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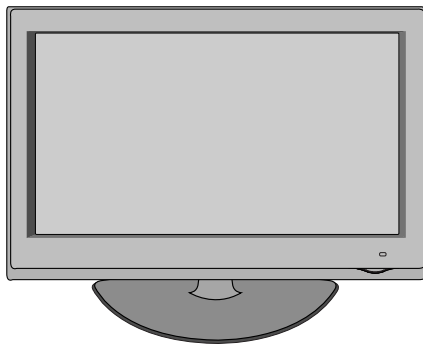
LCD TV SERVICE MANUAL

CHASSIS : LA92G

MODEL : 47LH41 47LH41-UE

CAUTION

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



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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 \triangle in the Schematic Diagram and Exploded View.

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

Do not modify the original design without permission of manufacturer.

General Guidance

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

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

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

When replacing a high wattage resistor (Oxide Metal Film Resistor, over 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 $1M\Omega$ and $5.2M\Omega$.

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

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

Leakage Current Hot Check (See below Figure)

Plug the AC cord directly into the AC outlet.

Do not use a line Isolation Transformer during this check.

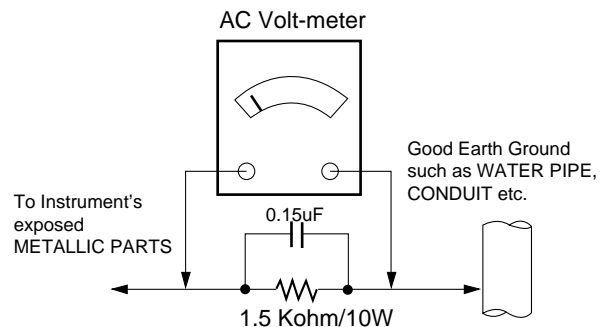
Connect 1.5K/10watt resistor in parallel with a 0.15uF capacitor between a known good earth ground (Water Pipe, Conduit, etc.) and the exposed metallic parts.

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 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



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

*Base on Adjustment standard

SERVICING PRECAUTIONS

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

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

General Servicing Precautions

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

CAUTION: A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.

2. Test high voltage only by measuring it with an appropriate high voltage meter or other voltage measuring device (DVM, FETVOM, etc) equipped with a suitable high voltage probe. Do not test high voltage by "drawing an arc".
3. Do not spray chemicals on or near this receiver or any of its assemblies.
4. Unless specified otherwise in this service manual, clean electrical contacts only by applying the following mixture to the contacts with a pipe cleaner, cotton-tipped stick or comparable non-abrasive applicator; 10% (by volume) Acetone and 90% (by volume) isopropyl alcohol (90%-99% strength)
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 is applied to the LCD TV used LA92G chassis.

2. Requirement for Test

Each part is tested as below without special appointment.

- 1) Temperature : 25±5°C (77±9°F), CST : 40±5°C
- 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 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, CE
 - EMC: FCC, ICES, IEC specification, CE

4. General specification

No	Item	Specification	Remark
1	Display Screen Device	47 wide Color Display Module	1920 x1080
2	Aspect Ratio	16:9	
3	LCD Module	LC470WUH-SBA1(without inverter)	FHD+Tconless 47LH40-UA
4	Available Channel	1) VHF : 02 ~ 13	
		2) UHF : 14 ~ 69	
		3) DTV : 02 ~ 69	
		4) CATV : 01 ~135	
		5) CADTV : 01 ~ 135	
5	Operating Environment	Temp.:0 ~ 40 deg	
		Humidity : ~ 80 %	
6	Storage Environment	Temp.: -20 ~ 60 deg	
		Humidity : ~ 85 %	
7	Input Voltage	AC100 ~240V,50/60Hz	
8	Tuning system	FS	

5. Chroma& Brightness

5.1 Module optical specification

No.	Item	Specification		Min.	Typ.	Max.	Remark
1.	Max Luminance (Center1-point/ Ful white pattern)	Modele		400		500	cd/m ²
2.	Luminance uniformity	Luminance		77			%
3.	Contrast Ratio			1000: 1 4000: 1(DCR)	1400: 1 50000:1(DCR)		
4.	Color Coordinates	White	WX	Typ -0.03	0.279	Typ +0.03	
			WY		0.292		
		RED	Xr		636		
			Yr		334		
		Green	Xg		290		
			Yg		608		
		Blue	Xb		145		
			Yb		064		
5.	Color Temperatue	Cool		0.274	0.276	0.278	85% Full white pattern
				0.281	0.283	0.285	**The W/B Tolerance is
		Medium		0.283	0.285	0.287	± 0.015 for Adjustment
				0.291	0.293	0.295	Dynamic contrast :off
		Warm		0.311	0.313	0.315	Dynamic color :off
				0.327	0.329	0.331	Energy saving mode :off
6.	Color Distortion, DG					10.0	%
7.	Color Distortion,DP					10.0	deg
8.	Color S/N,AM/FM			43.0			dB
9.	Color Killer Sensitivity			-80			dB

* Max Luminance & Contrast measure standard specification

- Max Luminance measure specification

- 1) In non-impressed condition, measure peak brightness displayable as much as possible LCD module.
- 2) Measuring instrument: CA-210 or a sort of Color Analyzer.
- 3) Pattern Generator :VG- 828 or a sort of digital pattern generator (displayable Full White & 1/25 White Window pattern)
- 4) Measure condition
 - Test pattern: in center, 1/5(H)*1/5(V) of Window Pattern (white pattern in non-impressed condition)
 - SET condition: Contrast & Brightness Level 100%
 - Environment condition : Dark room in the non outside light
 - Video menu option condition

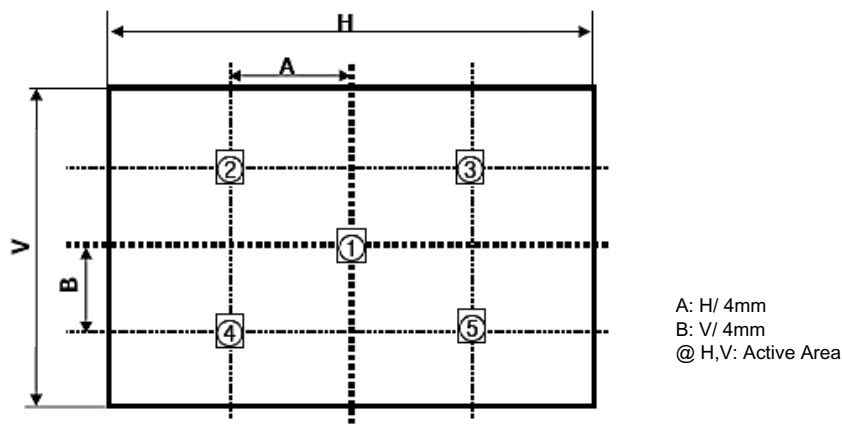
	Signal	Picture Mode	Dynamic Contrast	Dynamic Color	Black Level
RF	NTSC-M	Vivid	High	High	Low
AV	NTSC-J	Vivid	High	High	High
Component	720P	Vivid	High	High	High
RGB	1024x768	Vivid	NA	NA	NA
HDMI	DTV 720P	Vivid	High	High	Low

5) Measurement

- Do heat-run LCD module at 30minutes in normal temperature (25°C) by using full white pattern of 15% signal level (38 gray level).
- Impress test pattern signal in 1/5(H)*1/5(V) White Window of 100% (255 Gray Level)
- measure 3 times brightness of central white window, and mark peak brightness in max brightness degree
- measure the same condition in video signal / RGB signal.

- Luminance uniformity measure specification

- 1) Impress 100% (255 Gray Level) full white pattern at the same peak brightness measurement.
- 2) Measure average brightness in 5 points.



- Contrast ratio measure specification

- 1) Test display signal :30*30 dots White Window signal &all Black Raster signal
 - 2) Dark room measure condition: Using touch type Color analyzer CA-210 Dark room in the non outside light
 - 3) Bright room measure condition: In bright room of 150Lx illumination in the panel surface, locate a source of light on the above 45° of the panel surface.
 - 4) Measure method
 - In standard test condition,impress 30*30 dots White Window Pattern signal .
 Measure center peak brightness degree Lw of white window
 - Impress black Raster signal as contrast ratio measurement signal.
 Measure black brightness degree Lb of PDP central
- Calculate the following numerical formula.
 Contrast ratio =Lw /Lb

If it does not use Prior measurement, use generally simple test measurement. The Correct measure specification is followed by IEC61988-2/CD,JAPAN EIAJ-2710

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

No	Specification				Remark
	Resolution	H-freq(kHz)	V-freq(Hz)	Pixel Clock(MHz)	
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	31.47	60	27.027	SDTV 480P
4.	720*480	31.47	59.94	27.0	DTV 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	59.939	148.352	HDTV 1080P
11.	1920*1080	27.000	24.000	74.25	HDTV 1080P
12.	1920*1080	26.97	23.94	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

7.1 PC INPUT

No	Specification				Remark
	Resolution	H-freq(kHz)	V-freq(Hz)	Pixel Clock(MHz)	
1.	640*350	31.468	70.09	25.17	EGA
2.	720*400	31.469	70.08	28.32	DOS
3.	640*480	31.469	59.94	25.17	VESA(VGA)
4.	640*480	37.861	72.80	31.50	VESA(VGA)
5.	640*480	37.500	75.00	31.50	VESA(VGA)
6.	800*600	35.156	56.25	36.00	VESA(SVGA)
7.	800*600	37.879	60.31	40.00	VESA(SVGA)
8.	800*600	48.077	72.18	50.00	VESA(SVGA)
9.	800*600	46.875	75.00	49.50	VESA(SVGA)
10.	1024*768	48.363	60.00	65.00	VESA(XGA)
11.	1024*768	56.476	70.06	75.00	VESA(XGA)
12.	1024*768	60.023	75.02	78.75	VESA(XGA)
13.	1280*768	47.776	59.870	79.5	CVT(WXGA)
14.	1280*768	60.289	74.893	102.25	CVT(WXGA)
15.	1360*768	47.712	60.015	85.50	VESA (WXGA)
16.	1280*1024	63.981	60.020	108.00	VESA (SXGA)
17.	1280*1024	79.976	75.025	135	VESA (SXGA)
18.	1600*1200	75.00	60.00	162	VESA (UXGA)
19.	1920*1080	66.587	59.934	148.5	HDTV 1080P

7.2 EDID

7.2.1 Equipment

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

7.2.2 Download method

Press Adj. key On the Adj. R/C, press Adj. key then select EDID D/L. By pressing Enter key, EDID download will begin.

- 1) If Download is successful, OK is displayed.
- 2) If Download is a failure, NG is displayed.
- 3) Re-try download.

7.2.3 EDID Data

- Reference: Download is only possible in POWER ON MODE.

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	01	00	01	01	01	01
10	00	11	01	03	18	73	41	96	0A	CF	74	A3	57	4C	B0	23
20	09	48	4C	AF	CF	00	31	40	45	40	61	40	81	80	A9	40
30	01	01	01	01	01	01	01	66	21	50	B0	51	00	1B	30	40
40	36	00	C4	8E	21	00	00	1A	02	3A	80	18	71	38	2D	40
50	58	2C	45	00	C4	8E	21	00	00	1E	00	00	00	FD	00	30
60	58	1F	64	11	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	F6

EDID Block 1 table =

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	02	03	04	00	0E	1F	00	80	51	00	1E	30	40	80	37	00
10	C4	8E	21	00	00	1C	F1	27	00	A0	51	00	25	30	50	80
20	37	00	C4	8E	21	00	00	1C	26	36	80	A0	70	38	1F	40
30	30	20	25	00	C4	8E	21	00	00	0A	00	00	00	00	00	00
40	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
50	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
60	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
70	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	BC

8. HDMI Input (PC/DTV)

8.1 PC Mode

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	Remark
1	640*350	31.468	70.09	25.17	EGA	
2	720*400	31.469	70.08	28.32	DOS	
3	640*480	31.469	59.94	25.17	VESA(VGA)	
4	640*480	37.861	72.80	31.50	VESA(VGA)	
5	640*480	37.500	75.00	31.50	VESA(VGA)	
6	800*600	35.156	56.25	36.00	VESA(SVGA)	
7	800*600	37.879	60.31	40.00	VESA(SVGA)	
8	800*600	48.077	72.18	50.00	VESA(SVGA)	
9	800*600	46.875	75.00	49.50	VESA(SVGA)	
10	1024*768	48.363	60.00	65.00	VESA(XGA)	
11	1024*768	56.476	70.06	75.00	VESA(XGA)	
12	1024*768	60.023	75.02	78.75	VESA(XGA)	
13	1280*768	47.776	59.870	79.5	CVT(WXGA)	
14	1360*768	47.712	60.015	85.50	VESA (WXGA)	
15	1280*1024	63.981	60.020	108.00	VESA (SXGA)	
16	1280*1024	79.976	75.025	135	VESA (SXGA)	
17	1600*1200	75.00	60.00	162	VESA (UXGA)	
18	1920*1080	7.5	60	148.5	HDTV 1080P	

8.2 DTV Mode

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	Remark
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	23.94	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	

8.3 EDID Data

• HDMI I[C/S: 8A27]

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	01	00	01	01	01	01
10	00	11	01	03	80	73	41	96	0A	CF	74	A3	57	4C	B0	23
20	09	48	4C	AF	CF	00	31	40	45	40	61	40	81	80	A9	40
30	01	01	01	01	01	01	66	21	50	B0	51	00	1B	30	40	70
40	36	00	C4	8E	21	00	00	1E	02	3A	80	18	71	38	2D	40
50	58	2C	45	00	C4	8E	21	00	00	1E	00	00	00	FD	00	30
60	58	1F	64	11	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	8A

EDID Block 1 table =

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	02	03	18	F1	47	84	05	03	02	20	22	10	23	15	07	50
10	67	03	0C	00	10	00	B8	2D	01	1D	80	18	71	1C	16	20
20	58	2C	25	00	C4	8E	21	00	00	9E	01	1D	00	72	51	D0
30	1E	20	62	28	55	00	C4	8E	21	00	00	1E	8C	0A	D0	8A
40	20	E0	2D	10	10	3E	96	00	C4	8E	21	00	00	18	8C	0A
50	D0	8A	20	E0	2D	10	10	3E	96	00	13	8E	21	00	00	18
60	26	36	80	A0	70	38	1F	40	30	20	25	00	C4	8E	21	00
70	00	1A	00	00	00	00	00	00	00	00	00	00	00	00	00	27

