data Range (Hex.)		Default (Decimal)
		Cmd 1	Cmd 2	Min	Max	
Cool	R-Gain	j	g	00	C0	TBD
	G-Gain	j	h	00	C0	TBD
	B-Gain	j	i	00	C0	TBD
	R-Cut					TBD
	G-Cut					TBD
	B-Cut					TBD
Medium	R-Gain	j	a	00	C0	TBD
	G-Gain	j	b	00	C0	TBD
	B-Gain	j	c	00	C0	TBD
	R-Cut					TBD
	G-Cut					TBD
	B-Cut					TBD
Warm	R-Gain	j	d	00	C0	TBD
	G-Gain	j	e	00	C0	TBD
	B-Gain	j	f	00	C0	TBD
	R-Cut					TBD
	G-Cut					TBD

5.1.5 Adj. method
5.1.5.1 Auto-adj. method
1) Set TV in adj. mode using POWER On key.
2) Zero calibrate probe then place it on the center of the Display.
3) Connect Cable(RS-232C).
4) Select the model in adj. program and begin adjustment.
5) When adj. is completed (OK sign), check adj. status per mode. (Warm / Medium / Cool)
6) Remove the probe and RS-232C cable to complete adj.

•Adjustment must be begun “wb 00 00”, and ended “wb 00 ff”. If it is needed, adjust the Offset value.

5.1.5.2 Manual adj. method
1) Set TV in adj. mode using POWER On key.
2) Press ADJ key => EZ ADJUST using adj. R/C.
3) sing CH +/- key, select [7.Test Pattern] then press ENTER to place in HEAT RUN mode and wait for 30 minutes.
4) Check a zero calibration for the probe of color analyzer, then place it on the center of LCD module within 10• of the surface.
5) Press ADJ key [6.White Balance] then press the cursor to the right (▶) key. (When ▶ is pressed, Full White internal pattern will be displayed)
6) One of R Gain / G Gain / B Gain should be fixed at 192, and the rests will be lowered to meet the desired value.
7) Adj. is performed in COOL, MEDIUM, WARM 3 modes of color temperature.

•Adj. condition and cautionary items
1) Lighting condition in surrounding area
Surrounding lighting should be lower than 10 lux. Try to isolate adj. area into dark surrounding.
2) Probe location
- LCD: Color Analyzer (CA-210) probe should be within 10• and perpendicular of the module surface (80°~ 100°).
* In case of LCD, Back Light On should be checked using no signal or Full white pattern.

5.1.6 Reference (White Balance adj. coordinate and color temperature)
•Luminance: Full white 216 Gray

•Standard color coordinate and temperature using CS-1000

Mode	Coordinate		Temp	uvΔ
	x	y		
Cool	0.269	0.273	11000K	0.0000
Medium	0.285	0.293	9300K	0.0000
Warm	0.313	0.329	6500K	0.0000

5.2 EYE-Q function check

Step 1) Turn on TV
Step 2) Press EYE key of Adj. R/C
Step 3) Cover the Eye Q II sensor on the front of the using your hand and wait for 6 seconds
Step 4) Confirm that R/G/B value is lower than 10 of the “Raw Data (Sensor data, Back light)” . If after 6 seconds, R/G/B value is not lower than 10, replace Eye Q II sensor
Step 5) Remove your hand from the Eye Q II sensor and wait for 6 seconds
Step 6) Confirm that “ok” pop up.
If change is not seen, replace Eye Q II sensor

5.3 Wireless Pairing

5.3.1 Overview
•For the wireless connection between TV and Media-Box, Select the communication channel and fix the Mac address.
* The adjustment should be executed with being Wired.
(HDMI cable connection)

5.3.2 Method
1) Press IN-START key on adj. R/C then select [9.Wireless Check].
2) After Choosing the LRP Channel, Set OK in Paired Status.
3) Remove the HDMI cable and turn off/on TV and Media-box.
4) Check the Wireless status.

5.4 Shipment mode check(In-stop)

• After final inspection, press IN-STOP key of the Adj. R/C and check that the unit goes to Stand-by mode.

6. GND and Internal Pressure(I/P) check

6.1 Inspection method

1) GND & Internal Pressure auto-check preparation
- Check that Power cord is fully inserted to the set.
(If loose, re-insert)
2) Perform GND & Internal Pressure auto-check
- Unit with fully inserted POWER CORD, TUNER CABLE and A/V CABLE arrives to the auto-check process.
- Connect D-terminal AV JACK TESTER
- Auto CONTROLLER(GWS103-4) ON
- Perform GND TEST
- If NG, BUZZER will sound to inform the operator
- If OK, changeover to I/P check automatically
(Remove CORD, A/V from 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 Check point

• TEST voltage
- GND:1.5KV/min at 100mA
- SIGNAL:3KV/min at 100mA
• TEST time:1 sec.
• TEST POINT
- GND TEST = POWER CORD GND & SIGNAL CABLE METAL GND
- I/P TEST = POWER CORD GND & LIVE & NEUTRAL
• LEAKAGE CURRENT: set to 0.5mArms

7. Etc.

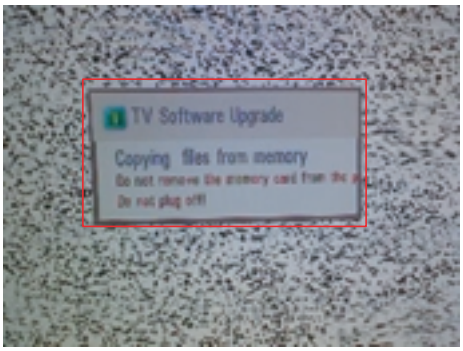
7.1 USB S/W Download (option)

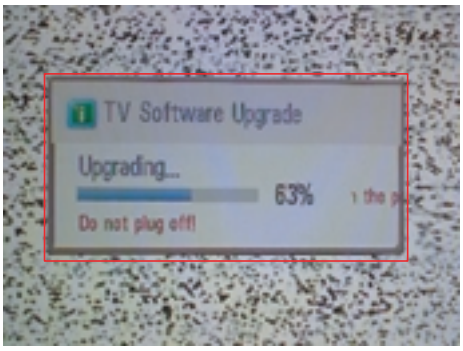
7.1.1 Overview

• USB download allows fast S/W upgrade in SVC areas or during Board-level production.

7.1.2 Dowunload method

1) After Set on, confirm that image is displayed.
2) Insert USB memory stick that contains the S/W and after a few seconds, Upgrade OSD is displayed.
(If the version of download file in USB is lower than the current version, Upgrade OSD is not displayed)
3) After download is finished, automatically Power off/on is executed. (If auto power on/off is not executed, perform the power off/on manually)
4) S/W upgrade is completed and eject USB Memory Stick form USB jack.
5) By pressing IN-START key on the adj. R/C, check the S/W version.





7.2 TOOL OPTION

7.2.1 Overview

•The model name and spec. will be confirmed and modified by adj. menu.
•No Modification at discretion

7.2.2 Confirm/Modify method

1) By Pressing ADJ key, [EZ ADJUST] -> [0.Tool Option1].
2) In the Tool Option1, It is possible to modify the Inch/ Tool/ Module maker/ Module revision.
3) Contents of Tool Option 1~4 are like the section 7.2.3.

* Entering into IN-START mode, [1.Adjust Check] shows Tool Options.

7.2.3 Contents of Tool Option

7.2.3.1 Tool Option1

•Inch
•Tool
•Maker
•Module Rev.

7.2.3.2 Tool Option2

•HDMI Count
•HDMI Switch IC
•Component Count
•S-Video
•RCA AV Count
•Scart Count

7.2.3.3 Tool Option3

•EMF(JPEG,MP3)
•Divx
•Bluetooth
•Digital Eye.
•Headphone
•OPC
•EPA
•e-Manual
•Audio Amp
•LED Type
•New E-Con

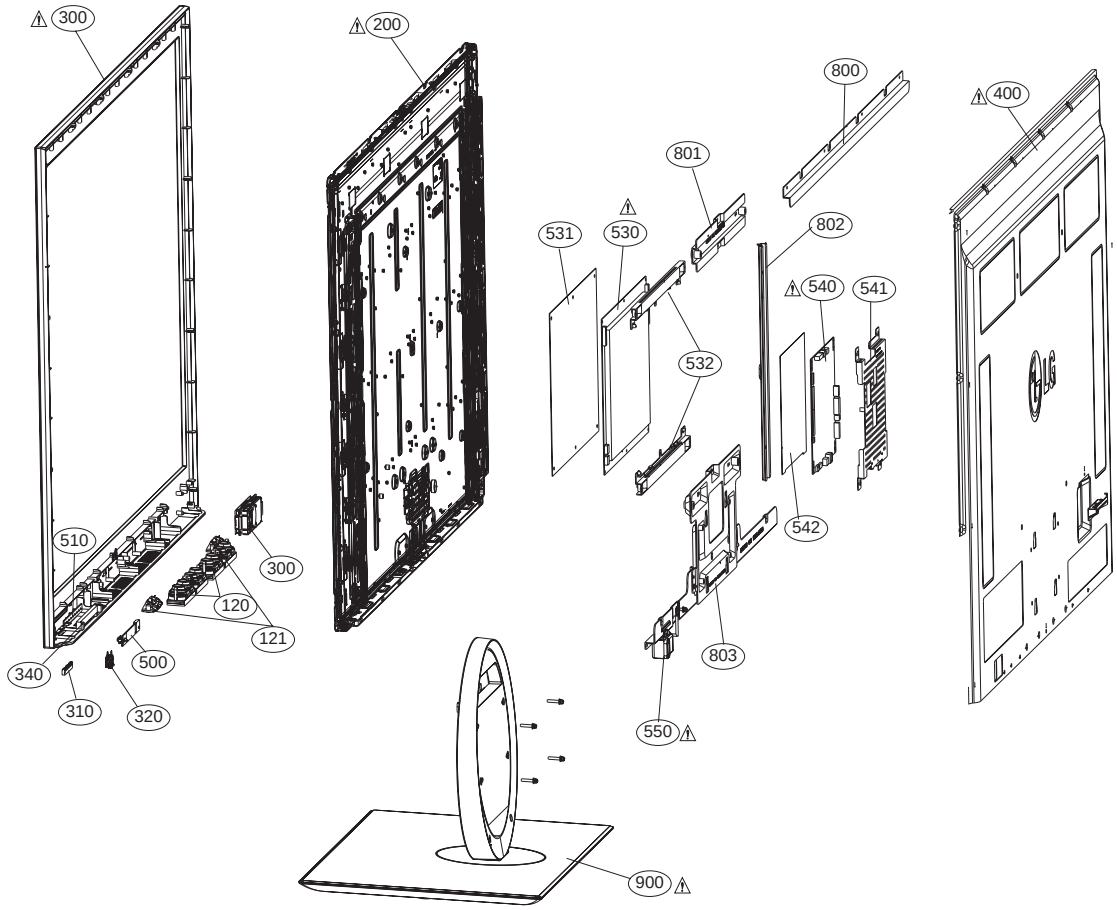
7.2.3.4 Tool Option4

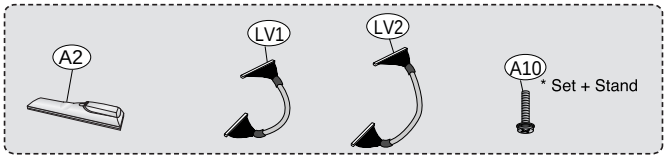
•Clear QAM
•Local Dimming
•THX
•Digital Demod
•Analog Demod
•THX Media Director

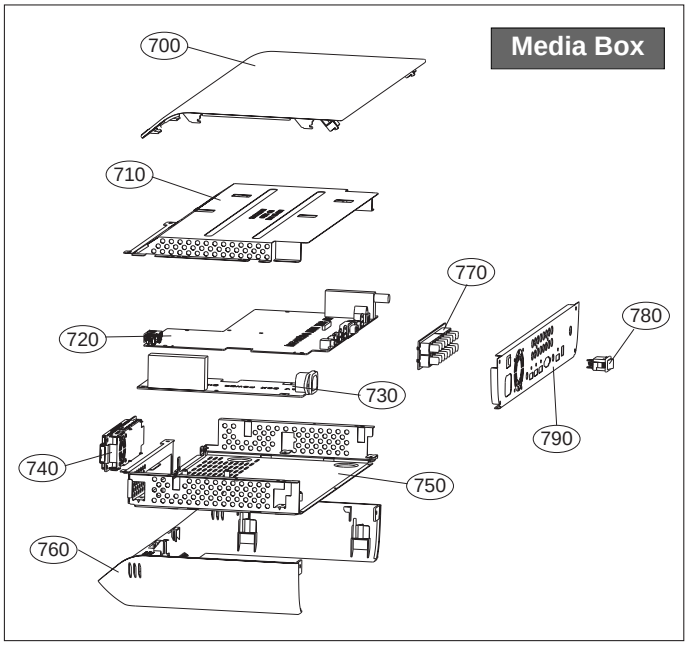
EXPLODED VIEW

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.



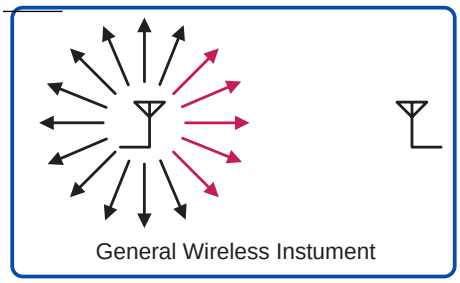


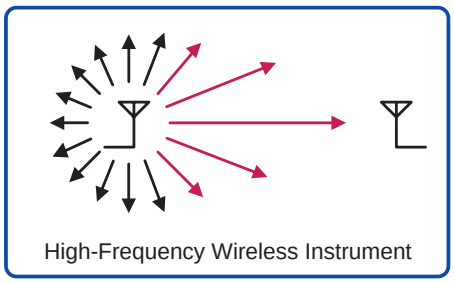


WIRELESS TV'S OPERATING PRINCIPLE

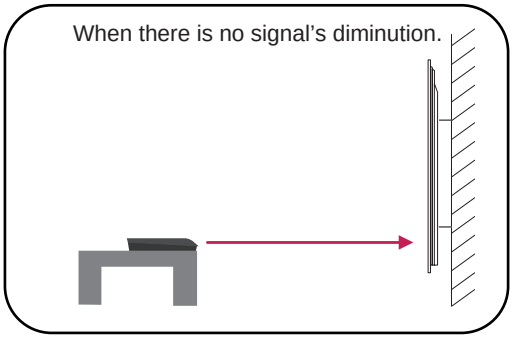
This product can transmit a video of 1080p HD picture quality as wireless.

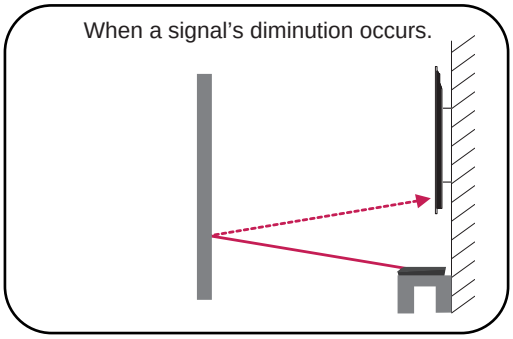
Wireless TV uses a high-frequency signal of 60GHz to transmit the image and voice of 1080p HD class picture quality without a loss. 60GHz high-frequency signal has a nature of going straight ahead unlike a radial form wireless instrument (Wireless Lan, DMB, Bluetooth, mobile phone, etc.) using an electric wave of some GHz band.

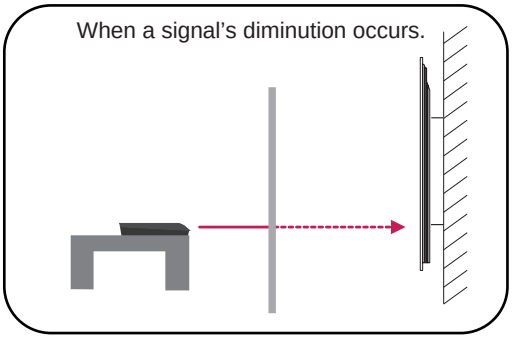




Thus, when there is an object at an electric wave progressing direction between media box and TV, due to high-frequency signal's characteristic, it could be penetrated or reflected according to the kind of an object and then the signal's diminution can happen.
(In case of an electric wave of a mobile phone, it is similar to the fact that the quality of a telephone call lowers because stuff consisting of a metal does not pass through.)





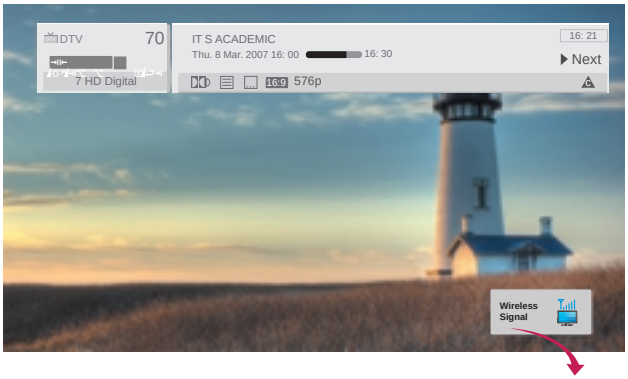


OPTIMAL INSTALLATION METHOD

If you install TV and media box toward the same direction like a picture, you can watch wireless TV with an optimal picture quality.

Please install making the number of an antenna to be more than three as you move media box.

To check a signal intensity, please press remote controller's confirm or information display button.

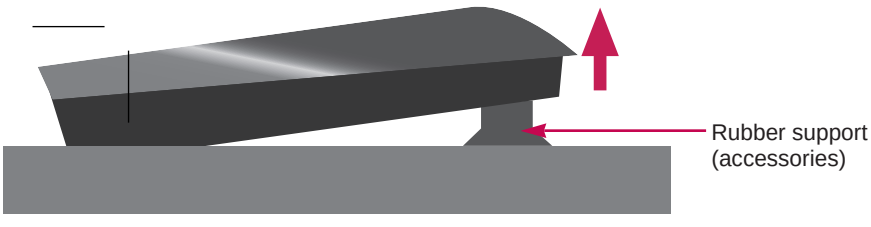


In case of a wrong installation

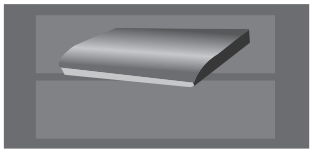
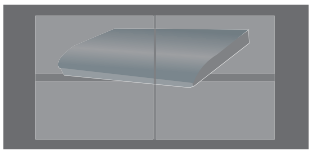
In case of a wrong installation

A wireless signal's reception is in good condition.
Please install TV and media box for wireless connection intensity to be like this.

When you need to install media box's front side slightly uplifted to match wireless connection intensity, please raise it by using provided rubber support.



When you install media box inside of a cabinet, a wireless TV might not operate normally if the cabinet door is sealed up.

	Recommended installation method	Wrong installation method
Installation example		
Cabinet structure	• Glass • Open type • Partially open type (Anelectric wave transmitting part should be exposed to the outside.)	• In case that there is media box inside a sealed cabinet • In case that an electric wave transmitting part of media box is obstructed • In case that a cabinet inside consists of a metal • In case that a media box is installed deep inside of a cabi-net
Problem phenomenon	It is possible to watch wire-less TV normally.	It is impossible to watch wireless TV.
Handling method	Please check if an antenna of wireless connection intensity is more than three.	Please install media box outside of a cabinet.

PLEASE CHECK BEFORE REPORTING A DEFECT.

• This is the case that TV power is switched on by a remote controller but the power of media box is not switched on.

Q. If switching on the power by a remote controller, I keep seeing the guidance of “It is connecting to a media box. Please wait for a moment.”

A. Please check if media box’s power switch is on.

A. Please check if media box’s LED is switched on.

A. Please check if there are any obstacles around media box and wireless transmitting/receiving part of TV front side.

• This is the case that a connection between TV or media box is cut because wireless receiving environment is affected.

Q. I keep seeing the guid-ance of “It is connecting to a media box. Please wait for a moment.” while watching TV through a wireless connection.

A. Please do not let an object or person directly obstruct media box or TV’s front side.

A. Please do not make any obstacles between media box and TV.

• This is the case that a wireless signal is weakly connected.

Q. A screen breaking problem keeps happening after a wireless connection.

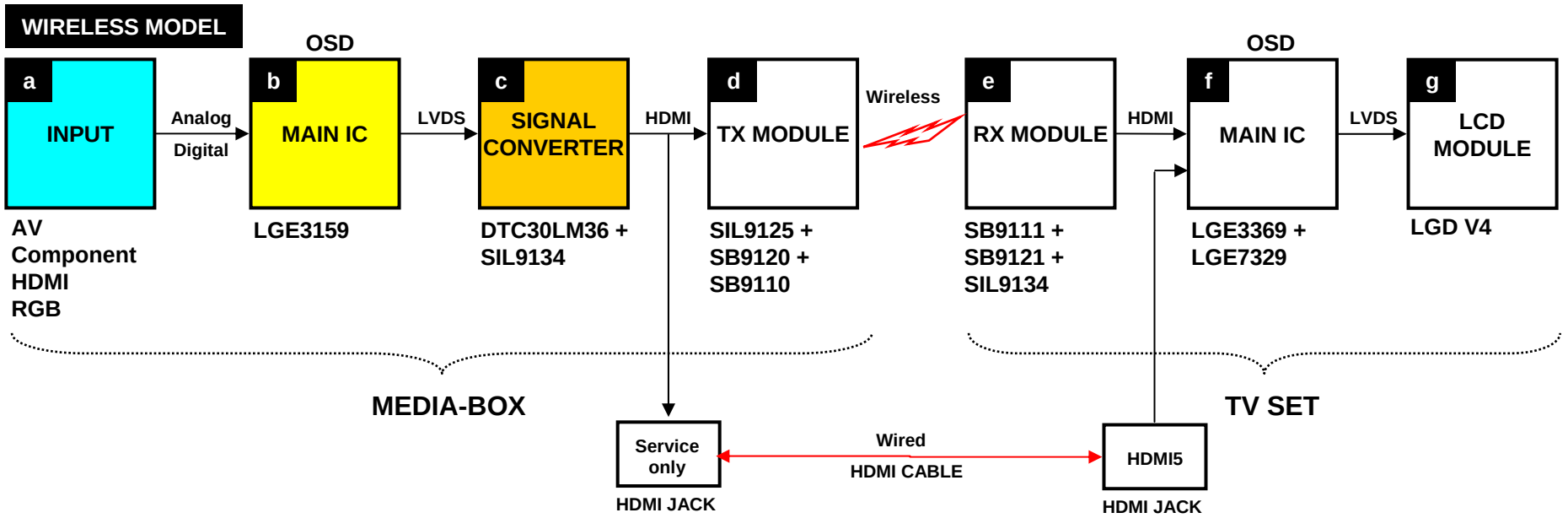
A. Please set up by moving the location of media box for an antenna display of wireless connection intensity to be more than three.

• This is the case that a wireless conditiongets bad b an obstacle around or moving object.

Q. After a wireless connection, a horizontal stripe/screen vibration momentarily occurs at a screen.

A. If there is an obstacle or it passes between TV and media box, it is not a product disorder because it is the characteristic of a wireless signal occurring in an instant.

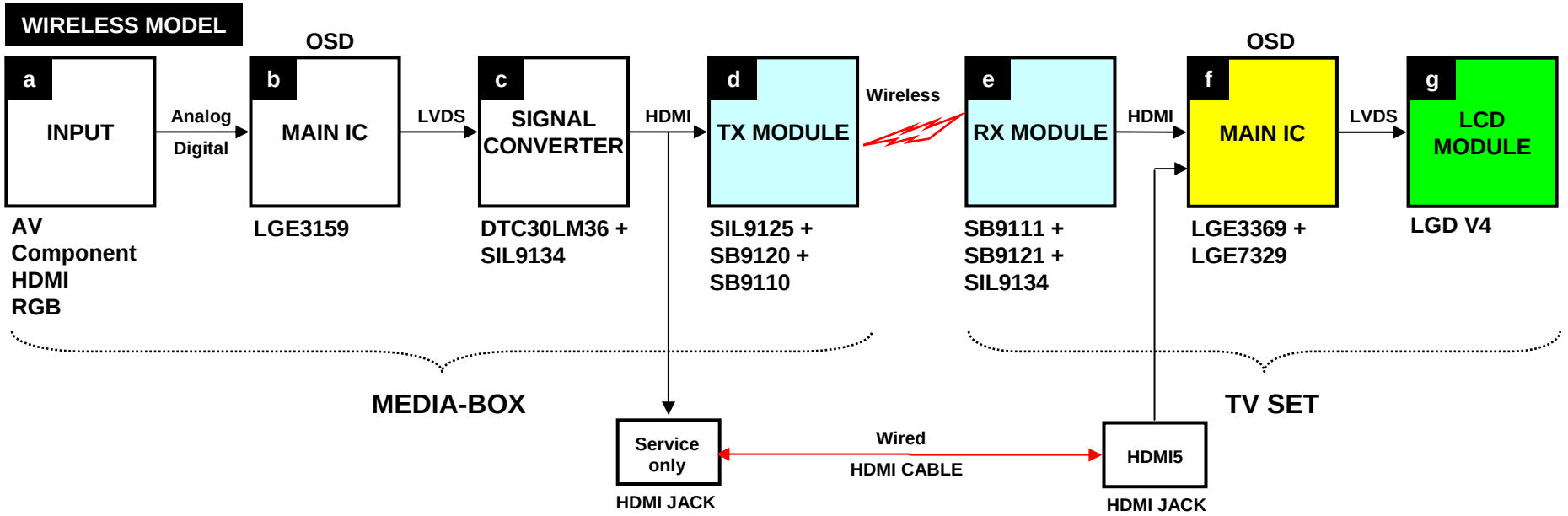
Trouble shooting



Defect block	Symptoms	Wireless connection	Check
a	▪Bad (noise) image / No image - osd is good ▪Bad sound / No sound	No effect directly	▶ Check the EDID of HDMI & RGB ▶ Check cable & contact error
b	▪Bad image - IC's cold soldering or memory defect accompanied noise on osd ▪Bad sound / No sound ▪Wireless connecting osd is displayed continually - There is no video signal from Rx module to TV main ic, so TV understand this time like disconnection state and display connecting osd continually. And then, if TV is not activated rightly within 15min, it will go to st-by mode.	No effect directly No effect directly No connection	▶ Check main ic basic power & power sequence ▶ Control line check (I2C & etc) ▶ Check input/output video & audio signal
C	▪Bad image / Bad or No sound ▪Wireless connecting osd is displayed continually - No image	No effect directly No connection	▶ Check power & control line ▶ Check input/output signal ▶ Check inner HDMI cable connection status (There can be cable's defect.)

