

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	: 26" (66 cm), 16:9 : 32" (82 cm), 16:9 : 37" (94 cm), 16:9 : 42" (107 cm), 16:9
Resolution (HxV pixels)	: 1366 x 768
Dyn. contrast ratio	: 4000:1 (26" and 32") : 5000:1 (37" and 42")
Min. light output (cd/m ²)	: 500
Typ. response time (ms)	: 8 (26", 32") : 6 (37") : 5 (42")
Viewing angle (HxV degrees)	: 160x150 (26") : 176x176 (> 26")
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	: 640x480 : 800x600 : 1024x768
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 _{RMS})	: 2 x 5 (26") : 2 x 10 (> 26")

1.1.3 Miscellaneous

Power supply:

- Mains voltage (V _{AC})	: 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)	: ≈ 120 (26") : ≈ 140 (32") : ≈ 175 (37") : ≈ 240 (42")
- Stand-by (W)	: < 1

Dimensions (WxHxD cm)	: 69.1x47.4x11.1 (26") : 81.6x55.2x11.6 (32") : 94.4x62.8x11.3 (37") : 105.8x69.2x11.6 (42")
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Weight (kg)	: 12.4 (26") : 16.3 (32") : 21.6 (37") : 27.9 (42")
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1.2 Connection Overview

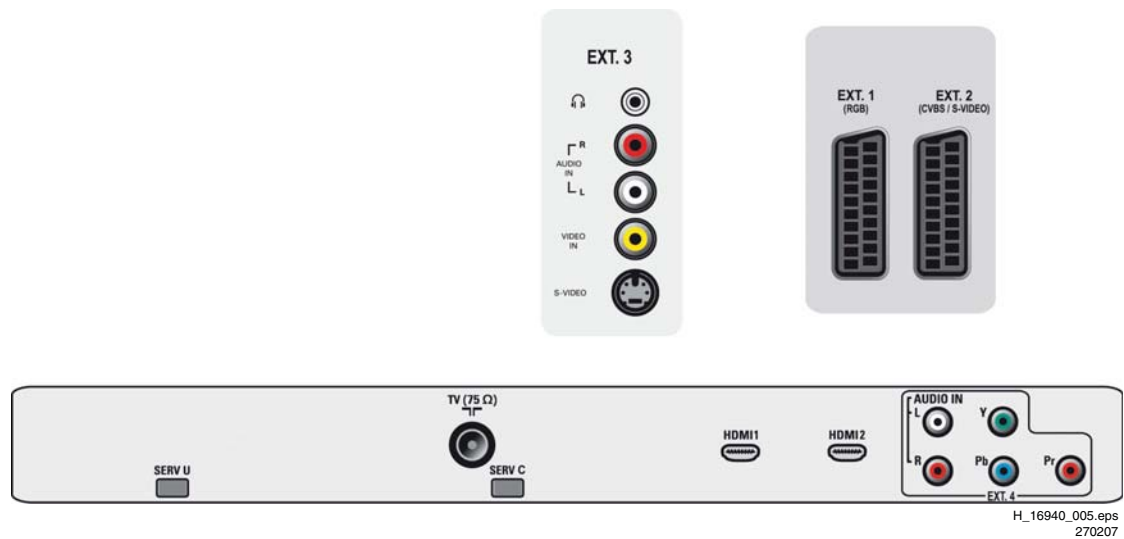


Figure 1-1 Side and rear I/O connections

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



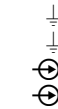
EXT3: Cinch: Video CVBS - In, Audio - In

Rd - Audio R 0.5 V_{RMS} / 10 kohm
Wh - Audio L 0.5 V_{RMS} / 10 kohm
Ye - Video CVBS 1 V_{PP} / 75 ohm



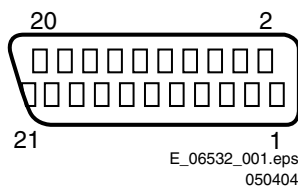
EXT3: S-Video (Hosiden): Video Y/C - In

1 - Ground Y Gnd
2 - Ground C Gnd
3 - Video Y 1 V_{PP} / 75 ohm
4 - Video C 0.3 V_{PP} / 75 ohm



1.2.2 Rear Connections

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



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Figure 1-2 SCART connector

1 - Audio R 0.5 V_{RMS} / 1 kohm
2 - Audio R 0.5 V_{RMS} / 10 kohm
3 - Audio L 0.5 V_{RMS} / 1 kohm
4 - Ground Audio Gnd
5 - Ground Blue Gnd
6 - Audio L 0.5 V_{RMS} / 10 kohm
7 - Video Blue 0.7 V_{PP} / 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

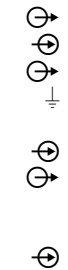


10 - Easylink P50 0 - 5 V / 4.7 kohm
11 - Video Green 0.7 V_{PP} / 75 ohm
12 - n.c.
13 - Ground Red Gnd
14 - Ground P50 Gnd
15 - Video Red 0.7 V_{PP} / 75 ohm
16 - Status/FBL 0 - 0.4 V: INT
1 - 3 V: EXT / 75 ohm
17 - Ground Video Gnd
18 - Ground FBL Gnd
19 - Video CVBS 1 V_{PP} / 75 ohm
20 - Video CVBS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



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

1 - Audio R 0.5 V_{RMS} / 1 kohm
2 - Audio R 0.5 V_{RMS} / 10 kohm
3 - Audio L 0.5 V_{RMS} / 1 kohm
4 - Ground Audio Gnd
5 - n.c.
6 - Audio L 0.5 V_{RMS} / 10 kohm
7 - C-out 0.7 V_{PP} / 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_{PP} / 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_{PP} / 75 ohm
20 - Video CVBS/Y 1 V_{PP} / 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, I2C)**

1 - SDA-S I²C Data (0 - 5 V)
 2 - SCL-S I²C Clock (0 - 5 V)
 3 - Ground Gnd

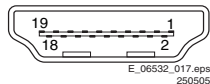
**HDMI 1 & 2: Digital Video, Digital Audio - In**

Figure 1-3 HDMI (type A) connector

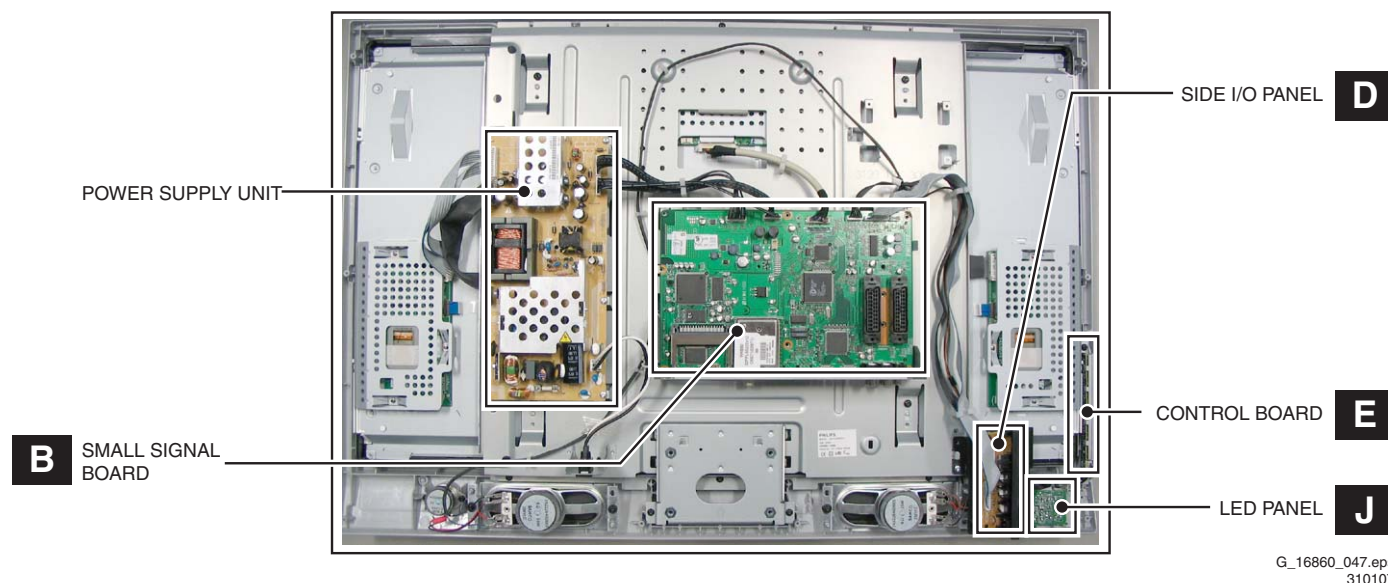
1 - D2+ Data channel
 2 - Shield Gnd
 3 - D2- Data channel
 4 - D1+ Data channel
 5 - Shield Gnd
 6 - D1- Data channel



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_{PP} / 75 ohm
 Bu - Video Pb 0.7 V_{PP} / 75 ohm
 Rd - Video Pr 0.7 V_{PP} / 75 ohm
 Wh - Audio L 0.5 V_{RMS} / 10 kohm
 Rd - Audio R 0.5 V_{RMS} / 10 kohm

**1.3 Chassis Overview**

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Figure 1-4 PWB/CBA locations (26" models and 32" models)

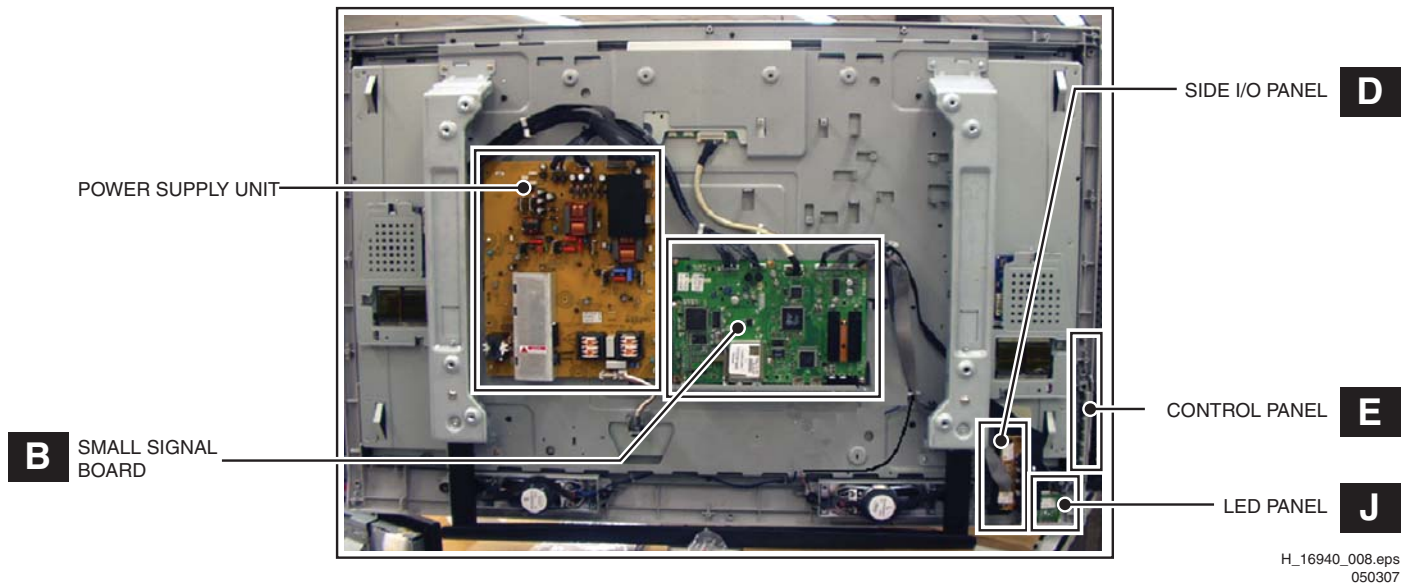


Figure 1-5 PWB/CBA locations (42" models without IPB PSU)

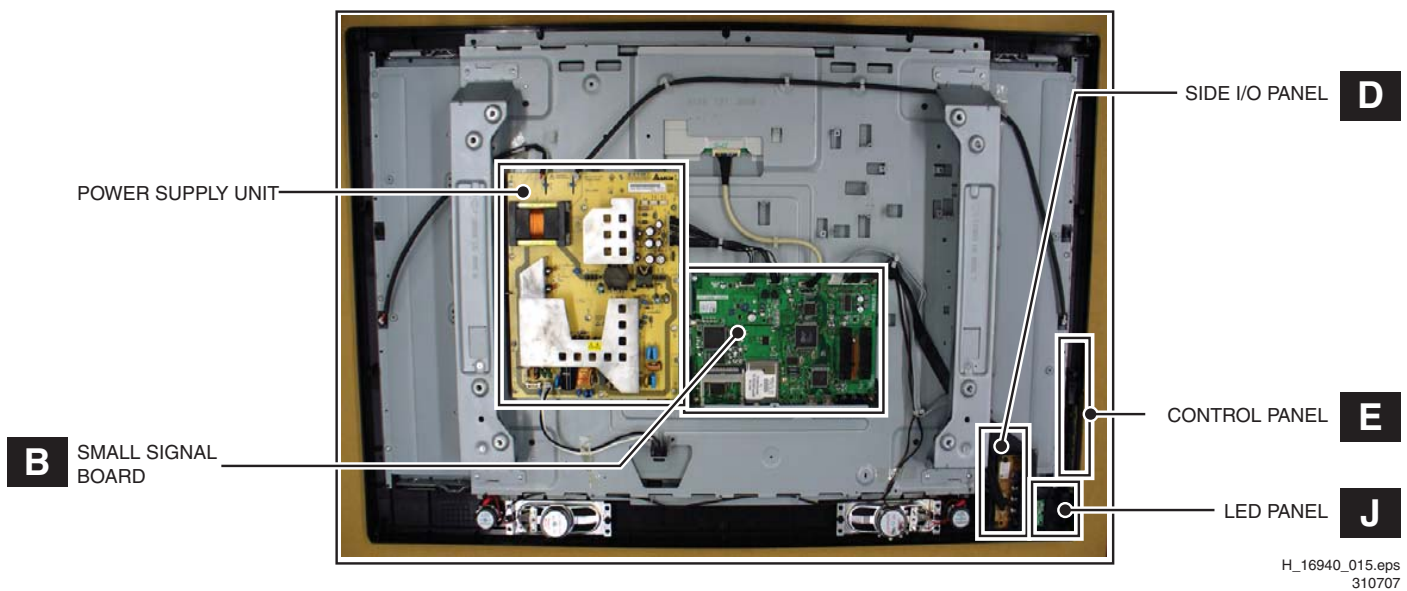


Figure 1-6 PWB/CBA locations (37" and 42" models with IPB PSU)

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 (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 (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 centre (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.



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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

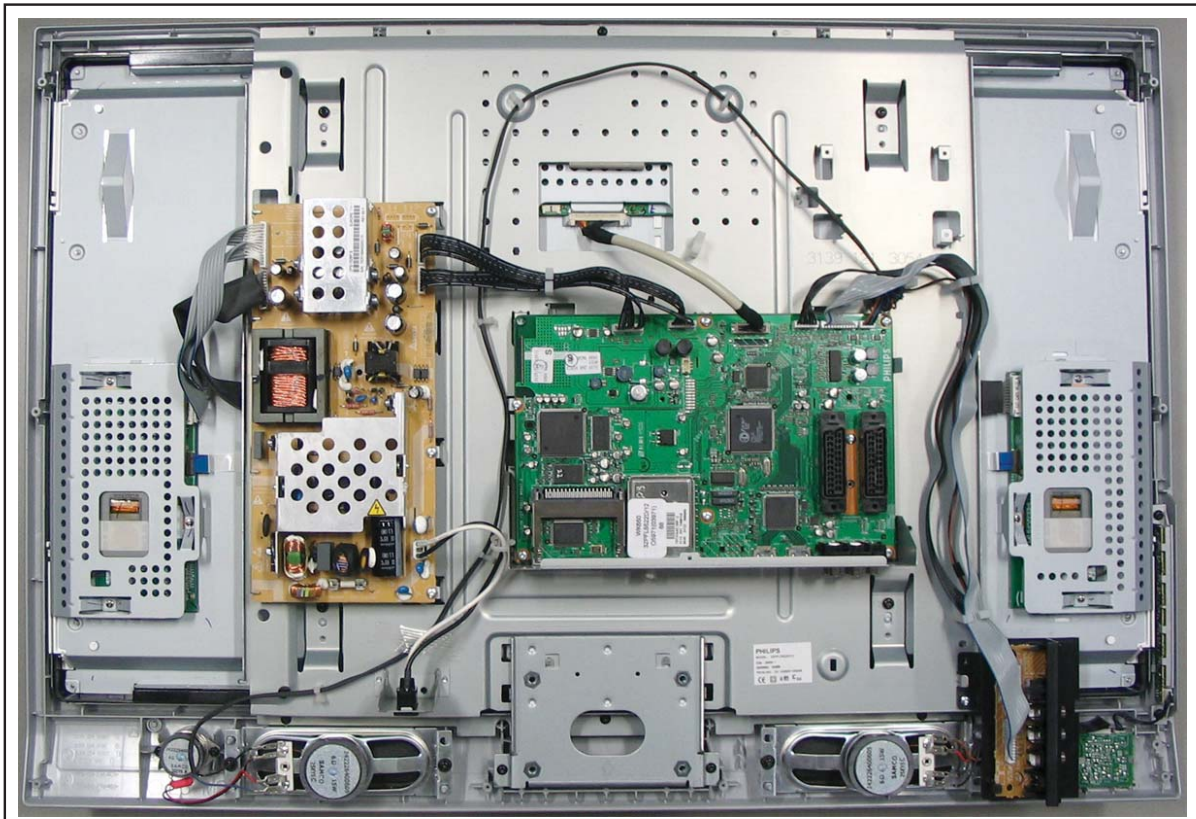
Index of this chapter:

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

Notes:

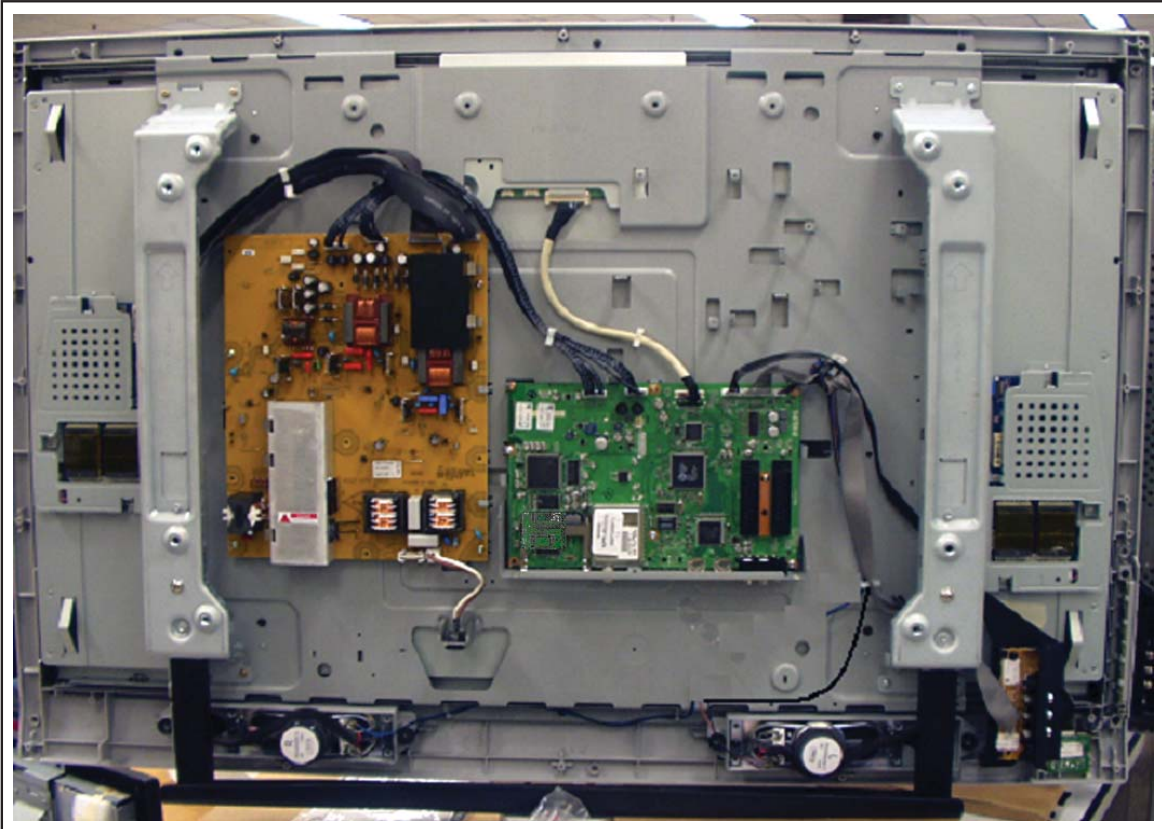
- Figures below can deviate slightly from the actual situation, due to the different set executions.
- Follow the disassemble instructions in described order. They apply to the 32" model, but the described method is comparable for the other screen sizes.

4.1 Cable Dressing



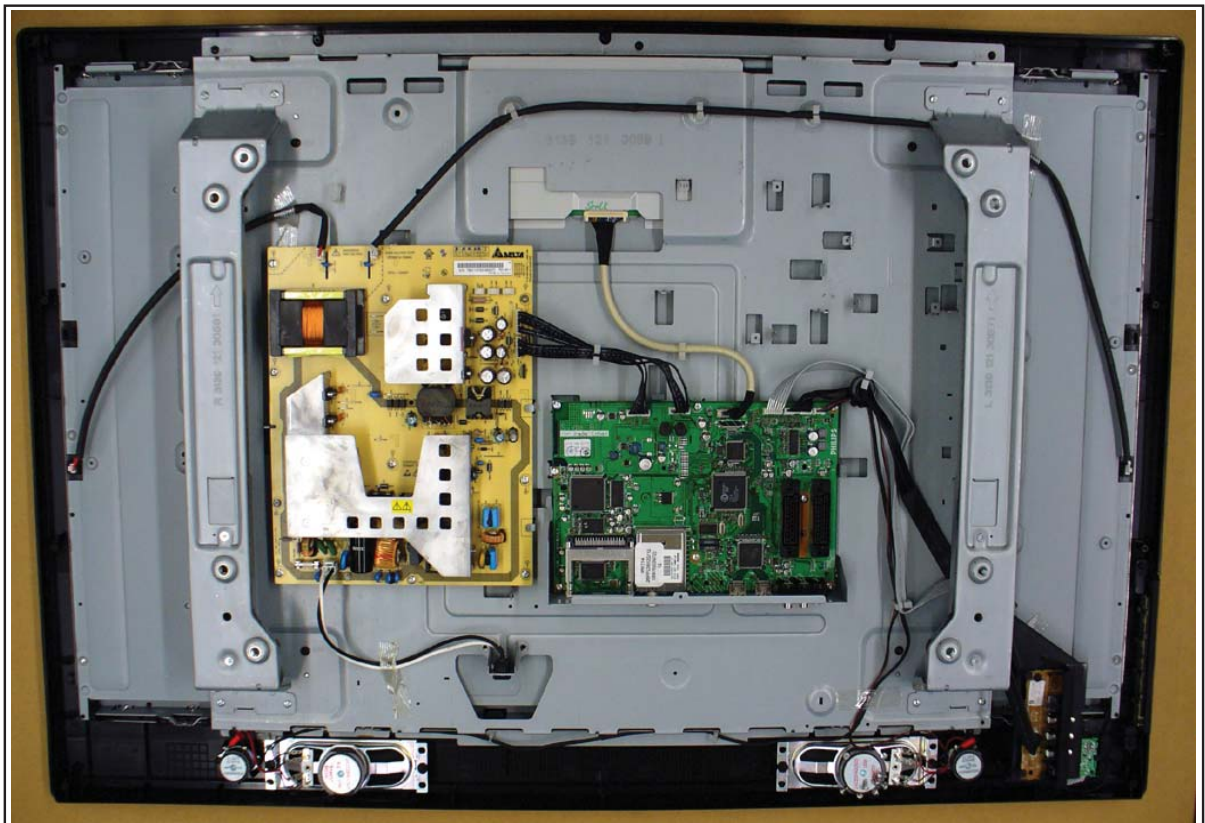
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Figure 4-1 Cable dressing (26" and 32" models)



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Figure 4-2 Cable dressing (37" and 42" models without IPB PSU)



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Figure 4-3 Cable dressing (37" and 42" models with IPB PSU)

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

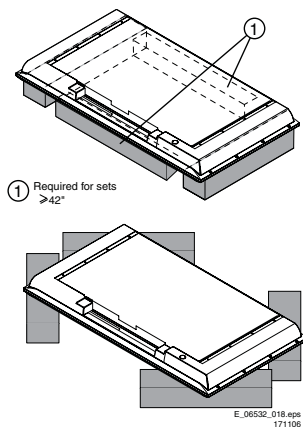


Figure 4-4 Foam bars

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

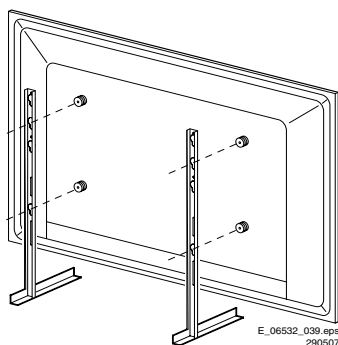


Figure 4-5 Aluminium stands

The MkII aluminium stands 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 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. Refer to next figure (taken from the 32" model, but the method is comparable for the other screen sizes).
2. Remove the T10 parker screws.
3. Unplug connector.
4. Remove the unit. **Note:** as the unit is "secured" by bosses located on the front cabinet, it can be difficult to remove the unit. Therefore, it is advised to use a long thin screwdriver, insert it vertically between the control knobs and the front cabinet, and use it as a lever (see arrows) while pulling the unit from the cabinet. You will here some "clicks" during removal.
5. Release clips and remove the board.

When defective, replace the whole unit.

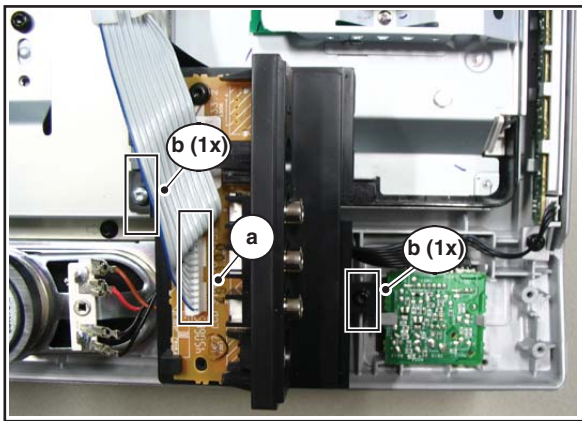


Figure 4-6 Keyboard control panel

4.3.3 Side I/O Panel

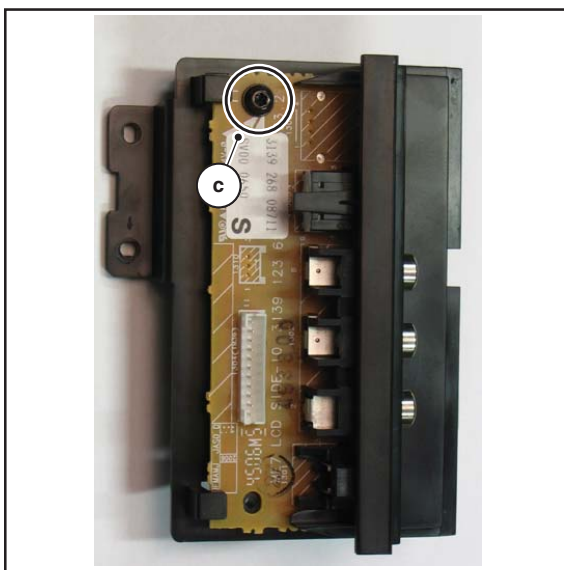
1. Remove the rear cover, as described earlier.
2. Unplug connector [a].
3. Remove screws [b] and remove the complete module. One of the screws is T10 tapping, the other one is T10 parker. See fig. "Side I/O module".
4. Remove T10 parker screw [c]. See fig. "Side I/O panel 1".
5. Push catch [d] (located 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.



