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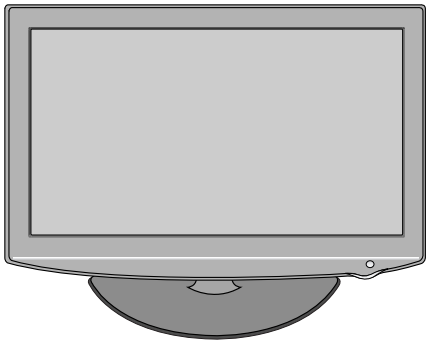
LCD TV
SERVICE MANUAL

CHASSIS : LA06H

MODEL : 32LD340H 32LD340H-UA
32LD330H 32LD330H-UA

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



P/NO : MFL67207503 (1106-REV00)

Printed in Korea

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SAFETY PRECAUTIONS

IMPORTANT SAFETY NOTICE

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

General Guidance

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

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

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

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

Keep wires away from high voltage or high temperature parts.

Before returning the receiver to the customer,

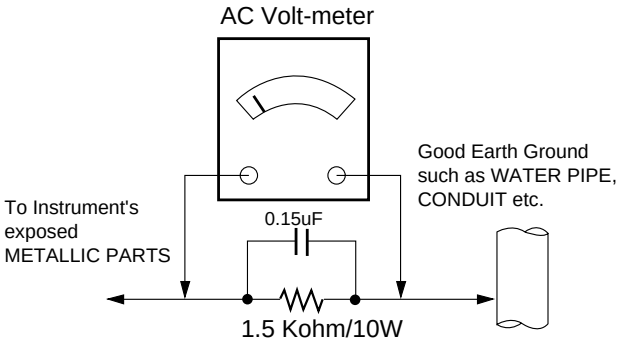
always perform an **AC leakage current check** on the exposed metallic parts of the cabinet, such as antennas, terminals, etc., to be sure the set is safe to operate without damage of electrical shock.

Leakage Current Cold Check(Antenna Cold Check)
With the instrument AC plug removed from AC source, connect an electrical jumper across the two AC plug prongs. Place the AC switch in the on position, connect one lead of ohm-meter to the AC plug prongs tied together and touch other ohm-meter lead in turn to each exposed metallic parts such as antenna terminals, phone jacks, etc.
If the exposed metallic part has a return path to the chassis, the measured resistance should be between 1MΩ and 5.2MΩ.
When the exposed metal has no return path to the chassis the reading must be infinite.
An other abnormality exists that must be corrected before the receiver is returned to the customer.

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

Do not use a line Isolation Transformer during this check.
Connect 1.5K/10watt resistor in parallel with a 0.15uF capacitor between a known good earth ground (Water Pipe, Conduit, etc.) and the exposed metallic parts.
Measure the AC voltage across the resistor using AC voltmeter with 1000 ohms/volt or more sensitivity.
Reverse plug the AC cord into the AC outlet and repeat AC voltage measurements for each exposed metallic part. Any voltage measured must not exceed 0.75 volt RMS which is corresponds to 0.5mA.
In case any measurement is out of the limits specified, there is possibility of shock hazard and the set must be checked and repaired before it is returned to the customer.

Leakage Current Hot Check circuit



SERVICING PRECAUTIONS

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

General Servicing Precautions

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

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

Electrostatically Sensitive (ES) Devices

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

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

General Soldering Guidelines

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

IC Remove/Replacement

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

Removal

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

Replacement

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

"Small-Signal" Discrete Transistor Removal/Replacement

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

Power Output, Transistor Device Removal/Replacement

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

Diode Removal/Replacement

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

Fuse and Conventional Resistor Removal/Replacement

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

Circuit Board Foil Repair

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

At IC Connections

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

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

At Other Connections

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

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

SPECIFICATION

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

1. Application range

This spec sheet is applied all of the 32”, 37”, 42” LCD TV with LA06G/H chassis and 26” LCD TV with LA06H chassis.

2. Requirement for Test

Each part is tested as below without special appointment.

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

3. Test method

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

4. General Specification(TV)

No	Item	Specification		Remark
1	Receivable 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 ~ 120V 50/60Hz		Mark : 110V, 60Hz
4	Market	North America		
5	Screen Size	32 / 37 / 42 inches		
6	Aspect Ratio	16:9		
7	Tuning System	FS		
8	LCD Module	LC370WUE-SCA1		37LD340H-UA/37LD330H-UA
		LC320WXE-SCA2		32LD340H-UA/37LD330H-UA
		LC420WUE-SCA2		42LD340H-UA
9	Operating Environment	Temp : 0 ~ 40 deg Humidity : ~ 80 %		
10	Storage Environment	Temp : -20 ~ 60 deg Humidity : -85 %		

5. Chrominance & Luminance

5.1. 42LD340H-UA : LC420WUG-SCA2(LGD)

No.	Item			Min	Typ	Max	Unit	Remarks
1	White brightness			200	250		cd/m²	EPA 4.0
2	Luminance uniformity					1.25		5point
3	Color coordinate	RED	X	Typ.	0.636	Typ.		
	(Default)		Y	-0.03	0.335	+0.03		
		GREEN	X		0.291			
			Y		0.603			
		BLUE	X		0.146			
			Y		0.061			
		WHITE	X		0.279			
			Y		0.292			
4	Contrast ratio			1100	1450			EPA 4.0, except RGB mode
				10,000:1	50,000:1			
6	Color Temperature	Cool		Typ.	0.269	Typ		The W/B Tolerance is
				-0.015	0.273	+0.015		±0.015 for Adjustment
		Medium		Typ	0.285	Typ		
				-0.015	0.293	+0.015		
		Warm		Typ	0.313	Typ		
				-0.015	0.329	+0.015		

5.2. 37LD340H-UA/37LD330H-UA : LC370WUE-SCA1(LGD)

No.	Item			Min	Typ	Max	Unit	Remarks
1	White brightness			250	300		cd/m²	EPA 4.0
2	Luminance uniformity							5point
3	Color coordinate	RED	X	Typ.	0.639	Typ.		
	(Default)		Y	-0.03	0.334	+0.03		
		GREEN	X		0.289			
			Y		0.606			
		BLUE	X		0.145			
			Y		0.065			
		WHITE	X		0.279			
			Y		0.292			
4	Contrast ratio			1100	1500			EPA 4.0, except RGB mode
				10,000:1	50,000:1			
6	Color Temperature	Cool		Typ.	0.269	Typ		The W/B Tolerance is
				-0.015	0.273	+0.015		±0.015 for Adjustment
		Medium		Typ	0.285	Typ		
				-0.015	0.293	+0.015		
		Warm		Typ	0.313	Typ		
				-0.015	0.329	+0.015		

- EPA 4.0

Luminance : To qualify as ENERGY STAR under this specification, the peak luminance of the product in the 'home" mode, or in the default mode as shipped, shall not be less than 65% of the peak luminance of the "retail" mode, or the brightest selectable preset mode, of the product.

5.3. 32LD340H-UA/32LD330H-UA : LC320WXN-SCA2(LGD)

No.	Item			Min	Typ	Max	Unit	Remarks
1	White brightness			200	250		cd/m^2	EPA 4.0
2	Luminance uniformity							5point
3	Color coordinate	RED	X	Typ.	0.636	Typ.		
	(Default)		Y	-0.03	0.335	+0.03		
		GREEN	X		0.291			
			Y		0.603			
		BLUE	X		0.146			
			Y		0.061			
		WHITE	X		0.279			
			Y		0.292			
4	Contrast ratio			900	1200			EPA 4.0, except RGB mode
				10,000:1	50,000:1			
6	Color Temperature	Cool		Typ.	0.269	Typ		The W/B Tolerance is
				-0.015	0.273	+0.015		±0.015 for Adjustment
		Medium		Typ	0.285	Typ		
				-0.015	0.293	+0.015		
		Warm		Typ	0.313	Typ		
				-0.015	0.329	+0.015		

- EPA 4.0

Luminance : To qualify as ENERGY STAR under this specification, the peak luminance of the product in the ‘home” mode, or in the default mode as shipped, shall not be less than 65% of the peak luminance of the “retail” mode, or the brightest selectable preset mode, of the product.

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

No	Resolution	H-freq(kHz)	V-freq.(kHz)	Pixel clock	Proposed
1.	720*480	15.73	60	13.5135	SDTV ,DVD 480I
2.	720*480	15.73	59.94	13.5	SDTV ,DVD 480I
3.	720*480	31.50	60	27.027	SDTV 480P
4.	720*480	31.47	59.94	27.0	SDTV 480P
5.	1280*720	45.00	60.00	74.25	HDTV 720P
6.	1280*720	44.96	59.94	74.176	HDTV 720P
7.	1920*1080	33.75	60.00	74.25	HDTV 1080I
8.	1920*1080	33.72	59.94	74.176	HDTV 1080I
9.	1920*1080	67.500	60	148.50	HDTV 1080P
10.	1920*1080	67.432	59.94	148.352	HDTV 1080P
11.	1920*1080	27.000	24.000	74.25	HDTV 1080P
12.	1920*1080	26.97	23.976	74.176	HDTV 1080P
13.	1920*1080	33.75	30.000	74.25	HDTV 1080P
14.	1920*1080	33.71	29.97	740176	HDTV 1080P

7. RGB Input (PC)

No	Resolution	H-freq(kHz)	V-freq.(kHz)	Pixel clock	Proposed	
	PC					DDC
1.	640*350	31.468	70.09	25.17	EGA	X
2.	720*400	31.469	70.08	28.32	DOS	O
3.	640*480	31.469	59.94	25.17	VESA(VGA)	O
4.	800*600	37.879	60.31	40.00	VESA(SVGA)	O
5.	1024*768	48.363	60.00	65.00	VESA(XGA)	O
6.	1280*768	47.776	59.87	79.50	CVT(WXGA)	X
7.	1360*768	47.712	60.015	85.50	VESA(WXGA)	X
8.	1280*1024	63.981	60.020	108.00	VESA (SXGA)	O
9.	1600*1200	75.000	60.000	162	VESA (UXGA)	O
10.	1920*1080	66.587	59.934	138.50	WUXGA	O

8. HDMI input (PC/DTV)

No	Resolution	H-freq(kHz)	V-freq.(kHz)	Pixel clock	Proposed	
	PC					DDC
1.	640*350	31.468	70.09	25.17	EGA	X
2.	720*400	31.469	70.08	28.32	DOS	O
3.	640*480	31.469	59.94	25.17	VESA(VGA)	X
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	75.000	60.000	162	VESA (UXGA)	X
10.	1920*1080	67.500	60.000	148.50	HDTV 1080P	O
	DTV					
1	720*480	31.50	60	27.027	SDTV 480P	O
2	720*480	31.47	59.94	27.00	SDTV 480P	O
3	1280*720	45.00	60.00	74.25	HDTV 720P	O
4	1280*720	44.96	59.94	74.176	HDTV 720P	O
5	1920*1080	33.75	60.00	74.25	HDTV 1080I	O
6	1920*1080	33.72	59.94	74.176	HDTV 1080I	O
7	1920*1080	67.500	60	148.50	HDTV 1080P	O
8	1920*1080	67.432	59.939	148.352	HDTV 1080P	O
9	1920*1080	27.000	24.000	74.25	HDTV 1080P	O
10	1920*1080	26.97	23.976	74.176	HDTV 1080P	O
11	1920*1080	33.75	30.000	74.25	HDTV 1080P	O
12	1920*1080	33.71	29.97	74.176	HDTV 1080P	O

ADJUSTMENT INSTRUCTION

1. Application range

This spec. sheet applies to LA06G Chassis applied LCD TV all models manufactured in TV factory

2. Specification

2.1 Because this is not a hot chassis, it is not necessary to use an isolation transformer. However, the use of isolation transformer will help protect test instrument.

2.2 AdjThe 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.

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

2.5 The receiver must be operated for about 5 minutes prior to the adjustment when module is in the circumstance of over 15

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

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

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

3. Adjustment items

3.1 Board Level Adjustment

- Adjust 480i Comp1 (ADC)
- EDID/DDC download

Above adjustment items can be also performed in Final Assembly if needed. Both Board-level and Final assembly adjustment items can be check using In-Star Menu 1.ADJUST CHECK.
Component 1080p RGB-PC Adjust will be calculated by 480i adjust value.

3.2 Final assembly adjustment

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

3.3 Etc

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

4. Automatic Adjustment

4.1. ADC Adjustment

(1) Overview

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

(2) Equipment & Condition

1) Jig (RS-232C protocol)

2) Inner Pattern

- Resolution : 1080P (Inner Pattern)
- Resolution : 1024*768 RGB (Inner Pattern)
- Pattern : Horizontal 100% Color Bar Pattern
- Pattern level : 0.7±0.1 Vp-p

(3) Adjustment

1) Adjustment method

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

2) Adj. protocol

Ref.) ADC Adj. RS232C Protocol_Ver1.0

3) Adj. order

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 1080p 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

- aa 00 00 [Enter ADC adj. mode]
- xb 00 40 [Change input source to Component1(480i)]
- ad 00 10 [Adjust 480i Comp1]
- xb 00 60 [Change input source to RGB(1024*768)]
- ad 00 10 [Adjust 1024*768 RGB]
- ad 00 90 End adj.

5. Manual Adjustment

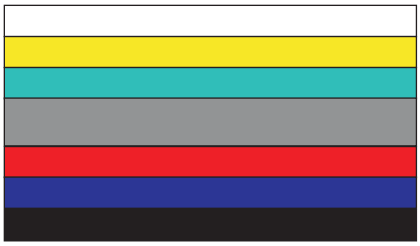
5.1 ADC(Saturn5) Adjustment

5.1.1 Overview

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

5.1.2 Equipment & Condition

1) Adjust Remocon
2) 801GF(802B, 802F, 802R) or MSPG925FA Pattern Generator
   - Resolution: 480i Comp1 (MSPG-925FA:model-209, pattern-65)
   - Resolution: 1024*768 RGB(Inner Pattern)
   - Pattern : Horizontal 100% Color Bar Pattern
   - Pattern level: 0.7±0.1 Vp-p
   - Image



3) Must use standard cable

5.1.3 Adjust method

5.1.3.1 ADC 480i/1080p Comp1 RGB

1) Check connected condition of Comp1 cable to the equipment
2) Give a 480i Mode, Horizontal 100% Color Bar Pattern to Comp1.
   (MSPG-925FA -> Model: 209, Pattern: 65)
3) Change input mode as Component1 and picture mode as “Standard”
4) Press the In-start Key on the ADJ remote after at least 1 min of signal reception. Then, select 5. ADC Calibration. And Press OK Button on the menu “Start”. The adjustment will start automatically.
5) If ADC Comp 480i is successful, “ADC Component Success” is displayed and Comp480i/1080p is completed.
   If ADC calibration is failure, “ADC Component Fail” is displayed.
6) If ADC calibration is failure, after rechecking ADC pattern or condition, retry calibration.
7) After completing ADC Component, input mode will be changed to RGB automatically.
8) If ADC calibration is successful, “ADC RGB Success” is displayed.
   If ADC calibration is failure, “ADC RGB Fail” is displayed.
9) If ADC calibration is failure, after recheck ACD pattern or condition, retry calibration.

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

5.2.1 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”

5.2.2 Equipment

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

5.2.3 Download method

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

- Caution) When EDID Download, must remove RGB/HDMI Cable.

5.2.4 EDID DATA

HDMI-1 EDID table

HDMI-2 EDID table

Analog (RGB) EDID table

5.3. White Balance Adjustment

(1) Overview

• W/B adj. Objective & How-it-works

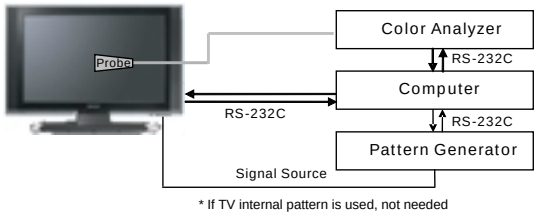
- Objective: To reduce each Panel's W/B deviation
- How-it-works: When R/G/B gain in the OSD is at 192, it means the panel is at its Full Dynamic Range. In order to prevent saturation of Full Dynamic range and data, one of R/G/B is fixed at 192, and the other two is lowered to find the desired value.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

(2) Equipment

1) Color Analyzer: CA-210 (NCG: CH 9 / WCG: CH12)
2) Adj. Computer(During auto adj., RS-232C protocol is needed)
3) Adjust Remocon
4) Video Signal Generator MSPG-925F 720p/216-Gray (Model:217, Pattern:78)
   -> Only when internal pattern is not available

• Color Analyzer Matrix should be calibrated using CS-1000

(3) Equipment connection MAP



Connection Diagram of Automatic Adjustment

(4) Adj. Command (Protocol)

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

RS-232C COMMAND [CMD	ID	DATA]	Meaning
wb	00	00	Begin White Balance adj.
wb	00	ff	End White Balance adj.(Internal 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. complete
*(wb 00 20(start), wb 00 2f(end)) -> Off-set adj.
wb 00 ff -> End white balance auto adj.

2) Adjustment Map
Applied Model : LA06A Chassis All models.

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

(5) Auto adj. method

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

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

(6) Manual adj. method

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

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

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

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

Mode	Color Coordination		Temp	ΔUV
	x	y		
COOL	0.269	0.273	11000K	0.0000
MEDIUM	0.285	0.293	9300K	0.0000
WARM	0.313	0.329	6500K	0.0000

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

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

5.4. HDCP (High-Bandwidth Digital Contents Protection) SETTING

- HDCP setting is not necessary in This Chassis.

5.5 Option selection per country

5.5.1 Overview
• Option selection is only done for models in Non-USA North America due to rating
• Applied model: LA06A Chassis applied None USA model(CANADA, MEXICO)

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

5.6 Tool Option selection

• Method : Press Adj. key on the Adj. R/C, then select Tool option.

Model	Tool 1	Tool 2	Tool 3	Tool 4	Tool 5
32LD320H-UA	16864	8786	32772	2305	0
37LD320H-UA	20960	8786	32772	2305	0
42LD320H-UA	25056	8786	32772	2305	0
26LD320H-UA	12768	8786	32772	2305	0

5.7 hip-out mode check (In-stop)

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

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

6. GND and Internal Pressure check

6.1. Method

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

6.2. Checkpoint

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

7. Audio

No	Item	Min	Typ	Max	Unit		Remark
1.	Audio practical max	9.0	10.0	12.0	W	Measurement	32/37/42LD320H-UA
	Output, L/R	8.5	8.9	9.8	Vrms	condition	
	(Distortion=10%	6.3	7.0	8.4	W	EQ Off	26LD320H-UA
	max Output)	7.09	7.48	8.19	Vrms	AVL Off	
						Clear Voice Off	
2.	Speaker (8Ω		10.0	15.0	W	Measurement	32/37/42LD320H-UA
	Impedance)		5.0	15.0	W	condition	26LD320H-UA
						EQ Off	
						AVL Off	
						Clear Voice Off	

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

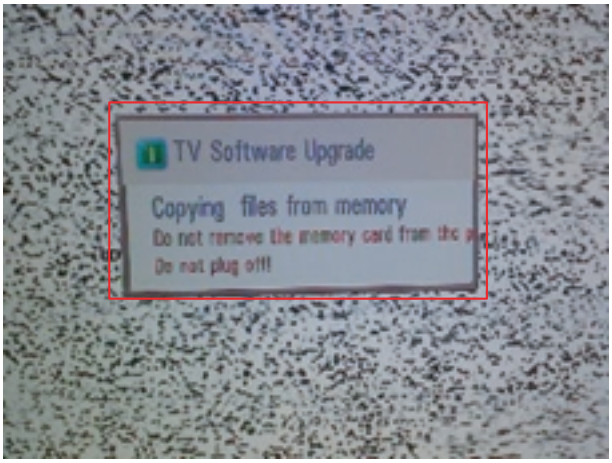
8. Etc

	Power Status	
	Main B/D Shipping Condition	AC Swithch condtion
Chassis Module Assembly	ON	N/A
Front Module Assembly	N/A	OFF
Factory incoming	ON	OFF
Final Assembly	ON	ON
Ship-Out	OFF	ON

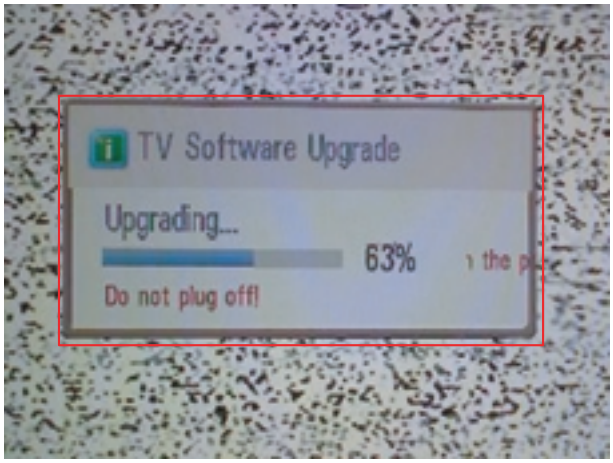
9. USB S/W Download (option)

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

(3) Show the message "Copying files from memory"



(4) Updating is staring.



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

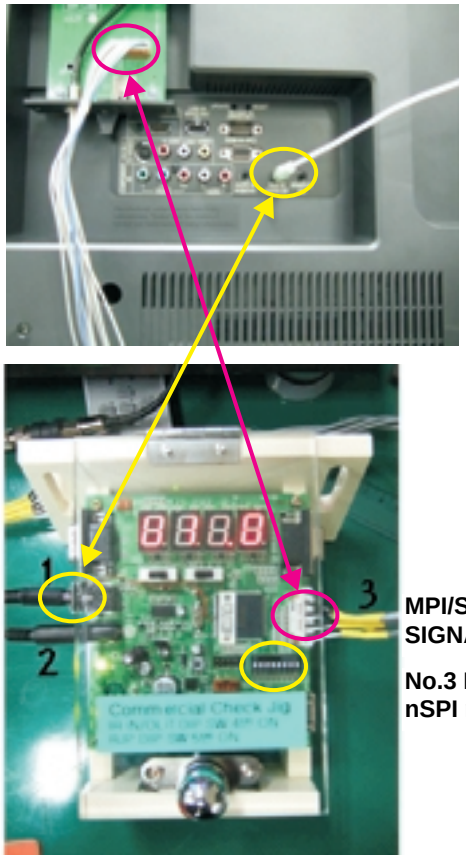
* After downloading, have to adjust TOOL OPTION again.
  1) Push "IN-START" key in service remote controller.
  2) Select "Tool Option 1" and Push "OK" button.
  3) Punch in the number. (Each model has their number.)

10. Test factor for commercial model

10.1 IR IN/Out, Lodgenet Check

10.1.1 Check Order “OK” Judgment

1) The method of Cable connecting from jig to TV.
   a) Power Cable is connected to jig for supplying voltage. (as below picture point2)
   b) Phone jack is Connected for IR out test from TV REMOTE CONTROL OUT(JK900) to jig. (as below picture point1)
   c) In the right side of check jig, 11pin SPI/MPI signal cable is connected to MPI dummy board. (as below picture point3)



IR IN

Power

MPI/SPI SIGNAL 11P

No.3 Pin on nSPI mode

2) Test sequence
   a) Press EYE using adjust remote-control.
   b) Then, tuning the channel 96- 1.(Lodgenet digital1.) automatically.
   c) Check it whether the video is clear and 1~5 factor “OK” like below picture.
   (IR IN / IR OUT / SPI TEST / MPI TEST / 12V IN)
   If you find any problem, press <Eye> button and retest.

10.1.2 Needs JIG & Equip. & Cable

1) adjust remote-control
2) commercial check jig & adapter
3) 11 pin cable
4) Phone jack Cable

10.2 Auto camport test

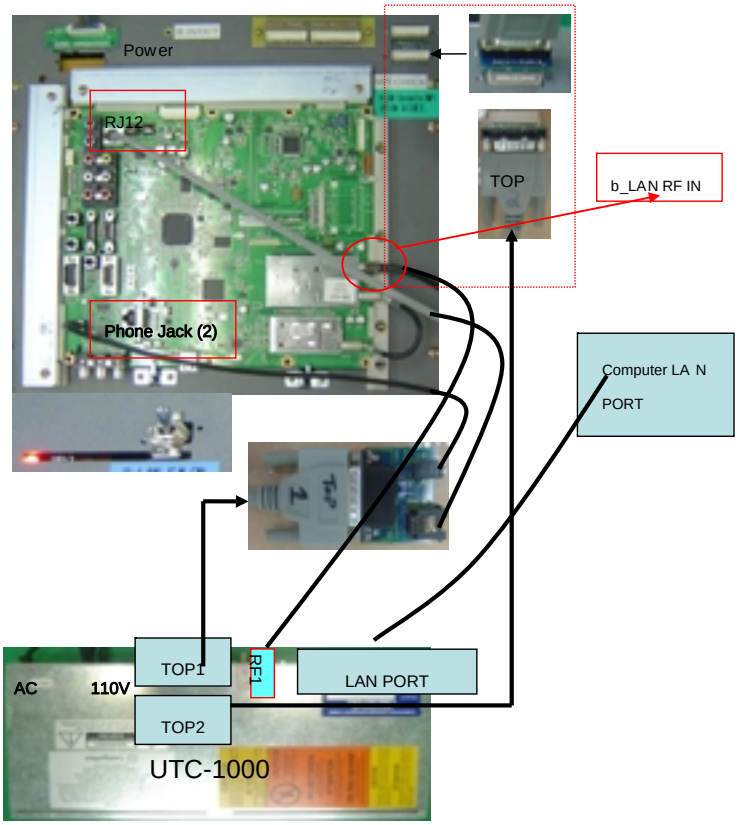
After D-box on, AC power Off and On.
When available AV signal comes to side AV jack, input mode changing to AV2 automatically.