• HDMI II[C/S: 8A17]

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	01	00	01	01	01	01
10	00	11	01	03	80	73	41	96	0A	CF	74	A3	57	4C	B0	23
20	09	48	4C	AF	CF	00	31	40	45	40	61	40	81	80	A9	40
30	01	01	01	01	01	01	66	21	50	B0	51	00	1B	30	40	70
40	36	00	C4	8E	21	00	00	1E	02	3A	80	18	71	38	2D	40
50	58	2C	45	00	C4	8E	21	00	00	1E	00	00	00	FD	00	30
60	58	1F	64	11	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	8A

EDID Block 1 table =

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	02	03	18	F1	47	84	05	03	02	20	22	10	23	15	07	50
10	67	03	0C	00	20	00	B8	2D	01	1D	80	18	71	1C	16	20
20	58	2C	25	00	C4	8E	21	00	00	9E	01	1D	00	72	51	D0
30	1E	20	62	28	55	00	C4	8E	21	00	00	1E	8C	0A	D0	8A
40	20	E0	2D	10	10	3E	96	00	C4	8E	21	00	00	18	8C	0A
50	D0	8A	20	E0	2D	10	10	3E	96	00	13	8E	21	00	00	18
60	26	36	80	A0	70	38	1F	40	30	20	25	00	C4	8E	21	00
70	00	1A	00	00	00	00	00	00	00	00	00	00	00	00	00	17

• HDMI III[C/S: 8A07]

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	01	00	01	01	01	01
10	00	11	01	03	80	73	41	96	0A	CF	74	A3	57	4C	B0	23
20	09	48	4C	AF	CF	00	31	40	45	40	61	40	81	80	A9	40
30	01	01	01	01	01	01	66	21	50	B0	51	00	1B	30	40	70
40	36	00	C4	8E	21	00	00	1E	02	3A	80	18	71	38	2D	40
50	58	2C	45	00	C4	8E	21	00	00	1E	00	00	00	FD	00	30
60	58	1F	64	11	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	8A

EDID Block 1 table =

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	02	03	18	F1	47	84	05	03	02	20	22	10	23	15	07	50
10	67	03	0C	00	30	00	B8	2D	01	1D	80	18	71	1C	16	20
20	58	2C	25	00	C4	8E	21	00	00	9E	01	1D	00	72	51	D0
30	1E	20	62	28	55	00	C4	8E	21	00	00	1E	8C	0A	D0	8A
40	20	E0	2D	10	10	3E	96	00	C4	8E	21	00	00	18	8C	0A
50	D0	8A	20	E0	2D	10	10	3E	96	00	13	8E	21	00	00	18
60	26	36	80	A0	70	38	1F	40	30	20	25	00	C4	8E	21	00
70	00	1A	00	00	00	00	00	00	00	00	00	00	00	00	00	07

• HDMI IV[C/S: 8AF7]

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	01	00	01	01	01	01
10	00	11	01	03	80	73	41	96	0A	CF	74	A3	57	4C	B0	23
20	09	48	4C	AF	CF	00	31	40	45	40	61	40	81	80	A9	40
30	01	01	01	01	01	01	66	21	50	B0	51	00	1B	30	40	70
40	36	00	C4	8E	21	00	00	1E	02	3A	80	18	71	38	2D	40
50	58	2C	45	00	C4	8E	21	00	00	1E	00	00	00	FD	00	30
60	58	1F	64	11	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	8A

EDID Block 1 table =

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	02	03	18	F1	47	84	05	03	02	20	22	10	23	15	07	50
10	67	03	0C	00	40	00	B8	2D	01	1D	80	18	71	1C	16	20
20	58	2C	25	00	C4	8E	21	00	00	9E	01	1D	00	72	51	D0
30	1E	20	62	28	55	00	C4	8E	21	00	00	1E	8C	0A	D0	8A
40	20	E0	2D	10	10	3E	96	00	C4	8E	21	00	00	18	8C	0A
50	D0	8A	20	E0	2D	10	10	3E	96	00	13	8E	21	00	00	18
60	26	36	80	A0	70	38	1F	40	30	20	25	00	C4	8E	21	00
70	00	1A	00	00	00	00	00	00	00	00	00	00	00	00	00	F7

9. DIGITAL Part

No	Item	Standard	Unit	Remark
1.	VSB Receiving	CH.2 ~69CH 1 ~135CH(CATV) 1 ~135CH(CADTV))		
2.	Video Resolution	ATSC 18 FORMAT		
3.	Audio Bit Resolution	32,40,48,56,64,80,96,112,128,160, 192,224,256,320,384,448,512,576,640	Kbps	
4.	VSB RF Input	75Ω unbalanced F type Connector input		
5.	Sync Stable Time	Under 3.0 SEC		

10. Power

No	Item		Min	Typ	Max	Unit	Remark	
1.	Power On/Off		10000			times		
2.	DC Voltage	Inverter Voltage	21.6	24	26.4	V		
		Logic Voltage(Vcc)	4.8	5	5.3	V		
		Sound Amp Vcc	15.0	24.0/20.	0 .26	V	PSU 24V ,Lips 20V	
		Tuner 5V	4.75	5.0	5.25	V		
		VSC Vcc	12V	11.0	12.0	13.0	V	
			5V	4.5	5.0	5.5	V	
			No operation	0	0.5	1	V	Inside Temp.Under 20deg.
3.	AC Power Shut Down Voltage		90		264	V	Wide Range PSU	

11. Mechanical specification

No	Item		Content	Unit	
1	Protrusion		Satisfy appearance inspection		LG(51)G2-2001
2	Appearance		quality Satisfy appearance inspection		LG(51)G1-1030
3	Print specification		Distinguish printed matter at a distance of 40cm		
4	Product Dimension	Before Packing	1153.2 (W)X 791.5 (H)X 337.4 (D)	mm	
		After Packing	1485 (W)X 860 (H)X 255 (D)	mm	
5	Product Weight	Only SET	23	Kg	
		With BOX	28.5	Kg	
6	Stand Ass'y	SWIVEL	(±)20°	degree	Fixed Stand

ADJUSTMENT INSTRUCTION

1. Application Range

This specification sheet is applied to all of the LCD TV with LA92G chassis.

2. Specification

- 1) Because this is not a hot chassis, it is not necessary to use an isolation transformer. However, the use of isolation transformer will help protect test instrument.
- 2) Adjustment must be done in the correct order.
- 3) The adjustment must be performed in the circumstance of $25 \pm 5^{\circ}\text{C}$ of temperature and $65 \pm 10\%$ 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.

* 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 Component1 adjustment
- Adjust 1080p Component1 adjustment
- Adjust 1024*768 RGB adjustment

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-Start Menu 1. Adjust Check.

3.2 Final assembly adjustment

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

3.3 Etc.

- Ship-out mode
- Service Option Default
- USB Download(S/W Update, Option)

4. Board-level adjustment

4.1 ADC 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) Internal pattern is used. No external signal is needed.

4.1.3 Adjustment

4.1.3.1 Method

- Using RS-232, adjust items listed in 3.1 in the order shown in "4.1.3.3".

4.1.3.2 Adjustment protocol

Protocol	Command	Set ack
Source Input	kb 00 04	b 00 OK04x (Adjust 480i/1080p Comp1)
Change	kb 00 06	b 00 OK06x (Adjust 1024*768 RGB)
Begin adj.	ad 00 10	
Return		OKx (Success)
adj. result		NGx (Fail)
Read	(main)	(main input)
adj. data	ad0020	0000000000000000000000007c007b006dx
	(sub)	(Sub input)
	ad 00 21	000000070000000000000000007c00830077x
Confirm adj.	ad 00 99	NG 03 00x (Fail)
		NG 03 01x Fail
		NG 03 02x (Fail)
		OK 03 03x (Success)
End adj.	ad 00 90	d 00 OK90x

4.1.3.3 Adjustment order

- ad 00 00 [Enter ADC adjustment mode]
- kb 00 04 [Component1 Input Change]
- ad 00 10 [Adjust 480i Component1]
- ad 00 10 [Adjust 1080p Component1]
- kb 00 06 [RGB Input Change]
- ad 00 10 [Adjust 1024*768 RGB]
- ad 00 90 [End adjustment mode]

5. Final Assembly adjustment

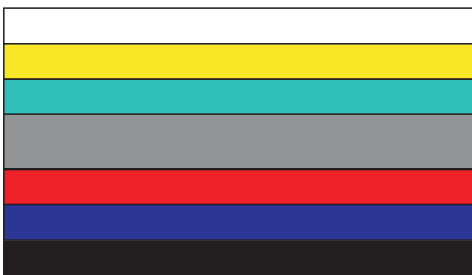
5.1 ADC(Saturn5) adjustment

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) IN-START. remote
- 2) 801GF(802B, 802F, 802R) or MSPG925FA Pattern Generator
- Resolution:
480i Comp1 (MSPG-925FA: model-209, pattern-65)
1080p Comp1 (MSPG-925FA: model-225, pattern-65)
1024*768 RGB (MSPG-925FA: model-60, pattern-65)
- Pattern Name: Horizontal 100% Color Bar Pattern
- Pattern Level: 0.7 ± 0.1 Vp-p
- Image



- 3) Use the certificated cable.

5.1.3 Method

5.1.3.1 ADC 480i Comp1

Set Component 480i mode and 100% Horizontal Color Bar Pattern(HozTV31Bar), then set TV set to Component1 mode and its screen to "NORMAL"

After get the signal, wait more a second and enter the "In START" with press In-Start key of Service remocon. After then select "6. External ADC-> Comp 480i" with navigator button and press "Enter". It is automatically adjustment

You can see "ADC Component Success" message after Adjustment success Error Messages: When its adjustment is not correct, "ADC Component Fail" message displayed. If its signal don't out, then "Check Signal Status" message displayed. These messages will be displayed just a second.

5.1.3.2 ADC 1080p Comp1

Set Component 1080P mode and 100% Horizontal Color Bar Pattern(HozTV31 Bar), then set TV set to Component1 mode and its screen to "NORMAL"

After get the signal, wait more a second and enter the "In START" with press In-Start key of Service remocon. After then select "6. External ADC-> Comp 1080P" with navigator button and press "Enter". It is automatically adjustment

You can see "ADC Component Success" message after Adjustment success Error Messages: When its adjustment is not correct, "ADC Component Fail" message displayed. If its signal don't out, then "Check Signal Status" message displayed. These messages will be displayed just a second.

5.1.3.3 ADC 1024*768 RGB-PC

Set RGB-PC 1024*768 mode and 100% Horizontal Color Bar Pattern(HozTV31Bar), then set TV set to Component1 mode and its screen to "NORMAL"

After get the signal, wait more a second and enter the "In START" with press In-Start key of Service remocon. After then select "6. External ADC-> RGB" with navigator button and press "Enter". It is automatically adjustment

You can see "ADC Component Success" message after Adjustment success Error Messages: When its adjustment is not correct, "ADC Component Fail" message displayed.

If its signal don't out, then "Check Signal Status" message displayed. These messages will be displayed just a second.

5.2 White Balance adjustment

5.2.1 Overview

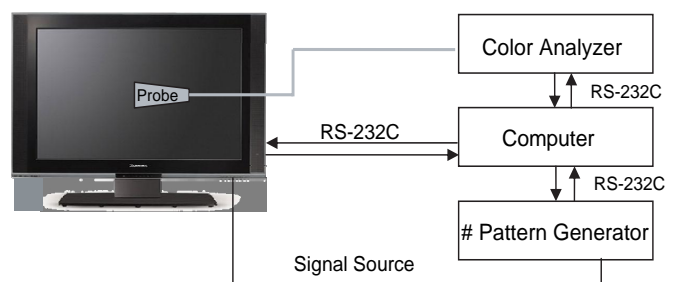
- W/B adjustment : Objective & How-it-works
- Objective: to reduce each Panel's W/B deviation
- How-it-works: when R/G/B gain in the OSD is at 192, it means the panel is at its Full Dynamic Range. In order to prevent saturation of Full Dynamic range and data, one of R/G/B is fixed at 192, and the other two is lowered to find the desired value.

5.2.2 Equipment

- 1) Color Analyzer : CA-210 (NCG: CH 9 / WCG: CH12 /LED Module:CH14)
- 2) Adjustment Computer (During auto adj., RS-232C protocol is needed)
- 3) Adjustment 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

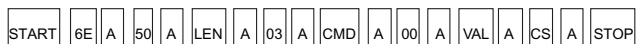
5.2.3 Equipment connection map



* If TV internal pattern is used, not needed

5.2.4 Adjustment Command (Protocol)

• Protocol



<Command Format>

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

- RS-232C Command used during auto-adjustment

CMD	ID	DATA	Explanation
wb	00	00	Begin White Balance adj.
wb	00	ff	End White Balance adj. (internal pattern disappears)

Ex) wb 00 00 -> Begin white balance auto-adj.
wb 00 10 -> Gain adj.
ja 00 ff -> Adj. data
jb 00 c0

...

...

wb 00 1f -> Gain adj. complete

*(wb 00 20(Start), wb 00 2f(End)) -> Off-set adj.

wb 00 ff -> End white balance auto-adj.

5.2.5 Adjustment method

5.2.5.1 Auto adjustment 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 Sign), check adj. status per mode (Warm, Medium, Cool)
- 6) Remove probe and RS-232C cable to complete adj.

- adj. must begin w/ command "Wb 00 00", and end w/"wb 00 ff" and adjustment offset if needed.

5.2.5.2 Manual adj. method

- 1) Set TV in adj. mode using POWER On Key
- 2) Press ADJ key AE EZ adjust using adj. R/C
- 3) Using CH + / - KEY, select 7.TEST PATTERN then press Enter to place inHEAT RUN mode and wait for 5 minutes.
- 4) Zero calibrate the probe of Color Analyzer, then place it on the center of LCD module within 10 cm of the surface.
- 5) Press ADJ key AE 6. White-Balance then press the cursor to the right (KEY \blacktriangleright)
(When \blacktriangleright 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 rest will be lowered to meet the desired value.
- 7) Adjustment is performed in COOL, MEDIUM, WARM 3 modes of color temperature

- If internal pattern is not available, use RF input(Full white 216 gray) In EZ Adjustment menu 6.White Balance, you can select one of 2 options: Test pattern ON, Test pattern OFF. Default is "ON" By selecting "OFF", you can adjust using RF signal.

