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LED LCD TV

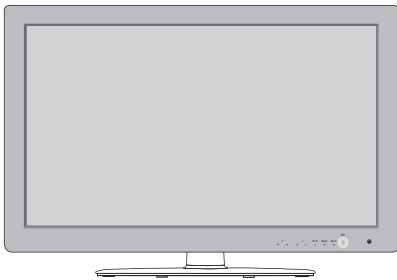
SERVICE MANUAL

CHASSIS : LD03E

| | |
|-----------------------------|-------------------------|
| MODEL: 42LE5500/550N | 42LE5500/550N-ZA |
| 42LE5800/5900 | 42LE5800/5900-ZA |
| 42LE5510/5810 | 42LE5510/5810-ZB |
| 42LE5910 | 42LE5910-ZB |

CAUTION

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



P/NO : MFL63263102 (1003-REV00)

Printed in Korea

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SAFETY PRECAUTIONS

IMPORTANT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by \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 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 M Ω and 5.2 M Ω .

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.

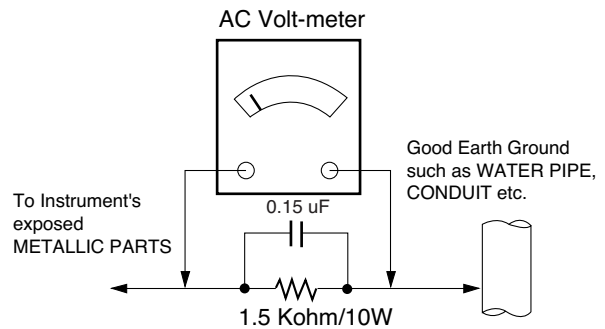
Connect 1.5 K / 10 watt resistor in parallel with a 0.15 μ F capacitor between a known good earth ground (Water Pipe, Conduit, etc.) and the exposed metallic parts.

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 0.5 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

SPECIFICATION

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

1. Application range

This specification is applied to the LCD TV used LD03E chassis.

2. Requirement for Test

Each part is tested as below without special appointment.

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

3. Test method

- 1) Performance: LGE TV test method followed
- 2) Demanded other specification
 - Safety : CE, IEC specification
 - EMC :CE, IEC

4. Module General Specification

| No. | Item | Specification | Remark |
|-----|-----------------------|---|---------------|
| 1 | Display Screen Device | 107 cm(42 inch) wide color display module | |
| 2 | Aspect Ratio | 16:9 | |
| 3 | LCD Module | 107 cm(42 inch) TFT LCD FHD | |
| 4 | Operating Environment | Temp. : 0 deg ~ 50 deg | |
| | | Humidity : 20 % ~ 90 % | |
| 5 | Storage Environment | Temp. : -20 deg ~ 60 deg | |
| | | Humidity : 10 ~ 90 % | |
| 6 | Input Voltage | AC 100-240V~, 50 / 60Hz | |
| 7 | Power Consumption | Power on (White) | |
| | | LGD | |
| 8 | Module Size | 937.2(H) x 566.2(V) x 23.5 mm(D) | With inverter |
| 8 | Pixel Pitch | 0.4845 (H) x 0.4845 (V) | |
| 9 | Back Light | LED(EDGE) | |
| 10 | Display Colors | 1.06 B(true) colors | |
| 11 | Coating | 3H | |

5. Module optical specification

| No. | Item | Specification | Min. | Typ. | Max. | Remark | |
|-----|-----------------------|--------------------------------|---------------|------|-------|---------------|--|
| 1. | Viewing Angle [CR>10] | Right/Left/Up/Down | 89/89/89/89 | | | CR > 10 | |
| 2. | Luminance | Luminance (cd/m ²) | 360 | 450 | | | |
| | | Variation | | | 1.3 | MAX /MIN | |
| 3. | Contrast Ratio | CR | 1000 | 1400 | | | |
| 4. | CIE Color Coordinates | White | Typ. -0.03 | Wx | 0.279 | Typ. +0.03 | |
| | | | | Wy | 0.292 | | |
| | | RED | | Xr | 0.636 | | |
| | | | | Yr | 0.335 | | |
| | | Green | | Xg | 0.291 | | |
| | | | | Yg | 0.603 | | |
| | | Blue | | Xb | 0.146 | | |
| | | | | Yb | 0.061 | | |

- 1) Standard Test Condition(The unit has been 'ON')
- 2) Stable for approximately 60 minutes in a dark environment at 25 °C
- 3) The values specified are at approximate distance 50 cm from the LCD surface.

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

| No. | Specification | | | Remark |
|-----|---------------|-------------|------------|-------------------|
| | Resolution | H-freq(kHz) | V-freq(Hz) | |
| 1. | 720x480 | 15.73 | 60.00 | SDTV,DVD 480i |
| 2. | 720x480 | 15.63 | 59.94 | SDTV,DVD 480i |
| 3. | 720x480 | 31.47 | 59.94 | 480p |
| 4. | 720x480 | 31.50 | 60.00 | 480p |
| 5. | 720x576 | 15.625 | 50.00 | SDTV,DVD 625 Line |
| 6. | 720x576 | 31.25 | 50.00 | HDTV 576p |
| 7. | 1280x720 | 45.00 | 50.00 | HDTV 720p |
| 8. | 1280x720 | 44.96 | 59.94 | HDTV 720p |
| 9. | 1280x720 | 45.00 | 60.00 | HDTV 720p |
| 10. | 1920x1080 | 31.25 | 50.00 | HDTV 1080i |
| 11. | 1920x1080 | 33.75 | 60.00 | HDTV 1080i |
| 12. | 1920x1080 | 33.72 | 59.94 | HDTV 1080i |
| 13. | 1920x1080 | 56.250 | 50 | HDTV 1080p |
| 14. | 1920x1080 | 67.5 | 60 | HDTV 1080p |

7. RGB (PC)

| No. | Specification | | | | Proposed | Remarks |
|-----|---------------|-------------|------------|------------------|-----------|--|
| | Resolution | H-freq(kHz) | V-freq(Hz) | Pixel Clock(MHz) | | |
| 1. | 720*400 | 31.468 | 70.08 | 28.321 | | For only DOS mode |
| 2. | 640*480 | 31.469 | 59.94 | 25.17 | VESA | Input 848*480 60 Hz, 852*480 60 Hz -> 640*480 60 Hz Display |
| 3. | 800*600 | 37.879 | 60.31 | 40.00 | VESA | |
| 4. | 1024*768 | 48.363 | 60.00 | 65.00 | VESA(XGA) | |
| 5. | 1280*768 | 47.78 | 59.87 | 79.5 | WXGA | |
| 6. | 1360*768 | 47.72 | 59.8 | 84.75 | WXGA | |
| 7. | 1280*1024 | 63.595 | 60.0 | 108.875 | SXGA | FHD model |
| 8. | 1920*1080 | 66.587 | 59.93 | 138.625 | WUXGA | FHD model |

8. HDMI Input (1) DTV Mode

| No. | Resolution | H-freq(kHz) | V-freq.(Hz) | Pixel clock(MHz) | Proposed | Remark |
|-----|------------|---------------|---------------|------------------|------------|--------|
| 1. | 720*480 | 31.469 /31.5 | 59.94 /60 | 27.00/27.03 | SDTV 480P | |
| 2. | 720*576 | 31.25 | 50 | 54 | SDTV 576P | |
| 3. | 1280*720 | 37.500 | 50 | 74.25 | HDTV 720P | |
| 4. | 1280*720 | 44.96 /45 | 59.94 /60 | 74.17/74.25 | HDTV 720P | |
| 5. | 1920*1080 | 33.72 /33.75 | 59.94 /60 | 74.17/74.25 | HDTV 1080I | |
| 6. | 1920*1080 | 28.125 | 50.00 | 74.25 | HDTV 1080I | |
| 7. | 1920*1080 | 26.97 /27 | 23.97 /24 | 74.17/74.25 | HDTV 1080P | |
| 8. | 1920*1080 | 33.716 /33.75 | 29.976 /30.00 | 74.25 | HDTV 1080P | |
| 9. | 1920*1080 | 56.250 | 50 | 148.5 | HDTV 1080P | |
| 10. | 1920*1080 | 67.43 /67.5 | 59.94 /60 | 148.35/148.50 | HDTV 1080P | |

(2) PC Mode

| No. | Resolution | H-freq(kHz) | V-freq.(Hz) | Pixel clock(MHz) | Proposed | Remark |
|-----|------------|-------------|-------------|------------------|-----------|----------------|
| 1. | 720*400 | 31.468 | 70.08 | 28.321 | | HDCP |
| 2. | 640*480 | 31.469 | 59.94 | 25.17 | VESA | HDCP |
| 3. | 800*600 | 37.879 | 60.31 | 40.00 | VESA | HDCP |
| 4. | 1024*768 | 48.363 | 60.00 | 65.00 | VESA(XGA) | HDCP |
| 5. | 1280*768 | 47.78 | 59.87 | 79.5 | WXGA | HDCP |
| 6. | 1360*768 | 47.72 | 59.8 | 84.75 | WXGA | HDCP |
| 7. | 1280*1024 | 63.595 | 60.0 | 108.875 | SXGA | HDCP/FHD model |
| 8. | 1920*1080 | 67.5 | 60.00 | 138.625 | WUXGA | HDCP/FHD model |

ADJUSTMENT INSTRUCTION

1. Application Range

This specification sheet is applied to all of the LCD TV with LD03E chassis.

2. Designation

- (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 °C ± 5 °C of temperature and 65 % ± 10 % of relative humidity if there is no specific designation.
- (4) The input voltage of the receiver must keep AC 100-240 V~ 50 / 60Hz.
- (5) The receiver must be operated for about 5 minutes prior to the adjustment when module is in the circumstance of over 15.

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

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

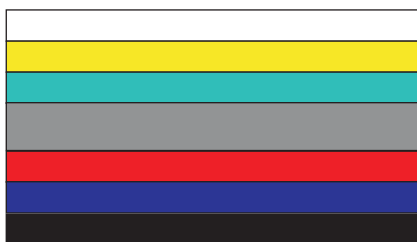
[Caution]

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

3. Automatic Adjustment

3.1. ADC Adjustment

- (1) Overview
 - ADC adjustment is needed to find the optimum black level and gain in Analog-to-Digital device and to compensate RGB deviation.
- (2) Equipment & Condition
 - 1) Jig (RS-232C protocol)
 - 2) MSPG-925 Series Pattern Generator(MSPG-925FA, pattern - 65)
 - Resolution : 480i Comp1
1080P Comp1
1920*1080 RGB
 - Pattern : Horizontal 100% Color Bar Pattern
 - Pattern level : 0.7±0.1 Vp-p
 - Image



(3) Adjustment

1) Adjustment method

- Using RS-232, adjust items listed in 3.1 in the other shown in "3.1.(3).3"

2) Adj. protocol

| Protocol | Command | Set ACK |
|--------------------|--------------------|--|
| Enter adj. mode | aa 00 00 | a 00 OK00x |
| Source change | xb 00 40 | b 00 OK40x (Adjust 480i, 1080p Comp1) |
| | xb 00 60 | b 00 OK60x (Adjust 1920*1080 RGB) |
| Begin adj. | ad 00 10 | |
| Return adj. result | | OKx (Case of Success) |
| | | NGx (Case of Fail) |
| Read adj. data | (main) ad 00 20 | (main) 0000000000000000000000000007c007b006dx |
| | (sub) ad 00 21 | (Sub) 0000000700000000000000000007c00830077x |
| Confirm adj. | ad 00 99 | NG 03 00x (Fail) |
| | | NG 03 01x (Fail) |
| | | NG 03 02x (Fail) |
| | | OK 03 03x (Success) |
| End adj. | aa 00 90 | a 00 OK90x |

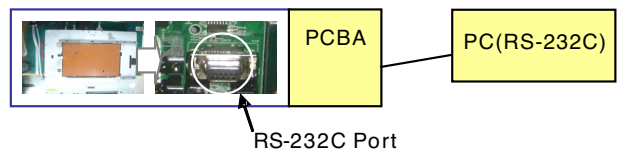
Ref.) ADC Adj. RS232C Protocol_Ver1.0

3) Adj. order

- aa 00 00 [Enter ADC adj. mode]
- xb 00 04 [Change input source to Component1(480i&1080p)]
- ad 00 10 [Adjust 480i Comp1]
- xb 00 06 [Change input source to RGB(1024*768)]
- ad 00 10 [Adjust 1024*768 RGB]
- ad 00 90 End adj.

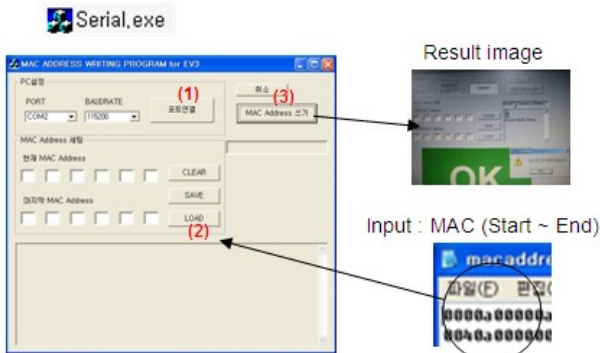
3.2. MAC Address

- (1) Equipment & Condition
 - Play file: Serial.exe
 - MAC Address edit
 - Input Start / End MAC address
- (2) Download method
 - 1) Communication Prot connection



Connect: PCBA Jig-> RS-232C Port== PC-> RS-232C Port

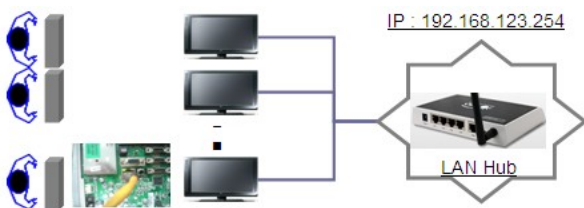
- 2) MAC Address Download
 - Com 1,2,3,4 and 115200(Baud rate)
 - Port connection button click(1)



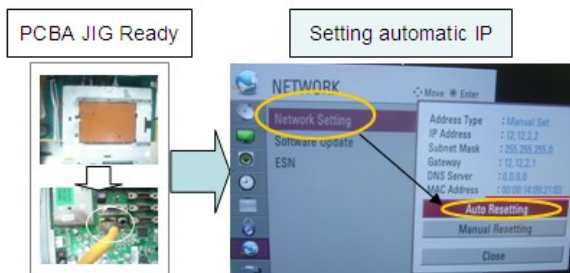
- Load button click(2) for MAC Address write.
- Start MAC Address write button(3)
- Check the OK Or NG

3.3. LAN

- (1) Equipment & Condition
 - Each other connection to LAN Port of IP Hub and Jig

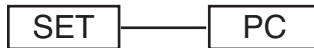


- (2) LAN inspection solution
 - LAN Port connection with PCB
 - Network setting at MENU Mode of TV
 - setting automatic IP
 - Setting state confirmation
 - > If automatic setting is finished, you confirm IP and MAC Address.

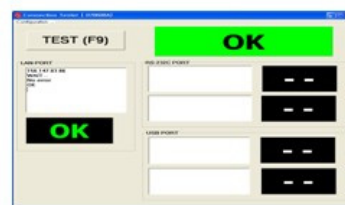


3.4. LAN PORT INSPECTION(PING TEST)

Connect SET -> LAN port == PC -> LAN Port

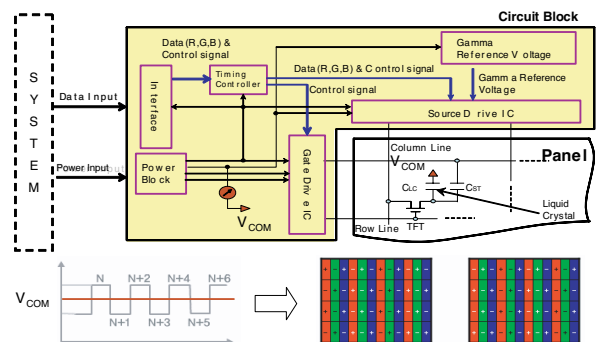


- (1) Equipment setting
 - 1) Play the LAN Port Test PROGRAM.
 - 2) Input IP set up for an inspection to Test Program.
 - *IP Number : 12.12.2.2
- (2) LAN PORT inspection (PING TEST)
 - 1) Play the LAN Port Test Program.
 - 2) Connect each other LAN Port Jack.
 - 3) Play Test (F9) button and confirm OK Message.
 - 4) Remove LAN CABLE



3.5. V-COM Adjust(Only LGD(M+S) Module)

- Why need Vcom adjustment?
 - The Vcom (Common Voltage) is a Reference Voltage of Liquid Crystal Driving.
 - > Liquid Crystal need for Polarity Change with every frame.



- Adjust sequence

- Press the PIP key of the ADJ remote control. (This PIP key is hot key to enter the VCOM adjusting mode)
(Or After enter Service Mode by pushing "ADJ" key, then Enter V-Com Adjust mode by pushing "▶" key at "10. V-Com")
- As pushing the right or the left button on the remote control, And find the V-COM value Which is no or minimized the Flicker.
(If there is no flicker at default value, Press the exit key and finish the VCOM adjustment.)
- Push the OK key to store value. Then the message "Saving OK" is pop.
- Press the exit key to finish VCOM adjustment.



[Visual Adjust and control the Voltage level]

3.6. Model name & serial number download

(1) Model name & Serial number D/L

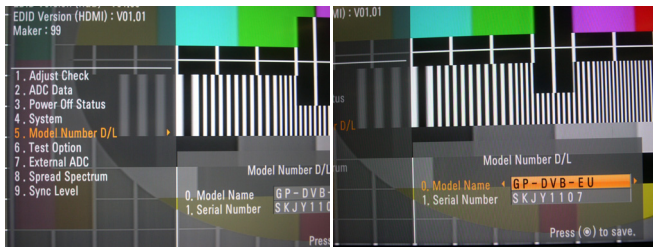
- Press "Power on" key of service remote control.(Baud rate : 115200 bps)
- Connect RS232 Signal Cable to RS-232 Jack.
- Write Serial number by use RS-232.
- Must check the serial number at Instart menu.

(2) Method & notice

- A. Serial number D/L is using of scan equipment.
- B. Setting of scan equipment operated by Manufacturing Technology Group.
- C. Serial number D/L must be conformed when it is produced in production line, because serial number D/L is mandatory by D-book 4.0

* Manual Download (Model Name and Serial Number)

- If the TV set is downloaded by OTA or service man, sometimes model name or serial number is initialized.(Not always)
- There is impossible to download by bar code scan, so It need Manual download.
- a. Press the 'instart' key of ADJ remote control.
- b. Go to the menu '5.Model Number D/L' like below photo.
- c. Input the Factory model name(ex 42LD450-ZA) or Serial number like photo.



- d. Check the model name Instart menu -> Factory name displayed (ex 42LE7500-ZA)
- e. Check the Diagnostics (DTV country only) -> Buyer model displayed (ex 42LE7500-ZA)

3.7. CI+ Key Download method

(1) Download Procedure

- 1) Press "Power on" button of a service R/C.(Baud rate : 115200 bps)
- 2) Connect RS232-C Signal Cable.
- 3) Write CI+ Key through RS-232-C.
- 4) Check whether the key was downloaded or not at 'In Start' menu. (Refer to below).



=> Check the Download to CI+ Key value in LGset.

1. check the method of CI+ Key value
 - a. check the method on Instart menu
 - b. check the method of RS232C Command
 - 1) into the main ass'y mode (RS232 : aa 00 00)

| CMD 1 | CMD 2 | Data 0 | Data 1 |
|-------|-------|--------|--------|
| A | A | 0 | 0 |

- 2) check the key download for transmitted command (RS232 : ci 00 10)

| CMD 1 | CMD 2 | Data 0 | Data 1 |
|-------|-------|--------|--------|
| C | I | 1 | 0 |

- 3) result value
 - normally status for download : OKx
 - abnormally status for download : NGx

2. Check the method of CI+ Key value (RS232)
 - 1) into the main ass'y mode (RS232 : aa 00 00)

| CMD 1 | CMD 2 | Data 0 | Data 1 |
|-------|-------|--------|--------|
| A | A | 0 | 0 |

- 2) Check the method of CI+ key by command (RS232 : ci 00 20)

| CMD 1 | CMD 2 | Data 0 | Data 1 |
|-------|-------|--------|--------|
| C | I | 2 | 0 |

- 3) Result value
 - i 01 OK 1d1852d21c1ed5dcx

→ CI+ key Value

4. Manual Adjustment

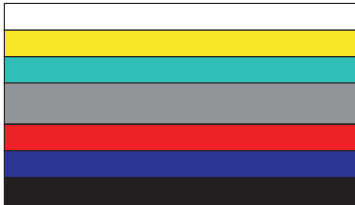
4.1. ADC(GP2) Adjustment

4.1.1. Overview

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

4.1.2. Equipment & Condition

- (1) Adjust Remocon
- (2) 801GF(802B, 802F, 802R) or MSPG925FA Pattern Generator
 - Resolution :
 - 480i, 720*480 (MSPG-925FA -> Model: 209, Pattern: 65)
 - 480i
 - 1080p, 1920*1080 (MSPG-925FA -> Model: 225, Pattern: 65) - 1080p
 - Pattern : Horizontal 100% Color Bar Pattern
 - Pattern level: 0.7 ± 0.1 Vp-p
 - Image



(3) Must use standard cable

4.1.3. Adjust method

- (1) ADC 480i, 1080p Comp1
 - 1) Check connected condition of Comp1 cable to the equipment
 - 2) Give a 480i, 1080p Mode, Horizontal 100% Color Bar Pattern to Comp1.
 - (MSPG-925FA -> Model: 209, Pattern: 65) - 480i
 - (MSPG-925FA -> Model: 225, Pattern: 65) - 1080p
 - 3) Change input mode as Component1 and picture mode as "Standard"
 - 4) Press the In-start Key on the ADJ remote after at least 1 min of signal reception. Then, select 7. External ADC -> 1. COMP 1080p on the menu. Press enter key. The adjustment will start automatically.
 - 5) If ADC calibration is successful, "ADC RGB Success" is displayed.
 - If ADC calibration is failure, "ADC RGB Fail" is displayed.
 - 6) If ADC calibration is failure, after recheck ADC pattern or condition retry calibration Error message refer to 5).
- (2) ADC 1920*1080 RGB
 - 1) Check connected condition of Component & RGB cable to the equipment
 - 2) Give a 1920*1080 Mode, 100 % Horizontal Color Bar Pattern to RGB port.
 - (MSPG-925 Series -> model:126 , pattern:65)
 - 3) Change input mode as RGB and picture mode as "Standard".
 - 4) Press the In-start Key on the ADJ remote after at least 1 min of signal reception. Then, select 7. External ADC -> 1. COMP 1080p on the menu. Press enter key. The adjustment will start automatically.
 - 5) If ADC calibration is successful, "ADC RGB Success" is displayed.
 - If ADC calibration is failure, "ADC RGB Fail" is displayed.
 - 6) If ADC calibration is failure, after recheck ADC pattern or condition retry calibration Error message refer to 5).

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

(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".

(2) Equipment

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

(3)Download method

- 1) Press Adj. key on the Adj. R/C, then select "10.EDID D/L", By pressing Enter key, enter EDID D/L menu.
- 2) Select [Start] button by pressing Enter key, HDMI1 / HDMI2 / HDMI3 / HDMI4 / RGB are Writing and display OK or NG.

| For Analog EDID | For HDMI EDID | |
|--|---|---|
| D-sub to D-sub | DVI-D to HDMI or HDMI to HDMI | |
|  |  |  |

(4) EDID DATA

■ HDMI

| | 0x00 | 0x01 | 0x02 | 0x03 | 0x04 | 0x05 | 0x06 | 0x07 | 0x08 | 0x09 | 0x0A | 0x0B | 0x0C | 0x0D | 0x0E | 0x0F |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 0x00 | 00 | FF | FF | FF | FF | FF | FF | 00 | 1E | 6D | | | | | | |
| 0x01 | | | 01 | 03 | 80 | 10 | 09 | 78 | 0A | EE | 91 | A3 | 54 | 4C | 99 | 26 |
| 0x02 | 0F | 50 | 54 | A1 | 08 | 00 | 71 | 4F | 81 | 80 | 01 | 01 | 01 | 01 | 01 | 01 |
| 0x03 | 01 | 01 | 01 | 01 | 01 | 01 | 02 | 3A | 80 | 18 | 71 | 38 | 2D | 40 | 58 | 2C |
| 0x04 | 45 | 00 | A0 | 5A | 00 | 00 | 00 | 1E | 01 | 1D | 00 | 72 | 51 | D0 | 1E | 20 |
| 0x05 | 6E | 28 | 55 | 00 | A0 | 5A | 00 | 00 | 00 | 1E | 00 | 00 | 00 | FD | 00 | 3A |
| 0x06 | 3E | 1E | 53 | 10 | 00 | 0A | 20 | 20 | 20 | 20 | 20 | 20 | | | | |
| 0x07 | | | | | | | | | | | | | | | 01 | |
| 0x00 | 02 | 03 | 26 | F1 | 4E | 10 | 1F | 84 | 13 | 05 | 14 | 03 | 02 | 12 | 20 | 21 |
| 0x01 | 22 | 15 | 01 | 26 | 15 | 07 | 50 | 09 | 57 | 07 | 67 | | | | | |
| 0x02 | | | E3 | 05 | 03 | 01 | 01 | 1D | 80 | 18 | 71 | 1C | 16 | 20 | 58 | 2C |
| 0x03 | 25 | 00 | A0 | 5A | 00 | 00 | 00 | 9E | 01 | 1D | 00 | 80 | 51 | D0 | 0C | 20 |
| 0x04 | 40 | 80 | 35 | 00 | A0 | 5A | 00 | 00 | 00 | 1E | 02 | 3A | 80 | 18 | 71 | 38 |
| 0x05 | 2D | 40 | 58 | 2C | 45 | 00 | A0 | 5A | 00 | 00 | 00 | 1E | 66 | 21 | 50 | B0 |
| 0x06 | 51 | 00 | 1B | 30 | 40 | 70 | 36 | 00 | A0 | 5A | 00 | 00 | 00 | 1E | 00 | 00 |
| 0x07 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 01 | |

■ RGB

| | 0x00 | 0x01 | 0x02 | 0x03 | 0x04 | 0x05 | 0x06 | 0x07 | 0x08 | 0x09 | 0x0A | 0x0B | 0x0C | 0x0D | 0x0E | 0x0F |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 0x00 | 00 | FF | FF | FF | FF | FF | FF | 00 | 1E | 6D | | | | | | |
| 0x01 | | | 01 | 03 | 68 | 10 | 09 | 78 | 0A | EE | 91 | A3 | 54 | 4C | 99 | 26 |
| 0x02 | 0F | 50 | 54 | A1 | 08 | 00 | 81 | 80 | 61 | 40 | 45 | 40 | 31 | 40 | 01 | 01 |
| 0x03 | 01 | 01 | 01 | 01 | 01 | 01 | 02 | 3A | 80 | 18 | 71 | 38 | 2D | 40 | 58 | 2C |
| 0x04 | 45 | 00 | A0 | 5A | 00 | 00 | 00 | 1E | 01 | 1D | 00 | 72 | 51 | D0 | 1E | 20 |
| 0x05 | 6E | 28 | 55 | 00 | A0 | 5A | 00 | 00 | 00 | 1E | 00 | 00 | 00 | FD | 00 | 3A |
| 0x06 | 3E | 1E | 53 | 10 | 00 | 0A | 20 | 20 | 20 | 20 | 20 | 20 | | | | |
| 0x07 | | | | | | | | | | | | | | | 00 | |

■ Reference

- HDMI1 ~ HDMI4 / RGB
- In the data of EDID, bellows may be different by S/W or Input mode.