10.3 b_LAN Main board Check

10.3.1 Overview
It is LNET RF modem & FTG card

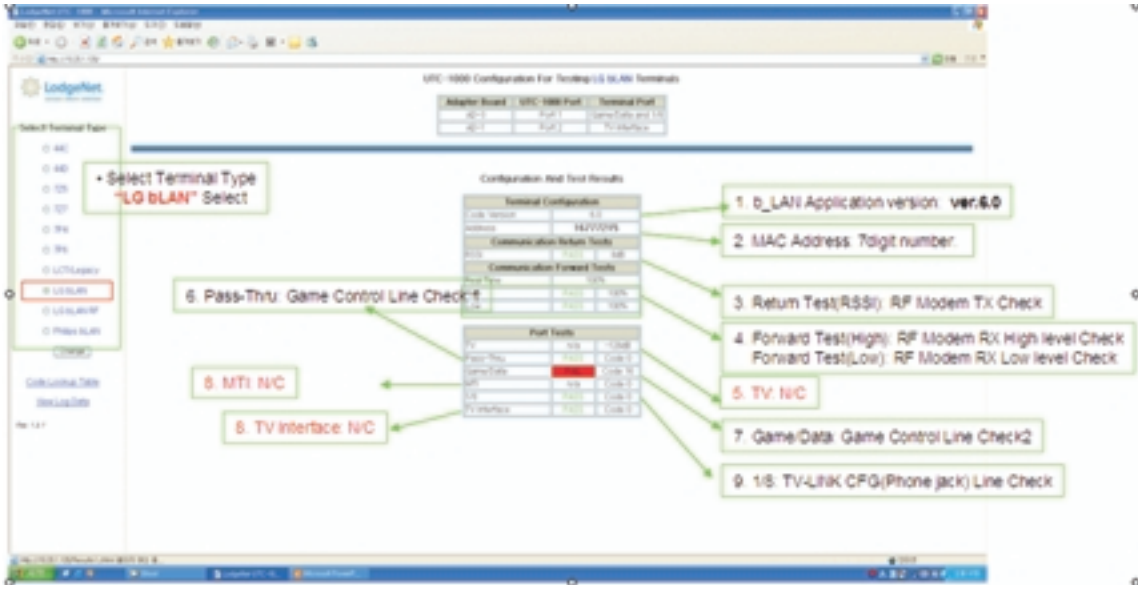
10.3.2 Equipment
1) b_LAN Checker: UTC-1000 (with Cable accessory)
2) Computer(for test result monitoring)
3) Connection JIG

10.3.3 Equipnent connection map & b_LAN Check



4) Check
==========
1. Setting Procedure
1) Setting JIG
(1) Connect UTC-1000 Equipment to JIG device as a like left picture
- Connection Line:
UTC-1000 TOP1 <--> Game port(RJ21)
-> TV-LINK CFG (Phone Jack)
UTC-1000 TOP2 <--> JIG 11pin Connection
UTC-1000 RF1 <--> b_LAN RF IN
UTC-1000 LAN <--> PC LAN Port

2. Working procedure
1) Connection
UTC-1000 LAN <--> PC LAN Port
UTC-1000 TOP1 <--> Game port(RJ21)
-> TV-LINK CFG (Phone Jack)
UTC-1000 RF1 <--> b_LAN RF IN
2) Power on JIG
3) Test Start
UTC-1000 TOP2 <--> JIG 11pin Connection
4) Checking b-LAN MAC Address
Check whether it is same their address numbers or not between B-LAN Label and on the pc address numbers.



* Checking JIG contents
1. Check whether displaying all “Pass” or not at the number 3.4.6.7.9 contents of UTC-1000 on the PC
2. Check “Version 6.0” of the 1. b_LAN Application version
3. Check whether it is same their address numbers or not between B-LAN Label and 2. MAC Address on the pc.

11. Serial number download.

Connect Bar Code scan equipment and TV set by RS-232C cable.

1) E2PROM Data Write

CMD	LENGTH	ID_1	ID_2	DATA_1	. . .	DATA_N	CR

- CMD : A0h
- LENGTH : 85 ~ 94h(1~16 BYTES)
- ID_1 : 73h('s')
- ID_2 : 1) Serial Number - 61h('a') 2) Model Name – 62h('b')
- CR : 0Dh
- RETURN : A0h + CR

2) E2PROM Data Read

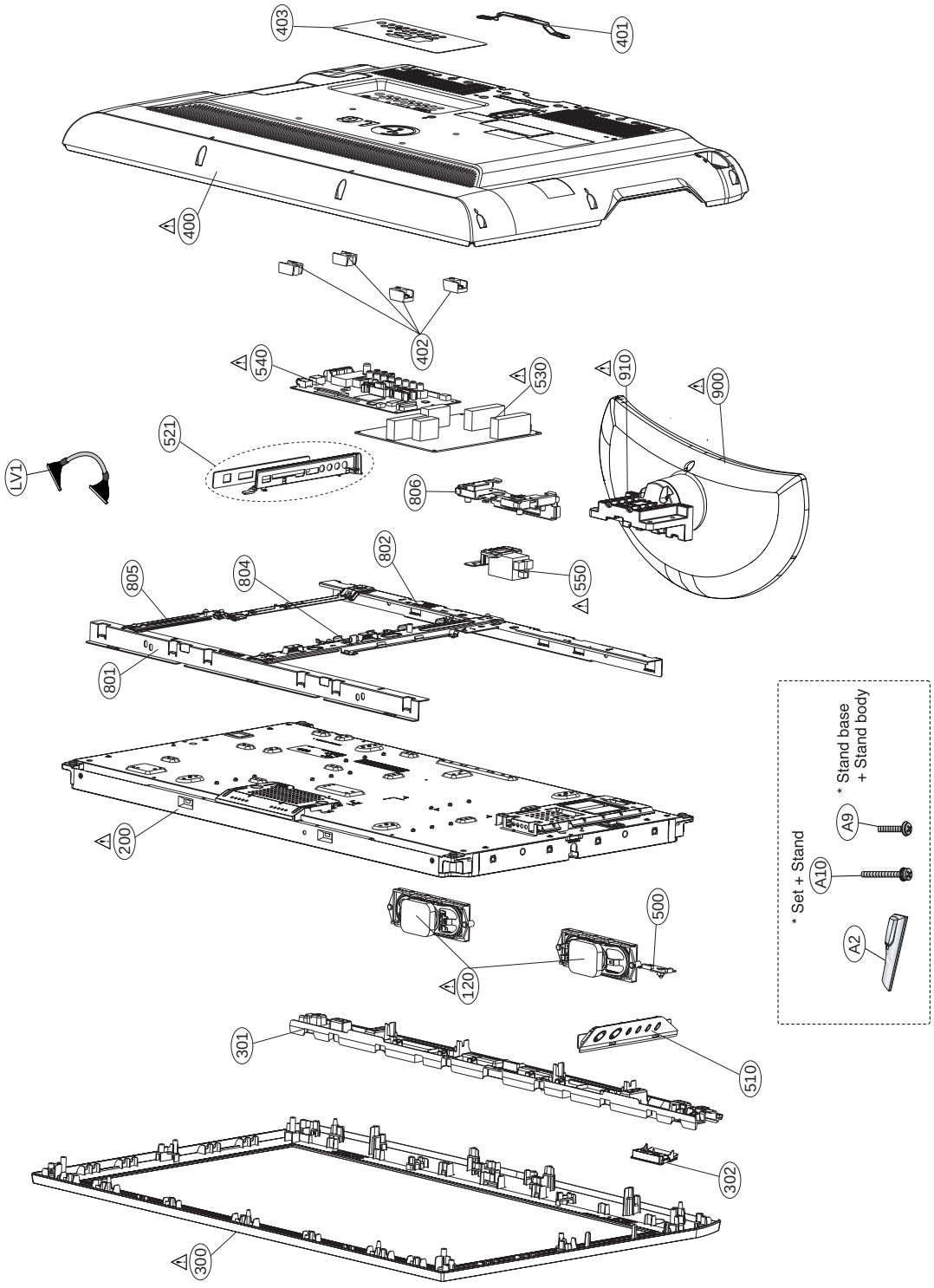
CMD	LENGTH	ID_1	ID_2	CR

- CMD : A1h
- LENGTH : 85 ~ 94h(1~16 BYTES)
- ID_1 : 73h('s')
- ID_2 : 1) Serial Number - 61h('a') 2) Model Name – 62h('b')
- CR : 0Dh
- RETURN : DATA + CR

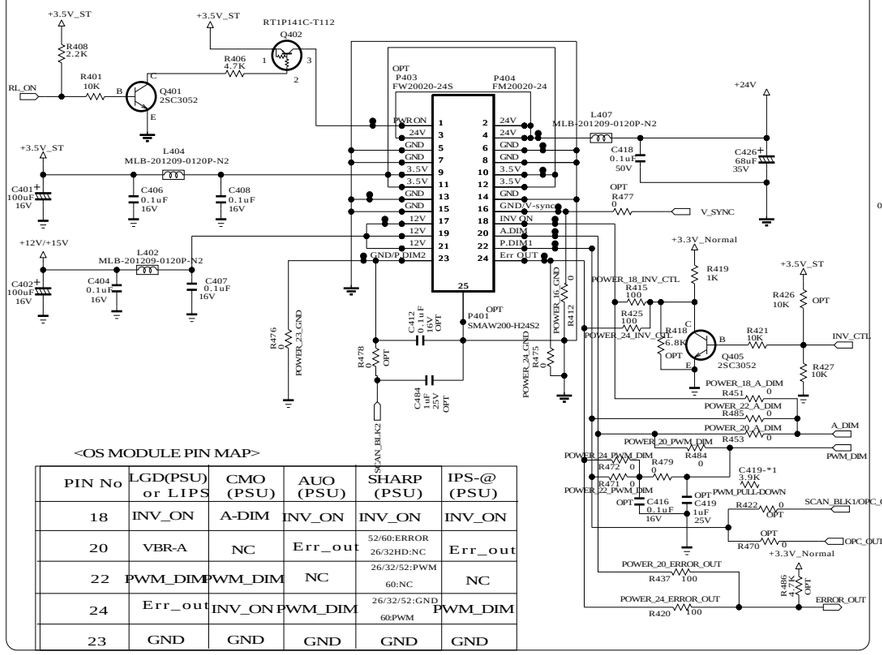
EXPLODED VIEW

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.



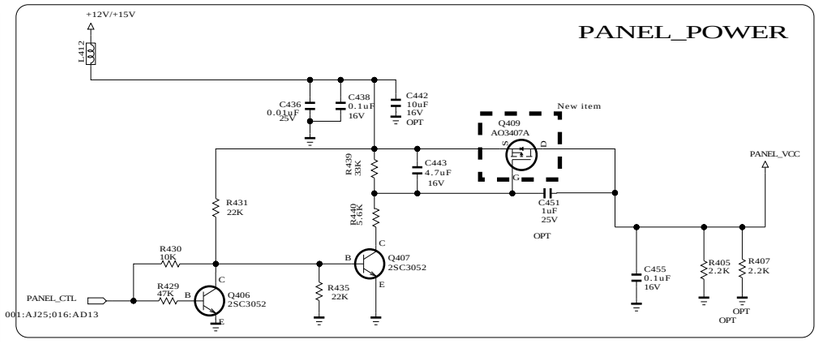
FROM LIPS & POWER B/D



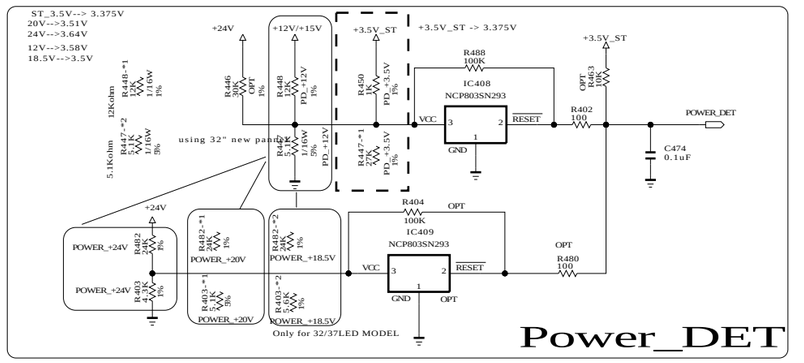
<OS MODULE PIN MAP>

PIN No	LGD(PSU) or LIPS	CMO (PSU)	AUO (PSU)	SHARP (PSU)	IPS-@ (PSU)
18	INV_ON	A-DIM	INV_ON	INV_ON	INV_ON
20	VBR-A	NC	Err_out	52/60:ERROR 26/32HD:NC	Err_out
22	PWM_DIM	PWM_DIM	NC	26/32/52:PWM 60:NC	NC
24	Err_out	INV_ON	PWM_DIM	26/32/52:GND 60:PWM	PWM_DIM
23	GND	GND	GND	GND	GND

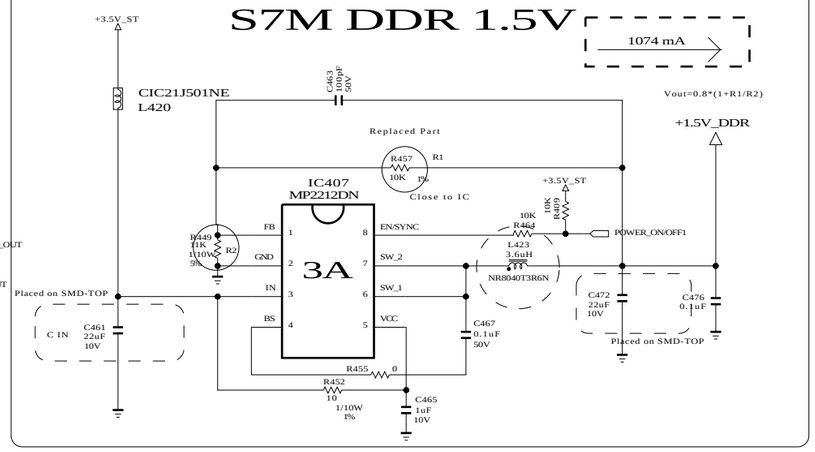
PANEL_POWER



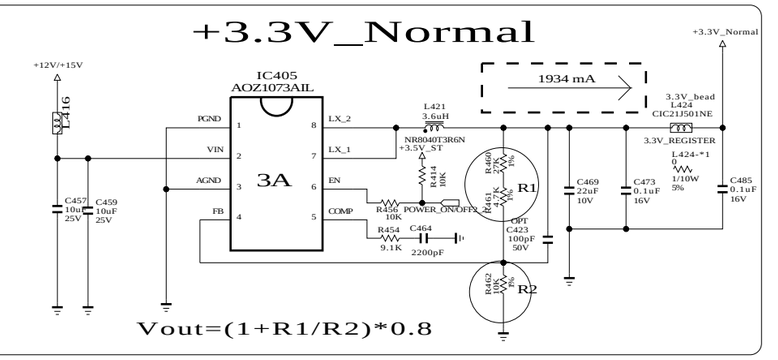
Power_DET



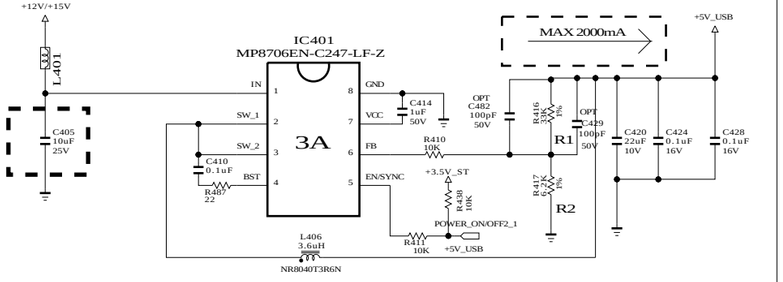
S7M DDR 1.5V



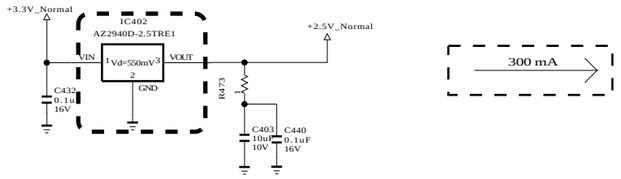
+3.3V_Normal



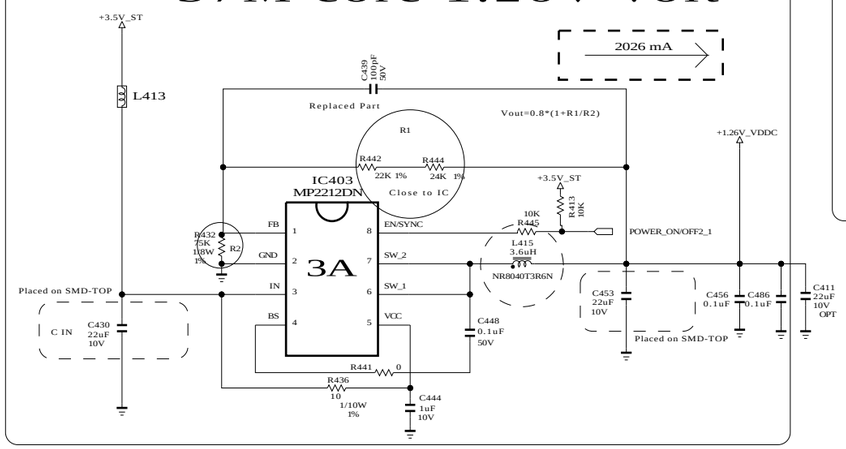
+5V_USB



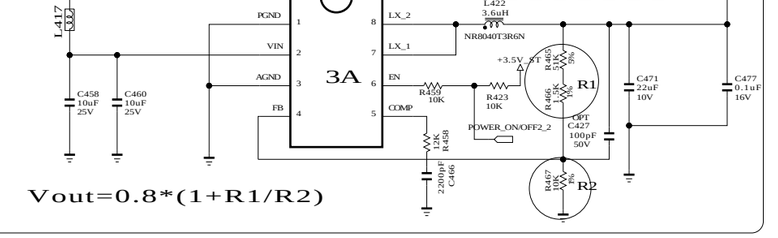
+2.5V/+1.8V



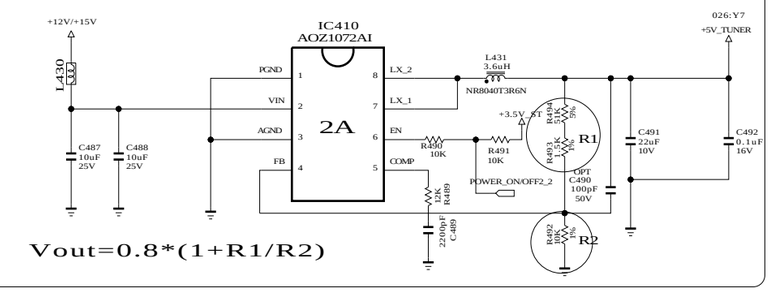
S7M core 1.26V volt



+5V_Normal



+5V_TUNER



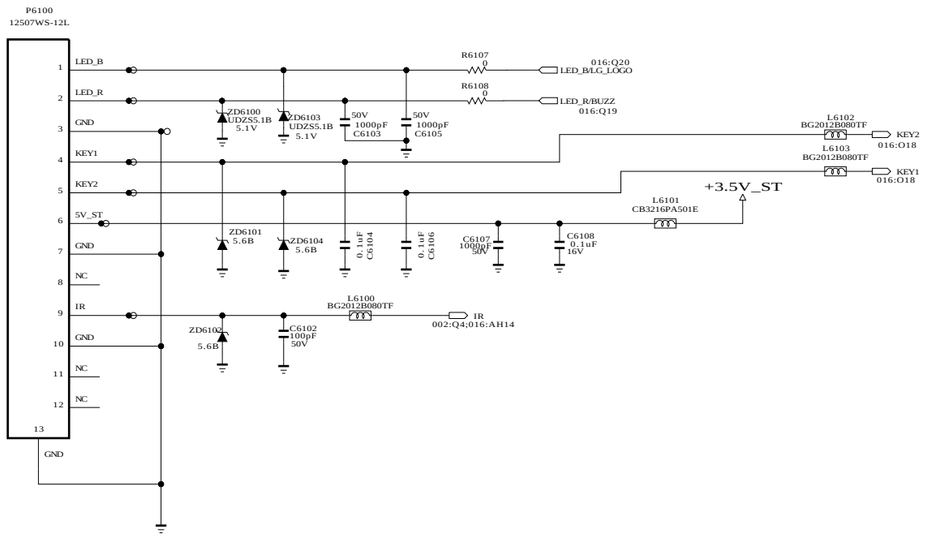
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