* Focused on Wireless connection

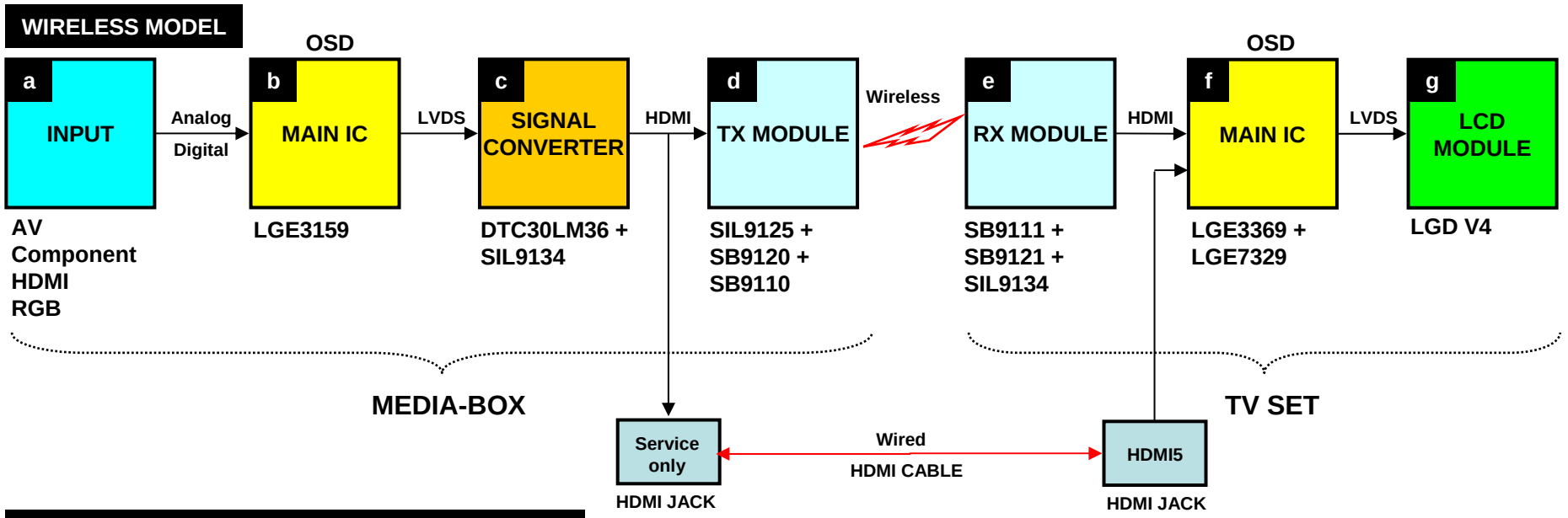
Trouble shooting



Defect block	Symptoms	Wireless connection	Check
d e	▪Wireless connection osd is displayed continually - That osd can be appeared by HDMI cable or Jack defect even though wireless connection is completed. (only Rx module)	No connection connection	▶ Check Wireless connecting osd ▶ Check inner HDMI cable connection status (There can be cable's defect.)
F	▪Bad image / No image - IC's cold soldering or memory defect accompanied noise on osd ▪Bad sound / No sound	No effect directly	▶ Check main ic basic power & power sequence ▶ Check control line (I2C & etc) ▶ Check input/output video & audio signal ▶ Check LVDS cable & wafer locking (There can be cable's defect.)
g	▪Bad image or No image	No effect directly	▶ Ticon b/d or Inverter check ▶ Check power

* Defect block means from itself to ahead of next part.
* Wireless TV is similar with the model using LGE3159 or LGE3369 except for wireless parts.

Trouble shooting



※ Check first when Wireless connection is disable!

- Pairing
- S/W version check
- Fan defect
  - ▷ TV Rx module fan defect: Check Fan error of TV In-start menu
  - ▷ Media-Box fan defect: Check the red led's blinking of Media-Box front
- Wireless interference check
  - ▷ Refer to the installation method guide
- Inner HDMI cable's connection status (From Rx/Tx module to Main)

※ Check Tip

- In some cases, TV only or Wired mode make easy to check.

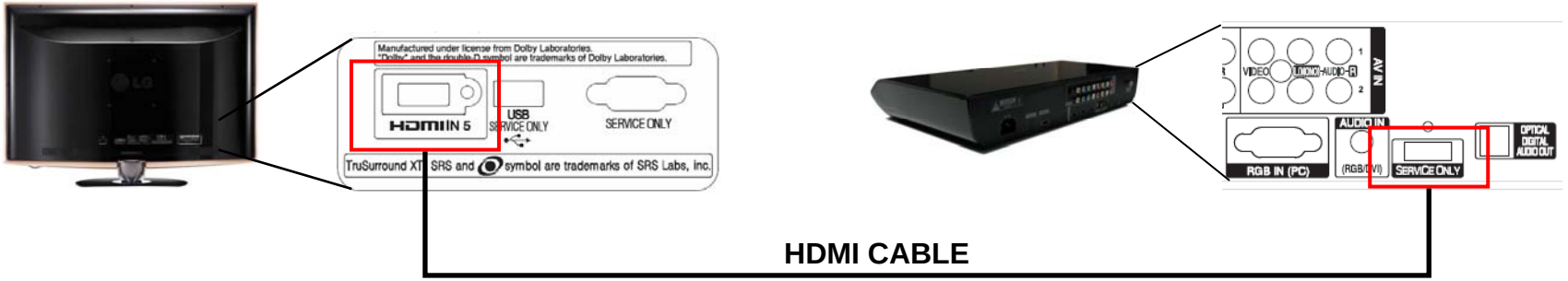
※ Caution & Information

- TV set & Media-Box is just 1:1 connection. (No multiple device connection)
- In order to download TV set, you must change the mode to HDMI5 or turn off Media-Box.
- Rx/Tx module's performance is very sensitive to temperature. So, When you repair the defect, should keep up with the original assembly state.

Trouble shooting

Pairing for SVC

1. Turn on the TV SET & Media-Box
2. Connect TV HDMI5 Jack & Media-Box rear [Service only] Jack with HDMI cable

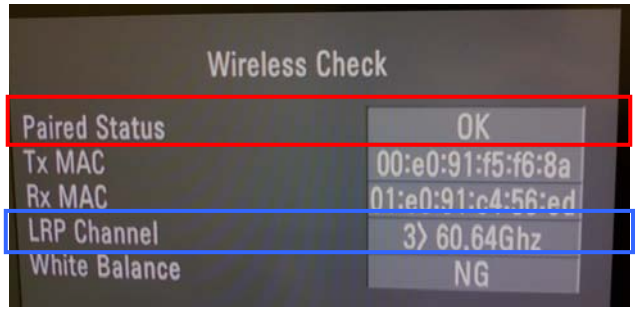


3. Enter the [IN START(Media Box)] menu and go to sub-title [9.Wireless check]

   Enter menu and Push the left or right remote-controller button.

   Check the Paired Status if changed from NG to OK

   ※ If s/w version of Tx/Rx module & TV/Media-box main isn't matched, Wireless can't be connected, So at that time check the version and upgrade by usb



→ If there are 2 or more wireless tv set, it's need to be set channel respectively. (Must separate them more than 10m)

4. Remove HDMI cable & check wireless connection.

   If connection is not completed, power off and on the TV & Media-Box.

Trouble shooting

Apply model

N.America: 47LH85-UC / 55LH85-UC

Korea: 42LH80YD-NB / 47LH80YD-NB / 55LH80YD-NB

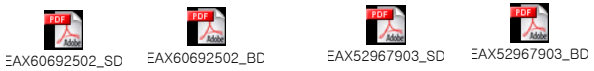
Circuit diagram

TV SET

1. TV MAIN(SD/BD) 2. RX module (SD/BD)

Media-Box

1. Box MAIN(SD/BD) 2. TX module (SD/BD)



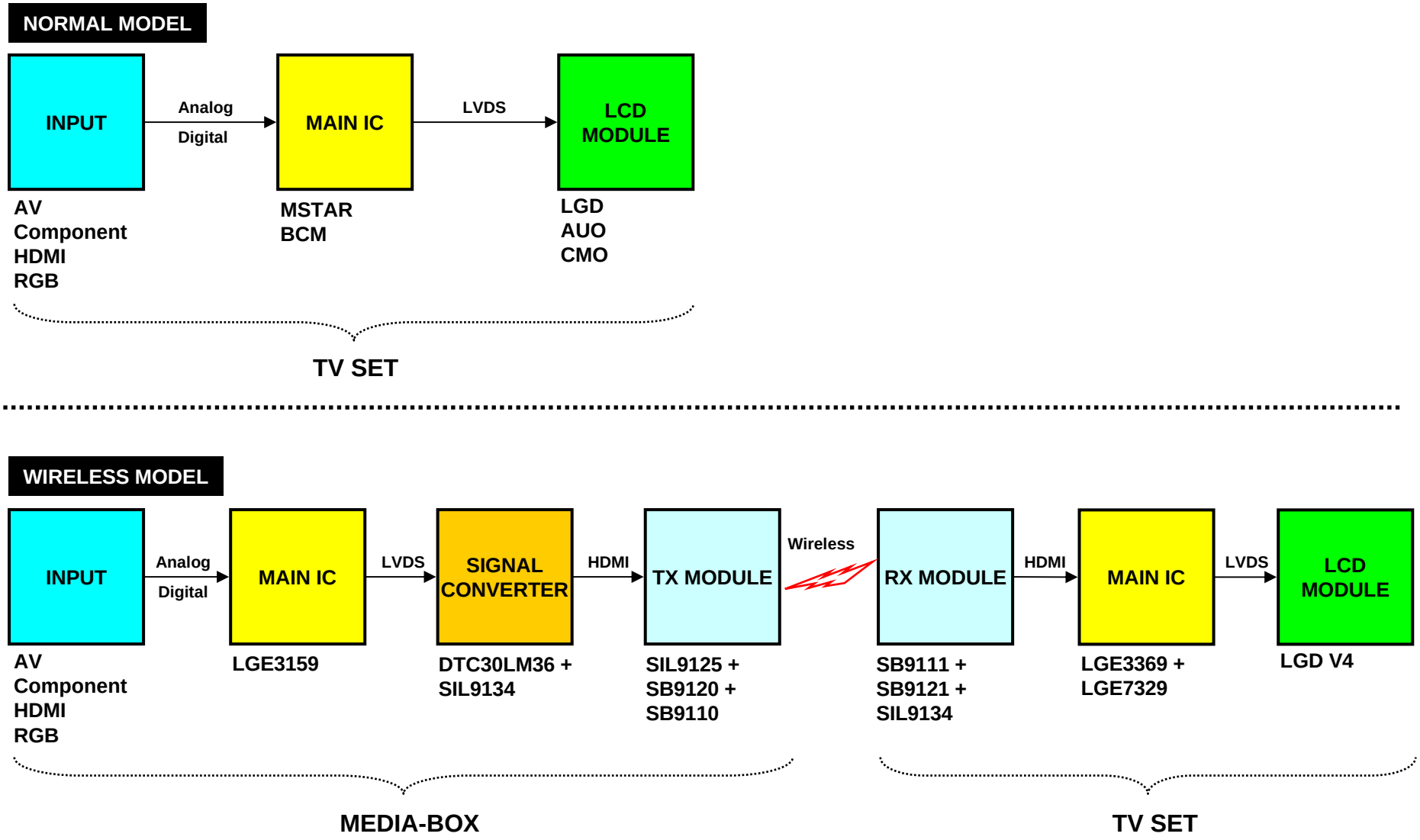
Total programmable IC

TV MAIN B/D	RX MODULE	Media-Box MAIN B/D	TX MODULE
IC102: MAIN S-FLASH	IC901: SIBEAM B/B S-FLASH	IC101: MAIN S-FLASH	IC901: SIBEAM B/B S-FLASH
IC103: MAIN N-FLASH	IC1301: PIC MICOM	IC102: MAIN N-FLASH	
IC700: FRC S-FLASH		IC401: MICOM	
IC902: MICOM		IC105: HDCP	
IC105: HDCP		IC104: NVRAM	
IC101: NVRAM		IC502: HDMI S/W EDID	
IC300: HDMI5 EDID			

Blue: USB upgrade

Total download files are under 6ea

About Wireless TV

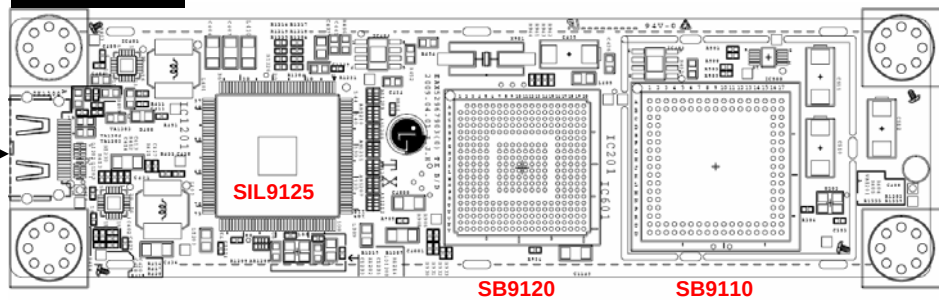


About Wireless TV

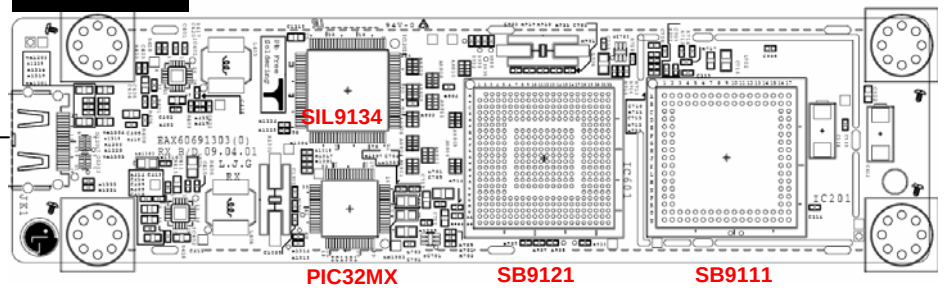
From Media-Box Main b/d

HDMI Cable

TX Module



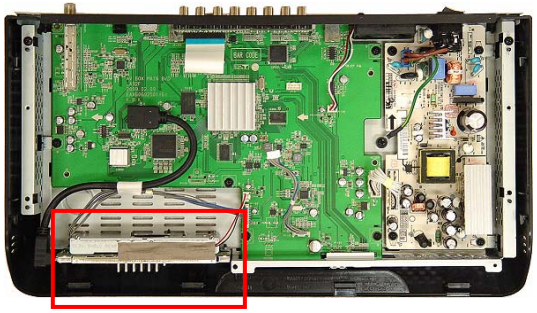
RX Module



To TV Main b/d

HDMI Cable

Media-Box



TX module

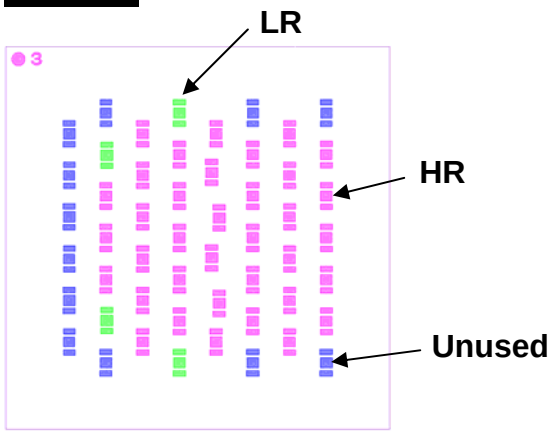
TV SET

RX module

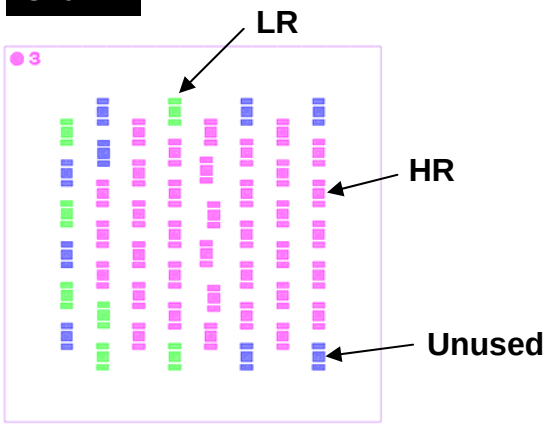
About Wireless TV

Top view of RF IC (Antenna)

SB9110

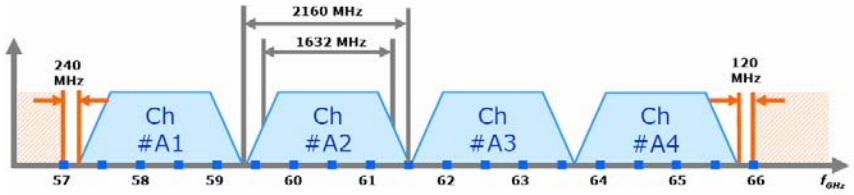


SB9111



HRP Channel

Channel Number	Low Freq. (GHz)	Center Freq. (GHz)	High Freq. (GHz)	Nyquist BW (MHz)	Roll-Off Factor
A1	57.240	58.320	59.400	1632	0.3235
A2	59.400	60.480	61.560	1632	0.3235
A3	61.560	62.640	63.720	1632	0.3235
A4	63.720	64.800	65.880	1632	0.3235

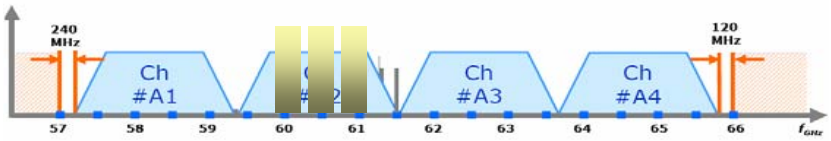


LRP Channel

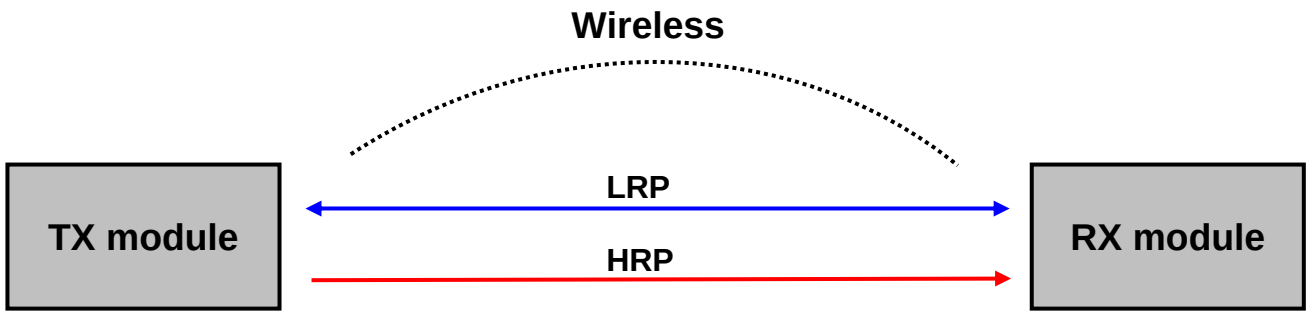
$F_{c(HRP)}$= 60.48GHz

LRP channel index	Start frequency[a]	Center frequency	Stop frequency[a]
1	$f_{c(HRP)}$ – 207.625 MHz	$f_{c(HRP)}$ – 158.625 MHz	$f_{c(HRP)}$ – 109.625 MHz
2	$f_{c(HRP)}$ – 49 MHz	$f_{c(HRP)}$	$f_{c(HRP)}$ + 49 MHz
3	$f_{c(HRP)}$ + 109.625 MHz	$f_{c(HRP)}$ + 158.625 MHz	$f_{c(HRP)}$ + 207.625 MHz

a. The start and stop frequencies are the nominal values. The LRP TX mask requirements are defined in 5.4.1.1



About Wireless TV



LRP: Control data
HRP: Video & Audio data

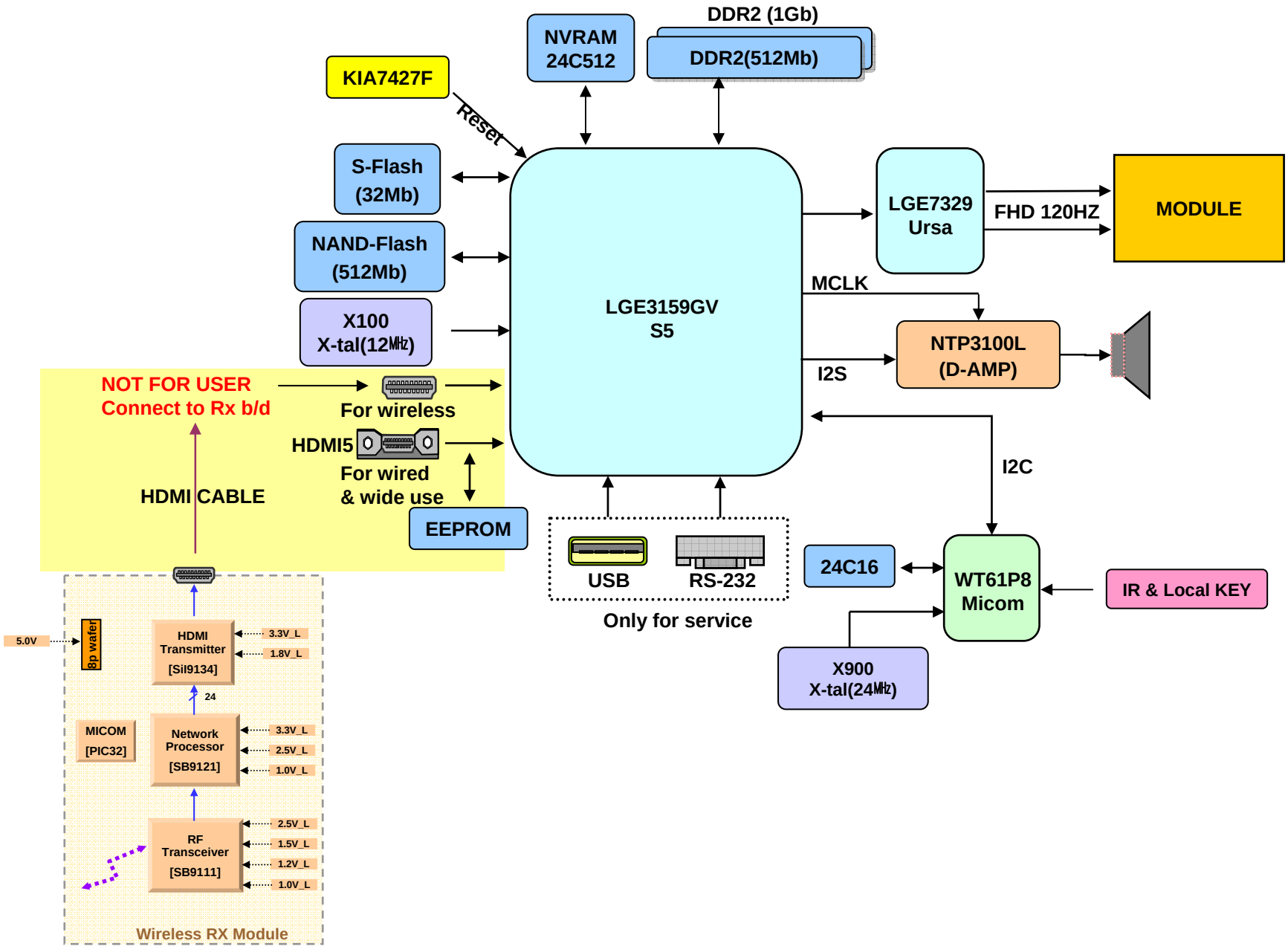
Wireless TV is similar to the walkie-talkie. We must match the channel of Tx & Rx module.

There are 4 HRP channel(A1~A4). We use only A2 channel and 3 LRP channel like this [60.32㎓], [60.48㎓],[60.64㎓].

First thing, the LRP channel setting has to be matched in wired mode. There are not only channel but also mac address that Tx/Rx modules have it's own for preventing wireless interference.

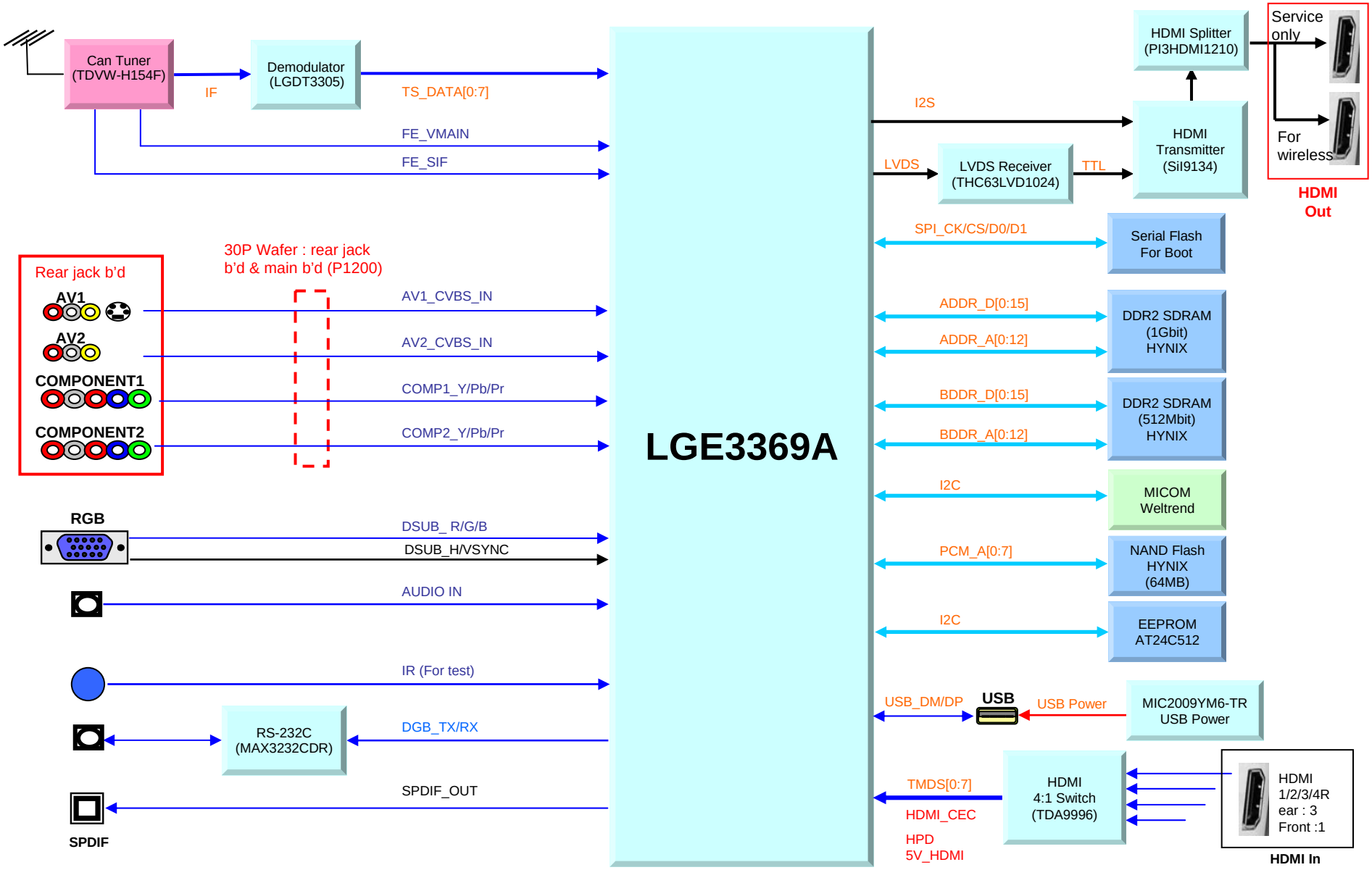
Set the LRP channel and share the mac address each other, that's called pairing.

