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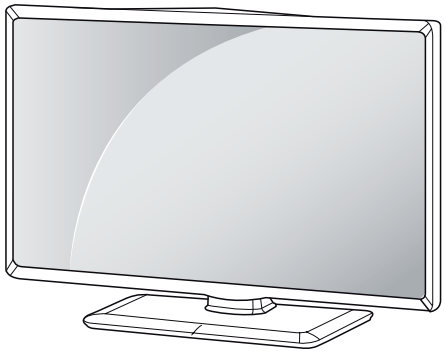
LED TV
SERVICE MANUAL

CHASSIS : LA32B

MODEL : 32LN520B 32LN520B-UM

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



P/NO : MFL67696504 (1307-REV00)

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SAFETY PRECAUTIONS

IMPORTANT SAFETY NOTICE

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

General Guidance

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

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

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

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

Keep wires away from high voltage or high temperature parts.

Before returning the receiver to the customer,

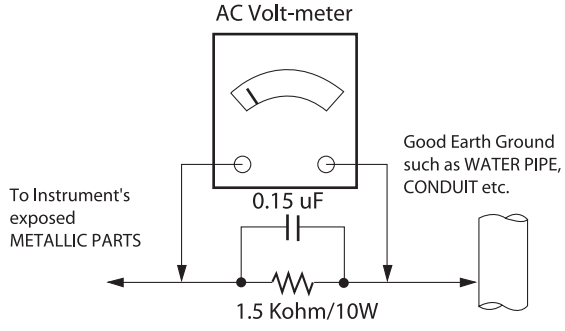
always perform an **AC leakage current check** on the exposed metallic parts of the cabinet, such as antennas, terminals, etc., to be sure the set is safe to operate without damage of electrical shock.

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 1 MΩ and 5.2 MΩ.
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 1.5 K / 10 watt resistor in parallel with a 0.15 uF capacitor between a known good earth ground (Water Pipe, Conduit, etc.) and the exposed metallic parts.
Measure the AC voltage across the resistor using AC voltmeter with 1000 ohms/volt or more sensitivity.
Reverse plug the AC cord into the AC outlet and repeat AC voltage measurements for each exposed metallic part. Any voltage measured must not exceed 0.75 volt RMS which is corresponds to 0.5 mA.
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 0.1 Ω
*Base on Adjustment standard

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SERVICING PRECAUTIONS

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

General Servicing Precautions

1. Always unplug the receiver AC power cord from the AC power source before;
   a. Removing or reinstalling any component, circuit board module or any other receiver assembly.
   b. Disconnecting or reconnecting any receiver electrical plug or other electrical connection.
   c. Connecting a test substitute in parallel with an electrolytic capacitor in the receiver.
   CAUTION: A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.
2. Test high voltage only by measuring it with an appropriate high voltage meter or other voltage measuring device (DVM, FETVOM, etc) equipped with a suitable high voltage probe. Do not test high voltage by "drawing an arc".
3. Do not spray chemicals on or near this receiver or any of its assemblies.
4. Unless specified otherwise in this service manual, clean electrical contacts only by applying the following mixture to the contacts with a pipe cleaner, cotton-tipped stick or comparable non-abrasive applicator; 10 % (by volume) Acetone and 90 % (by volume) isopropyl alcohol (90 % - 99 % strength)
   CAUTION: This is a flammable mixture.
   Unless specified otherwise in this service manual, lubrication of contacts in not required.
5. Do not defeat any plug/socket B+ voltage interlocks with which receivers covered by this service manual might be equipped.
6. Do not apply AC power to this instrument and/or any of its electrical assemblies unless all solid-state device heat sinks are correctly installed.
7. Always connect the test receiver ground lead to the receiver chassis ground before connecting the test receiver positive lead.
   Always remove the test receiver ground lead last.
8. Use with this receiver only the test fixtures specified in this service manual.
   CAUTION: Do not connect the test fixture ground strap to any heat sink in this receiver.

Electrostatically Sensitive (ES) Devices

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

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

General Soldering Guidelines

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

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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.

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SPECIFICATION

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

1. Application range

This spec sheet is applied LED TV with LA32Bchassis

2. Test condition

Each part is tested as below without special notice.

1) Temperature : 25 ºC ± 5 ºC(77 ± 9 ºF) , CST : 40 ºC±5 ºC
2) Relative Humidity: 65 % ± 10 %
3) Power Voltage

Market	Input voltage	Frequency	Remark
USA	110~240V	50/60Hz	Standard Voltage of each product is marked by models

4) Specification and performance of each parts are followed each drawing and specification by part number in accordance with BOM
5) The receiver must be operated for about 20 minutes prior to the adjustment

3. Test method

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

4. General Specification

No	Item	Specification	Result	Remark
1.	Receiving System	1) ATSC / NTSC-M / 64 QAM / 256 QAM		
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	AC 100 ~ 240V 50/60Hz		Mark : 110V, 60Hz (N.America)
4.	Market	NORTH AMERICA		
5.	Screen Size	32/39/42/47/50/55inch Wide (1920 × 1080)		55LN5400-UA 50LN5400-UA 47LN5400-UA 42LN5400-UA 42LN5300-UB 39LN5300-UB 32LN5300-UB 55LN5200-UA 47LN5200-UA 42LN5200-UA
		32/37inch Wide (1366 × 768)		37LN530B-UA 32LN530B-UA 32LN520B-UM
6.	Aspect Ratio	16:9		
7.	Tuning System	FS		

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No	Item		Specification	Result	Remark
8.	Module	POLA	LC550DUK-SEE1	LGD	55LN5400-UA
		Direct	LC500DUE-SFR1	LGD	50LN5400-UA
		Direct	LC470DUE-SFR1	LGD	47LN5400-UA
		Direct	LC420DUE-SFR1	LGD	42LN5400-UA
		Direct	LC420DUE-SFR1	LGD	42LN5300-UB
		POLA	TBD	AUO	42LN5300-UB
		POLA	HC420DUN-SLFP1	LGD	42LN5300-UB
		POLA	HC390DUN-VCFP1	CMI	39LN5300-UB
		POLA	TBD	AUO	39LN5300-UB
		POLA	HC320DXN-VSFP1	CSOT	32LN5300-UB
		Direct	LC320DUE-SFR1	LGD	32LN5300-UB
		Direct	LC370DXE-SFR1	LGD	37LN530B-UA
		Direct	LC320DXE-SFR1	LGD	32LN530B-UA
		POLA	HC320DXN-SLFP1	LGD	32LN530B-UA
		Direct	i-D	LGD	55LN5200-UA
		Direct	i-D	LGD	47LN5200-UA
		Direct	i-D	LGD	42LN5200-UA
		Direct	i-D	LGD	32LN520B-UM
9.	Operating Environment		1) Temp : 0 ~ 40 deg 2) Humidity : ~ 80 %		
10.	Storage Environment		1) Temp : -20 ~ 60 deg 2) Humidity : ~ 85 %		

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5. Supported video resolutions

5.1. Component input(Y, CB/PB, CR/PR)

No	Resolution	H-freq(kHz)	V-freq.(kHz)	Pixel clock	Proposed
1.	720*480	15.73	60.00	13.5135	SDTV ,DVD 480I
2.	720*480	15.73	59.94	13.50	SDTV ,DVD 480I
3.	720*480	31.50	60.00	27.027	SDTV 480P
4.	720*480	31.47	59.94	27.00	SDTV 480P
5.	1280*720	45.00	60.00	74.25	HDTV 720P
6.	1280*720	44.96	59.94	74.176	HDTV 720P
7.	1920*1080	33.75	60.00	74.25	HDTV 1080I
8.	1920*1080	33.72	59.94	74.176	HDTV 1080I
9.	1920*1080	67.50	60.00	148.50	HDTV 1080P
10.	1920*1080	67.432	59.94	148.352	HDTV 1080P
11.	1920*1080	27.00	24.00	74.25	HDTV 1080P
12.	1920*1080	26.97	23.94	74.176	HDTV 1080P
13.	1920*1080	33.75	30.00	74.25	HDTV 1080P
14.	1920*1080	33.71	29.97	74.176	HDTV 1080P

5.2. HDMI Input (DTV)

No	Resolution	H-freq(kHz)	V-freq.(kHz)	Pixel clock	Proposed
	DTV				
1.	720*480	31.47	60.00	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	67.50	60.00	148.50	HDTV 1080P
8.	1920*1080	67.432	59.94	148.352	HDTV 1080P
9.	1920*1080	27.00	24.00	74.25	HDTV 1080P
10.	1920*1080	26.97	23.976	74.176	HDTV 1080P
11.	1920*1080	33.75	30.00	74.25	HDTV 1080P
12.	1920*1080	33.71	29.97	74.176	HDTV 1080P

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ADJUSTMENT INSTRUCTION

1. Application

This spec. sheet applies to LA32B Chassis applied LED TV all models manufactured in TV factory

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 ±5 ºC of temperature and 65±10% of relative humidity if there is no specific designation
(4) The input voltage of the receiver must keep 100~240V, 50/60Hz
(5) At first Worker must turn on the SET by using Power Only key.
(6) The receiver must be operated for about 5 minutes prior to the adjustment when module is in the circumstance of over 15 ºC
In case of keeping module is in the circumstance of 0°C, it should be placed in the circumstance of above 15°C for 2 hours
In case of keeping module is in the circumstance of below -20°C, it should be placed in the circumstance of above 15°C for 3 hours.

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

3. Adjustment items

3.1. Main PCBA Adjustments

(1) ADC adjustment : ADC adjustment is OTP (Auto ADC)
(2) EDID download : HDMI

■ 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

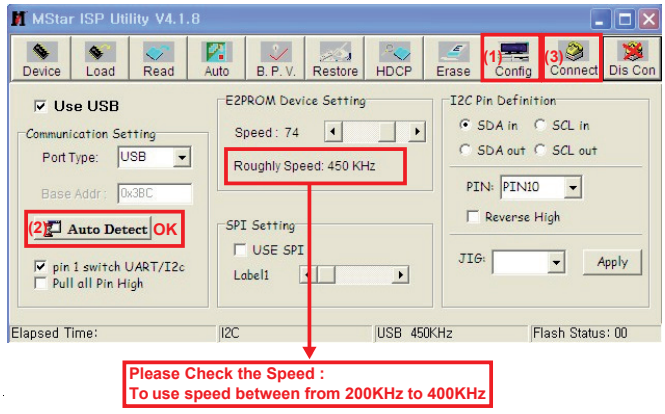
(1) White Balance adjustment
(2) RS-232C functionality check
(3) Factory Option setting per destination
(4) Shipment mode setting (In-Stop)
(5) GND and HI-POT test

3.3. Appendix

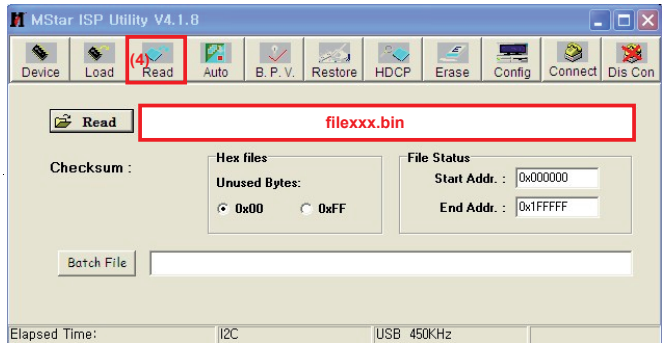
(1) Shipment conditions
(2) Tool option menu
(3) USB Download (S/W Update, Option and Service only)
(4) Preset CH Information

4. MAIN PCBA Adjustments

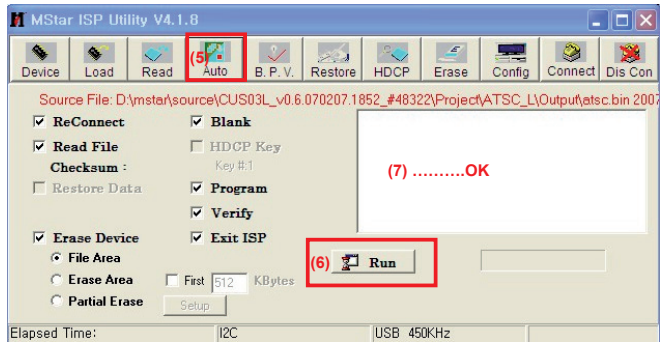
* Download
(1) Execute ISP program “Mstar ISP Utility” and then click “Config” tab.
(2) Set as below, and then click “Auto Detect” and check “OK” message
If display “Error”, Check connect computer, jig, and set.
(3) Click “Connect” tab. If display “Can’t ”, Check connect computer, jig, and set.



(4) Click “Read” tab, and then load download file(XXXX.bin) by clicking “Read”



(5) Click “Auto” tab and set as below.
(6) Click “Run”.
(7) After downloading, check “OK” message.



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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.
- ADC adjustment is OTP (Auto ADC)

4.2. EDID Download

4.2.1. Overview

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

4.2.2. Equipment

(1) Since EDID data is embedded, EDID download JIG, HDMI cable is not need.
(2) Adjust by using remote controller

4.2.3. Download method (using DFT)

※ PC(for communication through RS-232C), UART baud rate: 115200 bps
Command : aa 00 00 (Start Factory mode)
Command : ae 00 10 (Download All EDID)
Command : aa 00 90 (End of Factory mode)

4.2.4. Download method (using Service Remocon)

(1) Press Adj. key on the Adj. R/C.
(2) Select EDID D/L menu.
(3) By pressing Enter key, EDID download will begin
(4) If Download is successful, OK is display, but If Download is failure, NG is displayed.
(5) If Download is failure, Re-try downloads.
※Caution : When EDID Download, must remove HDMI Cable.
(6) EDID Write confirmation

EDID D/L (PCM)
HDMI1 : OK
HDMI2 : OK

4.2.5. EDID DATA

4.2.5.1. North America (PCM)
4.2.5.1.1. FHD Model

■ HDMI 1-FHD-8BIT (C/S : E808)
EDID Block 0, Bytes 0-127 [00H-7FH]

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	00	FF	FF	FF	FF	FF	FF	00	1E	6D	01	00	01	01	01	01
10	01	17	01	03	80	A0	5A	78	0A	EE	91	A3	54	4C	99	26
20	0F	50	54	A1	08	00	31	40	45	40	61	40	71	40	81	80
30	01	01	01	01	01	01	02	3A	80	18	71	38	2D	40	58	2C
40	45	00	40	84	63	00	00	1E	66	21	50	B0	51	00	1B	30
50	40	70	36	00	40	84	63	00	00	1E	00	00	00	FD	00	3A
60	3E	1E	53	10	00	0A	20	20	20	20	20	20	00	00	00	FC
70	00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	01	E8

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

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	02	03	19	F1	48	90	22	20	05	04	03	02	01	23	09	57
10	07	67	03	0C	00	10	00	80	1E	02	3A	80	18	71	38	2D
20	40	58	2C	04	05	40	84	63	00	00	1E	01	1D	80	18	71
30	1C	16	20	58	2C	25	00	40	84	63	00	00	9E	01	1D	00
40	72	51	D0	1E	20	6E	28	55	00	40	84	63	00	00	1E	8C
50	0A	D0	8A	20	E0	2D	10	10	3E	96	00	40	84	63	00	00
60	18	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	08

■ HDMI 2-FHD-8BIT (C/S : E8F8)
EDID Block 0, Bytes 0-127 [00H-7FH]

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	00	FF	FF	FF	FF	FF	FF	00	1E	6D	01	00	01	01	01	01
10	01	17	01	03	80	A0	5A	78	0A	EE	91	A3	54	4C	99	26
20	0F	50	54	A1	08	00	31	40	45	40	61	40	71	40	81	80
30	01	01	01	01	01	01	02	3A	80	18	71	38	2D	40	58	2C
40	45	00	40	84	63	00	00	1E	66	21	50	B0	51	00	1B	30
50	40	70	36	00	40	84	63	00	00	1E	00	00	00	FD	00	3A
60	3E	1E	53	10	00	0A	20	20	20	20	20	20	00	00	00	FC
70	00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	01	E8

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

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	02	03	19	F1	48	90	22	20	05	04	03	02	01	23	09	57
10	07	67	03	0C	00	20	00	80	1E	02	3A	80	18	71	38	2D
20	40	58	2C	04	05	40	84	63	00	00	1E	01	1D	80	18	71
30	1C	16	20	58	2C	25	00	40	84	63	00	00	9E	01	1D	00
40	72	51	D0	1E	20	6E	28	55	00	40	84	63	00	00	1E	8C
50	0A	D0	8A	20	E0	2D	10	10	3E	96	00	40	84	63	00	00
60	18	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	F8

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4.2.5.1.2. HD Model

■ HDMI 1-HD (C/S : 7008)
EDID Block 0, Bytes 0-127 [00H-7FH]

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	00	FF	FF	FF	FF	FF	FF	00	1E	6D	01	00	01	01	01	01
10	01	17	01	03	80	A0	5A	78	0A	EE	91	A3	54	4C	99	26
20	0F	50	54	A1	08	00	31	40	45	40	61	40	71	40	01	01
30	01	01	01	01	01	01	66	21	50	B0	51	00	1B	30	40	70
40	36	00	40	84	63	00	00	1E	64	19	00	40	41	00	26	30
50	18	88	36	00	40	84	63	00	00	1E	00	00	00	FD	00	3A
60	3E	1E	53	10	00	0A	20	20	20	20	20	20	00	00	00	FC
70	00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	01	70