SECRET

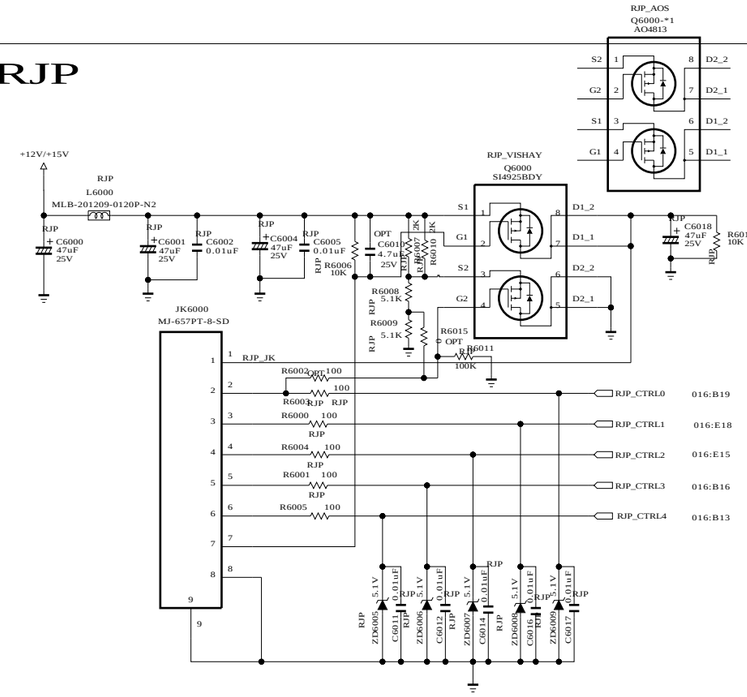
LGElectronics

LG ELECTRONICS

MODEL	37LD320H	DATE	2010.12.22
BLOCK	Power	SHEET	4

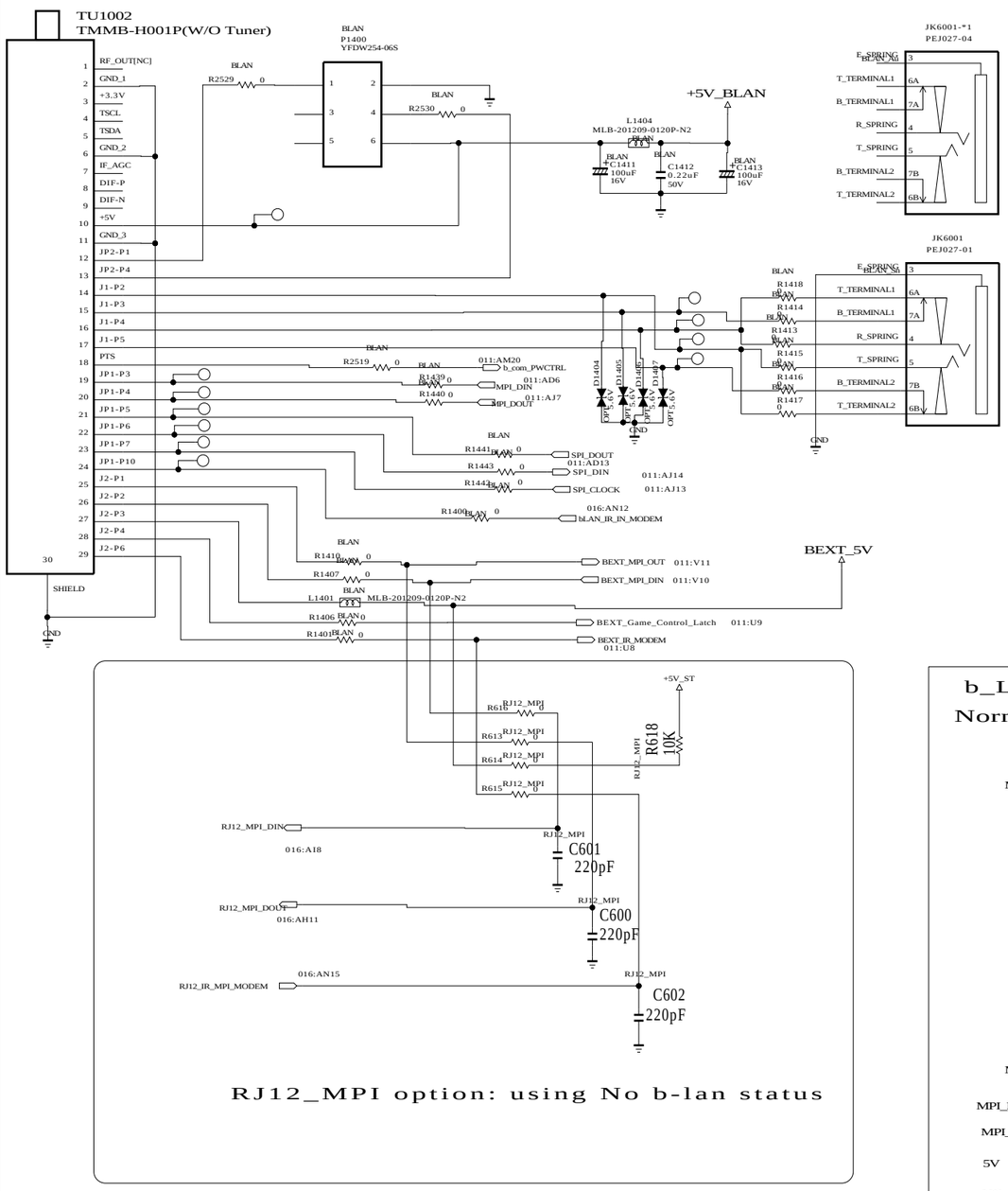


RJP



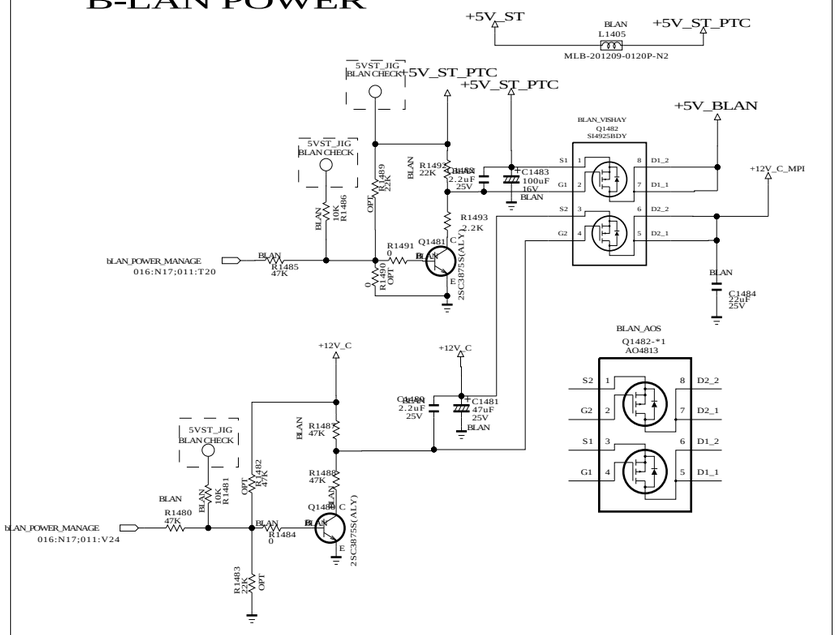
MODEL	37LD320H	DATE	2010.12.22
BLOCK	IR/RJP	SHEET	6 /

B-LAN

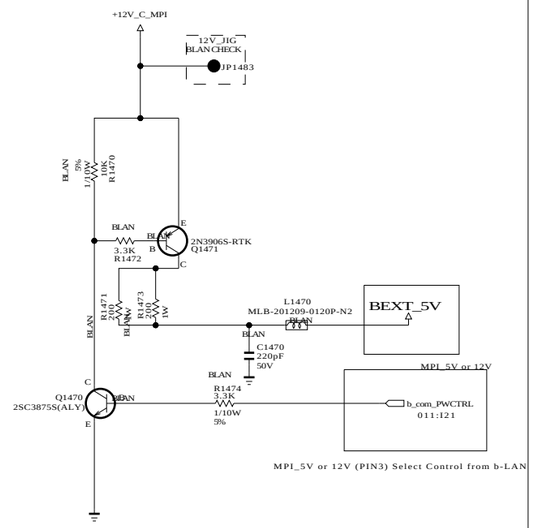


RJ12_MPI option: using No b-lan status

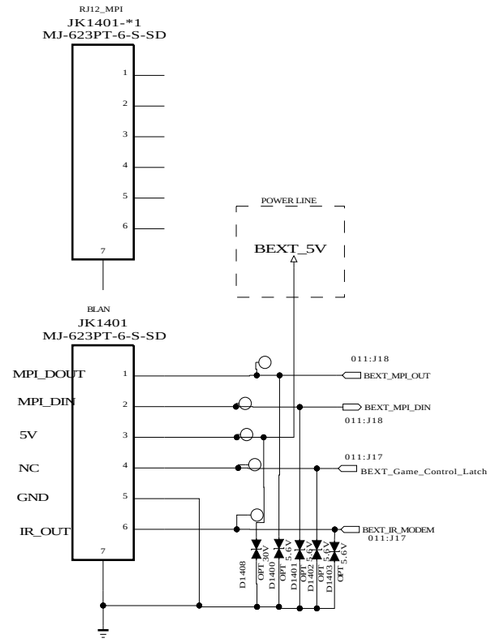
B-LAN POWER



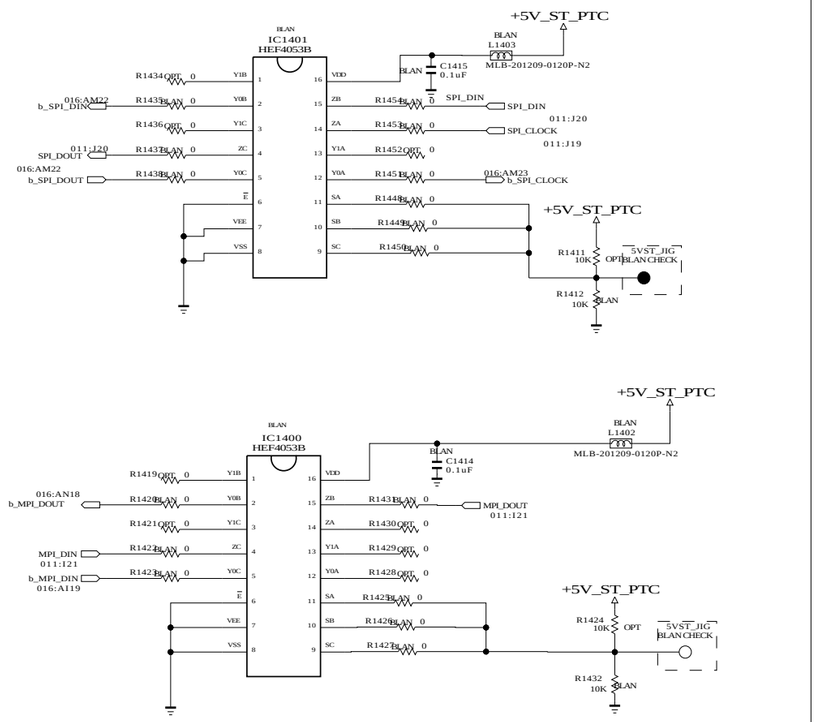
b_LAN MPI pin3 power control



b_LAN Game control JACK
Normal MPI JACK



for b_LAN JIG test



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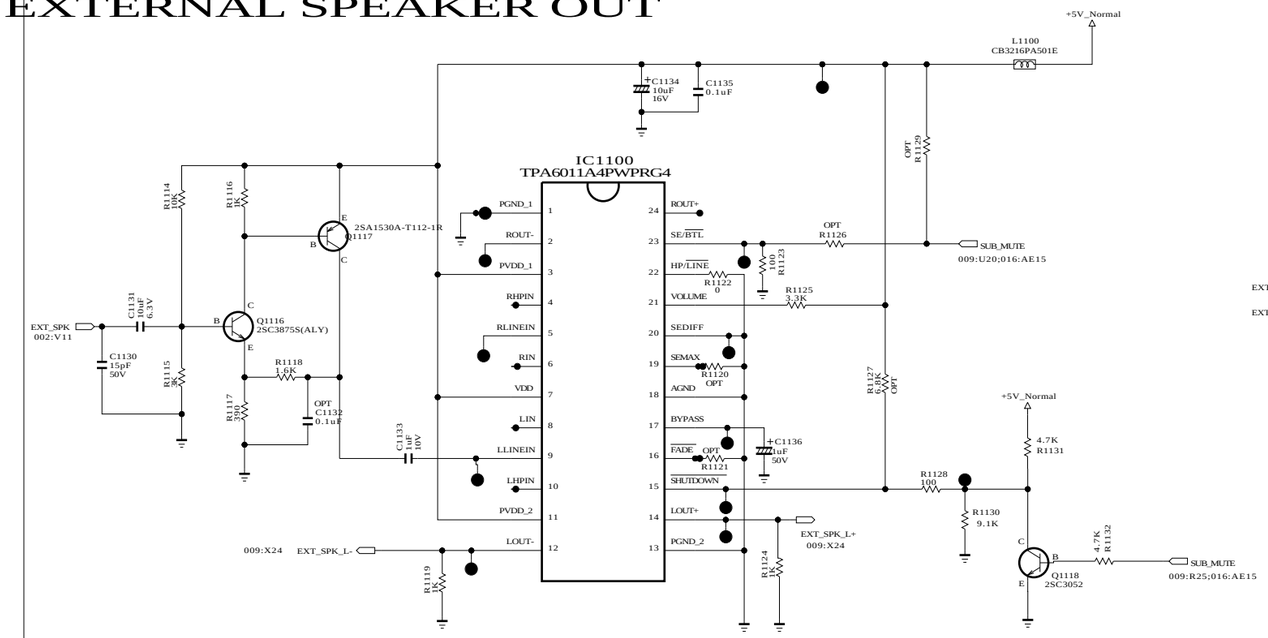
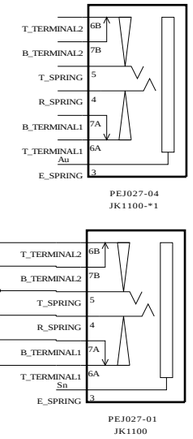
SECRET
LGElectronics

LG ELECTRONICS

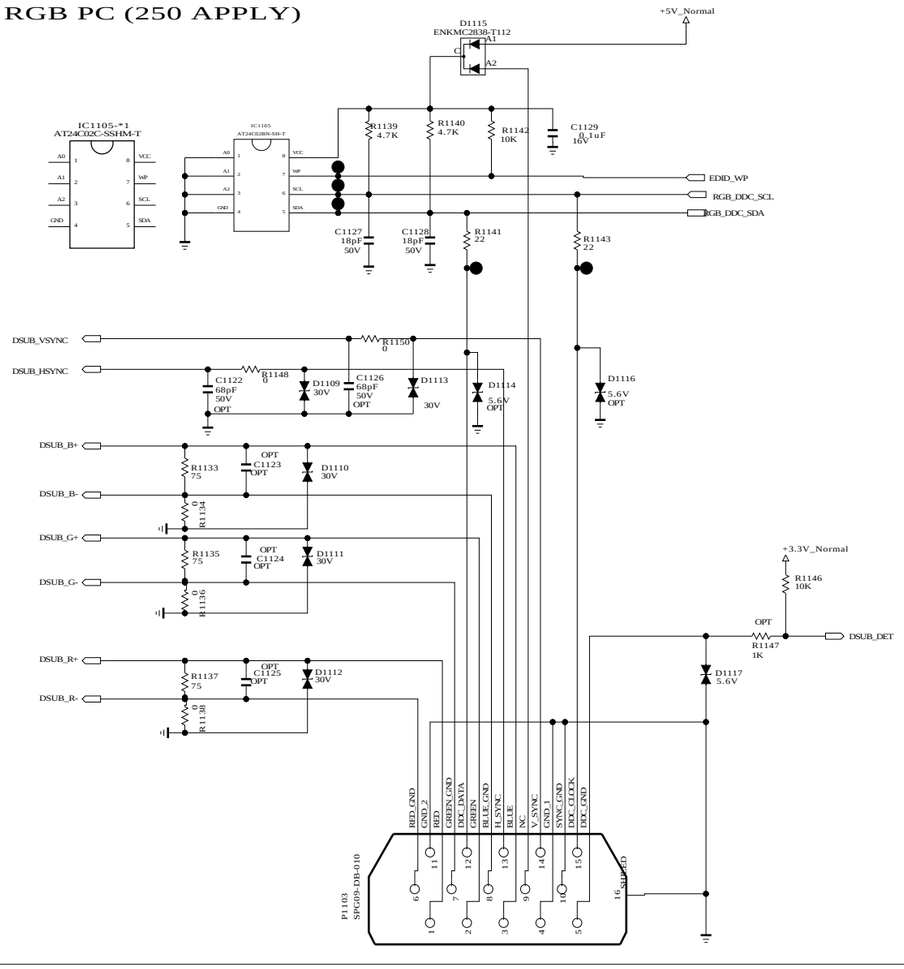
MODEL	37LD320H	DATE	2010.12.22
BLOCK	B-lan	SHEET	11

EXTERNAL SPEAKER OUT

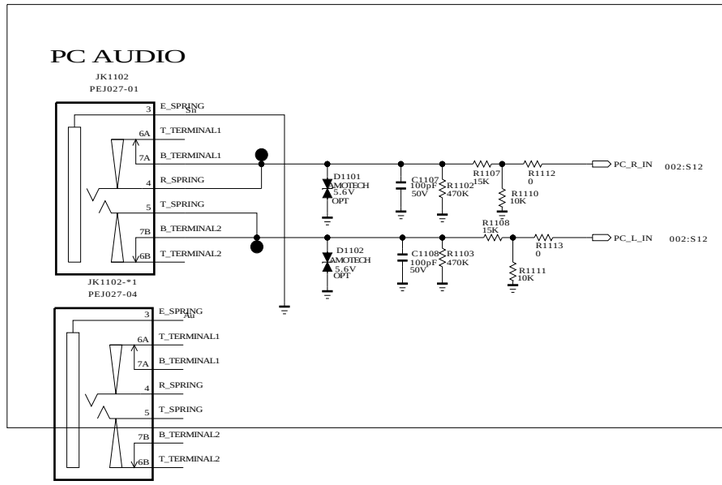




RGB PC (250 APPLY)



PC AUDIO



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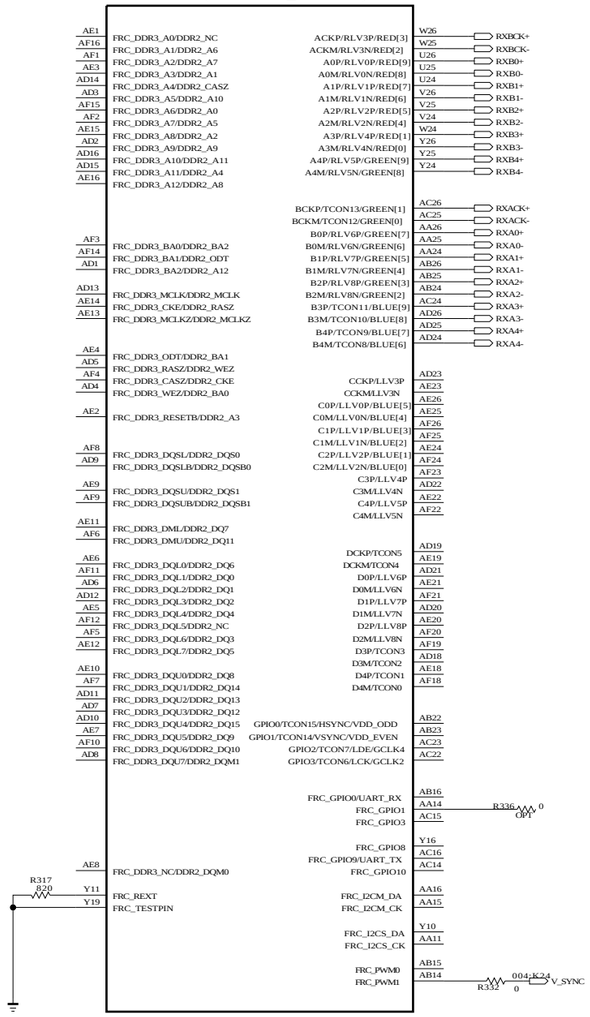
LG ELECTRONICS

MODEL	37LD320H	DATE	2010.12.22
BLOCK	External speaker	SHEET	9

S7M_DIVX

IC101

LGE107D (S7M Divx_Non RM)



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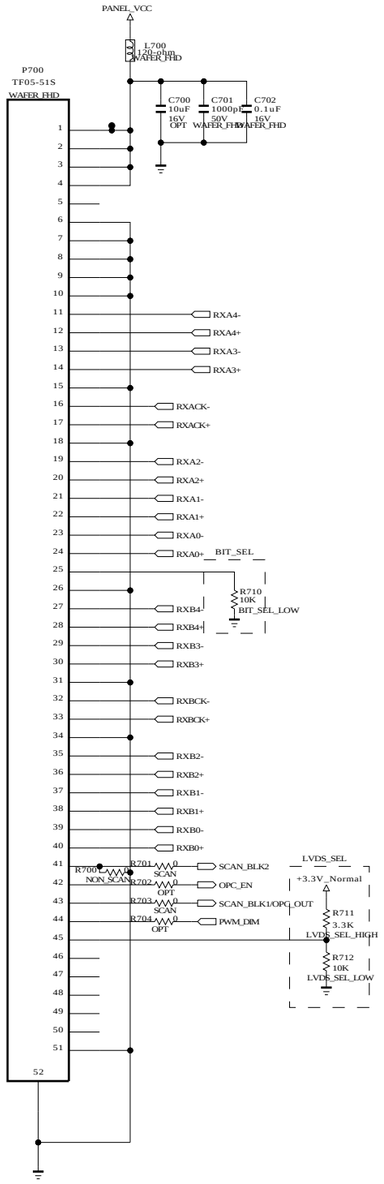
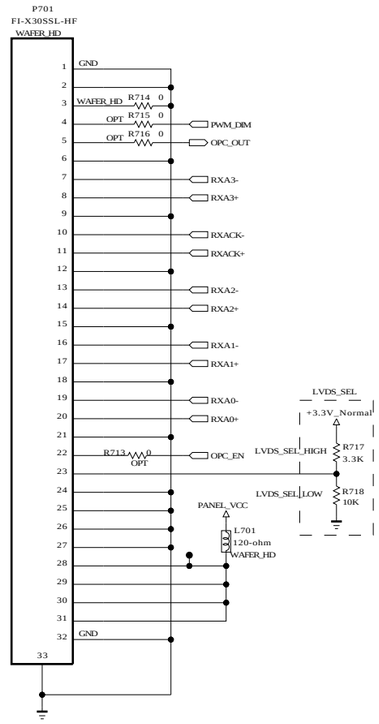
LG ELECTRONICS

MODEL	37LD320H	DATE	2010.12.22
BLOCK	Main	SHEET	3

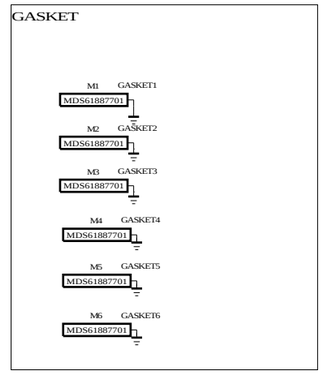
[51Pin LVDS Connector]
(For FHD 60/120Hz)



[30Pin LVDS Connector]
(For HD 60Hz_Normal)



GASKET



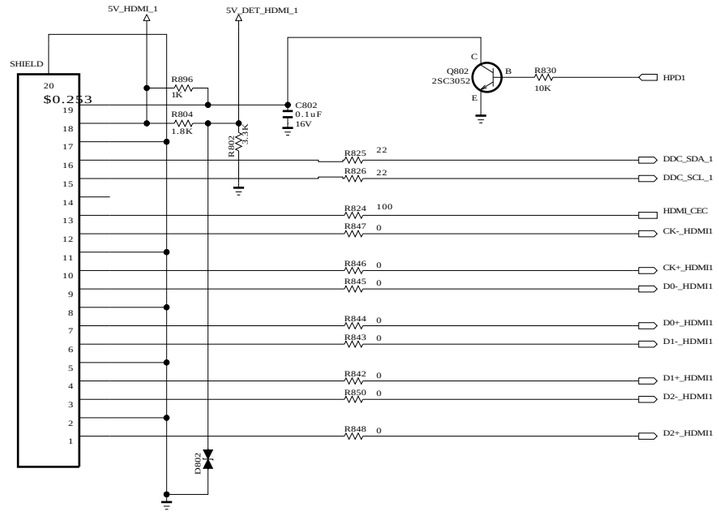
SECRET

LGElectronics

LG ELECTRONICS

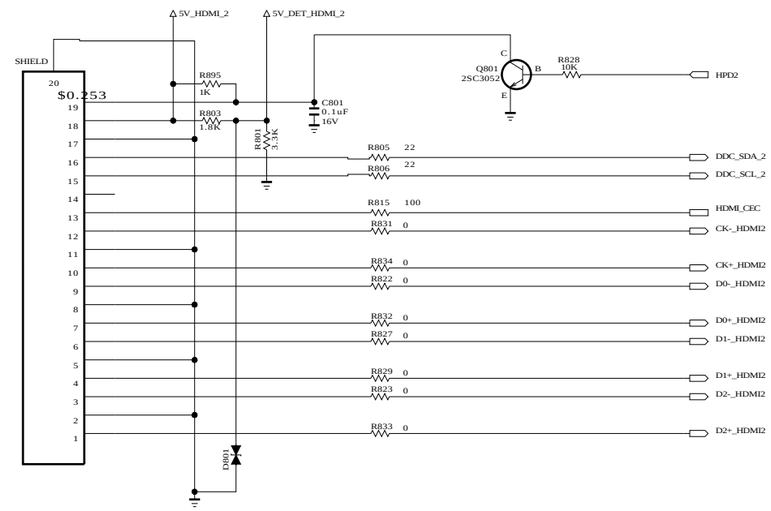
MODEL	37LD320H	DATE	2010.12.22
BLOCK	LVDS	SHEET	7 /

HDMI_1



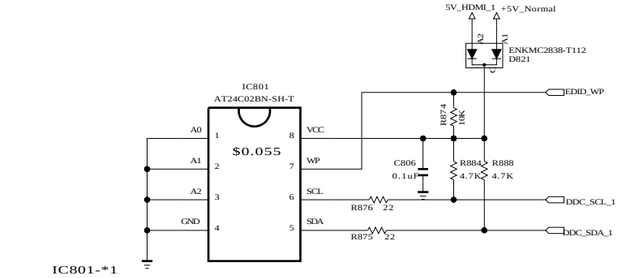
YKF45-7058V
JK802

HDMI_2

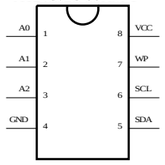


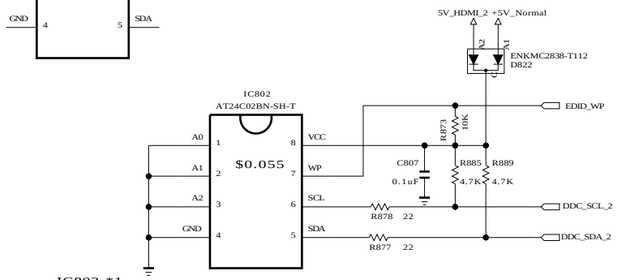
YKF45-7058V
JK801

HDMI EEPROM

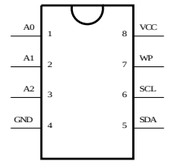


IC801-*1
AT24C02C-SSHM-T





IC802-*1
AT24C02C-SSHM-T



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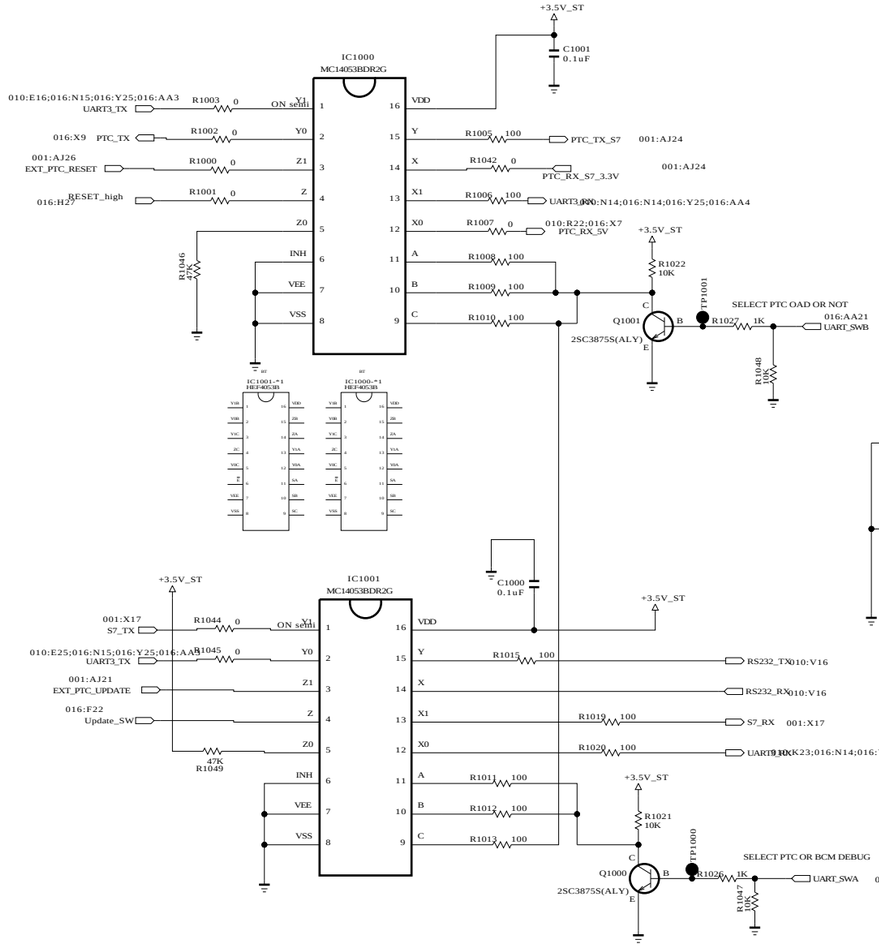
SECRET
LGElectronics