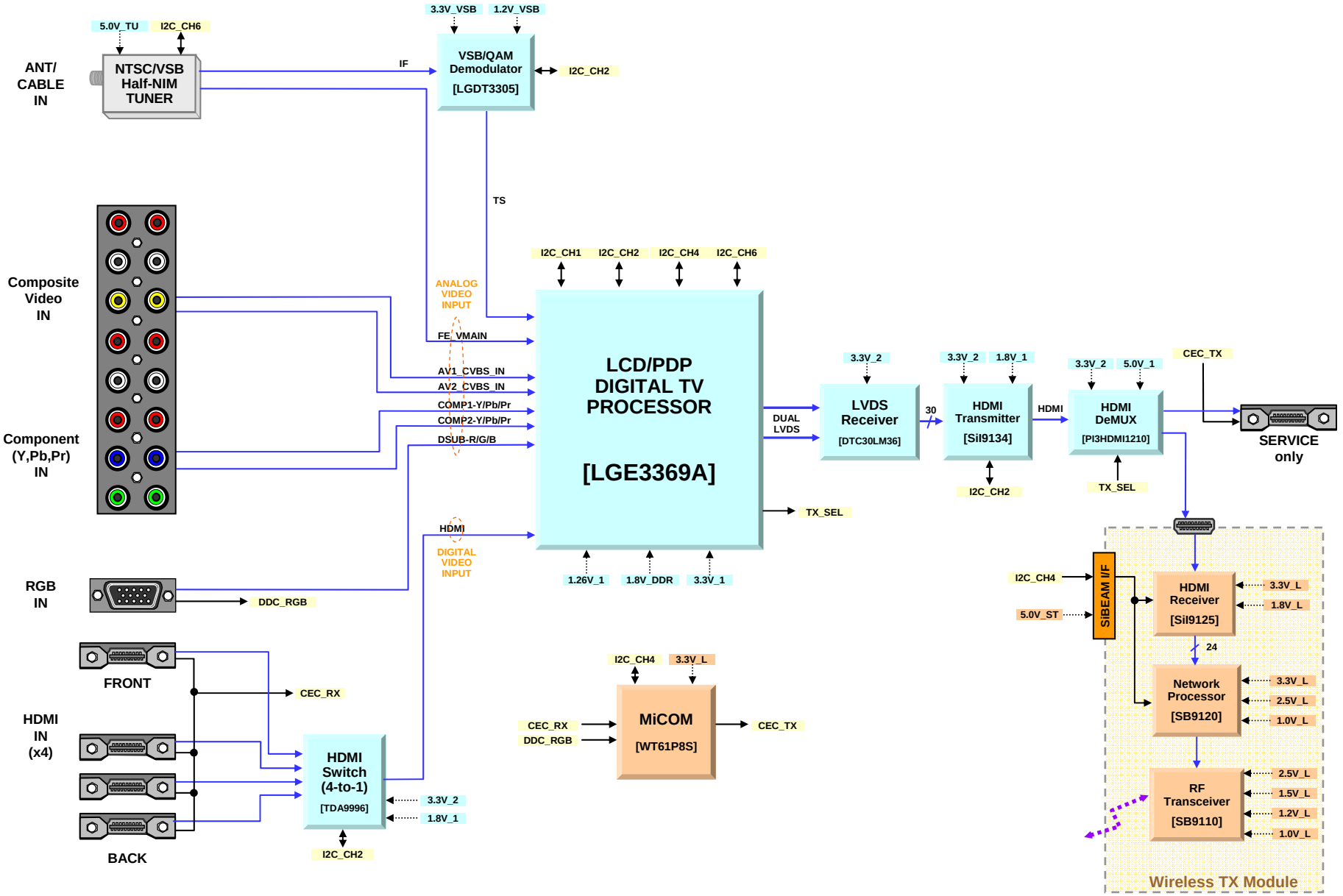
After pairing, Antenna search and set the wireless path by LRP and then send video & audio data to HRP channel.

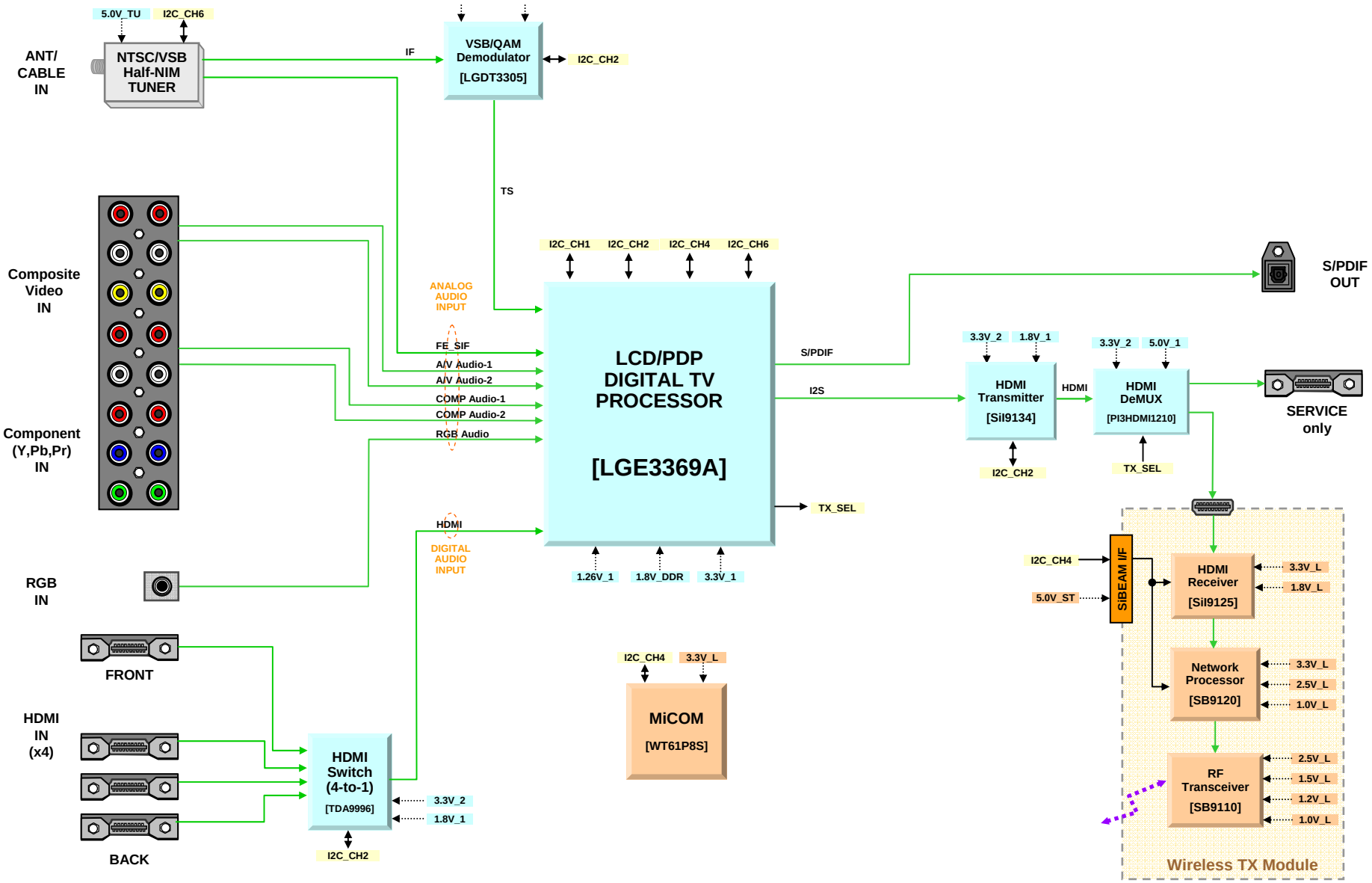

DDR2 (1Gb)
NVRAM 24C512
DDR2(512Mb)
KIA7427F
Reset
S-Flash (32Mb)
NAND-Flash (512Mb)
X100 X-tal(12㎒)
LGE3159GV S5
LGE7329 Ursa
FHD 120HZ
MODULE
MCLK
NTP3100L (D-AMP)
I2S
I2C
NOT FOR USER
Connect to Rx b/d
For wireless
HDMI5
For wired & wide use
HDMI CABLE
EEPROM
USB
RS-232
Only for service
24C16
WT61P8 Micom
IR & Local KEY
X900 X-tal(24㎒)
5.0V
8p wafer
HDMI Transmitter [Sil9134]
3.3V_L
1.8V_L
24
MICOM [PIC32]
Network Processor [SB9121]
3.3V_L
2.5V_L
1.0V_L
RF Transceiver [SB9111]
2.5V_L
1.5V_L
1.2V_L
1.0V_L
Wireless RX Module

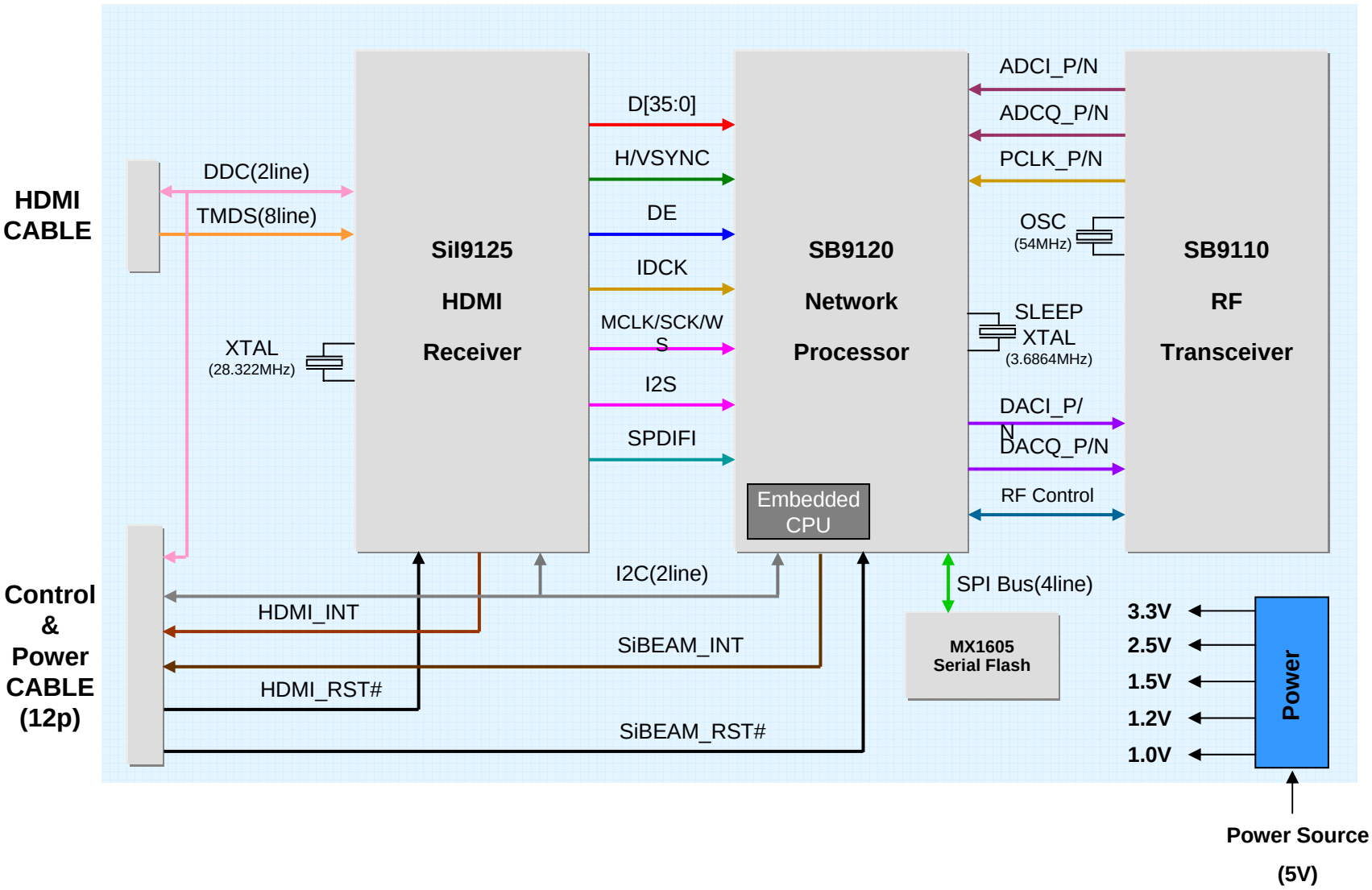
Block Diagram

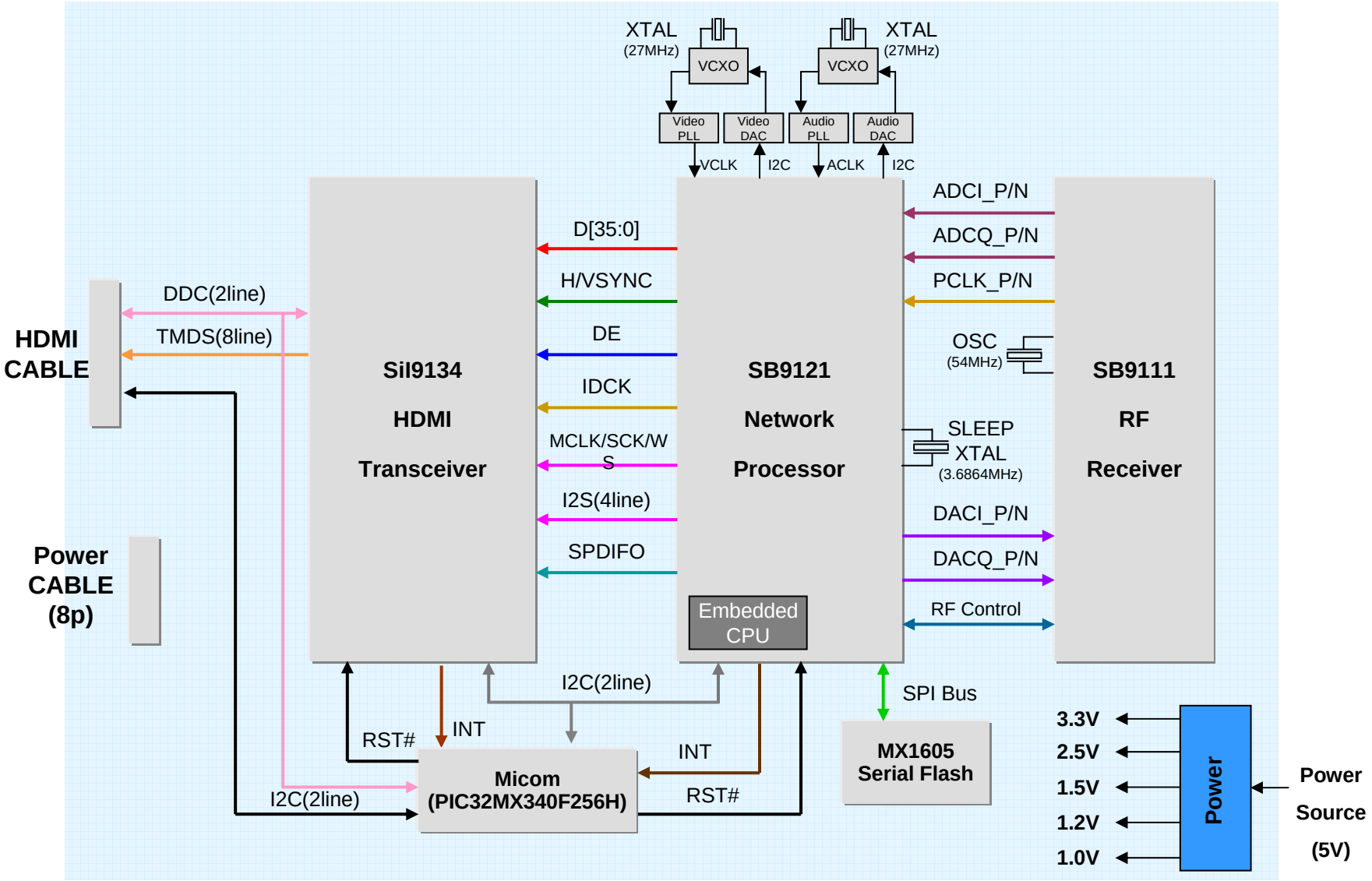
MEDIA-BOX(SIMPLE)

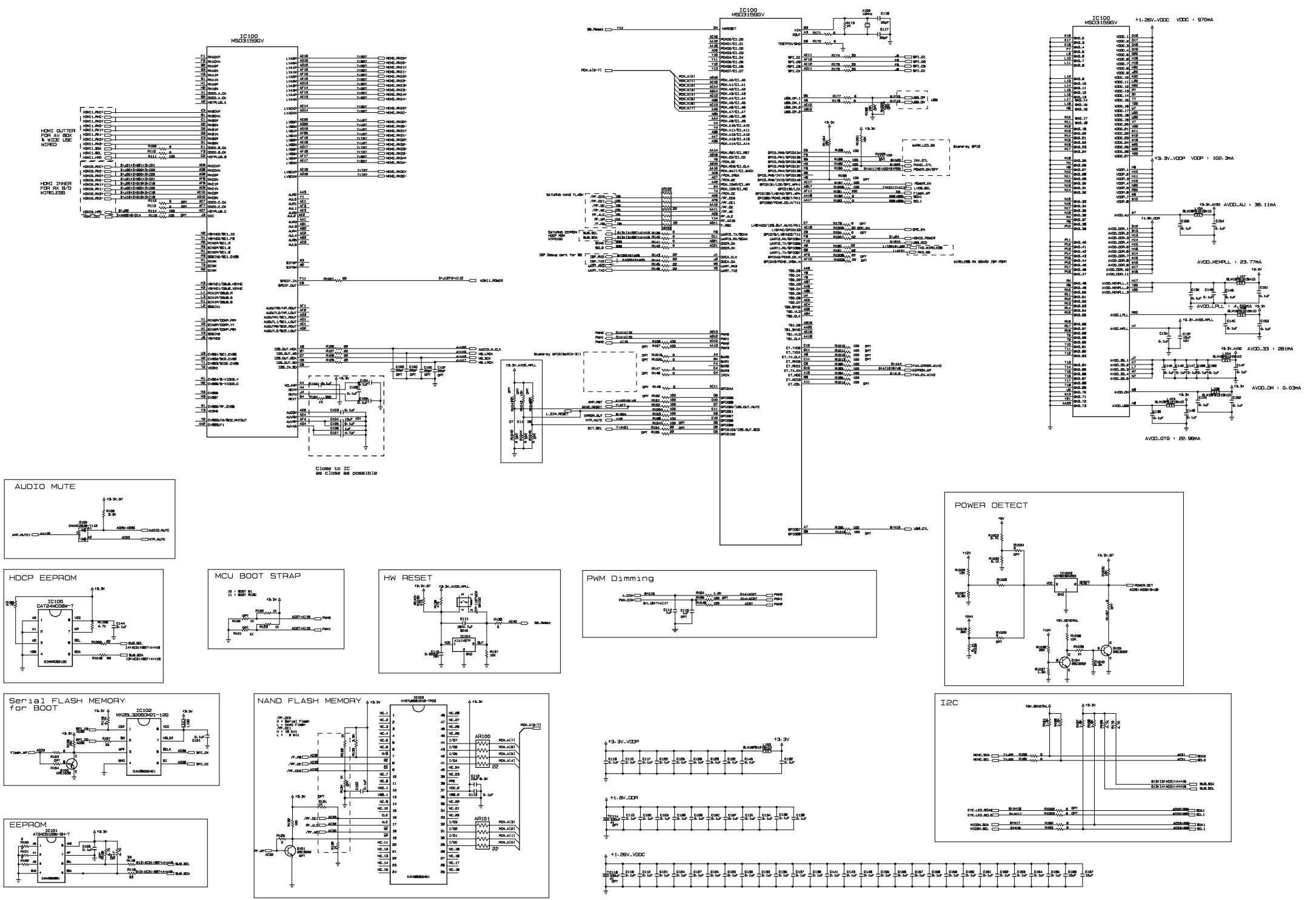



ANT/
CABLE
IN
5.0V_TU
I2C_CH6
NTSC/VSB
Half-NIM
TUNER
IF
3.3V_VSB
1.2V_VSB
VSB/QAM
Demodulator
[LGDT3305]
I2C_CH2
TS
Composite
Video
IN
Component
(Y,Pb,Pr)
IN
I2C_CH1
I2C_CH2
I2C_CH4
I2C_CH6
ANALOG
VIDEO
INPUT
FE_VMAIN
AV1_CVBS_IN
AV2_CVBS_IN
COMP1-Y/Pb/Pr
COMP2-Y/Pb/Pr
DSUB-R/G/B
LCD/PDP
DIGITAL TV
PROCESSOR
[LGE3369A]
DUAL
LVDS
TX_SEL
1.26V_1
1.8V_DDR
3.3V_1
3.3V_2
LVDS
Receiver
[DTC30LM36]
30
3.3V_2
1.8V_1
HDMI
Transmitter
[Sil9134]
I2C_CH2
HDMI
3.3V_2
5.0V_1
HDMI
DeMUX
[PI3HDMI1210]
TX_SEL
CEC_TX
SERVICE
only
RGB
IN
DDC_RGB
HDMI
DIGITAL
VIDEO
INPUT
HDMI
IN
(x4)
FRONT
BACK
CEC_RX
HDMI
Switch
(4-to-1)
[TDA9996]
3.3V_2
1.8V_1
I2C_CH2
I2C_CH4
3.3V_L
CEC_RX
DDC_RGB
MiCOM
[WT61P8S]
CEC_TX
I2C_CH4
5.0V_ST
SiBEAM I/F
HDMI
Receiver
[Sil9125]
3.3V_L
1.8V_L
24
Network
Processor
[SB9120]
3.3V_L
2.5V_L
1.0V_L
RF
Transceiver
[SB9110]
2.5V_L
1.5V_L
1.2V_L
1.0V_L
Wireless TX Module


5.0V_TU
I2C_CH6
ANT/
CABLE
IN
NTSC/VSB
Half-NIM
TUNER
IF
VSB/QAM
Demodulator
[LGDT3305]
I2C_CH2
TS
I2C_CH1
I2C_CH2
I2C_CH4
I2C_CH6
Composite
Video
IN
Component
(Y,Pb,Pr)
IN
ANALOG
AUDIO
INPUT
FE_SIF
A/V Audio-1
A/V Audio-2
COMP Audio-1
COMP Audio-2
RGB Audio
HDMI
DIGITAL
AUDIO
INPUT
LCD/PDP
DIGITAL TV
PROCESSOR
[LGE3369A]
1.26V_1
1.8V_DDR
3.3V_1
S/PDIF
I2S
TX_SEL
S/PDIF
OUT
3.3V_2
1.8V_1
HDMI
Transmitter
[Sil9134]
I2C_CH2
HDMI
3.3V_2
5.0V_1
HDMI
DeMUX
[PI3HDMI1210]
TX_SEL
SERVICE
only
RGB
IN
FRONT
HDMI
IN
(x4)
BACK
HDMI
Switch
(4-to-1)
[TDA9996]
3.3V_2
1.8V_1
I2C_CH2
I2C_CH4
3.3V_L
MiCOM
[WT61P8S]
I2C_CH4
5.0V_ST
SiBEAM I/F
HDMI
Receiver
[Sil9125]
3.3V_L
1.8V_L
Network
Processor
[SB9120]
3.3V_L
2.5V_L
1.0V_L
RF
Transceiver
[SB9110]
2.5V_L
1.5V_L
1.2V_L
1.0V_L
Wireless TX Module


HDMI CABLE
DDC(2line)
TMDS(8line)
XTAL
(28.322MHz)
Sil9125
HDMI
Receiver
D[35:0]
H/VSYNC
DE
IDCK
MCLK/SCK/WS
I2S
SPDIFI
SB9120
Network
Processor
Embedded CPU
ADCI_P/N
ADCQ_P/N
PCLK_P/N
OSC
(54MHz)
SLEEP
XTAL
(3.6864MHz)
DACI_P/N
DACQ_P/N
RF Control
SB9110
RF
Transceiver
SPI Bus(4line)
MX1605
Serial Flash
I2C(2line)
HDMI_INT
SiBEAM_INT
HDMI_RST#
SiBEAM_RST#
Control & Power CABLE (12p)
3.3V
2.5V
1.5V
1.2V
1.0V
Power
Power Source
(5V)


XTAL
(27MHz)
VCXO
XTAL
(27MHz)
VCXO
Video PLL
Video DAC
Audio PLL
Audio DAC
VCLK
I2C
ACLK
I2C
HDMI CABLE
DDC(2line)
TMDS(8line)
Sil9134
HDMI
Transceiver
D[35:0]
H/VSYNC
DE
IDCK
MCLK/SCK/WS
I2S(4line)
SPDIFO
SB9121
Network
Processor
Embedded CPU
ADCI_P/N
ADCQ_P/N
PCLK_P/N
OSC
(54MHz)
SLEEP
XTAL
(3.6864MHz)
DACI_P/N
DACQ_P/N
RF Control
SB9111
RF
Receiver
Power CABLE (8p)
I2C(2line)
RST#
INT
Micom
(PIC32MX340F256H)
INT
RST#
I2C(2line)
SPI Bus
MX1605
Serial Flash
3.3V
2.5V
1.5V
1.2V
1.0V
Power
Power Source (5V)

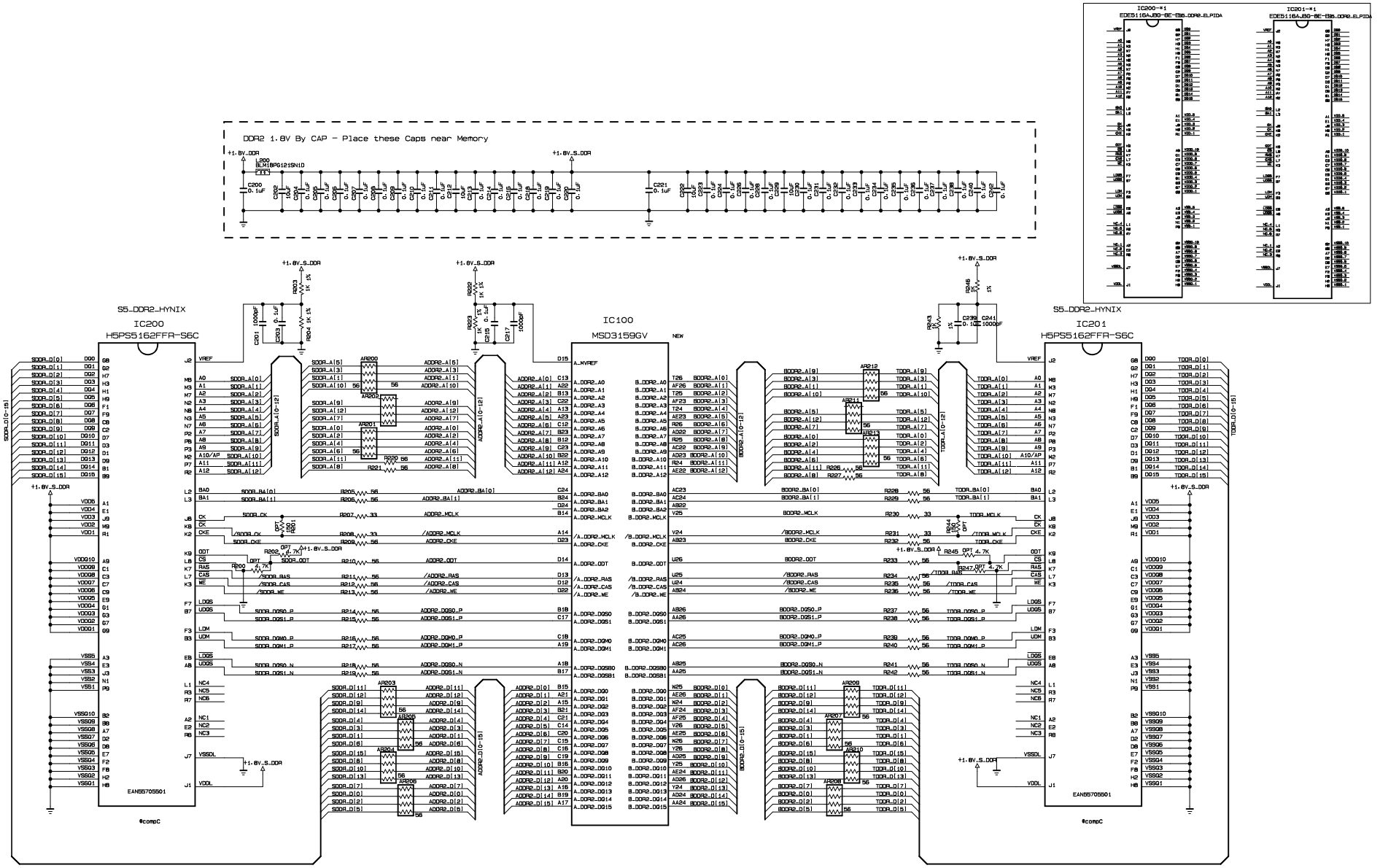


THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

SECRET
LGElectronics

LG ELECTRONICS

MODEL	JUPITER	DATE	
BLOCK	MAIN IC	SHEET	1 / 10



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.