- Adjustment 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
 - Color Analyzer (CA-210) probe should be within 10cm and perpendicular of the module surface (80°~ 100°)
 - B/L on should be checked using no signal or Full white Pattern

5.2.6 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	0.276	0.283	11000K	0.0000
Medium	0.285	0.293	9300K	0.0000
Warm	0.313	0.329	6500K	0.0000

- 37/42/47LH40-UA (N-America)

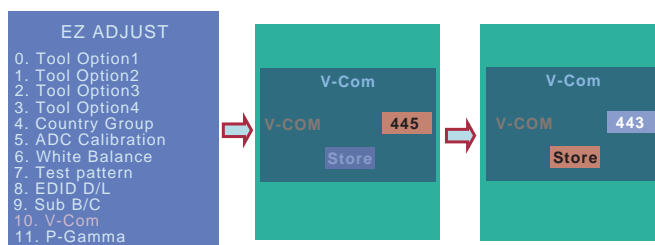
Standard color coordinate and temperature using CA-210(CH 09)

Mode	Coordinate		Temp	uvΔ
	x	y		
Cool	0.276±0.002	0.283±0.002	11000K	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

5.3 Manual V-Com adjustment Method

* V-Com needs to be adjusted.(Default value is "450")

- 1) Set TV in adj. mode using POWER On Key
- 2) Press ADJ key -> EZ adjust using adj. R/C
- 3) Using CH + / - KEY, select "10.V-Com"
- 4) Store the optimized default value "440" if there is not flicker on the picture.
- 5) But is there flicker on the picture, Adjust V-Com using VOL + / - KEY
- 6) Stop adjusting V-Com if green pattern doesn't show flicker. and then stored current value and exit.



5.4 Option selection per country

5.4.1 Overview

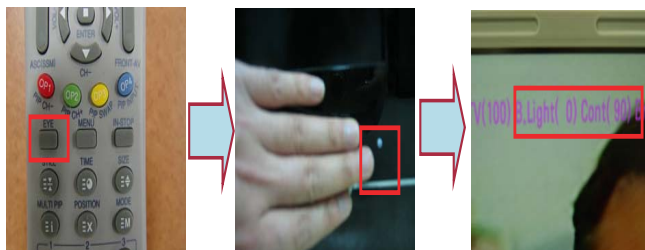
- Option selection is only done for models in Non-USA North America due to rating
- Applied model: LA92G Chassis applied None USA Model(Canada, Mexico)

5.4.2 Method

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

5.5 EYE-Q function check

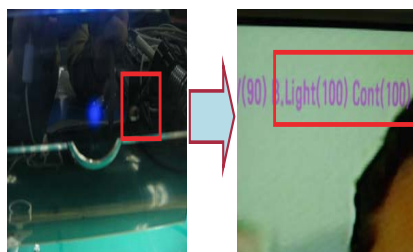
- Step 1) Turn on TV
- Step 2) Press EYE key of Adj. R/C
- Step 3) Cover the Eye Q II sensor on the front of the using your hand and wait for 6 seconds
- Step 4) Confirm that R/G/B value is lower than 10 of the "Raw Data (R: G: B:)" .
If after 6 seconds, R/G/B value is not lower than 10, replace Eye Q II sensor
- Step 5) Remove your hand from the Eye Q II sensor and wait for 6 seconds
- Step 6) Confirm that "B. Light(xxx)" value increases from 0.
If change is not seen, replace Eye Q II sensor



< step 2>

< step 3>

< step 4>



< step 5>

< step 6>

5.7 Ship-out (Default) mode check (Instop)

- After final inspection, press In-Stop key of the Adjustment R/C and check that the unit goes to Stand-by mode.
- After final inspection, Mechanical S/W(AC S/W) to the "on" position.

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 w/ fully inserted power cord and A/V 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 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

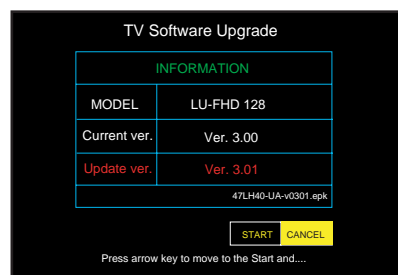
7. USB S/W Download (option)

7.1 Overview

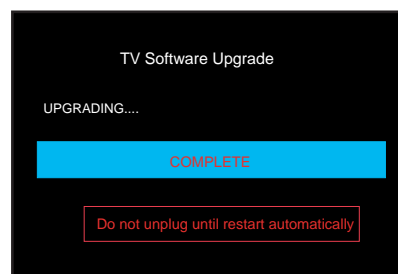
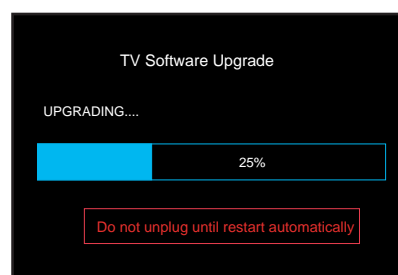
- USB download allows fast SW upgrade in SVC areas or during Board-level production

7.2 Download Method

- 1) After set on, confirm that image is displayed
- 2) Insert USB memory stick that contains the SW and after few seconds similar image to the picture below will appear



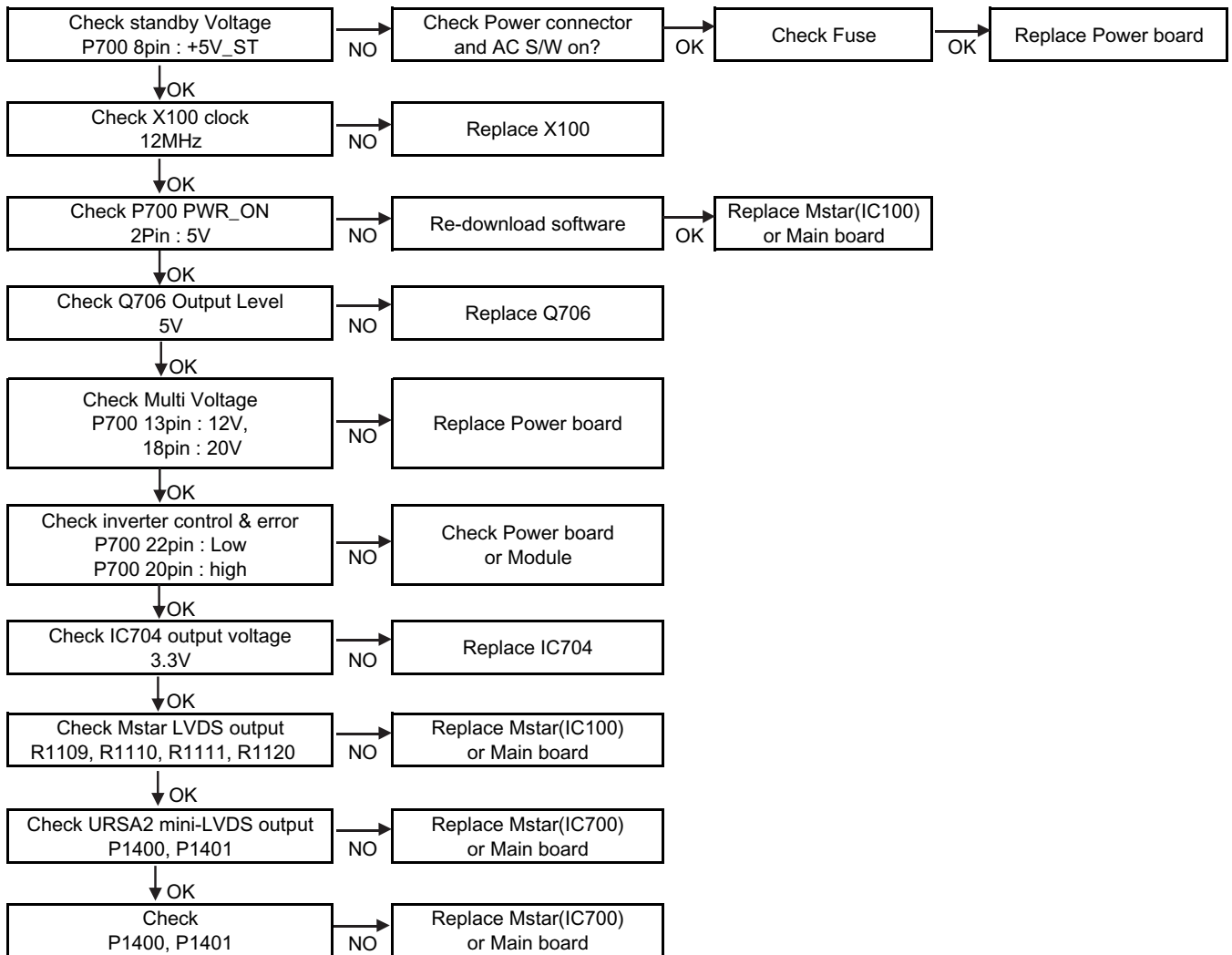
- 3) In [Current TV Software Version Information] confirm current version, and in [New Found TV Software Version Information] confirm to-be version then press Enter by selecting Start
- 4) Progress bar will appear as below and after completion, the set will reset (if the process does not advance to the picture below, reset the unit and repeat the steps)



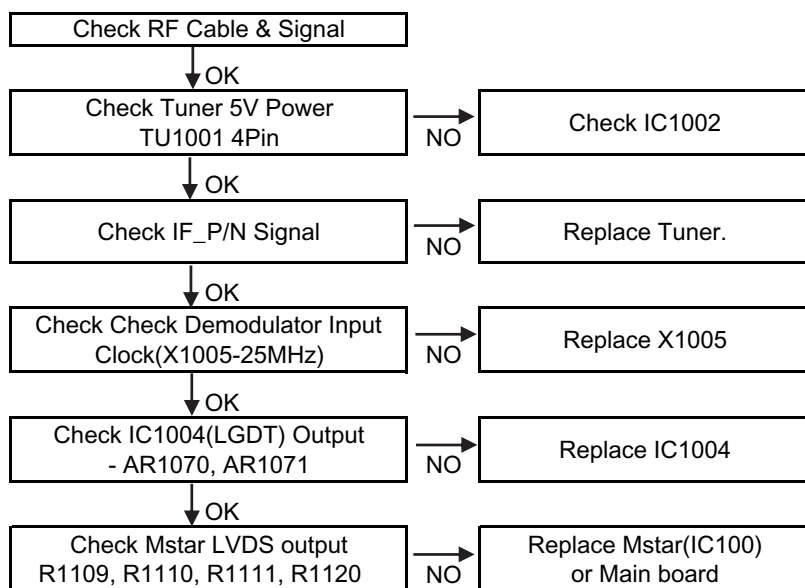
- 5) After download is complete, remove USB memory stick
- 6) By pressing In-Start on the adj. R/C, check the version

