

# Service Service Service



# Service Manual

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# 1. Technical Specifications, Connections, and Chassis Overview

## Index of this chapter:

- 1.1 Technical Specifications
- 1.2 Connection Overview
- 1.3 Chassis Overview

## Notes:

- Figures can deviate due to the different set executions.
- Specifications are indicative (subject to change).

## 1.1 Technical Specifications

### 1.1.1 Vision

|                                        |                        |
|----------------------------------------|------------------------|
| Display type                           | : LCD                  |
| Screen size                            | : 32" (82 cm), 16:9    |
|                                        | : 42" (107 cm), 16:9   |
| Resolution (HxV pixels)                | : 1366 x 768           |
| Min. contrast ratio                    | : 4000:1 (32")         |
|                                        | : 5000:1 (42")         |
| Min. light output (cd/m <sup>2</sup> ) | : 500                  |
| Typ. response time (ms)                | : 8 (32")              |
|                                        | : 5 (42")              |
| Viewing angle (HxV degrees)            | : 178x178              |
| Tuning system                          | : PLL                  |
| TV Colour systems                      | : PAL B/G, D/K, I      |
|                                        | : SECAM B/G, D/K, L/L' |
| Video playback                         | : NTSC                 |
|                                        | : PAL                  |
|                                        | : SECAM                |
| Supported computer formats             | : WXGA (1366x768)      |
| Supported video formats                | : 640x480i - 1fH       |
|                                        | : 720x576i - 1fH       |
|                                        | : 640x480p - 2fH       |
|                                        | : 720x576p - 2fH       |
|                                        | : 1920x1080i - 2fH     |
|                                        | : 1280x720p - 3fH      |
| Presets/channels                       | : 100 presets          |
| Tuner bands                            | : VHF                  |
|                                        | : UHF                  |
|                                        | : S-band               |
|                                        | : Hyper-band           |

### 1.1.2 Sound

|                                   |                      |
|-----------------------------------|----------------------|
| Sound systems                     | : NICAM D/K, I, L/L' |
|                                   | : 2CS D/K, B/G       |
| Equalizer                         | : 7-bands            |
| Maximum power (W <sub>RMS</sub> ) | : 2 x 10             |

### 1.1.3 Miscellaneous

|                                    |             |
|------------------------------------|-------------|
| Power supply:                      |             |
| - Mains voltage (V <sub>AC</sub> ) | : 220 - 240 |
| - Mains frequency (Hz)             | : 50 / 60   |

|                          |             |
|--------------------------|-------------|
| Ambient conditions:      |             |
| - Temperature range (°C) | : +5 to +40 |
| - Maximum humidity       | : 90% R.H.  |

|                                           |               |
|-------------------------------------------|---------------|
| Power consumption (values are indicative) |               |
| - Normal operation (W)                    | : ≈ 140 (32") |
|                                           | : ≈ 240 (42") |
| - Stand-by (W)                            | : < 1         |

|                       |                         |
|-----------------------|-------------------------|
| Dimensions (WxHxD cm) | : 80.5x54.6x11.5 (32")  |
|                       | : 104.5x68.6x11.6 (42") |

|             |              |
|-------------|--------------|
| Weight (kg) | : 15.5 (32") |
|             | : 25 (42")   |

## 1.2 Connection Overview

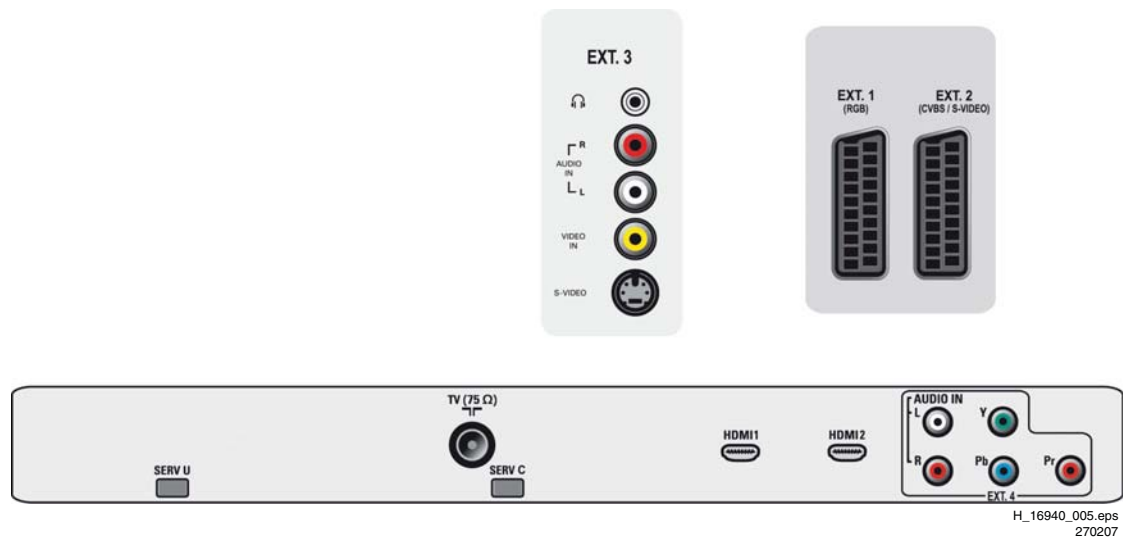


Figure 1-1 Side and rear I/O connections

**Note:** The following connector colour abbreviations are used (acc. to DIN/IEC 757): Bk= Black, Bu= Blue, Gn= Green, Gy= Grey, Rd= Red, Wh= White, and Ye= Yellow.

### 1.2.1 Side Connections

#### EXT3: Headphone - Out

Bk - Headphone 32 - 600 ohm / 10 mW



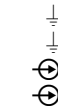
#### EXT3: Cinch: Video CVBS - In, Audio - In

Rd - Audio R 0.5 V<sub>RMS</sub> / 10 kohm  
Wh - Audio L 0.5 V<sub>RMS</sub> / 10 kohm  
Ye - Video CVBS 1 V<sub>PP</sub> / 75 ohm



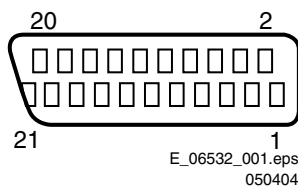
#### EXT3: S-Video (Hosiden): Video Y/C - In

1 - Ground Y Gnd  
2 - Ground C Gnd  
3 - Video Y 1 V<sub>PP</sub> / 75 ohm  
4 - Video C 0.3 V<sub>PP</sub> / 75 ohm



### 1.2.2 Rear Connections

#### EXT1: Video RGB - In, CVBS - In/Out, Audio - In/Out



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050404

Figure 1-2 SCART connector

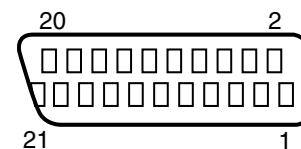
1 - Audio R 0.5 V<sub>RMS</sub> / 1 kohm  
2 - Audio R 0.5 V<sub>RMS</sub> / 10 kohm  
3 - Audio L 0.5 V<sub>RMS</sub> / 1 kohm  
4 - Ground Audio Gnd  
5 - Ground Blue Gnd  
6 - Audio L 0.5 V<sub>RMS</sub> / 10 kohm  
7 - Video Blue 0.7 V<sub>PP</sub> / 75 ohm  
8 - Function Select 0 - 2 V: INT  
4.5 - 7 V: EXT 16:9  
9.5 - 12 V: EXT 4:3  
9 - Ground Green Gnd



10 - Easylink P50 0 - 5 V / 4.7 kohm  
11 - Video Green 0.7 V<sub>PP</sub> / 75 ohm  
12 - n.c.  
13 - Ground Red Gnd  
14 - Ground P50 Gnd  
15 - Video Red 0.7 V<sub>PP</sub> / 75 ohm  
16 - Status/FBL 0 - 0.4 V: INT  
1 - 3 V: EXT / 75 ohm  
17 - Ground Video Gnd  
18 - Ground FBL Gnd  
19 - Video CVBS 1 V<sub>PP</sub> / 75 ohm  
20 - Video CVBS 1 V<sub>PP</sub> / 75 ohm  
21 - Shield Gnd



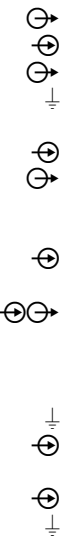
#### EXT2: Video YC - In, CVBS - In/Out, Audio - In/Out



E\_06532\_001.eps  
050404

Figure 1-3 SCART connector

1 - Audio R 0.5 V<sub>RMS</sub> / 1 kohm  
2 - Audio R 0.5 V<sub>RMS</sub> / 10 kohm  
3 - Audio L 0.5 V<sub>RMS</sub> / 1 kohm  
4 - Ground Audio Gnd  
5 - n.c.  
6 - Audio L 0.5 V<sub>RMS</sub> / 10 kohm  
7 - C-out 0.7 V<sub>PP</sub> / 75 ohm  
8 - Function Select 0 - 2 V: INT  
4.5 - 7 V: EXT 16:9  
9.5 - 12 V: EXT 4:3  
9 - n.c.  
10 - Easylink P50 0 - 5 V / 4.7 kohm  
11 - n.c.  
12 - n.c.  
13 - n.c.  
14 - Ground P50 Gnd  
15 - C 0.7 V<sub>PP</sub> / 75 ohm  
16 - Status/FBL 0 - 0.4 V: INT  
1 - 3 V: EXT / 75 ohm  
17 - Ground Video Gnd



|                   |                            |   |
|-------------------|----------------------------|---|
| 18 - Ground FBL   | Gnd                        | ⏏ |
| 19 - Video CVBS   | 1 V <sub>PP</sub> / 75 ohm | ⊕ |
| 20 - Video CVBS/Y | 1 V <sub>PP</sub> / 75 ohm | ⊕ |
| 21 - Shield       | Gnd                        | ⏏ |

**Service Connector (UART)**

|             |          |   |
|-------------|----------|---|
| 1 - UART_TX | Transmit | ⊕ |
| 2 - Ground  | Gnd      | ⏏ |
| 3 - UART_RX | Receive  | ⊕ |

**Aerial - In**

|                 |              |   |
|-----------------|--------------|---|
| - IEC-type (EU) | Coax, 75 ohm | ⏏ |
|-----------------|--------------|---|

**Service Connector (ComPair)**

|            |                                  |   |
|------------|----------------------------------|---|
| 1 - SDA-S  | I <sup>2</sup> C Data (0 - 5 V)  | ⊕ |
| 2 - SCL-S  | I <sup>2</sup> C Clock (0 - 5 V) | ⊕ |
| 3 - Ground | Gnd                              | ⏏ |

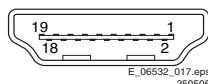
**HDMI 1 & 2: Digital Video, Digital Audio - In**

Figure 1-4 HDMI (type A) connector

|              |                 |   |
|--------------|-----------------|---|
| 1 - D2+      | Data channel    | ⊕ |
| 2 - Shield   | Gnd             | ⏏ |
| 3 - D2-      | Data channel    | ⊕ |
| 4 - D1+      | Data channel    | ⊕ |
| 5 - Shield   | Gnd             | ⏏ |
| 6 - D1-      | Data channel    | ⊕ |
| 7 - D0+      | Data channel    | ⊕ |
| 8 - Shield   | Gnd             | ⏏ |
| 9 - D0-      | Data channel    | ⊕ |
| 10 - CLK+    | Data channel    | ⊕ |
| 11 - Shield  | Gnd             | ⏏ |
| 12 - CLK-    | Data channel    | ⊕ |
| 13 - n.c.    |                 |   |
| 14 - n.c.    |                 |   |
| 15 - DDC_SCL | DDC clock       | ⊕ |
| 16 - DDC_SDA | DDC data        | ⊕ |
| 17 - Ground  | Gnd             | ⏏ |
| 18 - +5V     |                 | ⊕ |
| 19 - HPD     | Hot Plug Detect | ⊕ |
| 20 - Ground  | Gnd             | ⏏ |

**EXT4: Cinch: Video YPbPr - In, Audio - In**

|               |                                |   |
|---------------|--------------------------------|---|
| Gn - Video Y  | 1 V <sub>PP</sub> / 75 ohm     | ⊕ |
| Bu - Video Pb | 0.7 V <sub>PP</sub> / 75 ohm   | ⊕ |
| Rd - Video Pr | 0.7 V <sub>PP</sub> / 75 ohm   | ⊕ |
| Wh - Audio L  | 0.5 V <sub>RMS</sub> / 10 kohm | ⊕ |
| Rd - Audio R  | 0.5 V <sub>RMS</sub> / 10 kohm | ⊕ |

## 1.3 Chassis Overview

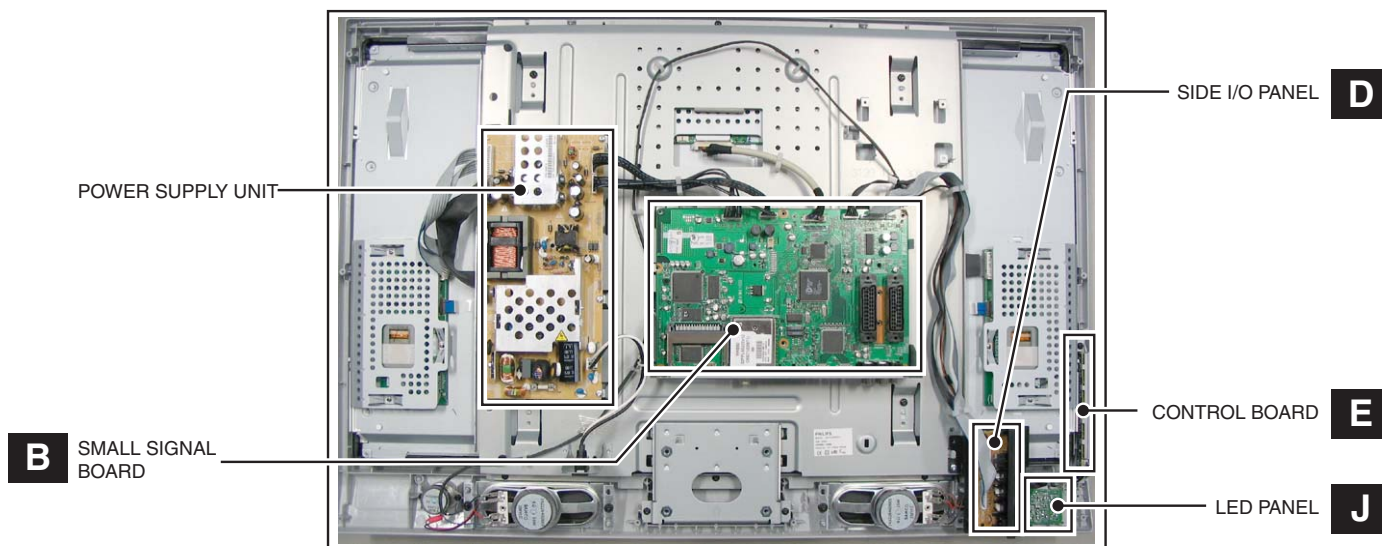
G\_16860\_047.eps  
310107

Figure 1-5 PWB/CBA locations (32" models)

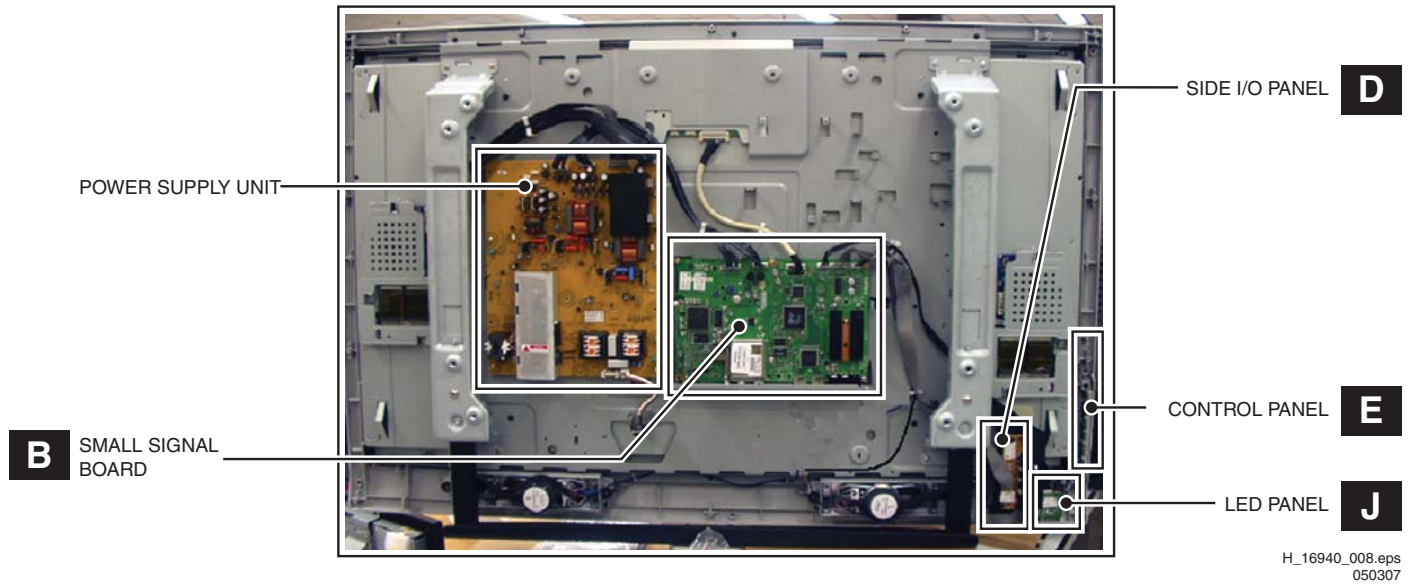


Figure 1-6 PWB/CBA locations (42" models)

## 2. Safety Instructions, Warnings, and Notes

### Index of this chapter:

- 2.1 Safety Instructions
- 2.2 Warnings
- 2.3 Notes

### 2.1 Safety Instructions

Safety regulations require the following **during** a repair:

- Connect the set to the Mains/AC Power via an isolation transformer (> 800 VA).
- Replace safety components, indicated by the symbol , only by components identical to the original ones. Any other component substitution (other than original type) may increase risk of fire or electrical shock hazard.

Safety regulations require that **after** a repair, the set must be returned in its original condition. Pay in particular attention to the following points:

- Route the wire trees correctly and fix them with the mounted cable clamps.
- Check the insulation of the Mains/AC Power lead for external damage.
- Check the strain relief of the Mains/AC Power cord for proper function.
- Check the electrical DC resistance between the Mains/AC Power plug and the secondary side (only for sets that have a Mains/AC Power isolated power supply):
  1. Unplug the Mains/AC Power cord and connect a wire between the two pins of the Mains/AC Power plug.
  2. Set the Mains/AC Power switch to the "on" position (keep the Mains/AC Power cord unplugged!).
  3. Measure the resistance value between the pins of the Mains/AC Power plug and the metal shielding of the tuner or the aerial connection on the set. The reading should be between 4.5 Mohm and 12 Mohm.
  4. Switch "off" the set, and remove the wire between the two pins of the Mains/AC Power plug.
- Check the cabinet for defects, to prevent touching of any inner parts by the customer.

### 2.2 Warnings

- All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD ) . Careless handling during repair can reduce life drastically. Make sure that, during repair, you are connected with the same potential as the mass of the set by a wristband with resistance. Keep components and tools also at this same potential. Available ESD protection equipment:
  - Complete kit ESD3 (small tablemat, wristband, connection box, extension cable and earth cable) 4822 310 10671.
  - Wristband tester 4822 344 13999.
- Be careful during measurements in the high voltage section.
- Never replace modules or other components while the unit is switched "on".
- When you align the set, use plastic rather than metal tools. This will prevent any short circuits and the danger of a circuit becoming unstable.

### 2.3 Notes

#### 2.3.1 General

- Measure the voltages and waveforms with regard to the chassis (= tuner) ground () or hot ground () , depending on the tested area of circuitry. The voltages and waveforms shown in the diagrams are indicative. Measure them in the

Service Default Mode (see chapter 5) with a colour bar signal and stereo sound (L: 3 kHz, R: 1 kHz unless stated otherwise) and picture carrier at 475.25 MHz for PAL, or 61.25 MHz for NTSC (channel 3).

- Where necessary, measure the waveforms and voltages with () and without () aerial signal. Measure the voltages in the power supply section both in normal operation () and in stand-by () . These values are indicated by means of the appropriate symbols.
- Manufactured under license from Dolby Laboratories. "Dolby", "Pro Logic" and the "double-D symbol", are trademarks of Dolby Laboratories.

#### 2.3.2 Schematic Notes

- All resistor values are in ohms, and the value multiplier is often used to indicate the decimal point location (e.g. 2K2 indicates 2.2 kohm).
- Resistor values with no multiplier may be indicated with either an "E" or an "R" (e.g. 220E or 220R indicates 220 ohm).
- All capacitor values are given in micro-farads ( $\mu = \times 10^{-6}$ ), nano-farads ( $n = \times 10^{-9}$ ), or pico-farads ( $p = \times 10^{-12}$ ).
- Capacitor values may also use the value multiplier as the decimal point indication (e.g. 2p2 indicates 2.2 pF).
- An "asterisk" (\*) indicates component usage varies. Refer to the diversity tables for the correct values.
- The correct component values are listed in the Spare Parts List. Therefore, always check this list when there is any doubt.

#### 2.3.3 BGA (Ball Grid Array) ICs

##### Introduction

For more information on how to handle BGA devices, visit this URL: [www.atyourservice.ce.philips.com](http://www.atyourservice.ce.philips.com) (needs subscription, not available for all regions). After login, select "Magazine", then go to "Repair downloads". Here you will find information on how to deal with BGA-ICs.

##### BGA Temperature Profiles

For BGA-ICs, you **must** use the correct temperature-profile, which is coupled to the 12NC. For an overview of these profiles, visit the website [www.atyourservice.ce.philips.com](http://www.atyourservice.ce.philips.com) (needs subscription, but is not available for all regions)

You will find this and more technical information within the "Magazine", chapter "Repair downloads".

For additional questions please contact your local repair help desk.

#### 2.3.4 Lead-free Soldering

Due to lead-free technology some rules have to be respected by the workshop during a repair:

- Use only lead-free soldering tin Philips SAC305 with order code 0622 149 00106. If lead-free solder paste is required, please contact the manufacturer of your soldering equipment. In general, use of solder paste within workshops should be avoided because paste is not easy to store and to handle.
- Use only adequate solder tools applicable for lead-free soldering tin. The solder tool must be able:
  - To reach a solder-tip temperature of at least 400°C.
  - To stabilize the adjusted temperature at the solder-tip.
  - To exchange solder-tips for different applications.
- Adjust your solder tool so that a temperature of around 360°C - 380°C is reached and stabilized at the solder joint. Heating time of the solder-joint should not exceed ~ 4 sec. Avoid temperatures above 400°C, otherwise wear-out of tips will increase drastically and flux-fluid will be destroyed.

To avoid wear-out of tips, switch “off” unused equipment or reduce heat.

- Mix of lead-free soldering tin/parts with leaded soldering tin/parts is possible but PHILIPS recommends strongly **to avoid** mixed regimes. If this cannot be avoided, carefully clear the solder-joint from old tin and re-solder with new tin.

### 2.3.5 Alternative BOM identification

The **third digit** in the serial number (example: AG2B0335000001) indicates the number of the alternative B.O.M. (Bill Of Materials) that has been used for producing the specific TV set. In general, it is possible that the same TV model on the market is produced with e.g. two different types of displays, coming from two different suppliers. This will then result in sets which have the same CTN (Commercial Type Number; e.g. 28PW9515/12) but which have a different B.O.M. number.

By looking at the third digit of the serial number, one can identify which B.O.M. is used for the TV set he is working with. If the third digit of the serial number contains the number “1” (example: AG1B0335000001), then the TV set has been manufactured according to B.O.M. number 1. If the third digit is a “2” (example: AG2B0335000001), then the set has been produced according to B.O.M. no. 2. ***This is important for ordering the correct spare parts!***

For the third digit, the numbers 1...9 and the characters A...Z can be used, so in total: 9 plus 26= 35 different B.O.M.s can be indicated by the third digit of the serial number.

**Identification:** The bottom line of a type plate gives a 14-digit serial number. Digits 1 and 2 refer to the production center (e.g. AG is Bruges), digit 3 refers to the B.O.M. code, digit 4 refers to the Service version change code, digits 5 and 6 refer to the production year, and digits 7 and 8 refer to production week (in example below it is 2006 week 17). The 6 last digits contain the serial number.



E\_06532\_024.eps  
130606

Figure 2-1 Serial number (example)

### 2.3.6 Board Level Repair (BLR) or Component Level Repair (CLR)

If a board is defective, consult your repair procedure to decide if the board has to be exchanged or if it should be repaired on component level.

If your repair procedure says the board should be exchanged completely, do not solder on the defective board. Otherwise, it cannot be returned to the O.E.M. supplier for back charging!

### 2.3.7 Practical Service Precautions

- **It makes sense to avoid exposure to electrical shock.** While some sources are expected to have a possible dangerous impact, others of quite high potential are of limited current and are sometimes held in less regard.
- **Always respect voltages.** While some may not be dangerous in themselves, they can cause unexpected reactions that are best avoided. Before reaching into a powered TV set, it is best to test the high voltage insulation. It is easy to do, and is a good service precaution.

### 3. Directions for Use

You can download this information from the following websites:

<http://www.philips.com/support>

<http://www.p4c.philips.com>

## 4. Mechanical Instructions

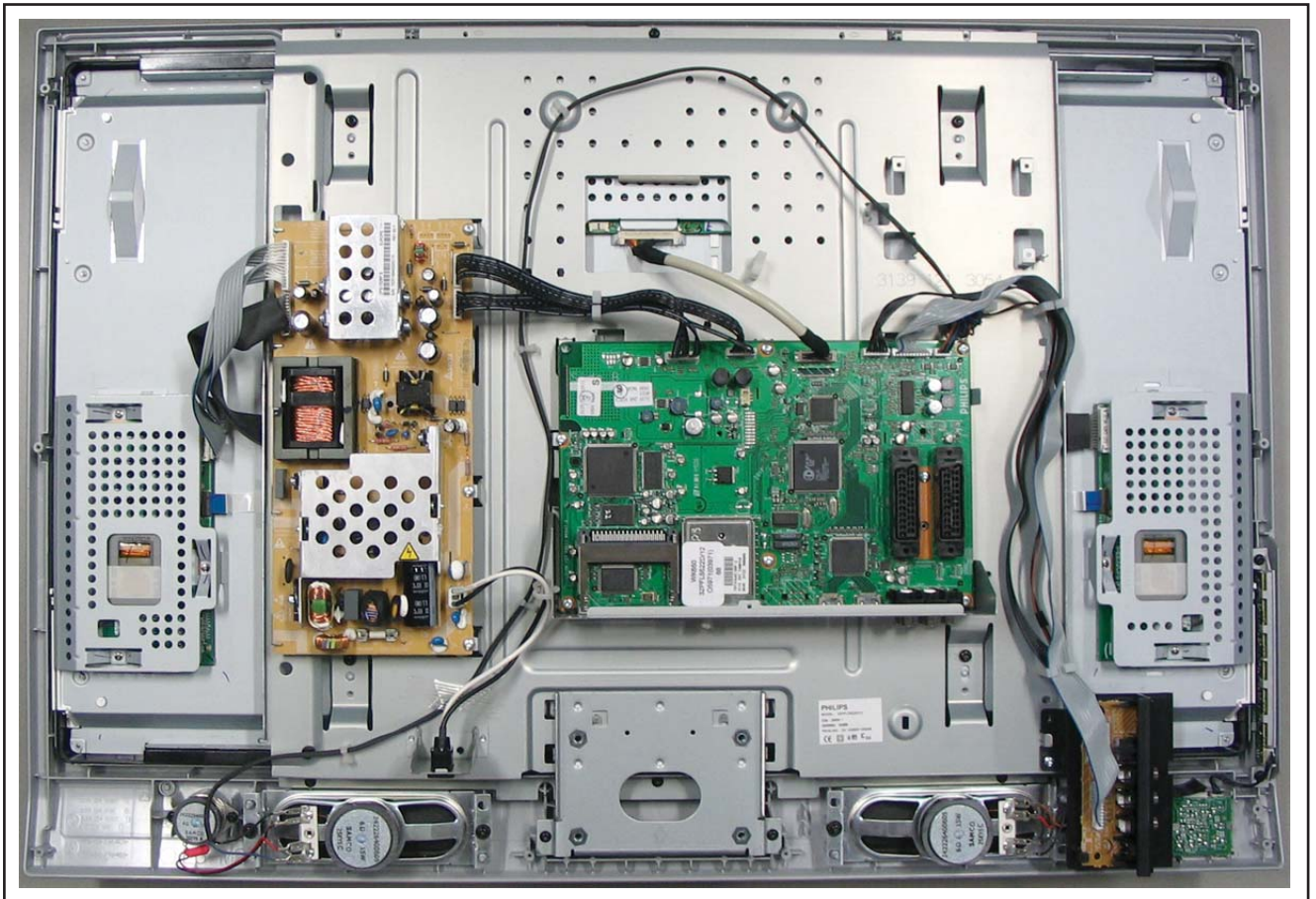
### Index of this chapter:

- 4.1 Cable Dressing
- 4.2 Service Positions
- 4.3 Assy/Panel Removal
- 4.4 Set Re-assembly

### Notes:

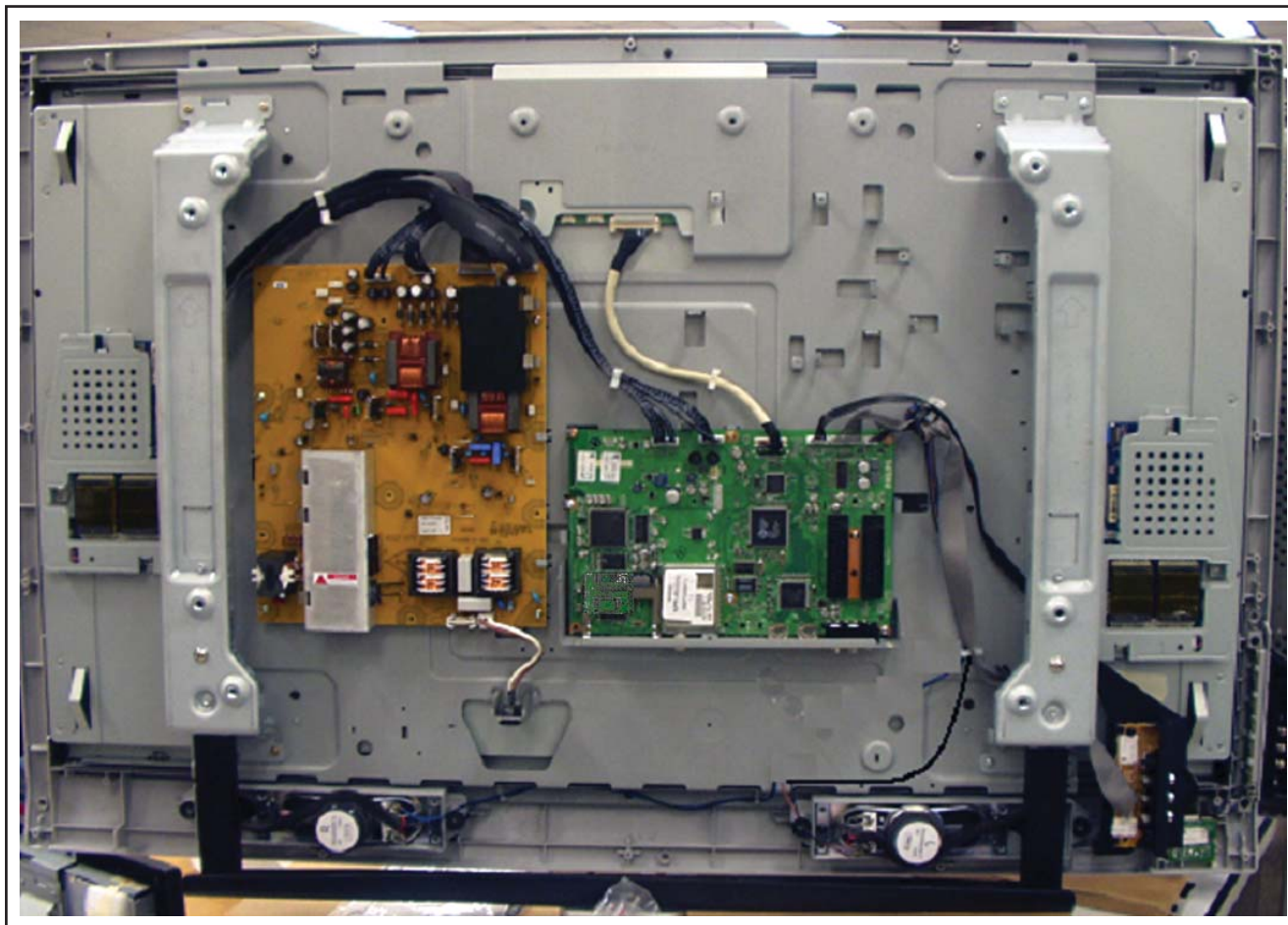
- Figures below can deviate slightly from the actual situation, due to the different set executions.
- Follow the disassemble instructions in described order. They apply to the 32" sets.

### 4.1 Cable Dressing



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310107

Figure 4-1 Cable dressing (32" models)



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050307

**Figure 4-2 Cable dressing (42" models)**

## 4.2 Service Positions

For easy servicing of this set, there are a few possibilities created:

- The buffers from the packaging.
- Foam bars (created for Service).
- Aluminium service stands (created for Service).

**Note:** the aluminium service stands can only be used when the set is equipped with so-called "mushrooms". Otherwise use the original stand that comes with the set.

### 4.2.1 Foam Bars

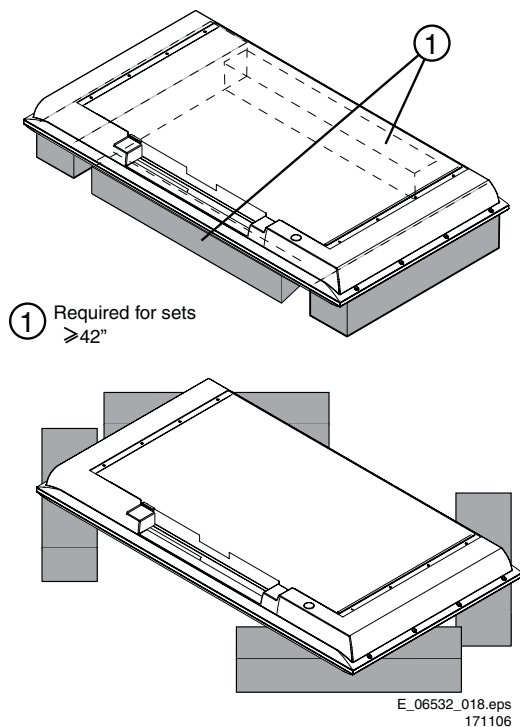


Figure 4-3 Foam bars

The foam bars (order code 3122 785 90580 for two pieces) can be used for all types and sizes of Flat TVs. See figure "Foam bars" for details. Sets with a display of 42" and larger, require **four** foam bars [1]. Ensure that the foam bars are always supporting the cabinet and **never** only the display. **Caution:** Failure to follow these guidelines can seriously damage the display!

By laying the TV face down on the (ESD protective) foam bars, a stable situation is created to perform measurements and alignments. By placing a mirror under the TV, you can monitor the screen.

### 4.2.2 Aluminium Stands

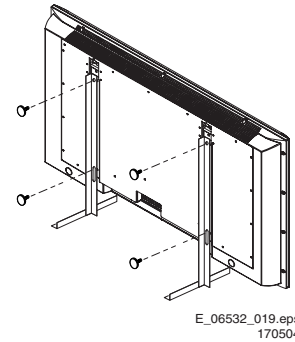


Figure 4-4 Aluminium stands (drawing of Mkl)

The new MkII aluminium stands (not on drawing) with order code 3122 785 90690, can also be used to do measurements, alignments, and duration tests. The stands can be (dis)mounted quick and easy by means of sliding them in/out the "mushrooms". The new stands are backwards compatible with the earlier models.

**Important:** For (older) FTV sets without these "mushrooms", it is obligatory to use the provided screws, otherwise it is possible to damage the monitor inside!

## 4.3 Assy/Panel Removal

### 4.3.1 Rear Cover

**Warning:** Disconnect the mains power cord before you remove the rear cover.

1. Place the TV set upside down on a table top, using the foam bars (see part "Service Position").
2. Remove rear cover screws and the stand (if mounted).
3. Remove rear cover.

### 4.3.2 Keyboard Control Panel

1. Remove the rear cover, as described earlier.
  2. Refer to fig. "Keyboard control panel" below.
  3. Remove the T10 parker screws [1].
  4. Unplug connector [2].
  5. Remove the unit.
  6. Release clips [3] and remove the board.
- When defective, replace the whole unit.

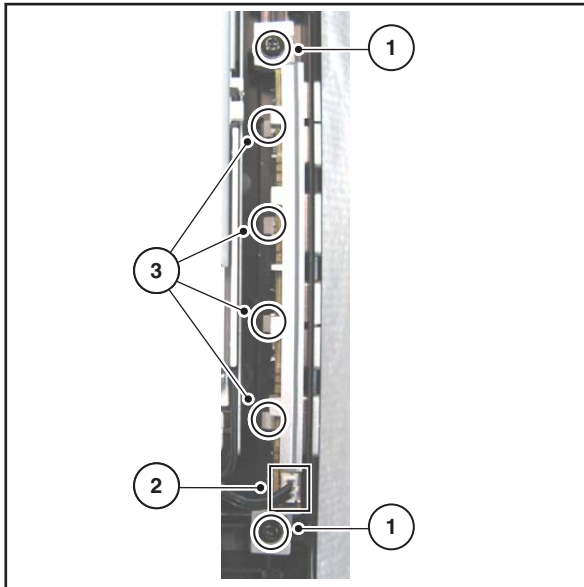
G\_16850\_007.eps  
090207

Figure 4-5 Keyboard control panel

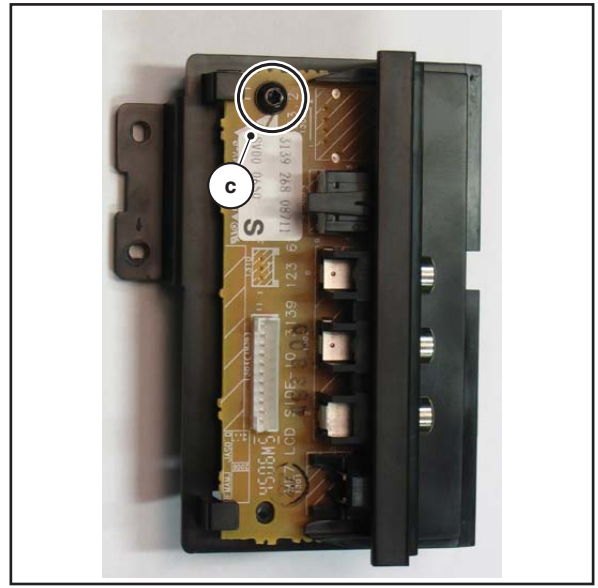
G\_16860\_075.eps  
010207

Figure 4-7 Side I/O panel [1/3] top side

#### 4.3.3 Side I/O Panel

1. Remove the rear cover, as described earlier.
2. Unplug connector [a].
3. Remove screws [b] and remove the complete module. One of the screws is T10 tapping, the other one is T10 parker. See fig. "Side I/O module".
4. Remove T10 parker screw [c]. See fig. "Side I/O panel 1".
5. Push catch [d] (located at the underside of the bracket) and slide the unit to the right from its bracket [e]. See fig. "Side I/O panel 2".
6. To remove the PWB from its bracket, you have to lift the catch [f] located on top of the headphone connector. At the same time, slide the PWB out of its bracket [g]. See fig. "Side I/O panel 3".

When defective, replace the whole unit.

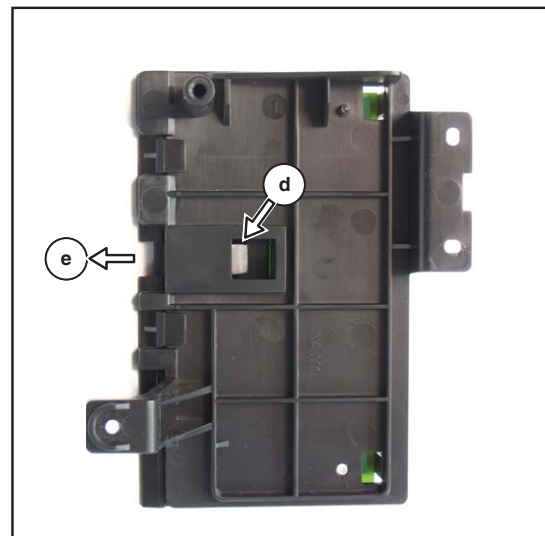
G\_16860\_076.eps  
010207

Figure 4-8 Side I/O panel [2/3] bottom side

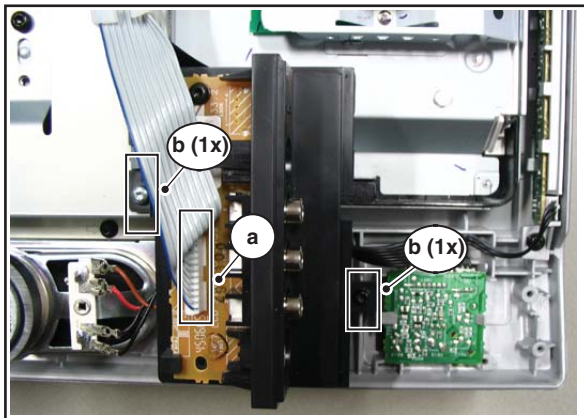
G\_16860\_066.eps  
010207

Figure 4-6 Side I/O module

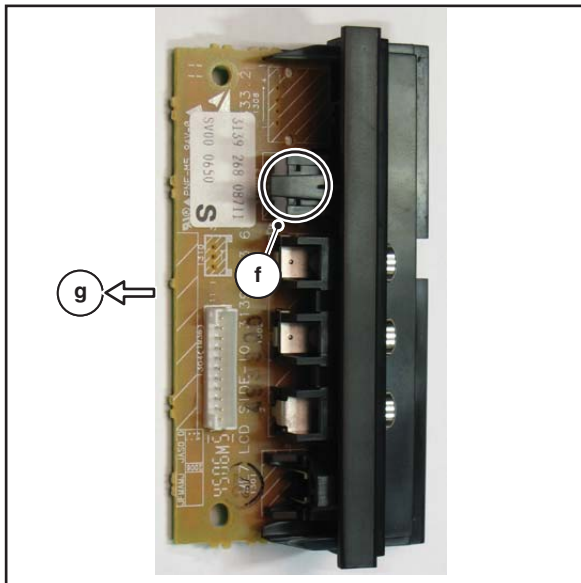
G\_16860\_077.eps  
010207

Figure 4-9 Side I/O panel [3/3]

#### 4.3.4 IR/LED Panel

1. Remove the rear cover, as described earlier.
  2. Refer to fig. "IR/LED panel" below.
  3. Unplug connector(s) [1].
  4. Release clip [2] and remove the board.
- When defective, replace the whole unit.

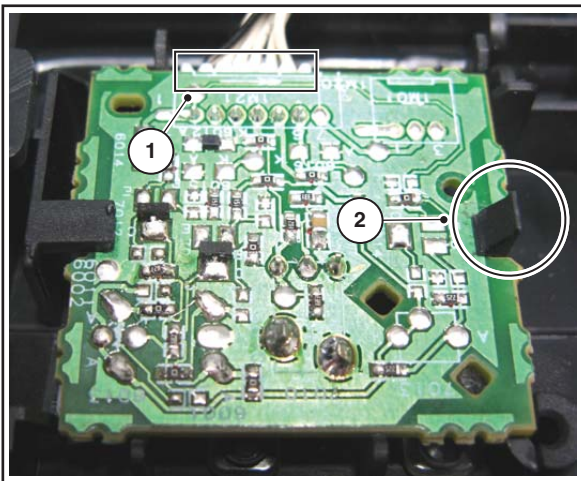
G\_16850\_009.eps  
110107

Figure 4-10 IR/LED panel

#### 4.3.5 Mid-range Speakers

1. Remove the rear cover, as described earlier.
2. Refer to fig. "Mid-range speakers" below.
3. Unplug connectors [1].
4. Remove T10 parker screws [2].

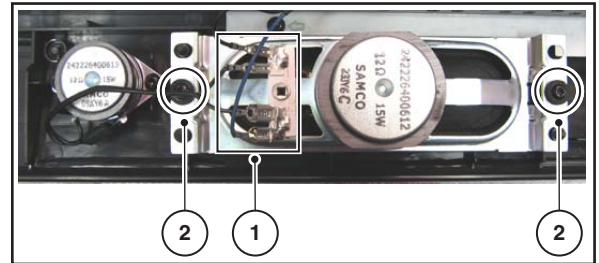
G\_16850\_010.eps  
110107

Figure 4-11 Mid-range speakers

#### 4.3.6 Tweeters

1. Remove the rear cover, as described earlier.
2. Refer to fig. "Tweeters" below.
3. Unplug connectors [1].
4. Remove T10 parker screws [2].

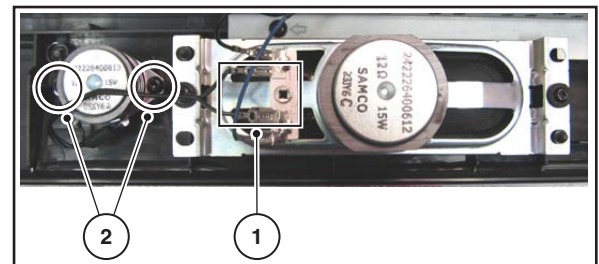
G\_16850\_011.eps  
110107

Figure 4-12 Tweeters

#### 4.3.7 Small Signal Board (SSB)

1. Remove the rear cover, as described earlier.
2. Refer to fig. "SSB removal" below.
3. Disconnect all cables [a] on the SSB.
4. Remove the T10 tapping screws [b] that hold the SSB. See Figure "SSB removal".
5. Remove the screws that hold the CINCH and HDMI connectors at the connector panel.
6. Lift the SSB from the set.

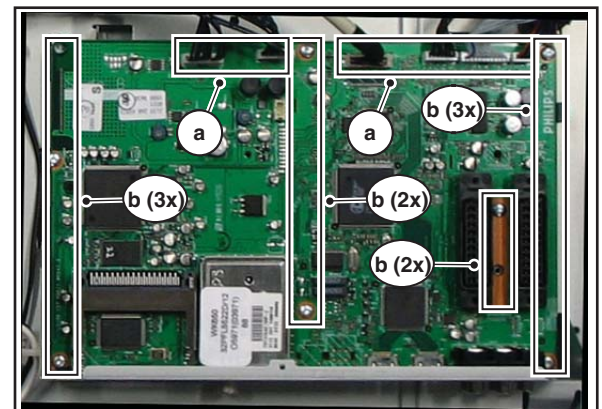
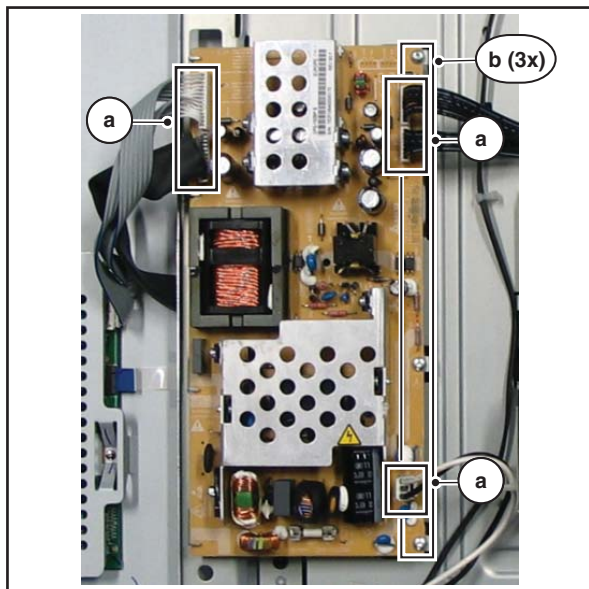
G\_16860\_074.eps  
010207

Figure 4-13 SSB removal

## 4.3.8 Main Supply Panel

1. Remove the rear cover, as described earlier.
2. Refer to fig. "Main supply panel" below.
3. Unplug cables [a].
4. Remove the fixation screws [b].
5. Take the board out (it hinges at the left side).

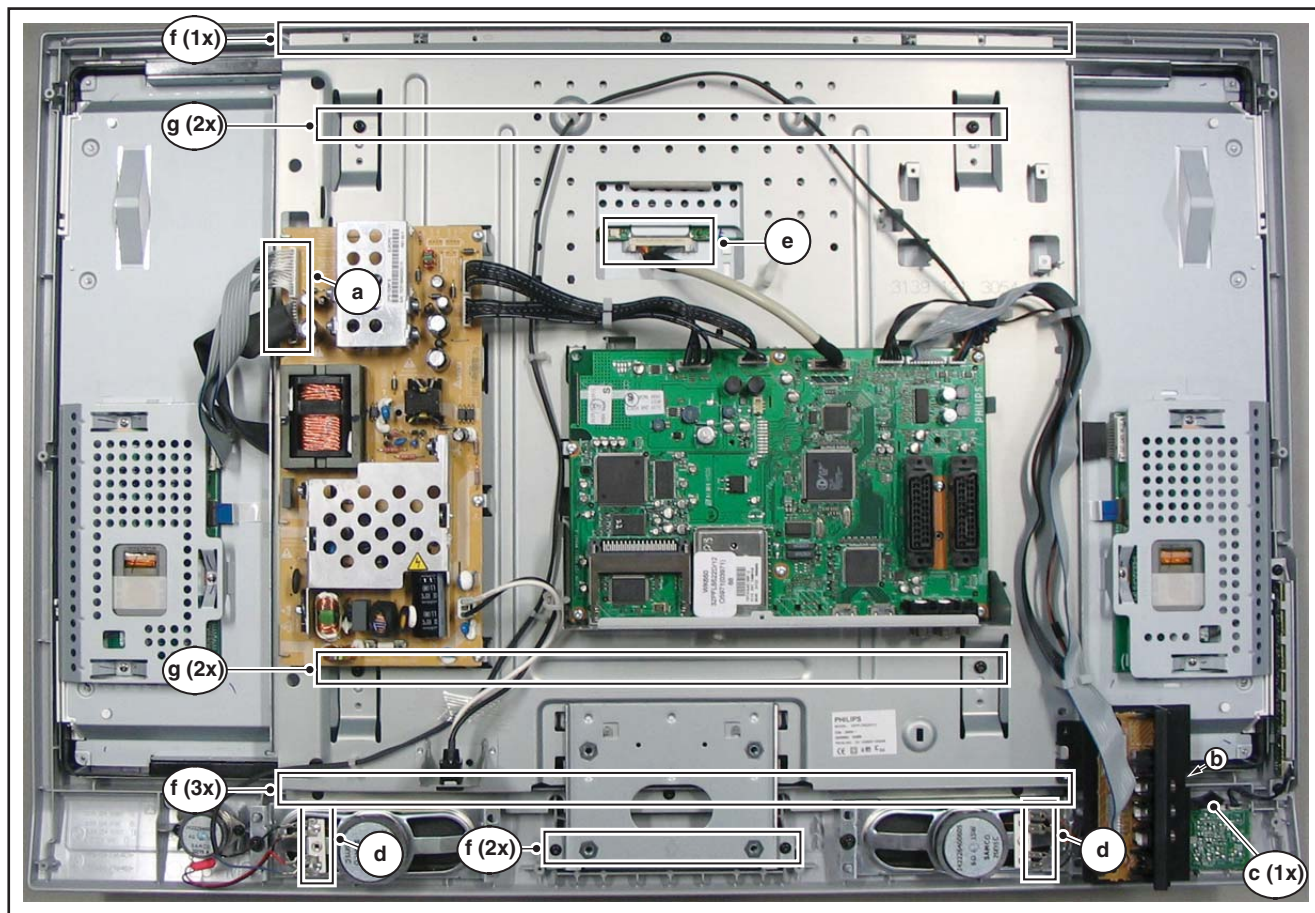


G\_16860\_065.eps  
010207

Figure 4-14 Main supply panel

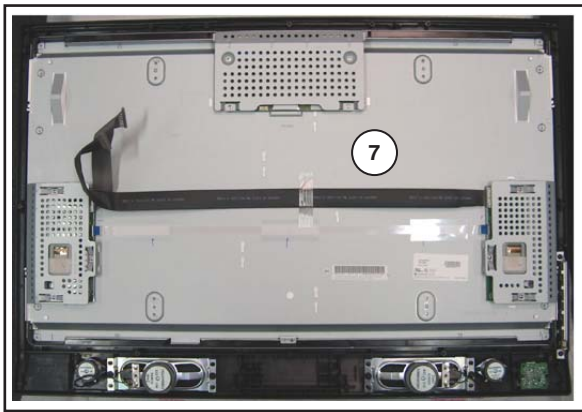
## 4.3.9 LCD Panel

1. Remove the rear cover, as described earlier.
2. Refer to fig. "LCD panel" below.
3. Unplug the connectors on the Main Supply Panel [a] and the LED & IR board [c].
4. Unplug the outer connectors [d] from the mid-range loudspeakers.
5. **Do NOT forget** to unplug the LVDS connector [e] from the SSB. **Important:** Be careful, as this is a very fragile connector!
6. Remove T10 parker screw [b] that holds the Side I/O module bracket.
7. Remove T10 parker screws [f] of the central sub-frame.
8. Remove LCD panel fixation screws [g] and lift the complete central sub-frame from the set (incl. the PSU, SSB, and Side I/O boards and wiring).
9. Lift the LCD panel [7] from the front cabinet.



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310107

Figure 4-15 LCD panel [1/2]



G\_16850\_015.eps  
110107

**Figure 4-16 LCD panel [2/2]**

#### **4.4 Set Re-assembly**

To re-assemble the whole set, execute all processes in reverse order.

**Notes:**

- While re-assembling, make sure that all cables are placed and connected in their original position. See figure "Cable dressing".
- Pay special attention not to damage the EMC foams. Ensure that EMC foams are mounted correctly (one is located above the LVDS connector on the display, between the LCD display and the metal sub-frame).

## 5. Service Modes, Error Codes, and Fault Finding

### Index of this chapter:

- 5.1 Test Points
- 5.2 Service Modes
- 5.3 Service Tools
- 5.4 Error Codes
- 5.5 The Blinking LED Procedure
- 5.7 Fault Finding and Repair Tips

### 5.1 Test Points

In the chassis schematics and layout overviews, the test points (Fxxx) are mentioned. In the schematics, test points are indicated with a rectangular box around "Fxxx" or "lxxx", in the layout overviews with a "half-moon" sign.

As most signals are digital, it will be difficult to measure waveforms with a standard oscilloscope. Several key ICs are capable of generating test patterns, which can be controlled via ComPair. In this way it is possible to determine which part is defective.

Perform measurements under the following conditions:

- Service Default Mode.
- Video: Colour bar signal.
- Audio: 3 kHz left, 1 kHz right.

### 5.2 Service Modes

The Service Mode feature is split into four parts:

- Service Default Mode (SDM).
- Service Alignment Mode (SAM).
- Customer Service Mode (CSM) and Digital Customer Service Mode (DCSM).
- Computer Aided Repair Mode (ComPair).

SDM and SAM offer features, which can be used by the Service engineer to repair/align a TV set. Some features are:

- A pre-defined situation to ensure measurements can be made under uniform conditions (SDM).
- Activates the blinking LED procedure for error identification when no picture is available (SDM).
- The possibility to overrule software protections when SDM was entered via the Service pins.
- Make alignments (e.g. white tone), (de)select options, enter options codes, reset the error buffer (SAM).
- Display information ("SDM" or "SAM" indication in upper right corner of screen, error buffer, software version, operating hours, options and option codes, submenus).

The (D)CSM is a Service Mode that can be enabled by the consumer. Instructions on how to enable the CSM can be given by telephone by either the dealer or the P3C (Philips Customer Care Center). The CSM displays diagnosis information, which the customer can forward to the dealer/P3C. In CSM mode, "CSM", is displayed in the top right corner of the screen.

The information provided in CSM and the purpose of CSM is to:

- Increase the home repair hit rate
- Decrease the number of nuisance calls
- Solved customers' problem without home visit

ComPair Mode is used for communication between a computer and a TV on I2C /UART level and can be used by a Service engineer to quickly diagnose the TV set by reading out error codes, read and write in NVMs, communicate with ICs and the uP (PWM, registers, etc.), and by making use of a faultfinding database. It will also be possible to up and download the software of the TV set via I2C with help of ComPair. To do this, ComPair has to be connected to the TV set via the ComPair connector, which will be accessible through the rear of the set (without removing the rear cover).

### 5.2.1 General

Some items are applicable to all Service Modes or are general. These are listed below.

#### **Life Timer**

During the life time cycle of the TV set, a life timer is kept. This life timer counts the normal operation hours, but not the Stand-by hours. The actual value of the life timer is displayed in SDM and CSM in a decimal value. Every two soft-resets should increase the hour by +1. Minimal five digits are displayed.

#### **Software Identification, Version, and Cluster**

The software identification, version, and cluster will be shown in the main menu display of SDM, SAM, and CSM.

The screen will show: "AAAABCD X.YY", where:

- **AAAA** is the chassis name: LC71 for analogue range (non-DVB), LC72 for digital range (DVB).
- **B** is the region indication: E= Europe, A= AP/China, U= NAFTA, L= LATAM.
- **C** is the display indication: L= LCD, P= Plasma.
- **D** is the language/features indication: 1= standard, H= 1080p full HD.
- **X** is the main version number: The main version number is updated with a major change of specification (incompatible with the previous software version). Numbering will go from 1 - 9 then from A - Z.
  - If the main version number changes, the new version number is written in the NVM
  - If the main version number changes, the default settings are loaded
- **YY** is the sub version number: The sub version number is updated with a minor change (backwards compatible with the previous versions) Numbering will go from 00 - 99.
  - If the sub version number changes, the new version number is written in the NVM
  - If the NVM is fresh, the software identification, version, and cluster will be written to NVM

**Display Option Code Selection**

When after a display exchange, the display option code is not properly set, it will result in a TV with “no display”. Therefore, **it is required** to set this display option code after such a repair.

To do so, press the following key sequence on a standard RC transmitter: “**062598**” directly followed by **MENU** and “**xxx**”, where “xxx” is a 3 digit decimal value of the panel type (see first column in table “Display Code Overview” or sticker on the side/bottom of the cabinet). When the value is properly accepted and stored in NVM, the set will switch to Stand-by, to indicate that the process has been completed successfully.