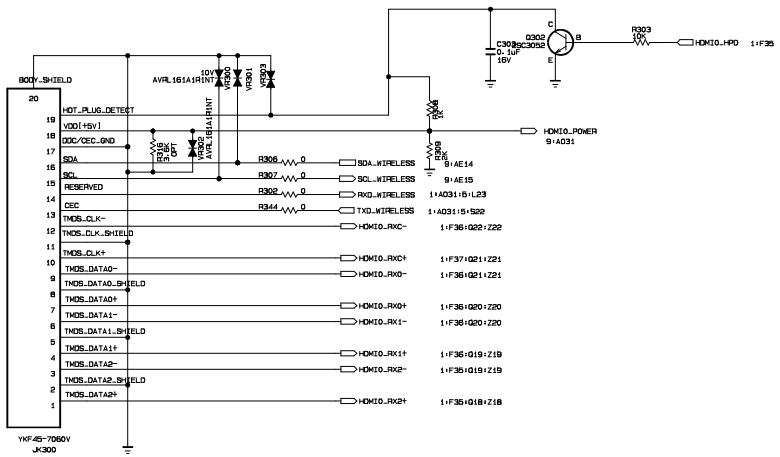
SECRET

LGElectronics

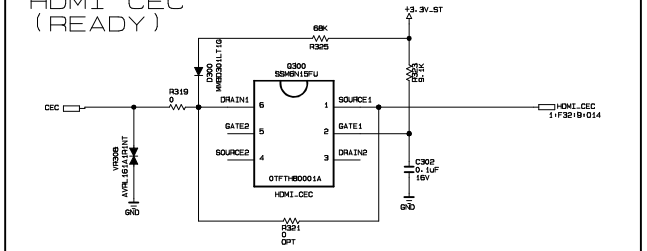
LG ELECTRONICS

MODEL	JUNO/JUPITER	DATE	
BLOCK	MAIN DDR2	SHEET	2 / 8

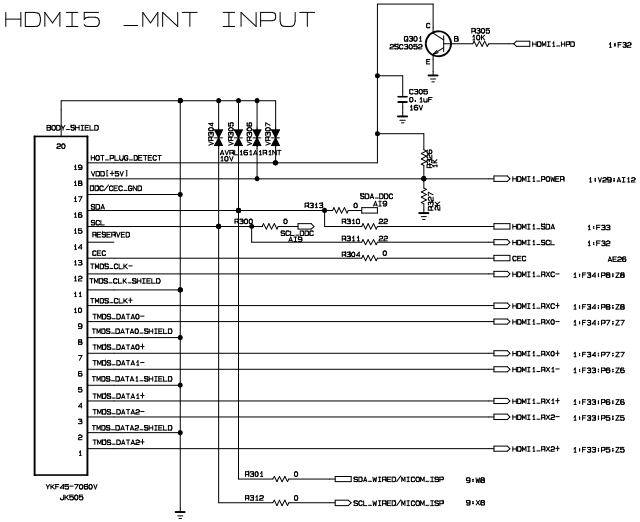
HDMI0 (ONLY FOR INNER RX BOARD)



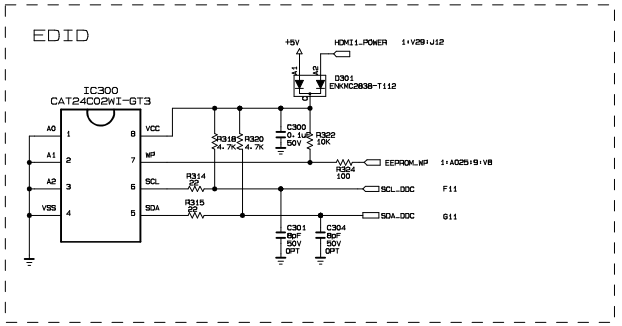
HDMI CEC (READY)



HDMI5 _MNT INPUT



EDID



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.

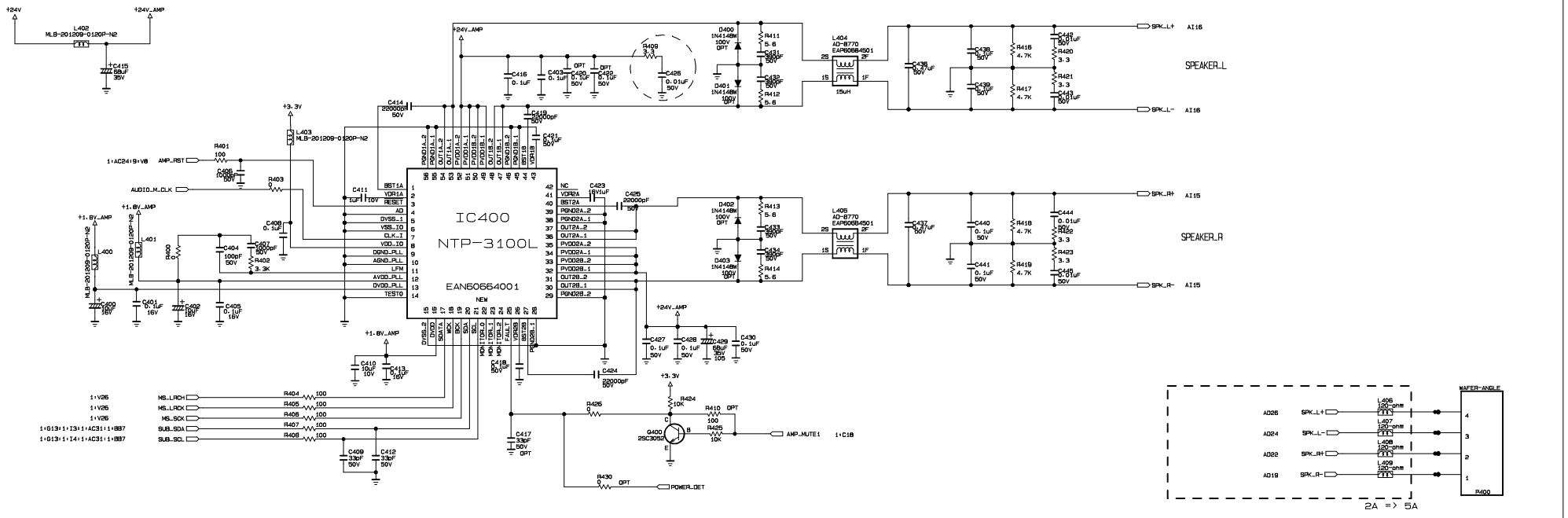
SECRET

LGElectronics

LG ELECTRONICS

MODEL	JUPITER	DATE	
BLOCK	HDMI	SHEET	3 / 10

AUDIO AMP



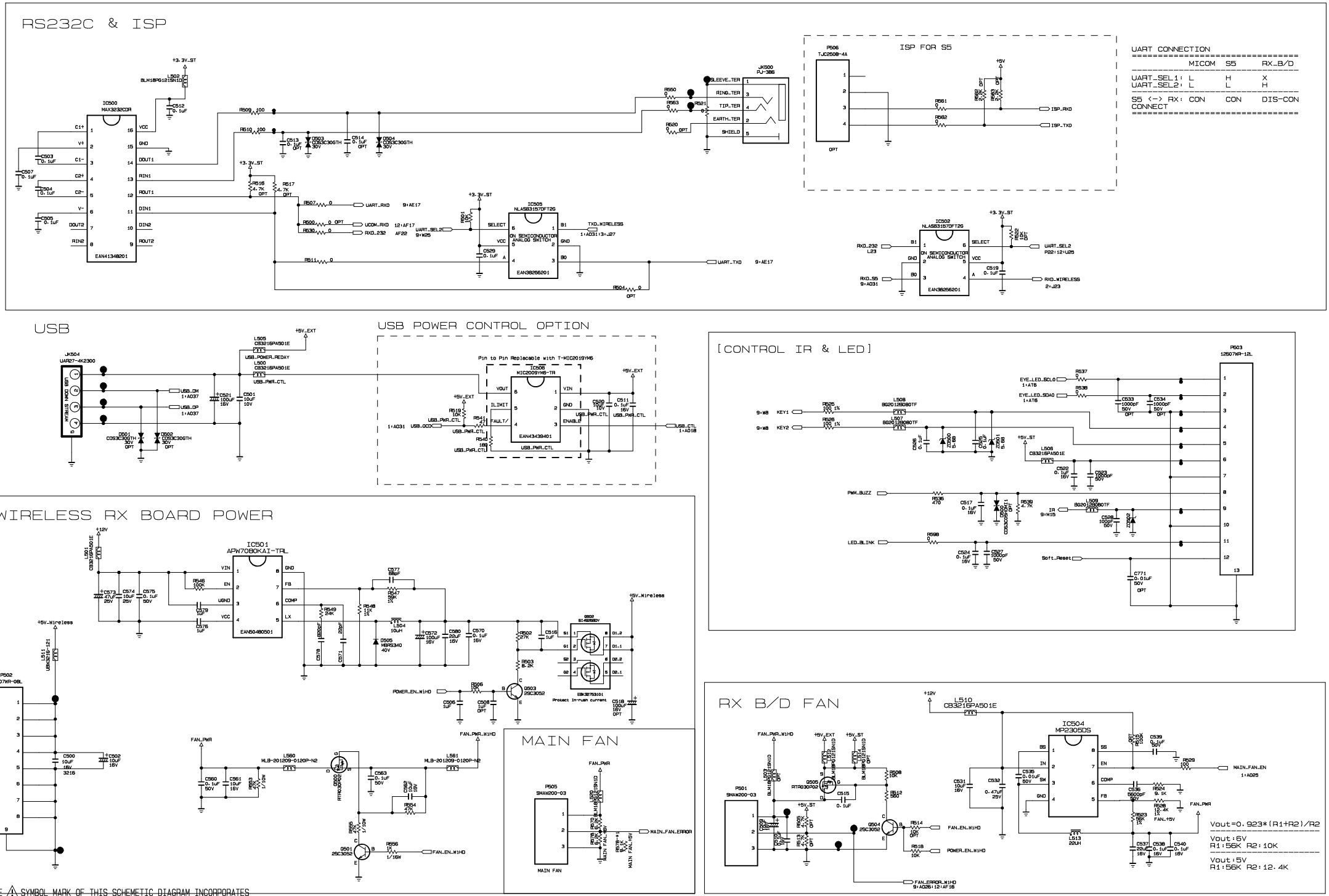
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

SECRET

LGElectronics

LG ELECTRONICS

MODEL	JUPITER	DATE	
BLOCK	Audio Amp	SHEET	4 / 10



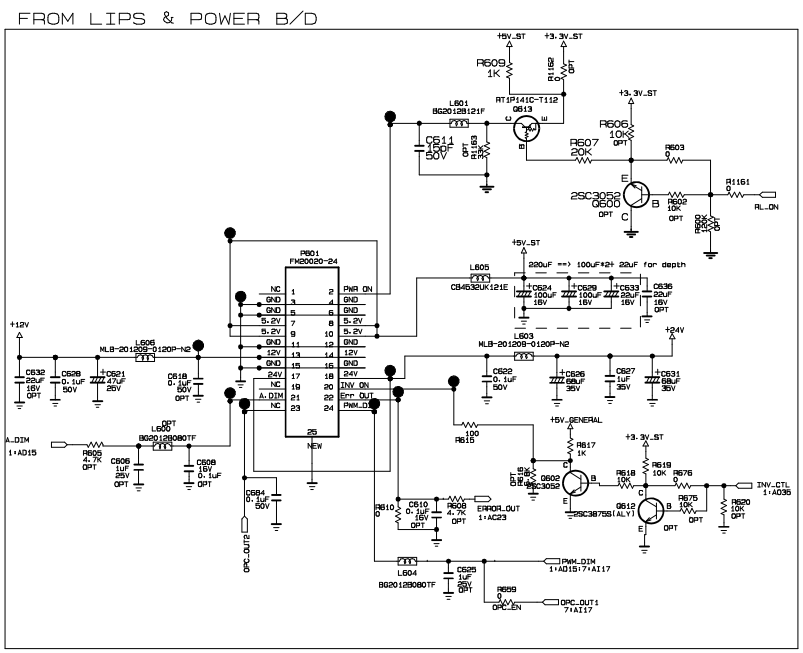
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

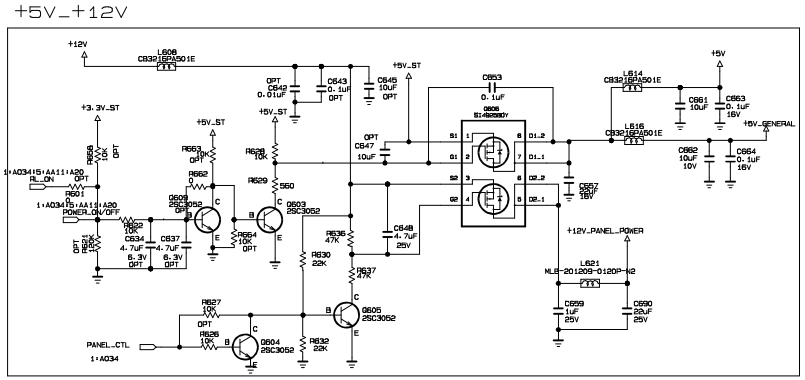
SECRET

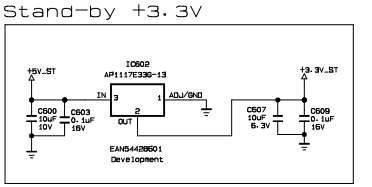
LGElectronics

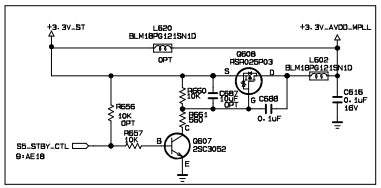
LG ELECTRONICS

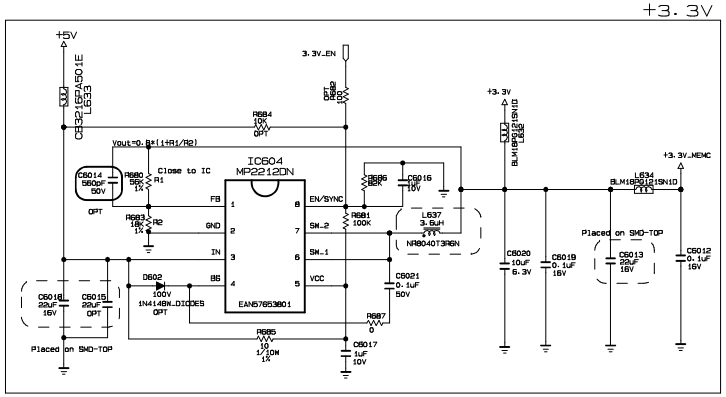
MODEL	JUPITER	DATE	
BLOCK	CONTROL	SHEET	5 / 10

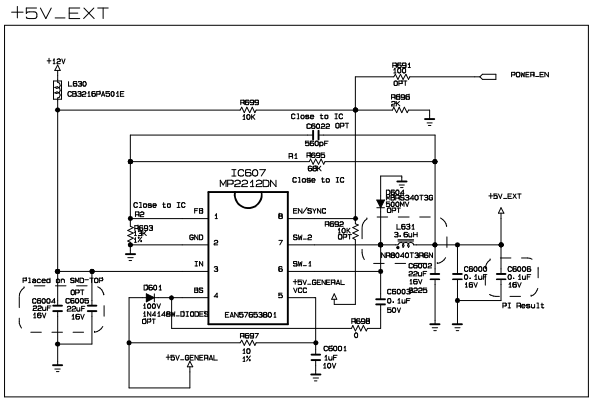


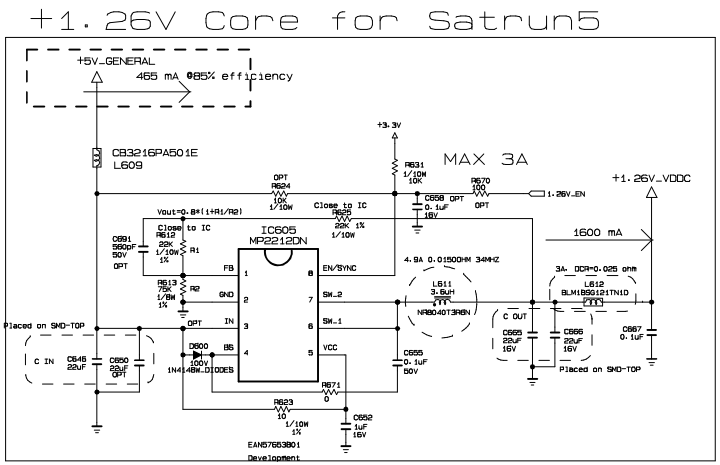


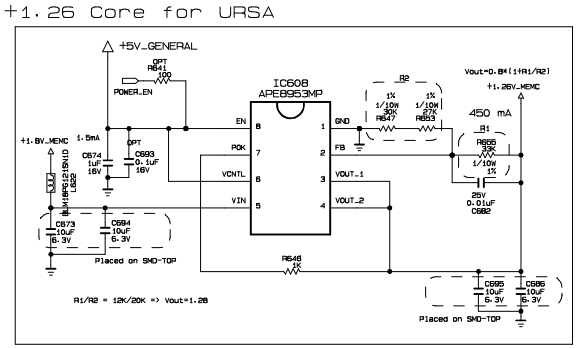


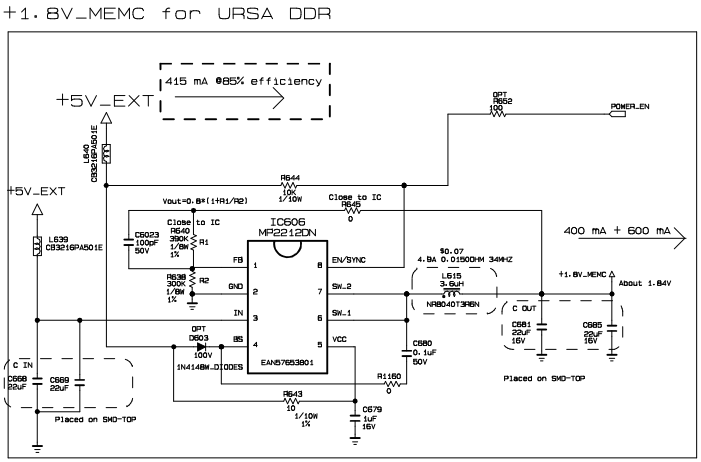


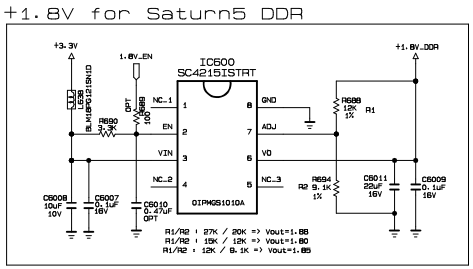


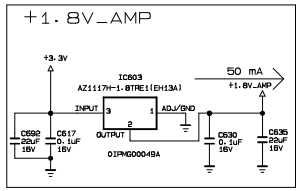


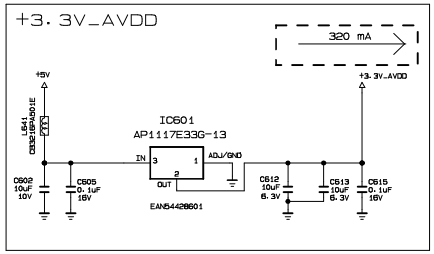












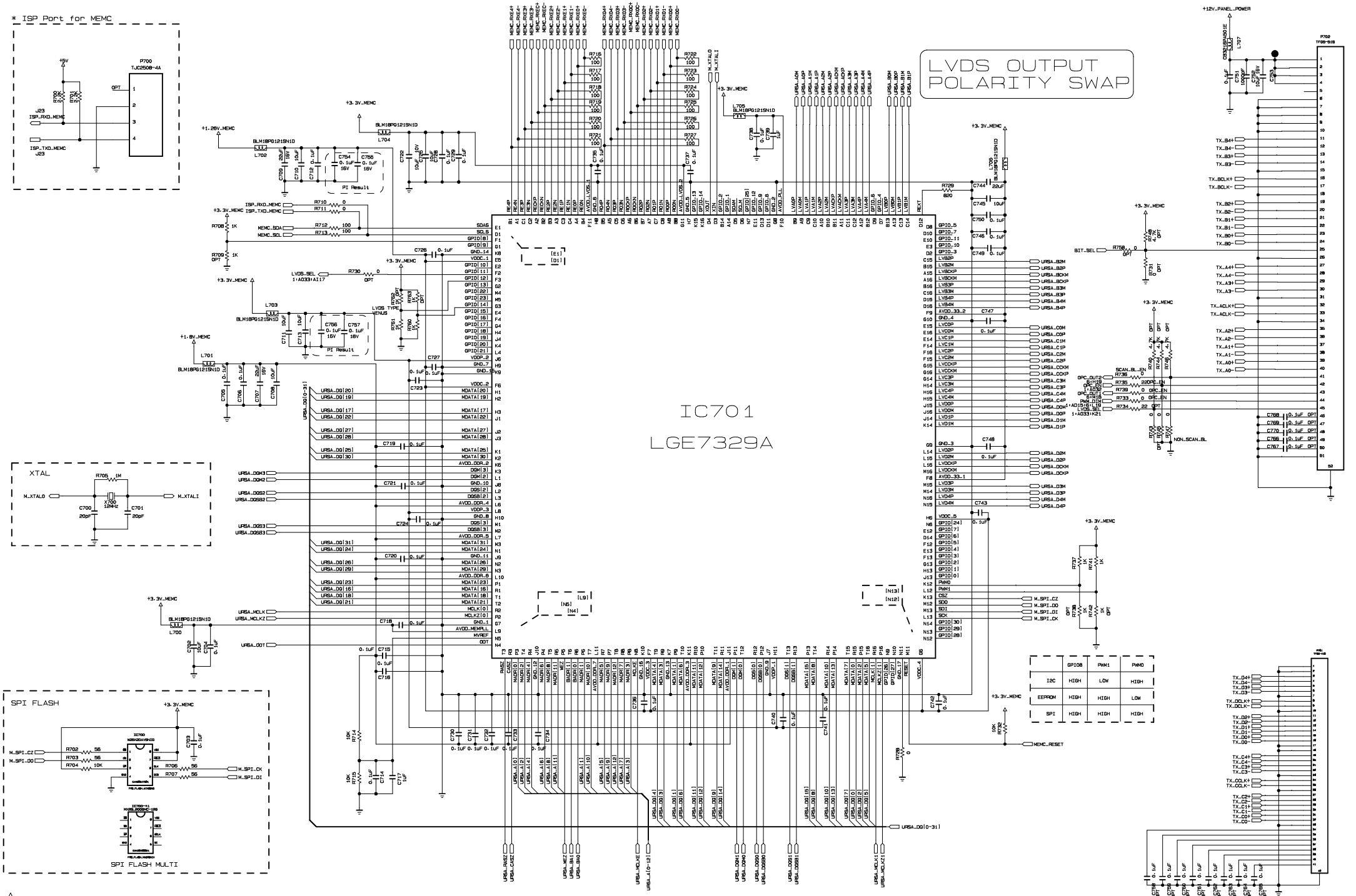
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

SECRET

LGElectronics

LG ELECTRONICS

MODEL	JUPITER	DATE	
BLOCK	Power	SHEET	6 / 10



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.

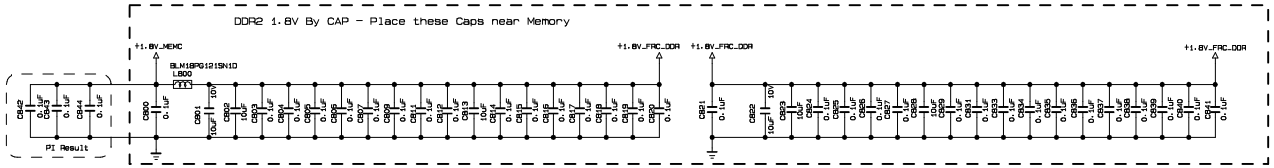
SECRET

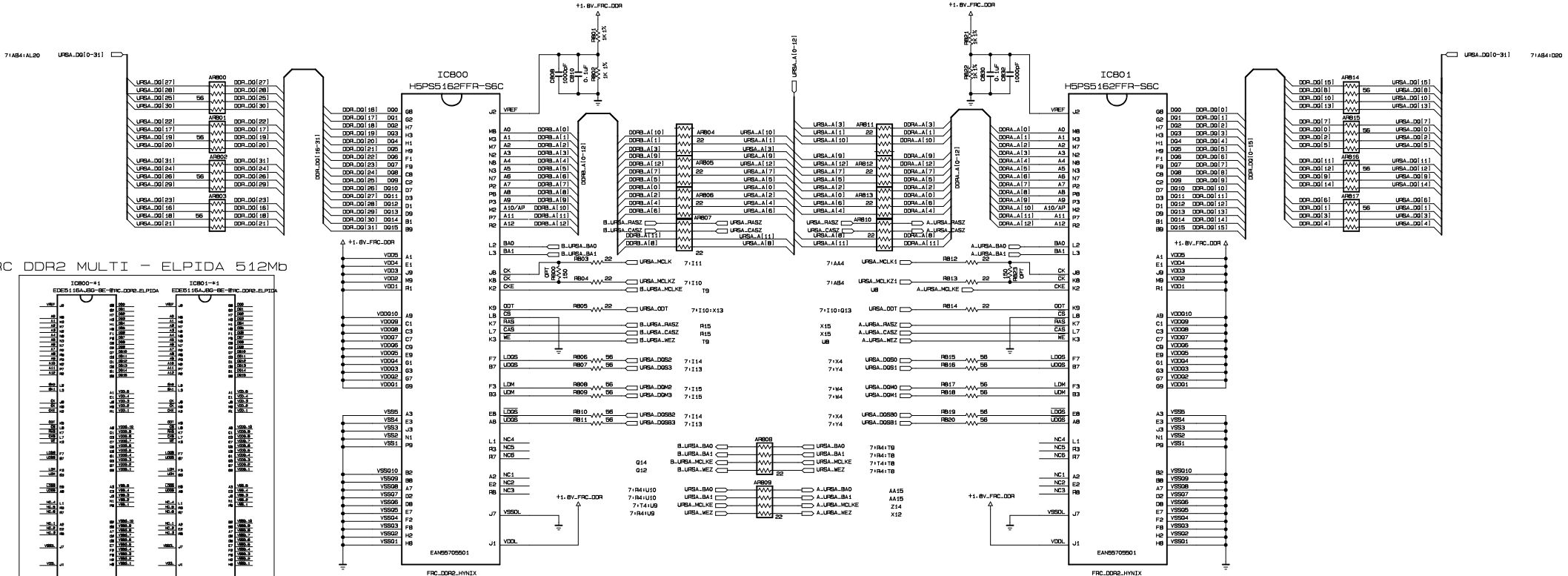
LGElectronics

LG ELECTRONICS

MODEL	JUPITER	DATE	
BLOCK	MST7323S(FRC)	SHEET	7 / 10

FRC DDR2





FRC DDR2 MULTI - ELPIDA 512Mb

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.

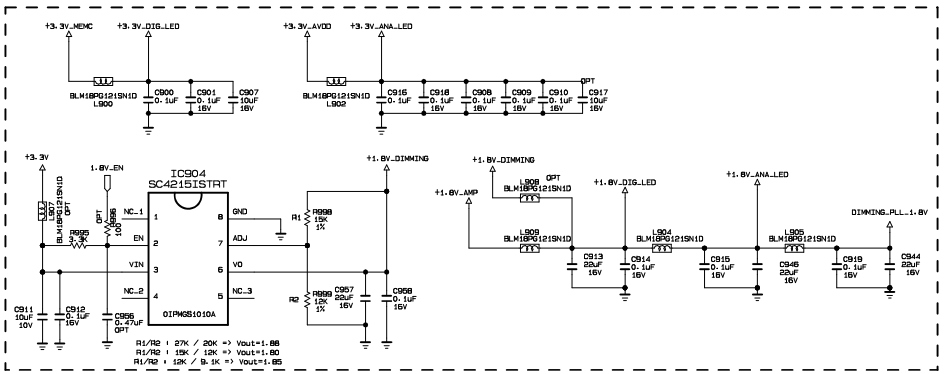
SECRET

LGElectronics

LG ELECTRONICS

MODEL	JUPITER	DATE	
BLOCK	MST7323S DDR2	SHEET	8 / 10

Local Dim



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.