TROUBLESHOOTING

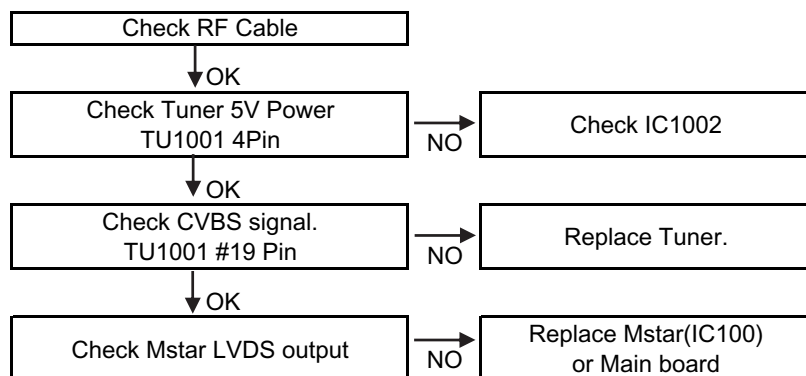
1. Power-up boot check



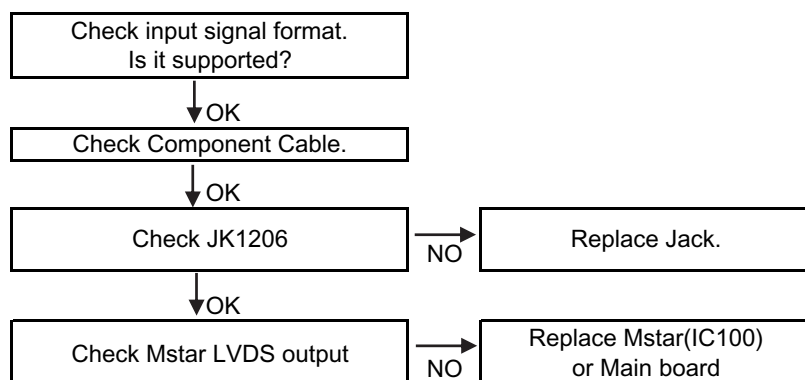
2. Digital TV Video



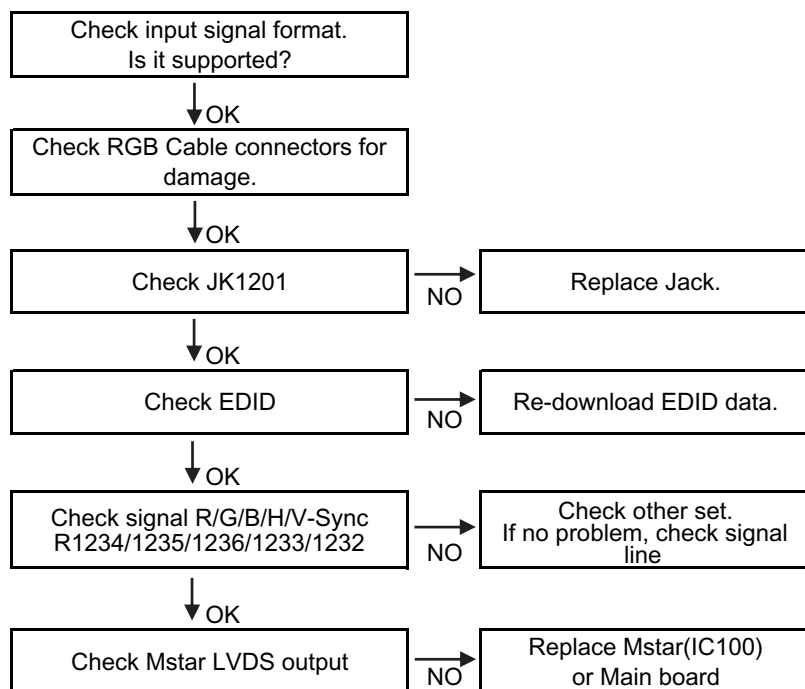
3. Analog TV Video



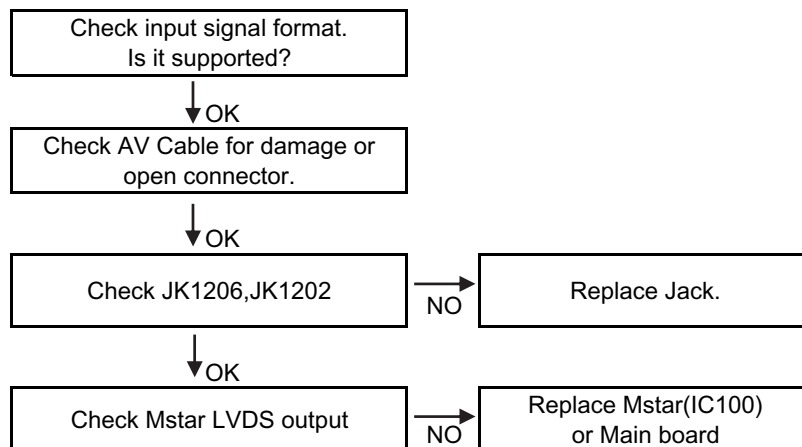
4. Component Video



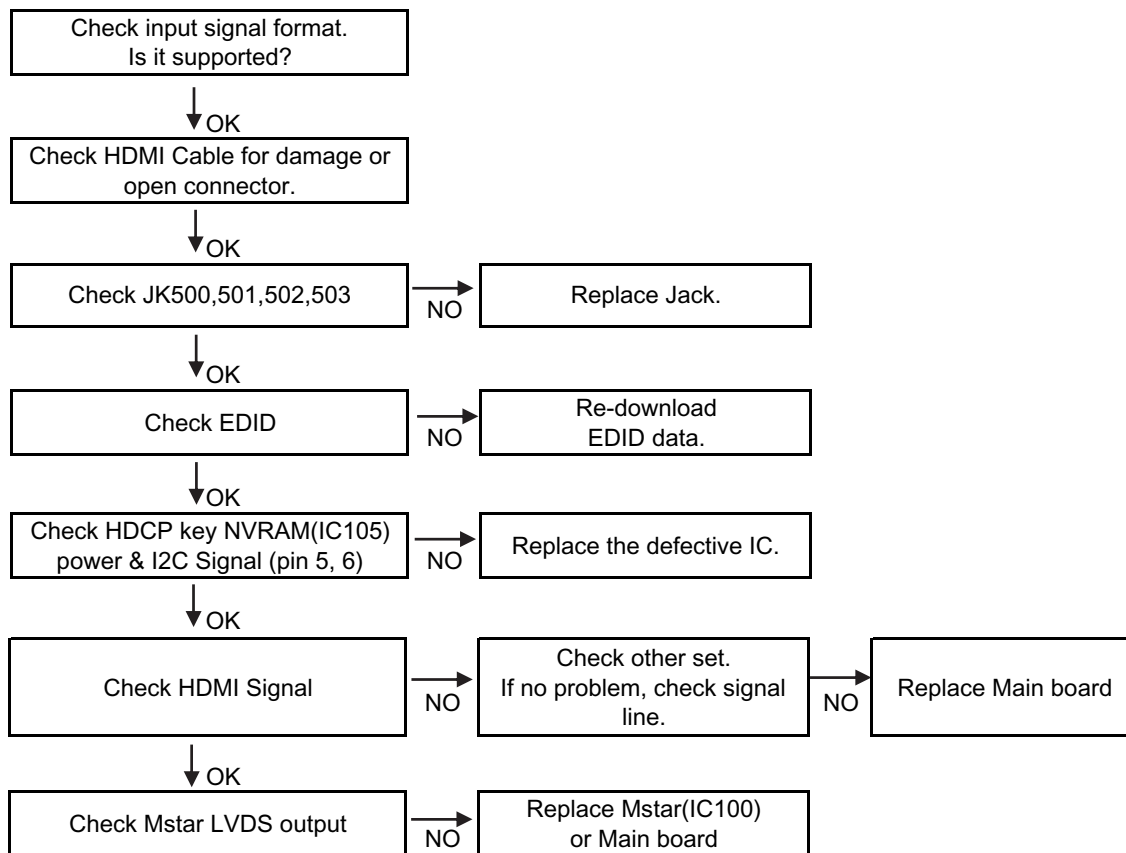
5. RGB Video



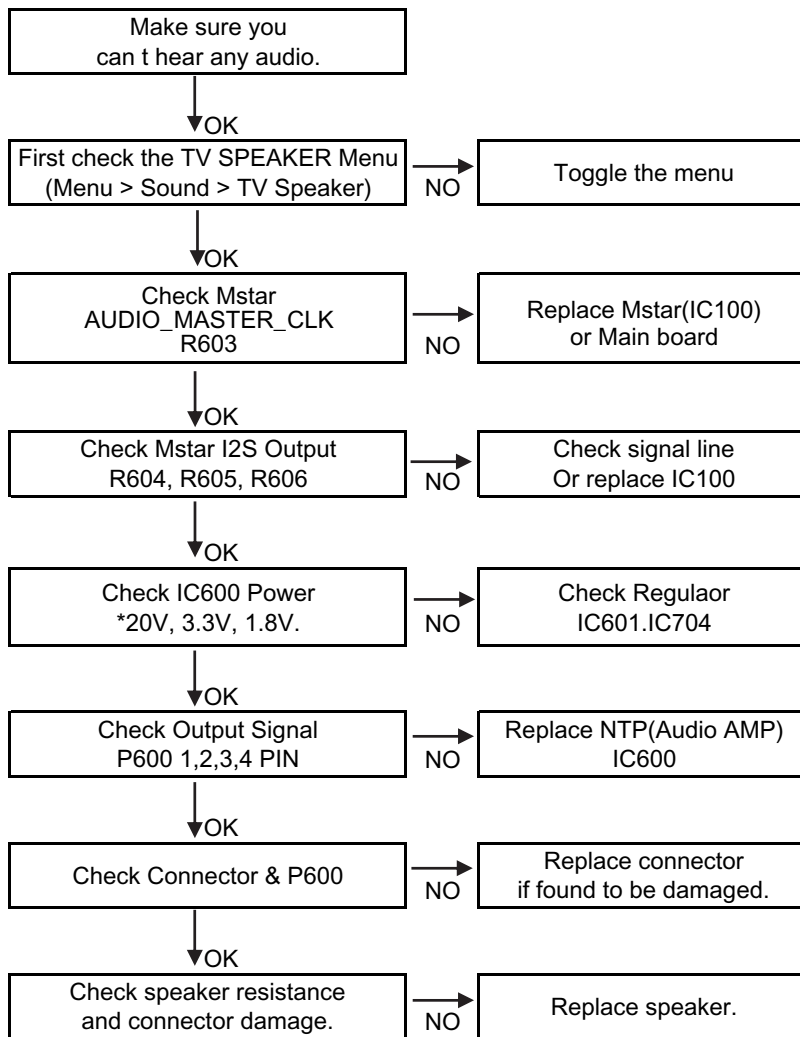
6. AV Video



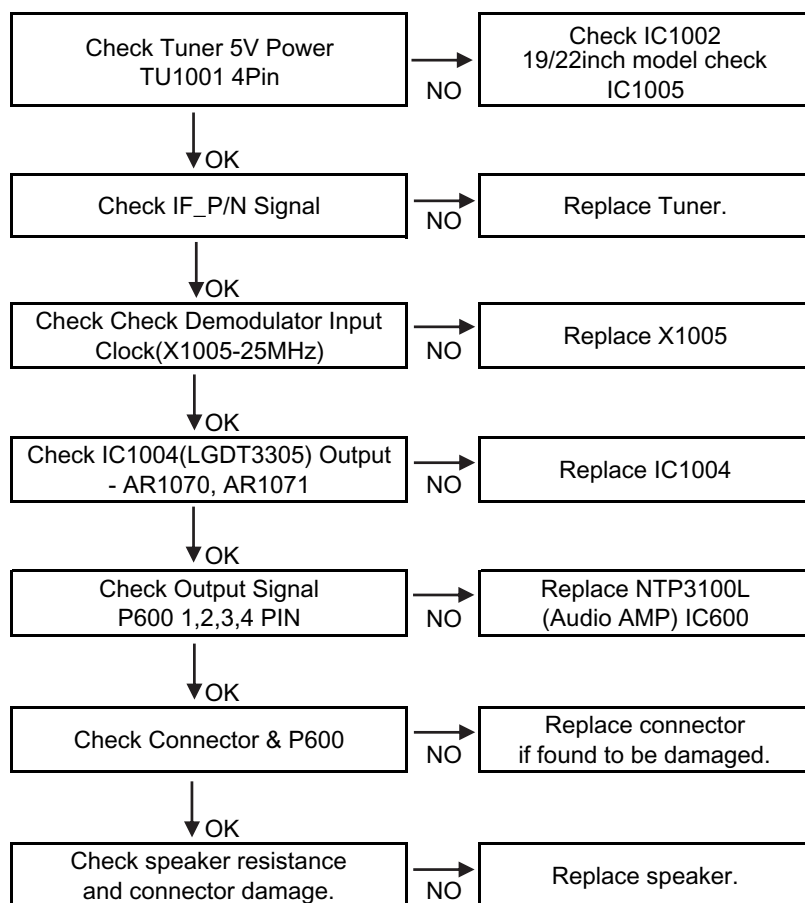
7. HDMI Video