During this algorithm, the NVM-content must be filtered, because several items in the NVM are TV-related and not SSB-related (e.g. Model and Prod. S/N). Therefore, “Model” and “Prod. S/N” data is changed into “See Type Plate”. In case a call centre or consumer reads “See Type Plate” in CSM mode, he needs to look to the side/bottom sticker to identify the set, for further actions.

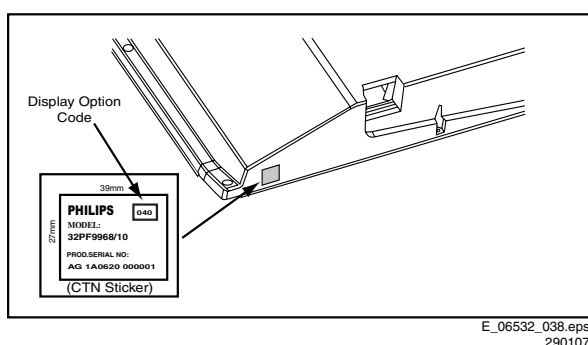


**Figure 5-1 Location of Display Option Code sticker**

**Table 5-1 Display option code overview**

| Display option | HEX | Display type | Brand | Size | Vert. resolution | Hor. resolution | Type number           | 12 NC          |
|----------------|-----|--------------|-------|------|------------------|-----------------|-----------------------|----------------|
| 045            | 2D  | LCD          | LPL   | 26   | 768p             | 1366            | LC260WX2-SLB2         | 9322 234 13682 |
| 046            | 2E  | LCD          | LPL   | 32   | 768p             | 1366            | LC320W01-SL06         | 9322 230 03682 |
| 068            | 44  | LCD          | CMO   | 26   | 768p             | 1366            | V260B1-L03            | 9322 249 37682 |
| 069            | 45  | LCD          | CMO   | 32   | 768p             | 1366            | V315B1 L05            | 9322 248 65682 |
| 070            | 46  | LCD          | CPT   | 32   | 768p             | 1366            | CLLAA320WB02P         | 9322 245 31682 |
| 071            | 47  | LCD          | LPL   | 37   | 768p             | 1366            | LC370WX1-SLB1         | 9322 246 96682 |
| 072            | 48  | LCD          | AUO   | 37   | 768p             | 1366            | T370XW02V5            | 9322 249 77682 |
| 073            | 49  | LCD          | LPL   | 42   | 768p             | 1366            | LC420WX3-SLA1         | 9322 246 97682 |
| 076            | 4B  | LCD          | AUO   | 42   | 768p             | 1366            | T420XW01V8            | 9322 249 10682 |
| 083            | 53  | PDP          | SDI   | 42   | 768p             | 1024            | S42AX-YD04(PS-426-PH) | 9322 246 76682 |
| 085            | 55  | PDP          | SDI   | 50   | 768p             | 1366            | S50HW-YD05(PS-506-PH) | 9322 246 81682 |
| 091            | 5B  | LCD          | AUO   | 32   | 768p             | 1366            | T315XW02VD            | 9322 249 06682 |
| 093            | 5D  | LCD          | LPL   | 42   | 1080p            | 1920            | LC420WU2-SLA1         | 9322 246 84682 |
| 103            | 67  | LCD          | LPL   | 20   | 480p             | 640             | LC201V02-SDB1         | 9322 242 65682 |
| 105            | 69  | LCD          | CMO   | 19   | 900p             | 1440            | TPM190A1-L02          | 9965 000 43654 |
| 106            | 6A  | LCD          | AUO   | 23   | 768p             | 1366            | T230XW01V3            | 9322 249 79682 |
| 107            | 6B  | LCD          | LPL   | 42   | 768p             | 1366            | LC420WX5-SLD1         | 9322 249 09682 |

5.2.2 Service Default Mode (SDM)

Purpose

- Set the TV in SDM mode in order to be able to:
- Create a predefined setting for measurements to be made.
  - Override software protections.
  - Start the blinking LED procedure.
  - Read the error buffer.
  - Check the life timer.

Specifications

Table 5-2 SDM default settings

| Region                                | Freq. (MHz)       | Default syst. |
|---------------------------------------|-------------------|---------------|
| Europe (except France), AP-PAL/-Multi | 475.25            | PAL B/G       |
| France                                |                   | SECAM L       |
| NAFTA, AP-NTSC                        | 61.25 (channel 3) | NTSC M        |
| LATAM                                 |                   | PAL M         |

- Set linear video and audio settings to 50 %, but volume to 25 %. Stored user settings are not affected.
- All service-unfriendly modes (if present) are disabled, since they interfere with diagnosing/repairing a set.. These service unfriendly modes are:
  - (Sleep) timer.
  - Blue mute/Wall paper.
  - Auto switch “off” (when there is no “ident” signal).
  - Hotel or hospital mode.
  - Child lock or parental lock (manual or via V-chip).
  - Skipping, blanking of “Not favourite”, “Skipped” or “Locked” presets/channels.
  - Automatic storing of Personal Preset or Last Status settings.
  - Automatic user menu time-out (menu switches back/ OFF automatically.
  - Auto Volume levelling (AVL).

How to Activate

- To activate SDM, use **one** of the following methods:
- Press the following key sequence on the remote control transmitter: **“062596”** directly followed by the **MENU** button (do not allow the display to time out between entries while keying the sequence).
  - Short one of the “Service” jumpers on the TV board during cold start (see Figures “Service jumper”). Then press the mains button (remove the short after start-up). **Caution:** Activating SDM by shorting “Service” jumpers will override the DC speaker protection (error 1), the General I2C error (error 4), and the Trident video processor error (error 5). When doing this, the service-technician must know exactly what he is doing, as it could damage the television set.

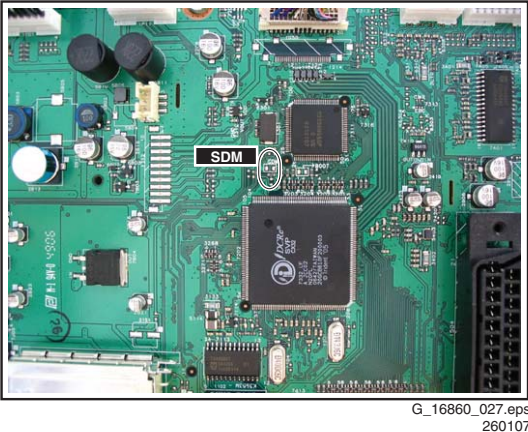


Figure 5-2 Service jumper (SSB component side)

On Screen Menu

After activating SDM, the following screen is visible, with SDM in the upper right corner of the screen to indicate that the television is in Service Default Mode.

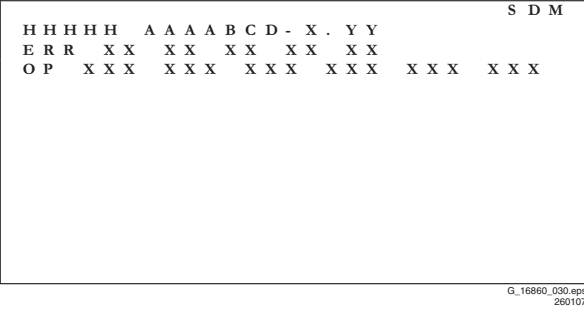


Figure 5-3 SDM menu

- Menu explanation:
- **HHHHH:** Are the operating hours (in decimal).
  - **AAAABCD-X.YY:** See paragraph “Service Modes” -> “General” -> “Software Identification, Version, and Cluster” for the SW name definition.
  - **SDM:** The character “SDM” to indicate that the TV set is in Service mode.
  - **ERR:** Shows all errors detected since the last time the buffer was erased. Five errors possible.
  - **OP:** Used to read-out the option bytes. See “Options” in the Alignments section for a detailed description. Seven codes are possible.

How to Navigate

- As this mode is read only, there is not much to navigate. To switch to other modes, use one of the following methods:
- Command MENU from the user remote will enter the normal user menu (brightness, contrast, colour, etc...) with “SDM” OSD remaining, and pressing MENU key again will return to the last status of SDM again.
  - To prevent the OSD from interfering with measurements in SDM, command “OSD” (“STATUS” for NAFTA and LATAM) from the user remote will toggle the OSD “on/off” with “SDM” OSD remaining always “on”.
  - Press the following key sequence on the remote control transmitter: **“062596”** directly followed by the **OSD/i+** button to switch to SAM (do not allow the display to time out between entries while keying the sequence).

How to Exit

Switch the set to STANDBY by pressing the mains button on the remote control transmitter or on the television set. If you switch the television set “off” by removing the mains (i.e., unplugging the television), the television set will remain in SDM when mains is re-applied, and the error buffer is not cleared. The error buffer will only be cleared when the “clear” command is used in the SAM menu.

Note:

- If the TV is switched “off” by a power interrupt while in SDM, the TV will show up in the last status of SDM menu as soon as the power is supplied again. The error buffer will not be cleared.
- In case the set is in Factory mode by accident (with “F” displayed on screen), by pressing and hold “VOL-“ and “CH-“ together should leave Factory mode.

### 5.2.3 Service Alignment Mode (SAM)

#### Purpose

- To change option settings.
- To display / clear the error code buffer.
- To perform alignments.

#### Specifications

- Operation hours counter (maximum five digits displayed).
- Software version, error codes, and option settings display.
- Error buffer clearing.
- Option settings.
- Software alignments (Tuner, White Tone, and Audio).
- NVM Editor.
- ComPair Mode switching.
- Set the screen mode to full screen (all contents on screen are viewable).

#### How to Activate

To activate SAM, use one of the following methods:

- Press the following key sequence on the remote control transmitter: "062596" directly followed by the **OSD/STATUS/INFO/i+** button (it depends on region which button is present on the RC). Do not allow the display to time out between entries while keying the sequence.
- Or via ComPair.

After entering SAM, the following screen is visible, with SAM in the upper right corner of the screen to indicate that the television is in Service Alignment Mode.

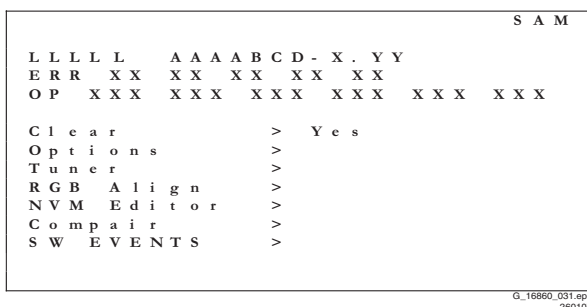


Figure 5-4 SAM menu

Menu explanation:

1. **LLLLL**. This represents the run timer. The run timer counts normal operation hours, but does not count Stand-by hours.
2. **AAAABCD-X.YY**. See paragraph "Service Modes" -> "General" -> "Software Identification, Version, and Cluster" for the SW name definition.
3. **SAM**. Indication of the Service Alignment Mode.
4. **ERR (ERRor buffer)**. Shows all errors detected since the last time the buffer was erased. Five errors possible.
5. **OP (Option Bytes)**. Used to read-out the option bytes. See "Options" in the Alignments section for a detailed description. Seven codes are possible.
6. **Clear**. Erases the contents of the error buffer. Select the CLEAR menu item and press the MENU RIGHT key. The content of the error buffer is cleared.
7. **Options**. Used to set the option bits. See "Options" in the "Alignments" chapter for a detailed description.
8. **Tuner**. Used to align the tuner. See "Tuner" in the "Alignments" chapter for a detailed description.
9. **RGB Align**. Used to align the White Tone. See "White Tone" in the "Alignments" chapter for a detailed description.
10. **NVM Editor**. Can be used to change the NVM data in the television set. See also paragraph "Fault Finding and Repair Tips" further on.
11. **ComPair**. Can be used to switch the television to "In Application Programming" mode (IAP), for software

uploading via ComPair. Read paragraph "Service Tools" -> "ComPair". **Caution:** When this mode is selected without ComPair connected, the TV will be blocked. Remove the AC power to reset the TV.

12. **SW Events**. Only to be used by development to monitor SW behaviour during stress test.

#### How to Navigate

- In the SAM menu, select menu items with the MENU UP/DOWN keys on the remote control transmitter. The selected item will be indicated. When not all menu items fit on the screen, use the MENU UP/DOWN keys to display the next / previous menu items.
- With the MENU LEFT/RIGHT keys, it is possible to:
  - Activate the selected menu item.
  - Change the value of the selected menu item.
  - Activate the selected submenu.
- When you press the MENU button twice while in top level SAM, the set will switch to the normal user menu (with the SAM mode still active in the background). To return to the SAM menu press the MENU button.
- Command "OSD/i+" key from the user remote will toggle the OSD "on/off" with "SAM" OSD remaining always "on".
- Press the following key sequence on the remote control transmitter: "062596" directly followed by the **MENU** button to switch to SDM (do not allow the display to time out between entries while keying the sequence).

#### How to Store SAM Settings

To store the settings changed in SAM mode (except the OPTIONS settings), leave the top level SAM menu by using the POWER button on the remote control transmitter or the television set.

#### How to Exit

Switch the set to STANDBY by pressing the mains button on the remote control transmitter or the television set.

#### Note:

- When the TV is switched "off" by a power interrupt while in SAM, the TV will show up in "normal operation mode" as soon as the power is supplied again. The error buffer will not be cleared.
- In case the set is in Factory mode by accident (with "F" displayed on screen), by pressing and hold "VOL-" and "CH-" together should leave Factory mode.

### 5.2.4 Customer Service Mode (CSM)

#### Purpose

The Customer Service Mode shows error codes and information on the TV's operation settings. A call centre can instruct the customer (by telephone) to enter CSM in order to identify the status of the set. This helps them to diagnose problems and failures in the TV before making a service call. The CSM is a read-only mode; therefore, modifications are not possible in this mode.

#### Specifications

- Ignore "Service unfriendly modes".
- Line number for every line (to make CSM language independent).
- Set the screen mode to full screen (all contents on screen are viewable).
- After leaving the Customer Service Mode, the original settings are restored.
- Possibility to use "CH+" or "CH-" for channel surfing, or enter the specific channel number on the RC.

#### How to Activate

To activate CSM, press the following key sequence on the remote control transmitter: "123654" (do not allow the display to time out between entries while keying the sequence).

Upon entering the Customer Service Mode, the following screen will appear:

```

1  M O D E L : 3 2 P F L 5 5 2 2 D / 1 0
2  P R O D S / N : A G 1 A 0 7 1 2 1 2 3 4 5 6
3  S W I D : L C 7 1 E L 1 - 1 . x x
4  O P : X X X X X X X X X X X X X X X X X X
5  C O D E S : X X X X X X X X
6  S S B : 3 1 3 9 1 2 7 1 2 3 4 1
7  N V M : X X X X X X X X
8  F l a s h D a t a : X X . X X . X X . X X
9  L I F E T I M E R : L L L L L
10 T U N E R : W E A K / G O O D / S T R O N G
11 S Y S T E M : P A L / N T S C / S E C A M
12 S O U N D : M O N O / S T E R E O / N I C A M
13 H D A U : Y E S / N O
14 F O R M A T : X X X X X X X X

```

C S M

G\_18860\_032.eps  
210207

Figure 5-5 CSM menu

#### Menu Explanation

1. **MODEL.** Type number, e.g. 32PFL5522D/10. (\*)
2. **PROD S/N.** Product serial no., e.g. AG1A0712123456. (\*)
3. **SW ID.** Software cluster and version is displayed.
4. **OP.** Option code information.
5. **CODES.** Error buffer contents.
6. **SSB.** Indication of the SSB factory identification code (12nc). (\*)
7. **NVM.** The NVM software version no.
8. **Flash Data.** PQ (picture quality) and AQ (audio quality) data version. This is a sub set of the main SW.
9. **LIFE TIMER.** Operating hours indication.
10. **TUNER.** Indicates the tuner signal condition: "Weak" when signal falls below threshold value, "Medium" when signal is at mid-range, and "Strong" when signal falls above threshold value.
11. **SYSTEM.** Gives information about the video system of the selected transmitter (PAL/SECAM/NTSC).
12. **SOUND.** Gives information about the audio system of the selected transmitter (MONO/STEREO/NICAM).
13. **HDAU.** HDMI audio stream detection. "YES" means audio stream detected. "NO" means no audio stream present. Only displayed when HDMI source is selected.
14. **FORMAT.** Gives information about the video format of the selected transmitter (480i/480p/720p/1080i).
15. **HD SW ID.** Software version of the 1080p full HD module (when present).
16. **Reserved.**
17. **Reserved.**
18. **Reserved.**

(\*) If an NVM IC is replaced or initialised, this data must be re-written to the NVM. ComPair will foresee in a possibility to do this.

#### How to Exit

To exit CSM, use one of the following methods:

- Press the MENU button twice, or POWER button on the remote control transmitter.
- Press the POWER button on the television set.

## 5.3 Service Tools

### 5.3.1 ComPair

#### Introduction

ComPair (Computer Aided Repair) is a Service tool for Philips Consumer Electronics products. and offers the following:

1. ComPair helps you to quickly get an understanding on how to repair the chassis in a short and effective way.
2. ComPair allows very detailed diagnostics and is therefore capable of accurately indicating problem areas. You do not have to know anything about I2C or UART commands yourself, because ComPair takes care of this.

3. ComPair speeds up the repair time since it can automatically communicate with the chassis (when the uP is working) and all repair information is directly available.
4. ComPair features TV software up possibilities.

#### Specifications

ComPair consists of a Windows based fault finding program and an interface box between PC and the (defective) product. The (new) ComPair II interface box is connected to the PC via an USB cable. For the TV chassis, the ComPair interface box and the TV communicate via a bi-directional cable via the service connector(s).

The ComPair fault finding program is able to determine the problem of the defective television, by a combination of automatic diagnostics and an interactive question/answer procedure.

#### How to Connect

This is described in the chassis fault finding database in ComPair.

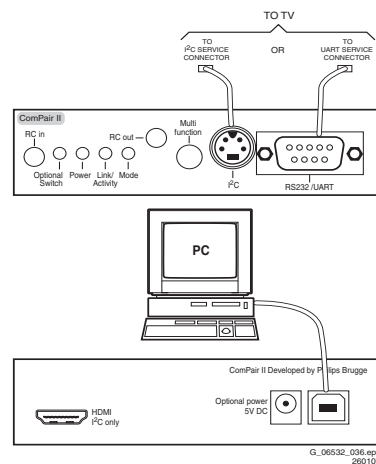


Figure 5-6 ComPair II interface connection

**Caution:** It is compulsory to connect the TV to the PC as shown in the picture above (with the ComPair interface in between), as the ComPair interface acts as a level shifter. If one connects the TV directly to the PC (via UART), ICs will be blown!

#### How to Order

ComPair II order codes:

- ComPair II interface: 3122 785 91020.
- ComPair32 CD (update): 3122 785 60160.
- ComPair interface cable: 3122 785 90004.
- ComPair interface extension cable: 3139 131 03791.
- ComPair UART interface cable: 3122 785 90630.

**Note:** If you encounter any problems, contact your local support desk

### 5.3.2 LVDS Tool

#### Introduction

This Service tool (also called "ComPair Assistant 1") may help you to identify, in case the TV does not show any picture, whether the Small Signal Board (SSB) or the display of a Flat TV is defective. Thus to determine if LVDS, RGB, and sync signals are okay.

Furthermore it is possible to program EPLDs with this tool (Byte blaster). Read the user manual for an explanation of this feature.

When operating, the tool will show a small (scaled) picture on a VGA monitor. Due to a limited memory capacity, it is not possible to increase the size when processing high-resolution

LVDS signals (> 1280x960). Below this resolution, or when a DVI monitor is used, the displayed picture will be full size.

### How to Connect

Connections are explained in the user manual, which is packed with the tool. The LVDS cables included in the package cover most chassis. For some chassis, a separate cable must be ordered.

**Note:** To use the LVDS tool, you must have ComPair release 2004-1 (or later) on your PC (engine version >= 2.2.05). For every TV type number and screen size, one must choose the proper settings via ComPair. The ComPair file will be updated regularly with new introduced chassis information.

### How to Order

- LVDS tool (incl. two LVDS cables: 31p and 20p, covering chassis BJx.x, EJx.x, FJx.x and LC4.1):  
3122 785 90671.
- LVDS tool Service Manual:  
3122 785 00810.
- LVDS cable 20p/DF -> 20p/DF (standard with tool):  
3122 785 90731.
- LVDS cable 31p/FI -> 31p/FI (standard with tool):  
3122 785 90662.

For other chassis, a separate LVDS cable must be ordered. Refer to table "LVDS cable order number" for an overview of all deliverable cables.

**Table 5-3 LVDS cable order number**

| Chassis | LVDS cable order number                        | Remarks                |
|---------|------------------------------------------------|------------------------|
| BJ2.4   | 3122 785 90662 <sup>1</sup>                    |                        |
| BJ2.5   | 3122 785 90662 <sup>1</sup>                    |                        |
| BJ3.0   | 3122 785 90662 <sup>1</sup>                    |                        |
| BJ3.1   | 3122 785 90662 <sup>1</sup>                    |                        |
| EJ2.0   | 3122 785 90662 <sup>1</sup>                    |                        |
| EJ3.0   | 3122 785 90662 <sup>1</sup>                    |                        |
| EL1.1   | 3122 785 90662 <sup>1</sup> / 3122 785 90821   |                        |
| FJ3.0   | 3122 785 90662 <sup>1</sup>                    |                        |
| FTL2.4  | 3122 785 90662 <sup>1,2</sup>                  |                        |
| LC4.1   | 3122 785 90731 <sup>1</sup> / 3122 785 90851   |                        |
| LC4.3   | 3122 785 90821                                 |                        |
| LC4.31  | 3122 785 90821                                 |                        |
| LC4.41  | 3122 785 90662 <sup>1,2</sup> / 3122 785 90851 | only for 26 & 32" sets |
| LC4.8   | 3122 785 90662 <sup>1,2</sup> / 3122 785 90851 |                        |
| LC4.9   | 3122 785 90662 <sup>1,2</sup> / 3122 785 90851 | MFD variant only       |
| LC7.2   | tbd                                            |                        |
| JL2.1   | 3122 785 90861                                 |                        |

### Notes

1. Included in LVDS tool package (order code 3122 785 90671)
2. Pins 27 and 28 should be grounded or not connected.

## 5.4 Error Codes

### 5.4.1 Introduction

Error codes are required to indicate failures in the TV set. In principle a unique error code is available for every:

- Activated protection.
- Failing I2C device.
- General I2C error.
- SDRAM failure.

The last five errors, stored in the NVM, are shown in the Service menu's. This is called the error buffer. The error code buffer contains all errors detected since the last time the buffer was erased. The buffer is written from left to right. When an error occurs that is not yet in the error code buffer, it is displayed at the left side and all other errors shift one position to the right.

An error will be added to the buffer if this error differs from any error in the buffer. The last found error is displayed on the left. An error with a designated error code may **never** lead to a deadlock situation. This means that it must always be diagnosable (e.g. error buffer via OSD or blinking LED procedure, ComPair to read from the NVM).

In case a failure identified by an error code automatically results in other error codes (cause and effect), only the error code of the MAIN failure is displayed.

**Example:** In case of a failure of the I2C bus (CAUSE), the error code for a "General I2C failure" and "Protection errors" is displayed. The error codes for the single devices (EFFECT) is not displayed. All error codes are stored in the same error buffer (TV's NVM) except when the NVM itself is defective.

### 5.4.2 How to Read the Error Buffer

You can read the error buffer in 3 ways:

- On screen via the SAM/SDM/CSM (if you have a picture).  
Example:
  - ERROR: 0 0 0 0 0 : No errors detected
  - ERROR: 6 0 0 0 0 : Error code 6 is the last and only detected error
  - ERROR: 9 6 0 0 0 : Error code 6 was detected first and error code 9 is the last detected (newest) error
- Via the blinking LED procedure (when you have no picture). See "The Blinking LED Procedure".
- Via ComPair.

### 5.4.3 Error Codes

In case of non-intermittent faults, write down the errors present in the error buffer and clear the error buffer before you begin the repair. This ensures that old error codes are no longer present.

If possible, check the entire contents of the error buffer. In some situations, an error code is only the result of another error and not the actual cause of the problem (for example, a fault in the protection detection circuitry can also lead to a protection).

Table 5-4 Error code overview

| Error code <sup>1)</sup> | Description                                              | Item nr.         | Remarks                                                                                                                                                                                |
|--------------------------|----------------------------------------------------------|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0                        | No error.                                                |                  |                                                                                                                                                                                        |
| 1                        | DC Protection of speakers.                               |                  |                                                                                                                                                                                        |
| 2                        | +12V protection error.                                   |                  | 12V missing or "low".                                                                                                                                                                  |
| 3                        | Reserved.                                                |                  |                                                                                                                                                                                        |
| 4                        | General I2C error.                                       |                  | note 2                                                                                                                                                                                 |
| 5                        | Trident Video Processor communication error.             | 7202             | When Trident IC is defective, error 10 and 14 might also be reported. Trident communicates via parallel bus, not via the I2C bus. The I2C bus of Trident is only used in ComPair mode. |
| 6                        | I2C error while communicating with the NVM.              | 7315             | The TV will not start-up due to critical data not available from the NVM, but the LED will blink the error code.                                                                       |
| 7                        | I2C error while communicating with the Tuner.            | 1101             |                                                                                                                                                                                        |
| 8                        | I2C error while communicating with the IF Demodulator.   | 7113             |                                                                                                                                                                                        |
| 9                        | I2C error communicating with the Sound Processor.        | 7411             |                                                                                                                                                                                        |
| 10                       | SDRAM defective.                                         | 7204             |                                                                                                                                                                                        |
| 11                       | I2C error while communicating with the HDMI IC.          | 7817             |                                                                                                                                                                                        |
| 12                       | I2C error while communicating with the MOJO PN8314.      | 7G00             | if applicable                                                                                                                                                                          |
| 13                       | DVB HW communication error.                              | 7F01, 7K00, 7G00 | if applicable                                                                                                                                                                          |
| 14                       | SDRAM defective.                                         | 7205             |                                                                                                                                                                                        |
| 15                       | Reserved.                                                |                  |                                                                                                                                                                                        |
| 16                       | Reserved.                                                |                  |                                                                                                                                                                                        |
| 17                       | Reserved.                                                |                  |                                                                                                                                                                                        |
| 18                       | I2C error while communicating with the iBoard processor. |                  | if applicable                                                                                                                                                                          |
| 19                       | I2C error while communication with 1080p bolt-on module. |                  | if applicable                                                                                                                                                                          |

**Notes**

1. Some of the error codes reported are depending on the option code configurations.
2. This error means: no I2C device is responding to the particular I2C bus. Possible causes: SCL/SDA shorted to GND, SCL shorted to SDA, or SCL/SDA open (at uP pin). The internal bus of the Trident platform should not cause the entire system to halt as such an error can be reported.

- To enter SAM, press the following key sequence on the remote control transmitter: "062596" directly followed by the OSD/i+ button (do not allow the display to time out between entries while keying the sequence).
- Make sure the menu item CLEAR is selected. Use the MENU UP/DOWN buttons, if necessary.
- Press the MENU RIGHT button to clear the error buffer. The text on the right side of the "CLEAR" line will change from "CLEAR?" to "CLEARED"
- If the contents of the error buffer have not changed for 50 hours, the error buffer resets automatically.

**Note:** If you exit SAM by disconnecting the mains from the television set, the error buffer is not reset.

#### 5.4.4 How to Clear the Error Buffer

The error code buffer is cleared in the following cases:

- By using the CLEAR command in the SAM menu:

## 5.5 The Blinking LED Procedure

### 5.5.1 Introduction

The software is capable of identifying different kinds of errors. Because it is possible that more than one error can occur over time, an error buffer is available, which is capable of storing the last five errors that occurred. This is useful if the OSD is not working properly.

Errors can also be displayed by the blinking LED procedure. The method is to repeatedly let the front LED pulse with as many pulses as the error code number, followed by a period of 1.5 seconds in which the LED is "off". Then this sequence is repeated.

**Example (1):** error code 4 will result in four times the sequence LED "on" for 0.25 seconds / LED "off" for 0.25 seconds. After this sequence, the LED will be "off" for 1.5 seconds. Any RC5 command terminates the sequence. Error code LED blinking is in red colour.

**Example (2):** the content of the error buffer is "12 9 6 0 0". After entering SDM, the following occurs:

- 1 long blink of 5 seconds to start the sequence,
- 12 short blinks followed by a pause of 1.5 seconds,
- 9 short blinks followed by a pause of 1.5 seconds,
- 6 short blinks followed by a pause of 1.5 seconds,
- 1 long blink of 1.5 seconds to finish the sequence,
- The sequence starts again with 12 short blinks.

### 5.5.2 Displaying the Entire Error Buffer

Additionally, the entire error buffer is displayed when Service Mode "SDM" is entered. In case the TV set is in protection or Stand-by: The blinking LED procedure sequence (as in SDM-mode in normal operation) must be triggered by the following RC sequence: "MUTE" "062500" "OK".

In order to avoid confusion with RC5 signal reception blinking, this blinking procedure is terminated when a RC5 command is received.

To erase the error buffer, the RC command "MUTE" "062599" "OK" can be used.

## 5.6 TV Main Software Upgrade

For instructions on how to upgrade the TV Main software, refer to ComPair.

## 5.7 Fault Finding and Repair Tips

### Notes:

- It is assumed that the components are mounted correctly with correct values and no bad solder joints.
- Before any fault finding actions, check if the correct options are set.

### 5.7.1 NVM Editor

In some cases, it can be convenient if one directly can change the NVM contents. This can be done with the "NVM Editor" in SAM mode. With this option, single bytes can be changed.

### Caution:

- **Do not change the NVM settings without understanding the function of each setting, because incorrect NVM settings may seriously hamper the correct functioning of the TV set!**
- Always write down the existing NVM settings, before changing the settings. This will enable you to return to the original settings, if the new settings turn out to be incorrect.

Table 5-5 NVM editor overview

|        | Hex    | Dec | Description    |
|--------|--------|-----|----------------|
| .ADR   | 0x000A | 10  | Existing value |
| .VAL   | 0x0000 | 0   | New value      |
| .Store | Store? |     |                |

### 5.7.2 Load Default NVM Values

It is possible to download default values automatically into the NVM in case a blank NVM is placed or when the NVM first 20 address contents are "FF". After the default values are downloaded, it is possible to start-up and to start aligning the TV set. To initiate a forced default download the following action has to be performed:

1. Switch "off" the TV set with the mains cord disconnected from the wall outlet (it does not matter if this is from "Standby" or "Off" situation).
2. Short-circuit the SDM jumpers on the SSB (keep short circuited).
3. Press "P+" or "CH+" on the local keyboard (and keep it pressed).
4. Reconnect the mains supply to the wall outlet.
5. Release the "P+" or "CH+" when the set is "on" or blue LED is blinking.

When the downloading has completed successfully, the set should be into Standby, i.e. red LED on.

### Alternative method (1):

1. Go to SAM.
2. Select NVM Editor.
3. Select ADR (address) to 1 (dec).
4. Change the VAL (value) to 170 (dec).
5. Store the value.
6. Do a hard reset to make sure new default values took place.

### Alternative method (2):

It is also possible to upload the default values to the NVM with ComPair in case the SW is changed, the NVM is replaced with a new (empty) one, or when the NVM content is corrupted. After replacing an EEPROM (or with a defective/no EEPROM), default settings should be used to enable the set to start-up and allow the Service Default Mode and Service Alignment Mode to be accessed.

### 5.7.3 Start-up/Shut-down Flowcharts

Important note for DVB sets:

- When you put a DVB set into Stand-by mode **with an RC**, the set will go to "Semi Stand-by" mode for 5 minutes. This, to facilitate "Off the Air download" (OAD). If there is no activity within these 5 minutes, the set will switch to Stand-by mode. In "Semi Stand-by" mode, the LCD backlight and Audio Amplifier are turned "off" but other circuits still work as normal. The customer might think the set is in Stand-by. However, in real Stand-by mode, only the uP and the NVM are alive and all other circuits are switched "off".
- If you press **the mains switch** at the local key board in a DVB set, the set will switch to Stand-by mode.

On the next pages you will find start-up and shut-down flowcharts, which might be helpful during fault finding.

**It should be noted**, that some events are only related to PDP sets, and therefore not applicable to this LCD chassis.

Start Up

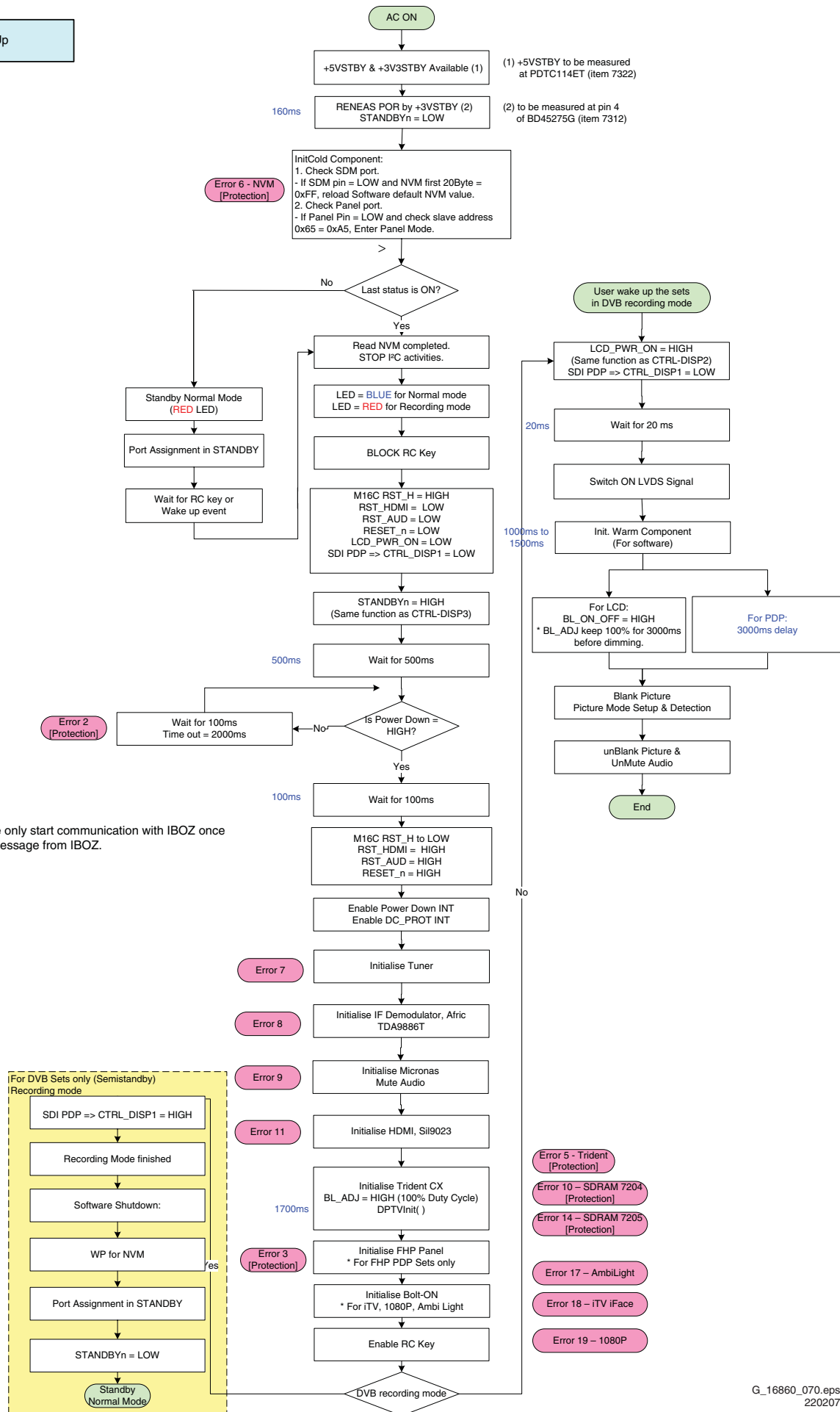


Figure 5-7 Start-up flowchart

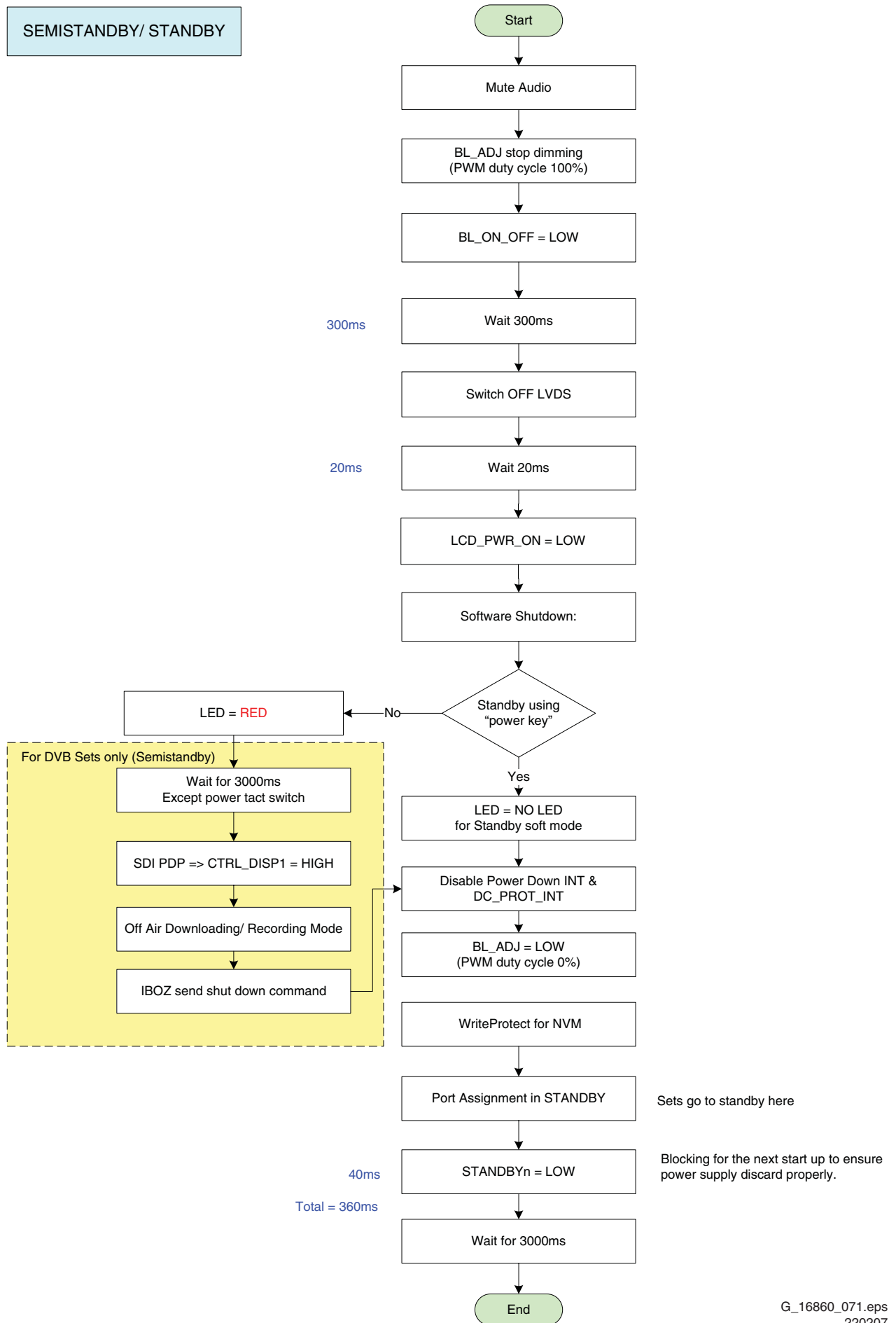
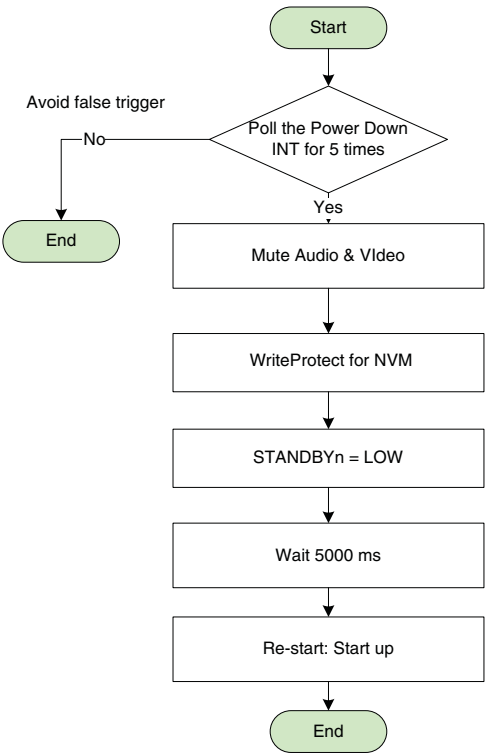


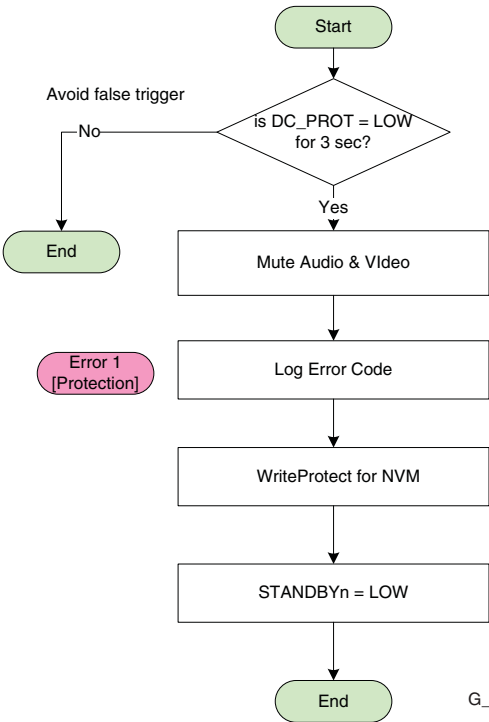
Figure 5-8 Semi Stand-by/Stand-by flowchart

Power Down INT:  
AC OFF or Transient INT

- Notes:
- 1. Power Down INT will be based on fall edge triggering
  - 2. +3V3STBY will stay for 15ms, software must perform WriteProtect for NVM within 15ms.



DC\_PROT INT



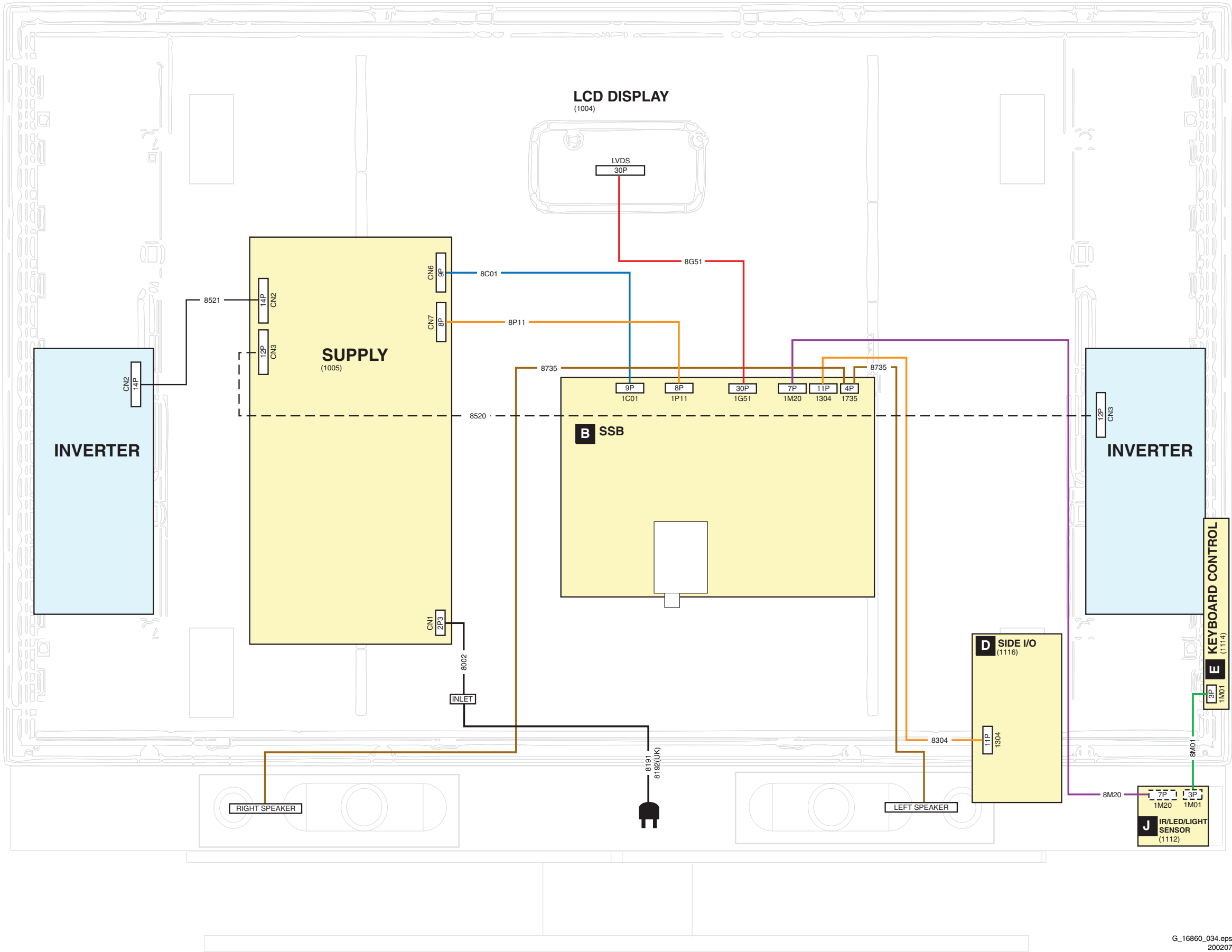
G\_16860\_072.eps  
220207

Figure 5-9 Power Down & DC\_PROT flowchart

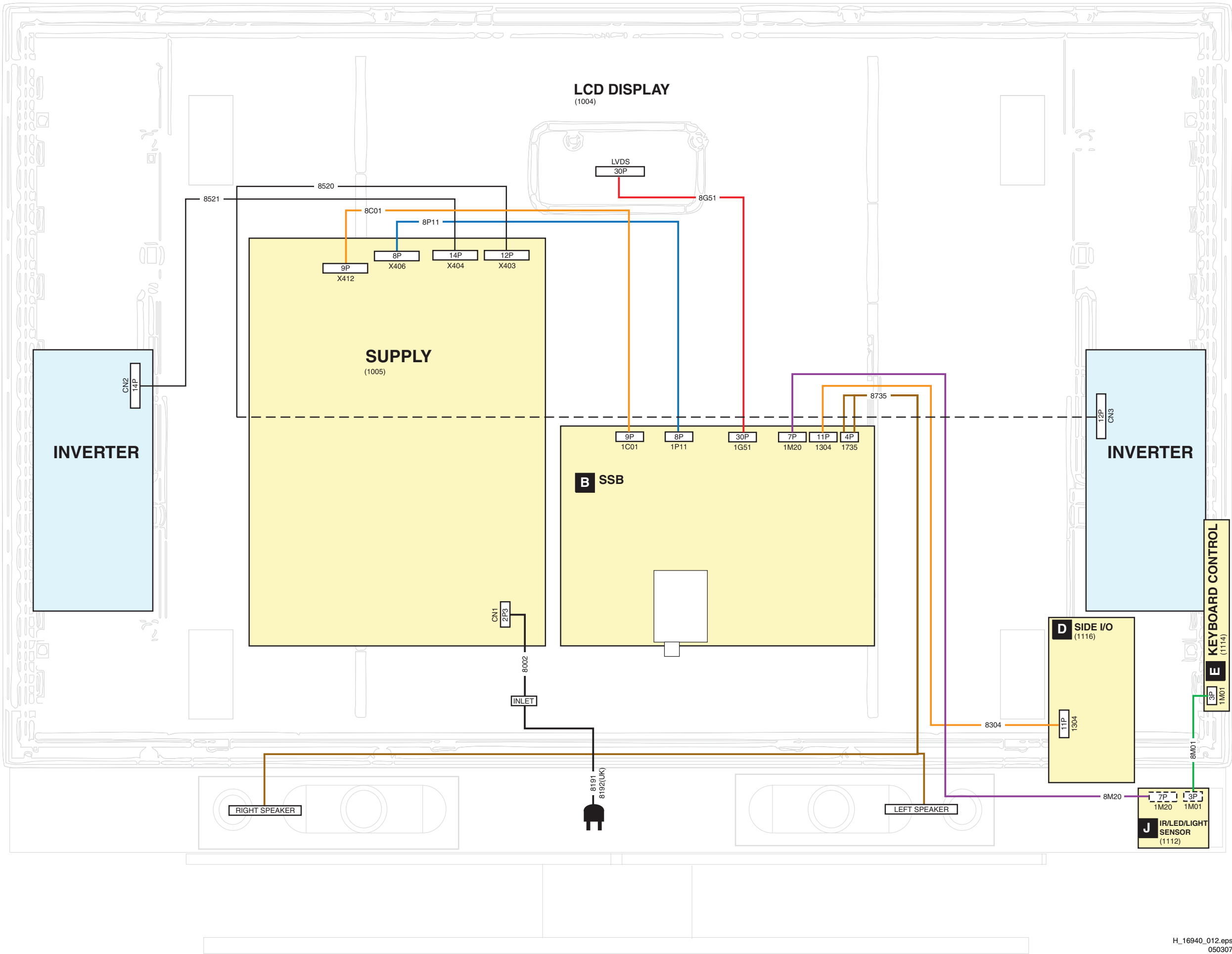
6. Block Diagrams, Test Point Overview, and Waveforms

Wiring Diagram 32”

WIRING 32” LCD (STYLING ME7)

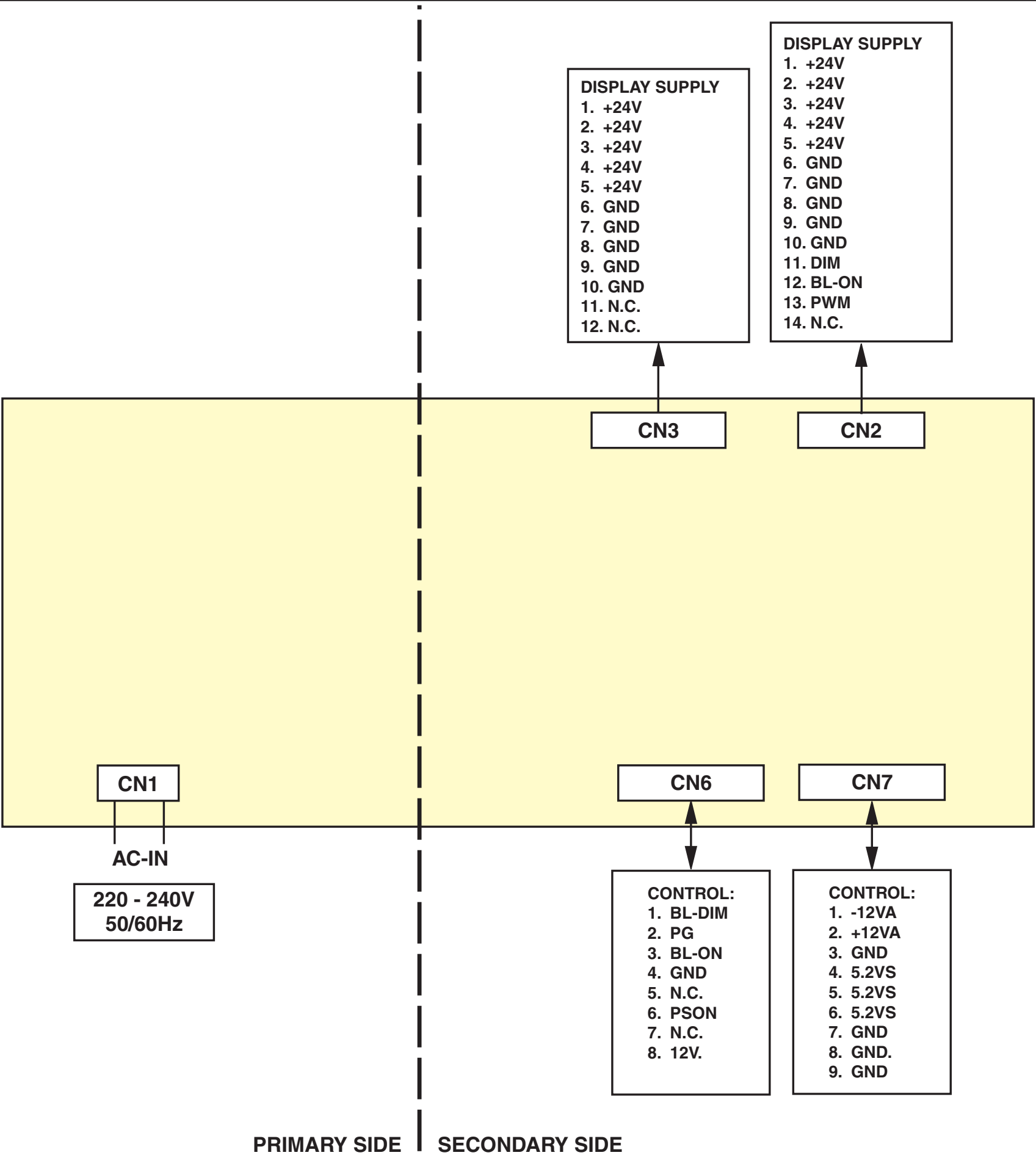


Wiring Diagram 37"-42"  
WIRING 37"- 42" LCD (STYLING ME7)