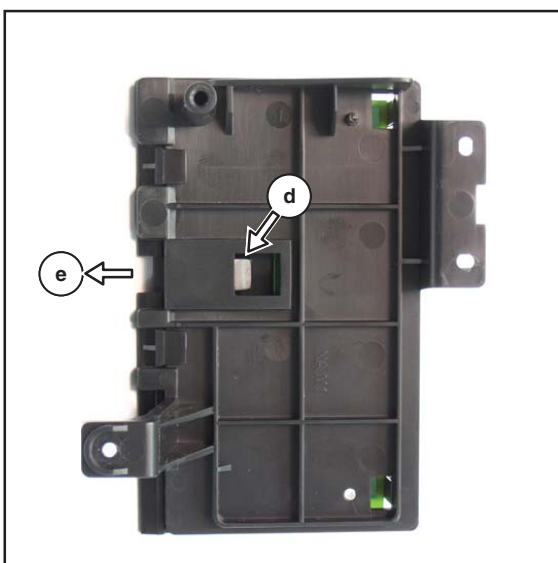
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Figure 4-7 Side I/O module



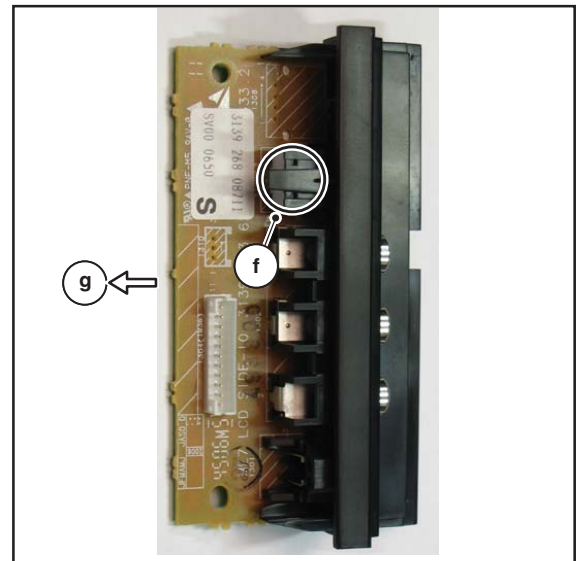
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Figure 4-8 Side I/O panel [1/3] top side



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Figure 4-9 Side I/O panel [2/3] bottom side

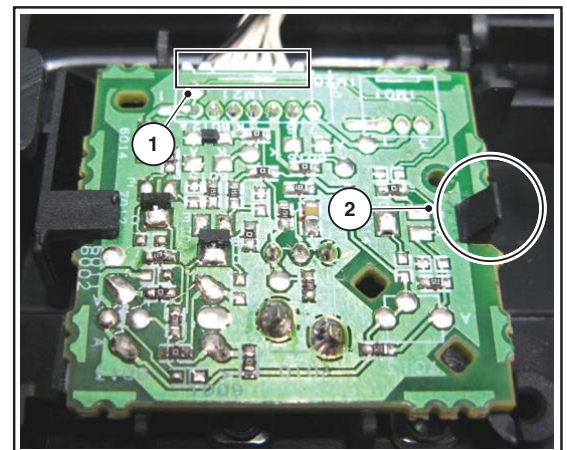


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010207

Figure 4-10 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.

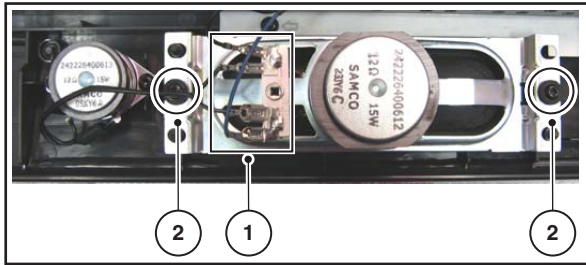


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Figure 4-11 IR/LED panel

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].

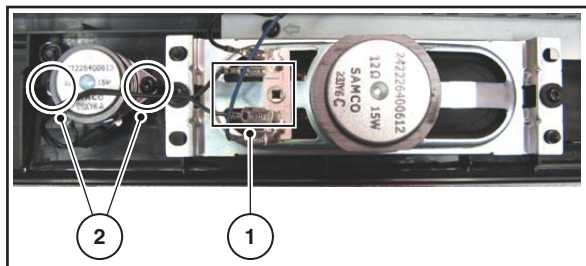


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Figure 4-12 Mid-range speakers

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].

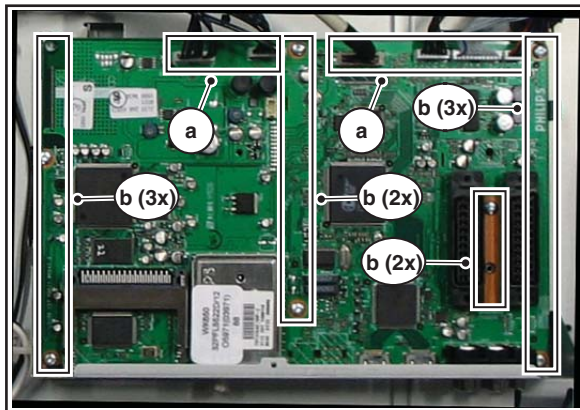


G_16850_011.eps
110107

Figure 4-13 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.



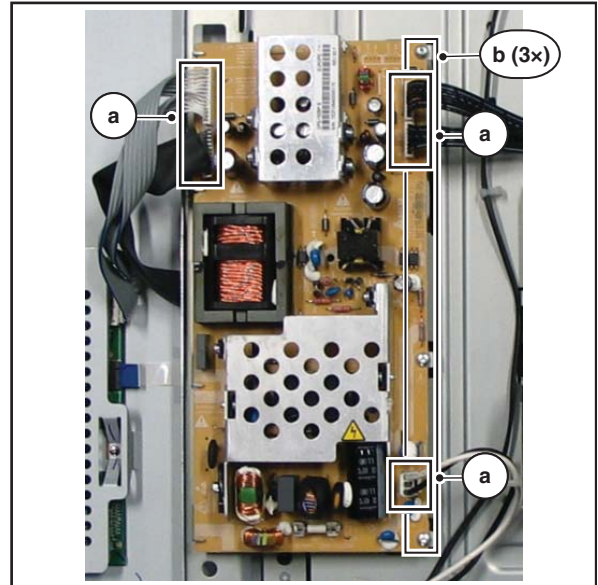
G_16860_074.eps
010207

Figure 4-14 SSB removal

4.3.8 Main Supply Panel

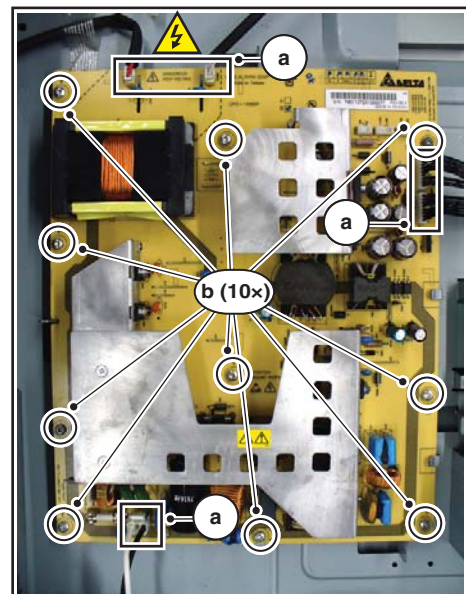
Some models (37 and 42PFL3312) come with a so-called IPB (Integrated Power Board) power supply. This power supply also incorporates the backlight inverters.

1. Refer to next figures.
2. Unplug cables [a].
3. Remove the fixation screws [b].
4. Take the board out (it hinges at the left side).



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010207

Figure 4-15 Main supply panel (non IPB PSU)

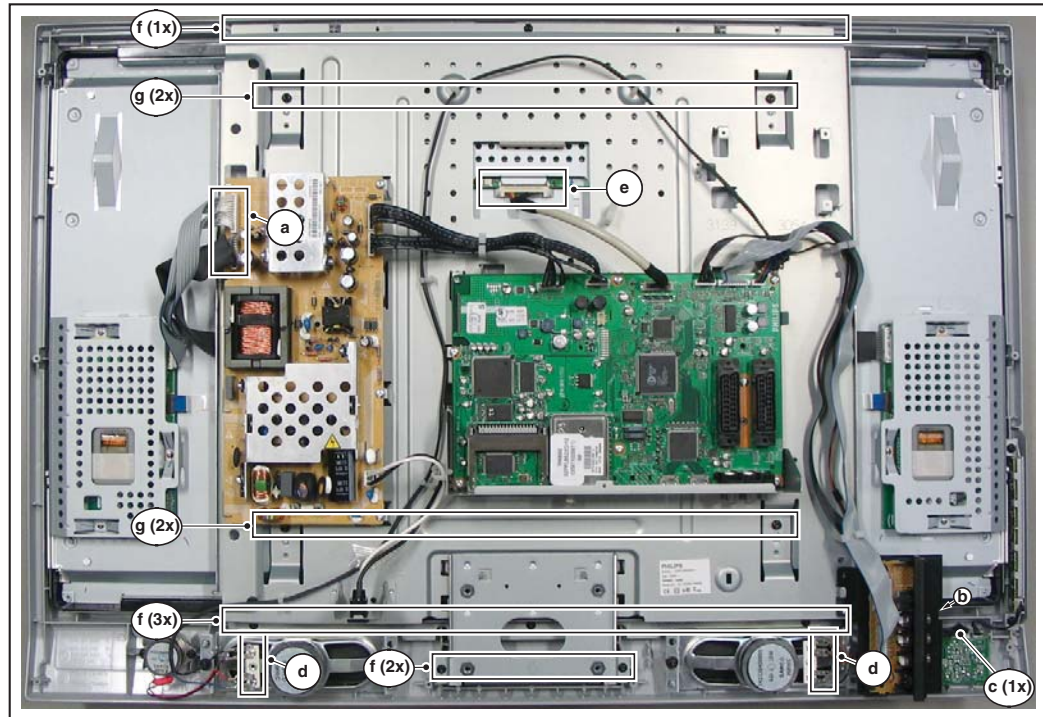


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310707

Figure 4-16 Main supply panel (IPB PSU)

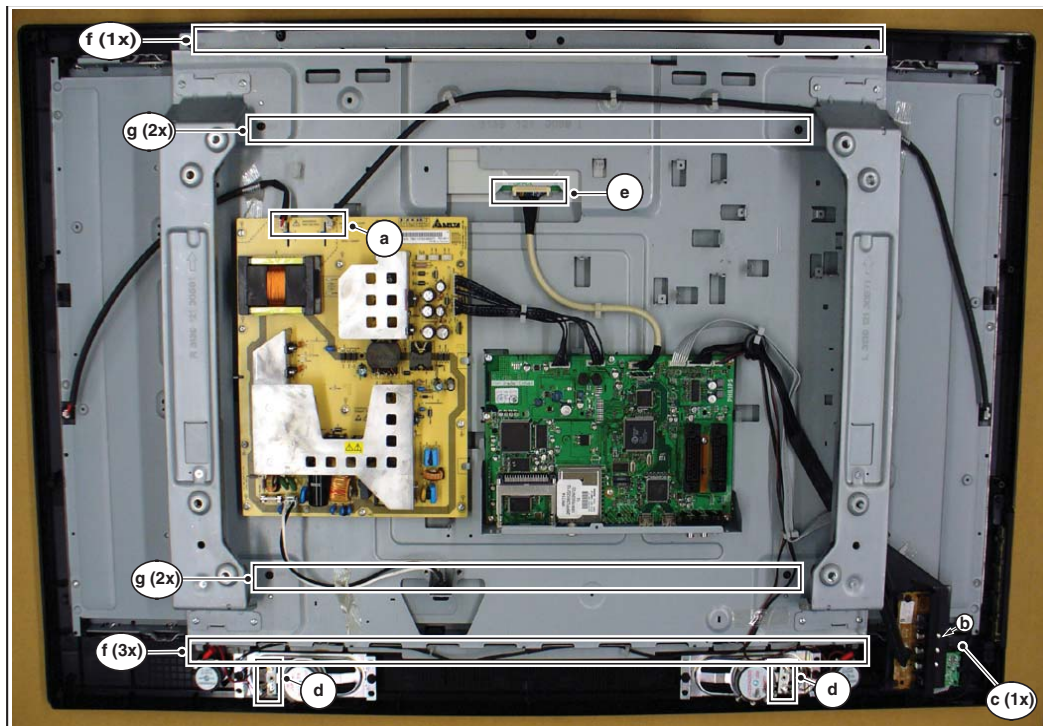
4.3.9 LCD Panel

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 4-17 LCD panel (26" and 32" models)



H_1616940_013.eps
310707

Figure 4-18 LCD panel (37" and 42" models)

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).
- 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 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 Centre). 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, 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

General items 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.

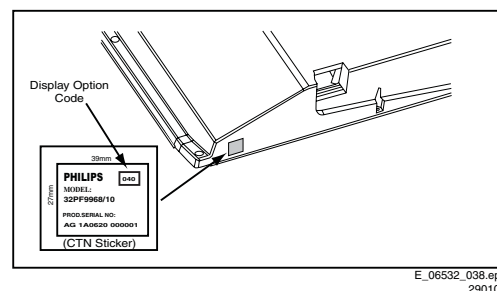
The screen will show: "AAAABCD X.YY", where:

- **AAAA** is the chassis name: LC71 for analogue range.
- **B** is the region indication: E= Europe.
- **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 an SSB or display exchange, the display option code is not set properly, 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 column "Panel Code" in table "Option and display code overview" (ch. 8), or see sticker on the side/bottom of the cabinet. When the value is accepted and stored in NVM, the set will switch to Stand-by, to indicate that the process has been completed.



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290107

Figure 5-1 Location of Display Option Code sticker

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.

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 5-1 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.

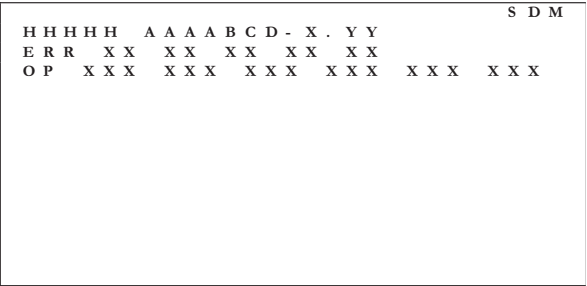


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Figure 5-2 Service jumper (SSB component side)

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.



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260107

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.

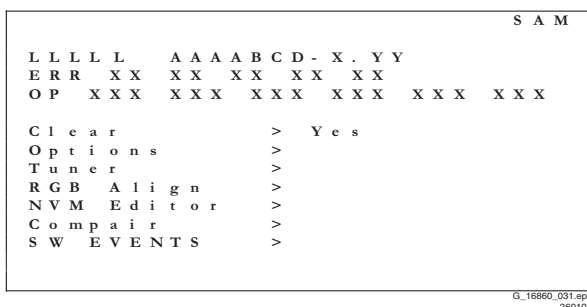


Figure 5-4 SAM menu

Menu explanation:

1. **LLLLL**. This represents the run timer. The run timer counts normal operation hours, but does not count Stand-by hours.
2. **AAAAABCD-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
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

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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 a USB cable. For the TV chassis, the ComPair interface box and the TV communicate via a bi-directional cable via the service connector(s).

How to Connect

This is described in the ComPair chassis fault finding database.

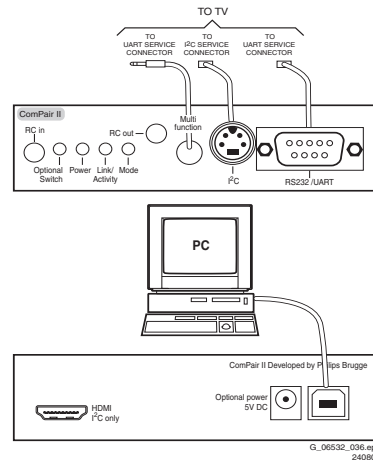


Figure 5-6 ComPair II interface connection

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 I²C interface cable: 3122 785 90004 (to be used with chassis L01, A02, A10, EMX, ...).
 - ComPair I²C interface extension cable: 3139 131 03791 (to be used with chassis L01, A02, A10, L04, LC4, LC7.1, LC7.2).
 - ComPair UART interface cable: 3122 785 90630 (to be used with chassis LC4, EJ3, BJ2, BL2, BP2, ...).
 - ComPair RS232 cable: 3104 311 12742 (to be used with chassis Q52x).
 - ComPair I²C adapter cable: 3122 785 90004 (to be used with chassis TPM1.xA).
 - ComPair I²C interface cable: 9965 100 07325 (to be used with chassis LC7.5).
- Note:** For I2C it is **compulsory** to use this particular cable.
- ComPair UART interface cable: 3138 188 75051 (to be used with chassis LC7.5).
- Note:** For UART it is also allowed to use a standard "Jack-Jack" cable.

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

5.3.2 LVDS Tool

Support of the LVDS Tool has been discontinued.

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 5-2 Error code overview

Error code ¹⁾	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 PNX8314.	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.

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:
 - 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.

5.5 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 5-3 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.

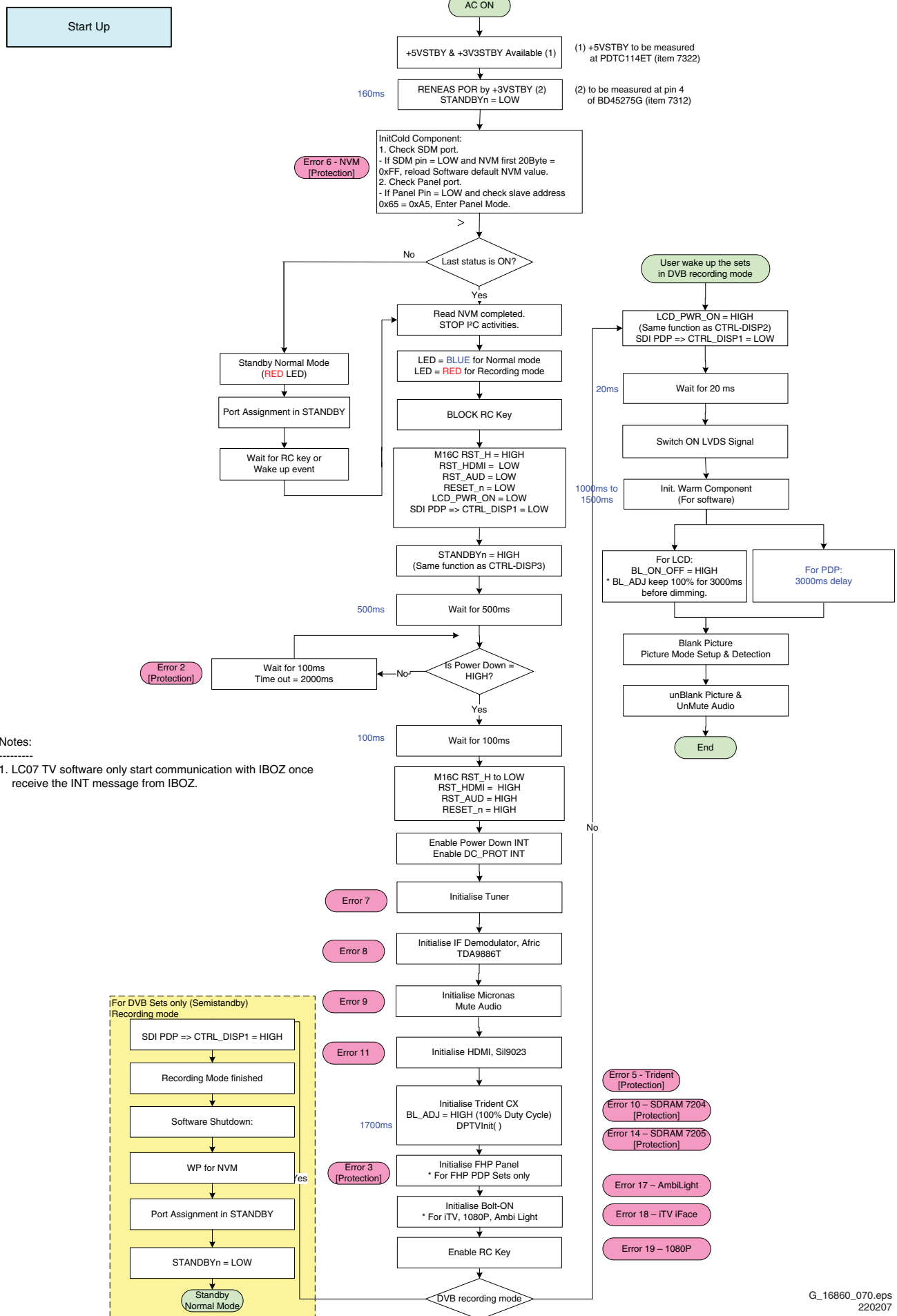


Figure 5-7 Start-up flowchart

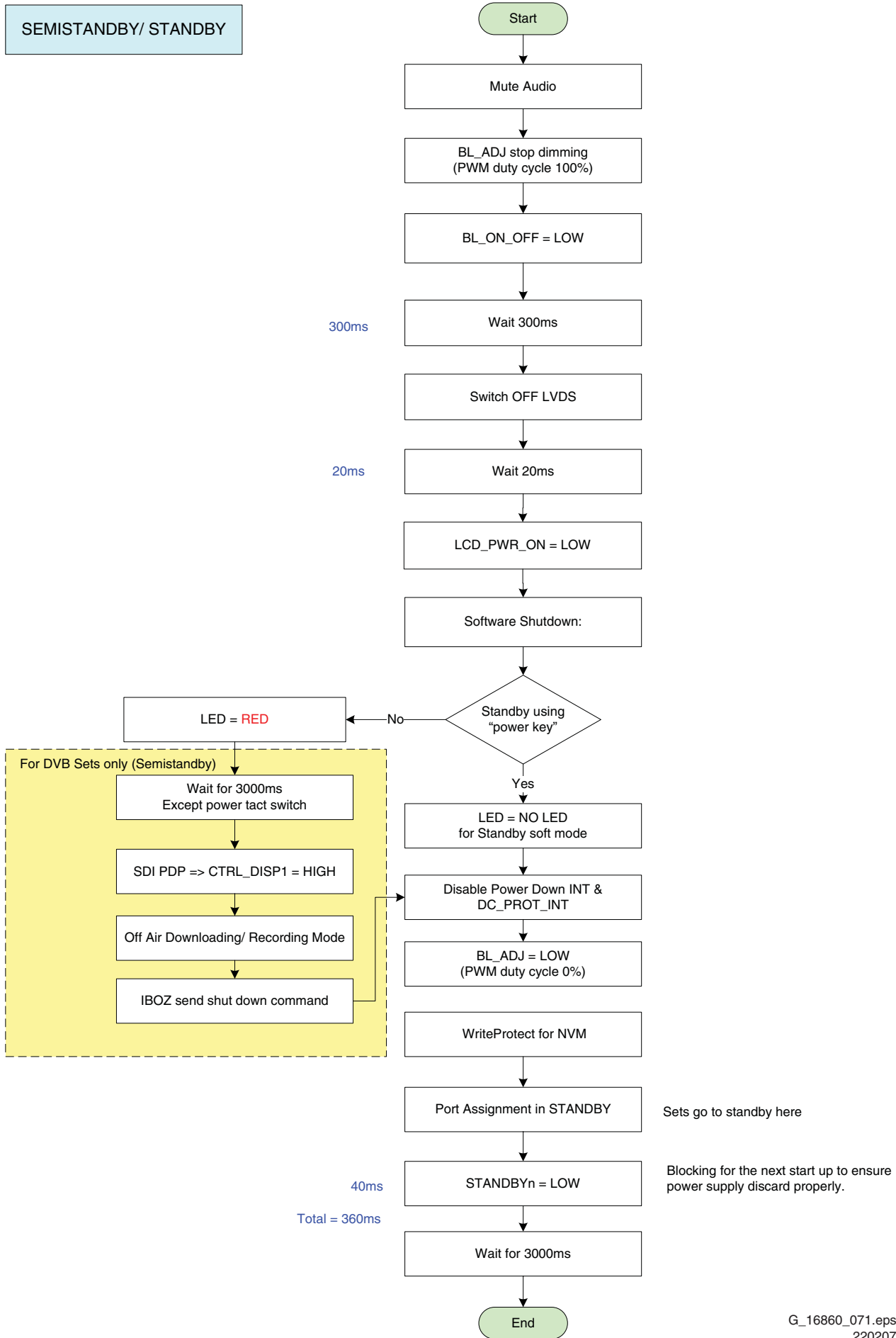
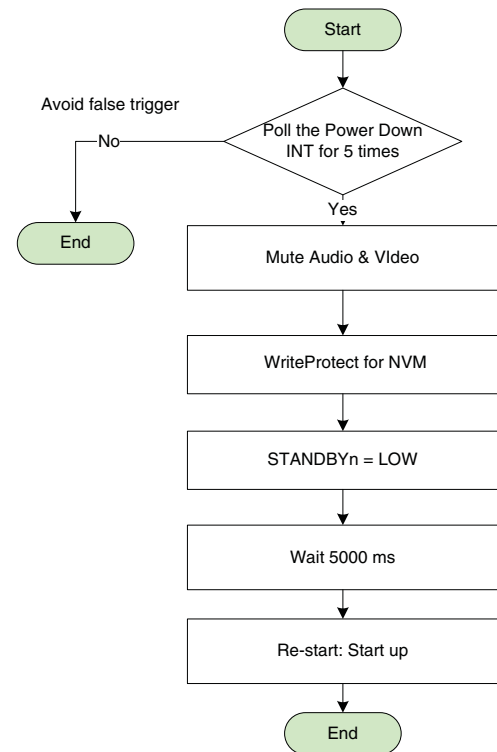


