



North/Latin America
Europe/Africa
Asia/Oceania

Internal Use Only

<http://aic.lgservice.com>
<http://eic.lgservice.com>
<http://biz.lgservice.com>

LCD TV

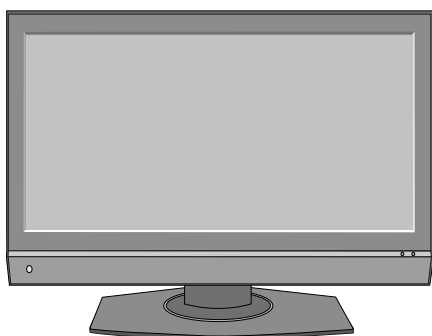
SERVICE MANUAL

CHASSIS : LA64A

MODEL : 37LC50CB 37LC50CB-UA

CAUTION

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



CONTENTS

CONTENTS	2
PRODUCT SAFETY	3
SPECIFICATION	6
ADJUSTMENT INSTRUCTION	12
TROUBLE SHOOTING	18
BLOCK DIAGRAM.....	24
EXPLODED VIEW	25
REPLACEMENT PARTS LIST	27
SVC. SHEET	

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.

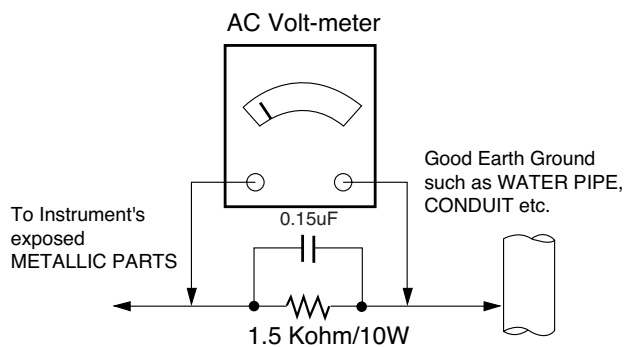
Connect 1.5K/10watt resistor in parallel with a 0.15uF capacitor between a known good earth ground (Water Pipe, Conduit, etc.) and the exposed metallic parts.

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



SERVICING PRECAUTIONS

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

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

General Servicing Precautions

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

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

Electrostatically Sensitive (ES) Devices

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

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed to prevent potential shock reasons prior to applying power to the

unit under test.

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

General Soldering Guidelines

1. Use a grounded-tip, low-wattage soldering iron and appropriate tip size and shape that will maintain tip temperature within the range or 500°F to 600°F.
2. Use an appropriate gauge of RMA resin-core solder composed of 60 parts tin/40 parts lead.
3. Keep the soldering iron tip clean and well tinned.
4. Thoroughly clean the surfaces to be soldered. Use a mall wire-bristle (0.5 inch, or 1.25cm) 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 circuitboard 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 LA64A chassis.

2. Requirement for Test

Testing for standard of each part must be followed in below condition.

(1) Temperature : $20 \pm 5^{\circ}\text{C}$

(2) Humidity : $65\% \pm 10\%$

(3) Power : Standard input voltage (100-240V~, 50/60Hz)

*Standard Voltage of each products is marked by models
(4) Specification and performance of each parts are followed each drawing and specification by part number in accordance with BOM.

(5) The receiver must be operated for about 20 minutes prior to the adjustment.

3. Test method

3.1 Performance : LGE TV test method followed

3.2 Demanded other specification

Safety : UL, CSA, IEC Specification

EMC : FCC, ICES, IEC

4. General Specification(TV)

No	Item	Specification	Remark
1	Receiving System	VSB/64 & 256 QAM/ NTSC-M	
2	Available Channel	1) VHF : 02~13 2) UHF : 14~69 3) DTV : 02-69 4) CATV : 01~135 5) CADTV : 01~135	
3	Input Voltage	1) AC 100 ~ 240V 50/60Hz	
4	Market	NORTH AMERICA	
5	Screen Size	37, 42 inch Wide	
6	Aspect Ratio	16:9	
7	Tuning System	FS	
8	LCD Module	LC370WX3-SLD1 LC420WX6-SLD1	LG Philips LCD
9	Operating Environment	1) Temp : 0 ~ 40 deg 2) Humidity : ~ 80 %	
10	Storage Environment	1) Temp. : -20 ~ 50 deg 2) Humidity : 10 ~ 90 %	

5. Chroma & Brightness

No	Item			Min	Typ	Max	Unit	Remark
1	White brightness			400	500		cd/m²	EZ Picture: Daylight, Color Temperature: Medium
2	Color coordinate (Default)	RED	X	0.602	0.632	0.662		Full Signal Swing ± 0.025
			Y	0.312	0.342	0.372		
		GREEN	X	0.258	0.288	0.318		
			Y	0.580	0.610	0.640		
		BLUE	X	0.117	0.147	0.177		
			Y	0.035	0.065	0.095		
		WHITE	X	0.246	0.287	0.296		
			Y	0.254	0.289	0.304		
3	Brightness uniformity			80			%	Full white
4	Contrast ratio			600:1	800:1			EZ Picture: Daylight, Color Temperature: Medium
5	Color Temperature	Standard		8,300	9,300	10,300	oK	
		Cool		10,000	11,000	12,000	oK	
		Warm		5,500	6,500	7,500	oK	

6. Component Video Input (Y, CB/PB, CR/PR)

No	Resolution	H-freq(kHz)	V-freq.(kHz)	Proposed
1	720*480	15.73	59.94	SDTV ,DVD 480I
2	720*480	15.73	60.00	SDTV ,DVD 480I
3	720*480	31.47	59.94	SDTV 480P
4	720*480	31.50	60.00	SDTV 480P
5	1280*720	44.96	59.94	HDTV 720P
6	1280*720	45.00	60.00	HDTV 720P
7	1920*1080	33.72	59.94	HDTV 1080I
8	1920*1080	33.75	60.00	HDTV 1080I

7. RGB Input (PC/DTV)

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	
	PC					DDC
1	640*350	31.469	70.08	25.17	DOS	X
2	640*480	31.469	59.94	25.17	VESA(VGA)	O
3	640*480	37.861	72.80	31.50	VESA(VGA)	O
4	640*480	37.500	75.00	31.50	VESA(VGA)	O
5	800*600	35.156	56.25	36.00	VESA(SVGA)	O
6	800*600	37.879	60.31	40.00	VESA(SVGA)	O
7	800*600	48.077	72.18	50.00	VESA(SVGA)	O
8	800*600	46.875	75.00	49.50	VESA(SVGA)	O
9	1024*768	48.363	60.00	65.00	VESA(XGA)	O
10	1024*768	56.476	70.06	75.00	VESA(XGA)	O
11	1024*768	60.023	75.02	78.75	VESA(XGA)	O
12	1280*768	47.700	60.000	80.140	VESA(WXGA)	
	1360*768	47.720	59.799	84.750	VESA(WXGA)	
	1366*768	47.130	59.658	72.000	VESA(WXGA)	
	DTV					
1	720*480	31.50	59.94		SDTV 480P	
2	720*480	31.47	60.00		SDTV 480P	
3	1280*720	44.96	59.94		HDTV 720P	
4	1280*720	45.00	60.00		HDTV 720P	
5	1920*1080	33.72	59.94		HDTV 1080I	
6	1920*1080	33.75	60.00		HDTV 1080I	

8. HDMI1 Input (PC/DTV)

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	
	PC					DDC
1	640*480	31.469	59.94	25.17	VESA(VGA)	O
2	640*480	37.861	72.80	31.50	VESA(VGA)	O
3	640*480	37.500	75.00	31.50	VESA(VGA)	O
4	800*600	35.156	56.25	36.00	VESA(SVGA)	O
5	800*600	37.879	60.31	40.00	VESA(SVGA)	O
6	800*600	48.077	72.18	50.00	VESA(SVGA)	O
7	800*600	46.875	75.00	49.50	VESA(SVGA)	O
8	1024*768	48.363	60.00	65.00	VESA(XGA)	O
9	1024*768	56.476	70.06	75.00	VESA(XGA)	O
10	1024*768	60.023	75.02	78.75	VESA(XGA)	O
11	1280*768	47.700	60.00	80.140	VESA(WXGA)	O
12	1360*768	47.720	59.799	84.750	VESA(WXGA)	O
13	1366*768	47.130	59.658	72.000	VESA(WXGA)	O
	DTV					
1	720*480	31.500	59.94	27.00	SDTV 480P	
2	720*480	31.469	60.00	27.03	SDTV 480P	
3	1280*720	44.96	59.94		HDTV 720P	
4	1280*720	45.00	60.00		HDTV 720P	
5	1920*1080	33.72	59.94		HDTV 1080I	
6	1920*1080	33.75	60.00		HDTV 1080I	

9. HDMI2 Input (DTV)

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	
1	720*480	31.500	59.94	27.00	SDTV 480P	
2	720*480	31.469	60.00	27.03	SDTV 480P	
3	1280*720	44.96	59.94		HDTV 720P	
4	1280*720	45.00	60.00		HDTV 720P	
5	1920*1080	33.72	59.94		HDTV 1080I	
6	1920*1080	33.75	60.00		HDTV 1080I	

10. General specifications (module)

10-1. 37LC5DC

No	Item	Value	Unit	Remark
1	Active Screen Size	940.3(diagonal)	mm	37.02 inches
2	Outline Dimension	877.0(H)x516.8(V)x46.9(D)	mm	
3	Pixel Pitch	200 x 600 x RGB	um	
4	Pixel Format	1366(H)x768(V) stripe arrangement		
5	Color Depth	8bit 16.7	Mbit	
6	Luminance ,White	500 (center 1 point typ)	cd/m2	
7	Viewing Angle (CR>10)	R/L 178(Typ),U/D 178(Typ)	degree	
8	Power Consumption	126	Watt	
9	Weight	9	kg	
10	Display Operating Mode	Transmissive mode, normally black		
11	Surface Treatment	Hard coating (3H)		

10-2. 42LC5DC

No	Item	Value	Unit	Remark
1	Active Screen Size	1067.308 (diagonal)	mm	42.02 inches
2	Outline Dimension	983(H)x576(V)x47.3(D)	mm	
3	Pixel Pitch	227 x 681 x RGB	um	
4	Pixel Format	1366(H)x768(V) stripe arrangement		
5	Color Depth	8bit 16.7	Mbit	
6	Luminance ,White	450 (center 1 point typ)	cd/m2	
7	Viewing Angle (CR>10)	R/L 178(Typ),U/D 178(Typ)	degree	
8	Power Consumption	168.36	Watt	
9	Weight	110(Typ), 12(Max)	kg	
10	Display Operating Mode	Transmissive mode ,normally black		
11	Surface Treatment	Hard coating (3H)		

11. Electro Optical Characteristic Specifications (module standard)

11-1. 37LC5DC

No	Item			Min	Typ	Max	Unit	Remark
1	Contrast Ratio(CR)			700	900			
2	Surface Luminance, White			400	500		Cd/m ²	Full white
3	Luminance Variation					1.3		(δwhite/5P)
4	Response Time	Gray to Gray			6	10	msec	
5	Color coordinate	RED	X	Typ -0.03	0.636	Typ +0.03		Full Pattern
			Y		0.343			
		GREEN	X		0.284			
			Y		0.615			
		BLUE	X		0.144			
			Y		0.063			
		WHITE	X		0.279			
			Y		0.292			
6	Viewing Angle (CR>10)	X axis right(ø=0)		85	89		degree	
		X axis left(ø=180)		85	89			
		Yaxis up (ø=90)		85	89			
		Z axis down(ø=270)		85	89			

11-2. 42LC5DC

No	Item		Min	Typ	Max	Unit	Remark
1	Contrast Ratio	CR	800	1000			
		CR with DCR	TBD	TBD			
2	Surface Luminance, White		400	450		Cd/m ²	Full white
3	Luminance Variation				1.3		(δwhite/5P)
4	Response Time	Gray to Gray		5	18	msec	
		Rise+decay		10	14		
5	Color coordinate	RED	Typ -0.03	0.635	Typ +0.03		Full Pattern
		X		0.344			
		Y					
	GREEN	X		0.286			
		Y		0.614			
	BLUE	X		0.146			
		Y		0.061			
	WHITE	X		0.279			
		Y	0.292				
6	Viewing Angle (CR>10)	X axis right(ø=0)		85	89	degree	
		X axis left(ø=180)		85	89		
		Yaxis up (ø=90)		85	89		
		Z axis down(ø=270)		85	89		
7	Gray Scale	Without DCR			2.2		
		With DCR					

12. Customer Menu Setup (Shipment Condition)

No	Item		Condition	Remark
1	Input Mode		TV02CH	
2	Volume Level		20	
3	Mute		Off	
4	Aspect Ratio		16:9	
5	Video	EZ Picture	Daylight	
		Color temperature	(Disable)	Can be access only EZ picture is setting user mode
		XD	Auto	
		Advanced	Cinema: Off	
		Reset		
6	Audio	Audio Language	Off	
		EZ SoundRite	Off	
		EZ Sound	Normal	
		Balance	0	
		Treble	50	
		Bass	50	
		Front Surround	Off	
		TV Speaker	On	
7	Timer	Auto clock	Off	
		Manual Clock	Off	
		Off Timer	Off	
		On Timer	Off	
		Auto Off	Off	
8	Option	Aspect Ratio	16:9	
		Caption/Text	Off	
		Caption Option	Off	
		Language	English	
		ISM Method	Normal	
		SET ID	1	
9	Lock	Lock System	Off	
		Set password	On	(Default : 0000)
		Block channel	None	
		Movie Rating	Off	
		TV Rating-Children	Off	
		TV Rating-General	Off	
		Audio Block	Off	
10	Channel Memory		none	

ADJUSTMENT INSTRUCTION

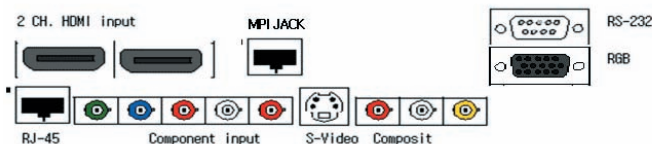
1. Application Range

This spec sheet is applied all of the 'LA64A' Chassis.