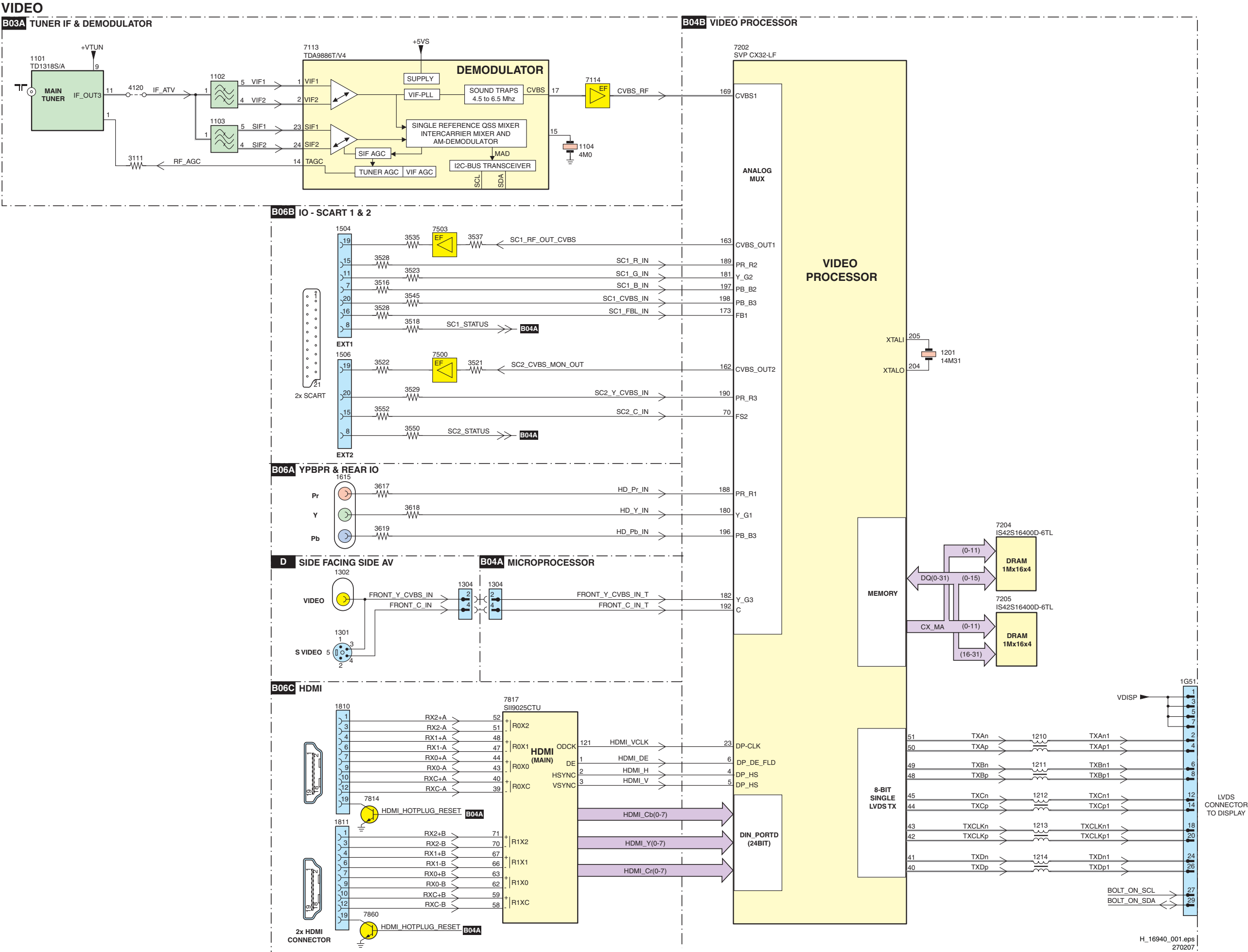


Block Diagram Supply

SUPPLY 32" LCD



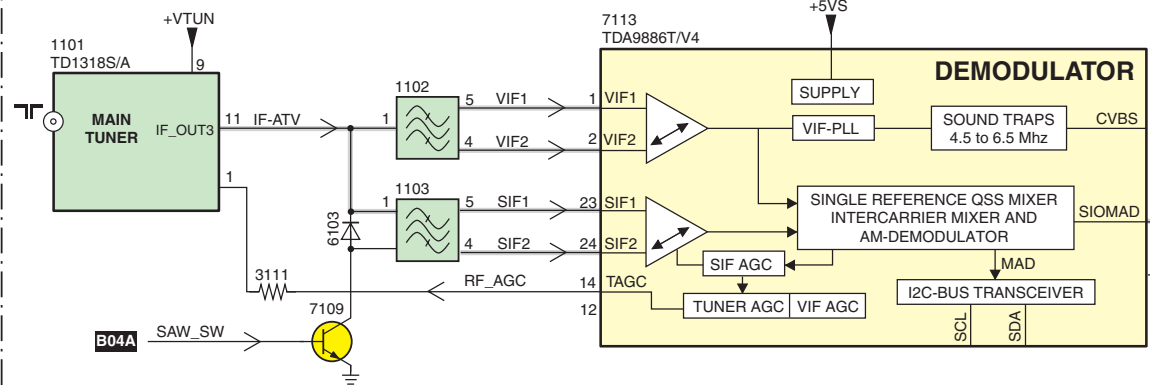
Block Diagram Video



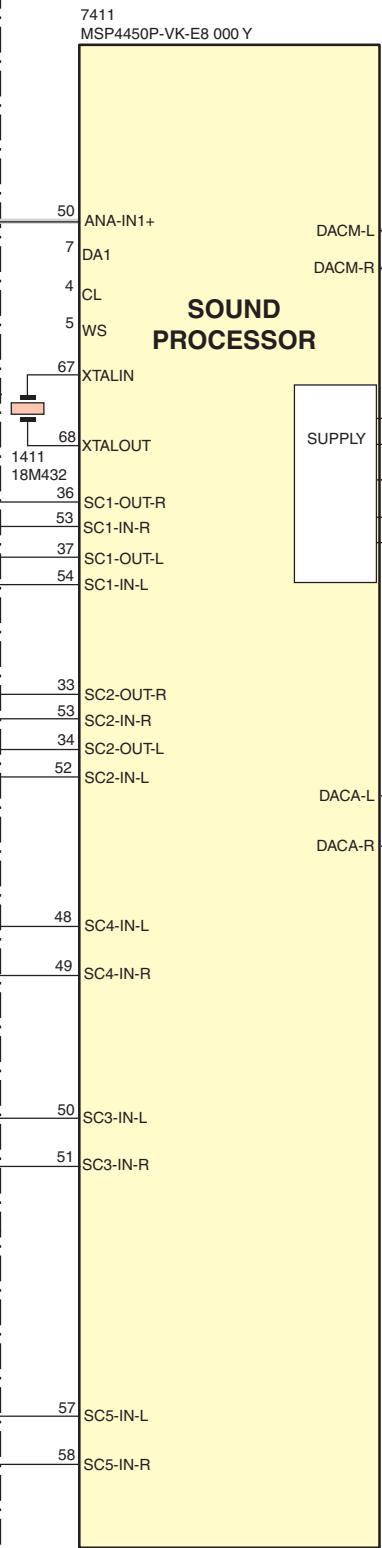
Block Diagram Audio

AUDIO

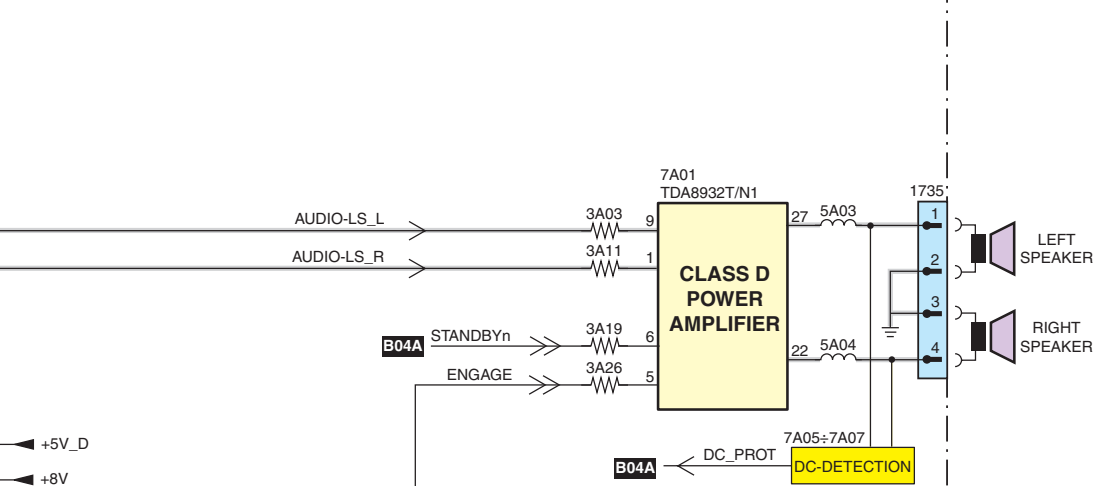
B03A TUNER IF & DEMODULATOR



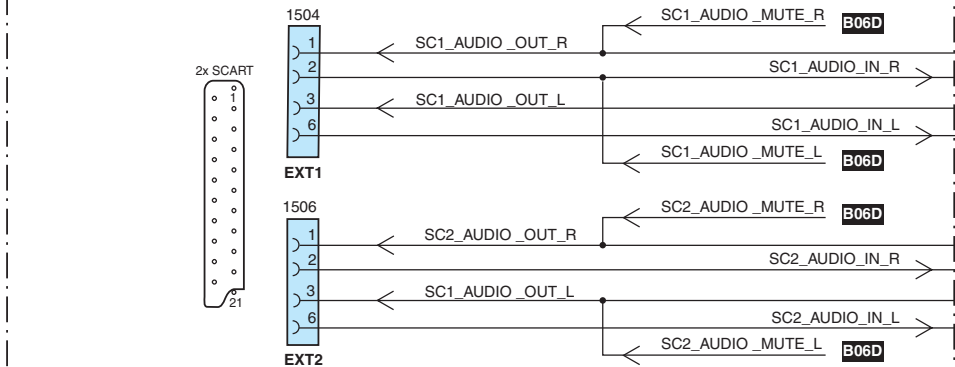
B04C AUDIO PROCESSOR



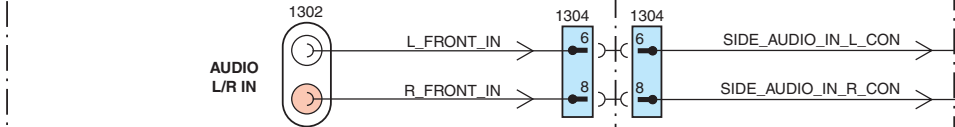
B07 AUDIO



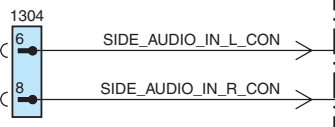
B06B I0 - SCART 1 & 2



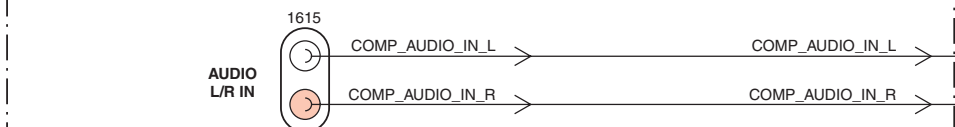
D SIDE FACING SIDE AV



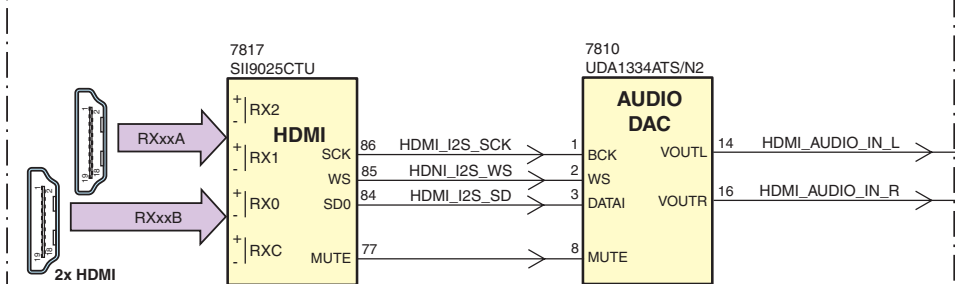
B04A MICROPROCESSOR



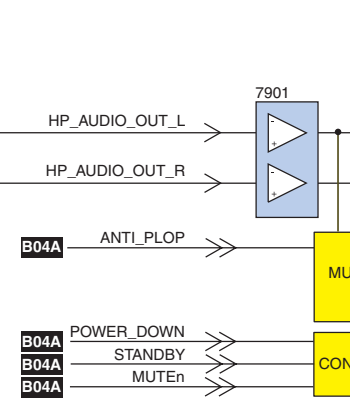
B06A YPBPR & REAR IO



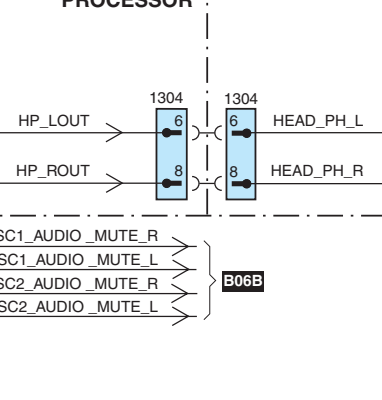
B06C HDMI



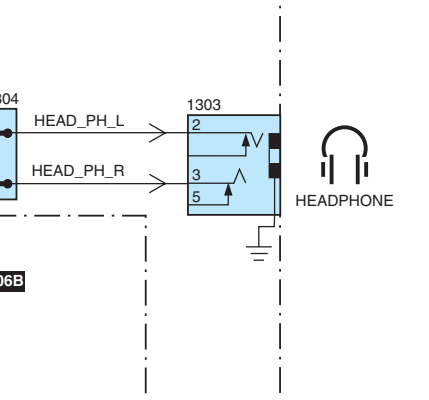
B06D HEADPHONE AMP & MUTING



B04A MICRO PROCESSOR



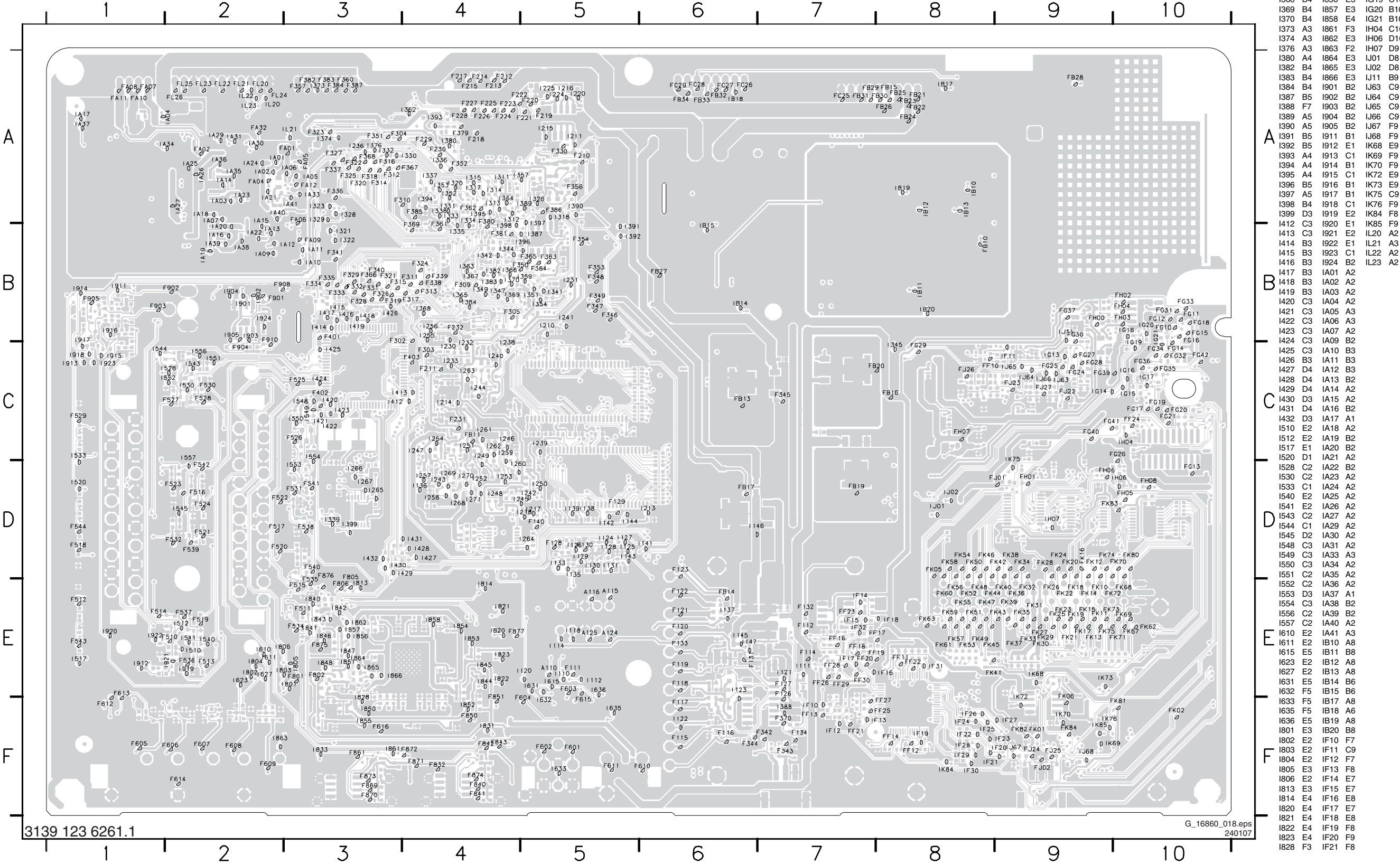
D SIDE FACING SIDE AV





Test Point Overview SSB (Bottom Side)

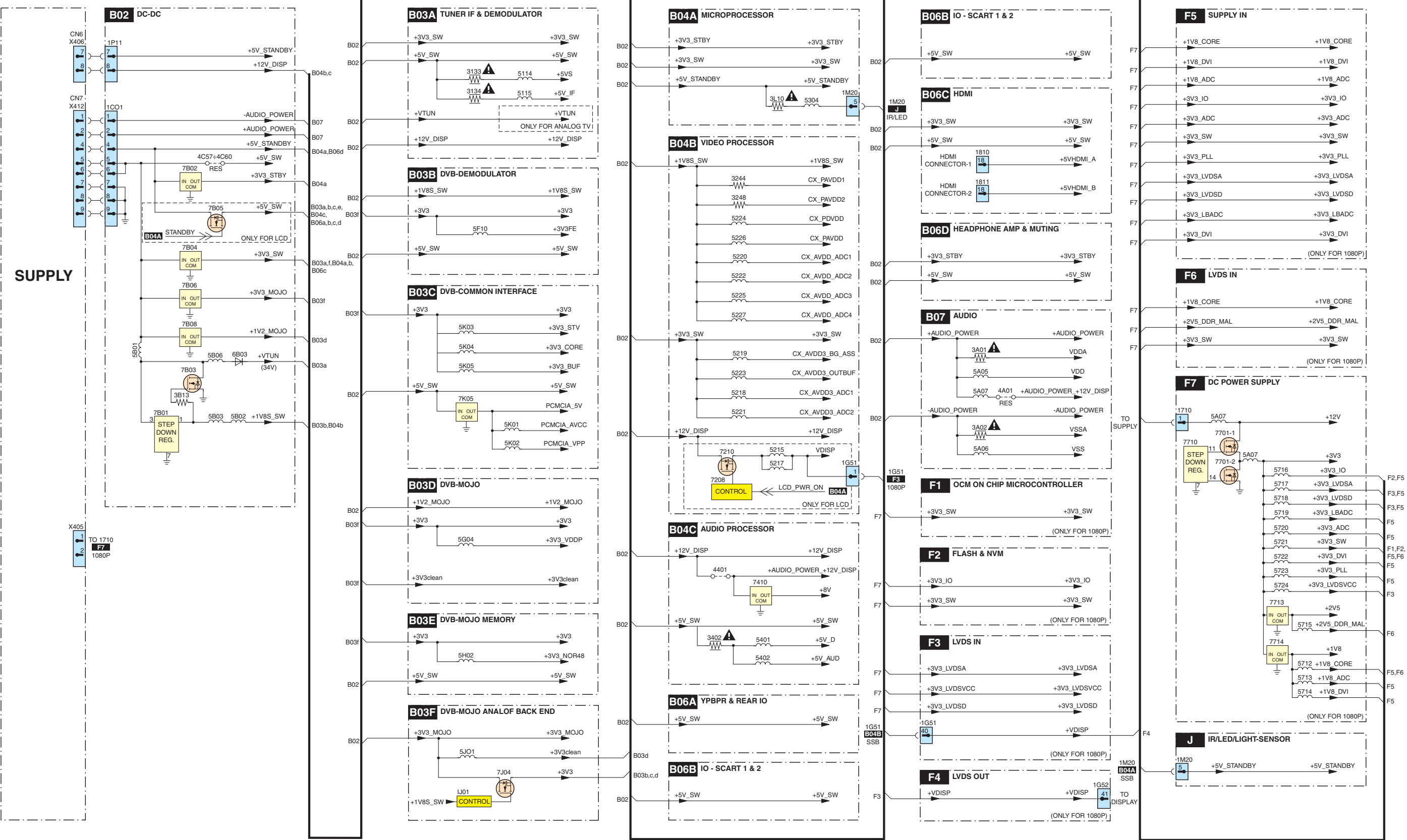
|         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |          |          |          |          |         |         |          |          |         |         |         |         |         |         |         |         |          |
|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|----------|----------|----------|---------|---------|----------|----------|---------|---------|---------|---------|---------|---------|---------|---------|----------|
| A110 E5 | F126 E7 | F218 A4 | F304 A3 | F324 B4 | F341 B3 | F361 B4 | F386 A5 | F522 D2 | F540 D3 | F613 E1 | F870 F3 | FA04 A2 | FB19 D7 | FC26 A6 | FF24 C10 | FG20 C10 | FG40 C9  | FJ25 F9  | FK20 D9 | FK37 E9 | FK54 D8  | FK74 D9  | I114 E5 | I137 E6 | I218 D5 | I246 C4 | I263 C4 | I321 B3 | I342 B4 | I831 F4 | IF22 F8  |
| A115 E5 | F127 E7 | F219 A5 | F305 B4 | F325 A3 | F342 F7 | F362 A4 | F387 A3 | F523 D2 | F541 D3 | F614 F2 | F871 F4 | FA05 A3 | FB20 C8 | FC27 A6 | FF25 F8  | FG21 C10 | FG41 C9  | FJ26 C8  | FK21 E9 | FK38 D9 | FK55 E8  | FK75 E9  | I118 E5 | I138 D5 | I220 A5 | I247 C4 | I264 D5 | I322 B3 | I344 B4 | I833 F3 | IF23 F9  |
| A116 E5 | F128 D5 | F220 A5 | F309 B4 | F326 B3 | F343 F7 | F363 B5 | F401 B3 | F524 D2 | F542 D2 | F615 F5 | F872 F4 | FA06 A3 | FB21 A8 | FC28 A6 | FF26 F7  | FG24 C9  | FG42 C10 | FJ27 C9  | FK22 E9 | FK39 E9 | FK56 E8  | FK80 D10 | I120 E5 | I139 D5 | I224 A5 | I248 D4 | I265 D3 | I323 A3 | I345 C8 | I840 C3 | IF24 F8  |
| A124 E5 | F129 D5 | F221 A5 | F310 A4 | F327 A3 | F344 F6 | F364 B5 | F402 C3 | F525 C3 | F543 E1 | F616 F3 | F873 F3 | FA07 A1 | FB22 A8 | FC29 A6 | FF27 F8  | FG25 C9  | FH00 B9  | FK01 F9  | FK23 E9 | FK40 E9 | FK57 E8  | FK81 F10 | I121 E7 | I141 D6 | I225 A5 | I249 C4 | I266 D3 | I326 A5 | I347 B4 | I841 E3 | IF25 F8  |
| A125 E5 | F130 D5 | F222 A4 | F311 B4 | F328 B3 | F345 C7 | F365 B5 | F403 C4 | F526 C3 | F544 D1 | F801 E3 | F874 F4 | FA08 A1 | FB23 A8 | FF10 C8 | FF28 E7  | FG26 C10 | FH01 D9  | FK02 F10 | FK24 D9 | FK41 E8 | FK58 D8  | FK82 F9  | I122 F6 | I142 D5 | I230 C4 | I250 D5 | I267 D3 | I328 A3 | I349 B4 | I842 E3 | IF26 F8  |
| F111 E5 | F131 E6 | F223 A4 | F312 A3 | F329 B3 | F346 B5 | F366 B3 | F510 E2 | F527 C2 | F601 F5 | F802 E3 | F875 E3 | FA09 B3 | FB24 A8 | FF11 E8 | FF29 E7  | FG27 C9  | FH02 B10 | FK05 D8  | FK25 E9 | FK42 D9 | FK59 E8  | FK83 D9  | I123 E6 | I143 D5 | I231 B5 | I251 C4 | I268 D4 | I329 A3 | I351 B5 | I843 E3 | IF27 F9  |
| F112 E7 | F132 E7 | F224 A4 | F313 B4 | F330 A5 | F347 B5 | F367 A4 | F511 E3 | F528 C2 | F602 F5 | F805 D3 | F876 D3 | FA10 A1 | FB25 A8 | FF12 F8 | FF30 E7  | FG28 C9  | FH03 B10 | FK06 E9  | FK26 E9 | FK43 E9 | FK60 E8  | FK84 F9  | I124 D5 | I144 D5 | I232 C4 | I252 D4 | I269 D4 | I330 A4 | I352 A4 | I844 E4 | IF28 F8  |
| F114 E7 | F133 E6 | F225 A4 | F314 A3 | F331 B3 | F348 B5 | F368 A3 | F512 E1 | F529 C1 | F603 E5 | F806 E3 | F877 E4 | FA11 A1 | FB26 A8 | FF13 F7 | FF31 B10 | FG29 C8  | FH04 B10 | FK10 E9  | FK27 E9 | FK44 E8 | FK61 E8  | FK85 F10 | I125 D5 | I145 E6 | I233 C4 | I253 D4 | I270 D4 | I331 A4 | I353 A4 | I845 E4 | IF29 F8  |
| F115 F6 | F134 F7 | F226 A4 | F315 B3 | F332 B3 | F349 B5 | F369 B4 | F513 E2 | F530 C2 | F604 F5 | F832 F4 | F901 B2 | FA12 A3 | FB27 B6 | FF14 F8 | FF32 E7  | FG30 B9  | FH05 D10 | FK11 E9  | FK28 D9 | FK45 E8 | FK62 E10 | FL21 A2  | I126 D5 | I146 D6 | I236 A3 | I254 C4 | I271 D4 | I332 A3 | I354 B5 | I846 E3 | IF30 F8  |
| F116 F6 | F140 D5 | F227 A4 | F316 A3 | F333 B3 | F350 B5 | F370 F7 | F514 E1 | F531 D3 | F605 F1 | F840 F4 | F902 B2 | FA32 A2 | FB28 A9 | FF16 E7 | FF33 E7  | FG31 B10 | FH06 D9  | FK12 D9  | FK29 E9 | FK46 D8 | FK63 E8  | FL22 A2  | I127 D5 | I147 E6 | I238 C4 | I255 B4 | I311 A4 | I333 A4 | I357 A5 | I847 E3 | IF31 E8  |
| F117 F6 | F210 A5 | F228 A4 | F317 B4 | F334 B3 | F351 A3 | F379 A4 | F515 E3 | F532 D2 | F606 F2 | F841 F4 | F903 B1 | FB10 B8 | FB29 A7 | FF17 E8 | FF34 E7  | FG32 C10 | FH07 C8  | FK13 E9  | FK30 E9 | FK47 E8 | FK67 E10 | FL23 A2  | I128 D5 | I210 B5 | I239 C5 | I256 B4 | I312 A4 | I334 A4 | I359 B5 | I848 E3 | IF32 E7  |
| F118 E6 | F211 C4 | F229 A4 | F318 A3 | F335 B3 | F352 A4 | F380 A4 | F516 D2 | F534 E3 | F607 F2 | F842 F4 | F904 C2 | FB11 C4 | FB30 A8 | FF18 E7 | FF35 E7  | FG33 B10 | FH08 D10 | FK14 E9  | FK31 E9 | FK48 E8 | FK68 E10 | FL24 A2  | I129 D5 | I211 A5 | I240 C4 | I257 D4 | I313 A4 | I335 B4 | I362 A4 | I850 F3 | IG13 C9  |
| F119 E6 | F212 A4 | F230 A4 | F319 B3 | F336 A3 | F353 B5 | F381 B4 | F517 D2 | F535 E3 | F608 F2 | F843 F4 | F905 B1 | FB13 C6 | FB31 A7 | FF19 E8 | FF36 E7  | FG34 C10 | FJ01 D9  | FK15 E9  | FK32 E9 | FK49 E8 | FK69 E10 | FL25 A2  | I130 D5 | I213 D6 | I241 B5 | I258 D4 | I314 A4 | I336 A4 | I363 B4 | I851 E3 | IG14 C9  |
| F120 E6 | F213 A4 | F231 C4 | F320 A3 | F337 A3 | F354 B5 | F382 A3 | F518 D1 | F536 E2 | F609 F2 | F850 F4 | F908 B2 | FB14 E6 | FB32 A6 | FF20 E7 | FF37 E7  | FG35 C10 | FJ02 F9  | FK16 D9  | FK33 E9 | FK50 D8 | FK70 D10 | FL26 A2  | I131 D5 | I214 C4 | I242 D5 | I259 C4 | I315 A4 | I337 A4 | I364 A4 | I852 F4 | IG15 C10 |
| F121 E6 | F214 A4 | F232 B4 | F321 B3 | F338 B4 | F356 A5 | F383 A3 | F519 E2 | F537 E2 | F610 F6 | F851 E4 | F910 B2 | FB15 A8 | FB33 A6 | FF21 F7 | FF38 E7  | FG36 C10 | FJ22 C9  | FK17 E9  | FK34 D9 | FK51 E8 | FK71 E10 | I110 E5  | I133 D5 | I215 A5 | I243 D4 | I260 D4 | I317 A4 | I338 A4 | I365 B4 | I853 E4 | IG16 C10 |
| F122 E6 | F215 A4 | F302 B3 | F322 A3 | F339 B4 | F357 A3 | F384 A3 | F520 D2 | F538 D3 | F611 F5 | F861 F3 | FA01 A3 | FB16 C8 | FB34 A6 | FF22 E8 | FF39 E7  | FG37 B9  | FJ23 C9  | FK18 E9  | FK35 E9 | FK52 E8 | FK72 E10 | I111 E7  | I135 D5 | I216 A5 | I244 C4 | I261 C4 | I318 A5 | I339 D3 | I366 B4 | I854 E4 | IG17 C10 |
| F123 D6 | F217 A4 | F303 C4 | F323 A3 | F340 B3 | F360 A3 | F385 A4 | F521 D2 | F539 D2 | F612 F1 | F869 F3 | FA02 A2 | FB17 D6 | FC25 A7 | FF23 E7 | FG19 C10 | FG39 C9  | FJ24 F9  | FK19 E9  | FK36 E9 | FK53 E8 | FK73 E9  | I112 E5  | I136 D4 | I217 D5 | I245 D5 | I262 C4 | I320 A4 | I341 B5 | I367 B4 | I855 F3 | IG18 B10 |





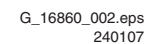
Supply Lines Overview

SUPPLY LINES OVERVIEW





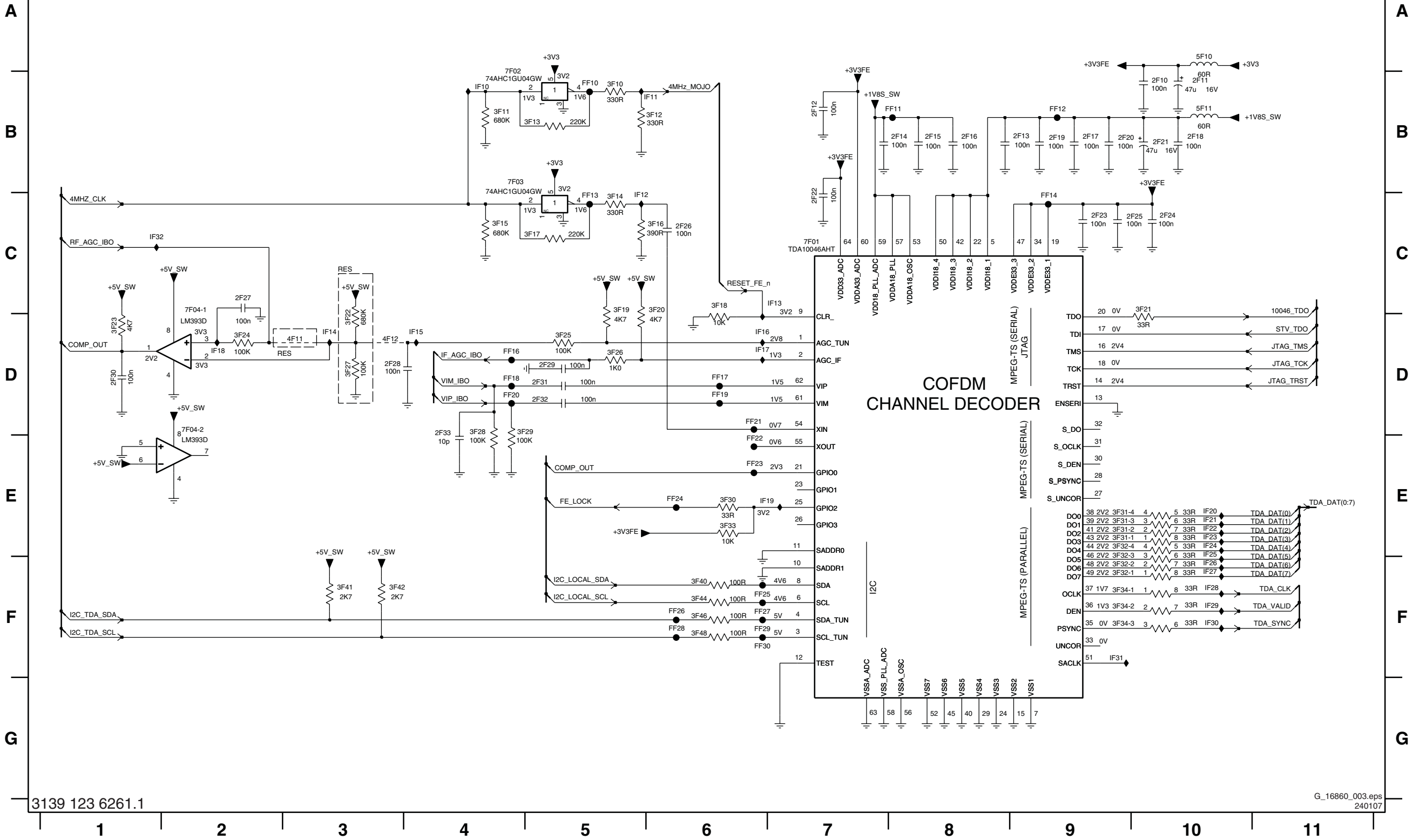
## B03A TUNER IF & DEMODULATOR



SSB: DVB - Demodulator (Not implemented in this chassis)

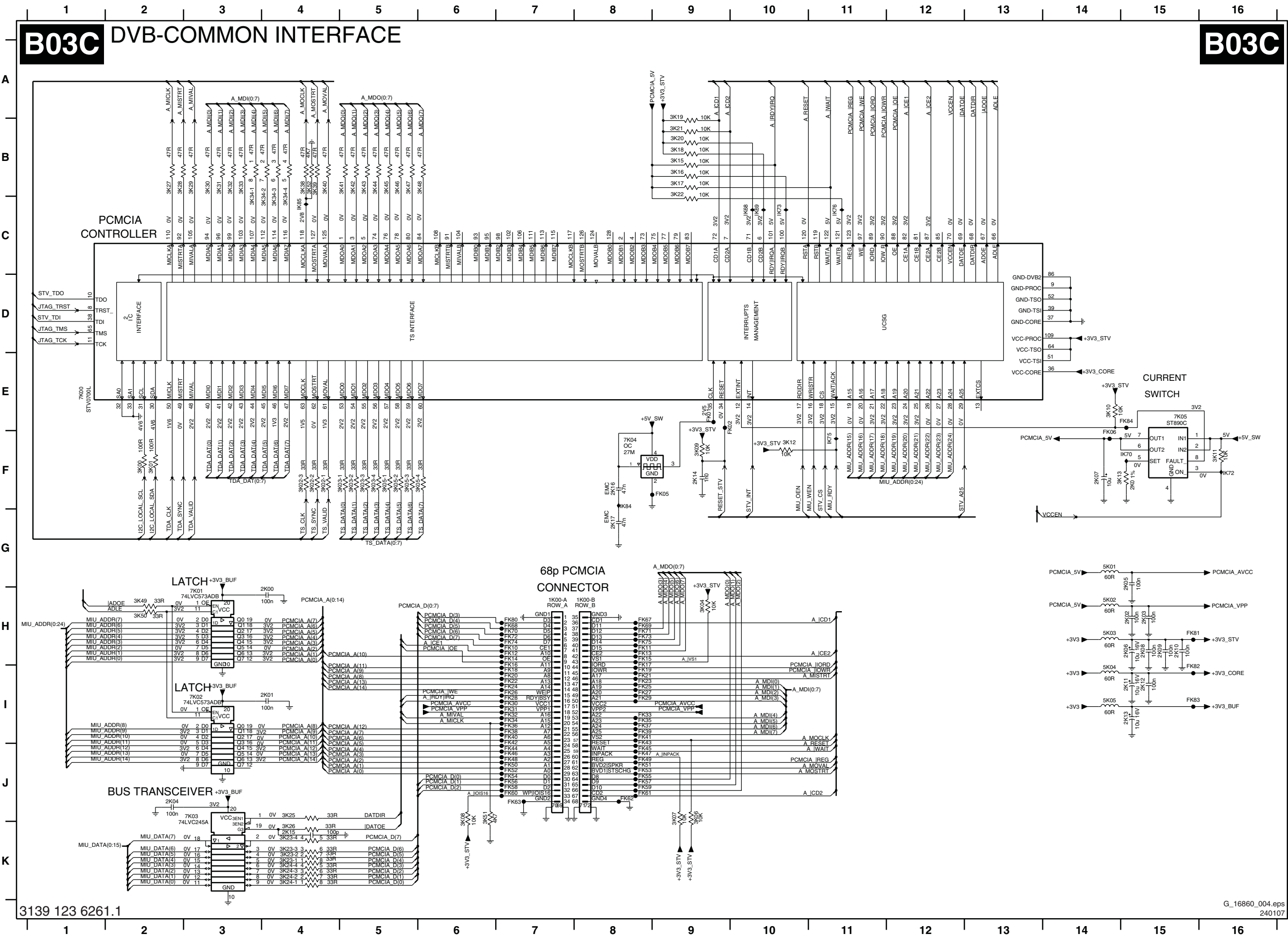
B03B DVB - DEMODULATOR

B03B

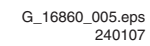


|           |          |
|-----------|----------|
| 2F10 B10  | FF25 F6  |
| 2F11 B10  | FF26 F6  |
| 2F12 B7   | FF27 F6  |
| 2F13 B9   | FF28 F6  |
| 2F14 B8   | FF29 F6  |
| 2F15 B8   | FF30 F6  |
| 2F16 B8   | IF10 B4  |
| 2F17 B9   | IF11 B6  |
| 2F18 B10  | IF12 C5  |
| 2F19 B9   | IF13 C7  |
| 2F20 B9   | IF14 D3  |
| 2F21 B10  | IF15 D4  |
| 2F22 C7   | IF16 D6  |
| 2F23 C9   | IF17 D6  |
| 2F24 C10  | IF18 D2  |
| 2F25 C10  | IF19 E6  |
| 2F26 C6   | IF20 E10 |
| 2F27 C2   | IF21 E10 |
| 2F28 D3   | IF22 E10 |
| 2F29 D5   | IF23 E10 |
| 2F30 D1   | IF24 E10 |
| 2F31 D5   | IF25 E10 |
| 2F32 D5   | IF26 F10 |
| 2F33 D4   | IF27 F10 |
| 3F10 B5   | IF28 F10 |
| 3F11 B4   | IF29 F10 |
| 3F12 B6   | IF30 F10 |
| 3F13 B5   | IF31 F9  |
| 3F14 C5   | IF32 C1  |
| 3F15 C4   |          |
| 3F16 C6   |          |
| 3F17 C5   |          |
| 3F18 C6   |          |
| 3F19 C5   |          |
| 3F20 C6   |          |
| 3F21 C10  |          |
| 3F22 D3   |          |
| 3F23 D1   |          |
| 3F24 D2   |          |
| 3F25 D5   |          |
| 3F26 D5   |          |
| 3F27 D3   |          |
| 3F28 D4   |          |
| 3F29 D5   |          |
| 3F30 E6   |          |
| 3F31-1 E9 |          |
| 3F31-2 E9 |          |
| 3F31-3 E9 |          |
| 3F31-4 E9 |          |
| 3F32-1 F9 |          |
| 3F32-2 F9 |          |
| 3F32-3 F9 |          |
| 3F32-4 E9 |          |
| 3F33 E6   |          |
| 3F34-1 F9 |          |
| 3F34-2 F9 |          |
| 3F34-3 F9 |          |
| 3F40 F6   |          |
| 3F41 F3   |          |
| 3F42 F3   |          |
| 3F44 F6   |          |
| 3F46 F6   |          |
| 3F48 F6   |          |
| 4F11 D3   |          |
| 4F12 D3   |          |
| 5F10 A10  |          |
| 5F11 B10  |          |
| 7F01 C7   |          |
| 7F02 B4   |          |
| 7F03 B4   |          |
| 7F04-1 C2 |          |
| 7F04-2 D2 |          |
| FF10 B5   |          |
| FF11 B8   |          |
| FF12 B9   |          |
| FF13 C5   |          |
| FF14 C9   |          |
| FF16 D4   |          |
| FF17 D6   |          |
| FF18 D4   |          |
| FF19 D6   |          |
| FF20 D4   |          |
| FF21 D6   |          |
| FF22 E6   |          |
| FF23 E6   |          |
| FF24 E6   |          |

## SSB: DVB - Common Interface (Not implemented in this chassis)



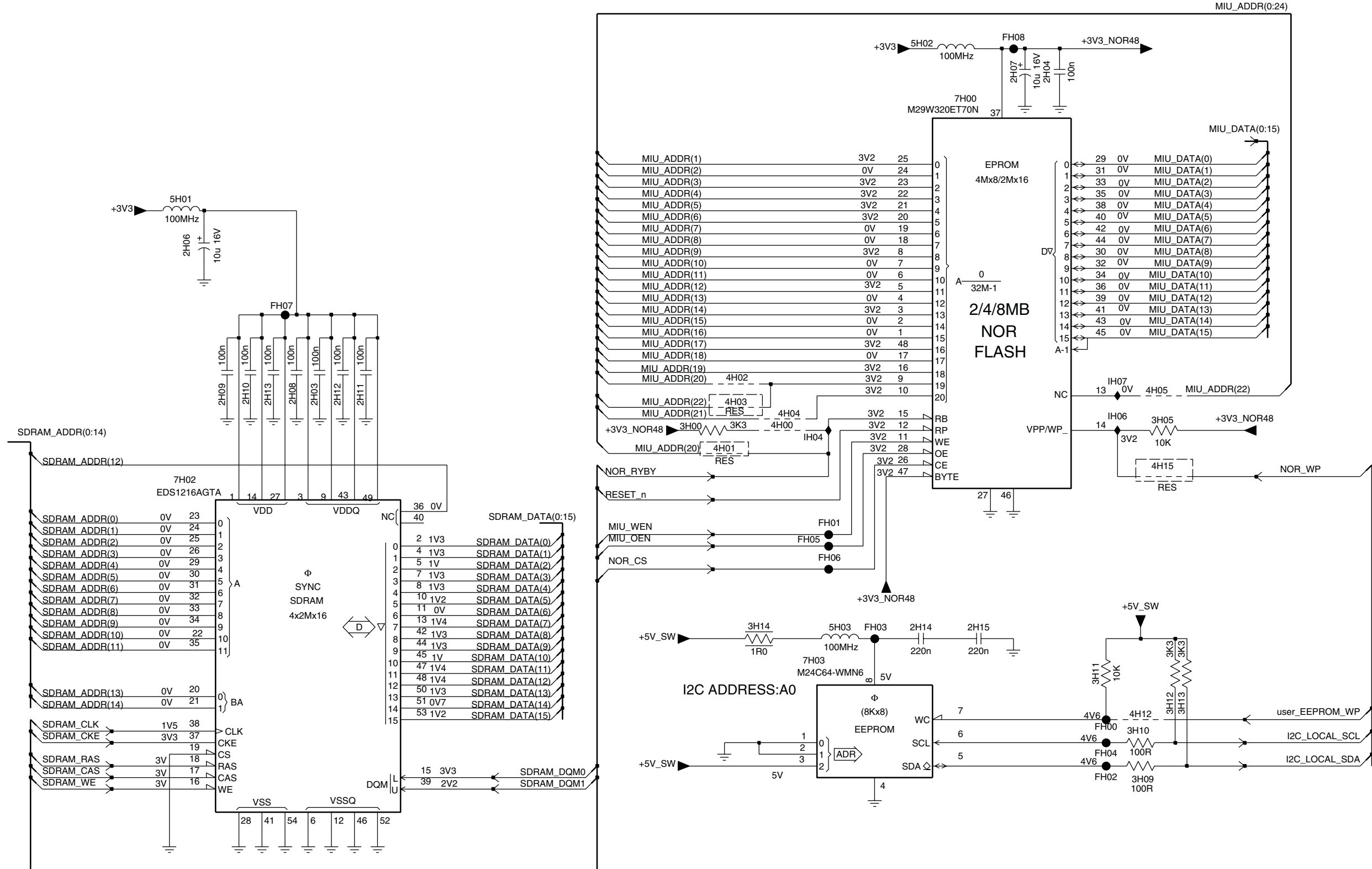
**B03D** DVB-MOJO



SSB: DVB - Mojo Memory (Not implemented in this chassis)

B03E DVB-MOJO MEMORY

B03E

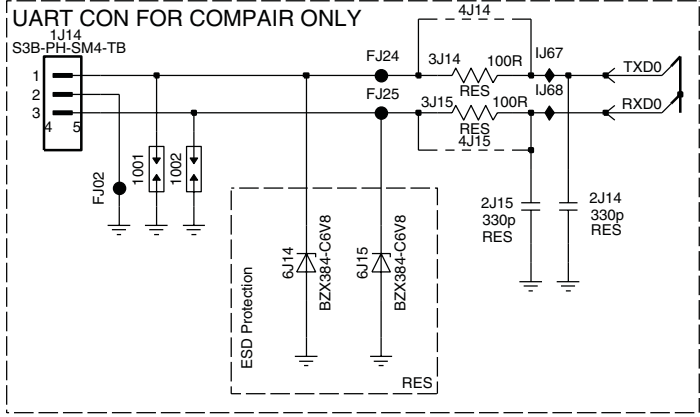
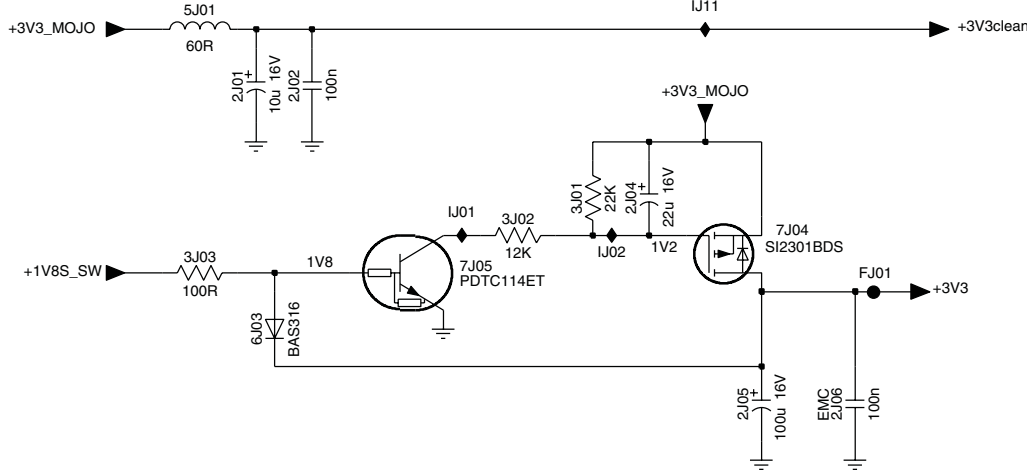
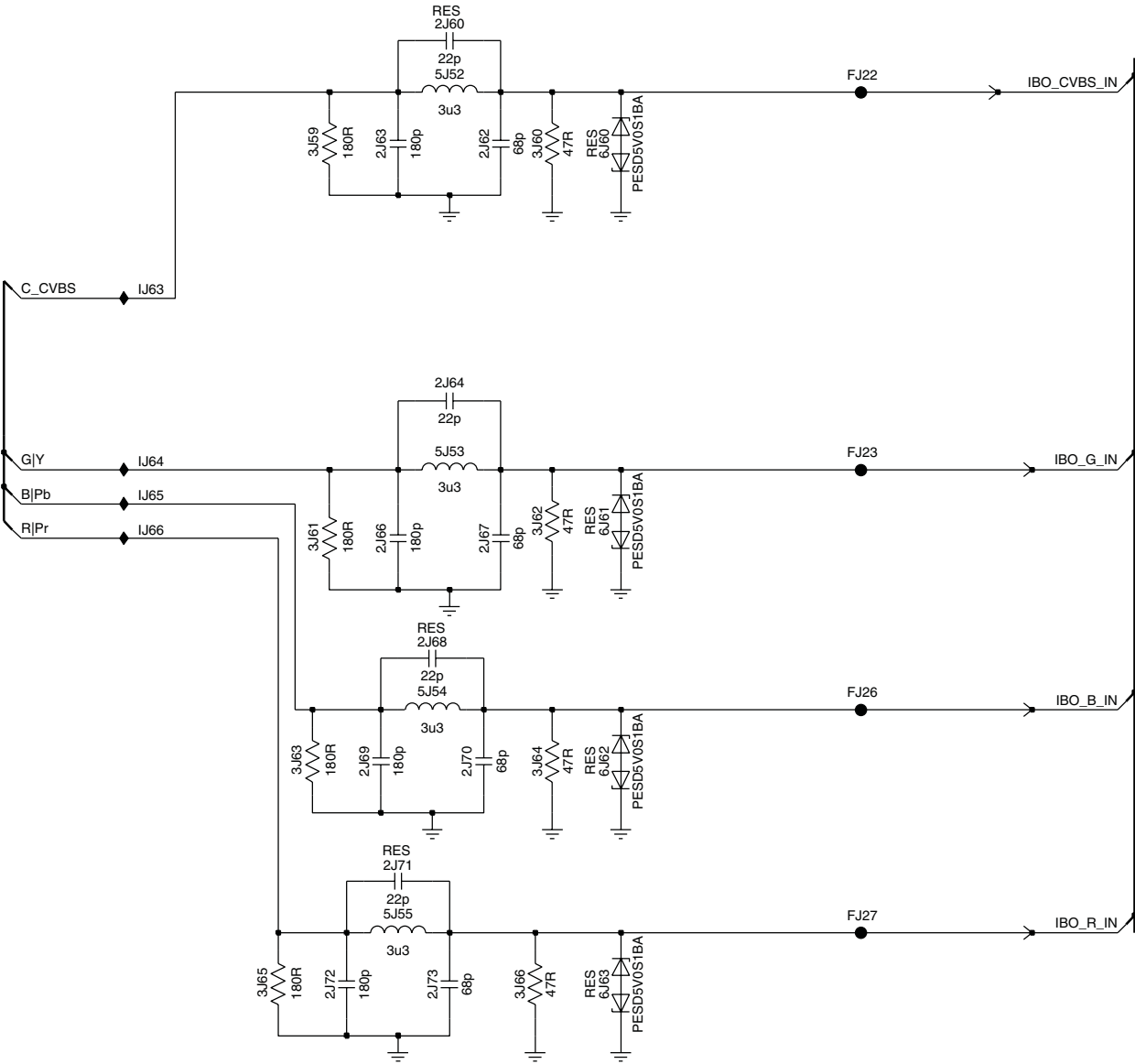


- 2H03 C2
- 2H04 A7
- 2H06 B1
- 2H07 A6
- 2H08 C2
- 2H09 C2
- 2H10 C2
- 2H11 C2
- 2H12 C2
- 2H13 C2
- 2H14 D6
- 2H15 D6
- 3H00 C4
- 3H05 C7
- 3H09 E7
- 3H10 E7
- 3H11 E7
- 3H12 E7
- 3H13 E7
- 3H14 D5
- 4H00 C5
- 4H01 C5
- 4H02 C5
- 4H03 C5
- 4H04 C5
- 4H05 C7
- 4H12 E7
- 4H15 C7
- 5H01 B1
- 5H02 A6
- 5H03 D5
- 7H00 A6
- 7H02 C1
- 7H03 D5
- FH00 E7
- FH01 D5
- FH02 E7
- FH03 D6
- FH04 E7
- FH05 D5
- FH06 D5
- FH07 B2
- FH08 A6
- IH04 C5
- IH06 C7
- IH07 C7

SSB: DVB - Mojo Analog Back End (Not implemented in this chassis)

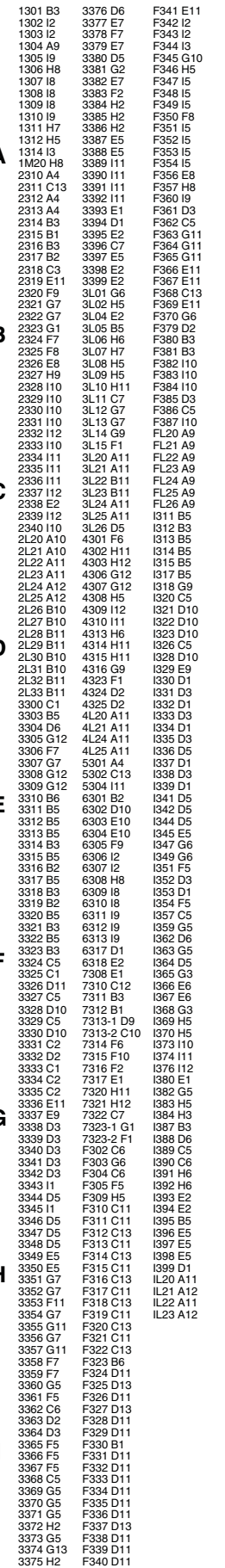
B03F DVB-MOJO ANALOG BACK END

B03F



- 1001 D7
- 1002 D7
- 1J14 D6
- 2J01 B7
- 2J02 B7
- 2J04 B8
- 2J05 C8
- 2J06 C9
- 2J14 D8
- 2J15 D8
- 2J60 A2
- 2J62 B3
- 2J63 B2
- 2J64 C2
- 2J66 C2
- 2J67 C3
- 2J68 D2
- 2J69 D2
- 2J70 D3
- 2J71 E2
- 2J72 E2
- 2J73 E2
- 3J01 B8
- 3J02 B8
- 3J03 B6
- 3J14 D8
- 3J15 D8
- 3J59 B2
- 3J60 B3
- 3J61 C2
- 3J62 C3
- 3J63 D2
- 3J64 D3
- 3J65 E2
- 3J66 E3
- 4J14 D8
- 4J15 D8
- 5J01 A6
- 5J52 A2
- 5J53 C2
- 5J54 D2
- 5J55 E2
- 6J03 C7
- 6J14 D7
- 6J15 D8
- 6J60 B3
- 6J61 C3
- 6J62 D3
- 6J63 E3
- 7J04 B9
- 7J05 B7
- FJ01 B9
- FJ02 D6
- FJ22 A4
- FJ23 C4
- FJ24 D8
- FJ25 D8
- FJ26 D4
- FJ27 E4
- IJ01 B7
- IJ02 B8
- IJ11 A8
- IJ63 B1
- IJ64 C1
- IJ65 C1
- IJ66 C1
- IJ67 D8
- IJ68 D8

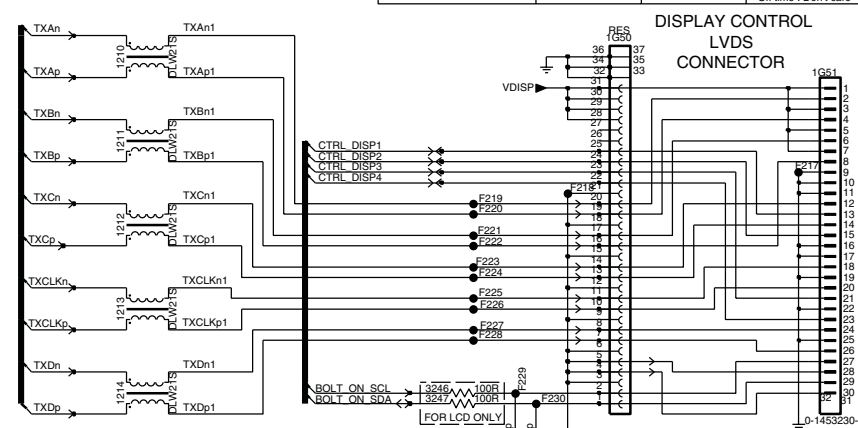
# B04A MICROPROCESSOR



## B04B VIDEO PROCESSOR

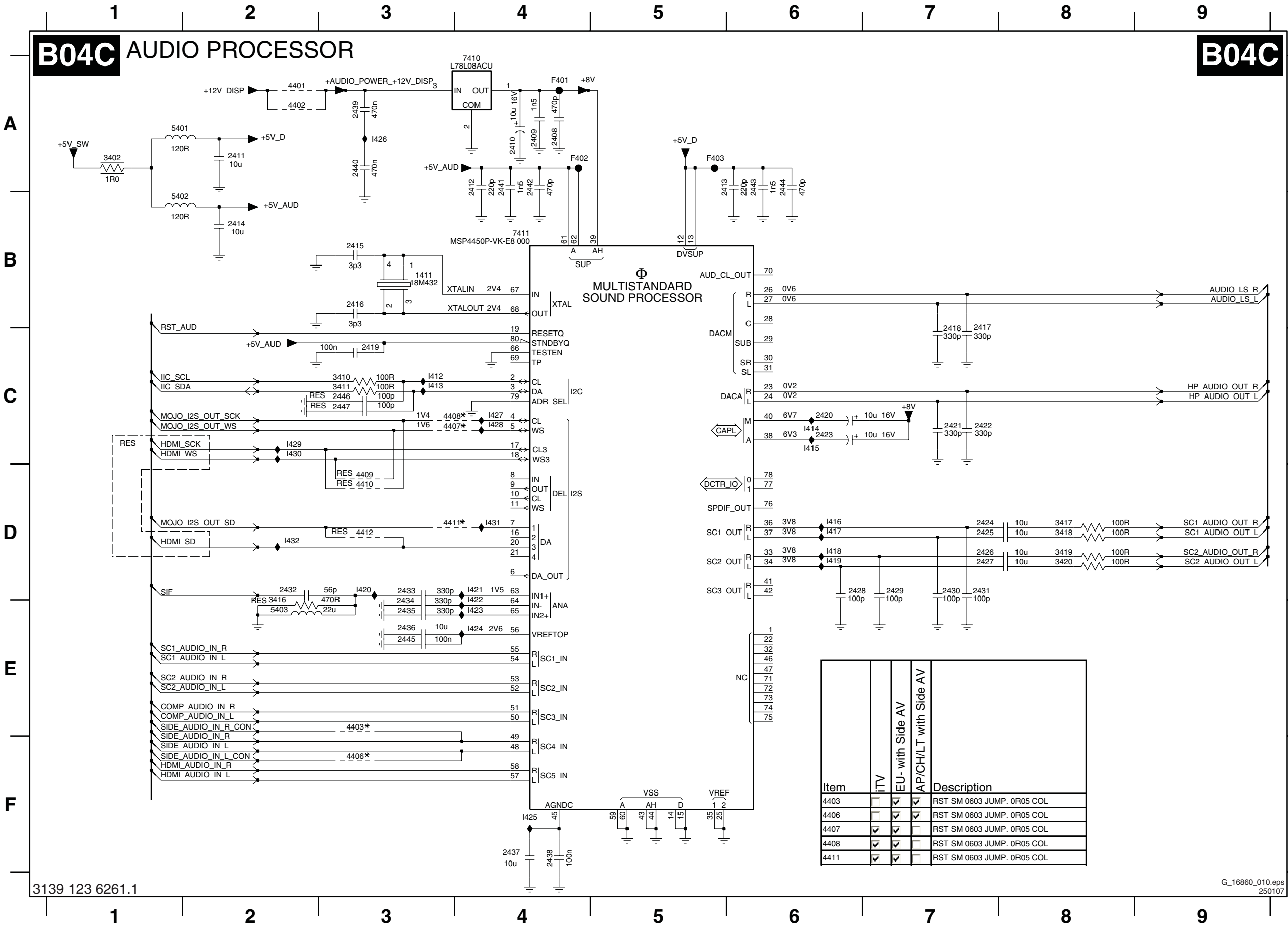


|                          | LGE                                            | SDI                                                                | FHP                                            |
|--------------------------|------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------|
| CTRL-DISP1               |                                                | RESET<br>Semi standby : H<br>Normal and off : L                    |                                                |
| CTRL-DISP2(LCD_PWR_on)   | DISPEN<br>On time : H<br>Off time : Don't care |                                                                    | CPU_GO<br>On time : H<br>Off time : Don't care |
| CTRL-DISP3(Rev. Standby) |                                                | PDWIN<br>On time : H<br>Off time : Don't care                      |                                                |
| CTRL-DISP4               |                                                | PDF_GO<br>On time : H<br>Semi standby : L<br>Off time : Don't care |                                                |



|      |            |          |
|------|------------|----------|
| 1201 | 3241 K9    | 1232 E4  |
| 1210 | 3242 K9    | 1233 E4  |
| 1211 | 3243 K9    | 1234 E5  |
| 1212 | 3244 AT    | 1235 A4  |
| 1213 | 3245 K8    | 1236 A4  |
| 1214 | 3246 J14   | 1240 K8  |
| 1215 | 3247 J14   | 1241 K9  |
| 1216 | 3248 AT    | 1242 A6  |
| 1217 | 3249 K8    | 1243 AT  |
| 1218 | 3250 J2    | 1244 K8  |
| 1219 | 3251 J3    | 1245 L8  |
| 1220 | 3252 K2    | 1246 B9  |
| 1221 | 3253 K2    | 1247 A9  |
| 1222 | 3254 K2    | 1248 A9  |
| 1223 | 3255 K3    | 1249 B8  |
| 1224 | 3256 K1    | 1250 A6  |
| 1225 | 3257 K1    | 1251 B7  |
| 1226 | 3260-1 B12 | 1252 B9  |
| 1227 | 3260-1 B12 | 1253 B9  |
| 1228 | 3260-1 B12 | 1254 C7  |
| 1229 | 3261-1 B12 | 1255 D2  |
| 1230 | 3261-2 B12 | 1256 D2  |
| 1231 | 3261-1 B12 | 1257 A4  |
| 1232 | 3261-4 B12 | 1258 J4  |
| 1233 | 3262-1 B12 | 1259 J10 |
| 1234 | 3262-3 C12 | 1260 J10 |
| 1235 | 3262-4 C12 | 1262 J10 |
| 1236 | 3263-1 E12 | 1263 K8  |
| 1237 | 3263-1 E12 | 1264 L3  |
| 1238 | 3263-3 E12 | 1265 A3  |
| 1239 | 3263-4 E12 | 1266 A2  |
| 1240 | 3264-1 E12 | 1267 K7  |
| 1241 | 3264-3 E12 | 1270 K8  |
| 1242 | 3264-4 E12 | 1271 K7  |
| 1243 | 3265-1 E12 | 1272 K8  |
| 1244 | 3265-2 E12 | 1273 K8  |
| 1245 | 3265-3 F12 |          |
| 1246 | 3266 C12   |          |
| 1247 | 3267 F13   |          |
| 1248 | 3268-1 F12 |          |
| 1249 | 3268-2 C12 |          |
| 1250 | 3268-3 F12 |          |
| 1251 | 3268-4 C12 |          |
| 1252 | 3271-1 C12 |          |
| 1253 | 3271-2 C12 |          |
| 1254 | 3271-3 C12 |          |
| 1255 | 3271-4 F12 |          |
| 1256 | 3272 J9    |          |
| 1257 | 3273 A2    |          |
| 1258 | 3274 B2    |          |
| 1259 | 3275 A3    |          |
| 1260 | 3276 B3    |          |
| 1261 | 3277 A3    |          |
| 1262 | 3278 B4    |          |
| 1263 | 3279 A7    |          |
| 1264 | 3280 B2    |          |
| 1265 | 3281 C12   |          |
| 1266 | 3282 D13   |          |
| 1267 | 3283 C15   |          |
| 1268 | 3284 B1    |          |
| 1269 | 3285 K12   |          |
| 1270 | 3286 J14   |          |
| 1271 | 3287 A12   |          |
| 1272 | 3288 B13   |          |
| 1273 | 3289 A12   |          |
| 1274 | 3290 B13   |          |
| 1275 | 3291 B6    |          |
| 1276 | 3292 B8    |          |
| 1277 | 3293 B4    |          |
| 1278 | 3294 B4    |          |
| 1279 | 3295 B7    |          |
| 1280 | 3296 C7    |          |
| 1281 | 3297 C8    |          |
| 1282 | 3298 D13   |          |
| 1283 | 3299 C15   |          |
| 1284 | 3300 C17   |          |
| 1285 | 3301 A12   |          |
| 1286 | 3302 D4    |          |
| 1287 | 3303 B9    |          |
| 1288 | 3304 B11   |          |
| 1289 | 3305 E11   |          |
| 1290 | 3306 K9    |          |
| 1291 | 3307 B16   |          |
| 1292 | 3308 C16   |          |
| 1293 | 3309 A15   |          |
| 1294 | 3310 K2    |          |
| 1295 | 3311-1 K2  |          |
| 1296 | 3311-2 K2  |          |
| 1297 | 3311-3 K2  |          |
| 1298 | 3311-4 L5  |          |
| 1299 | 3312 A14   |          |
| 1300 | 3312-1 B3  |          |
| 1301 | 3312-2 B3  |          |
| 1302 | 3312-3 B3  |          |
| 1303 | 3312-4 B3  |          |
| 1304 | 3313 A13   |          |
| 1305 | 3313-1 K2  |          |
| 1306 | 3313-2 K2  |          |
| 1307 | 3314 A2    |          |
| 1308 | 3314 A17   |          |
| 1309 | 3315 C9    |          |
| 1310 | 3315 D16   |          |
| 1311 | 3316 E12   |          |
| 1312 | 3317 E16   |          |
| 1313 | 3318 E16   |          |
| 1314 | 3319 E16   |          |
| 1315 | 3320 E16   |          |
| 1316 | 3321 E17   |          |
| 1317 | 3322 E15   |          |
| 1318 | 3323 E15   |          |
| 1319 | 3324 E15   |          |
| 1320 | 3325 E15   |          |
| 1321 | 3326 E15   |          |
| 1322 | 3327 E15   |          |
| 1323 | 3328 E15   |          |
| 1324 | 3329 E15   |          |
| 1325 | 3330 E15   |          |
| 1326 | 3331 E17   |          |
| 1327 | 3332 E18   |          |
| 1328 | 3333 E18   |          |
| 1329 | 3334 E18   |          |
| 1330 | 3335 E18   |          |
| 1331 | 3336 E18   |          |
| 1332 | 3337 E18   |          |
| 1333 | 3338 E18   |          |
| 1334 | 3339 E18   |          |
| 1335 | 3340 E18   |          |
| 1336 | 3341 E18   |          |
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| 1338 | 3343 E18   |          |
| 1339 | 3344 E18   |          |
| 1340 | 33         |          |