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

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	02	03	19	F1	48	10	22	20	05	84	03	02	01	23	09	57
10	07	67	03	0C	00	10	00	80	1E	02	3A	80	18	71	38	2D
20	40	58	2C	04	05	40	84	63	00	00	1E	01	1D	80	18	71
30	1C	16	20	58	2C	25	00	40	84	63	00	00	9E	01	1D	00
40	72	51	D0	1E	20	6E	28	55	00	40	84	63	00	00	1E	8C
50	0A	D0	8A	20	E0	2D	10	10	3E	96	00	40	84	63	00	00
60	18	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	08

■ HDMI 2-HD (C/S : 70F8)
EDID Block 0, Bytes 0-127 [00H-7FH]

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	00	FF	FF	FF	FF	FF	FF	00	1E	6D	01	00	01	01	01	01
10	01	17	01	03	80	A0	5A	78	0A	EE	91	A3	54	4C	99	26
20	0F	50	54	A1	08	00	31	40	45	40	61	40	71	40	01	01
30	01	01	01	01	01	01	66	21	50	B0	51	00	1B	30	40	70
40	36	00	40	84	63	00	00	1E	64	19	00	40	41	00	26	30
50	18	88	36	00	40	84	63	00	00	1E	00	00	00	FD	00	3A
60	3E	1E	53	10	00	0A	20	20	20	20	20	20	00	00	00	FC
70	00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	01	70

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

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	02	03	19	F1	48	10	22	20	05	84	03	02	01	23	09	57
10	07	67	03	0C	00	20	00	80	1E	02	3A	80	18	71	38	2D
20	40	58	2C	04	05	40	84	63	00	00	1E	01	1D	80	18	71
30	1C	16	20	58	2C	25	00	40	84	63	00	00	9E	01	1D	00
40	72	51	D0	1E	20	6E	28	55	00	40	84	63	00	00	1E	8C
50	0A	D0	8A	20	E0	2D	10	10	3E	96	00	40	84	63	00	00
60	18	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	F8

4.2.5.2. AC3 EDID Data
4.2.5.2.1. FHD Model

■ HDMI 1-FHD-8BIT (C/S : E896)
EDID Block 0, Bytes 0-127 [00H-7FH]

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	00	FF	FF	FF	FF	FF	FF	00	1E	6D	01	00	01	01	01	01
10	01	17	01	03	80	A0	5A	78	0A	EE	91	A3	54	4C	99	26
20	0F	50	54	A1	08	00	31	40	45	40	61	40	71	40	81	80
30	01	01	01	01	01	01	02	3A	80	18	71	38	2D	40	58	2C
40	45	00	40	84	63	00	00	1E	66	21	50	B0	51	00	1B	30
50	40	70	36	00	40	84	63	00	00	1E	00	00	00	FD	00	3A
60	3E	1E	53	10	00	0A	20	20	20	20	20	20	00	00	00	FC
70	00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	01	E8

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

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	02	03	1C	F1	48	90	22	20	05	04	03	02	01	26	15	07
10	50	09	57	07	67	03	0C	00	10	00	80	1E	02	3A	80	18
20	71	38	2D	40	58	2C	04	05	40	84	63	00	00	1E	01	1D
30	80	18	71	1C	16	20	58	2C	25	00	40	84	63	00	00	9E
40	01	1D	00	72	51	D0	1E	20	6E	28	55	00	40	84	63	00
50	00	1E	8C	0A	D0	8A	20	E0	2D	10	10	3E	96	00	40	84
60	63	00	00	18	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	96

■ HDMI 2-FHD-8BIT (C/S : E886)
EDID Block 0, Bytes 0-127 [00H-7FH]

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	00	FF	FF	FF	FF	FF	FF	00	1E	6D	01	00	01	01	01	01
10	01	17	01	03	80	A0	5A	78	0A	EE	91	A3	54	4C	99	26
20	0F	50	54	A1	08	00	31	40	45	40	61	40	71	40	81	80
30	01	01	01	01	01	01	02	3A	80	18	71	38	2D	40	58	2C
40	45	00	40	84	63	00	00	1E	66	21	50	B0	51	00	1B	30
50	40	70	36	00	40	84	63	00	00	1E	00	00	00	FD	00	3A
60	3E	1E	53	10	00	0A	20	20	20	20	20	20	00	00	00	FC
70	00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	01	E8

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

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	02	03	1C	F1	48	90	22	20	05	04	03	02	01	26	15	07
10	50	09	57	07	67	03	0C	00	20	00	80	1E	02	3A	80	18
20	71	38	2D	40	58	2C	04	05	40	84	63	00	00	1E	01	1D
30	80	18	71	1C	16	20	58	2C	25	00	40	84	63	00	00	9E
40	01	1D	00	72	51	D0	1E	20	6E	28	55	00	40	84	63	00
50	00	1E	8C	0A	D0	8A	20	E0	2D	10	10	3E	96	00	40	84
60	63	00	00	18	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	86

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4.2.5.2.2. HD Model

■ HDMI 1-HD (C/S : 7096)
EDID Block 0, Bytes 0-127 [00H-7FH]

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	00	FF	FF	FF	FF	FF	FF	00	1E	6D	01	00	01	01	01	01
10	01	17	01	03	80	A0	5A	78	0A	EE	91	A3	54	4C	99	26
20	0F	50	54	A1	08	00	31	40	45	40	61	40	71	40	01	01
30	01	01	01	01	01	01	66	21	50	B0	51	00	1B	30	40	70
40	36	00	40	84	63	00	00	1E	64	19	00	40	41	00	26	30
50	18	88	36	00	40	84	63	00	00	1E	00	00	00	FD	00	3A
60	3E	1E	53	10	00	0A	20	20	20	20	20	20	00	00	00	FC
70	00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	01	70

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

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	02	03	1C	F1	48	10	22	20	05	84	03	02	01	26	15	07
10	50	09	57	07	67	03	0C	00	10	00	80	1E	02	3A	80	18
20	71	38	2D	40	58	2C	04	05	40	84	63	00	00	1E	01	1D
30	80	18	71	1C	16	20	58	2C	25	00	40	84	63	00	00	9E
40	01	1D	00	72	51	D0	1E	20	6E	28	55	00	40	84	63	00
50	00	1E	8C	0A	D0	8A	20	E0	2D	10	10	3E	96	00	40	84
60	63	00	00	18	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	96

■ HDMI 2-HD (C/S : 7086)
EDID Block 0, Bytes 0-127 [00H-7FH]

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	00	FF	FF	FF	FF	FF	FF	00	1E	6D	01	00	01	01	01	01
10	01	17	01	03	80	A0	5A	78	0A	EE	91	A3	54	4C	99	26
20	0F	50	54	A1	08	00	31	40	45	40	61	40	71	40	01	01
30	01	01	01	01	01	01	66	21	50	B0	51	00	1B	30	40	70
40	36	00	40	84	63	00	00	1E	64	19	00	40	41	00	26	30
50	18	88	36	00	40	84	63	00	00	1E	00	00	00	FD	00	3A
60	3E	1E	53	10	00	0A	20	20	20	20	20	20	00	00	00	FC
70	00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	01	70

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

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	02	03	1C	F1	48	10	22	20	05	84	03	02	01	26	15	07
10	50	09	57	07	67	03	0C	00	20	00	80	1E	02	3A	80	18
20	71	38	2D	40	58	2C	04	05	40	84	63	00	00	1E	01	1D
30	80	18	71	1C	16	20	58	2C	25	00	40	84	63	00	00	9E
40	01	1D	00	72	51	D0	1E	20	6E	28	55	00	40	84	63	00
50	00	1E	8C	0A	D0	8A	20	E0	2D	10	10	3E	96	00	40	84
60	63	00	00	18	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	86

4.3. Tool Option Input

- Input Model Tool Option according to BOM

5. Final Assembly Adjustment

5.1. White Balance Adjustment

5.1.1. Overview

5.1.1.1. W/B adj. Objective & How-it-works

(1) Objective: To reduce each Panel's W/B deviation

(2) 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.

(3) Adj. condition: normal temperature

- Surrounding Temperature: 25±5 ºC
- Warm-up time: About 5 Min
- Surrounding Humidity: 20% ~ 80%
- Before White balance adjustment, Keep power on status, don't power off

5.1.1.2. Adj. condition and cautionary items

(1) Lighting condition in surrounding area surrounding lighting should be lower 10 lux. Try to isolate adj. area into dark surrounding.

(2) Probe location: Color Analyzer (CA-210) probe should be within 10cm and perpendicular of the module surface (80°~ 100°)

(3) Aging time

- After Aging Start, Keep the Power ON status during 5 Minutes.
- In case of LCD, Back-light on should be checked using no signal or Full-white pattern.

5.1.2. Equipment

(1) Color Analyzer: CA-210 (NCG: CH 9 / WCG: CH12 / LED: CH14)

(2) Adj. Computer(During auto adj., RS-232C protocol is needed)

(3) Adjust Remocon

(4) Video Signal Generator MSPG-925F 720p/204-Gray (Model:217, Pattern:49)

→ Only when internal pattern is not available

※ Color Analyzer Matrix should be calibrated using CS-1000

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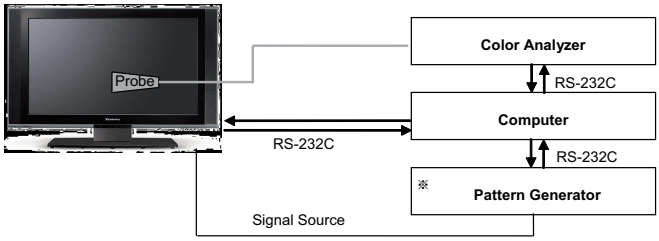
5.1.3. Equipment connection



5.1.4. Adjustment Command (Protocol)

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

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

(2) Adjustment Map

	Adj. item	Command (lower case ASCII)		Data Range (Hex.)		Default (Decimal)
		CMD1	CMD2	MIN		MAX
Cool	R Gain	j	g	00	C0	172
	G Gain	j	h	00	C0	172
	B Gain	j	i	00	C0	192
	R Cut					128
	G Cut					128
	B Cut					128
Medium	R Gain	j	a	00	C0	192
	G Gain	j	b	00	C0	192
	B Gain	j	c	00	C0	192
	R Cut					128
	G Cut					128
	B Cut					128
Warm	R Gain	j	d	00	C0	192
	G Gain	j	e	00	C0	192
	B Gain	j	f	00	C0	172
	R Cut					128
	G Cut					128
	B Cut					128

5.1.5. Adjustment method

5.1.5.1. Auto WB calibration

(1) Set TV in ADJ mode using P-ONLY key (or POWER ON key)
(2) Place optical probe on the center of the display
- It need to check probe condition of zero calibration before adjustment.
(3) Connect RS-232C Cable
(4) Select mode in ADJ Program and begin a adjustment.
(5) When WB adjustment is completed with OK message, check adjustment status of pre-set mode (Cool, Medium, Warm)
(6) Remove probe and RS-232C cable.

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

5.1.5.2. Manual adj. method

(1) Set TV in Adj. mode using POWER ON
(2) Zero Calibrate the probe of Color Analyzer, then place it on the center of LCD module within 10cm of the surface..
(3) Press ADJ key -> EZ adjust using adj. R/C -> 6. White-Balance then press the cursor to the right (KEY►). (When KEY(►) is pressed 204 Gray(80IRE) internal pattern will be displayed)
(4) One of R Gain / G Gain / B Gain should be fixed at 192, and the rest will be lowered to meet the desired value.
(5) Adj. is performed in COOL, MEDIUM, WARM 3 modes of color temperature.

※ CASE
First adjust the coordinate far away from the target value(x, y).
(1) x, y > target
i) Decrease the R, G.
(2) x, y < target
i) First decrease the B gain,
ii) Decrease the one of the others.
(3) x >target , y < target
i) First decrease B, so make y a little more than the target.
ii) Adjust x value by decreasing the R
(4) x < target , y > target
i) First decrease B, so make x a little more than the target.
ii) Adjust x value by decreasing the G

► How to adjust
(1) Fix G gain at least 172
Adjust R, B Gain (In Case of Mostly Blue Gain Saturation)
(2) When R or B Gain > 255, Release Fixed G Gain and Readjust

※ CASE Medium / Warm
First adjust the coordinate far away from the target value(x, y).
(1) x, y > target
i) Decrease the R, G.
(2) x, y < target
i) First decrease the B gain,
ii) Decrease the one of the others.
(3) x > target , y < target
i) First decrease B, so make y a little more than the target.
ii) Adjust x value by decreasing the R
(4) x < target , y > target
i) First decrease B, so make x a little more than the target.
ii) Adjust x value by decreasing the G

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5.1.6. Reference
(White Balance Adj. coordinate and color temperature)

▪ Luminance: 204 Gray, 80IRE
▪ Normal line
model: (normal line)LN5xxx, LA6xxx, LA7xxx, LA8xxx

H/R Time(Min)		Cool		Medium		Warm	
		x	y	x	x	y	x
		269	273	285	293	313	329
1	0-2	281	290	297	310	322	342
2	3-5	280	288	296	308	321	340
3	6-9	279	287	295	307	320	339
4	10-19	277	284	293	304	318	336
5	20-35	275	280	291	300	316	332
6	36-49	273	277	289	297	314	329
7	50-79	271	275	287	295	312	327
8	80-119	270	274	286	294	311	326
9	Over 120	269	273	285	293	310	325

▪ Aging chamber line
(Aging chamber) Model : LN5xxx, LA6xxx, LA7xxx, LA8xxx
▪ Standard color coordinate and temperature using CA-210(CH-14) – by aging time

H/R Time(Min)		Cool		Medium		Warm	
		x	y	x	x	y	x
		269	273	285	293	313	329
1	0-5	280	288	296	308	321	340
2	6-10	276	283	292	303	317	335
3	11-20	273	278	289	298	314	330
4	21-30	270	275	286	295	311	327
5	31-40	267	272	283	292	308	324
6	41-50	266	270	282	290	307	322
7	51-80	265	269	281	289	306	321
8	81-119	264	267	280	287	305	319
9	Over 120	263	266	279	286	304	318

5.2. Option selection per country

5.2.1. Overview
(1) Tool option selection is only done for models in Non-USA North America due to rating
(2) Applied model: LA32B Chassis applied to CANADA and MEXICO

5.2.2. Country Group selection
(1) Press ADJ key on the Adj. R/C, and then select Country Group Menu
(2) Depending on destination, select US, then on the lower Country option, select US, CA, MX.
Selection is done using +, - KEY
(3) Using DFT(Auto)
※ PC (for communication through RS-232C) -> UART Baud rate : 115200 bps
Command : ah 00 00 DATA(Area Number(hexadecimal))

ITEM	DATA(Area Number)	AREA
AREA OPTION1	0	USA
	1	CANADA
	2	MEXICO

5.2.3. Tool Option inspection
▪ Press Adj. key on the Adj. R/C, then select Tool option

Model	Module	Tool option1	Tool option2	Tool option3	Tool option4
32LN5300-UB	LGD	545	41478	37004	12031
47LN5400-UA	LGD	1569	33286	37004	46847
55LN5400-UA	LGD(POLA)	2065	33286	37004	40703
50LN5400-UA	LGD	1825	33286	37004	48895
42LN5400-UA	LGD	1313	33286	37004	36607
42LN5300-UB	LGD	1313	41478	37004	03839
42LN5300-UB	AUO	9505	41478	37004	03839
42LN5300-UB	LGD(POLA)	1297	41478	37004	03839
39LN5300-UB	CMI(POLA)	5137	41478	37004	03839
39LN5300-UB	AUO(POLA)	9233	41478	37004	03839
32LN5300-UB	CSOT(POLA)	4625	41478	37004	03839
32LN530B-UB	LGD	545	45574	37004	03839
32LN530B-UB	LGD(POLA)	545	45574	37004	03839

※ Tool option can be reconstructed by Software

5.3. Ship-out mode check (In-stop)
- After final inspection, press In-Stop key of the Adj. R/C and check that the unit goes to Stand-by mode

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6. GND and HI-POT Test

6.1. GND & HI-POT auto-check preparation

(1) Check the POWER CABLE and SIGNAL CABE insertion condition

6.2. GND & HI-POT auto-check

(1) Pallet moves in the station. (POWER CORD / AV CORD is tightly inserted)
(2) Connect the AV JACK Tester.
(3) Controller (GWS103-4) on.
(4) GND Test (Auto)
- If Test is failed, Buzzer operates.
- If Test is passed, execute next process (Hi-pot test). (Remove A/V CORD from A/V JACK BOX)

(5) HI-POT test (Auto)
- If Test is failed, Buzzer operates.
- If Test is passed, GOOD Lamp on and move to next process automatically

6.3. Checkpoint

(1) Test voltage
- GND: 1.5KV/min at 100mA
- SIGNAL: 3KV/min at 100mA

(2) TEST time: 1 second
(3) TEST POINT
- GND Test = POWER CORD GND and SIGNAL CABLE GND.
- Hi-pot Test = POWER CORD GND and LIVE & NEUTRAL.