Product ID

| Model Name | HEX | EDID Table | DDC Function |
|------------|------|------------|--------------|
| All Model | 0001 | 01 00 | Analog |
| | 0001 | 01 00 | Digital |

Serial No. : Controlled on product line
 Month, Year: Controlled on production line:
 ex) Monthly : '01' -> '01'
 Year : '2010' -> '14'
 Model Name(Hex):

| MODEL | MODEL NAME(HEX) |
|-------|---|
| all | 00 00 00 FC 00 4C 47 20 54 56 0A 20 20 20 20 20 20 20 |

Checksum: Changeable by total EDID data.
 Vendor Specific(HDMI)

| INPUT | MODEL NAME(HEX) |
|-------|-------------------------|
| HDMI1 | 67 03 0C 00 10 00 B8 2D |
| HDMI2 | 67 03 0C 00 20 00 B8 2D |
| HDMI3 | 67 03 0C 00 30 00 B8 2D |
| HDMI4 | 67 03 0C 00 40 00 B8 2D |
| HDMI5 | 67 03 0C 00 50 00 B8 2D |

4.3. White Balance Adjustment

4.3.1 Overview

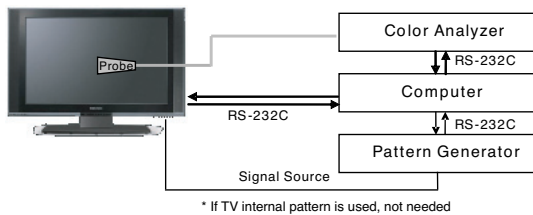
- (1) W/B adj. Objective & How-it-works
- (2) Objective: To reduce each Panel's W/B deviation
- (3) How-it-works : When R/G/B gain in the OSD is at 192, it means the panel is at its Full Dynamic Range. In order to prevent saturation of Full Dynamic range and data, one of R/G/B is fixed at 192, and the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

4.3.2 Equipment

- 1) Color Analyzer: CA-210 (LED Module : CH 14)
- 2) Adj. Computer(During auto adj., RS-232C protocol is needed)
- 3) Adjust Remocon
- 4) Video Signal Generator MSPG-925F 720p/216-Gray (Model:217, Pattern:78)
 -> Only when internal pattern is not available

■ Color Analyzer Matrix should be calibrated using CS-1000

4.3.3. Equipment connection MAP



4.3.4. Adj. Command (Protocol)

<Command Format>

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

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

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

| RS-232C COMMAND | | | Explanation |
|-----------------|----|--------|---|
| [CMD] | ID | [DATA] | |
| wb | 00 | 00 | Begin White Balance adj. |
| wb | 00 | 10 | Gain adj.(internal white pattern) |
| wb | 00 | 1f | Gain adj. completed |
| wb | 00 | 20 | Offset adj.(internal white pattern) |
| wb | 00 | 2f | Offset adj. completed |
| wb | 00 | ff | End White Balance adj.(Internal pattern disappears) |

- Ex) wb 00 00 -> Begin white balance auto-adj.
 wb 00 10 -> Gain adj.
 ja 00 ff -> Adj. data
 jb 00 c0
 ...
 ...
 wb 00 1f -> Gain adj. completed
 *(wb 00 20(Start), wb 00 2f(completed)) -> Off-set adj.
 wb 00 ff -> End white balance auto-adj.

■ Adj. Map

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

4.3.5. Adj. method

(1) Auto adj. method

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

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

(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 -> 7. White-Balance then press the cursor to the right (KEY ►).
(When KEY(►) is pressed 216 Gray internal pattern will be displayed)
- 4) One of R Gain / G Gain / B Gain should be fixed at 192, and the rest will be lowered to meet the desired value.
- 5) Adj. is performed in COOL, MEDIUM, WARM 3 modes of color temperature.

■ If internal pattern is not available, use RF input. In EZ Adj. menu 7.White Balance, you can select one of 2 Test-pattern: ON, OFF. Default is inner(ON). By selecting OFF, you can adjust using RF signal in 216 Gray pattern.

■ Adj. condition and cautionary items

- 1) Lighting condition in surrounding area
Surrounding lighting should be lower 10 lux. Try to isolate adj. area into dark surrounding.
- 2) Probe location
: 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.

4.3.6. Reference (White Balance Adj. coordinate and temperature)

■ Luminance : 216 Gray

■ Standard color coordinate and temperature using CS-1000 (over 26 inch)

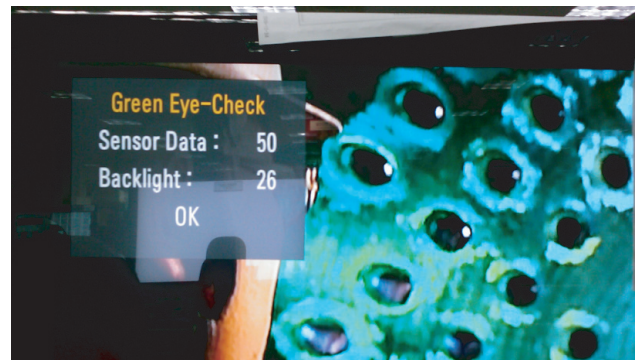
| Mode | Color Coordination | | Temp | ΔUV |
|--------|--------------------|-------|---------|--------|
| | x | y | | |
| COOL | 0.269 | 0.273 | 13000 K | 0.0000 |
| MEDIUM | 0.285 | 0.293 | 9300 K | 0.0000 |
| WARM | 0.313 | 0.329 | 6500 K | 0.0000 |

■ Standard color coordinate and temperature using CA-210(CH 9)

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

4.4. EYE-Q function check

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



4.5. Local Dimming Function Check

- Step 1) Turn on TV.
- Step 2) Press Tilt key of Adj. R/C.
- Step 3) Confirm under the screen.



4.6. Option selection per country

(1) Overview

- Option selection is only done for models in Non-EU
- Applied model: LD03D/03E Chassis applied EU model

(2) Method

- 1) Press ADJ key on the Adj. R/C, then select Country Group Menu
- 2) Depending on destination, select Country Group Code 04 or Country Group EU then on the lower Country option, select US, CA, MX. Selection is done using +, - or ►◀ KEY.

4.7. Tool Option selection

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

| MODEL | Tool 1 | Tool 2 | Tool 3 | Tool 4 | Tool 5 |
|----------|--------|--------|--------|--------|--------|
| 47LE5*** | 33024 | 31795 | 56364 | 22958 | 2066 |

4.8. 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.
After final inspection, Always turn on the Mechanical S/W.

5. GND and Internal Pressure check

5.1. Method

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

5.2. Checkpoint

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

6. Audio

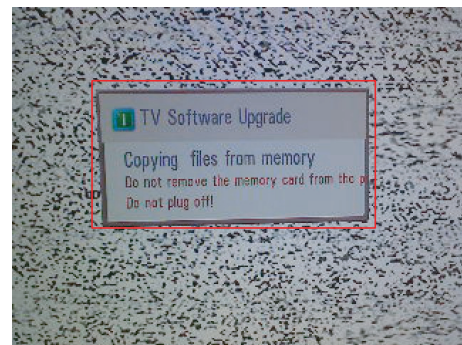
| No. | Item | Min. | Typ. | Max. | Unit | |
|-----|---|------|------|------|------|-----------------------------------|
| 1. | Audio practical max Output, L/R (Distortion=10% max Output) | 9.0 | 10.0 | 12.0 | W | EQ Off AVL Off |
| | | 8.5 | 8.9 | 9.8 | Vrms | Clear Voice Off |
| 2. | Speaker (8Ω Impedance) | | 10.0 | 15.0 | W | EQ On AVL On Clear Voice On |

Measurement condition:

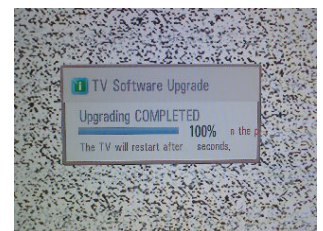
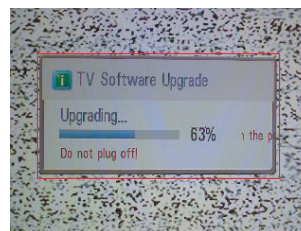
1. RF input: Mono, 1KHz sine wave signal, 100% Modulation
2. CVBS, Component: 1KHz sine wave signal 0.4Vrms
3. RGB PC: 1KHz sine wave signal 0.7Vrms

7. 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 starting.

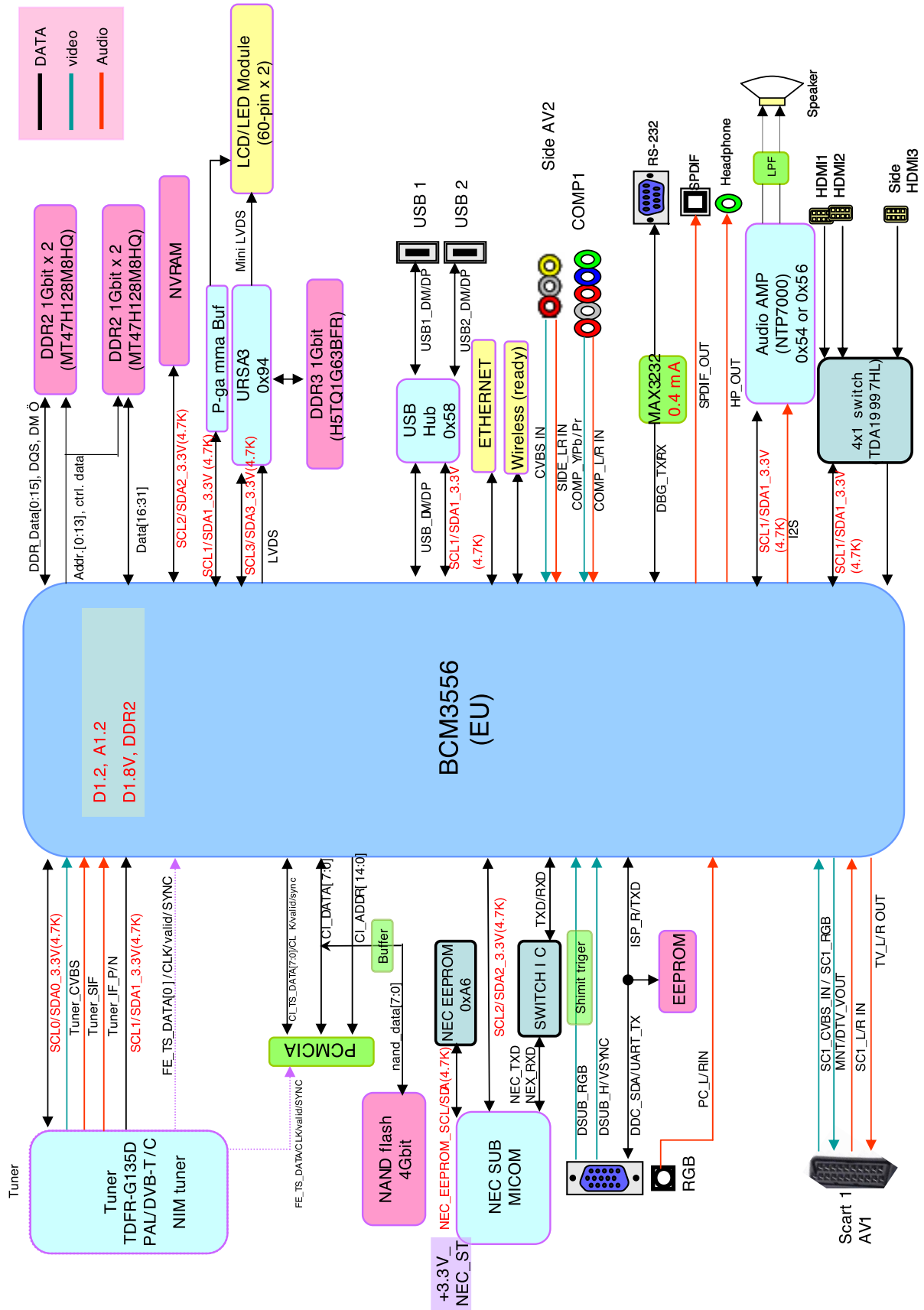


- 5) Updating Completed, The TV will restart automatically
- 6) If your TV is turned on, check your updated version and Tool option. (explain the Tool option, next stage)
 - * If downloading version is more high than your TV have, TV can lost all channel data. In this case, you have to channel recover.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

* After downloading, have to adjust TOOL OPTION again.

1. Push "IN-START" key in service remote control.
2. Select "Tool Option 1" and Push "OK" button.
3. Punch in the number. (Each model has their number.)

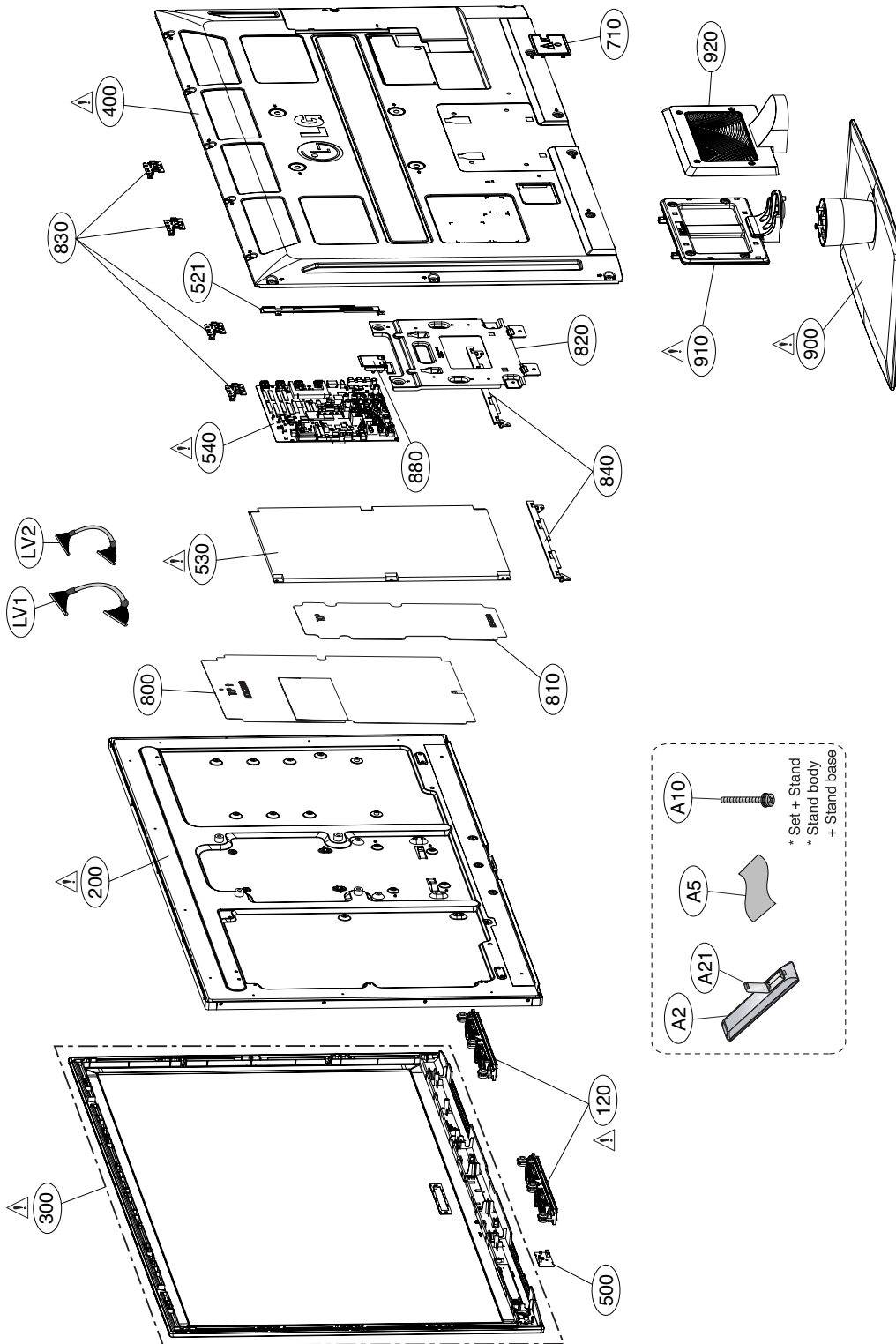
BLOCK DIAGRAM



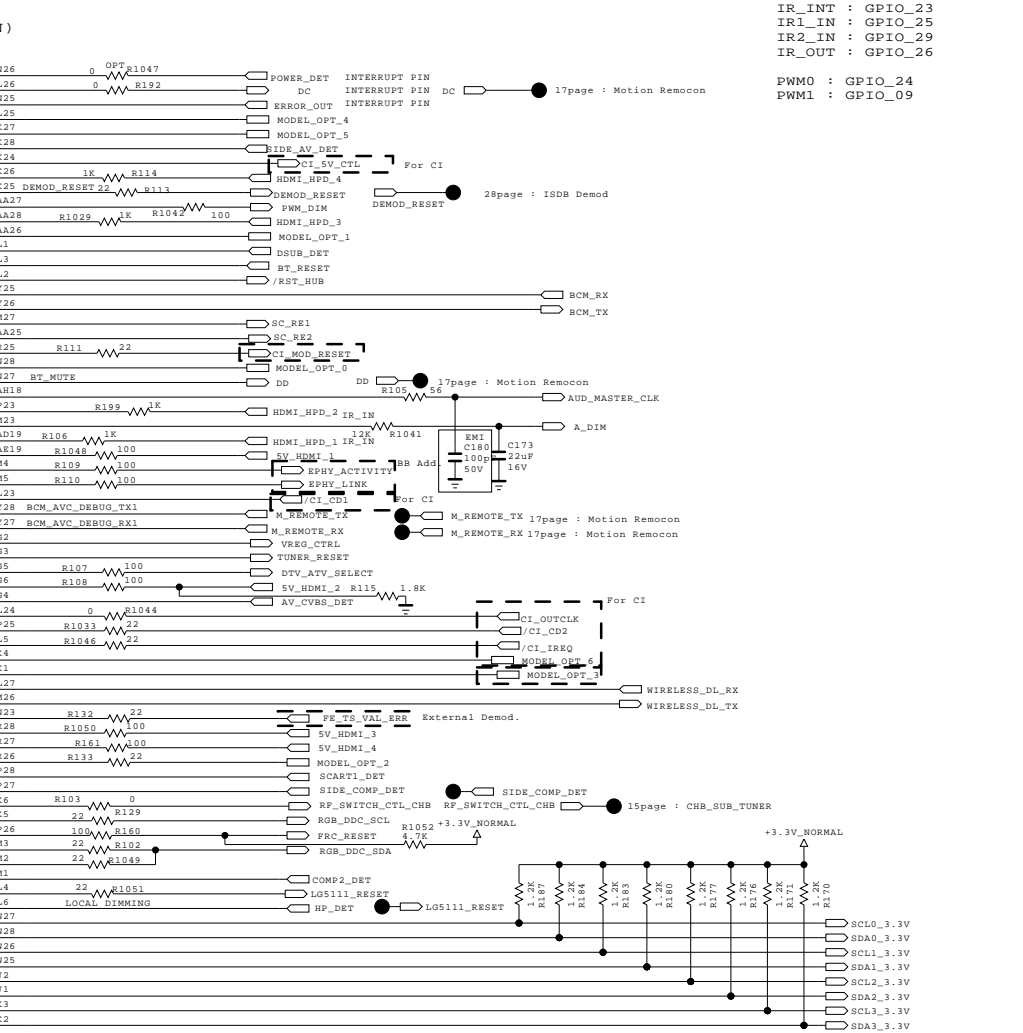
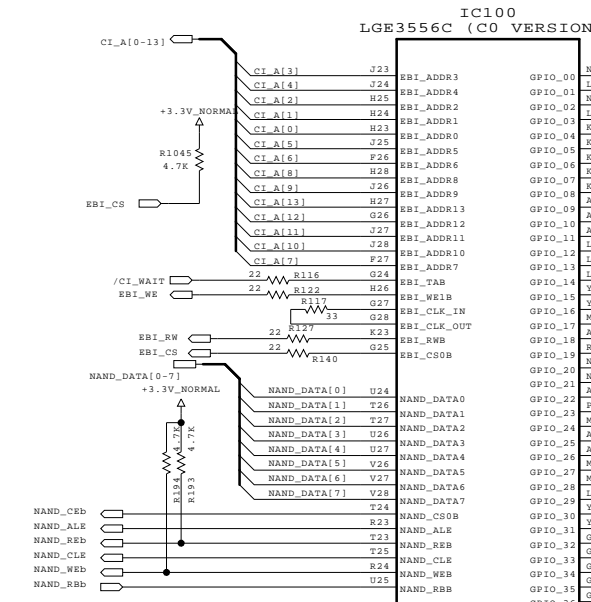
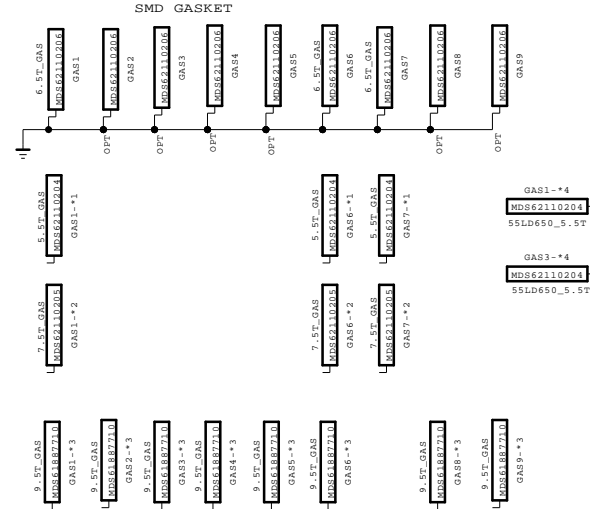
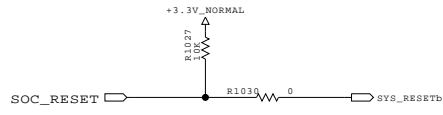
EXPLODED VIEW

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.

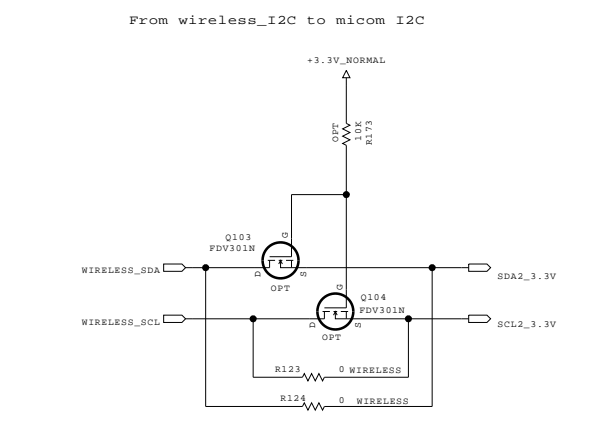
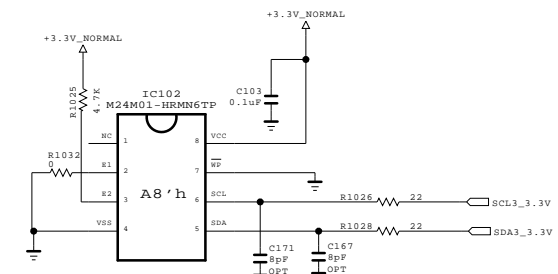


RESET



EXT_IRQ : GPIO_00, GPIO_01, GPIO_02, GPIO_11, GPIO_11, GPIO_39
 IR_INT : GPIO_23
 IRI_IN : GPIO_25
 IR2_IN : GPIO_29
 IR_OUT : GPIO_26
 PWM0 : GPIO_24
 PWM1 : GPIO_09

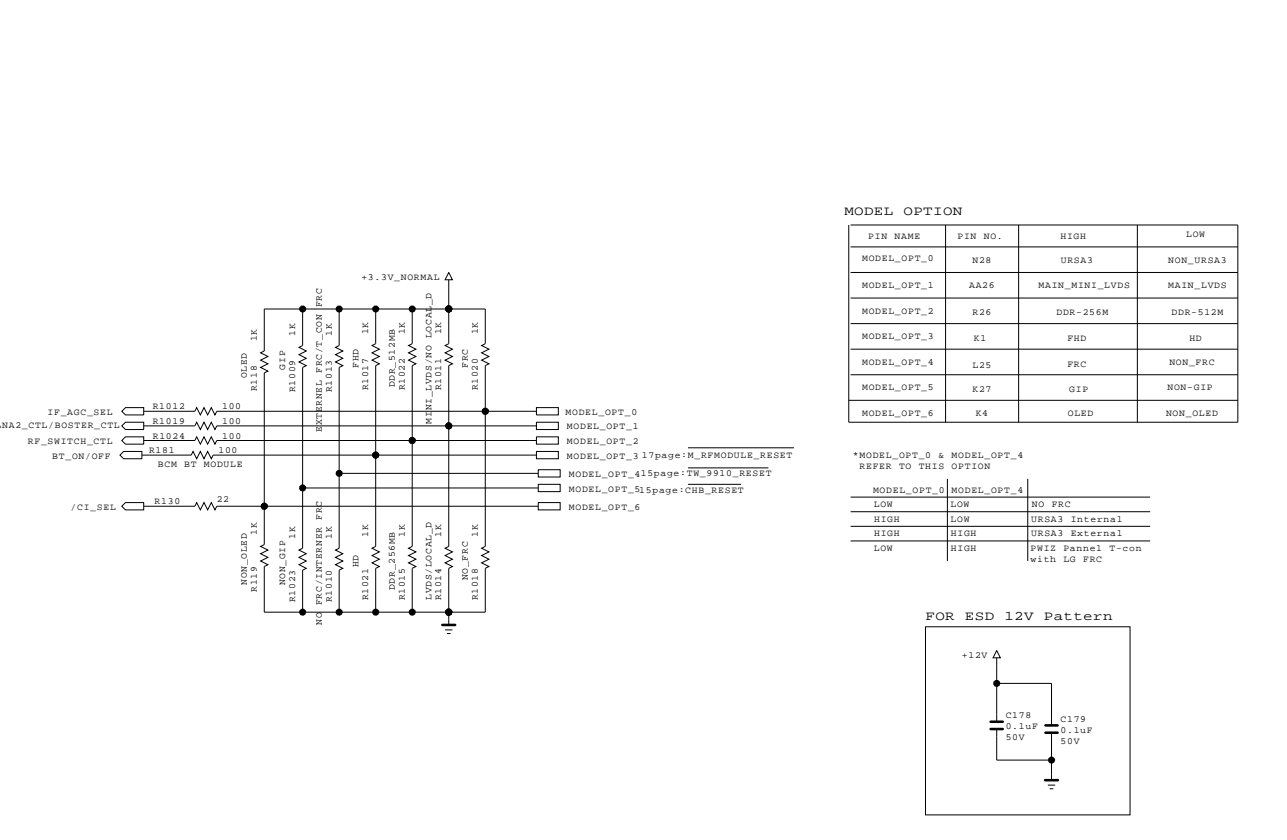
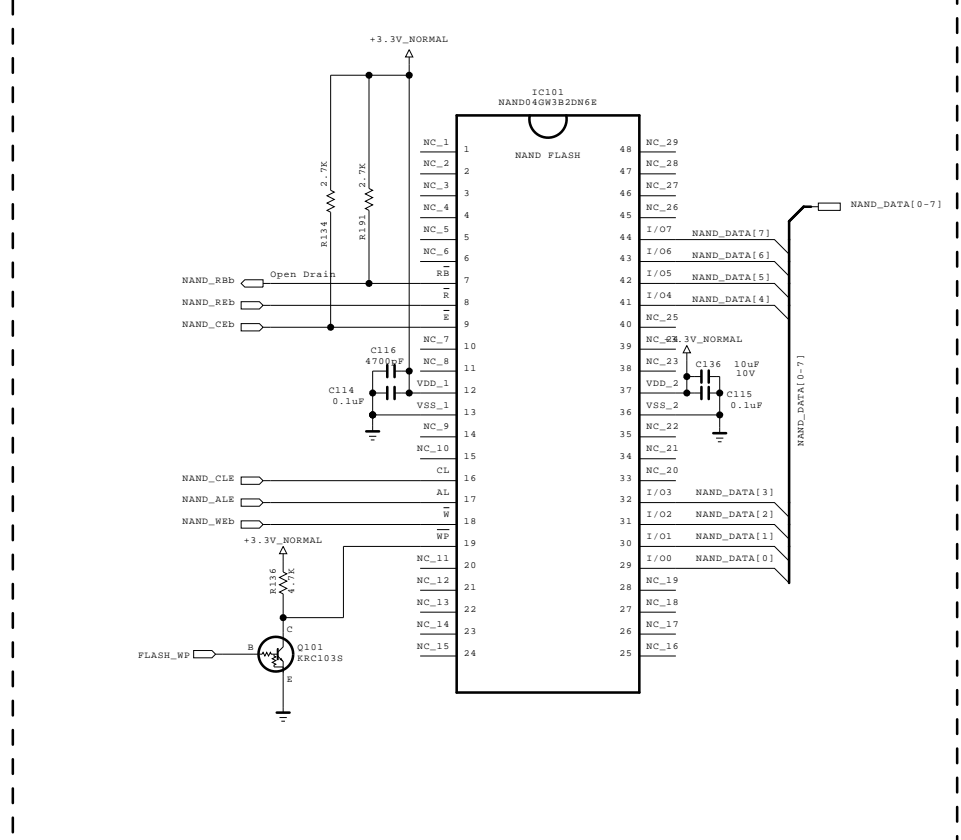
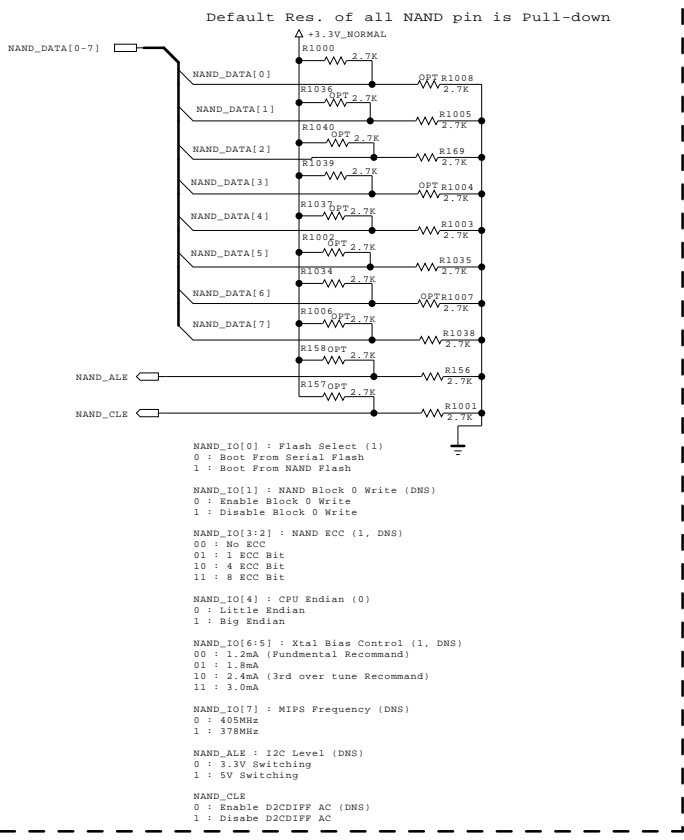
NVRAM