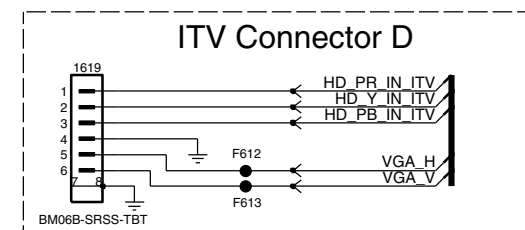
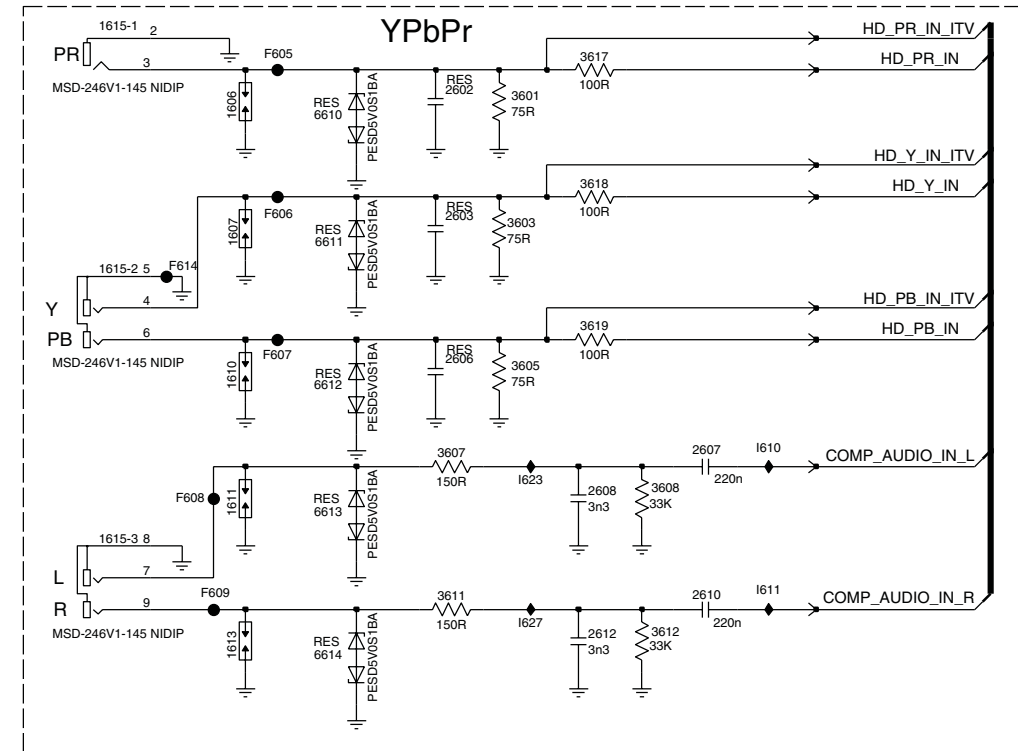
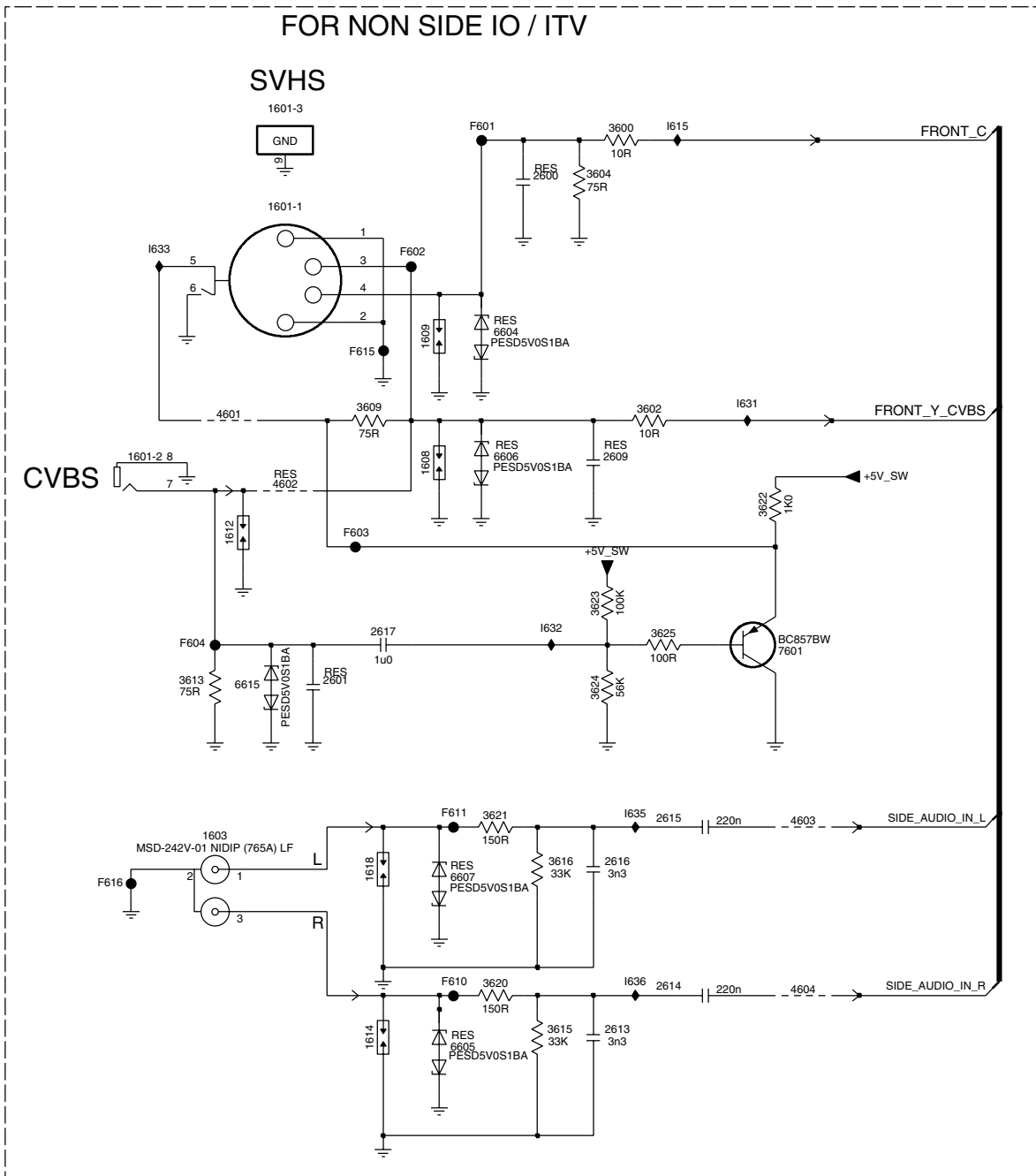
SSB: PNX2015: Audio Processor



- 1411 B3
- 2408 A4
- 2409 A4
- 2410 A4
- 2411 A2
- 2412 A4
- 2413 A6
- 2414 B2
- 2415 B3
- 2416 B3
- 2417 B7
- 2418 B7
- 2419 C3
- 2420 C6
- 2421 C7
- 2422 C7
- 2423 C6
- 2424 D7
- 2425 D7
- 2426 D7
- 2427 D7
- 2428 D6
- 2429 D7
- 2430 D7
- 2431 D7
- 2432 D2
- 2433 D3
- 2434 E3
- 2435 E3
- 2436 E3
- 2437 F4
- 2438 F4
- 2439 A3
- 2440 A3
- 2441 A4
- 2442 A4
- 2443 A6
- 2444 A6
- 2445 E3
- 2446 C3
- 2447 C3
- 3402 A1
- 3410 C3
- 3411 C3
- 3416 E2
- 3417 D8
- 3418 D8
- 3419 D8
- 3420 D8
- 4401 A2
- 4402 A2
- 4403 E3
- 4406 F3
- 4407 C3
- 4408 C3
- 4409 D3
- 4410 D3
- 4411 D3
- 4412 D3
- 5401 A1
- 5402 B1
- 5403 E2
- 7410 A4
- 7411 B4
- F401 A4
- F402 A4
- F403 A5
- I412 C3
- I413 C3
- I414 C6
- I415 C6
- I416 D6
- I417 D6
- I418 D6
- I419 D6
- I420 D3
- I421 D4
- I422 D4
- I423 E4
- I424 E4
- I425 F4
- I426 A3
- I427 C4
- I428 C4
- I429 C2
- I430 C2
- I431 D4
- I432 D2

## B06A YPBPR & REAR IO

**B06A**



|           |         |
|-----------|---------|
| 1601-1 B2 | I615 B4 |
| 1601-2 D1 | I623 D9 |
| 1601-3 B2 | I627 D9 |
| 1603 E2   | I631 C4 |
| 1606 B7   | I632 D3 |
| 1607 C7   | I633 B1 |
| 1608 D3   | I635 E4 |
| 1609 C3   | I636 F4 |

**A** 1611 D7  
1612 D2  
1613 D7  
1614 F2  
1615-1 B7  
1615-2 C7  
1615-3 D7  
1618 F2  
1619 E7  
2600 B3  
2601 E2  
2602 B8  
2603 B8  
2606 C8  
2607 C9  
2608 D9  
2609 D4  
2610 D9  
2612 D9  
2613 F4  
2614 F4  
2615 E4  
2616 F4  
2617 D2

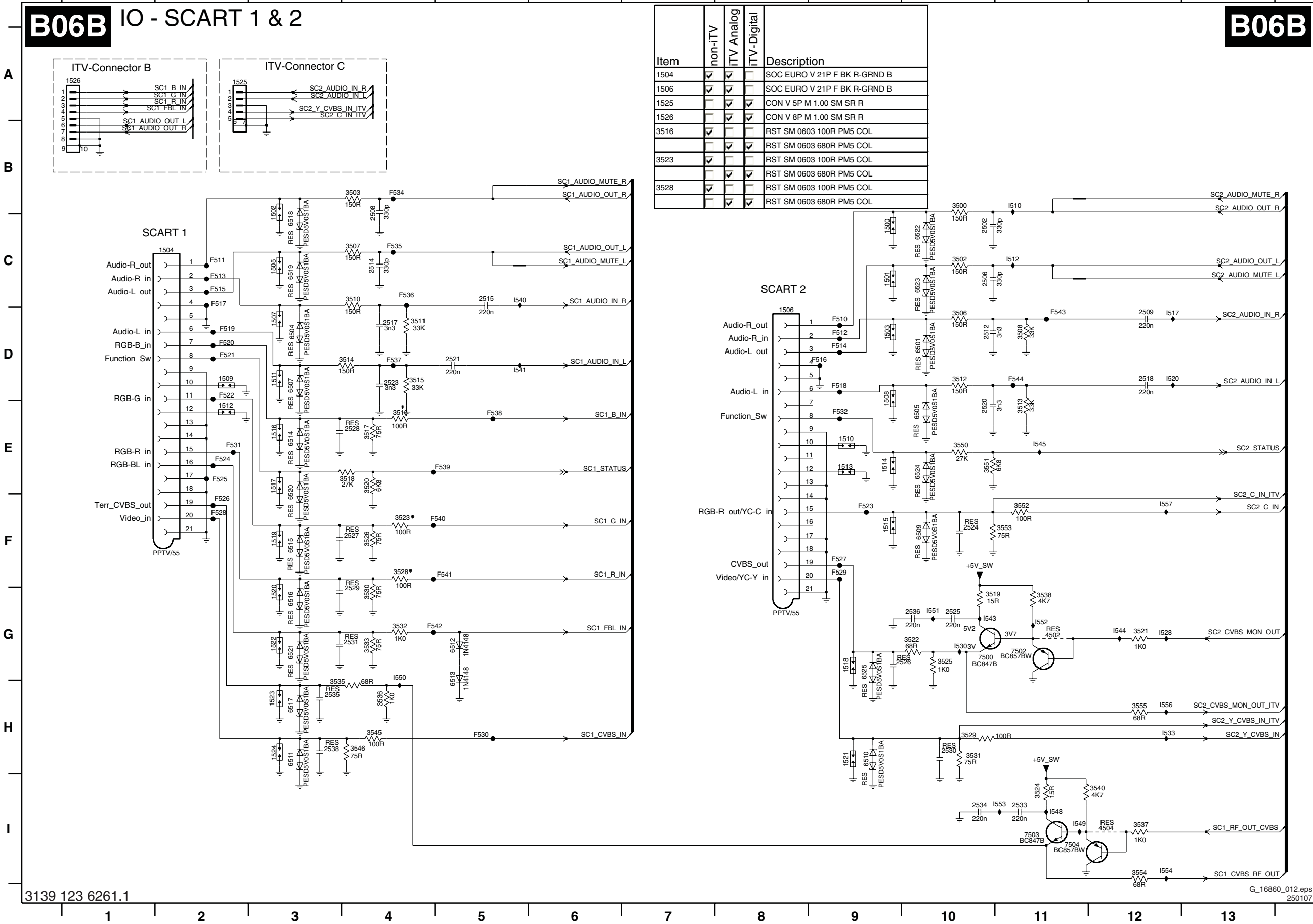
**C** 3600 B4  
3601 B8  
3602 C4  
3603 B8  
3604 B4  
3605 C8  
3607 D8  
3608 D9  
3609 C2  
3611 D8  
3612 D9

**D** 3613 E1  
3615 F3  
3616 F3  
3617 B9  
3618 B9  
3619 C9  
3620 F3  
3621 E3  
3622 D4  
3623 D4  
3624 E4  
3625 D4

**E** 4601 C2  
4602 D2  
4603 E5  
4604 F5  
6604 C3  
6605 G3  
6606 D3  
6607 F3  
6610 B8  
6611 C8  
6612 C8  
6613 D8  
6614 D8  
6615 E2  
7601 D4  
F601 B3  
F602 C3  
F603 D2  
F604 D1  
F605 B7  
F606 B7  
F607 C7  
F608 D7  
F609 D7  
F610 F3  
F611 E3  
F612 F7  
F613 F7  
F614 C7  
F615 C2  
F616 F1  
I610 C10  
I611 D10

SSB: I/O Scart 1 & 2

B06B IO - SCART 1 & 2

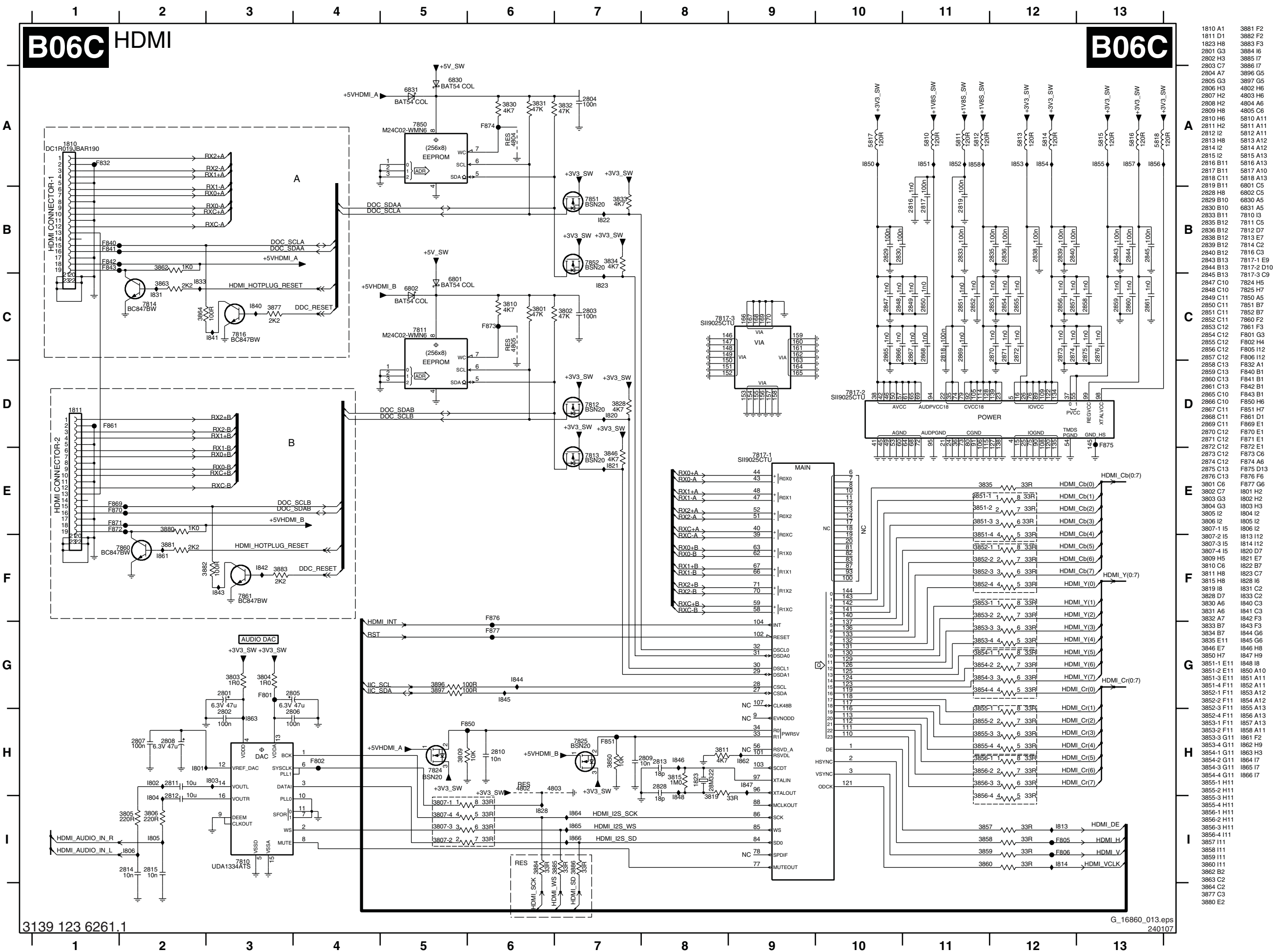


- 1500 C9
- 1501 C9
- 1502 C3
- 1503 D9
- 1504 C2
- 1505 C3
- 1506 D8
- 1507 D3
- 1508 E9
- 1509 D2
- 1510 E9
- 1511 D3
- 1512 E2
- 1513 E9
- 1514 E9
- 1515 F9
- 1516 E3
- 1517 E3
- 1518 G9
- 1519 F3
- 1520 G3
- 1521 H9
- 1522 G3
- 1523 H3
- 1524 H3
- 1525 A2
- 1526 A1
- 2502 C10
- 2506 C10
- 2508 B4
- 2509 D12
- 2512 D10
- 2514 C4
- 2515 C5
- 2517 D4
- 2518 D12
- 2520 E10
- 2521 D5
- 2523 D4
- 2524 F10
- 2525 G10
- 2526 G10
- 2527 F4
- 2528 E4
- 2529 F4
- 2530 H10
- 2531 G4
- 2533 I11
- 2534 I10
- 2535 H3
- 2536 G10
- 2538 H3
- 3500 B10
- 3502 C10
- 3503 B4
- 3506 D10
- 3507 C4
- 3508 D11
- 3510 C4
- 3511 D4
- 3512 D11
- 3513 E11
- 3514 D4
- 3515 D4
- 3516 E4
- 3517 E4
- 3518 E3
- 3519 G10
- 3520 E4
- 3521 G12
- 3522 G10
- 3523 F4
- 3524 I11
- 3525 G10
- 3526 F4
- 3528 F4
- 3529 H10
- 3530 G4
- 3531 H10
- 3532 G4
- 3533 G4
- 3535 H3
- 3536 H4
- 3537 I12
- 3538 G11
- 3540 I12
- 3545 H4
- 3546 H4
- 3550 E10
- 3551 E10
- 3552 F11
- 3553 F11
- 3554 I12
- 3555 H12
- 4502 G11
- 4504 I12
- 6501 D10
- 6504 D3
- 6505 E10
- 6507 D3
- 6509 F10
- 6510 H9
- 6511 H3
- 6512 G5
- 6513 G5
- 6514 E3
- 6515 F3
- 6516 G3
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- 6519 C3
- 6520 E3
- 6521 G3
- 6522 C10
- 6523 C10
- 6524 E10
- 6525 G9
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- 7502 G11
- 7503 I11
- 7504 I11
- 7505 C2
- 7506 D8
- 7507 D3
- 7508 E9
- 7509 D2
- 7510 E9
- 7511 D3
- 7512 E2
- 7513 E9
- 7514 E9
- 7515 F9
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- 7521 H9
- 7522 G3
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- 7525 A2
- 7526 A1
- 7527 F9
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- 7529 F9
- 7530 H5
- 7531 E2
- 7532 E9
- 7534 B4
- 7535 C4
- 7536 C4
- 7537 D4
- 7538 E5
- 7539 E4
- 7540 F4
- 7541 F5
- 7542 G4
- 7543 D11
- 7544 D11
- 7545 B11
- 7546 C11
- 7547 D12
- 7548 G12
- 7549 G10
- 7550 H12
- 7551 C5
- 7552 D5
- 7553 G10
- 7554 G12
- 7555 E11
- 7556 I11
- 7557 G4
- 7558 G4
- 7559 G10
- 7560 E4
- 7561 G12
- 7562 G10
- 7563 F4
- 7564 G10
- 7565 H10
- 7566 H10
- 7567 H10
- 7568 H10
- 7569 H10
- 7570 H10
- 7571 H10
- 7572 H10
- 7573 H10
- 7574 H10
- 7575 H10
- 7576 H10
- 7577 H10
- 7578 H10
- 7579 H10
- 7580 H10
- 7581 H10
- 7582 H10
- 7583 H10
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- 7585 H10
- 7586 H10
- 7587 H10
- 7588 H10
- 7589 H10
- 7590 H10
- 7591 H10
- 7592 H10
- 7593 H10
- 7594 H10
- 7595 H10
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- 7598 H10
- 7599 H10
- 7600 H10

SSB: HDMI

B06C HDMI

B06C

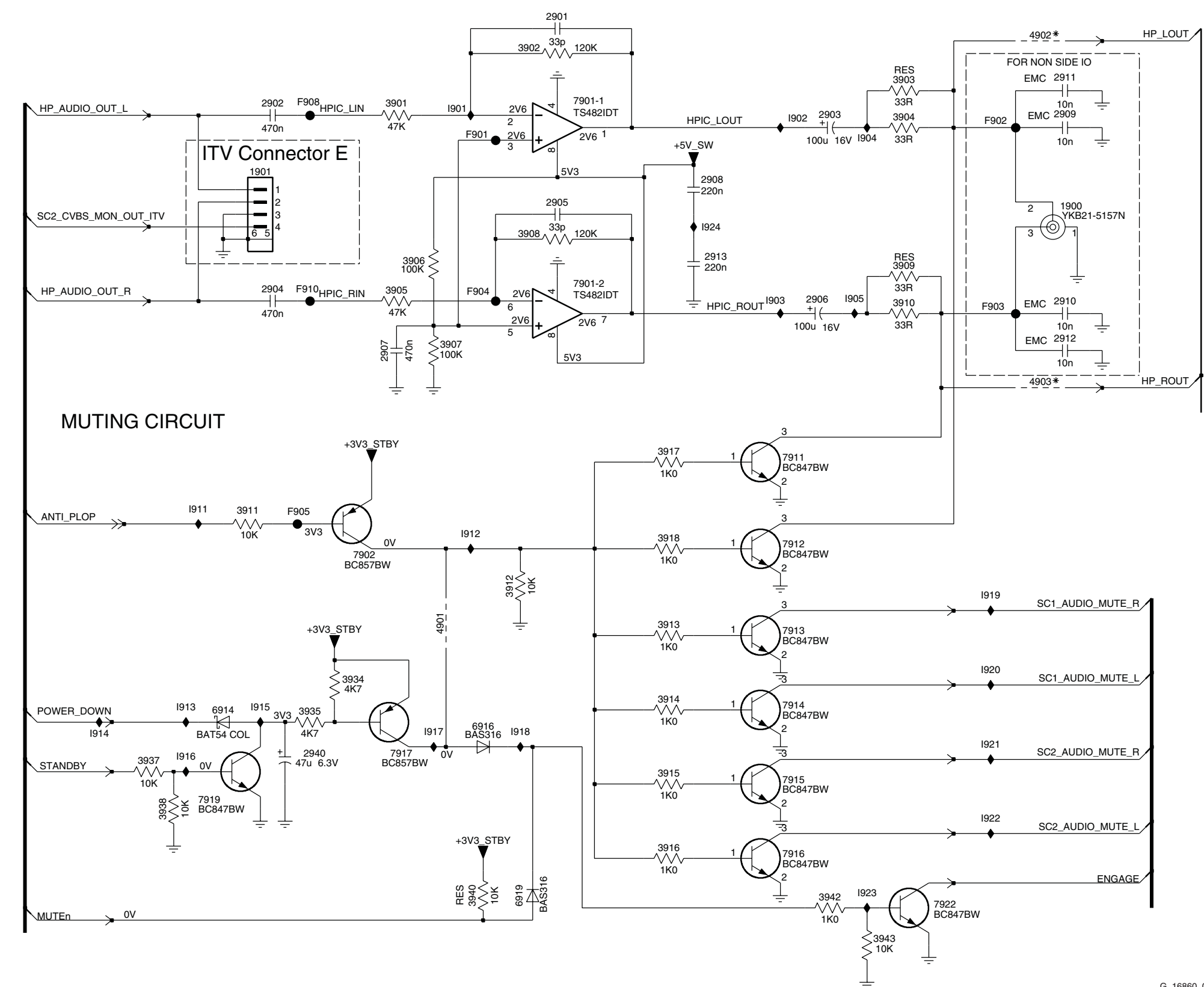


|            |            |
|------------|------------|
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| 1811 D1    | 3882 F2    |
| 1823 H8    | 3883 F3    |
| 2801 G3    | 3884 I6    |
| 2802 H3    | 3885 I7    |
| 2803 C7    | 3886 I7    |
| 2804 A7    | 3886 G5    |
| 2805 G3    | 3887 G5    |
| 2806 H3    | 4802 H6    |
| 2807 H2    | 4803 H6    |
| 2808 H2    | 4804 A6    |
| 2809 H8    | 4805 C6    |
| 2810 H6    | 5810 A11   |
| 2811 H2    | 5811 A11   |
| 2812 I2    | 5812 A11   |
| 2813 H8    | 5813 A12   |
| 2814 I2    | 5814 A12   |
| 2815 I2    | 5815 A13   |
| 2816 B11   | 5816 A13   |
| 2817 B11   | 5817 A10   |
| 2818 C11   | 5818 A13   |
| 2819 B11   | 6801 C5    |
| 2828 H8    | 6802 C5    |
| 2829 B10   | 6830 A5    |
| 2830 B10   | 6831 A5    |
| 2833 B11   | 7810 I3    |
| 2835 B12   | 7811 C5    |
| 2836 B12   | 7812 D7    |
| 2838 B12   | 7813 E7    |
| 2839 B12   | 7814 C2    |
| 2840 I2    | 7816 C3    |
| 2843 B13   | 7817-1 E9  |
| 2844 B13   | 7817-2 D10 |
| 2845 B13   | 7817-3 C9  |
| 2847 C10   | 7824 H5    |
| 2848 C10   | 7825 H7    |
| 2849 C11   | 7850 A5    |
| 2850 C11   | 7851 B7    |
| 2851 C11   | 7852 B7    |
| 2852 C11   | 7850 F2    |
| 2853 C12   | 7861 F3    |
| 2854 C12   | F801 G3    |
| 2855 C12   | F802 H4    |
| 2856 C12   | F805 I12   |
| 2857 C12   | F806 I12   |
| 2858 C13   | F832 A1    |
| 2859 C13   | F840 B1    |
| 2860 C13   | F841 B1    |
| 2861 C13   | F842 B1    |
| 2865 C10   | F843 B1    |
| 2866 C10   | F850 H6    |
| 2867 C11   | F851 H7    |
| 2868 C11   | F861 D1    |
| 2869 C11   | F869 E1    |
| 2870 C12   | F870 E1    |
| 2871 C12   | F871 E1    |
| 2872 C12   | F872 E1    |
| 2873 C12   | F873 C6    |
| 2874 C12   | F874 A6    |
| 2875 C13   | F875 D13   |
| 2876 C13   | F876 F6    |
| 3801 C6    | F877 G6    |
| 3802 C7    | I801 H2    |
| 3803 G3    | I802 H2    |
| 3804 G3    | I803 H3    |
| 3805 I2    | I804 I2    |
| 3806 I2    | I805 I2    |
| 3807-1 I5  | I806 I2    |
| 3807-2 I5  | I813 I12   |
| 3807-3 I5  | I814 I12   |
| 3807-4 I5  | I820 D7    |
| 3809 H5    | I821 E7    |
| 3810 C6    | I822 B7    |
| 3811 H8    | I823 C7    |
| 3815 H8    | I828 I6    |
| 3819 I8    | I831 C2    |
| 3828 D7    | I833 C2    |
| 3830 A6    | I840 C3    |
| 3831 A6    | I841 C3    |
| 3832 A7    | I842 F3    |
| 3833 B7    | I843 F3    |
| 3834 B7    | I844 G6    |
| 3835 E11   | I845 G6    |
| 3846 E7    | I846 H8    |
| 3850 H7    | I847 H8    |
| 3851-1 E11 | I848 I8    |
| 3851-2 E11 | I850 A10   |
| 3851-3 E11 | I851 A11   |
| 3851-4 F11 | I852 A11   |
| 3852-1 F11 | I853 A12   |
| 3852-2 F11 | I854 A12   |
| 3852-3 F11 | I855 A13   |
| 3852-4 F11 | I856 A13   |
| 3853-1 F11 | I857 A13   |
| 3853-2 F11 | I858 A11   |
| 3853-3 G11 | I861 F2    |
| 3853-4 G11 | I862 H9    |
| 3854-1 G11 | I863 H3    |
| 3854-2 G11 | I864 I7    |
| 3854-3 G11 | I865 I7    |
| 3854-4 G11 | I866 I7    |
| 3855-1 H11 |            |
| 3855-2 H11 |            |
| 3855-3 H11 |            |
| 3855-4 H11 |            |
| 3856-1 H11 |            |
| 3856-2 H11 |            |
| 3856-3 H11 |            |
| 3856-4 H11 |            |
| 3857 I11   |            |
| 3858 I11   |            |
| 3859 I11   |            |
| 3860 I11   |            |
| 3862 B2    |            |
| 3863 C2    |            |
| 3864 C2    |            |
| 3877 C3    |            |
| 3880 E2    |            |

SSB: Headphone Amp & Muting

B06D HEADPHONE AMP & MUTING

B06D



- 1900 B7
- 1901 B2
- 2901 A4
- 2902 A2
- 2903 B5
- 2904 C2
- 2905 B4
- 2906 C5
- 2907 C3
- 2908 B5
- 2909 A7
- 2910 C7
- 2911 A7
- 2912 C7
- 2913 B5
- 2940 E2
- 3901 A3
- 3902 A4
- 3903 A6
- 3904 B6
- 3905 C3
- 3906 B3
- 3907 C3
- 3908 B4
- 3909 B6
- 3910 C6
- 3911 D2
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- 3914 E4
- 3915 E4
- 3916 F4
- 3917 C4
- 3918 D4
- 3919 E3
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- 3991 F6
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- 3998 F6
- 3999 F6
- 4000 F6

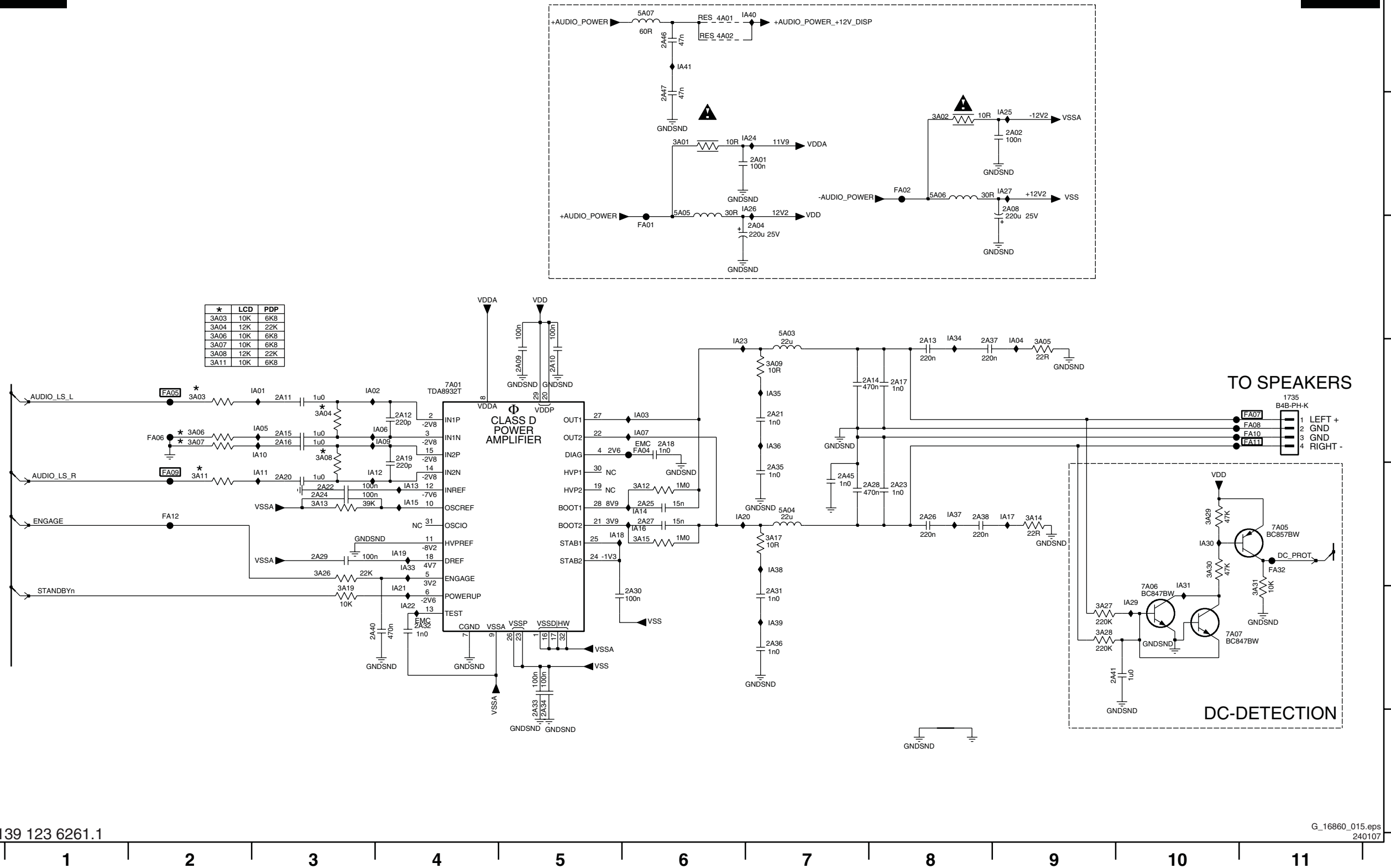
| Item | EU | ITV | non-ITV | US | ITV | Description                  |
|------|----|-----|---------|----|-----|------------------------------|
| 1901 |    |     |         |    |     | CON V 4P M 1.00 SM SR R      |
| 2901 |    |     |         |    |     | CER1 0603 NP0 50V 33P COL    |
| 2902 |    |     |         |    |     | CER2 0603 Y5V 10V 470N COL   |
| 2903 |    |     |         |    |     | ELCAP SM 16V 100U PM20 COL R |
| 2904 |    |     |         |    |     | CER2 0603 Y5V 10V 470N COL   |
| 2905 |    |     |         |    |     | CER1 0603 NP0 50V 33P COL    |
| 2906 |    |     |         |    |     | ELCAP SM 16V 100U PM20 COL R |
| 2907 |    |     |         |    |     | CER2 0603 Y5V 10V 470N COL   |
| 2909 |    |     |         |    |     | CER2 0603 X7R 50V 10N COL    |
| 2910 |    |     |         |    |     | CER2 0603 X7R 50V 10N COL    |
| 2911 |    |     |         |    |     | CER2 0603 X7R 50V 10N COL    |
| 2912 |    |     |         |    |     | CER2 0603 X7R 50V 10N COL    |
| 3901 |    |     |         |    |     | RST SM 0603 47K PM5 COL      |
| 3902 |    |     |         |    |     | RST SM 0603 RC21 120K PM5 R  |
| 3904 |    |     |         |    |     | RST SM 0603 33R PM5 COL      |
| 3905 |    |     |         |    |     | RST SM 0603 47K PM5 COL      |
| 3906 |    |     |         |    |     | RST SM 0603 100K PM5 COL     |
| 3907 |    |     |         |    |     | RST SM 0603 100K PM5 COL     |
| 3908 |    |     |         |    |     | RST SM 0603 RC21 120K PM5 R  |
| 3910 |    |     |         |    |     | RST SM 0603 33R PM5 COL      |
| 3917 |    |     |         |    |     | RST SM 0603 1K PM5 COL       |
| 3918 |    |     |         |    |     | RST SM 0603 1K PM5 COL       |
| 4902 |    |     |         |    |     | RST SM 0603 JUMP. 0R05 COL   |
| 4903 |    |     |         |    |     | RST SM 0603 JUMP. 0R05 COL   |
| 7901 |    |     |         |    |     | IC SM TS482ID (ST00) R       |
| 7911 |    |     |         |    |     | TRA SIG SM BC847BW (COL) R   |
| 7912 |    |     |         |    |     | TRA SIG SM BC847BW (COL) R   |

- 7901-1 A4
- 7901-2 B4
- 7902 D3
- 7911 C5
- 7912 D5
- 7913 D5
- 7914 E5
- 7915 E5
- 7916 F5
- 7917 E3
- 7919 E2
- 7922 F6
- F901 B3
- F902 B6
- F903 C6
- F904 C3
- F905 D2
- F908 A2
- F910 B2
- I901 A3
- I902 B5
- I903 C5
- I904 B6
- I905 C5
- I911 D2
- I912 D3
- I913 E2
- I914 E1

SSB: Audio

B07 AUDIO

B07



- 1735 D11  
2A01 B7  
2A02 B9  
2A04 C7  
2A08 B9  
2A09 D5  
2A10 D5  
2A11 D3  
2A12 D4  
2A13 D8  
2A14 D8  
2A15 D3  
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2A41 F9  
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FA12 E2  
FA32 E11  
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IA02 D3  
IA03 D6  
IA04 D9  
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IA06 D4  
IA07 D6  
IA09 D4  
IA10 D3  
IA11 E3  
IA12 E3  
IA13 E4  
IA14 E6  
IA15 E4  
IA16 E6  
IA17 E9  
IA18 E5  
IA19 E4  
IA20 E6  
IA21 F4  
IA22 F4  
IA23 D6  
IA24 B7  
IA25 B9  
IA26 B7  
IA27 B9  
IA29 F10  
IA30 E10  
IA31 E10  
IA33 E4  
IA34 C8  
IA35 D7  
IA36 D7  
IA37 E8  
IA38 E7  
IA39 F7  
IA40 A7  
IA41 A6

## SSB: SRP List

## 1.1. Introduction

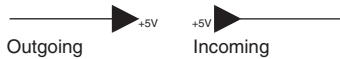
SRP (Service Reference Protocol) is a software tool that creates a list with all references to signal lines. The list contains references to the signals within all schematics of a PWB. It replaces the text references currently printed next to the signal names in the schematics. These printed references are created manually and are therefore not guaranteed to be 100% correct. In addition, in the current crowded schematics there is often none or very little place for these references. Some of the PWB schematics will use SRP while others will still use the manual references. Either there will be an SRP reference list for a schematic, or there will be printed references in the schematic.

## 1.2. Non-SRP Schematics

There are several different signals available in a schematic:

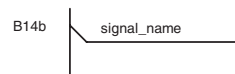
## 1.2.1. Power Supply Lines

All power supply lines are available in the supply line overview (see chapter 6). In the schematics (see chapter 7) is not indicated where supplies are coming from or going to. It is however indicated if a supply is incoming (created elsewhere), or outgoing (created or adapted in the current schematic).



## 1.2.2. Normal Signals

For normal signals, a schematic reference (e.g. B14b) is placed next to the signals.

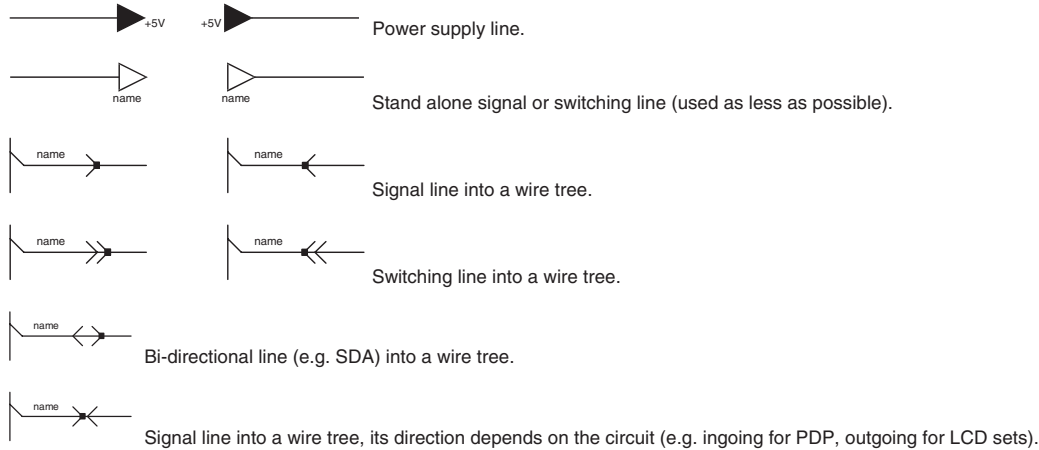


## 1.2.3. Grounds

For normal and special grounds (e.g. GNDHOT or GND3V3 etc.), nothing is indicated.

## 1.3. SRP Schematics

SRP is a tool, which automatically creates a list with signal references, indicating on which schematic the signals are used. A reference is created for all signals indicated with an SRP symbol, these symbols are:



## Remarks:

- When there is a black dot on the "signal direction arrow" it is an SRP symbol, so there will be a reference to the signal name in the SRP list.
- All references to normal grounds (Ground symbols without additional text) are not listed in the reference list, this to keep it concise.
- Signals that are not used in multiple schematics, but only once or several times in the same schematic, are included in the SRP reference list, but only with one reference.

## Additional Tip:

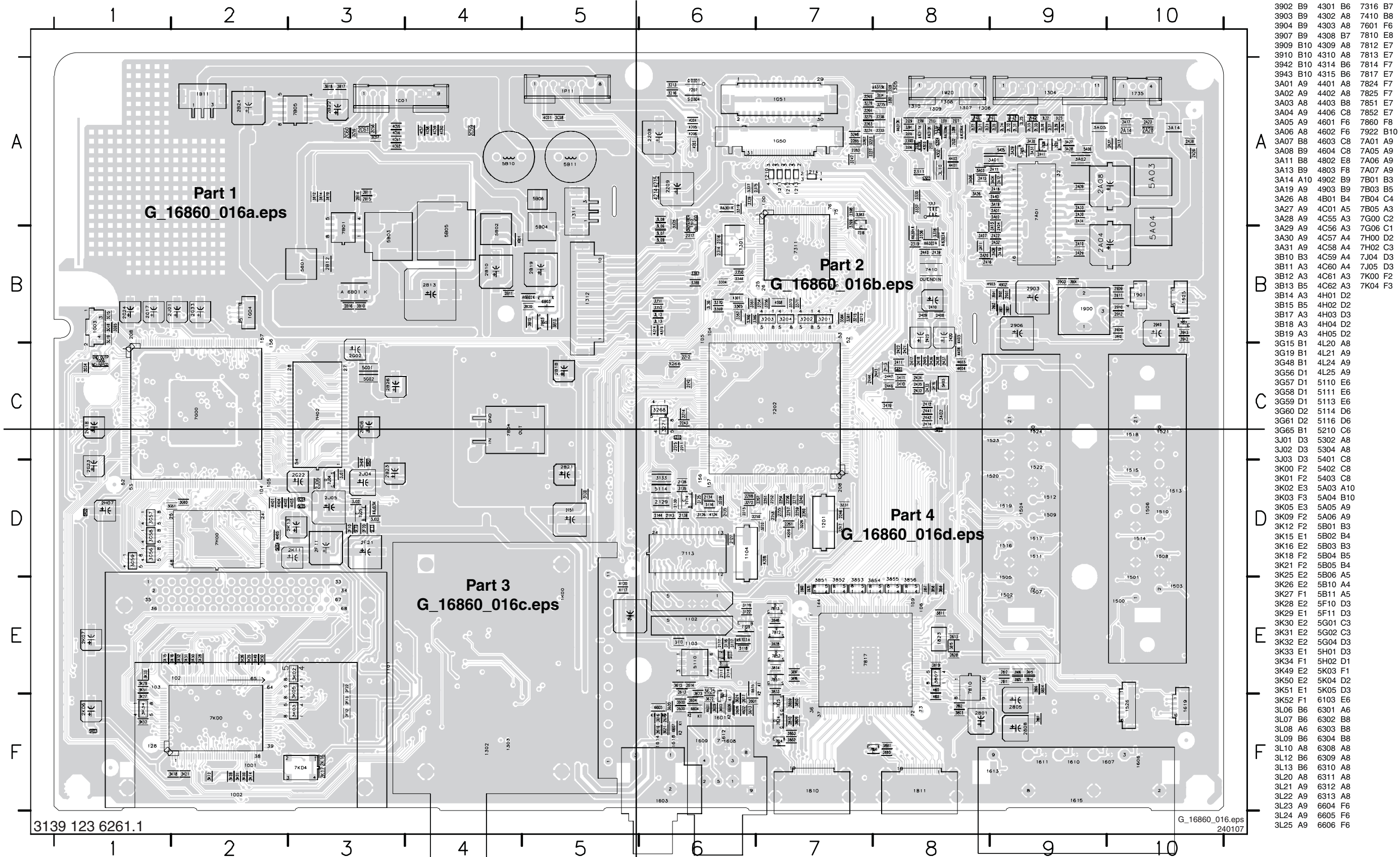
When using the PDF service manual file, you can very easily search for signal names and follow the signal over all the schematics. In Adobe PDF reader:

- Select the signal name you want to search for, with the "Select text" tool.
- Copy and paste the signal name in the "Search PDF" tool.
- Search for all occurrences of the signal name.
- Now you can quickly jump between the different occurrences and follow the signal over all schematics. It is advised to "zoom in" to e.g. 150% to see clearly, which text is selected. Then you can zoom out, to get an overview of the complete schematic.