(4) LEAKAGE CURRENT: At 0.5mArms

7. AUDIO output check

7.1. Audio input condition

(1) RF input: Mono, 1KHz sine wave signal, 100% Modulation
(2) CVBS, Component: 1KHz sine wave signal (0.4Vrms)

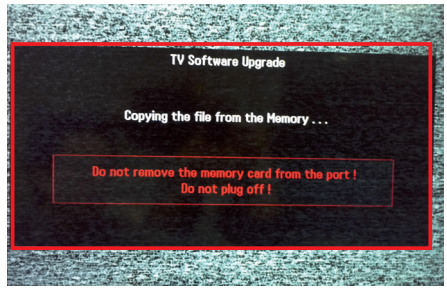
7.2. Specification

No	Item	Min	Typ	Max	Unit	Remark
1	Audio practical max Output, L/R (Distortion=10% max Output)	9.0 8.5	10.9 9.3	12.0 9.8	W Vrms	(1) Measurement condition - EQ/AVL/Clear Voice: Off (2) Speaker (8Ω Impedance)

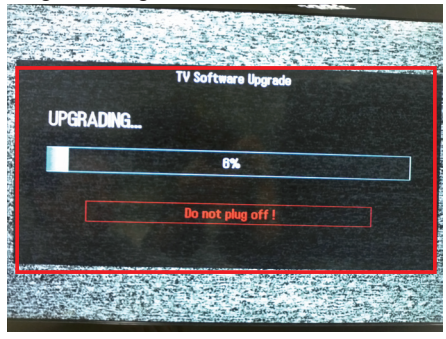
* USB S/W Download (option, Service only)

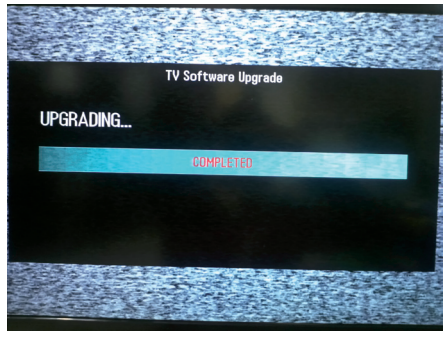
(1) Put the USB Stick to the USB socket.
(2) Automatically detecting update file in USB Stick.
- If your downloaded program version in USB Stick is Low, it didn't work. But your downloaded version is High, USB data is automatically detecting

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



(4) Updating is staring.





(5) After updating is complete, The TV will restart automatically.
(6) If TV turns on, check your updated version and Tool option. (refer to the next page about tool option)
* If downloading version is higher than your TV have, TV can lost all channel data. In this case, you have to channel recover. If all channel data is cleared, you didn't have a DTV/ATV test on production line.

※After downloading, TOOL OPTION setting is needed again.
(1) Push "IN-START" key in service remote controller.
(2) Select "Tool Option 1" and Push “OK” button.
(3) Punch in the number. (Each model has their number.)

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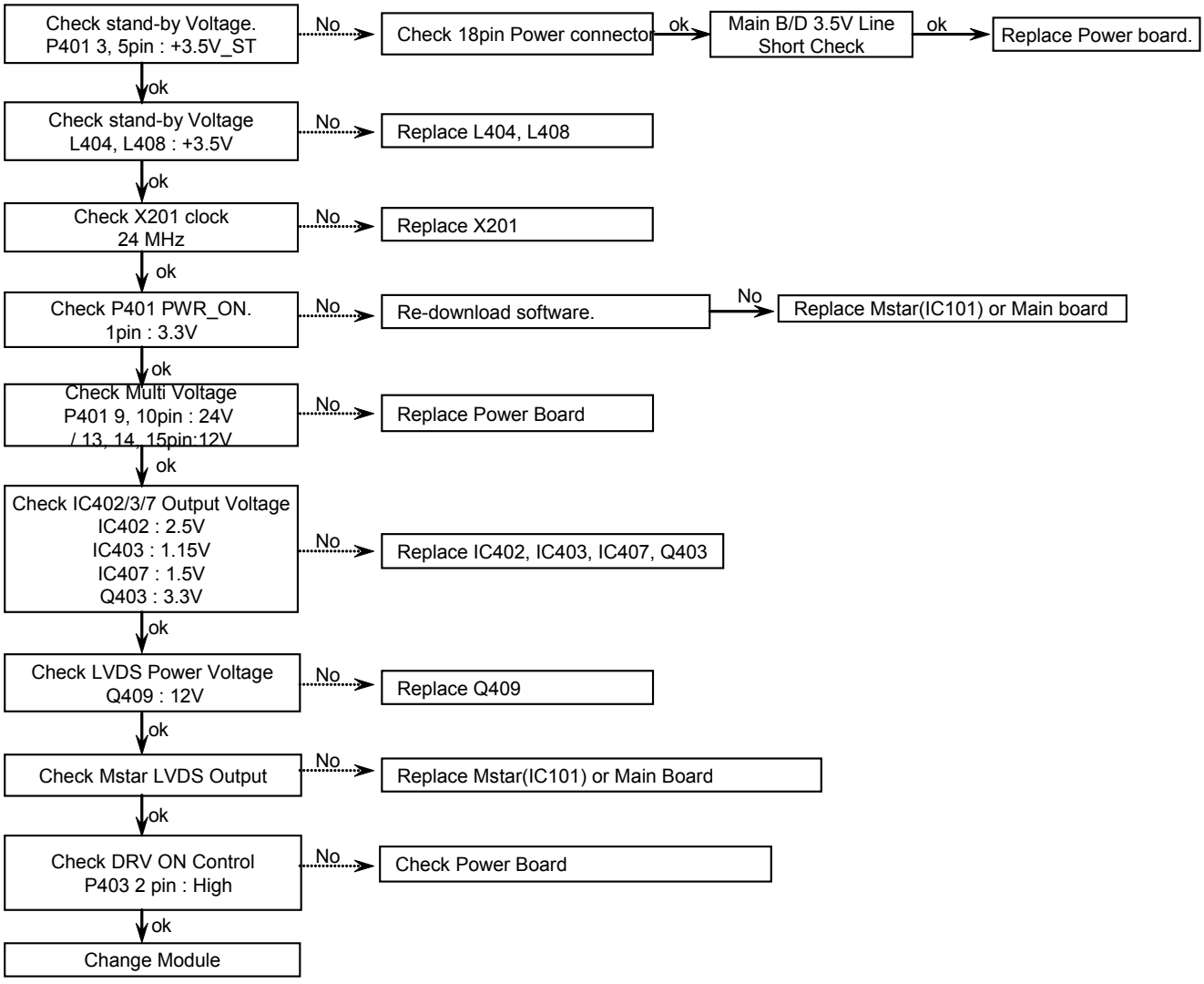
TROUBLE SHOOTING

1. Power-up boot check



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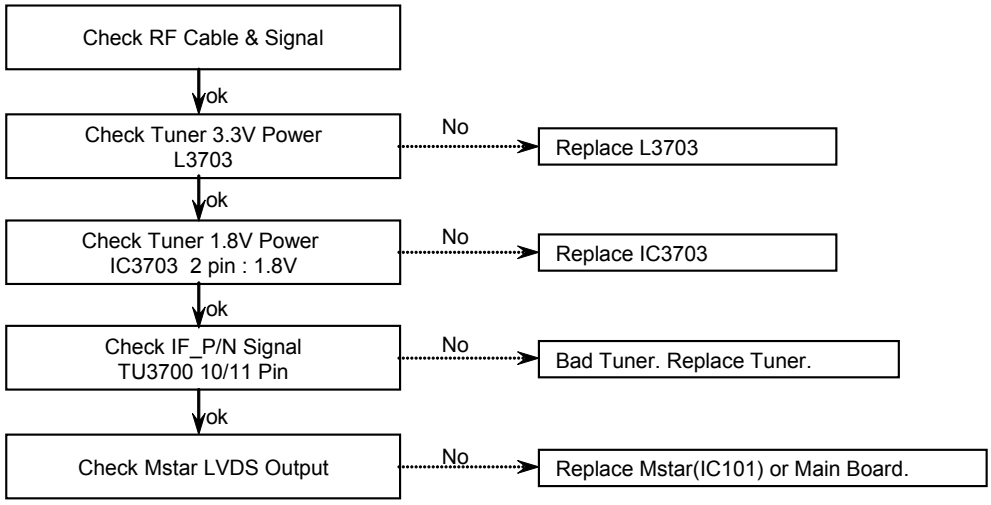
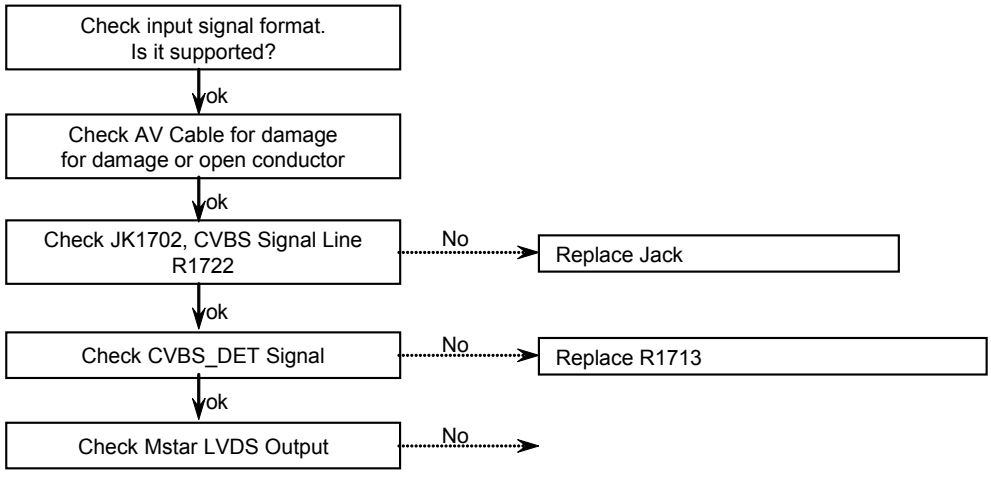
2. Digital/Analog TV Video



3. AV Video



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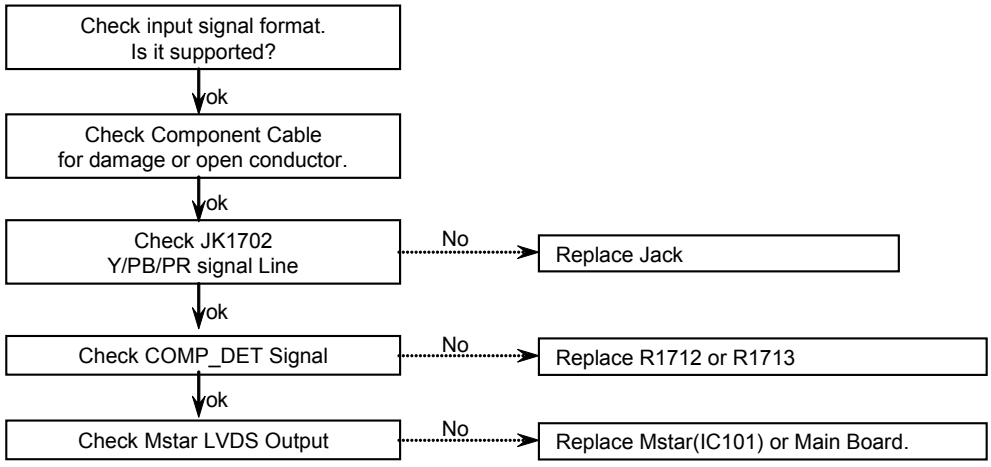
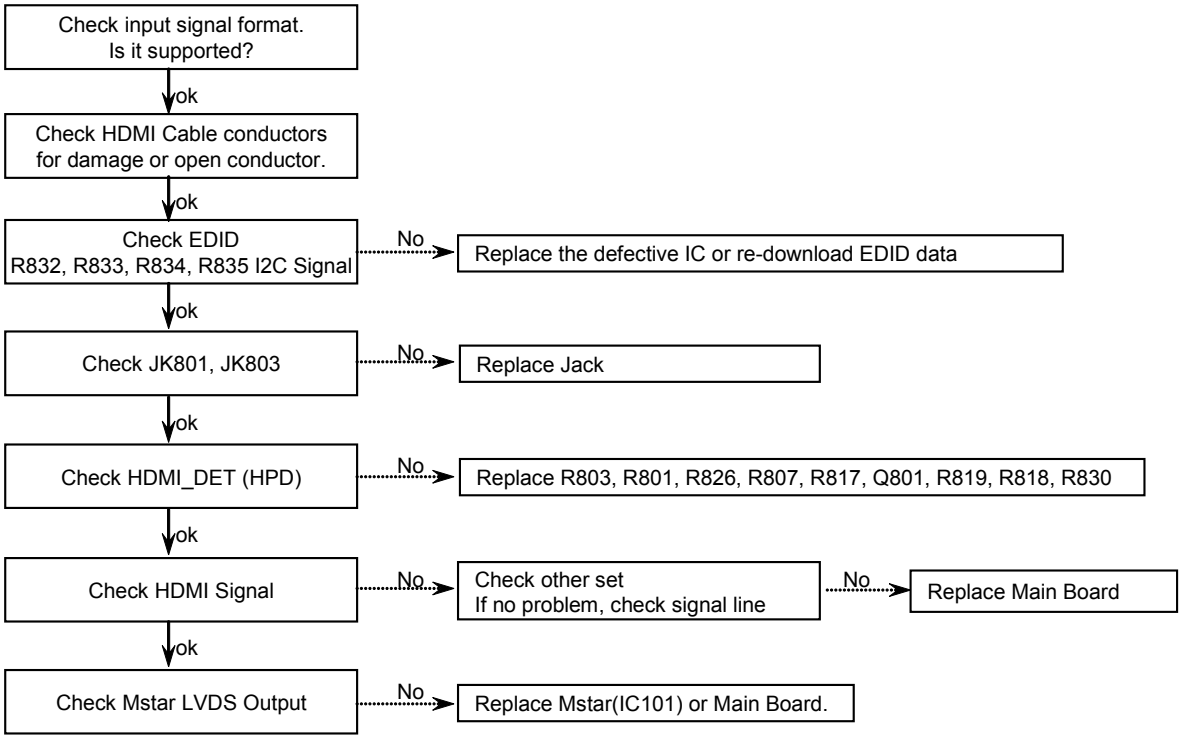
4. Component Video



5. HDMI Video



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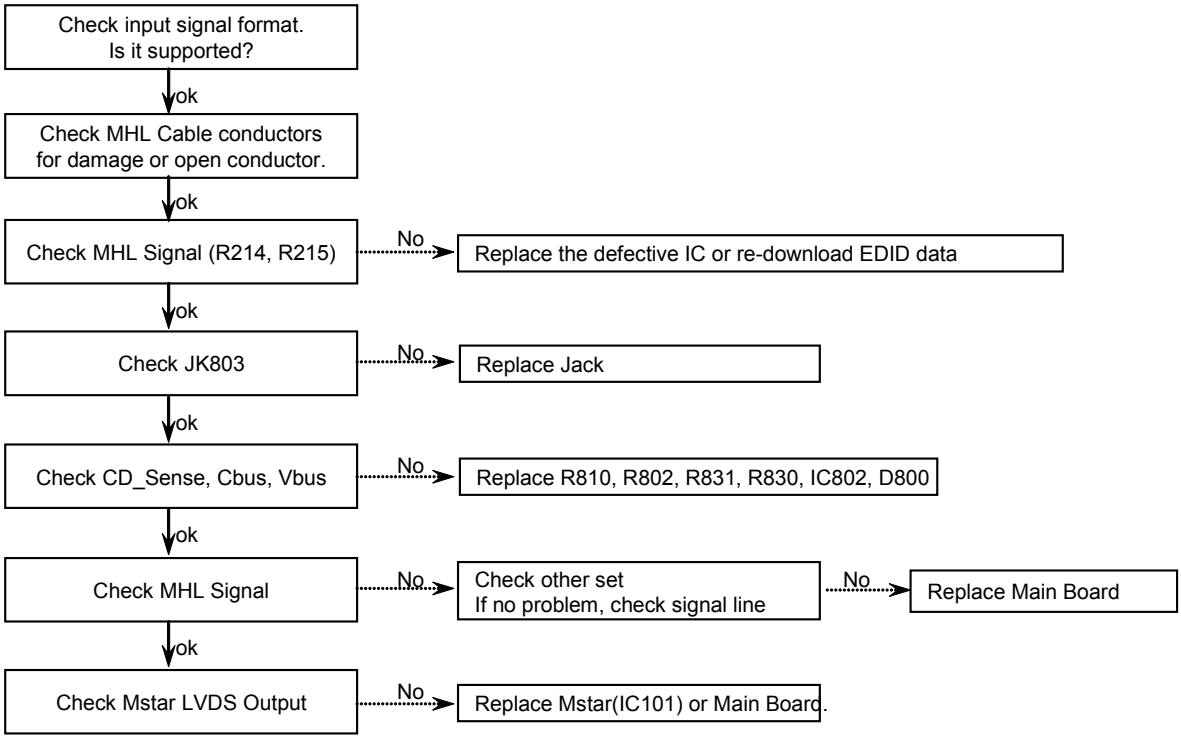
6. MHL Video