* I2C MAP
 * I2C_0 :
 * I2C_1 :
 * I2C_2 :
 * I2C_3 :

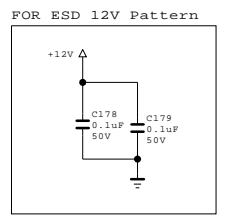
Boot Strap

* NAND FLASH MEMORY 4Gbit (512M for BB)



| MODEL OPTION | | | |
|--------------|---------|----------------|-----------|
| PIN NAME | PIN NO. | HIGH | LOW |
| MODEL_OPT_0 | N28 | URSA3 | NON_URSA3 |
| MODEL_OPT_1 | AA26 | MAIN_MINI_LVDS | MAIN_LVDS |
| MODEL_OPT_2 | R26 | DDR-256M | DDR-512M |
| MODEL_OPT_3 | K1 | FRD | HD |
| MODEL_OPT_4 | L25 | FRC | NON_FRC |
| MODEL_OPT_5 | K27 | GIP | NON-GIP |
| MODEL_OPT_6 | K4 | OLED | NOR_OLED |

*MODEL_OPT_0 & MODEL_OPT_4 REFER TO THIS OPTION
 MODEL_OPT_0 MODEL_OPT_4
 LOW LOW NO FRC
 HIGH LOW URSA3 Internal
 HIGH HIGH URSA3 External
 LOW HIGH PWIZ Panel 7-con With LG FRC

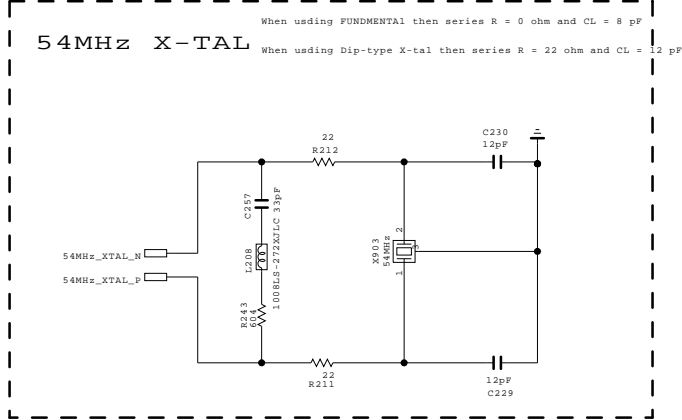
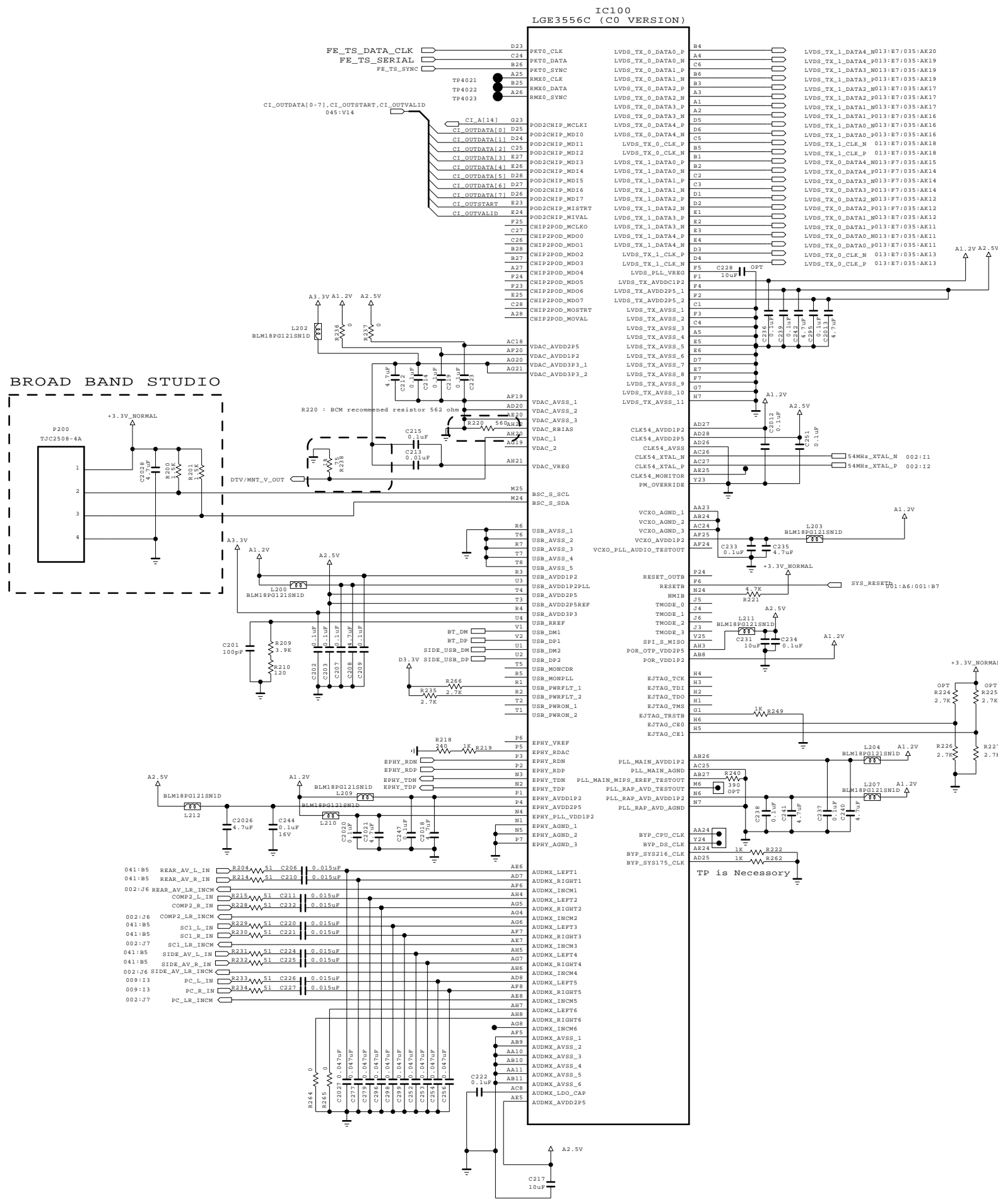


THE Δ SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE Δ SYMBOL MARK OF THE SCHEMATIC.

SECRET
 LGElectronics

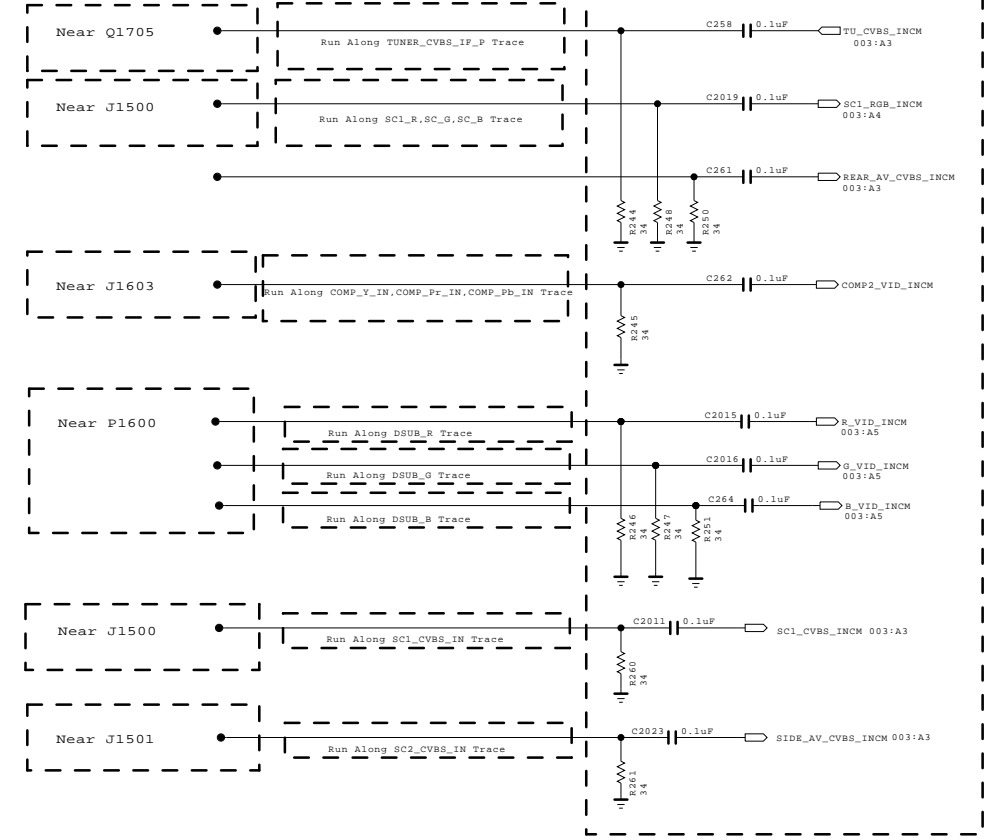


| | | | |
|-------------|----------------------|------------|------------|
| MODEL BLOCK | BCM (EUROBBTV) | DATE SHEET | 2009.06.18 |
| | BCM3556 & NAND FLASH | | 1 |

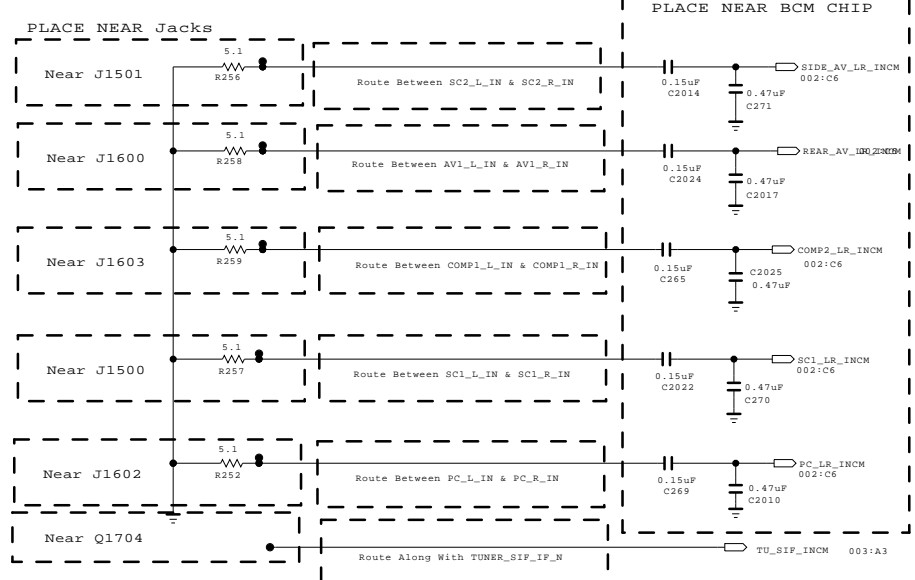


VIDEO INCM

PLACE NEAR BCM CHIP



AUDIO INCM



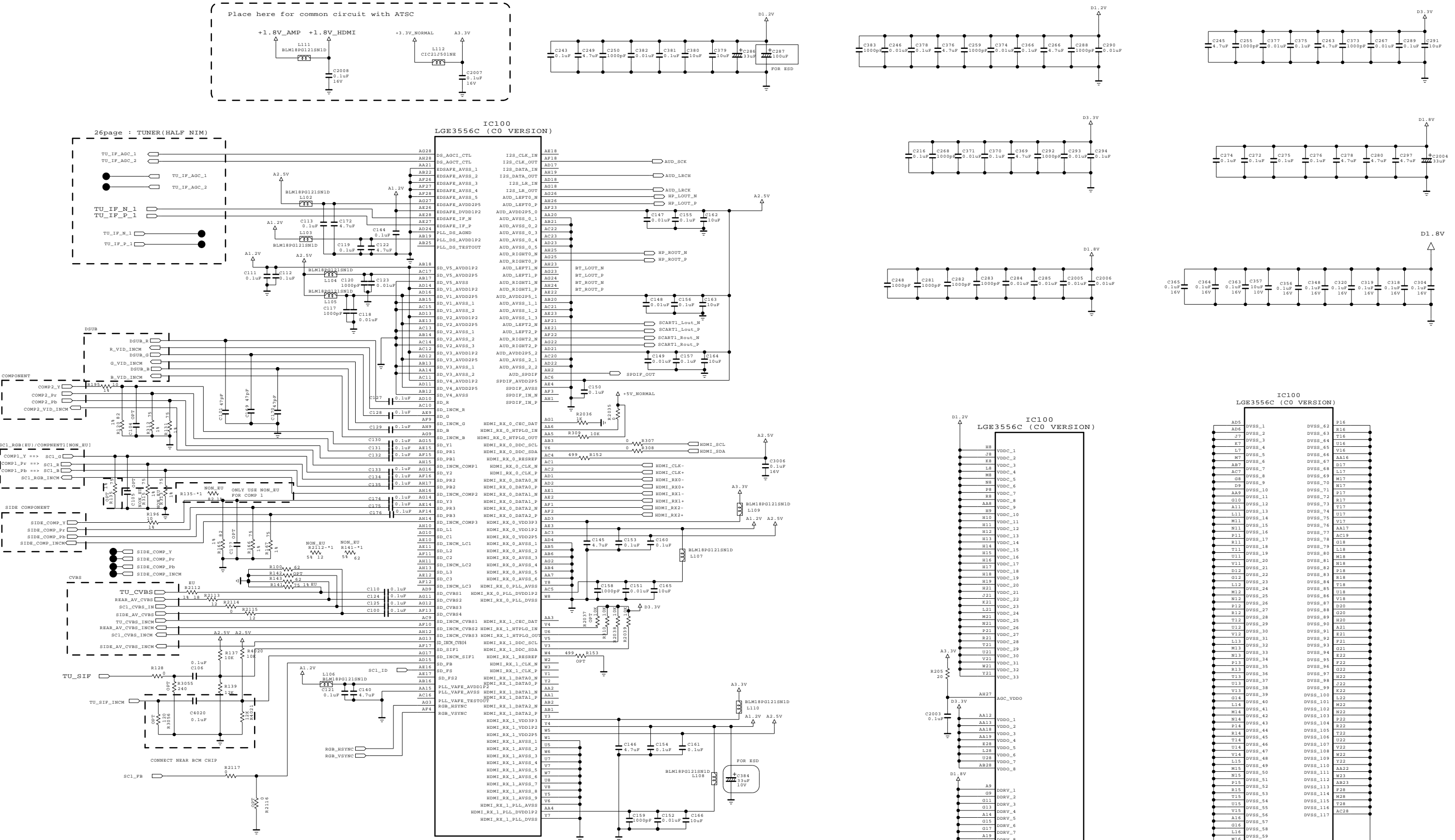
Route INCM between associated left and right signals of same channel. The INCM trace ends at the same point where the connector ground connects to the board ground (thru-hole connector pin). Place test points, resistors near audio connector. Connect the other side of the resistor to GND as close as possible to the ground connection of the associated audio connector.

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SECRET
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| | | | |
|-------|---------------------|-------|------------|
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| BLOCK | BCM3556 AUD_IN/LVDS | SHEET | 2 |

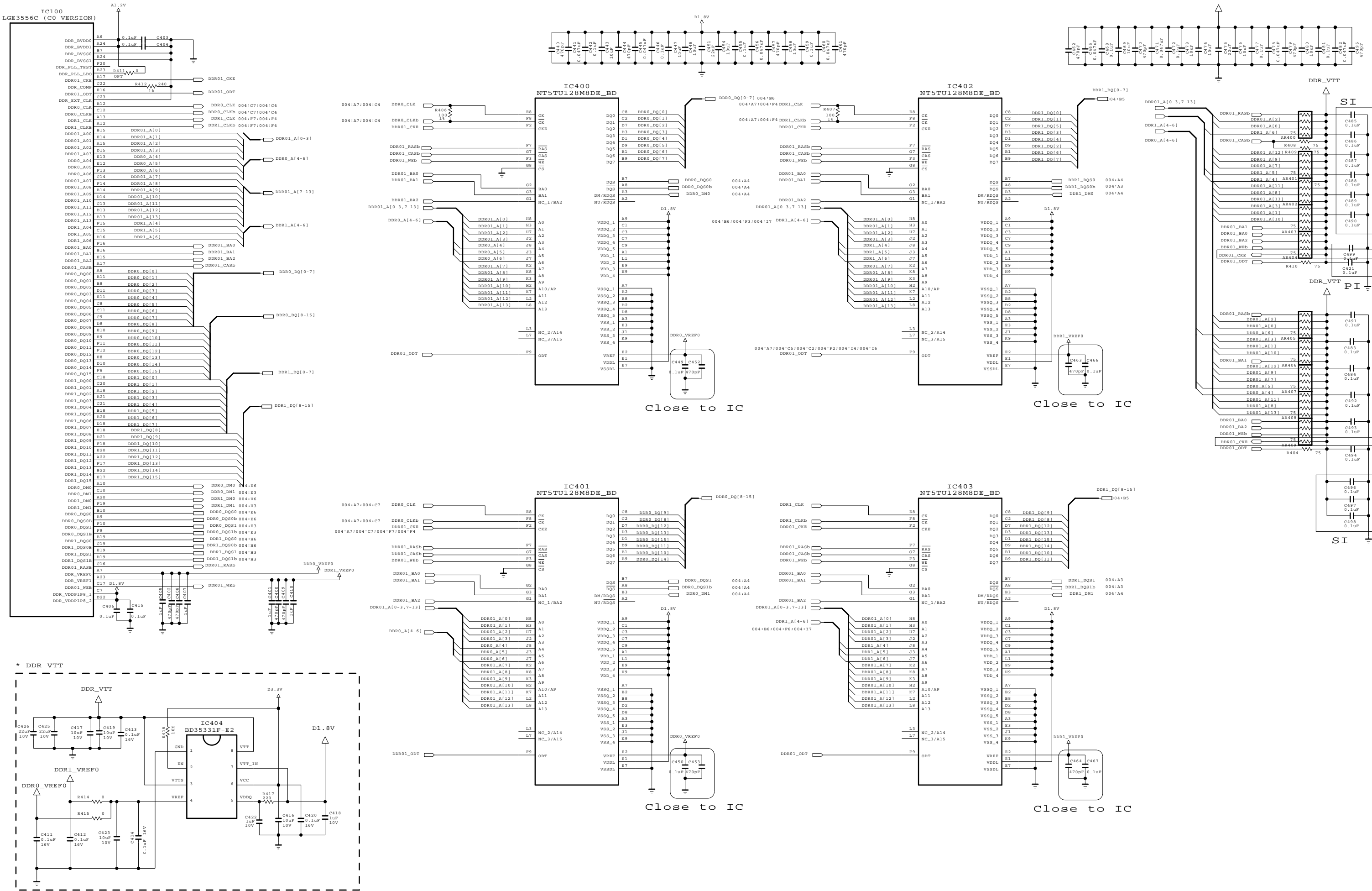


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LGElectronics



| | | | |
|-------|------------------|-------|------------|
| MODEL | EUROBTV | DATE | 2009.06.18 |
| BLOCK | BCM3556 VIDEO IN | SHEET | 3 |



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

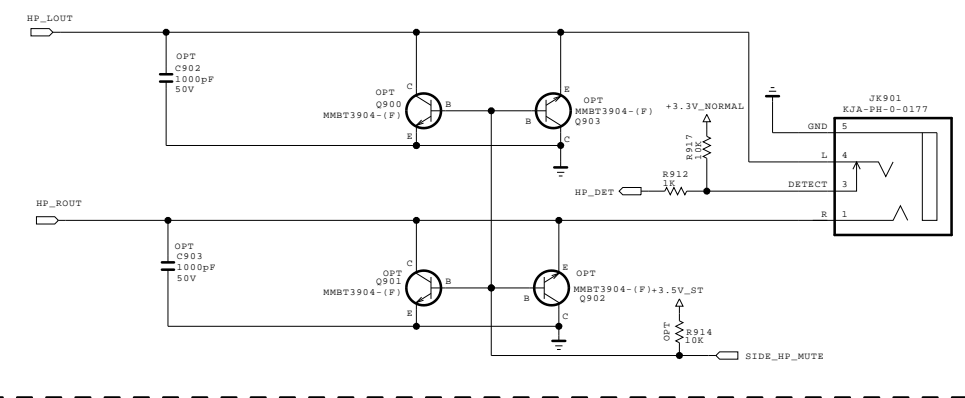
SECRET
LGElectronics

HONG YEON HYUK

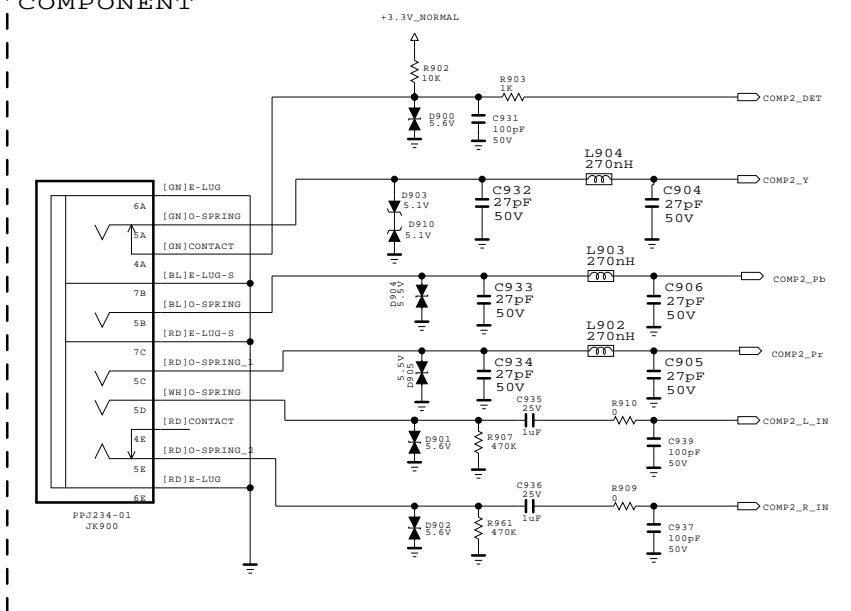


| | | | |
|-------|----------------|-------|------------|
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| BLOCK | DDR Memory | SHEET | 4 |

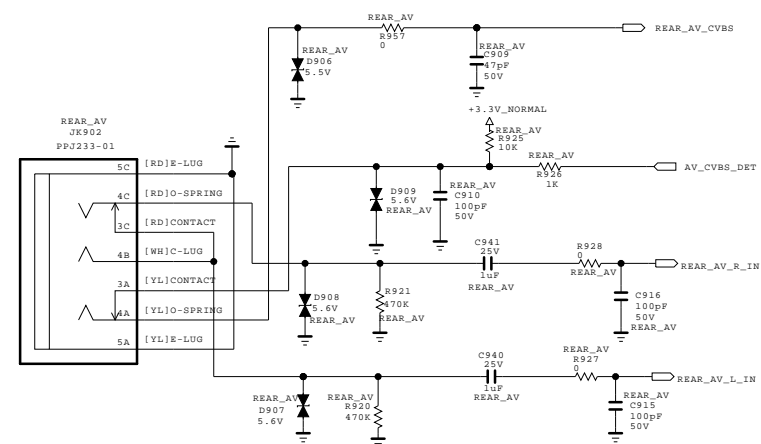
New Item Development
EARPHONE BLOCK



COMPONENT



Rear CVBS



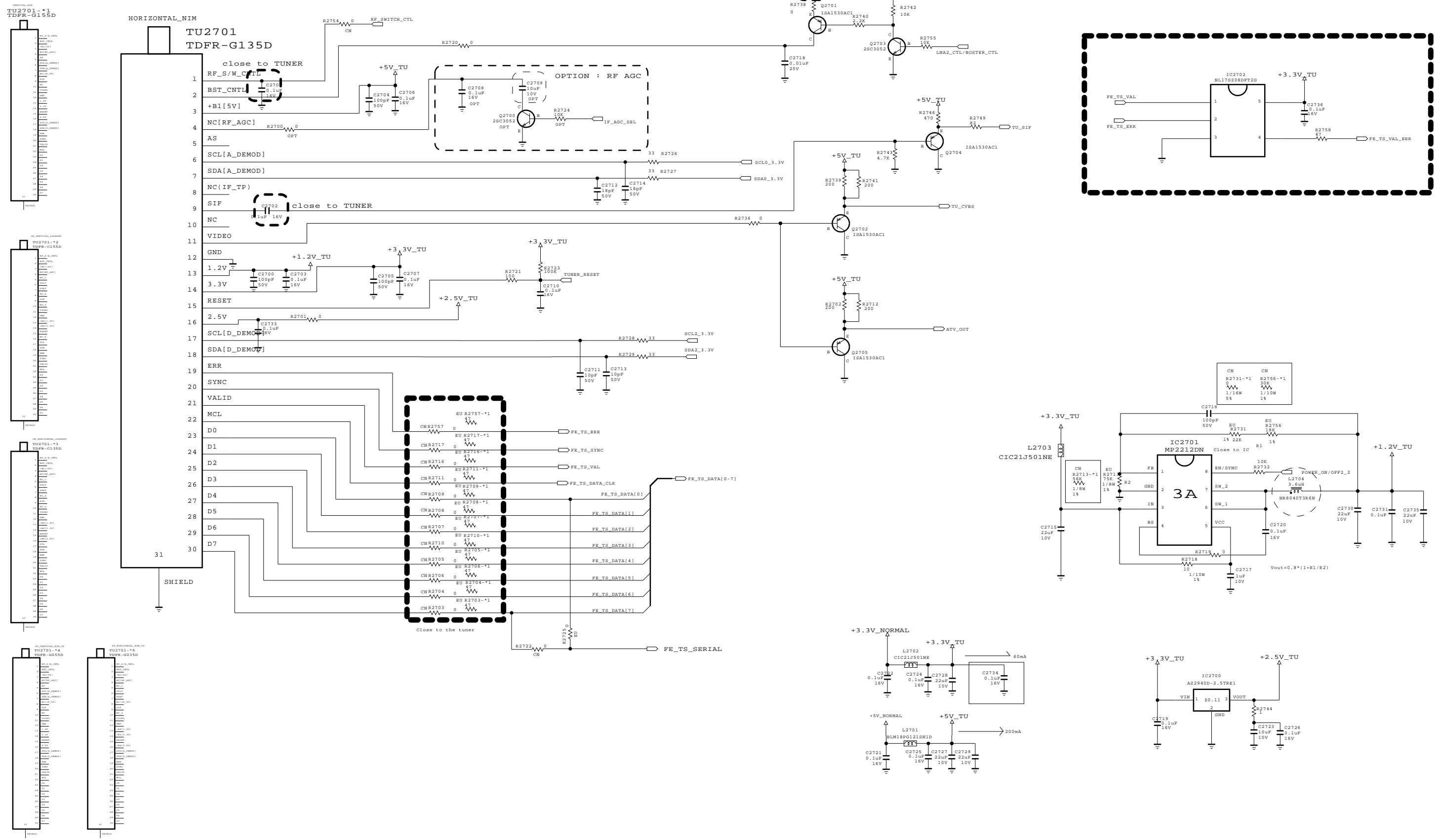
THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.