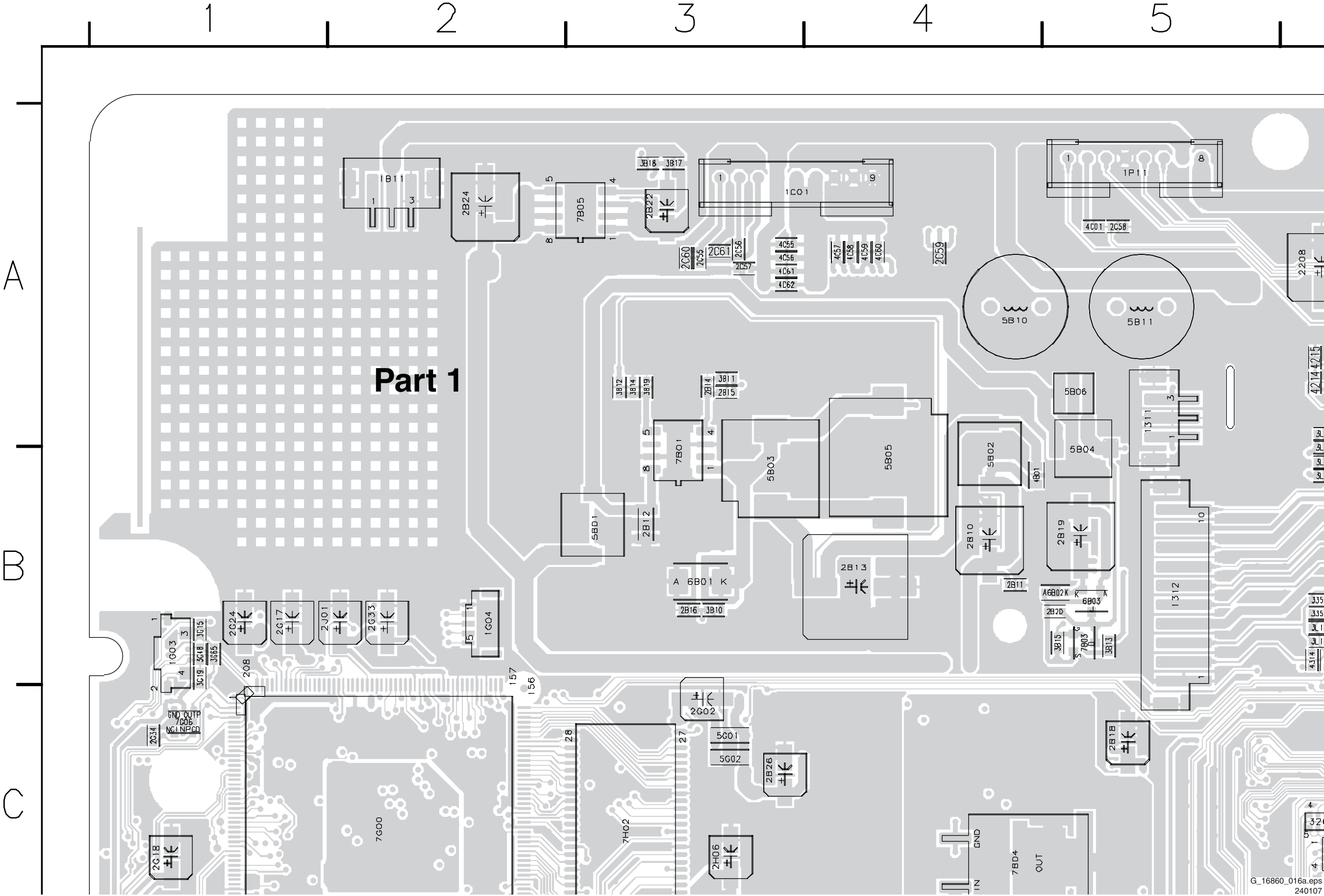
PS. It is recommended to use at least Adobe PDF (reader) version 6.x, due to better search possibilities in this version.

| Netname      | Schematic  | ALE_EMU         | B04A (1x) | HDMI_Y(0)       | B04B (1x) | MIU_ADDR(22)   | B03C (1x) | SC1_AUDIO_MUTE_R | B06B (1x) | SIF          | B04C (1x) |
|--------------|------------|-----------------|-----------|-----------------|-----------|----------------|-----------|------------------|-----------|--------------|-----------|
| +12V_DISP    | B02 (1x)   | ALE_EMU         | B04B (1x) | HDMI_Y(0)       | B06C (1x) | MIU_ADDR(22)   | B03D (1x) | SC1_AUDIO_MUTE_R | B06D (1x) | SIF1         | B03A (2x) |
| +12V_DISP    | B04A (1x)  | ANTI_PLOP       | B04A (1x) | HDMI_Y(0:7)     | B04B (1x) | MIU_ADDR(22)   | B03E (1x) | SC1_AUDIO_OUT_L  | B04C (1x) | SIF2         | B03A (2x) |
| +12V_DISP    | B04B (1x)  | ANTI_PLOP       | B06D (1x) | HDMI_Y(0:7)     | B06C (1x) | MIU_ADDR(23)   | B03C (1x) | SC1_AUDIO_OUT_L  | B06B (2x) | STANDBY      | B02 (2x)  |
| +1V2_MOJO    | B02 (1x)   | AUDIO_LS_L      | B04C (1x) | HDMI_Y(1)       | B04B (1x) | MIU_ADDR(23)   | B03D (1x) | SC1_AUDIO_OUT_R  | B04C (1x) | STANDBYn     | B04A (1x) |
| +1V2_MOJO    | B03D (2x)  | AUDIO_LS_L      | B07 (1x)  | HDMI_Y(1)       | B06C (1x) | MIU_ADDR(24)   | B03C (1x) | SC1_AUDIO_OUT_R  | B06B (2x) | STANDBYn     | B04A (1x) |
| +1V8_SW      | B02 (1x)   | AUDIO_LS_R      | B04C (1x) | HDMI_Y(2)       | B04B (1x) | MIU_ADDR(24)   | B03D (1x) | SC1_B_IN         | B04B (1x) | STANDBYn     | B04B (1x) |
| +1V8_SW      | B03B (2x)  | AUDIO_LS_R      | B07 (1x)  | HDMI_Y(2)       | B06C (1x) | MIU_ADDR(3)    | B03C (1x) | SC1_B_IN         | B06B (2x) | STANDBYn     | B04B (1x) |
| +1V8_SW      | B03F (1x)  | -AUDIO_POWER    | B02 (1x)  | HDMI_Y(3)       | B04B (1x) | MIU_ADDR(3)    | B03D (1x) | SC1_CVBS_IN      | B04B (1x) | STANDBYn     | B07 (1x)  |
| +1V8_SW      | B04B (3x)  | -AUDIO_POWER    | B07 (1x)  | HDMI_Y(3)       | B06C (1x) | MIU_ADDR(3)    | B03E (1x) | SC1_CVBS_IN      | B06B (1x) | STV_CS       | B03C (1x) |
| +1V8_SW      | B06C (3x)  | BACKLIGHT_BOOST | B02 (1x)  | HDMI_Y(4)       | B04B (1x) | MIU_ADDR(4)    | B03C (1x) | SC1_CVBS_RF_OUT  | B04A (1x) | STV_A25      | B03D (1x) |
| +3V3         | B03C (3x)  | BACKLIGHT_BOOST | B04A (1x) | HDMI_Y(4)       | B06C (1x) | MIU_ADDR(4)    | B03D (1x) | SC1_CVBS_RF_OUT  | B06B (1x) | STV_CS       | B03C (1x) |
| +3V3         | B03D (8x)  | BL_ADJUST       | B02 (1x)  | HDMI_Y(5)       | B06C (1x) | MIU_ADDR(5)    | B03C (1x) | SC1_FBL_IN       | B04B (1x) | STV_CS       | B03D (1x) |
| +3V3         | B03E (2x)  | BL_ADJUST       | B04A (1x) | HDMI_Y(5)       | B06C (1x) | MIU_ADDR(5)    | B03D (1x) | SC1_FBL_IN       | B06B (2x) | STV_INT      | B03C (1x) |
| +3V3         | B03F (1x)  | BL_ON_OFF       | B04A (1x) | HDMI_Y(6)       | B04B (1x) | MIU_ADDR(6)    | B03C (1x) | SC1_G_IN         | B04B (1x) | STV_INT      | B03D (1x) |
| +3V3         | B03F (1x)  | BL_ON_OFF       | B02 (1x)  | HDMI_Y(6)       | B06C (1x) | MIU_ADDR(6)    | B03E (1x) | SC1_G_IN         | B06B (2x) | STV_TDO      | B03B (1x) |
| +3V3_BUF     | B03C (4x)  | BL_ON_OFF       | B04A (1x) | HDMI_Y(7)       | B04B (1x) | MIU_ADDR(6)    | B03C (1x) | SC1_R_IN         | B04B (1x) | STV_TDO      | B03C (1x) |
| +3V3_CORE    | B03C (2x)  | BOLT_ON_SCL     | B04A (2x) | HDMI_Y(7)       | B06C (1x) | MIU_ADDR(6)    | B03D (1x) | SC1_R_IN         | B06B (2x) | TDA_CLK      | B03B (1x) |
| +3V3_MOJO    | B02 (1x)   | BOLT_ON_SDA     | B04A (2x) | HP_AUDIO_OUT_L  | B04C (1x) | MIU_ADDR(6)    | B03E (1x) | SC1_RF_OUT_CVBS  | B04B (1x) | TDA_CLK      | B03C (1x) |
| +3V3_MOJO    | B03F (2x)  | CE              | B04A (1x) | HP_AUDIO_OUT_R  | B06D (1x) | MIU_ADDR(7)    | B03C (1x) | SC1_RF_OUT_CVBS  | B06B (1x) | TDA_DAT(0)   | B03B (1x) |
| +3V3_MOJO    | B03E (4x)  | COMP_AUDIO_IN_L | B04C (1x) | HP_AUDIO_OUT_R  | B04C (1x) | MIU_ADDR(7)    | B03D (1x) | SC1_STATUS       | B04A (1x) | TDA_DAT(0)   | B03C (1x) |
| +3V3_NOR48   | B02 (1x)   | COMP_AUDIO_IN_L | B06A (1x) | I2C_LOCAL_SCL   | B06D (1x) | MIU_ADDR(7)    | B03E (1x) | SC1_STATUS       | B06B (1x) | TDA_DAT(0:7) | B03B (1x) |
| +3V3_STBY    | B02 (1x)   | COMP_AUDIO_IN_R | B04C (1x) | I2C_LOCAL_SCL   | B03B (1x) | MIU_ADDR(8)    | B03C (1x) | SC2_AUDIO_IN_L   | B04C (1x) | TDA_DAT(1)   | B03B (1x) |
| +3V3_STBY    | B04A (30x) | CPU_RST         | B06A (1x) | I2C_LOCAL_SCL   | B03C (1x) | MIU_ADDR(8)    | B03D (1x) | SC2_AUDIO_IN_L   | B06B (2x) | TDA_DAT(1)   | B03C (1x) |
| +3V3_STBY    | B06D (3x)  | CS              | B04A (1x) | I2C_LOCAL_SCL   | B03D (1x) | MIU_ADDR(8)    | B03E (1x) | SC2_AUDIO_IN_R   | B04C (1x) | TDA_DAT(2)   | B03B (1x) |
| +3V3_STBY    | B03C (10x) | CS              | B04B (1x) | I2C_LOCAL_SCL   | B03E (1x) | MIU_ADDR(9)    | B03C (1x) | SC2_AUDIO_IN_R   | B06B (2x) | TDA_DAT(2)   | B03C (1x) |
| +3V3_SW      | B02 (1x)   | CTRL_DISP1      | B04A (8x) | I2C_LOCAL_SDA   | B03C (1x) | MIU_ADDR(9)    | B03E (1x) | SC2_AUDIO_MUTE_L | B06D (1x) | TDA_DAT(3)   | B03C (1x) |
| +3V3_SW      | B04B (8x)  | CTRL_DISP1_up   | B04B (1x) | I2C_LOCAL_SDA   | B03D (1x) | MIU_DATA(0)    | B03C (1x) | SC2_AUDIO_MUTE_R | B06B (1x) | TDA_DAT(4)   | B03B (1x) |
| +3V3_SW      | B04B (13x) | CTRL_DISP1_up   | B04B (1x) | I2C_LOCAL_SDA   | B03E (1x) | MIU_DATA(0)    | B03D (1x) | SC2_AUDIO_MUTE_R | B06D (1x) | TDA_DAT(4)   | B03C (1x) |
| +3V3_SW      | B06C (19x) | CTRL_DISP2      | B04B (2x) | I2C_TDA_SCL     | B03A (1x) | MIU_DATA(0)    | B03E (1x) | SC2_AUDIO_OUT_L  | B04C (1x) | TDA_DAT(5)   | B03B (1x) |
| +3V3_VDDP    | B03D (3x)  | CTRL_DISP3      | B04B (2x) | I2C_TDA_SCL     | B03B (1x) | MIU_DATA(0:15) | B03D (1x) | SC2_AUDIO_OUT_L  | B06B (1x) | TDA_DAT(5)   | B03C (1x) |
| +3V3clean    | B03D (1x)  | CTRL_DISP4      | B04B (2x) | I2C_TDA_SDA     | B03A (1x) | MIU_DATA(1)    | B03E (1x) | SC2_AUDIO_OUT_R  | B04C (1x) | TDA_DAT(6)   | B03B (1x) |
| +3V3clean    | B03F (1x)  | CTRL_DISP4_up   | B04B (1x) | IBO_B_IN        | B03F (1x) | MIU_DATA(1)    | B03D (1x) | SC2_C_IN         | B04B (1x) | TDA_DAT(7)   | B03B (1x) |
| +3V3FE       | B03B (6x)  | CTRL_DISP4_up   | B04B (1x) | IBO_B_IN        | B04B (1x) | MIU_DATA(1)    | B03E (1x) | SC2_C_IN         | B06B (2x) | TDA_DAT(7)   | B03C (1x) |
| +5V_AUD      | B04C (3x)  | CVBS_RF         | B03A (1x) | IBO_CVBS_IN     | B03F (1x) | MIU_DATA(10)   | B03D (1x) | SC2_CVBS_MON_OUT | B04B (1x) | TDA_SYNC     | B03B (1x) |
| +5V_D        | B04C (4x)  | CVBS_RF         | B04B (1x) | IBO_CVBS_IN     | B04B (1x) | MIU_DATA(10)   | B03E (1x) | SC2_CVBS_MON_OUT | B06B (1x) | TDA_SYNC     | B03C (1x) |
| +5V_IF       | B03A (4x)  | CX_AVDD_ADC1    | B02 (4x)  | IBO_G_IN        | B03F (1x) | MIU_DATA(11)   | B03D (1x) | SC2_CVBS_MON_OUT | B06D (1x) | TDA_VALID    | B03B (1x) |
| +5V_STANDBY  | B04A (4x)  | CX_AVDD_ADC2    | B04B (2x) | IBO_G_IN        | B04B (1x) | MIU_DATA(11)   | B03E (1x) | SC2_STATUS       | B04A (1x) | TDA_VALID    | B03C (1x) |
| +5V_STANDBY  | B04B (2x)  | CX_AVDD_ADC3    | B04B (2x) | IBO_IRQ         | B03D (1x) | MIU_DATA(12)   | B03C (1x) | SC2_STATUS       | B06B (1x) | TS_CLK       | B03D (1x) |
| +5V_SW       | B02 (6x)   | CX_AVDD_ADC4    | B04B (2x) | IBO_IRQ         | B04B (1x) | MIU_DATA(12)   | B03E (1x) | SC2_Y_CVBS_IN    | B04B (1x) | TS_CLK       | B03D (1x) |
| +5V_SW       | B03A (4x)  | CX_AVDD3_ADC1   | B04B (2x) | IBO_R_IN        | B03F (1x) | MIU_DATA(13)   | B03D (1x) | SC2_Y_CVBS_IN    | B06B (2x) | TS_DATA(0)   | B03C (1x) |
| +5V_SW       | B03B (9x)  | CX_AVDD3_ADC2   | B04B (2x) | IBO_R_IN        | B04B (1x) | MIU_DATA(13)   | B03E (1x) | SDRAM_ADDR(0)    | B03D (1x) | TS_DATA(0)   | B03D (1x) |
| +5V_SW       | B03C (2x)  | CX_AVDD3_BG_ASS | B04B (2x) | IF_AGC_IBO      | B03A (1x) | MIU_DATA(14)   | B03D (1x) | SDRAM_ADDR(0:14) | B03D (1x) | TS_DATA(1)   | B03D (1x) |
| +5V_SW       | B03E (3x)  | CX_AVDD3_OUTBUF | B04B (2x) | IF_AGC_IBO      | B03B (1x) | MIU_DATA(15)   | B03C (1x) | SDRAM_ADDR(1)    | B03D (1x) | TS_DATA(2)   | B03C (1x) |
| +5V_SW       | B04A (1x)  | CX_PAVDD        | B04B (2x) | IF_ATV          | B03A (2x) | MIU_DATA(16)   | B03C (1x) | SDRAM_ADDR(2)    | B03D (1x) | TS_DATA(3)   | B03C (1x) |
| +5V_SW       | B04B (2x)  | CX_PAVDD1       | B04B (2x) | IF_ATV          | B03B (1x) | MIU_DATA(17)   | B03C (1x) | SDRAM_ADDR(3)    | B03D (1x) | TS_DATA(4)   | B03C (1x) |
| +5V_SW       | B04C (2x)  | CX_PAVDD2       | B04B (2x) | IC_SCL          | B03D (1x) | MIU_DATA(18)   | B03C (1x) | SDRAM_ADDR(4)    | B03D (1x) | TS_DATA(5)   | B03C (1x) |
| +5V_SW       | B06B (2x)  | CX_PVDOD        | B04B (2x) | IC_SCL          | B03D (1x) | MIU_DATA(19)   | B03C (1x) | SDRAM_ADDR(5)    | B03D (1x) | TS_DATA(6)   | B03C (1x) |
| +5V_SW       | B06D (1x)  | DC_PROT         | B04A (1x) | IC_SCL          | B04A (1x) | MIU_DATA(2)    | B03D (1x) | SDRAM_ADDR(6)    | B03E (1x) | TS_DATA(7)   | B03C (1x) |
| +5VHDMI_A    | B06C (3x)  | DC_PROT         | B07 (1x)  | IC_SCL          | B04B (2x) | MIU_DATA(3)    | B03E (1x) | SDRAM_ADDR(7)    | B03D (1x) | TS_DATA(8)   | B03C (1x) |
| +5VHDMI_B    | B03A (3x)  | DDC_RESET       | B04A (1x) | IC_SCL          | B04C (1x) | MIU_DATA(4)    | B03C (1x) | SDRAM_ADDR(8)    | B03D (1x) | TS_DATA(9)   | B03C (1x) |
| +5VVS        | B04C (2x)  | DDC_RESET       | B06C (2x) | IC_SCL          | B06C (1x) | MIU_DATA(5)    | B03C (1x) | SDRAM_ADDR(9)    | B03D (1x) | TS_DATA(10)  | B03C (1x) |
| +8V          | B02 (1x)   | DVB_SW          | B03A (1x) | IC_SCL_up       | B04A (2x) | MIU_DATA(6)    | B03E (1x) | SDRAM_ADDR(10)   | B03D (1x) | TS_DATA(11)  | B03C (1x) |
| +AUDIO_POWER | B04C (1x)  | DVB_SW          | B04B (1x) | IC_SDA          | B03D (1x) | MIU_DATA(7)    | B03C (1x) | SDRAM_ADDR(11)   | B03D (1x) | TS_DATA(12)  | B03C (1x) |
| +AUDIO_POWER | B06A (1x)  | E_PAGE          | B04A (1x) | IC_SDA          | B04A (1x) | MIU_DATA(8)    | B03C (1x) | SDRAM_ADDR(12)   | B03D (1x) | TS_DATA(13)  | B03C (1x) |
| +AUDIO_POWER | B07 (1x)   | ENGAGE          | B06D (1x) | IC_SDA          | B04B (2x) | MIU_DATA(9)    | B03C (1x) | SDRAM_ADDR(13)   | B03D (1x) | TS_DATA(14)  | B03C (1x) |
| +IO_POWER    | B03D (1x)  | ENGAGE          | B07 (1x)  | IC_SDA          | B04B (2x) | MIU_DATA(10)   | B03C (1x) | SDRAM_ADDR(14)   | B03D (1x) | TS_DATA(15)  | B03C (1x) |
| +IO_POWER    | B06B (7x)  | FE_LOCK         | B03B (1x) | IC_SDA          | B04C (1x) | MIU_DATA(11)   | B03C (1x) | SDRAM_ADDR(15)   | B03D (1x) | TS_DATA(16)  | B03C (1x) |
| +VTUN        | B02 (1x)   | FE_LOCK         | B03D (1x) | IC_SDA          | B06C (1x) | MIU_DATA(12)   | B03C (1x) | SDRAM_ADDR(16)   | B03D (1x) | TS_DATA(17)  | B03C (1x) |
| +VTUN        | B03A (1x)  | FRONT_C_IN      | B04B (1x) | IC_SDA_up       | B04A (2x) | MIU_DATA(13)   | B03C (1x) | SDRAM_ADDR(17)   | B03D (1x) | TS_DATA(18)  | B03C (1x) |
| +VTUN        | B04A (1x)  | FRONT_C_IN      | B06A (1x) | IC_SDA          | B04B (1x) | MIU_DATA(14)   | B03C (1x) | SDRAM_ADDR(18)   | B03D (1x) | TS_DATA(19)  | B03C (1x) |
| 10046_TDO    | B03B (1x)  | FRONT_Y_CVBS_IN | B06A (1x) | INT             | B04B (1x) | MIU_DATA(15)   | B03C (1x) | SDRAM_ADDR(19)   | B03D (1x) | TS_DATA(20)  | B03C (1x) |
| 10046_TDO    | B03D (1x)  | GNDDC           | B02 (1x)  | ISP             | B04A (1x) | MIU_DATA(16)   | B03C (1x) | SDRAM_ADDR(20)   | B03D (1x) | TS_DATA(21)  | B03C (1x) |
| 4MHZ_CLK     | B03A (1x)  | GNDSND          | B02 (3x)  | ITV_SPI_CLK     | B04A (2x) | MIU_DATA(17)   | B03D (1x) | SDRAM_ADDR(21)   | B03D (1x) | TS_DATA(22)  | B03C (1x) |
| 4MHZ_CLK     | B03B (1x)  | GNDSND          | B07 (21x) | ITV_SPI_DATA_IN | B04B (2x) | MIU_DATA(18)   | B03D (1x) | SDRAM_ADDR(22)   | B03D (1x) | TS_DATA(23)  | B03C (1x) |
| 4MHZ_MOJO    | B03D (1x)  | GNDSND          | B02 (1x)  | JTAG_TCK        | B03B (1x) | MIU_DATA(19)   | B03C (1x) | SDRAM_ADDR(23)   | B03D (1x) | TS_DATA(24)  | B03C (1x) |
| A(0)         | B04A (1x)  | GNDSND          | B02 (1x)  | JTAG_TCK        | B03C (1x) | MIU_DATA(20)   | B03C (1x) | SDRAM_ADDR(24)   | B03D (1x) | TS_DATA(25)  | B03C (1x) |
| A(0)         | B04B (1x)  | GNDSND          | B02 (1x)  | JTAG_TCK        | B03D (1x) | MIU_DATA(21)   | B03C (1x) | SDRAM_ADDR(25)   | B03D (1x) | TS_DATA(26)  | B03C (1x) |
| A(0:7)       | B04A (1x)  | GNDSND          | B02 (1x)  | JTAG_TMS        | B03B (1x) | MIU_DATA(22)   | B03C (1x) | SDRAM_ADDR(26)   | B03D (1x) | TS_DATA(27)  | B03C (1x) |
| A(0:7)       | B04B (1x)  | GNDSND          | B02 (1x)  | JTAG_TMS        | B03C (1x) | MIU_DATA(23)   | B03C (1x) | SDRAM_ADDR(27)   | B03D (1x) | TS_DATA(28)  | B03C (1x) |
| A(1)         | B04A (1x)  | GNDSND          | B02 (1x)  | JTAG_TMS        | B03D (1x) | MIU_DATA(24)   | B03C (1x) | SDRAM_ADDR(28)   | B03D (1x) | TS_DATA(29)  | B03C (1x) |
| A(1)         | B04B (1x)  | GNDSND          | B02 (1x)  | JTAG_TMS        | B03E (1x) | MIU_DATA(25)   | B03C (1x) | SDRAM_ADDR(29)   | B03D (1x) | TS_DATA(30)  | B03C (1x) |
| A(1:7)       | B04A (1x)  | GNDSND          | B02 (1x)  | JTAG_TMS        | B03F (1x) | MIU_DATA(26)   | B03C (1x) | SDRAM_ADDR(30)   | B03D (1x) | TS_DATA(31)  | B03C (1x) |
| A(10)        | B04A (1x)  | GNDSND          | B02 (1x)  | JTAG_TMS        | B03G (1x) | MIU_DATA(27)   | B03C (1x) | SDRAM_ADDR(31)   | B03D (1x) | TS_DATA(32)  | B03C (1x) |
| A(11)        | B04A (2x)  | GNDSND          | B02 (1x)  | JTAG_TMS        | B03H (1x) | MIU_DATA(28)   | B03C (1x) | SDRAM_ADDR(32)   | B03D (1x) | TS_DATA(33)  | B03C (1x) |
| A(12)        | B04A (2x)  | GNDSND          | B02 (1x)  | JTAG_TMS        | B03I (1x) | MIU_DATA(29)   | B03C (1x) | SDRAM_ADDR(33)   | B03D (1x) | TS_DATA(34)  | B03C (1x) |
| A(13)        | B04A (2x)  | GNDSND          | B02 (1x)  | JTAG_TMS        | B03J (1x) | MIU_DATA(30)   | B03C (1x) | SDRAM_ADDR(34)   | B03D (1x) | TS_DATA(35)  | B03C (1x) |
| A(14)        | B04A (2x)  | GNDSND          | B02 (1x)  | JTAG_TMS        | B03K (1x) | MIU_DATA(31)   | B03C (1x) | SDRAM_ADDR(35)   | B03D (1x) | TS_DATA(36)  | B03C (1x) |
| A(15)        | B04A (2x)  | GNDSND          | B02 (1x)  | JTAG_TMS        | B03L (1x) | MIU_DATA(32)   | B03C (1x) | SDRAM_ADDR(36)   | B03D (1x) | TS_DATA(37)  | B03C (1x) |
| A(16)        | B04A (2x)  | GNDSND          | B02 (1x)  | JTAG_TMS        | B03M (1x) | MIU_DATA(33)   | B03C (1x) | SDRAM_ADDR(37)   | B03D (1x) | TS_DATA(38)  | B03C (1x) |
| A(17)        | B04A (2x)  | GNDSND          | B02 (1x)  | JTAG_TMS        | B03N (1x) | MIU_DATA(34)   | B03C (1x) | SDRAM_ADDR(38)   | B03D (1x) | TS_DATA(39)  | B03C (1x) |
| A(18)        | B04A (2x)  | GNDSND          | B02 (1x)  | JTAG_TMS        | B03O (1x) | MIU_DATA(35)   | B03C (1x) | SDRAM_ADDR(39)   | B03D (1x) | TS_DATA(40)  | B03C (1x) |
| A(19)        | B04A (2x)  | GNDSND          | B02 (1x)  | JTAG_TMS        | B03P (1x) | MIU_DATA(36)   | B03C (1x) | SDRAM_ADDR(40)   | B03D (1x) | TS_DATA(41)  | B03C (1x) |
| A(2)         | B04A (2x)  | GNDSND          | B02 (1x)  | JTAG_TMS        | B03Q (1x) | MIU_DATA(37)   | B03C (1x) | SDRAM_ADDR(41)   | B03D (1x) | TS_DATA(42)  | B03C (1x) |
| A(2)         | B04B (1x)  | GNDSND          | B02 (1x)  | JTAG_TMS        | B03R (1x) | MIU_DATA(38)   | B03C (1x) | SDRAM_ADDR(42)   | B03D (1x) | TS_DATA(43)  | B03C (1x) |

|      |    |      |     |      |     |      |     |      |     |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |     |      |     |      |     |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |
|------|----|------|-----|------|-----|------|-----|------|-----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|-----|------|-----|------|-----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|
| 1101 | E3 | 1307 | A8  | 1508 | D10 | 1522 | D9  | 1613 | F9  | 1G04 | B2 | 2134 | D6 | 2243 | C6 | 2262 | A7 | 2317 | B6 | 2340 | A8 | 2423 | B8 | 2445 | C8 | 2806 | E9 | 2906 | B9  | 2A12 | A9  | 2A29 | B9  | 2B15 | A3 | 2C59 | A4 | 2G23 | D1 | 2K13 | D3 | 2L30 | A9 | 3135 | D6 | 3229 | D7 | 3304 | B6 | 3356 | B7 | 3388 | B6 | 3609 | F6 | 3807 | E8 | 3854 | E8 | 3L26 | B6 | 6607 | F6 |
| 1102 | E6 | 1308 | A8  | 1509 | D9  | 1523 | C9  | 1614 | F6  | 1G50 | A7 | 2135 | D6 | 2246 | D7 | 2263 | A7 | 2319 | B8 | 2408 | B8 | 2432 | C8 | 2446 | C8 | 2807 | F9 | 2907 | B9  | 2A13 | A10 | 2A30 | A9  | 2B16 | B3 | 2C60 | A3 | 2G24 | B1 | 2K14 | F2 | 2L31 | A9 | 3201 | B7 | 3231 | D7 | 3319 | A6 | 3361 | B6 | 3389 | A8 | 3613 | F6 | 3809 | F7 | 3855 | E8 | 4110 | E6 | 6615 | E6 |
| 1103 | E6 | 1308 | A8  | 1510 | D10 | 1524 | C9  | 1615 | F9  | 1G51 | A7 | 2138 | D6 | 2247 | D7 | 2264 | A7 | 2327 | A8 | 2409 | B8 | 2433 | C8 | 2447 | C8 | 2808 | F9 | 2909 | B10 | 2A14 | A10 | 2A32 | B9  | 2B18 | C5 | 2C61 | A3 | 2G33 | B2 | 2K16 | F3 | 2L32 | A9 | 3202 | B7 | 3232 | D7 | 3325 | A6 | 3365 | B6 | 3390 | A8 | 3615 | E6 | 3811 | E8 | 3856 | E8 | 4111 | E6 | 6801 | B3 |
| 1104 | D6 | 1310 | A8  | 1511 | D9  | 1525 | B10 | 1618 | F6  | 1K00 | E5 | 2142 | E5 | 2250 | D7 | 2265 | A7 | 2328 | A8 | 2410 | B8 | 2434 | C8 | 2600 | F6 | 2809 | F7 | 2910 | B10 | 2A15 | A8  | 2A33 | A9  | 2B19 | B5 | 2F10 | D3 | 2G34 | C1 | 2K17 | F3 | 2L33 | A9 | 3203 | B7 | 3233 | A8 | 3327 | A6 | 3366 | B6 | 3391 | A8 | 3616 | F6 | 3815 | E8 | 3857 | E8 | 4117 | E5 | 6802 | B5 |
| 1201 | D7 | 1311 | A5  | 1512 | D9  | 1526 | F10 | 1619 | F10 | 1M20 | A8 | 2143 | D6 | 2251 | D7 | 2267 | D7 | 2329 | A8 | 2411 | C8 | 2435 | C8 | 2601 | F6 | 2810 | F7 | 2911 | B10 | 2A16 | B8  | 2A34 | A9  | 2B20 | B5 | 2F11 | D3 | 2H06 | C3 | 2L20 | A9 | 3113 | E6 | 3204 | B7 | 3235 | A8 | 3328 | B8 | 3367 | B6 | 3392 | A8 | 3620 | F6 | 3819 | E8 | 3858 | E8 | 4120 | E5 | 6803 | B5 |
| 1210 | A7 | 1312 | B5  | 1513 | D10 | 1601 | F6  | 1735 | A10 | 1P11 | A5 | 2144 | D6 | 2252 | D7 | 2268 | D6 | 2330 | A8 | 2412 | C8 | 2436 | C8 | 2609 | F6 | 2811 | E9 | 2912 | B10 | 2A17 | A10 | 2A37 | A10 | 2B21 | A5 | 2F12 | F3 | 2H07 | D1 | 2L21 | A8 | 3116 | E6 | 3212 | B7 | 3238 | A8 | 3329 | A6 | 3369 | B6 | 3398 | A7 | 3621 | F6 | 3828 | E7 | 3859 | E8 | 4124 | D6 | 6J03 | D3 |
| 1211 | A7 | 1500 | E10 | 1514 | D10 | 1603 | F6  | 1810 | F7  | 2110 | E6 | 2151 | D5 | 2253 | D7 | 2273 | D6 | 2331 | A8 | 2413 | C8 | 2437 | C8 | 2613 | E6 | 2812 | E9 | 2940 | B10 | 2A18 | A9  | 2A38 | A10 | 2B22 | A3 | 2F13 | F3 | 2H08 | D3 | 2L22 | A8 | 3117 | E6 | 3213 | A6 | 3239 | D6 | 3330 | A8 | 3370 | B6 | 3399 | A7 | 3622 | F6 | 3833 | E7 | 3860 | E7 | 4203 | A6 | 7109 | E6 |
| 1212 | A7 | 1501 | E10 | 1515 | D10 | 1606 | F10 | 1811 | F8  | 2111 | E6 | 2208 | A6 | 2254 | D7 | 2277 | D7 | 2332 | A8 | 2414 | C8 | 2438 | C8 | 2614 | E6 | 2813 | E8 | 2A01 | A9  | 2A19 | B9  | 2A40 | A9  | 2B23 | D3 | 2F20 | D3 | 2J01 | B1 | 2L23 | A8 | 3118 | E6 | 3215 | B7 | 3240 | D7 | 3336 | B8 | 3371 | B7 | 3402 | C8 | 3623 | E6 | 3834 | E7 | 3862 | F7 | 4204 | A6 | 7113 | D6 |
| 1213 | A7 | 1502 | E9  | 1516 | D9  | 1607 | F10 | 1823 | E8  | 2114 | E6 | 2209 | A6 | 2255 | D7 | 2283 | A7 | 2333 | A8 | 2417 | C8 | 2439 | B8 | 2615 | F6 |      |    |      |     |      |     |      |     |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |      |    |



Layout Small Signal Board (Part 1 Top Side)



## 10

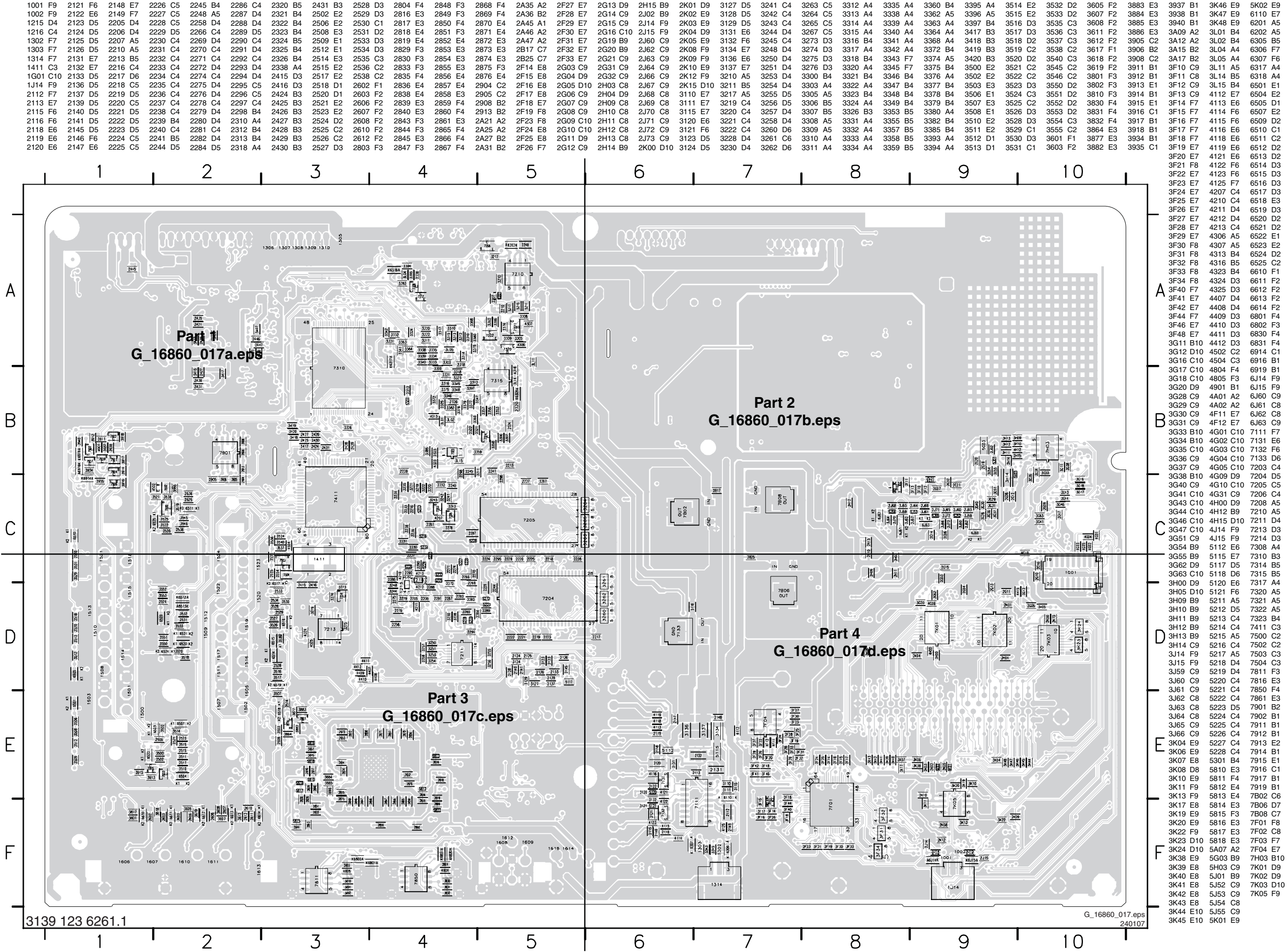


## F

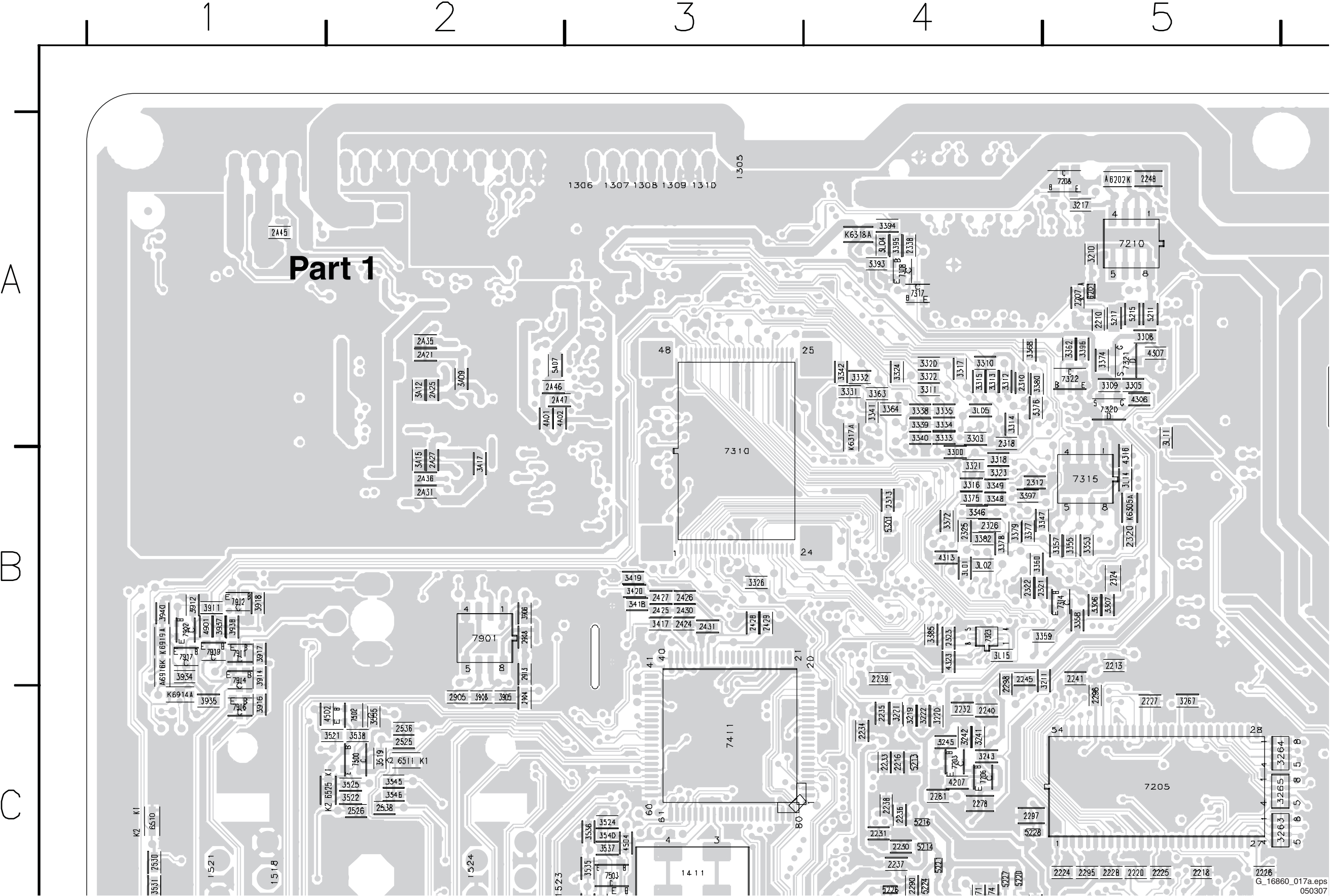




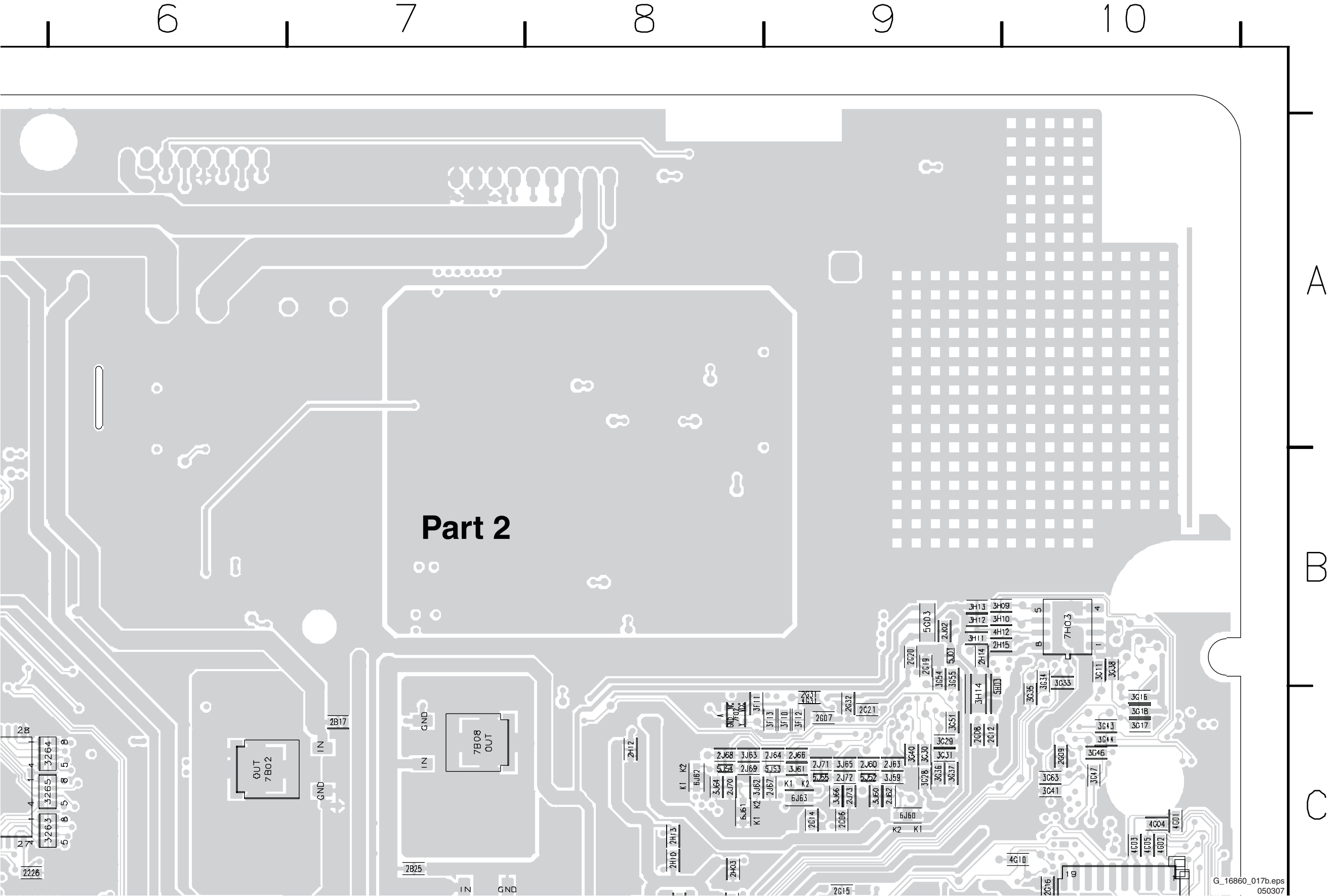
Layout Small Signal Board (Overview Bottom Side)



Layout Small Signal Board (Part 1 Bottom Side)



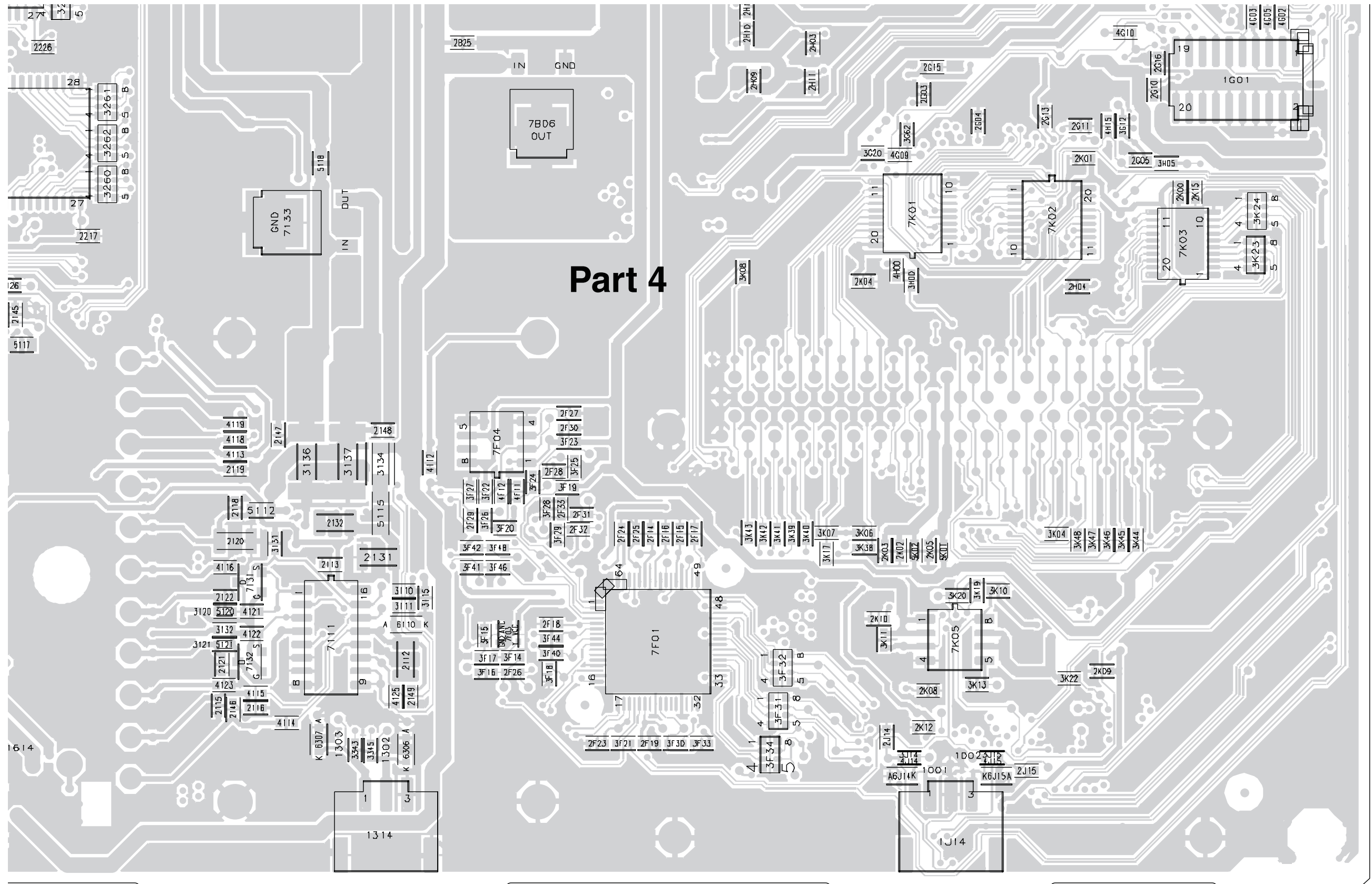
Layout Small Signal Board (Part 2 Bottom Side)



## F

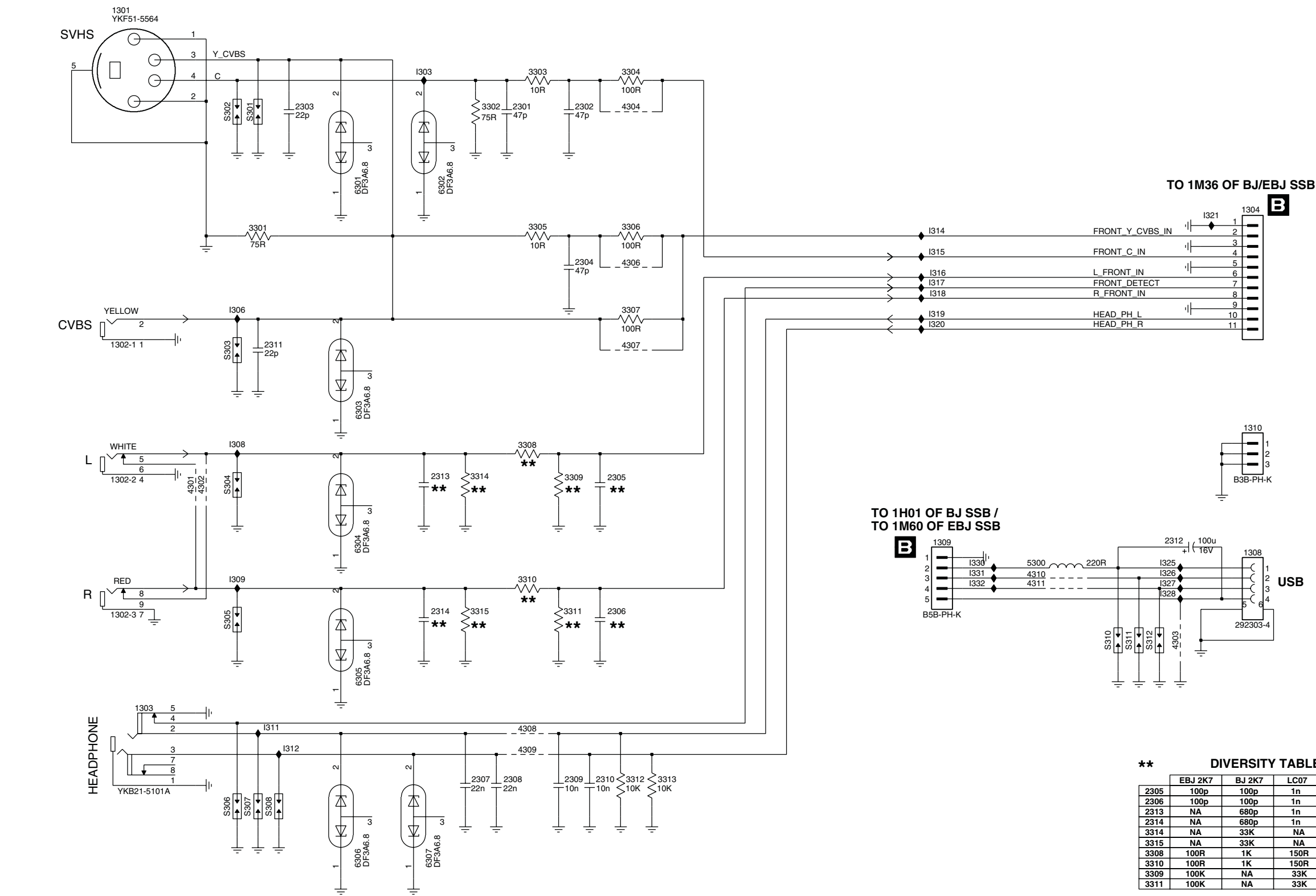


## Part 4



Side A/V Panel

D SIDE FACING SIDE AV

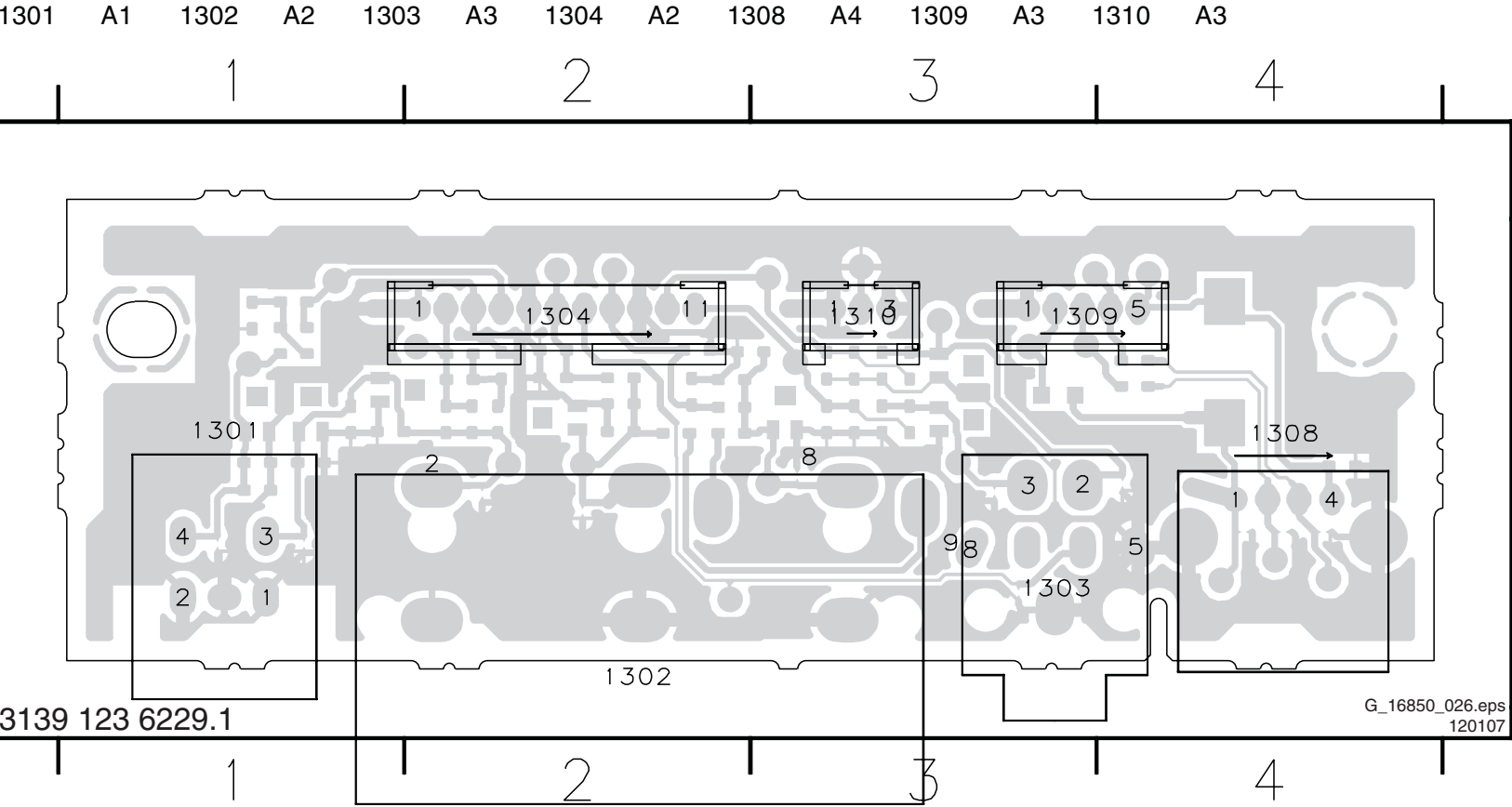


\*\*\* DIVERSITY TABLE

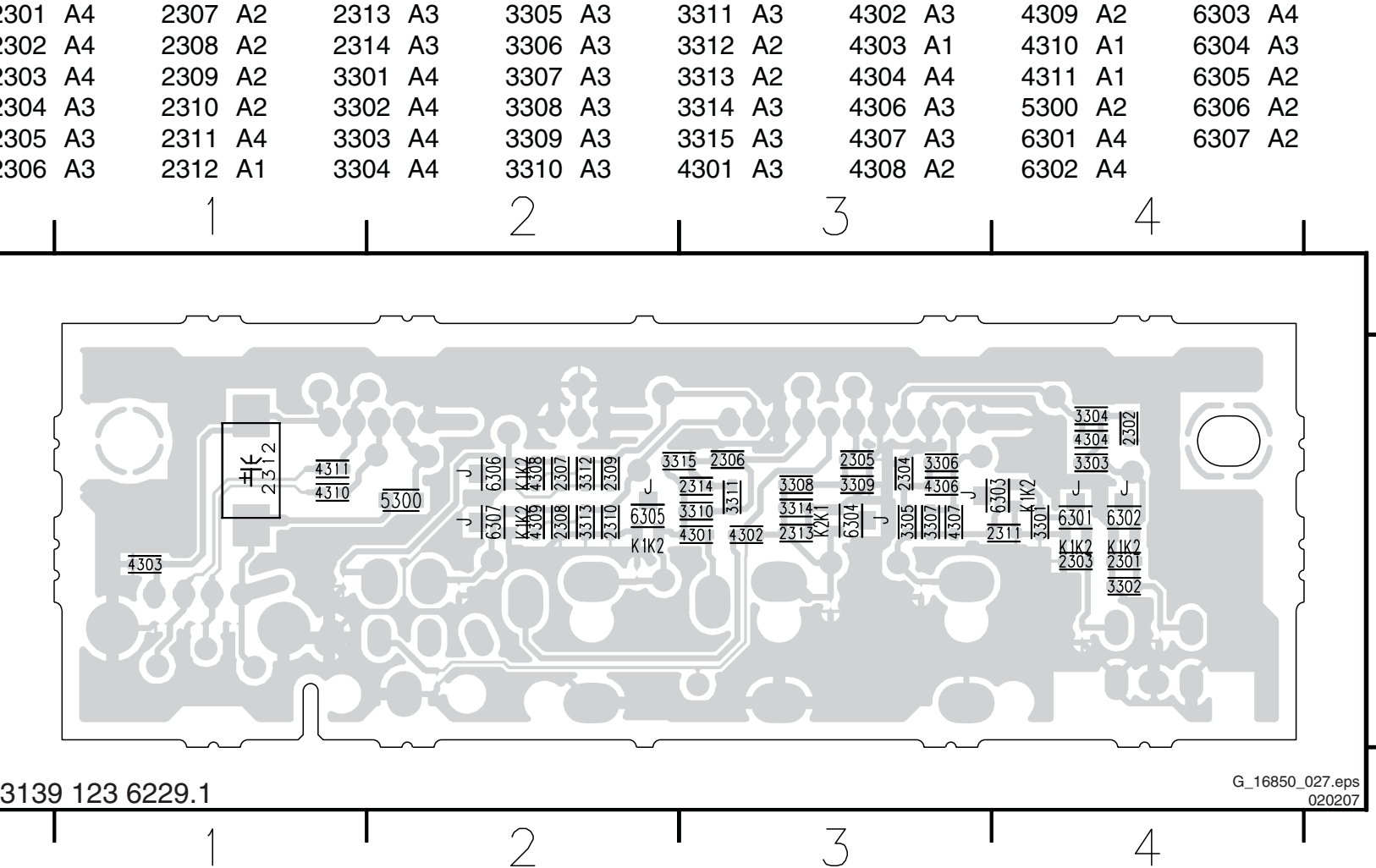
|      | EBJ 2K7 | BJ 2K7 | LC07 |
|------|---------|--------|------|
| 2305 | 100p    | 100p   | 1n   |
| 2306 | 100p    | 100p   | 1n   |
| 2313 | NA      | 680p   | 1n   |
| 2314 | NA      | 680p   | 1n   |
| 3314 | NA      | 33K    | NA   |
| 3315 | NA      | 33K    | NA   |
| 3308 | 100R    | 1K     | 150R |
| 3310 | 100R    | 1K     | 150R |
| 3309 | 100K    | NA     | 33K  |
| 3311 | 100K    | NA     | 33K  |

- 1301 A1
- 1302-1 C1
- 1302-2 D1
- 1302-3 E1
- 1303 E1
- 1304 B9
- 1308 D9
- 1309 D7
- 1310 D9
- 2301 A4
- 2302 A4
- 2303 A2
- 2304 B4
- 2305 D4
- 2306 E4
- 2307 F4
- 2308 F4
- 2309 F4
- 2310 F4
- 2311 C2
- 2312 D8
- 2313 D3
- 2314 E3
- 3301 B2
- 3302 A4
- 3303 A4
- 3304 A5
- 3305 B4
- 3306 B5
- 3307 C5
- 3308 D4
- 3309 D4
- 3310 E4
- 3311 E4
- 3312 F5
- 3313 F5
- 3314 D4
- 3315 E4
- 4301 D2
- 4302 D2
- 4303 E8
- 4304 A5
- 4306 B5
- 4307 C5
- 4308 F4
- 4309 F4
- 4310 E7
- 4311 E7
- 5300 D7
- 6301 B3
- 6302 B3
- 6303 C3
- 6304 D3
- 6305 E3
- 6306 F3
- 6307 F3
- I303 A3
- I306 C2
- I308 D2
- I309 E2
- I311 F2
- I312 F2
- I314 B7
- I315 B7
- I316 B7
- I317 B7
- I318 C7
- I319 C7
- I320 C7
- I321 B9
- I325 D8
- I326 D8
- I327 E8
- I328 E8
- I330 D7
- I331 D7
- I332 E7
- S301 A2
- S302 A2
- S303 C2
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- S306 F2
- S307 F2
- S308 F2
- S310 E8
- S311 E8
- S312 E8

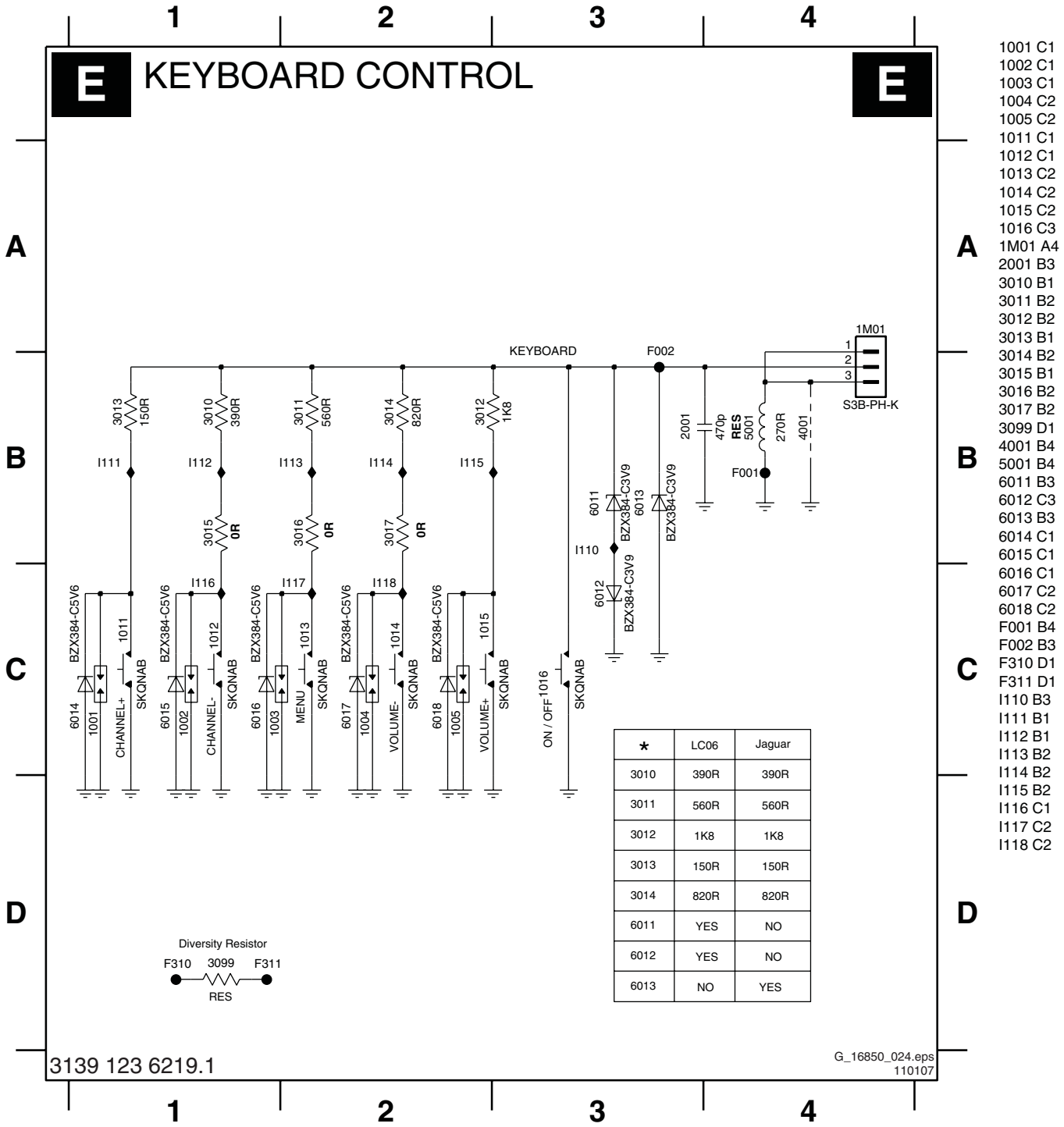
Layout Side A/V Panel (Top Side)