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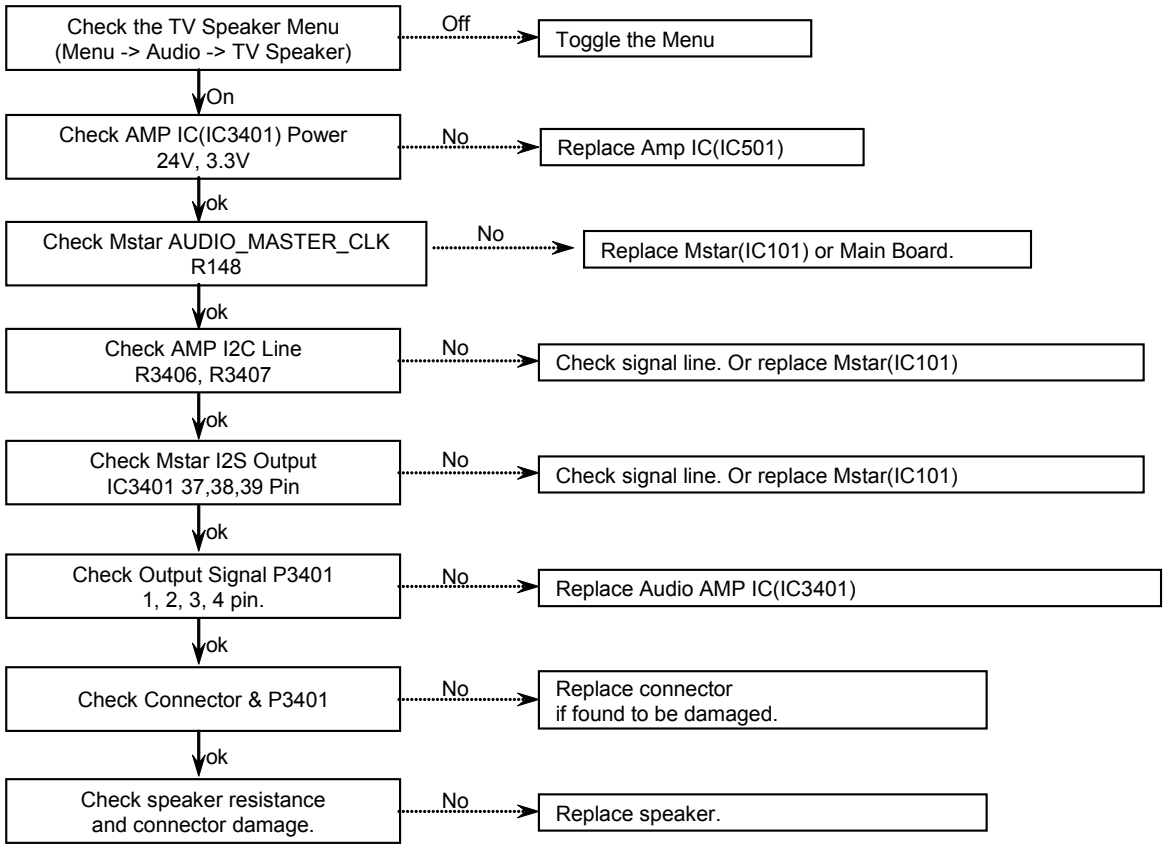
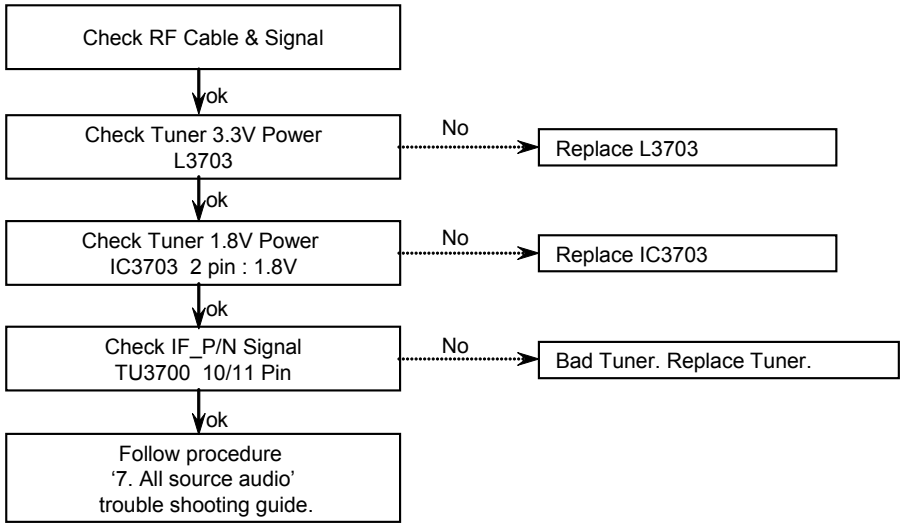
7. All Source Audio



8. Digital/Analog TV Audio



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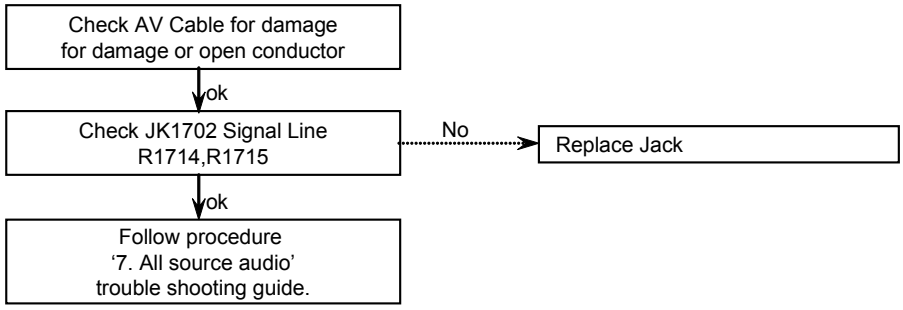
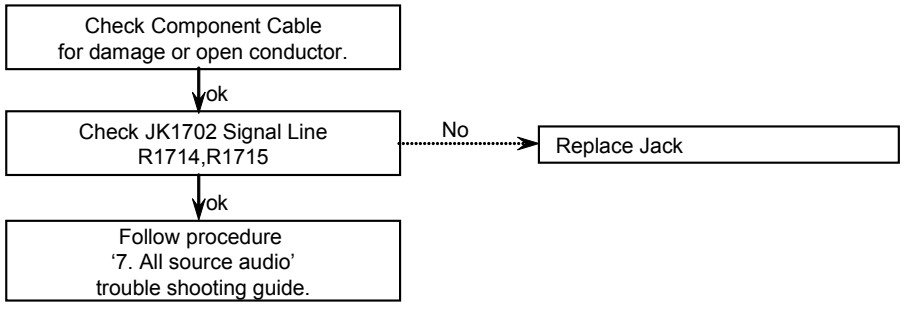
9. AV Audio



10. Component Audio



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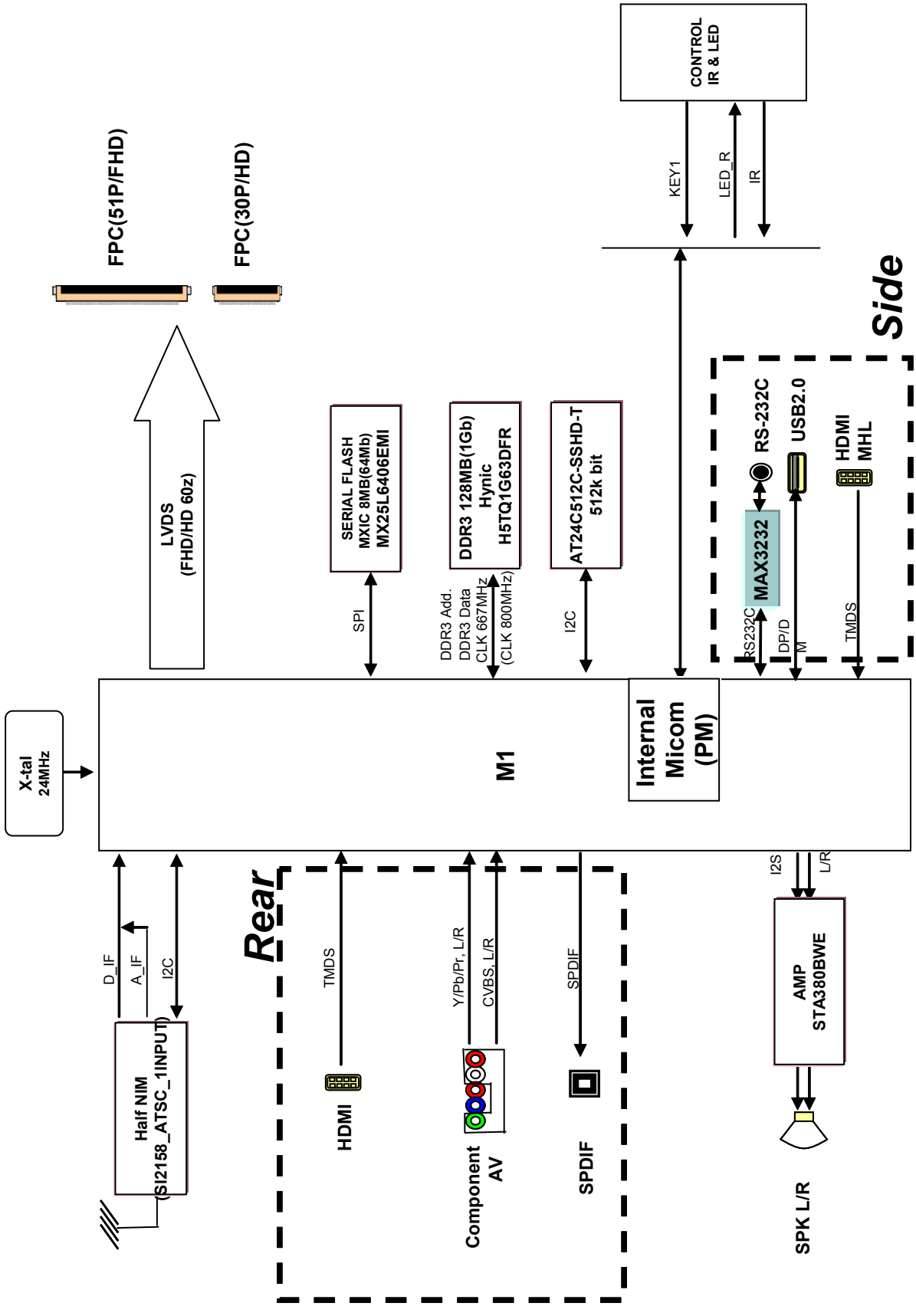
BLOCK DIAGRAM



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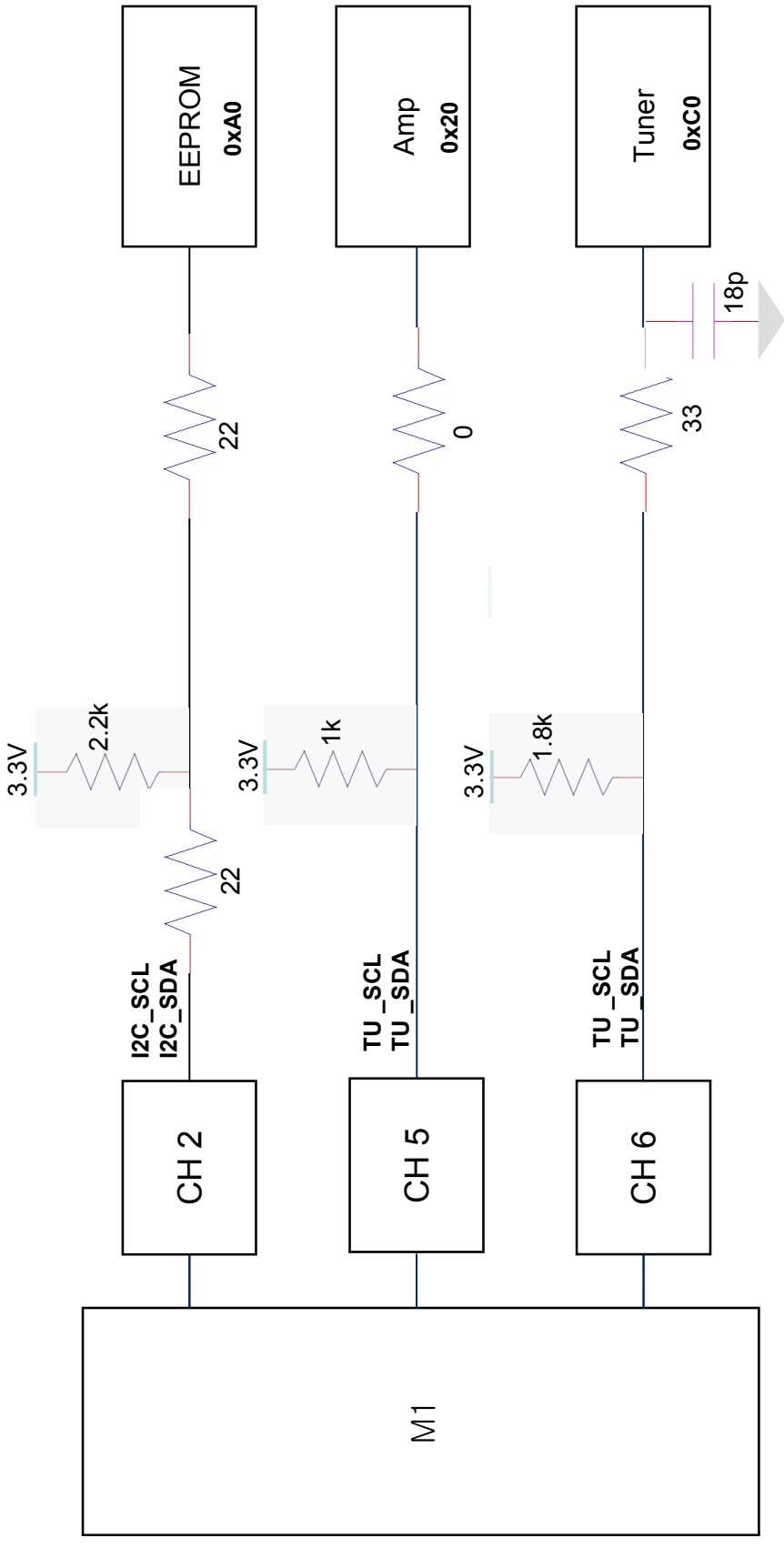

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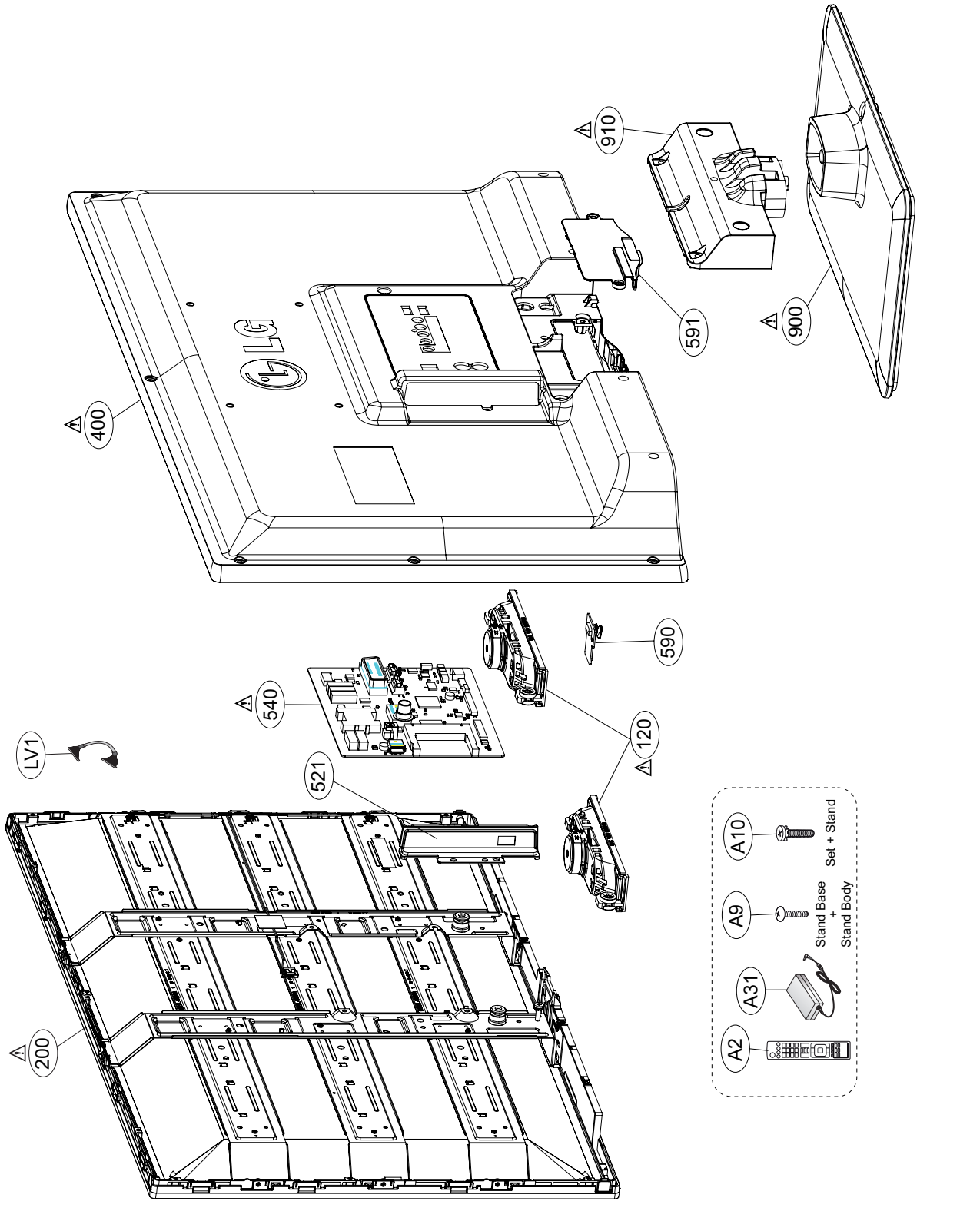
EXPLODED VIEW