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| | | | |
|-------|-------------------|-------|------------|
| MODEL | EUROBBTV | DATE | 2009.06.18 |
| BLOCK | ETC SUB BOARD I/F | SHEET | 9 |

CAN H-NIM/NIM TUNER for EU



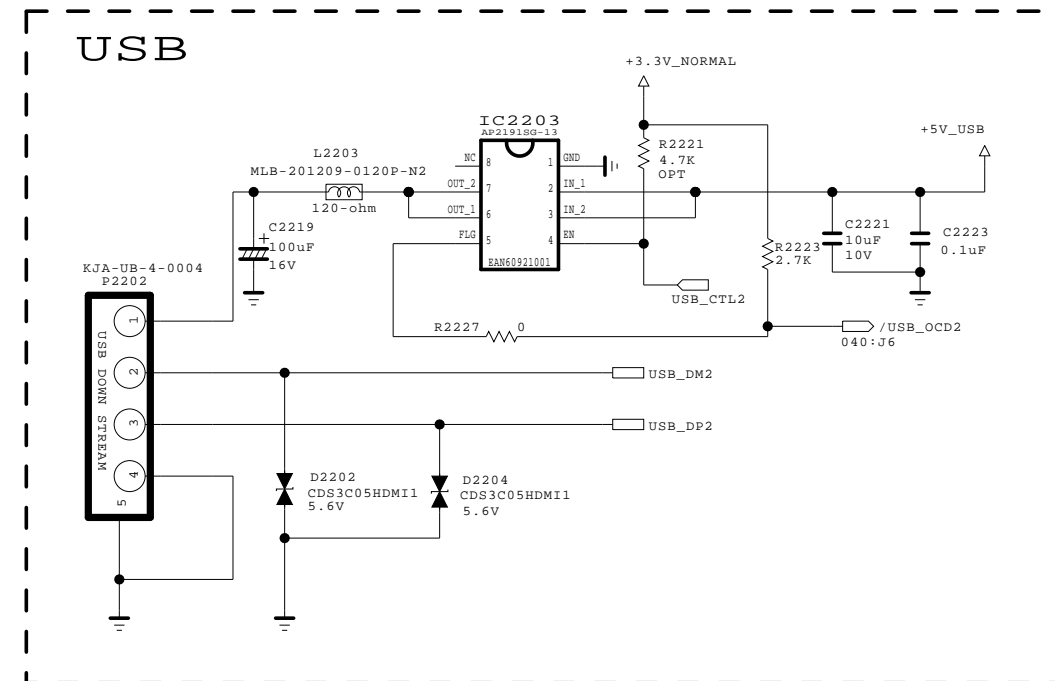
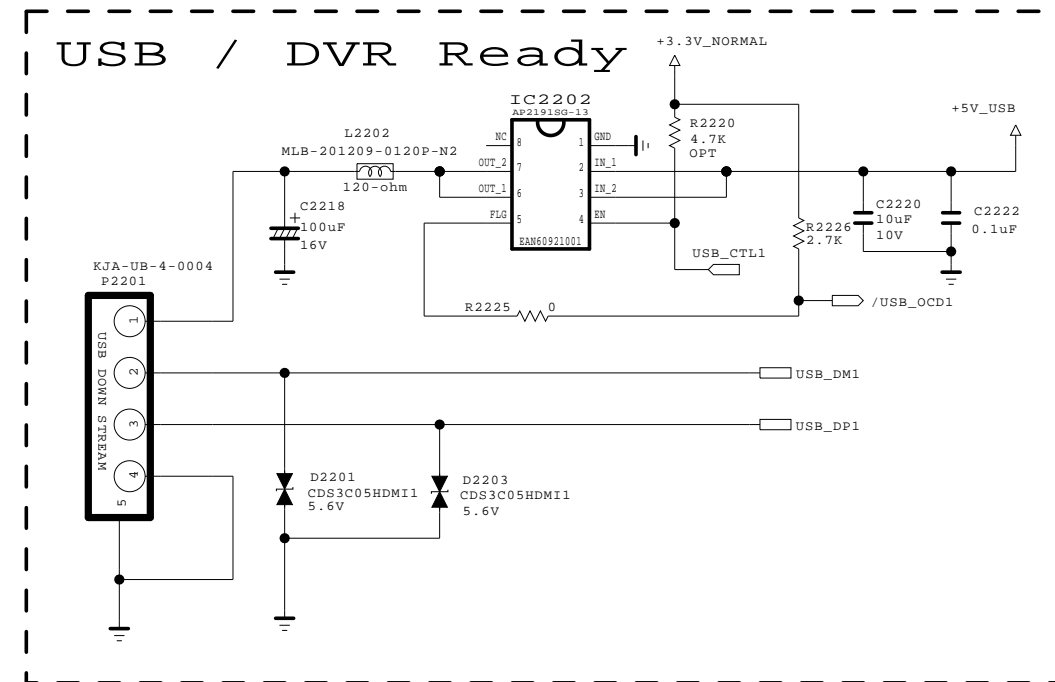
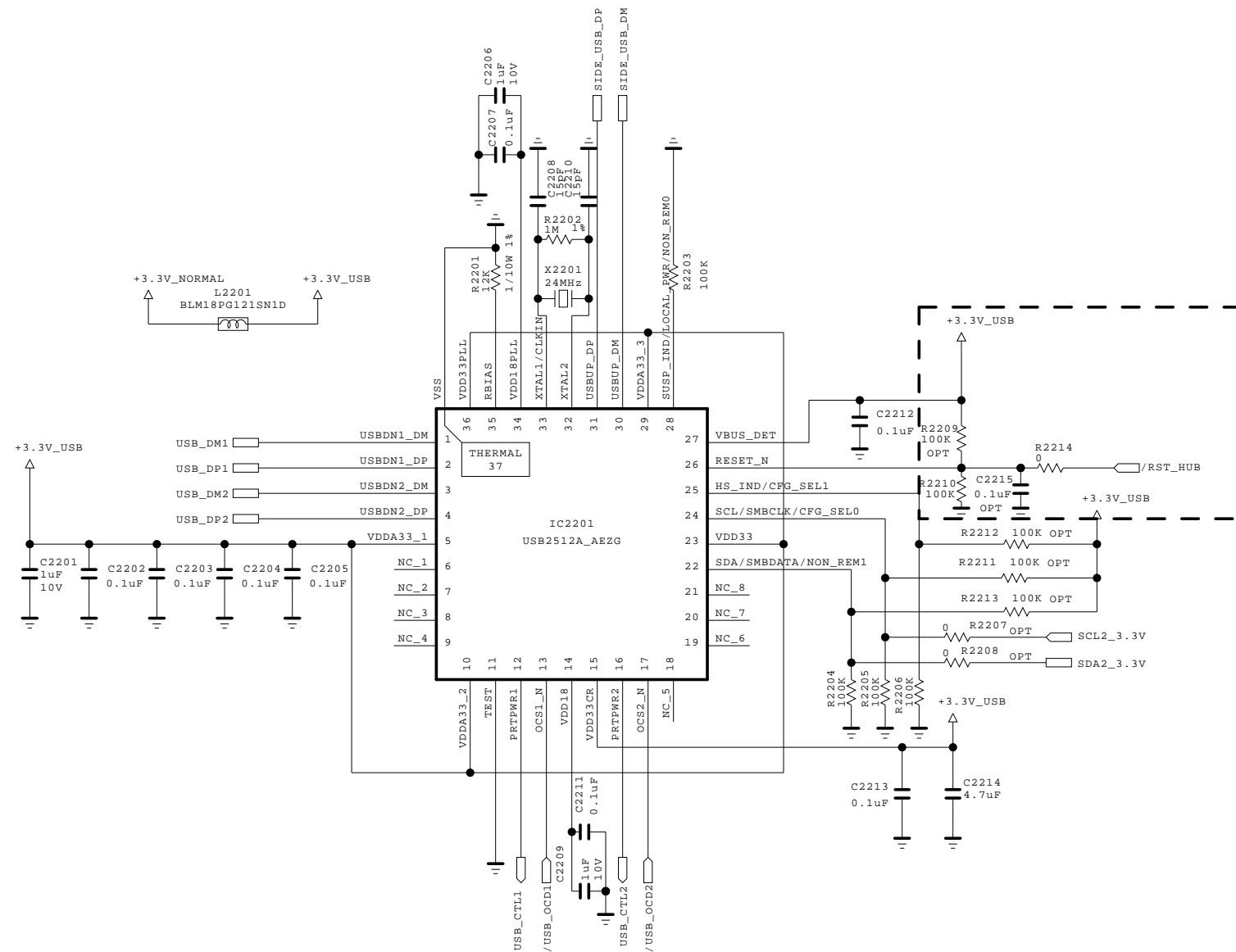
THE Δ SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE Δ SYMBOL MARK OF THE SCHEMATIC.

SECRET
LGElectronics



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| MODEL | | DATE | |
| BLOCK | | SHEET | 27 |

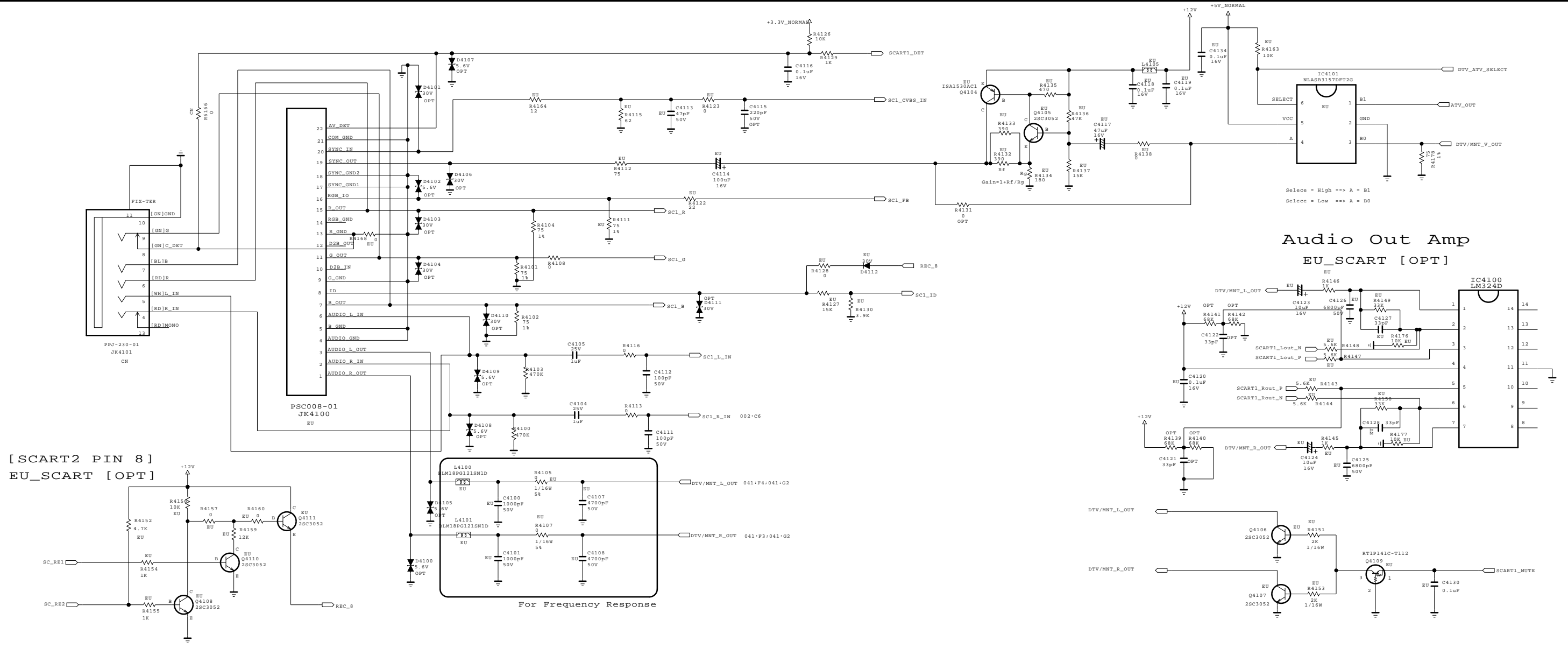
USB2 OPTION



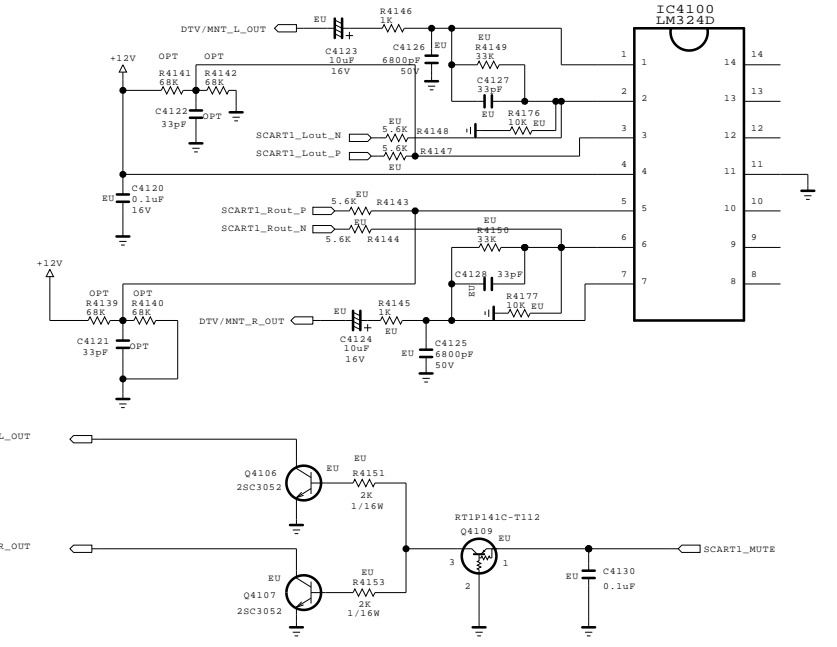
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| SECRET | LG ELECTRONICS |
| LGElectronics | |

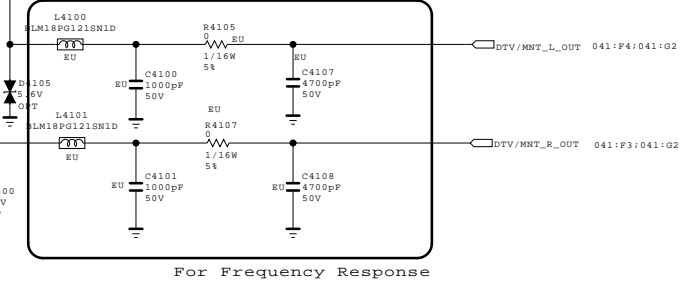
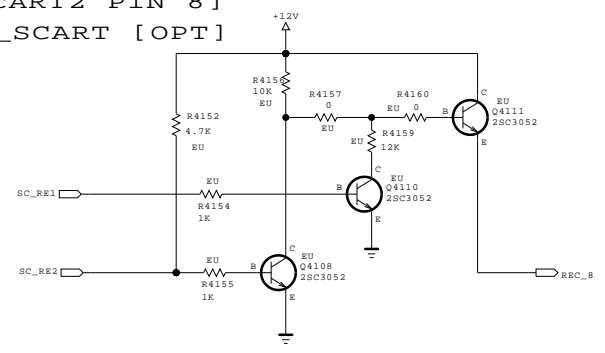
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| MODEL | | DATE | |
| BLOCK | | SHEET | 40 / |



Audio Out Amp EU_SCART [OPT]

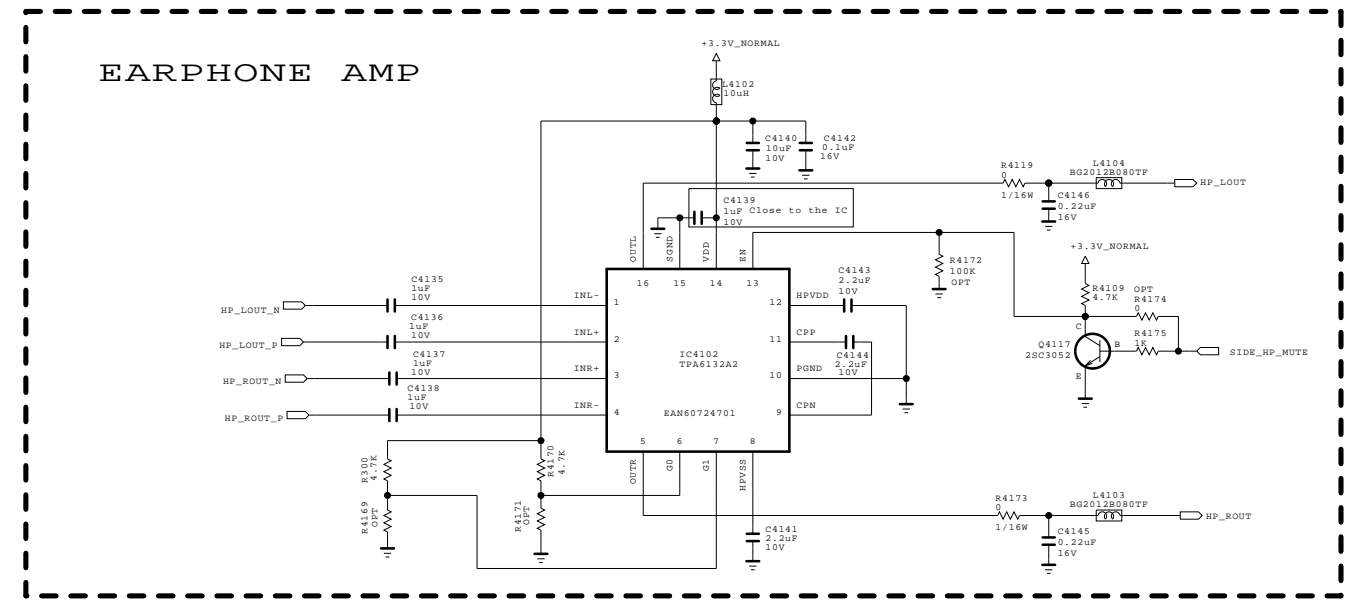


[SCART2 PIN 8] EU_SCART [OPT]



EARPHONE BLOCK

EARPHONE AMP



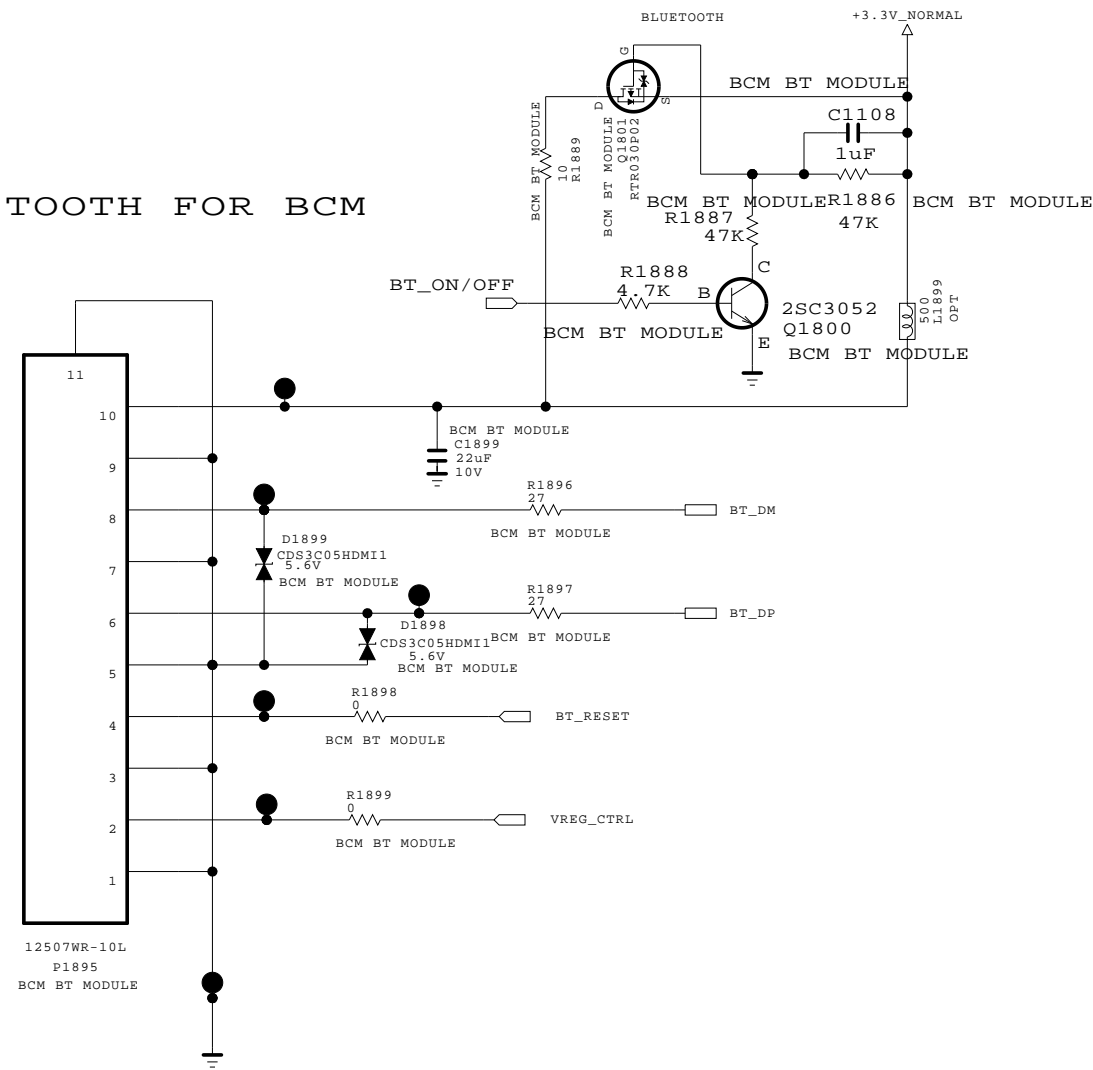
THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.