2. Specification

- 2.1 Because this is not a hot chassis, it is not necessary to use an isolation transformer. However, the use of isolation transformer will help protect test instrument.
- 2.2 Adjustment must be done in the correct order.
- 2.3 The adjustment must be performed in the circumstance of $25\pm 5^{\circ}\text{C}$ of temperature and $65\pm 10\%$ of relative humidity if there is no specific designation.
- 2.4 The input voltage of the receiver must keep 100~240V, 60Hz.
- 2.5 The receiver must be operated for about 15 minutes prior to the adjustment.
 - After RGB Full White in HEAT-RUN Mode, the receiver must be operated prior to the adjustment.
 - Enter into HEAT-RUN MODE
 - (1) Press the POWER ON KEY on R/C for adjustment.
 - (2) OSD display and screen display 100% full WHITE PATTERN.
 - Set is activated HEAT run without signal generator in this mode.
 - Single color pattern (RED / BLUE / GREEN) of HEAT RUN MODE uses to check panel.
 - Caution: If you turn on a still screen more than 20 minutes (Especially digital pattern, cross hatch pattern), an after image may be occur in the black level part of the screen.

3. Adjustment items

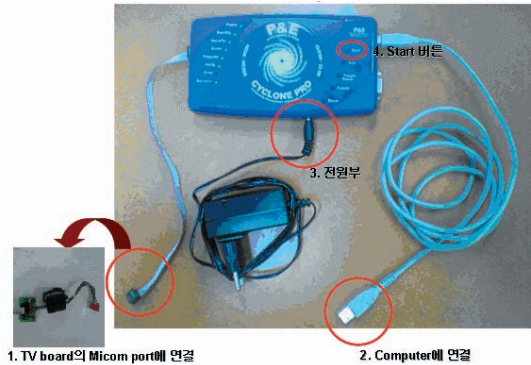


=> Use cross connected RS-232C Cable. Don't use straightly connected RS-232C Cable.
(Pin Connection: 1-1, 2-3, 3-2, 4-4, 5-5, 6-6, 7-7, 8-8, 9-9)

- Method of PTC MICOM Download
- Select method of Module type
- Auto AV (CVBS) Color Balance adjustment.
 - Standard equipment: 802F Pattern Generator. Master Pattern Generator (MSPG-925, etc) or same product
- Auto Component Color Balance adjustment.
 - standard equipment: 802F Pattern Generator. Master Pattern Generator (MSPG-925, etc) or same product
- Auto RGB Color Balance adjustment.
 - Standard equipment: PC Pattern Generator(VG828, VG854, 801GF, MSP3240A, MSPG-925, etc) or same product
- Auto RF Color Balance adjustment.
 - RF 2CH
- EDID/DDC Data input.
- Adjustment of White Balance.
- Factoring Option Data input.

4. Method of PTC MICOM Download

4.1 Connection of MICOM JIG

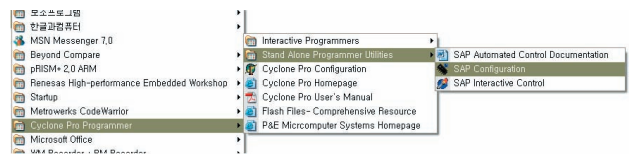


- 1) Connect port(3) with Power Code
- 2) Connect jack(1) with PTC Microm.
- 3) Connect USB Cable to the computer
- 4) Download Program execution (SAP Configuration)

* Notice!

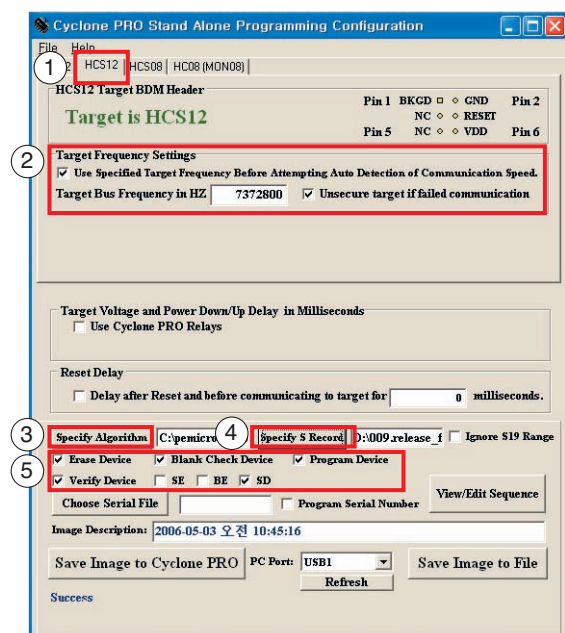
Because PTC Download JIG has internal memory, it can save download files using download program (SAP Configuration). Push the START button (4) after file saving, then it execute download.

4.2 Execution of download program (SAP Configuration)



<SAP Configuration>

4.2.1 Execution of SAP Configuration



- 1) Select HCS12
- 2) Target Frequency Settings :
 - A. Checking the factor -> Use Specified Target Frequency
..., Unsecure target....
 - B. Insert Target Bus Frequency -> 7372800
- 3) Specify Algorithm: 9S12dt128_128k .12P
- 4) Specify S Record: select download file.
- 5) Checking factor: Erase Device, Blank Check Device,
Program Device, Verify Device
- * Notice!
Don't check other checking boxes. You must follow fig.
- 6) Push the 'Save Image to Cyclone PRO' button, files
transfer from PC to the Download JIG.



PC -> Download Jig

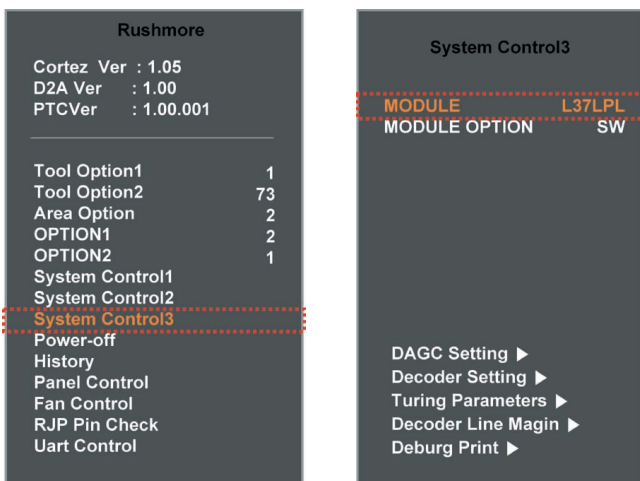
5. Select method of Module type

5.1 Setting up like figure

(Setting: Press ADJ Key in the Adjust remocon.

Select "System Control 3" by using ▲/▼ (CH+/-) key, and press ■(ENTER)

Using Adjust remocon, select module)



Before ADC Calibration, should be executed the "Module type selection".

6. Color Balance adjustment.

6.1 Auto AV (CVBS) Color Balance

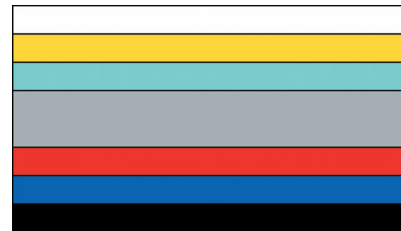
6.1.1 Required Equipment

- Remote controller for adjustment
- AV Pattern Generator: 802F Pattern Generator, Master (MSPG-925FS), etc
(Which has NTSC-J Composite Video format output with standard (1.0 Vpp) See Fig. 1)
- It is very import to use correct adjustment pattern like Fig.1.

6.1.2 Method of Auto AV (CVBS) Color Balance

- 1) Input the NTSC-J Composite Video (Fig.1.) into video input.
=> MSPG-925FS Model No: 207 / Pattern No: 65 / NTSC-J
- 2) Set the EZ Picture to Daylight mode in Video menu.
- 3) Press INSTART key on R/C for adjustment.
- 4) Press the ►(Vol. +) key operate to set, then it becomes automatically.
- 5) Auto-RGB OK means completed adjustment.

* When adjust main picture, sub picture is included.



<Fig.1> Auto AV (CVBS) Color Balance Test Pattern

Auto Color Balance (Hex)		
Auto-RGB	►	To Set
Source		Main
Red Offset1		102
Green Offset1		0C6
Blue Offset1		0DA
Red Offset2		3F
Green Offset2		3F
Blue Offset2		3F
Red Gain		072
Green Gain		070
Blue Gain		07B
Reset	►	To Set

Default Value on OSD

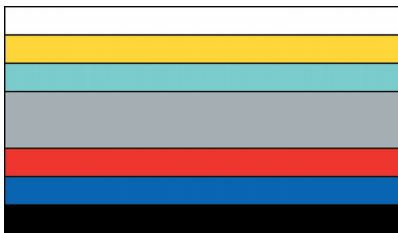
6.2 Auto Component Color Balance

6.2.1 Required Test Equipment

- Remote controller for adjustment
- 802F Pattern Generator Which has 720p YPbPr output with Standard (0.7Vpp) See Fig. 2
- It is very important to use correct adjustment pattern like Fig. 2.

6.2.2 Method of Auto Component Color Balance

- 1) Input the Component 1280*720p 60Hz signal into Component.
=> MSPG-925FS Model No: 217 / Pattern No: 65
- 2) Set the EZ Pictures to Daylight mode in Video menu.
- 3) Press INSTANT key on R/C for adjustment.
- 4) Press the ►(Vol. +) key operate To set, then it becomes automatically.
- 5) Auto-RGB OK means completed adjustment



<Fig.2> Auto Component Color Balance Test Pattern

Auto Color Balance (Hex)		
Auto-RGB	►	To Set
Source		Main
Red Offset1		0F8
Green Offset1		0DA
Blue Offset1		0BC
Red Offset2		01
Green Offset2		01
Blue Offset2		01
Red Gain		1FE
Green Gain		1FE
Blue Gain		1FE
Reset	►	To Set

Default Value on OSD

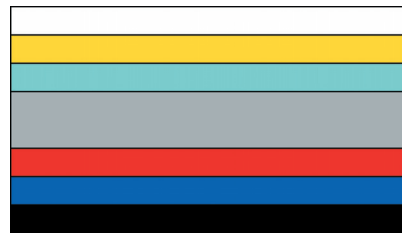
6.3 Auto RGB Color Balance

6.3.1 Required Test Equipment

- Remote controller for adjustment
- 802F Pattern Generator, Master (MSPG-925FS), etc.
(Which has XGA 60Hz PC Format output with standard (0.7Vpp) See Fig. 3)
- It is very import to use correct adjustment pattern like Fig. 3.

6.3.2 Method of Auto RGB Color Balance

- 1) Input the PC 1024x768 @ 60Hz into RGB.
=> MSPG-925FS Model No: 60 / Pattern No: 65
- 2) Set the EZ Pictures to Daylight mode in Video menu.
- 3) Press INSTANT key on R/C for adjustment.
- 4) Press the ►(Vol. +) key operate To set, then it becomes automatically.
- 5) Auto-RGB OK means completed adjustment.



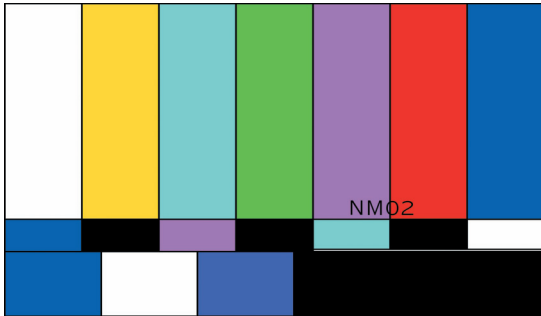
<Fig.3> Auto RGB Color Balance Test Pattern

Auto Color Balance (Hex)		
Auto-RGB	►	To Set
Source		Main
Red Offset1		069
Green Offset1		0DA
Blue Offset1		0D0
Red Offset2		37
Green Offset2		39
Blue Offset2		3F
Red Gain		19F
Green Gain		183
Blue Gain		195
Reset	►	To Set

Default Value on OSD

6.4 RF Color Balance

- 1) Input the RF cable(2 ch)
- 2) Set the EZ Pictures to Daylight mode in Video menu.
- 3) Press INSTART key on R/C for adjustment.
- 4) Press the ►(Vol. +) key operate To set, then it becomes automatically.
- 5) Auto-RGB OK means completed adjustment



Auto Color Balance (Hex)	
Auto-RGB	► To Set
Source	Main
Red Offset1	032
Green Offset1	030
Blue Offset1	033
Red Offset2	40
Green Offset2	40
Blue Offset2	40
Red Gain	03C
Green Gain	03C
Blue Gain	01F
Reset	► To Set

Default Value on OSD

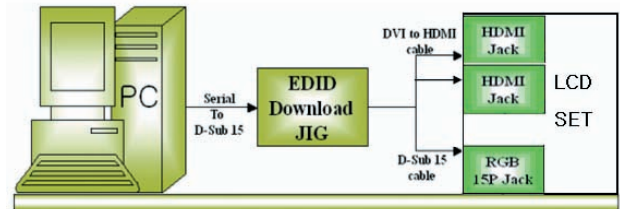
7. EDID / DDC INPUT

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

7.1.1 Required Test Equipment

- 1) Adjusting PC with S/W for writing EDID Data.
- 2) A Jig for EDID Download
- 3) Cable: Serial (9Pin or USB) to D-sub 15Pin cable, D-sub 15Pin cable, DVI to HDMI cable.