Figure 5-8 Semi Stand-by/Stand-by flowchart

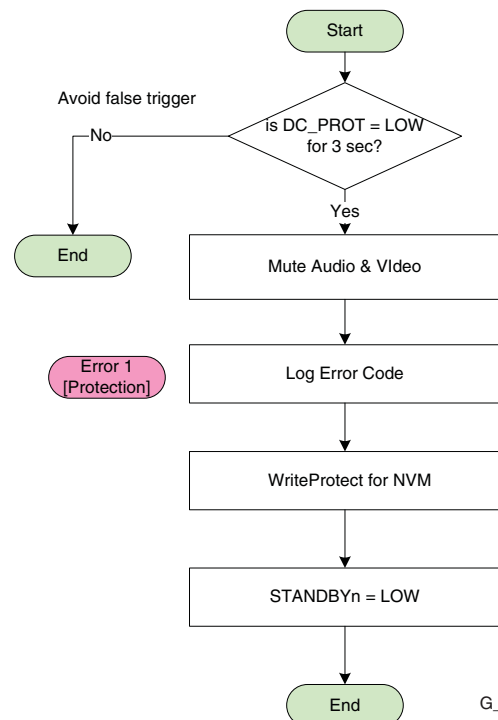
Power Down INT:
AC OFF or Transient INT

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



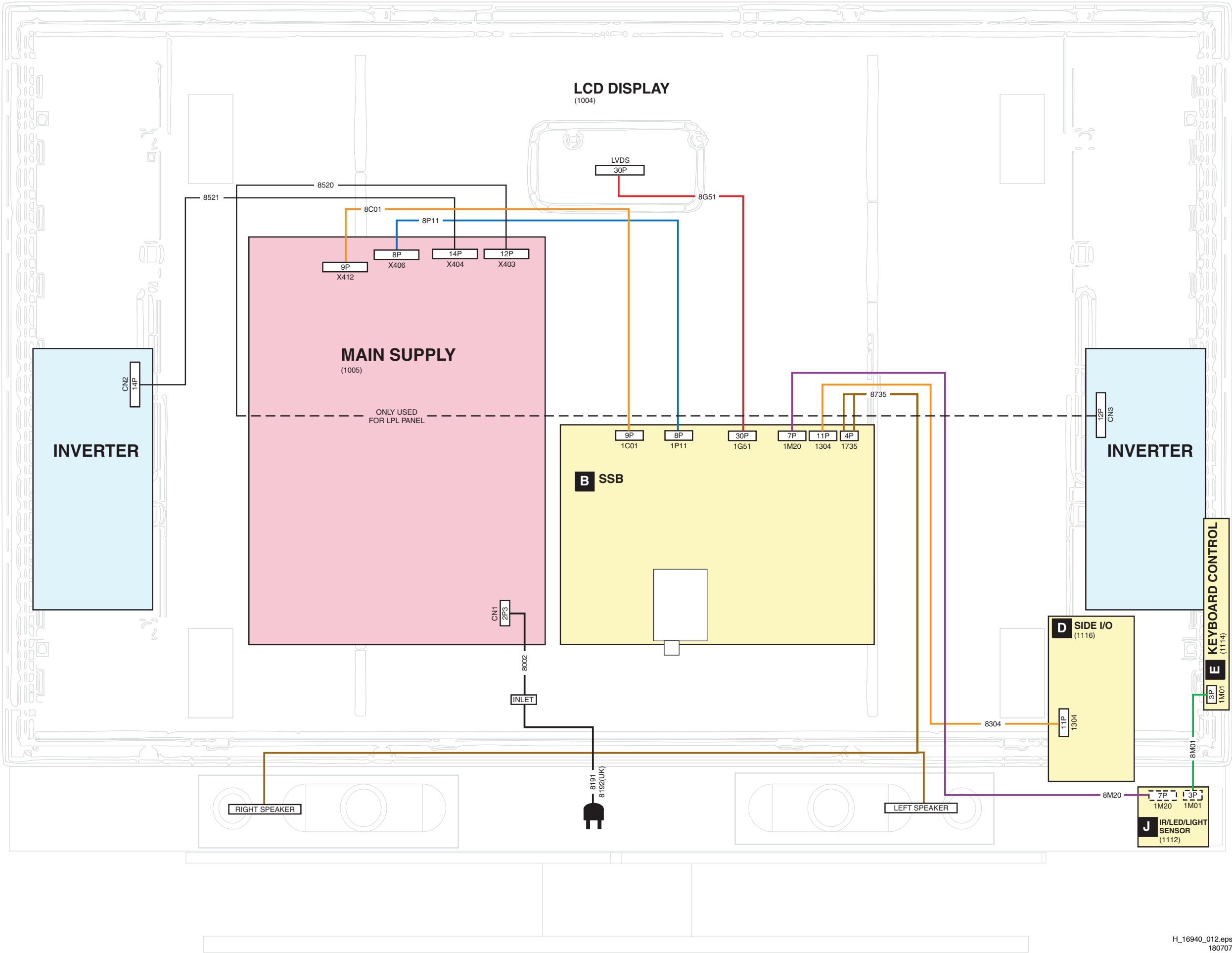
G_16860_072.eps
220207

Figure 5-9 Power Down & DC_PROT flowchart

Personal Notes:

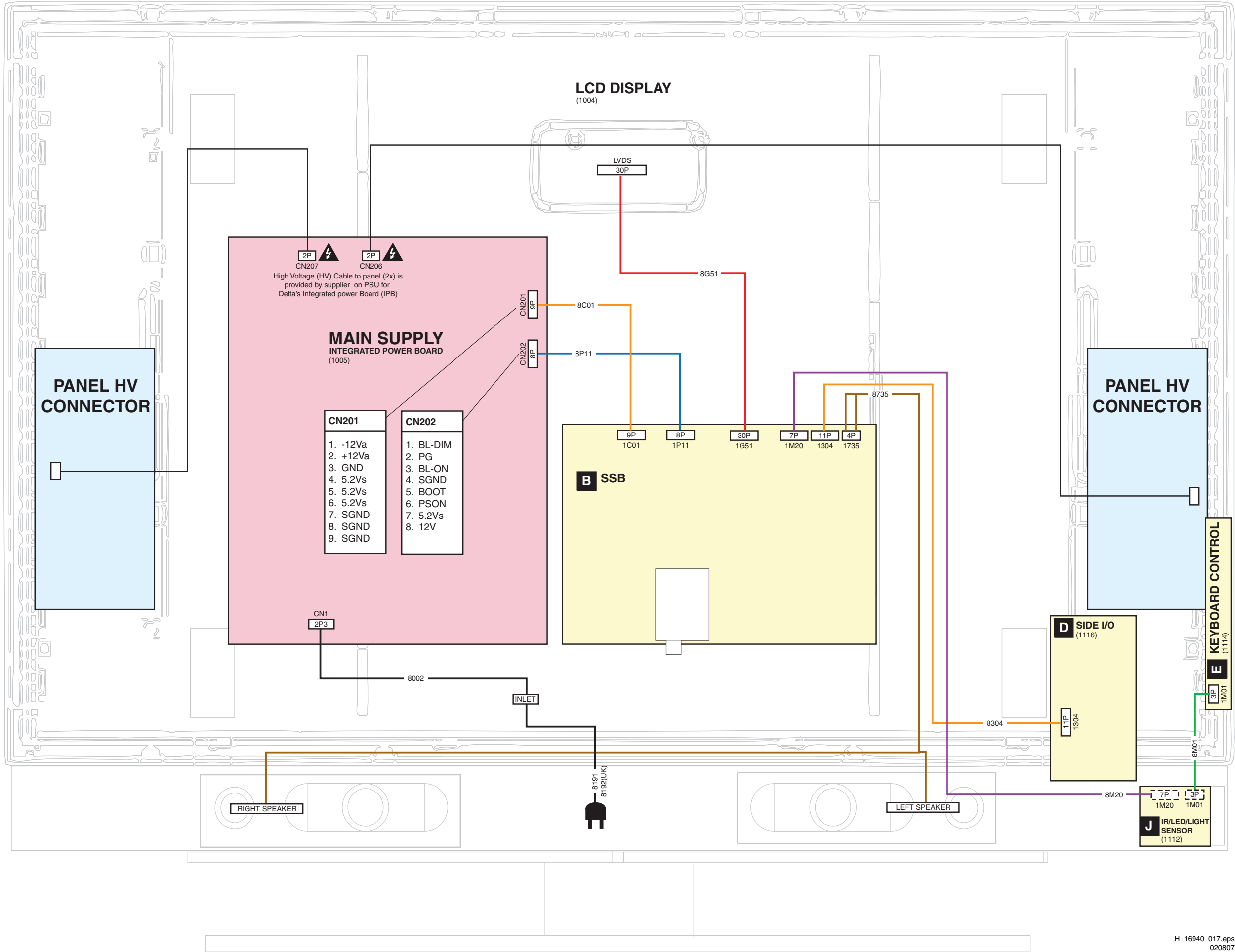
Wiring Diagram 37"-42" (without IPB PSU)

WIRING 37"- 42" LCD (STYLING ME7)



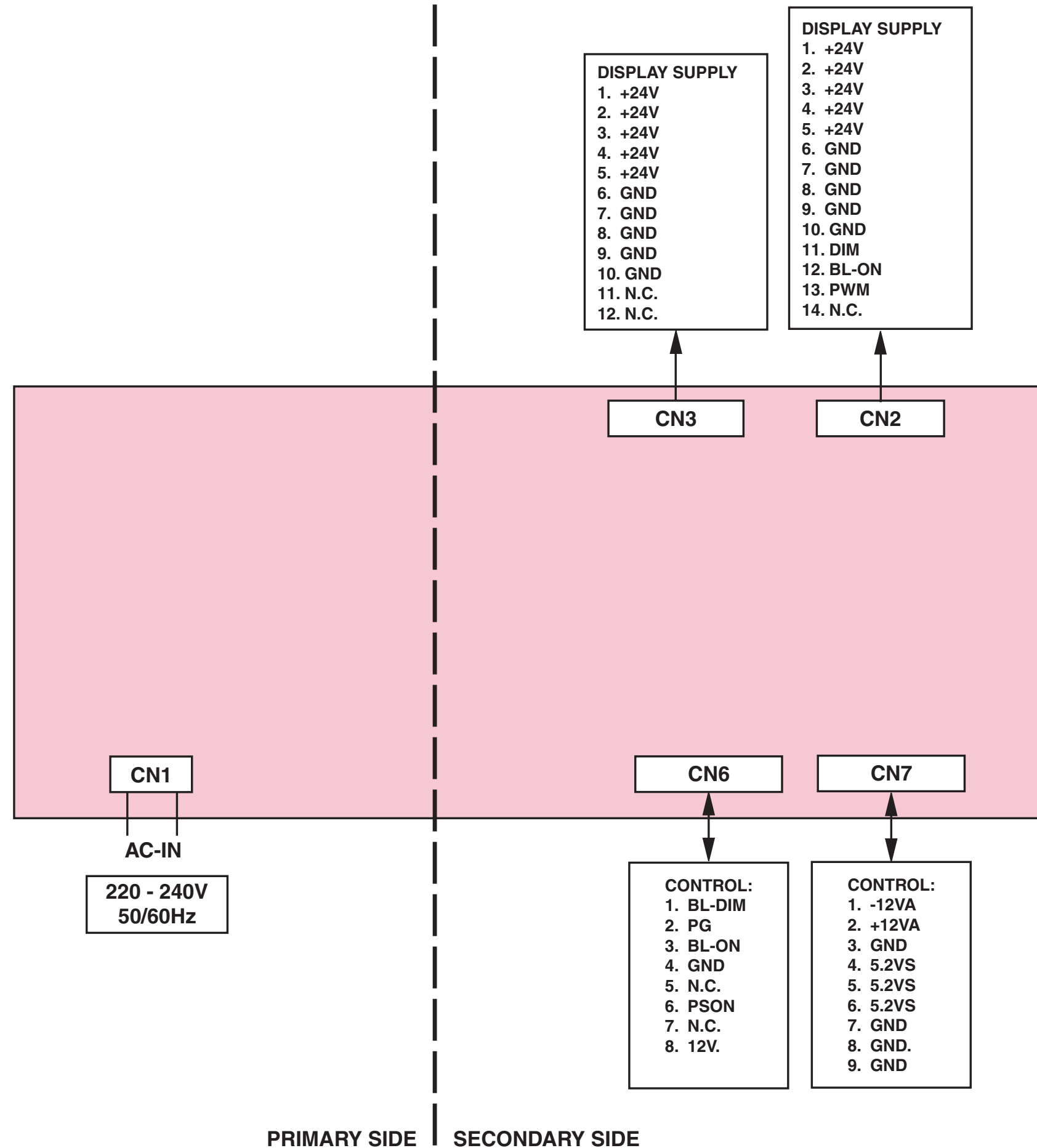
Wiring Diagram 37"-42" (with IPB PSU)

WIRING 37"- 42" LCD (STYLING ME7 PROMO SET)