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LGElectronics



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| MODEL | EUROBTV | DATE | 2009.06.18 |
| BLOCK | ETC SUB BOARD I/F | SHEET | 41 |

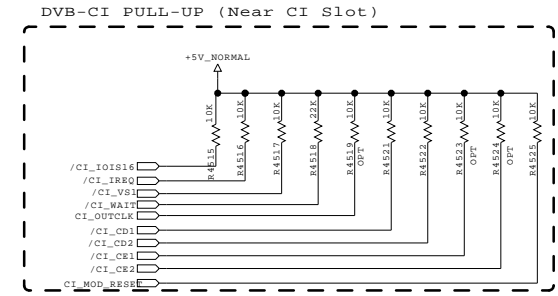
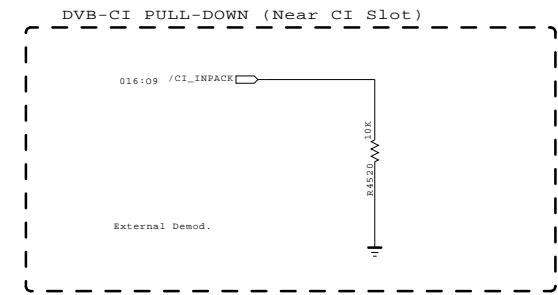
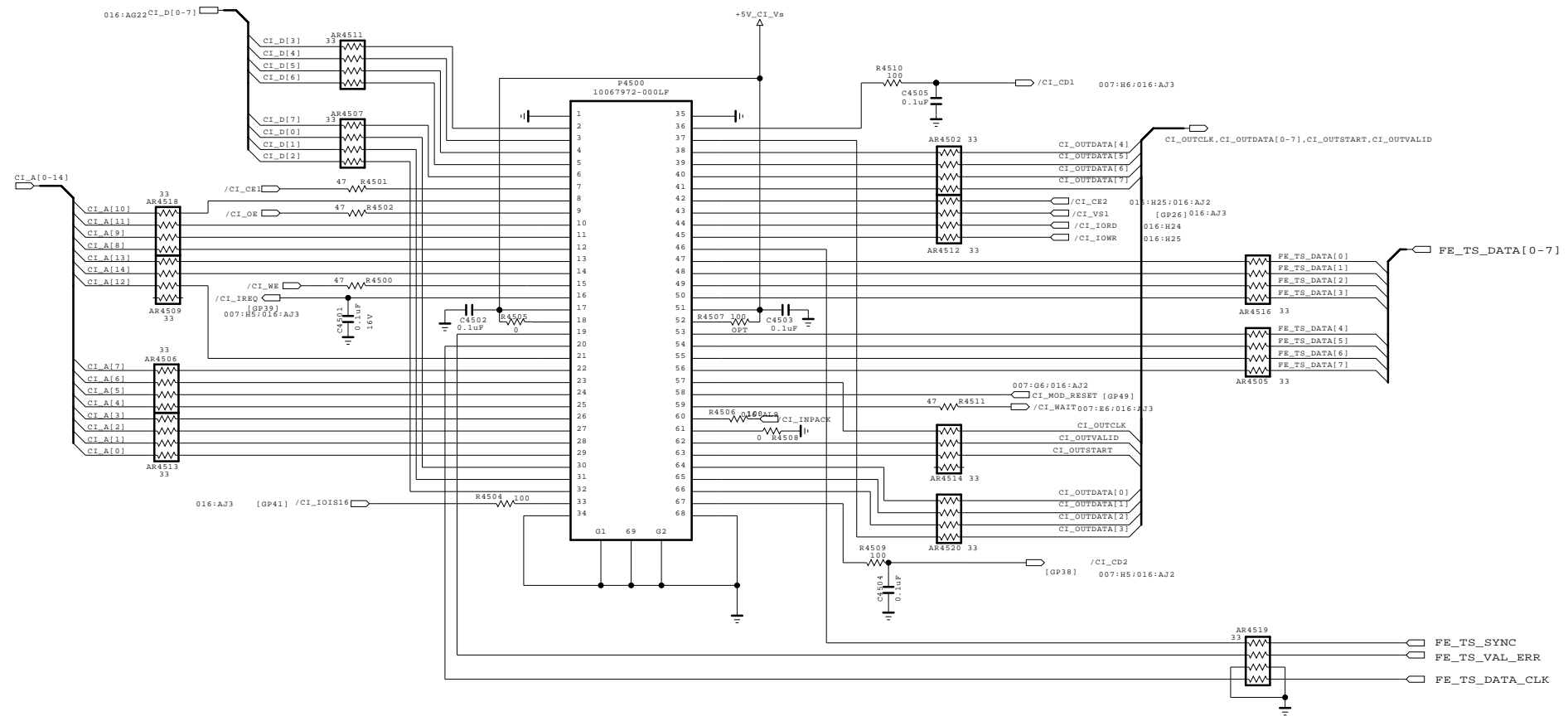
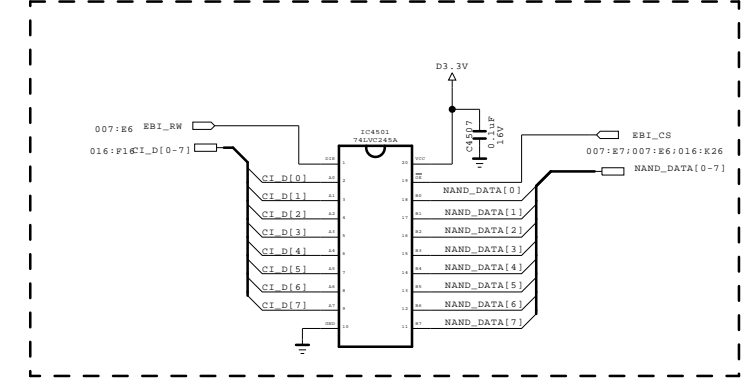
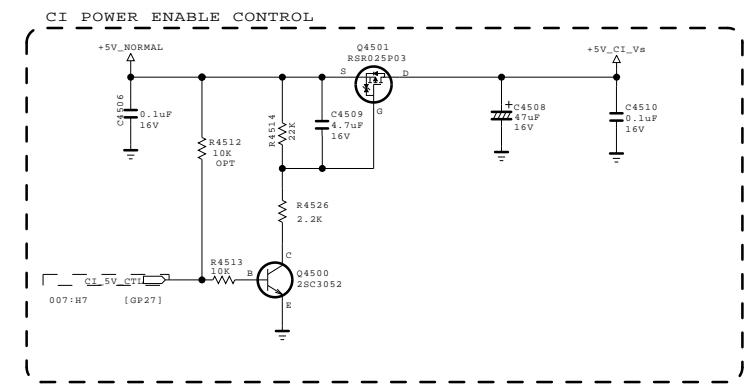
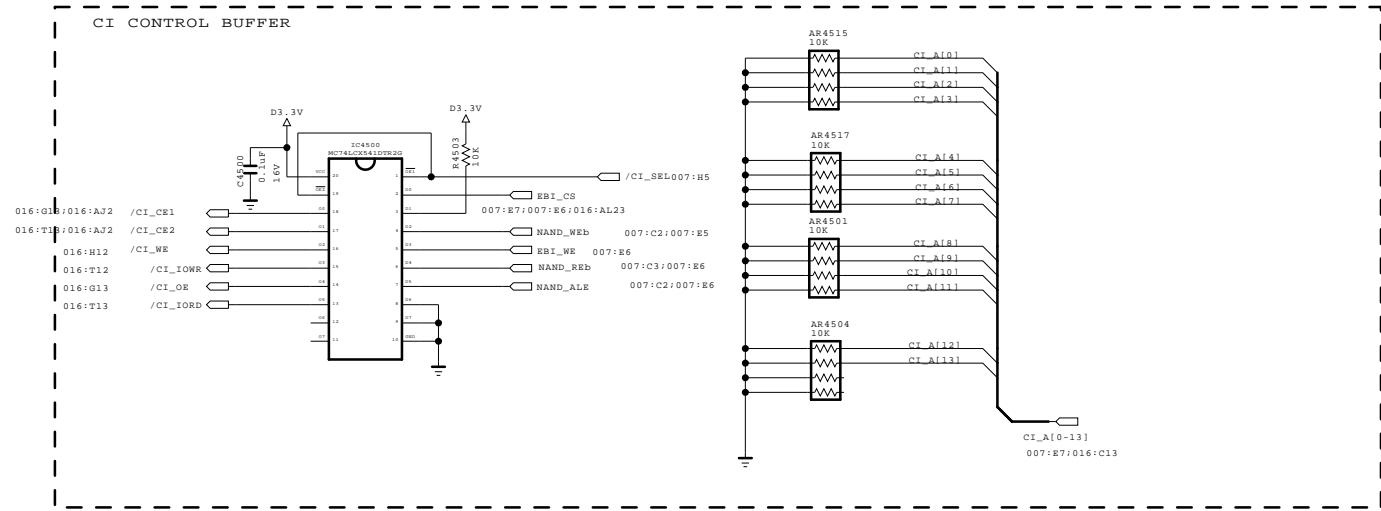
BLUETOOTH FOR BCM



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

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| SECRET | LG ELECTRONICS |
| LGElectronics | |

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| MODEL | | DATE | |
| BLOCK | | SHEET | 43 / |



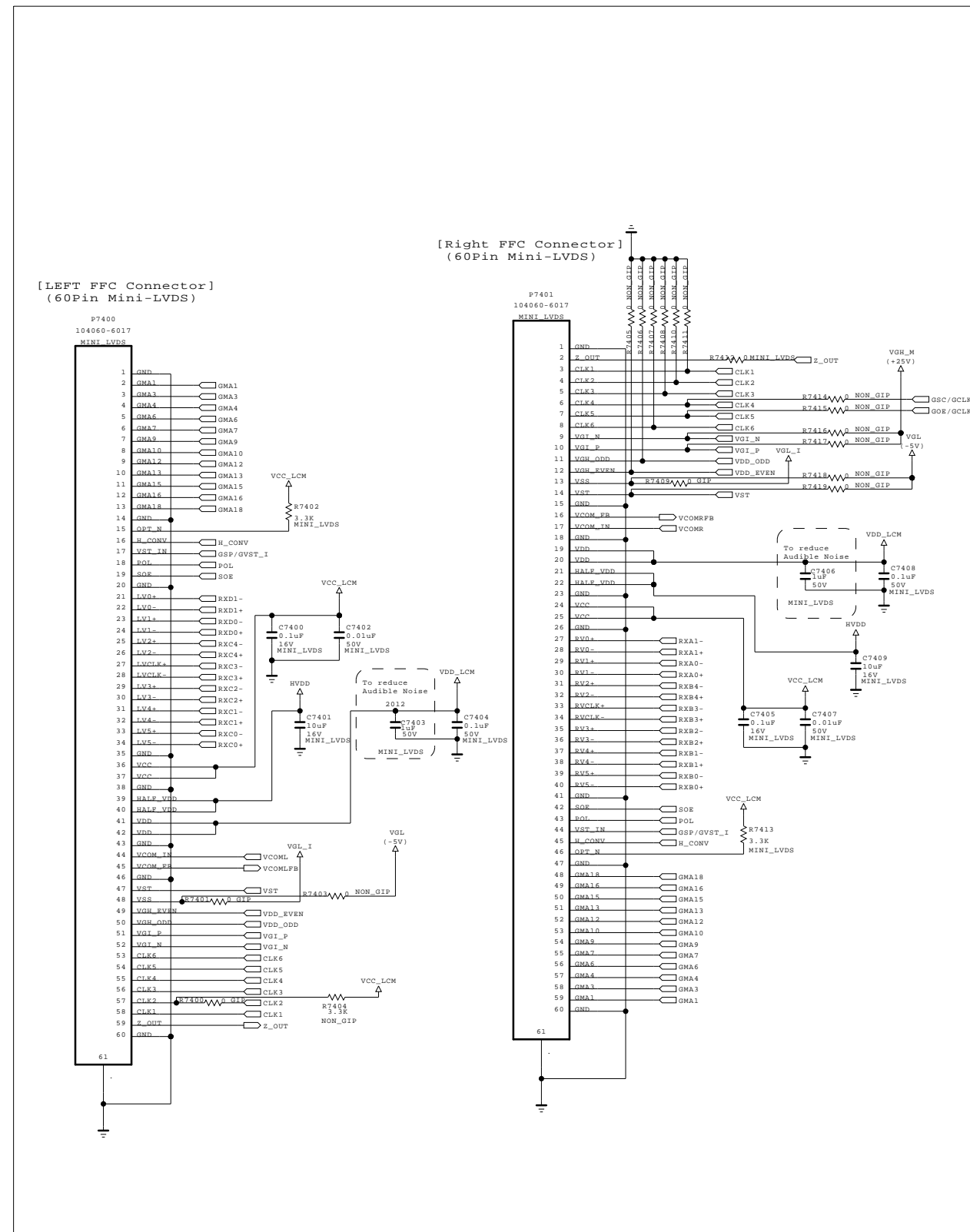
THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.

SECRET
LGElectronics



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| MODEL | EUROBBTV | DATE | 2009.06.18 |
| BLOCK | CI | SHEET | 45 / |

Mini LVDS



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

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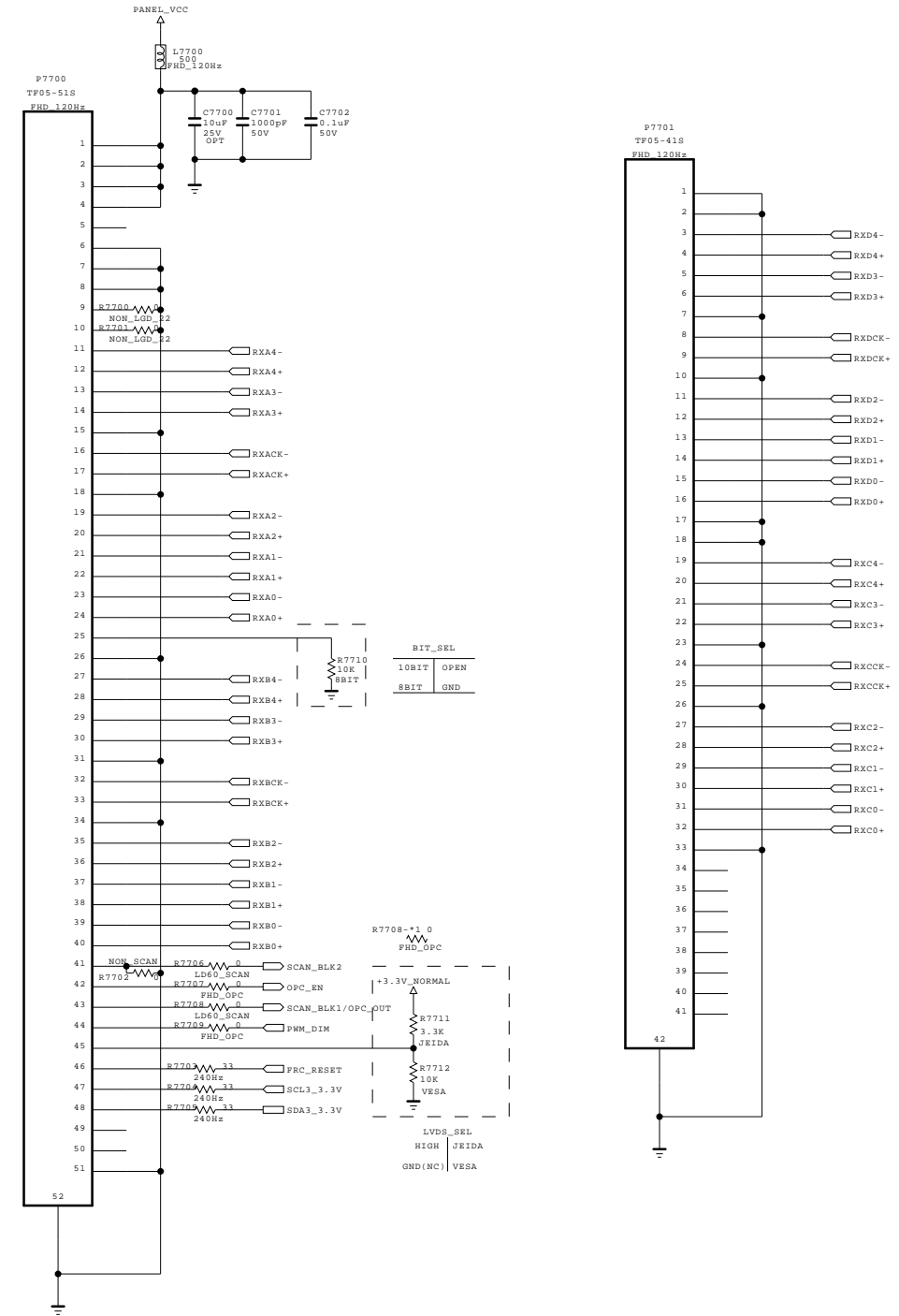


| | | | |
|-------|-----------------------|-------|----------|
| MODEL | COMMON | DATE | 09/10/xx |
| BLOCK | URSA3 120Hz MINI_LVDS | SHEET | 74 |

LVDS

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

[41Pin LVDS Connector]
(For FHD 120Hz)



TP7700 ● ——— OPC_OUT

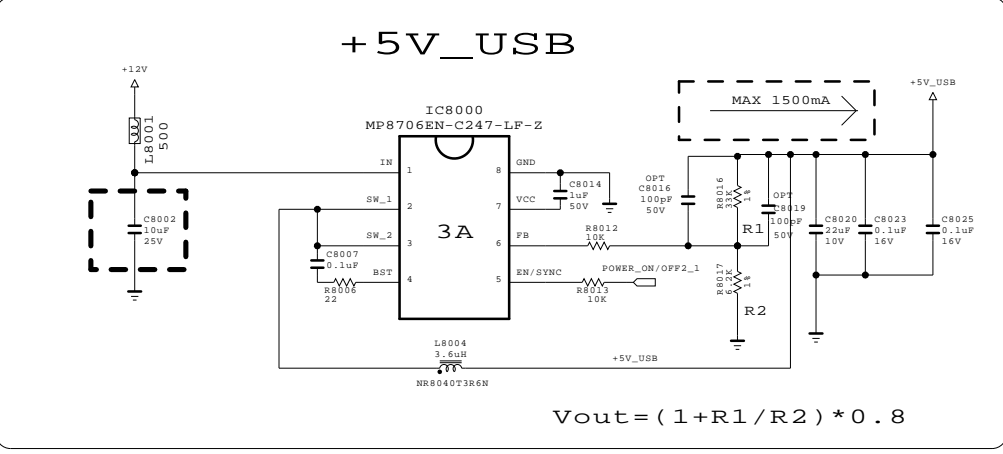
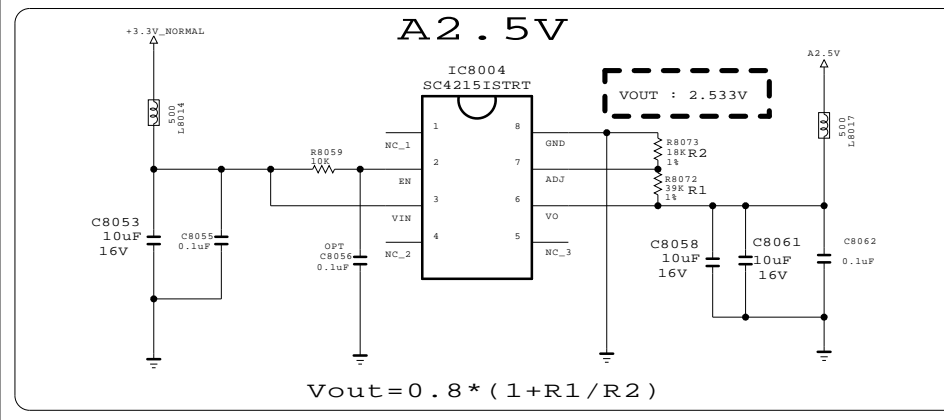
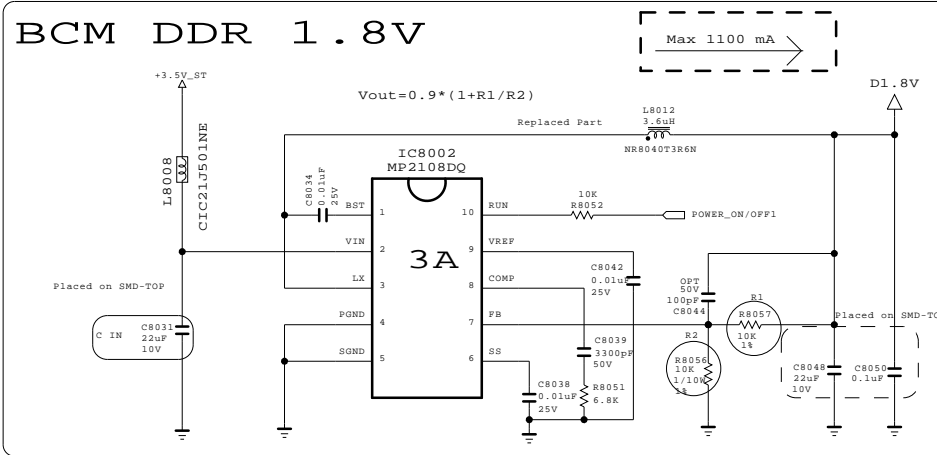
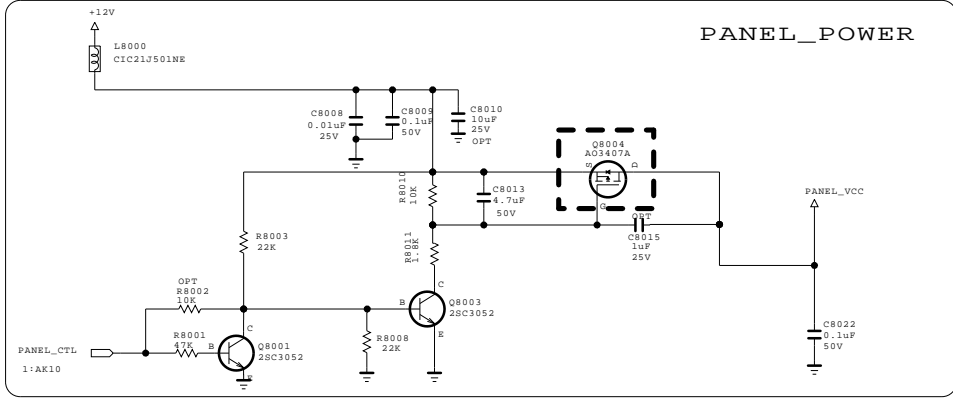
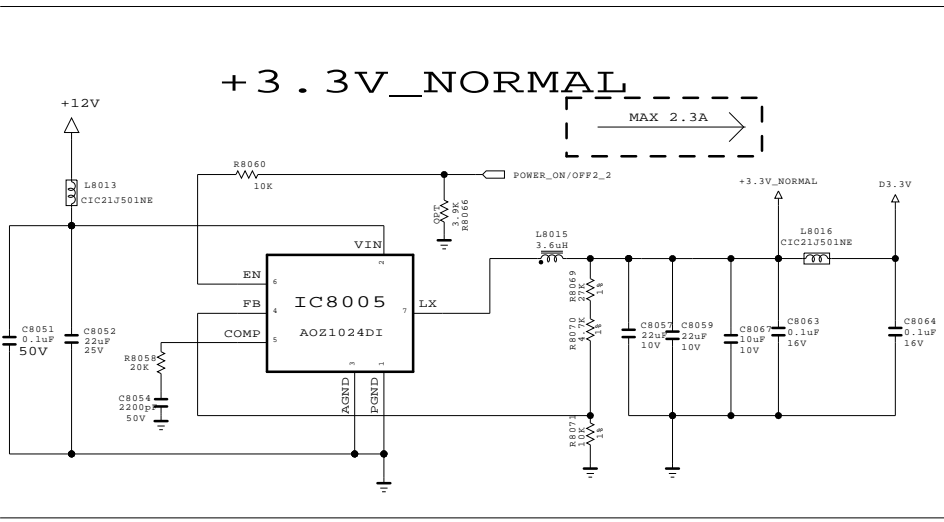
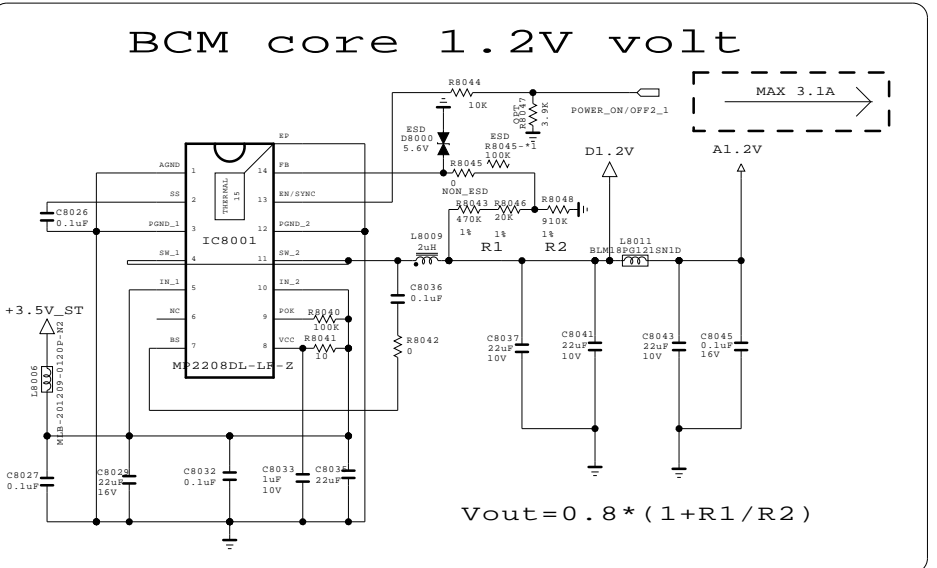
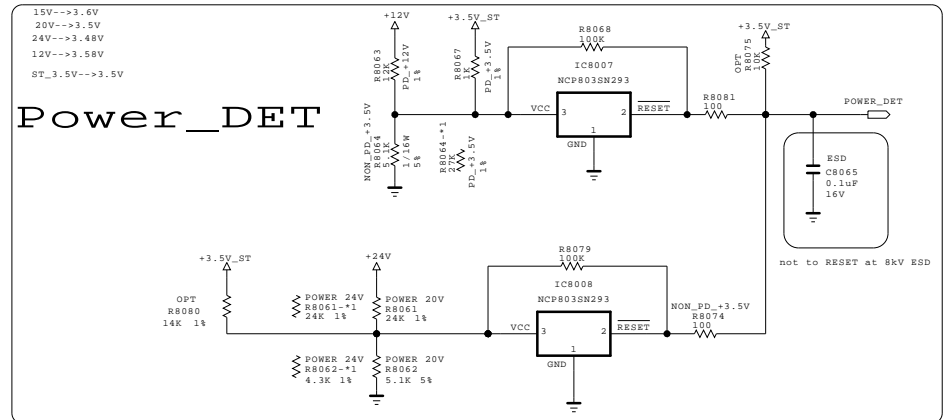
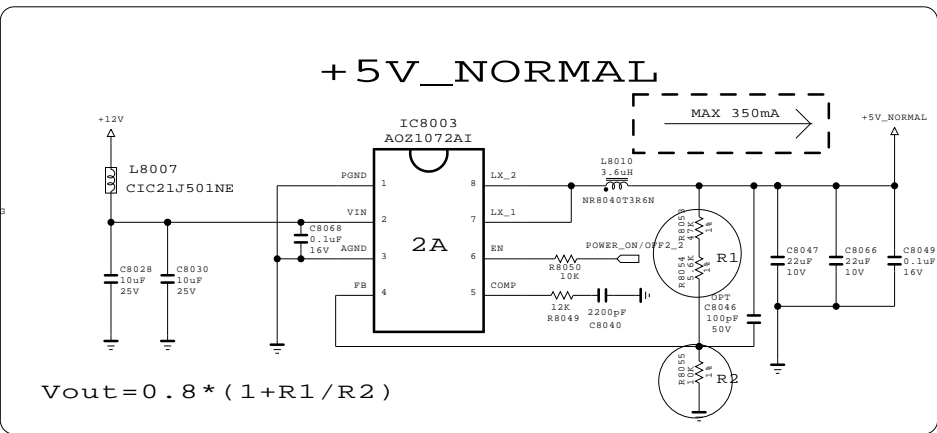
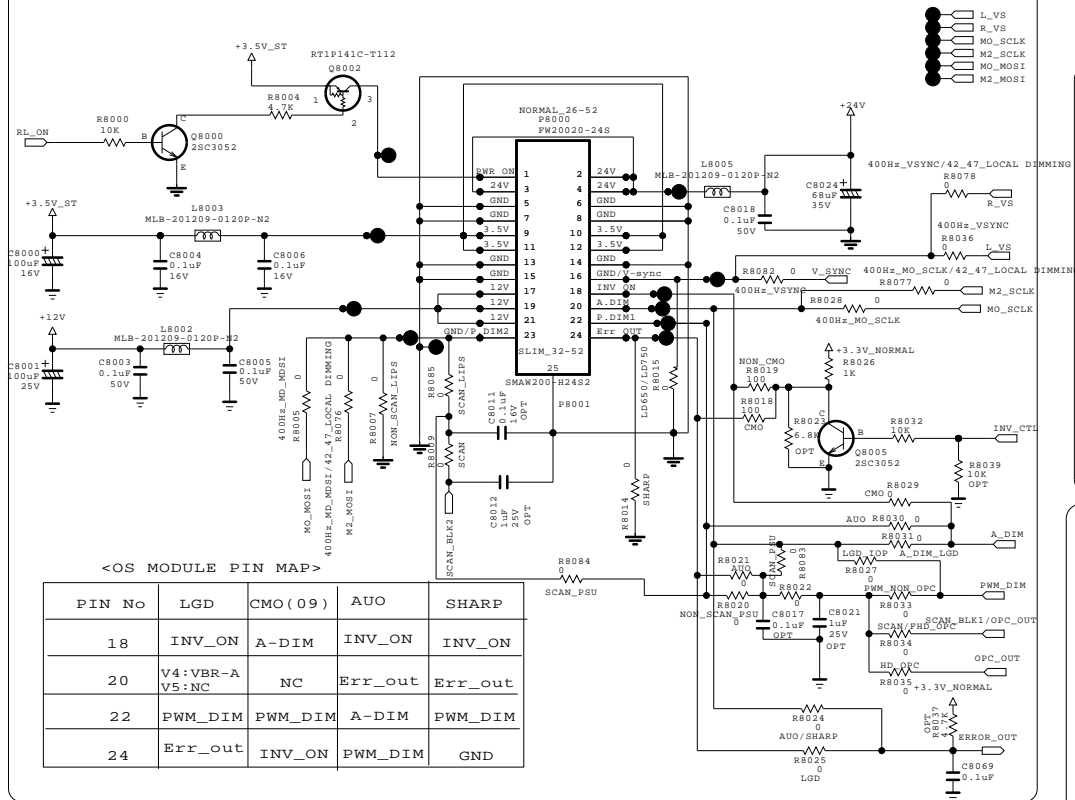
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SECRET
LGElectronics