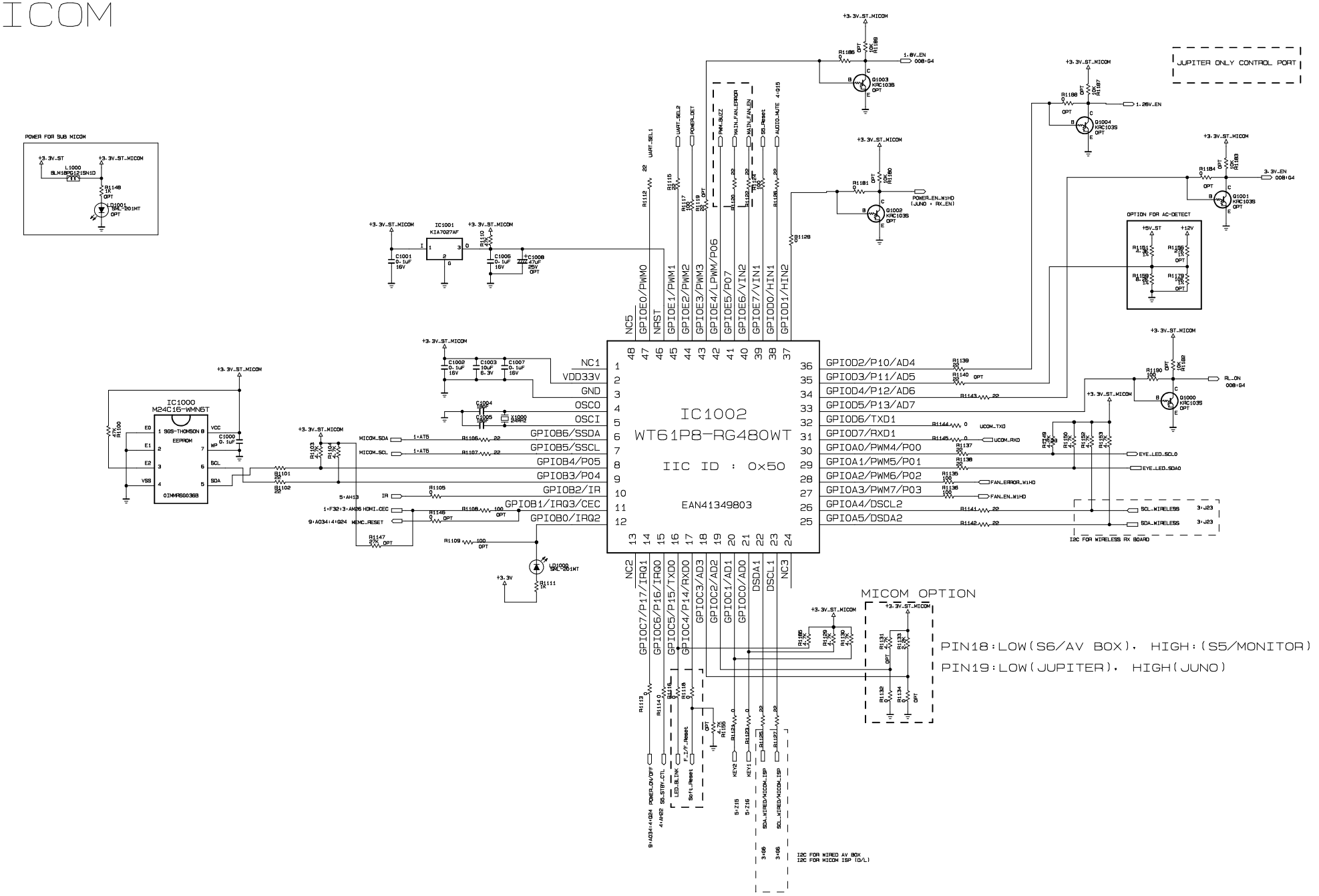
SECRET

LGElectronics

LG ELECTRONICS

MODEL	JUPITER	DATE	
BLOCK	Local Dimming	SHEET	9 / 10

MICOM



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.

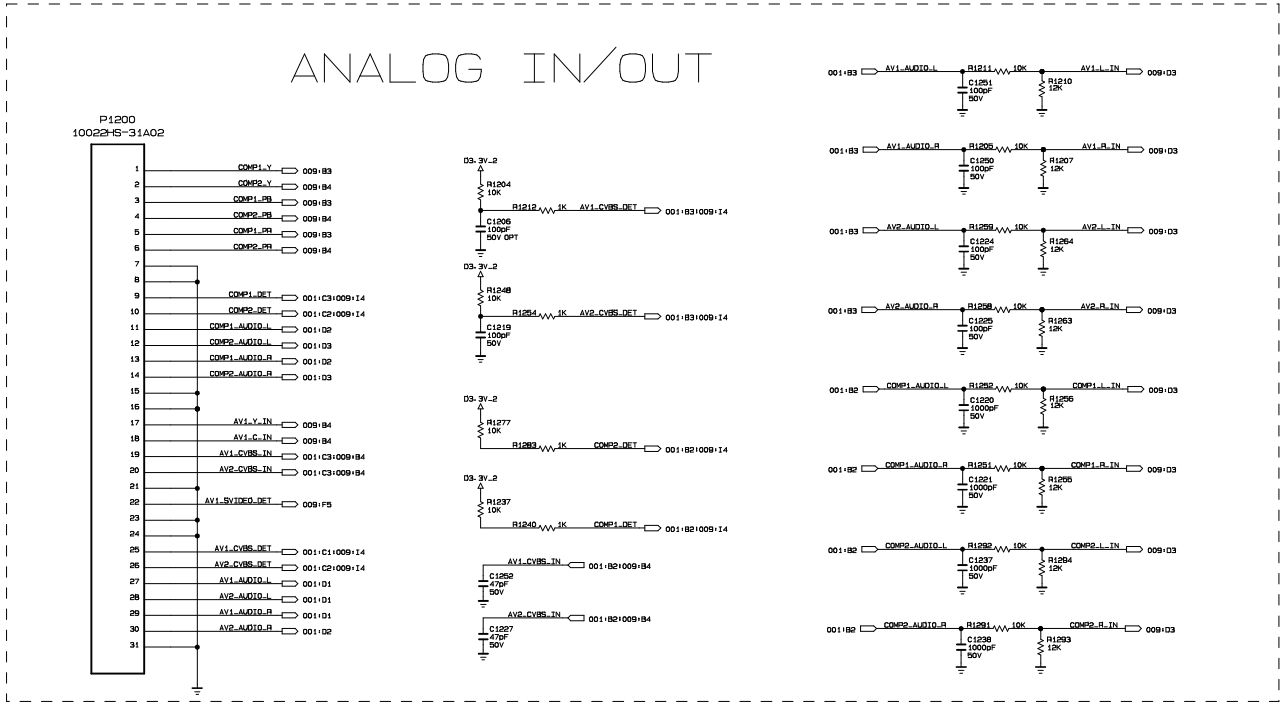
SECRET

LGElectronics

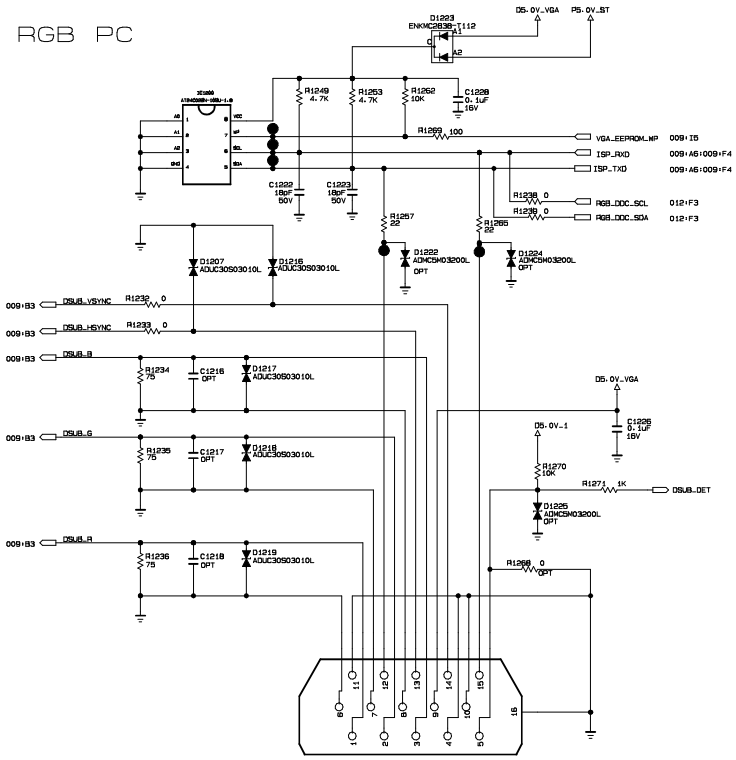
LG ELECTRONICS

MODEL	JUPITER	DATE	
BLOCK	MICOM	SHEET	9 / 9

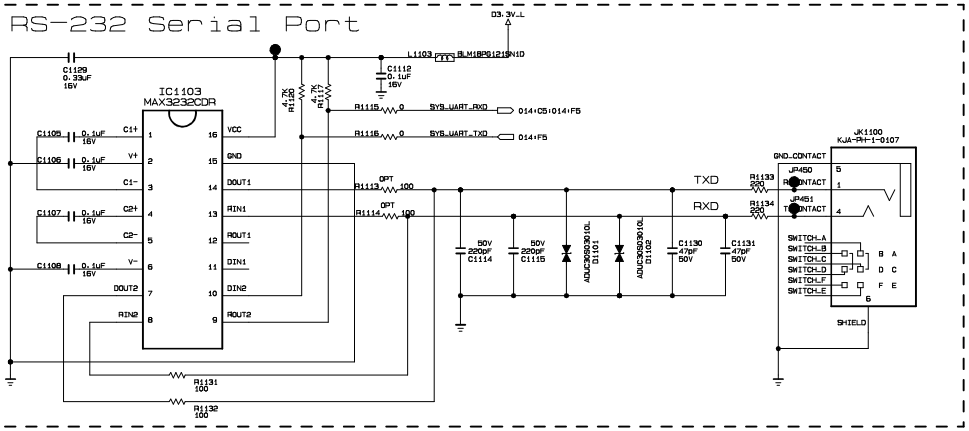
ANALOG IN/OUT



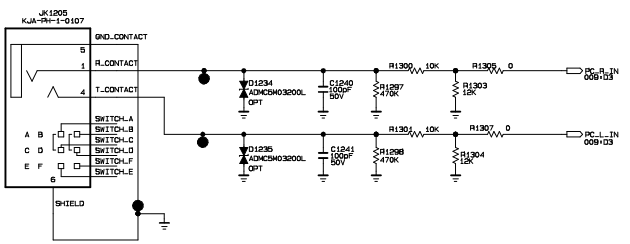
RGB PC



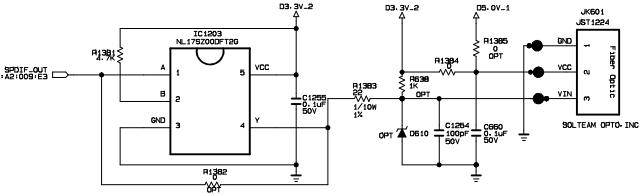
RS-232 Serial Port



PC AUDIO



SPDIF OPTIC JACK



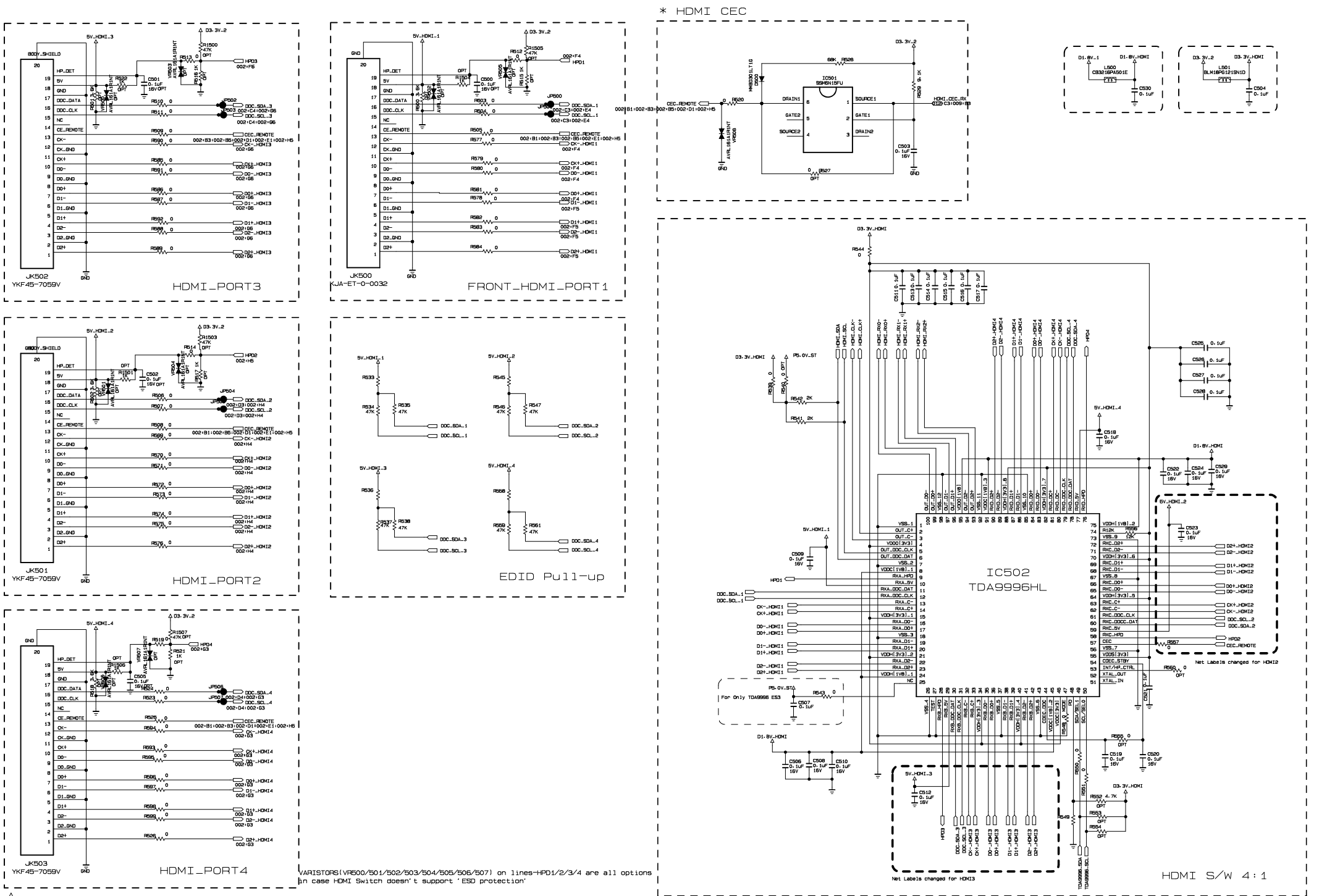
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

SECRET
LGElectronics

DO JAE GEUN

LG ELECTRONICS

MODEL	JUNO-BOX	DATE	09.02.05
BLOCK	IN/OUT	SHEET	01 / 17



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

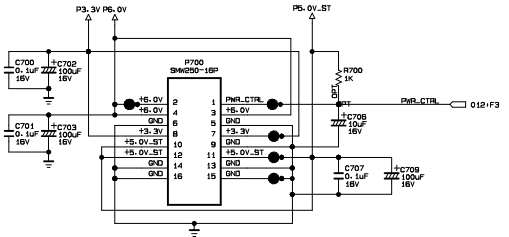
LEE GI YOUNG

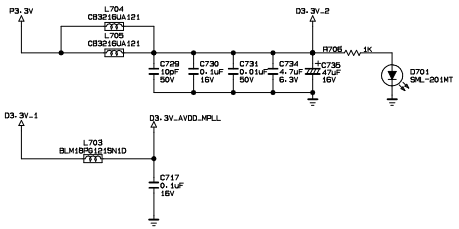
LG ELECTRONICS

MODEL	JUNO-BOX	DATE	09.02.05
BLOCK	HDMI RX	SHEET	02 / 17

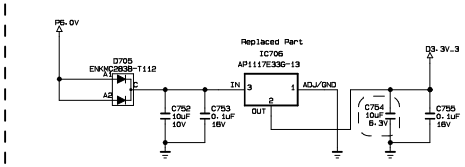
POWER SUPPLY

POWER CONNECTOR

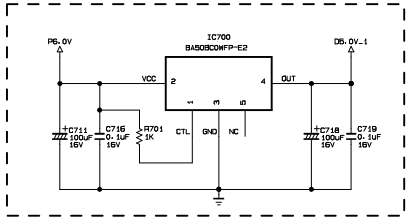




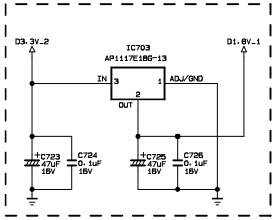
+3.3V For TMDS Switch



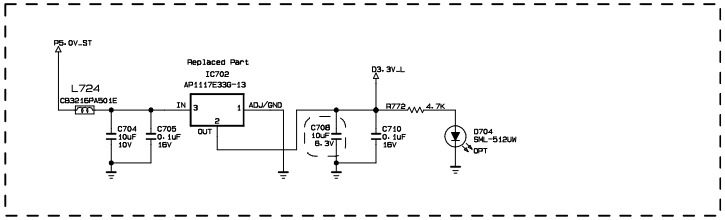
+5.0V For USB & Etc



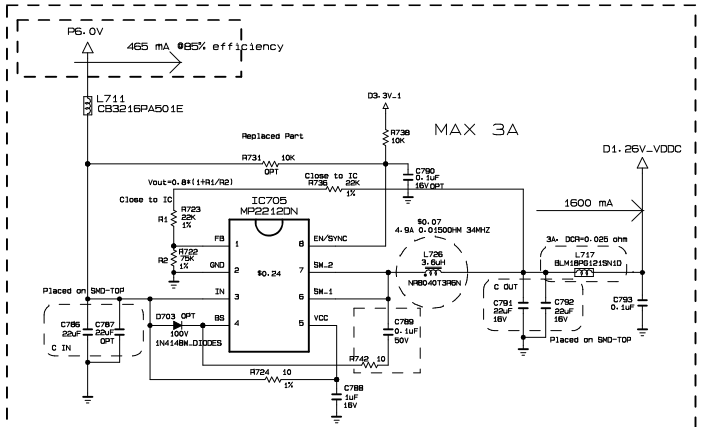
+1.8V For HDMI TX



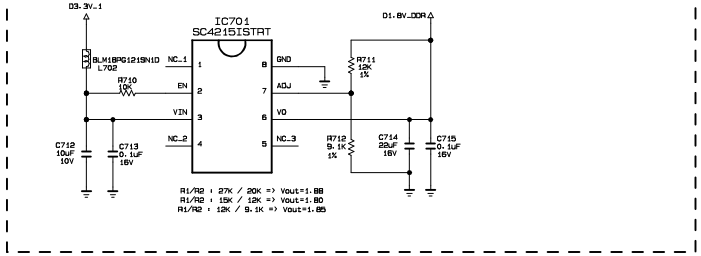
Stand-by +3.3V



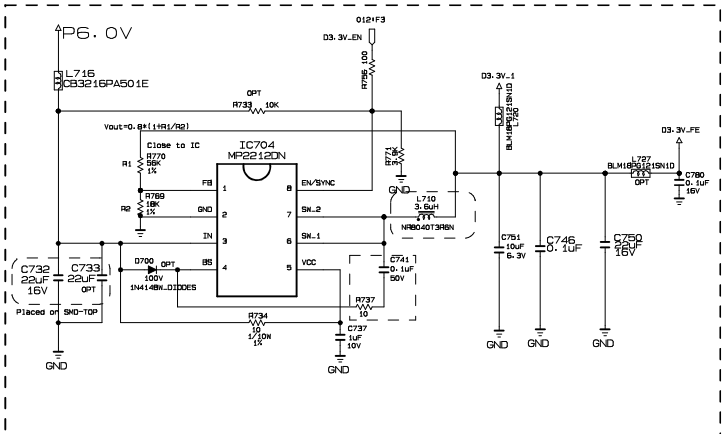
+1.26 Core for Saturn6



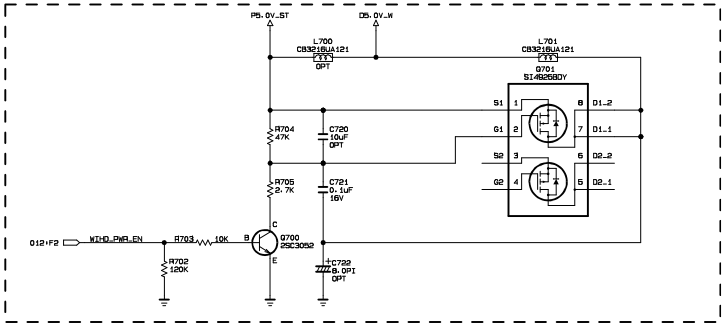
+1.8V for Saturn6 DDR



+3.3V



Switch for +5.0V (WIRELESS)



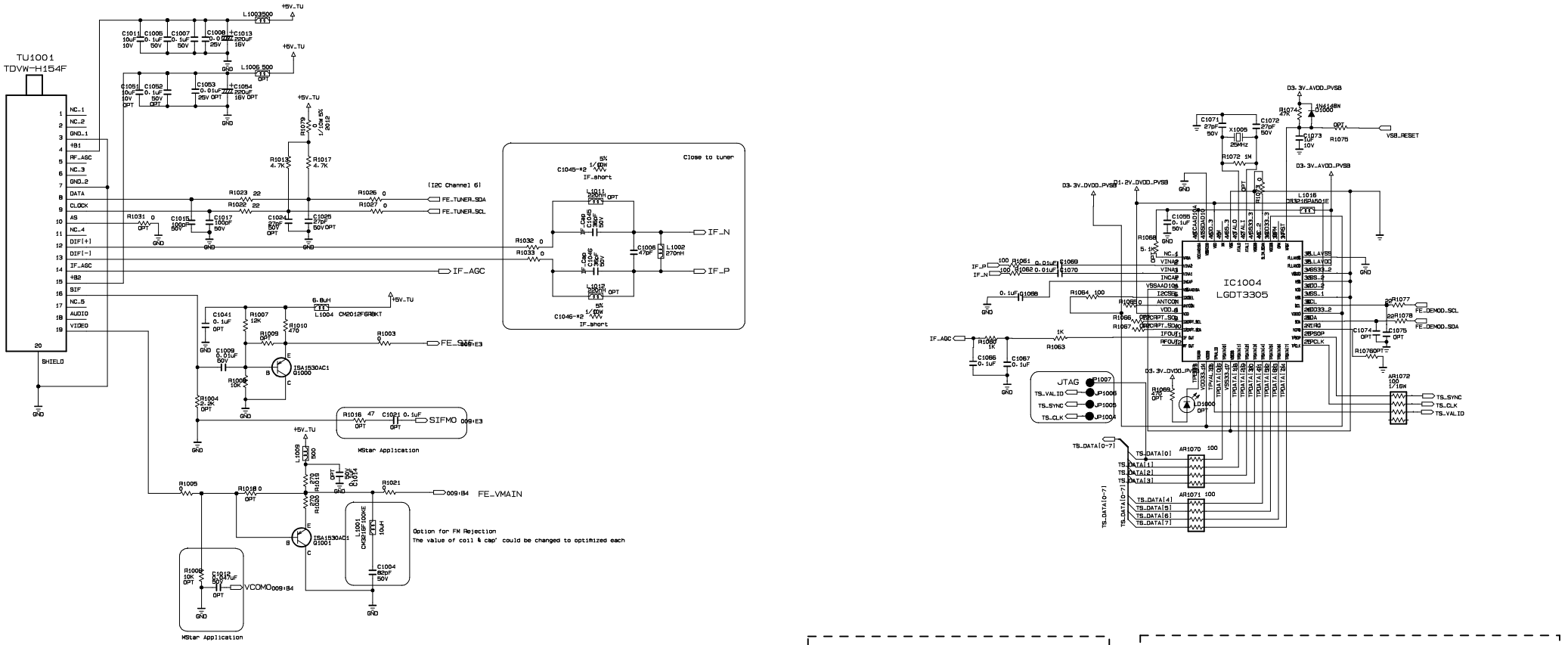
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FILRE AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

SECRET
LGElectronics

AN SO YOUNG

LG ELECTRONICS

MODEL	JUNO-BOX	DATE	09.02.05
BLOCK	POWER	SHEET	04 / 17



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

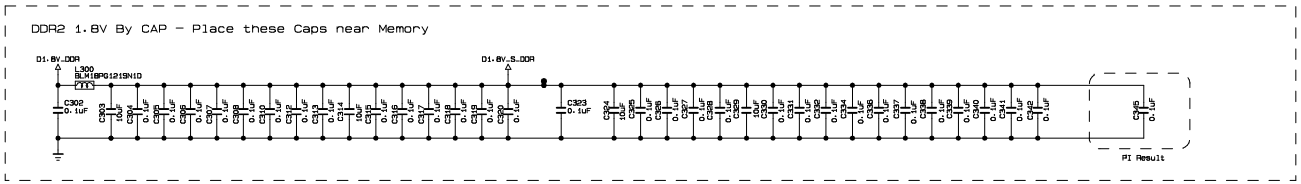
LGElectronics

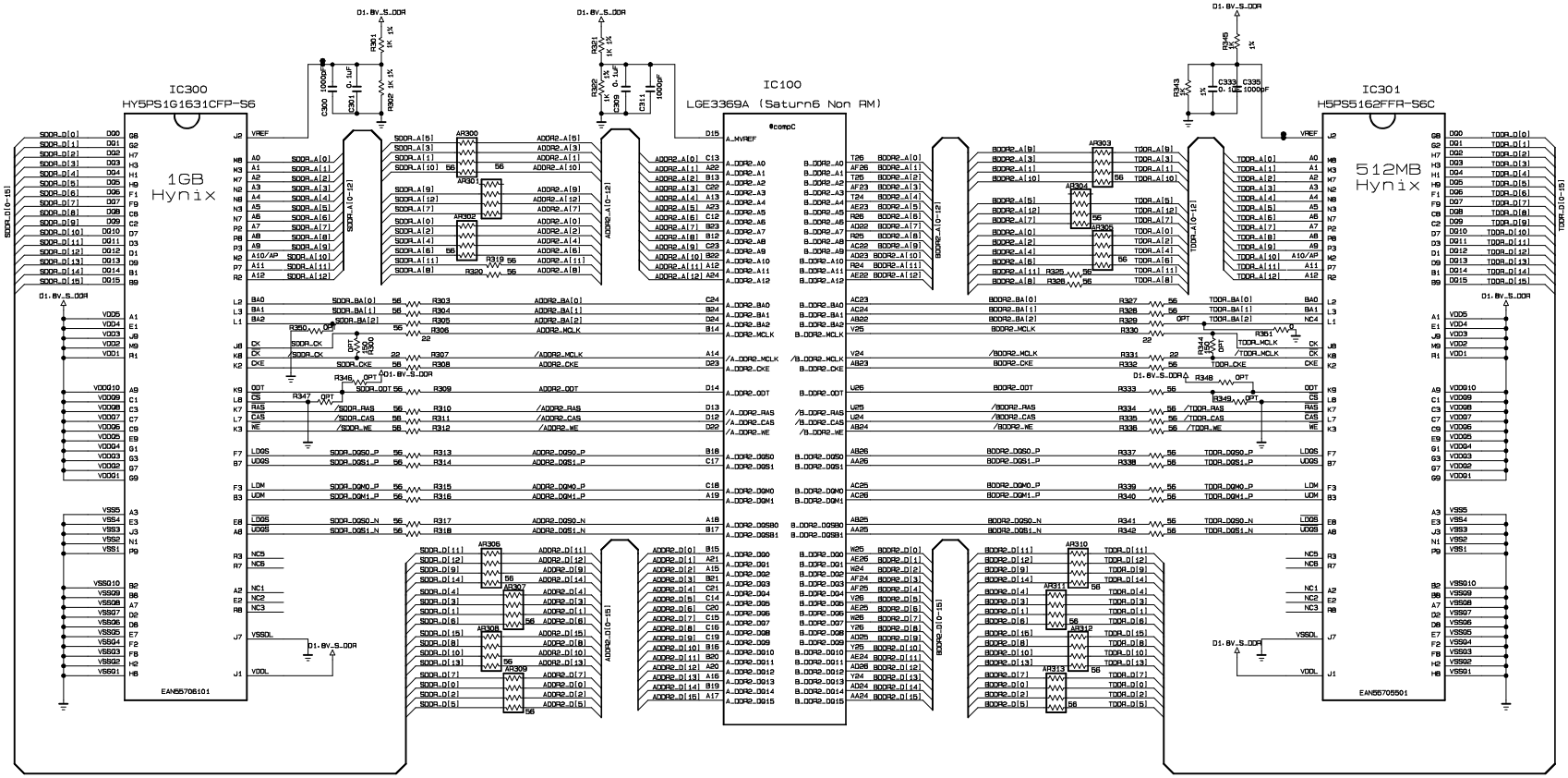
HA JAE MIN

LG ELECTRONICS

MODEL	JUNO-BOX	DATE	09.02.05
BLOCK	TUNER	SHEET	05 / 17

DDR2





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.