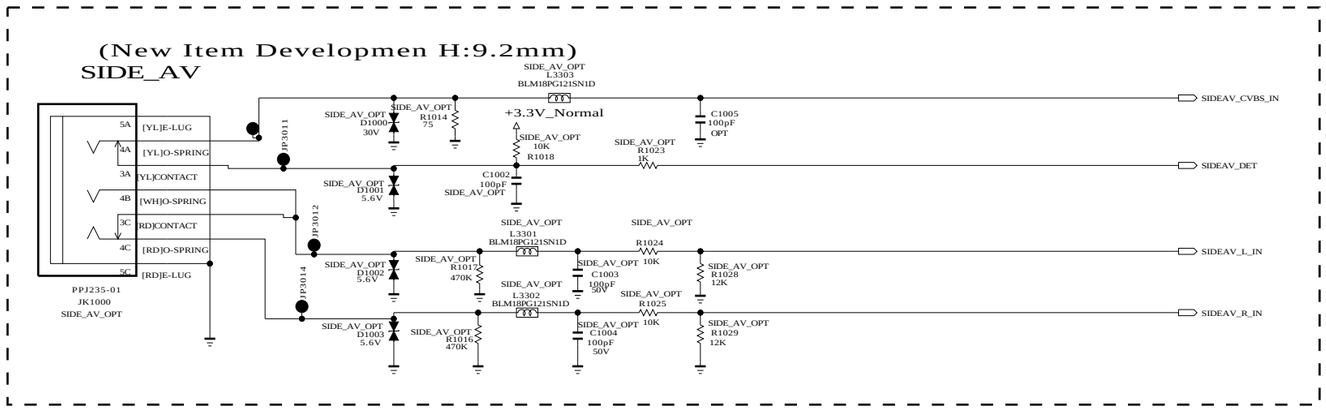
LG ELECTRONICS

MODEL	37LD320H	DATE	2010.12.22
BLOCK	HDMI	SHEET	8

Serial Port



Objective	SW_A	SW_B	PC_SIM
M-STAR DEBUG	0	X	X
PTC DEBUG	1	1	X
PTC OAD	0	0	X
COMMON	X	1	1
SIMULATION	X	1	0



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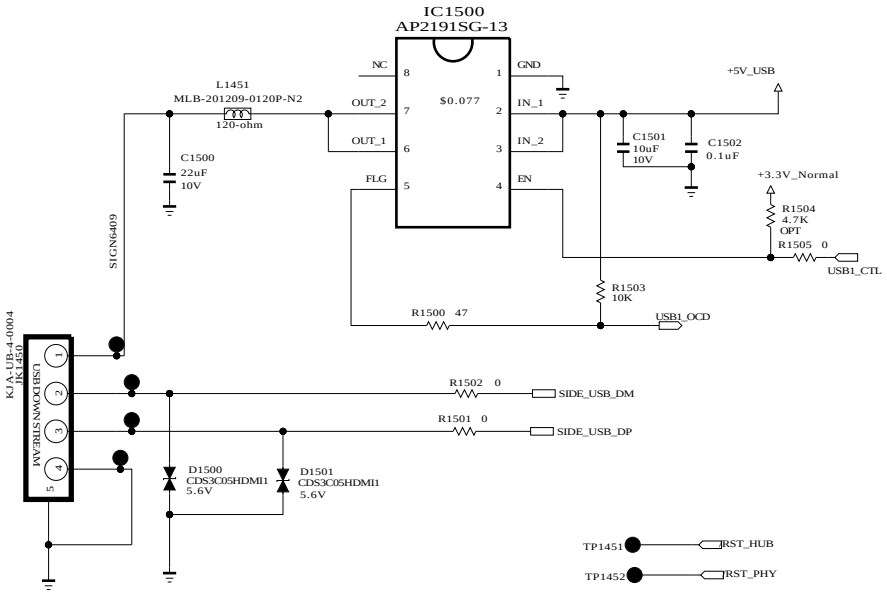
LGElectronics

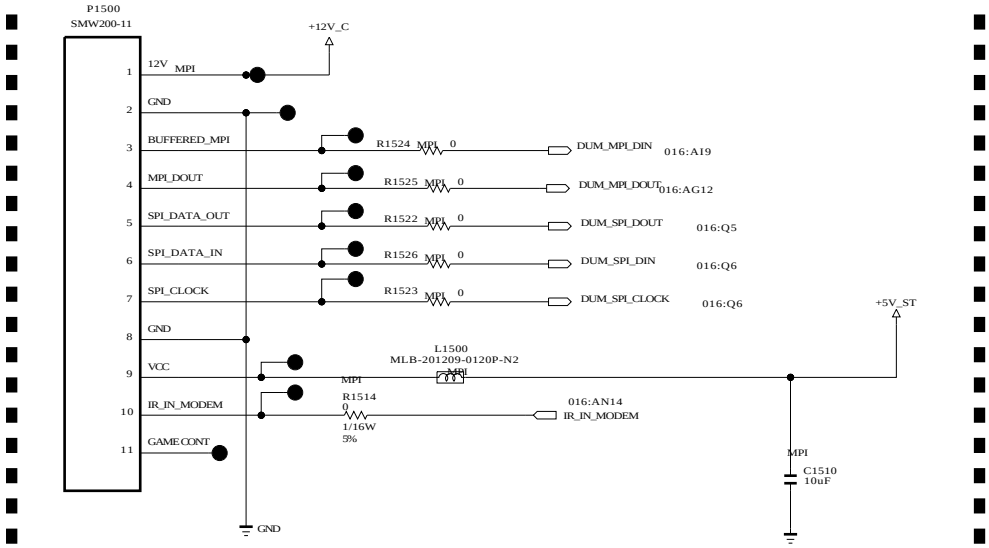
LG ELECTRONICS

MODEL	37LD320H	DATE	2010.12.22
BLOCK	RS232C	SHEET	10

USB_DIODES



MPI



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LGElectronics

LG ELECTRONICS

MODEL	37LD320H	DATE	2010.12.22
BLOCK	USB/MPI	SHEET	14

12V power

+12V/+15V +12V_ST

D1600 MBRA340T3G

D1601 MBRA340T3G

+12V_C

PTC power

+3.5V_ST +3.5V_ST_PTC

L1605 BLM18PG121SN1D

RESET_high 010:E23

Q1615 2SC3875S(ALY)

Update_SW 010:E15

2N3906S-RTK Q1612

SKHMPWE010 SW501

PTC_RESET

SKHMPWE010 SW502

PTC_UPDATE

Only_32" Hot Power

IC_microcontroller IC1602 MSP430F5419IPZR

P6.4/A4 P6.5/A5 P6.6/A6 P6.7/A7 P7.4/A12 P7.5/A13 P7.6/A14 P7.7/A15 P5.0/VREF+/VEREF+ P5.1/VREF-/VEREF- AVCC AVSS P7.0/XIN P7.1/XOUT DVSS DVCC P1.0/TA0CLK/ACLK P1.1/TA0.0 P1.2/TA0.1 P1.3/TA0.2 P1.4/TA0.3 P1.5/TA0.4 P1.6/SMCLK P1.7 P2.0/TA1CLK/MCLK

P9.7 P9.6 P9.5/UCA2RXDUCA2SOMI P9.4/UCA2TXD/UCA2SIMO P9.3/UCB2CLK/UCA2STE P9.2/UCB2SOMI/UCB2SCL P9.1/UCB2SIMO/UCB2SDA P9.0/UCB2STE/UCA2CLK P8.7 P8.6/TA1+B.5V_PTC P8.5/TA1.0 DVCC2 DVSS2 VCORE P8.4/TA0.4 P8.3/TA0.3 P8.2/TA0.2 P8.1/TA0.1 P8.0/TA0.0 P7.3/TA1.2 P7.2/TBOUTH/SVMOUT P5.7/UCA1RXD/UCA1SOMI P5.6/UCA1TXD/UCA1SIMO P5.5/UCB1CLK/UCA1STE P5.4/UCB1SOMI/UCB1SCL

P2.1/TA1.1 P2.2/TA1.2 P2.3/TA1.3 P2.4/RTCCLK P2.5 P2.6/ACLK P2.7/ADC12CLK/DMAE0 P3.0/UCB0STE/UCA0CLK P3.1/UCB0SIMO/UCB0SDA P3.2/UCB0SOMI/UCB0SCL P3.3/UCB0CLK/UCA0STE DVSS3 DVCC3 P3.4/UCA0TXD/UCA0SIMO P3.5/UCA0RXD/UCA0SOMI P3.6/UCB1STE/UCA1CLK P3.7/UCB1SIMO/UCB1SDA P4.0/TB0 P4.1/TB1 P4.2/TB2 P4.3/TB3 P4.4/TB4 P4.5/TB5 P4.6/TB6 P4.7/TBCLK/SMCLK

P6.3/A3 P6.2/A2 P6.1/A1 P6.0/A0 RST/NMI/SBWTDIO P1.3/TCK P1.2/TMS P1.1/TDI/TCLK P1.0/TDO TEST/SBWTCK P5.3/XT2IN P5.2/XT2IN DVSS4 DVCC4 P11.2/SMCLK P11.1/MCLK P11.0/ACLK P10.7 P10.6 P10.5/UCA3RXD/UCA3SOMI P10.4/UCA3TXD/UCA3SIMO P10.3/UCB3CLK/UCA3STE P10.2/UCB3SOMI/UCB3SCL P10.1/UCB3SIMO/UCB3SDA P10.0/UCB3STE/UCA3CLK

IC1608 FM24C16A

IC1608-*1 FM24C16B

IC1607 TXS0104EDR

BLAN IC1606 TXS0104EDR

MPI IC1603 TXS0104EDR

IC1601 BD9306AFVM

IC1600 SC632ULTRT

Q1600 Si4800BDY

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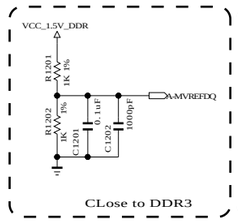
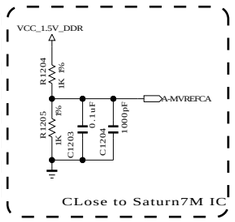
SECRET

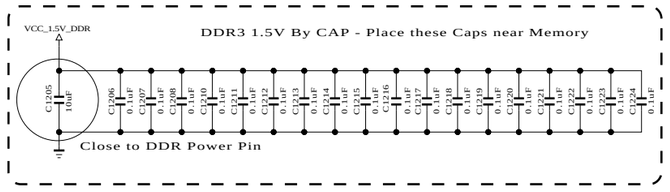
LGElectronics

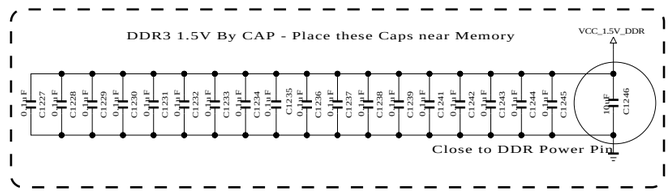
LG ELECTRONICS

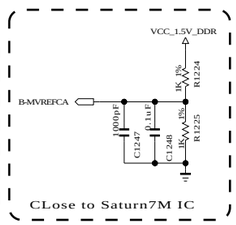
MODEL	37LD320H	DATE	2010.12.22
BLOCK	PTC	SHEET	16

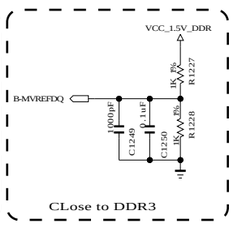


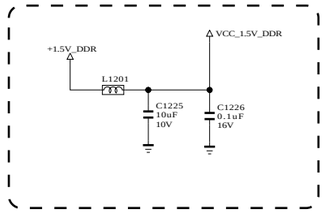


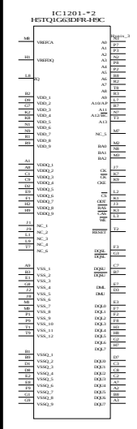


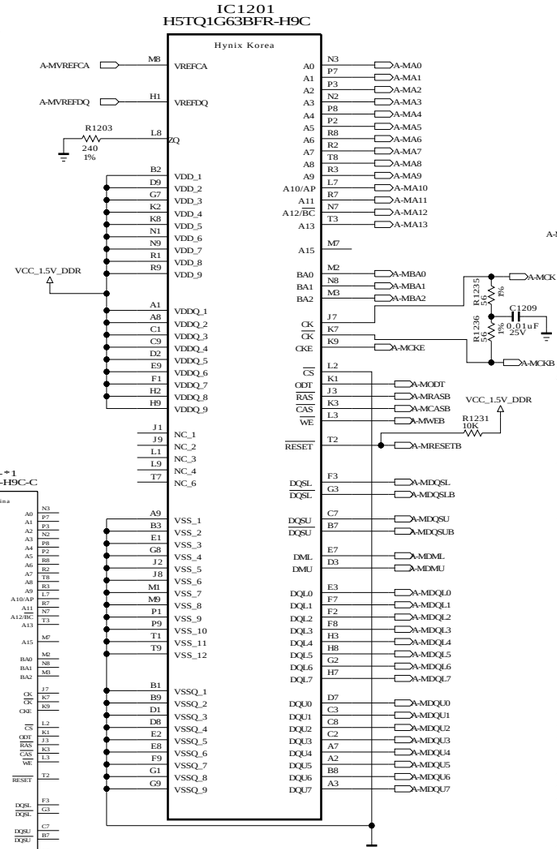


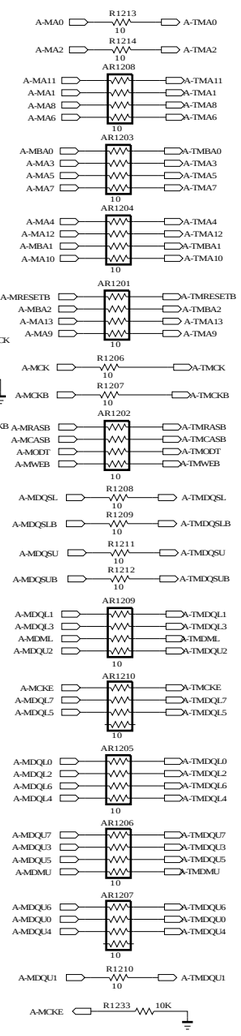


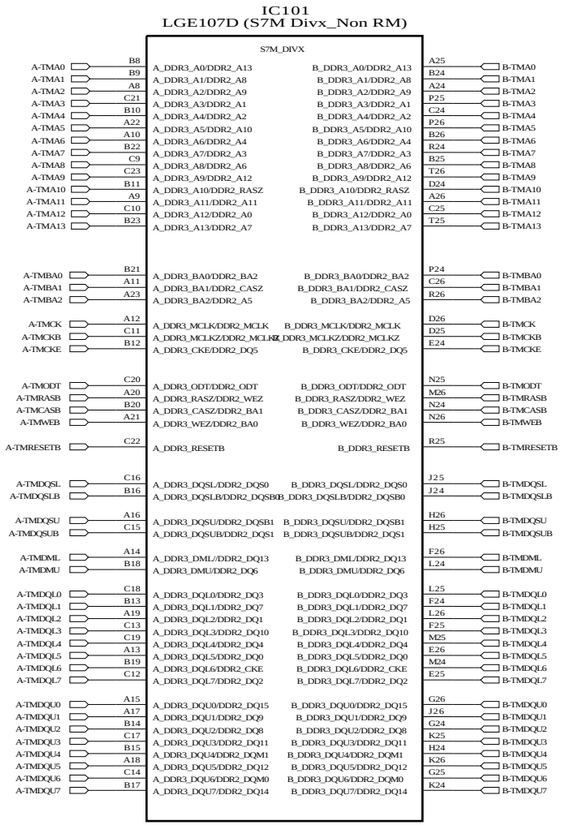


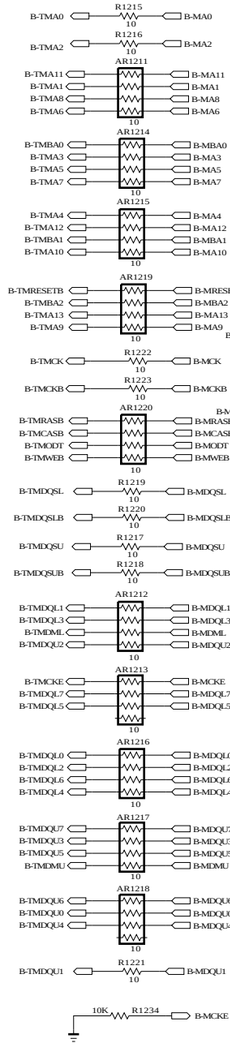


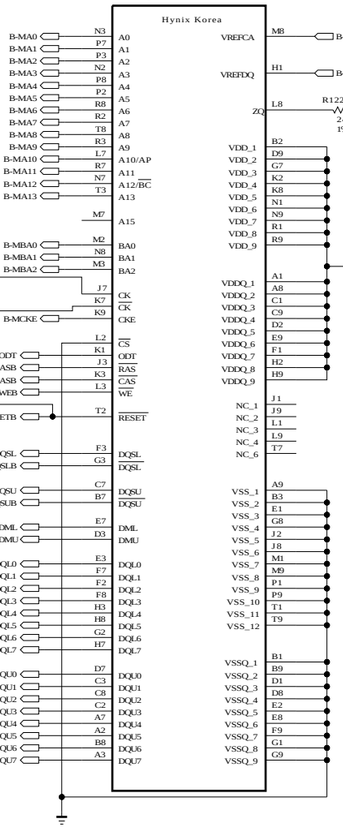


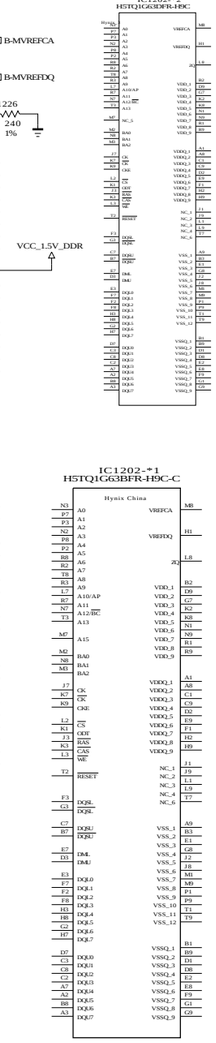












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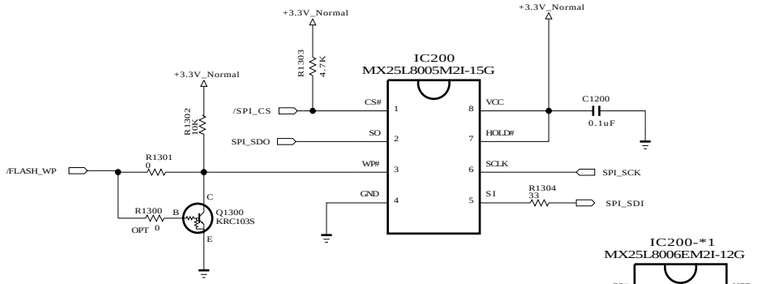
SECRET

LGElectronics

LG ELECTRONICS

MODEL	37LD320H	DATE	2010.12.22
BLOCK	DDR	SHEET	21



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LG ELECTRONICS

MODEL	37LD320H	DATE	2010.12.22
BLOCK	S-flash	SHEET	23 /

GIT CAN H/N TUNER for US&KOR&BRAZIL&TAIWAN&AUS

TU5001-*1
TDTR-T035F
NTSC_2INPUT_H_LGIT

TU5001-*2
TDVJ-H031F
NTSC_1INPUT_V_LGIT

TU5001-*3
TDVJ-H001F
NTSC_1INPUT_H_LGIT

DVB_1INPUT_H_LGIT
TU5001
TDTJ-S001D

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

+5V_TU
C5001 100pF 50V
C5003 0.1uF 16V

+3.3V_TU
NON_BR_TU_I2C R5018 1.2K
NON_BR_TU_I2C R5020 1.2K
33 R5015 NON_BR_TU_I2C → TU_SCL
33 R5016 NON_BR_TU_I2C → TU_SDA
C5012 18pF 50V
C5013 18pF 50V
NON_BR_TU_I2C NON_BR_TU_I2C

Option name:BR_TU_I2C
BRAZIL model use I2C Standard Mode

BR_TU_I2C R5018-*1 3.3K	BR_TU_I2C R5020-*1 3.3K
BR_TU_I2C R5015-*1 100 1/16W 5%	BR_TU_I2C R5016-*1 100 1/16W 5%
BR_TU_I2C C5012-*1 47pF 50V	BR_TU_I2C C5013-*1 47pF 50V

+5V_TU
R5029 470
R5032 82 → TU_SIF
C5025 0.1uF 16V
R5025 4.7K
Q5004 ISA1530AC1

+5V_TU
R5026 1K OPT
R5030 220 OPT
R5031 220 OPT
R5039 0 → TU_CVBS_BYPASS → TU_CVBS
R5300 0
Q5005 ISA1530AC1
R5027 1K OPT

+1.2V/+1.8V_TU
+3.3V_TU
C5006 100pF 50V
C5007 0.1uF 16V
+3.3V_TU
R5009 100
R5011 100K
C5010 0.1uF 16V → TUNER_RESET

R5003 0
R5034 0 → IF_N_MSTAR
R5035 0 → IF_P_MSTAR
R5022 1K → IF_AGC_MAIN
C5016 0.1uF 16V OPT
should be guarded by ground
Close to the tuner

+3.3V_TU
IC5001
AZ1117H-ADJTRE1
VIN 3 → 1 ADJ/GND
2 VOUT
R5036 10
R5038 1.2K
+1.2V/+1.8V_TU
R5033 1
C5029 10uF 10V
C5028 0.1uF 16V
C5031 0.1uF 16V

+5V_TU
200mA
+5V_TUNER
L5002 BLM18PG121SN1D
C5019 22uF 16V
C5021 0.1uF 16V
C5023 0.1uF 16V

+3.3V_Normal
+3.3V_TU
60mA
L5003 BLM18PG121SN1D
C5020 22uF 16V
C5022 0.1uF 16V
C5024 0.1uF 16V

*Change History.
Ver 1.0 --> 1.1:Change of chip type, 091019, w.s.jeong
Ver 1.1 --> 1.2:Change of chip type, Add of Tuner P/N for NTSC_1INPUT P/N for NTSC_1IN
1.De-reting
1) R5029,R5030,R5031 : 1005 Type ==> 1608 Type(w.s.Jeong_1019)
2) R5030,R5031 : 200/1608 Type ==> 220/2012 Type(w.s.Jeong_1116)
2.ADD of TUNER P/N (w.s.Jeong_1116)