IMPORTANT SAFETY NOTICE

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



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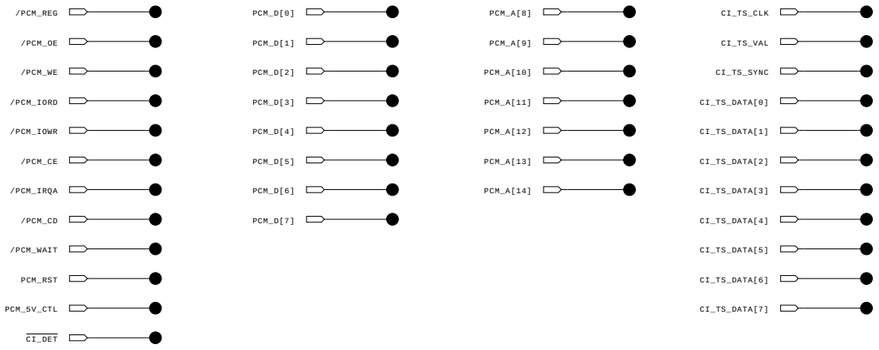
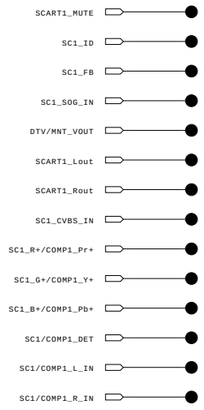
TP for NON-EU models(except EU and China)

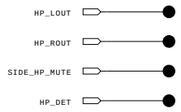
TP for CI slot



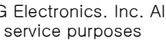
TP for SCART



TP for Headphone



TP for S2



TP for FE_TS_DATA

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MODEL	NC4_S7LRM	DATE	2012.07.02
BLOCK	TP_NON_EN	SHEET	3 /

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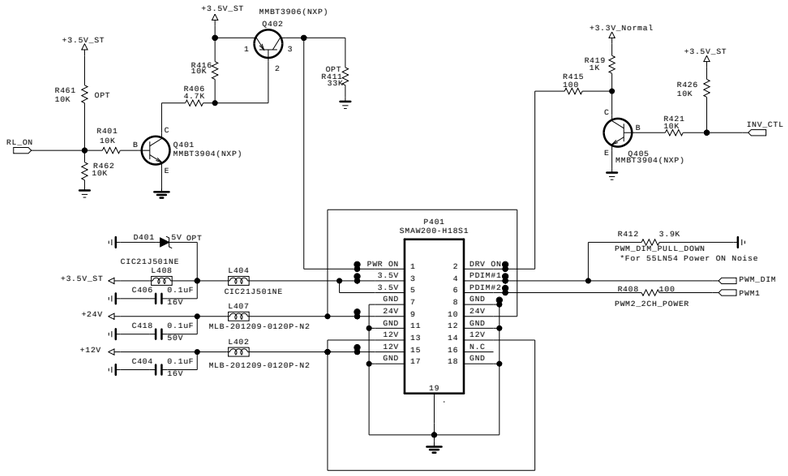
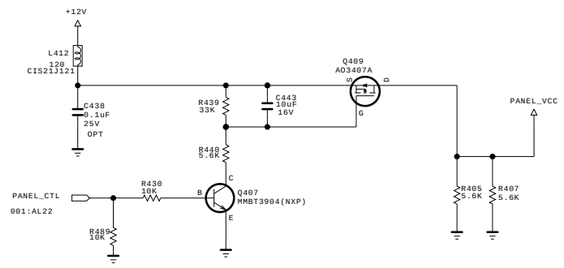
L13 POWER BLOCK (POWER DETECT 2)

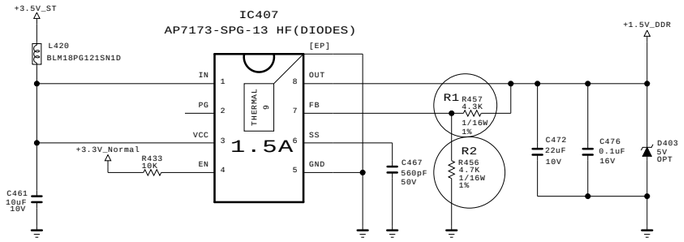
FROM LIPS & POWER B/D



PANEL_POWER

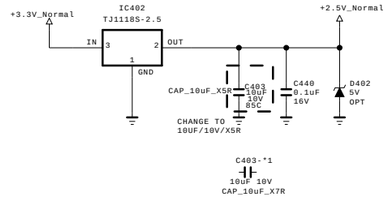


+1.5V_DDR



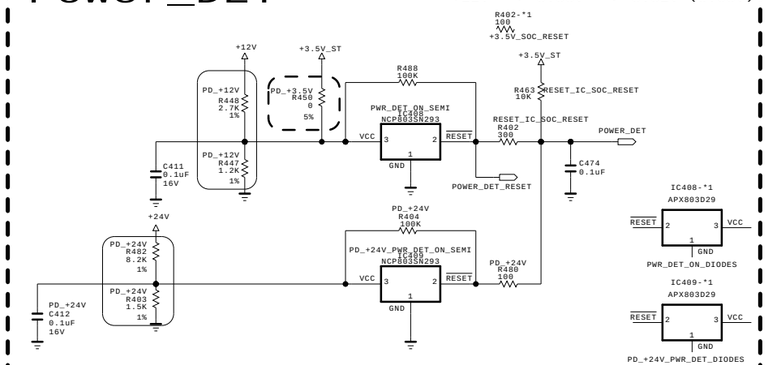
Vout=0.8*(1+R1/R2)=1.5319

+2.5V_Normal

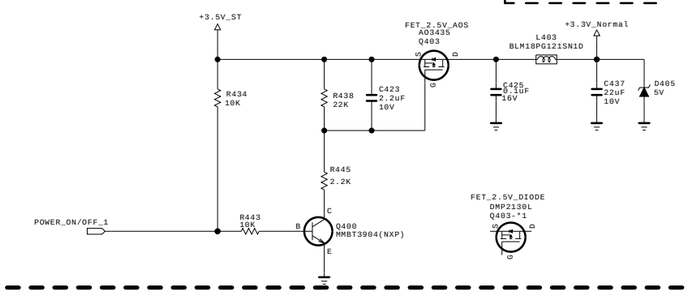


Power_DET

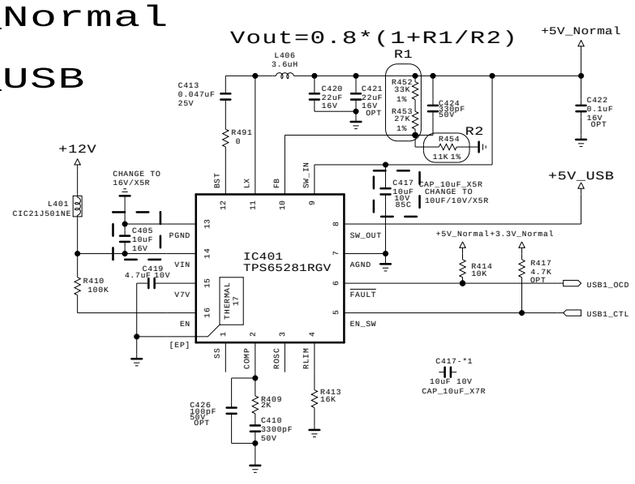
+3.5V_ST --> 3.375V --> 3.46V
+24V --> 3.78V --> 3.92V (3.79V)
+12V --> 3.58V --> 3.82V (3.68V)



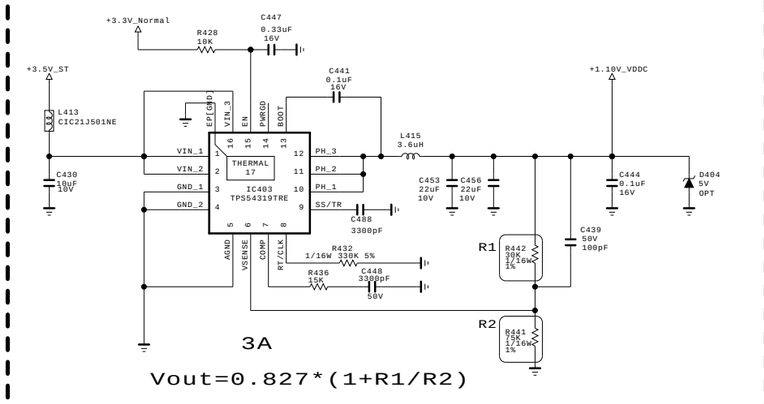
+3.3V_Normal



+5V_Normal & +5V_USB



S7LR core 1.15V volt



Vout=0.827*(1+R1/R2)

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MODEL	NC4_S7LRM	DATE	2012/09/19
BLOCK	Power_PD2	SHEET	4

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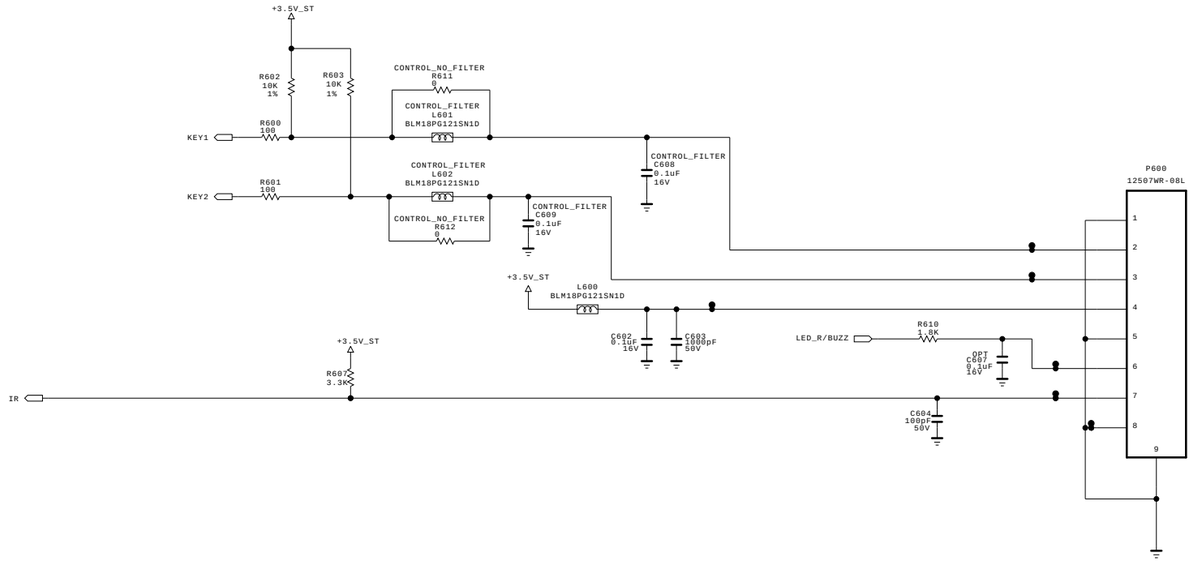
IR/LED and Control



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MODEL	NC4_S7LRM	DATE	2012/07/18
BLOCK	IR/CONTROL	SHEET	6 /

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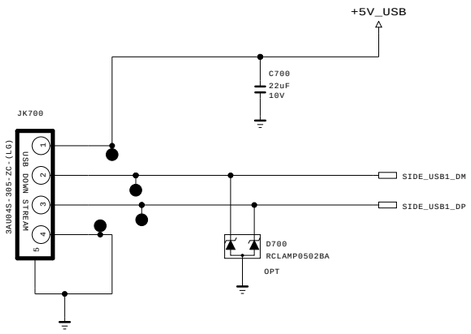
USB (SIDE)



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MODEL	NC4_S7LRM	DATE	12/06/20
BLOCK	USB	SHEET	7 /

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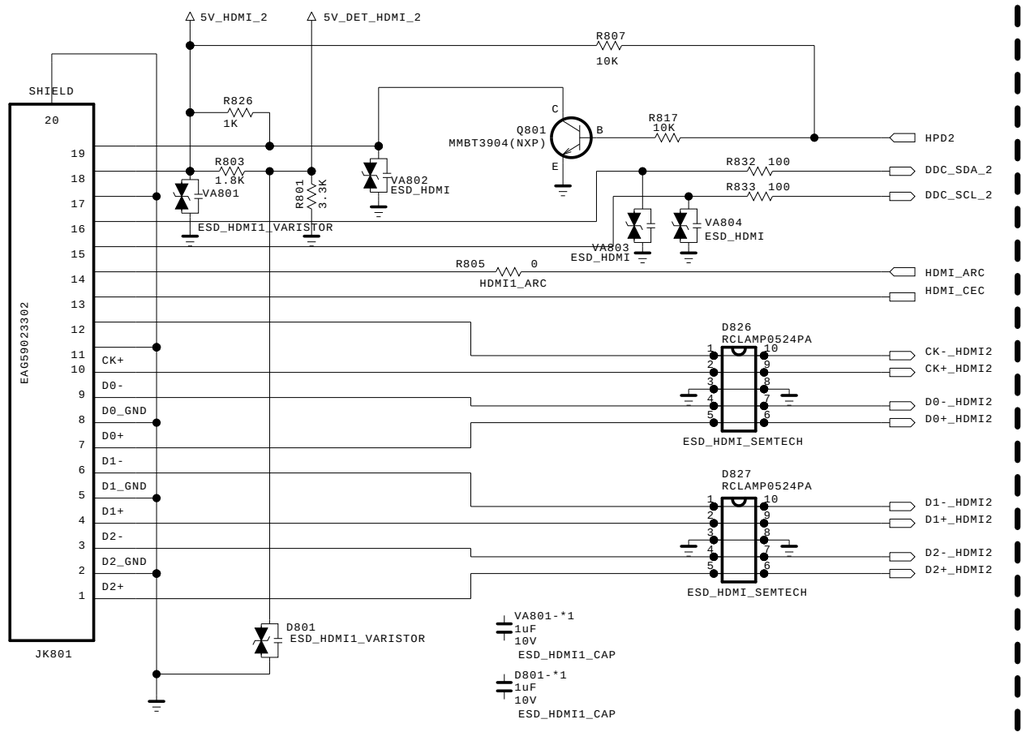
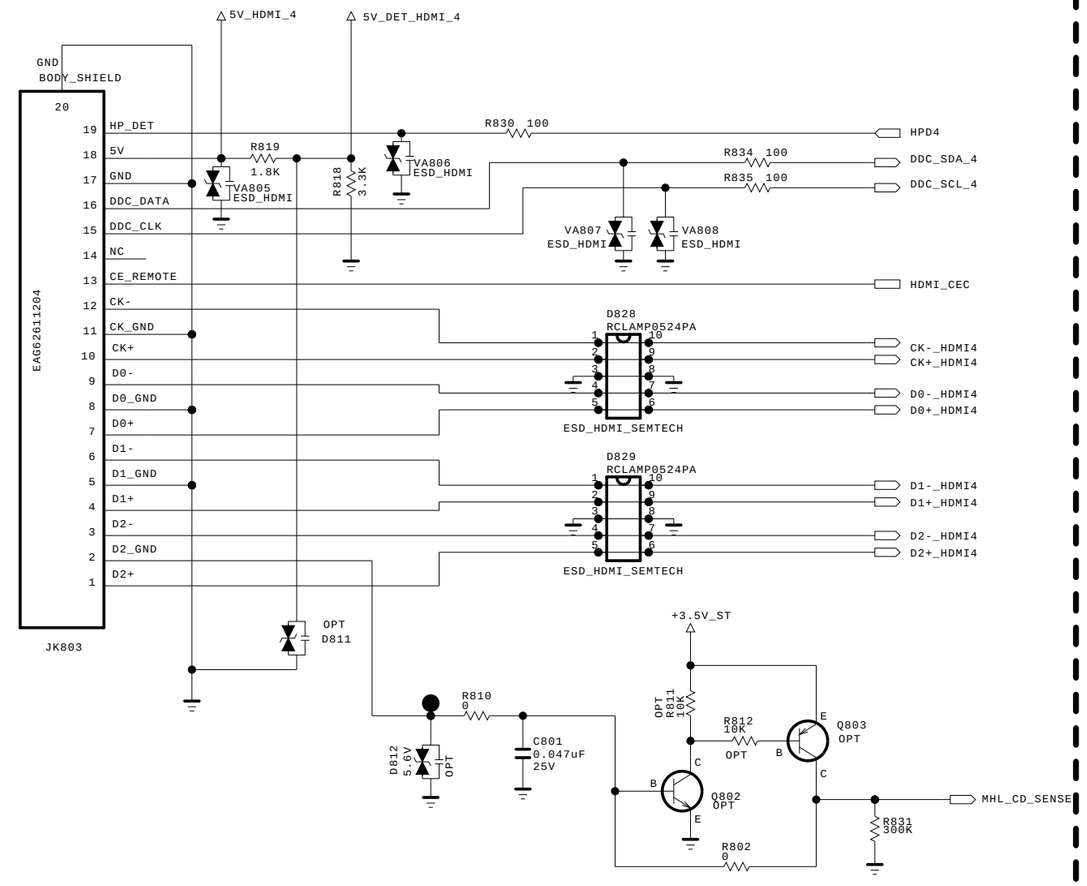
HDMI (REAR 1 / SIDE 1 MHL)