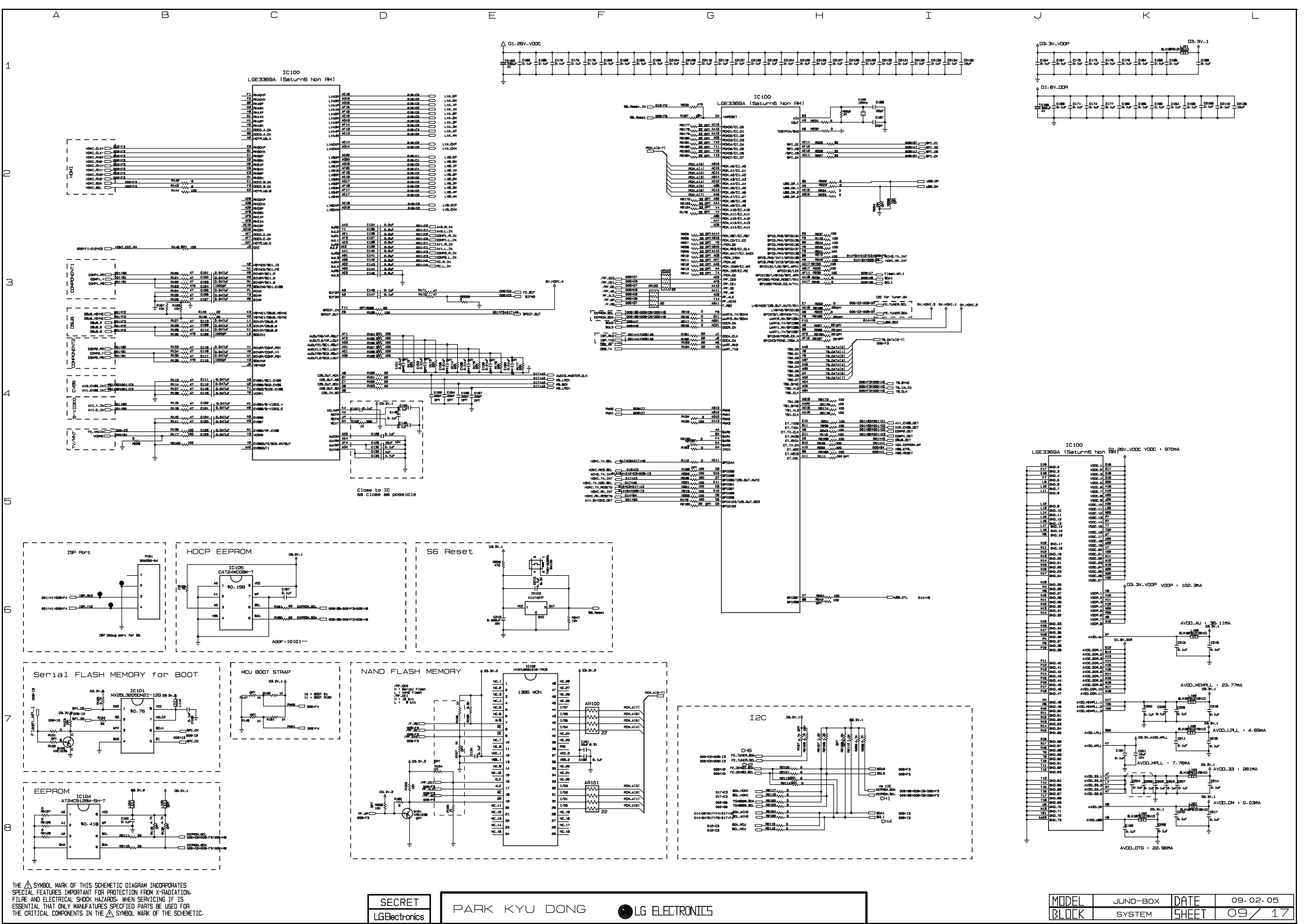
SECRET

LGElectronics

HONG YEON HYUK

LG ELECTRONICS

MODEL	JUNO-BOX	DATE	09.02.05
BLOCK	DDR2	SHEET	06 / 17



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 SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

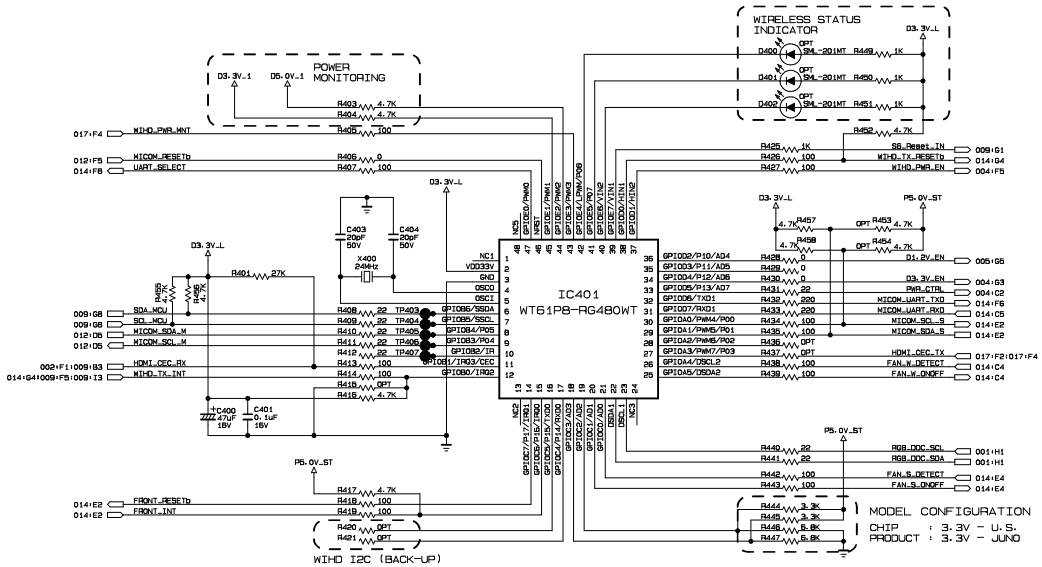
SECRET
LGElectronics

PARK KYU DONG

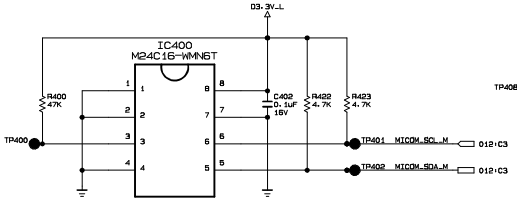
LG ELECTRONICS

MODEL	JUNO-BOX	DATE	09.02.05
BLOCK	SYSTEM	SHEET	09 / 17

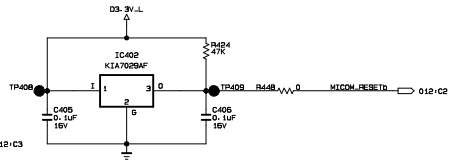
MICRO-CONTROLLER



EEPROM



MICOM RESET



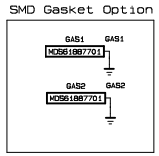
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

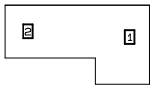
SECRET
LGElectronics

LIM KYOUNG RYUL

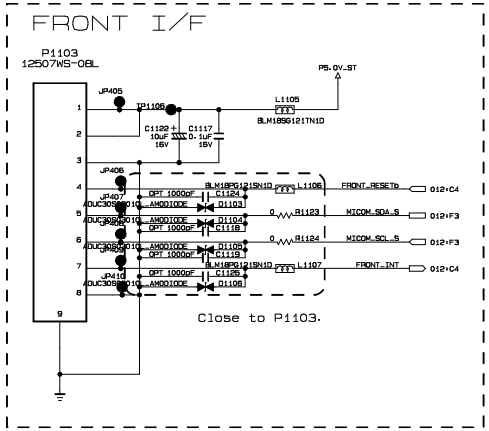
LG ELECTRONICS

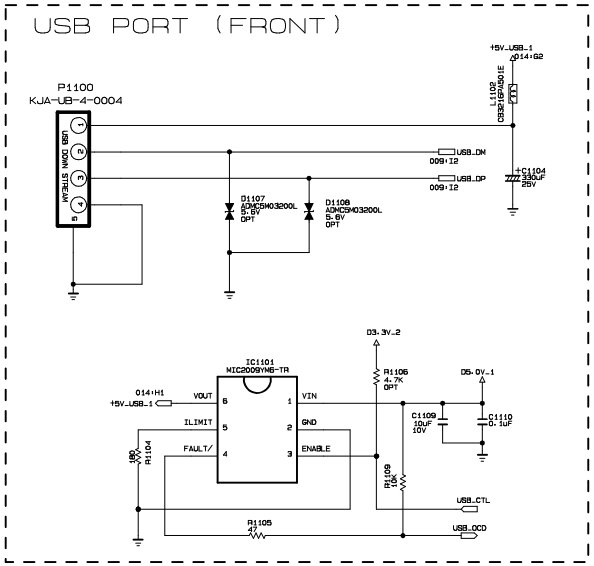
MODEL	JUNO-BOX	DATE	09.02.05
BLOCK	MICOM	SHEET	12 / 17

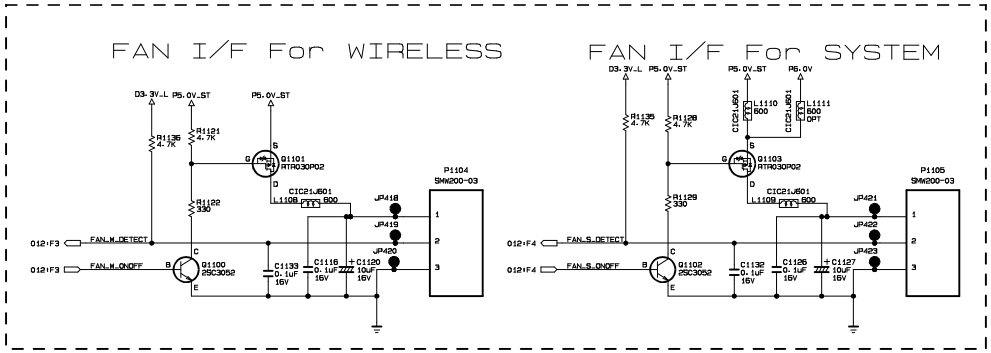


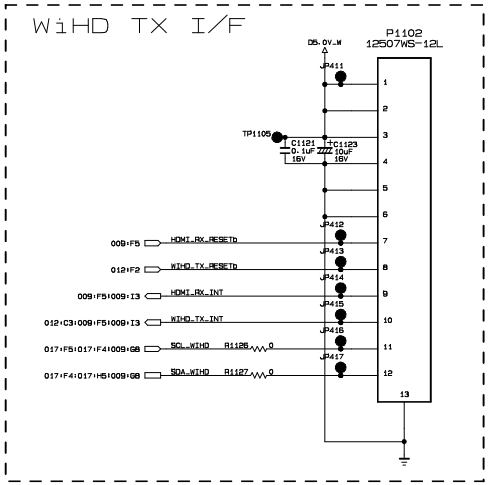


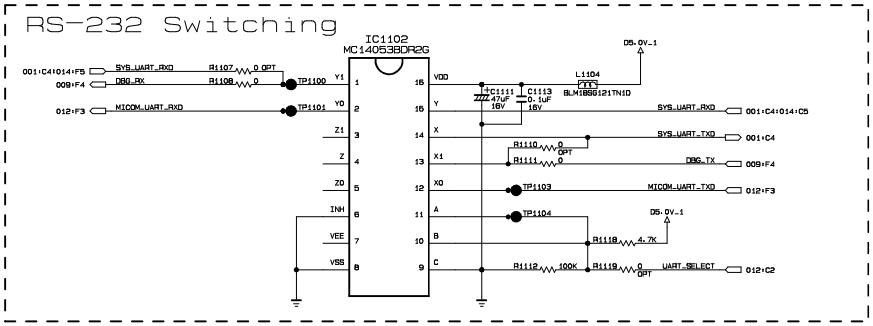
1. Bottom of P1105
2. Between under of JK801 and IC1001











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

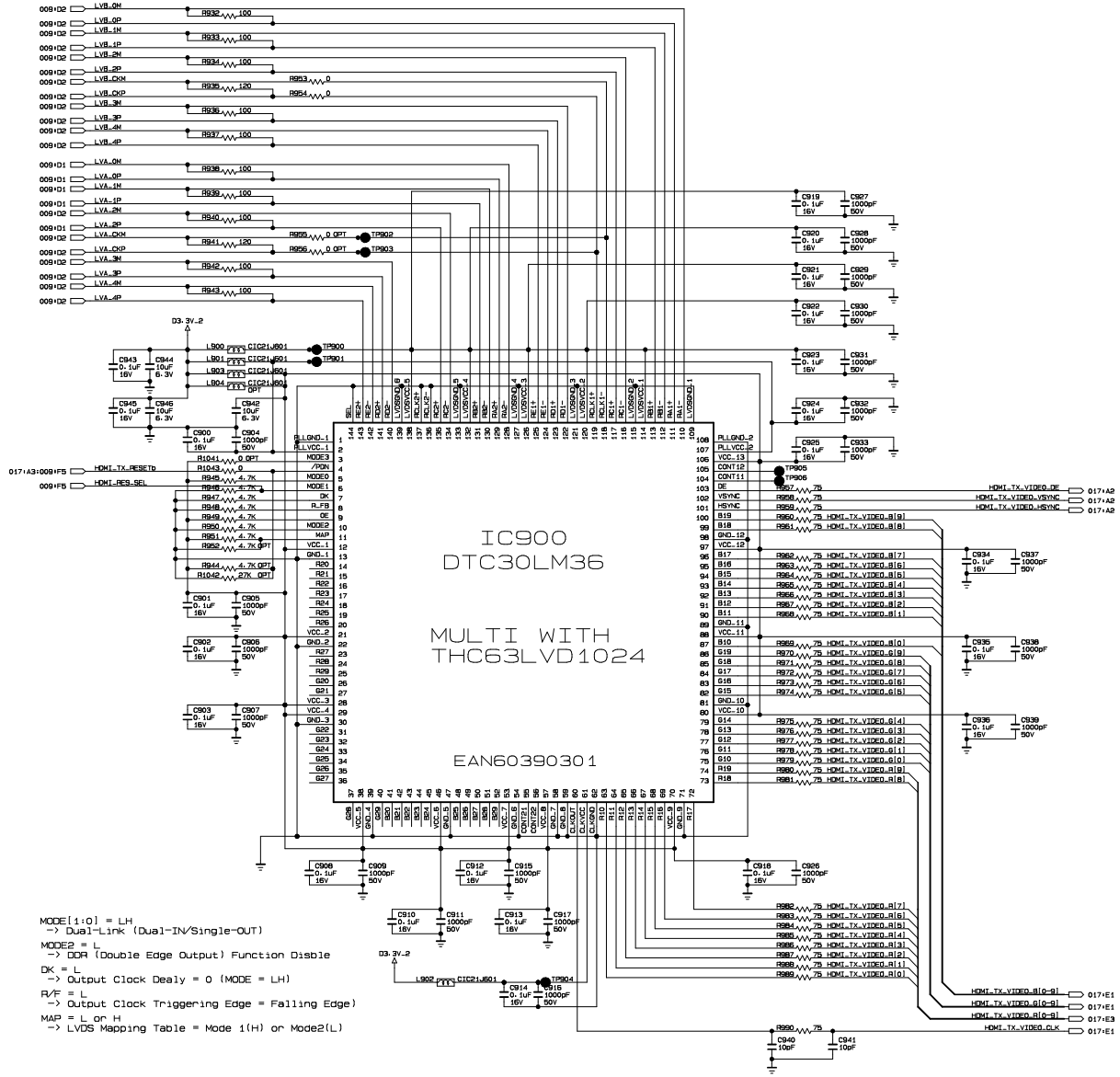
LGElectronics

DO JAE GEUN

LG ELECTRONICS

MODEL	JUNO-BOX	DATE	09.02.05
BLOCK	SUB	SHEET	14 / 17

LVDS RECEIVER



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.

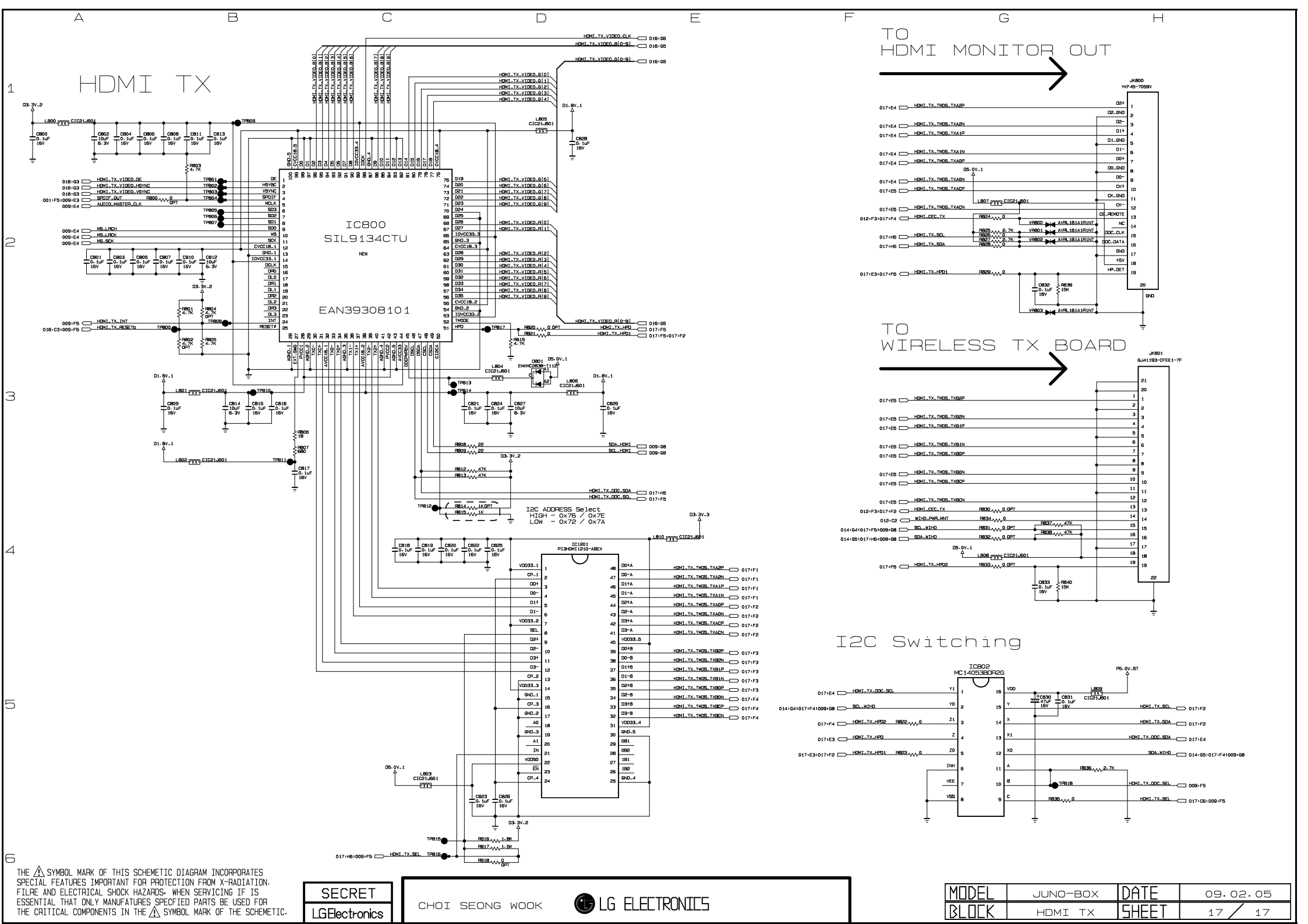
SECRET

LGElectronics

CHOI SEONG WOOK

LG ELECTRONICS

MODEL	JUNO-BOX	DATE	09.02.05
BLOCK	LVDS RX	SHEET	16 / 17



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

CHOI SEONG WOOK

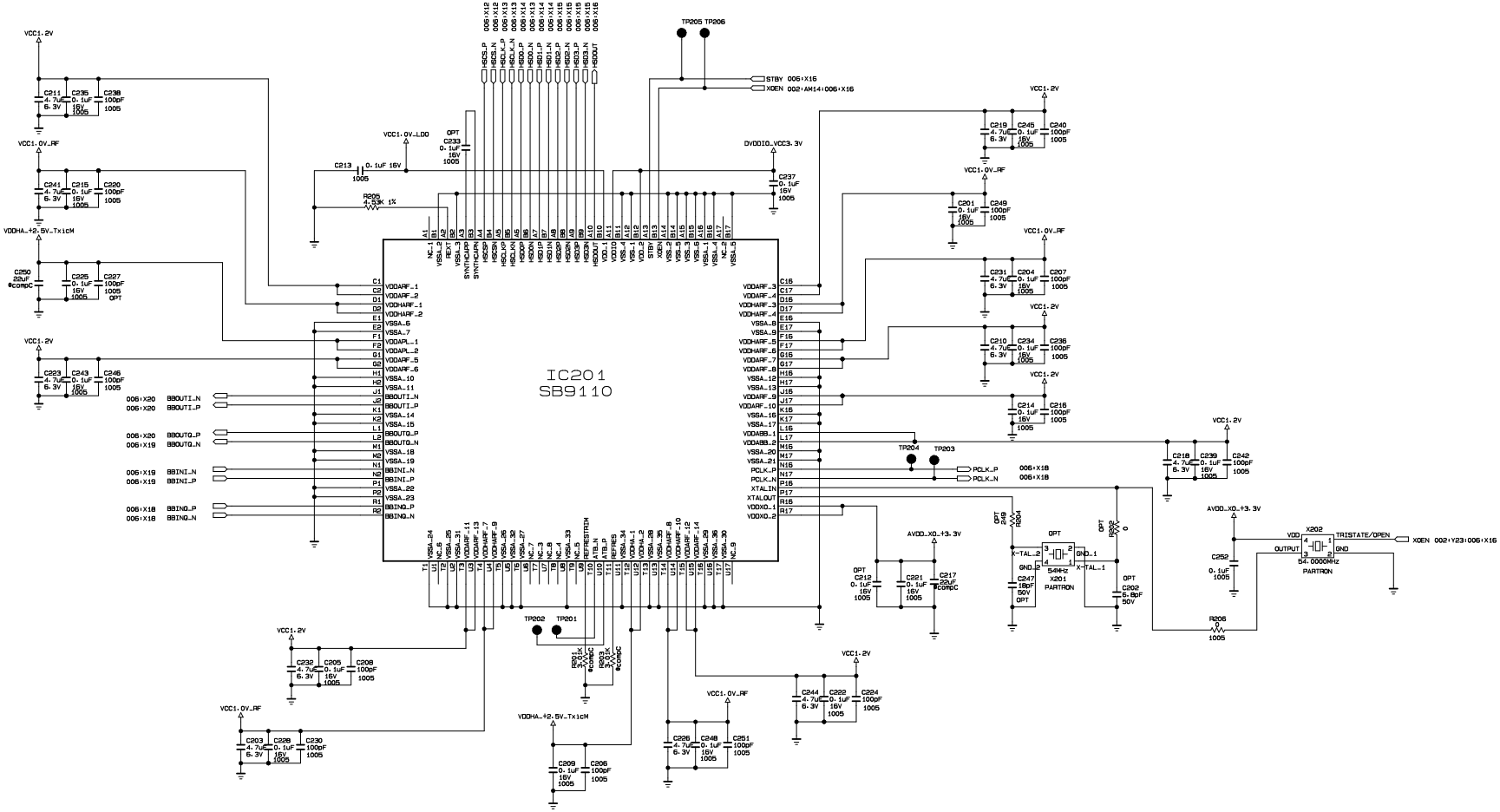
LG ELECTRONICS

MODEL	JUNO-BOX	DATE	09.02.05
BLOCK	HDMI TX	SHEET	17 / 17

Wireless TV Transmitter Board

CHOI SEONG WOOK
LG ELECTRONICS

MODEL	W-TV Tx	DATE	2009.02.05
BLOCK	Title Sheet	SHEET	1 / 12



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.

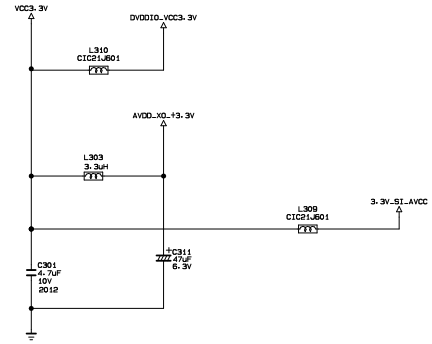
SECRET

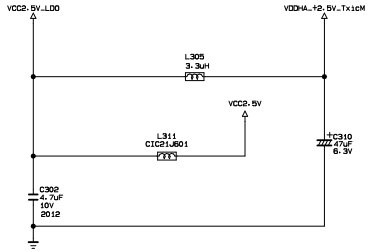
LGElectronics

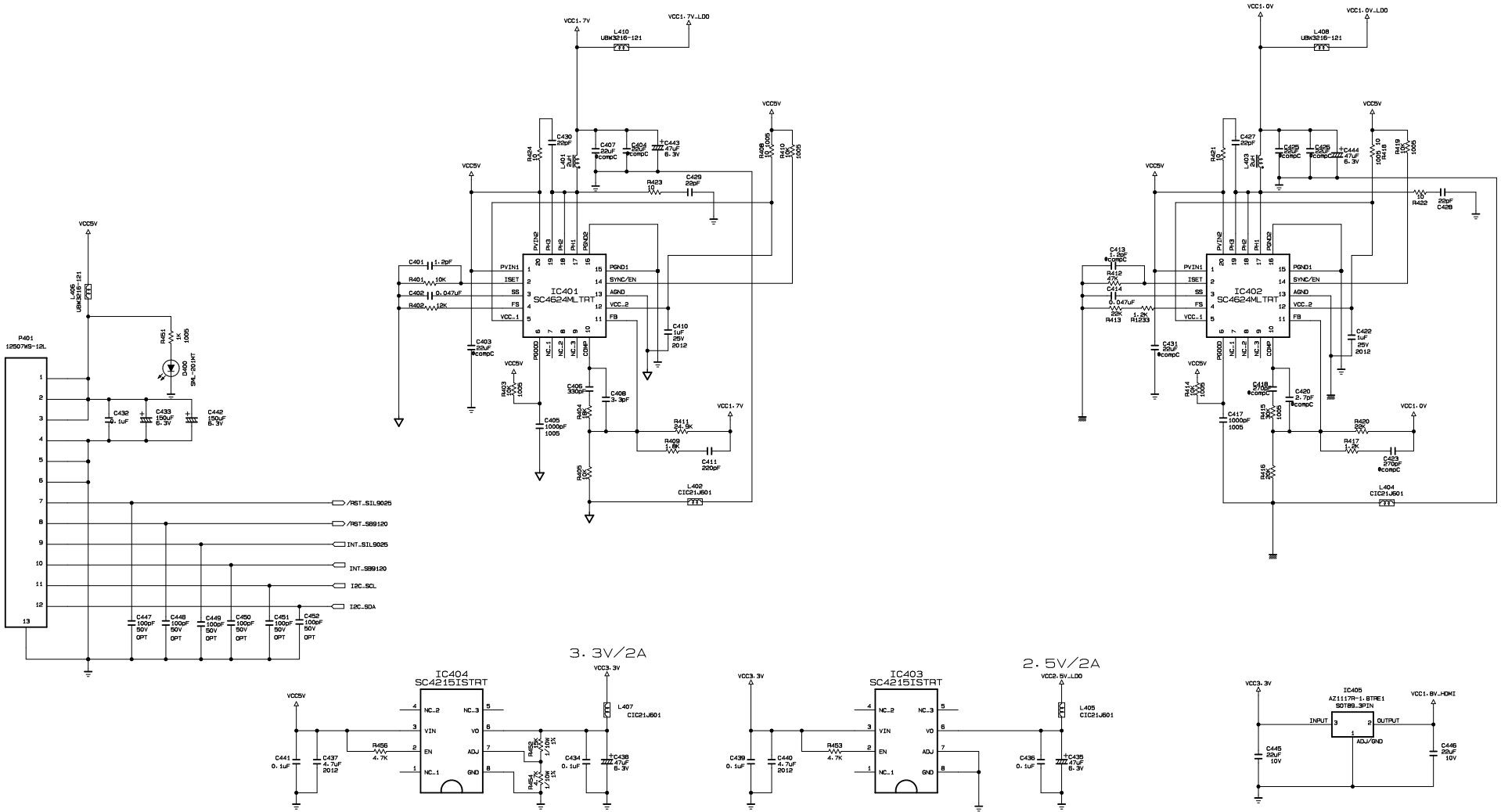
CHOI SEONG WOOK

LG ELECTRONICS

MODEL	W-TV Tx	DATE	2009.02.05
BLOCK	RFIC	SHEET	2 / 12







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.