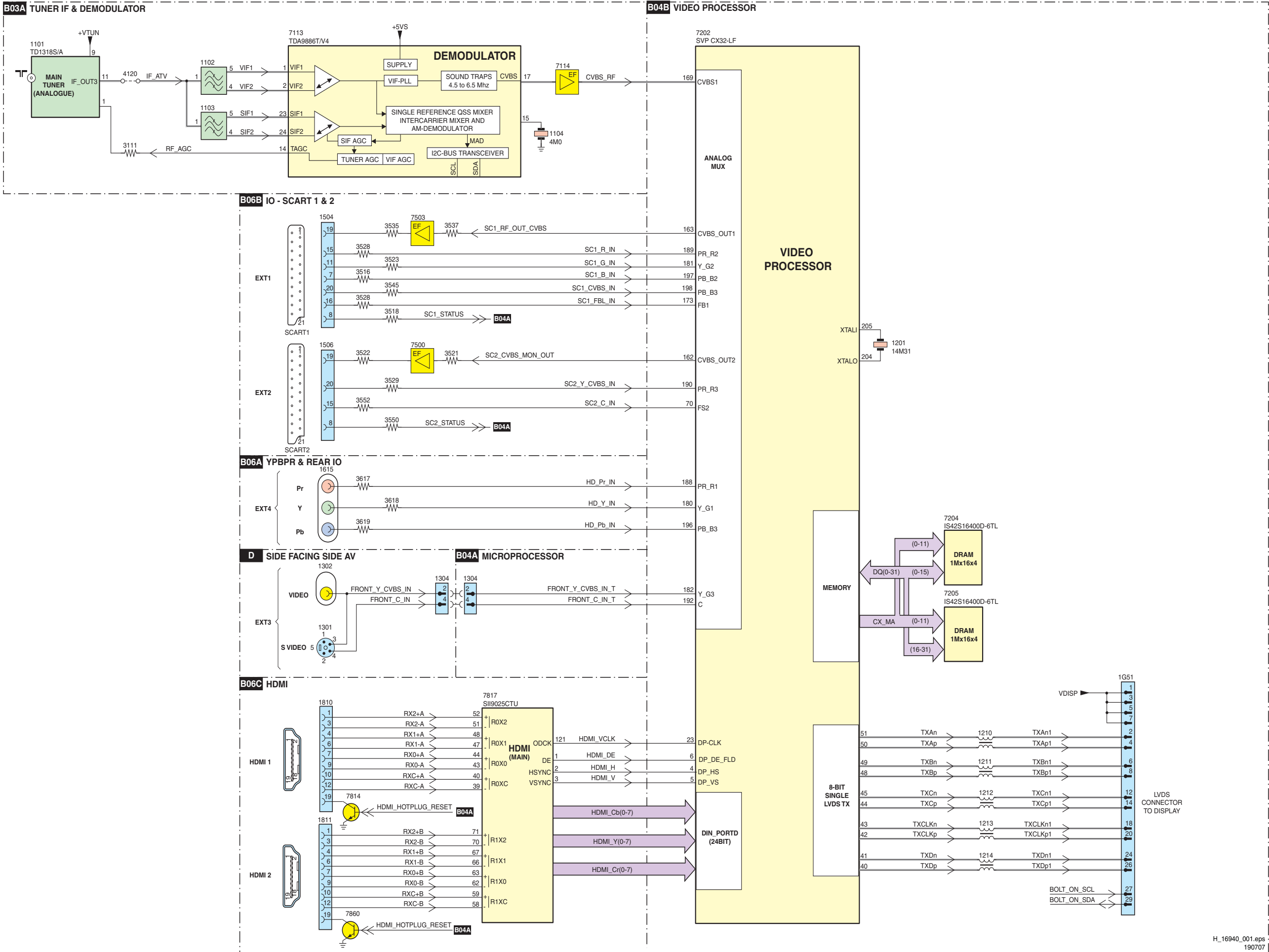
Block Diagram Supply

SUPPLY 26"- 32" LCD



Block Diagram Video

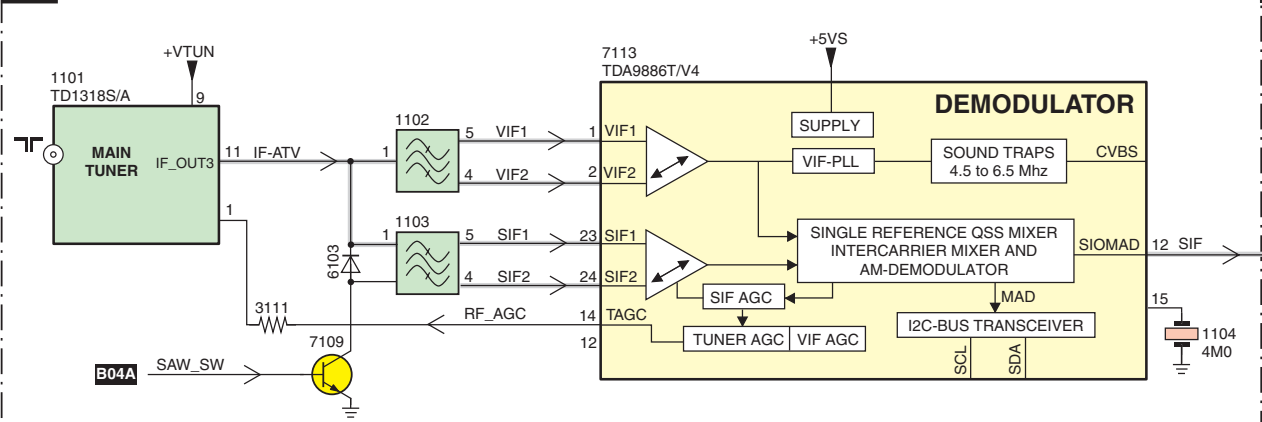
VIDEO



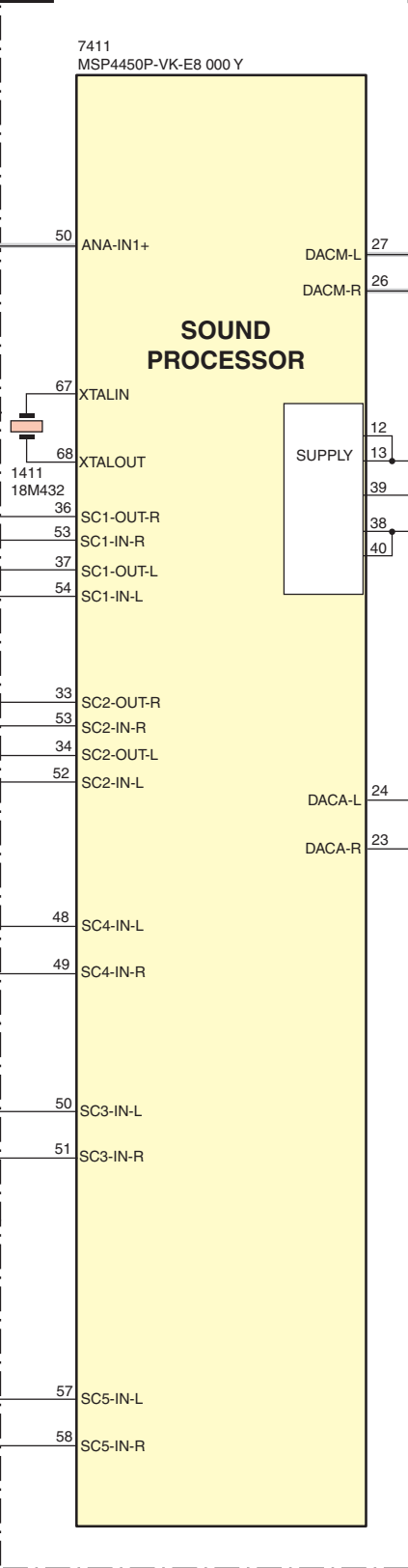
Block Diagram Audio

AUDIO

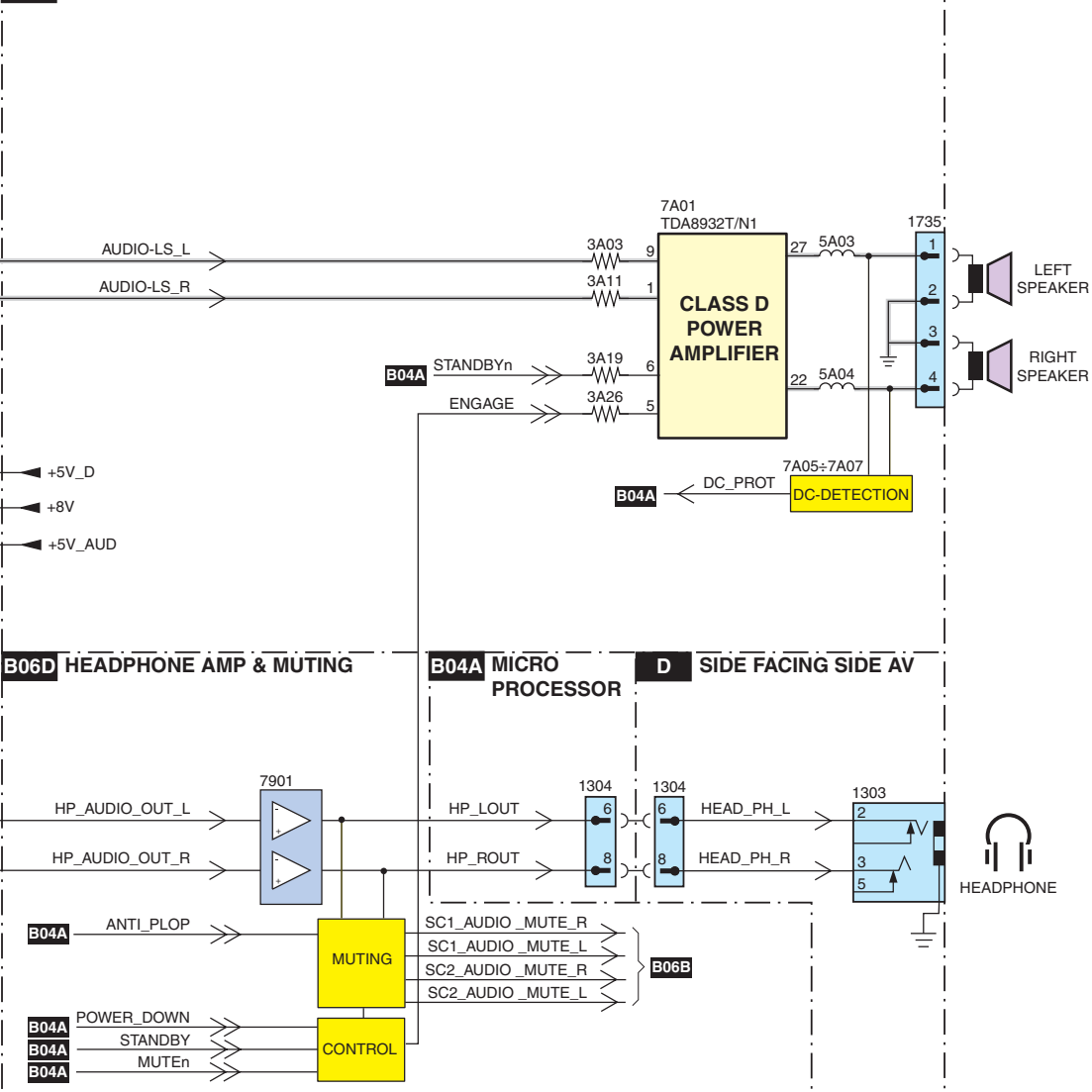
B03A TUNER IF & DEMODULATOR



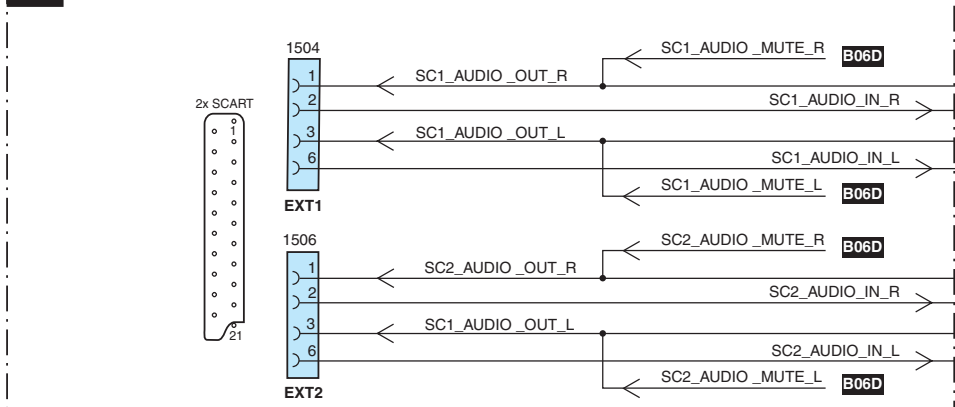
B04C AUDIO PROCESSOR



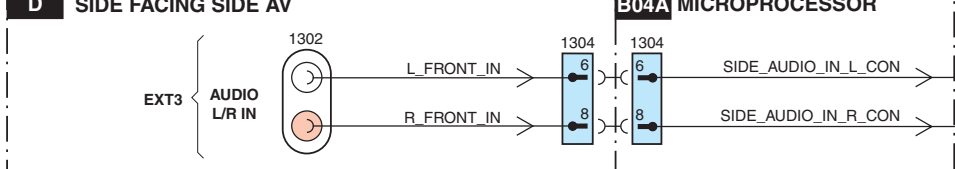
B07 AUDIO



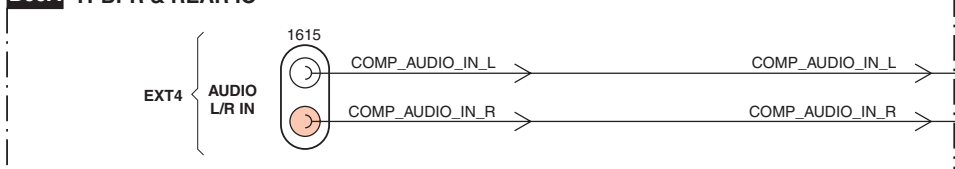
B06B I0 - SCART 1 & 2



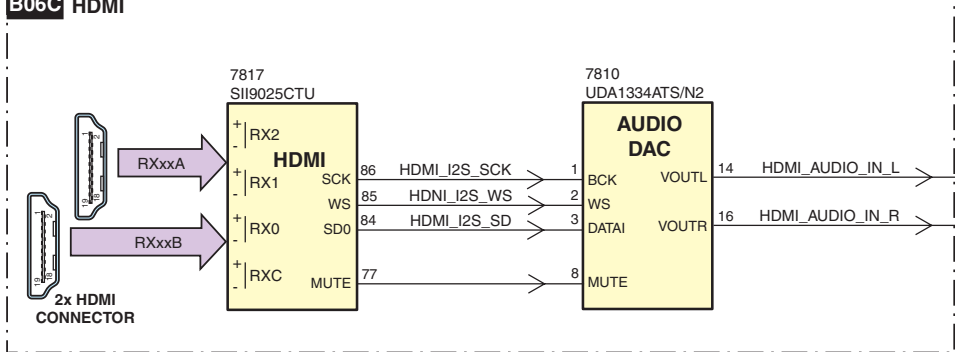
D SIDE FACING SIDE AV



B06A YPBPR & REAR IO

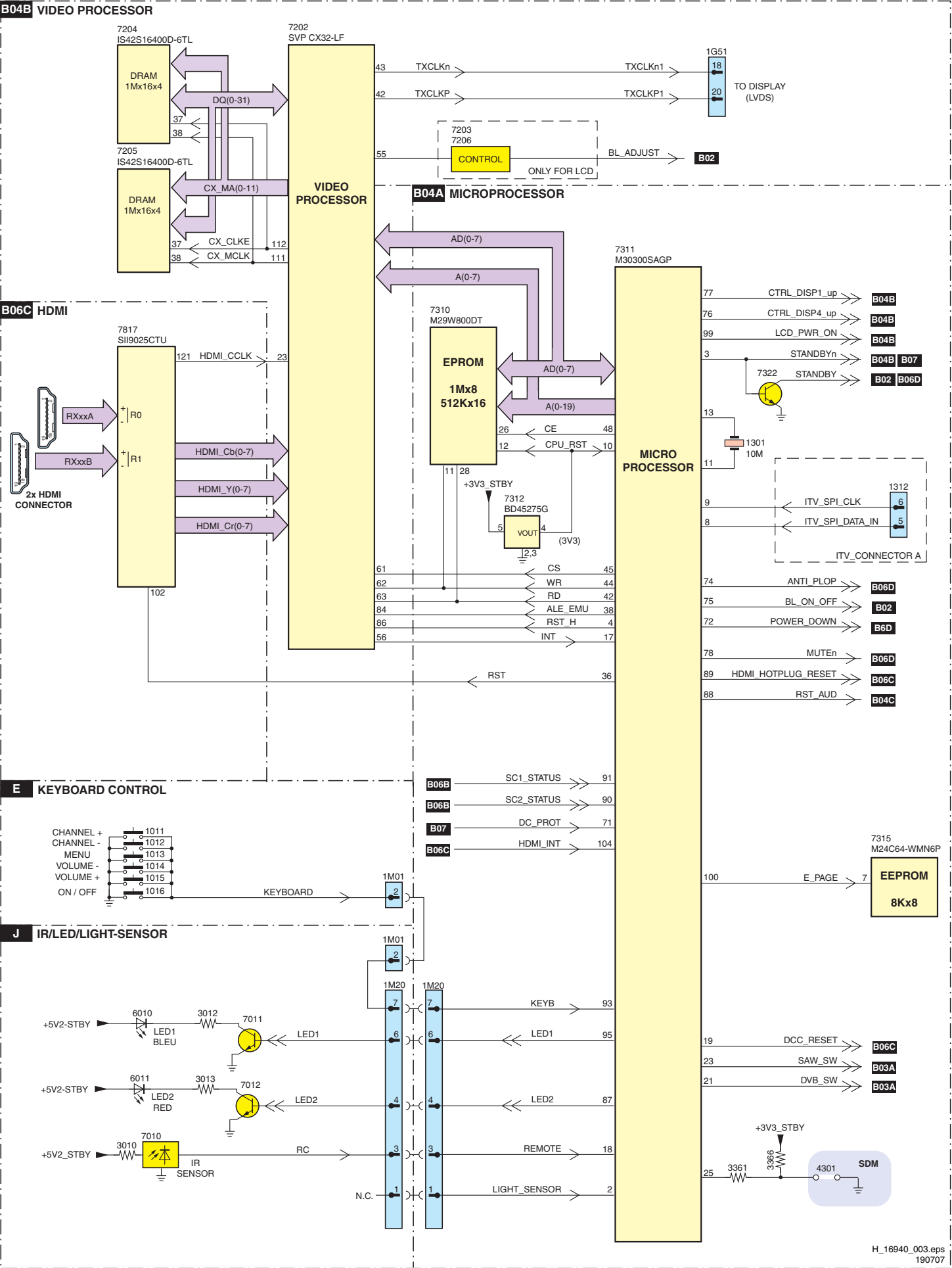


B06C HDMI



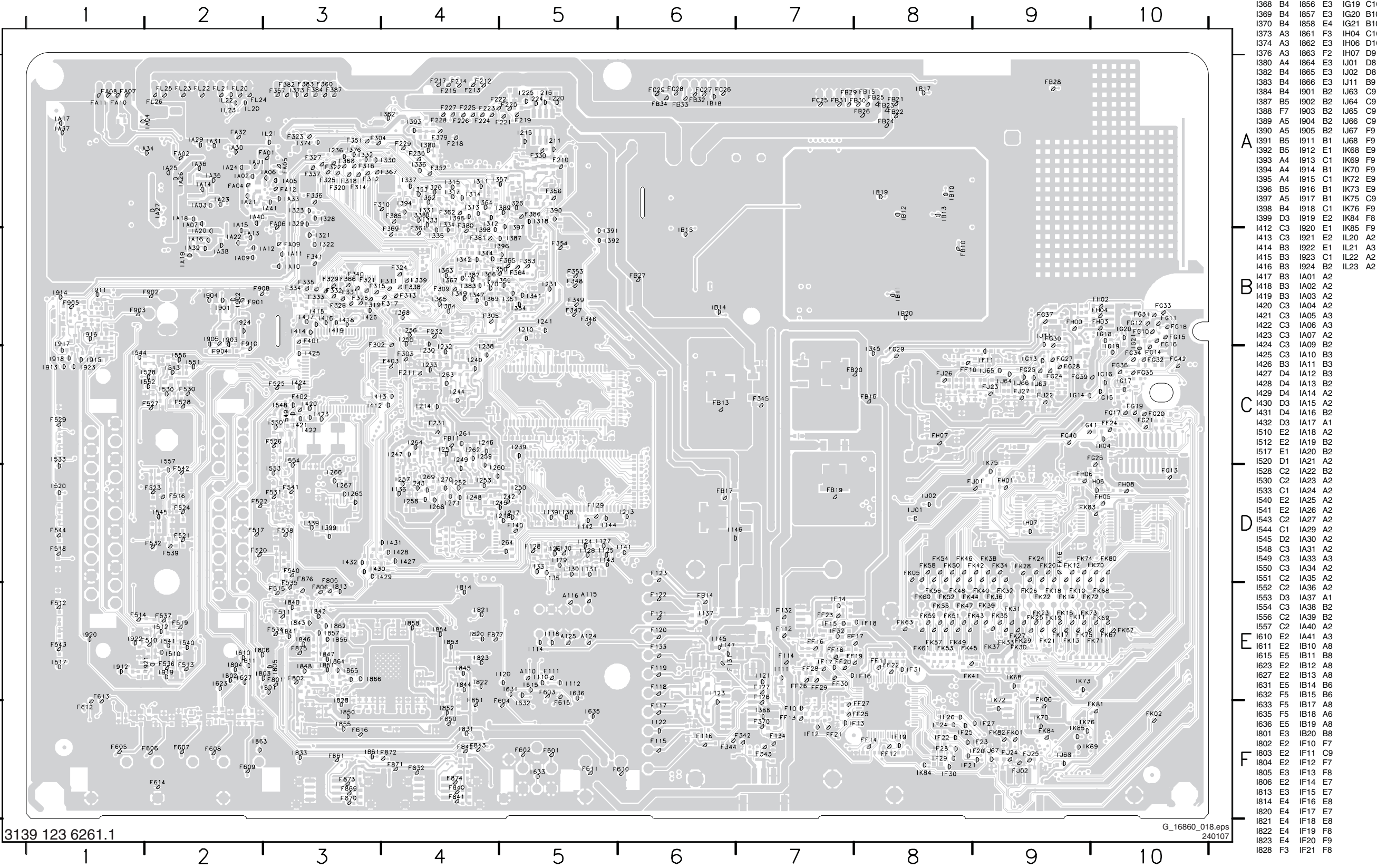
Block Diagram Control & Clock Signals

CONTROL & CLOCK SIGNALS

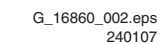


Test Point Overview SSB (Bottom Side)

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 E7	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	F617 E3	F874 F4	FA08 A1	FB23 A8	FC30 A6	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 C3	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	FC31 A6	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	FC32 A6	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	FC33 A6	FF31 F7	FG29 C8	FH04 B10	FK07 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	FC34 A6	FF32 F7	FG30 B9	FH05 D10	FK11 E9	FK28 D9	FK45 E8	FK62 E10	FK86 F9	I126 D5	I146 D6	I234 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	FC35 A6	FF33 E7	FG31 B10	FH06 D9	FK12 D9	FK29 E9	FK46 D8	FK63 E8	FK87 F9	I127 D5	I147 E6	I235 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	FC36 A6	FF34 E7	FG32 C10	FH07 C8	FK13 E9	FK30 E9	FK47 E8	FK67 E10	FK88 F9	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	FC37 A6	FF35 E7	FG33 B10	FH08 D10	FK14 E9	FK31 E9	FK48 E8	FK68 E10	FK89 F9	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	FC38 A6	FF36 E7	FG34 C10	FJ01 D9	FK15 E9	FK32 E9	FK49 E8	FK69 E10	FK90 F9	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	F844 F4	F906 B2	FB14 E6	FB32 A6	FC39 A6	FF37 E7	FG35 C10	FJ02 F9	FK16 D9	FK33 E9	FK50 D8	FK70 D10	FK91 F9	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	FC40 A6	FF38 F7	FG36 C10	FJ22 C9	FK17 E9	FK34 D9	FK51 E8	FK71 E10	I111 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	FC41 A6	FF39 E7	FG37 B9	FJ23 C9	FK18 E9	FK35 E9	FK52 E8	FK72 E10	I112 E5	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



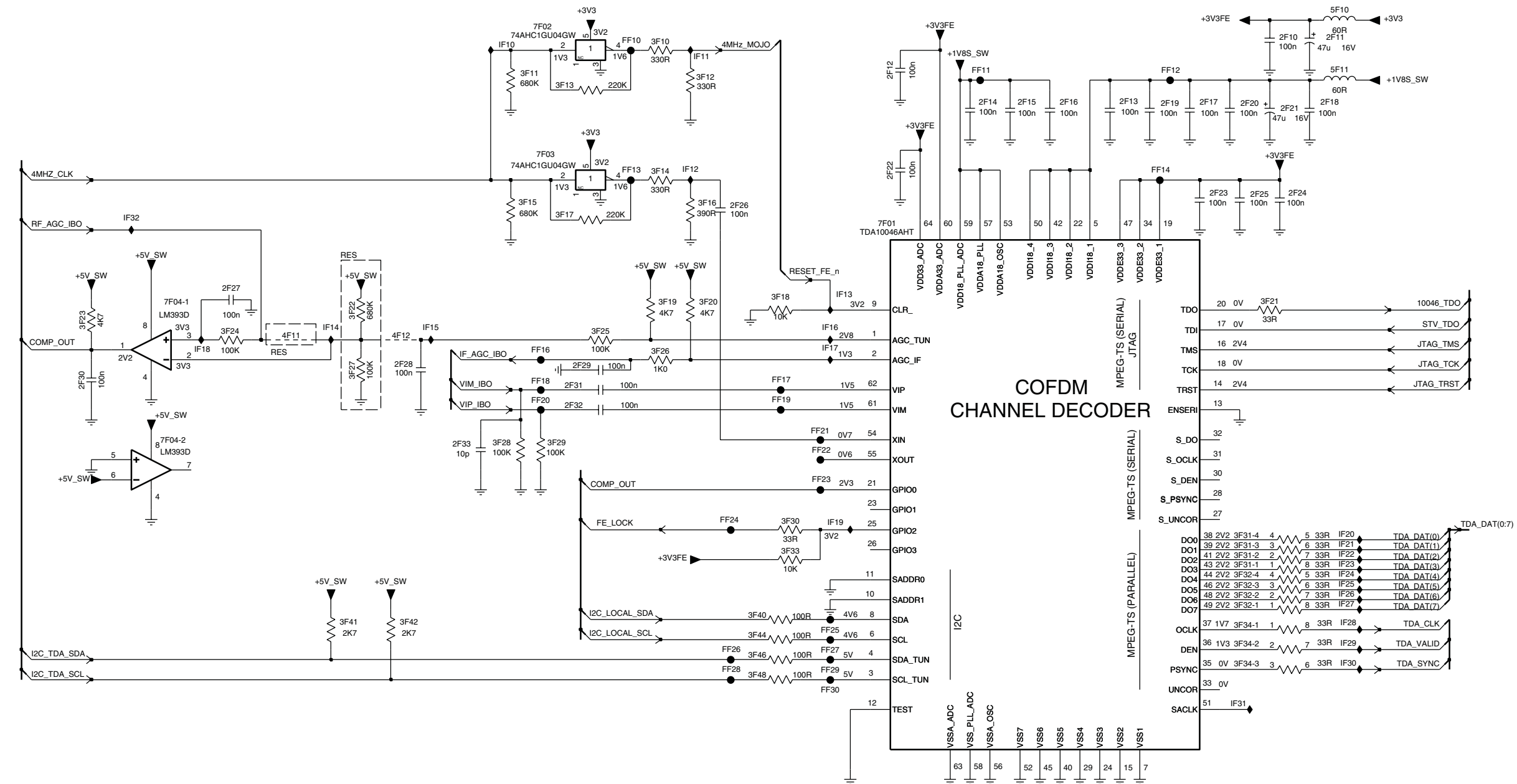
B03A TUNER IF & DEMODULATOR



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

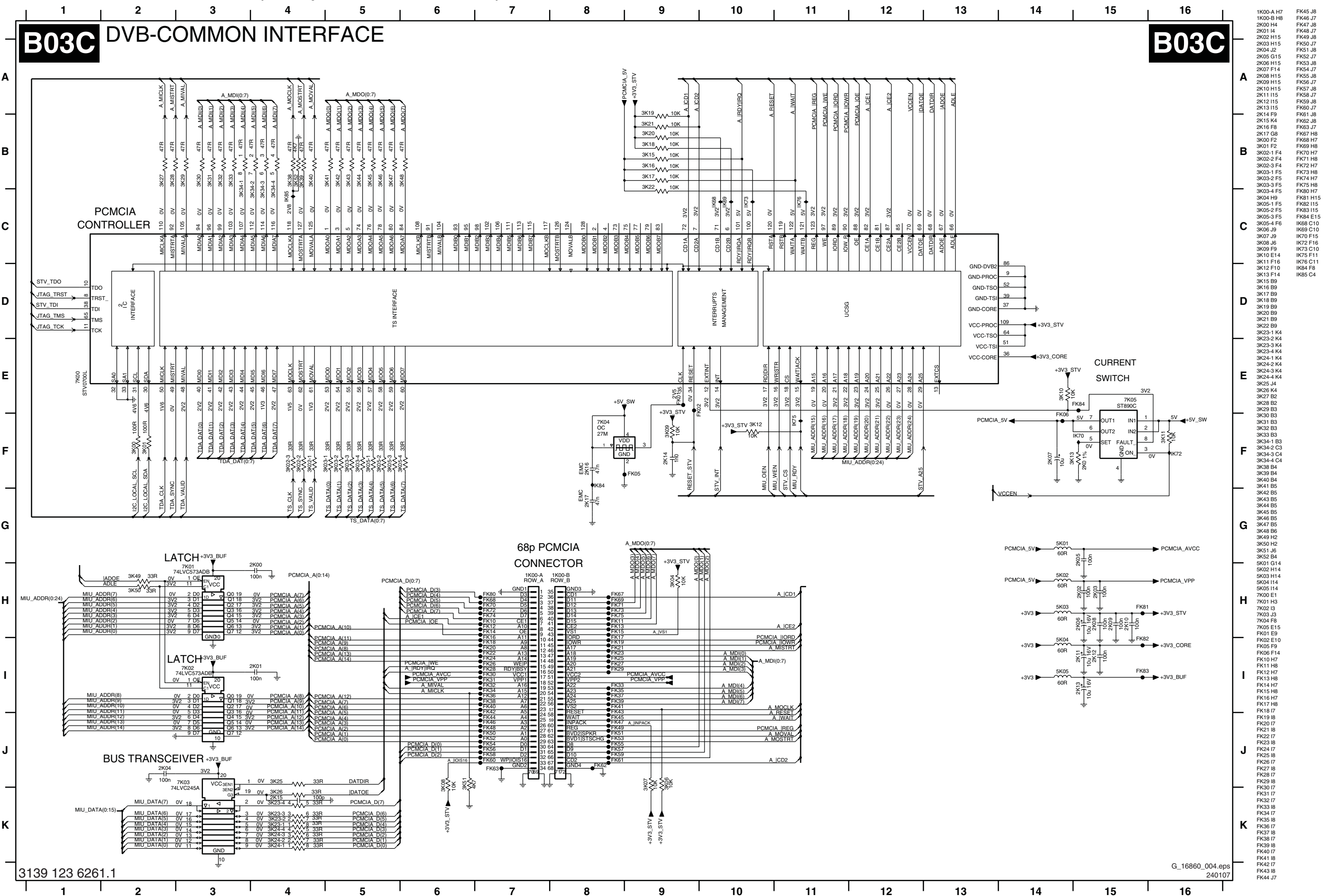
B03B DVB - DEMODULATOR

B03B

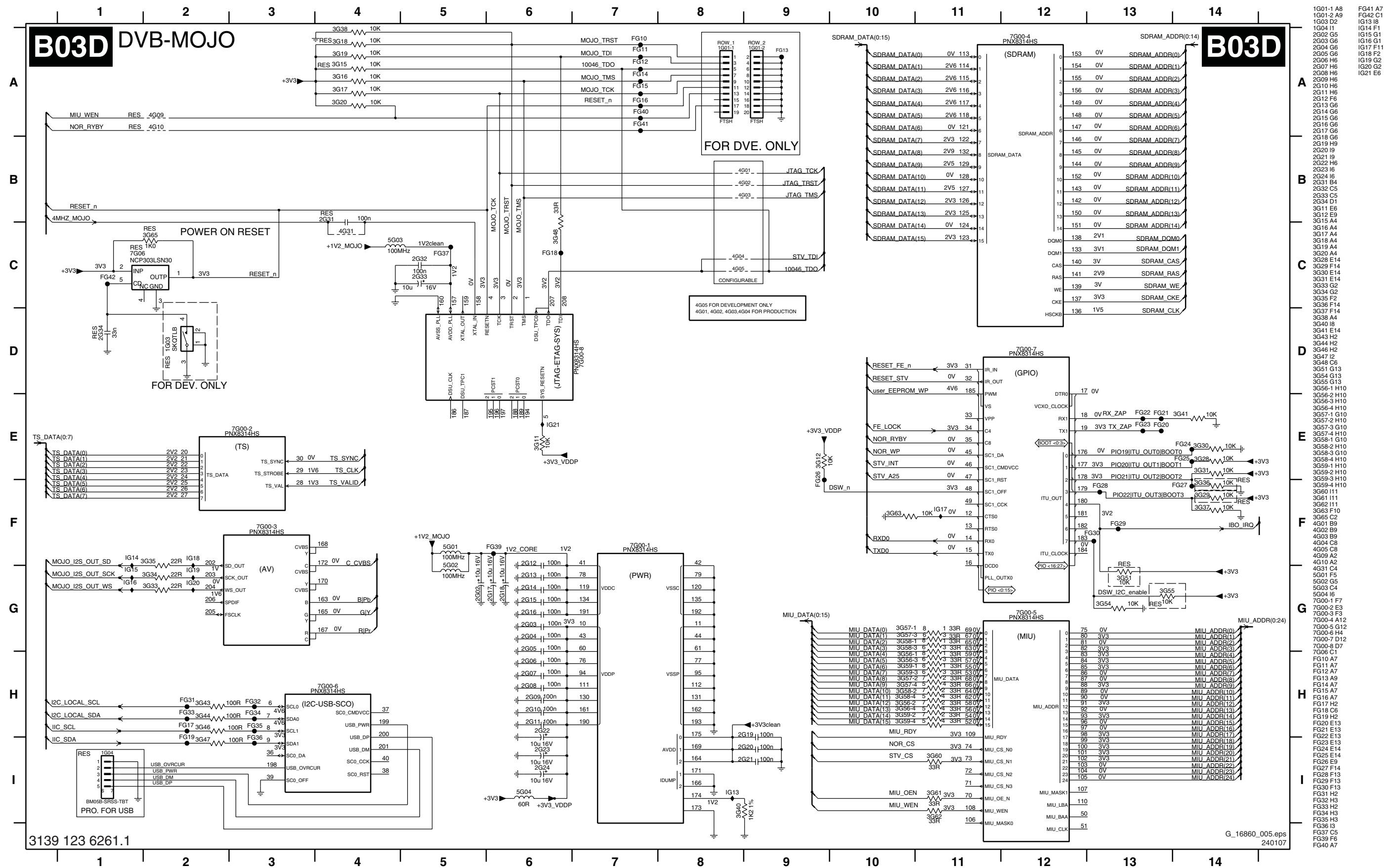


- 2F10 B10
- 2F11 B10
- 2F12 B7
- 2F13 B9
- 2F14 B8
- 2F15 B8
- 2F16 B8
- 2F17 B9
- 2F18 B10
- 2F19 B9
- 2F20 B9
- 2F21 B10
- 2F22 C7
- 2F23 C9
- 2F24 C10
- 2F25 C10
- 2F26 C6
- 2F27 C2
- 2F28 D3
- 2F29 D5
- 2F30 D1
- 2F31 D5
- 2F32 D5
- 2F33 D4
- 3F10 B5
- 3F11 B4
- 3F12 B6
- 3F13 B5
- 3F14 C5
- 3F15 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
- FF25 F6
- FF26 F6
- FF27 F6
- FF28 F6
- FF30 F6
- IF10 B4
- IF11 B6
- IF12 C5
- IF13 C7
- IF14 D3
- IF15 D4
- IF16 D6
- IF17 D6
- IF18 D2
- IF19 E6
- IF20 E10
- IF21 E10
- IF22 E10
- IF23 E10
- IF24 E10
- IF25 E10
- IF26 F10
- IF27 F10
- IF28 F10
- IF29 F10
- IF30 F10
- IF31 F9
- IF32 C1

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



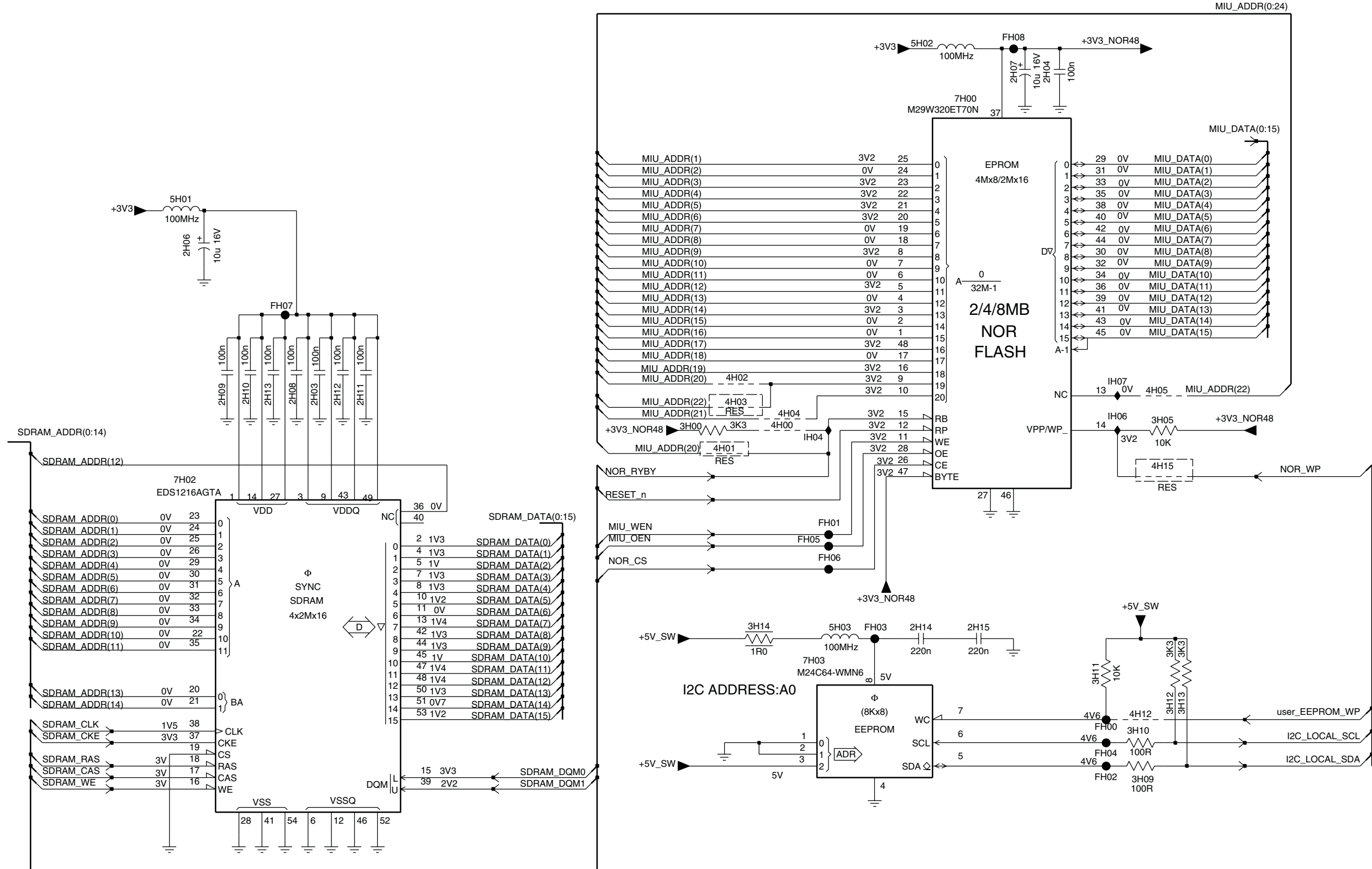
SSB: DVB - Mojo (Not implemented in this chassis)



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

B03E DVB-MOJO MEMORY

B03E

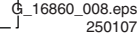


- 2H03 C2
- 2H04 A7
- 2H06 B1
- 2H07 A6
- 2H08 C2
- 2H09 C2
- 2H10 C2
- 2H11 C2
- 2H12 C2
- 2H13 C2
- 2H14 D6
- 2H15 D6
- 3H00 C4
- 3H05 C7
- 3H09 E7
- 3H10 E7
- 3H11 E7
- 3H12 E7
- 3H13 E7
- 3H14 D5
- 4H00 C5
- 4H01 C5
- 4H02 C5
- 4H03 C5
- 4H04 C5
- 4H05 C7
- 4H12 E7
- 4H15 C7
- 5H01 B1
- 5H02 A6
- 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

B03F DVB-MOJO ANALOG BACK END

1001 D7	IJ66 C1
1002 D7	IJ67 D8
1J14 D6	IJ68 D8
2J01 B7	
2J02 B7	
2J04 B8	
2J05 C8	
2J06 C9	
2J14 D8	
2J15 D8	
2J60 A2	
2J62 B3	
2J63 B2	
2J64 C2	
2J66 C2	
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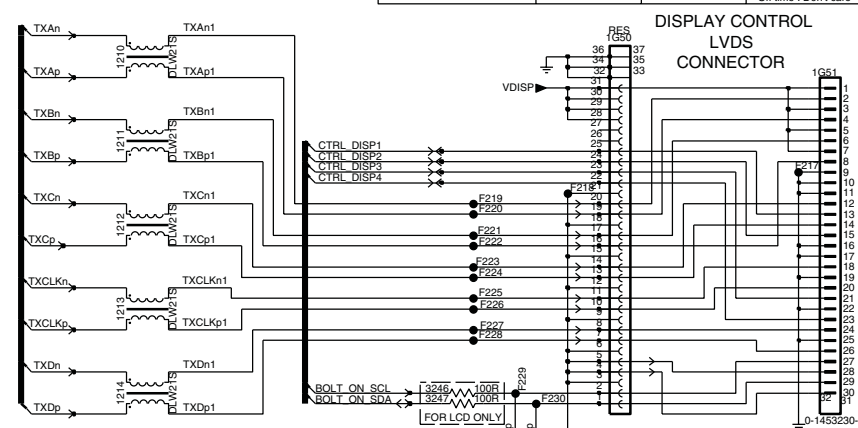
B04A MICROPROCESSOR