Layout Side A/V Panel (Bottom Side)



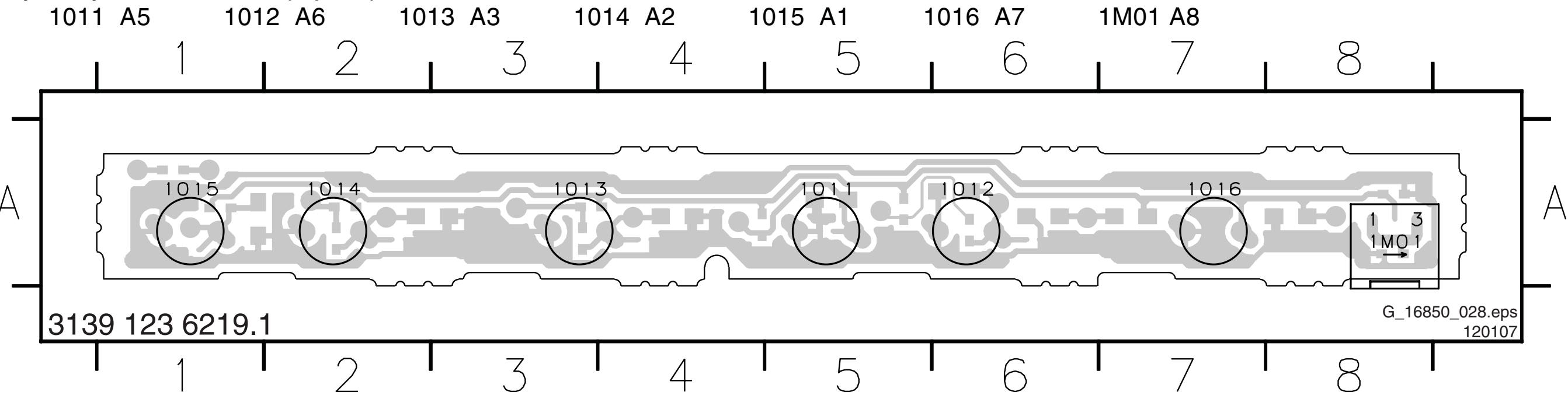
Keyboard Control Panel



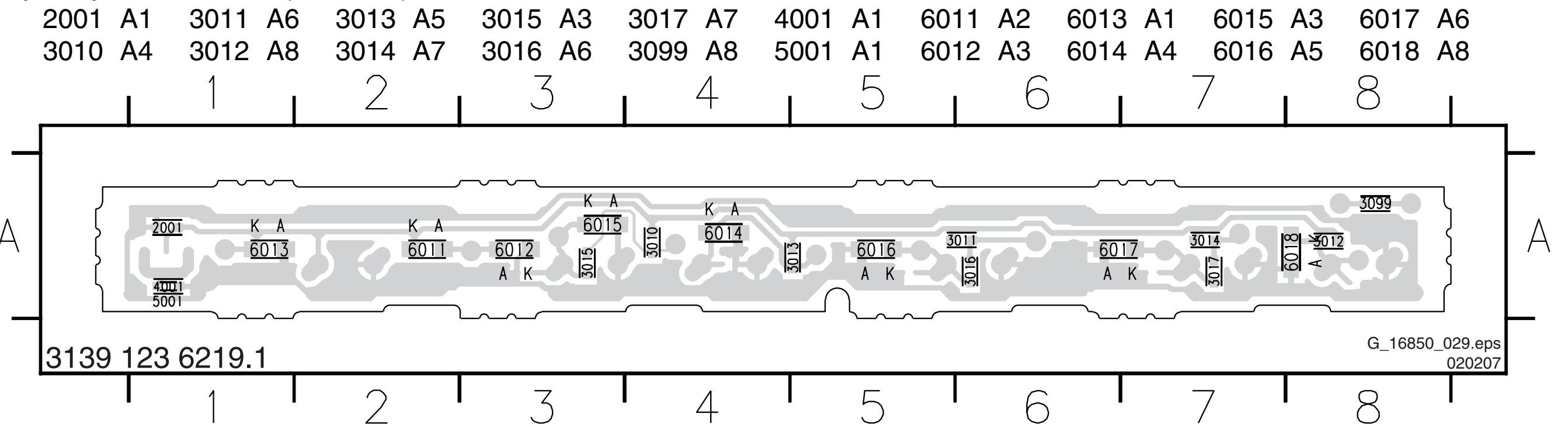
Personal Notes:

|         |  |
|---------|--|
| 1001 C1 |  |
| 1002 C1 |  |
| 1003 C1 |  |
| 1004 C2 |  |
| 1005 C2 |  |
| 1011 C1 |  |
| 1012 C1 |  |
| 1013 C2 |  |
| 1014 C2 |  |
| 1015 C2 |  |
| 1016 C3 |  |
| 1M01 A4 |  |
| 2001 B3 |  |
| 3010 B1 |  |
| 3011 B2 |  |
| 3012 B2 |  |
| 3013 B1 |  |
| 3014 B2 |  |
| 3015 B1 |  |
| 3016 B2 |  |
| 3017 B2 |  |
| 3099 D1 |  |
| 4001 B4 |  |
| 5001 B4 |  |
| 6011 B3 |  |
| 6012 C3 |  |
| 6013 B3 |  |
| 6014 C1 |  |
| 6015 C1 |  |
| 6016 C1 |  |
| 6017 C2 |  |
| 6018 C2 |  |
| F001 B4 |  |
| F002 B3 |  |
| F310 D1 |  |
| F311 D1 |  |
| I110 B3 |  |
| I111 B1 |  |
| I112 B1 |  |
| I113 B2 |  |
| I114 B2 |  |
| I115 B2 |  |
| I116 C1 |  |
| I117 C2 |  |
| I118 C2 |  |

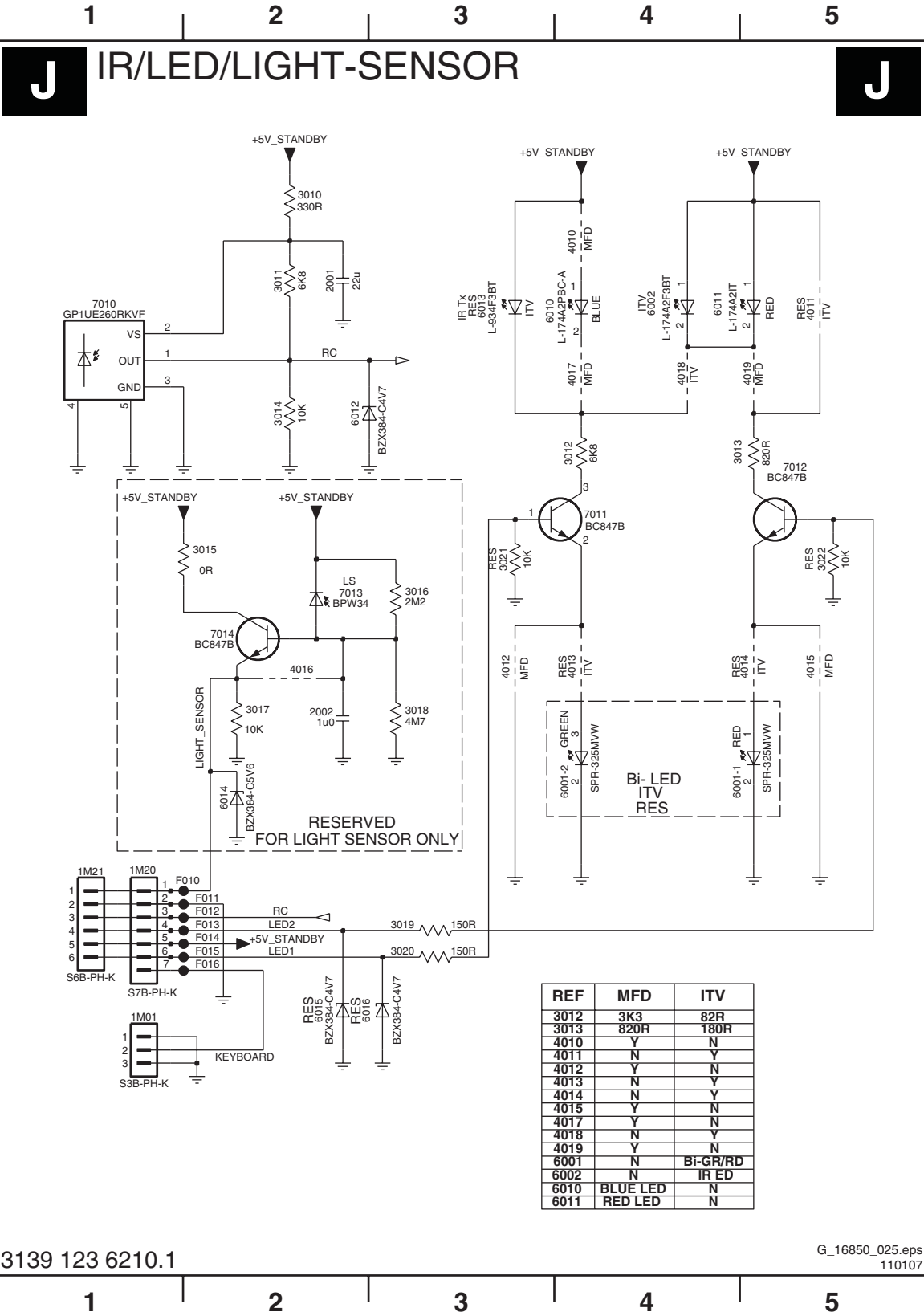
Layout Keyboard Control Panel (Top Side)



Layout Keyboard Control Panel (Bottom Side)



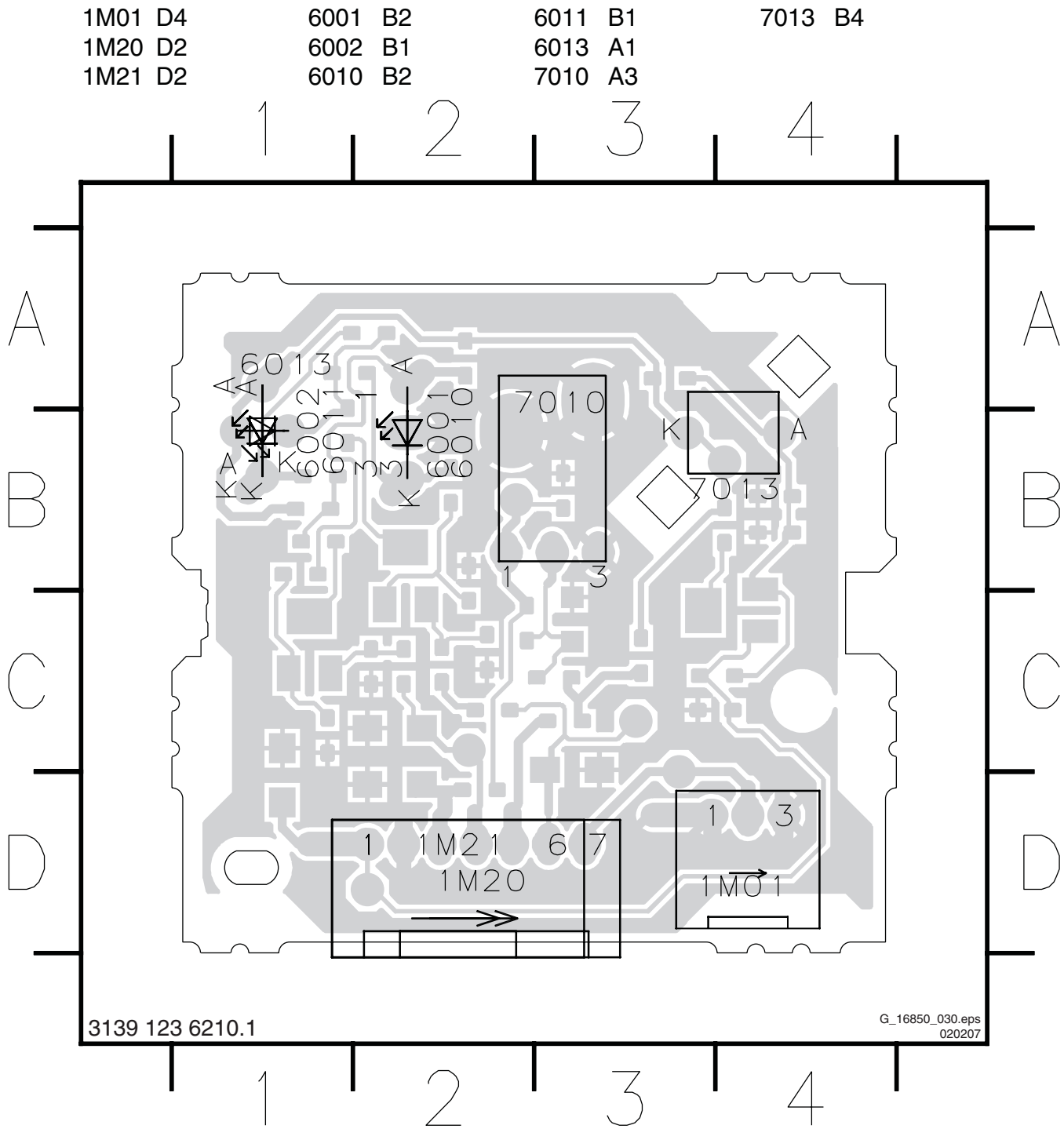
Front IR / LED Panel



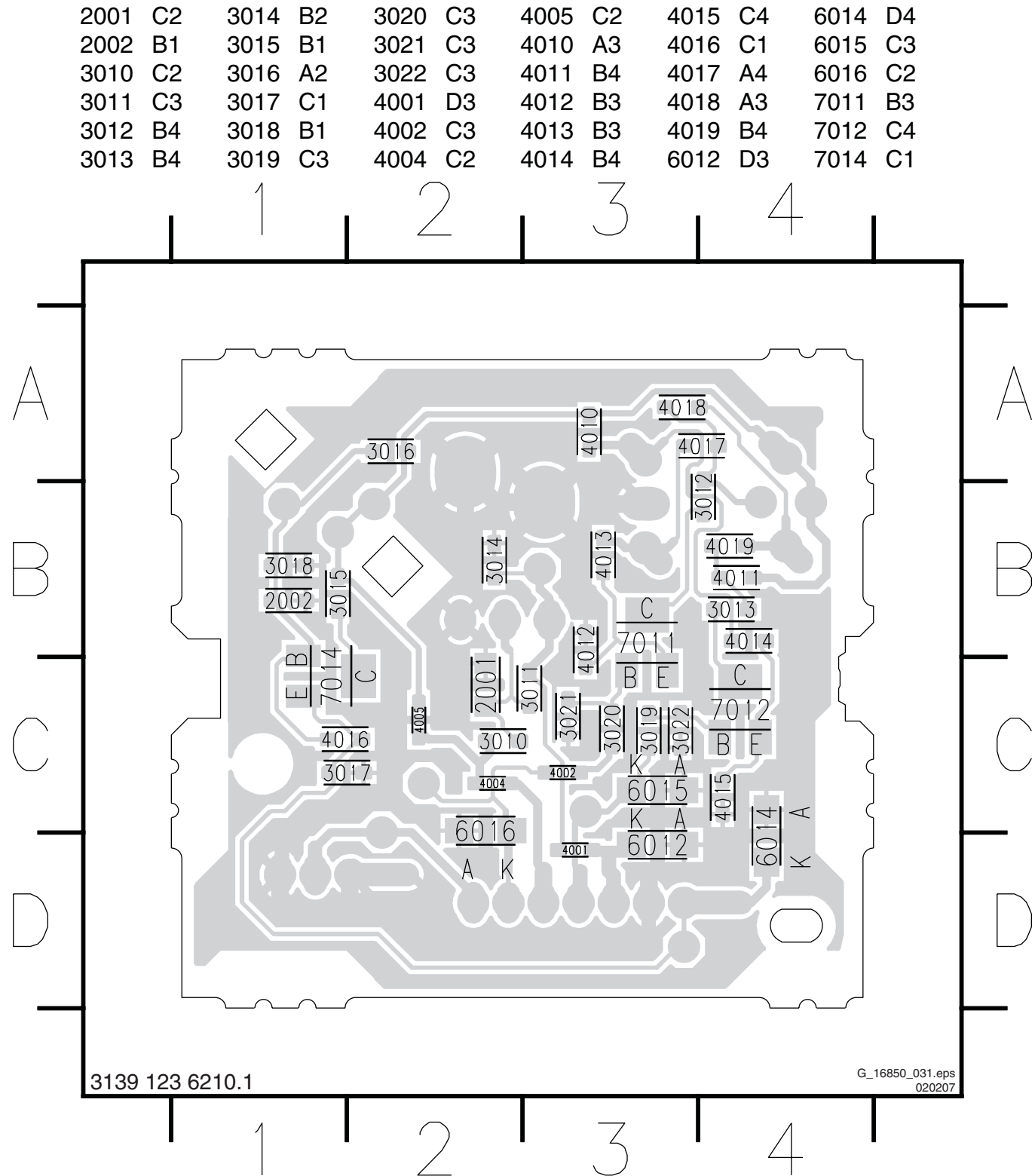
Personal Notes:

1M01 E1  
1M20 E1  
1M21 E1  
2001 A2  
2002 D2  
3010 A2  
3011 A2  
3012 B4  
3013 B4  
3014 B2  
3015 C2  
3016 C3  
3017 D2  
3018 D3  
3019 E3  
3020 E3  
3021 C3  
3022 C5  
4010 A4  
4011 B5  
4012 D3  
4013 D4  
4014 D5  
4015 D5  
4016 D2  
4017 B4  
4018 B4  
4019 B5  
6001-1 D5  
6001-2 D4  
6002 B4  
6010 B3  
6011 B4  
6012 B2  
6013 B3  
6014 D2  
6015 E2  
6016 E2  
7010 B1  
7011 C4  
7012 B5  
7013 C2  
7014 C2  
F010 E2  
F011 E2  
F012 E2  
F013 E2  
F014 E2  
F015 E2  
F016 E2

Layout Front IR / LED Panel (Top Side)



Layout Front IR / LED Panel (Bottom Side)



## This image shows a full page of blank white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. In the bottom right corner, there is small black text that reads "E\_06532\_013.eps" and "131004".

## 8. Alignments

### Index of this chapter:

- 8.1 General Alignment Conditions
- 8.2 Hardware Alignments
- 8.3 Software Alignments
- 8.4 Option Settings

**Note:** Figures below can deviate slightly from the actual situation, due to the different set executions.

**General:** The Service Default Mode (SDM) and Service Alignment Mode (SAM) are described in chapter 5. Menu navigation is done with the CURSOR UP, DOWN, LEFT or RIGHT keys of the remote control transmitter.

### 8.1 General Alignment Conditions

Perform all electrical adjustments under the following conditions:

- Power supply voltage (depends on region):
  - AP-NTSC: 120 V<sub>AC</sub> or 230 V<sub>AC</sub> / 50 Hz (± 10%).
  - AP-PAL-multi: 120 - 230 V<sub>AC</sub> / 50 Hz (± 10%).
  - EU: 230 V<sub>AC</sub> / 50 Hz (± 10%).
  - LATAM-NTSC: 120 - 230 V<sub>AC</sub> / 50 Hz (± 10%).
  - US: 120 V<sub>AC</sub> / 60 Hz (± 10%).
- Connect the set to the mains via an isolation transformer with low internal resistance.
- Allow the set to warm up for approximately 15 minutes.
- Measure voltages and waveforms in relation to correct ground (e.g. measure audio signals in relation to AUDIO\_GND).
 

**Caution:** It is not allowed to use heatsinks as ground.
- Test probe: Ri > 10 Mohm, Ci < 20 pF.
- Use an isolated trimmer/screwdriver to perform alignments.

### 8.2 Hardware Alignments

There are no hardware alignments foreseen for this chassis, but below find an overview of the most important DC voltages on the SSB. These can be used for checking proper functioning of the DC/DC converters.

| Description  | Test Point | Specifications (V) |        |        | Diagram          |
|--------------|------------|--------------------|--------|--------|------------------|
|              |            | Min.               | Typ.   | Max.   |                  |
| +AUDIO_POWER | FB21       | 11.40              | 12.00  | 12.60  | B02_DC-DC        |
| -AUDIO_POWER | FB23       | -11.40             | -12.00 | -12.60 | B02_DC-DC        |
| +12V_DISP    | FB34       | 11.40              | 12.00  | 12.60  | B02_DC-DC        |
| +8V          | F401       | 7.60               | 8.00   | 8.40   | B04C_Audio Proc. |
| +5V_STANDBY  | FB27       | 4.94               | 5.20   | 5.46   | B02_DC-DC        |
| +5V_SW       | FB16       | 4.93               | 5.19   | 5.45   | B02_DC-DC        |
| +5V_D        | I411       | 4.75               | 5.00   | 5.25   | B04C_Audio Proc. |
| +5V_AUD      | I410       | 4.75               | 5.00   | 5.25   | B04C_Audio Proc. |
| +5V_TUN      | I115       | 4.75               | 5.00   | 5.25   | B03_Tuner IF     |
| +3V3_STBY    | FB13       | 3.10               | 3.30   | 3.50   | B02_DC-DC        |
| +3V3_SW      | FB17       | 3.1                | 3.3    | 3.5    | B02_DC-DC        |
| +3V3_MOJO    | FB19       | 3.1                | 3.3    | 3.5    | B02_DC-DC        |
| +3V3         | FJ01       | 3.2                | 3.27   | 3.4    | B03F_DVB-MOJO    |
| +3V3FE       | FF14       | 3.2                | 3.27   | 3.4    | B03B_DVB-Demod   |
| +1V8S_SW     | FB11       | 1.70               | 1.80   | 1.90   | B02_DC-DC        |
| +1V2_MOJO    | FB20       | 1.18               | 1.25   | 1.31   | B02_DC-DC        |
| +1V2_CORE    | FG39       | 1.14               | 1.24   | 1.34   | B03D_DVB-MOJO    |
| V_DISP       | F210       | 11.40              | 12.00  | 12.60  | B04B_Video proc. |

### 8.3 Software Alignments

With the software alignments of the Service Alignment Mode (SAM) the Tuner and RGB settings can be aligned. To store the data: Use the RC button "Menu" to switch to the main menu and next, switch to "Stand-by" mode.

#### 8.3.1 Tuner Adjustment (RF AGC Take Over Point)

**Purpose:** To keep the tuner output signal constant as the input signal amplitude varies.

The LC7.xx chassis comes with two tuner types: the UV1318S for the analogue sets (LC7.1x) and the TD1316AF for the hybrid sets (LC7.2x).

For the digital tuner TD1316AF, no alignment is necessary, as the AGC alignment is done automatically (standard value: "15"), even during analogue reception.

The analogue tuner UV1318S can also use the default value of "15", however in case of problems use the following method (use multimeter and RF generator):

- Apply a vision IF carrier of 38.9 MHz (105 dBuV = 178 mVrms) to test point F111 (input via 50 ohm coaxial cable terminated with an RC network of series 10nF with 120 ohm to ground).
- Measure voltage on pin 1 of the tuner.
- Adjust AGC (via SAM menu: TUNER -> AGC), until voltage on pin 1 is 3.3 +0.5/-1.0 V.
- Store settings and quit SAM.

#### 8.3.2 RGB Alignment

Before alignment, choose "TV MENU" -> "Picture" and set:

- "Brightness" to "50".
- "Colour" to "50".
- "Contrast" to "100".

#### White Tone Alignment:

- Activate SAM.
- Select "RGB Align." -> "White Tone" and choose a colour temperature.
- Use a 100% white screen as input signal and set the following values:
  - All "White point" values initial to "256".
  - All "BlackL Offset" values to "0".

In case you have a colour analyser:

- Measure with a calibrated (phosphor- independent) colour analyser (e.g. Minolta CA-210) in the centre of the screen. Consequently, the measurement needs to be done in a dark environment.
- Adjust the correct x,y coordinates (while holding one of the White point registers R, G or B on "256") by means of decreasing the value of one or two other white points to the correct x,y coordinates (see table "White D alignment values"). Tolerance: dx: ± 0.004, dy: ± 0.004.
- Repeat this step for the other colour Temperatures that need to be aligned.
- When finished return to the SAM root menu and press STANDBY on the RC to store the aligned values to the NVM.

**Table 8-1 White D alignment values**

| Value | Cool (11000 K) | Normal (9000 K) | Warm (6500 K) |
|-------|----------------|-----------------|---------------|
| x     | 0.278          | 0.289           | 0.314         |
| y     | 0.278          | 0.291           | 0.319         |

If you do **not** have a colour analyser, you can use the default values. This is the next best solution. The default values are average values coming from production (statistics).

- Set the RED, GREEN and BLUE default values per temperature according to the values in the "Tint settings" table.

- When finished return to the SAM root menu and press STANDBY on the RC to store the aligned values to the NVM.

**Table 8-2 Tint settings**

| Colour Temp. | R   | G   | B   |
|--------------|-----|-----|-----|
| Cool         | 249 | 241 | 246 |
| Normal       | 251 | 238 | 229 |
| Warm         | 246 | 222 | 199 |

#### Black Level Offset Alignment

- Activate SAM.
- Select “RGB Align.” -> “BlackL Offset” and choose a colour.
- Set all “BlackL Offset” values to “0”.
- When finished return to the SAM root menu and press STANDBY on the RC to store the aligned values to the NVM.

**Note:** For models with “Pixel Plus”, the “Black Offset” (black level offset) should NOT be changed in SAM. These offset values of RGB should be set to “0”, and should **NOT** be adjusted. Any adjustment of these values will affect the low light white balance.

#### ADC YPbPr Gray Scale Alignment

When the grey scale is not correct, use this alignment:

- Activate SAM.
- Select “NVM Editor”.
- Enter address “ 26(dec)” (ADR).
- Set value (VAL) to “197(dec) ± 25”.
- Store (STORE) the value.

## 8.4 Option Settings

### 8.4.1 Introduction

The microprocessor communicates with a large number of I<sup>2</sup>C ICs in the set. To ensure good communication and to make digital diagnosis possible, the microprocessor has to know which ICs to address. The presence/absence of these specific ICs (or functions) is made known by the option codes.

#### Notes:

- After changing the option(s), save them with the STORE command.
- The new option setting becomes active after the TV is switched "off" and "on" again with the mains switch (the EAROM is then read again).

### 8.4.2 How To Set Option Codes

When the NVM is replaced, all options will require resetting. To be certain that the factory settings are reproduced exactly, you must set all option numbers. You can find the correct option numbers in table “Option Codes OP1...OP7” below.

#### How to Change Options Codes

An option code (or “option byte”) represents eight different options (bits). When you change these numbers directly, you can set all options very quickly. All options are controlled via seven option numbers (OP1... OP7).

Activate SAM and select “Options”. Now you can select the option byte (OP1.. OP7) with the CURSOR UP/ DOWN keys, and enter the new 3 digit (decimal) value. For the correct factory default settings, see the table “Option codes OP1...OP7” below. For more detailed information, see the second table “Option codes at bit level”. If an option is set (value “1”), it represents a certain decimal value.

When all the correct options (bits) are set, the sum of the decimal values of each Option Byte (OP) will give the option code.

| Sets 12NC                        | Sets Type    | Panel Type          | Panel Code (Dec) | Option Byte |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |
|----------------------------------|--------------|---------------------|------------------|-------------|-----|-----|-----|---------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| LC07_EU_ATV_LCD_Europe (/10)     |              |                     |                  | Group 1     |     |     |     | Group 2 |     |     |     |     |     |     |     |     |     |     |     |
|                                  |              |                     |                  | 1           | 2   | 3   | 4   | 5       | 6   | 7   |     |     |     |     |     |     |     |     |     |
| 867000025487                     | 26PFL5322/10 | LPL : LC260WX2-SLB2 | 045              | 003         | 023 | 010 | 223 | 009     | 000 | 000 |     |     |     |     |     |     |     |     |     |
|                                  |              | CMO : V260B1-L03    | 068              |             |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |
|                                  |              | AUO : T260XW03 V1   | 067              |             |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |
| 867000025408                     | 32PFL5322/10 | LPL : LC320W01-SL06 | 046              |             |     |     |     |         |     | 001 |     |     |     |     |     |     |     |     |     |
|                                  |              | AUO : T315XW02 VD   | 091              |             |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |
|                                  |              | CMO : V315B1-L05    | 069              |             |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |
| 867000025489                     | 37PFL5322/10 | LPL : LC370WX1-SLB1 | 071              |             |     |     |     |         |     |     | 002 |     |     |     |     |     |     |     |     |
|                                  |              | AUO : T370XW02 V5   | 072              |             |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |
|                                  |              | LPL : LC420WX3-SLA1 | 073              |             |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |
| 867000025492                     | 42PFL5322/10 | AUO : T420XW01 V8   | 076              |             |     |     |     |         |     |     |     | 002 |     |     |     |     |     |     |     |
|                                  |              | LPL : LC420WX5-SLD1 | 107              |             |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |
|                                  |              |                     |                  |             |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |
| LC07_EU_ATV_LCD_Pan Europe (/12) |              |                     |                  |             |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |
| 867000025488                     | 26PFL5322/12 | LPL : LC260WX2-SLB2 | 045              | 003         | 023 | 010 | 223 | 009     | 000 |     |     |     | 000 |     |     |     |     |     |     |
|                                  |              | CMO : V260B1-L03    | 068              |             |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |
|                                  |              | AUO : T260XW03 V1   | 067              |             |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |
| 867000025439                     | 32PFL5322/12 | LPL : LC320W01-SL06 | 046              |             |     |     |     |         |     | 001 |     |     |     |     |     |     |     |     |     |
|                                  |              | AUO : T315XW02 VD   | 091              |             |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |
|                                  |              | CMO : V315B1-L05    | 069              |             |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |
| 867000025491                     | 37PFL5322/12 | LPL : LC370WX1-SLB1 | 071              |             |     |     |     |         |     |     | 002 |     |     |     |     |     |     |     |     |
|                                  |              | AUO : T370XW02 V5   | 072              |             |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |
|                                  |              | LPL : LC420WX3-SLA1 | 073              |             |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |
| 867000025493                     | 42PFL5322/12 | AUO : T420XW01 V8   | 076              |             |     |     |     |         |     |     |     | 002 |     |     |     |     |     |     |     |
|                                  |              | LPL : LC420WX5-SLD1 | 107              |             |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |
|                                  |              |                     |                  |             |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |
| LC07_EU_ATV_PDP_Europe (/10)     |              |                     |                  |             |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |
| 867000025494                     | 42PFP5332/10 | SDI : 42 HD W2      | 083              |             |     |     |     |         |     |     |     |     | 003 | 007 | 011 | 223 | 009 | 000 | 003 |
|                                  |              | LG : 42 HD X4       | 084              |             |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |
| LC07_EU_ATV_PDP_Pan Europe (/12) |              |                     |                  |             |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |
| 867000025495                     | 42PFP5332/12 | SDI : 42 HD W2      | 083              | 003         | 007 | 011 | 223 | 009     | 000 |     |     |     | 003 |     |     |     |     |     |     |
|                                  |              | LG : 42 HD X4       | 084              |             |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |

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**Figure 8-1 Option codes OP1...OP7 (for all LC7.1E models)**

**Option Bit Overview**

Below find an overview of the Option Codes on **bit** level.

**Table 8-3 Option codes at bit level (OP1-OP4)**

| Option Byte & Bit | Dec. Value | Option Name       | Description                                                                                                  |
|-------------------|------------|-------------------|--------------------------------------------------------------------------------------------------------------|
| Byte OP1          |            |                   |                                                                                                              |
| Bit 7 (MSB)       | 128        | Reserved          | Not Used (Reserved)                                                                                          |
| Bit 6             | 64         | CHINA             | ON = SW is for CHINA only OFF = SW is for Non-China AP cluster                                               |
| Bit 5             | 32         | DTV_CHINA         | ON = DTV_CHINA will be available (Reserved) OFF = DTV_CHINA will not be available                            |
| Bit 4             | 16         | DTV_EU            | ON = DTV will be available OFF = DTV will not be available                                                   |
| Bit 3             | 8          | UK_PNP            | ON = UK PNP is available OFF = UK PNP is not available                                                       |
| Bit 2             | 4          | VIRGIN_MODE       | ON = Virgin Mode (PNP) is available OFF = Virgin Mode (PNP) is not available                                 |
| Bit 1             | 2          | ACI               | ON = ACI is available OFF = ACI is not available                                                             |
| Bit 0 (LSB)       | 1          | ATS               | ON = ATS is available OFF = ATS is not available                                                             |
| Total DEC Value   |            |                   |                                                                                                              |
| Byte OP2          |            |                   |                                                                                                              |
| Bit 7 (MSB)       | 128        | 1080P             | ON = 1080p is available OFF = 1080p is not available                                                         |
| Bit 6             | 64         | LIGHT_SENSOR      | ON = Light Sensor is available OFF = Light Sensor is not available                                           |
| Bit 5             | 32         | AMBILIGHT         | ON = Ambilight Feature will be available OFF = Ambilight Feature will not be available                       |
| Bit 4             | 16         | BACKLIGHT_DIMMING | ON = Backlight Dimming is available OFF = Backlight Dimming is not available                                 |
| Bit 3             | 8          | HUE               | ON = Hue is available OFF = Hue is not available                                                             |
| Bit 2             | 4          | 2D3DCF            | ON = 3D Comb Filter is available OFF = 2D Comb Filter is available                                           |
| Bit 1             | 2          | WSSB              | ON = WSS is available OFF = WSS is not available                                                             |
| Bit 0 (LSB)       | 1          | WIDE_SCREEN       | ON = TV is 16x9 set OFF = TV is 4x3 set                                                                      |
| Total DEC Value   |            |                   |                                                                                                              |
| Byte OP3          |            |                   |                                                                                                              |
| Bit 7 (MSB)       | 128        | CVI2              | ON=CVI1 (YPbPr) (For ROW)                                                                                    |
| Bit 6             | 64         | Reserved          | Not Used (Reserved)                                                                                          |
| Bit 5             | 32         | Reserved          | Not Used (Reserved)                                                                                          |
| Bit 4             | 16         | VCHIP             | ON = VChip is available OFF = VChip is not available                                                         |
| Bit 3             | 8          | VIDEO_TEXT        | ON = Video-TXT is available OFF = Video-TXT is not available                                                 |
| Bit 2             | 4          | STEREO_DBX        | ON = Stereo DBX detection is available (LATAM) OFF = Stereo DBX detection is not available                   |
| Bit 1             | 2          | STEREO_NICAM_2CS  | ON = Stereo NICAM 2CS detection is available (EU/AP/China) OFF = Stereo NICAM 2CS detection is not available |
| Bit 0 (LSB)       | 1          | LIP_SYNC          | ON = Lip Sync is available OFF = Lip Sync is not available                                                   |
| Total DEC Value   |            |                   |                                                                                                              |
| Byte OP4          |            |                   |                                                                                                              |
| Bit 7 (MSB)       | 128        | HDMI2             | ON = HDMI2 is available OFF = HDMI2 is not available                                                         |
| Bit 6             | 64         | HDMI1             | ON = HDMI1 is available OFF = HDMI1 is not available                                                         |
| Bit 5             | 32         | VGA               | ON = VGA is available OFF = VGA is not available                                                             |
| Bit 4             | 16         | SVHS3             | ON = SVHS3 is available OFF = SVHS3 is not available                                                         |
| Bit 3             | 8          | AV3               | ON = AV3 is available OFF = AV3 is not available                                                             |
| Bit 2             | 4          | CVI               | ON = CVI is available OFF = CVI is not available                                                             |
| Bit 1             | 2          | SVHS2             | ON = SVHS2 is available OFF = SVHS2 is not available                                                         |
| Bit 0 (LSB)       | 1          | AV2               | ON = AV2 is available OFF = AV2 is not available                                                             |
| Total DEC Value   |            |                   |                                                                                                              |

Table 8-4 Option codes at bit level (OP5-OP7)

| Option Byte & Bit | Dec. Value | Option Name     | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------|------------|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Byte OP5          |            |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Bit 7 (MSB)       | 128        | NVM_CHECK       | ON = NVM (range) checking is available OFF = NVM (range) checking is not available                                                                                                                                                                                                                                                                                                                                                                          |
| Bit 6             | 64         | Reserved        | Not Used (Reserved)                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Bit 5             | 32         | Reserved        | Not Used (Reserved)                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Bit 4             | 16         | MP_ALIGN        | ON = Using multi-point alignment for Gamma & White Point OFF = Using old way for Gamma (pre-defined) & WP alignment                                                                                                                                                                                                                                                                                                                                         |
| Bit 3             | 8          | SYS_RECOVERY    | ON = System Recovery is available OFF = System Recovery is not available                                                                                                                                                                                                                                                                                                                                                                                    |
| Bit 2             | 4          | SL_WIRED        | ON = BDS Smart Loader Wired is available OFF = BDS Smart Loader Wired is not available                                                                                                                                                                                                                                                                                                                                                                      |
| Bit 1             | 2          | HOTEL           | ON = Hotel/BDS is available OFF = Hotel/BDS is not available                                                                                                                                                                                                                                                                                                                                                                                                |
| Bit 0 (LSB)       | 1          | SS_DEMO         | ON = Split Screen Demo is available OFF = Split Screen is not available                                                                                                                                                                                                                                                                                                                                                                                     |
| Total DEC Value   |            |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Byte OP6          |            |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Bit 7 (MSB)       | 128        | Reserved        | Not Used (Reserved)                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Bit 6             | 64         | Reserved        | Not Used (Reserved)                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Bit 5             | 32         | Reserved        | Not Used (Reserved)                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Bit 4             | 16         | Reserved        | Not Used (Reserved)                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Bit 3             | 8          | TUNER PROFILE   | 0 = ATV_EU_PHILIPS UV1318S/AIH-3 1 = ATV_EU_Panasonic EN57K28G3F2 = DTV_EU_PHILIPS TD1316AF/IHP-24 = ATV_AP_PHILIPS UV1316E/AIH-45 = ATV_AP_Tuner2 (Reserved)6 = ATV_CHINA_ALPS TEDE9-286B7 = ATV_CHINA_Tuner2 (Reserved)8 = ATV_LATAM_PHILIPS UV1338/AIH-4 9 = ATV_LATAM_Tuner2 (Reserved)10 = DTV_CHINA_Tuner1 (Reserved)11 = DTV_CHINA_Tuner2 (Reserved)12 = Not Used (Reserved)13 = Not Used (Reserved)14 = Not Used (Reserved)15 = Not Used (Reserved) |
| Bit 2             | 4          |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Bit 1             | 2          |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Bit 0 (LSB)       | 1          |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Total DEC Value   |            |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Byte OP7          |            |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Bit 7 (MSB)       | 128        | Reserved        | Not Used (Reserved)                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Bit 6             | 64         | Reserved        | Not Used (Reserved)                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Bit 5             | 32         | Reserved        | Not Used (Reserved)                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Bit 4             | 16         | CABINET PROFILE | 0 = Cabinet_Profile_26_LCD_ME7 1 = Cabinet_Profile_32_LCD_ME7 2 = Cabinet_Profile_37_42_47_LCD_ME73 = Cabinet_Profile_42_50_PDP_ME7 4 = Cabinet_Profile_26_LCD_ME5P5 - 32 = Reserved                                                                                                                                                                                                                                                                        |
| Bit 3             | 8          |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Bit 2             | 4          |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Bit 1             | 2          |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Bit 0 (LSB)       | 1          |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Total DEC Value   |            |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

## 9. Circuit Descriptions, Abbreviation List, and IC Data Sheets

### Index of this chapter:

- 9.1 Introduction
- 9.2 LCD Power Supply
- 9.3 DC/DC converters
- 9.4 Front-End
- 9.5 Video Processing
- 9.6 Memory addressing
- 9.7 Audio Processing
- 9.8 HDMI
- 9.9 Abbreviation List
- 9.10 IC Data Sheets

### Notes:

- Only **new** circuits (circuits that are not published recently) are described.
- Figures can deviate slightly from the actual situation, due to different set executions.
- For a good understanding of the following circuit descriptions, please use the Wiring, Block (chapter 6) and Circuit Diagrams (chapter 7). Where necessary, you will find a separate drawing for clarification.

### 9.1 Introduction

The LC7.x (development name "LC07") is a new global chassis for the year 2007 (LC7.1 is the analogue range, LC7.2 is the digital range). It covers a screen size of 26 to 47 inch for LCD and 42 to 50 inch for Plasma sets with a new styling called "ME7". Some key components are:

- **Audio:** Sound processing is performed by a multi-standard sound processor MSP4450 (item 7411)
- **Video:** Video processing is performed by the Trident video processor SVP CV32-LF (item 7202).

For analogue reception, a standard IF demodulator is used, whereas digital input signals (DVB-T) are processed through a COFDM channel decoder together with an MPEG decoder. A so-called "Reneas" microprocessor performs the control functionality.

Important features of this chassis are:

- **AmbiLight:** LED AmbiLight (where applicable) is introduced as the successor of glass-tube AmbiLight
- **1080p Full HD** (where applicable).

## 9.1.1 SSB Cell Layout

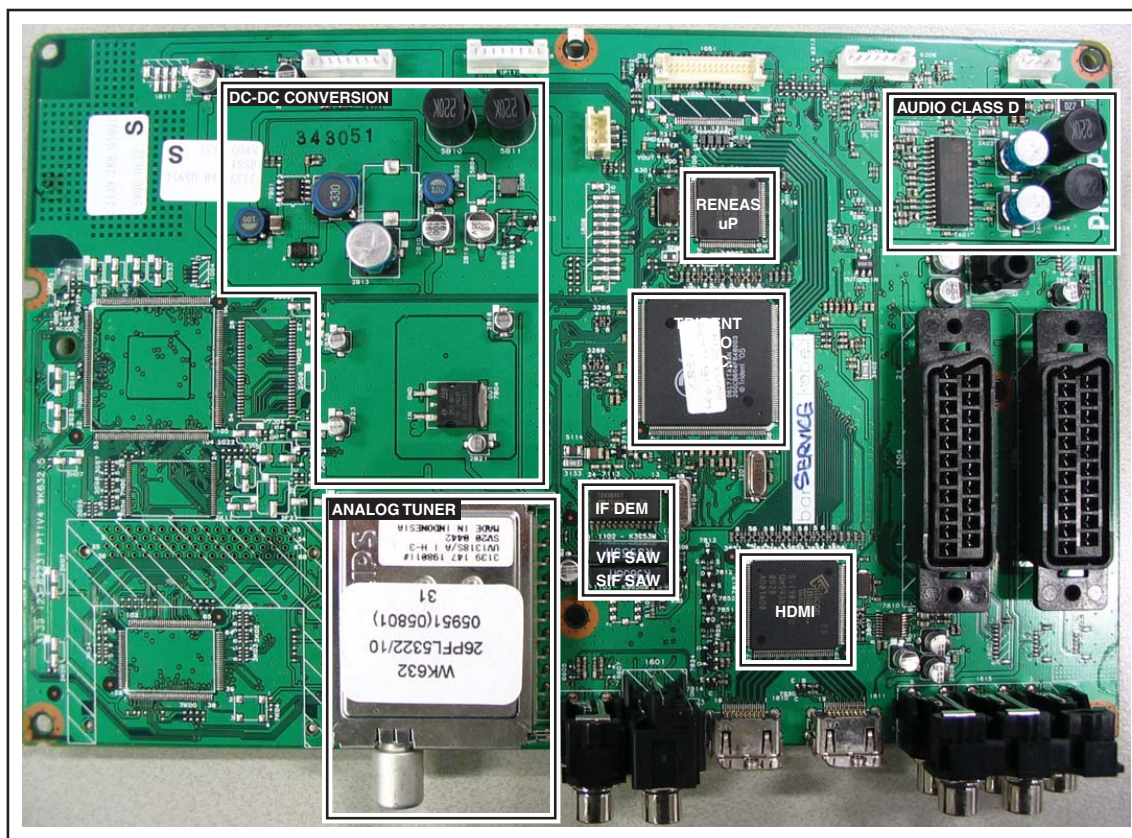
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Figure 9-1 SSB top view

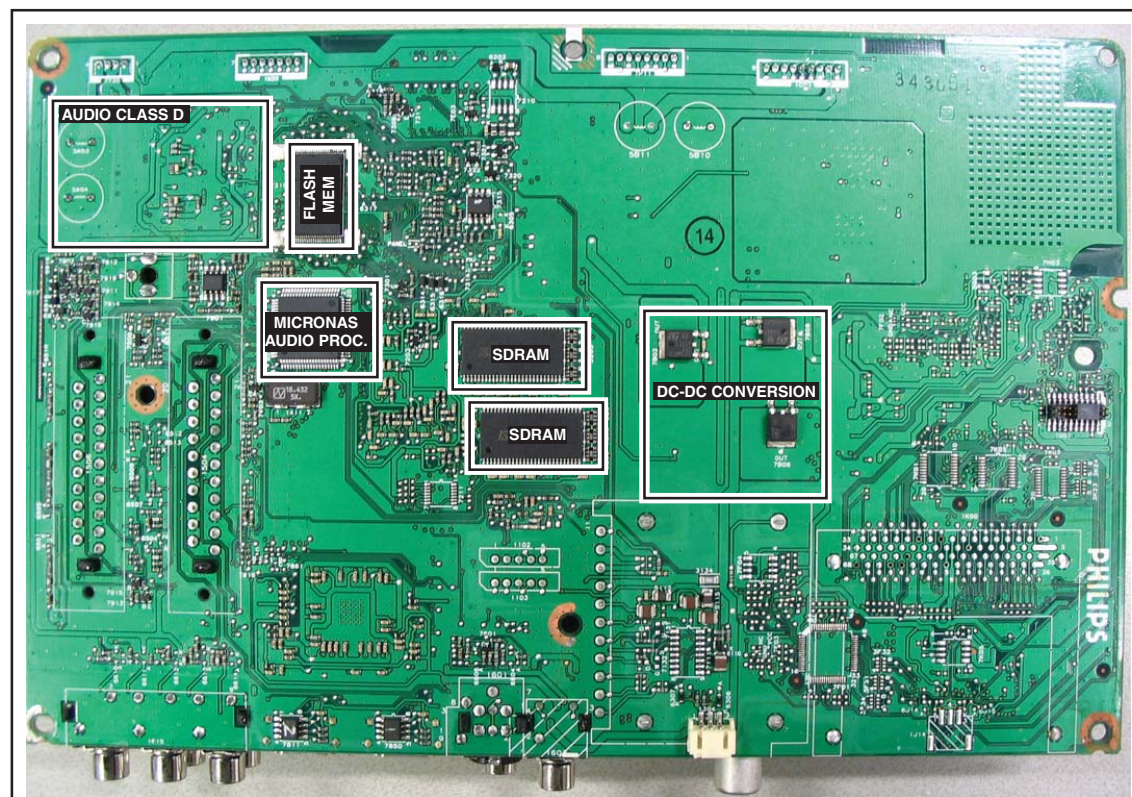
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Figure 9-2 SSB bottom view

## 9.2 LCD Power Supply

The Power Supply Unit (PSU) in this chassis is a buy-in and is a black-box for Service. When defective, a new panel must be ordered and the defective panel must be sent for repair, unless the main fuse of the unit is broken. Always replace the fuse with one with the correct specifications! This part is available in the regular market.

Three different PSU can be used in this chassis:

- 26 and 32 inch sets use a “Delta” PSU
- 37 and 42 inch sets use a “PPS” (Philips Power Solutions) PSU
- 47 inch sets use a “Delta” PSU.

Figure “Overview of PSU connectivity” shows the connectivity of the Power Supply Unit with the other panels in the set.

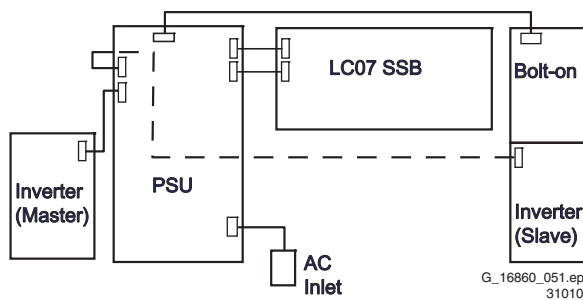


Figure 9-3 Overview of PSU connectivity

All Power Supply Units deliver the following voltages to the chassis:

- +24 V to the inverters
- +12 V to SSB
- +12 V and -12 V to Audio Supply
- 12 V to Bolt-on Supply (where applicable)
- +5.2 V Standby voltage.

## 9.3 DC/DC converters

A switch generates the +5.2 V (+5V\_SW) from the +5.2 V (+5V\_STANDBY) supply voltage. For LCD sets, this switch is mounted on-board the SSB. For PDP sets, this switch is mounted on the Power Supply Panel. This results in the +5V\_STANDBY (and +5V\_SW for PDP sets) voltage(s), coming from the Power Supply Unit, is (are) used as input for the on-board DC/DC converters.

They deliver the following voltages to the board:

- +3.3 V (+3V3\_STBY)
- +5.2 V (+5V\_SW) (only for LCD sets)
- +1.8 V (+1V8S\_SW)
- +34 V (+VTUN)
- +3.3 V (+3V3\_SW)
- +3.3 V (+3V3\_MOJO)
- +1.2 V (+1V2\_MOJO)

An overview can be found in figure “DC-DC converter block diagram”.

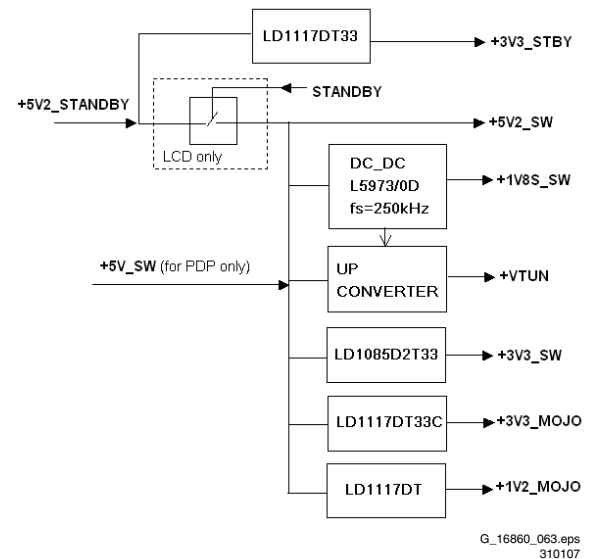


Figure 9-4 DC-DC converter block diagram

## 9.4 Front-End

This chassis uses different tuners depending on the region and execution. An overview of the different executions can be found in table “Tuner diversity”.

Table 9-1 Tuner diversity

| Region | Tuner    | Type     |
|--------|----------|----------|
| Europe | TD1316AF | hybrid   |
|        | UV1318S  | analogue |
| AP     | UV1316E  | analogue |
| China  | TEDE9    | analogue |
| Latam  | UV1338   | analogue |

For a general outline of tuner applications in this chassis see figure “Tuner IF diagram”.

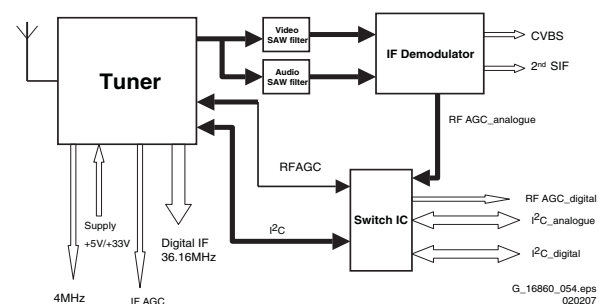


Figure 9-5 Tuner IF diagram

In the LC7.1x chassis (analogue sets), the signal coming from the tuner is fed to the IF demodulator (through the SAW filters) and then passed to the Trident Video Processor.

In the LC7.2x chassis (digital sets), the TD1316AF hybrid tuner is used which is capable of receiving both analogue and digital (DVB-T) signals. While receiving analogue signals, the signal coming from the tuner is fed to the IF demodulator (through the SAW filters) and then passed to the Trident Video Processor. While receiving digital signals, the signal coming from the tuner is first fed to the channel decoder, then to the MPEG decoder and then to the Trident Video Processor.

9.4.1 Video IF Amplifier

The IF-filter is integrated in a SAW (Surface Acoustic Wave) filter. One for filtering IF-video (item 1102) and one for IF-audio (item 1103). The type of these filters depends on the standard(s) received (region-dependency). Some filters can be switched to another standard, what makes them suitable for applications in multi-standard platforms. An overview of the SAW filter diversity can be found in table “SAW filter diversity”.

Table 9-2 SAW filter diversity

| SAW filter | Switching Y/N | Region | Video/Audio |
|------------|---------------|--------|-------------|
| OFWK3953M  | No            | Europe | Video       |
| OFWK9656M  | Yes           | Europe | Audio       |
| OFWK7265L  | Yes           | AP     | Video       |
| OFWK9361L  | No            | AP     | Sound       |
| OFWK3956L  | No            | China  | Video       |
| OFWK3955L  | No            | China  | Video       |
| OFWK9352L  | No            | China  | Audio       |
| OFWM1967L  | No            | LATAM  | Video/Audio |

Switching is done by the microcontroller via SAW\_SW. In table “SAW filter switching” is explained how to address the different system standards.

Table 9-3 SAW filter switching

| Region | SAW_SW | System        |
|--------|--------|---------------|
| Europe | 1      | L'            |
|        | 0      | other systems |
| AP     | 1      | B/G, D/K, I   |
|        | 0      | M/N           |
| China  | 1      | B/G, D/K, I   |
|        | 0      | M/N           |
| LATAM  | n.a.   | M/N           |

The hybrid tuner TDA1316AF, used in Europe sets, needs to be switched between digital and analogue mode. This is done by the microcontroller via DVB\_SW. Refer to table “Hybrid tuner digital/analogue switching” for details.

Table 9-4 Hybrid tuner digital/analogue switching

| Region | DVB_SW | Mode               |
|--------|--------|--------------------|
| Europe | 1      | analogue reception |
|        | 0      | Digital reception  |

The pin assignment of all analogue tuners is equal and can be found in table “Pin assignment analogue tuners”.

Table 9-5 Pin assignment analogue tuners

| Pin number | Description                         | DC voltage (V)                                      |
|------------|-------------------------------------|-----------------------------------------------------|
| 1          | RF AGC voltage                      | 3.3 - 4.5 (weak or no signal) < 3.3 (strong signal) |
| 2          | n.c.                                |                                                     |
| 3          | I <sup>2</sup> C-bus address select | 0                                                   |
| 4          | SCL                                 | 0 to 3.3                                            |
| 5          | SDA                                 | 0 to 3.3                                            |
| 6          | n.c.                                |                                                     |
| 7          | supply voltage                      | 5 ±0.25                                             |
| 8          | n.c.                                |                                                     |
| 9          | tuning supply voltage               | 33                                                  |

| Pin number | Description  | DC voltage (V) |
|------------|--------------|----------------|
| 10         | n.c.         |                |
| 11         | TV IF output |                |

The pin assignment of the hybrid tuner can be found in table “Pin assignment hybrid tuner”.

Table 9-6 Pin assignment hybrid tuner

| Pin number | Description                         | DC voltage (V)                                      |
|------------|-------------------------------------|-----------------------------------------------------|
| 1          | n.c.                                |                                                     |
| 2          | RF AGC voltage                      | 3.3 - 4.5 (weak or no signal) < 3.3 (strong signal) |
| 3          | I <sup>2</sup> C-bus address select | 0                                                   |
| 4          | SCL                                 | 0 to 3.3                                            |
| 5          | SDA                                 | 0 to 3.3                                            |
| 6          | 4 MHz reference output              |                                                     |
| 7          | supply voltage                      | 5 ±0.25                                             |
| 8          | broadband IF output                 |                                                     |
| 9          | IF AGC voltage                      | 0 to 3                                              |
| 10         | narrowband IF output                |                                                     |
| 11         | narrowband IF output                |                                                     |

9.4.2 Automatic Gain Control

In the LC7.2x chassis (digital sets), the automatic gain control depends on if the set is receiving a digital or an analogue signal. During analogue reception, the hybrid tuner receives an external AGC voltage, coming from the demodulator, to perform automatic gain control. During digital reception, no external AGC voltage is used but the tuners internal AGC loop is used.

In the LC7.1x chassis (analogue sets), the tuner receives an external AGC voltage, coming from the demodulator, to perform automatic gain control.

9.5 Video Processing

The video processing is completely handled by the Trident SVP CX32 video processor which features:

- CVBS-input for analogue signals
- RGB-input for digital (DVB-T) signals
- Motion and “edge-adaptive” deinterlacing
- Integrated ADC
- Built-in 8-bit LVDS transmitter
- Colour stretch
- Skin colour enhancement
- 3D Digital Comb Video Decoder
- Interlaced and Progressive Scan refresh
- Teletext decoding
- OSD and VBI/Closed Caption.