7.1.2 Setting of device



<Fig.4> Connection Diagram of DDC download

- When input HDMI EDID data through RGB or HDMI jack, writing 8bits of the data at every turn with 'DDC2B' protocol.

7.1.3 Data of EDID for 32/37/42LC5DC-UA,32LX5DC-UA

7.1.3.1 DDC data of Analog-RGB

Addr	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
0000	00	FF	FF	FF	FF	FF	FF	00	1E	6D	01	00	01	01	01	01
0010	00	11	01	03	19	73	41	96	0A	CF	74	A3	57	4C	E0	23
0020	09	48	4C	AF	CE	00	31	40	45	40	61	40	81	80	A9	40
0030	01	01	01	01	01	01	66	21	50	B0	51	00	1B	30	40	70
0040	36	00	C4	8E	21	00	00	1A	02	3A	80	18	71	38	2D	40
0050	58	2C	45	00	C4	8E	21	00	00	1E	00	00	00	FD	00	30
0060	58	1E	64	11	00	0A	20	20	20	20	20	20	00	00	00	FC
0070	00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	01	F6
0080	02	03	04	00	0E	1F	00	80	51	00	1E	30	40	80	37	00
0090	C4	8E	21	00	00	1C	F1	27	00	A0	51	00	25	30	50	80
00A0	37	00	C4	8E	21	00	00	1C	00	00	00	00	00	00	00	00
00B0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
00C0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
00D0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
00E0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
00F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	31

7.1.3.2 DDC data of Digital-HDMI1

Addr	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
0000	00	FF	FF	FF	FF	FF	FF	00	1E	6D	01	00	01	01	01	01
0010	0B	11	01	03	80	73	41	96	0A	CF	74	A3	57	4C	E0	23
0020	09	48	4C	2F	CE	00	31	40	45	40	61	40	01	01	01	01
0030	01	01	01	01	01	01	64	19	00	40	41	00	26	30	18	88
0040	36	00	00	D0	52	00	00	18	00	00	FC	00	4C	47	20	
0050	54	56	0A	20	20	20	20	20	20	20	00	00	00	FD	00	33
0060	37	4C	43	35	44	43	2D	55	41	0A	20	20	00	00	00	00
0070	00	00	00	00	00	00	00	00	00	00	00	00	00	00	01	84
0080	02	03	13	F1	44	84	05	03	02	23	15	07	50	65	03	0C
0090	00	10	00	01	1D	00	72	51	D0	1E	20	6E	28	55	00	C4
00A0	8E	21	00	00	1E	01	1D	80	18	71	1C	16	20	58	2C	25
00B0	00	C4	8E	21	00	00	9E	8C	0A	D0	8A	20	E0	2D	10	10
00C0	3E	96	00	C4	8E	21	00	00	18	8C	0A	D0	8A	20	E0	2D
00D0	10	10	3E	96	00	13	8E	21	00	00	18	00	00	00	00	00
00E0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
00F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	ED

7.1.3.3 DDC data of Digital-HDMI2

Addr	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
0000	00	FF	FF	FF	FF	FF	FF	00	1E	6D	01	00	01	01	01	01
0010	0B	11	01	03	80	73	41	96	0A	CF	74	A3	57	4C	E0	23
0020	09	48	4C	2F	CE	00	31	40	45	40	61	40	01	01	01	01
0030	01	01	01	01	01	01	64	19	00	40	41	00	26	30	18	88
0040	36	00	00	D0	52	00	00	18	00	00	FC	00	4C	47	20	
0050	54	56	0A	20	20	20	20	20	20	20	00	00	00	FD	00	33
0060	37	4C	43	35	44	43	2D	55	40	0A	20	20	00	00	00	00
0070	00	00	00	00	00	00	00	00	00	00	00	00	00	00	01	85
0080	02	03	13	F1	44	84	05	03	02	23	15	07	50	65	03	0C
0090	00	10	00	01	1D	00	72	51	D0	1E	20	6E	28	55	00	C4
00A0	8E	21	00	00	1E	01	1D	80	18	71	1C	16	20	58	2C	25
00B0	00	C4	8E	21	00	00	9E	8C	0A	D0	8A	20	E0	2D	10	10
00C0	3E	96	00	C4	8E	21	00	00	18	8C	0A	D0	8A	20	E0	2D
00D0	10	10	3E	96	00	13	8E	21	00	00	18	00	00	00	00	00
00E0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
00F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	ED

Before adjustment of white balance, should be executed the 'color balance adjustment'

8. Adjustment of White Balance

8.1 Required Equipment

- Remote controller for adjustment
- Color Analyzer (CA-210 or same product)
- Auto W/B adjustment instrument(only for Auto adjustment)
- Use inner(SELF) Pattern

8.2 Adjustment of White Balance (For Manual adjustment)

Set TV input to RF.

Operate the zero-calibration of the CA-210, Ch.9.

Then stick sensor to LCD module surface when you adjust.

For manual adjustment, it is also possible by the following sequence.

- 1) Select white pattern of heat-run mode by pressing power on key on remote control for adjustment then operate heat run more than 15 minutes.
- 2) Enter the White Balance adjustment mode by pressing the INSTANT key twice (White Balance) on R/C.
- 3) Stick sensor to center of the screen and select each items using ▲/▼(CH +/-) key on R/C.
- 4) Adjust G Gain / B Gain using ◀▶(VOL +/-) key on R/C.
- 5) Adjust it until color coordination becomes as below.

- By controlling G, B GAIN, adjust X, Y target value.
- R Gain fixed at cool, normal, warm mode.
- But, Control the R GAIN, unless it has correct value

(Initially, R/G/B gain and R/G/B offset values are fixed as below.)

Red Gain: 80h Green Gain: 80h Blue Gain: 80h

Red Offset: 80h Green Offset: 80h Blue Offset: 80h

*Target value

	X	Y	Temp (Δuv)
Cool	0.276 ± 0.002	0.283 ± 0.002	11000k (0.000)
Normal	0.285 ± 0.002	0.293 ± 0.002	9300k (0.000)
Warm	0.313 ± 0.002	0.329 ± 0.002	6500k (0.003)

- 6) When adjustment is completed, Exit adjustment mode using EXIT key on R/C.

9. Auto white Balance (AV)

command1	command2	Set ID	Data	Default value
			Min	Max
Input Select	x	01	20h	90h
R-Gain	j	01	0h	FEh
G-Gain	j	01	0h	FEh
B-Gain	j	01	0h	FEh
R-Offset	j	01	0h	FEh
G-Offset	j	01	0h	FEh
B-Offset	j	01	0h	FEh

10. Test factor for commercial model

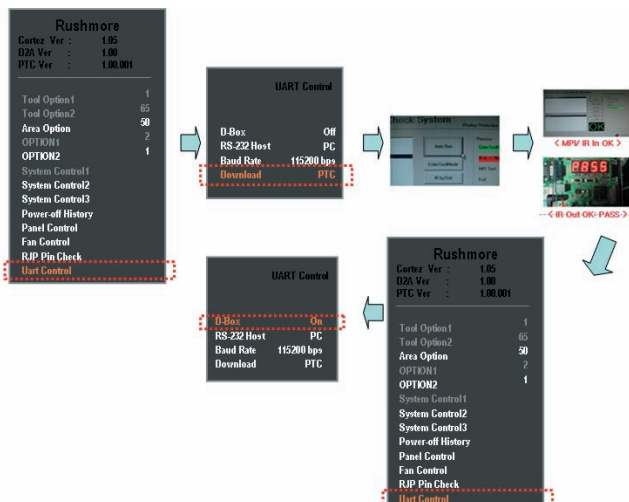
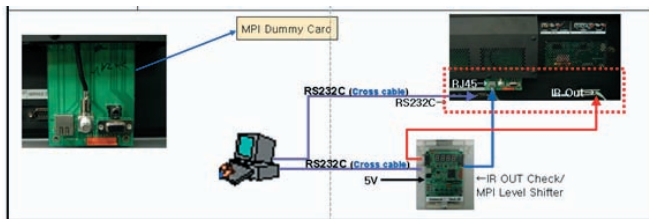
10.1 IR In/ Out Check

10.1.1 Check Order 'Pass' Judgment

- 1) Insert RJ45 Cable, RS-232C Cable 2EA. Phone Jack to each Port as below Picture.
- 2) Change the Mode 'PTC Only' On OSD(In-start -> Uart Control -> Download -> PTC°±)
- 3) Running the 'IR/MPI Check Program' on PC
- 4) Click the 'AUTO Run' or 'Push the Spacebar' on the keyboard
- 5) If the Sign is 'NG' try One More as 'Push the Spacebar'
- 6) Confirm the 'OK' Sign on Screen that means IR in & MPI Test Pass / 'NG' Sign is NG
Confirm the 'PASS' Sign of IR Out Check JIG / 'NG' Sign is NG
- 7) After finish Check. Change the Mode 'D-Box On'(In-start -> Uart Control -> D-Box 'ON')

10.1.2 Needs JIG & Equip. & Cable

PC('MPI/IP In' Check Program. RS-232C 2Port), IR Out Check Jig(With level Shifter), 232C to Phone jack Cable, 5V Adapter, 232C Cable(Cross) 232C Cable(Cross) 2EZ, RJ45(Direct) Cable.



10.2 Lodgenet Card & Auto Camport Check

Check Order "Pass" Judgment	(Mode be changed to "D-Box On" and Set is resetting before this check) 1. Insert the 11Pin Connector & RF Cable to MPI Dummy Card as below Picture 2. Turn on the Set by Only "Lodgenet R/C" 3. After Turn on the set, Push to the "Channel Up Key" 4. Check operating the Encrypted Channel(Ch 96-1) 5. If the Encrypted Channel be operated It's "PASS", not "NG" 6. After Lodgenet check, Insert the Video Jack into Video Jack hole of the Side AV Ass'y 7. If the input source be changed to AV2 It's Auto camport "PASS" 8. After all check, Push to the "Power Only" Key(D-Box off)	
Needs JIG & Equip. & Cable..	Lodgenet Card & 11 Pin Connector,	Lodgenet R/C, Video Jack

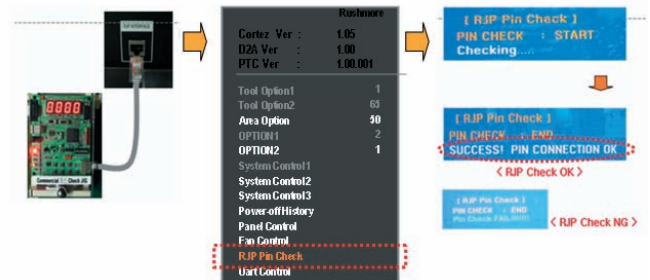
10.3 RJP(Remote Jack Pack) Check

10.3.1 Check Order 'Pass' Judgment

- 1) Connecting RJP Test JIG & RJP Port of Set with Modem Cable(8Pin)
- 2) Check the RJP operation on OSD(In-start -> RJP Pin Check -> ▶)
- 3) 'SUCCESS! PIN CONNECTION OK' -> PASS
- 4) 'Pin Check Fail!!!!' -> NG
- 5) If the Result is 'NG', try One More

10.3.2 Needs JIG & Equip. & Cable

- 1) RJP Check JIG, Modem Cable (8 Pin)



10.4 MPI Card Check

Check Order "Pass" Judgment	1. Insert RJ45 Cable to the MPI Card as below Picture 2. Running the "IR/MPI Check Program" on PC 3. Click the "MPI Test" Button on Screen 4. If the MPI Test Index Color is Green It's "PASS", RED is "NG" 5. If the Result is "NG" try One More	
Needs JIG & Equip. & Cable..	1. PC, MPI Level shifter, RJ45 Cable, Adapter	

Innotek Power Board Structure

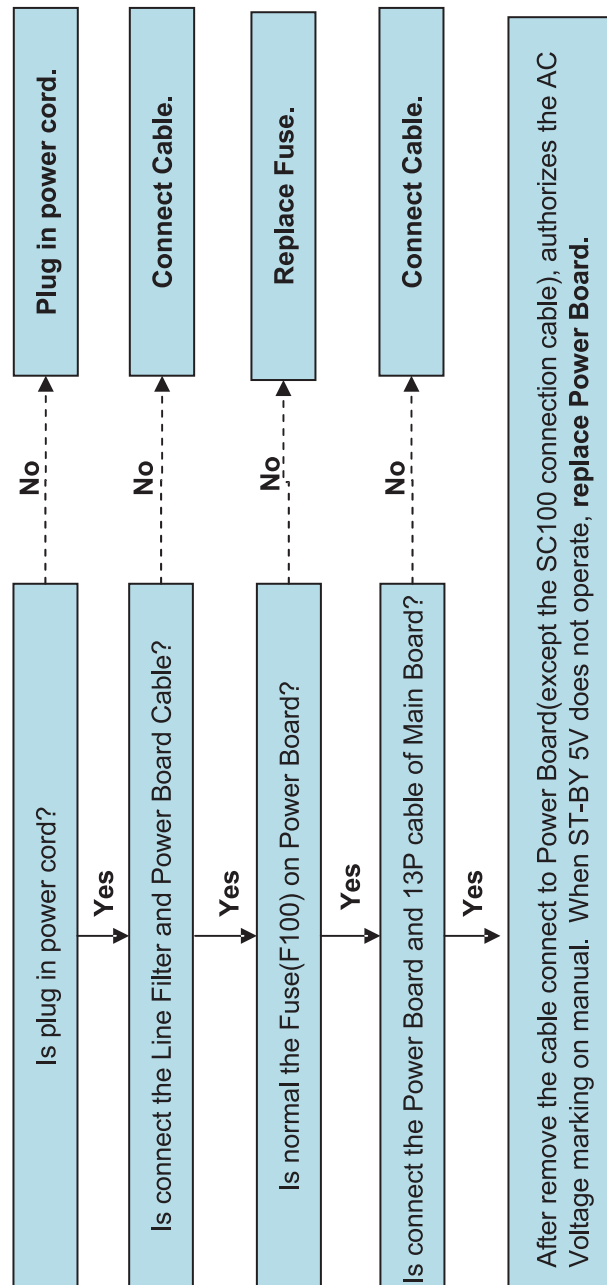
[illegible]

1. No Power

Symptom

- 1) Doesn't minute discharge at module.
- 2) Non does not come in into the front LED.