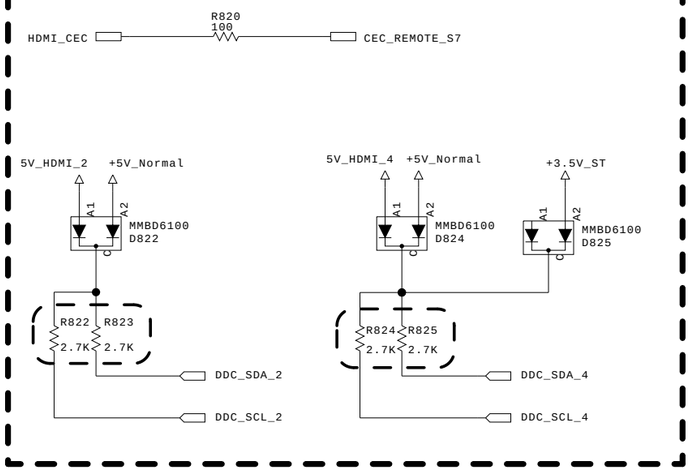
HDMI_1

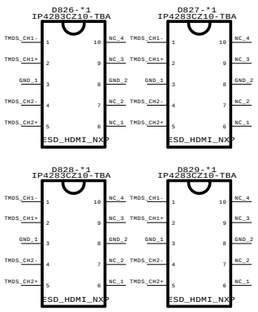


SIDE_HDMI (MHL)

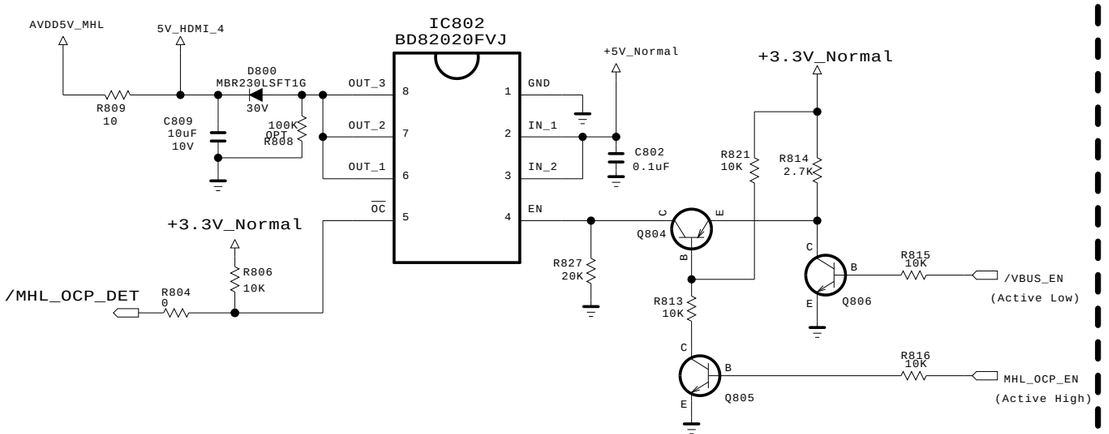


CEC





MHL OCP



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MODEL	NC4_S7LRM	DATE	2012/11/07
BLOCK	HDMI_R1_S1	SHEET	8

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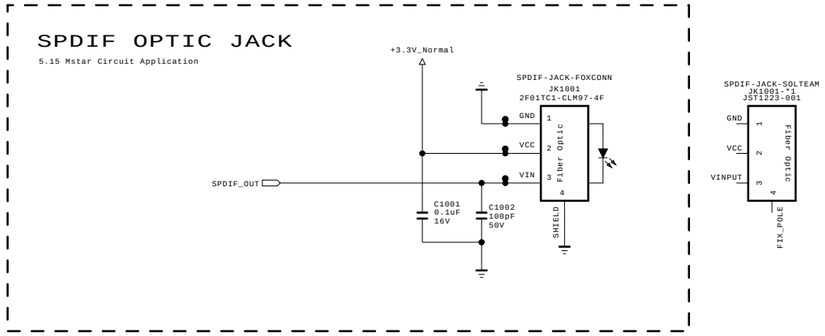
SPDIF



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MODEL	NC4_S7LRM	DATE	12/06/12
BLOCK	SPDIF	SHEET	10

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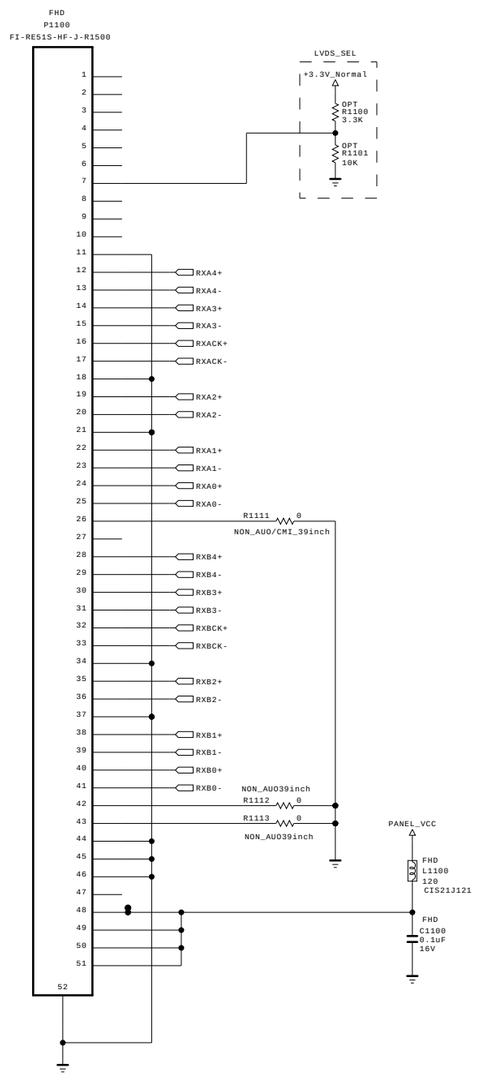
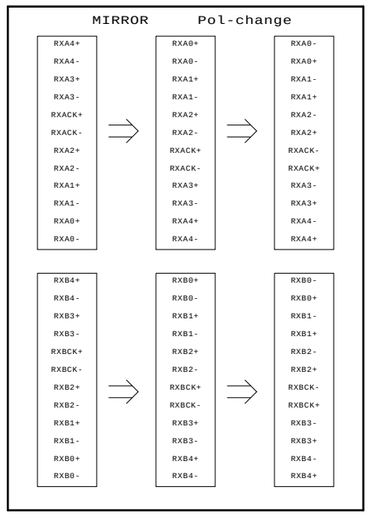
LVDS (NON EU)

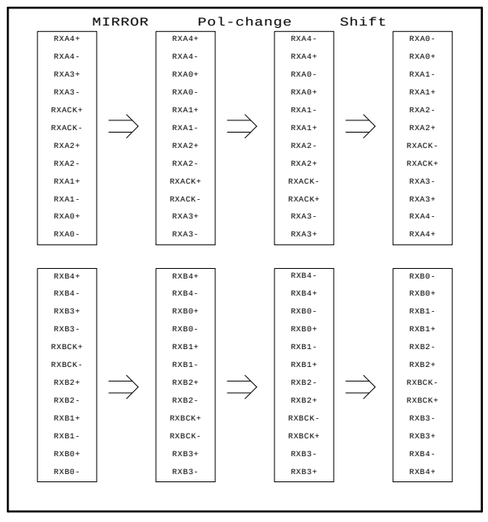
[51Pin LVDS Connector] (For FHD 60Hz)



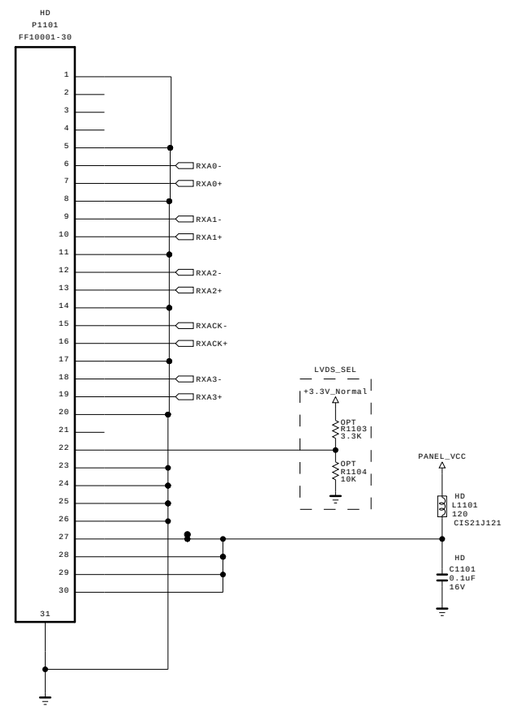
FOR FHD REVERSE(10bit) Change in S7LR



FOR FHD REVERSE(8bit) Change in S7LR



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



EU pin assign is different from NON EU.
Because of position of HD wafer.

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MODEL	NC4_S7LRM	DATE	2012/09/19
BLOCK	LVDS_NON_EU	SHEET	11

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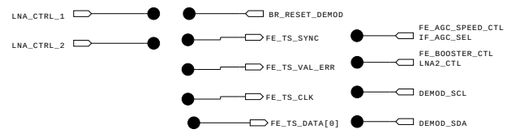
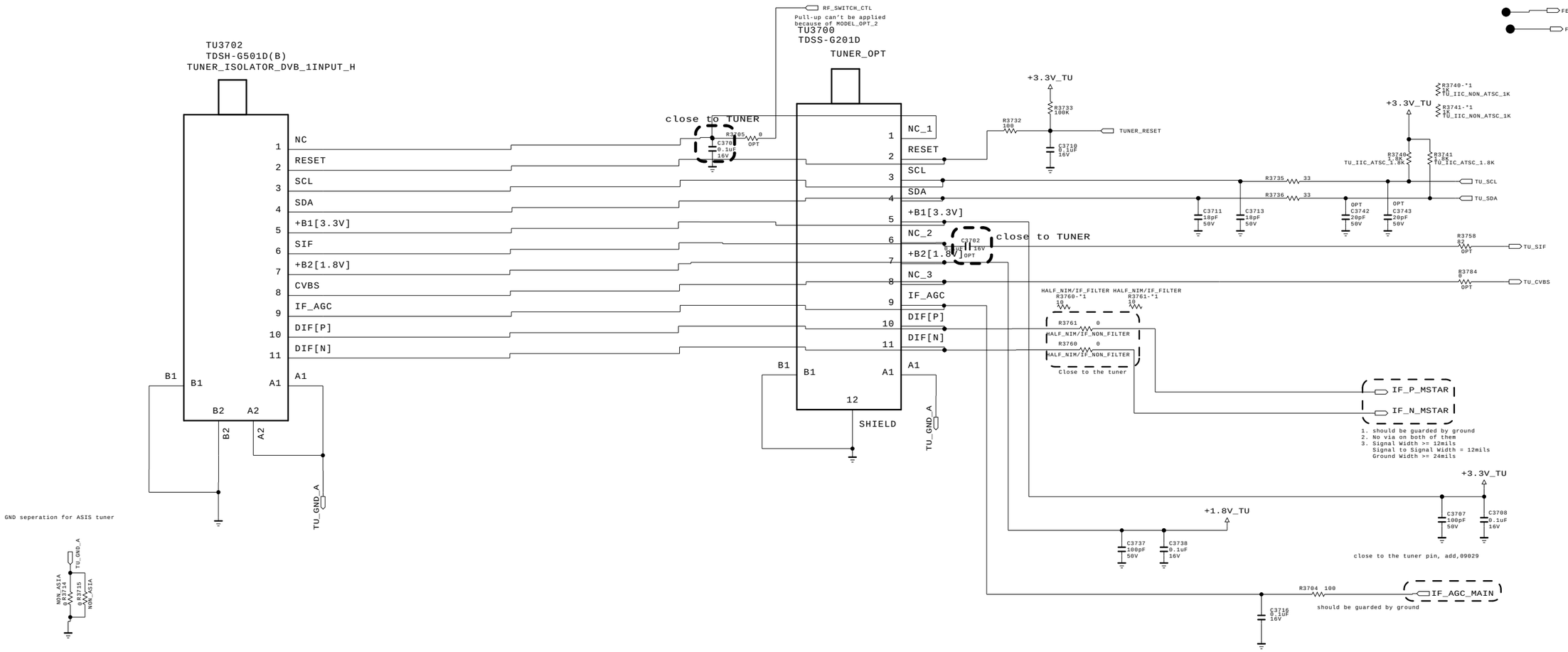
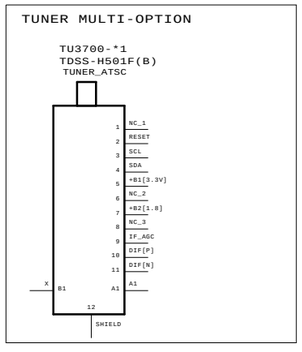
GLOBAL tuner block except EU and China





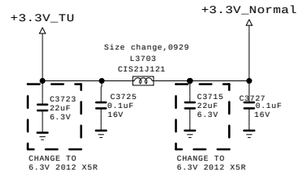
GND seperation for ASIS tuner

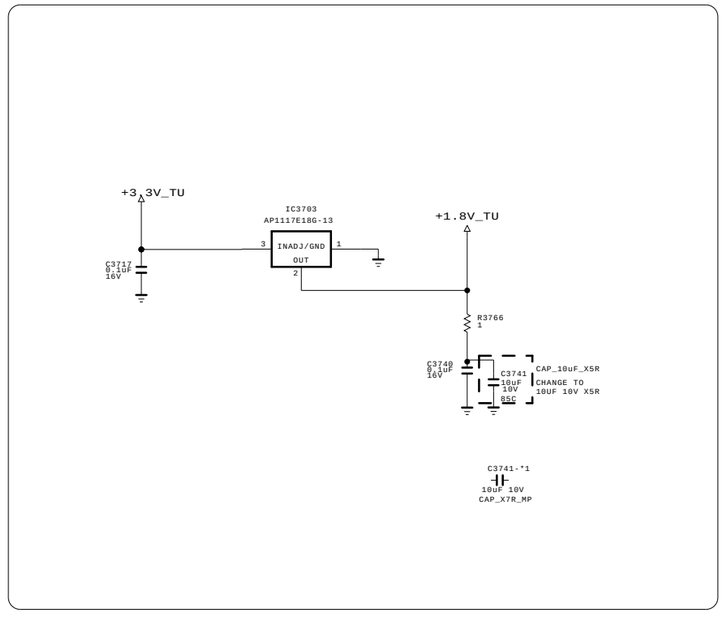
TUNER MULTI-OPTION



TW_FE_LNA FILTER_SETTING

Frequence	CTRL_1	CTRL_2	Filter_Type
54MHz~350MHz	1	0	LPF
350Hz~450MHz	0	0	Through
450Hz~870MHz	0	1	HPF





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MODEL	NC4_S7LRM	DATE	2012.06.21
BLOCK	TUNER_NON_EU	SHEET	14

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COMPONENT1 & AV(COMMON), AV2

COMPONENT
&
AV1

AV2

COMP_AV1/2
JK1701
PPJ248-01

7C	[RD3]E-LUG
6C	[RD3]C-SPRING
4C	[RD3]CONTACT
5B	[WH2]C-SPRING
4A	[YL]CONTACT
6A	[YL]C-SPRING
7A	[YL]E-LUG

COMP_AV1
JK1702
PPJ245-01

7E	[RD2]E-LUG
6E	[RD2]C-SPRING
4E	[RD2]CONTACT
5D	[WH]C-SPRING
4C	[RD1]CONTACT
6C	[RD1]C-SPRING
8C	[RD1]E-LUG-S
5B	[BL]C-SPRING
4A	[GN]CONTACT
6A	[GN]C-SPRING
7A	[GN]E-LUG

7H	[RD2]E-LUG
6H	[RD2]C-SPRING
4H	[RD2]CONTACT
5G	[WH1]C-SPRING
4F	[RD1]CONTACT
6F	[RD1]C-SPRING
8F	[RD1]E-LUG-S
5E	[BL]C-SPRING
4D	[GN]CONTACT
6D	[GN]C-SPRING
7D	[GN]E-LUG

D1700 5.6V AV2_LR_ZENER · R1700 470K AV2 · C1701 1000PF 50V OPT · R1716 10K AV2 · R1718 12K AV2 · AV2_R_IN

D1701 5.6V AV2_LR_ZENER · R1701 470K AV2 · C1702 1000PF 50V OPT · R1717 10K AV2 · R1719 12K AV2 · AV2_L_IN

+3.3V_Normal · R1708 10K AV2 · R1711 1K AV2 · AV2_CVBS_DET

D1702 5.6V OPT

D1713 AV2_CVBS_ZENER_ROHM · D1714 AV2_CVBS_ZENER_ROHM · R1702 75 AV2 · C1703 47pF 50V AV2 · AV2_CVBS_IN

D1713-*1 AV2_CVBS_ZENER_KEC · D1714-*1 AV2_CVBS_ZENER_KEC

D1704 5.6V COMP_LR_ZENER · R1703 470K · C1704 1000PF 50V OPT · R1714 10K · R1720 12K · COMP2_R_IN

D1705 5.6V COMP_LR_ZENER · R1704 470K · C1705 1000PF 50V OPT · R1715 10K · R1721 12K · COMP2_L_IN

+3.3V_Normal · R1709 10K · R1712 1K · COMP2_DET

D1706 5.6V OPT

D1703 COMP_Pr_ZENER_ROHM · D1707 COMP_Pr_ZENER_ROHM · R1705 75 · COMP2_Pr+

D1703-*1 COMP_Pr_ZENER_KEC · D1707-*1 COMP_Pr_ZENER_KEC

D1708 COMP_Pb_ZENER_ROHM · D1710 COMP_Pb_ZENER_ROHM · R1706 75 · COMP2_Pb+

D1708-*1 COMP_Pb_ZENER_KEC · D1710-*1 COMP_Pb_ZENER_KEC

+3.3V_Normal · R1710 10K · R1713 1K · AV_CVBS_DET

D1709 5.6V OPT

D1711 COMP_Y_ZENER_ROHM · D1712 COMP_Y_ZENER_ROHM · R1707 75 · R1722 0 · COMP2_Y+/AV_CVBS_IN

D1711-*1 COMP_Y_ZENER_KEC · D1712-*1 COMP_Y_ZENER_KEC

+3.3V_Normal

CVBS_TEST IC1708 MM1756DURE
VCC 6 · PS 5 · OUT 4 · IN 1 · GND 2 · BIAS 3

CVBS_TEST C1706 0.1uF · CVBS_TEST C1707 0.1uF · DTV/MNT_VOUT

CVBS_TEST R1723 75

CVBS_TEST C1708 4.7uF

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MODEL	NC4_S7LRM	DATE	2012.08.14
BLOCK	REAR_NON_EU_L	SHEET	17