## 9.5.1 Region-dependent applications

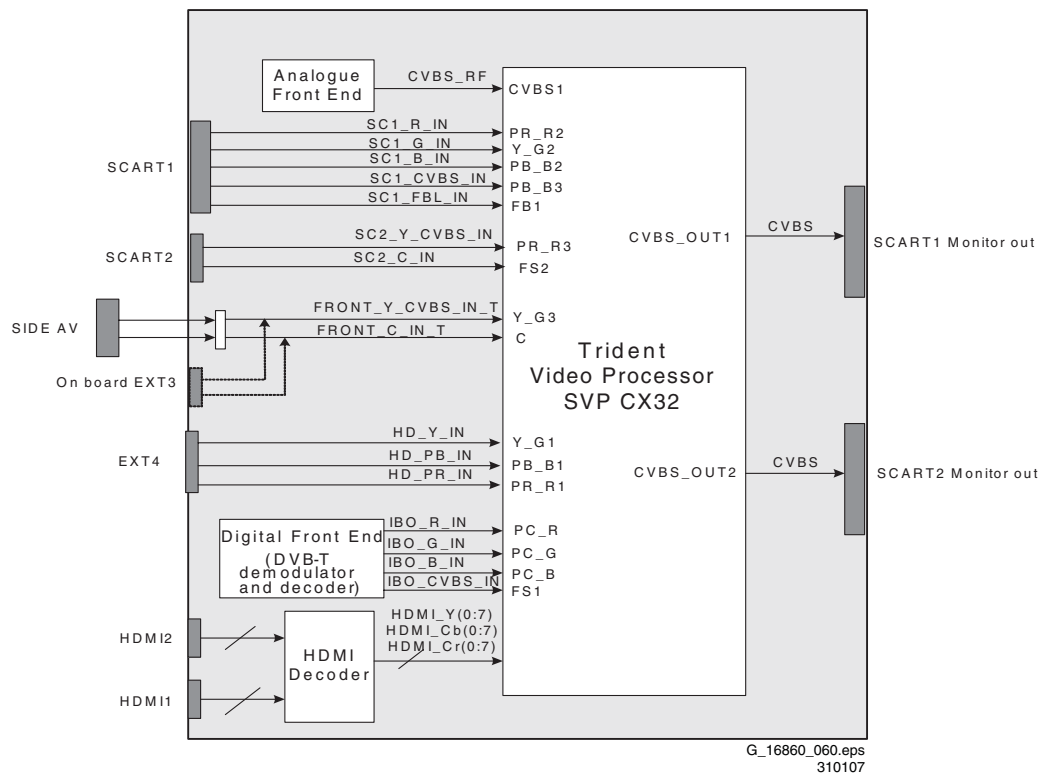


Figure 9-6 Block diagram video processing - EU version

“Block diagram video processing - EU version” shows the input and output signals to and from the Trident Video Processor in EU applications.

During analogue reception, a CVBS signal coming from the analogue front-end is fed to the video processor via pin CVBS1. During digital reception, the video signal coming from the MPEG decoder (MOJO) is fed to the video processor via pins FS1, PC\_B, PC\_G and PC\_R.

The video processor also interfaces the SCART1 & 2 input, side AV, EXT4 (HD where applicable) and HDMI1 & 2 input. Through the SCART1 & 2 connectors, a monitor output is foreseen.

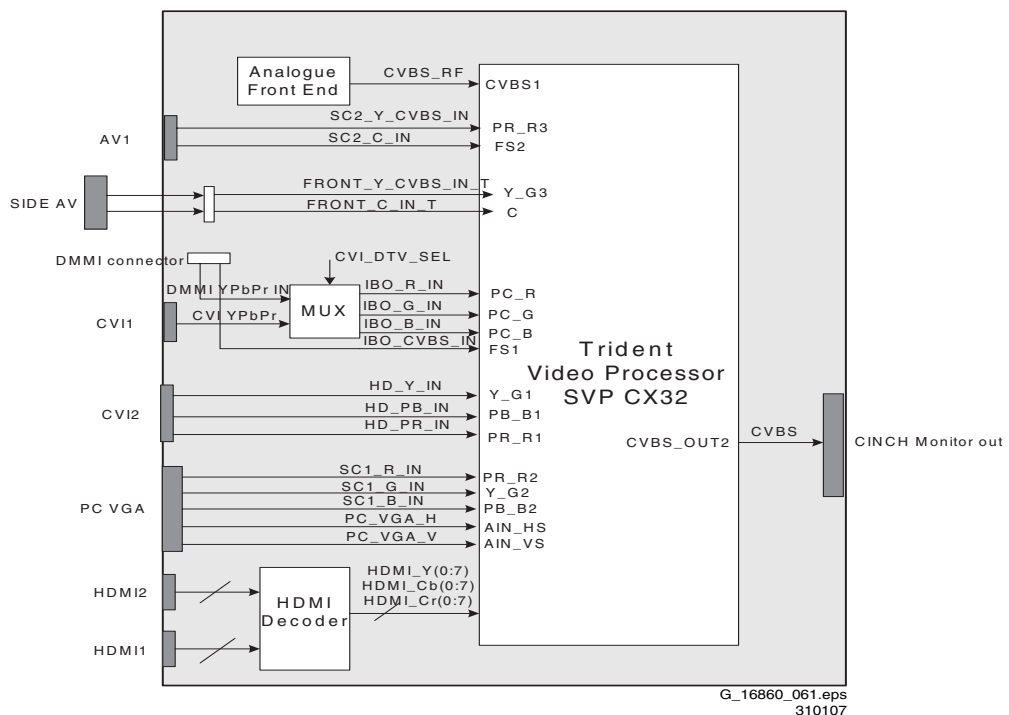


Figure 9-7 Block diagram video processing - AP version

“Block diagram video processing - AP version” shows the input and output signals to and from the Trident Video Processor in AP applications.

During analogue reception, a CVBS signal coming from the analogue front-end is fed to the video processor via pin CVBS1. No digital reception (DVB-T) reception is foreseen in AP region. However, an internal DMMI connector is implemented for future digital reception applications in combination with IBO. CVI\_DTV\_SEL is a control signal from the microprocessor. When this signal is LOW, then the MUX passes the CVI1 YPbPr input signal to the Trident Video Processor. When this signal is HIGH, then the YPbPr input signal coming from the DMMI connector is passed to the video processor. Currently, this signal is always LOW since no IBO is used.

The video processor also interfaces the AV1 and Side AV input, CVI2 (HD), VGA(PC), HDMI1 & 2. A cinch output connector for Monitor output is foreseen.

## 9.6 Memory addressing

Figure “Memory block diagram” shows the interconnection between the microprocessor, the FLASH memory, the Trident Video Processor and the SDRAM.

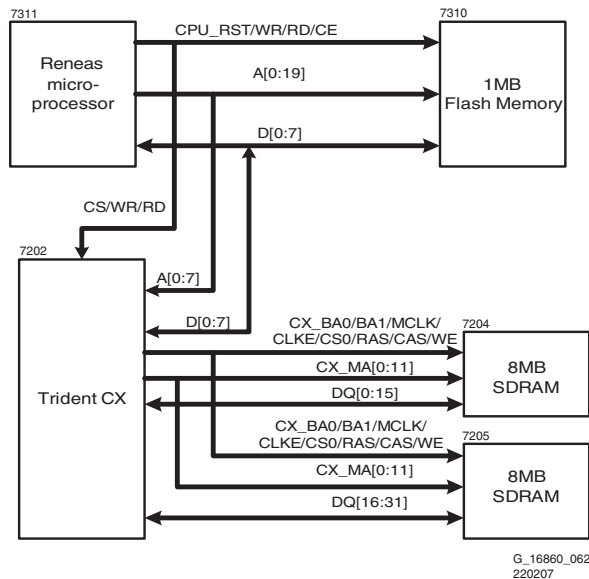


Figure 9-8 Memory block diagram

Control signals CPU\_RST, WR, RD and CE, address lines A[0:19] and data lines D[0:7] are used for transferring data between the microprocessor (item 7311) and the flash memory (item 7310). Control signals CS, WR and RD, address lines A[0:7] and data lines D[0:7] are used for transferring data between the Trident Video Processor (item 7202) and the microprocessor (item 7311). Control signals CX\_BA0, CX\_BA1, CX\_MCLK, CX\_CLKE, CX\_CS0, CX\_RAS, CX\_CAS and CX\_WE, address lines CX\_MA[0:11] and data lines DQ[0:15] are used for transferring data between the Trident Video Processor and the SDRAM ICs (items 7204 and 7205).

## 9.7 Audio Processing

The audio decoding is done entirely via the Multistandard Sound Processor (MSP) 4450P (item 7411). This processor covers the processing of both analogue and (NICAM) digital input signals by processing the (analogue) IF signal-in to processed (analogue) AF-out (baseband audio). An

internal 40 ms (stereo) audio delay line (LIP SYNC) is foreseen and therefore no external delay line is necessary.

All internal clock signals are derived from an external 18.432 MHz oscillator, which, in NICAM or I<sup>2</sup>S-mode, on its turn is locked to the corresponding source.

The following functionality is included:

- Automatic Standard Detection (ASD) automatically detects the actual broadcasted TV standard
- Automatic Sound Select (ASS) automatically switches (without any I<sup>2</sup>C-bus action) between mono/stereo/bilingual mode when the broadcast mode changes.

### 9.7.1 Region-dependent applications

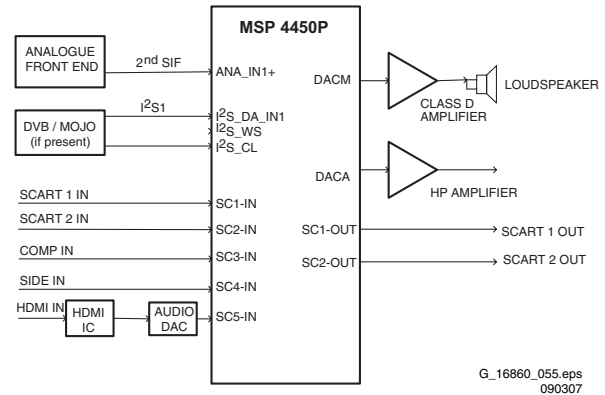


Figure 9-9 Block diagram audio processing - EU application

In EU applications, the MSP features:

- Sound IF input for signals coming from the analogue front-end
- Three I<sup>2</sup>S-inputs for signals (“DATA”, “CLK” and “WS”) coming from the MOJO in case of digital reception
- Five analogue inputs: for EXT1 to EXT4 and HDMI
- Loudspeaker output path
- Headphone output path
- SCART-1 output path (RF)
- SCART-2 output path (WYSIWYG = monitor).

Digital audio signals coming from HDMI sources are fed to a digital-to-analogue converter and then fed to the MSP. In case of reception of digital TV signals, digital audio signals coming from the MOJO are directly fed to the MSP via the I<sup>2</sup>S\_DA\_IN1, I<sup>2</sup>S\_WS1 and I<sup>2</sup>S\_CL1 lines. This ensures a “true digital path”.

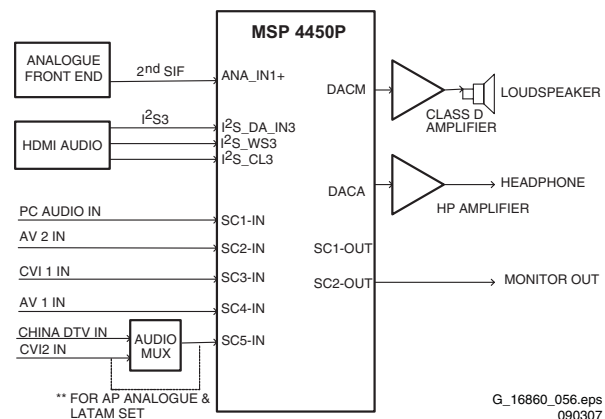


Figure 9-10 Block diagram audio processing - AP application

In AP applications, the MSP features:

- Sound IF input for signals coming from the analogue front-end

- Three I<sup>2</sup>S-inputs for signals ("DATA", "CLK" and "WS") coming from the HDMI interface
- Five analogue inputs: for CVI1, CVI2, AV1, AV2, DTV (China) and PC audio
- Loudspeaker output path
- Headphone output path
- Monitor output path (WYSIWYG).

Digital audio signals coming from HDMI sources are directly fed to the MSP via the I2S\_DA\_IN3, I2S\_WS3 and I2S\_CL3 lines. This ensures a "true digital path".

In case of reception of digital TV signals, a multiplexer is used to switch between China DTV or DVI2 audio. In China sets, the audio signal coming from the DTV module is in analogue format. The output from the multiplexer is fed to the MSP via the SC5-input.

In both applications, the microprocessor (item 7311) controls the audio part with the following control lines:

- MUTE<sub>n</sub>: used to mute the Class D amplifiers
- ANTI\_PLOP: used to detect any DC failure in the Class D amplifiers
- DC\_PROT: used to detect any DC failure in the Class D amplifiers.

### 9.7.2 Audio Amplifier

The audio amplifier is an integrated class-D amplifier (TDA8932T, item 7A01). It combines a good performance with a high efficiency, resulting in a big reduction in heat generation.

#### Principle

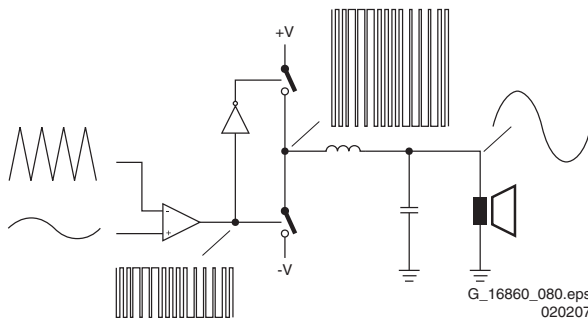


Figure 9-11 Principle Class-D Amplifier

The Class D amplifier works by varying the duty cycle of a Pulse Width Modulated (PWM) signal.

By comparing the input voltage to a triangle wave, the amplifier increases duty cycle to increase output voltage, and decreases duty cycle to decrease output voltage.

The output transistors of a Class D amplifier switch from 'full off' to 'full on' (saturated) and then back again, spending very little time in the linear region in between. Therefore, very little power is lost to heat. If the transistors have a low 'on' resistance (RDS(ON)), little voltage is dropped across them, further reducing losses.

A Low Pass Filter at the output passes only the average of the output wave, which is an amplified version of the input signal. In order to keep the distortion low, negative feedback is applied.

The **advantage** of Class D is increased efficiency (= less heat dissipation). Class D amplifiers can drive the same output power as a Class AB amplifier using less supply current.

The **disadvantage** is the large output filter. The main reason for this filter is that the switching waveform results in maximum current flow. This causes more loss in the load, which causes lower efficiency. An LC filter with a cut-off frequency less than the Class D switching frequency, allows the switching current to flow through the filter instead of the load, thus reducing the overall loss and increasing the efficiency.

#### DC-protection

A DC-detection circuit is foreseen to protect the speakers. It is built around three transistors (items 7A05 to 7A07) and generates a protection signal (DC\_PROT) to the microprocessor in case of a DC failure in the Class D amplifiers.

## 9.8 HDMI

### 9.8.1 Introduction

**Note:** Text below is an excerpt from the "HDMI Specification" that is issued by the HDMI founders (see <http://www.hdmi.org>).

The High-Definition Multimedia Interface is developed for transmitting digital signals from DVD players, set-top boxes and other audiovisual sources to television sets, projectors and other video displays.

HDMI can carry high quality multi-channel audio data and can carry all standard and high-definition consumer electronics video formats. Content protection technology is available. HDMI can also carry control and status information in both directions.

HDMI is backward compatible with DVI (1.0). Compared with DVI, HDMI offers extra:

- YUV 4:4:4 (3 x 8-bit) or 4:2:2 (up to 2 x 12-bit), where DVI offers only RGB 4:4:4 (3 x 8 bit).
- Digital audio in CD quality (16-bit, 32/44.1/48 kHz), higher quality available (8 channels, 192 kHz).
- Remote control via CEC bus (Consumer Electronics Control): allows user to control all HDMI devices with the TV's remote control and menus.
- Smaller connector (SCART successor).
- Less cables: e.g. from 10 audio/9 video cables to 3 HDMI cables.

### 9.8.2 Implementation

The IC used is the SiI 9025 (Silicon Image) third generation HDMI receiver, item 7817 on the SSB.

It has the following features:

- Dual HDMI input connector
- Two EEPROMs to support EDID
- HDMI audio
- I<sup>2</sup>S output to low-cost DACs which operate at a frequency of 32 to 192 kHz
- Integrated HDCP decryption engine
- Built-in pre-programmed HDCP keys for highest level of copy-protection security
- Colour space conversion RGB to YCbCr
- "Hot Plug Reset" signal.

Figure "HDMI implementation" shows the HDMI configuration in this chassis.

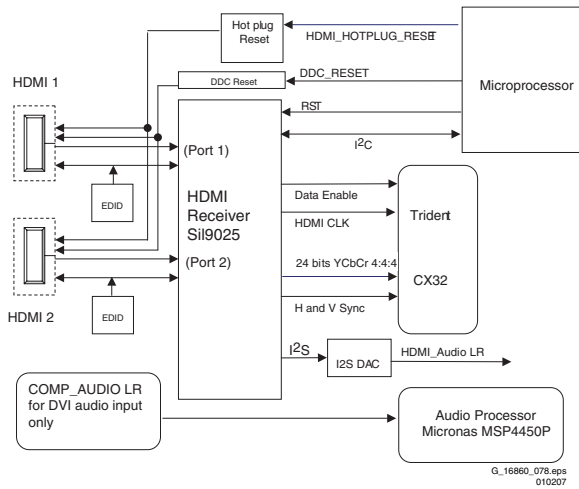


**Figure 9-12 HDMI implementation**

HDMI connectors 1 and 2 are connected to resp. ports 1 and 2 of the HDMI receiver. The ports cannot be activated at the same moment. Switching is controlled by software.

“Hot Plug Reset” and “DDC Reset” are controlled by the microprocessor.

The HDMI receiver will convert all RGB or YCbCr 4:2:2 signals to 24-bit YCbCr 4:4:4. When it receives a YCbCr 4:4:4 signal it will just pass the signal directly to the Trident Video Processor.

## 9.9 Abbreviation List

|              |                                                                                                                                             |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| 1080i        | 1080 visible lines, interlaced                                                                                                              |
| 1080p        | 1080 visible lines, progressive scan                                                                                                        |
| 2CS          | 2 Carrier Sound                                                                                                                             |
| 2DNR         | Spatial (2D) Noise Reduction                                                                                                                |
| 3DNR         | Temporal (3D) Noise Reduction                                                                                                               |
| 480i         | 480 visible lines, interlaced                                                                                                               |
| 480p         | 480 visible lines, progressive scan                                                                                                         |
| AARA         | Automatic Aspect Ratio Adaptation: algorithm that adapts aspect ratio to remove horizontal black bars; keeping up the original aspect ratio |
| ACI          | Automatic Channel Installation: algorithm that installs TV channels directly from a cable network by means of a predefined TXT page         |
| ADC          | analogue to Digital Converter                                                                                                               |
| AFC          | Automatic Frequency Control: control signal used to tune to the correct frequency                                                           |
| AGC          | Automatic Gain Control: algorithm that controls the video input of the feature box                                                          |
| AM           | Amplitude Modulation                                                                                                                        |
| AUO          | Acer Unipack Optronics                                                                                                                      |
| AP           | Asia Pacific                                                                                                                                |
| AR           | Aspect Ratio: 4 by 3 or 16 by 9                                                                                                             |
| ASD          | Automatic Standard Detection                                                                                                                |
| AV           | Audio Video                                                                                                                                 |
| B/G          | Monochrome TV system. Sound carrier distance is 5.5 MHz                                                                                     |
| BTSC         | Broadcast Television System Committee                                                                                                       |
| CAM          | Conditional Access Module                                                                                                                   |
| CBA          | Circuit Board Assembly (or PWB)                                                                                                             |
| CEC          | Consumer Electronics Control bus; remote control bus on HDMI connections                                                                    |
| CI           | Common Interface; E.g PCMCIA slot for a CAM in a set top box                                                                                |
| CL           | Constant Level: audio output to connect with an external amplifier                                                                          |
| CLUT         | Colour Look Up Table                                                                                                                        |
| ComPair      | Computer aided rePair                                                                                                                       |
| COFDM        | Coded Orthogonal Frequency Division Multiplexing; A multiplexing technique that distributes the data to be transmitted over many carriers   |
| CSM          | Customer Service Mode                                                                                                                       |
| CVBS         | Composite Video Blanking and Synchronisation                                                                                                |
| CVBS-MON     | CVBS monitor signal                                                                                                                         |
| CVBS-TER-OUT | CVBS terrestrial out                                                                                                                        |
| CVI          | Component Video Input                                                                                                                       |
| DAC          | Digital to analogue Converter                                                                                                               |
| DBE          | Dynamic Bass Enhancement: extra low frequency amplification                                                                                 |
| DDC          | Display Data Channel; is a part of the "Plug and Play" feature                                                                              |
| DFU          | Directions For Use: owner's manual                                                                                                          |
| DNR          | Dynamic Noise Reduction                                                                                                                     |
| DRAM         | Dynamic RAM                                                                                                                                 |
| DSP          | Digital Signal Processing                                                                                                                   |
| DST          | Dealer Service Tool: special (European) remote control designed for service technicians                                                     |
| DTS          | Digital Theatre Sound                                                                                                                       |
| DVB(T)       | Digital Video Broadcast; An MPEG2 based standard for transmitting digital audio and video. T= Terrestrial                                   |
| DVD          | Digital Versatile Disc                                                                                                                      |
| DVI          | Digital Visual Interface                                                                                                                    |
| DW           | Double Window                                                                                                                               |

|             |                                                                                                                                                                                                                                                                                                                                                                                                              |            |                                                                                                                                        |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----------------------------------------------------------------------------------------------------------------------------------------|
| ED          | Enhanced Definition: 480p, 576p                                                                                                                                                                                                                                                                                                                                                                              | NICAM      | Near Instantaneous Compounded                                                                                                          |
| EDID        | Extended Display Identification Data (VESA standard)                                                                                                                                                                                                                                                                                                                                                         |            | Audio Multiplexing. This is a digital sound system, used mainly in Europe.                                                             |
| EEPROM      | Electrically Erasable and Programmable Read Only Memory                                                                                                                                                                                                                                                                                                                                                      | NTSC       | National Television Standard Committee. Colour system used mainly in North America and Japan.                                          |
| EU          | EUrope                                                                                                                                                                                                                                                                                                                                                                                                       |            | Colour carrier NTSC M/N = 3.579545 MHz, NTSC 4.43 = 4.433619 MHz (this is a VCR norm, it is not transmitted off-air)                   |
| EXT         | EXTeRnal (source), entering the set by SCART or by cinches (jacks)                                                                                                                                                                                                                                                                                                                                           |            |                                                                                                                                        |
| FBL         | Fast Blanking: DC signal accompanying RGB signals                                                                                                                                                                                                                                                                                                                                                            |            |                                                                                                                                        |
| FBL-TXT     | Fast Blanking Teletext                                                                                                                                                                                                                                                                                                                                                                                       | NVM        | Non Volatile Memory: IC containing TV related data (for example, options)                                                              |
| FLASH       | FLASH memory                                                                                                                                                                                                                                                                                                                                                                                                 |            | Open Circuit                                                                                                                           |
| FM          | Field Memory / Frequency Modulation                                                                                                                                                                                                                                                                                                                                                                          | O/C        | On/Off control signal for the LED                                                                                                      |
| FMR         | FM Radio                                                                                                                                                                                                                                                                                                                                                                                                     | ON/OFF LED | Over the Air Download                                                                                                                  |
| FRC         | Frame Rate Converter                                                                                                                                                                                                                                                                                                                                                                                         | OAD        | On Screen Display                                                                                                                      |
| FTV         | Flat TeleVision                                                                                                                                                                                                                                                                                                                                                                                              | OSD        | Phase Alternating Line. Colour system used mainly in Western Europe                                                                    |
| H           | H_sync to the module                                                                                                                                                                                                                                                                                                                                                                                         | PAL        | (colour carrier = 4.433619 MHz) and South America (colour carrier PAL M = 3.575612 MHz and PAL N = 3.582056 MHz)                       |
| HD          | High Definition: 720p, 1080i, 1080p                                                                                                                                                                                                                                                                                                                                                                          |            | Personal Computer                                                                                                                      |
| HDCP        | High-bandwidth Digital Content Protection; A "key" encoded into the HDMI/DVI signal that prevents video data piracy. If a source is HDCP coded and connected via HDMI/DVI without the proper HDCP decoding, the picture is put into a "snow vision" mode or changed to a low resolution. For normal content distribution, the source and the display device must be enabled for HDCP "software key" decoding | PC         | Printed Circuit Board (or PWB)                                                                                                         |
|             |                                                                                                                                                                                                                                                                                                                                                                                                              | PCB        | Plasma Display Panel                                                                                                                   |
|             |                                                                                                                                                                                                                                                                                                                                                                                                              | PDP        | Picture In Graphic                                                                                                                     |
|             |                                                                                                                                                                                                                                                                                                                                                                                                              | PIG        | Picture In Picture                                                                                                                     |
|             |                                                                                                                                                                                                                                                                                                                                                                                                              | PIP        | Phase Locked Loop. Used, for example, in FST tuning systems. The customer can directly provide the desired frequency                   |
|             |                                                                                                                                                                                                                                                                                                                                                                                                              | PLL        | Power Supply Unit                                                                                                                      |
| HDMI        | High Definition Multimedia Interface, digital audio and video interface                                                                                                                                                                                                                                                                                                                                      | PSU        | Printed Wiring Board (or PCB)                                                                                                          |
| HP          | Head Phone                                                                                                                                                                                                                                                                                                                                                                                                   | PWB        | Random Access Memory                                                                                                                   |
| I           | Monochrome TV system. Sound carrier distance is 6.0 MHz                                                                                                                                                                                                                                                                                                                                                      | RAM        | Remote Control transmitter                                                                                                             |
| I2C         | Integrated IC bus                                                                                                                                                                                                                                                                                                                                                                                            | RC         | Remote Control system 5 (6), the signal from the remote control receiver                                                               |
| I2S         | Integrated IC Sound bus                                                                                                                                                                                                                                                                                                                                                                                      | RC5 (6)    | Radio Frequency                                                                                                                        |
| IBO(Z)      | Intelligent Bolt On module. Z= Zapper; module for DVB reception.                                                                                                                                                                                                                                                                                                                                             | RF         | Red, Green, and Blue. The primary colour signals for TV. By mixing levels of R, G, and B, all colours (Y/C) are reproduced.            |
| IC          | Integrated Circuit                                                                                                                                                                                                                                                                                                                                                                                           | RGB        | Red, Green, Blue, Horizontal sync, and Vertical sync                                                                                   |
| IF          | Intermediate Frequency                                                                                                                                                                                                                                                                                                                                                                                       |            | Read Only Memory                                                                                                                       |
| IR          | Infra Red                                                                                                                                                                                                                                                                                                                                                                                                    |            | Service Alignment Mode                                                                                                                 |
| IRQ         | Interrupt ReQuest                                                                                                                                                                                                                                                                                                                                                                                            | RGBHV      | SandCastle: two-level pulse derived from sync signals                                                                                  |
| Last Status | The settings last chosen by the customer and read and stored in RAM or in the NVM. They are called at start-up of the set to configure it according the customers wishes                                                                                                                                                                                                                                     | ROM        | SCART output of the MSP audio IC                                                                                                       |
|             |                                                                                                                                                                                                                                                                                                                                                                                                              | SAM        | SCART output of the MSP audio IC                                                                                                       |
|             |                                                                                                                                                                                                                                                                                                                                                                                                              | SC         | Short Circuit                                                                                                                          |
| LATAM       | LATin America                                                                                                                                                                                                                                                                                                                                                                                                | SC1-OUT    | Clock signal on I2C bus                                                                                                                |
| LC07        | Philips chassis name for LCD TV 2007 project                                                                                                                                                                                                                                                                                                                                                                 | SC2-OUT    | Standard Definition: 480i, 576i                                                                                                        |
| LCD         | Liquid Crystal Display                                                                                                                                                                                                                                                                                                                                                                                       | S/C        | Data signal on I2C bus                                                                                                                 |
| LED         | Light Emitting Diode                                                                                                                                                                                                                                                                                                                                                                                         | SCL        | Samsung Display Industry                                                                                                               |
| L/L'        | Monochrome TV system. Sound carrier distance is 6.5 MHz. L' is Band I, L is all bands except for Band I                                                                                                                                                                                                                                                                                                      | SD         | Service Default Mode                                                                                                                   |
| LPL         | LG Philips LCD                                                                                                                                                                                                                                                                                                                                                                                               | SDA        | Synchronous DRAM                                                                                                                       |
| LS          | Loud Speaker                                                                                                                                                                                                                                                                                                                                                                                                 | SDI        | SEquence Couleur Avec Memoire. Colour system used mainly in France and Eastern Europe. Colour carriers = 4.406250 MHz and 4.250000 MHz |
| LVDS        | Low Voltage Differential Signalling, data transmission system for high speed and low EMI communication.                                                                                                                                                                                                                                                                                                      | SDM        | Sound Intermediate Frequency                                                                                                           |
|             |                                                                                                                                                                                                                                                                                                                                                                                                              | SDRAM      | Switch Mode Power Supply                                                                                                               |
| M/N         | Monochrome TV system. Sound carrier distance is 4.5 MHz                                                                                                                                                                                                                                                                                                                                                      | SECAM      | SouND                                                                                                                                  |
| MOSFET      | Metal Oxide Semiconductor Field Effect Transistor                                                                                                                                                                                                                                                                                                                                                            |            | Self Oscillating Power Supply                                                                                                          |
| MPEG        | Motion Pictures Experts Group                                                                                                                                                                                                                                                                                                                                                                                | SIF        | Sony Philips Digital InterFace                                                                                                         |
| MSP         | Multi-standard Sound Processor: ITT sound decoder                                                                                                                                                                                                                                                                                                                                                            | SMPS       | Static RAM                                                                                                                             |
| MUTE        | MUTE Line                                                                                                                                                                                                                                                                                                                                                                                                    | SND        | Small Signal Board                                                                                                                     |
| NAFTA       | North American Free Trade Association: Trade agreement between Canada, USA and Mexico                                                                                                                                                                                                                                                                                                                        | SOPS       | Stand-by                                                                                                                               |
|             |                                                                                                                                                                                                                                                                                                                                                                                                              | S/PDIF     | Super Video Home System                                                                                                                |
|             |                                                                                                                                                                                                                                                                                                                                                                                                              | SRAM       | Sub Woofer / SoftWare                                                                                                                  |
|             |                                                                                                                                                                                                                                                                                                                                                                                                              | SSB        | Total Harmonic Distortion                                                                                                              |
|             |                                                                                                                                                                                                                                                                                                                                                                                                              | STBY       | TeleteXT                                                                                                                               |
|             |                                                                                                                                                                                                                                                                                                                                                                                                              | SVHS       | Microprocessor                                                                                                                         |
|             |                                                                                                                                                                                                                                                                                                                                                                                                              | SW         |                                                                                                                                        |
|             |                                                                                                                                                                                                                                                                                                                                                                                                              | THD        |                                                                                                                                        |
|             |                                                                                                                                                                                                                                                                                                                                                                                                              | TXT        |                                                                                                                                        |
| NC          | Not Connected                                                                                                                                                                                                                                                                                                                                                                                                | uP         |                                                                                                                                        |

|         |                                                                                                              |
|---------|--------------------------------------------------------------------------------------------------------------|
| VL      | Variable Level out: processed audio output toward external amplifier                                         |
| VCR     | Video Cassette Recorder                                                                                      |
| VGA     | Video Graphics Array                                                                                         |
| WD      | Watch Dog                                                                                                    |
| WYSIWYR | What You See Is What You Record: record selection that follows main picture and sound                        |
| XTAL    | Quartz crystal                                                                                               |
| YPbPr   | Component video (Y= Luminance, Pb/Pr= Colour difference signals B-Y and R-Y, other amplitudes w.r.t. to YUV) |
| Y/C     | Video related signals: Y consists of luminance signal, blanking level and sync; C consists of colour signal. |
| Y-OUT   | Luminance-signal                                                                                             |
| YUV     | Baseband component video (Y= Luminance, U/V= Colour difference signals)                                      |

9.10 IC Data Sheets

This section shows the internal block diagrams and pin layouts of ICs that are drawn as "black boxes" in the electrical diagrams (with the exception of "memory" and "logic" ICs).

9.10.1 Diagram B06C, Type SIL9025CTU(IC7817) (HDMI)

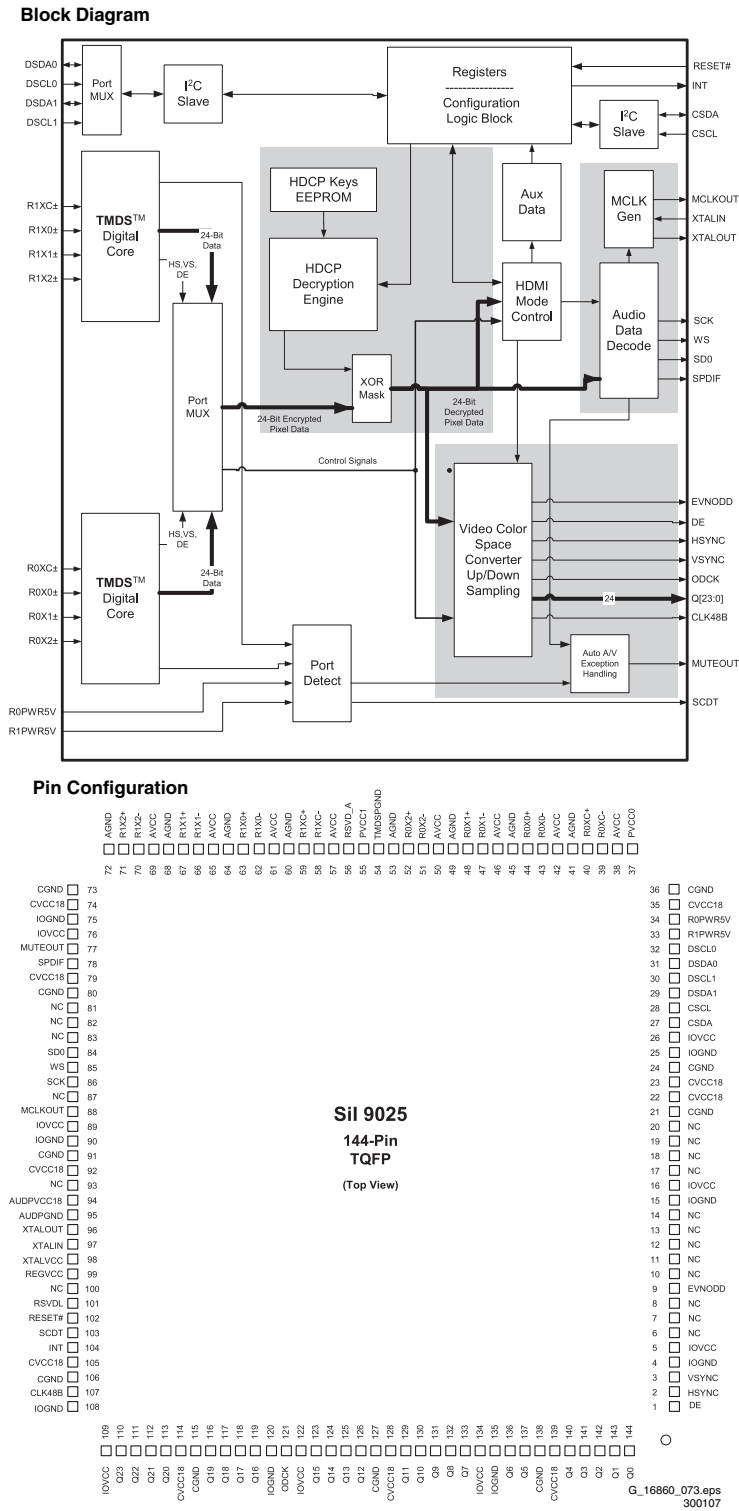
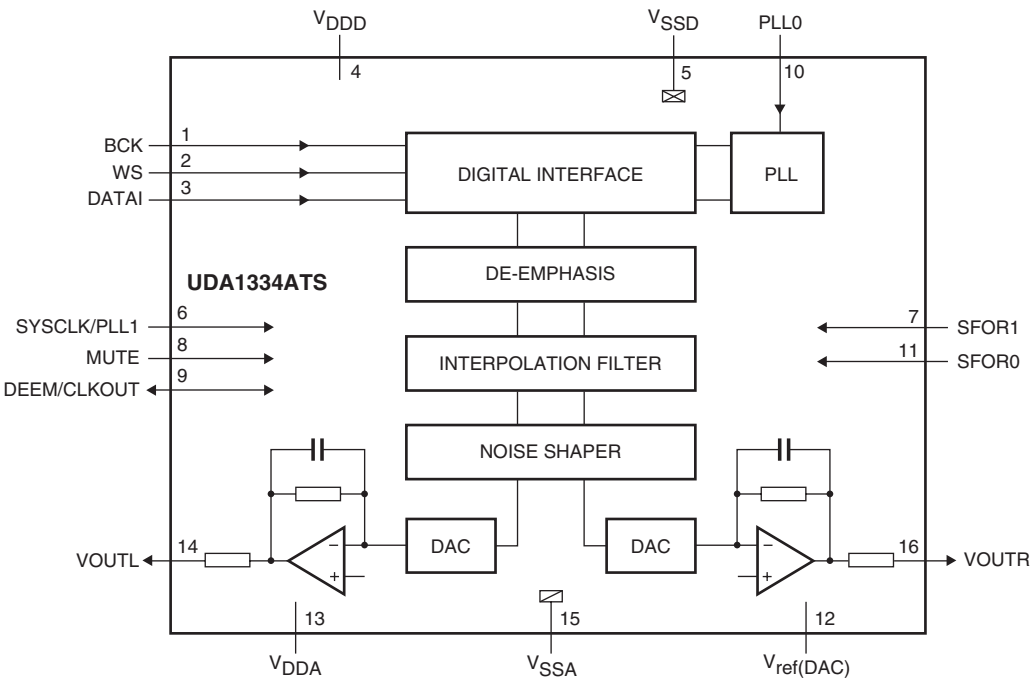


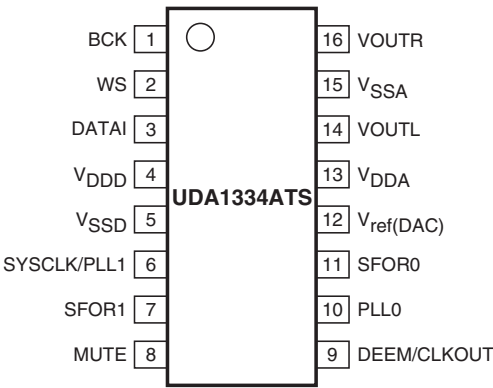
Figure 9-13 Internal block diagram and pin configuration

9.10.2 Diagram B06C, Type UDA1334ATS (IC7810) (audio DAC)

Block Diagram



Pin Configuration

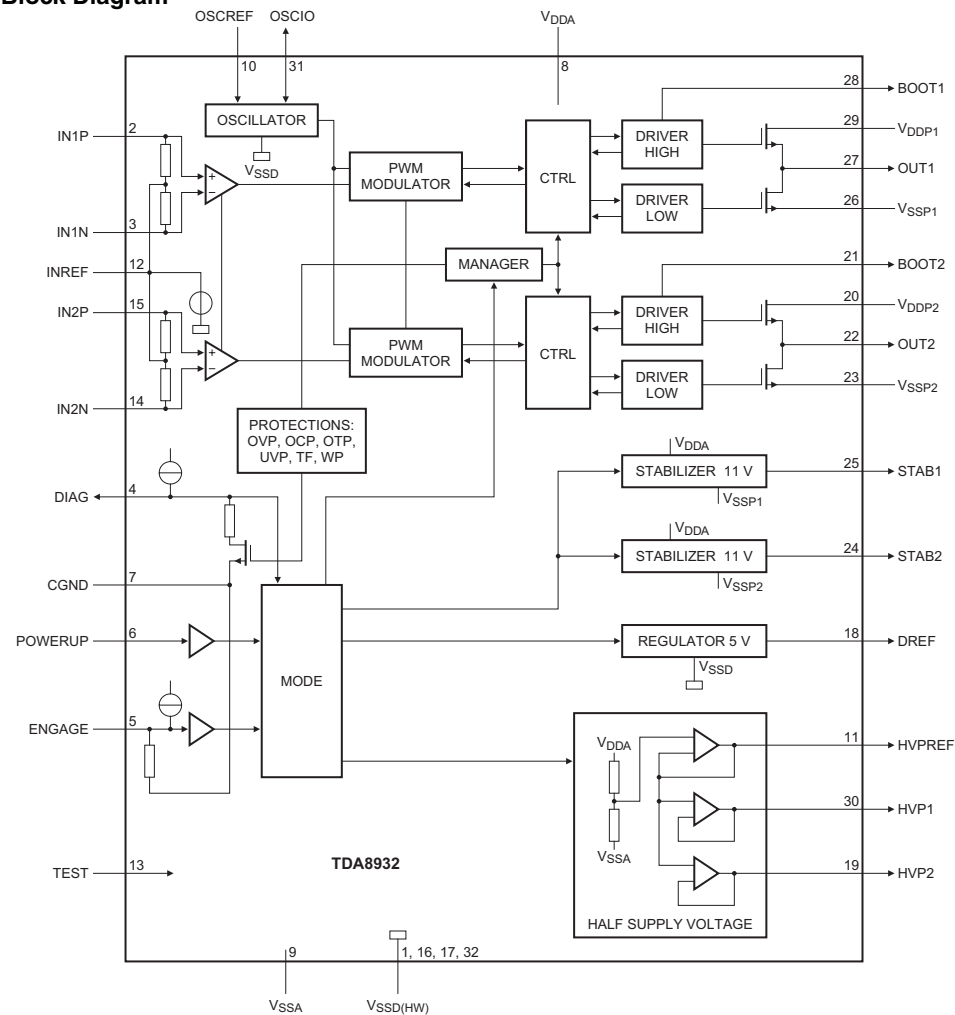


G\_16860\_081.eps  
220207

Figure 9-14 Internal block diagram and pin configuration

9.10.3 Diagram B07, Type TDA8932T (IC7A01) (audio amplifier)

Block Diagram



Pin Configuration

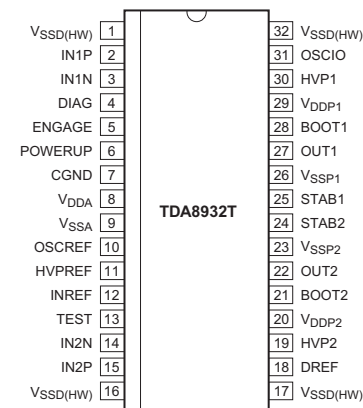
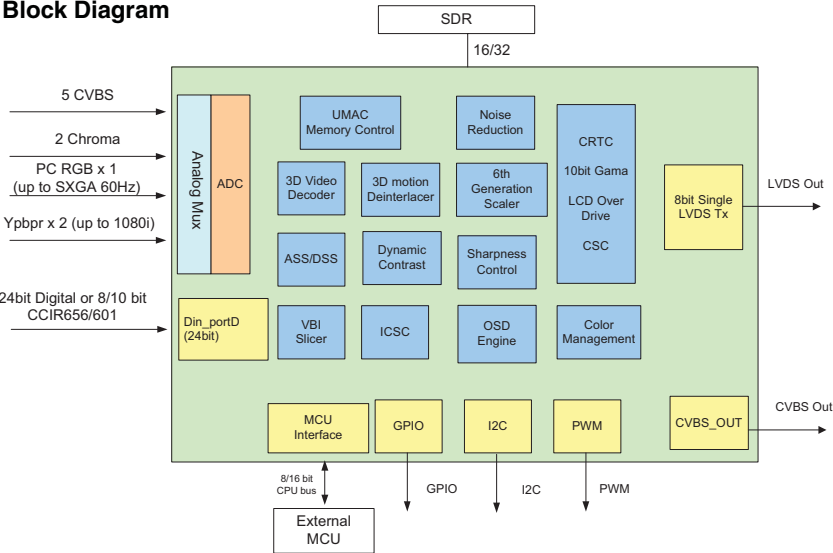


Figure 9-15 Internal block diagram and pin configuration

9.10.4 Diagram B04B, Type SVP CX32 (IC7202) (Trident video processor)

Block Diagram



Pin Configuration

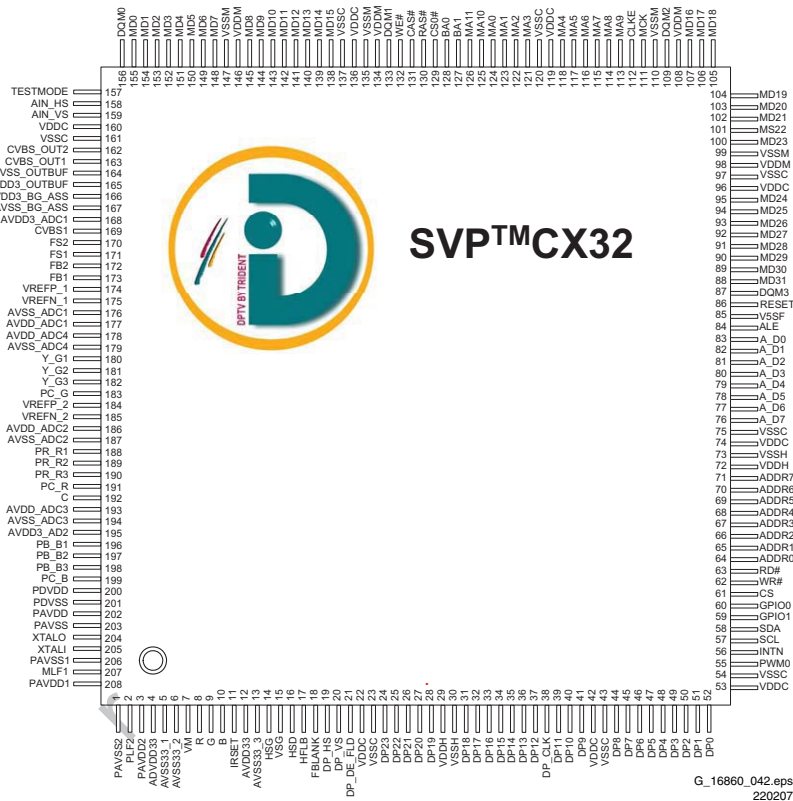
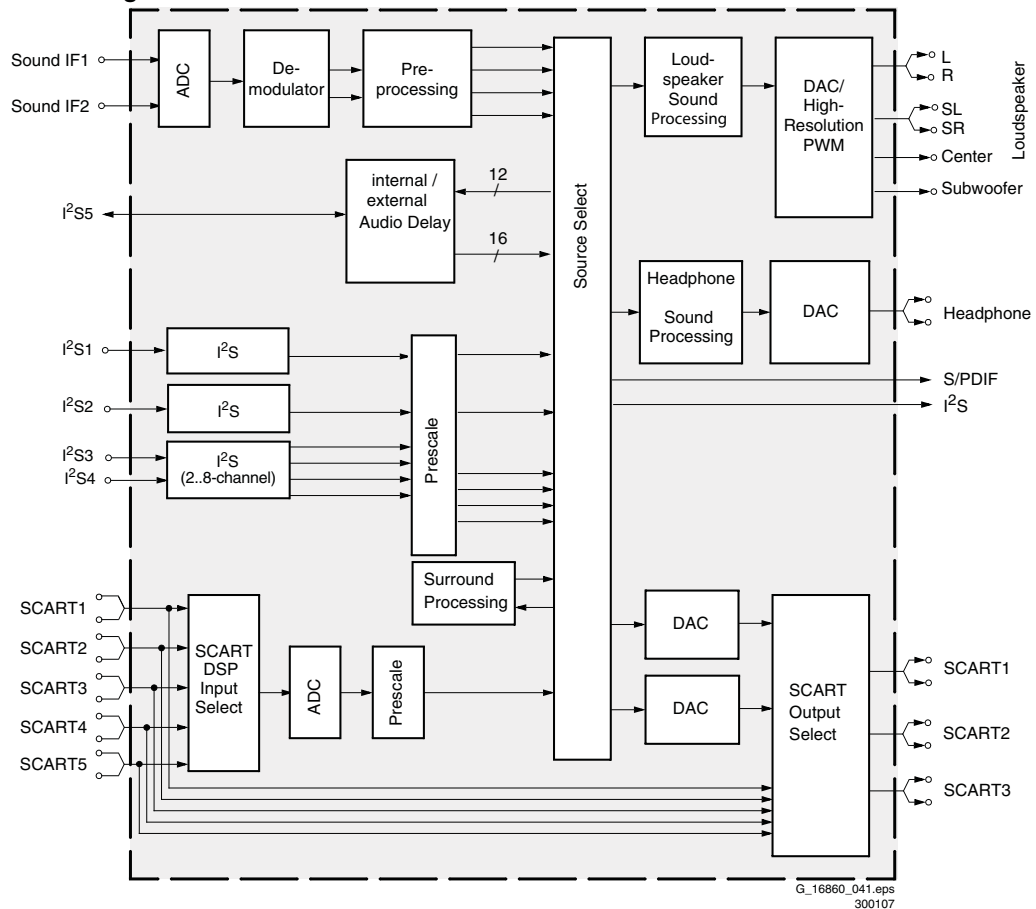


Figure 9-16 Internal block diagram and pin configuration

## 9.10.5 Diagram B04C, Type MSP4450P (IC7411) (Micronas sound processor)

**Block Diagram****Figure 9-17 Internal block diagram**

# 10. Spare Parts List

| Set Level per Model Number (CTN) |                |                        |
|----------------------------------|----------------|------------------------|
| 32PFL5322/10                     |                |                        |
| 0815                             | 3139 127 09075 | Main Software          |
| 0816                             | 3139 127 09093 | Main NVM Software      |
| 0821                             | 3139 127 09103 | HDMI-1 Software        |
| 0822                             | 3139 127 09113 | HDMI-2 Software        |
| 1004▲                            | 9322 230 03682 | LC320W01-SL06          |
| 1005▲                            | 3139 128 78521 | Power Supply Unit      |
| 1112                             | 3139 268 05931 | IR/LED Assy [J]        |
| 1114                             | 3139 268 05921 | Keyboard Assy [E]      |
| 1116                             | 3139 268 08851 | Side IO Assy [D]       |
| 8002                             | 3104 311 07121 | Cable 2p3/220/Inlet    |
| 8304                             | 3104 311 08031 | Cable 11p/480/11p      |
| 8520                             | 3104 311 10701 | Cable 12p/680/12p      |
| 8521                             | 3104 311 12431 | Cable 14p/180/14p      |
| 8735                             | 3139 131 08671 | Cable 4p/480 1000/2ft  |
| 8C01                             | 3139 131 08541 | Cable 9p/220/9p Bk     |
| 8G51                             | 3139 131 08281 | Cable 30p/180/30p Fi-x |
| 8M01                             | 3139 131 08601 | Cable 3p/80/3p Bk      |
| 8M20                             | 3139 131 08691 | Cable 7p/560/7p Bk     |
| 8P11                             | 3139 131 08581 | Cable 8p/220/8p Bk     |
|                                  |                |                        |
| 5213                             | 2422 264 00605 | Loudsp. 6Ω 15W FR      |
| 5215                             | 2422 264 00607 | Loudsp. 6Ω 15W Tw      |
| 32PFL5322/12                     |                |                        |
| 0815                             | 3139 127 09075 | Main Software          |
| 0816                             | 3139 127 09093 | Main NVM Software      |
| 0821                             | 3139 127 09103 | HDMI-1 Software        |
| 0822                             | 3139 127 09113 | HDMI-2 Software        |
| 1004▲                            | 9322 230 03682 | LC320W01-SL06          |
| 1005▲                            | 3139 128 78521 | Power Supply Unit      |
| 1112                             | 3139 268 05931 | IR/LED Assy [J]        |
| 1114                             | 3139 268 05921 | Keyboard Assy [E]      |
| 1116                             | 3139 268 08851 | Side IO Assy [D]       |
| 8002                             | 3104 311 07121 | Cable 2p3/220/Inlet    |
| 8304                             | 3104 311 08031 | Cable 11p/480/11p      |
| 8520                             | 3104 311 10701 | Cable 12p/680/12p      |
| 8521                             | 3104 311 12431 | Cable 14p/180/14p      |
| 8735                             | 3139 131 08671 | Cable 4p/480 1000/2ft  |
| 8C01                             | 3139 131 08541 | Cable 9p/220/9p Bk     |
| 8G51                             | 3139 131 08281 | Cable 30p/180/30p Fi-x |
| 8M01                             | 3139 131 08601 | Cable 3p/80/3p Bk      |
| 8M20                             | 3139 131 08691 | Cable 7p/560/7p Bk     |
| 8P11                             | 3139 131 08581 | Cable 8p/220/8p Bk     |
|                                  |                |                        |
| 5213                             | 2422 264 00605 | Loudsp. 6Ω 15W FR      |
| 5215                             | 2422 264 00607 | Loudsp. 6Ω 15W Tw      |
| 42PFL5322/10                     |                |                        |
| 0815                             | 3139 127 09075 | Main Software          |
| 0816                             | 3139 127 09093 | Main NVM Software      |
| 0821                             | 3139 127 09103 | HDMI-1 Software        |
| 0822                             | 3139 127 09113 | HDMI-2 Software        |
| 1004▲                            | 9322 246 97682 | LC420WX3-SLA1          |
| 1005                             | 3122 427 24571 | Power Supply Unit      |
| 1112                             | 3139 268 05931 | IR/LED Assy [J]        |
| 1114                             | 3139 268 05921 | Keyboard Assy [E]      |
| 1116                             | 3139 268 08961 | Side IO Assy [D] 42    |
| 8002                             | 3104 311 08071 | Cable 2P3/140          |
| 8304                             | 3104 311 07951 | Cable 11p/680/11p      |
| 8520                             | 3104 311 08191 | Cable 12p/1200/12p     |
| 8521                             | 3104 311 12481 | Cable 14p/400/14p Wh   |
| 8735                             | 3139 131 08041 | Cable 4p/560 820/2ft   |
| 8C01                             | 3139 131 08521 | Cable 9p/400/9p Bk     |
| 8G51                             | 3139 131 08291 | Cable 30p/280/30p Fi-x |
| 8M01                             | 3139 131 08601 | Cable 3p/80/3p Bk      |
| 8M20                             | 3104 311 13091 | Cable 7p/560/7p Wh     |
| 8P11                             | 3139 131 08561 | Cable 8p/400/8p Bk     |
|                                  |                |                        |
| 5211                             | 2422 264 00618 | Loudsp. 6Ω 15W R       |
| 5212                             | 2422 264 00617 | Loudsp. 6Ω 15W L       |

| 42PFL5322/12 |                |                        |
|--------------|----------------|------------------------|
| 0815         | 3139 127 09075 | Main Software          |
| 0816         | 3139 127 09093 | Main NVM Software      |
| 0821         | 3139 127 09103 | HDMI-1 Software        |
| 0822         | 3139 127 09113 | HDMI-2 Software        |
| 1004▲        | 9322 246 97682 | LC420WX3-SLA1          |
| 1005▲        | 3122 427 24571 | Power Supply Unit      |
| 1112         | 3139 268 05931 | IR/LED Assy [J]        |
| 1114         | 3139 268 05921 | Keyboard Assy [E]      |
| 1116         | 3139 268 08961 | Side IO Assy [D] 42    |
| 8002         | 3104 311 08071 | Cable 2P3/140          |
| 8304         | 3104 311 07951 | Cable 11p/680/11p      |
| 8735         | 3139 131 08041 | Cable 4p/560 820/2ft   |
| 8C01         | 3139 131 08521 | Cable 9p/400/9p Bk     |
| 8G51         | 3139 131 08291 | Cable 30p/280/30p Fi-x |
| 8M01         | 3139 131 08601 | Cable 3p/80/3p Bk      |
| 8M20         | 3104 311 13091 | Cable 7p/560/7p Wh     |
| 8P11         | 3139 131 08561 | Cable 8p/400/8p Bk     |
|              |                |                        |
| 5211         | 2422 264 00618 | Loudsp. 6Ω 15W R       |
| 5212         | 2422 264 00617 | Loudsp. 6Ω 15W L       |