B04B VIDEO PROCESSOR

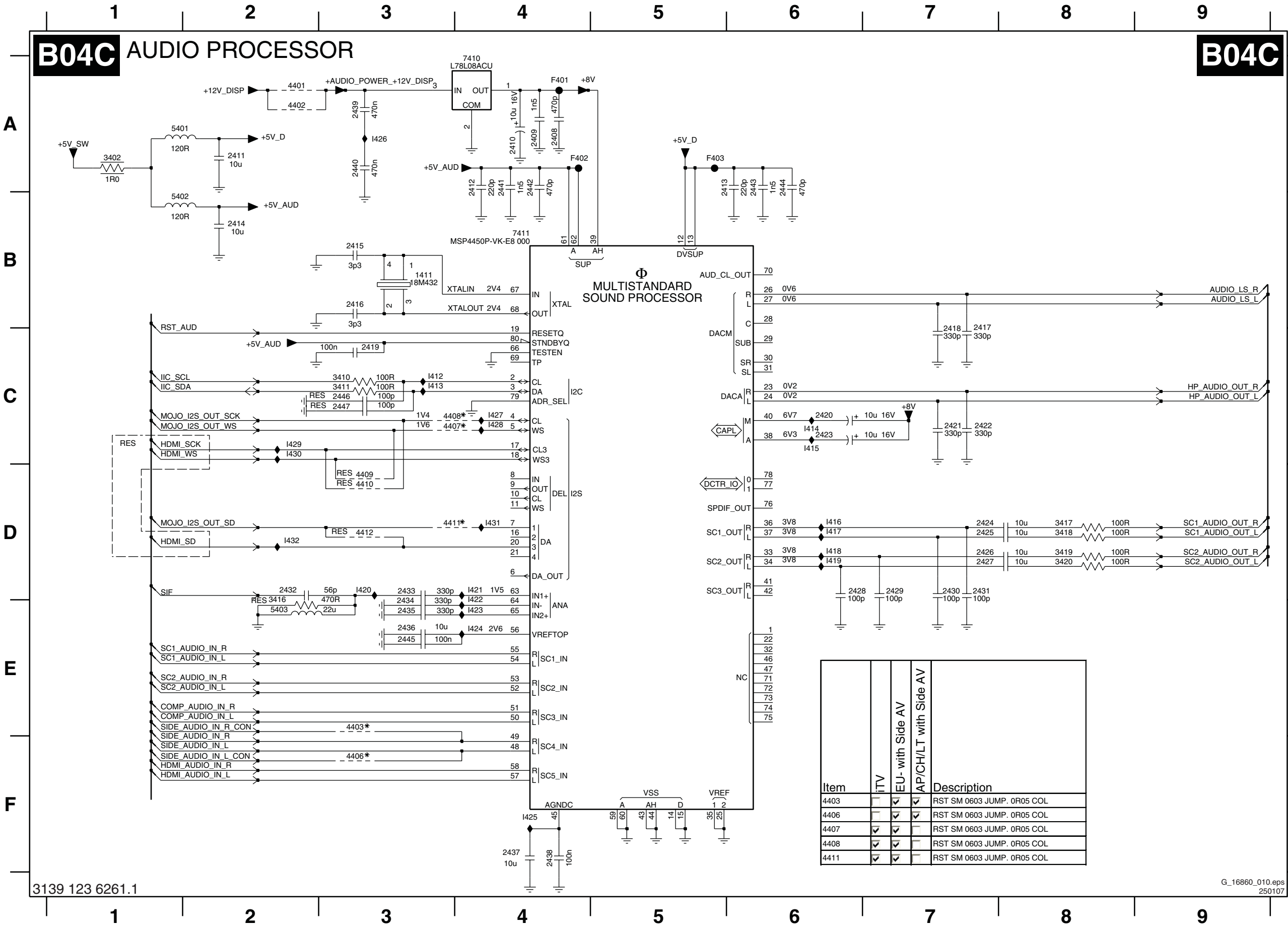


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CTRL-DISP1		RESET Semi standby : H Normal and off : L	
CTRL-DISP2(LCD_PWR_on)	DISPEN On time : H Off time : Don't care		CPU_GO On time : H Off time : Don't care
CTRL-DISP3(Rev. Standby)		PDWIN On time : H Off time : Don't care	
CTRL-DISP4		PDF_GO On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



1201	3241	K9	I232 E4
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1215	3247	K14	I241 K9
1216	3248	B7	I242 A6
1217	3249	B7	I243 A7
1218	3250	J2	I244 A7
1219	3251	J3	I245 L8
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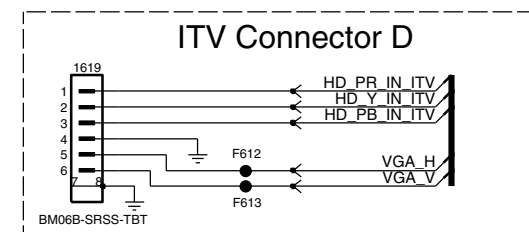
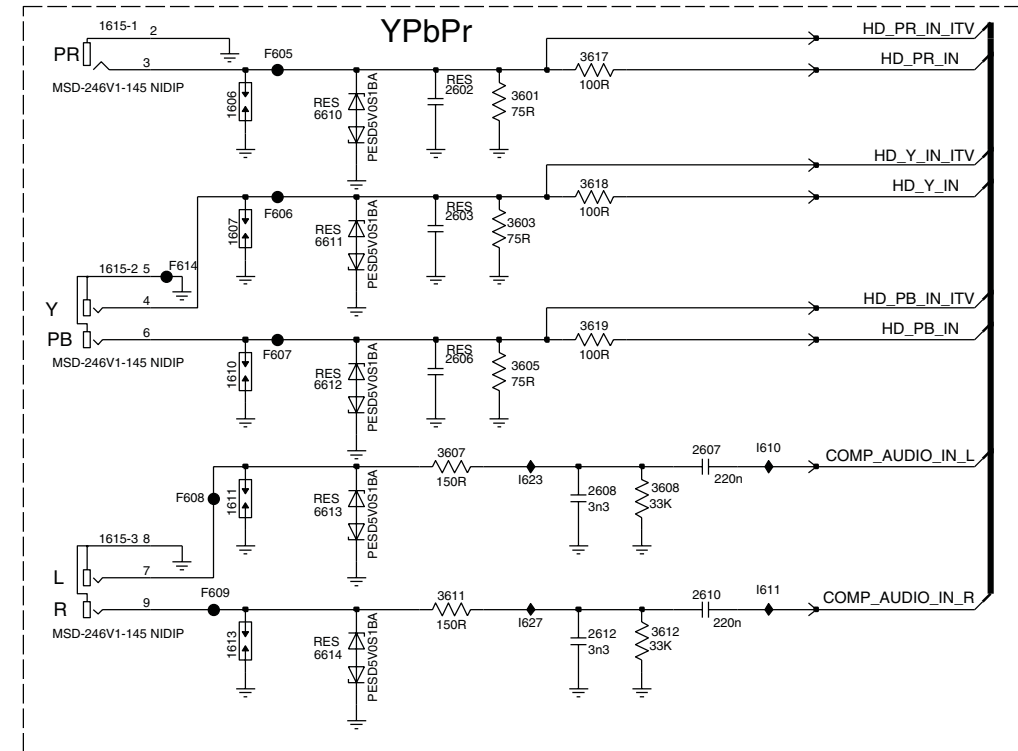
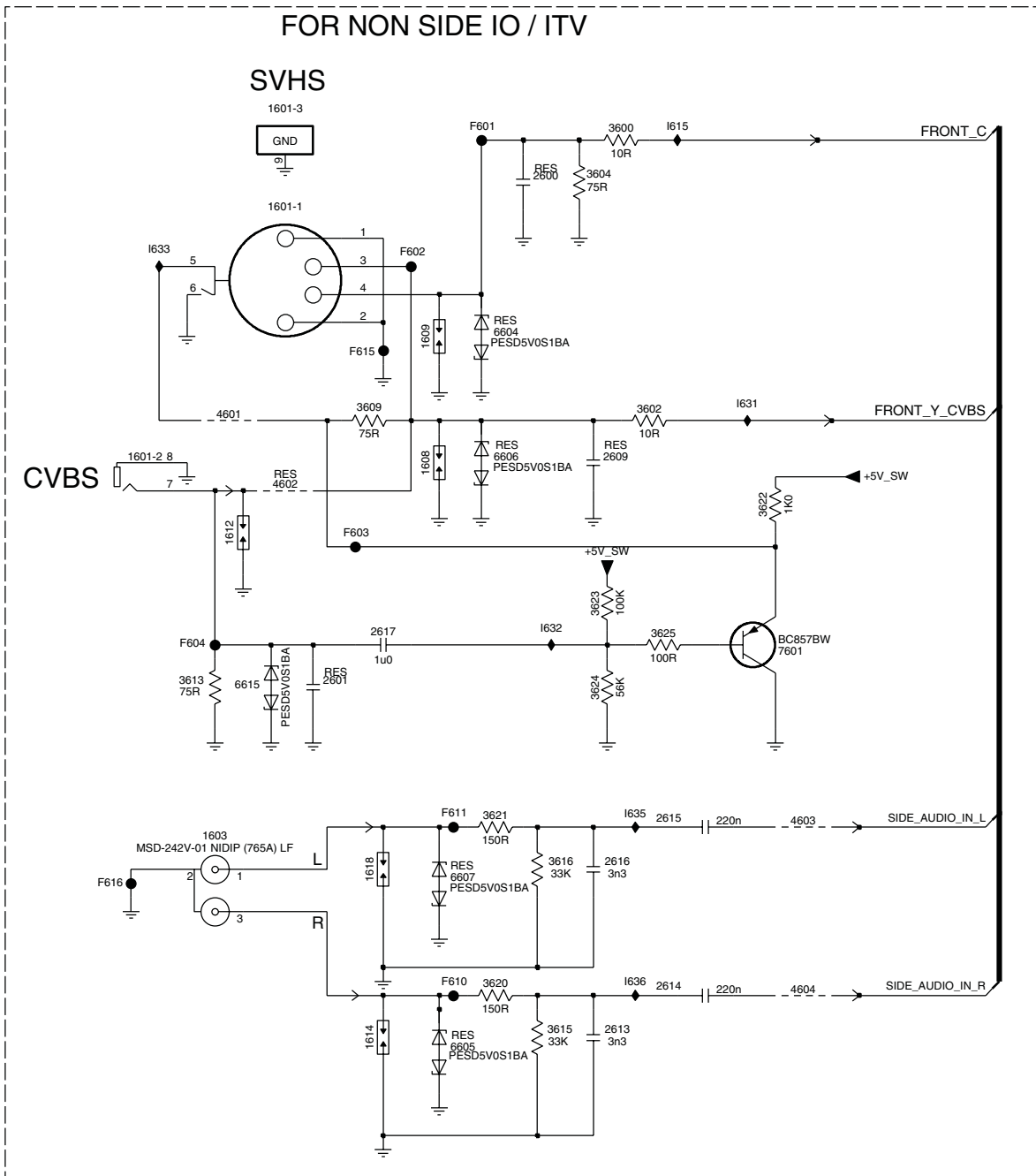
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- 4401 A2
- 4402 A2
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- 4407 C3
- 4408 C3
- 4409 D3
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- I416 D6
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- I420 D3
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- I424 E4
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B06A YPBPR & REAR IO

B06A

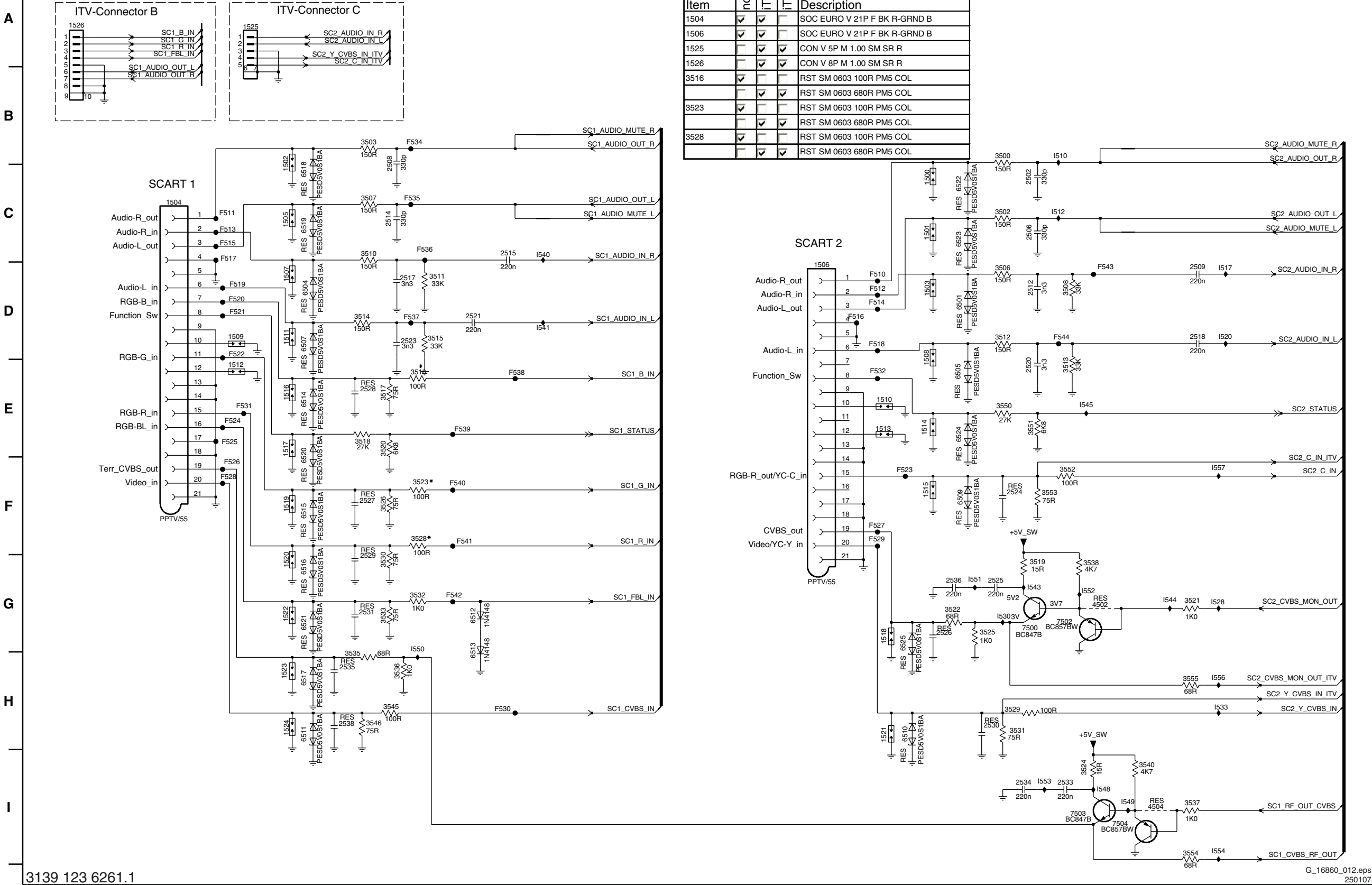


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SSB: I/O Scart 1 & 2

B06B IO - SCART 1 & 2

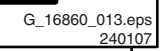


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1506	✓	✓	✓	SOC EURO V 21P F BK R-GRND B
1525	✓	✓	✓	CON V 5P M 1.00 SM SR R
1526	✓	✓	✓	CON V 8P M 1.00 SM SR R
3516	✓	✓	✓	RST SM 0603 100R PM5 COL
	✓	✓	✓	RST SM 0603 680R PM5 COL
3523	✓	✓	✓	RST SM 0603 100R PM5 COL
	✓	✓	✓	RST SM 0603 680R PM5 COL
3528	✓	✓	✓	RST SM 0603 100R PM5 COL
	✓	✓	✓	RST SM 0603 680R PM5 COL

B06B

- 1500 C9
- 1501 C9
- 1502 C3
- 1503 D9
- 1504 C2
- 1505 C3
- 1506 D8
- 1507 D3
- 1508 E9
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- 1514 E9
- 1515 F9
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- 1517 E3
- 1518 G9
- 1519 F3
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- 1521 H9
- 1522 G3
- 1523 H3
- 1524 H3
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- 1526 A1
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- 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
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- 3536 H4
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B06C HDMI

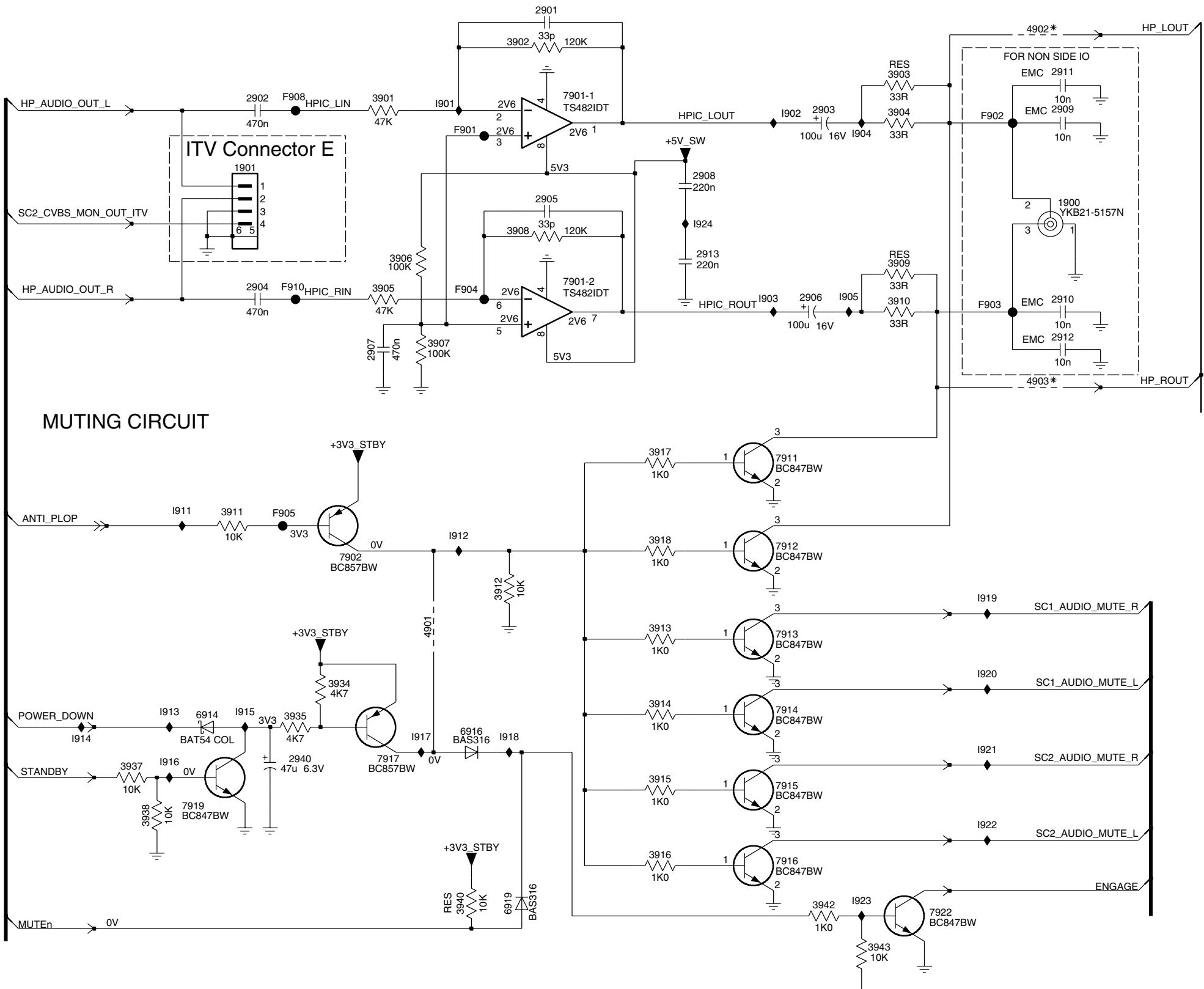


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2904 A7	3889 G5
2805 G3	3897 G0
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2807 H2	4803 H6
2808 H2	4804 A6
2809 H8	4805 C6
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2812 I2	5811 A11
2813 H8	5812 A11
2814 I2	5814 A12
2815 I2	5815 A13
2816 B11	5816 A13
2817 B11	5817 A10
2818 C11	5818 A13
2819 B11	6801 A5
2820 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
2843 B13	7816 C2
2844 B13	7817-2 E9
2845 B13	7817-2 D10
2847 C10	7824 H5
2848 C10	7825 H7
2849 C11	7850 A5
2850 C11	7851 B7
2851 C11	7852 B7
2852 C11	7860 F2
2853 C12	7861 F3
2854 C12	F801 G3
2855 C12	F802 H4
2856 C12	F805 I12
2857 C12	F806 I12
2858 C12	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 F7
3809 H5	I821 E7
3810 C6	I822 B7
3811 H8	I823 C7
3815 H8	I828 I6
3818 D7	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 H9
3851-1 E11	I848 I8
3851-2 E11	I850 A10
3851-3 E11	I851 A11
3851-4 E11	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
3854-1 G11	I862 H9
3854-1 G11	I863 H3
3854-2 G11	I864 I7
3854-3 G11	I865 I7
3854-4 H11	I866 I7
3855-1 H11	
3855-2 H11	
3855-3 H11	
3855-4 H11	
3856-1 H11	
3856-2 H11	
3857 H11	
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
- 3912 D4
- 3913 D4
- 3914 E4
- 3915 E4
- 3916 F4
- 3917 C4
- 3918 D4
- 3934 E3
- 3935 E2
- 3937 E1
- 3938 E2
- 3940 F3
- 3942 F5
- 3943 F6
- 4901 D3
- 4902 A7
- 4903 C7
- 6914 E2
- 6916 E3
- 6919 F4
- 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
- I915 E2
- I916 E2
- I917 E3
- I918 E4
- I919 D6
- I920 E6
- I921 E6
- I922 F6
- I923 F6
- I924 B5

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 TS4821D (ST00) R
7911						TRA SIG SM BC847BW (COL) R
7912						TRA SIG SM BC847BW (COL) R

SSB: Audio

B07 AUDIO

B07

*	LCD	PDP
3A03	10K	6K8
3A04	12K	22K
3A06	10K	6K8
3A07	10K	6K8
3A08	12K	22K
3A11	10K	6K8

VDDA
VDD
VSSA
VSS
VSSD1HW
VSSD2HW
VSSD3HW
VSSD4HW
VSSD5HW
VSSD6HW
VSSD7HW
VSSD8HW
VSSD9HW
VSSD10HW
VSSD11HW
VSSD12HW
VSSD13HW
VSSD14HW
VSSD15HW
VSSD16HW
VSSD17HW
VSSD18HW
VSSD19HW
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VSSD82HW
VSSD83HW
VSSD84HW
VSSD85HW
VSSD86HW
VSSD87HW
VSSD88HW
VSSD89HW
VSSD90HW
VSSD91HW
VSSD92HW
VSSD93HW
VSSD94HW
VSSD95HW
VSSD96HW
VSSD97HW
VSSD98HW
VSSD99HW
VSSD100HW

CLASS D POWER AMPLIFIER

TO SPEAKERS

DC-DETECTION

- 1735 D11
- 2A01 B7
- 2A02 B9
- 2A04 C7
- 2A08 B9
- 2A09 D5
- 2A10 D5
- 2A11 D3
- 2A12 D4
- 2A13 D8
- 2A14 D8
- 2A15 D3
- 2A16 D3
- 2A17 D8
- 2A18 D6
- 2A19 D4
- 2A20 E3
- 2A21 D7
- 2A22 E3
- 2A23 E8
- 2A24 E3
- 2A25 E6
- 2A26 E8
- 2A27 E6
- 2A28 E8
- 2A29 E3
- 2A30 F6
- 2A31 F7
- 2A32 F4
- 2A33 F5
- 2A34 F5
- 2A35 E7
- 2A36 F7
- 2A37 D8
- 2A38 E8
- 2A40 F3
- 2A41 F9
- 2A45 E7
- 2A46 A6
- 2A47 B6
- 3A01 B6
- 3A02 B8
- 3A03 D2
- 3A04 D3
- 3A05 D9
- 3A06 D2
- 3A07 D2
- 3A08 D3
- 3A09 D7
- 3A11 E2
- 3A12 E6
- 3A13 E3
- 3A14 E9
- 3A15 E6
- 3A17 E7
- 3A19 F3
- 3A26 E3
- 3A27 F9
- 3A28 F9
- 3A29 E10
- 3A30 E10
- 3A31 F11
- 4A01 A6
- 4A02 A6
- 5A03 C7
- 5A04 E7
- 5A05 B6
- 5A06 B8
- 5A07 A6
- 7A01 D4
- 7A05 E11
- 7A06 F10
- 7A07 F10
- FA01 C6
- FA02 B8
- FA04 D6
- FA05 D2
- FA06 D2
- FA07 D11
- FA08 D11
- FA09 E2
- FA10 D11
- FA11 D11
- FA12 E2
- FA32 E11
- IA01 D3
- IA02 D3
- IA03 D6
- IA04 D9
- IA05 D3
- 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

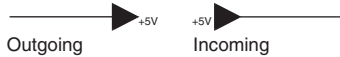
SRP (Service Reference Protocol) is a software tool that creates a list with all references to signal lines. The list contains references to the signals within all schematics of a PWB. It replaces the text references currently printed next to the signal names in the schematics. These printed references 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:

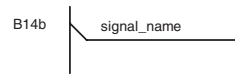
1.2.1. Power Supply Lines

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.