Check follow

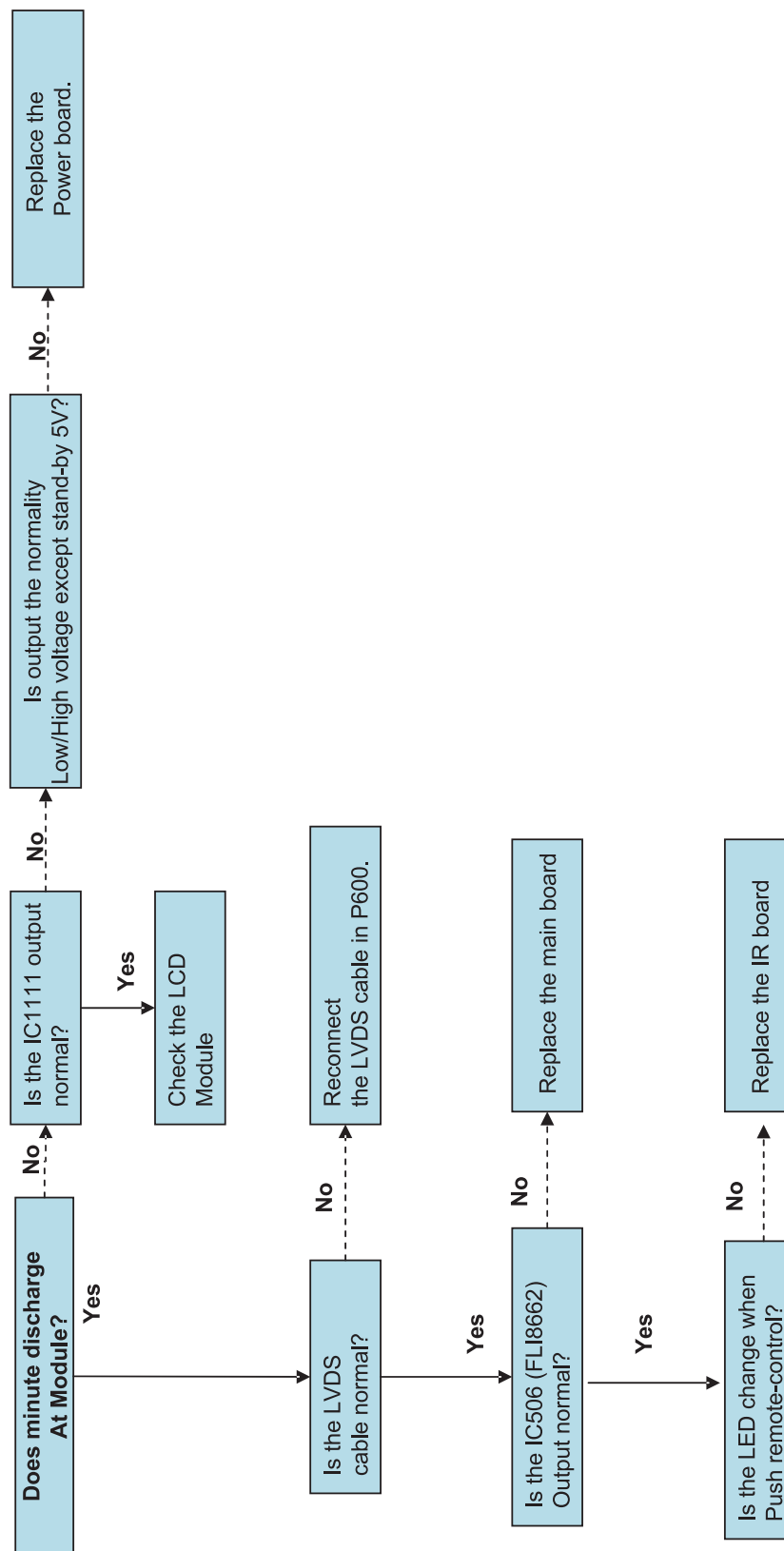


2. No Raster

Symptom

- 1) No OSD and image occur at screen.
- 2) It maintains the condition where the front LED is green.

Check follow



3. In case of occur strange screen into specific mode

Symptom

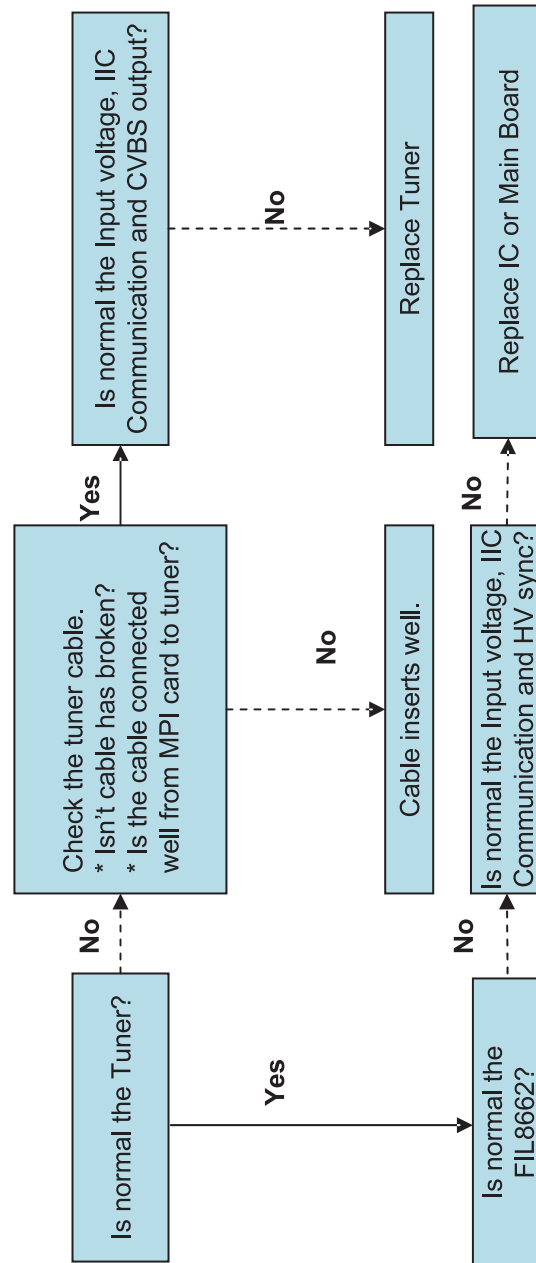
CE The screen does not become the display from specific input mode (RF, AV, Component, RGB, HDMI).

Check follow

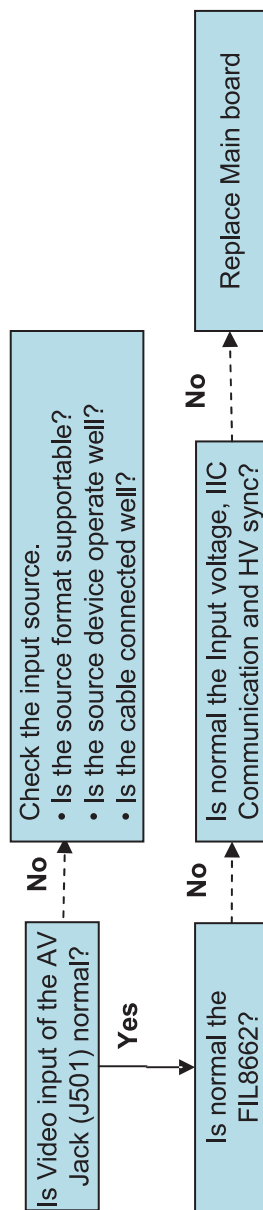
CE Check the all input mode should become normality display.

CE Check the Video(Main)/Data(Sub), Video(Main)/Video(Sub) should become normality display from the PIP mode or DW mode. (Re-Check it Swap)

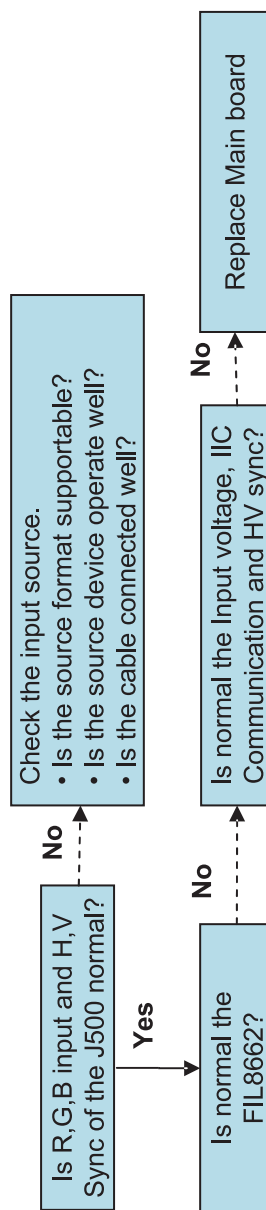
In case of becomes unusual display from RF mode



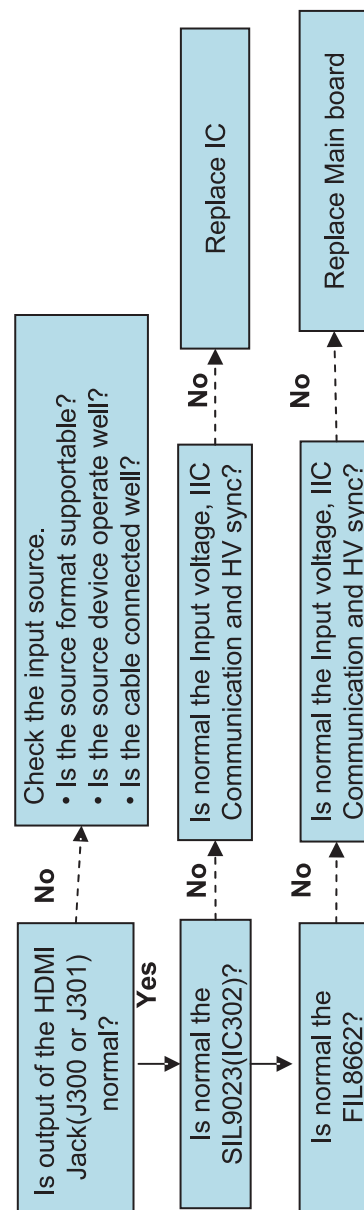
In the case of becomes unusual display from side S-video/AV mode