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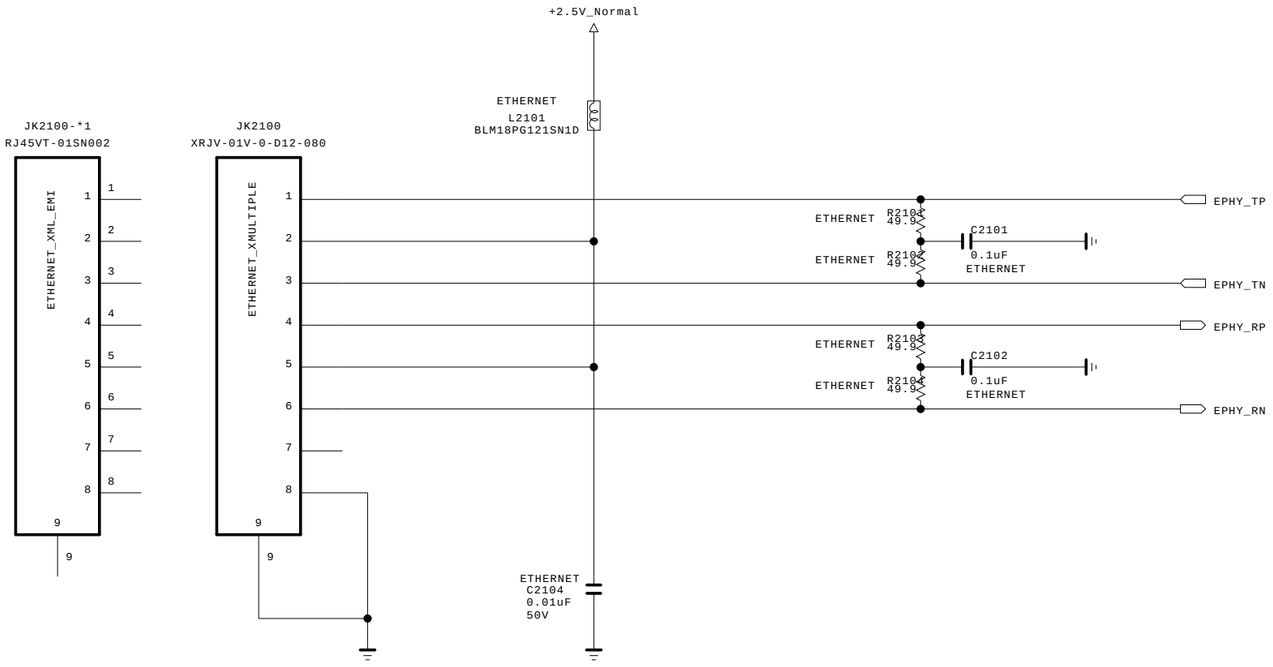
ETHERNET

* H/W option : ETHERNET



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MODEL	NC4_S7LRM	DATE	2012/06/21
BLOCK	LAN	SHEET	21 /

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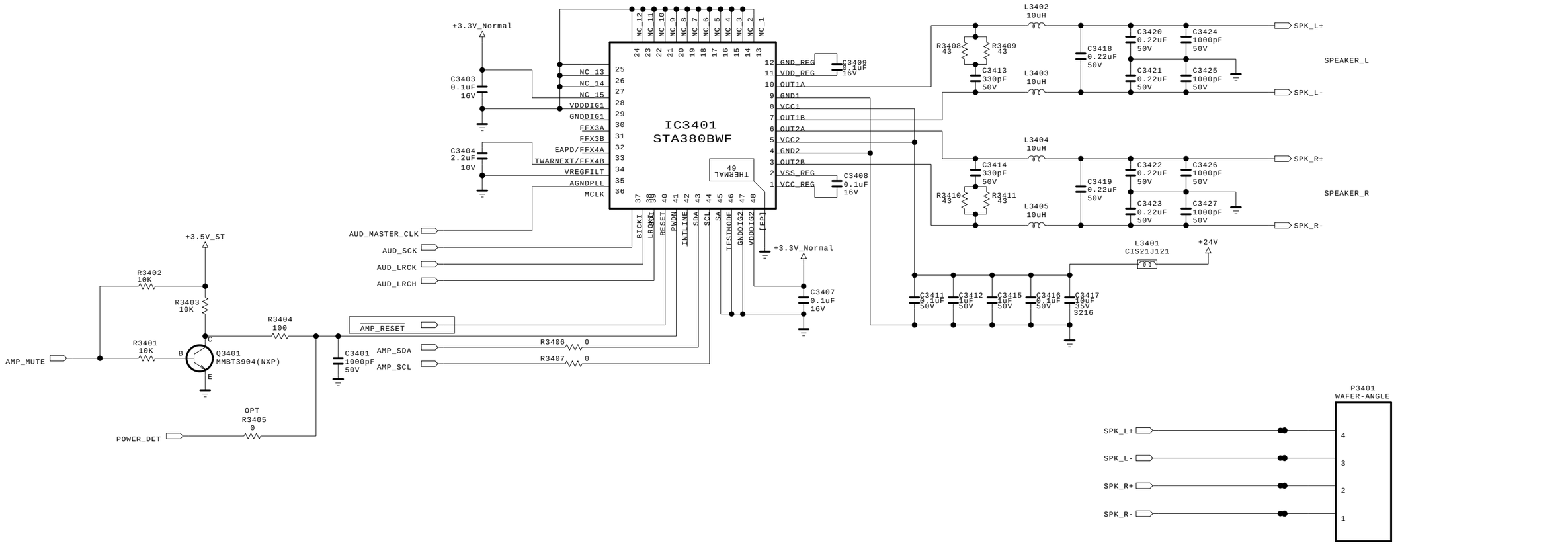
AUDIO AMP(STA380BWEF)



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MODEL	NC4_S7LRM	DATE	2012/08/29
BLOCK	AMP_STA380BWEF	SHEET	34

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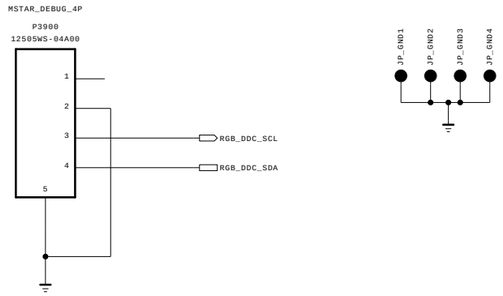
MSTART DEBUG_4PIN



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MODEL	NC4_S7LRM	DATE	2012/06/20
BLOCK	MSTAR DEBUG_4PIN	SHEET	39 /

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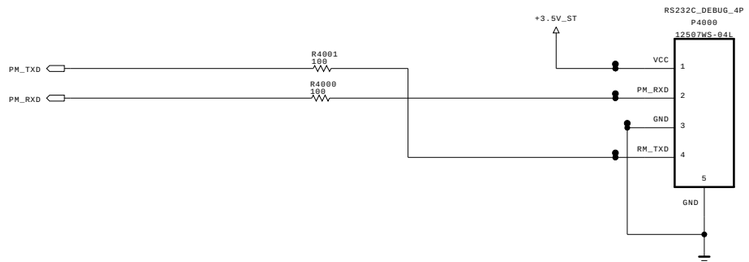
RS-232C



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MODEL	NC4_S7LRM	DATE	2012/06/20
BLOCK	RS232C_4P_OS	SHEET	40 /

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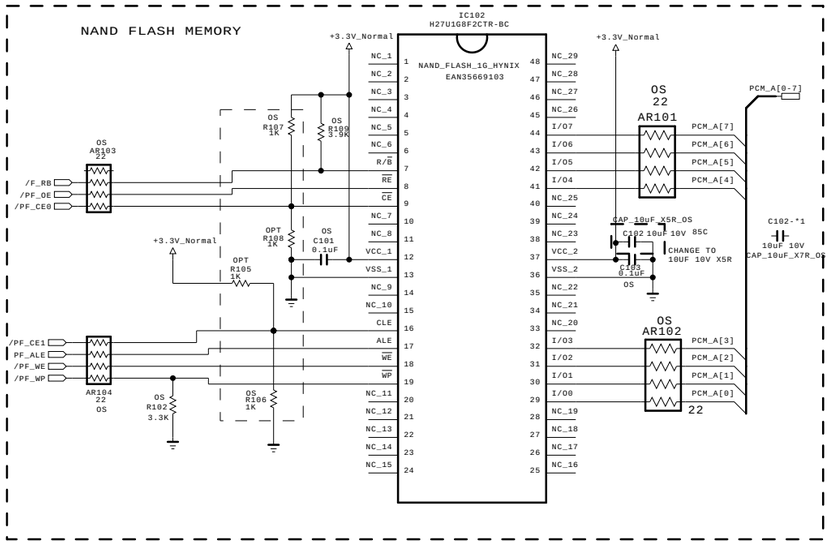
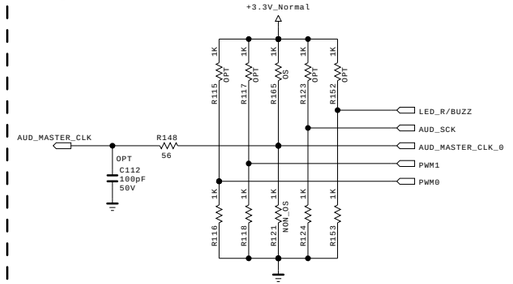
NAND FLASH MEMORY



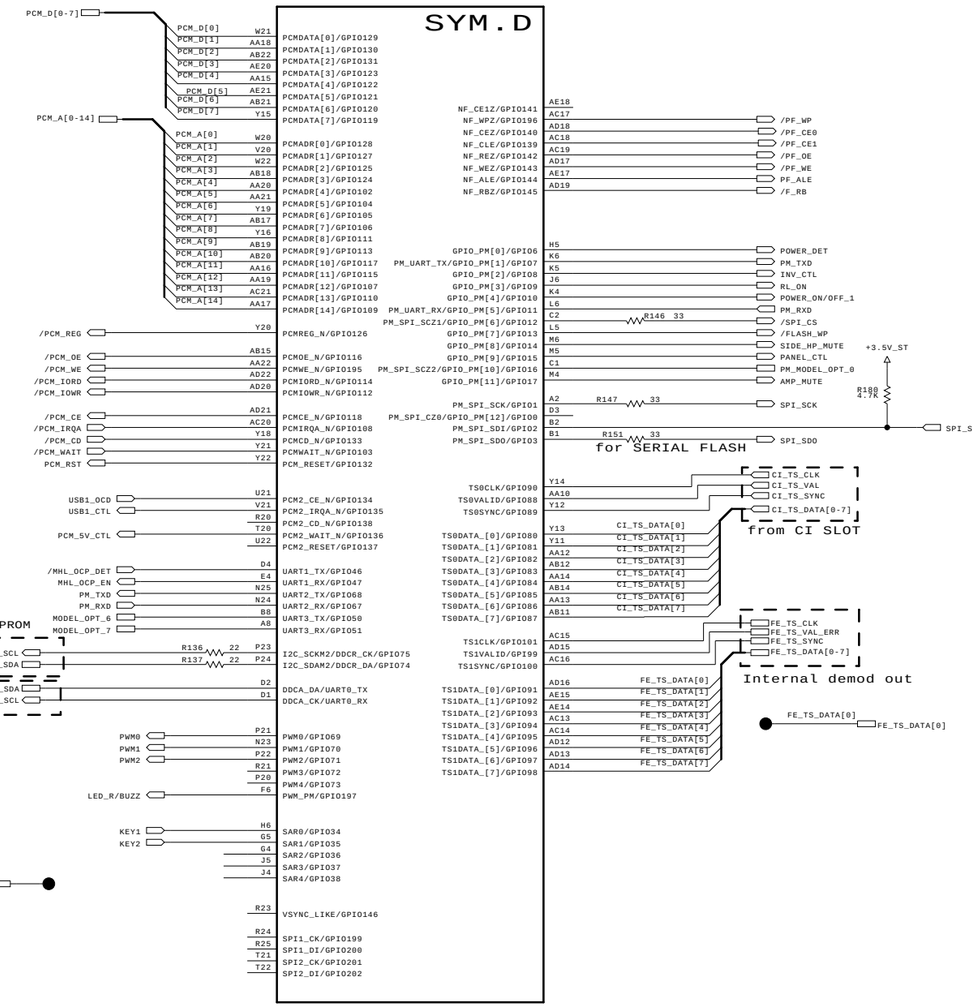
<CHIP Config(LED_R/BUZZ)>
Boot from SPI CS1N(EXT_FLASH) 1'b0
Boot from SPI_CS0N(INT_FLASH) 1'b1

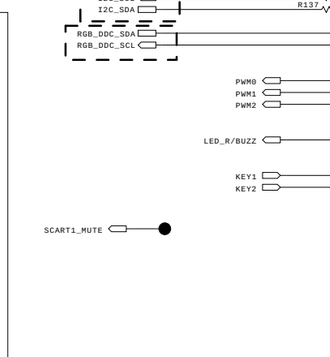
<CHIP Config>
(I2S_OUT_BCK, I2S_OUT_MCK, PAD_PWM1PAD_PWM0)

B51_no_EJ	: 4'b0000	Boot from 8051 with SPI flash
SB51_WOS	: 4'b0001	Secure B51 without scramble
SB51_WS	: 4'b0010	Secure B51 with scramble
MIPS_SPE_NO_EJ	: 4'b0100	Boot from MIPS with SPI flash
MIPS_SPI_EJ_1	: 4'b0101	Boot from MIPS with SPI flash
MIPS_SPI_EJ_2	: 4'b0110	Boot from MIPS with SPI flash
MIPS_WOS	: 4'b1001	Secure MIPS without scramble
MIPS_WS	: 4'b1010	Scerur MIPS with SCRAMBLE



S7LR-M_NON_MS10
IC101
MSD804KKX

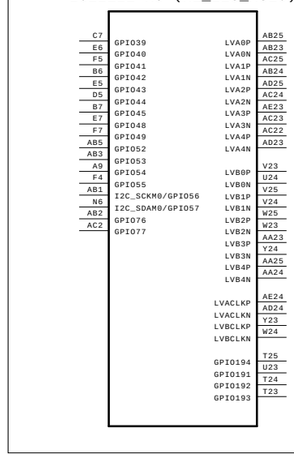




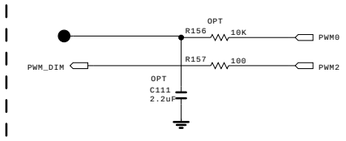
S7LR-M Multi Package

S7LR-M_MS10

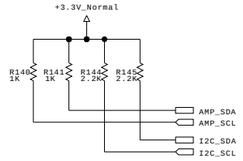
IC101-*1
LGE2121-MS (M1_L13_MS10)



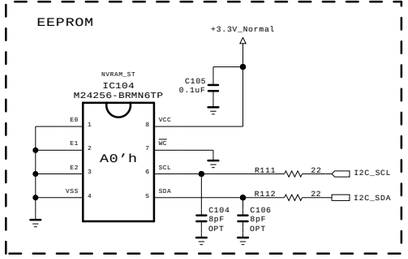
DIMMING



I2C



EEPROM

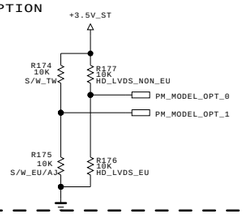


NVRAM_RENESAS
IC104-*1
R1EX24256BSAS0A
EAN62389501

NON_OS_512k_ST
IC104-*2
M24512-RMN6TP
EAN43349003

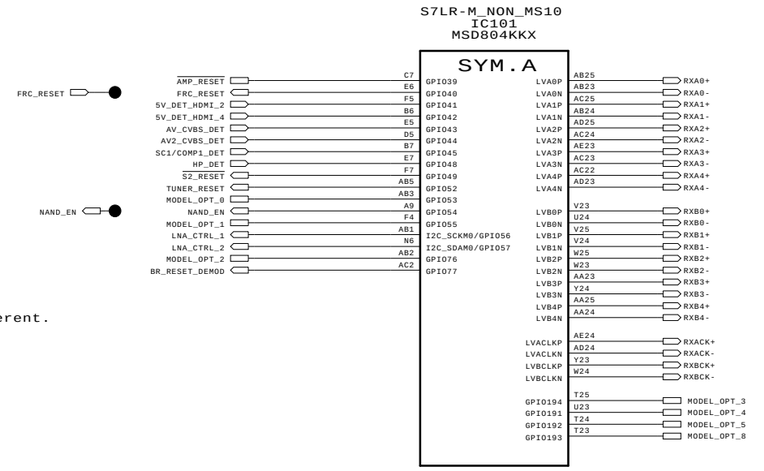
NON_OS_512k_ATMEL
IC104-*3
AT24C512C-SSHD-T
EAN43349004