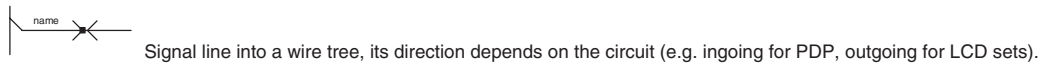
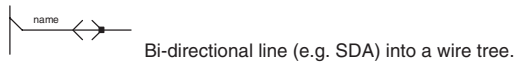
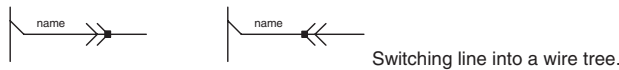
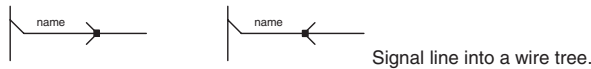
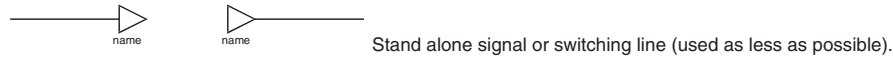


1.2.3. Grounds

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:

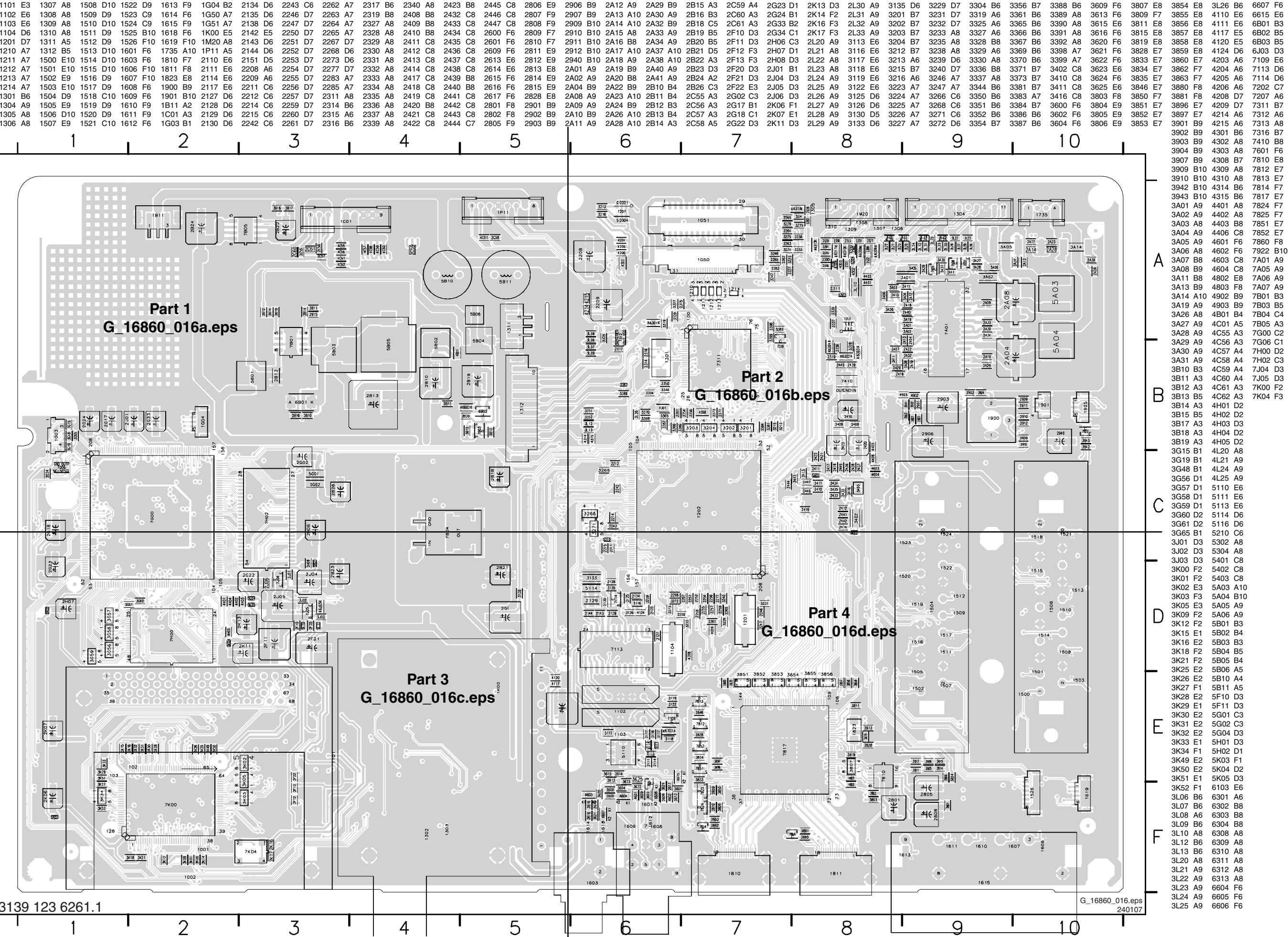
When using the PDF service manual file, you can very easily search for signal names and follow the signal over all the schematics. In Adobe PDF reader:

- 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.

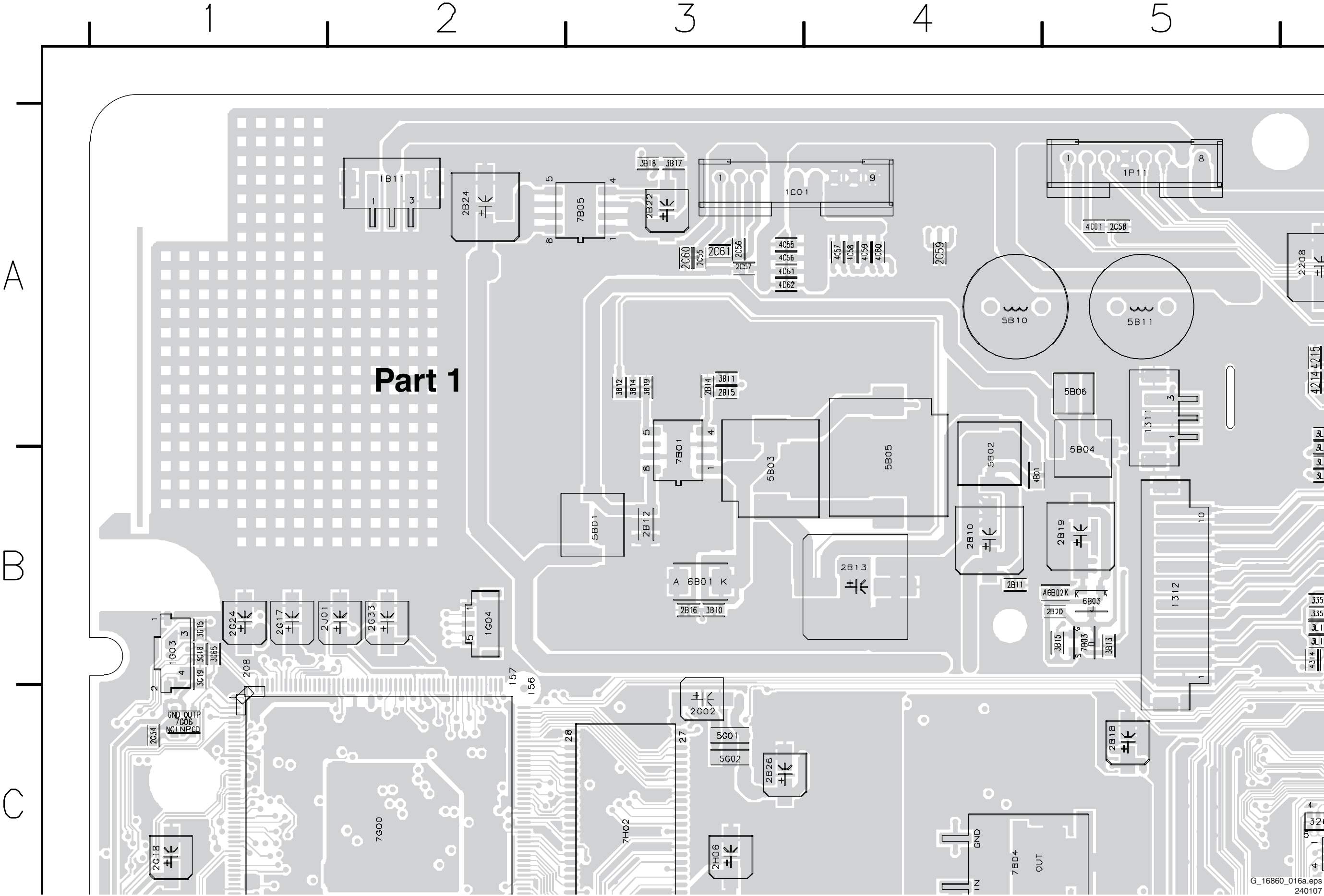
PS. It is recommended to use at least Adobe PDF (reader) version 6.x, due to better search possibilities in this version.

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)	AUDIO_LS_L	B04C (1x)	HDMI_Y(1)	B04B (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)	B07 (1x)	MIU_ADDR(24)	B03D (1x)	SC1_AUDIO_OUT_R	B04C (1x)	STANDBY	B04A (2x)
+1V2_MOJO	B03D (2x)	AUDIO_LS_R	B04C (1x)	HDMI_Y(2)	B04B (1x)	MIU_ADDR(24)	B03C (1x)	SC1_AUDIO_OUT_R	B06B (2x)	STANDBYn	B04A (1x)
+1V8_SW	B02 (1x)	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	B03E (2x)	-AUDIO_POWER	B02 (1x)	HDMI_Y(3)	B04B (1x)	MIU_ADDR(3)	B03D (1x)	SC1_CVBS_IN	B04B (1x)	STANDBYn	B07 (1x)
+1V8_SW	B03F (1x)	-AUDIO_POWER	B07 (1x)	HDMI_Y(3)	B06C (1x)	MIU_ADDR(3)	B03E (1x)	SC1_CVBS_IN	B06B (1x)	STV_A25	B03C (1x)
+1V8_SW	B04B (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)
+1V8_SW	B06C (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	B03C (3x)	BL_ADJUST	B02 (1x)	HDMI_Y(5)	B04B (1x)	MIU_ADDR(5)	B03C (1x)	SC1_FB_L_IN	B04B (1x)	STV_CS	B03D (1x)
+3V3	B03D (8x)	BL_ADJUST	B04A (1x)	HDMI_Y(5)	B06C (1x)	MIU_ADDR(5)	B03D (1x)	SC1_FB_L_IN	B06B (2x)	STV_INT	B03C (1x)
+3V3	B03E (2x)	BL_ON_OFF	B02 (1x)	HDMI_Y(6)	B04B (1x)	MIU_ADDR(5)	B03E (1x)	SC1_G_IN	B04B (1x)	STV_INT	B03D (1x)
+3V3	B03F (1x)	BL_ON_OFF	B04A (1x)	HDMI_Y(6)	B06C (1x)	MIU_ADDR(5)	B03E (1x)	SC1_G_IN	B06B (2x)	STV_TDO	B03B (1x)
+3V3_BUF	B03C (4x)	BOLT_ON_SCL	B04A (1x)	HDMI_Y(7)	B04B (1x)	MIU_ADDR(6)	B03C (1x)	SC1_R_IN	B04B (1x)	STV_TDO	B03C (1x)
+3V3_BUF	B03C (4x)	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_CORE	B03C (2x)	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_CORE	B02 (1x)	CE	B04A (1x)	HP_AUDIO_OUT_L	B06D (1x)	MIU_ADDR(7)	B03C (1x)	SC1_RF_OUT_CVBS	B06B (1x)	TDA_DAT(0)	B03B (1x)
+3V3_CORE	B03F (2x)	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_CORE	B03E (4x)	COMP_AUDIO_IN_L	B06A (1x)	HP_AUDIO_OUT_R	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)	COMP_AUDIO_IN_R	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)	CPU_RST	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	B04A (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	B04B (8x)	I2C_LOCAL_SDA	B03C (1x)	MIU_ADDR(9)	B03D (1x)	SC2_AUDIO_MUTE_L	B06B (1x)	TDA_DAT(3)	B03C (1x)
+3V3_SW	B04A (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_DISP2	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_DISP3	B04B (2x)	I2C_TDA_SDA	B03A (1x)	MIU_DATA(15)	B03E (1x)	SC2_AUDIO_OUT_R	B06B (1x)	TDA_DAT(6)	B03B (1x)
+3V3clean	B03F (1x)	CTRL_DISP4	B04A (1x)	I2C_TDA_SDA	B03B (1x)	MIU_DATA(1)	B03D (1x)	SC2_C_IN	B04B (1x)	TDA_DAT(7)	B03C (1x)
+3V3FE	B03B (6x)	CTRL_DISP4_up	B04B (1x)	IBO_B_IN	B03F (1x)	MIU_DATA(1)	B03E (1x)	SC2_C_IN	B06B (2x)	TDA_SYNC	B03B (1x)
+5V_AUD	B04C (3x)	CVBS_RF	B03A (1x)	IBO_B_IN	B04B (1x)	MIU_DATA(1)	B03E (1x)	SC2_CVBS_MON_OUT	B04B (1x)	TDA_SYNC	B03C (1x)
+5V_D	B04C (4x)	CVBS_RF	B04B (1x)	IBO_CVBS_IN	B03F (1x)	MIU_DATA(10)	B03D (1x)	SC2_CVBS_MON_OUT	B06B (1x)	TDA_SYNC	B03C (1x)
+5V_IF	B03A (4x)	CX_AVDD_ADC1	B02 (4x)	IBO_CVBS_IN	B04B (1x)	MIU_DATA(10)	B03E (1x)	SC2_CVBS_MON_OUT	B06B (1x)	TDA_SYNC	B03C (1x)
+5V_STANDBY	B02 (4x)	CX_AVDD_ADC2	B04B (2x)	IBO_G_IN	B03F (1x)	MIU_DATA(11)	B03D (1x)	SC2_CVBS_MON_OUT	B06B (1x)	TDA_VALID	B03B (1x)
+5V_STANDBY	B04A (4x)	CX_AVDD_ADC3	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_ADC4	B04B (2x)	IBO_IRQ	B03D (1x)	MIU_DATA(12)	B03E (1x)	SC2_STATUS	B06B (1x)	TS_CLK	B03C (1x)
+5V_SW	B02 (6x)	CX_AVDD3_ADC1	B04B (2x)	IBO_IRQ	B03F (1x)	MIU_DATA(12)	B03E (1x)	SC2_Y_CVBS_IN	B04B (1x)	TS_CLK	B03D (1x)
+5V_SW	B03A (4x)	CX_AVDD3_ADC2	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_BG_ASS	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_OUTBUF	B04B (2x)	IF_AGC_IBO	B03A (1x)	MIU_DATA(14)	B03D (1x)	SDRAM_ADDR(0)	B03E (1x)	TS_DATA(0:7)	B03D (1x)
+5V_SW	B03E (3x)	CX_PAVDD	B04B (2x)	IF_AGC_IBO	B03B (1x)	MIU_DATA(14)	B03D (1x)	SDRAM_ADDR(0:14)	B03D (1x)	TS_DATA(1)	B03C (1x)
+5V_SW	B04A (1x)	CX_PAVDD1	B04B (2x)	IF_ATV	B03A (2x)	MIU_DATA(15)	B03D (1x)	SDRAM_ADDR(1)	B03E (1x)	TS_DATA(1)	B03D (1x)
+5V_SW	B04B (2x)	CX_PAVDD2	B04B (2x)	IF_ATV	B03A (2x)	MIU_DATA(15)	B03D (1x)	SDRAM_ADDR(1)	B03E (1x)	TS_DATA(2)	B03C (1x)
+5V_SW	B04C (2x)	CX_PVDOD	B04B (2x)	IIC_SCL	B03D (1x)	MIU_DATA(2)	B03C (1x)	SDRAM_ADDR(10)	B03D (1x)	TS_DATA(2)	B03D (1x)
+5V_SW	B06A (2x)	DC_PROT	B04A (1x)	IIC_SCL	B04A (1x)	MIU_DATA(2)	B03D (1x)	SDRAM_ADDR(10)	B03E (1x)	TS_DATA(3)	B03C (1x)
+5V_SW	B06B (2x)	DC_PROT	B07 (1x)	IIC_SCL	B04B (2x)	MIU_DATA(2)	B03E (1x)	SDRAM_ADDR(11)	B03D (1x)	TS_DATA(3)	B03D (1x)
+5V_SW	B06D (1x)	DDC_RESET	B04A (1x)	IIC_SCL	B04C (1x)	MIU_DATA(3)	B03C (1x)	SDRAM_ADDR(11)	B03E (1x)	TS_DATA(4)	B03C (1x)
+5VHDMILA	B06C (2x)	DDC_RESET	B06C (2x)	IIC_SCL	B06C (1x)	MIU_DATA(3)	B03D (1x)	SDRAM_ADDR(12)	B03D (1x)	TS_DATA(4)	B03C (1x)
+5VHDMILB	B03A (3x)	DVB_SW	B03A (1x)	IIC_SDA	B04A (2x)	MIU_DATA(3)	B03E (1x)	SDRAM_ADDR(12)	B03E (1x)	TS_DATA(5)	B03C (1x)
+5VVS	B04C (1x)	DVB_SW	B04B (1x)	IIC_SDA	B03D (1x)	MIU_DATA(4)	B03C (1x)	SDRAM_ADDR(13)	B03D (1x)	TS_DATA(5)	B03C (1x)
+8V	B04C (2x)	E_PAGE	B04A (1x)	IIC_SDA	B04A (1x)	MIU_DATA(4)	B03D (1x)	SDRAM_ADDR(13)	B03E (1x)	TS_DATA(6)	B03C (1x)
+AUDIO_POWER	B02 (1x)	ENGAGE	B06D (1x)	IIC_SDA	B04B (2x)	MIU_DATA(4)	B03E (1x)	SDRAM_ADDR(14)	B03D (1x)	TS_DATA(6)	B03D (1x)
+AUDIO_POWER	B04C (1x)	ENGAGE	B07 (1x)	IIC_SDA	B04B (2x)	MIU_DATA(5)	B03C (1x)	SDRAM_ADDR(14)	B03E (1x)	TS_DATA(7)	B03C (1x)
+AUDIO_POWER	B03D (1x)	FE_LOCK	B03B (1x)	IIC_SDA	B04C (1x)	MIU_DATA(5)	B03D (1x)	SDRAM_ADDR(2)	B03D (1x)	TS_DATA(7)	B03D (1x)
+AUDIO_POWER	B03E (1x)	FE_LOCK	B03D (1x)	IIC_SDA	B06C (1x)	MIU_DATA(5)	B03C (1x)	SDRAM_ADDR(2)	B03E (1x)	TS_SYNC	B03C (1x)
+IO_POWER	B06B (7x)	FRONT_C_IN	B04B (1x)	IIC_SDA_up	B04A (2x)	MIU_DATA(6)	B03C (1x)	SDRAM_ADDR(3)	B03D (1x)	TS_SYNC	B03D (1x)
+IO_POWER	B02 (1x)	FRONT_C_IN	B06A (1x)	INT	B04A (1x)	MIU_DATA(6)	B03D (1x)	SDRAM_ADDR(3)	B03E (1x)	TS_VALID	B03C (1x)
+VTUN	B04A (1x)	FRONT_Y_CVBS_IN	B04B (1x)	ISP	B04A (1x)	MIU_DATA(6)	B03E (1x)	SDRAM_ADDR(4)	B03D (1x)	TS_VALID	B03D (1x)
+VTUN	B03B (1x)	GNDDC	B02 (1x)	ITV_SPI_CLK	B04A (1x)	MIU_DATA(7)	B03C (1x)	SDRAM_ADDR(4)	B03E (1x)	TXAn	B04B (2x)
10046_TDO	B03D (1x)	GNDSND	B02 (3x)	ITV_SPI_CLK	B04A (2x)	MIU_DATA(7)	B03D (1x)	SDRAM_ADDR(5)	B03D (1x)	TXAn	B04B (2x)
10046_TDO	B03D (1x)	GNDSND	B02 (3x)	ITV_SPI_DATA_IN	B04A (2x)	MIU_DATA(7)	B03D (1x)	SDRAM_ADDR(5)	B03E (1x)	TXBn	B04B (2x)
4MHz_CLK	B03A (1x)	JTAG_TCK	B07 (21x)	JTAG_TCK	B03B (1x)	MIU_DATA(8)	B03D (1x)	SDRAM_ADDR(6)	B03D (1x)	TXBp	B04B (2x)
4MHz_CLK	B03B (1x)	JTAG_TCK	B02 (1x)	JTAG_TCK	B03C (1x)	MIU_DATA(8)	B03E (1x)	SDRAM_ADDR(6)	B03E (1x)	TXCkLn	B04B (2x)
4MHz_MOJO	B03B (1x)	HD_PB_IN	B04B (1x)	JTAG_TCK	B03D (1x)	MIU_DATA(9)	B03D (1x)	SDRAM_ADDR(7)	B03D (1x)	TXCkLn	B04B (2x)
4MHz_MOJO	B03B (1x)	HD_PB_IN	B06A (2x)	JTAG_TMS	B03B (1x)	MIU_DATA(9)	B03E (1x)	SDRAM_ADDR(7)	B03E (1x)	TXCkLn	B04B (2x)
A(0)	B04A (1x)	HD_PR_IN	B04B (1x)	JTAG_TMS	B03C (1x)	MIU_OEN	B03C (1x)	SDRAM_ADDR(8)	B03D (1x)	TXCp	B04B (2x)
A(0)	B04B (1x)	HD_PR_IN	B06A (2x)	JTAG_TMS	B03D (1x)	MIU_OEN	B03D (1x)	SDRAM_ADDR(8)	B03E (1x)	TXDn	B04B (2x)
A(0:7)	B04A (1x)	HD_Y_IN	B04B (1x)	JTAG_TRST	B03B (1x)	MIU_OEN	B03E (1x)	SDRAM_ADDR(9)	B03E (1x)	TXDp	B04B (2x)
A(0:7)	B04B (1x)	HD_Y_IN	B06A (2x)	JTAG_TRST	B03C (1x)	MIU_OEN	B03D (1x)	SDRAM_ADDR(9)	B03E (1x)	TXDp	B04B (2x)
A(1)	B04A (2x)	HDMI_AUDIO_IN_L	B04C (1x)	JTAG_TRST	B03D (1x)	MIU_RDY	B03D (1x)	SDRAM_ADDR(10)	B03E (1x)	TXDp	B04B (2x)
A(1)	B04B (1x)	HDMI_AUDIO_IN_L	B06C (1x)	KEYB	B04A (2x)	MIU_WEN	B03C (1x)	SDRAM_ADDR(11)	B03E (1x)	TXDp	B04B (2x)
A(1:7)	B04A (1x)	HDMI_AUDIO_IN_R	B04C (1x)	LCD_PWR_ON	B04A (1x)	MIU_WEN	B03D (1x)	SDRAM_ADDR(12)	B03E (1x)	TXDp	B04B (2x)
A(10)	B04A (2x)	HDMI_AUDIO_IN_R	B06C (1x)	LCD_PWR_ON	B04B (1x)	MIU_WEN	B03E (1x)	SDRAM_ADDR(13)	B03E (1x)	TXDp	B04B (2x)
A(11)	B04A (2x)	HDMI_Cb(0)	B04B (1x)	LED1	B04A (2x)	MOJO_I2S_OUT_SCK	B03D (1x)	SDRAM_ADDR(14)	B03E (1x)	TXDp	B04B (2x)
A(12)	B04A (2x)	HDMI_Cb(1)	B06C (1x)	LED2	B04B (2x)	MOJO_I2S_OUT_SCK	B03D (1x)	SDRAM_ADDR(15)	B03E (1x)	TXDp	B04B (2x)
A(13)	B04A (2x)	HDMI_Cb(2)	B06C (1x)	LIGHT_SENSOR	B04A (2x)	MOJO_I2S_OUT_SD	B04C (1x)	SDRAM_ADDR(16)	B03E (1x)	TXDp	B04B (2x)
A(14)	B04A (2x)	HDMI_Cb(3)	B06C (1x)	MIU_ADDR(0)	B03C (1x)	MOJO_I2S_OUT_WS	B04C (1x)	SDRAM_ADDR(17)	B03E (1x)	TXDp	B04B (2x)
A(15)	B04A (2x)	HDMI_Cb(4)	B06C (1x)	MIU_ADDR(1)	B03C (1x)	MOJO_I2S_OUT_WS	B04C (1x)	SDRAM_ADDR(18)	B03E (1x)	TXDp	B04B (2x)
A(16)	B04A (2x)	HDMI_Cb(5)	B06C (1x)	MIU_ADDR(2)	B03C (1x)	MUTEN	B04A (1x)	SDRAM_ADDR(19)	B03E (1x)	TXDp	B04B (2x)
A(17)	B04A (2x)	HDMI_Cb(6)	B06C (1x)	MIU_ADDR(3)	B03C (1x)	MUTEN	B04B (1x)	SDRAM_ADDR(20)	B03E (1x)	TXDp	B04B (2x)
A(18)	B04A (2x)	HDMI_Cb(7)	B06C (1x)	MIU_ADDR(4)	B03C (1x)	NOR_CS	B06D (1x)	SDRAM_ADDR(21)	B03E (1x)	TXDp	B04B (2x)
A(19)	B04A (2x)	HDMI_Cb(8)	B06C (1x)	MIU_ADDR(5)	B03C (1x)	NOR_CS	B06D (1x)	SDRAM_ADDR(22)	B03E (1x)	TXDp	B04B (2x)
A(2)	B04A (2x)	HDMI_Cb(9)	B06C (1x)	MIU_ADDR(6)	B03C (1x)	NOR_CS	B06D (1x)	SDRAM_ADDR(23)	B03E (1x)	TXDp	B04B (2x)
A(2)	B04B (1x)	HDMI_Cb(10)	B06C (1x)	MIU_ADDR(7)	B03C (1x)	NOR_RBYB	B03D (1x)	SDRAM_ADDR(24)	B03E (1x)	TXDp	B04B (2x)
A(3)	B04A (2x)	HDMI_Cb(11)	B06C (1x)	MIU_ADDR(8)	B03C (1x)	NOR_RBYB	B03E (1x)	SDRAM_ADDR(25)	B03E (1x)	TXDp	B04B (2x)
A(3)	B04B (1x)	HDMI_Cb(12)	B06C (1x)	MIU_ADDR(9)	B03C (1x)	NOR_WP	B03D (1x)	SDRAM_ADDR(26)	B03E (1x)	TXDp	B04B (2x)
A(4)	B04A (2x)	HDMI_Cb(13)	B06C (1x)	MIU_ADDR(10)	B03C (1x)	NOR_WP	B03E (1x)	SDRAM_ADDR(27)	B03E (1x)	TXDp	B04B (2x)
A(4)	B04B (1x)	HDMI_Cb(14)	B06C (1x)	MIU_ADDR(11)	B03C (1x)	NOR_WP	B03E (1x)	SDRAM_ADDR(28)	B03E (1x)	TXDp	B04B (2x)
A(5)	B04A (2x)	HDMI_Cb(15)	B06C (1x)	MIU_ADDR(12)	B03C (1x)	PCMCIA_WP	B03C (1x)	SDRAM_ADDR(29)	B03E (1x)	TXDp	B04B (2x)
A(5)	B04B (1x)	HDMI_Cb(16)	B06C (1x)	MIU_ADDR(13)	B03C (1x)	PCMCIA_WP	B03C (1x)	SDRAM_ADDR(30)	B03E (1x)	TXDp	B04B (2x)
A(6)	B04A (2x)	H									

Layout Small Signal Board (Overview Top Side)



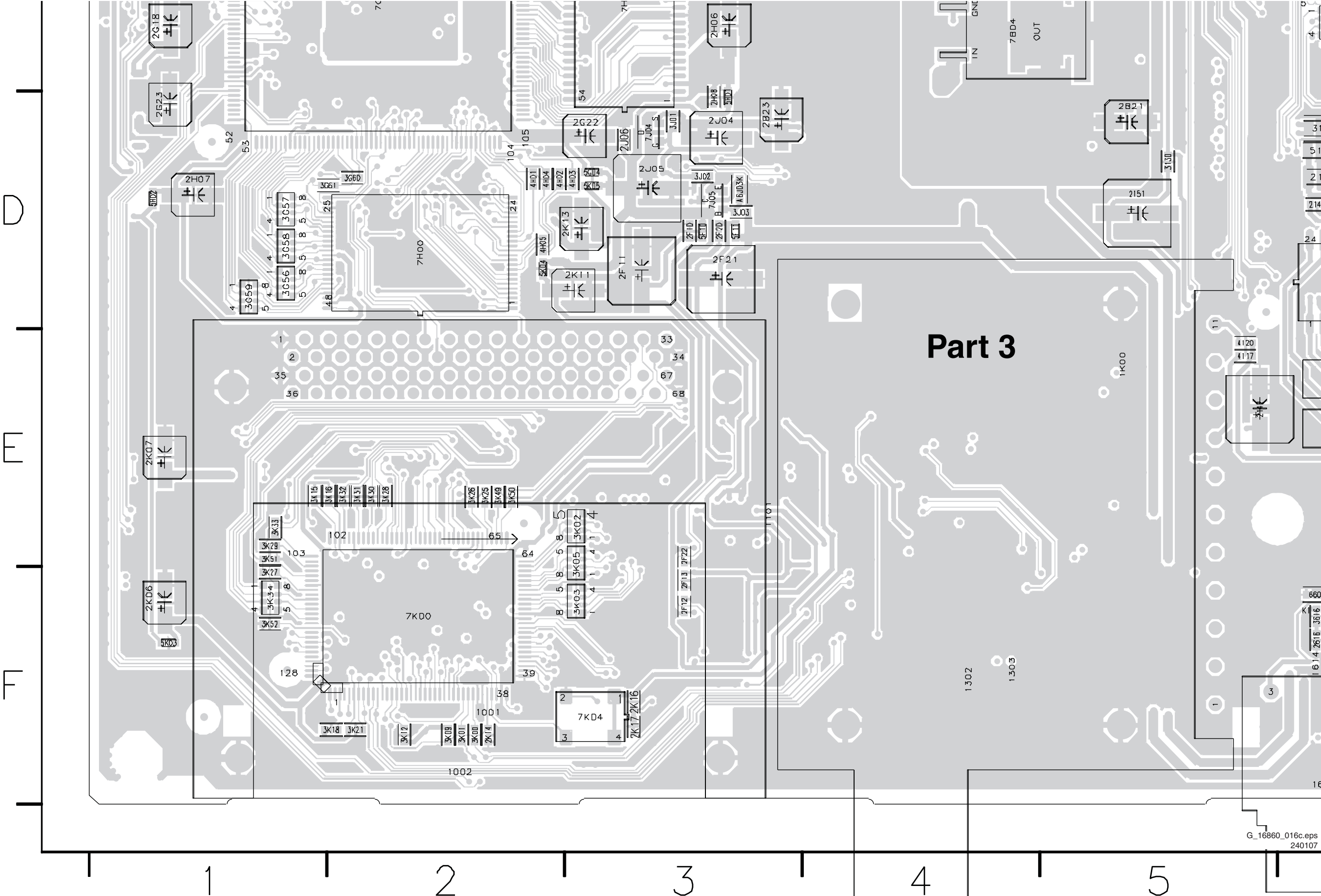
Layout Small Signal Board (Part 1 Top Side)