In the case of becomes unusual display from Component, RGB mode



In the case of becomes unusual display from HDMI mode

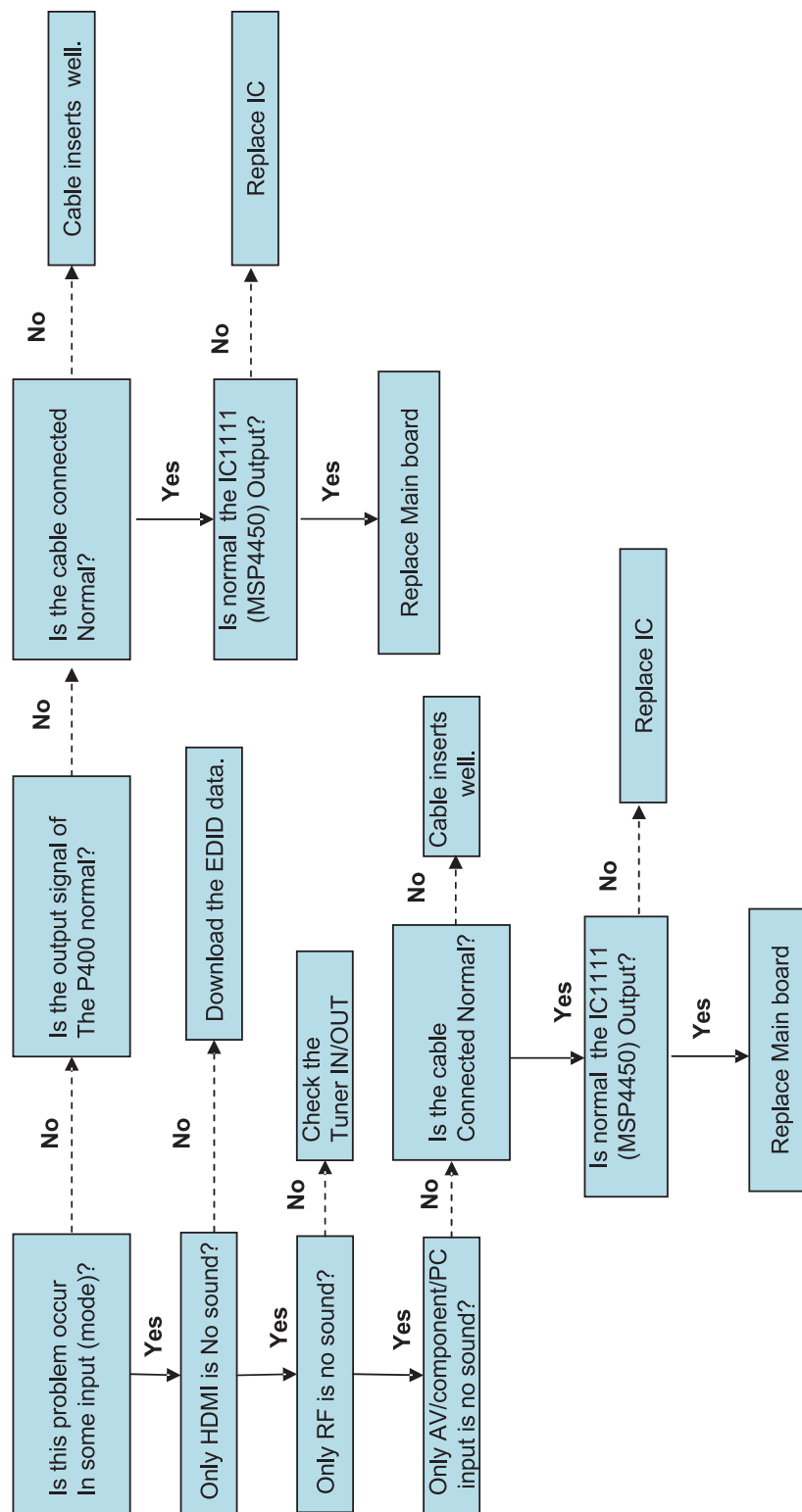


4. In case of no sound

Symptom

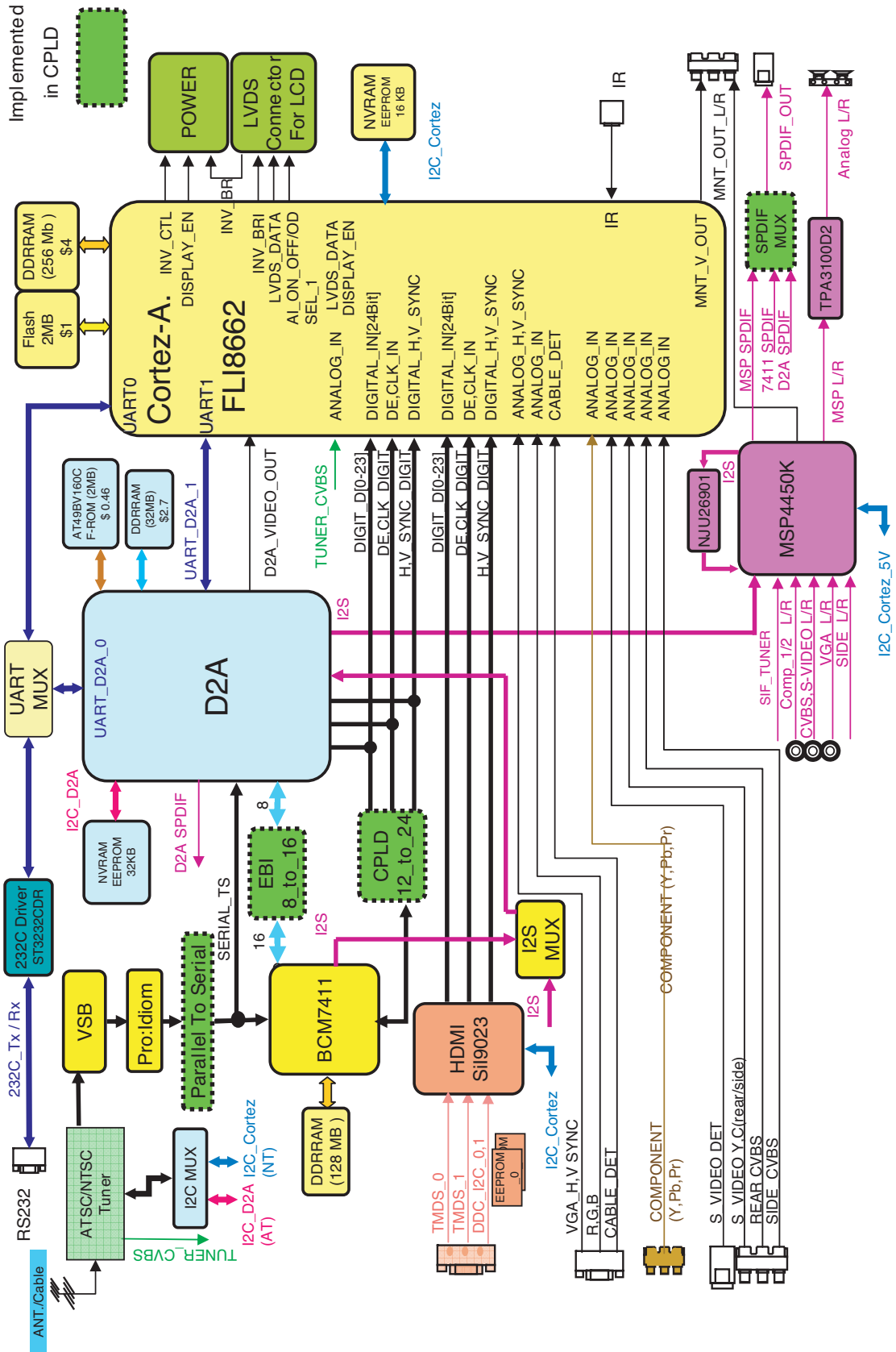
- 1) LED is green
- 2) Screen display but sound is not output

Check follow



BLOCK DIAGRAM

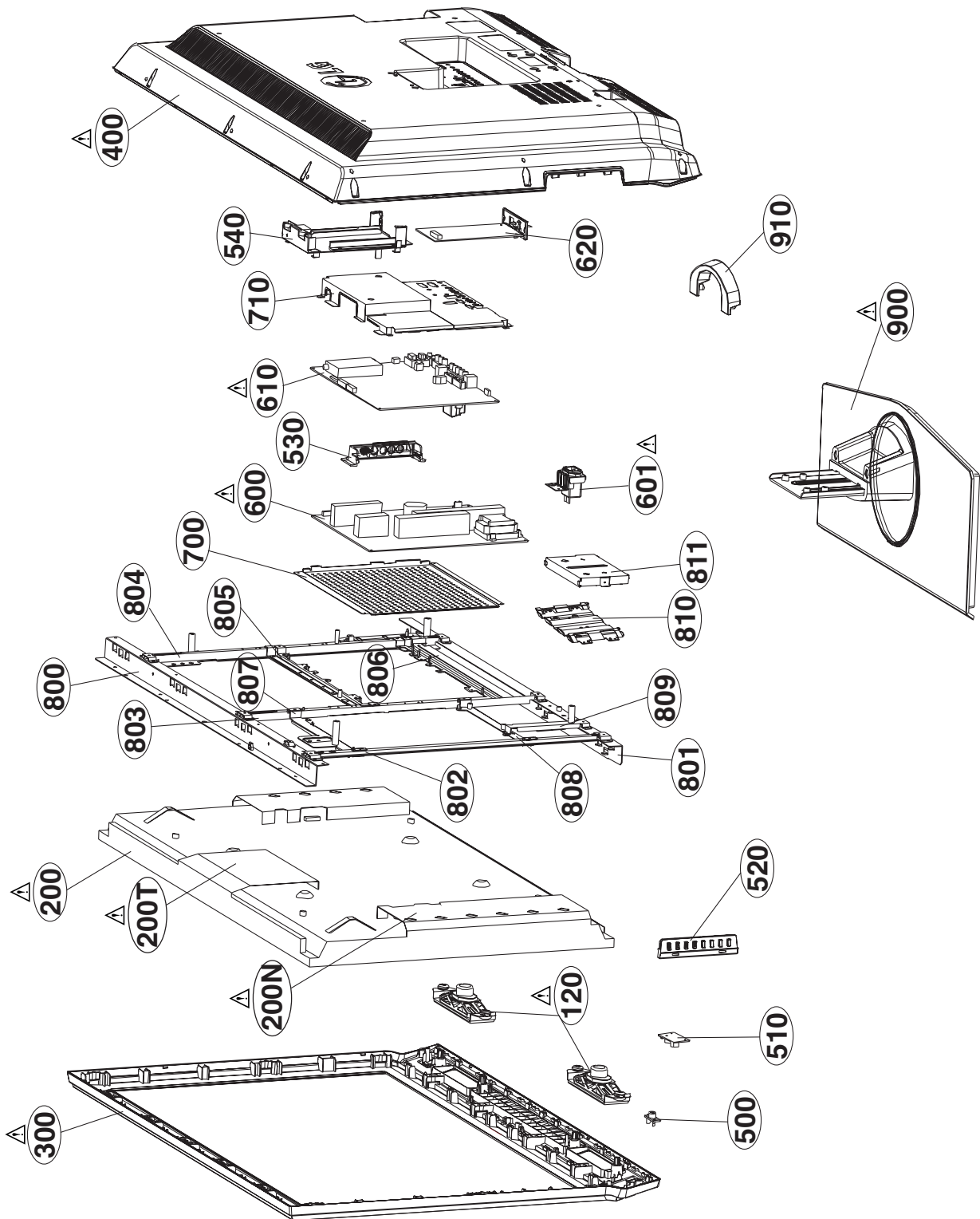
1. Overall Block Diagram (D2A + BCM7411 + Cortex Adv.)

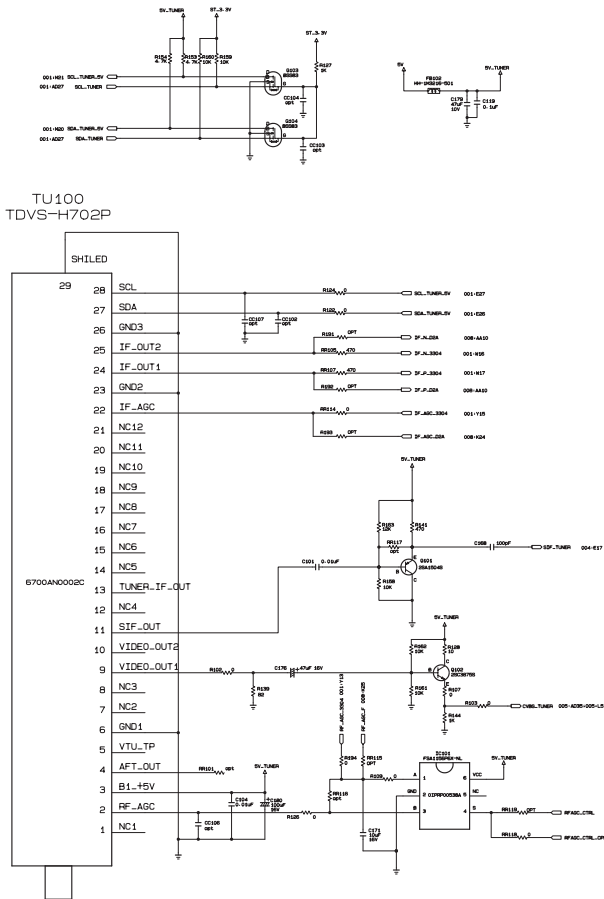


EXPLODED VIEW

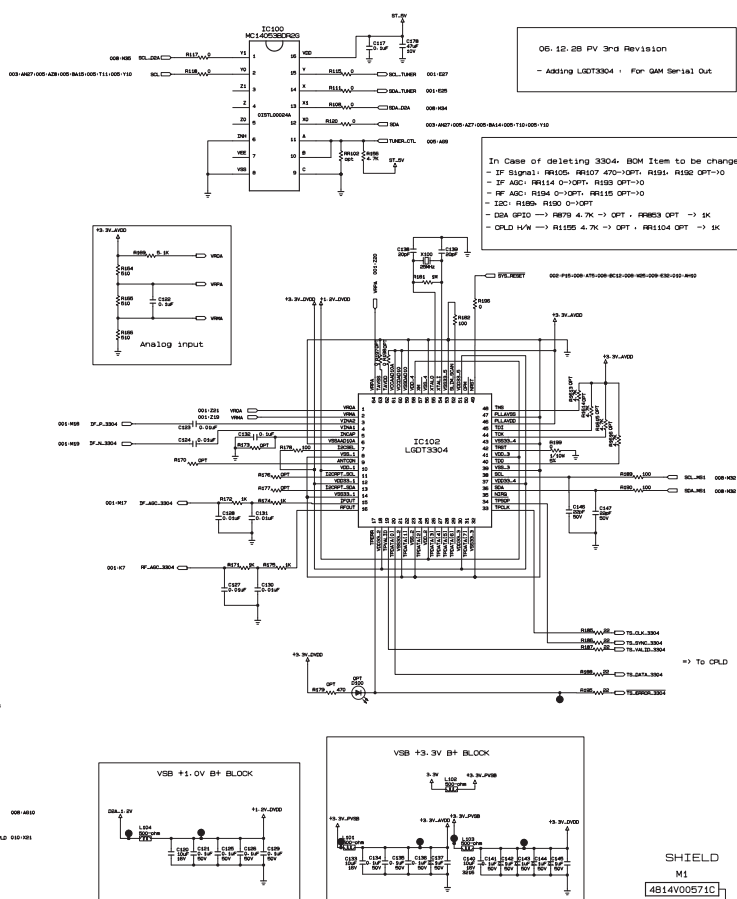
IMPORTANT SAFETY NOTICE

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.