PM MODEL OPTION



PM_MODEL_OPT_0
HIGH : HD_NON_EU
LOW : HD_EU
HD_LVDS_pattern is different.
Between EU and NON_EU
PM_MODEL_OPT_1
HIGH : S/W_NON_EU
LOW : S/W_EU/AJ
S/W is different.
Between TW

S7LR-M_NON_MS10
IC101
MSD804KKX



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MODEL	NC4_S7LRM	DATE	2012/09/19
BLOCK	MAIN1_NON_EU	SHEET	51

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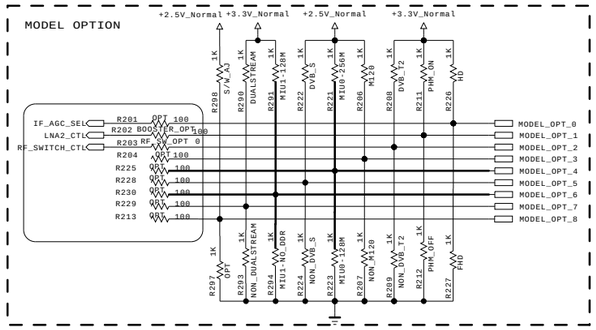
MODEL OPTION

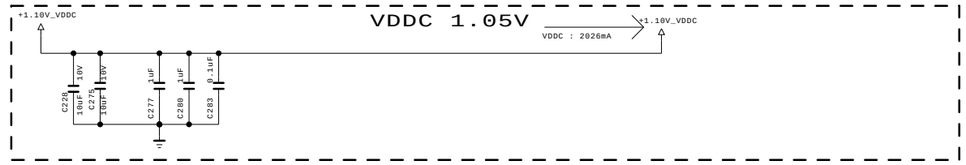
PIN NAME	PIN NO	LOW	HIGH
MODEL_OPT_0	AB3	FHD	HD
MODEL_OPT_1	F4	PHM_OFF	PHM_ON
MODEL_OPT_2	AB2	NON_DVB_T2	DVB_T2
MODEL_OPT_3	T25	NON_M120	M120
MODEL_OPT_4	U23	MIU0-128M	MIU0-256M
MODEL_OPT_5	T24	NON_DVB_S	DVB_S
MODEL_OPT_6	B8	MIU1-NO_DDR	MIU1-128M
MODEL_OPT_7	A8	NON_DUALSTREAM	DUALSTREAM

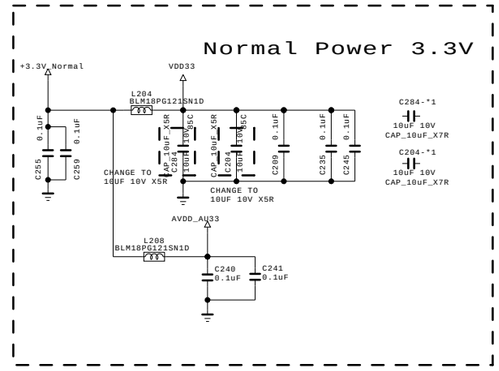
* Dual Stream is only Korea 3D spec

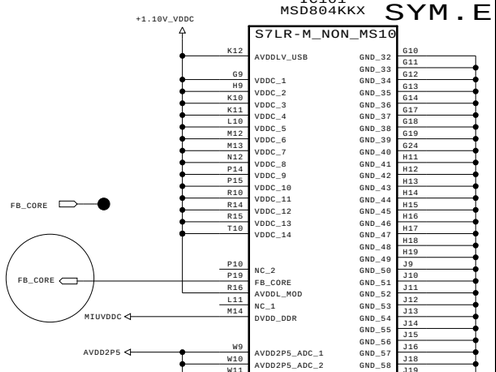
Memory OPTION

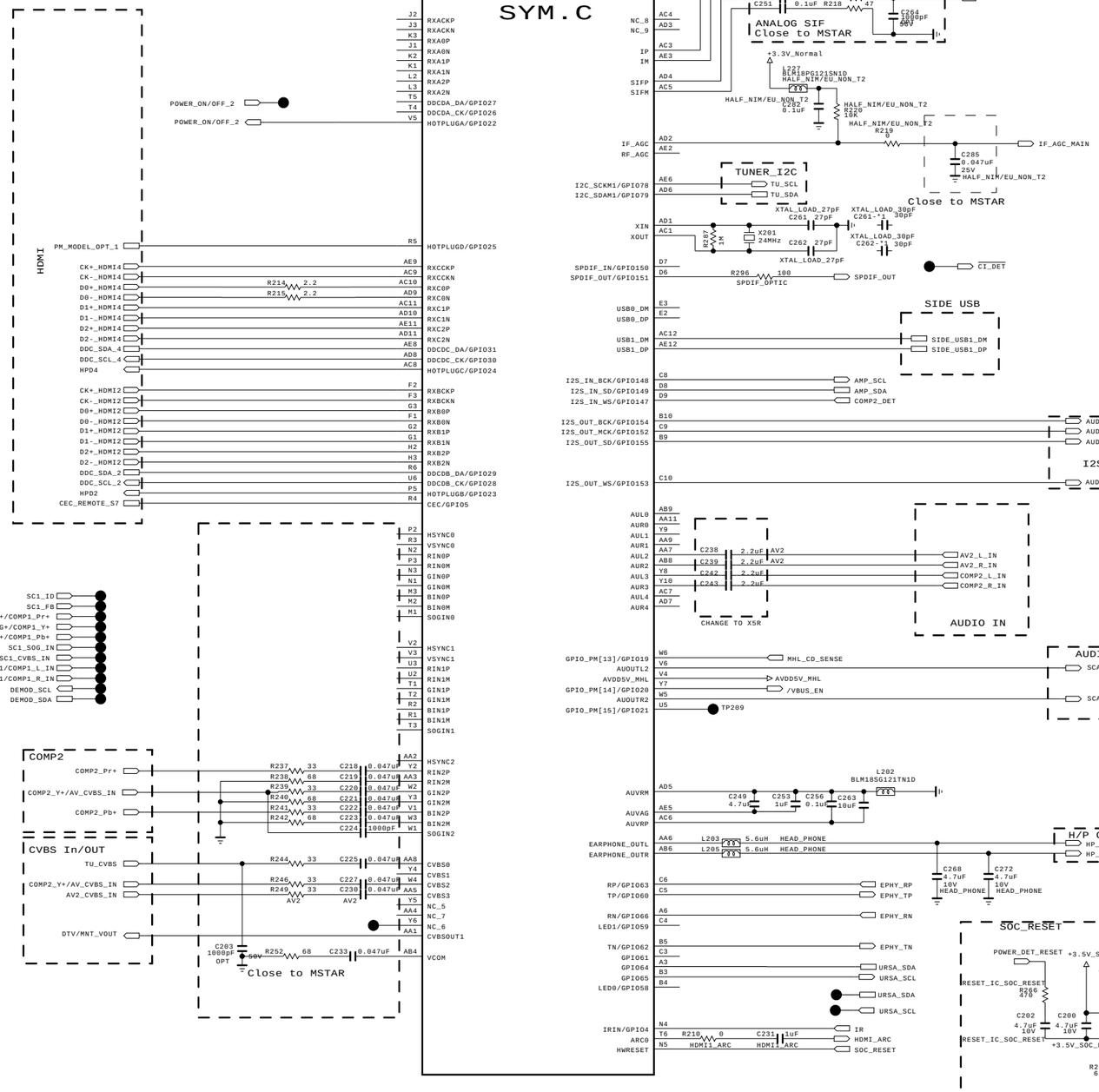
Memory	MODEL_OPT_4 PIN NO.U23	MODEL_OPT_6 PIN NO. B8	Note
128M	0	0	
128M+128M	0	1	
256M	1	0	
256M+128M	1	1	Ginga

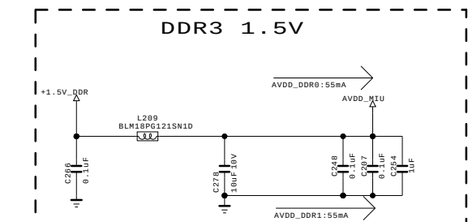


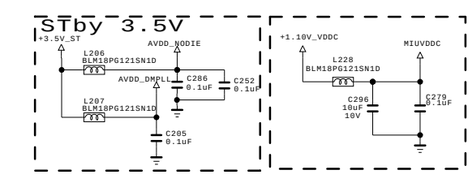












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MODEL	NC4_S7LRM	DATE	2012.09.19
BLOCK	MAIN2_NON_EU	SHEET	52

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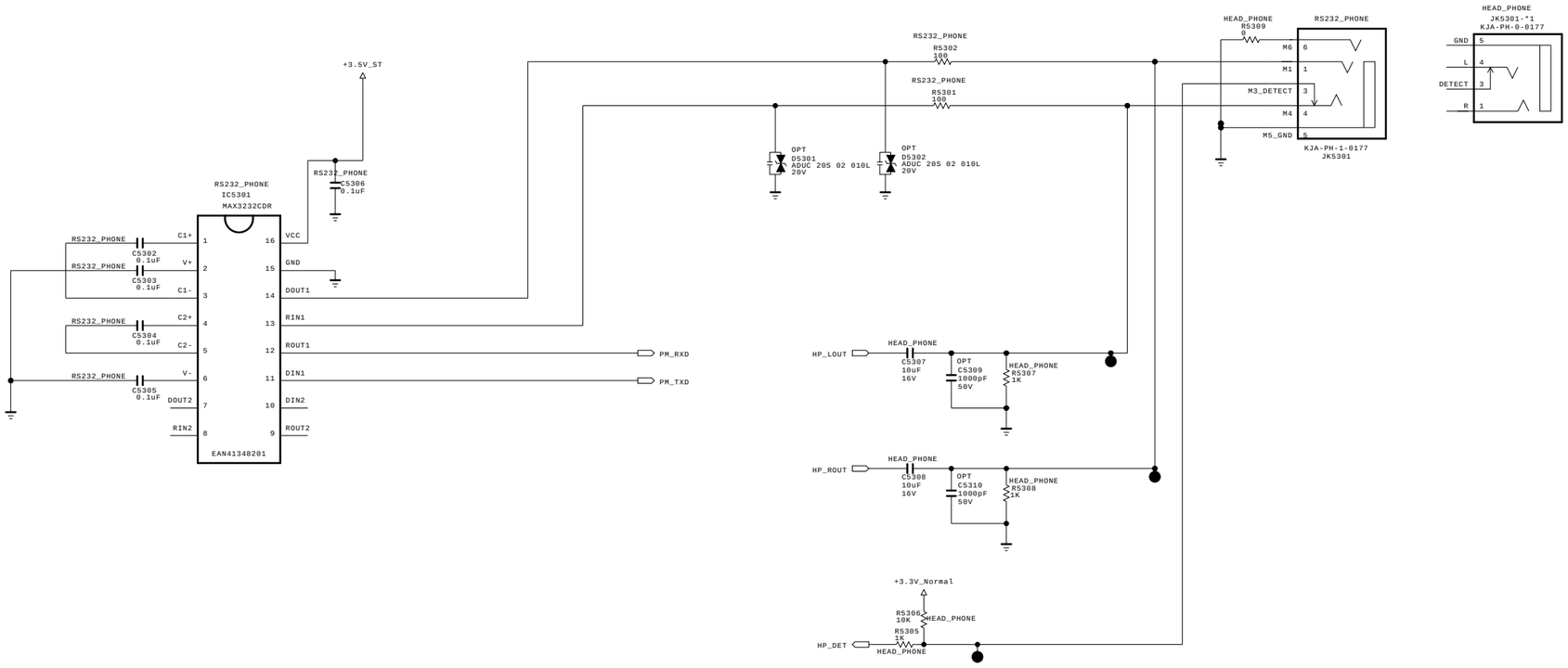
RS-232C



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MODEL	NC4_S7LRM	DATE	2012/06/21
BLOCK	RS232C_PHONE	SHEET	53

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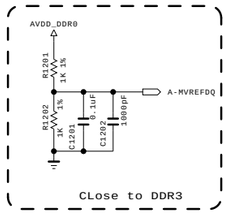

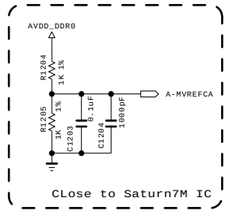

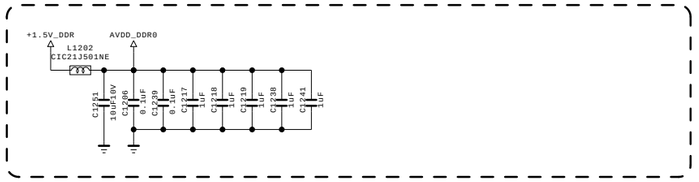

DDR_1600_2G_HYNIX

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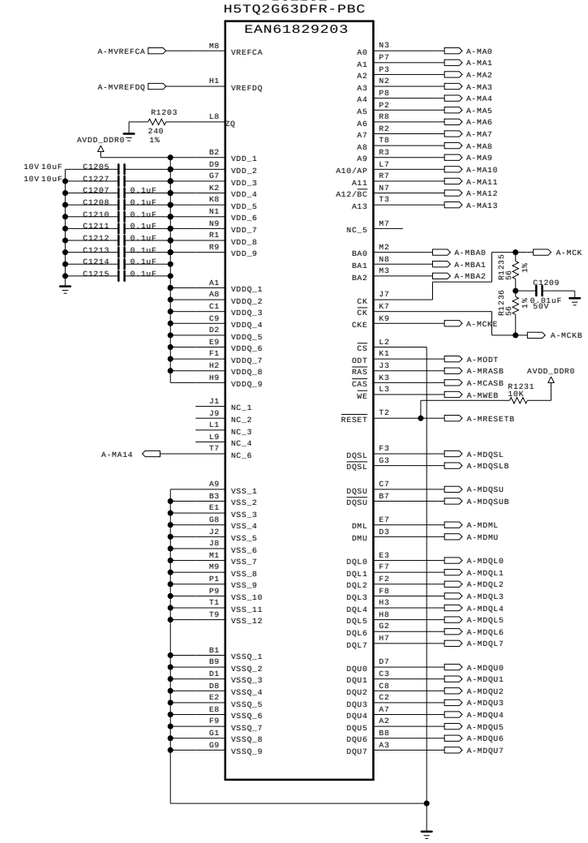

IC101
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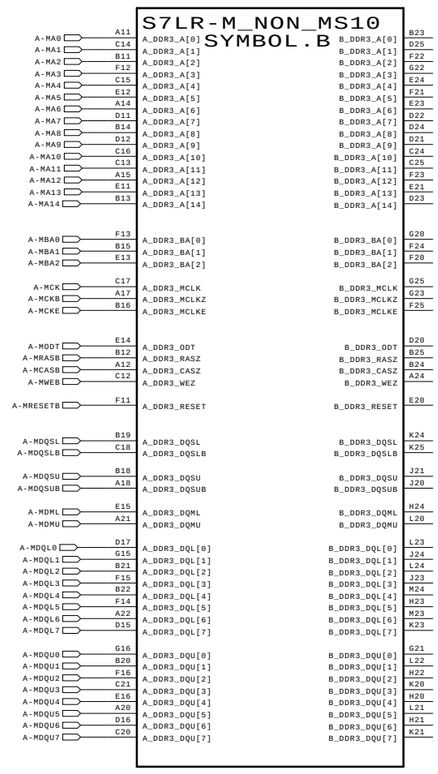

DDR_1600_2G_SS
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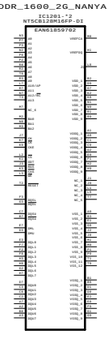
K4B2G1646E-BCK0

DDR_1600_2G_NANYA
IC1201-*2
NT5CB128M16P-DI



DDR_1600_1G_HYNIX
IC1201-*3
H5TQ1G63EFR-PBC

DDR_1600_1G_SS
IC1201-*4
K4B1G1646G-BCK0

DDR_1600_1G_NANYA
IC1201-*5
NT5CB64M16P-DH

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

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MODEL	NC4_S7LRM	DATE	2012/06/21
BLOCK	M1_DDR (1DDR)	SHEET	54

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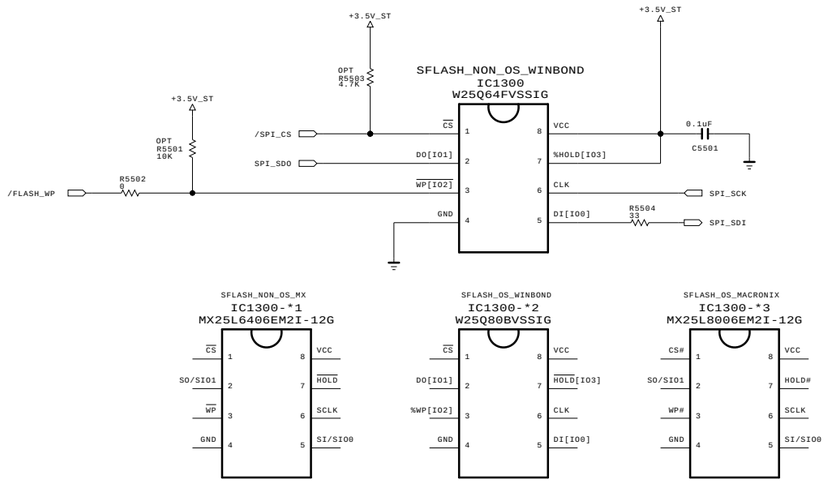
Serial Flash for SPI boot_NON_OS



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

SECRET
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MODEL	NC4_S7LRM	DATE	2012.06.21
BLOCK	S_FLASH_NON_OS	SHEET	55

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