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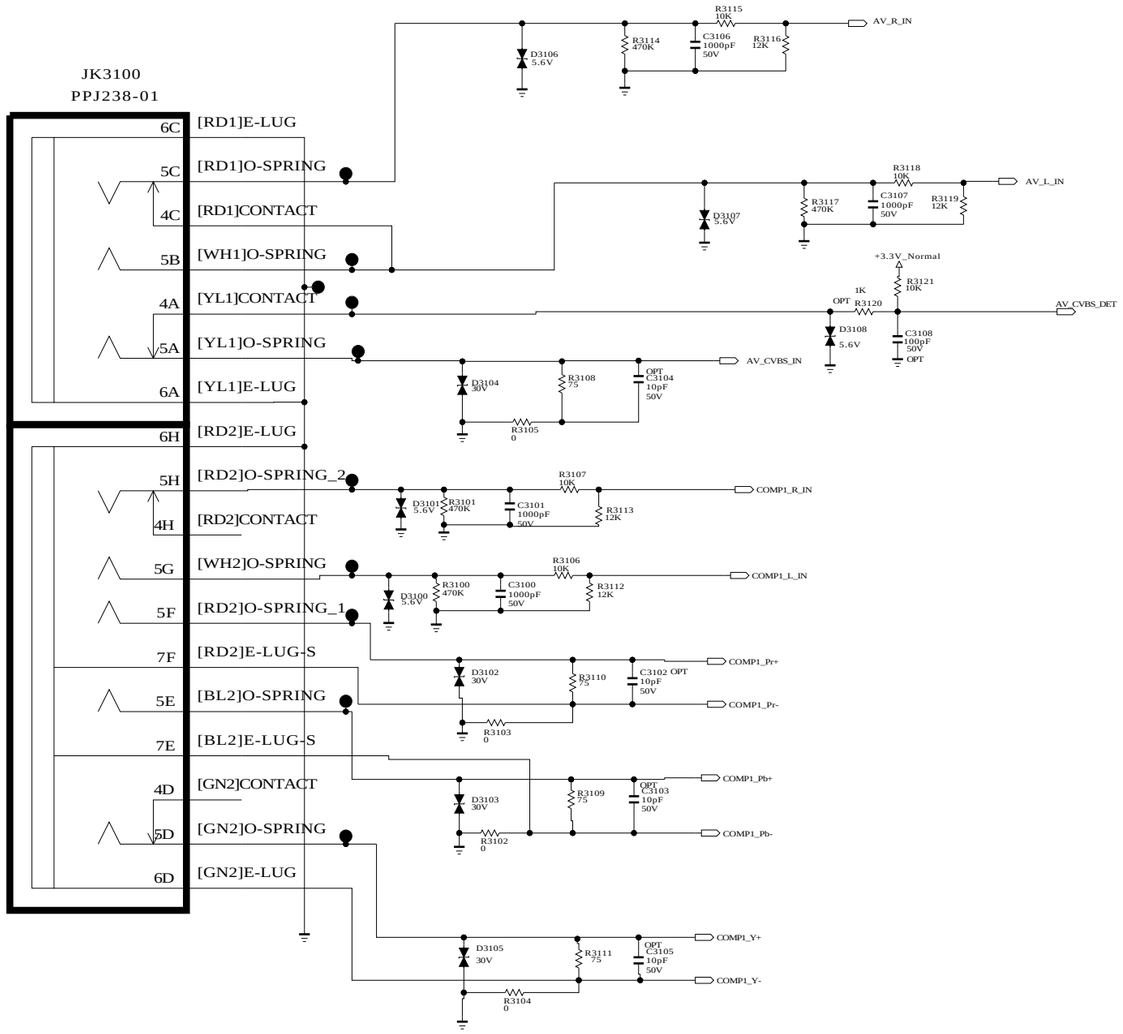
LG ELECTRONICS

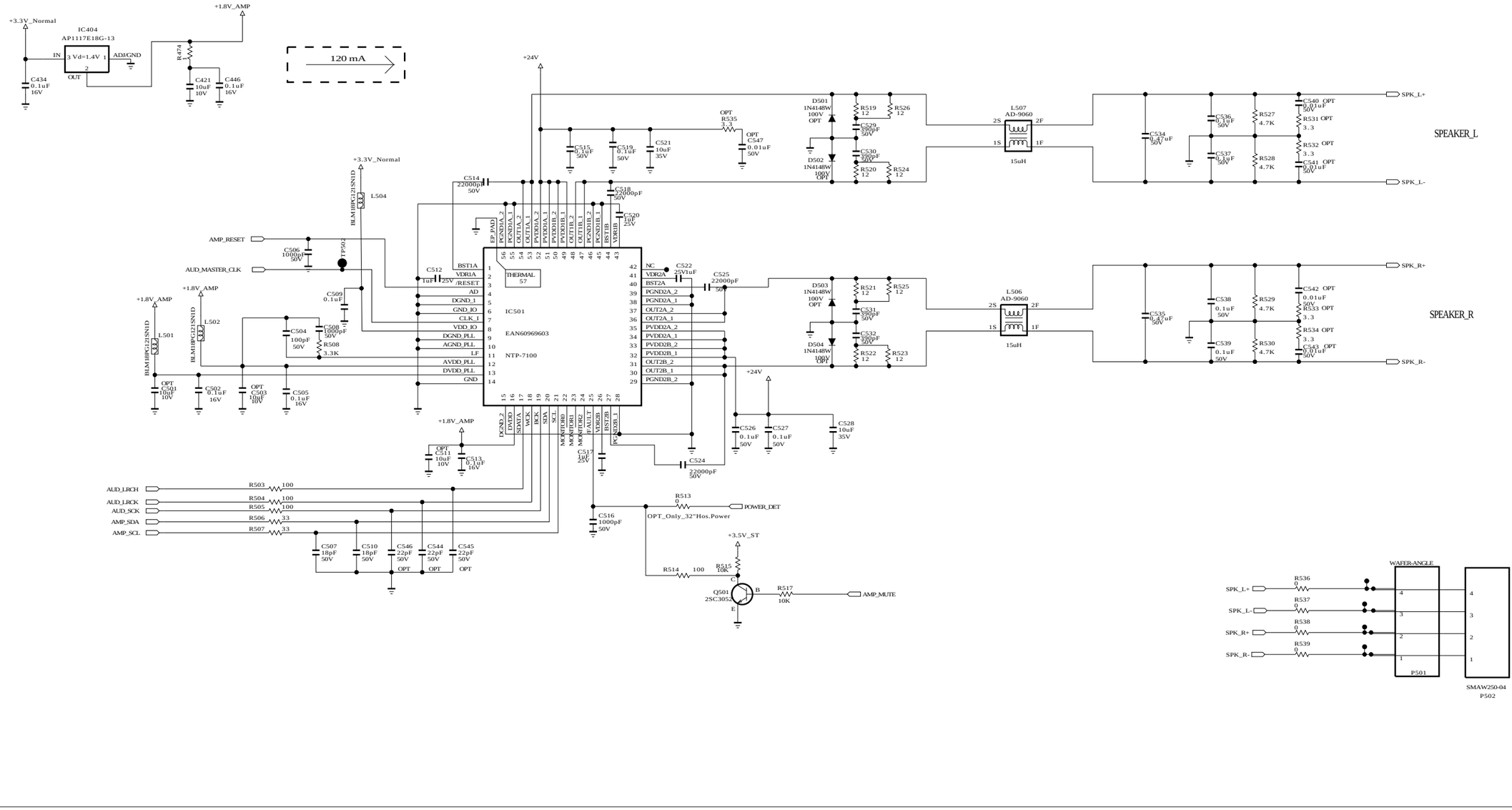
MODEL	37LD320H	DATE	2010.12.22
BLOCK	Tuner	SHEET	26

COMPONENT1,AV1



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.

AUDIO AMP



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SECRET

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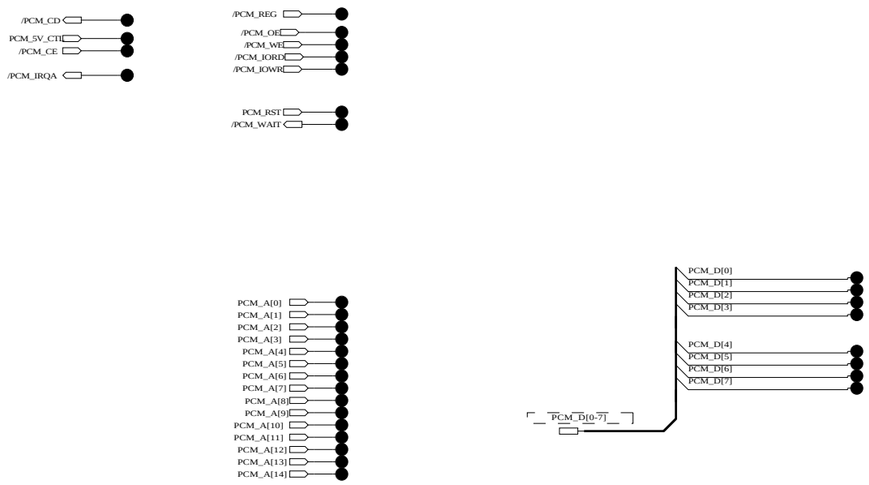
MODEL	37LD320H	DATE	2010.12.22
BLOCK	AMP	SHEET	38 /

NON CI Region



LG ELECTRONICS

MODEL	26LD320H GP2	DATE	2010.08.11
BLOCK		SHEET	46

NAND FLASH MEMORY

IC102
HY27UF082G2B-TPCB
2GBIT

+3.3V_Normal

/PF_CE0
H : Serial Flash
L : NAND Flash
/PF_CE1
H : 16 bit
L : 8 bit

R107 1K
R109 2.5K
/F_RB
/PF_OE
/PF_CE0
R108 1K OPT
C101 0.1uF

NC_1 NC_2 NC_3 NC_4 NC_5 NC_6 R/B RE CE NC_7 NC_8 VCC_1 VSS_1 NC_9 NC_10 CLE ALE WE WP NC_11 NC_12 NC_13 NC_14 NC_15

NC_29 NC_28 NC_27 NC_26 I/O7 I/O6 I/O5 I/O4 NC_25 NC_24 VCC_2 VSS_2 NC_23 NC_22 NC_21 NC_20 I/O3 I/O2 I/O1 I/O0 NC_19 NC_18 NC_17 NC_16

AR101
PCM_A[7] PCM_A[6] PCM_A[5] PCM_A[4]
22
C102 10uF
C103 0.1uF
AR102
PCM_A[3] PCM_A[2] PCM_A[1] PCM_A[0]
22
PCM_A[0-7]

+3.3V_Normal
R105 1K OPT
/PF_CE1
PF_ALE
/PF_WE
+3.5V_ST
R103 0
R101 3.3K OPT
R106 1K
/PF_WP
Q101 KRC103S OPT
R102 3.3K

<T3 CHIP Config(AUD_LRCH)>

Boot from SPI flash : 1'b0
Boot from NOR flash : 1'b1

<T3 CHIP Config>
(AUD_SCK, AUD_MASTER_CLK, PWM1, PWM0)

MIPS_no_EJ_NOR8 : 4'h3 (MIPS as host. No EJ PAD. Byte mode NAND flash.)
MIPS_EJ1_NOR8 : 4'h4 (MIPS as host. EJ use PAD1. Byte mode NAND flash.)
MIPS_EJ2_NOR8 : 4'h5 (MIPS as host. EJ use PAD2. Byte mode NAND flash.)
B51_Secure_no scramble : 4'hb (8051 as host. Internal SPI flash secure boot, no scramble)
B51_Sesure_scramble : 4'hc (8051 as host. Internal SPI flash secure boot with scramble)

+3.3V_Normal
R115 10K OPT
R117 10K OPT
R120 10K OPT
R123 10K OPT
R125 10K OPT
AUD_LRCH
AUD_SCK
AUD_MASTER_CLK
PWM1
PWM0
R116 10K OPT
R118 10K OPT
R121 10K OPT
R124 10K OPT
R126 10K OPT

LGE107D (S7M Divx_Non RM)

IC101

S7M_DIVX & MS10

PCM_D[0-7]
PCM_D[0] U22
PCM_D[1] T21
PCM_D[2] T22
PCM_D[3] AB18
PCM_D[4] AC18
PCM_D[5] AC19
PCM_D[6] AC20
PCM_D[7] AC21
PCM_D0 PCM_D1 PCM_D2 PCM_D3 PCM_D4 PCM_D5 PCM_D6 PCM_D7

PCM_A[0-14]
PCM_A[0] U21
PCM_A[1] V21
PCM_A[2] Y22
PCM_A[3] AA22
PCM_A[4] R22
PCM_A[5] R21
PCM_A[6] T23
PCM_A[7] T24
PCM_A[8] AA23
PCM_A[9] Y20
PCM_A[10] AB17
PCM_A[11] AA21
PCM_A[12] U23
PCM_A[13] Y23
PCM_A[14] W23
PCM_A0 PCM_A1 PCM_A2 PCM_A3 PCM_A4 PCM_A5 PCM_A6 PCM_A7 PCM_A8 PCM_A9 PCM_A10 PCM_A11 PCM_A12 PCM_A13 PCM_A14

/PCM_REG W22 PCM_REG_N
/PCM_OE AA17 PCM_OE_N
/PCM_WE V22 PCM_WE_N
/PCM_IORD W21 PCM_IORD_N
/PCM_IOWR Y21 PCM_IOWR_N

+5V_Normal
R132 10K /PCM_CE AA20 PCM_CE_N
R133 10K /PCM_IRQA V23 PCM_IRQA_N
/PCM_CD P23 PCM_CD_N
/PCM_WAIT R23 PCM_WAIT_N
PCM_RST P22 PCM_RESET
C108 0.1uF OPT
C109 0.1uF

/PF_CE0 AC17 PCM_PF_CE0Z
/PF_CE1 AB20 PCM_PF_CE1Z
/PF_OE AA18 PCM_PF_OEZ
/PF_WE AB21 PCM_PF_WEZ
PF_ALE AB19 PCM_PF_ALE
/PF_WP AD17 PCM_PF_AD[15]
/F_RB AA19 PCM_PF_RBZ
AR104 22
AR103 22
R130 22
R131 22

S7_TX M23 UART_TX2/GPIO65
S7_RX N23 UART_RX2/GPIO64
R134 22
R135 22

for SYSTEM/HDCP EEPROM&URSA3
I2C_SDA M22 DDCR_DA/GPIO71
I2C_SCL N22 DDCR_CK/GPIO72
R136 22
R137 22
RGB_DDC_SDA A5 DDCA_DA/UART0_TX
RGB_DDC_SCL B5 DDCA_CK/UART0_RX
R138 22
R139 22

PWM0 K23 PWM0/GPIO66
PWM1 K22 PWM1/GPIO67
PWM2 G23 PWM2/GPIO68
PWM3 G22 PWM3/GPIO69
PWM4 G21 PWM4/GPIO70

DSUB_DET C6 SAR0/GPIO31
MODEL_OPT_3 B6 SAR1/GPIO32
PCM_5V_CTL C8 SAR2/GPIO33
/RST_PHY C7 SAR3/GPIO34
/RST_HUB A6 SAR4/GPIO35

GPIO143/TCON0 N21 5V_DET_HDMI_1
GPIO145/TCON2 M21 5V_DET_HDMI_2
GPIO147/TCON4 L22 R161 22 OPT
GPIO149/TCON6 L21 R162 22 EXT_PTC_RESET
GPIO151/TCON8 P21 SIDEAV_DET

GPIO36/UART3_RX K21 R163 OPT 0 INV_CTL
GPIO37/UART3_TX L23 R164 0 PANEL_CTL
GPIO38 K20 R168 OPT 22
GPIO39 L20 R165 OPT 22
GPIO40 M20 AV_CVBS_DET
GPIO41 G20 ERROR_OUT
GPIO42 G19 MODEL_OPT_0

GPIO50/UART1_RX F20 22 R148 PTC_TX_S7
GPIO51/UART1_TX F19 22 R149 PTC_RX_S7_3.3V

GPIO6/PM0/1NT0 E7 USB1_OCD
GPIO7/PM1/PM_UART_TX D7 USB1_CTL
GPIO8/PM2 E11 Opt R114
GPIO9/PM3 G9 Opt R150
GPIO10/PM4 F9 0 R110 MODEL_OPT_6
GPIO11/PM5/PM_UART_RX/INT1 C5 MODEL_OPT_1
PM_SPI_CS1/GPIO12/PM6 E8 33 R146
PM_SPI_WP1/GPIO13/PM7 E9 /FLASH_WP
PM_SPI_WP2/GPIO14/PM8/INT2 F7 MODEL_OPT_2
GPIO15/PM9 F6 TUNER_RESET
PM_SPI_CS2/GPIO16/PM10 D8 SYS_RESET
GPIO17/PM11/INT3 G12 AV_CVBS_DET
GPIO18/PM12/INT4 F10 EXT_PTC_UPDATE

PM_SPI_CK/GPIO1 D9 33 R147 SPI_SCK
GPIO0/PM_SPI_CZ D11 /SPI_CS
PM_SPI_DI/GPIO2 E10 SPI_SDI
PM_SPI_DO/GPIO3 D10 33 R151 SPI_SDO

for SERIAL FLASH

TS0_CLK AA9 PM_TS_CLK
TS0_VLD AA5 PM_TS_VALID
TS0_SYNC AA10 PM_TS_SYNC
PM_TS[0-7]

from ProIdiom

TS0_D0 AB5 PM_TS[0]
TS0_D1 AC4 PM_TS[1]
TS0_D2 Y6 PM_TS[2]
TS0_D3 AA6 PM_TS[3]
TS0_D4 W6 PM_TS[4]
TS0_D5 AA7 PM_TS[5]
TS0_D6 Y9 PM_TS[6]
TS0_D7 AA8 PM_TS[7]

TS1_CLK AC5 TS_CLK
TS1_VLD AC6 TS_VALID
TS1_SYNC AB6 TS_SYNC

Internal demod out /ProIdiom in

TS1_D0 AC10 TS_0
TS1_D1 AB10 TS_1
TS1_D2 AC9 TS_2
TS1_D3 AB9 TS_3
TS1_D4 AC8 TS_4
TS1_D5 AB8 TS_5
TS1_D6 AC7 TS_6
TS1_D7 AB7 TS_7

MPIF_CLK D12
MPIF_CS_N D14
MPIF_BUSY E14 R160 1K
MPIF_D0 E12
MPIF_D1 F12
MPIF_D2 D13
MPIF_D3 E13

S7R

S7R_BASIC

IC102-*1
HY27US08121B-TPCB
512MBIT

NC_1 NC_2 NC_3 NC_4 NC_5 NC_6 R/B RE CE NC_7 NC_8 VCC_1 VSS_1 NC_9 NC_10 CLE ALE WE WP NC_11 NC_12 NC_13 NC_14 NC_15

NC_28 NC_27 NC_26 NC_25 I/O7 I/O6 I/O5 I/O4 NC_24 NC_23 PRE VCC_2 VSS_2 NC_22 NC_21 NC_20 I/O3 I/O2 I/O1 I/O0 NC_19 NC_18 NC_17 NC_16

IC102-*2
NAND01GW3B2CN6E
1GBIT

NC_1 NC_2 NC_3 NC_4 NC_5 NC_6 RB RE CE NC_7 NC_8 VDD_1 VSS_1 NC_9 NC_10 CL AL W WP NC_11 NC_12 NC_13 NC_14 NC_15

NC_28 NC_27 NC_26 NC_25 I/O7 I/O6 I/O5 I/O4 NC_24 NC_23 VDD_2 VSS_2 NC_22 NC_21 NC_20 I/O3 I/O2 I/O1 I/O0 NC_19 NC_18 NC_17 NC_16

S7M_DIVX & DD

& MS10 :Region that support MS10(ex:DTV Country)
& DD :Region that support only Dolby Digital(ex:AISA Analog/KOREA)

S7M_NON_DIVX & MS10 | S7M_NON_DIVX & DD | S7T_DIVX & MS10 | S7T_DIVX & DD | S7T_NON_DIVX & MS10 | S7T_NON_DIVX & DD

HDCP EEPROM

+3.3V_Normal
Addr:10101--
Catalyst
IC103
CAT24WC08W-T
R113 4.7K
A0 A1 A2 VSS VCC WP SCL SDA
C107 0.1uF
R127 4.7K
R128 22 I2C_SCL
R129 22 I2C_SDA

IC103-*1
CAT24C08WI-GT3/H-RECV(TV)

EEPROM

+3.3V_Normal
IC104
M24M01-HRMN6TP
C105 0.1uF
NC E1 E2 VSS VCC WP SCL SDA
A0'h
R111 22 I2C_SCL
R112 22 I2C_SDA
C104 8pF OPT
C106 8pF OPT

S7_DIVX & MS10 | S7_DIVX & DD | S7_NON_DIVX & MS10 | S7_NON_DIVX & DD

I2C

+3.3V_Normal
R140 R141 R142 2.2K R143 3.3K R144 3.3K R145 2.2K
AMP_SDA
AMP_SCL
I2C_SDA
I2C_SCL
FE_DEMOD_SDA
FE_DEMOD_SCL

DIMMING

A_DIM R156 10K PWM0
PWM_DIM R157 100 PWM2
C111 2.2uF

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LG ELECTRONICS

MODEL	37LD320H	DATE	2010.12.22
BLOCK	Main	SHEET	1

MODEL OPTION

PIN NAME	PIN NO.	HIGH	LOW
MODEL_OPT_0	G19	FRC	NO FRC
MODEL_OPT_4	E18	100/120Hz LVDS	50/60Hz LVDS
MODEL_OPT_1	C5	MINI LVDS	LVDS
MODEL_OPT_2	F7	DDR_512MB	DDR_256MB
MODEL_OPT_3	B6	FHD	HD
MODEL_OPT_5	D18	GIP	NON_GIP
MODEL_OPT_6	F9	OLED	LCD

	OPT_0	OPT_4
NO_FRC	: LOW	LOW
U3_INTERNAL	: HIGH	LOW
U3_EXTERNAL	: HIGH	HIGH
PWIZ TCON with LG FRC	: HIGH	HIGH

RSDS Power OPT

VDDC 1.26V

Normal Power 3.3V

Normal 2.5V

DDR3 1.5V

RSDS Power OPT

IC101 LGE107D (S7M Divx_Non RM)

S7M_DIVX

HDMI

DSUB

SCART1_RGB/COMP1

CVBS In/OUT

ANALOG SIF Close to MSTAR

DTV_IF

TU/DEMOD_I2C

B/T USB

SIDE USB

I2S_1/F

AUDIO IN

AUDIO OUT

HP OUT

RMII For Ethernet

Close to MSTAR

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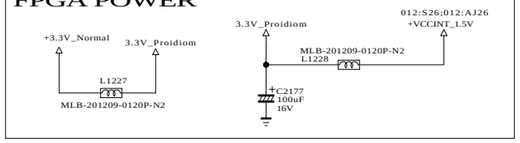
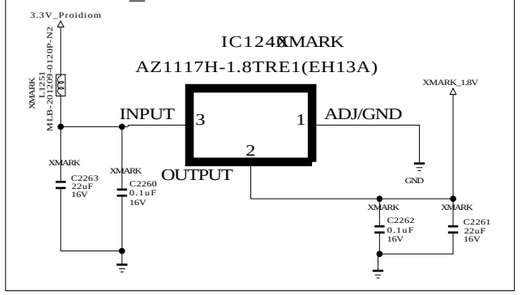
MODEL	37LD320H	DATE	2010.12.22
BLOCK	Main	SHEET	2

Pro:Idiom (XMARK)