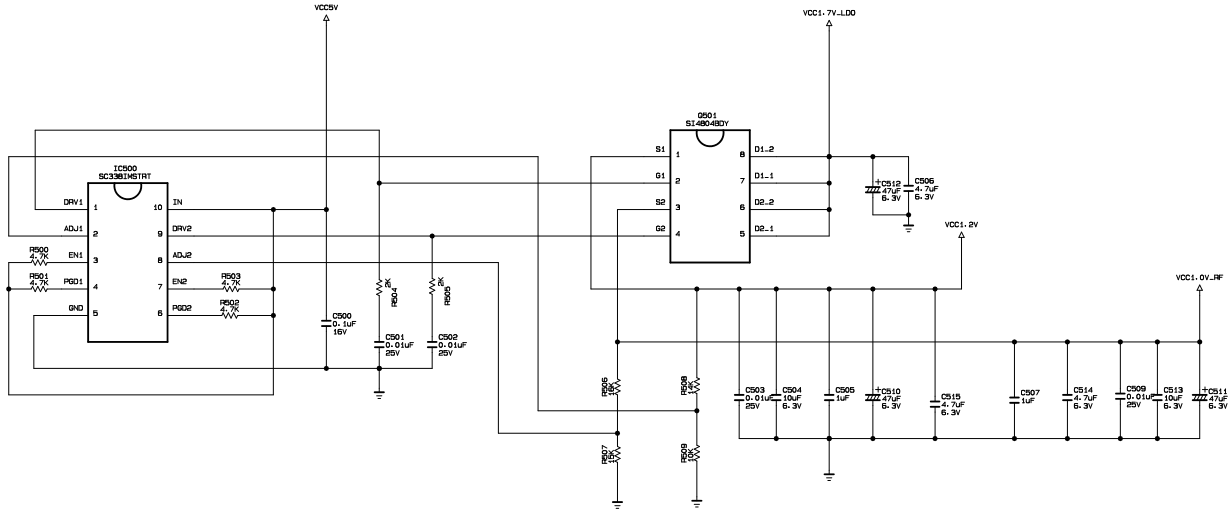
SECRET

LGElectronics

CHOI SEONG WOOK

LG ELECTRONICS

MODEL	W-TV Tx	DATE	2009.02.05
BLOCK	Power Supply1	SHEET	4 / 12



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.

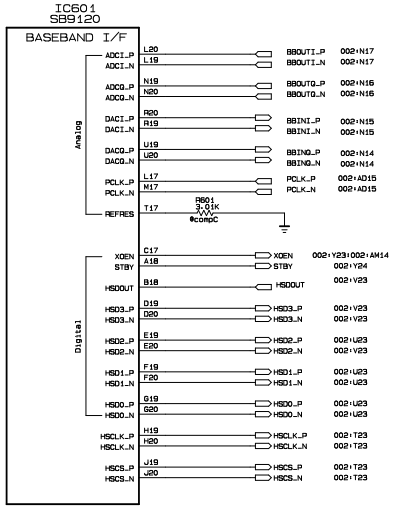
SECRET

LGElectronics

CHOI SEONG WOOK

LG ELECTRONICS

MODEL	W-TV Tx	DATE	2009.02.05
BLOCK	Power Supply2	SHEET	5 / 12



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

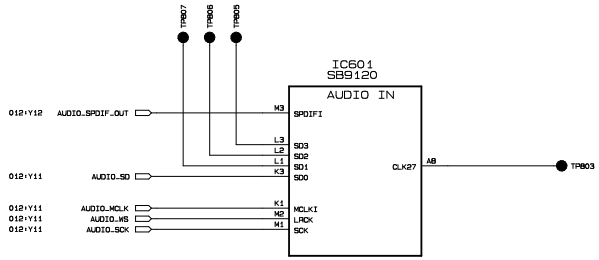
CHOI SEONG WOOK

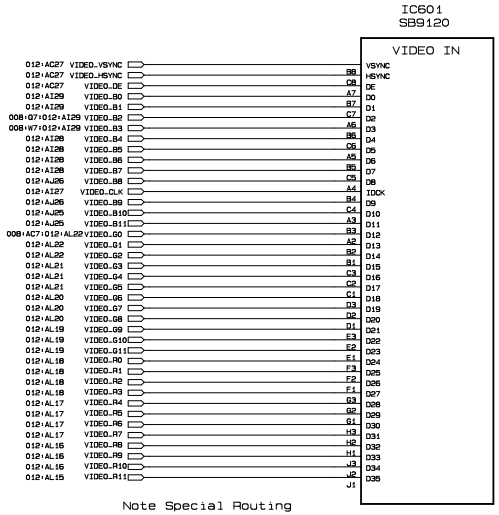
LG ELECTRONICS

MODEL	W-TV Tx	DATE	2009.02.05
BLOCK	BBIC IF	SHEET	6 / 12

BACK CHANNEL AUDIO CIRCUIT REMOVED

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.





Note Special Routing

PD : hw umac disabled
PU : hw umac enabled

PD : imac_ipdk disabled
PU : imac_ipdk enabled

PD : 6bit DAC
PU : 7bit DAC

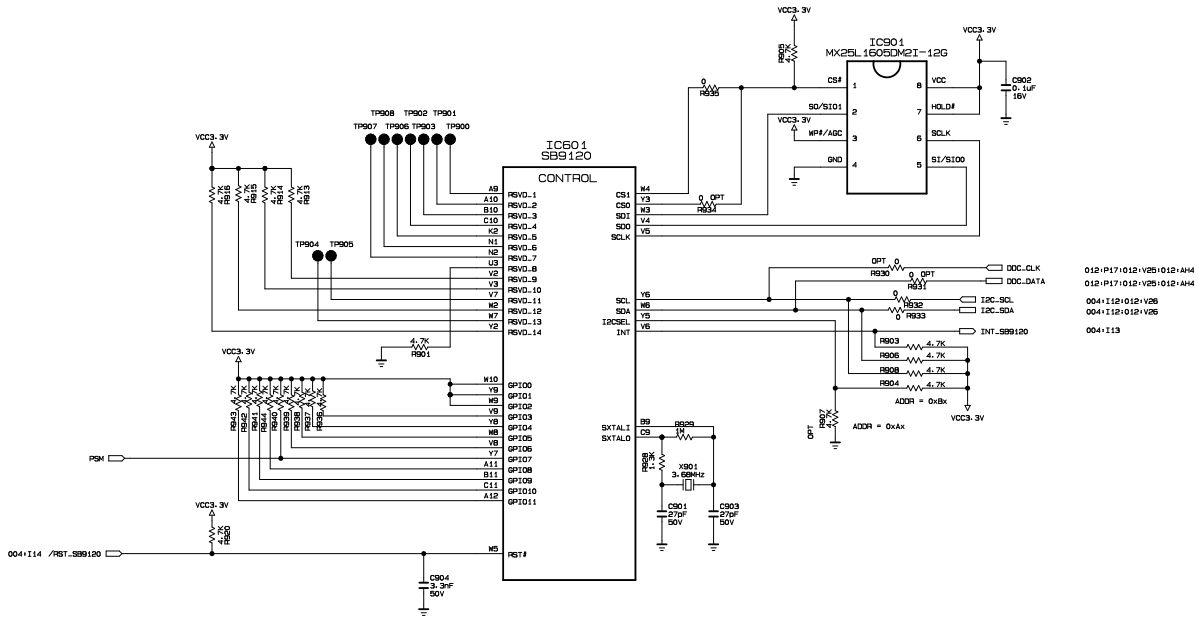
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

SECRET
LGElectronics

CHOI SEONG WOOK

LG ELECTRONICS

MODEL	W-TV Tx	DATE	2009.02.05
BLOCK	BBIC Audio/Video Output	SHEET	8 / 12



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.

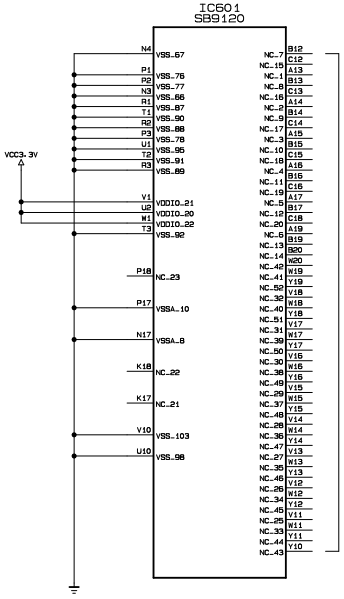
SECRET

LGElectronics

CHOI SEONG WOOK

LG ELECTRONICS

MODEL	W-TV Tx	DATE	2009.02.05
BLOCK	BBIC Control	SHEET	9 / 12



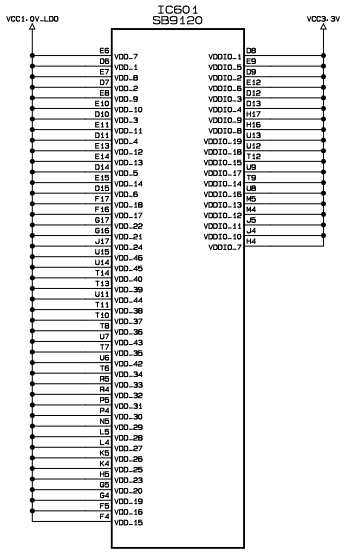
Interface is NC

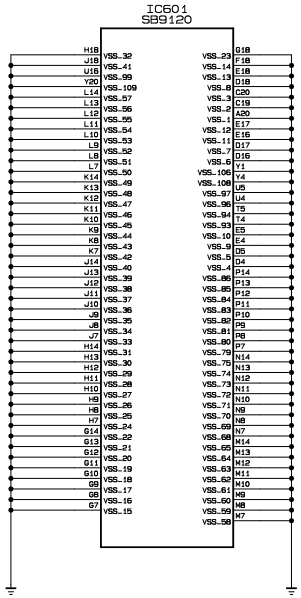
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

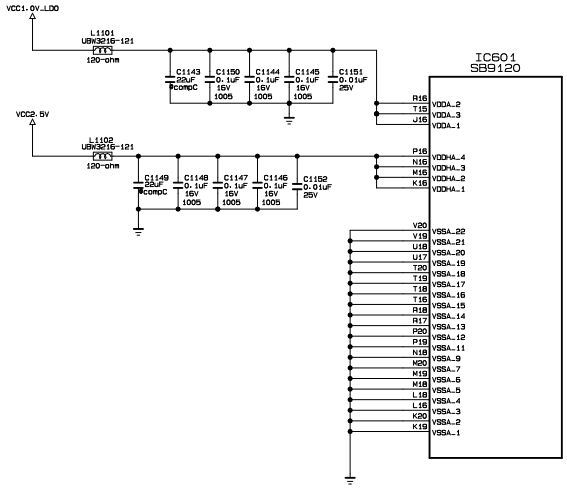
SECRET
LGElectronics

CHOI SEONG WOOK LG ELECTRONICS

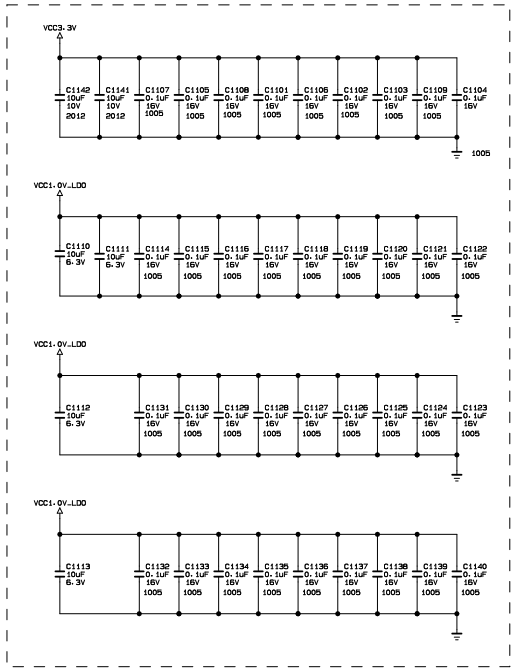
MODEL	W-TV Tx	DATE	2009.02.05
BLOCK	BBIC Misc	SHEET	10 / 12







SB9120 Bypass Caps



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.

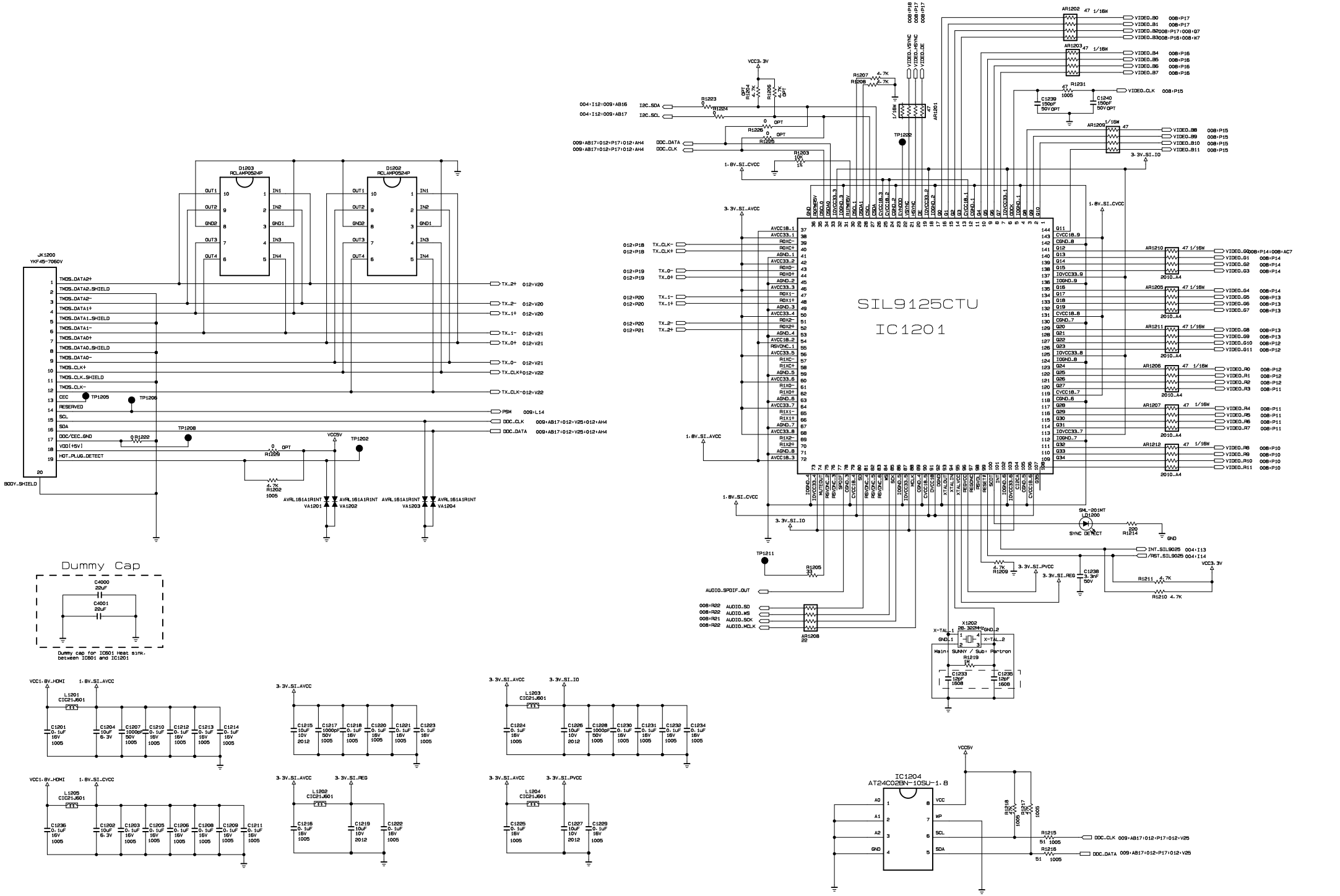
SECRET

LGElectronics

CHOI SEONG WOOK

LG ELECTRONICS

MODEL	W-TV Tx	DATE	2009.02.05
BLOCK	BBIC Power/Ground	SHEET	11 / 12



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

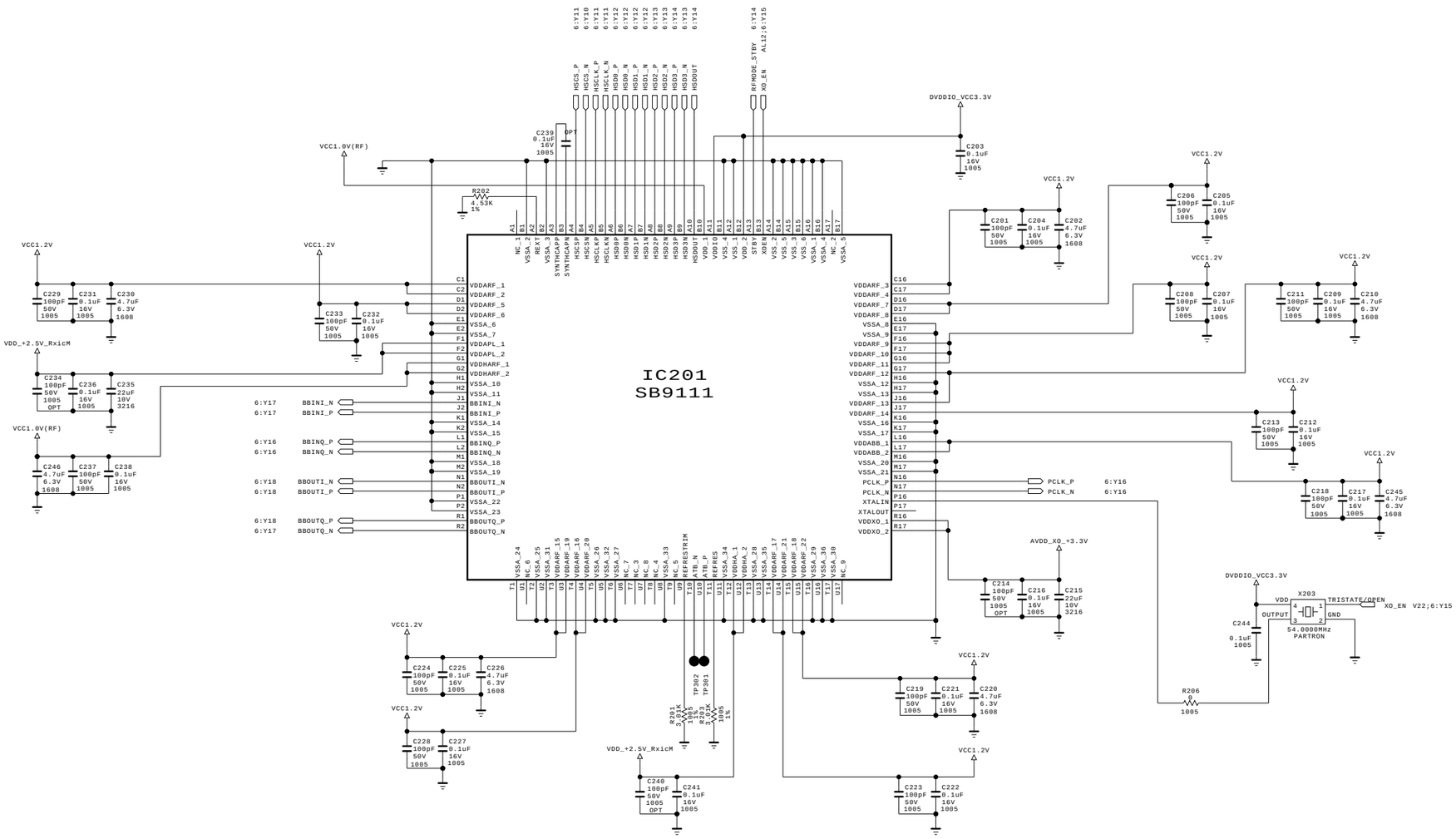
CHOI SEONG WOOK

LG ELECTRONICS

MODEL	W-TV Tx	DATE	2009.02.05
BLOCK	HDMI Rx	SHEET	12 / 12

Wireless TV Receiver Board

MODEL	W-TV Rx	DATE	2009.02.03
BLOCK	Title Sheet	SHEET	1 / 13



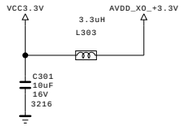
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

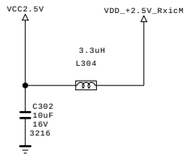
SECRET

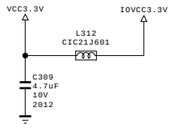
LGElectronics

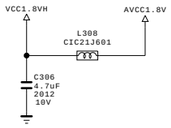
LG ELECTRONICS

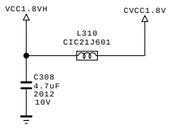
MODEL	W-TV Rx	DATE	2009.02.03
BLOCK	RFIC	SHEET	2 /13

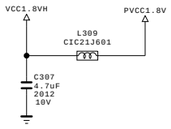


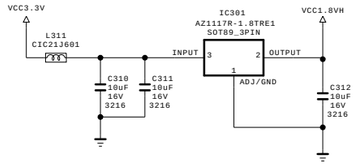












THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

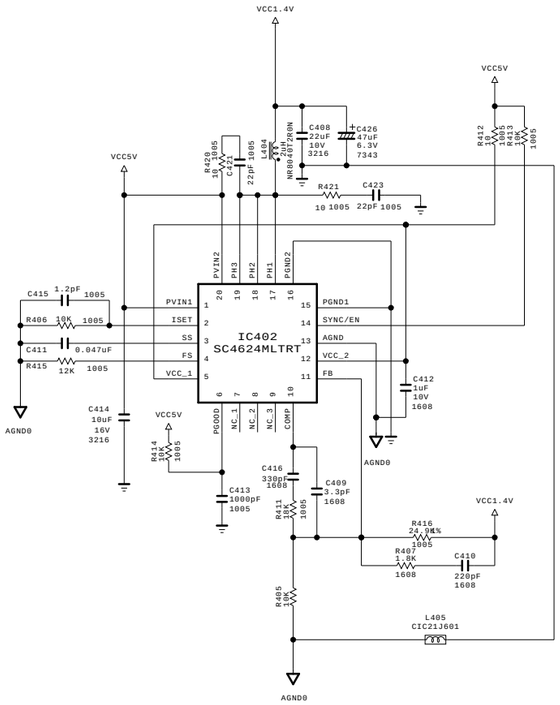
SECRET

LGElectronics

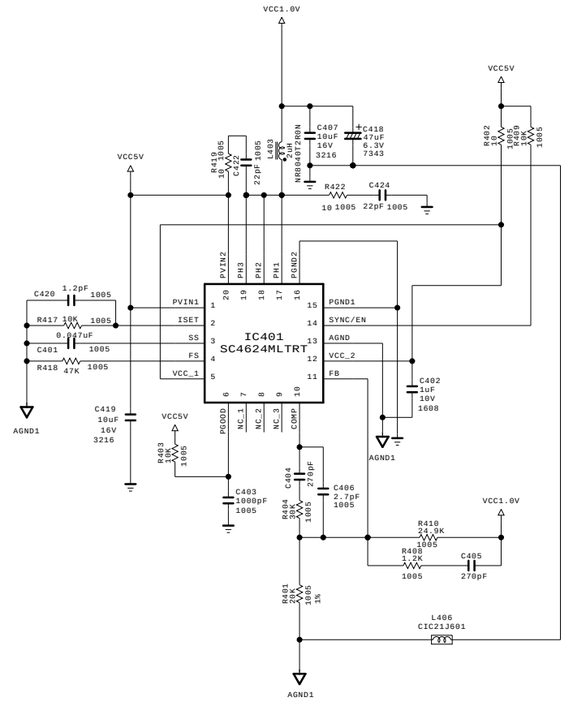
LG ELECTRONICS

MODEL	W-TV Rx	DATE	2009.02.03
BLOCK	Power	SHEET	3 / 13

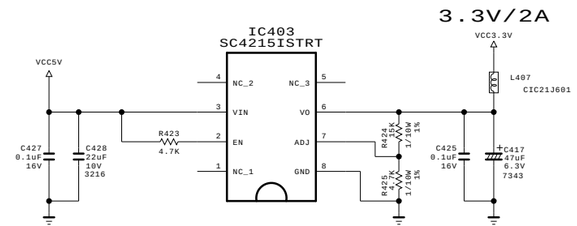
1.4V/3.5A



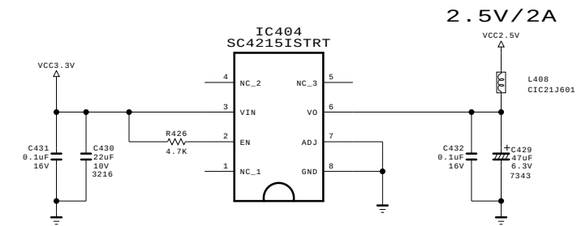
1.0V/3A



3.3V/2A



2.5V/2A



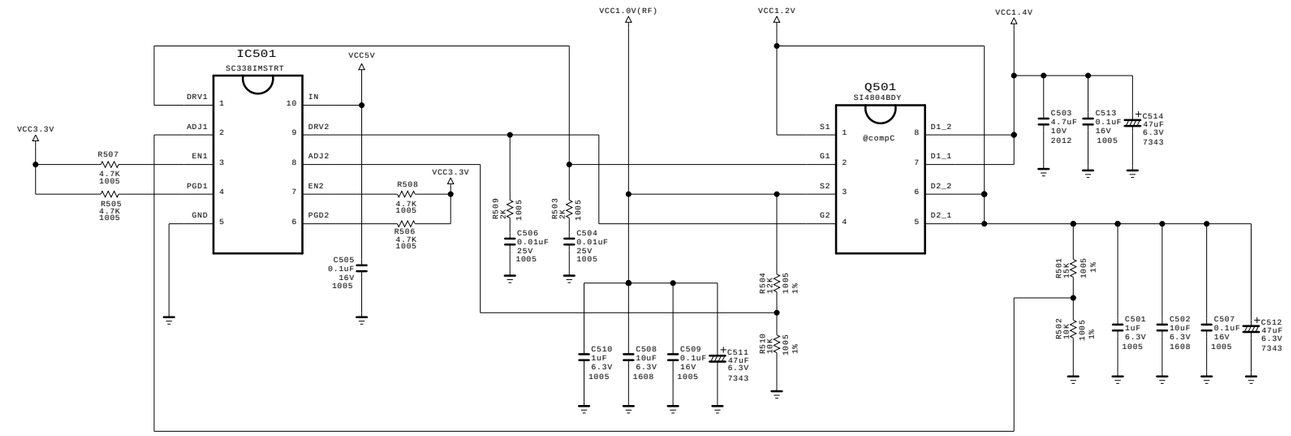
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