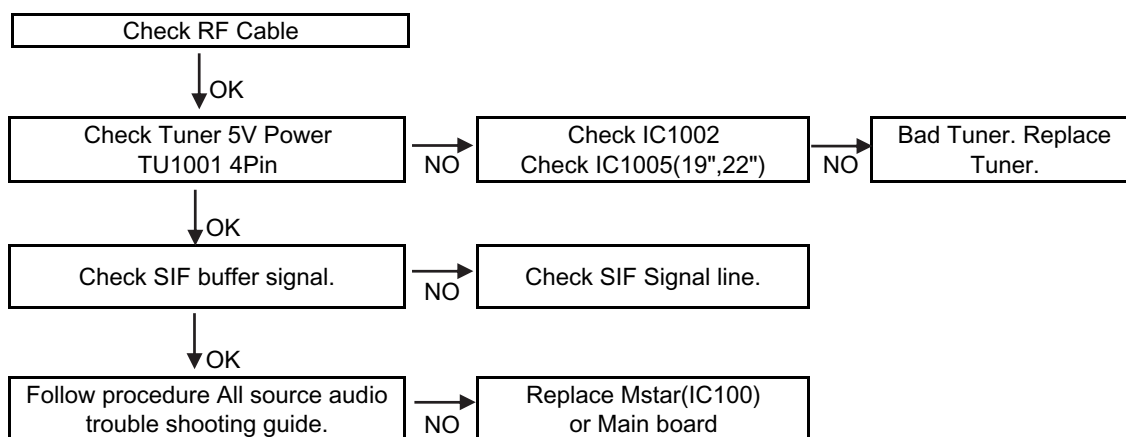
8. All Source Audio



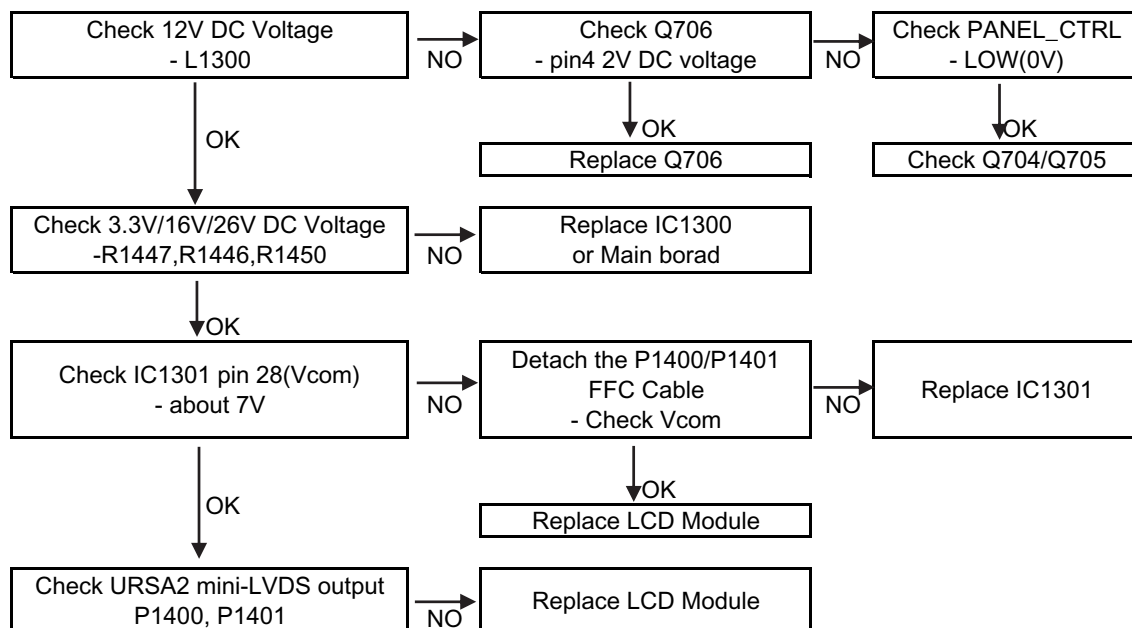
9. Digital TV Audio



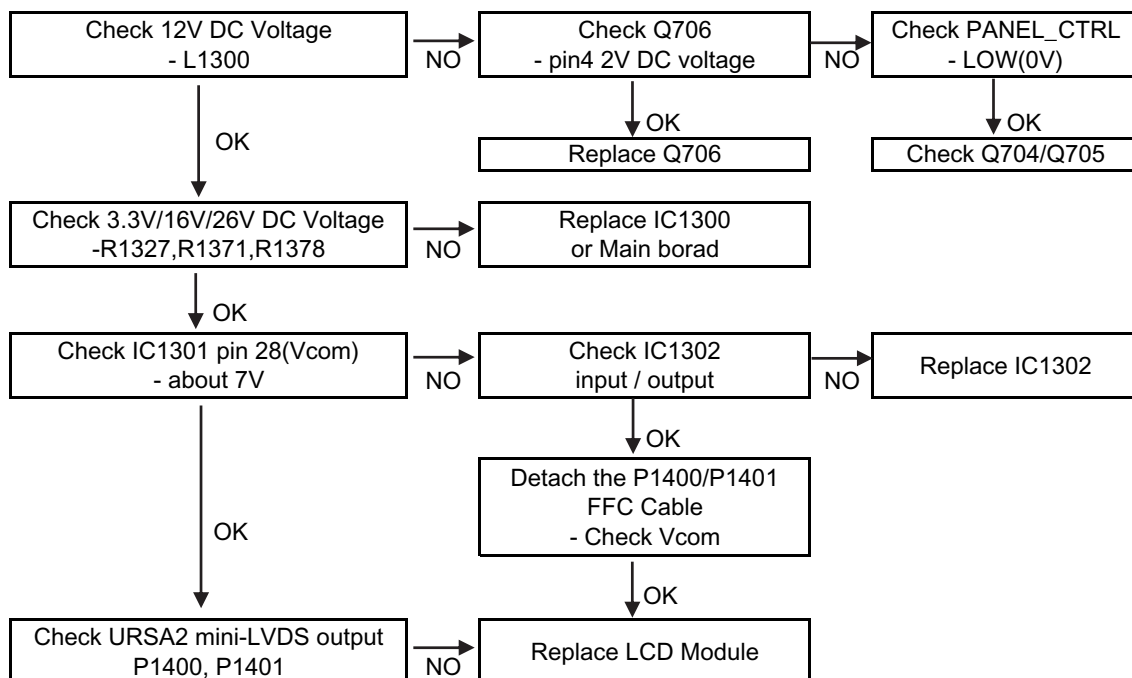
10. Analog TV Audio



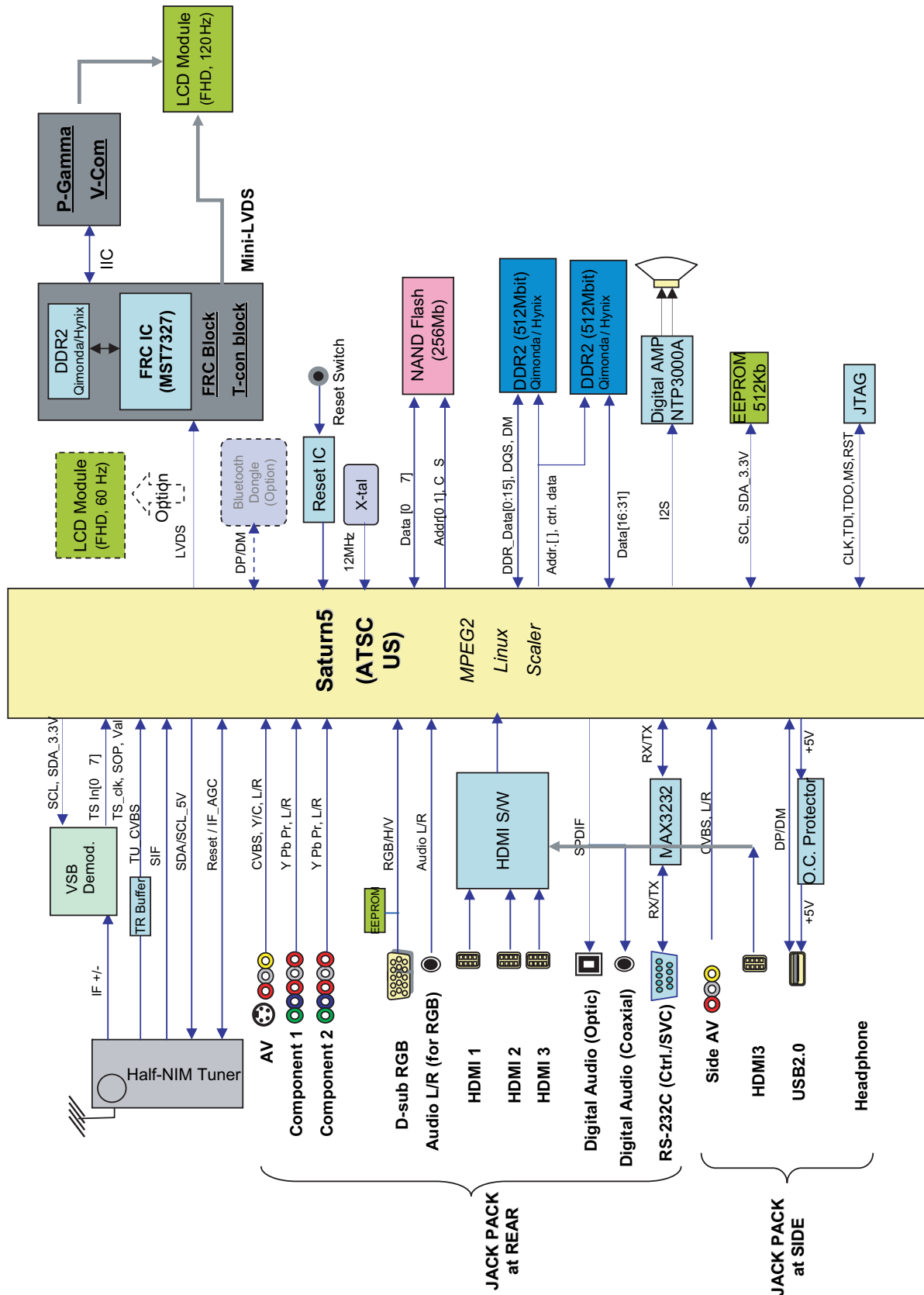
11. No Video(for 42/47LH40-UA)



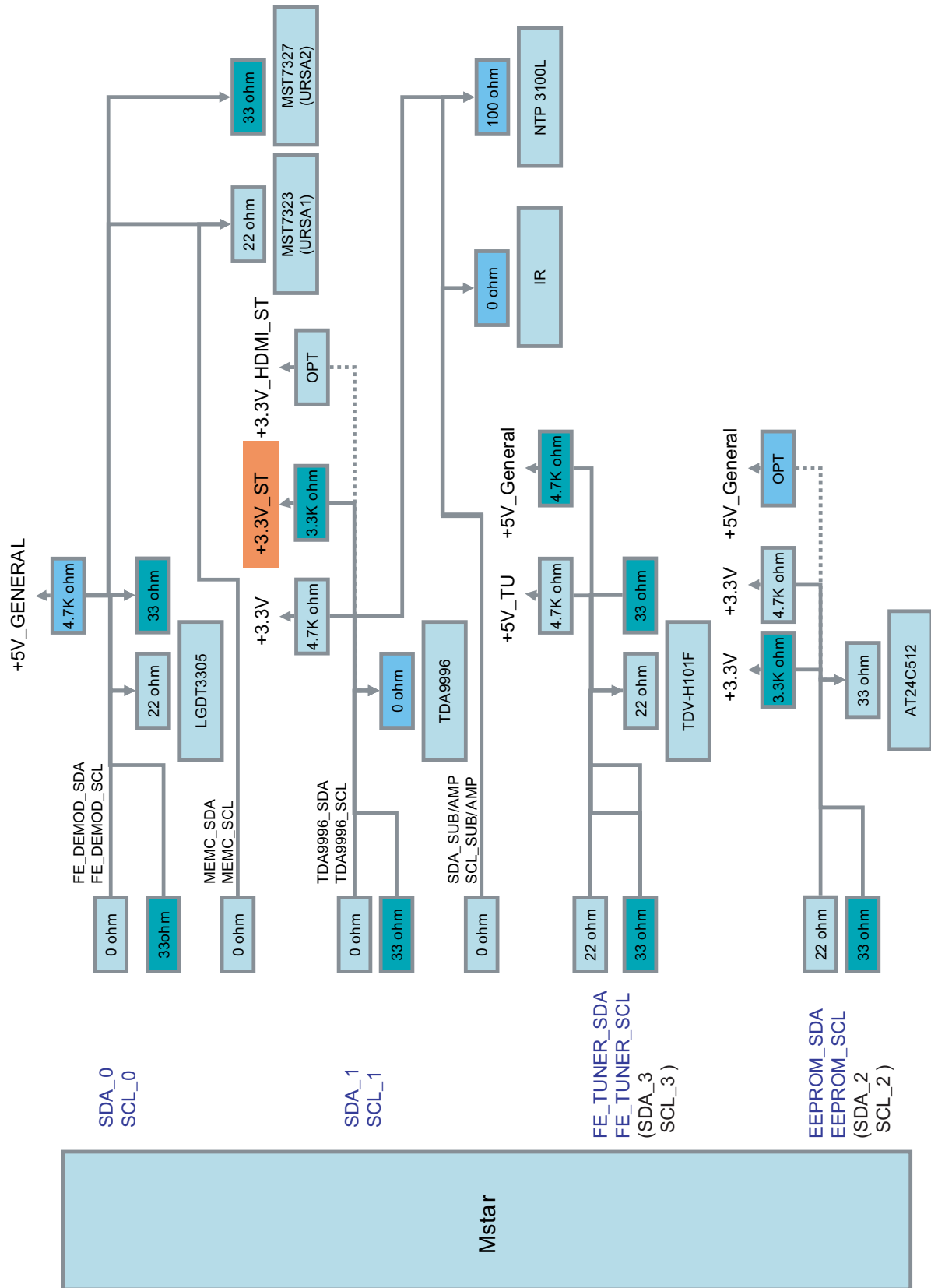
12. No Video(for 37LH40-UA)



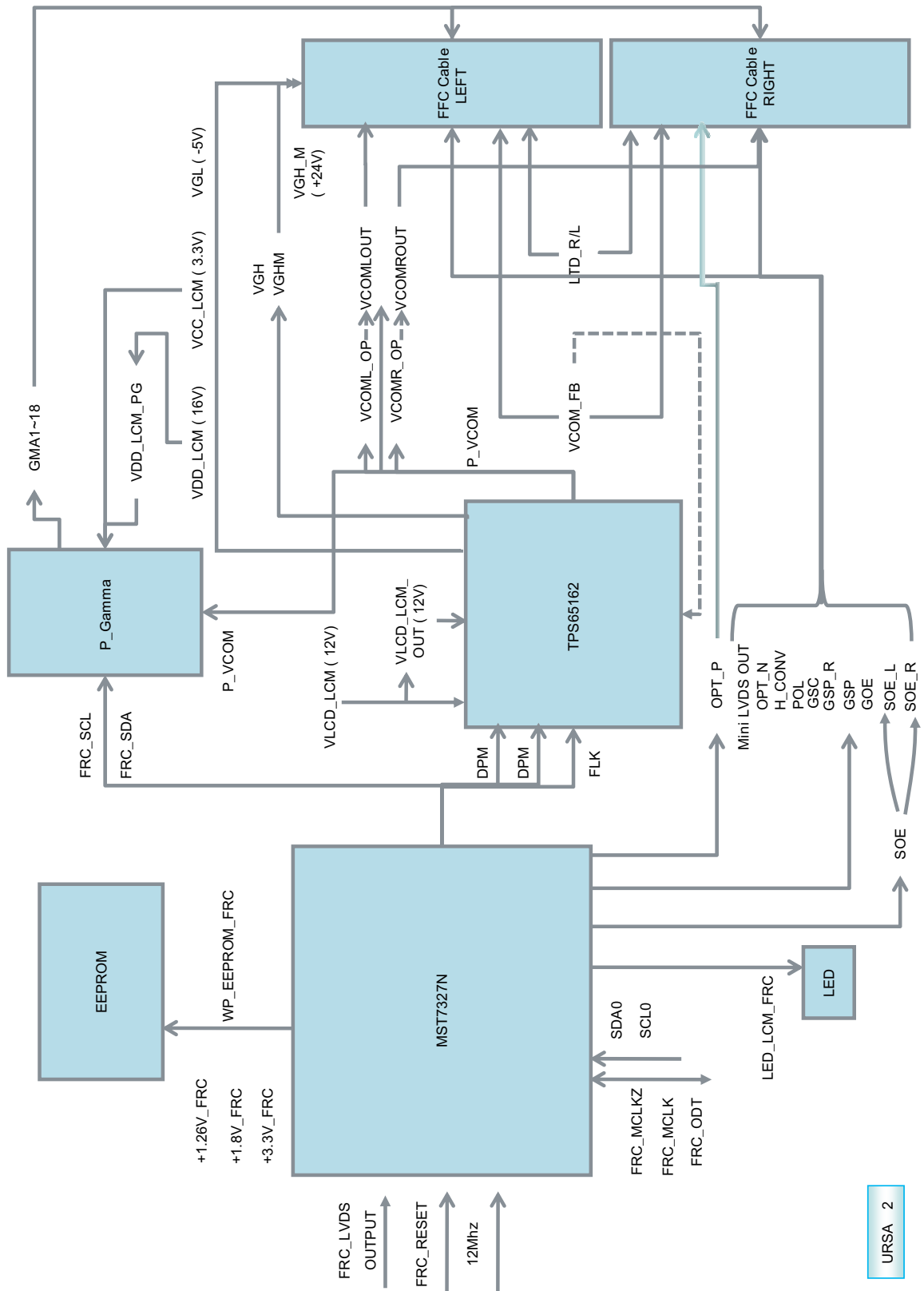
BLOCK DIAGRAM



IIC Map



T-Con block (non GIP)