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| MODEL | | DATE | |
| BLOCK | | SHEET | 35 / |

FROM LIPS & POWER B/D

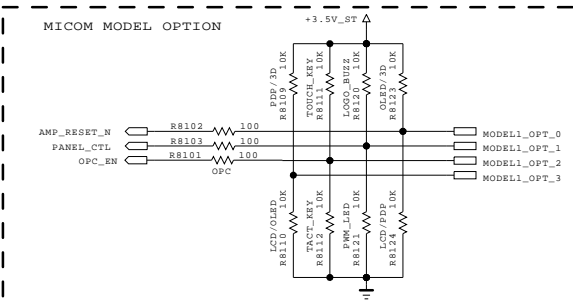
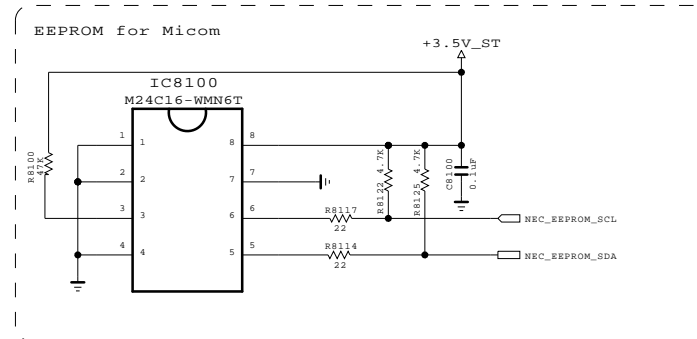
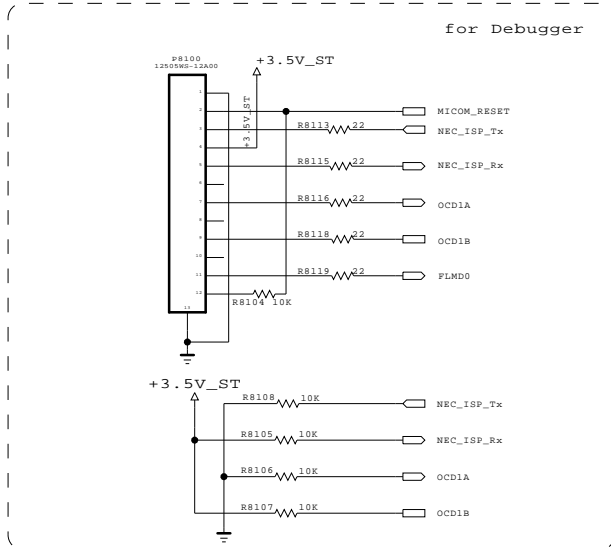


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SECRET
LGElectronics



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| MODEL | BCM (EUROBBTV) | DATE | |
| BLOCK | POWER | SHEET | 15 |

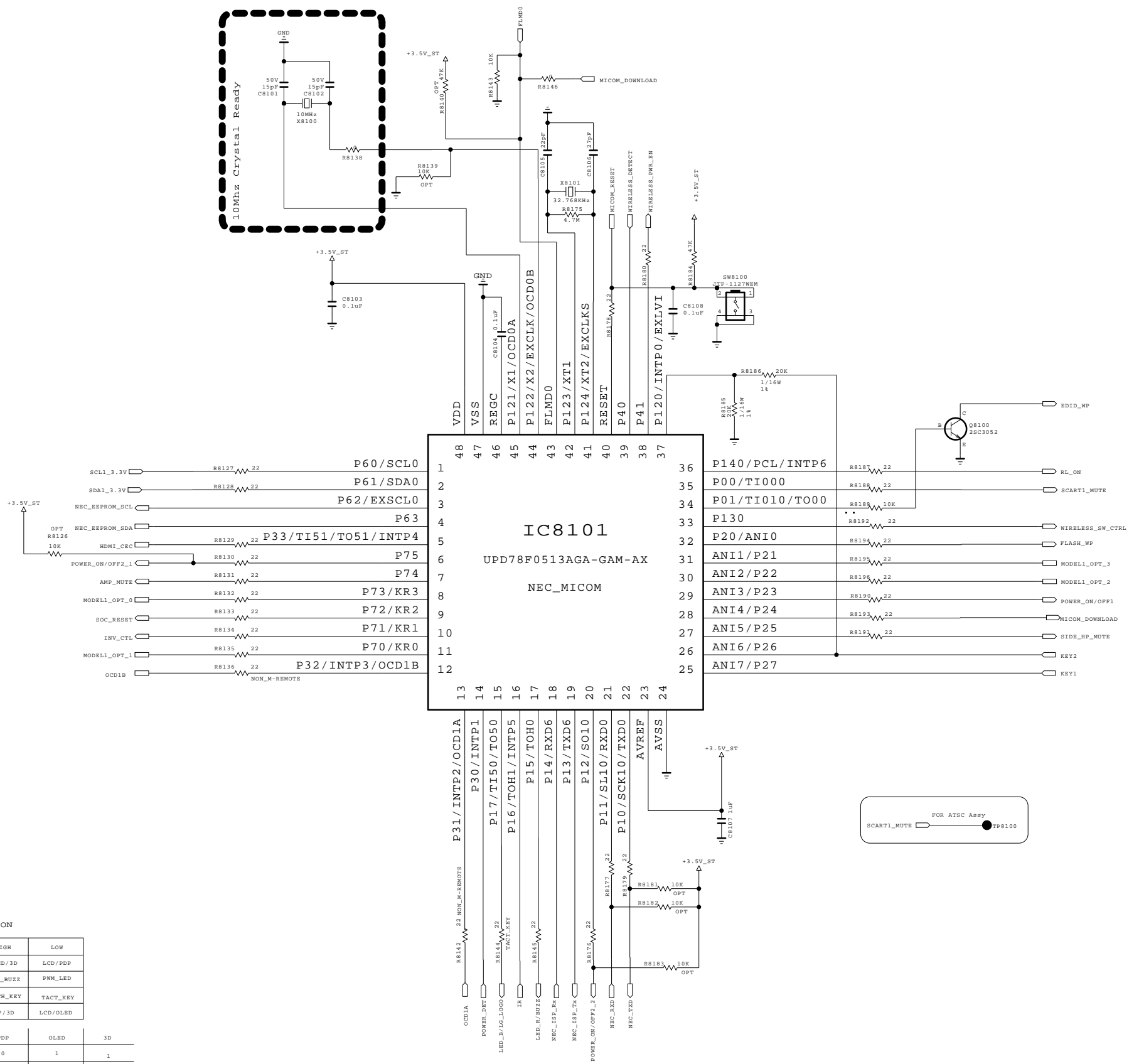


MODEL OPTION

| PIN NAME | PIN NO. | HIGH | LOW |
|-------------|---------|-----------|----------|
| MODEL_OPT_0 | 8 | OLED/3D | LCD/PDP |
| MODEL_OPT_1 | 11 | LOGO_BUZZ | PMW_LED |
| MODEL_OPT_2 | 30 | TOUCH_KEY | TACT_KEY |
| MODEL_OPT_3 | 31 | PDP/3D | LCD/OLED |

| | LCD | PDP | OLED | 3D |
|-------------|-----|-----|------|----|
| MODEL_OPT_0 | 0 | 0 | 1 | 1 |
| MODEL_OPT_3 | 0 | 1 | 0 | 1 |

| | LOW | LOW_SMALL | TBD | HIGH |
|-------------|-----|-----------|-----|------|
| MODEL_OPT_1 | 0 | 0 | 1 | 1 |
| MODEL_OPT_2 | 0 | 1 | 0 | 1 |



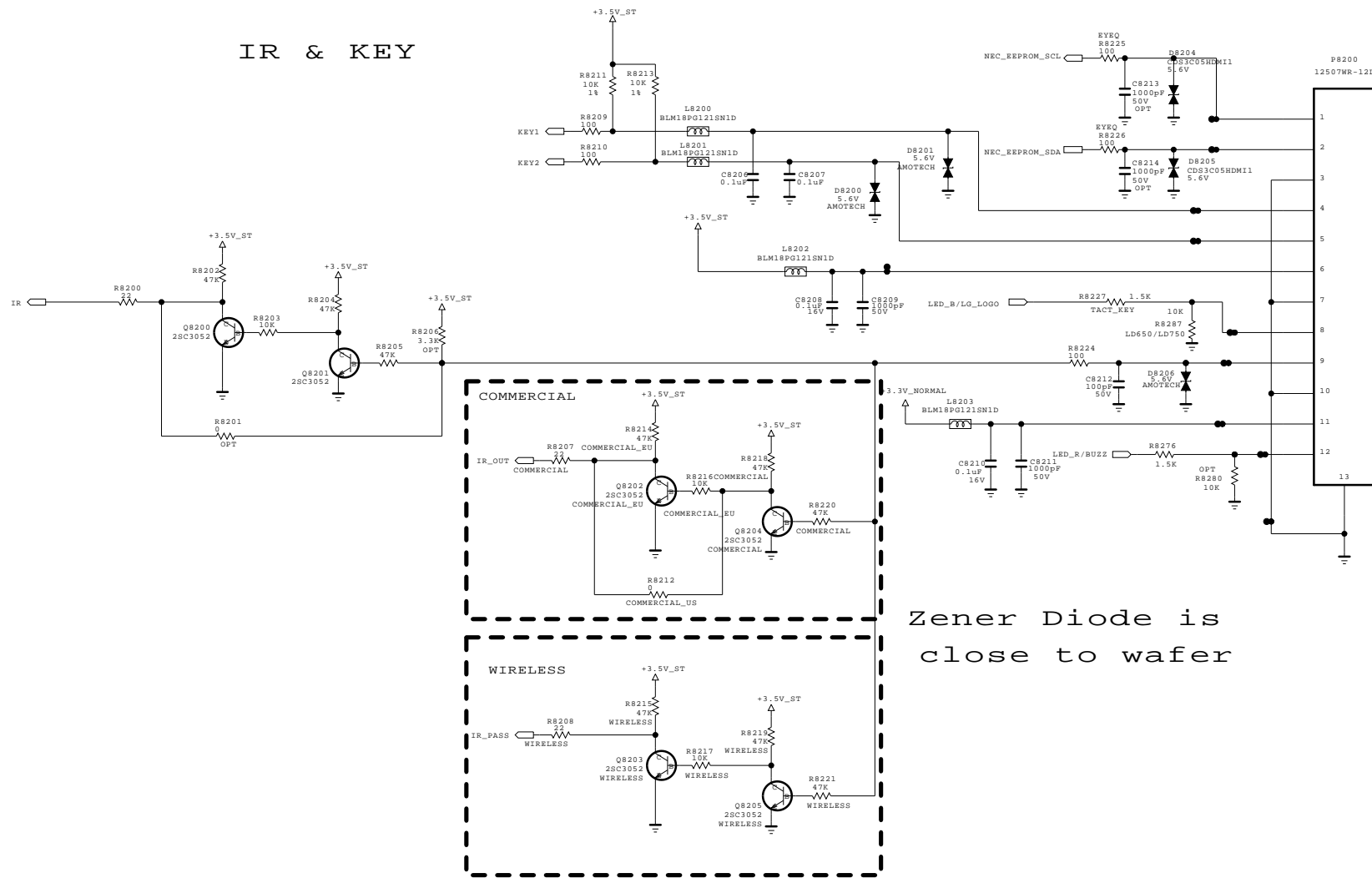
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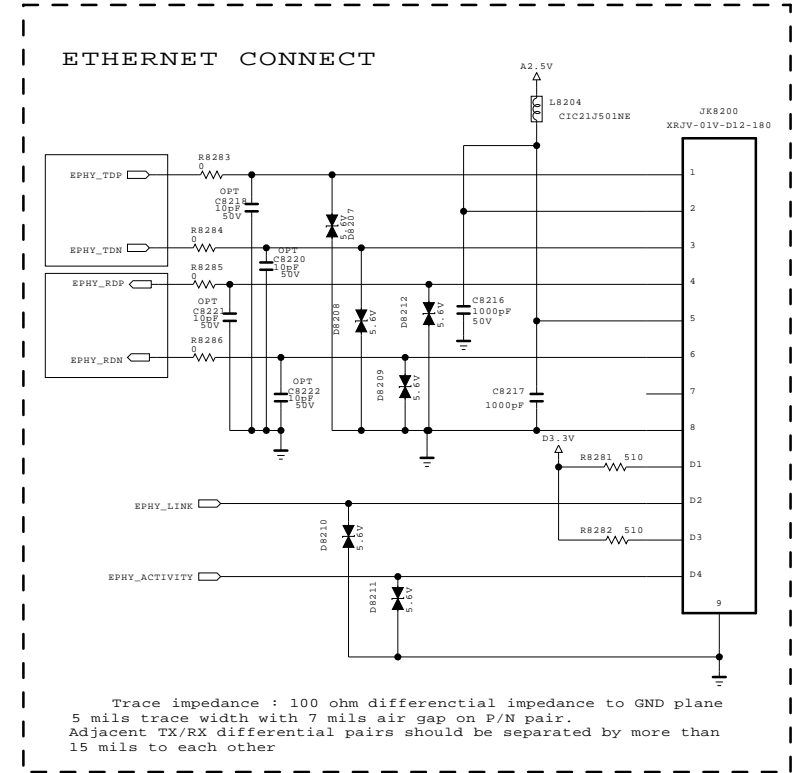


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|-------|--------------|-------|----------|
| MODEL | GP2_Saturn7M | DATE | Ver. 1.4 |
| BLOCK | MICOM | SHEET | 5 |

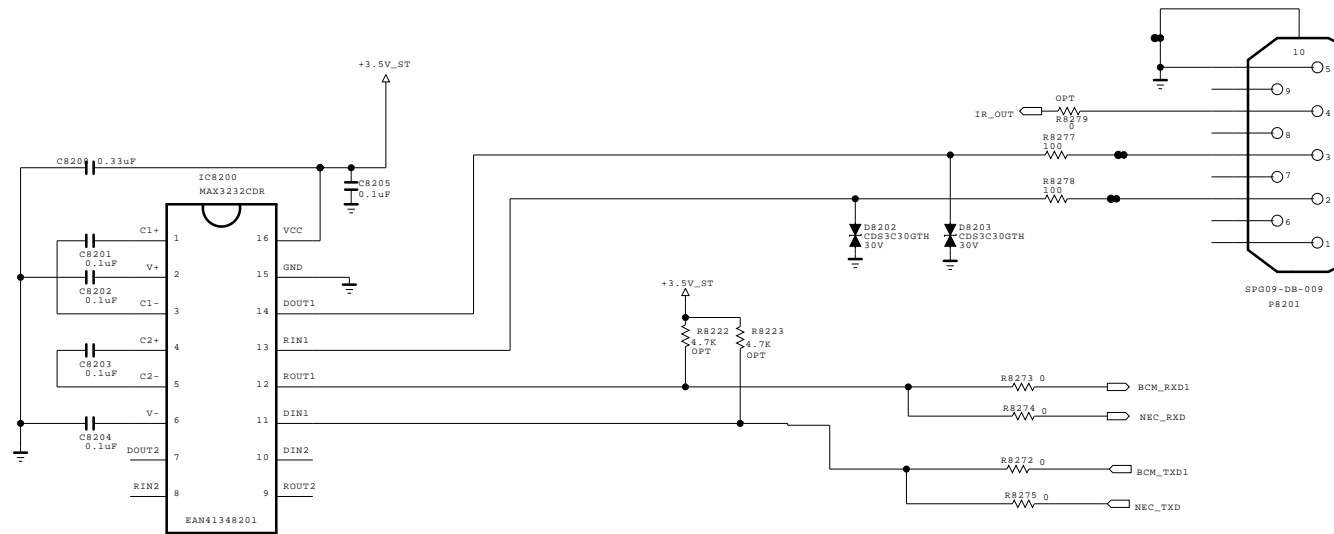
IR & KEY



Zener Diode is close to wafer



RS232C

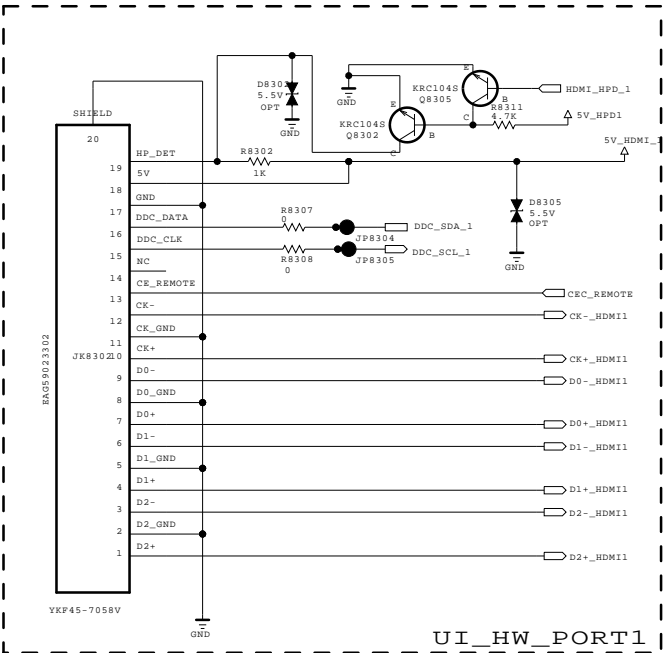


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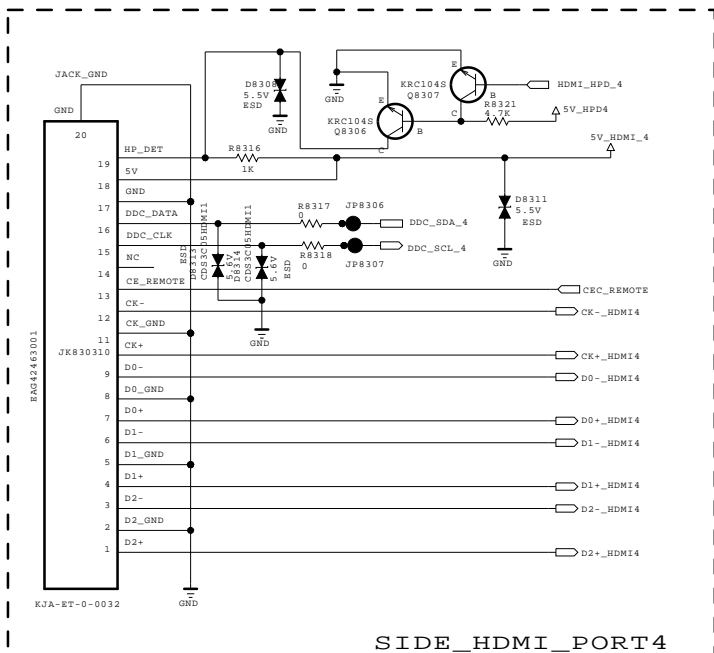
SECRET
 LGElectronics



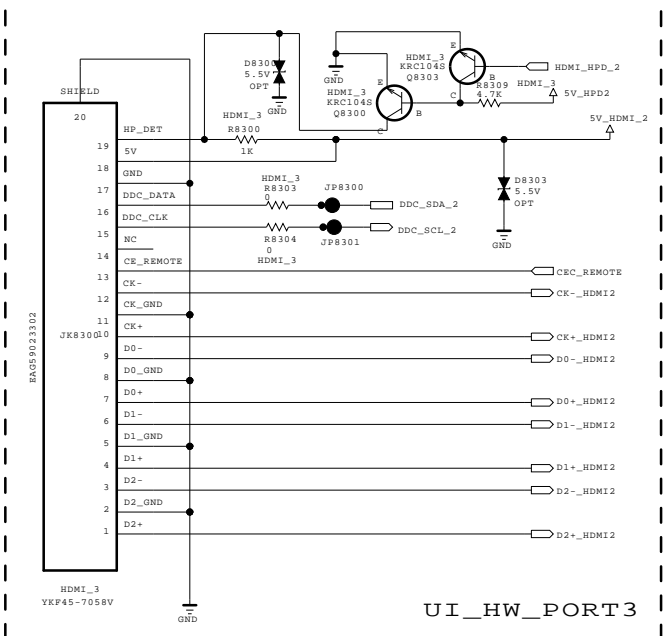
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| MODEL | | DATE | |
| BLOCK | | SHEET | / |



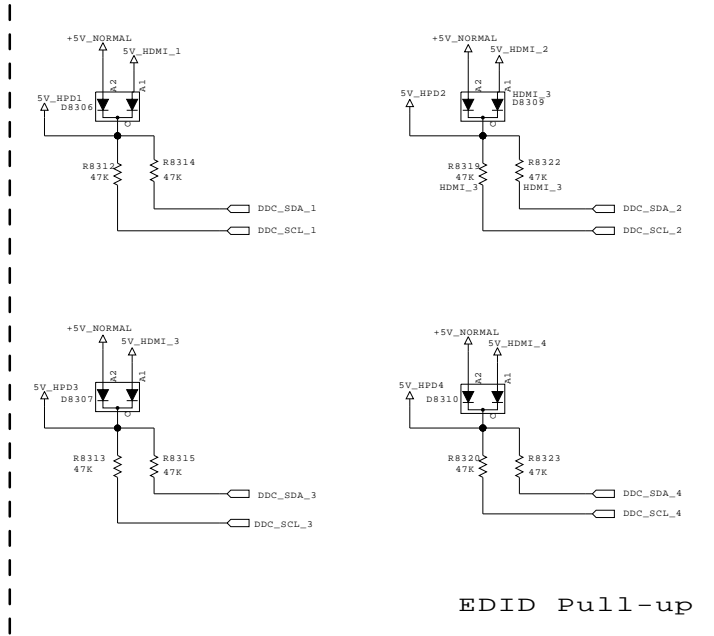
UI_HW_PORT1



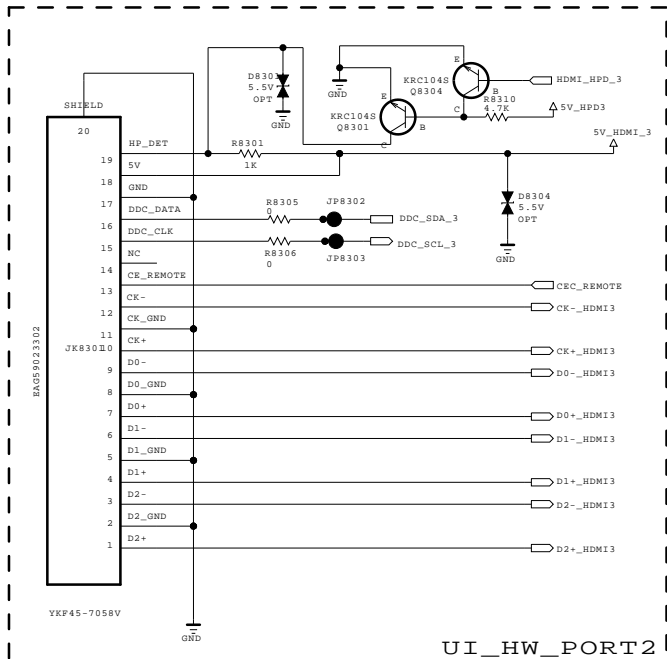
SIDE_HDMI_PORT4



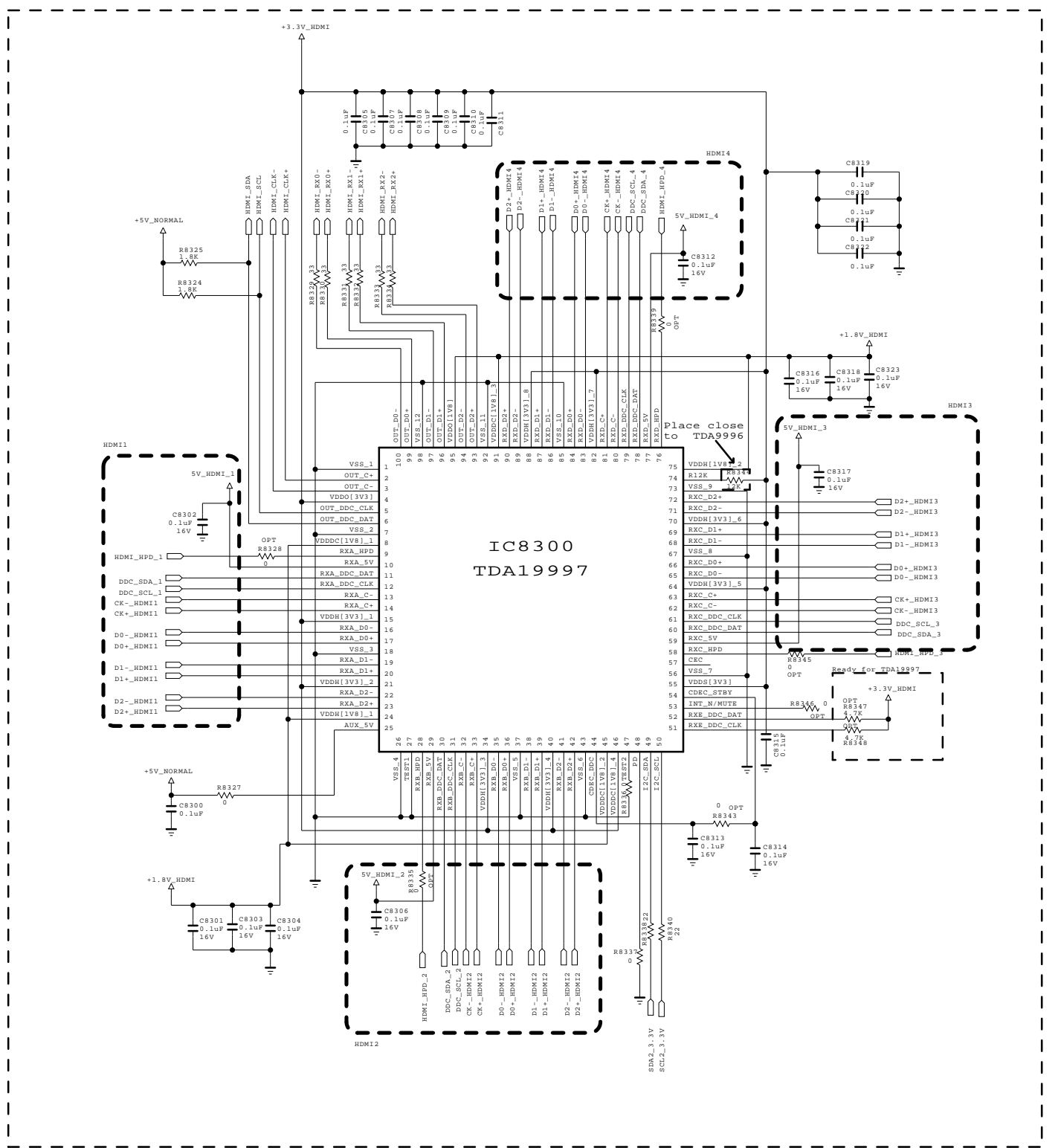
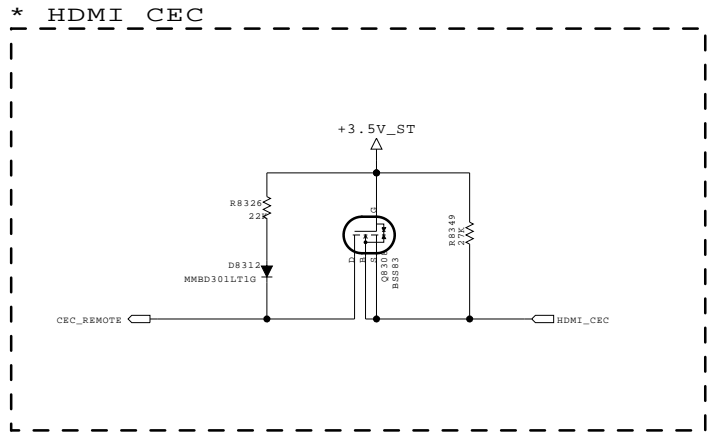
UI_HW_PORT3