10

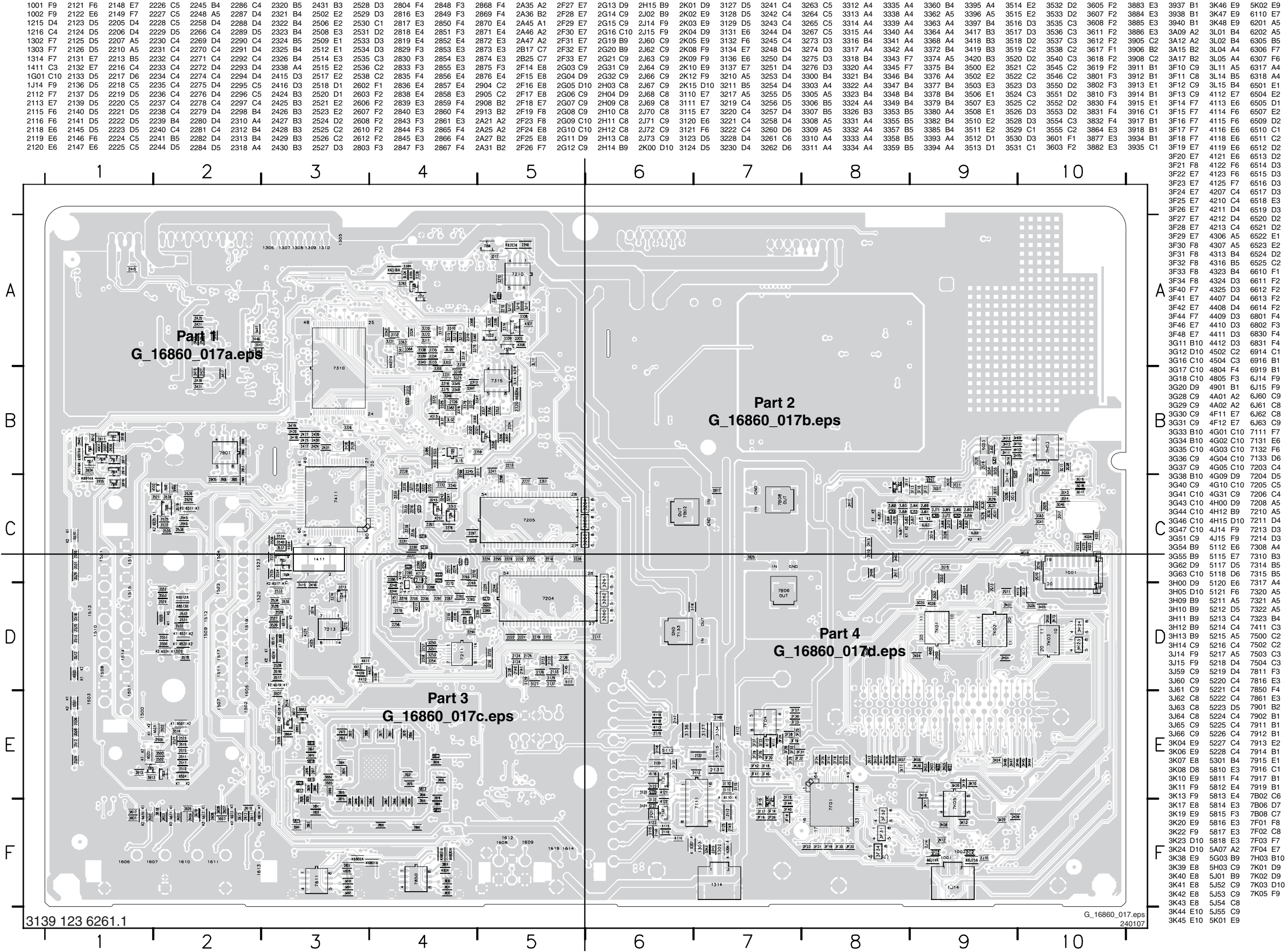


Layout Small Signal Board (Part 3 Top Side)

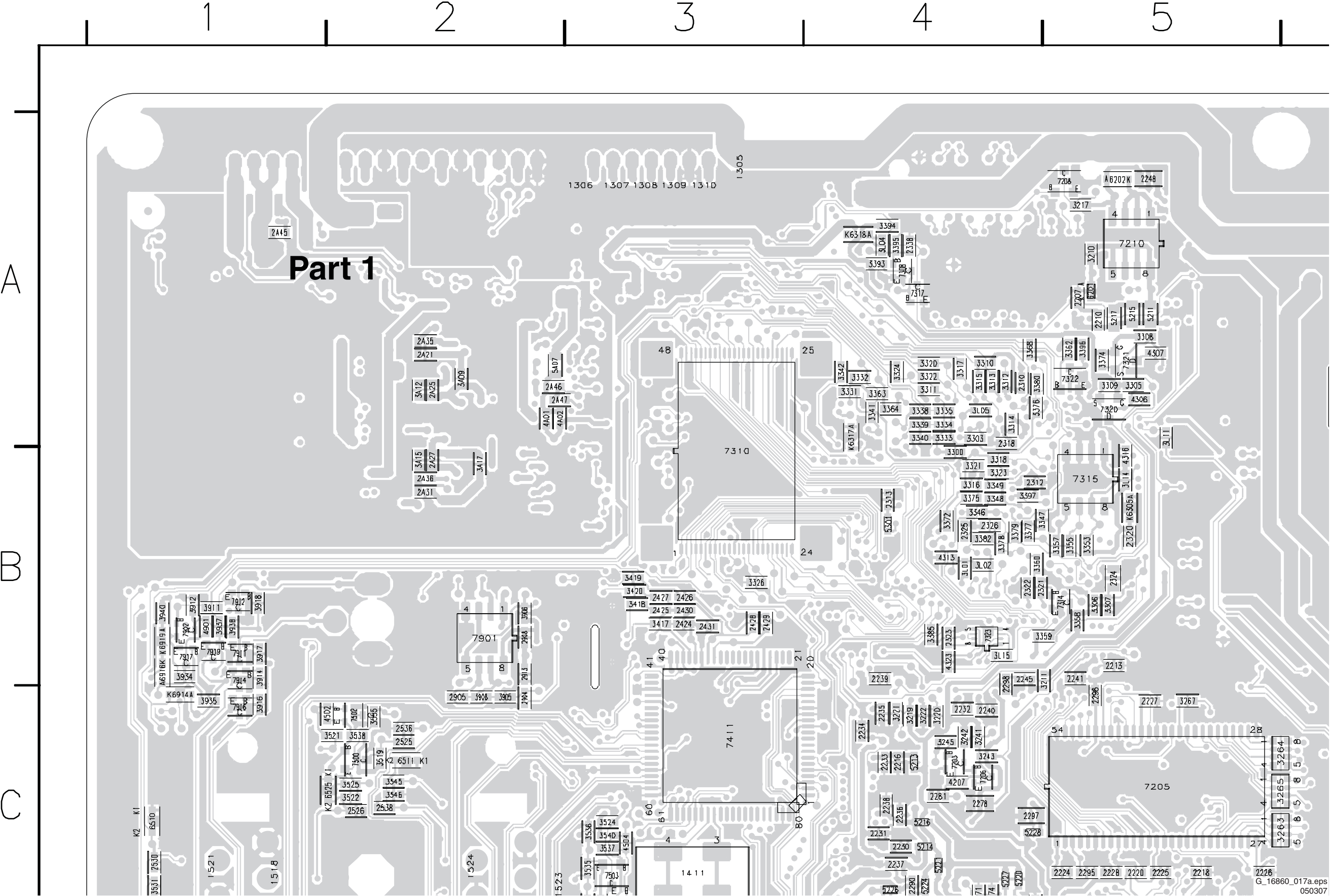


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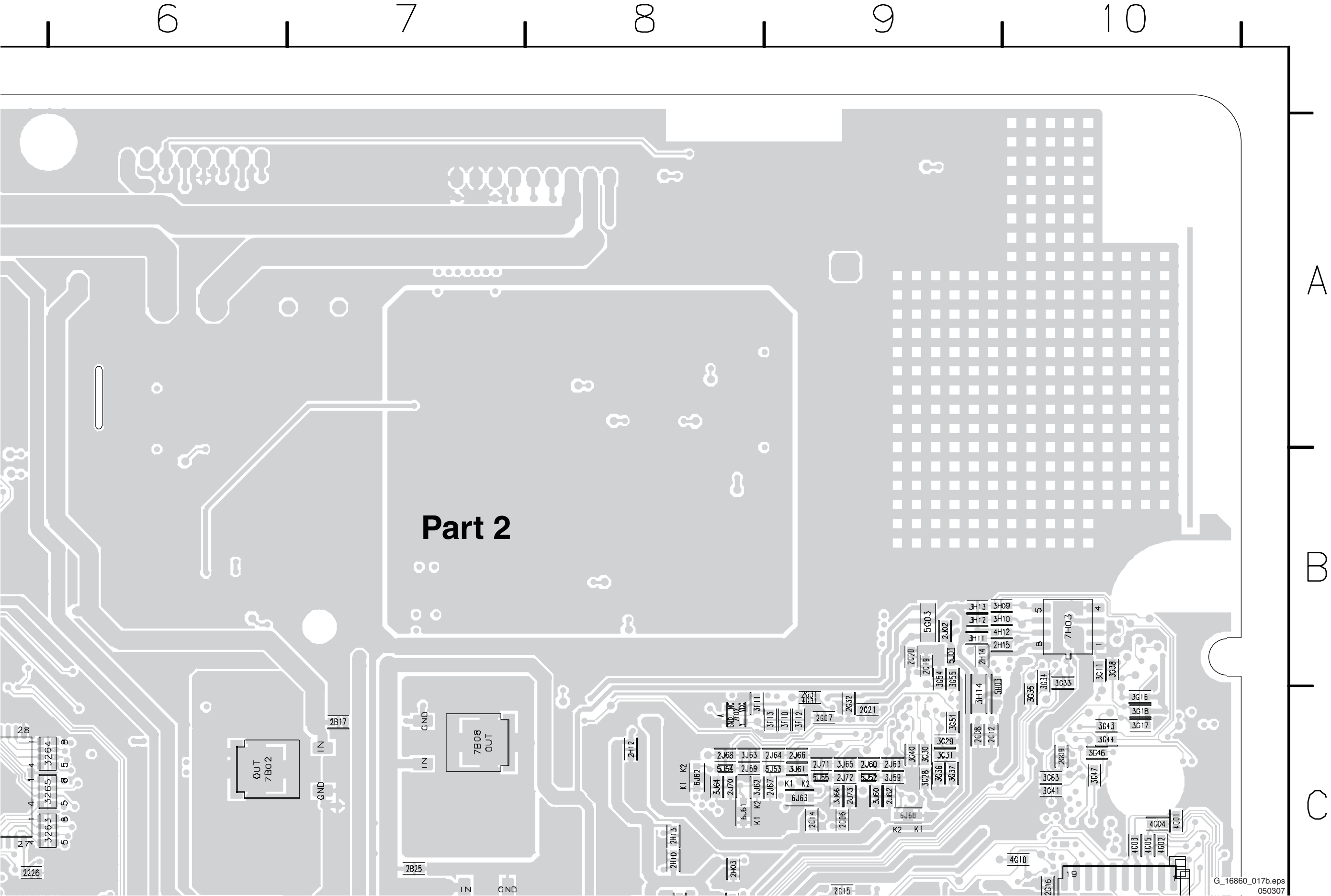
Layout Small Signal Board (Overview Bottom Side)



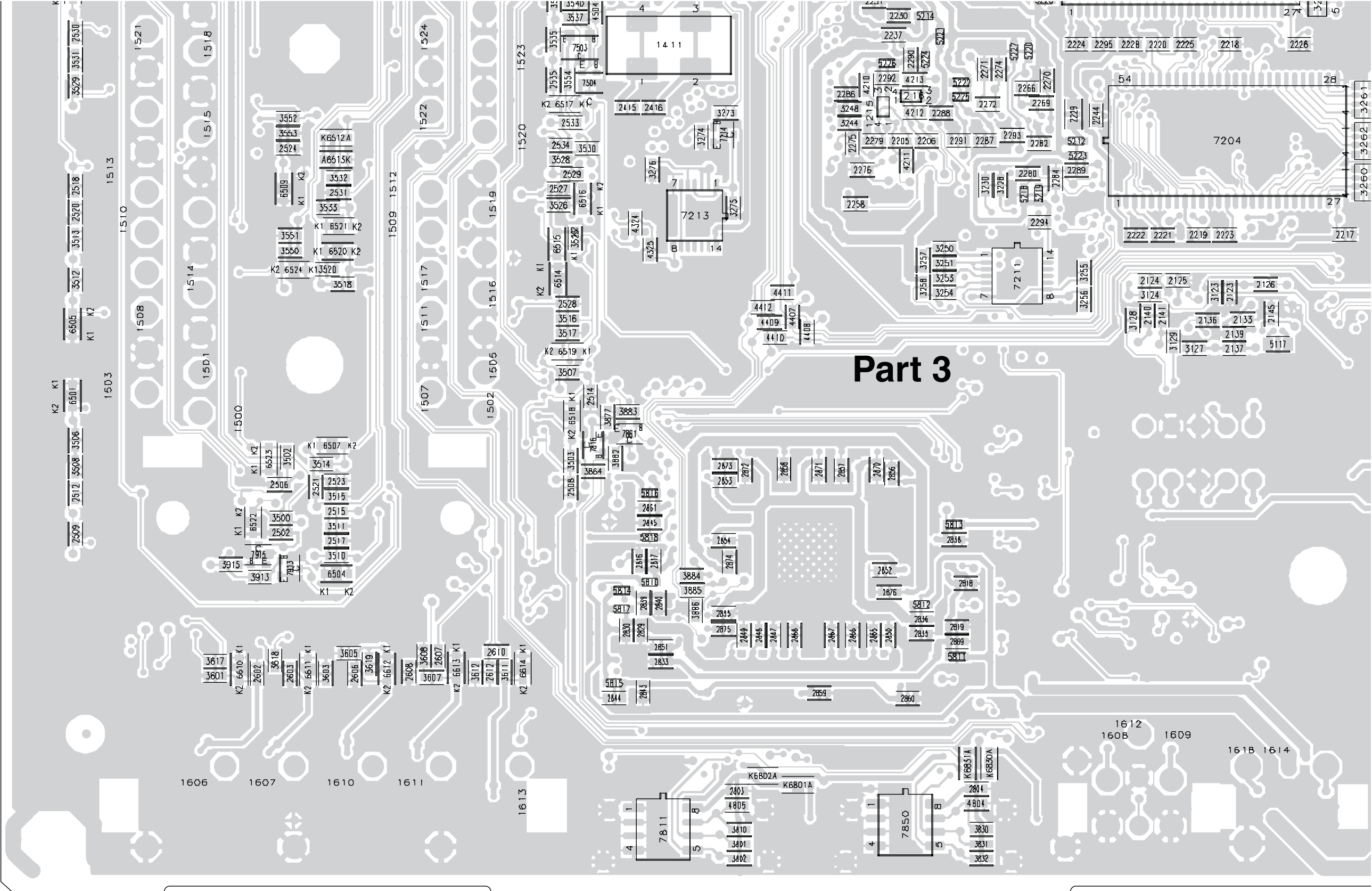
Layout Small Signal Board (Part 1 Bottom Side)



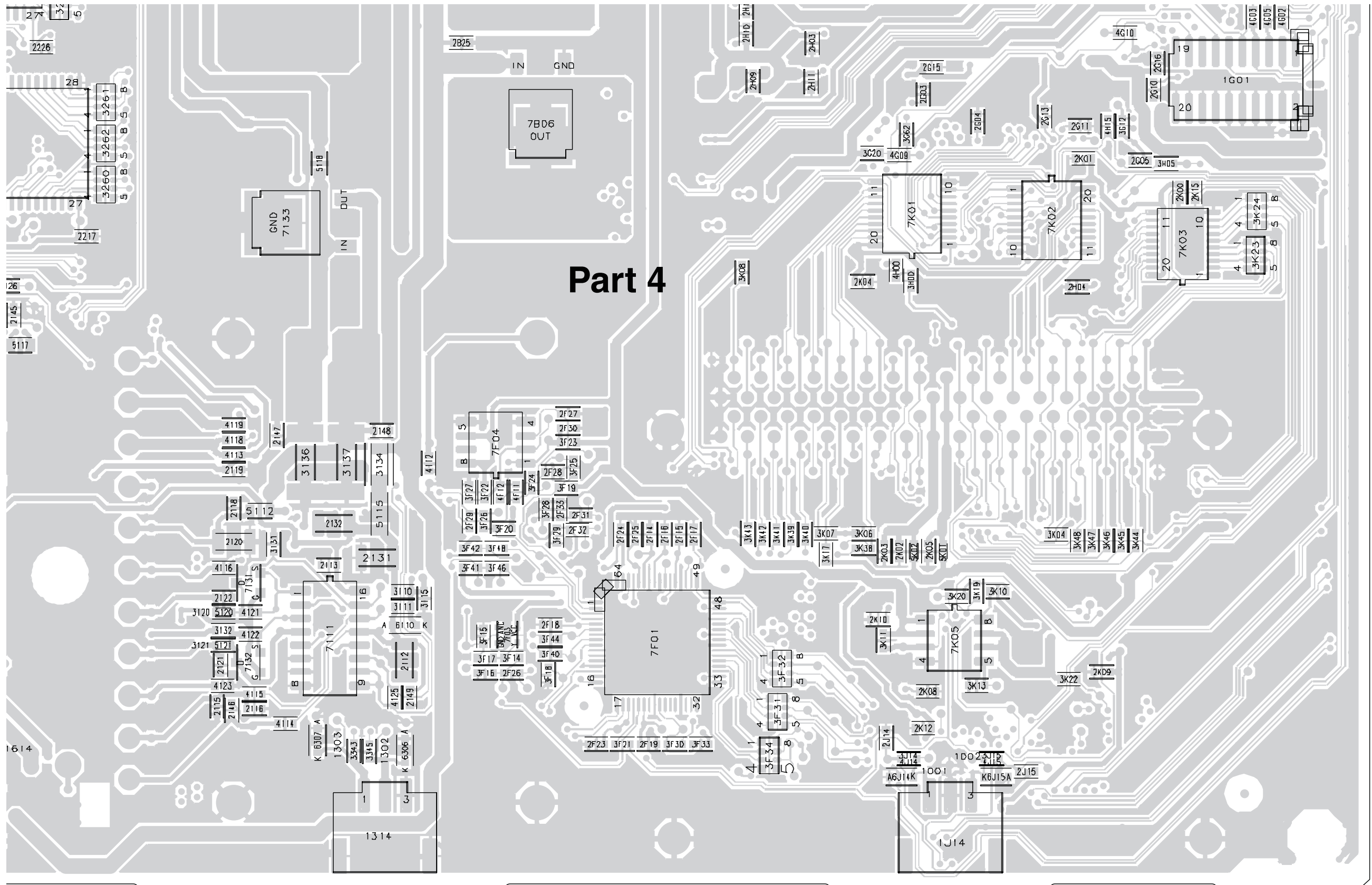
Layout Small Signal Board (Part 2 Bottom Side)



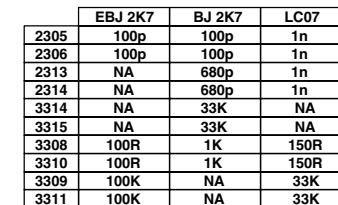
Layout Small Signal Board (Part 3 Bottom Side)



Part 4



D



S307 F2
S308 F2
S310 E8
S311 E8
S312 E8

3

c

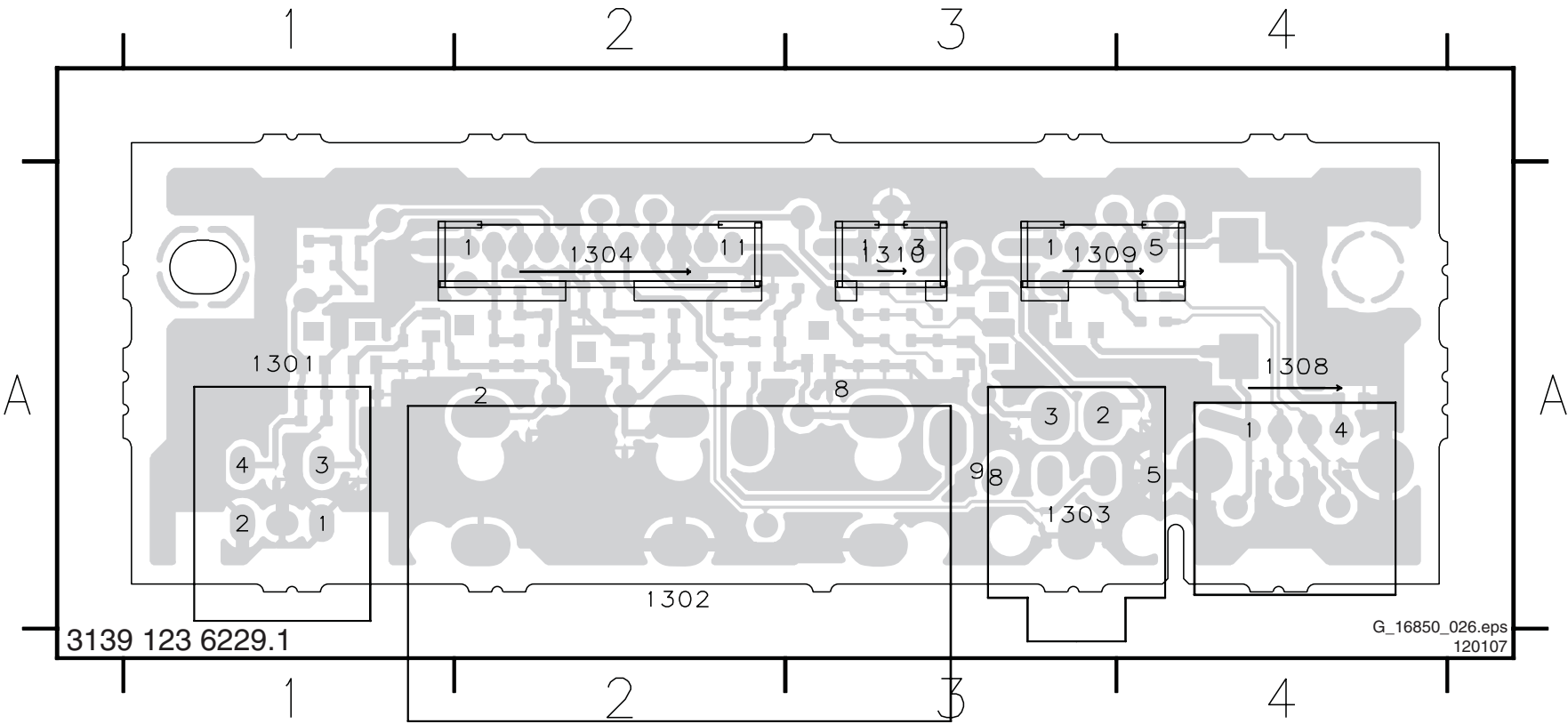
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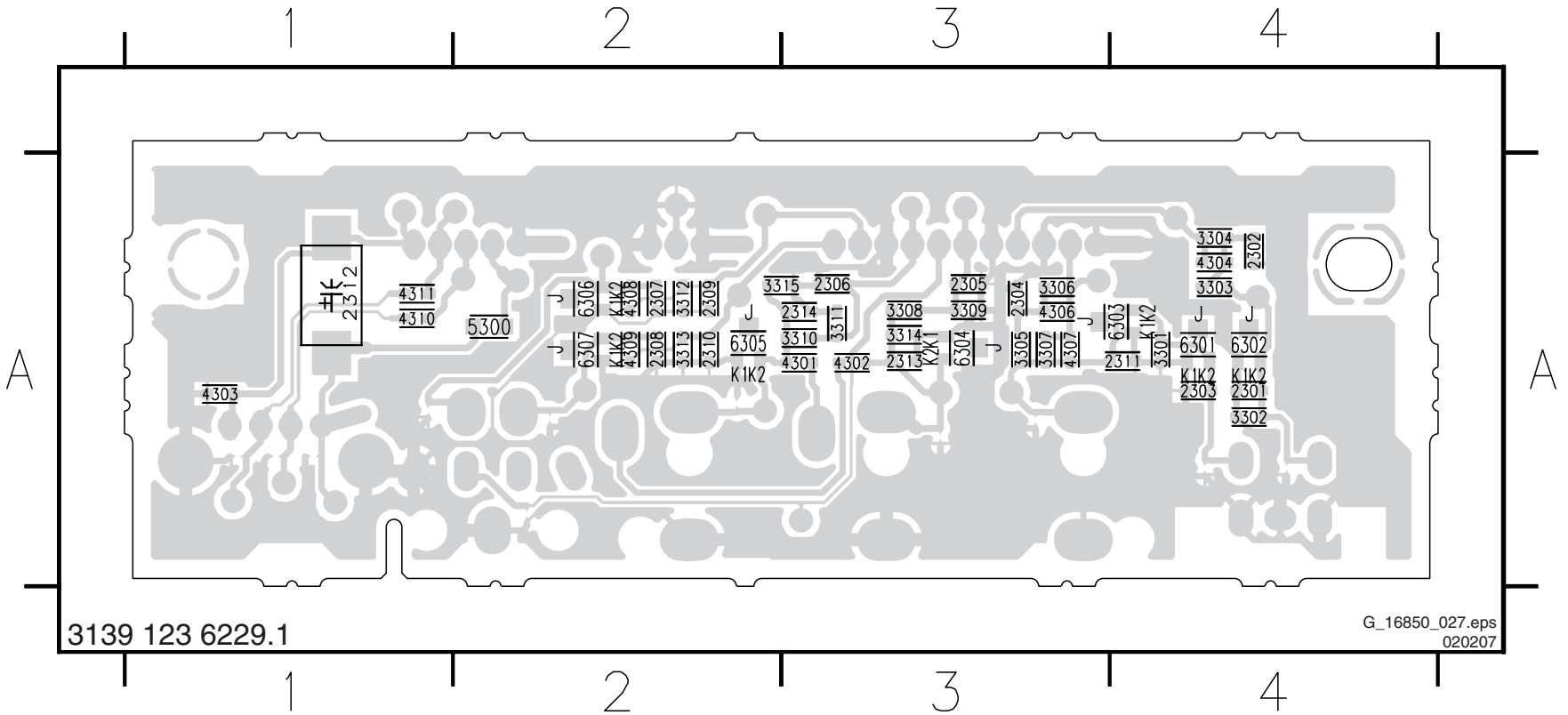
Layout Side A/V Panel (Top Side)