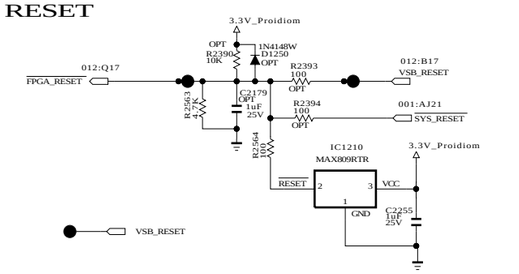
FPGA POWER



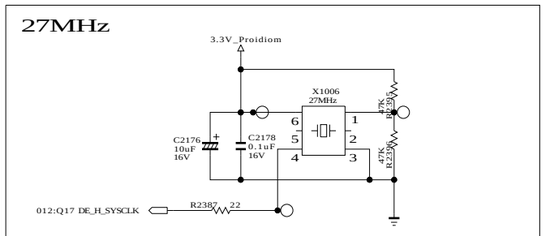
XMARK_1.8V



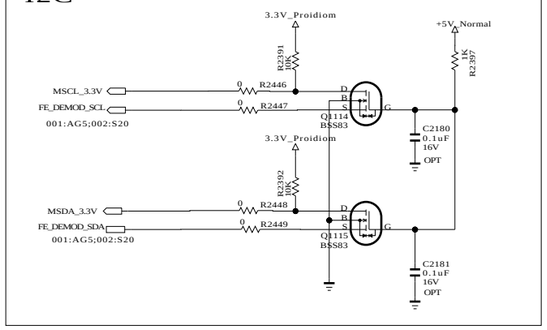
RESET



27MHz

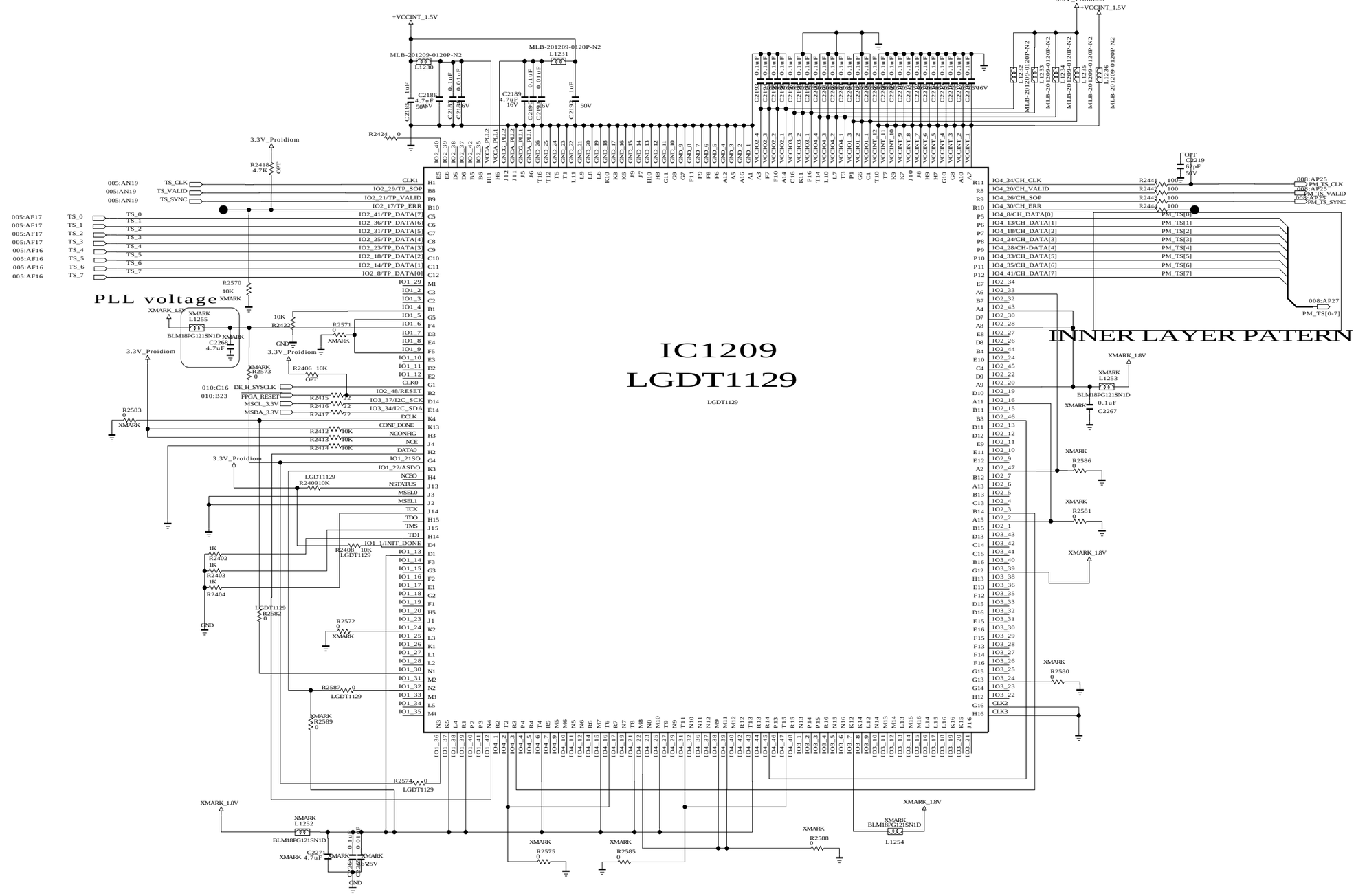


I2C



IC1209 LGDT1129

LGDT1129



LGDT1129	not use XMARK
XMARK	LG1001(XMARK)

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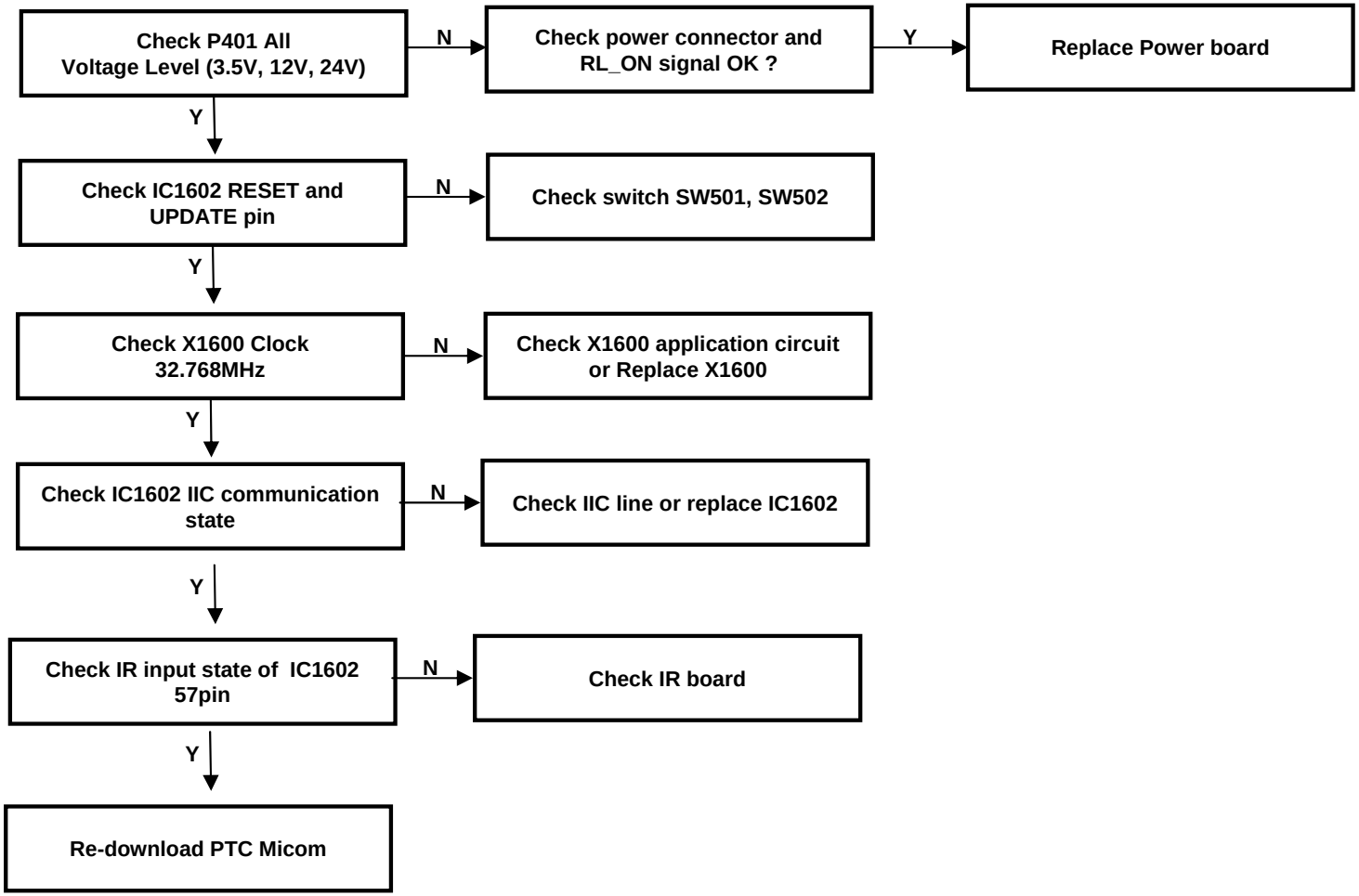
LG ELECTRONICS

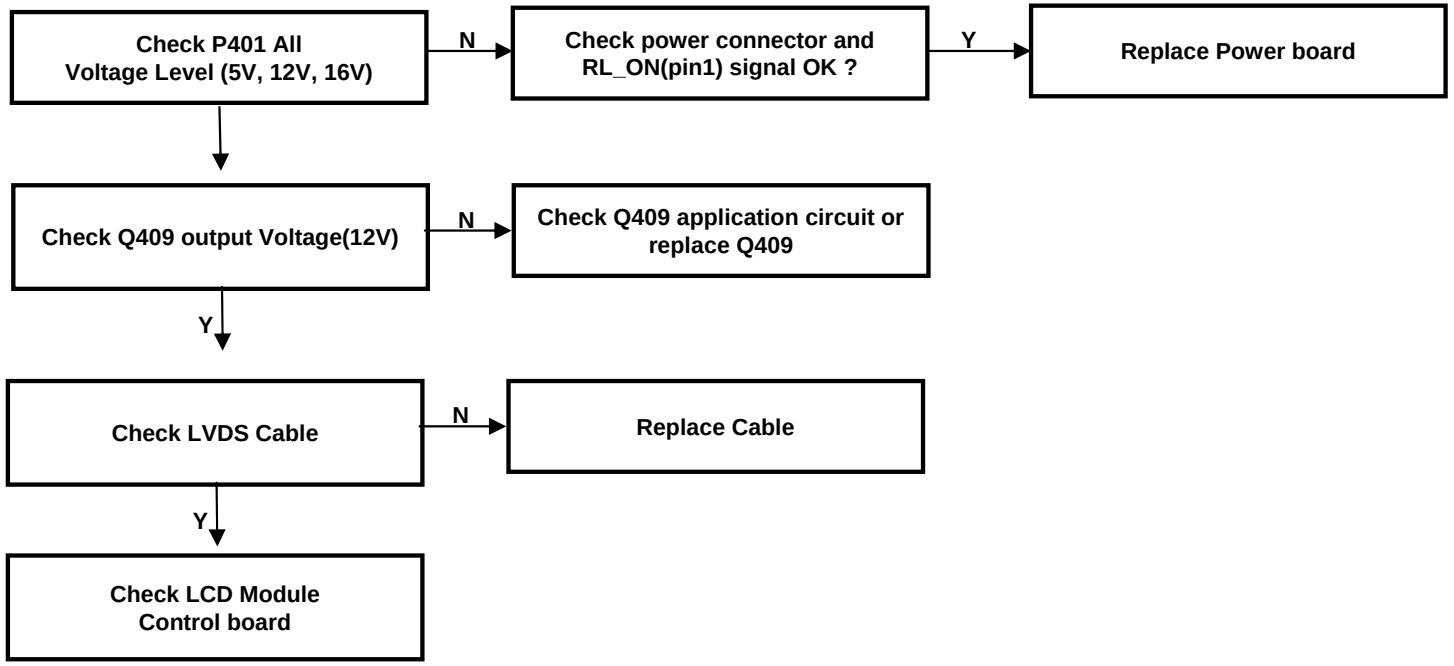
MODEL	37LD320H	DATE	2010.12.22
BLOCK	Proidiom	SHEET	12


LG Electronics Inc.

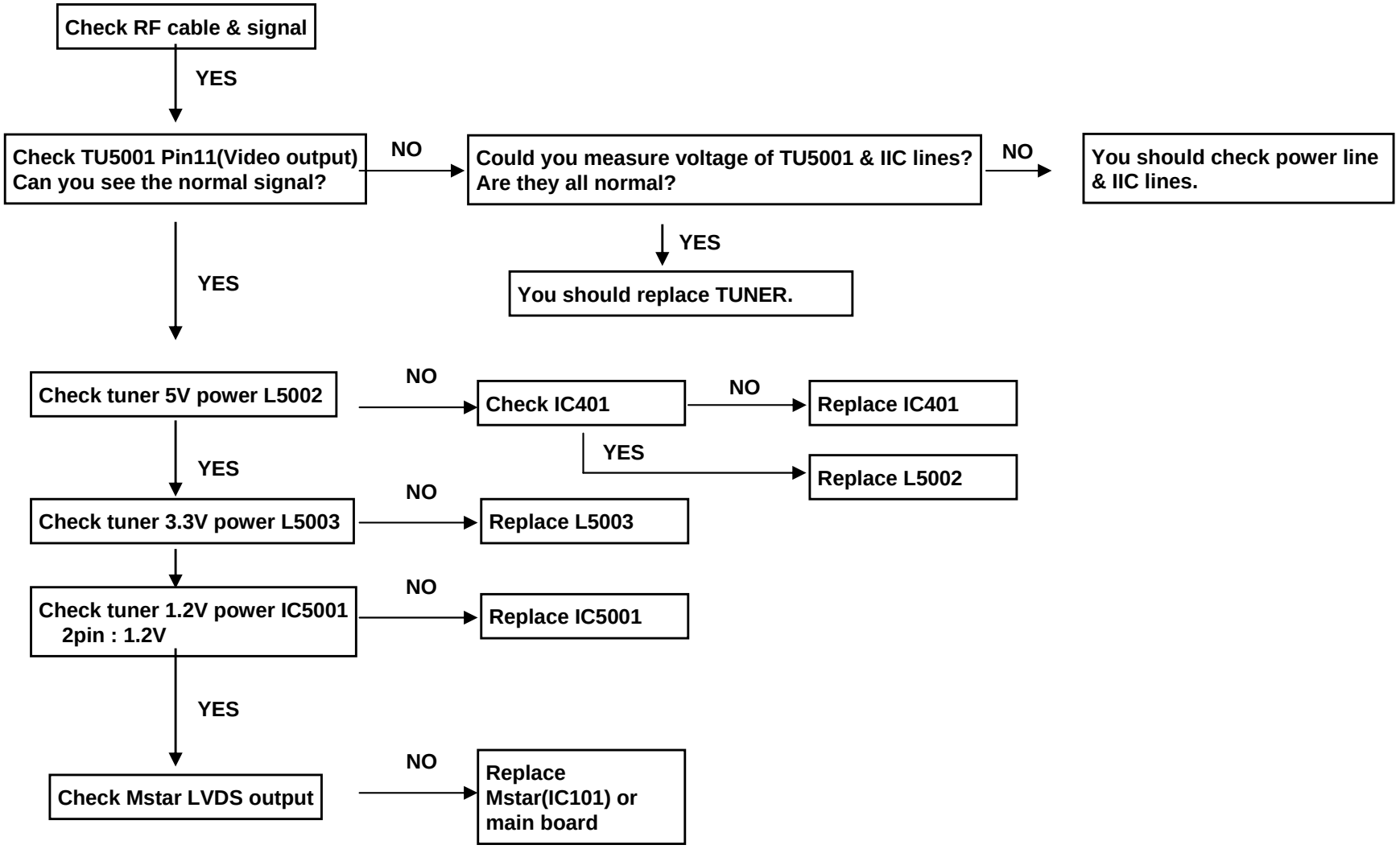
Power-Up Boot Fail Trouble Shooting guide