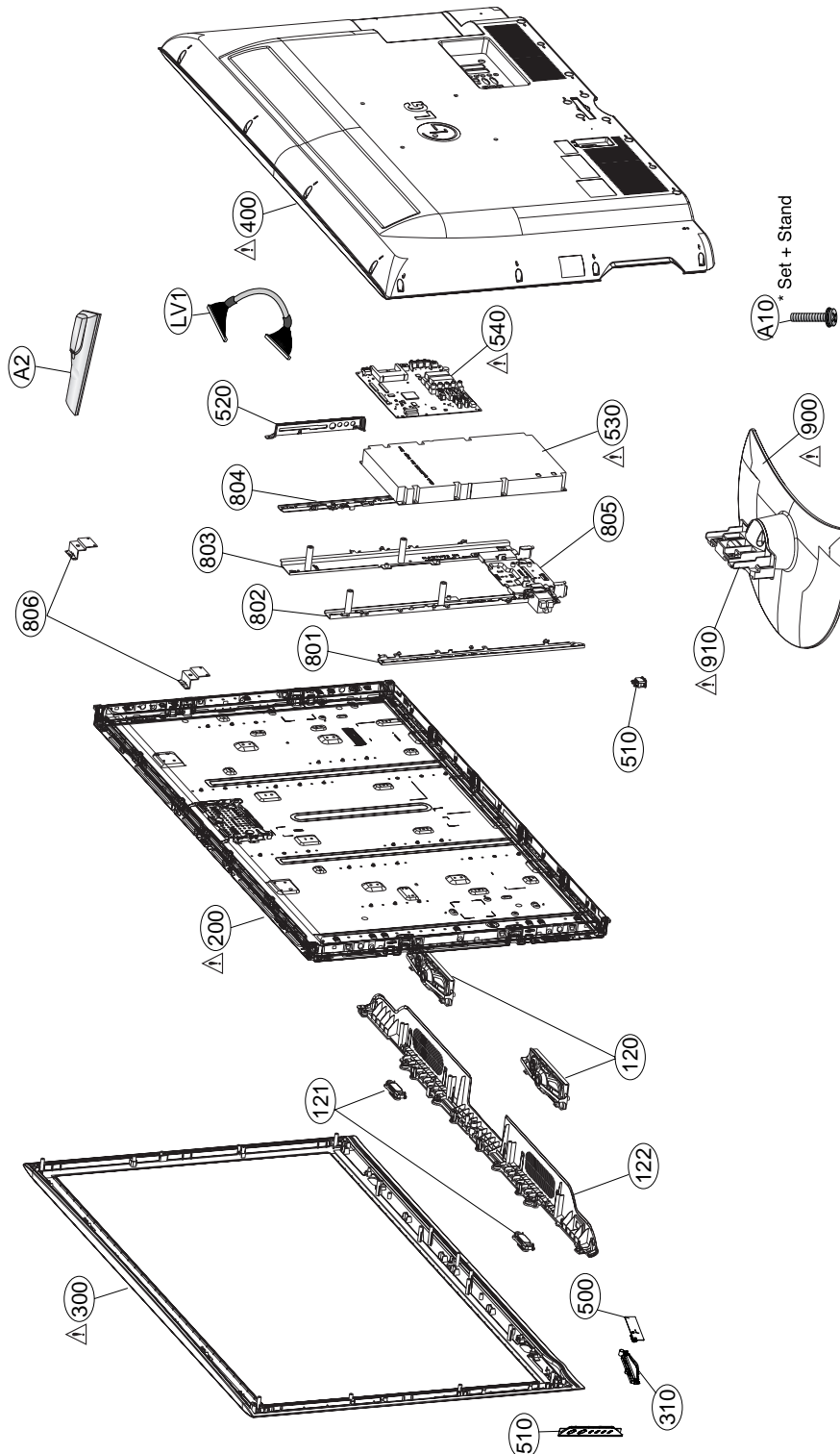
EXPLODED VIEW

IMPORTANT SAFETY NOTICE

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

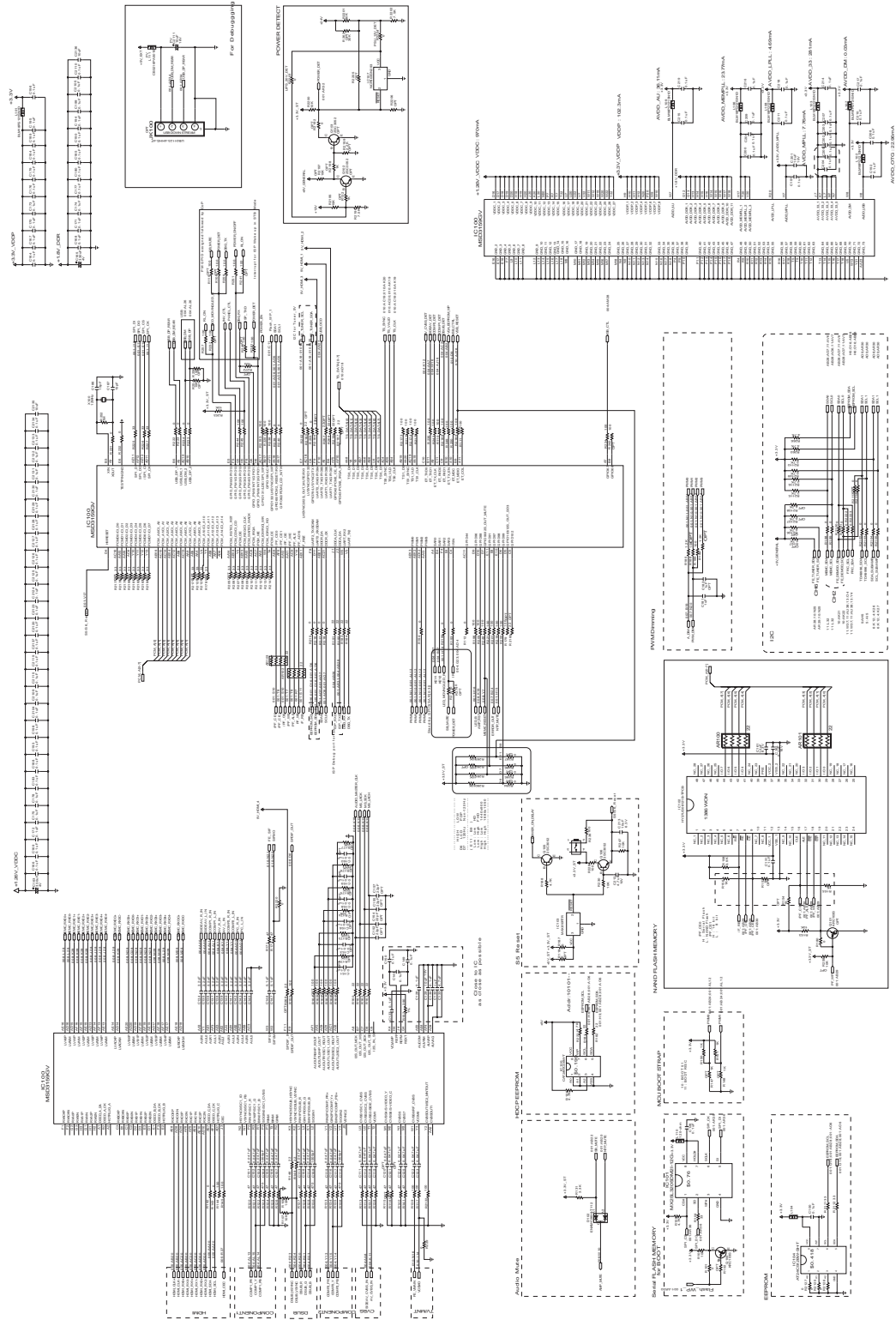
It is essential that these special safety parts should be replaced with the same components as recommended in this manual to prevent X-RADIATION, Shock, Fire, or other Hazards.

Do not modify the original design without permission of manufacturer.



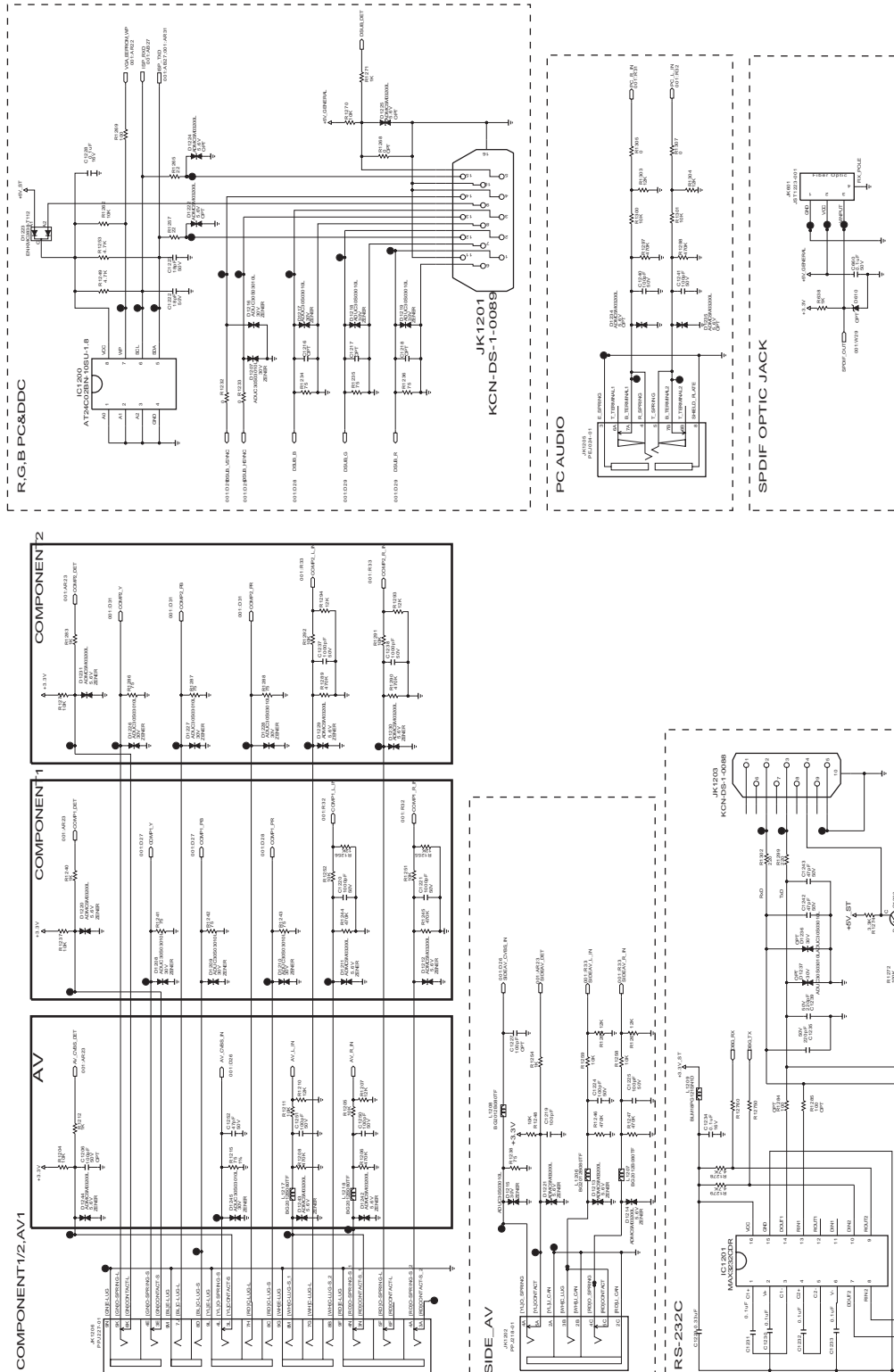
SCHEMATIC DIAGRAM

MAIN IC



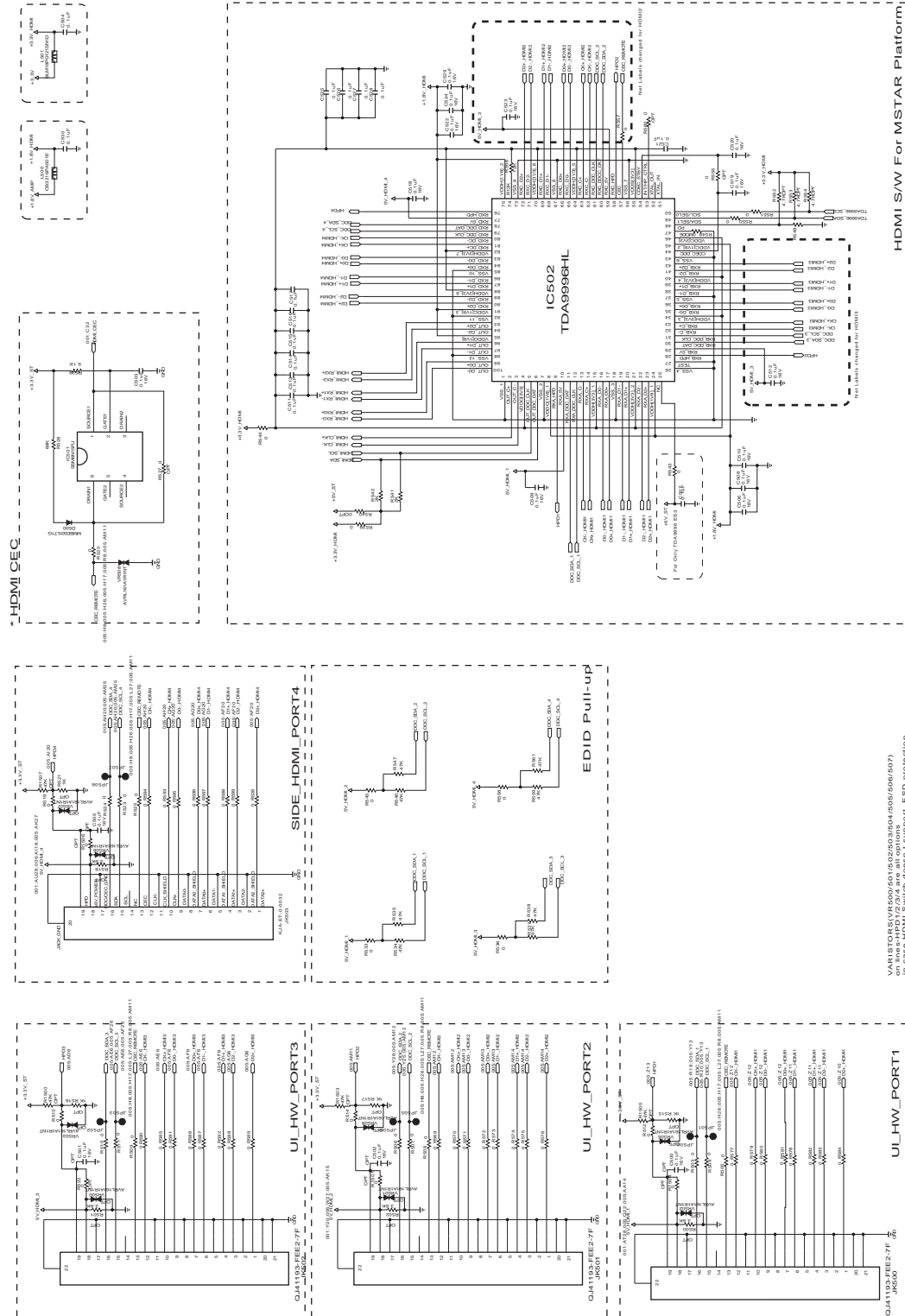
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IN / OUT