| Small Signal Board [B] |                |                        |
|------------------------|----------------|------------------------|
| Various                |                |                        |
| 1101                   | 3139 147 19801 | Tuner UV1318S/A IH -3  |
| 1102                   | 9322 042 72682 | SAW 38.9MHz K3953M     |
| 1103                   | 2422 549 44341 | SAW 38.9MHz K9656M     |
| 1104                   | 2422 543 01386 | Xtal 4MHz 20p          |
| 1201                   | 2422 543 01133 | Xtal 14.32MHz 20pF     |
| 1210                   | 2422 549 45325 | Bead 67Ω at 100MHz     |
| 1211                   | 2422 549 45325 | Bead 67Ω at 100MHz     |
| 1212                   | 2422 549 45325 | Bead 67Ω at 100MHz     |
| 1213                   | 2422 549 45325 | Bead 67Ω at 100MHz     |
| 1214                   | 2422 549 45325 | Bead 67Ω at 100MHz     |
| 1215                   | 2422 549 45325 | Bead 67Ω at 100MHz     |
| 1216                   | 2422 549 45325 | Bead 67Ω at 100MHz     |
| 1301                   | 2422 543 01526 | Xtal 10MHz 12p NX8045  |
| 1304                   | 2422 025 10655 | Connector 11p m        |
| 1314                   | 2422 025 18749 | Connector 3p m         |
| 1411                   | 2422 543 01461 | Xtal 18.432MHz 12p     |
| 1504                   | 2422 025 20251 | SCART V 21p F Bk       |
| 1506                   | 2422 025 20251 | SCART V 21p F Bk       |
| 1615                   | 2422 026 05894 | Socket CINCH           |
| 1735                   | 2422 025 09406 | Connector 4p m         |
| 1810                   | 2422 033 00617 | Socket HDMI            |
| 1811                   | 2422 033 00617 | Socket HDMI            |
| 1823                   | 2422 543 01517 | Xtal 28M322 18p NX5032 |
| 1C01                   | 2422 025 10769 | Connector 9p m         |
| 1G51                   | 2422 025 18772 | Connector 30p m        |
| 1M20                   | 4822 267 10618 | Connector 7p           |
| 1P11                   | 4822 265 11352 | Connector 8p           |
|                        |                |                        |
| 2112                   | 2020 552 00343 | 22μF 10% 16V           |
| 2117                   | 5322 126 11583 | 10nF 10% 50V 0603      |
| 2118                   | 5322 126 11583 | 10nF 10% 50V 0603      |
| 2119                   | 2020 552 96863 | 100nF 50V 0603         |
| 2120                   | 2020 552 00343 | 22μF 10% 16V           |
| 2121                   | 3198 016 31590 | 15pF 10% 50V 0603      |
| 2122                   | 3198 016 31590 | 15pF 10% 50V 0603      |
| 2123                   | 4822 126 14247 | 1.5nF 50V 0603         |
| 2125                   | 3198 017 44740 | 470nF 10V 0603         |
| 2126                   | 3198 017 42240 | 220nF 16V Y5V 0603     |
| 2127                   | 4822 122 33761 | 22pF 5% 50V            |
| 2128                   | 5322 126 11583 | 10nF 10% 50V 0603      |
| 2129                   | 2020 552 00343 | 22μF 10% 16V           |
| 2130                   | 5322 126 11583 | 10nF 10% 50V 0603      |
| 2131                   | 2020 552 00343 | 22μF 10% 16V           |
| 2132                   | 2020 552 00343 | 22μF 10% 16V           |
| 2133                   | 5322 126 11583 | 10nF 10% 50V 0603      |
| 2136                   | 3198 017 44740 | 470nF 10V 0603         |
| 2137                   | 5322 126 11583 | 10nF 10% 50V 0603      |
| 2138                   | 5322 126 11583 | 10nF 10% 50V 0603      |
| 2139                   | 4822 126 14315 | 390pF 5% 50V 0603      |
| 2143                   | 5322 126 11578 | 1nF 10% 50V 0603       |
| 2144                   | 5322 126 11583 | 10nF 10% 50V 0603      |
| 2145                   | 5322 126 11578 | 1nF 10% 50V 0603       |
| 2147                   | 2238 786 19856 | 330nF 20% 160V 0603    |
| 2148                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2149                   | 2020 552 00132 | 2.2μF 10% 10V          |
| 2151                   | 3198 030 81090 | 10μF 20% 50V           |
| 2207                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2208                   | 4822 124 12095 | 100μF 20% 16V          |
| 2209                   | 4822 124 12095 | 100μF 20% 16V          |
| 2210                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2211                   | 2020 552 00291 | 10μF 20% 6V3 0603      |
| 2212                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2213                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2214                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2215                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2216                   | 2020 552 00291 | 10μF 20% 6V3 0603      |
| 2217                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2218                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2219                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2220                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2221                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2222                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2223                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2224                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2225                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2226                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2227                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2228                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2229                   | 2020 552 00134 | 22μF 20% 6.3V 0805     |
| 2230                   | 2020 552 00291 | 10μF 20% 6V3 0603      |
| 2231                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2232                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2233                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2234                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2235                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2236                   | 2020 552 00291 | 10μF 20% 6V3 0603      |
| 2237                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2238                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2239                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2240                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2241                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2242                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2243                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2244                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2245                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2246                   | 2020 552 96749 | 20pF 5% 50V 0603       |
| 2247                   | 2020 552 96749 | 20pF 5% 50V 0603       |
| 2248                   | 2022 552 05679 | 1μF 10% 16V 0805       |
| 2250                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2251                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2252                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2253                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2254                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2255                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2256                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2257                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2258                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2259                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2260                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2261                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2266                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2267                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2268                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2269                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2270                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2271                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2272                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2273                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2274                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2275                   | 2238 586 15628 | 2.7nF 10% 50V 0603     |
| 2276                   | 2238 586 15628 | 2.7nF 10% 50V 0603     |
| 2277                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2279                   | 2020 552 00291 | 10μF 20% 6V3 0603      |
| 2280                   | 2020 552 00291 | 10μF 20% 6V3 0603      |
| 2282                   | 2020 552 00291 | 10μF 20% 6V3 0603      |
| 2284                   | 2020 552 00291 | 10μF 20% 6V3 0603      |
| 2286                   | 2020 552 00291 | 10μF 20% 6V3 0603      |
| 2287                   | 2020 552 00291 | 10μF 20% 6V3 0603      |
| 2288                   | 2020 552 00291 | 10μF 20% 6V3 0603      |
| 2289                   | 2020 552 00291 | 10μF 20% 6V3 0603      |
| 2290                   | 2020 552 00291 | 10μF 20% 6V3 0603      |
| 2291                   | 2020 552 00291 | 10μF 20% 6V3 0603      |
| 2292                   | 2020 552 00291 | 10μF 20% 6V3 0603      |
| 2293                   | 2020 552 00291 | 10μF 20% 6V3 0603      |
| 2295                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2296                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2297                   | 2020 552 00134 | 22μF 20% 6.3V 0805     |
| 2298                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2310                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2311                   | 2020 552 00291 | 10μF 20% 6V3 0603      |
| 2312                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2313                   | 2238 586 59812 | 100nF 20% 50V 0603     |
| 2314                   | 3198 016 31590 | 15pF 10% 50V 0603      |
| 2315                   | 2238 586 59812 | 100nF 20% 50V 0603     |

|      |                |                    |      |                |                    |      |                |                    |
|------|----------------|--------------------|------|----------------|--------------------|------|----------------|--------------------|
| 2316 | 3198 016 31590 | 15pF 10% 50V 0603  | 2830 | 2238 586 59812 | 100nF 20% 50V 0603 | 2B19 | 2022 031 00308 | 22μF 20% 35V       |
| 2317 | 2238 586 59812 | 100nF 20% 50V 0603 | 2833 | 2238 586 59812 | 100nF 20% 50V 0603 | 2B20 | 2020 552 94427 | 100pF 5% 50V       |
| 2318 | 2238 586 59812 | 100nF 20% 50V 0603 | 2835 | 2238 586 59812 | 100nF 20% 50V 0603 | 2B21 | 4822 124 23002 | 10μF 16V           |
| 2320 | 2238 586 59812 | 100nF 20% 50V 0603 | 2836 | 2238 586 59812 | 100nF 20% 50V 0603 | 2B22 | 3198 030 74780 | 4u7 20% 35V        |
| 2323 | 2238 586 59812 | 100nF 20% 50V 0603 | 2838 | 2238 586 59812 | 100nF 20% 50V 0603 | 2B24 | 2020 012 93822 | 47μF 20% 16V       |
| 2327 | 5322 126 11583 | 10nF 10% 50V 0603  | 2839 | 2238 586 59812 | 100nF 20% 50V 0603 | 2B25 | 2238 586 59812 | 100nF 20% 50V 0603 |
| 2329 | 5322 126 11578 | 1nF 10% 50V 0603   | 2840 | 2238 586 59812 | 100nF 20% 50V 0603 | 2C55 | 5322 126 11578 | 1nF 10% 50V 0603   |
| 2330 | 5322 126 11578 | 1nF 10% 50V 0603   | 2843 | 2238 586 59812 | 100nF 20% 50V 0603 | 2C56 | 5322 126 11578 | 1nF 10% 50V 0603   |
| 2331 | 5322 126 11578 | 1nF 10% 50V 0603   | 2844 | 2238 586 59812 | 100nF 20% 50V 0603 | 2C57 | 5322 126 11578 | 1nF 10% 50V 0603   |
| 2332 | 5322 126 11578 | 1nF 10% 50V 0603   | 2845 | 2238 586 59812 | 100nF 20% 50V 0603 | 2L24 | 4822 126 13879 | 220nF +80-20% 16V  |
| 2333 | 5322 126 11578 | 1nF 10% 50V 0603   | 2847 | 5322 126 11578 | 1nF 10% 50V 0603   | 2L25 | 4822 126 13879 | 220nF +80-20% 16V  |
| 2335 | 5322 126 11578 | 1nF 10% 50V 0603   | 2848 | 5322 126 11578 | 1nF 10% 50V 0603   |      |                |                    |
| 2336 | 5322 126 11578 | 1nF 10% 50V 0603   | 2849 | 5322 126 11578 | 1nF 10% 50V 0603   |      |                |                    |
| 2337 | 5322 126 11578 | 1nF 10% 50V 0603   | 2850 | 5322 126 11578 | 1nF 10% 50V 0603   |      |                |                    |
| 2338 | 4822 126 13879 | 220nF +80-20% 16V  | 2851 | 5322 126 11578 | 1nF 10% 50V 0603   |      |                |                    |
| 2408 | 4822 126 13881 | 470pF 5% 50V       | 2852 | 5322 126 11578 | 1nF 10% 50V 0603   |      |                |                    |
| 2409 | 4822 126 14247 | 1.5nF 50V 0603     | 2853 | 5322 126 11578 | 1nF 10% 50V 0603   |      |                |                    |
| 2410 | 4822 124 23002 | 10μF 16V           | 2854 | 5322 126 11578 | 1nF 10% 50V 0603   |      |                |                    |
| 2411 | 2020 552 00291 | 10μF 20% 6V3 0603  | 2855 | 3198 016 31020 | 1nF 25V 0603       |      |                |                    |
| 2412 | 4822 126 13883 | 220pF 5% 50V       | 2856 | 5322 126 11578 | 1nF 10% 50V 0603   |      |                |                    |
| 2413 | 4822 126 13883 | 220pF 5% 50V       | 2857 | 5322 126 11578 | 1nF 10% 50V 0603   |      |                |                    |
| 2414 | 2020 552 00291 | 10μF 20% 6V3 0603  | 2858 | 5322 126 11578 | 1nF 10% 50V 0603   |      |                |                    |
| 2415 | 3198 016 33380 | 3.3pF 50V 0603     | 2859 | 5322 126 11578 | 1nF 10% 50V 0603   |      |                |                    |
| 2416 | 3198 016 33380 | 3.3pF 50V 0603     | 2860 | 5322 126 11578 | 1nF 10% 50V 0603   |      |                |                    |
| 2417 | 4822 126 14241 | 330pF 0603 50V     | 2861 | 5322 126 11578 | 1nF 10% 50V 0603   |      |                |                    |
| 2418 | 4822 126 14241 | 330pF 0603 50V     | 2865 | 3198 016 31020 | 1nF 25V 0603       |      |                |                    |
| 2419 | 2238 586 59812 | 100nF 20% 50V 0603 | 2866 | 5322 126 11578 | 1nF 10% 50V 0603   |      |                |                    |
| 2420 | 4822 124 23002 | 10μF 16V           | 2867 | 5322 126 11578 | 1nF 10% 50V 0603   |      |                |                    |
| 2421 | 4822 126 14241 | 330pF 0603 50V     | 2868 | 5322 126 11578 | 1nF 10% 50V 0603   |      |                |                    |
| 2422 | 4822 126 14241 | 330pF 0603 50V     | 2869 | 5322 126 11578 | 1nF 10% 50V 0603   |      |                |                    |
| 2423 | 4822 124 23002 | 10μF 16V           | 2870 | 5322 126 11578 | 1nF 10% 50V 0603   |      |                |                    |
| 2424 | 2020 552 00291 | 10μF 20% 6V3 0603  | 2871 | 5322 126 11578 | 1nF 10% 50V 0603   |      |                |                    |
| 2425 | 2020 552 00291 | 10μF 20% 6V3 0603  | 2872 | 5322 126 11578 | 1nF 10% 50V 0603   |      |                |                    |
| 2426 | 2020 552 00291 | 10μF 20% 6V3 0603  | 2873 | 5322 126 11578 | 1nF 10% 50V 0603   |      |                |                    |
| 2427 | 2020 552 00291 | 10μF 20% 6V3 0603  | 2874 | 3198 016 31020 | 1nF 25V 0603       |      |                |                    |
| 2428 | 2020 552 94427 | 100pF 5% 50V       | 2875 | 5322 126 11578 | 1nF 10% 50V 0603   |      |                |                    |
| 2429 | 2020 552 94427 | 100pF 5% 50V       | 2876 | 5322 126 11578 | 1nF 10% 50V 0603   |      |                |                    |
| 2430 | 2020 552 94427 | 100pF 5% 50V       | 2901 | 2020 552 96664 | 33pF 50V 0603      |      |                |                    |
| 2431 | 2020 552 94427 | 100pF 5% 50V       | 2902 | 3198 017 44740 | 470nF 10V 0603     |      |                |                    |
| 2432 | 4822 126 14225 | 56pF 5% 50V 0603   | 2903 | 4822 124 12095 | 100μF 20% 16V      |      |                |                    |
| 2433 | 4822 126 14241 | 330pF 0603 50V     | 2904 | 3198 017 44740 | 470nF 10V 0603     |      |                |                    |
| 2434 | 4822 126 14241 | 330pF 0603 50V     | 2905 | 2020 552 96664 | 33pF 50V 0603      |      |                |                    |
| 2435 | 4822 126 14241 | 330pF 0603 50V     | 2906 | 4822 124 12095 | 100μF 20% 16V      |      |                |                    |
| 2436 | 2020 552 00291 | 10μF 20% 6V3 0603  | 2907 | 3198 017 44740 | 470nF 10V 0603     |      |                |                    |
| 2437 | 2020 552 00291 | 10μF 20% 6V3 0603  | 2908 | 4822 126 13879 | 220nF +80-20% 16V  |      |                |                    |
| 2438 | 2238 586 59812 | 100nF 20% 50V 0603 | 2913 | 4822 126 13879 | 220nF +80-20% 16V  |      |                |                    |
| 2439 | 2020 552 00247 | 470nF 10% 25V      | 2940 | 4822 124 11131 | 47μF 6.3V          |      |                |                    |
| 2440 | 2020 552 00247 | 470nF 10% 25V      | 2A01 | 2238 586 59812 | 100nF 20% 50V 0603 |      |                |                    |
| 2441 | 4822 126 14247 | 1.5nF 50V 0603     | 2A02 | 2238 586 59812 | 100nF 20% 50V 0603 |      |                |                    |
| 2442 | 4822 126 13881 | 470pF 5% 50V       | 2A04 | 2020 021 00215 | 220μF 20% 25V      |      |                |                    |
| 2443 | 4822 126 14247 | 1.5nF 50V 0603     | 2A08 | 2020 021 00215 | 220μF 20% 25V      |      |                |                    |
| 2444 | 4822 126 13881 | 470pF 5% 50V       | 2A09 | 2238 586 59812 | 100nF 20% 50V 0603 |      |                |                    |
| 2445 | 2238 586 59812 | 100nF 20% 50V 0603 | 2A10 | 2238 586 59812 | 100nF 20% 50V 0603 |      |                |                    |
| 2502 | 4822 126 14241 | 330pF 0603 50V     | 2A11 | 2020 552 96807 | 1μF 10% 10V 0603   |      |                |                    |
| 2506 | 4822 126 14241 | 330pF 0603 50V     | 2A12 | 4822 126 13883 | 220pF 5% 50V       |      |                |                    |
| 2508 | 4822 126 14241 | 330pF 0603 50V     | 2A13 | 3198 017 42240 | 220nF 16V Y5V 0603 |      |                |                    |
| 2509 | 4822 126 13879 | 220nF +80-20% 16V  | 2A14 | 2020 552 00247 | 470nF 10% 25V      |      |                |                    |
| 2512 | 5322 126 11579 | 3.3nF 10% 63V      | 2A15 | 2020 552 96807 | 1μF 10% 10V 0603   |      |                |                    |
| 2514 | 4822 126 14241 | 330pF 0603 50V     | 2A16 | 2020 552 96807 | 1μF 10% 10V 0603   |      |                |                    |
| 2515 | 4822 126 13879 | 220nF +80-20% 16V  | 2A17 | 3198 016 31020 | 1nF 25V 0603       |      |                |                    |
| 2517 | 5322 126 11579 | 3.3nF 10% 63V      | 2A18 | 3198 016 31020 | 1nF 25V 0603       |      |                |                    |
| 2518 | 4822 126 13879 | 220nF +80-20% 16V  | 2A19 | 4822 126 13883 | 220pF 5% 50V       |      |                |                    |
| 2520 | 5322 126 11579 | 3.3nF 10% 63V      | 2A20 | 2020 552 96807 | 1μF 10% 10V 0603   |      |                |                    |
| 2521 | 4822 126 13879 | 220nF +80-20% 16V  | 2A21 | 3198 016 31020 | 1nF 25V 0603       |      |                |                    |
| 2523 | 5322 126 11579 | 3.3nF 10% 63V      | 2A22 | 2238 586 59812 | 100nF 20% 50V 0603 |      |                |                    |
| 2525 | 4822 126 13879 | 220nF +80-20% 16V  | 2A23 | 3198 016 31020 | 1nF 25V 0603       |      |                |                    |
| 2533 | 4822 126 13879 | 220nF +80-20% 16V  | 2A24 | 2238 586 59812 | 100nF 20% 50V 0603 |      |                |                    |
| 2534 | 4822 126 13879 | 220nF +80-20% 16V  | 2A25 | 3198 017 31530 | 15nF 20% 50V 0603  |      |                |                    |
| 2536 | 4822 126 13879 | 220nF +80-20% 16V  | 2A26 | 3198 017 42240 | 220nF 16V Y5V 0603 |      |                |                    |
| 2607 | 4822 126 13879 | 220nF +80-20% 16V  | 2A27 | 3198 017 31530 | 15nF 20% 50V 0603  |      |                |                    |
| 2608 | 5322 126 11579 | 3.3nF 10% 63V      | 2A28 | 2020 552 00247 | 470nF 10% 25V      |      |                |                    |
| 2610 | 4822 126 13879 | 220nF +80-20% 16V  | 2A29 | 2238 586 59812 | 100nF 20% 50V 0603 |      |                |                    |
| 2612 | 5322 126 11579 | 3.3nF 10% 63V      | 2A30 | 2238 586 59812 | 100nF 20% 50V 0603 |      |                |                    |
| 2801 | 4822 124 11131 | 47μF 6.3V          | 2A31 | 3198 016 31020 | 1nF 25V 0603       |      |                |                    |
| 2802 | 2238 586 59812 | 100nF 20% 50V 0603 | 2A32 | 3198 016 31020 | 1nF 25V 0603       |      |                |                    |
| 2803 | 2238 586 59812 | 100nF 20% 50V 0603 | 2A33 | 2238 586 59812 | 100nF 20% 50V 0603 |      |                |                    |
| 2804 | 2238 586 59812 | 100nF 20% 50V 0603 | 2A34 | 2238 586 59812 | 100nF 20% 50V 0603 |      |                |                    |
| 2805 | 4822 124 11131 | 47μF 6.3V          | 2A35 | 3198 016 31020 | 1nF 25V 0603       |      |                |                    |
| 2806 | 2238 586 59812 | 100nF 20% 50V 0603 | 2A36 | 3198 016 31020 | 1nF 25V 0603       |      |                |                    |
| 2807 | 2238 586 59812 | 100nF 20% 50V 0603 | 2A37 | 3198 017 42240 | 220nF 16V Y5V 0603 |      |                |                    |
| 2808 | 4822 124 11131 | 47μF 6.3V          | 2A38 | 3198 017 42240 | 220nF 16V Y5V 0603 |      |                |                    |
| 2809 | 5322 126 11583 | 10nF 10% 50V 0603  | 2A40 | 2020 552 00247 | 470nF 10% 25V      |      |                |                    |
| 2810 | 5322 126 11583 | 10nF 10% 50V 0603  | 2A41 | 2020 552 96807 | 1μF 10% 10V 0603   |      |                |                    |
| 2811 | 2020 552 00291 | 10μF 20% 6V3 0603  | 2A45 | 3198 016 31020 | 1nF 25V 0603       |      |                |                    |
| 2812 | 2020 552 00291 | 10μF 20% 6V3 0603  | 2A46 | 3198 024 44730 | 47nF 50V 0603      |      |                |                    |
| 2813 | 4822 126 14507 | 18pF 5% 50V 0603   | 2A47 | 3198 024 44730 | 47nF 50V 0603      |      |                |                    |
| 2814 | 5322 126 11583 | 10nF 10% 50V 0603  | 2B10 | 4822 124 12095 | 100μF 20% 16V      |      |                |                    |
| 2815 | 5322 126 11583 | 10nF 10% 50V 0603  | 2B11 | 5322 126 11583 | 10nF 10% 50V 0603  |      |                |                    |
| 2816 | 5322 126 11578 | 1nF 10% 50V 0603   | 2B12 | 2020 552 00343 | 22μF 10% 16V       |      |                |                    |
| 2817 | 2238 586 59812 | 100nF 20% 50V 0603 | 2B13 | 2022 031 00373 | 470μF 20% 16V      |      |                |                    |
| 2818 | 2238 586 59812 | 100nF 20% 50V 0603 | 2B14 | 4822 126 13883 | 220pF 5% 50V       |      |                |                    |
| 2819 | 2238 586 59812 | 100nF 20% 50V 0603 | 2B15 | 2238 916 15641 | 22nF 10% 25V 0603  |      |                |                    |
| 2828 | 4822 126 14507 | 18pF 5% 50V 0603   | 2B17 | 2238 586 59812 | 100nF 20% 50V 0603 |      |                |                    |
| 2829 | 2238 586 59812 | 100nF 20% 50V 0603 | 2B18 | 4822 124 23002 | 10μF 16V           |      |                |                    |

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|------|----------------|----------------------|
| 3110 | 3198 021 38220 | 8.2kΩ 5% 0.062W 0603 |
| 3111 | 4822 051 30562 | 5.6kΩ 5% 0.063W 0603 |
| 3115 | 4822 051 30393 | 39kΩ 5% 0.062W       |
| 3116 | 4822 051 30682 | 6.8Ω 5% 0.062W       |
| 3117 | 4822 051 30222 | 2.2kΩ 5% 0.062W      |
| 3118 | 4822 051 30222 | 2.2kΩ 5% 0.062W      |
| 3119 | 4822 051 30223 | 22kΩ 5% 0.062W       |
| 3120 | 2422 549 42896 | Bead 120Ω 100MHz     |
| 3121 | 2422 549 42896 | Bead 120Ω 100MHz     |
| 3122 | 4822 051 30183 | 18kΩ 5% 0.062W       |
| 3123 | 4822 051 30151 | 150Ω 5% 0.062W       |
| 3124 | 4822 051 30101 | 100Ω 5% 0.062W       |
| 3125 | 4822 051 30151 | 150Ω 5% 0.062W       |
| 3126 | 4822 051 30181 | 180Ω 5% 0.062W       |
| 3127 | 4822 051 30562 | 5.6kΩ 5% 0.063W 0603 |
| 3128 | 4822 051 30101 | 100Ω 5% 0.062W       |
| 3129 | 4822 051 30101 | 100Ω 5% 0.062W       |
| 3130 | 4822 051 30102 | 1kΩ 5% 0.062W        |
| 3133 | 4822 117 11151 | 1Ω 5%                |
| 3134 | 4822 117 11151 | 1Ω 5%                |
| 3135 | 4822 117 12971 | 15Ω 5% 0603 0.62W    |
| 3136 | 2322 762 60479 | 47Ω 5% 2512          |
| 3137 | 2322 762 60479 | 47Ω 5% 2512          |
| 3201 | 3198 031 11010 | 4 x 100Ω 5% 1206     |
| 3202 | 3198 031 11010 | 4 x 100Ω 5% 1206     |
| 3203 | 4822 117 13523 | 220Ω 5% 0.63W        |
| 3204 | 4822 117 13523 | 220Ω 5% 0.63W        |
| 3211 | 4822 051 30102 | 1kΩ 5% 0.062W        |
| 3212 | 4822 051 30101 | 100Ω 5% 0.062W       |
| 3213 | 4822 117 12925 | 47kΩ 1% 0.063W 0603  |
| 3215 | 4822 051 30101 | 100Ω 5% 0.062W       |
| 3216 | 4822 051 30479 | 47Ω 5% 0.062W        |
| 3217 | 4822 117 12925 | 47kΩ 1% 0.063W 0603  |
| 3221 | 4822 051 30472 | 4.7Ω 5% 0.062W       |
| 3222 | 4822 051 30472 | 4.7Ω 5% 0.062W       |
| 3239 | 4822 051 30101 | 100Ω 5% 0.062W       |
| 3241 | 4822 051 30221 | 220Ω 5% 0.062W       |
| 3242 | 4822 051 30472 | 4.7Ω 5% 0.062W       |
| 3243 | 4822 051 30101 | 100Ω 5% 0.062W       |
| 3244 | 3198 021 32290 | 22Ω 5% 0603          |
| 3245 | 4822 051 30103 | 10kΩ 5% 0.062W       |
| 3246 | 4822 051 30101 | 100Ω 5% 0.062W       |
| 3247 | 4822 051 30101 | 100Ω 5% 0.062W       |
| 3248 | 3198 021 32290 | 22Ω 5% 0603          |
| 3260 | 2350 035 10229 | 4 x 22Ω 5% 1206      |
| 3261 | 2350 035 10229 | 4 x 22Ω 5% 1206      |
| 3262 | 2350 035 10229 | 4 x 22Ω 5% 1206      |
| 3263 | 2350 035 10229 | 4 x 22Ω 5% 1206      |
| 3264 | 2350 035 10229 | 4 x 22Ω 5% 1206      |
| 3265 | 2350 035 10229 | 4 x 22Ω 5% 1206      |
| 3266 | 3198 021 32290 | 22Ω 5% 0603          |
| 3267 | 3198 021 32290 | 22Ω 5% 0603          |
| 3268 | 2350 035 10229 | 4 x 22Ω 5% 1206      |
| 3271 | 2350 035 10229 | 4 x 22Ω 5% 1206      |
| 3300 | 4822 117 11817 | 1.2kΩ 1% 0.0625W     |
| 3303 | 4822 051 30101 | 100Ω 5% 0.062W       |
| 3305 | 4822 051 30332 | 3.3Ω 5% 0.062W       |
| 3308 | 4822 051 30332 | 3.3Ω 5% 0.062W       |
| 3310 | 4822 051 30102 | 1kΩ 5% 0.062W        |
| 3313 | 4822 051 30331 | 330Ω 5% 0.062W       |
| 3314 | 4822 051 30103 | 10kΩ 5% 0.062W       |
| 3315 | 4822 051 30101 | 100Ω 5% 0.062W       |
| 3316 | 4822 051 30103 | 10kΩ 5% 0.062W       |
| 3318 | 4822 051 30101 | 100Ω 5% 0.062W       |
| 3319 | 4822 051 30103 | 10kΩ 5% 0.062W       |
| 3320 | 4822 051 30101 | 100Ω 5% 0.062W       |
| 3322 | 4822 051 30101 | 100Ω 5% 0.062W       |
| 3323 | 4822 051 30101 | 100Ω 5% 0.062W       |
| 3324 | 4822 051 30331 | 330Ω 5% 0.062W       |
| 3325 | 4822 051 30103 | 10kΩ 5% 0.062W       |
| 3329 | 4822 051 30101 | 100Ω 5% 0.062W       |
| 3336 | 4822 051 30101 | 100Ω 5% 0.062W       |
| 3338 | 4822 051 30101 | 100Ω 5% 0.062W       |
| 3339 | 4822 051 30101 | 100Ω 5% 0.062W       |
| 3340 | 4822 051 30101 | 100Ω 5% 0.062W       |
| 3341 | 4822 051 30101 | 100Ω 5% 0.062W       |
| 3342 | 4822 051 30101 | 100Ω 5% 0.062W       |
| 3343 | 4822 051 30101 | 100Ω 5% 0.062W       |
| 3345 | 4822 051 30101 | 100Ω 5% 0.062W       |

|       |                |                     |      |                |                     |       |                |                     |
|-------|----------------|---------------------|------|----------------|---------------------|-------|----------------|---------------------|
| 3346  | 4822 051 30101 | 100Ω 5% 0.062W      | 3605 | 4822 051 30759 | 75Ω 5% 0.062W       | 3B12  | 5322 117 13049 | 470Ω 1% 0.063W 0603 |
| 3347  | 4822 051 30103 | 10kΩ 5% 0.062W      | 3607 | 4822 051 30151 | 150Ω 5% 0.062W      | 3B13  | 4822 051 30221 | 220Ω 5% 0.062W      |
| 3348  | 4822 051 30479 | 47Ω 5% 0.062W       | 3608 | 4822 051 30333 | 33kΩ 5% 0.062W      | 3B14  | 2322 704 61002 | 1kΩ 1%              |
| 3349  | 4822 051 30103 | 10kΩ 5% 0.062W      | 3611 | 4822 051 30151 | 150Ω 5% 0.062W      | 3B15  | 4822 051 30102 | 1kΩ 5% 0.062W       |
| 3350  | 4822 051 30103 | 10kΩ 5% 0.062W      | 3612 | 4822 051 30333 | 33kΩ 5% 0.062W      | 3B17  | 4822 051 30682 | 6.8Ω 5% 0.062W      |
| 3351  | 4822 051 30332 | 3.3Ω 5% 0.062W      | 3617 | 4822 051 30101 | 100Ω 5% 0.062W      | 3B18  | 4822 051 30682 | 6.8Ω 5% 0.062W      |
| 3352  | 4822 051 30332 | 3.3Ω 5% 0.062W      | 3618 | 4822 051 30101 | 100Ω 5% 0.062W      | 3B19  | 4822 051 30103 | 10kΩ 5% 0.062W      |
| 3353  | 4822 051 30103 | 10kΩ 5% 0.062W      | 3619 | 4822 051 30101 | 100Ω 5% 0.062W      | 3L01  | 4822 051 30472 | 4.7Ω 5% 0.062W      |
| 3354  | 4822 051 30101 | 100Ω 5% 0.062W      | 3801 | 4822 117 12925 | 47kΩ 1% 0.063W 0603 | 3L02  | 4822 051 30101 | 100Ω 5% 0.062W      |
| 3355  | 4822 051 30101 | 100Ω 5% 0.062W      | 3802 | 4822 117 12925 | 47kΩ 1% 0.063W 0603 | 3L04  | 4822 051 30152 | 1.5Ω 5% 0.062W      |
| 3356  | 4822 051 30101 | 100Ω 5% 0.062W      | 3803 | 3198 021 31080 | 1Ω 5% 0603          | 3L05  | 4822 051 30101 | 100Ω 5% 0.062W      |
| 3357  | 4822 051 30101 | 100Ω 5% 0.062W      | 3804 | 3198 021 31080 | 1Ω 5% 0603          | 3L10▲ | 4822 117 11151 | 1Ω 5%               |
| 3361  | 4822 051 30101 | 100Ω 5% 0.062W      | 3805 | 4822 051 30221 | 220Ω 5% 0.062W      | 3L11  | 4822 051 30101 | 100Ω 5% 0.062W      |
| 3364  | 4822 051 30101 | 100Ω 5% 0.062W      | 3806 | 4822 051 30221 | 220Ω 5% 0.062W      | 3L15  | 4822 051 30331 | 330Ω 5% 0.062W      |
| 3365  | 4822 051 30101 | 100Ω 5% 0.062W      | 3807 | 3198 031 13390 | 4 x 33Ω 5% 1206     | 3L22  | 4822 051 30008 | Jumper 0603         |
| 3366  | 4822 051 30103 | 10kΩ 5% 0.062W      | 3809 | 4822 051 30103 | 10kΩ 5% 0.062W      | 3L23  | 4822 051 30008 | Jumper 0603         |
| 3368  | 4822 051 30101 | 100Ω 5% 0.062W      | 3810 | 4822 051 30472 | 4.7Ω 5% 0.062W      | 4110  | 4822 051 30008 | Jumper 0603         |
| 3370  | 4822 051 30101 | 100Ω 5% 0.062W      | 3811 | 4822 051 30472 | 4.7Ω 5% 0.062W      | 4111  | 4822 051 30008 | Jumper 0603         |
| 3372  | 4822 051 30472 | 4.7Ω 5% 0.062W      | 3815 | 4822 051 30105 | 1MΩ 5% 0.062W       | 4112  | 4822 051 30008 | Jumper 0603         |
| 3373  | 4822 051 30101 | 100Ω 5% 0.062W      | 3819 | 4822 051 30339 | 33Ω 5% 0.062W       | 4113  | 4822 051 30008 | Jumper 0603         |
| 3375  | 4822 051 30472 | 4.7Ω 5% 0.062W      | 3828 | 4822 051 30472 | 4.7Ω 5% 0.062W      | 4114  | 4822 051 30008 | Jumper 0603         |
| 3377  | 4822 051 30332 | 3.3Ω 5% 0.062W      | 3830 | 4822 051 30472 | 4.7Ω 5% 0.062W      | 4120  | 4822 051 30008 | Jumper 0603         |
| 3378  | 4822 051 30101 | 100Ω 5% 0.062W      | 3831 | 4822 117 12925 | 47kΩ 1% 0.063W 0603 | 4121  | 4822 051 30008 | Jumper 0603         |
| 3379  | 4822 051 30332 | 3.3Ω 5% 0.062W      | 3832 | 4822 117 12925 | 47kΩ 1% 0.063W 0603 | 4122  | 4822 051 30008 | Jumper 0603         |
| 3380  | 4822 051 30101 | 100Ω 5% 0.062W      | 3833 | 4822 051 30472 | 4.7Ω 5% 0.062W      | 4123  | 4822 051 30008 | Jumper 0603         |
| 3381  | 3198 021 32290 | 22Ω 5% 0603         | 3834 | 4822 051 30472 | 4.7Ω 5% 0.062W      | 4124  | 4822 051 30008 | Jumper 0603         |
| 3382  | 4822 051 30101 | 100Ω 5% 0.062W      | 3835 | 4822 051 30339 | 33Ω 5% 0.062W       | 4204  | 4822 051 30008 | Jumper 0603         |
| 3383  | 4822 117 12925 | 47kΩ 1% 0.063W 0603 | 3846 | 4822 051 30472 | 4.7Ω 5% 0.062W      | 4205  | 4822 051 30008 | Jumper 0603         |
| 3384  | 3198 021 32290 | 22Ω 5% 0603         | 3850 | 4822 051 30103 | 10kΩ 5% 0.062W      | 4206  | 4822 051 30008 | Jumper 0603         |
| 3385  | 4822 117 12925 | 47kΩ 1% 0.063W 0603 | 3851 | 3198 031 13390 | 4 x 33Ω 5% 1206     | 4309  | 4822 051 30008 | Jumper 0603         |
| 3386  | 4822 051 30101 | 100Ω 5% 0.062W      | 3852 | 3198 031 13390 | 4 x 33Ω 5% 1206     | 4310  | 4822 051 30008 | Jumper 0603         |
| 3387  | 4822 051 30101 | 100Ω 5% 0.062W      | 3853 | 3198 031 13390 | 4 x 33Ω 5% 1206     | 4316  | 4822 051 30008 | Jumper 0603         |
| 3388  | 4822 051 30101 | 100Ω 5% 0.062W      | 3854 | 3198 031 13390 | 4 x 33Ω 5% 1206     | 4401  | 4822 051 30008 | Jumper 0603         |
| 3389  | 4822 051 30479 | 47Ω 5% 0.062W       | 3855 | 3198 031 13390 | 4 x 33Ω 5% 1206     | 4402  | 4822 051 30008 | Jumper 0603         |
| 3390  | 4822 051 30479 | 47Ω 5% 0.062W       | 3856 | 3198 031 13390 | 4 x 33Ω 5% 1206     | 4403  | 4822 051 30008 | Jumper 0603         |
| 3391  | 4822 051 30479 | 47Ω 5% 0.062W       | 3857 | 4822 051 30339 | 33Ω 5% 0.062W       | 4406  | 4822 051 30008 | Jumper 0603         |
| 3393  | 4822 051 30153 | 15kΩ 5% 0.062W      | 3858 | 4822 051 30339 | 33Ω 5% 0.062W       | 4407  | 4822 051 30008 | Jumper 0603         |
| 3394  | 4822 051 30223 | 22kΩ 5% 0.062W      | 3859 | 4822 051 30339 | 33Ω 5% 0.062W       | 4408  | 4822 051 30008 | Jumper 0603         |
| 3395  | 4822 051 30152 | 1.5Ω 5% 0.062W      | 3860 | 4822 051 30339 | 33Ω 5% 0.062W       | 4411  | 4822 051 30008 | Jumper 0603         |
| 3396  | 4822 051 30102 | 1kΩ 5% 0.062W       | 3862 | 4822 051 30102 | 1kΩ 5% 0.062W       | 4803  | 4822 051 30008 | Jumper 0603         |
| 3397  | 4822 117 12925 | 47kΩ 1% 0.063W 0603 | 3863 | 4822 051 30222 | 2.2kΩ 5% 0.062W     | 4901  | 4822 051 30008 | Jumper 0603         |
| 3398  | 4822 117 13632 | 100kΩ 1% 0603 0.62W | 3864 | 4822 051 30101 | 100Ω 5% 0.062W      | 4902  | 4822 051 30008 | Jumper 0603         |
| 3399  | 4822 051 30103 | 10kΩ 5% 0.062W      | 3877 | 4822 051 30222 | 2.2kΩ 5% 0.062W     | 4903  | 4822 051 30008 | Jumper 0603         |
| 3402▲ | 4822 117 11151 | 1Ω 5%               | 3880 | 4822 051 30102 | 1kΩ 5% 0.062W       | 4C55  | 4822 051 30008 | Jumper 0603         |
| 3410  | 4822 051 30101 | 100Ω 5% 0.062W      | 3881 | 4822 051 30222 | 2.2kΩ 5% 0.062W     | 4C56  | 4822 051 30008 | Jumper 0603         |
| 3411  | 4822 051 30101 | 100Ω 5% 0.062W      | 3882 | 4822 051 30101 | 100Ω 5% 0.062W      | 4C61  | 4822 051 30008 | Jumper 0603         |
| 3417  | 4822 051 30101 | 100Ω 5% 0.062W      | 3883 | 4822 051 30222 | 2.2kΩ 5% 0.062W     | 4C62  | 4822 051 30008 | Jumper 0603         |
| 3418  | 4822 051 30101 | 100Ω 5% 0.062W      | 3896 | 4822 051 30101 | 100Ω 5% 0.062W      | 4L20  | 4822 051 30008 | Jumper 0603         |
| 3419  | 4822 051 30101 | 100Ω 5% 0.062W      | 3897 | 4822 051 30101 | 100Ω 5% 0.062W      | 4L21  | 4822 051 30008 | Jumper 0603         |
| 3420  | 4822 051 30101 | 100Ω 5% 0.062W      | 3901 | 4822 117 12925 | 47kΩ 1% 0.063W 0603 | 4L24  | 4822 051 30008 | Jumper 0603         |
| 3500  | 4822 051 30151 | 150Ω 5% 0.062W      | 3902 | 4822 051 30124 | 120kΩ 5% 0.062W     | 4L25  | 4822 051 30008 | Jumper 0603         |
| 3502  | 4822 051 30151 | 150Ω 5% 0.062W      | 3904 | 4822 051 30339 | 33Ω 5% 0.062W       |       |                |                     |
| 3503  | 4822 051 30151 | 150Ω 5% 0.062W      | 3905 | 4822 117 12925 | 47kΩ 1% 0.063W 0603 |       |                |                     |
| 3506  | 4822 051 30151 | 150Ω 5% 0.062W      | 3906 | 4822 117 13632 | 100kΩ 1% 0603 0.62W | 5111  | 2422 536 01057 | 0.39μH 5% 0603      |
| 3507  | 4822 051 30151 | 150Ω 5% 0.062W      | 3907 | 4822 117 13632 | 100kΩ 1% 0603 0.62W | 5112  | 2422 549 44197 | Bead 220Ω at 100MHz |
| 3508  | 4822 051 30333 | 33kΩ 5% 0.062W      | 3908 | 4822 051 30124 | 120kΩ 5% 0.062W     | 5114  | 2422 536 01521 | 10μH 10% 1207       |
| 3510  | 4822 051 30151 | 150Ω 5% 0.062W      | 3910 | 4822 051 30339 | 33Ω 5% 0.062W       | 5115  | 2422 536 01521 | 10μH 10% 1207       |
| 3511  | 4822 051 30333 | 33kΩ 5% 0.062W      | 3911 | 4822 051 30103 | 10kΩ 5% 0.062W      | 5118  | 2422 549 44197 | Bead 220Ω at 100MHz |
| 3512  | 4822 051 30151 | 150Ω 5% 0.062W      | 3912 | 4822 051 30103 | 10kΩ 5% 0.062W      | 5210  | 4822 157 11499 | Bead 60Ω at 100MHz  |
| 3513  | 4822 051 30333 | 33kΩ 5% 0.062W      | 3913 | 4822 051 30102 | 1kΩ 5% 0.062W       | 5212  | 4822 157 11499 | Bead 60Ω at 100MHz  |
| 3514  | 4822 051 30151 | 150Ω 5% 0.062W      | 3914 | 4822 051 30102 | 1kΩ 5% 0.062W       | 5213  | 4822 157 11499 | Bead 60Ω at 100MHz  |
| 3515  | 4822 051 30333 | 33kΩ 5% 0.062W      | 3915 | 4822 051 30102 | 1kΩ 5% 0.062W       | 5214  | 4822 157 11499 | Bead 60Ω at 100MHz  |
| 3516  | 4822 051 30101 | 100Ω 5% 0.062W      | 3916 | 4822 051 30102 | 1kΩ 5% 0.062W       | 5215  | 2422 549 44197 | Bead 220Ω at 100MHz |
| 3517  | 4822 051 30759 | 75Ω 5% 0.062W       | 3917 | 4822 051 30102 | 1kΩ 5% 0.062W       | 5216  | 2422 549 43769 | Bead 30Ω at 100MHz  |
| 3518  | 4822 051 30273 | 27kΩ 5% 0.062W      | 3918 | 4822 051 30102 | 1kΩ 5% 0.062W       | 5217  | 2422 549 44197 | Bead 220Ω at 100MHz |
| 3519  | 4822 117 12971 | 15Ω 5% 0603 0.62W   | 3934 | 4822 051 30472 | 4.7Ω 5% 0.062W      | 5218  | 4822 157 11499 | Bead 60Ω at 100MHz  |
| 3520  | 4822 051 30682 | 6.8Ω 5% 0.062W      | 3935 | 4822 051 30472 | 4.7Ω 5% 0.062W      | 5219  | 4822 157 11499 | Bead 60Ω at 100MHz  |
| 3521  | 4822 051 30102 | 1kΩ 5% 0.062W       | 3937 | 4822 051 30103 | 10kΩ 5% 0.062W      | 5220  | 4822 157 11499 | Bead 60Ω at 100MHz  |
| 3522  | 4822 051 30689 | 68Ω 5% 0.063W 0603  | 3938 | 4822 051 30103 | 10kΩ 5% 0.062W      | 5221  | 4822 157 11499 | Bead 60Ω at 100MHz  |
| 3523  | 4822 051 30101 | 100Ω 5% 0.062W      | 3942 | 4822 051 30102 | 1kΩ 5% 0.062W       | 5222  | 4822 157 11499 | Bead 60Ω at 100MHz  |
| 3524  | 4822 117 12971 | 15Ω 5% 0603 0.62W   | 3943 | 4822 051 30103 | 10kΩ 5% 0.062W      | 5223  | 4822 157 11499 | Bead 60Ω at 100MHz  |
| 3525  | 4822 051 30102 | 1kΩ 5% 0.062W       | 3A01 | 5322 117 11726 | 10Ω 5%              | 5224  | 4822 157 11499 | Bead 60Ω at 100MHz  |
| 3526  | 4822 051 30759 | 75Ω 5% 0.062W       | 3A02 | 5322 117 11726 | 10Ω 5%              | 5225  | 4822 157 11499 | Bead 60Ω at 100MHz  |
| 3528  | 4822 051 30101 | 100Ω 5% 0.062W      | 3A03 | 4822 051 30103 | 10kΩ 5% 0.062W      | 5226  | 4822 157 11499 | Bead 60Ω at 100MHz  |
| 3529  | 4822 051 30101 | 100Ω 5% 0.062W      | 3A04 | 4822 051 30123 | 12kΩ 5% 0.1W        | 5227  | 4822 157 11499 | Bead 60Ω at 100MHz  |
| 3530  | 4822 051 30759 | 75Ω 5% 0.062W       | 3A05 | 2322 762 60229 | 22Ω 5% 1005         | 5228  | 4822 157 11499 | Bead 60Ω at 100MHz  |
| 3531  | 4822 051 30759 | 75Ω 5% 0.062W       | 3A06 | 4822 051 30103 | 10kΩ 5% 0.062W      | 5301  | 4822 157 11499 | Bead 60Ω at 100MHz  |
| 3532  | 4822 051 30102 | 1kΩ 5% 0.062W       | 3A07 | 4822 051 30103 | 10kΩ 5% 0.062W      | 5302  | 4822 157 11499 | Bead 60Ω at 100MHz  |
| 3533  | 4822 051 30759 | 75Ω 5% 0.062W       | 3A08 | 4822 051 30123 | 12kΩ 5% 0.1W        | 5304  | 2422 549 01397 | Bead 220Ω at 100MHz |
| 3535  | 4822 051 30689 | 68Ω 5% 0.063W 0603  | 3A09 | 4822 051 30109 | 10Ω 5% 0.062W       | 5401  | 2422 549 42896 | Bead 120Ω 100MHz    |
| 3536  | 4822 051 30102 | 1kΩ 5% 0.062W       | 3A11 | 4822 051 30103 | 10kΩ 5% 0.062W      | 5402  | 2422 549 42896 | Bead 120Ω 100MHz    |
| 3537  | 4822 051 30102 | 1kΩ 5% 0.062W       | 3A12 | 4822 051 30105 | 1MΩ 5% 0.062W       | 5403  | 3198 018 62290 | 22μH 5% 1008        |
| 3538  | 4822 051 30472 | 4.7Ω 5% 0.062W      | 3A13 | 4822 051 30393 | 39kΩ 5% 0.062W      | 5810  | 2422 549 42896 | Bead 120Ω 100MHz    |
| 3540  | 4822 051 30472 | 4.7Ω 5% 0.062W      | 3A14 | 2322 762 60229 | 22Ω 5% 1005         | 5811  | 2422 549 42896 | Bead 120Ω 100MHz    |
| 3545  | 4822 051 30101 | 100Ω 5% 0.062W      | 3A15 | 4822 051 30105 | 1MΩ 5% 0.062W       | 5812  | 2422 549 42896 | Bead 120Ω 100MHz    |
| 3546  | 4822 051 30759 | 75Ω 5% 0.062W       | 3A17 | 4822 051 30109 | 10Ω 5% 0.062W       | 5813  | 2422 549 42896 | Bead 120Ω 100MHz    |
| 3550  | 4822 051 30273 | 27kΩ 5% 0.062W      | 3A19 | 4822 051 30103 | 10kΩ 5% 0.062W      | 5814  | 2422 549 42896 | Bead 120Ω 100MHz    |
| 3551  | 4822 051 30682 | 6.8Ω 5% 0.062W      | 3A26 | 4822           |                     |       |                |                     |

|      |                |                    |
|------|----------------|--------------------|
| 5A04 | 2422 536 01564 | 22µH 20%           |
| 5A05 | 4822 157 11716 | Bead 30Ω at 100MHz |
| 5A06 | 4822 157 11716 | Bead 30Ω at 100MHz |
| 5A07 | 2422 549 45186 | Bead 100MHz 0805   |
| 5B01 | 2422 535 94134 | 10µH 20% 0805      |
| 5B02 | 2422 536 00779 | 10µH 20%           |
| 5B03 | 2422 536 00707 | 33µH 20%           |
| 5B06 | 2422 536 01516 | 68µF 20%           |
| 5B10 | 2422 536 01495 | 22µH 10%           |
| 5B11 | 2422 536 01495 | 22µH 10%           |



|      |                |                  |
|------|----------------|------------------|
| 6103 | 4822 130 11525 | 1SS356           |
| 6110 | 4822 130 11397 | BAS316           |
| 6202 | 3198 020 55680 | BZX384-C5V6      |
| 6301 | 4822 130 11397 | BAS316           |
| 6306 | 4822 130 11416 | PDZ6.8B          |
| 6307 | 4822 130 11416 | PDZ6.8B          |
| 6318 | 9340 548 54115 | PDZ6.2B          |
| 6511 | 9340 580 04115 | PESD5V0S1BA      |
| 6512 | 9965 000 20150 | 1N4148WS SOD-323 |
| 6513 | 9965 000 20150 | 1N4148WS SOD-323 |
| 6517 | 9340 580 04115 | PESD5V0S1BA      |
| 6801 | 4822 130 80622 | BAT54            |
| 6802 | 4822 130 80622 | BAT54            |
| 6830 | 4822 130 80622 | BAT54            |
| 6831 | 4822 130 80622 | BAT54            |
| 6914 | 4822 130 80622 | BAT54            |
| 6916 | 4822 130 11397 | BAS316           |
| 6919 | 4822 130 11397 | BAS316           |
| 6B01 | 3198 010 10720 | SS24             |
| 6B02 | 9340 548 71115 | PDZ33B           |
| 6B03 | 5322 130 34337 | BAV99            |



|      |                |                      |
|------|----------------|----------------------|
| 7109 | 5322 130 60159 | BC846B               |
| 7113 | 9352 723 71118 | TDA9886T/V4          |
| 7114 | 5322 130 60159 | BC846B               |
| 7133 | 9322 104 47668 | L78M05CDT            |
| 7202 | 9322 240 94671 | CX32-LF              |
| 7203 | 3198 010 42310 | BC847BW              |
| 7204 | 9322 245 45668 | IS42S16400D-6TL      |
| 7205 | 9322 245 45668 | IS42S16400D-6TL      |
| 7206 | 3198 010 42310 | BC847BW              |
| 7208 | 4822 130 11155 | PDTCT114ET           |
| 7210 | 9322 204 71668 | SI4835BDY            |
| 7308 | 3198 010 42310 | BC847BW              |
| 7310 |                | For SW see item 0815 |
| 7311 | 9322 245 53671 | M30300SAGP           |
| 7312 | 9322 229 46685 | BD45275G             |
| 7315 |                | For SW see item 0816 |
| 7316 | 3198 010 42310 | BC847BW              |
| 7317 | 3198 010 42310 | BC847BW              |
| 7320 | 9340 560 36235 | BSH111               |
| 7321 | 9340 560 36235 | BSH111               |
| 7322 | 4822 130 11155 | PDTCT114ET           |
| 7323 | 9322 246 85685 | NL27WZ08USG          |
| 7410 | 9322 198 11685 | L78L08ACU            |
| 7411 | 9322 243 36671 | MSP4450P-VK-E8       |
| 7500 | 5322 130 60159 | BC846B               |
| 7502 | 3198 010 42320 | BC857BW              |
| 7503 | 5322 130 60159 | BC846B               |
| 7504 | 3198 010 42320 | BC857BW              |
| 7810 | 9352 668 39118 | UDA1334ATS/N2        |
| 7811 |                | For SW see item 0822 |
| 7812 | 9965 000 04199 | BSN20                |
| 7813 | 9965 000 04199 | BSN20                |
| 7814 | 3198 010 42310 | BC847BW              |
| 7816 | 3198 010 42310 | BC847BW              |
| 7817 | 9322 245 55671 | SI9025CTU            |
| 7824 | 9965 000 04199 | BSN20                |
| 7825 | 9965 000 04199 | BSN20                |
| 7850 |                | For SW see item 0821 |
| 7851 | 9965 000 04199 | BSN20                |
| 7852 | 9965 000 04199 | BSN20                |
| 7860 | 3198 010 42310 | BC847BW              |
| 7861 | 3198 010 42310 | BC847BW              |
| 7901 | 9322 183 05668 | TS482ID              |
| 7902 | 3198 010 42320 | BC857BW              |
| 7911 | 3198 010 42310 | BC847BW              |
| 7912 | 3198 010 42310 | BC847BW              |
| 7913 | 3198 010 42310 | BC847BW              |
| 7914 | 3198 010 42310 | BC847BW              |
| 7915 | 3198 010 42310 | BC847BW              |
| 7916 | 3198 010 42310 | BC847BW              |
| 7917 | 3198 010 42320 | BC857BW              |
| 7919 | 3198 010 42310 | BC847BW              |
| 7922 | 3198 010 42310 | BC847BW              |
| 7A01 | 9352 796 42518 | TDA8932T/N1          |
| 7A05 | 3198 010 42320 | BC857BW              |

|      |                |             |
|------|----------------|-------------|
| 7A06 | 3198 010 42310 | BC847BW     |
| 7A07 | 3198 010 42310 | BC847BW     |
| 7B01 | 9322 202 34668 | L5973D      |
| 7B02 | 4822 209 17398 | LD1117DT33  |
| 7B03 | 4822 130 11057 | 2N7002      |
| 7B04 | 9322 175 62687 | LD1085D2T33 |
| 7B05 | 9322 212 14668 | SI4423DY    |

Side I/O Panel [D]

Various

|      |                |                        |
|------|----------------|------------------------|
| 1301 | 2422 026 05133 | Connector SVHS 4p f    |
| 1302 | 2422 026 05807 | Soc. Cinch 3p f YeWhRd |
| 1303 | 4822 267 31014 | Socket Headphone       |
| 1304 | 2422 025 10655 | Connector 11p m        |



|      |                |                   |
|------|----------------|-------------------|
| 2301 | 4822 126 11785 | 47pF 5% 50V 0603  |
| 2302 | 4822 126 11785 | 47pF 5% 50V 0603  |
| 2303 | 4822 122 33761 | 22pF 5% 50V       |
| 2304 | 4822 126 11785 | 47pF 5% 50V 0603  |
| 2305 | 3198 016 31020 | 1nF 25V 0603      |
| 2306 | 3198 016 31020 | 1nF 25V 0603      |
| 2307 | 2238 916 15641 | 22nF 10% 25V 0603 |
| 2308 | 2238 916 15641 | 22nF 10% 25V 0603 |
| 2309 | 5322 126 11583 | 10nF 10% 50V 0603 |
| 2310 | 5322 126 11583 | 10nF 10% 50V 0603 |
| 2311 | 3198 016 36890 | 68pF 50V 0603     |
| 2313 | 3198 016 31020 | 1nF 25V 0603      |
| 2314 | 3198 016 31020 | 1nF 25V 0603      |



|      |                |                  |
|------|----------------|------------------|
| 3301 | 4822 051 30759 | 75Ω 5% 0.062W    |
| 3302 | 4822 051 30759 | 75Ω 5% 0.062W    |
| 3303 | 4822 051 30109 | 10Ω 5% 0.062W    |
| 3304 | 4822 051 30101 | 100Ω 5% 0.062W   |
| 3305 | 4822 051 30109 | 10Ω 5% 0.062W    |
| 3306 | 4822 051 30101 | 100Ω 5% 0.062W   |
| 3308 | 4822 051 30151 | 150Ω 5% 0.062W   |
| 3309 | 4822 051 30333 | 33kΩ 5% 0.062W   |
| 3310 | 4822 051 30151 | 150Ω 5% 0.062W   |
| 3311 | 4822 051 30333 | 33kΩ 5% 0.062W   |
| 3312 | 4822 051 30103 | 10kΩ 5% 0.062W   |
| 3313 | 4822 051 30103 | 10kΩ 5% 0.062W   |
| 4308 | 2422 549 42896 | Bead 120Ω 100MHz |
| 4309 | 2422 549 42896 | Bead 120Ω 100MHz |



|      |                |           |
|------|----------------|-----------|
| 6301 | 9322 146 61685 | DF3A6.8FU |
| 6302 | 9322 146 61685 | DF3A6.8FU |
| 6303 | 9322 146 61685 | DF3A6.8FU |
| 6304 | 9322 146 61685 | DF3A6.8FU |
| 6305 | 9322 146 61685 | DF3A6.8FU |
| 6306 | 9322 146 61685 | DF3A6.8FU |
| 6307 | 9322 146 61685 | DF3A6.8FU |

Keyboard Control Panel [E]

Various

|      |                |                    |
|------|----------------|--------------------|
| 1011 | 4822 276 13775 | Switch 1p 0.1A 12V |
| 1012 | 4822 276 13775 | Switch 1p 0.1A 12V |
| 1013 | 4822 276 13775 | Switch 1p 0.1A 12V |
| 1014 | 4822 276 13775 | Switch 1p 0.1A 12V |
| 1015 | 4822 276 13775 | Switch 1p 0.1A 12V |
| 1016 | 4822 276 13775 | Switch 1p 0.1A 12V |
| 1M01 | 2422 025 10775 | Connector 3p m     |



|      |                |              |
|------|----------------|--------------|
| 2001 | 4822 126 13881 | 470pF 5% 50V |
|------|----------------|--------------|



|      |                |                      |
|------|----------------|----------------------|
| 3010 | 4822 051 30391 | 390Ω 5% 0.062W       |
| 3011 | 4822 051 30561 | 560Ω 5% 0.062W       |
| 3012 | 3198 021 31820 | 1.8kΩ 5% 0.062W 0603 |
| 3013 | 4822 051 30151 | 150Ω 5% 0.062W       |
| 3014 | 4822 117 12968 | 820Ω 5% 0.62W        |
| 3015 | 4822 051 30008 | Jumper 0603          |
| 3016 | 4822 051 30008 | Jumper 0603          |
| 3017 | 4822 051 30008 | Jumper 0603          |
| 4001 | 4822 051 30008 | Jumper 0603          |



|      |                |             |
|------|----------------|-------------|
| 6011 | 4822 130 11564 | UDZ3.9B     |
| 6012 | 4822 130 11564 | UDZ3.9B     |
| 6014 | 3198 020 55680 | BZX384-C5V6 |
| 6015 | 3198 020 55680 | BZX384-C5V6 |
| 6016 | 3198 020 55680 | BZX384-C5V6 |
| 6017 | 3198 020 55680 | BZX384-C5V6 |
| 6018 | 3198 020 55680 | BZX384-C5V6 |

IR LED Panel [J]

Various

|      |                |                   |
|------|----------------|-------------------|
| 1M01 | 2422 025 10775 | Connector 3p m    |
| 1M01 | 2422 025 18146 | Connector 3p m Wh |
| 1M20 | 2422 025 18151 | Connector 7p m Wh |
| 1M20 | 4822 265 41343 | Connector 7p m    |



|      |                |                    |
|------|----------------|--------------------|
| 2001 | 2020 552 00134 | 22µF 20% 6.3V 0805 |
|------|----------------|--------------------|



|      |                |                |
|------|----------------|----------------|
| 3010 | 4822 051 30331 | 330Ω 5% 0.062W |
| 3011 | 4822 051 30682 | 6.8Ω 5% 0.062W |
| 3012 | 4822 051 30682 | 6.8Ω 5% 0.062W |
| 3013 | 4822 117 12968 | 820Ω 5% 0.62W  |
| 3014 | 4822 051 30103 | 10kΩ 5% 0.062W |
| 3019 | 4822 051 30151 | 150Ω 5% 0.062W |
| 3020 | 4822 051 30151 | 150Ω 5% 0.062W |
| 4001 | 4822 051 30008 | Jumper 0603    |
| 4002 | 4822 051 30008 | Jumper 0603    |
| 4004 | 4822 051 30008 | Jumper 0603    |
| 4005 | 4822 051 30008 | Jumper 0603    |
| 4010 | 4822 051 30008 | Jumper 0603    |
| 4012 | 4822 051 30008 | Jumper 0603    |
| 4015 | 4822 051 30008 | Jumper 0603    |
| 4017 | 4822 051 30008 | Jumper 0603    |
| 4019 | 4822 051 30008 | Jumper 0603    |



|      |                |                       |
|------|----------------|-----------------------|
| 6010 | 9322 243 77676 | LED L-174A2PBC        |
| 6011 | 9322 244 07676 | LED L-174A2IT-TNB5-19 |
| 6012 | 4822 130 11148 | UDZ4.7B               |



|      |                |             |
|------|----------------|-------------|
| 7010 | 9322 243 06671 | IR Receiver |
| 7011 | 5322 130 60159 | BC846B      |
| 7012 | 5322 130 60159 | BC846B      |

# 11. Revision List

Manual xxxx xxx xxxx.0

- First release.

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