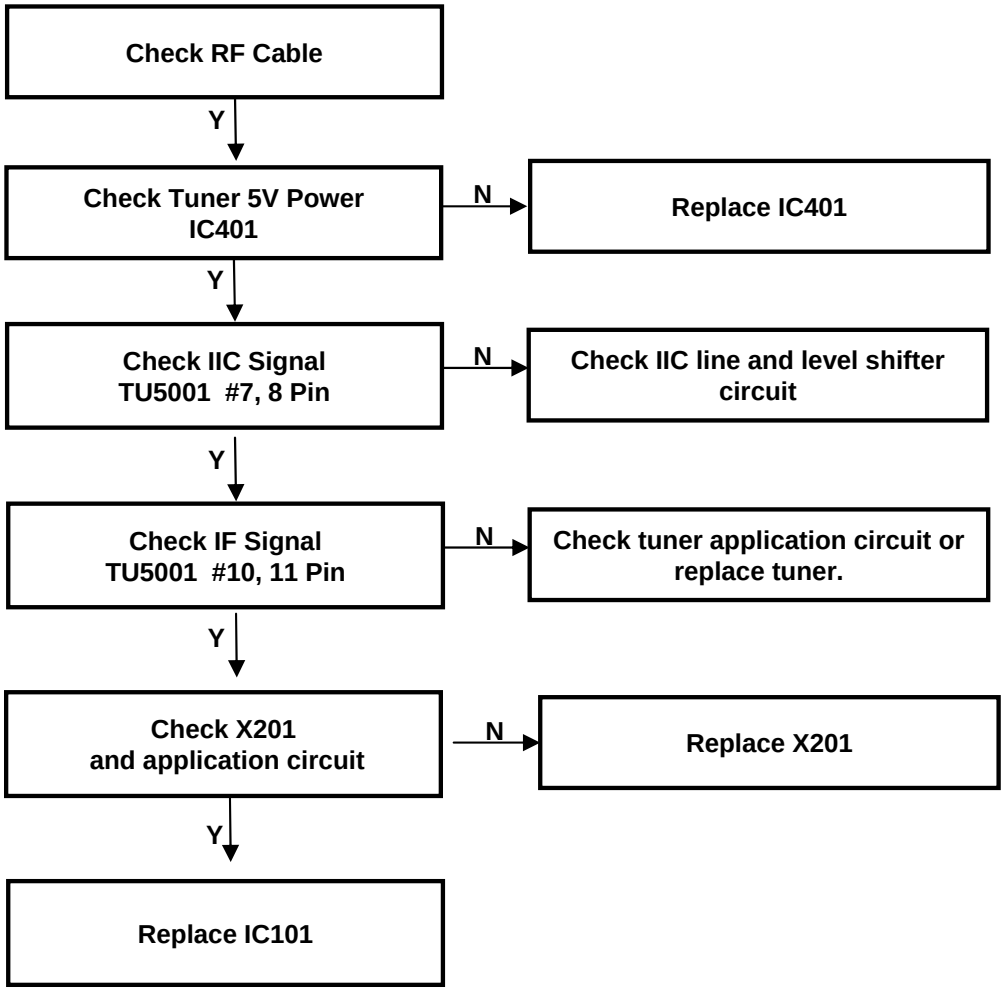
No OSD Trouble Shooting guide



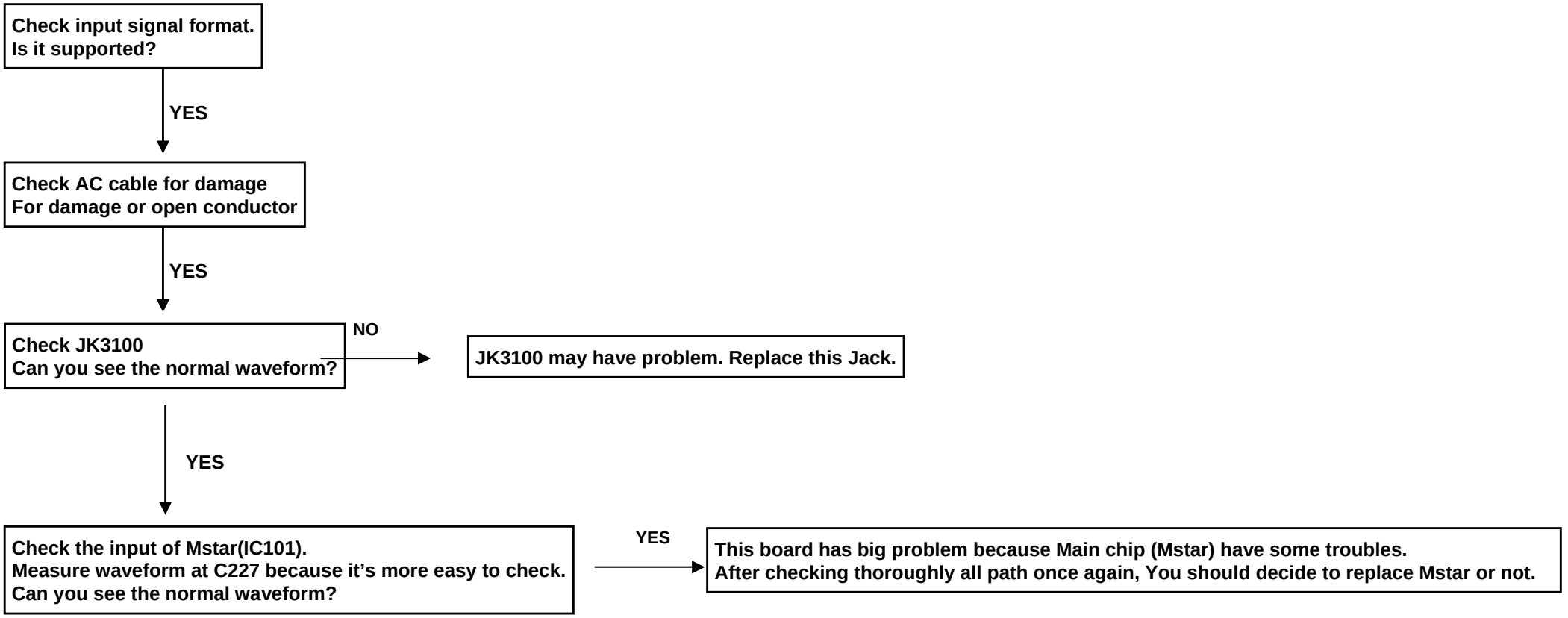
Analog RF Video Trouble shooting guide



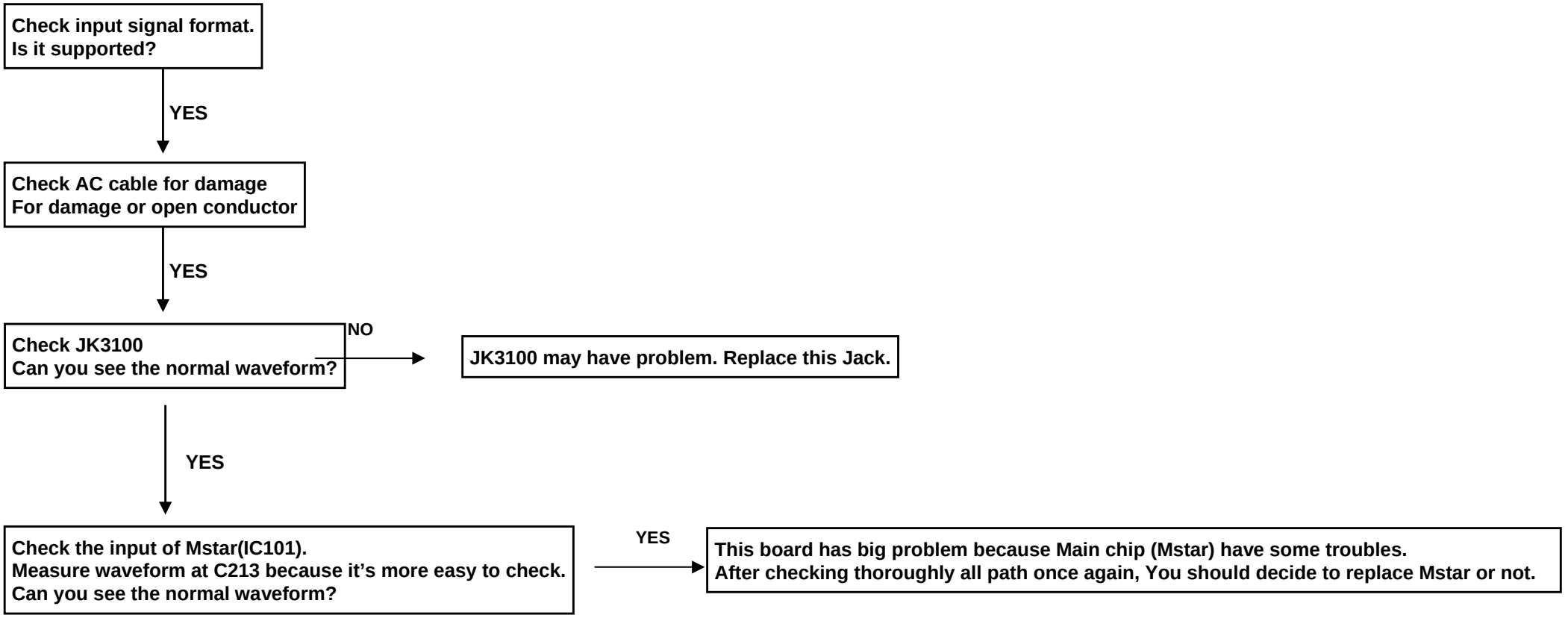
Digital RF Trouble shooting guide



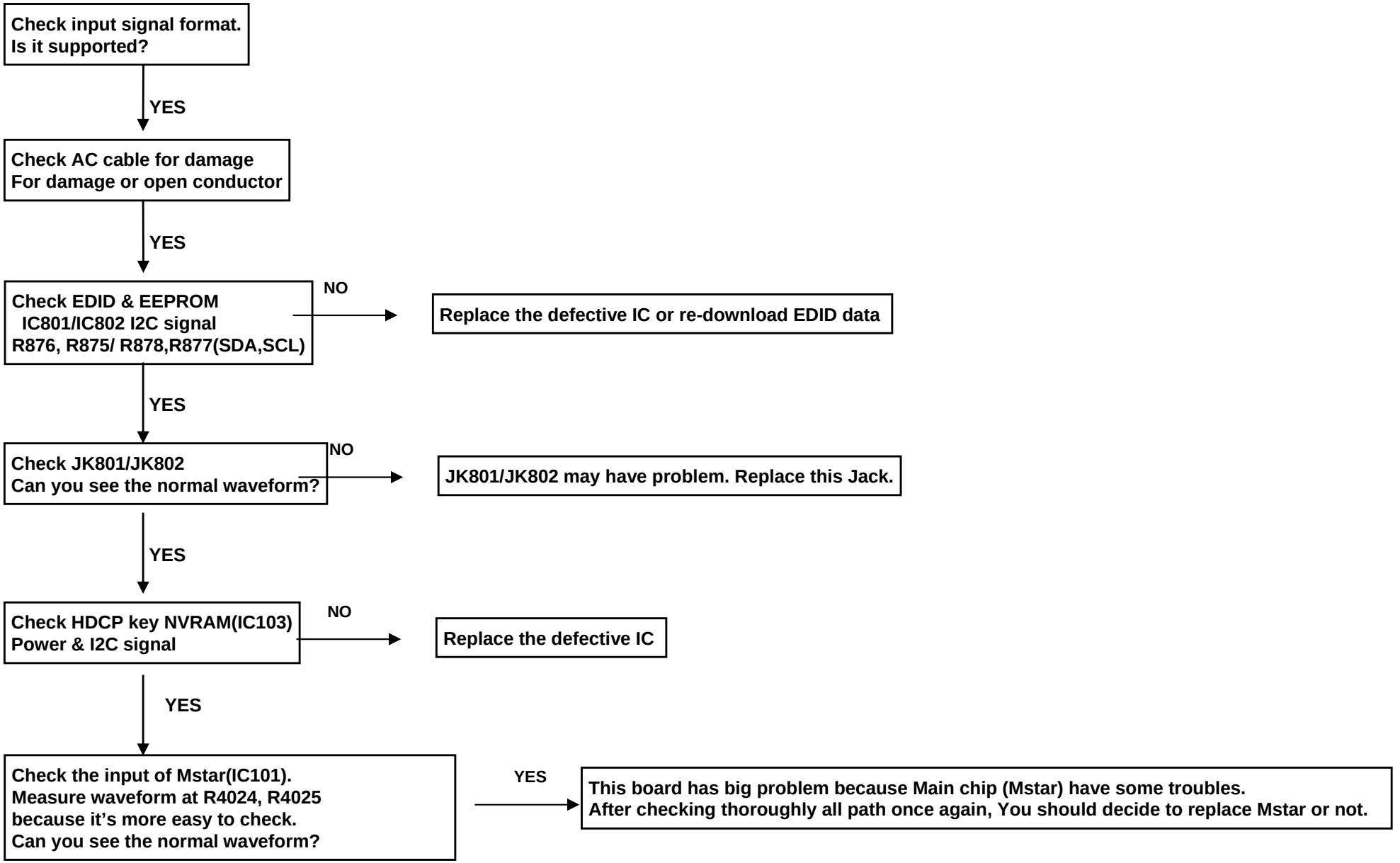
AV Video Trouble shooting guide



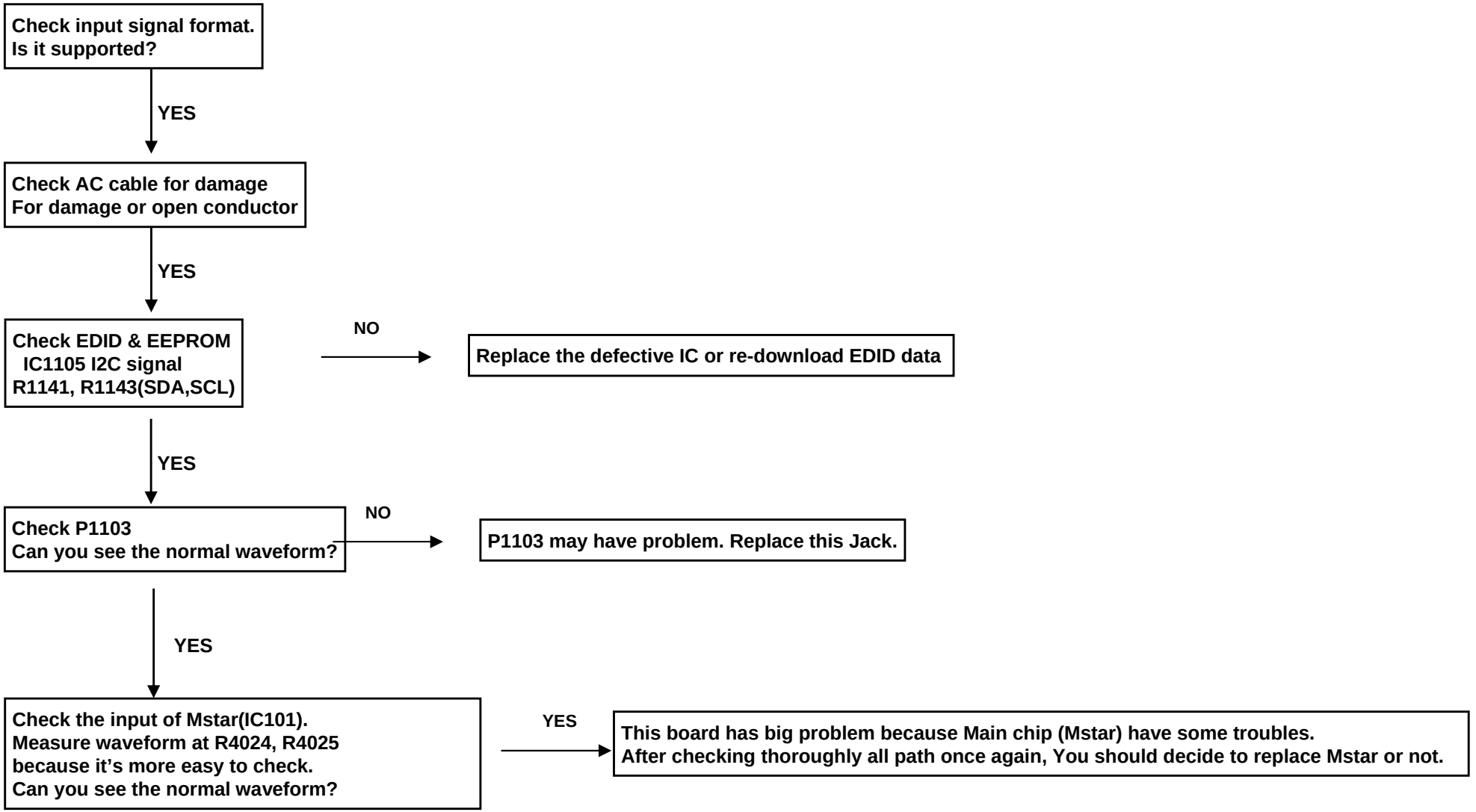
Component Video Trouble shooting guide



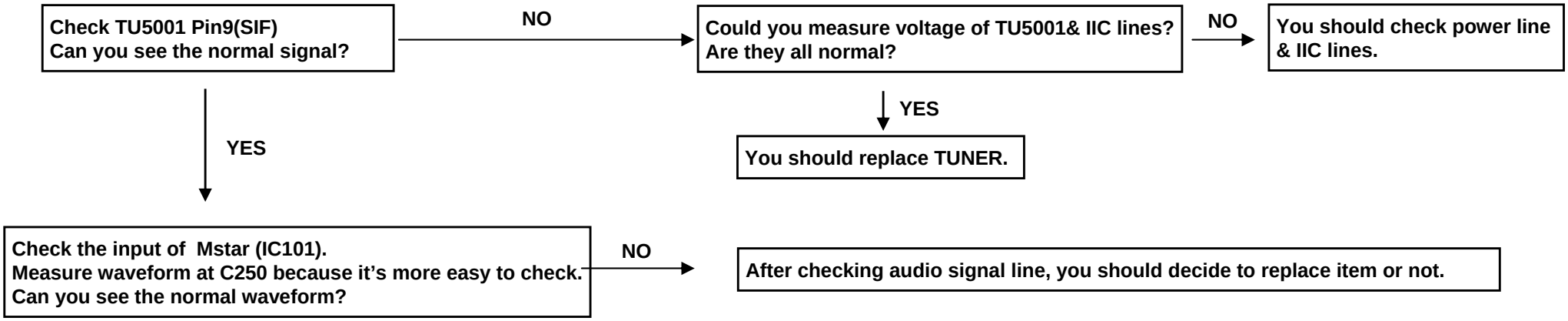
HDMI Video Trouble shooting guide



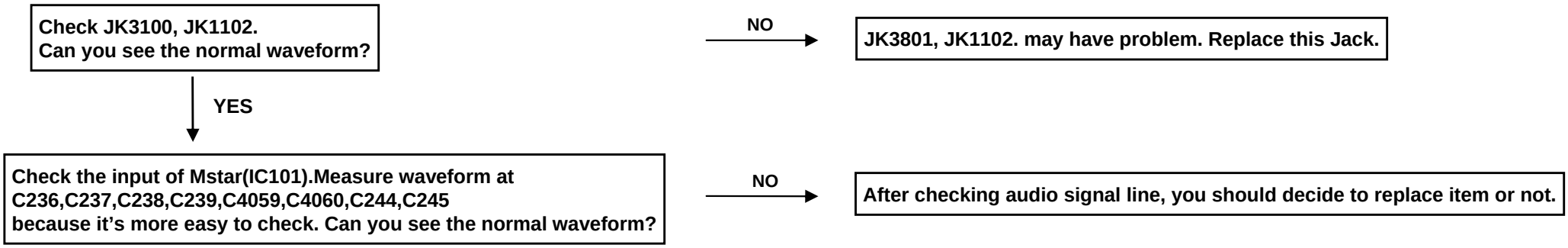
RGB-PC Video Trouble shooting guide



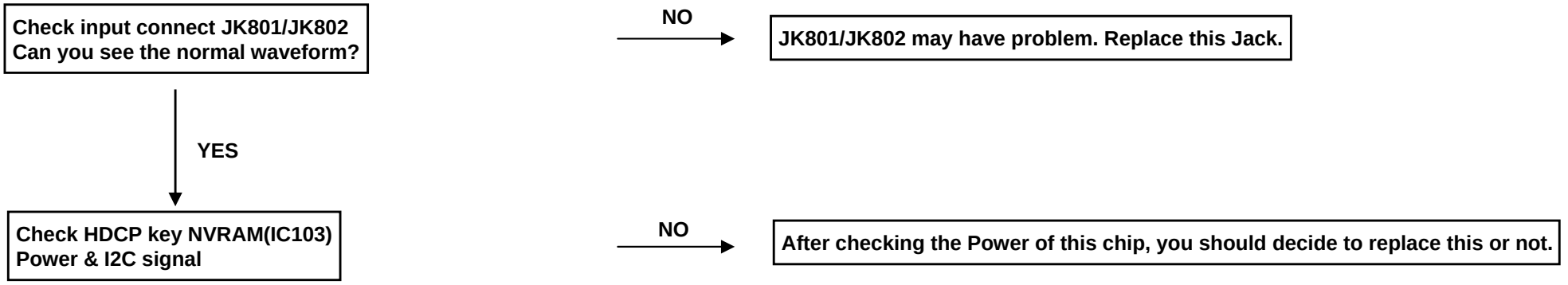
Analog RF Audio Trouble shooting guide



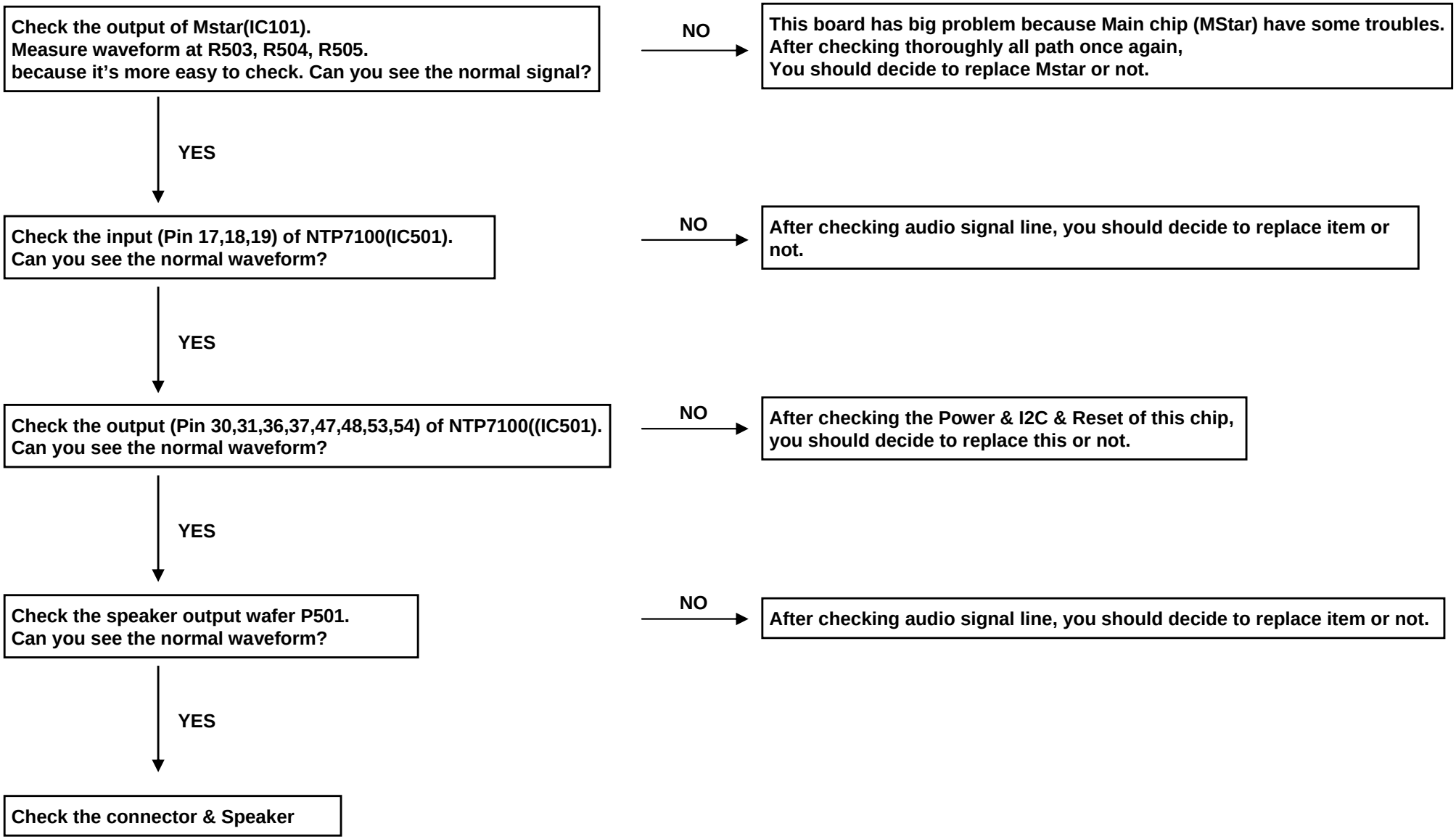
AV/Component/RGB-PC Audio(in)Trouble shooting guide



HDMI Audio(in) Trouble shooting guide



Audio out Trouble shooting guide



xxLD340H-UA Block Diagram

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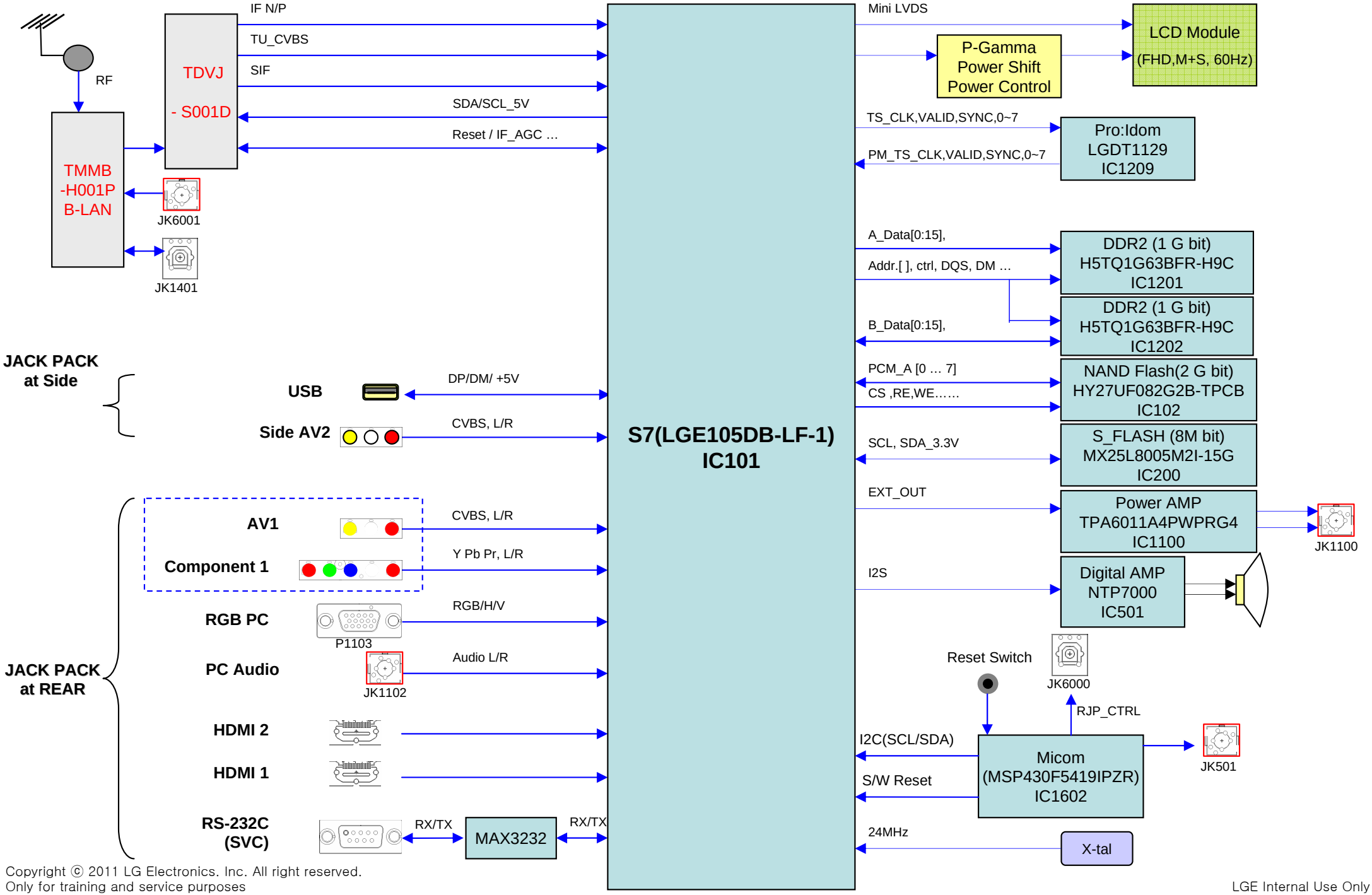
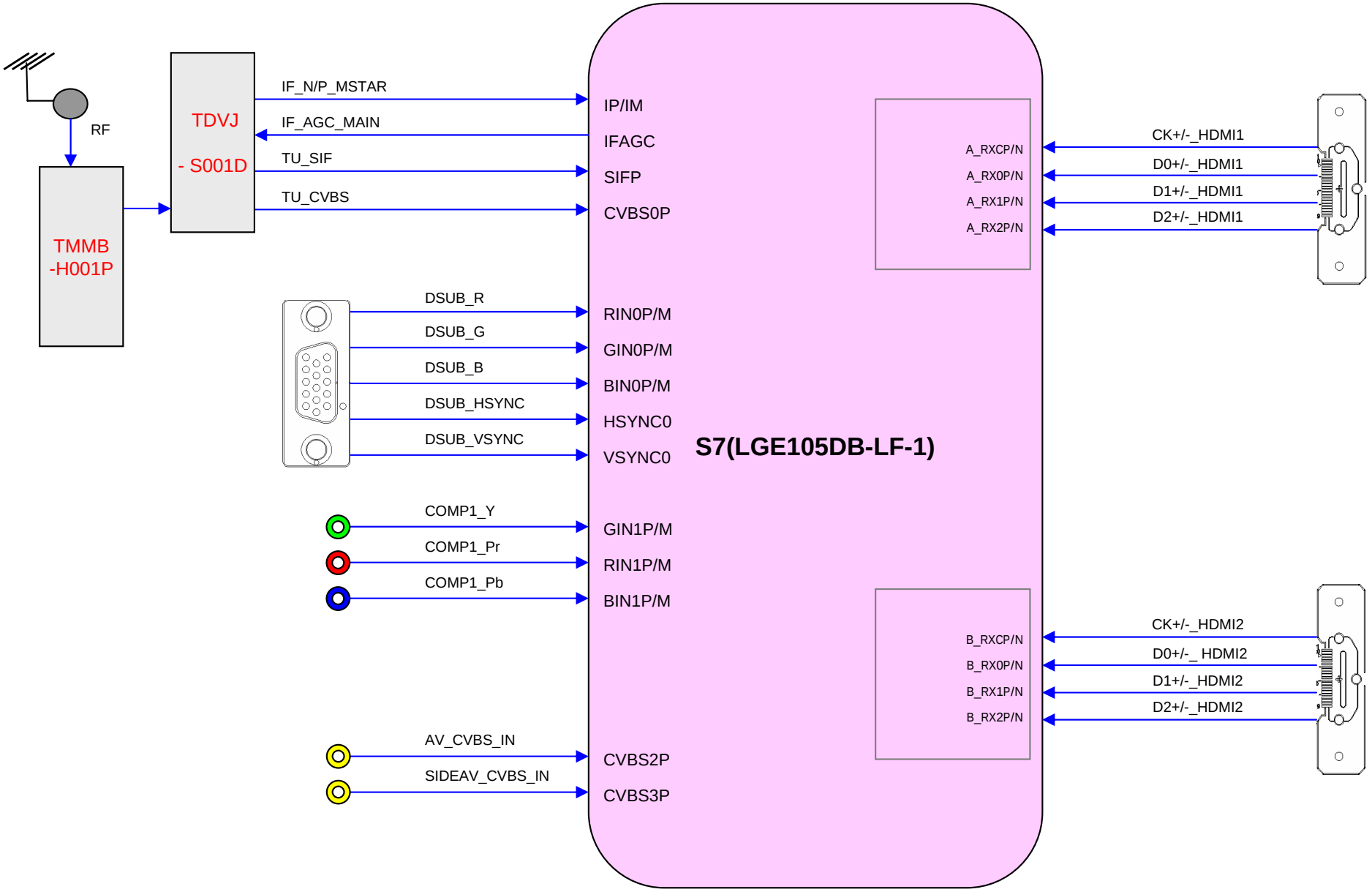
LG Electronics/ BS Division
Commercial Display H/W Gr.