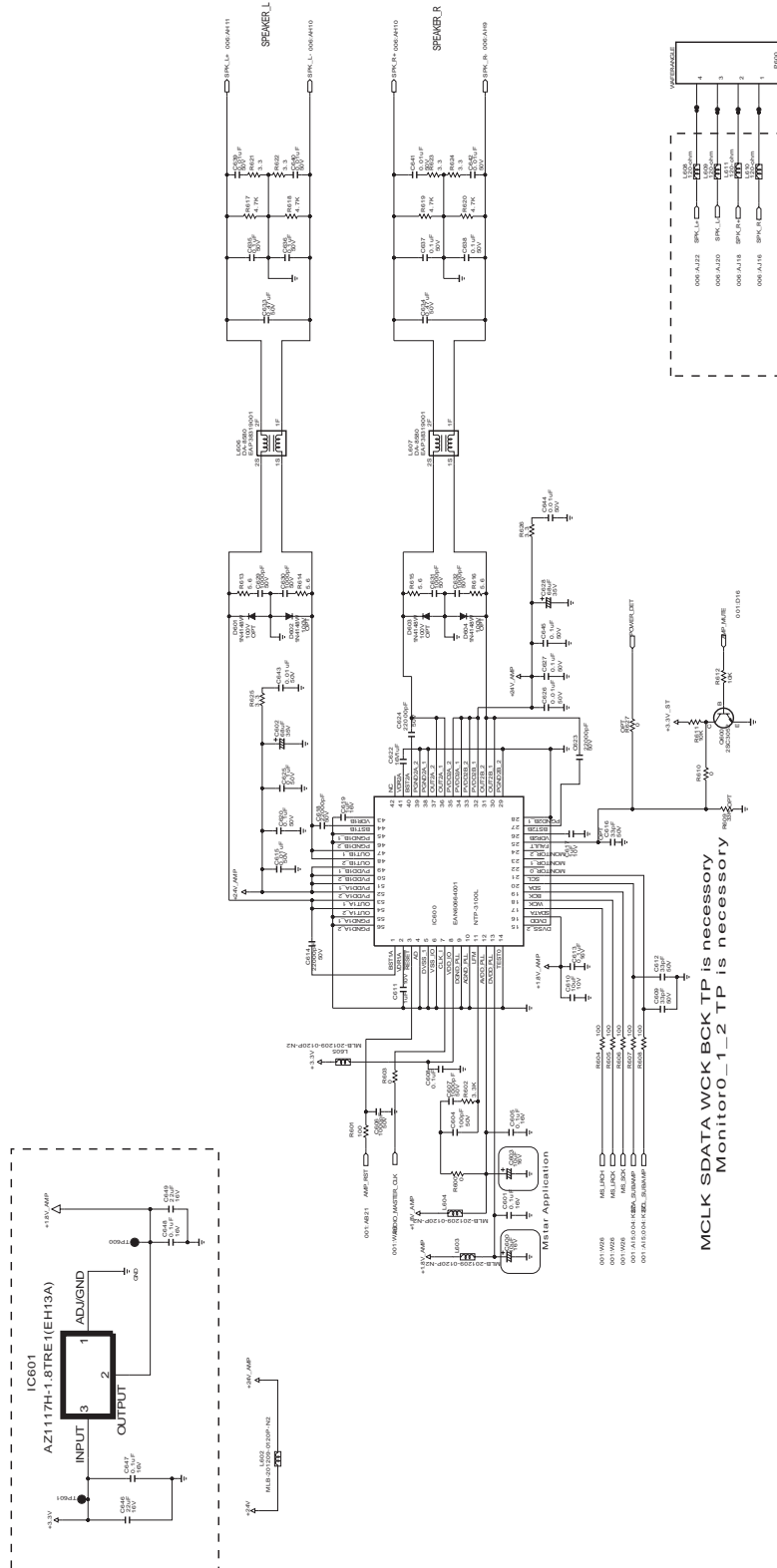
THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILM AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURER SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ZAS SYMBOL MARK OF THE SCHEMATIC.

HDMI



VARISTORS VR500/501/502/503/504/505/506/507 on lines-HDMI1/2/3/4 are all optional in case HDMI switch doesn't support ESD protection

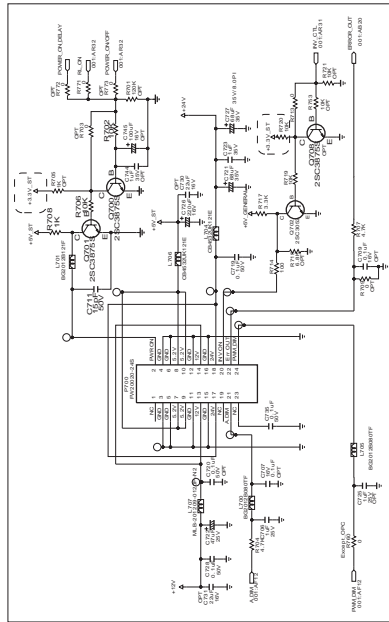
THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FIRE AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING IT IS ESSENTIAL THAT ONLY MANUFACTURER SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.



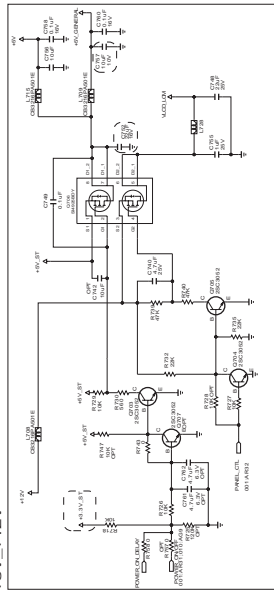
THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FILRE AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.

POWER

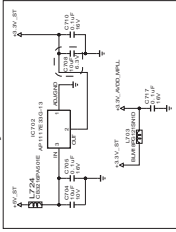
FROM LIPS & POWER B/D



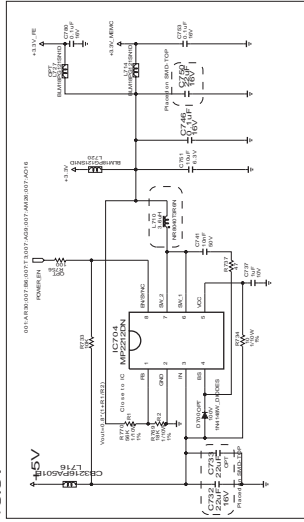
+5V_+12V



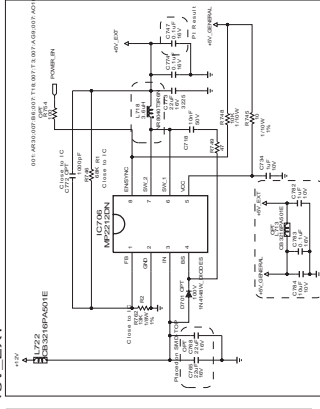
Stand-by +3.3V



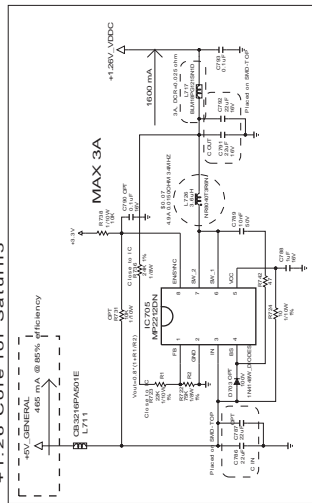
+3.3V



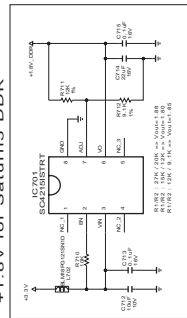
+5V_EXT



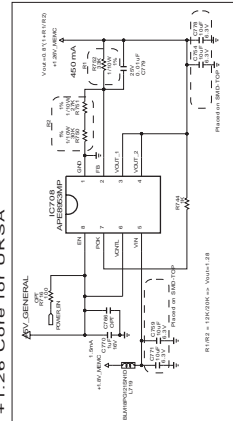
+1.26 Core for Saturn5



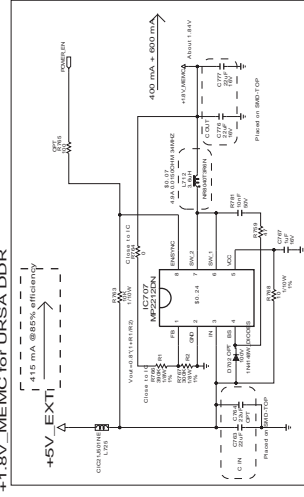
+1.8V for Saturn5 DDR



+1.26 Core for URSA

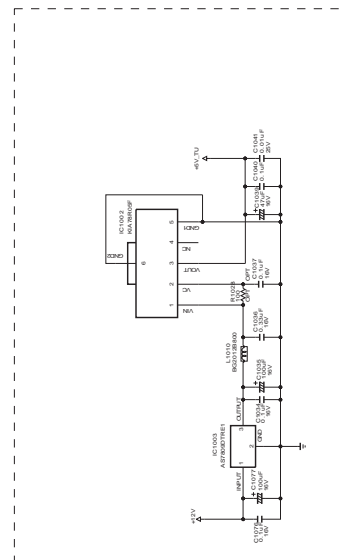
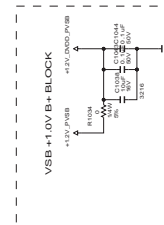
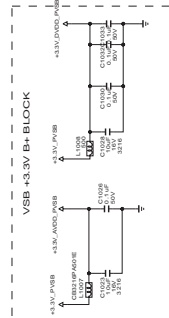
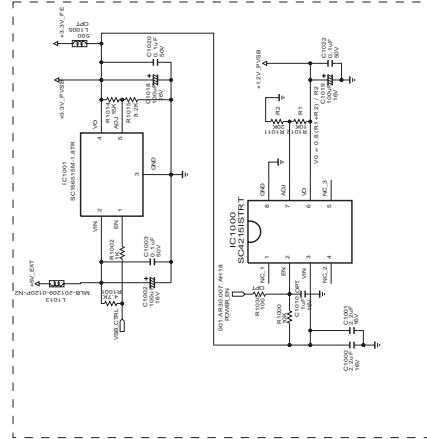
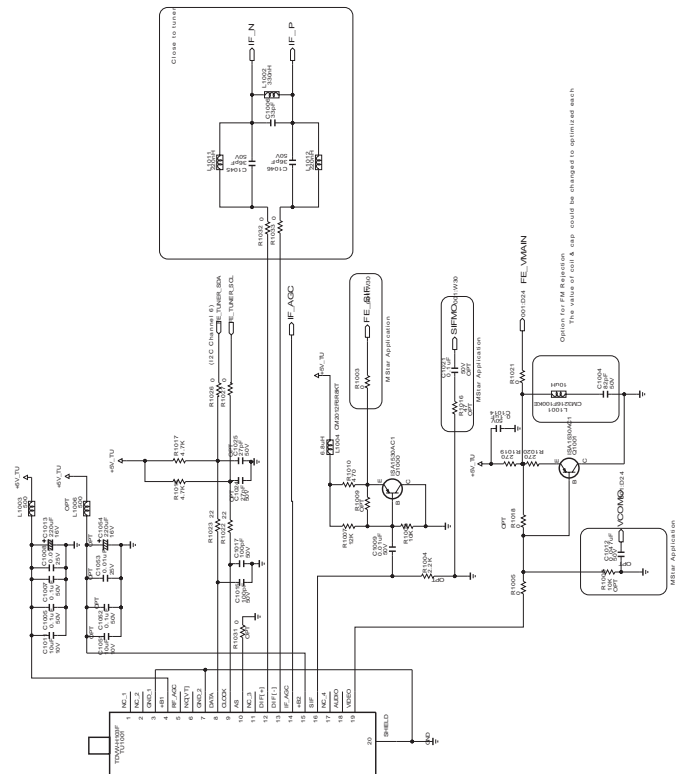