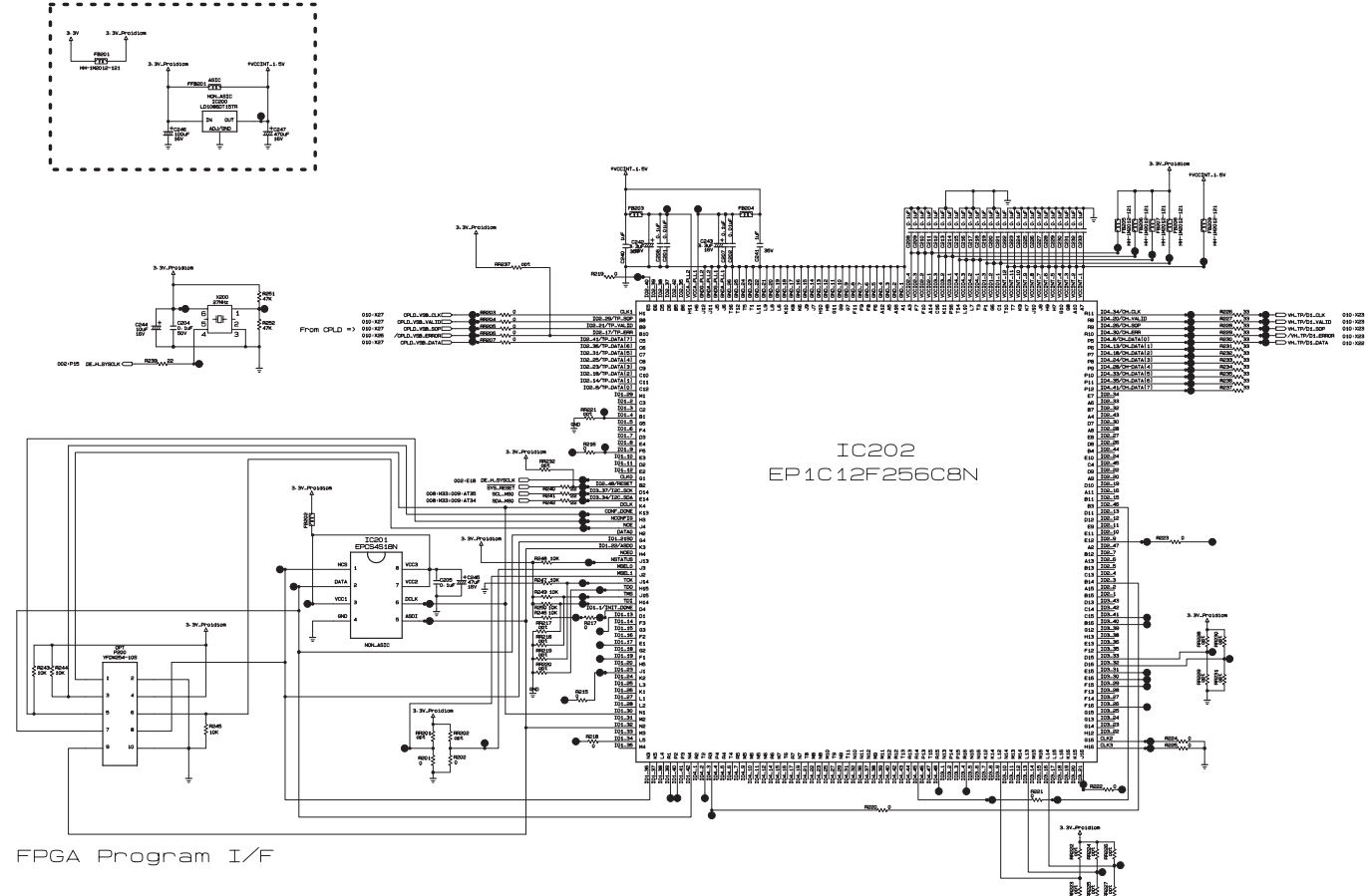




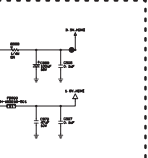
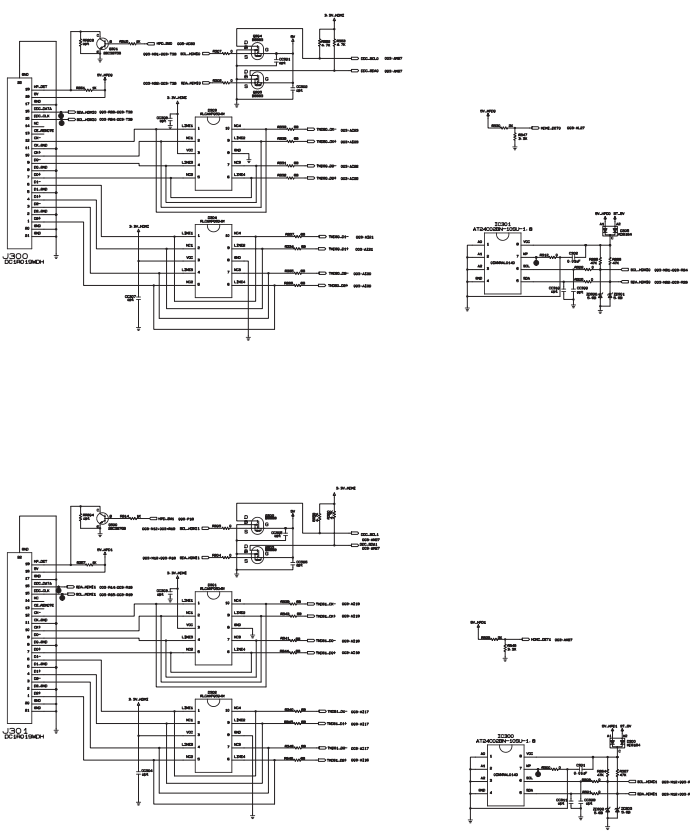
THE Δ SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FILTRATION AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURED SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE Δ SYMBOL MARK OF THE SCHEMATIC.