EDID Pull-up



UI_HW_PORT2



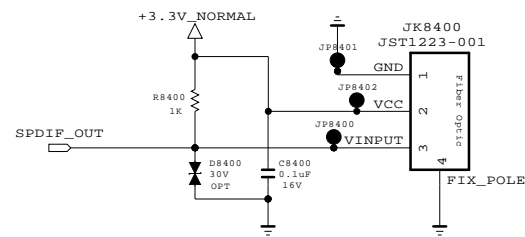
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SECRET
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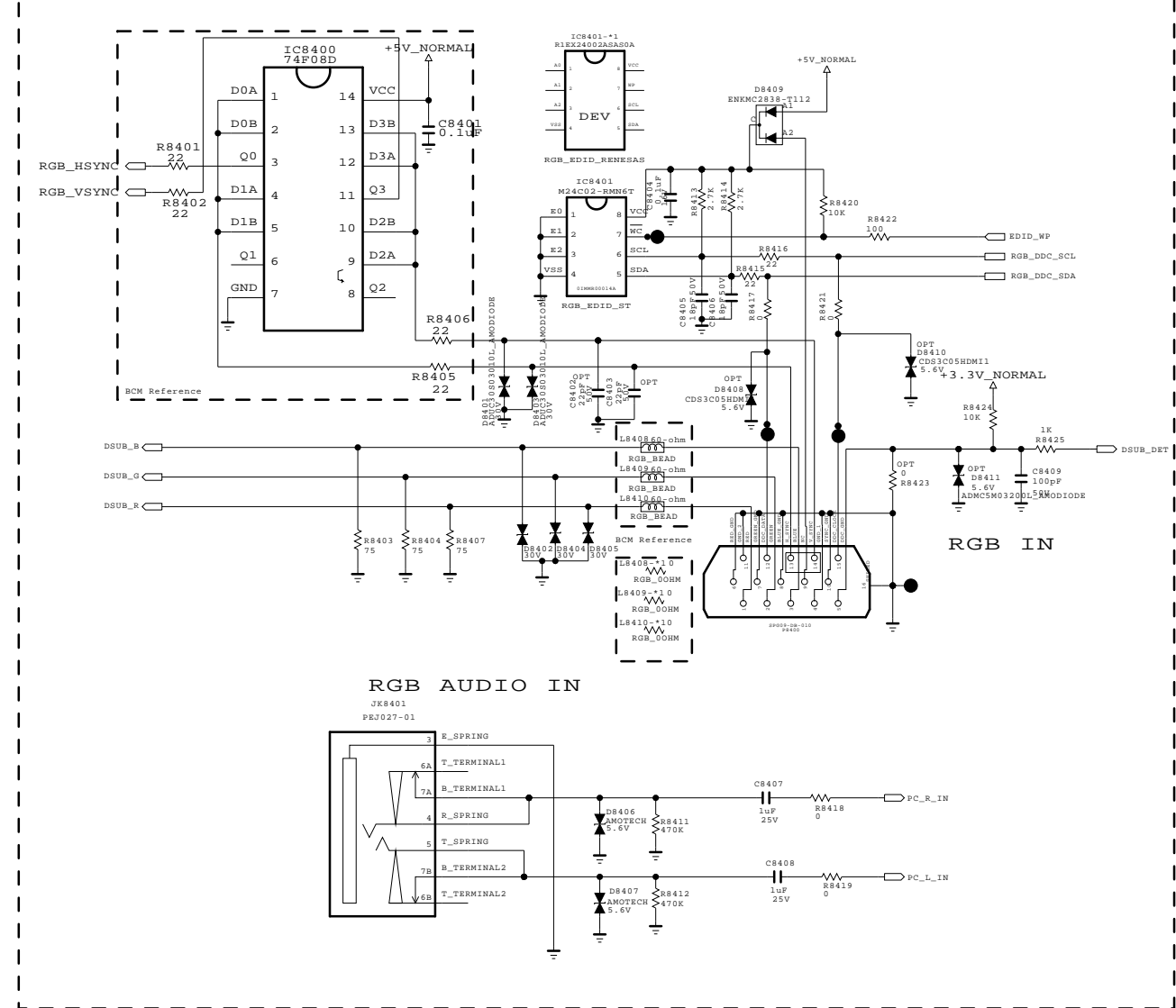
LEE GI YOUNG



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| MODEL | BCM (EUROBBTV) | DATE | 2009.06.18 |
| BLOCK | HDMI | SHEET | 8 |



RGB_PC



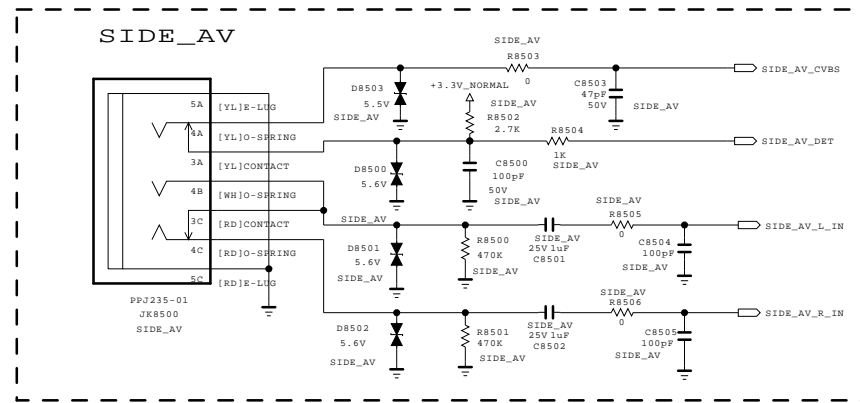
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| MODEL | EUROBBTV | DATE | 2009.06.18 |
| BLOCK | ETC SUB BOARD I/F | SHEET | 9 / |

(New Item Development H:9.2mm)



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

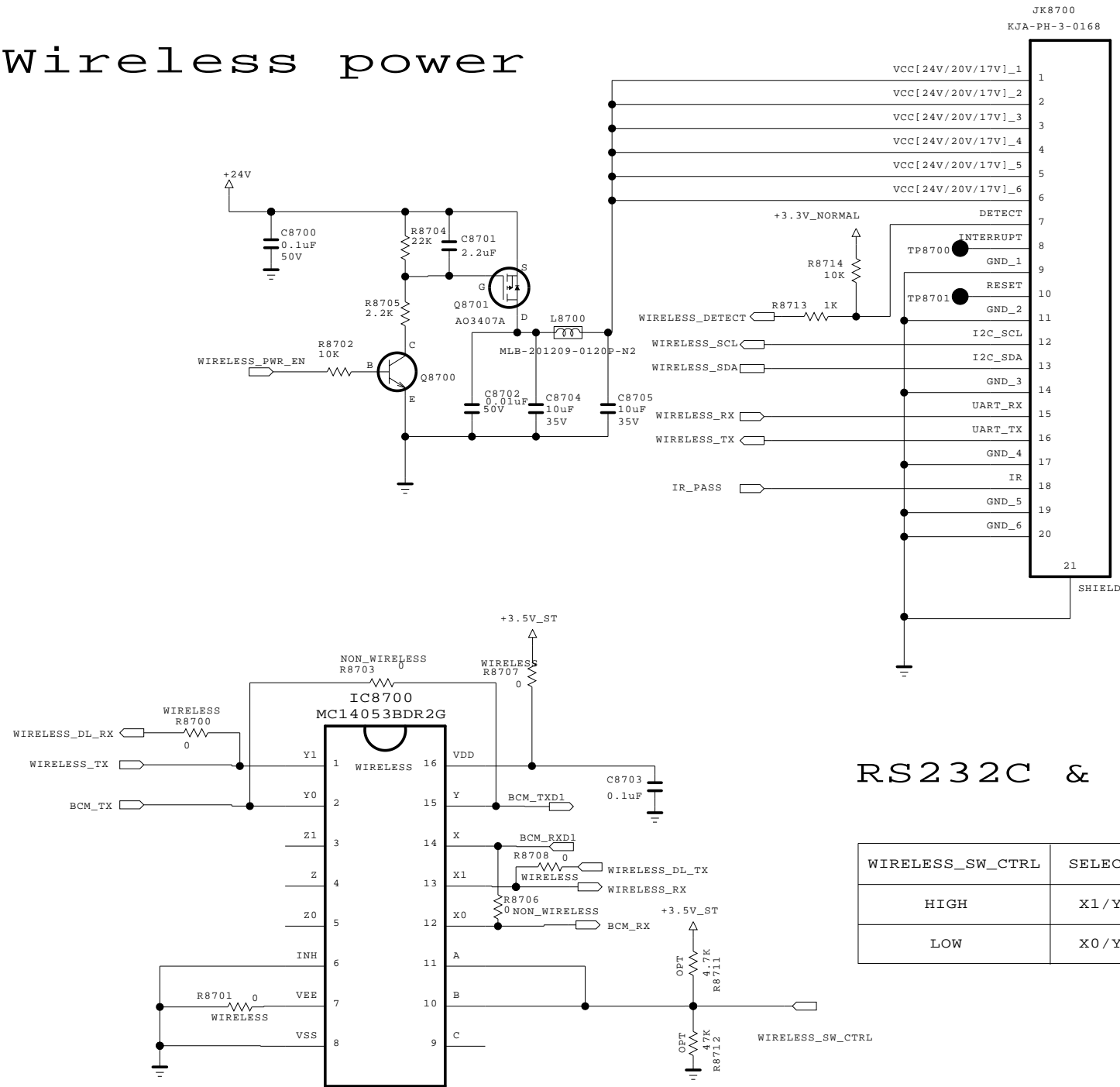
SECRET
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| MODEL | | DATE | |
| BLOCK | | SHEET | / |

WIRELESS READY MODEL

Wireless power



RS232C & Wireless

| WIRELESS_SW_CTRL | SELECT PIN | STATUS |
|------------------|------------|--|
| HIGH | X1/Y1/Z1 | WIRELESS Dongle connect --> WIRELESS RS232 |
| LOW | X0/Y0/Z0 | WIRELESS Dongle Dis_con --> S7 RS232 |

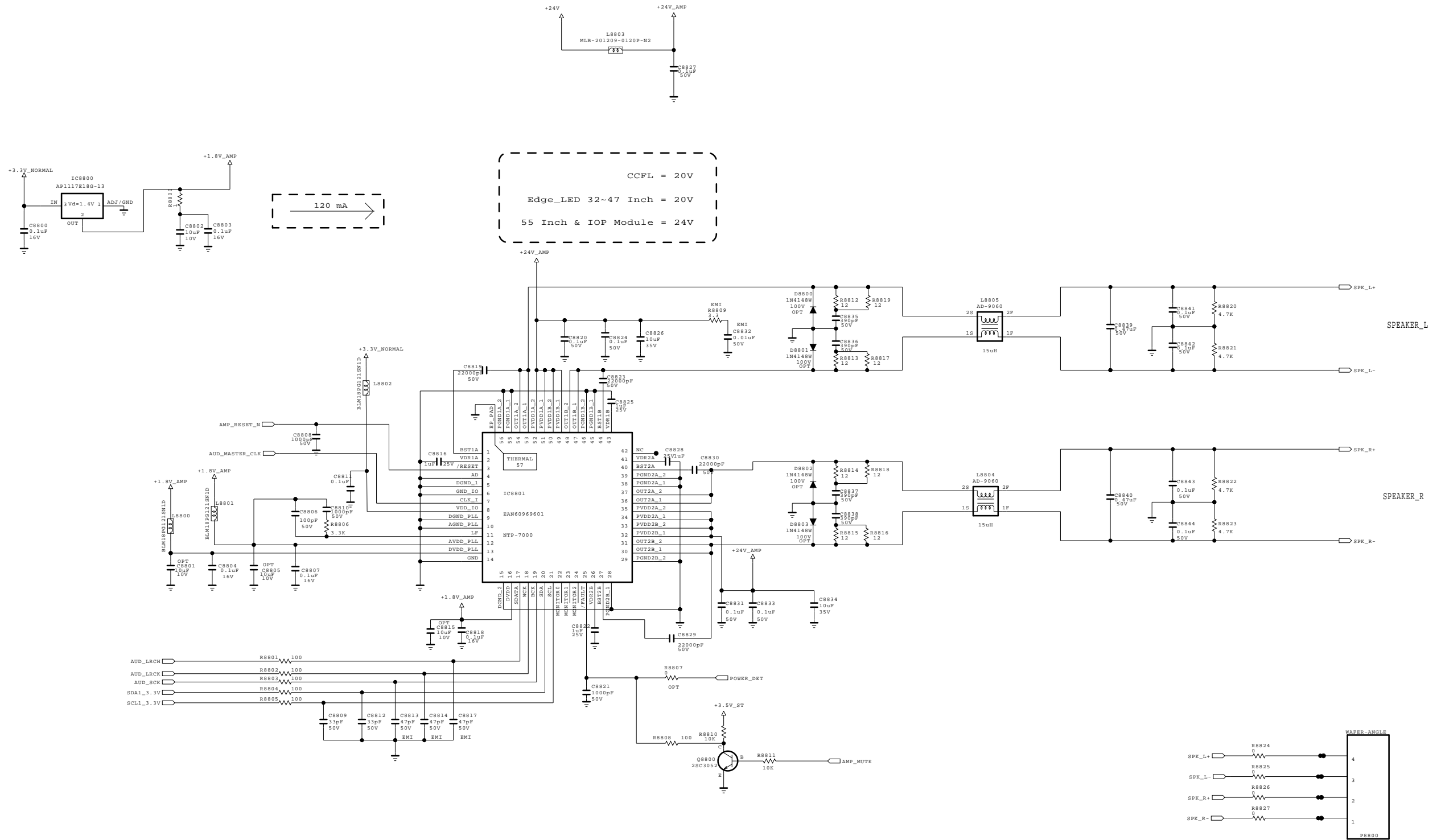
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SECRET

LG Electronics

LG ELECTRONICS

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| MODEL | | DATE | |
| BLOCK | | SHEET | 12 / |

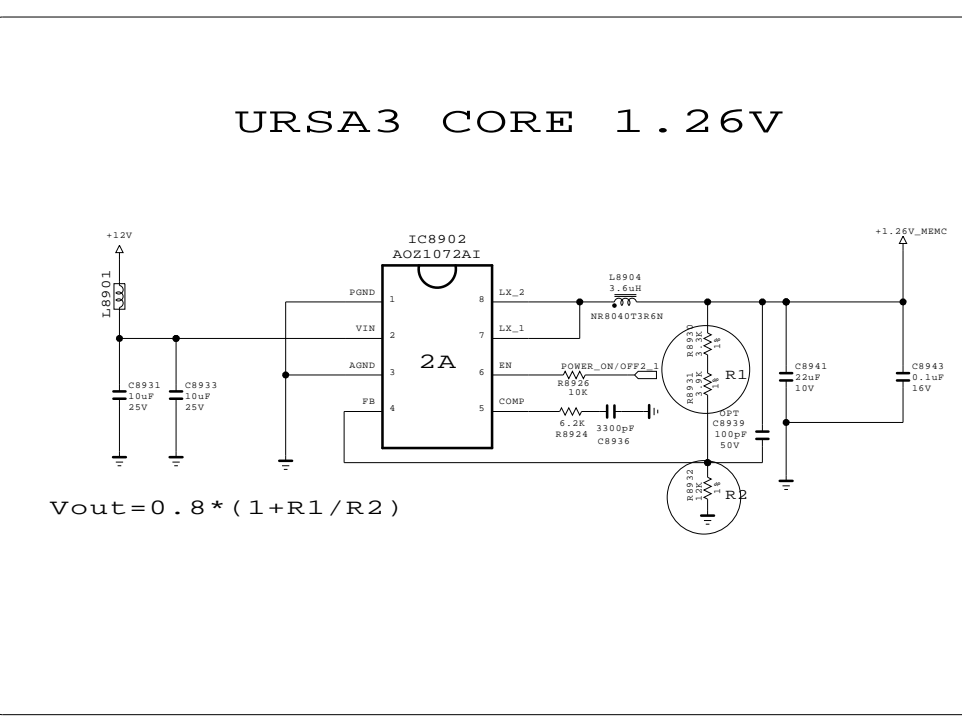
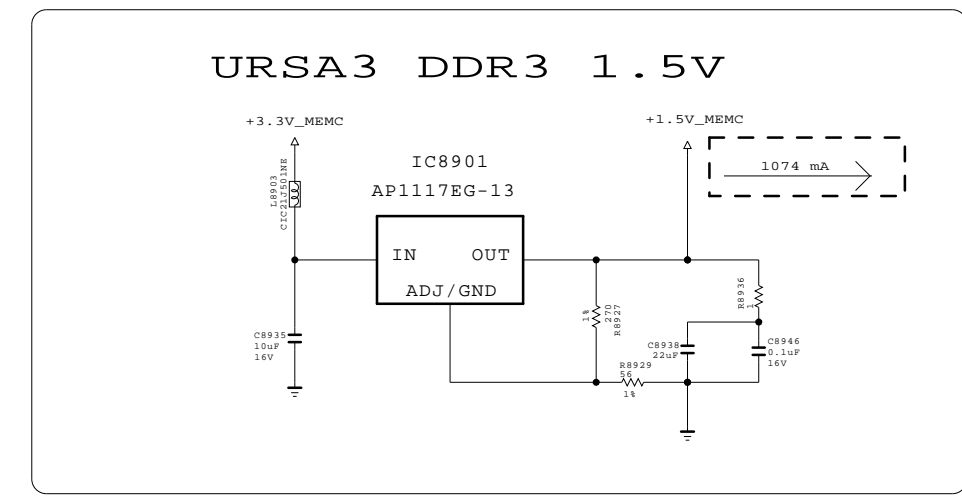
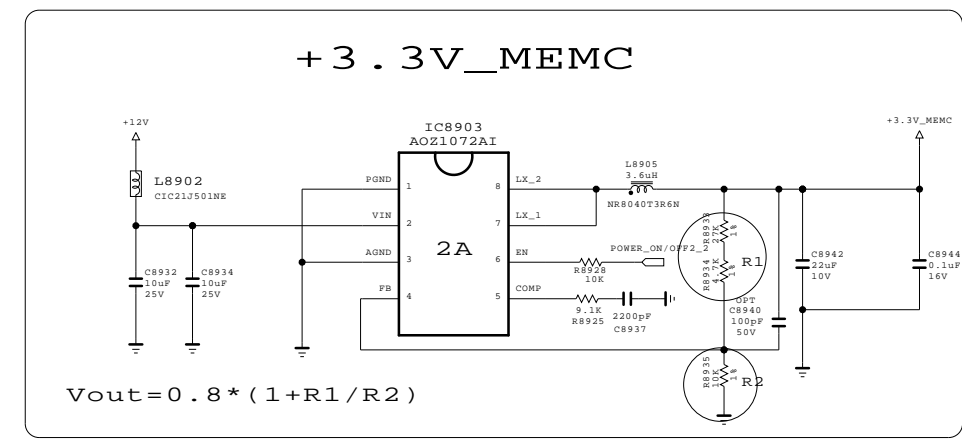
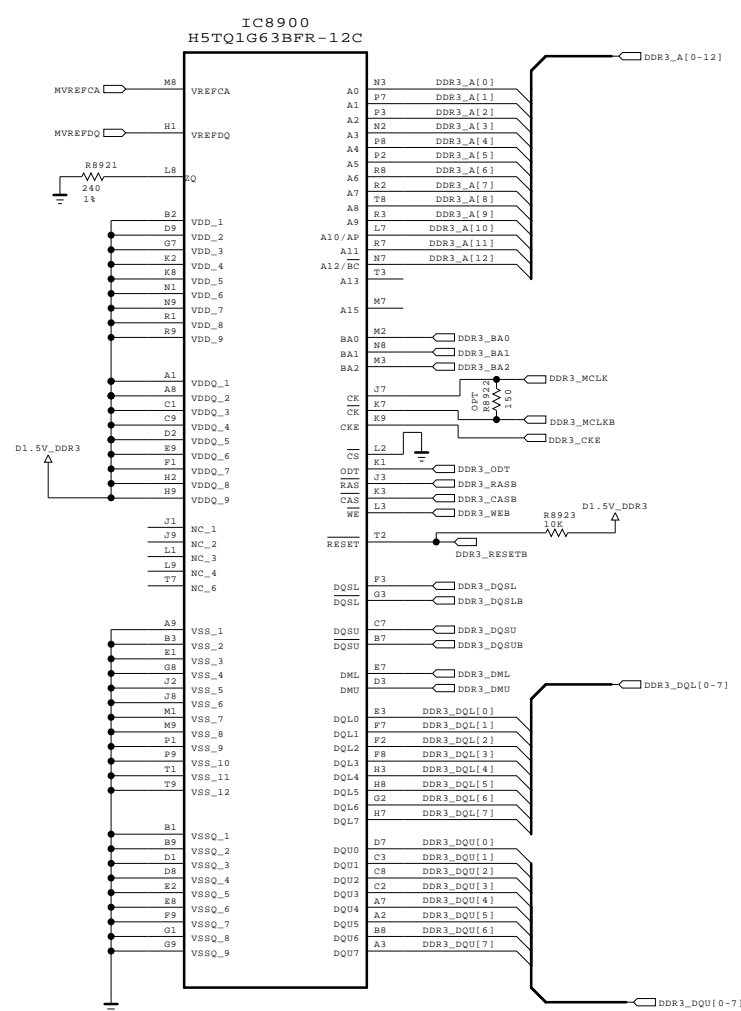
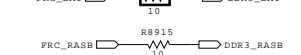
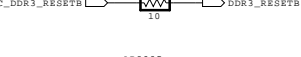
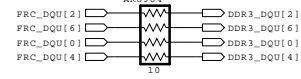
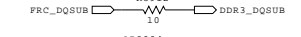
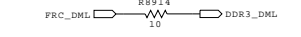
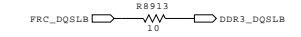
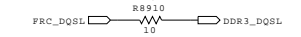
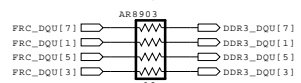
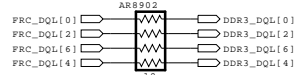
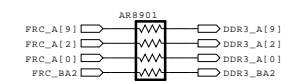
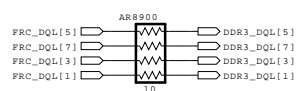
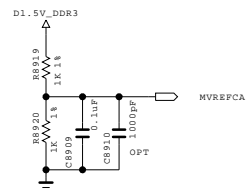
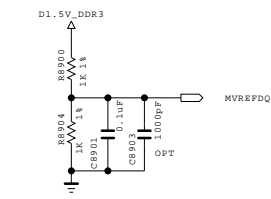
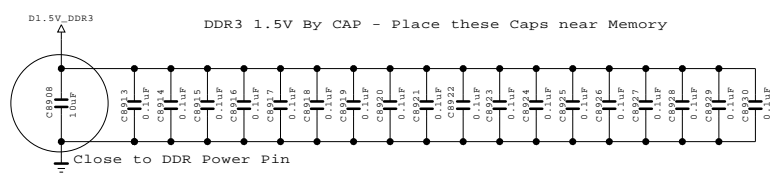
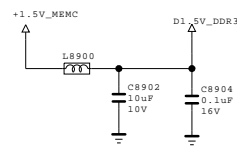


THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.