+1.8V_MEMC for URSA DDR



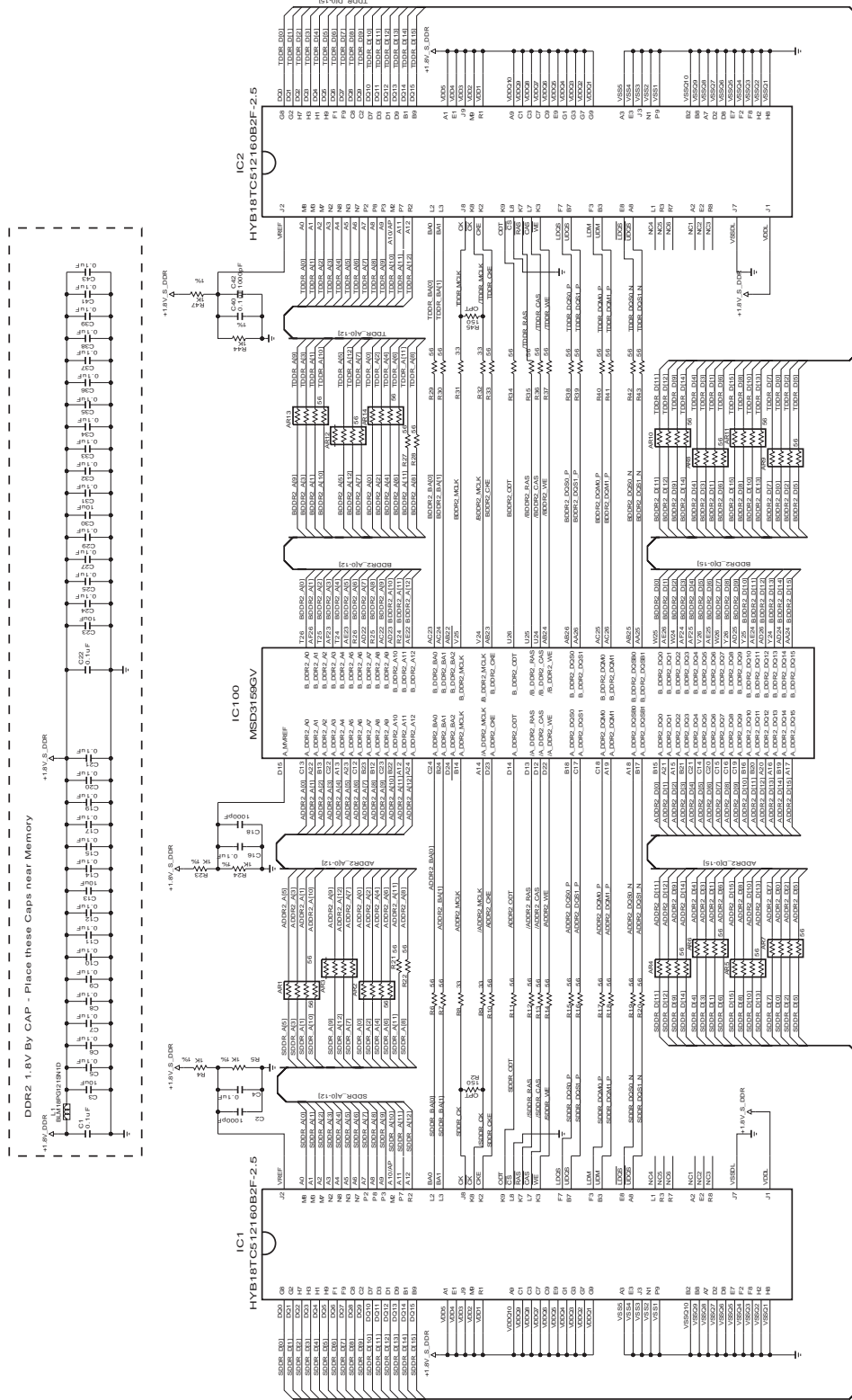
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TUNER



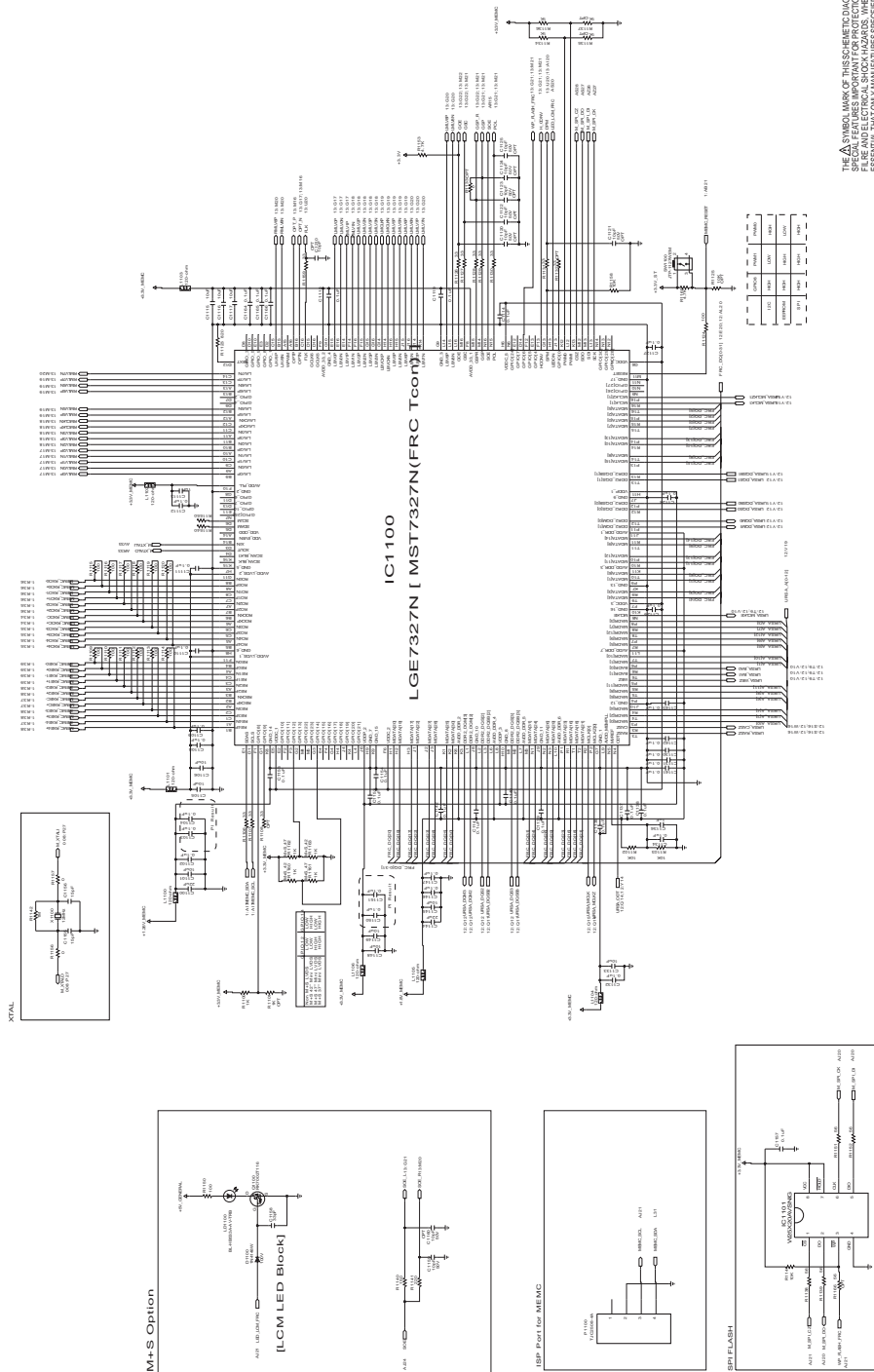
THE Δ SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FILRE AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURED SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE Δ SYMBOL MARK OF THE SCHEMATIC.

DDR2

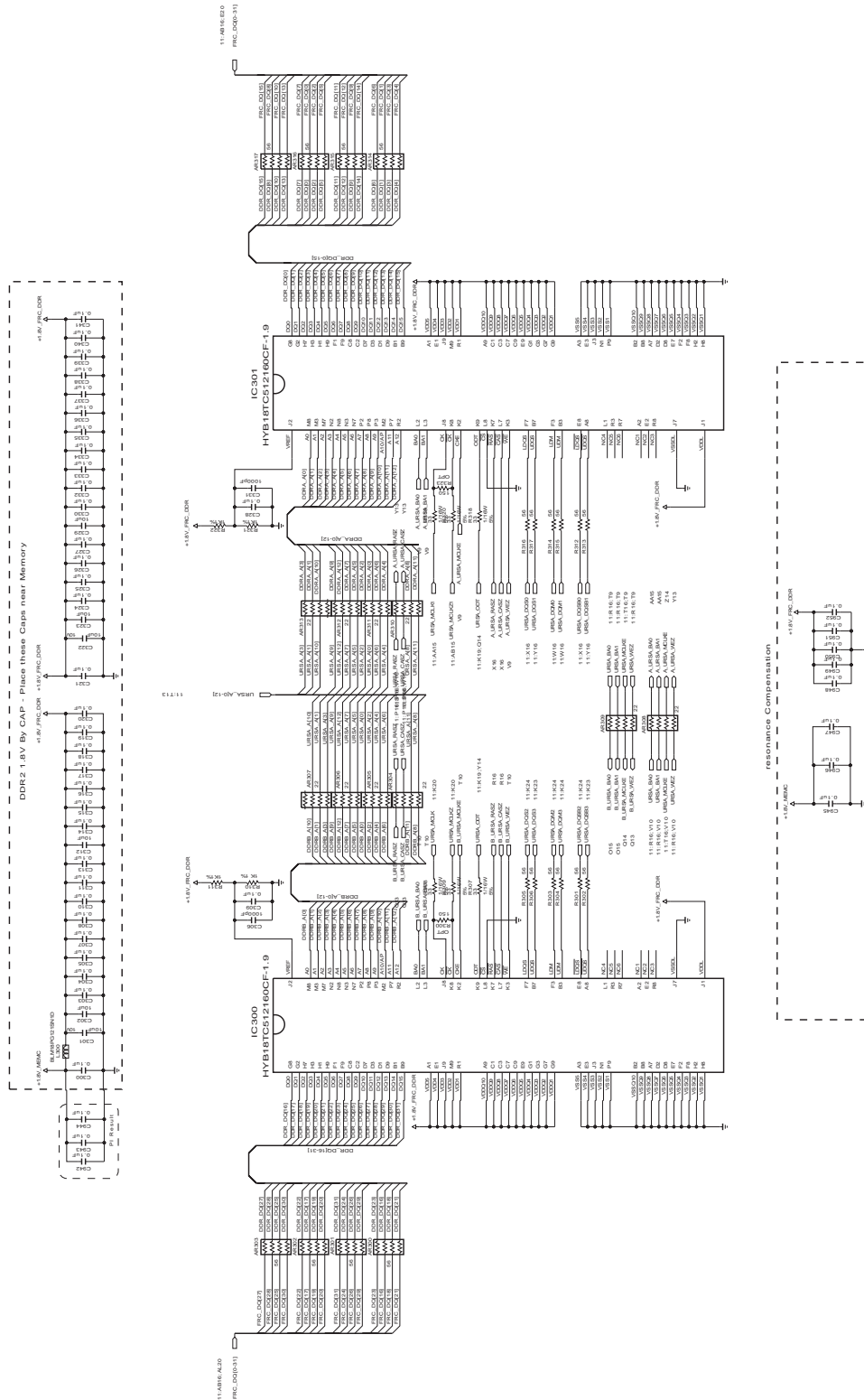


THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FIRE AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING IT IS ESSENTIAL THAT THE PARTS AND MATERIALS SPECIFIED ARE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.

URSA2/FRC IC

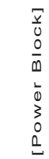


URSA2 DDR2 IC



THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FLUKE AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING IF IS IMPORTANT TO AVOID THE USE OF A SCREWDRIVER OR OTHER METALLIC OBJECTS TO OPEN THE SCHEMATIC MARK OF THE SCHEMATIC.

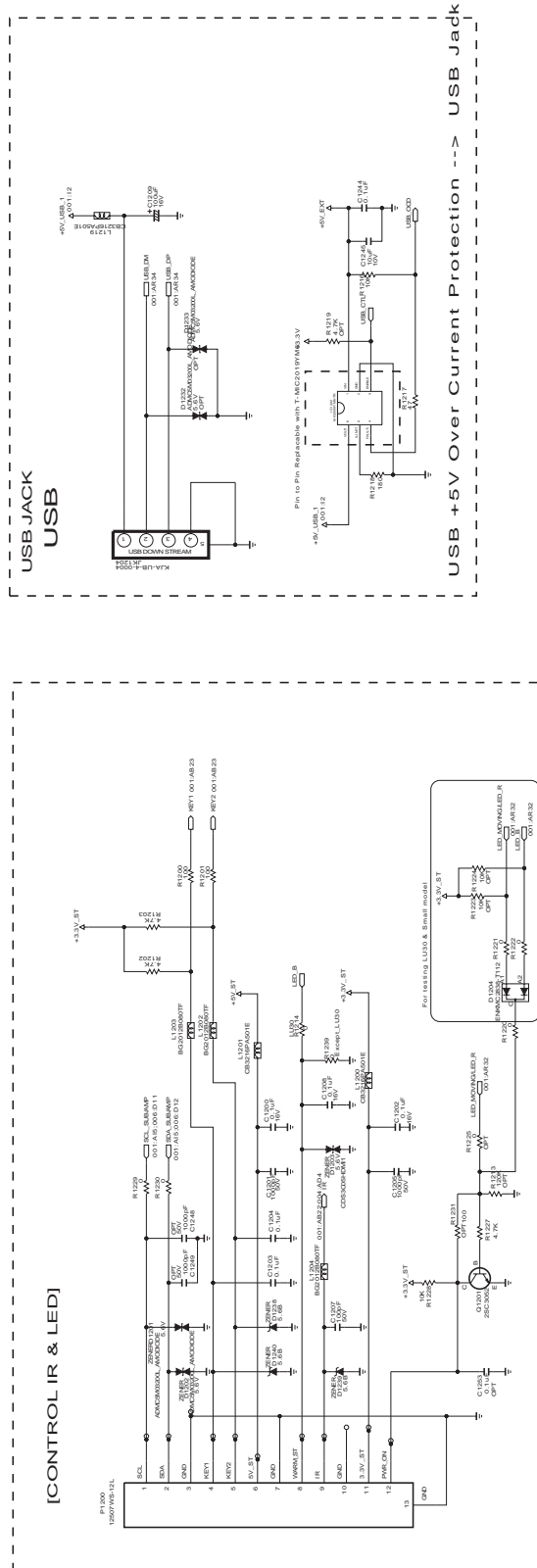
P-GAMMA/ MINI LVDS DC-DC CONVERTER



[P-GAMMA BLOCK]
I2C Slave Address : 0x74

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

ETC SUB BOARD I/F



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



P/NO : MFL58436004

Jan., 2009
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