SECRET

LGElectronics

LG ELECTRONICS

MODEL	W-TV Rx	DATE	2009.02.03
BLOCK	Power Supply1	SHEET	4 / 13



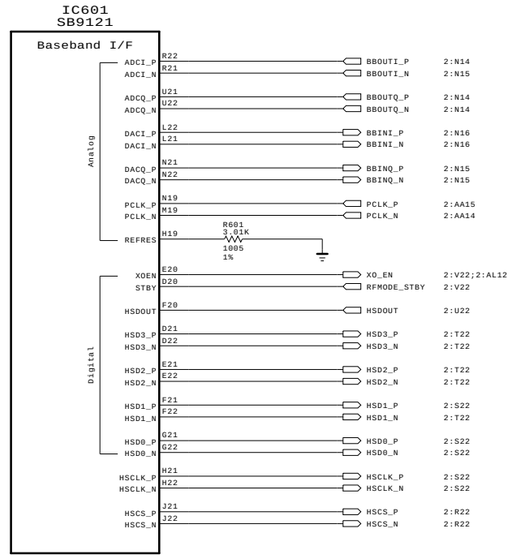
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

SECRET

LGElectronics

LG ELECTRONICS

MODEL	W-TV Rx	DATE	2009.02.03
BLOCK	Power Supply2	SHEET	5 / 13



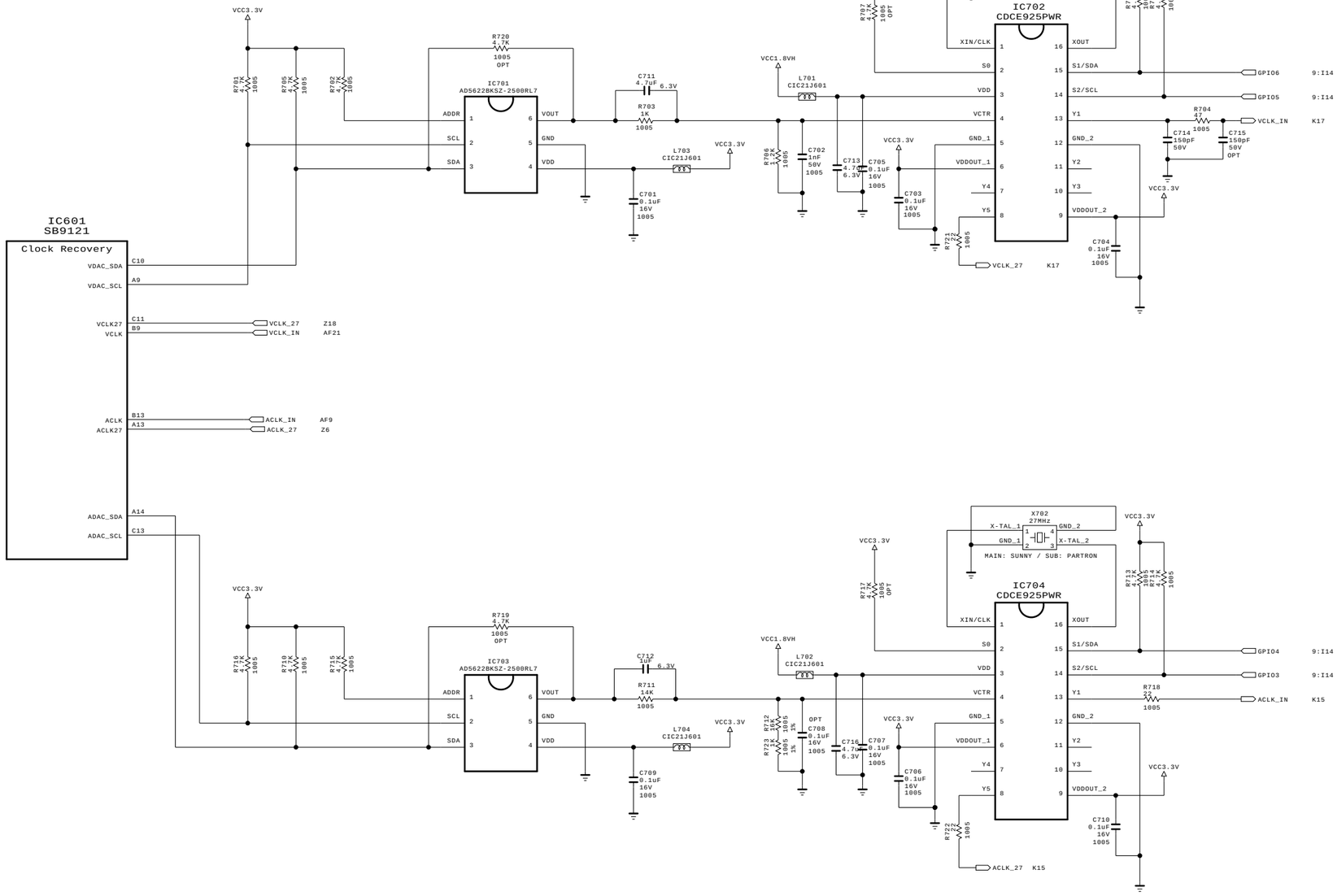
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

SECRET

LGElectronics

LG ELECTRONICS

MODEL	W-TV Rx	DATE	2009.02.03
BLOCK	BBIC IF	SHEET	6 /13



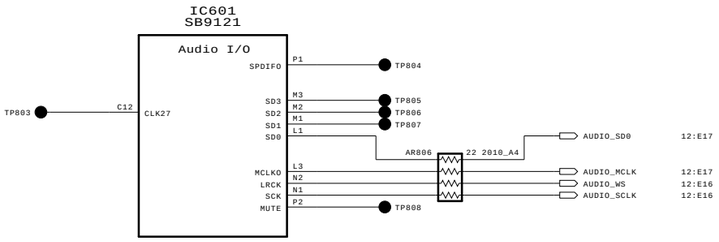
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

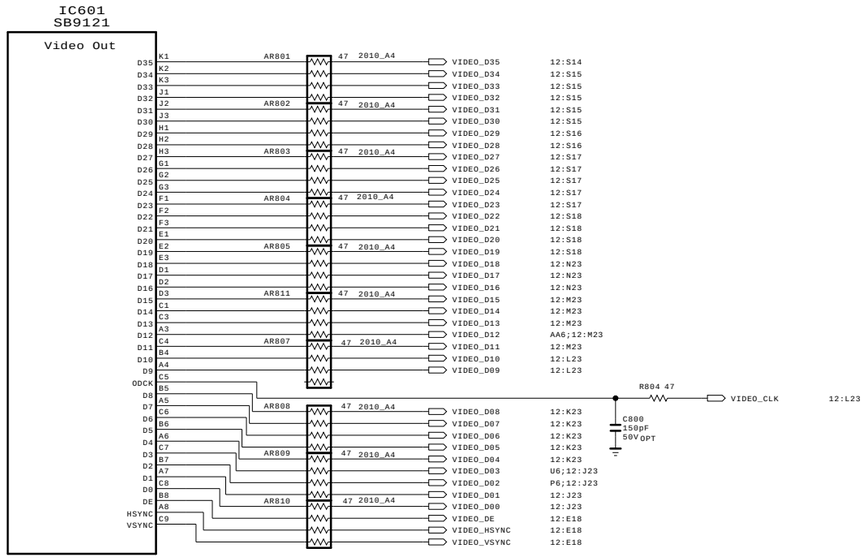
SECRET

LGElectronics

LG ELECTRONICS

MODEL	W-TV Rx	DATE	2009.02.03
BLOCK	BBIC Clock Recovery	SHEET	7 /13





Note Special Routing

PD : hw umac disabled

PD : lmac_1pbk disabled

PD : 6bit DAC

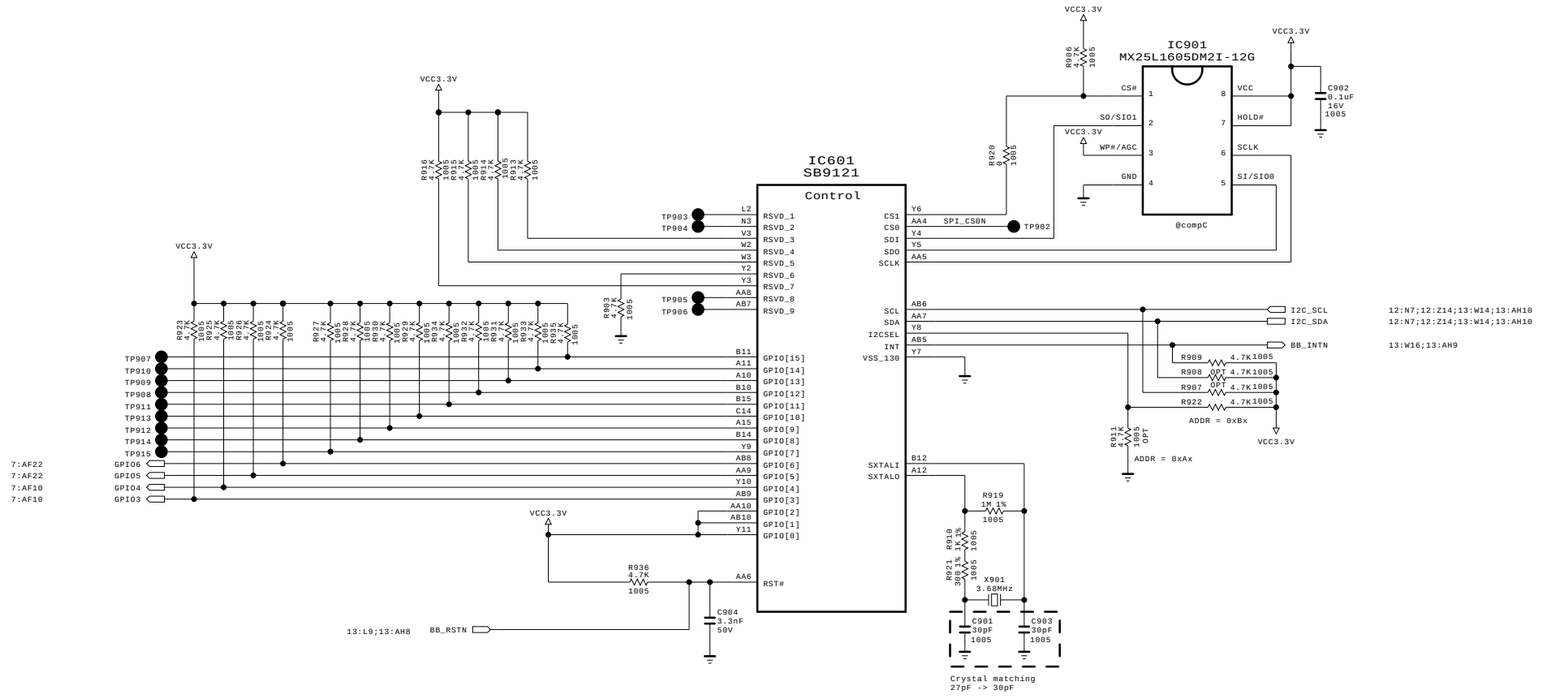
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

SECRET

LGElectronics

LG ELECTRONICS

MODEL	W-TV Rx	DATE	2009.02.03
BLOCK	BBIC Audio/Video Output	SHEET	8 /13



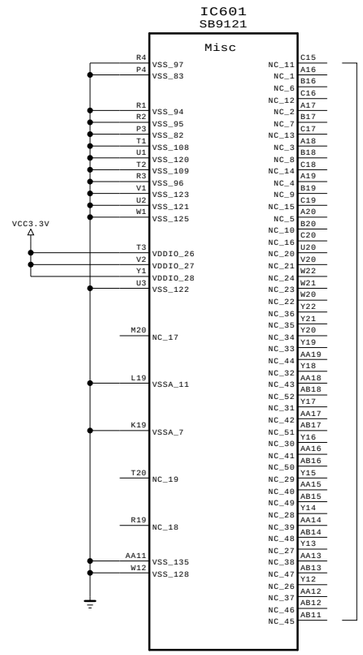
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

SECRET

LGElectronics

LG ELECTRONICS

MODEL	W-TV Rx	DATE	2009.02.03
BLOCK	BBIC Control	SHEET	9 /13



Interface is NC

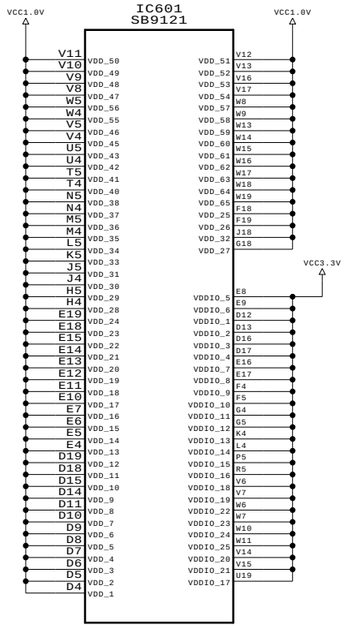
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

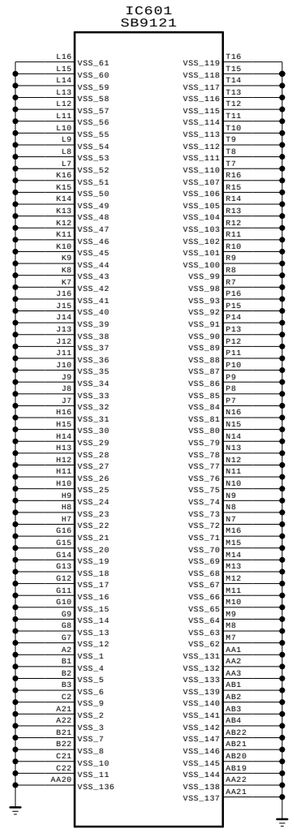
SECRET

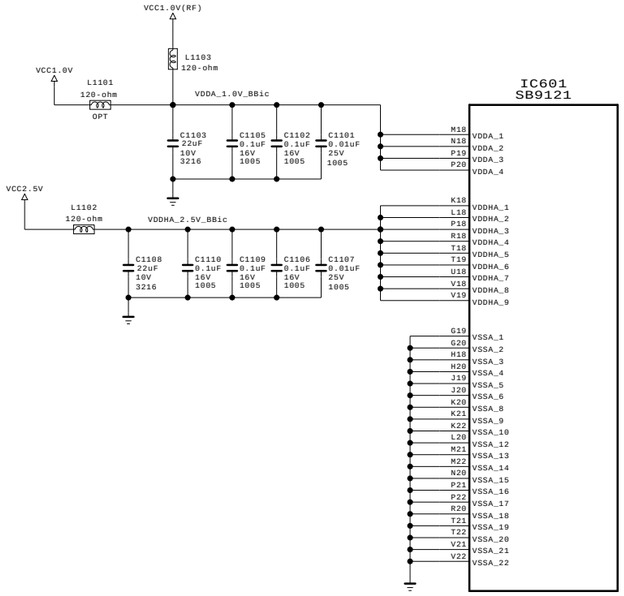
LGElectronics

LG ELECTRONICS

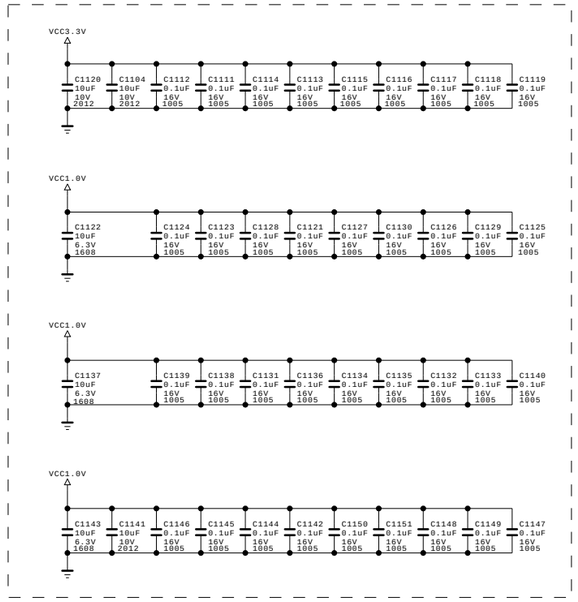
MODEL	W-TV Rx	DATE	2009.02.03
BLOCK	BBIC Misc	SHEET	10 / 13







SB9121 Bypass Caps

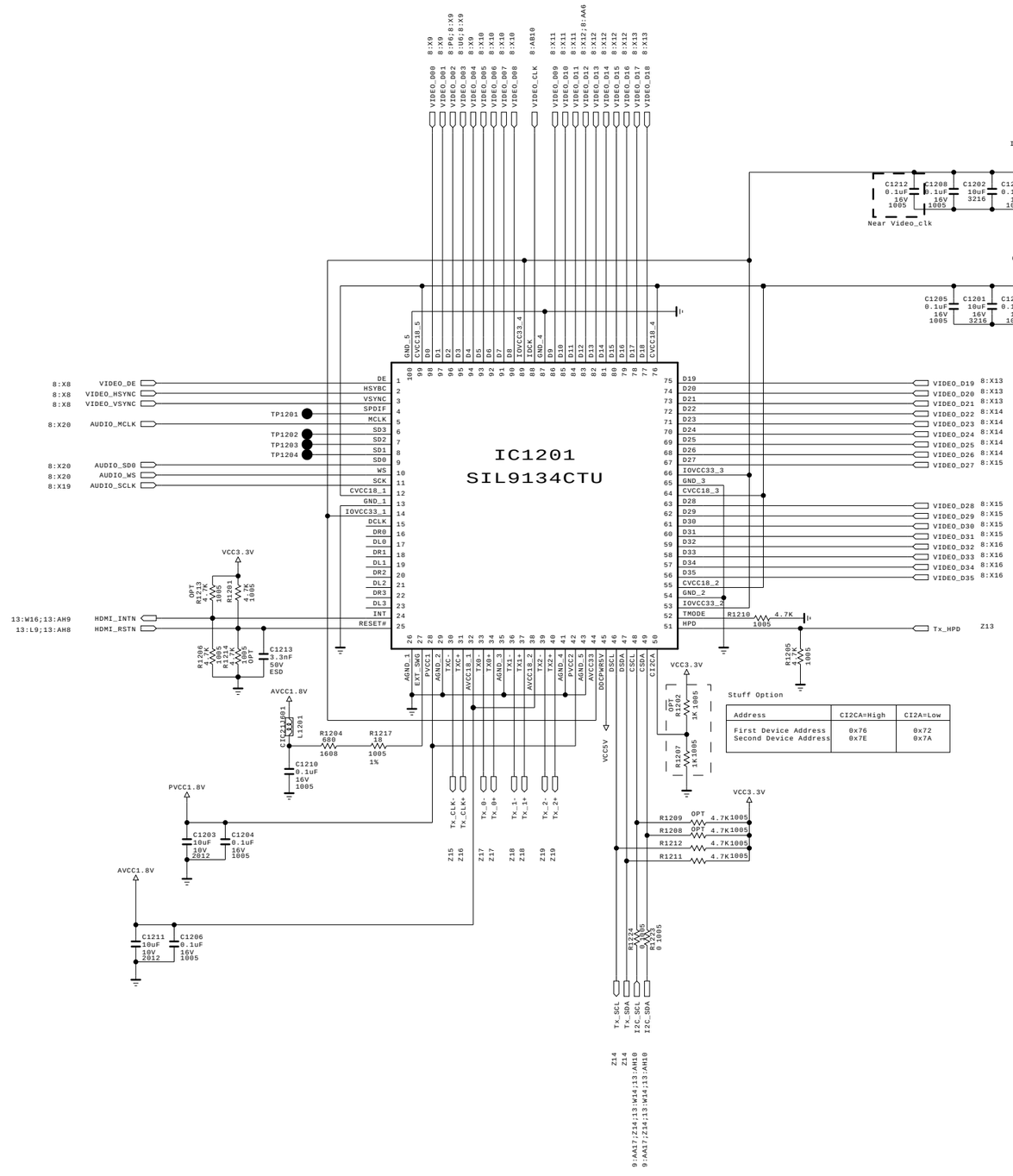


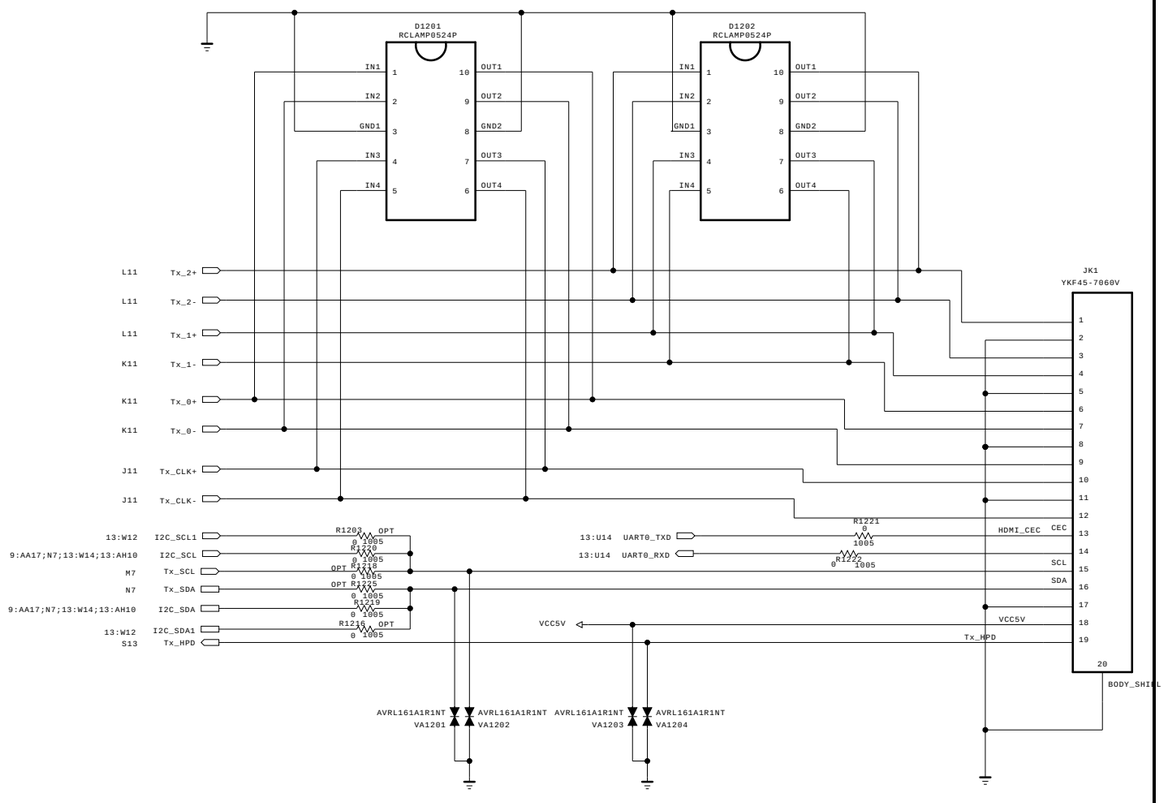
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

SECRET
LGElectronics

LG ELECTRONICS

MODEL	W-TV Rx	DATE	2009.02.03
BLOCK	BBIC Power/Ground	SHEET	11 / 13





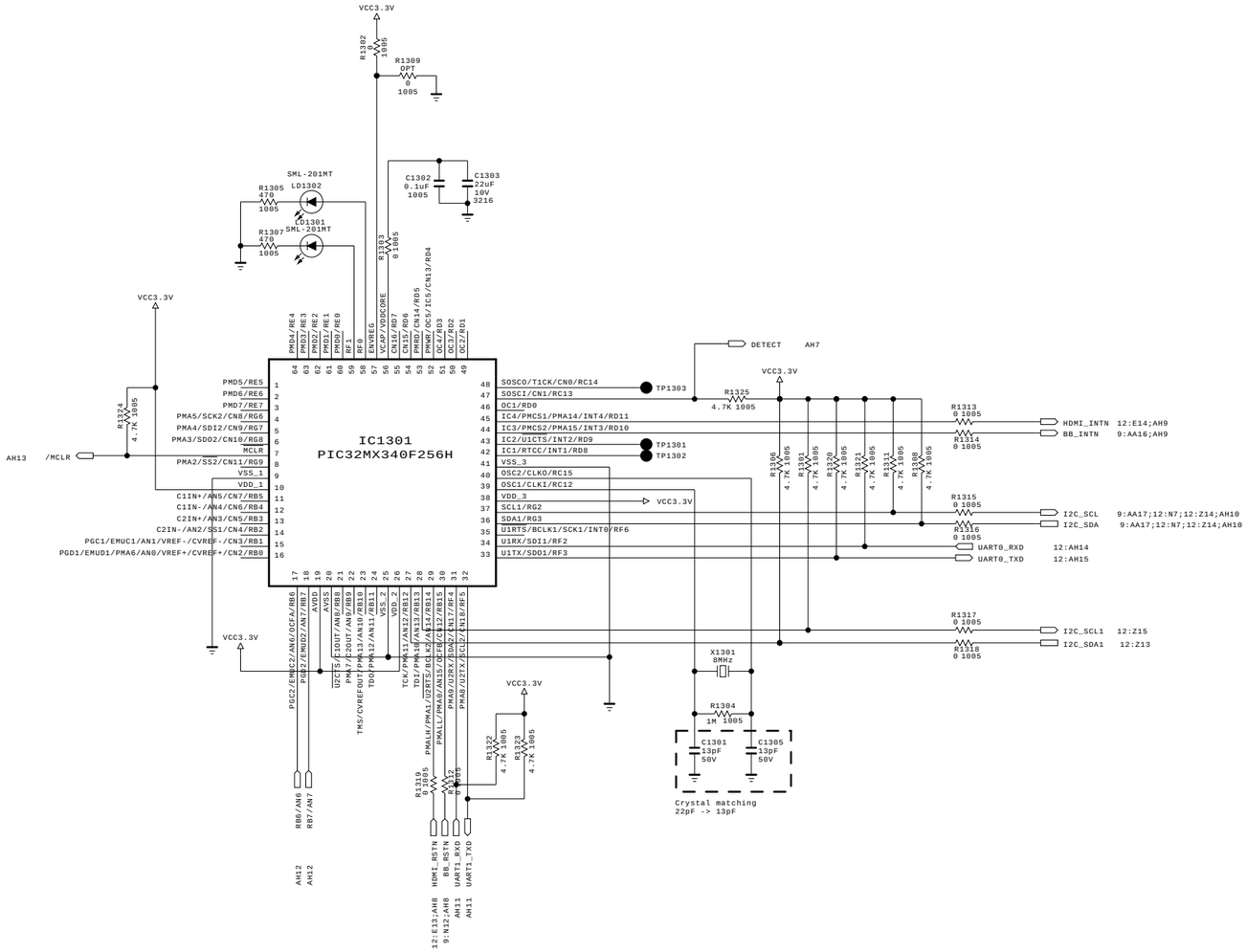
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

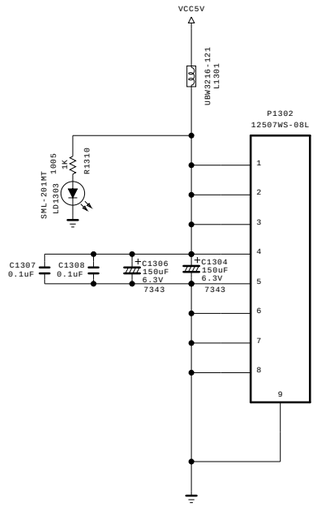
SECRET

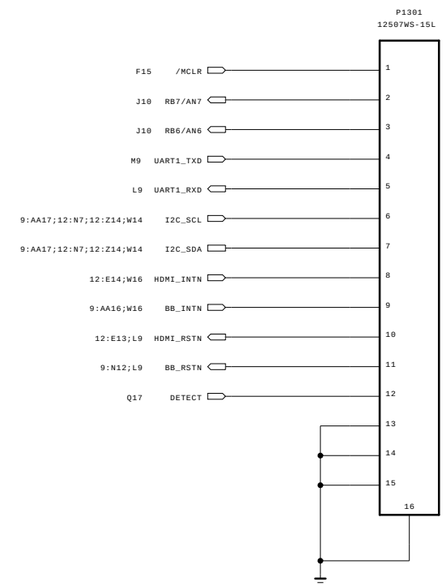
LGElectronics

LG ELECTRONICS

MODEL	W-TV Rx	DATE	2009.02.03
BLOCK	HTMI Tx	SHEET	12 / 13







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	W-TV Rx	DATE	2009.03.21
BLOCK	uController	SHEET	13 / 13


LG Electronics Inc.