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KIM JONG HYUN
 LG ELECTRONICS

| | | | |
|-------|----------------|-------|------------|
| MODEL | BCM (EUROBBTV) | DATE | 2009.06.18 |
| BLOCK | NTP7000 | SHEET | 38 / |



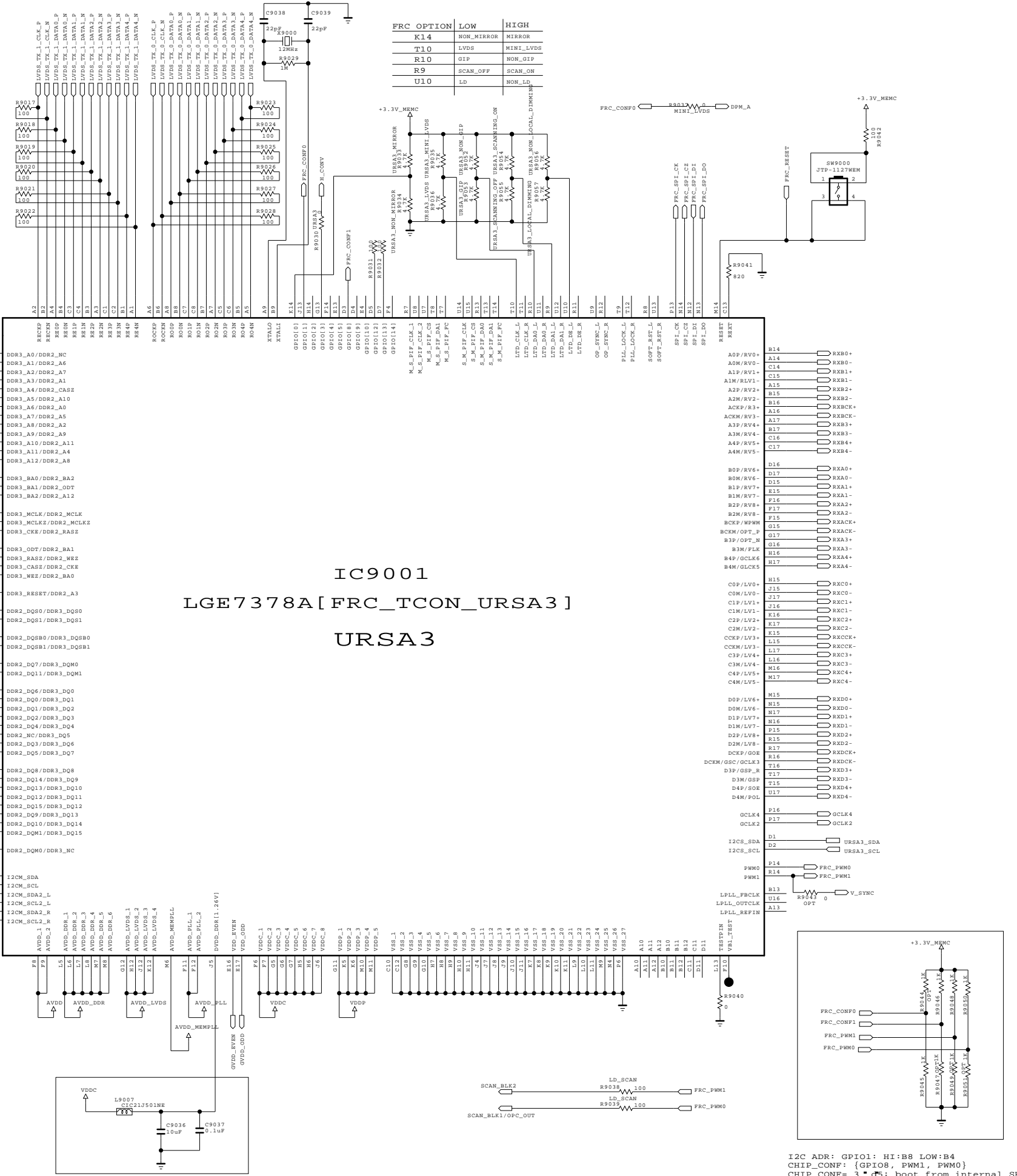
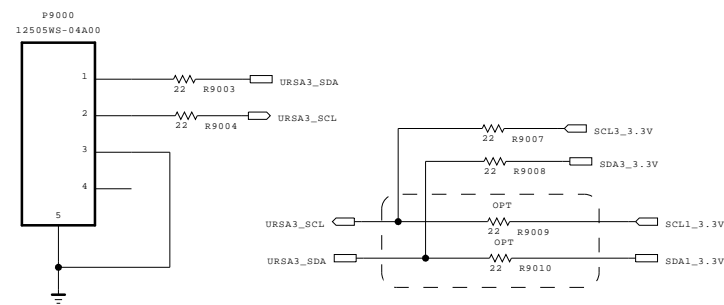
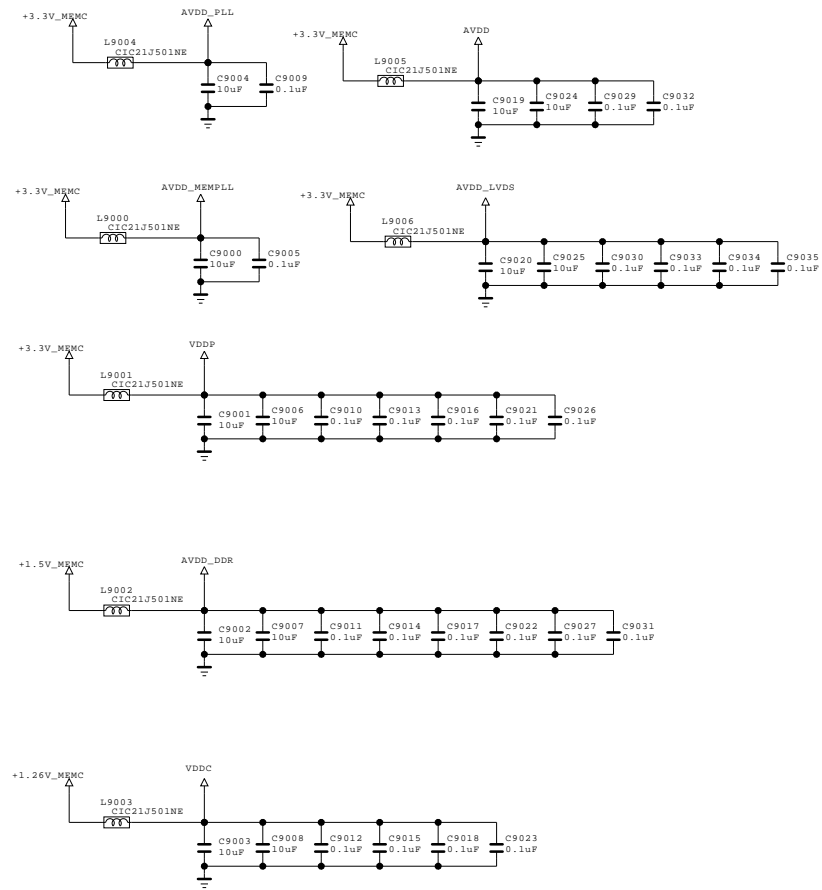
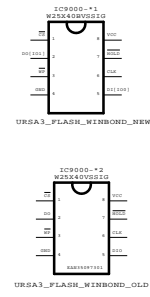
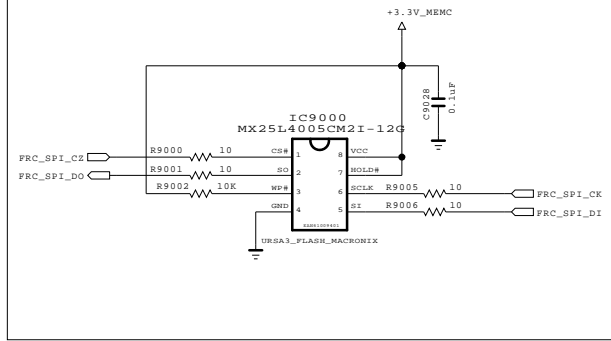
THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.

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| MODEL | COMMON | DATE | 2009.09.11 |
| BLOCK | URSA3 DDR & Power | SHEET | 89 |

Serial Flash



Separate DVDD_DDR Power



I2C ADR: GPIO1: HI:B8 LOW:B4
 CHIP_CONF: {GPIO8, PWM1, PWM0}
 CHIP_CONF= 3 * #5: boot from internal SRAM
 CHIP_CONF= 3 * #6: boot from EEPROM
 CHIP_CONF= 3 * #7: boot from SPI Flash

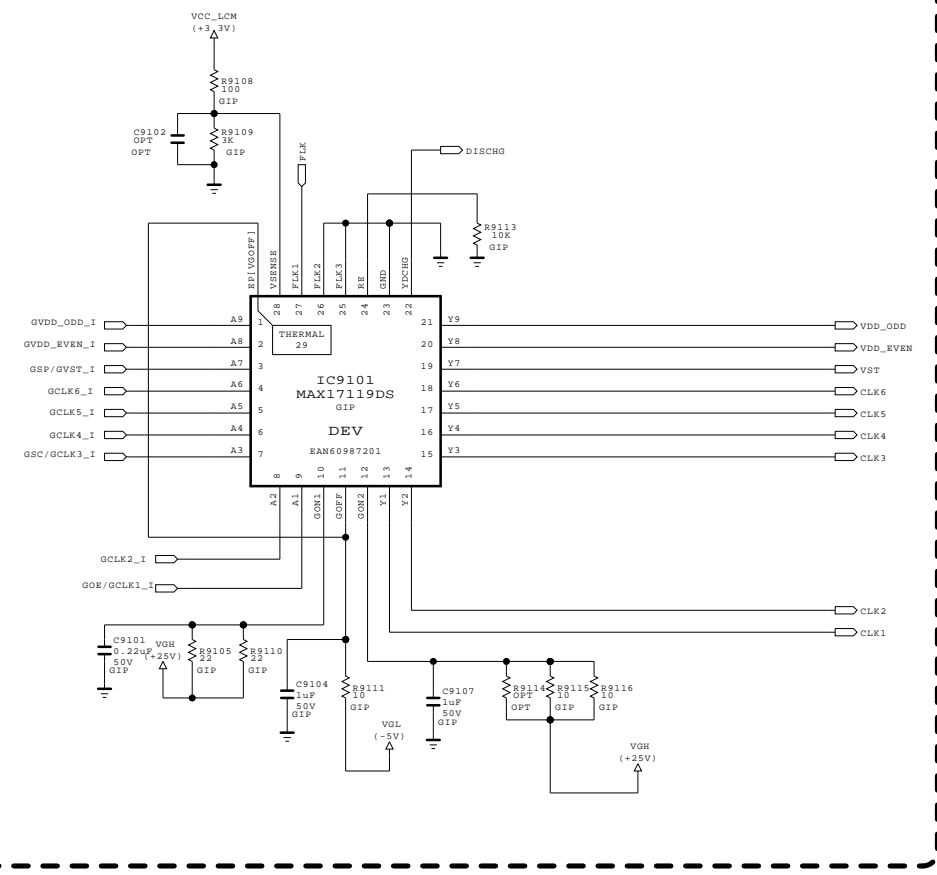
THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.

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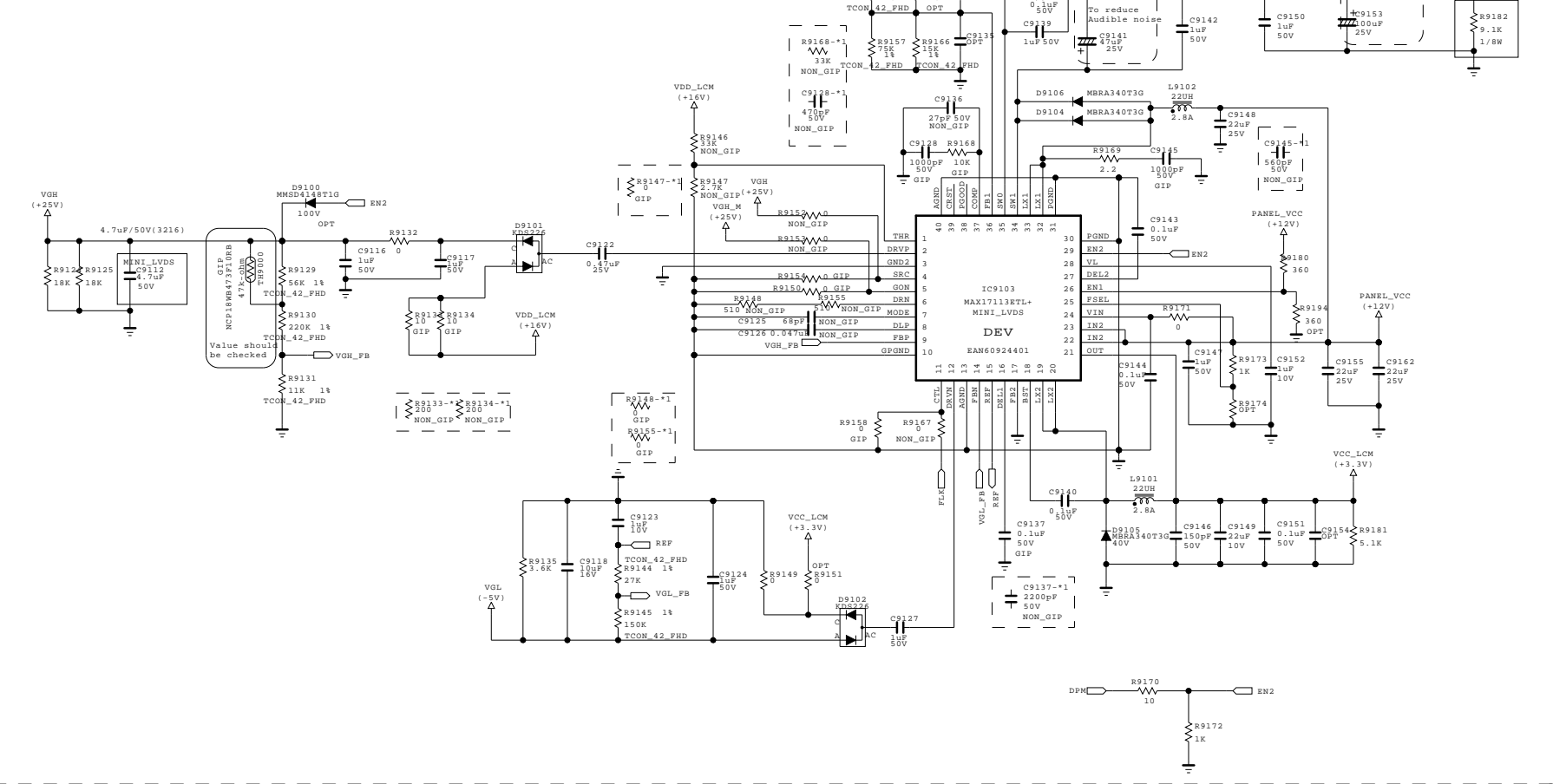
| | | | |
|-------|-----------------|-------|------------|
| MODEL | COMMON | DATE | 2009.09.11 |
| BLOCK | URSA3 (NO L.D.) | SHEET | 90 |

[LEVEL Shift Block]



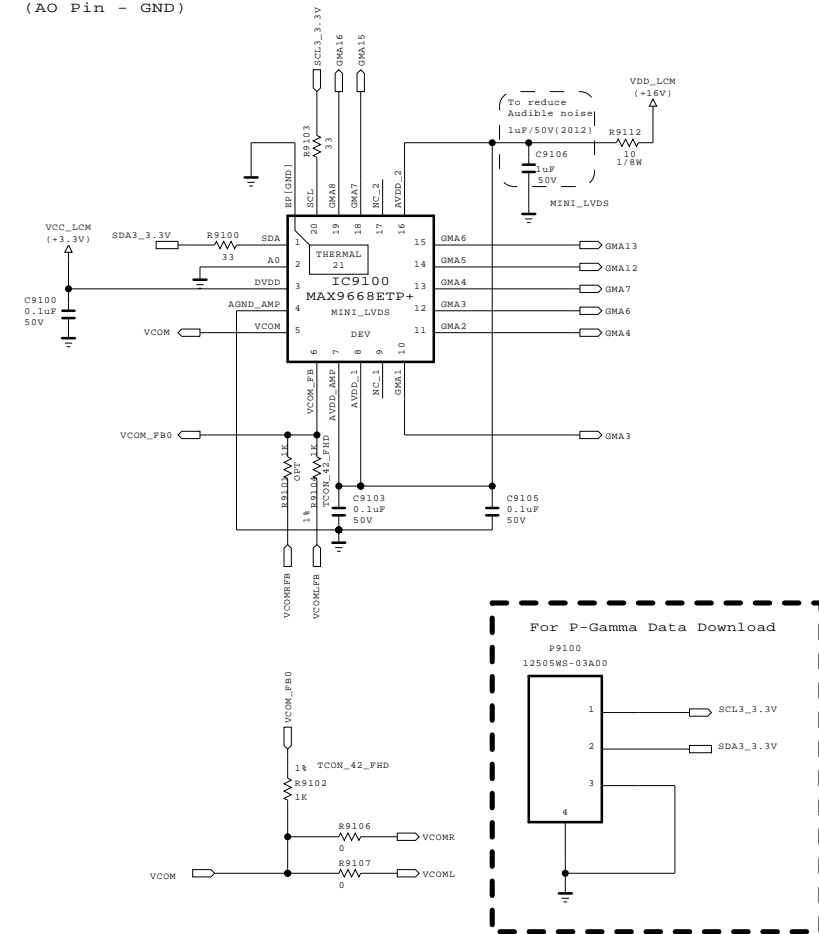
[POWER Block]

* Voltage Target
 VDD_LCM = 16.25V
 VGH = 28.50V
 VGL = -5.35V

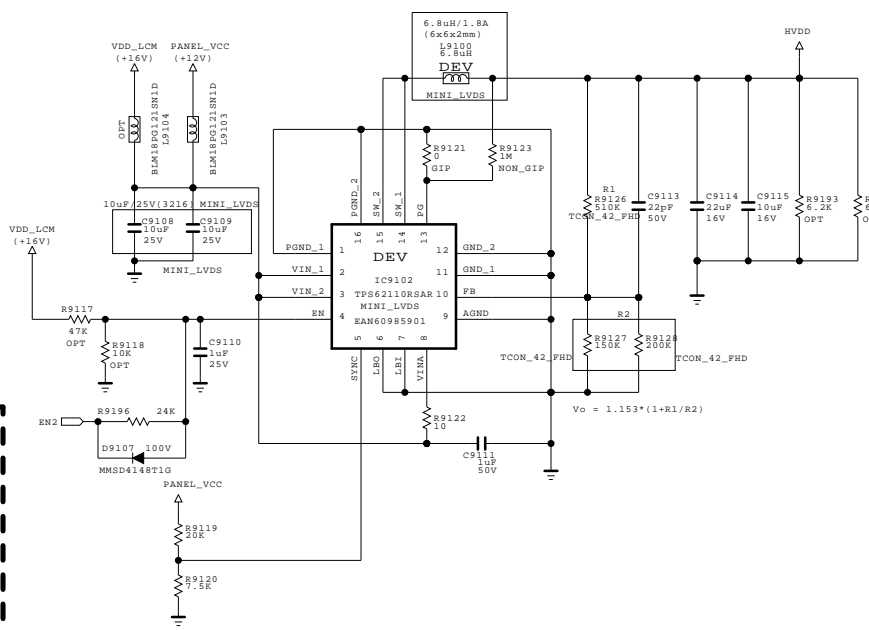


[P-GAMMA Block]

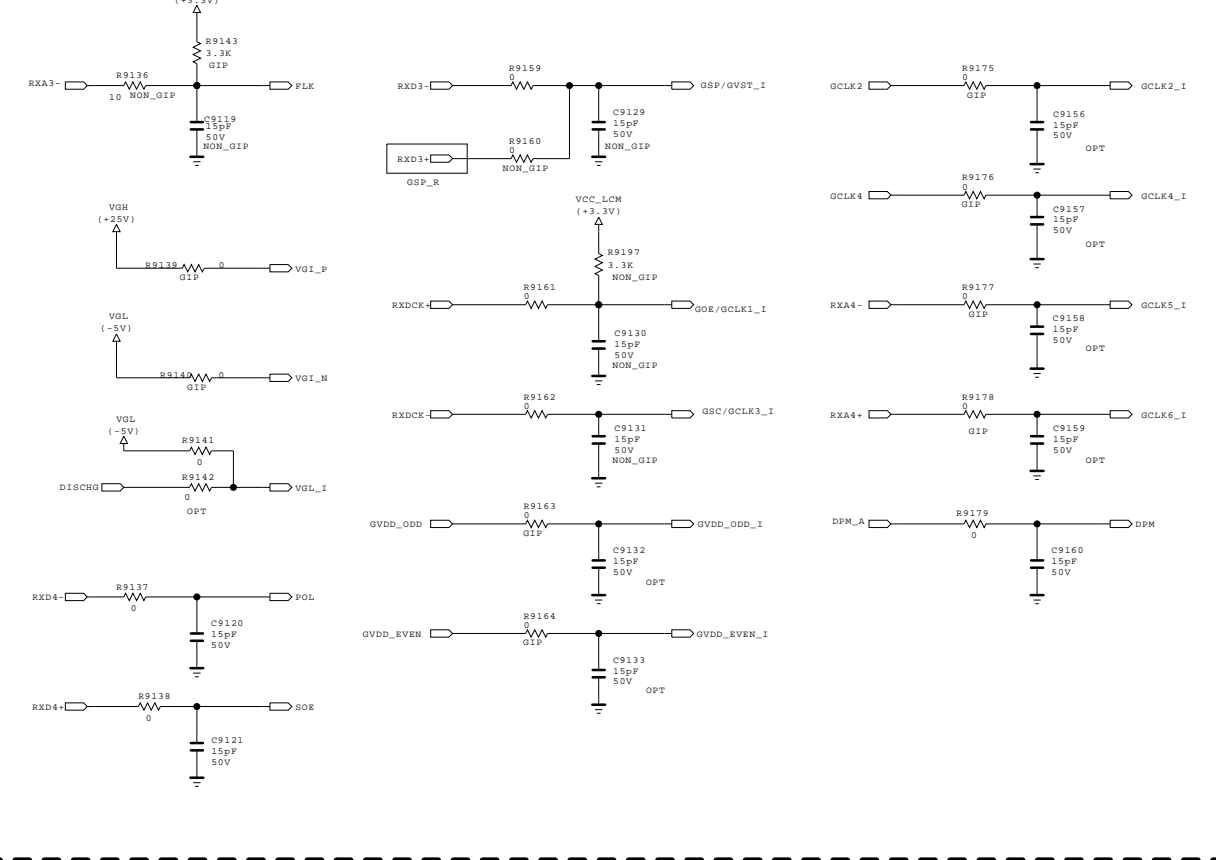
Slave Address : 0xE8h
 (AO Pin - GND)



[HVDD Block]



(Signal Name Change)

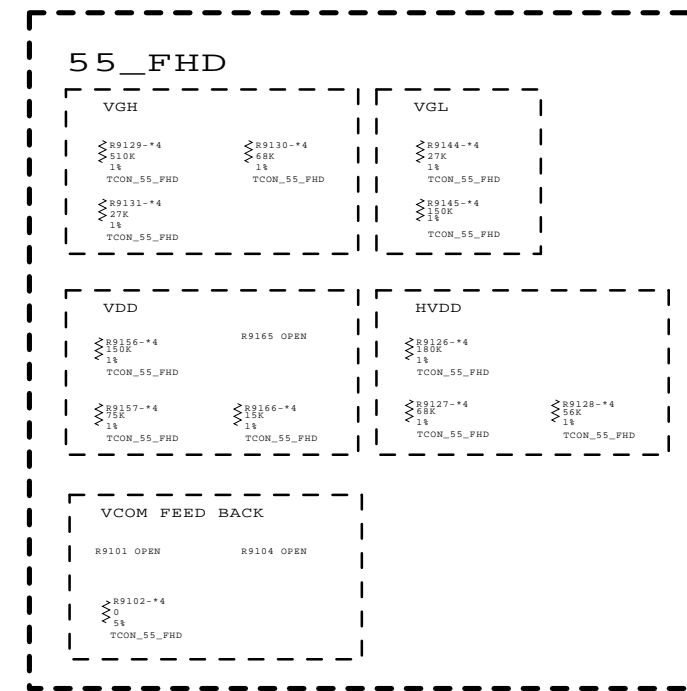
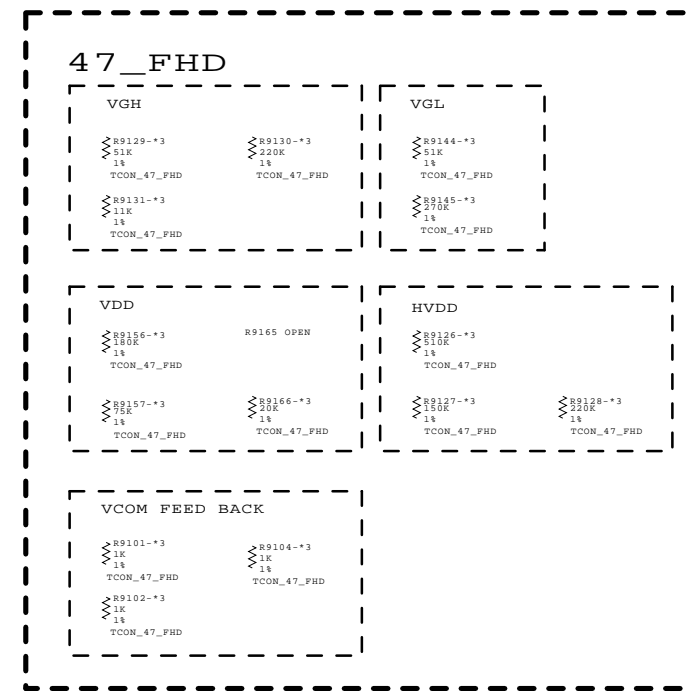
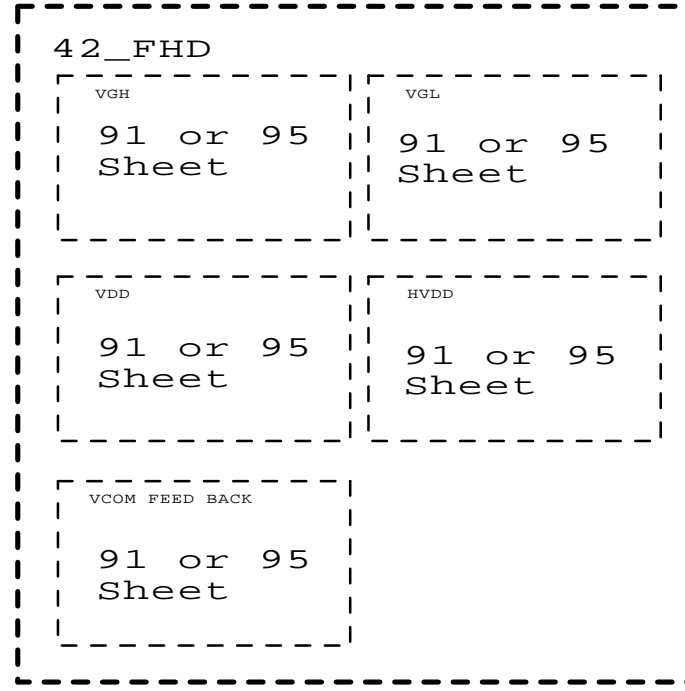
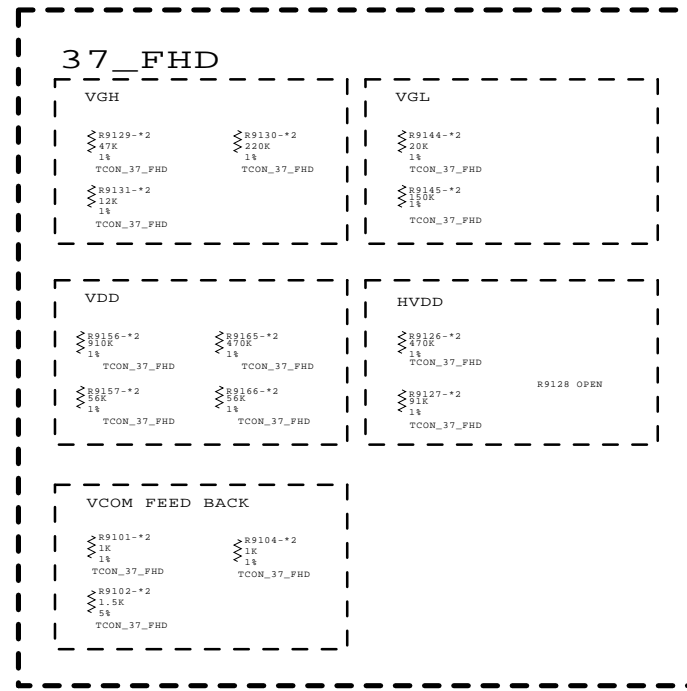
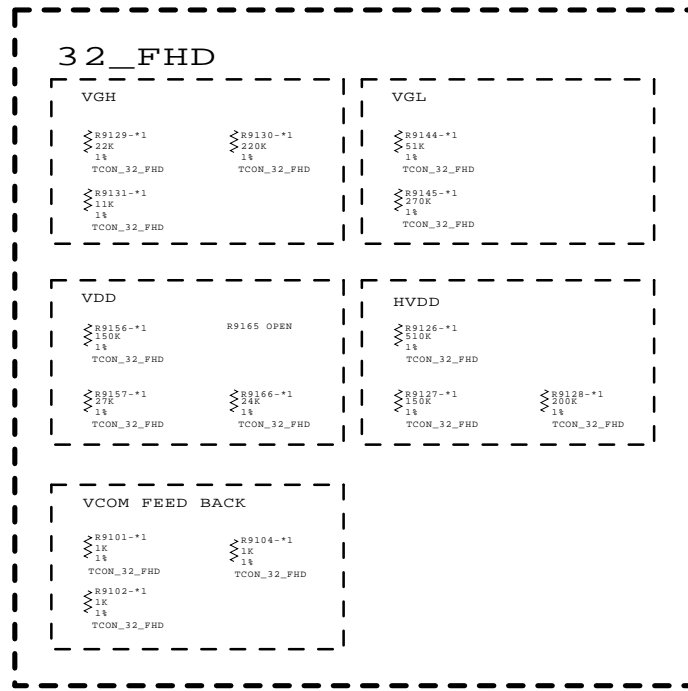


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| MODEL | COMMON | DATE | 09/09/10 |
| BLOCK | T-Con (NO L.D.) | SHEET | 91 |



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

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| | | | |
|-------|--------------------|-------|----------|
| MODEL | Common | DATE | 09/12/15 |
| BLOCK | T-Con Power Option | SHEET | 98 / |