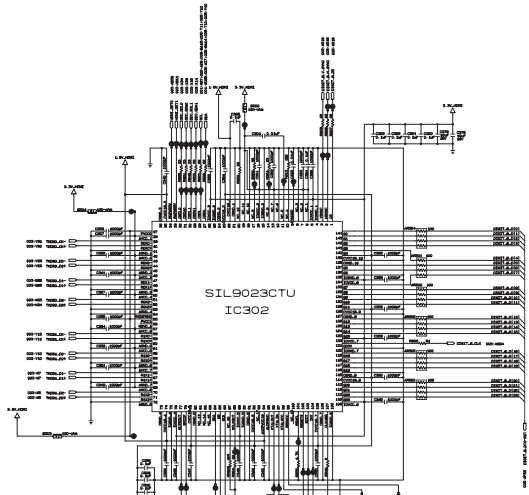
MODEL RUSHMORE
BLOCK 3304&tuner



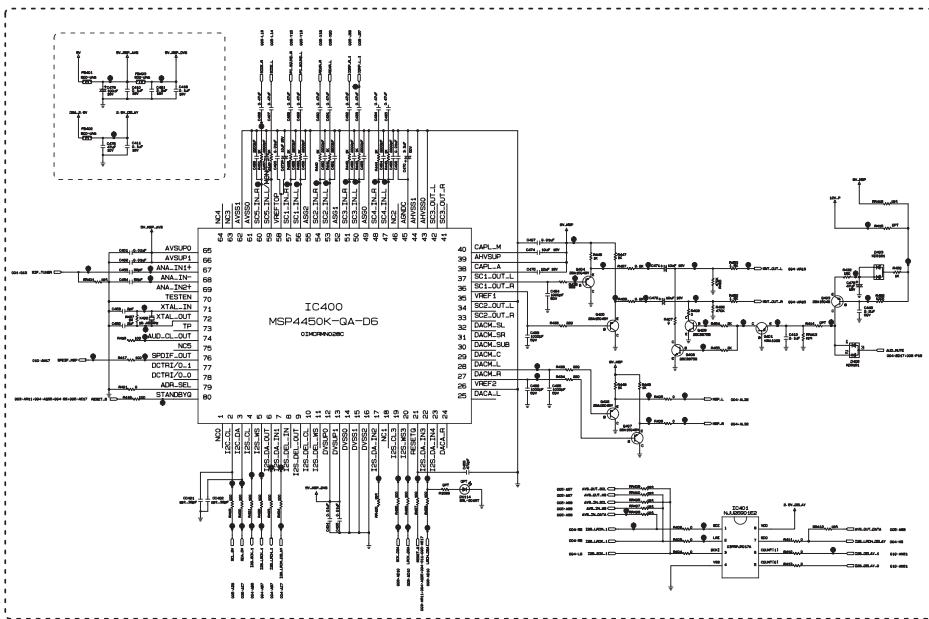
MODEL RUSHMORE
BLOCK FPGA



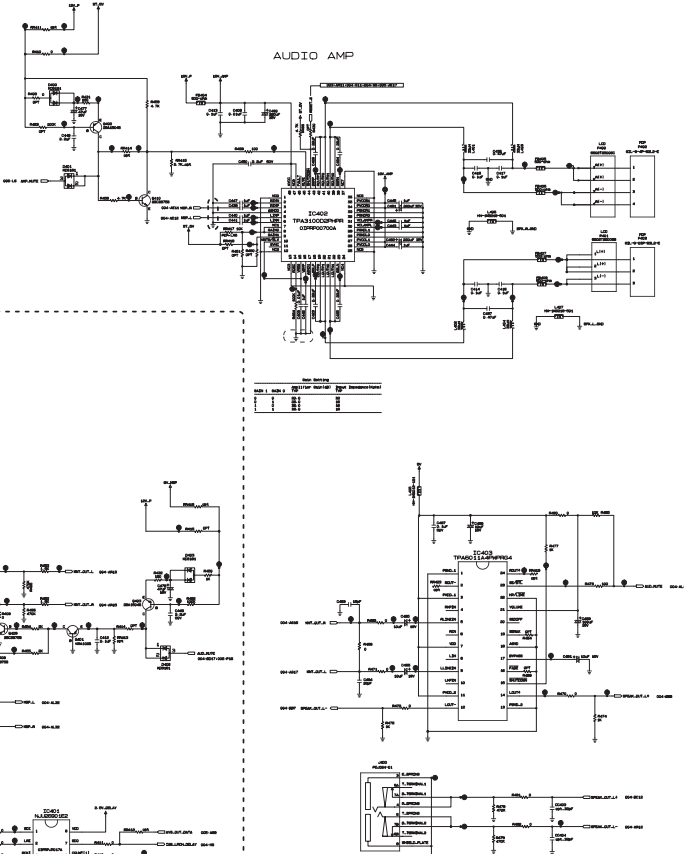
HDMI RX



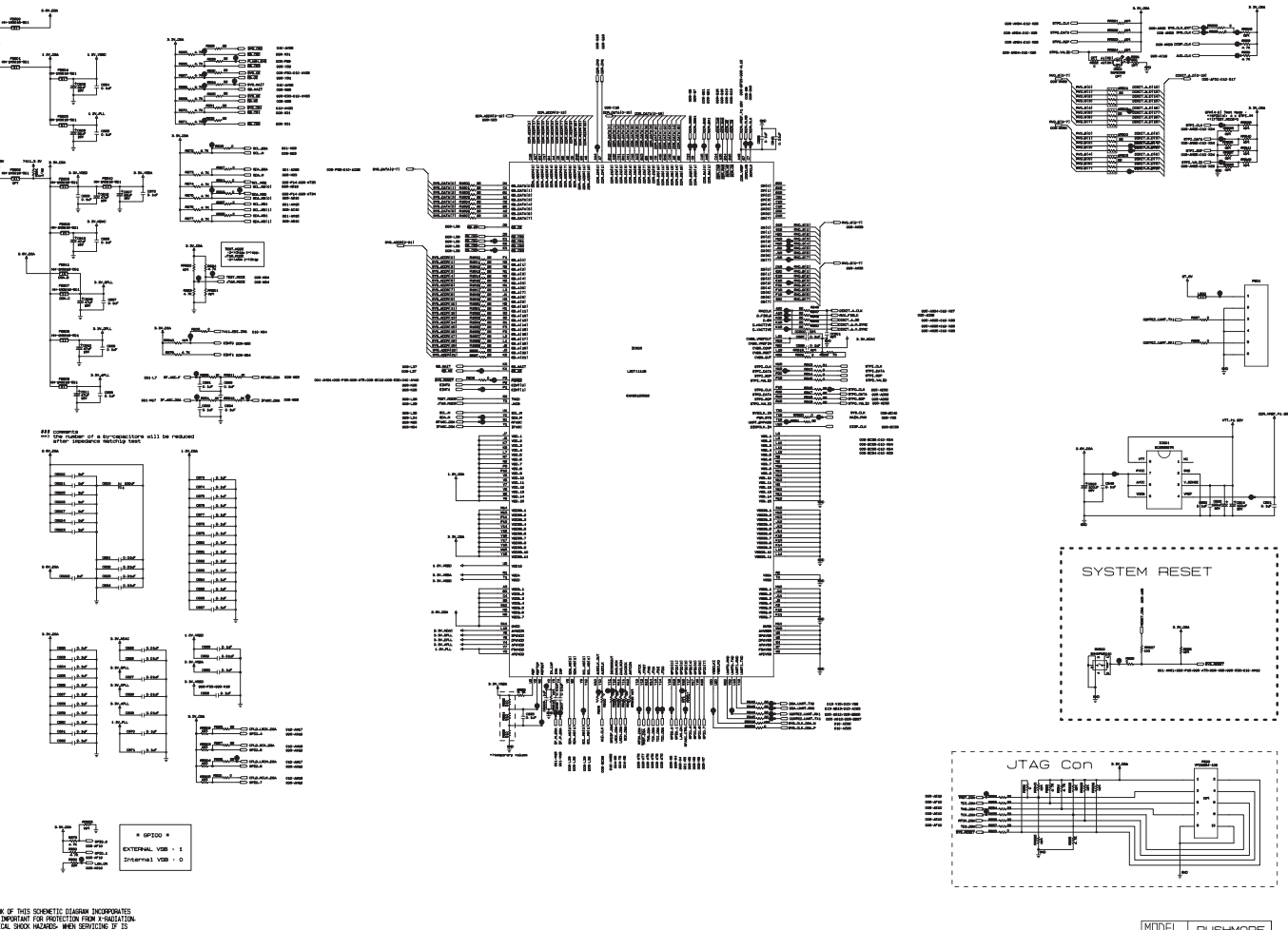
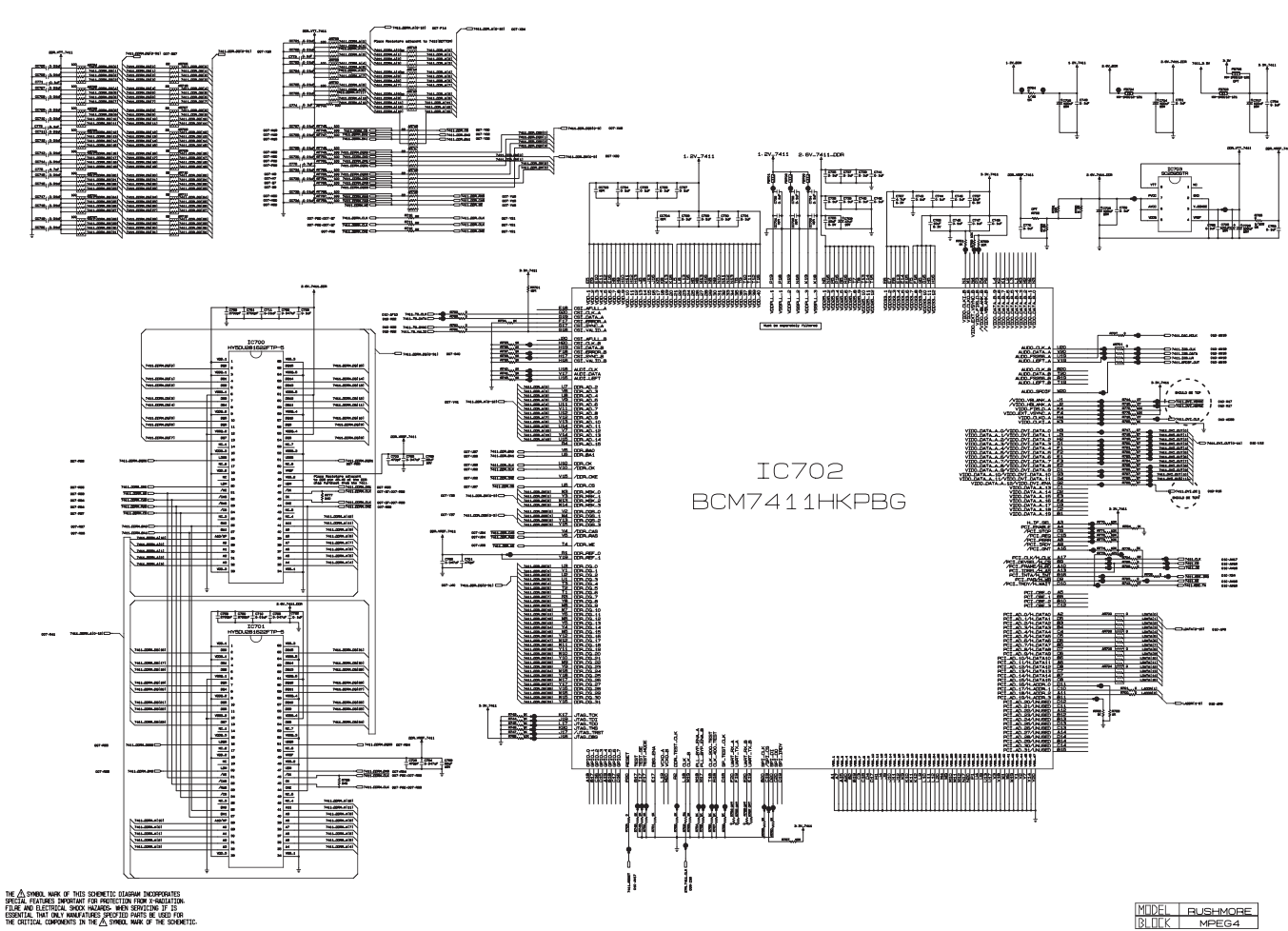
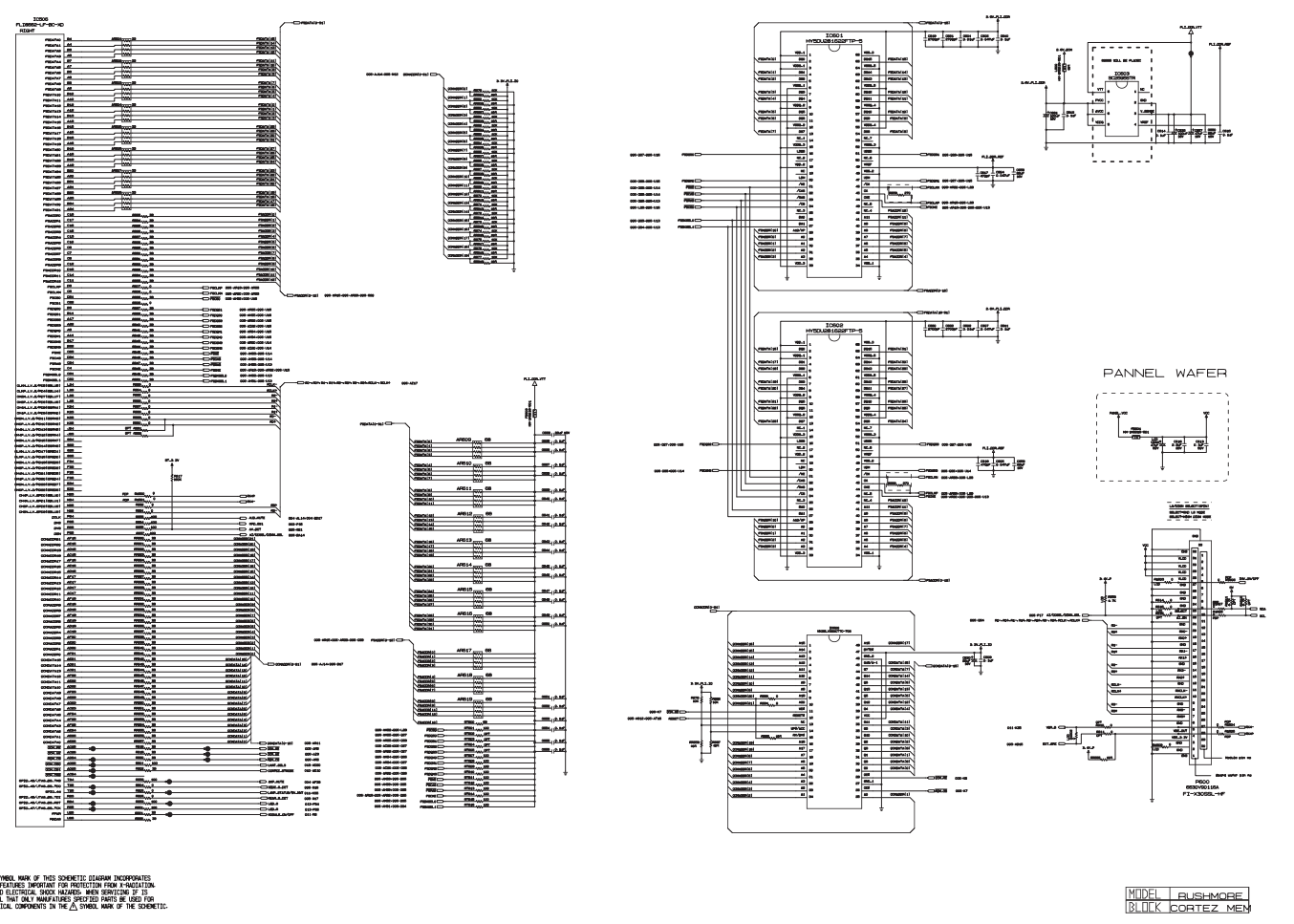
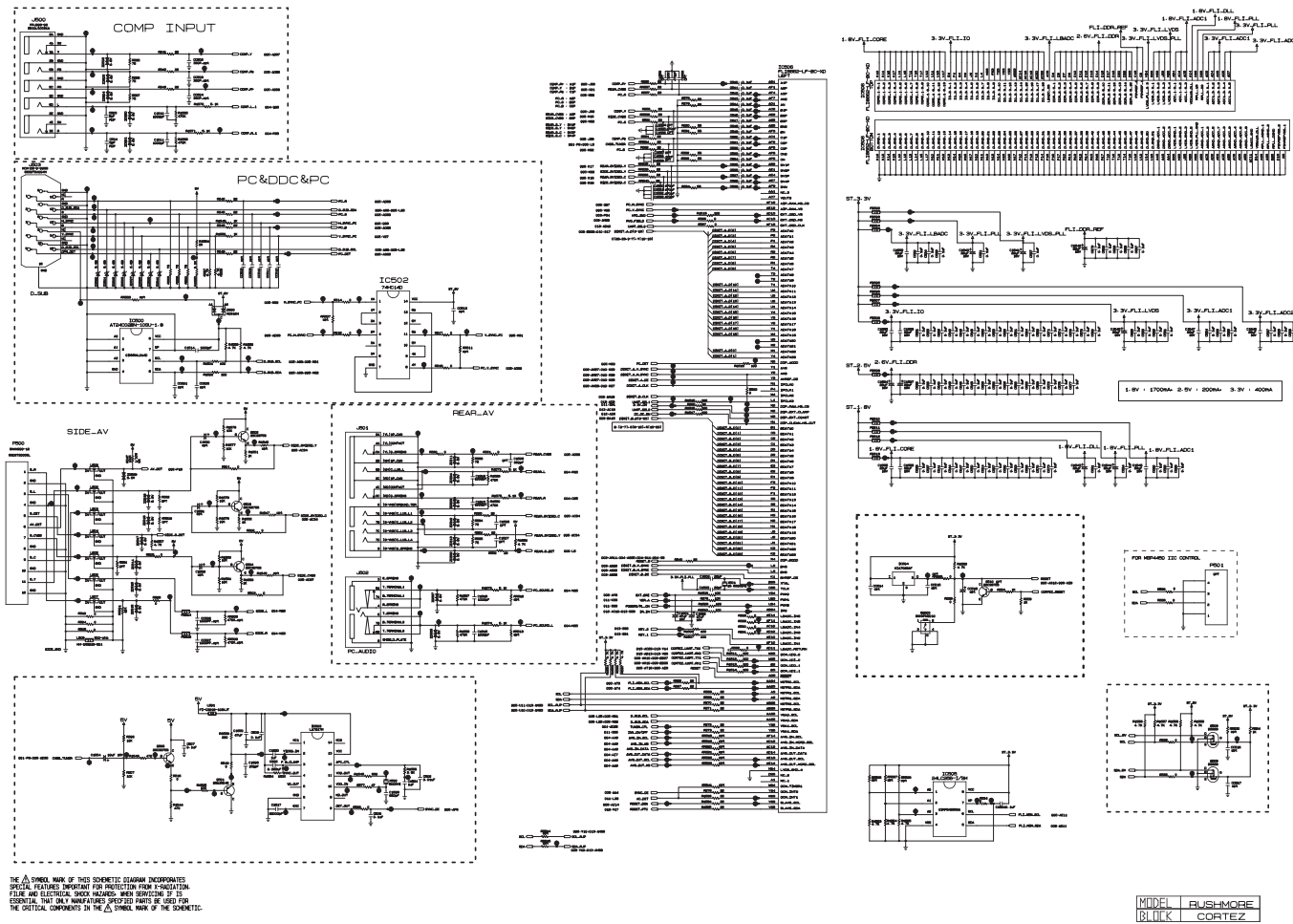
MODEL RUSHMORE
BLOCK HDMI