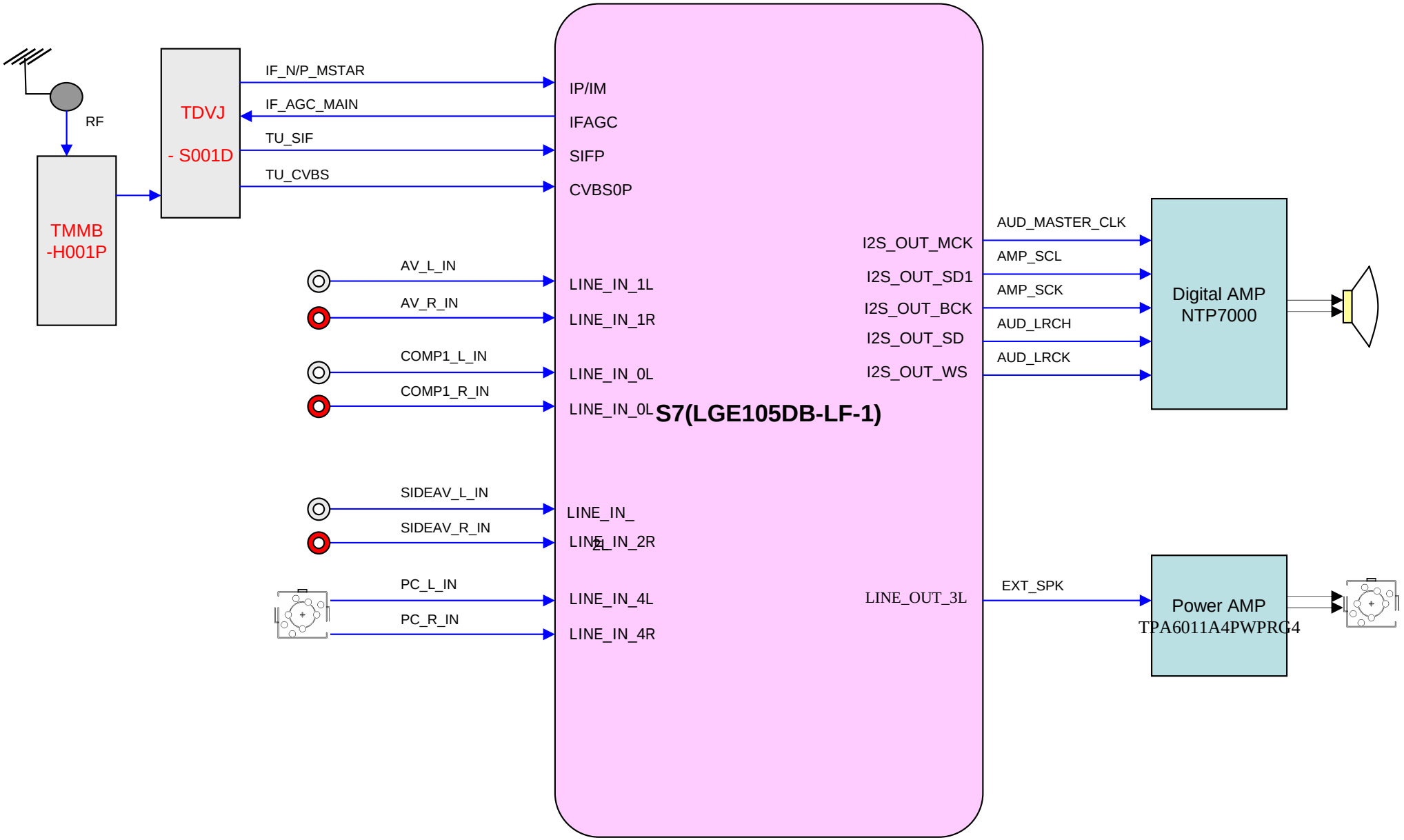
Overall Block Diagram



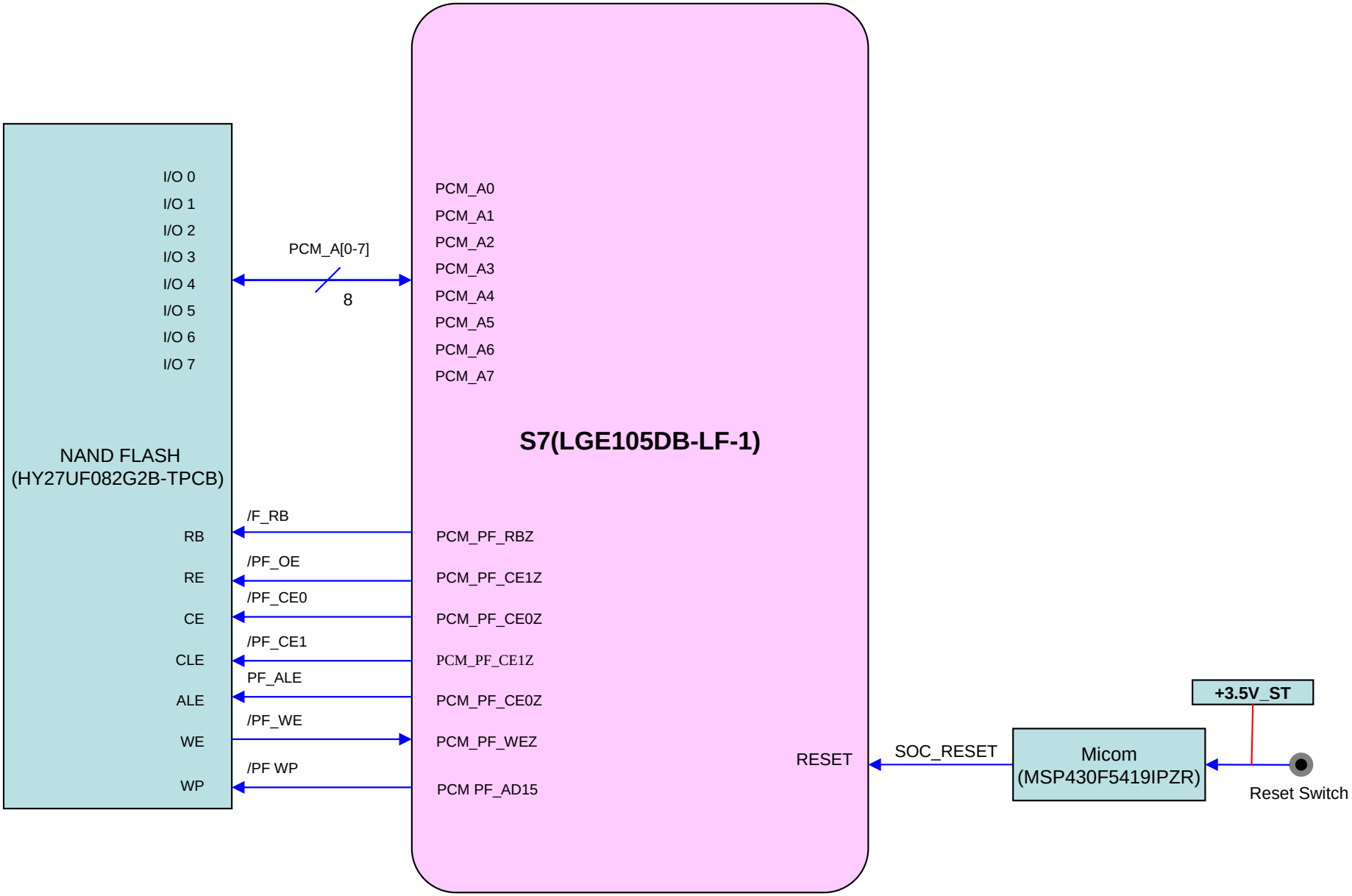
Video Signal Block



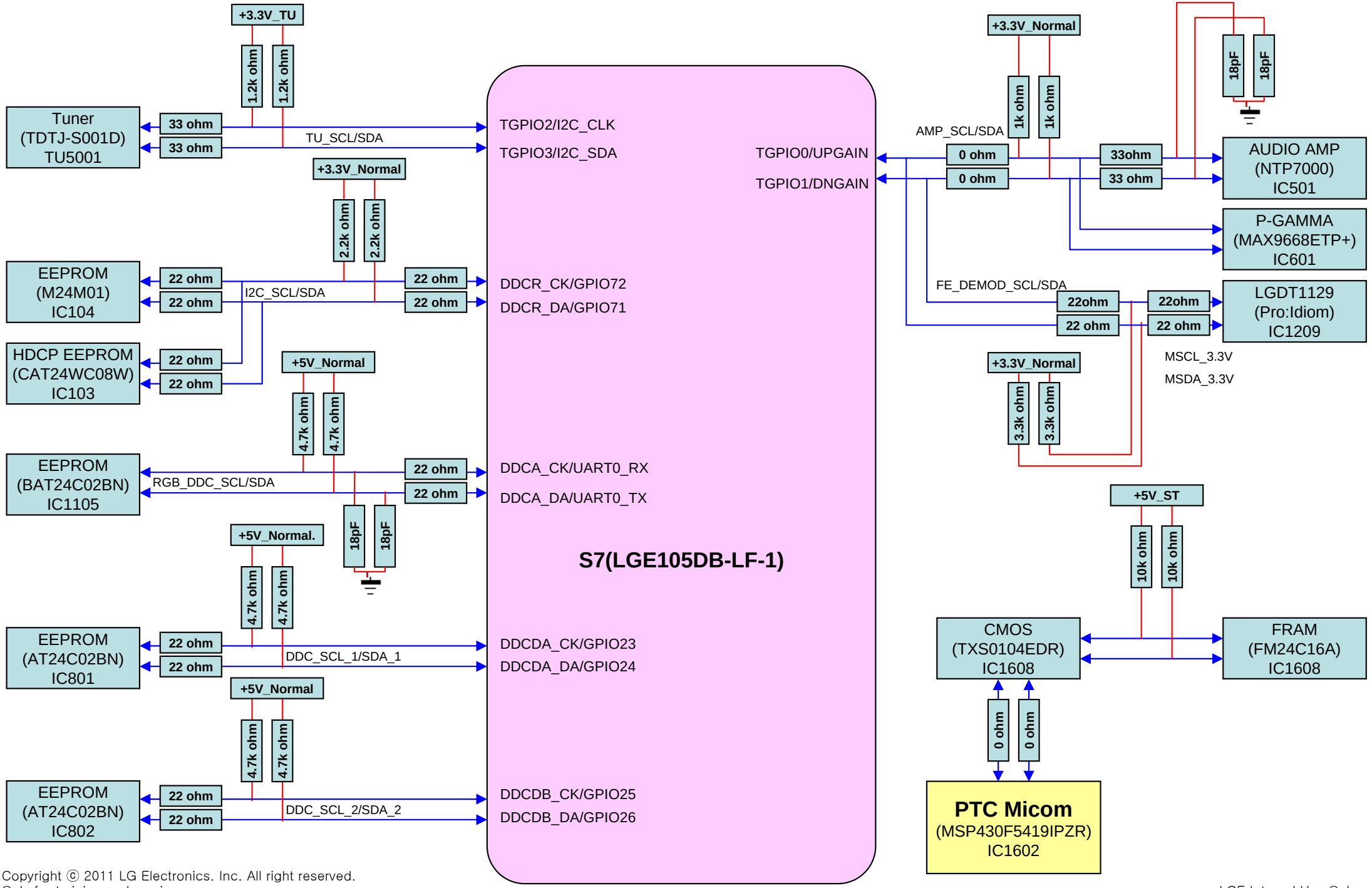
Audio Signal Block



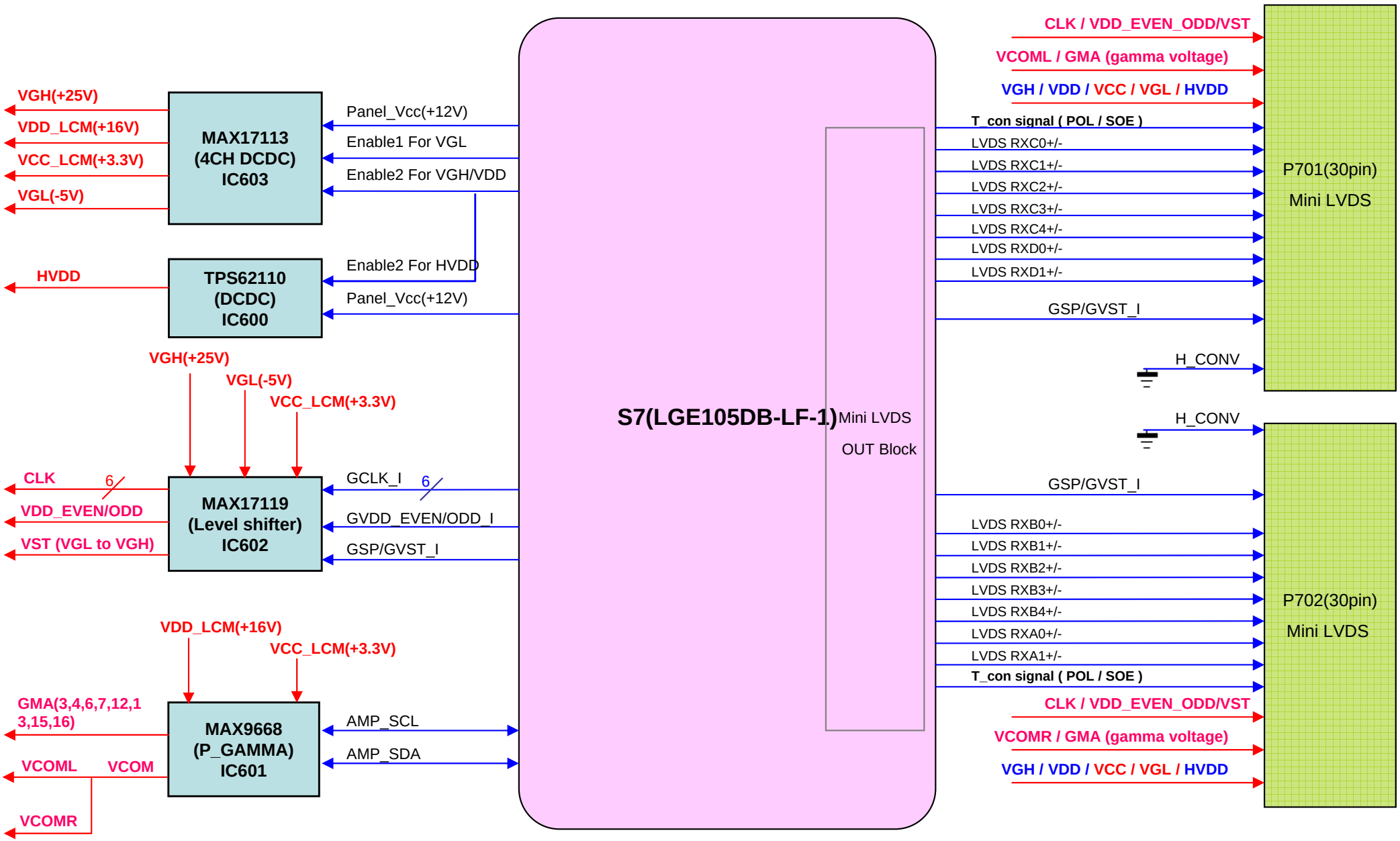
Flash Block & Reset



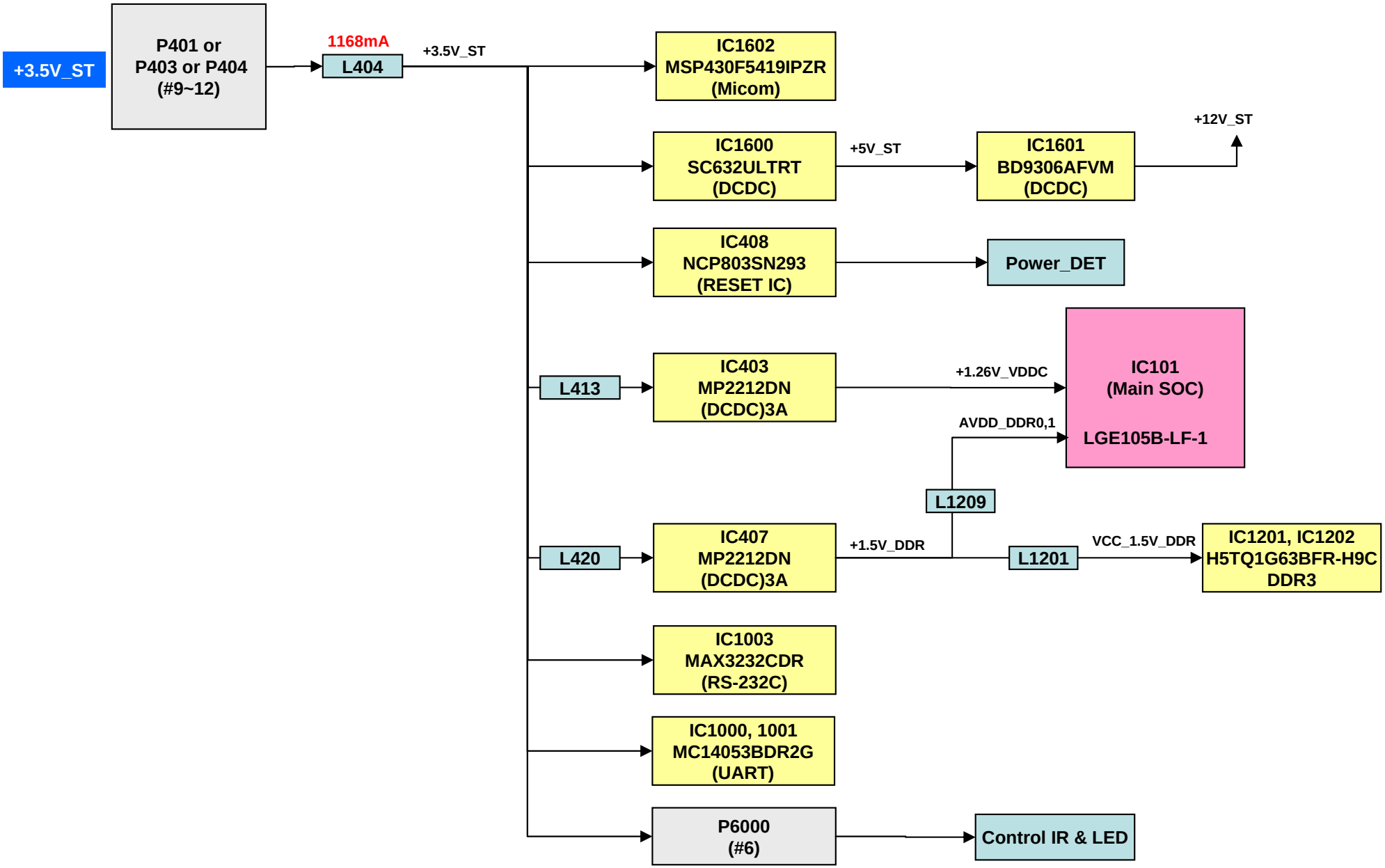
I2C Block



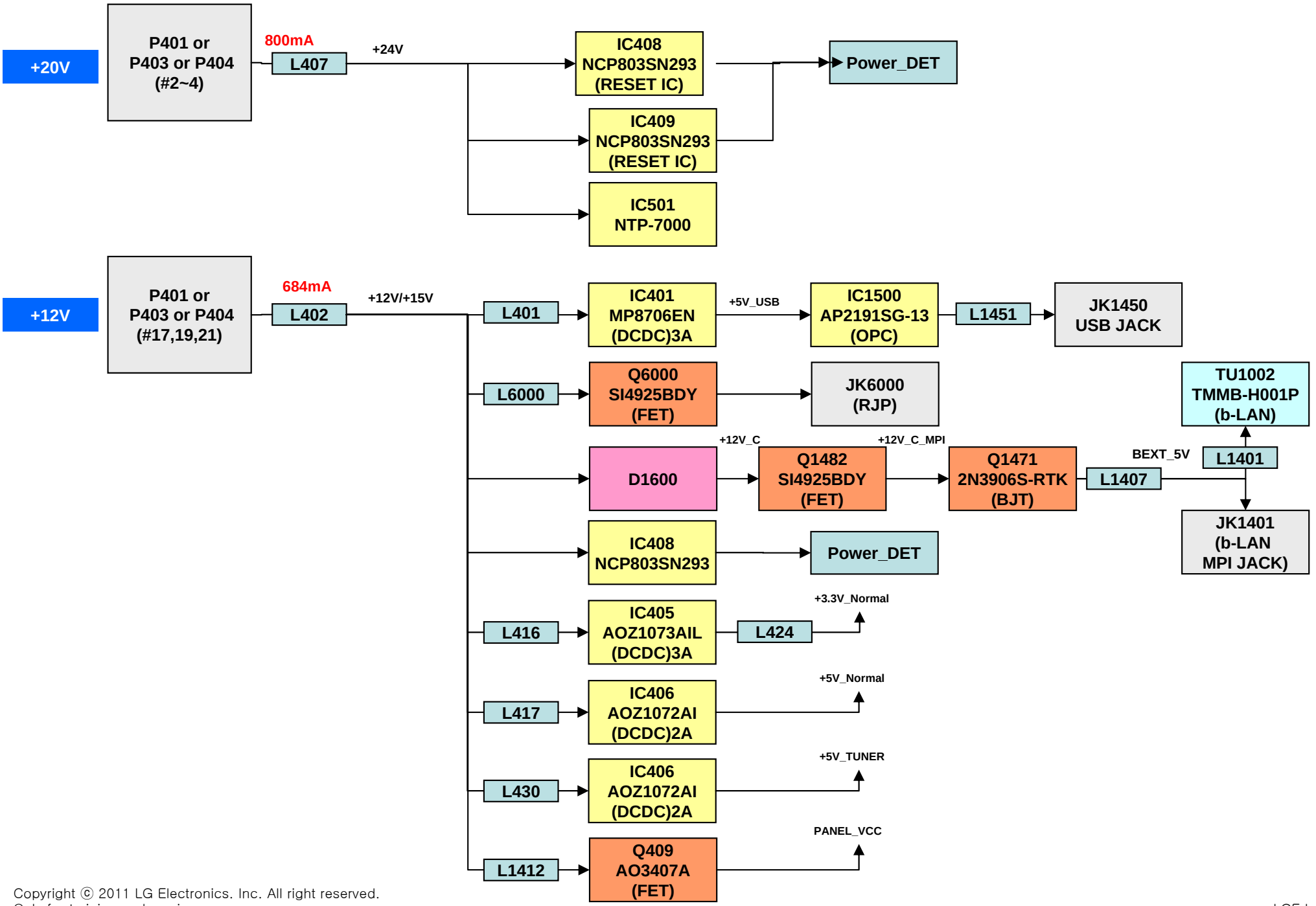
M+S Output Block(37”/42”)



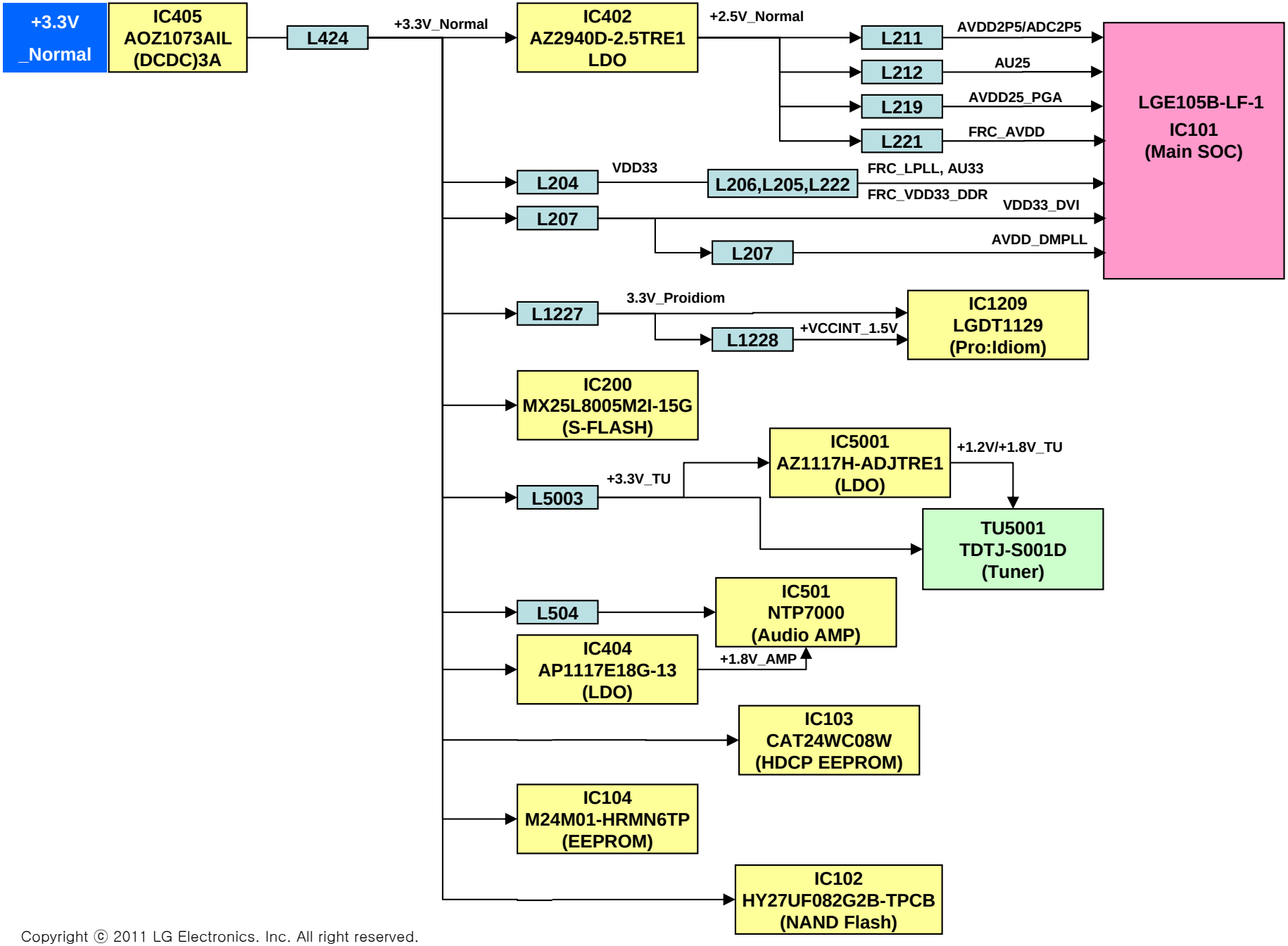
POWER Block (+3.5V_ST)



POWER Block (+24V & 12V)



POWER Block (+3.3V_Normal)



POWER Block (+5V_Normal, +5V_Tuner, PANEL_VCC)