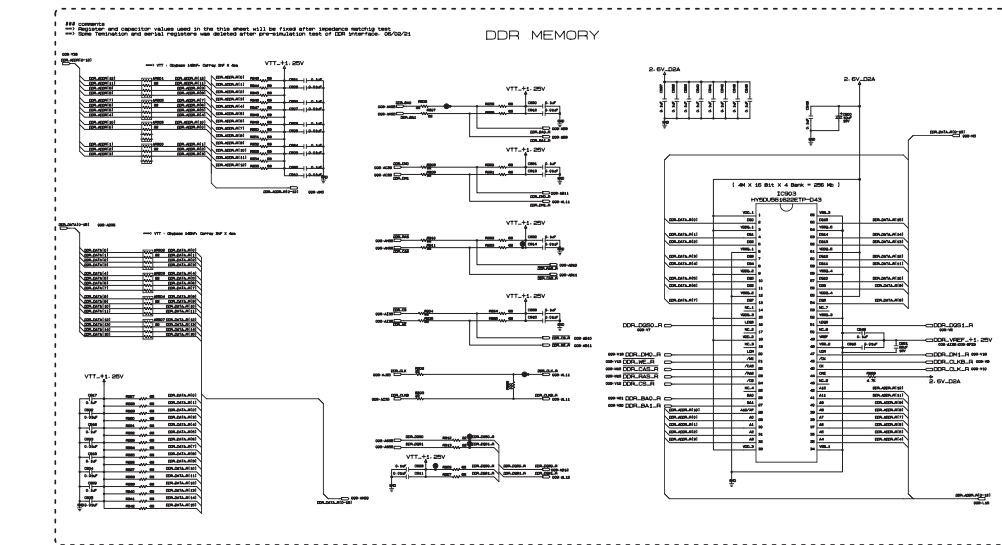
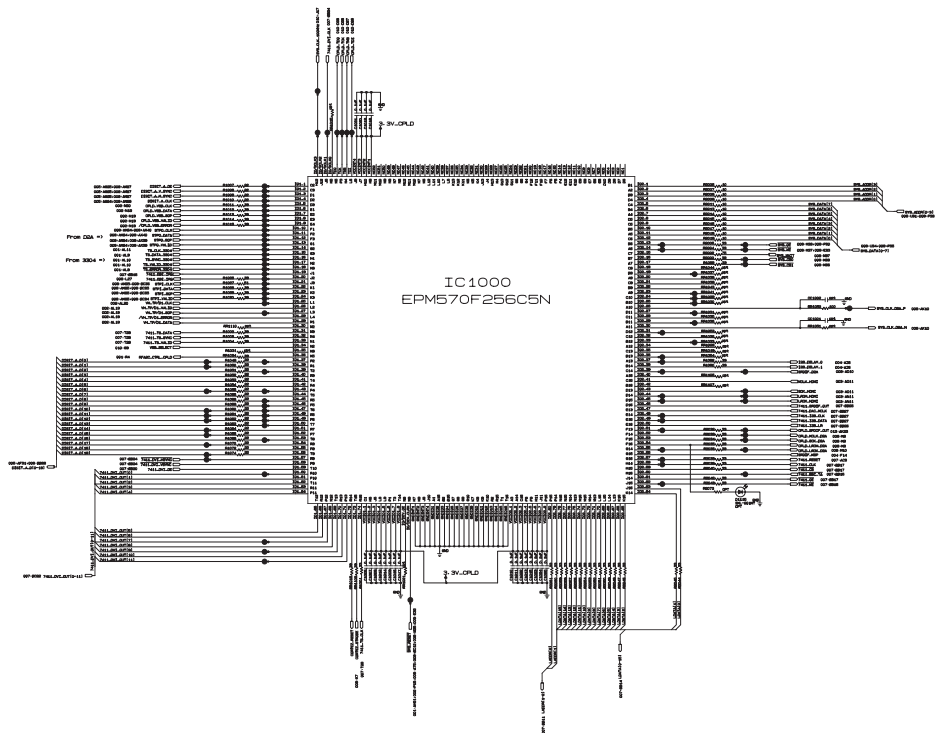
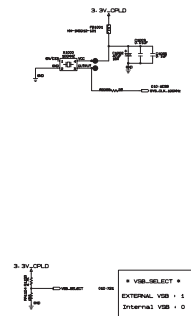
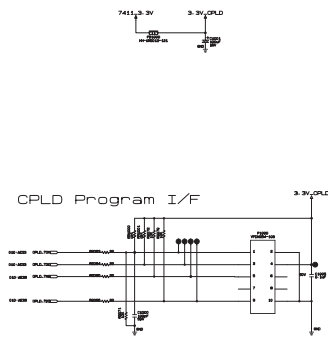
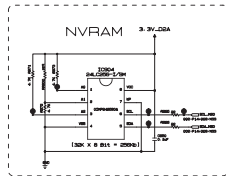
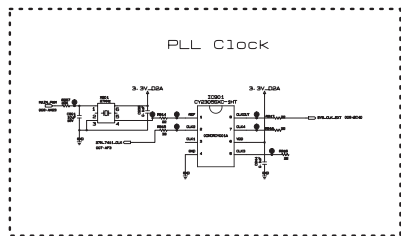
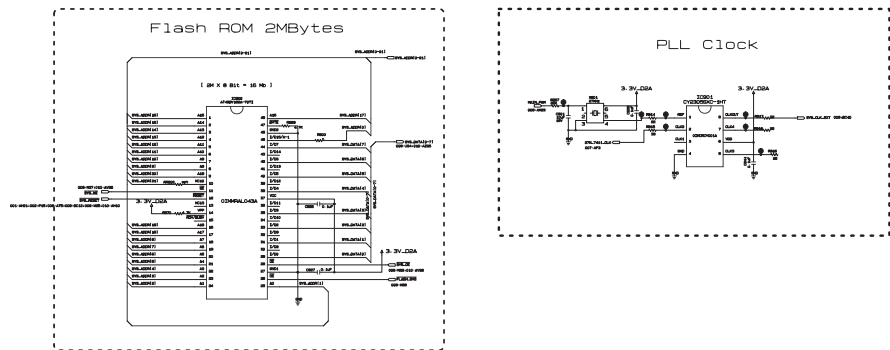


THE Δ SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FILTRATION AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURED SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE Δ SYMBOL MARK OF THE SCHEMATIC.



MODEL RUSHMORE
BLOCK AUDIO&4450



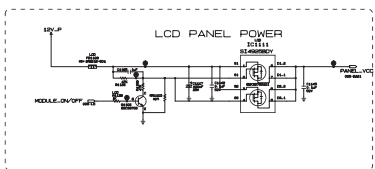
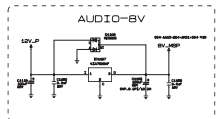
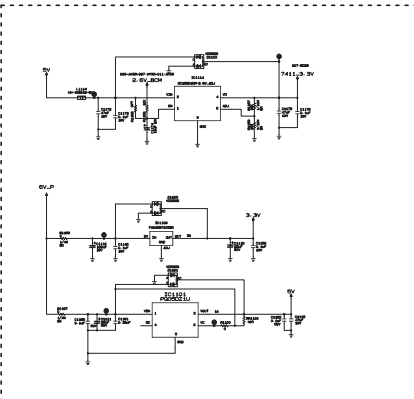
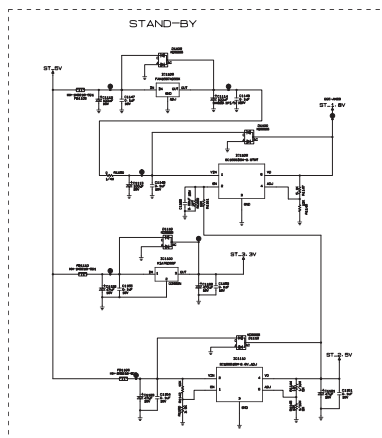
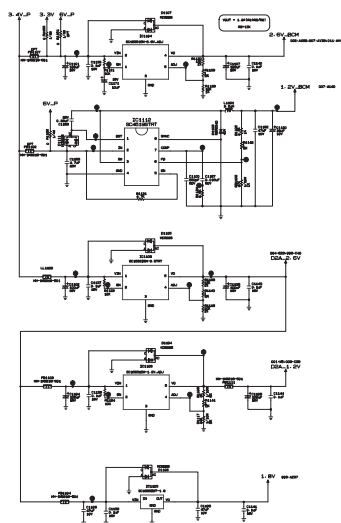
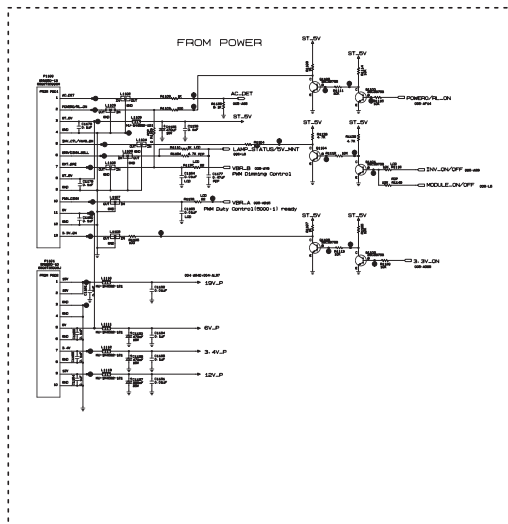


THE Δ SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM IRRADIATION, FLAME AND ELECTRICAL SHOCK HAZARDS. WHEN REPRODUCING IT IS ESSENTIAL THAT ONLY MANUFACTURED SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE Δ SYMBOL MARK OF THE SCHEMATIC.

MODEL RUSH-MORE
BLOCK D2A MEM

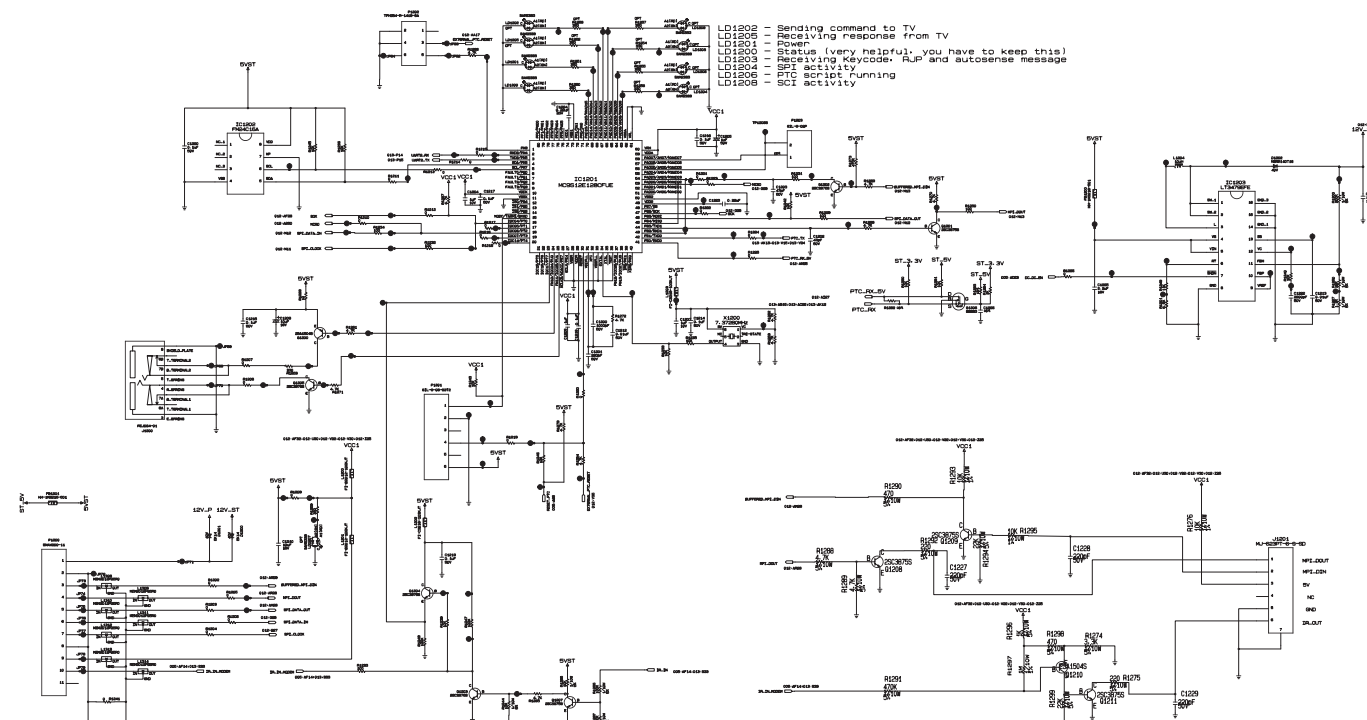
THE Δ SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM IRRADIATION, FLAME AND ELECTRICAL SHOCK HAZARDS. WHEN REPRODUCING IT IS ESSENTIAL THAT ONLY MANUFACTURED SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE Δ SYMBOL MARK OF THE SCHEMATIC.

MODEL RUSH-MORE
BLOCK CPLD



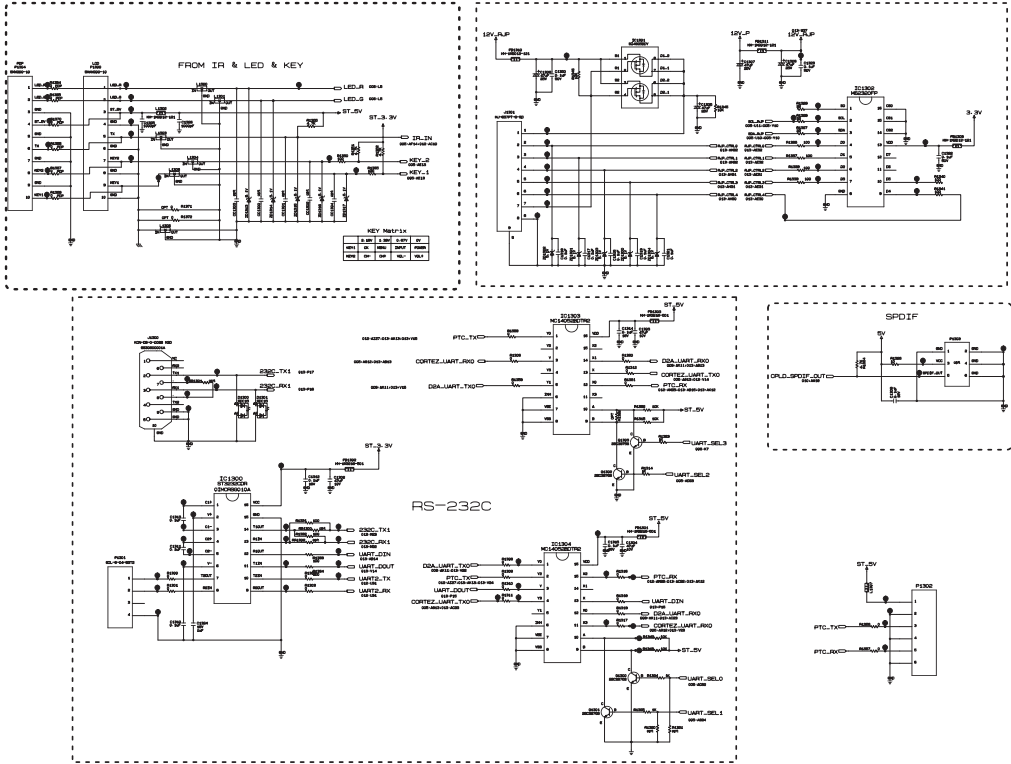
06-10-14 PV 010 REV13101
- ADDED IN REGISTRATION - PPT LETTERS

MODEL RUSH-MORE
BLOCK POWER



THE Δ SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM IRRADIATION, FLAME AND ELECTRICAL SHOCK HAZARDS. WHEN REPRODUCING IT IS ESSENTIAL THAT ONLY MANUFACTURED SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE Δ SYMBOL MARK OF THE SCHEMATIC.

MODEL RUSH-MORE
BLOCK PTC&MPI



THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. PLEASE READ ELECTRICAL SAFETY INSTRUCTIONS WITH EXTENSION OF 25 ESSENTIAL. ONLY THE MANUFACTURED SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.

MODEL	RUSHMORE
BLOCK	AUX I/F



P/NO : MFL36550709

Jun., 2008
Printed in Korea