1301 A1 1302 A2 1303 A3 1304 A2 1308 A4 1309 A3 1310 A3

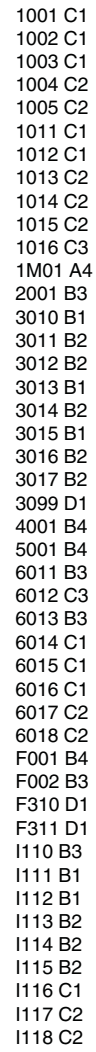


Layout Side A/V Panel (Bottom Side)

2301 A4	2307 A2	2313 A3	3305 A3	3311 A3	4302 A3	4309 A2	6303 A4
2302 A4	2308 A2	2314 A3	3306 A3	3312 A2	4303 A1	4310 A1	6304 A3
2303 A4	2309 A2	3301 A4	3307 A3	3313 A2	4304 A4	4311 A1	6305 A2
2304 A3	2310 A2	3302 A4	3308 A3	3314 A3	4306 A3	5300 A2	6306 A2
2305 A3	2311 A4	3303 A4	3309 A3	3315 A3	4307 A3	6301 A4	6307 A2
2306 A3	2312 A1	3304 A4	3310 A3	4301 A3	4308 A2	6302 A4	

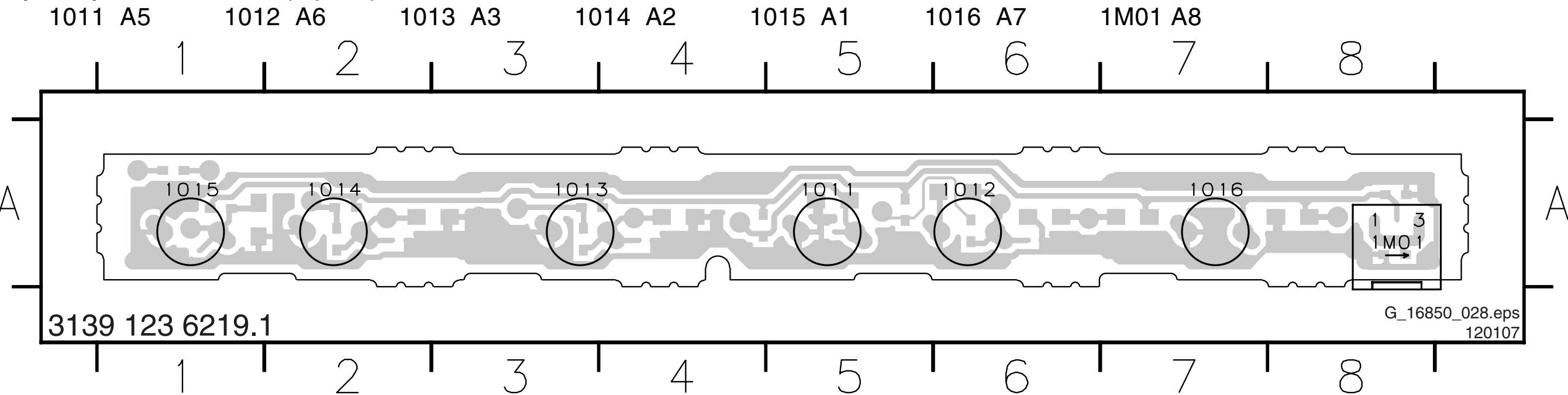


KEYBOARD CONTROL

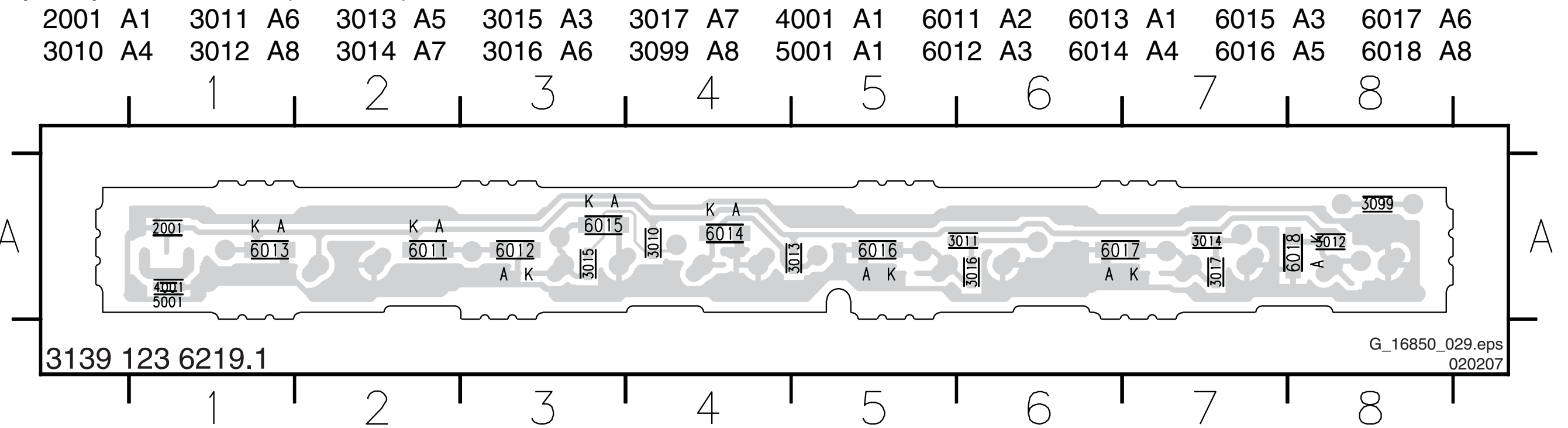


This image shows a full page of white paper with horizontal blue or grey ruling lines, typical of notebook paper. The lines are evenly spaced and run across the width of the page. In the bottom right corner, there is small black text that reads "E_06532_012.eps" on the top line and "131004" on the line below it.

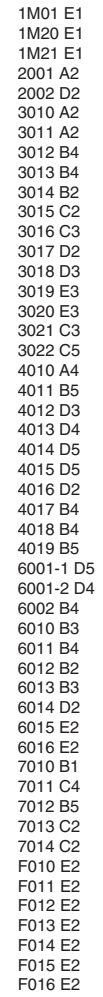
Layout Keyboard Control Panel (Top Side)



Layout Keyboard Control Panel (Bottom Side)



J IR/LED/LIGHT-SENSOR



REF	MFD	ITV
3012	3K3	82R
3013	820R	180R
4010	Y	N
4011	N	Y
4012	Y	N
4013	N	Y
4014	N	Y
4015	Y	N
4017	Y	N
4018	N	Y
4019	Y	N
6001	N	BI-G/RD
6002	N	IR ED
6010	BLUE LED	N
6011	RED LED	N

G_16850_025.eps
110107

Personal Notes:

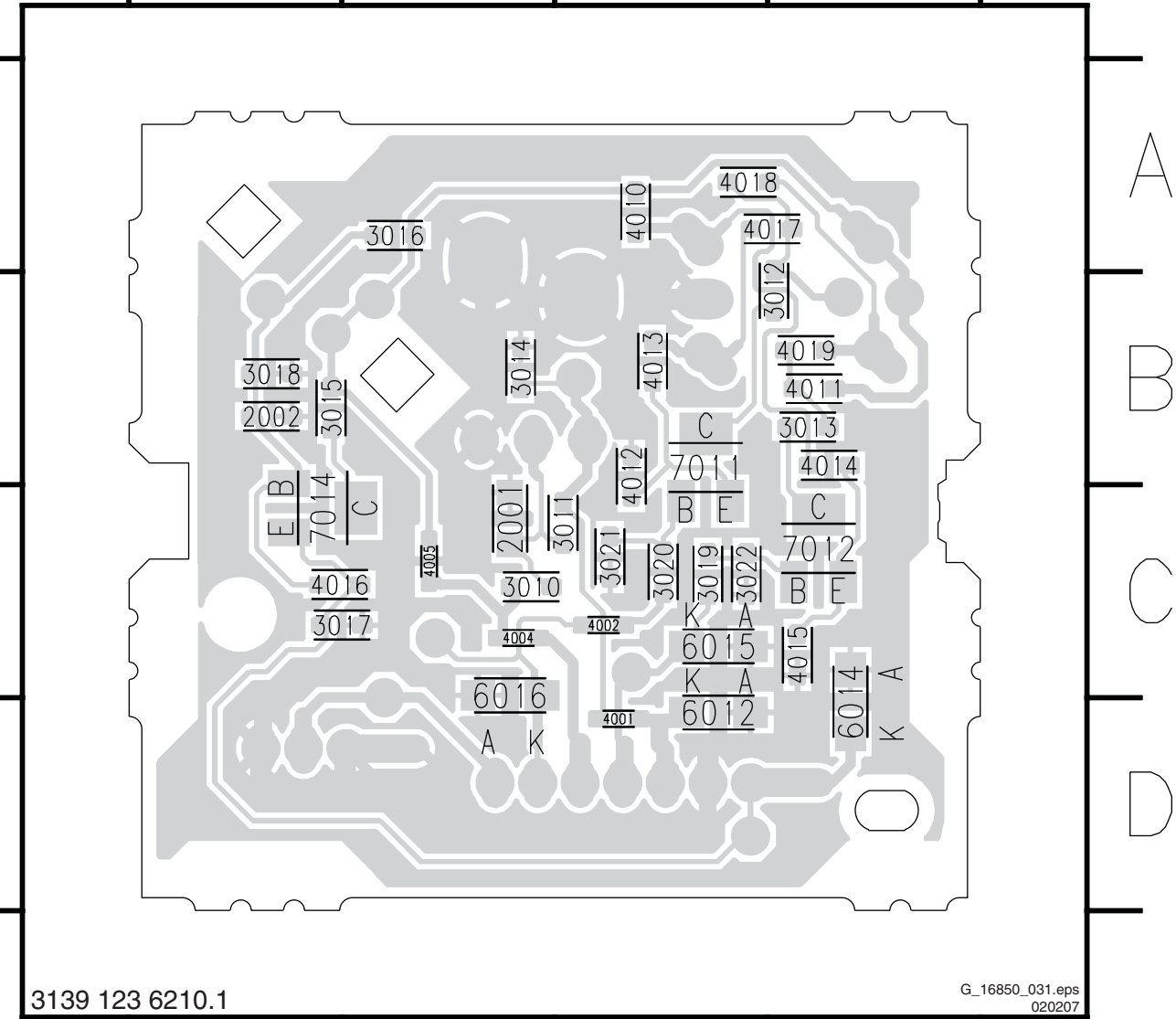
Layout Front IR / LED Panel (Top Side)

Layout Front IR / LED Panel (Bottom Side)

2001	C2	3014	B2	3020	C3	4005	C2	4015	C4	6014	D4
2002	B1	3015	B1	3021	C3	4010	A3	4016	C1	6015	C3
3010	C2	3016	A2	3022	C3	4011	B4	4017	A4	6016	C2
3011	C3	3017	C1	4001	D3	4012	B3	4018	A3	7011	B3
3012	B4	3018	B1	4002	C3	4013	B3	4019	B4	7012	C4
3013	B4	3019	C3	4004	C2	4014	B4	6012	D3	7014	C1

1M01 D4 6001 B2 6011 B1 7013 B4
1M20 D2 6002 B1 6013 A1
1M21 D2 6010 B2 7010 A3

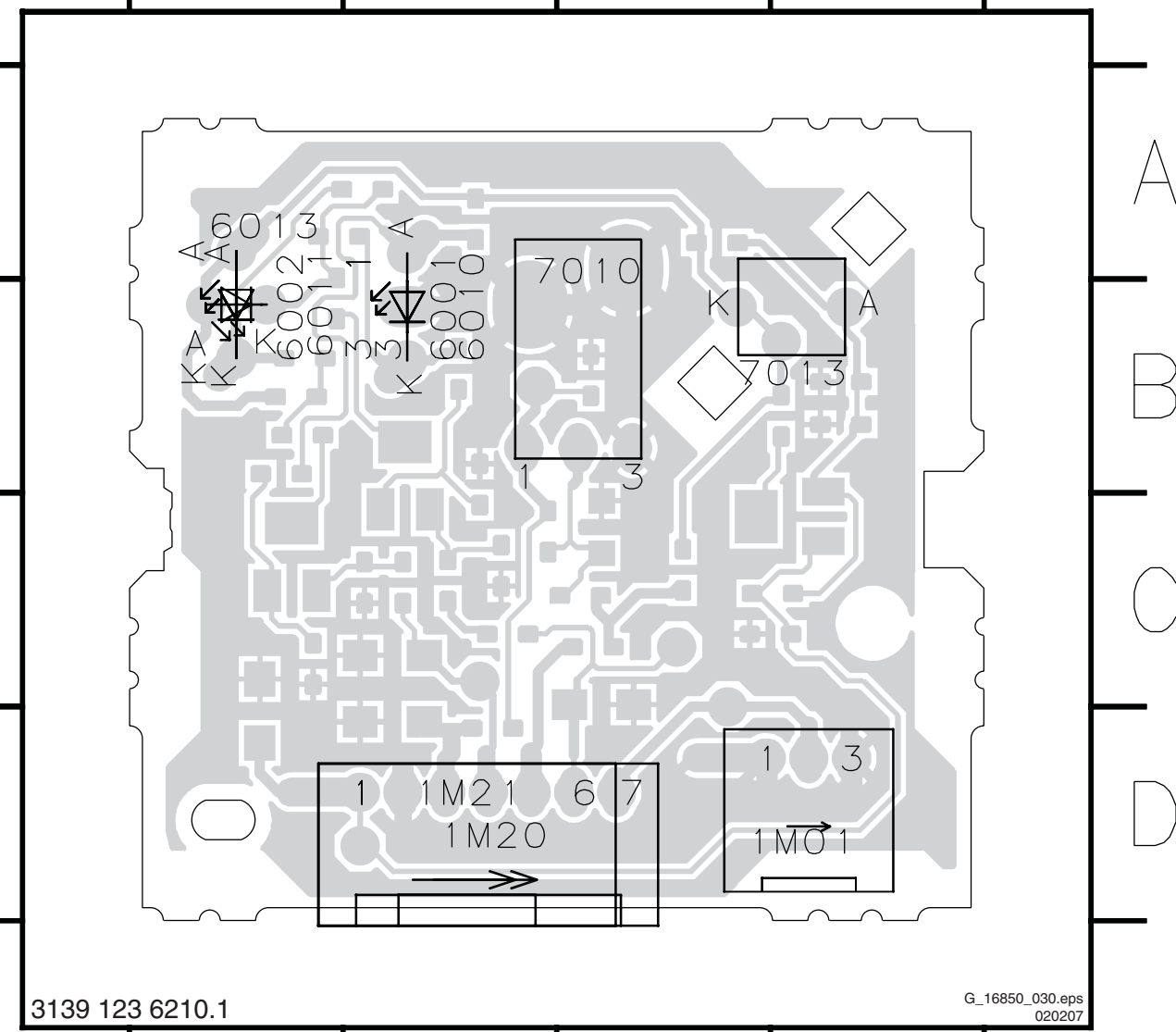
1 2 3 4



3139 123 6210.1

G_16850_031.eps
020207

1 2 3 4



3139 123 6210.1

G_16850_030.eps
020207

1 2 3 4

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_{AC} or 230 V_{AC} / 50 Hz (± 10%).
 - AP-PAL-multi: 120 - 230 V_{AC} / 50 Hz (± 10%).
 - EU: 230 V_{AC} / 50 Hz (± 10%).
 - LATAM-NTSC: 120 - 230 V_{AC} / 50 Hz (± 10%).
 - US: 120 V_{AC} / 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: R_i > 10 Mohm, C_i < 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
+1V8S_SW	FB11	1.70	1.80	1.90	B02_DC-DC
VDISP	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	243	256	249
Normal	251	256	220
Warm	256	241	189

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) $\pm$ 25".
- Store (STORE) the value.

8.4 Option Settings**8.4.1 Introduction**

The microprocessor communicates with a large number of I²C 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 NVM is then read again).

8.4.2 How To Set Option Codes

When the NVM is replaced, all options will require re-setting. To be certain that the factory settings are reproduced exactly, you must set all option numbers.

How to Change Options Codes

All options are controlled via seven "option codes" (or "option bytes" OP1... OP7), who each represent eight different options (option bits).

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 next table "Option and display code overview". For more detailed information, see the second table "Option codes on 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.

Table 8-3 Option and display code overview

Model Number	Display Type	Display code	Option Byte						
			1	2	3	4	5	6	7
26PFL3312/10	CMO: V260B1-L03	068	003	023	010	223	009	000	
26PFL3312S/60	CMO: V260B1-L03	068							
26PFL5322/10	LPL: LC260WX2-SLB2	045							
	CMO: V260B1-L03	068							
	AUO: T260XW03 V1	067							
26PFL5322/12	LPL: LC260WX2-SLB2	045							
	CMO: V260B1-L03	068							
	AUO: T260XW03 V1	067							
26PFL5322S/60	CMO: V260B1-L03	068							
26PFL7332S/60	CMO: V260B1-L03	068							
32PFL3312/10	CMO: V315B1-L05	069							
32PFL3312S/60	CMO: V315B1-L05	069							
32PFL5322/10	LPL: LC320W01-SL06, LC320W01-SLB1	046							
	AUO: T315XW02 VD	091							
	CMO: V315B1-L05	069							
32PFL5322/12	LPL: LC320W01-SL06, LC320W01-SLB1	046							
	AUO: T315XW02 VD	091							
	CMO: V315B1-L05	069							
32PFL5322S/60	AUO: T315XW02VD	091							
	AUO: T315XW02VD	091							
37PFL3312/10	LPL: LC370WX1-SLB1, LC370WX4-SLB1	071							
	AUO: T370XW02 V9	112							
37PFL3312S/60	LPL: LC370WX4-SLB1	071							
37PFL5322/10	LPL: LC370WX1-SLB1, LC370WX4-SLB1	071							
	AUO: T370XW02 V5	072							
37PFL5322/12	LPL: LC370WX1-SLB1, LC370WX4-SLB1	071							
	AUO: T370XW02 V5	072							
37PFL5322S/60	LPL: LC370WX1-SLB1	071							
	LPL: LC370WX4-SLB1	071							
42PFL3312/10	LPL: LC420WX5-SLD1,LC420WX7-SLB1	107							
	AUO: T420XW01 V9	113							
42PFL3312S/60	LPL: LC420WX7-SLB1	107							
42PFL5322/10	LPL: LC420WX3-SLA1	073							
	AUO: T420XW01 V8	076							
	LPL: LC420WX5-SLD1, LC420WX7-SLB1	107							
42PFL5322/12	LPL: LC420WX3-SLA1	073							
	AUO: T420XW01 V8	076							
	LPL: LC420WX5-SLD1, LC420WX7-SLB1	107							
42PFL5322S/60	LPL: LC420WX5-SLD1	107							
	LPL: LC420WX7-SLB1	107							

Option Code Overview on Bit Level

Table 8-4 Option codes on bit level

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
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
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
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
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_RECVRY	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
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_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)
Bit 2	4		
Bit 1	2		
Bit 0 (LSB)	1		
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		

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

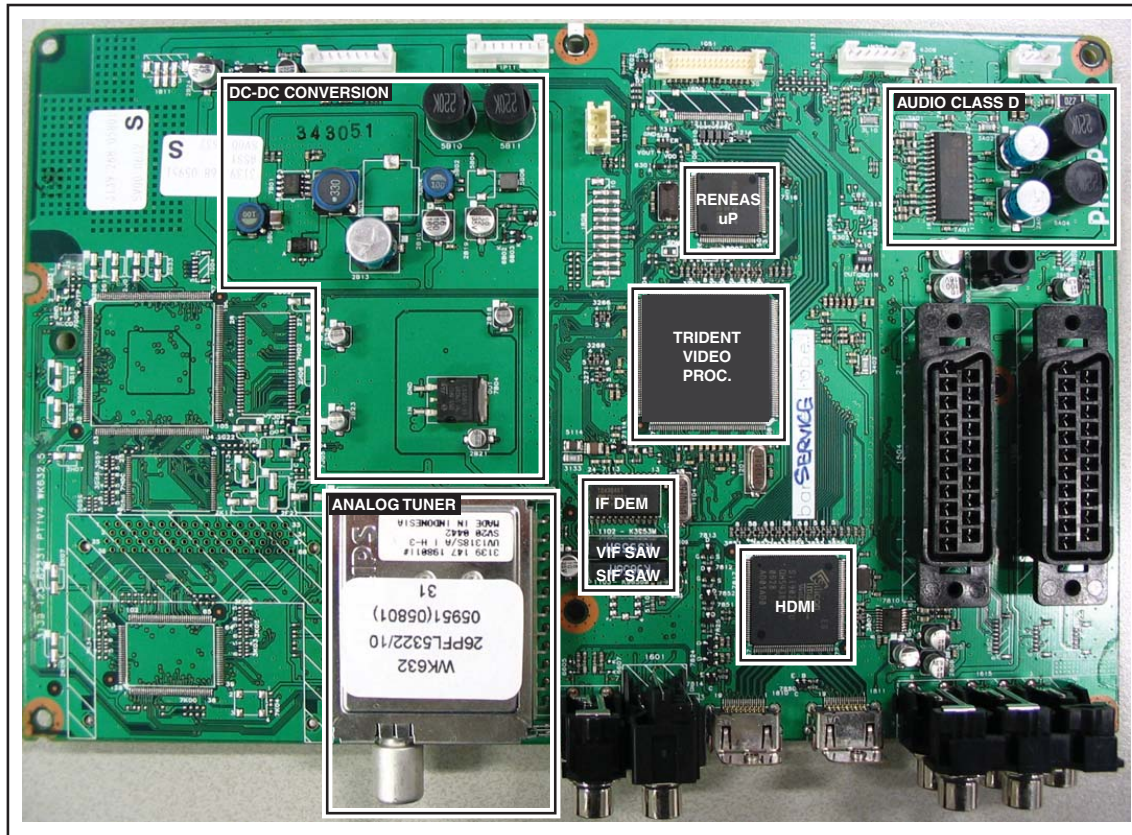
H_16940_010.eps
260407

Figure 9-1 SSB top view

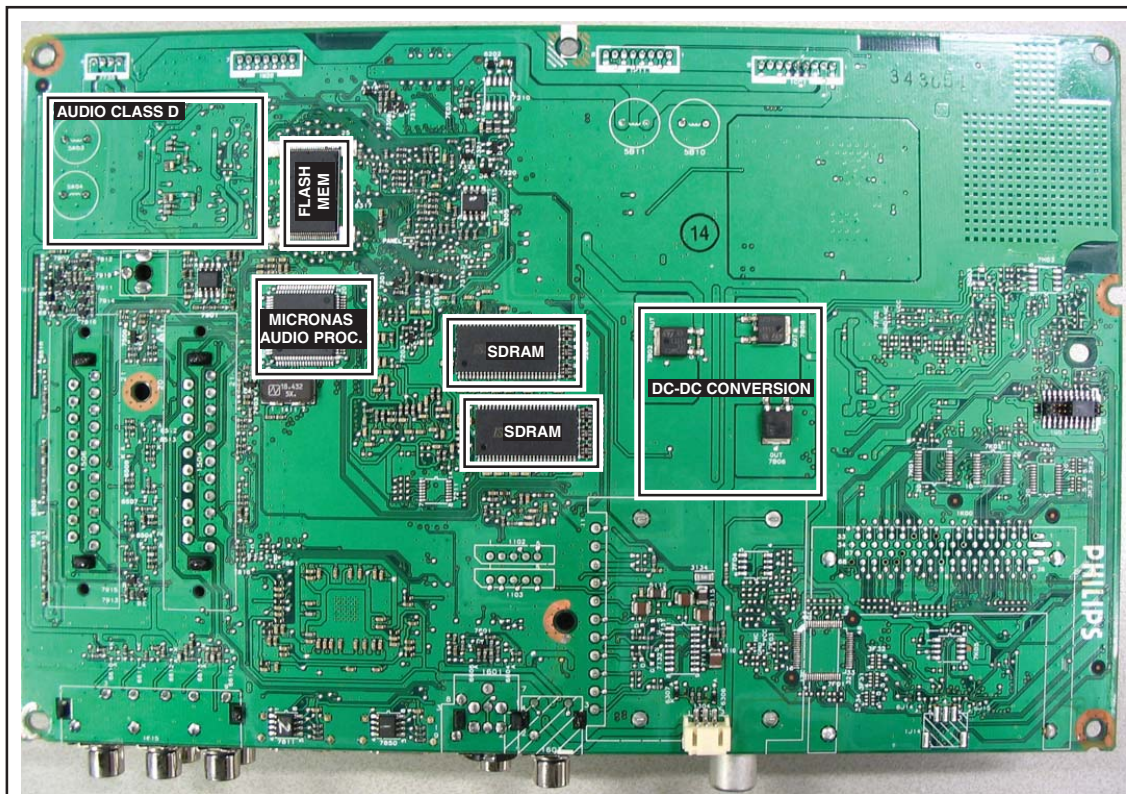
H_16940_011.eps
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Figure 9-2 SSB bottom view

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.

Some models (37 and 42PFL3312) come with a so-called IPB (Integrated Power Board) power supply. This power supply also incorporates the backlight inverters.

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, except for IPB PSUs; they come from "Delta".
- 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.

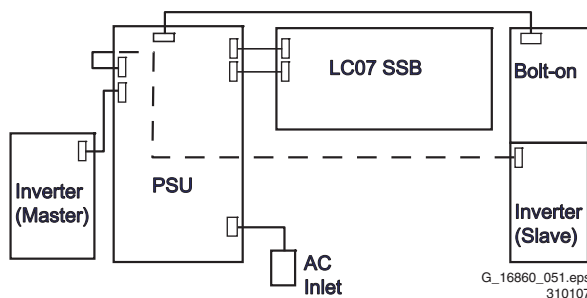


Figure 9-3 Overview of PSU connectivity (for non-IPB sets)

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

- +24 V to the inverters (not on IPB PSU's)
- +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".

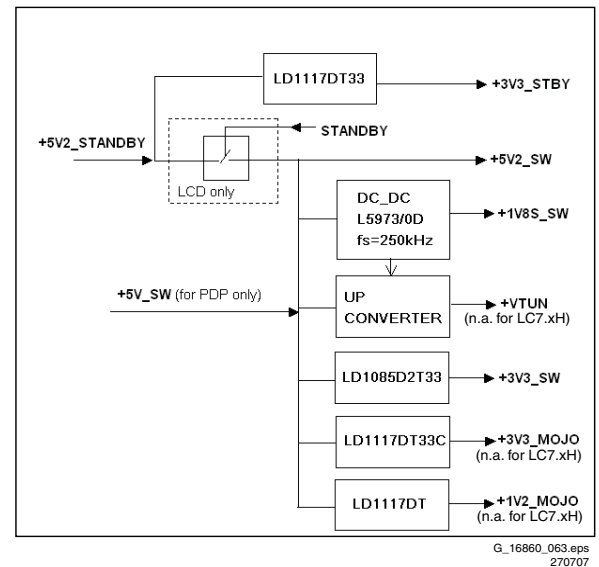


Figure 9-4 DC-DC converter block diagram

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".

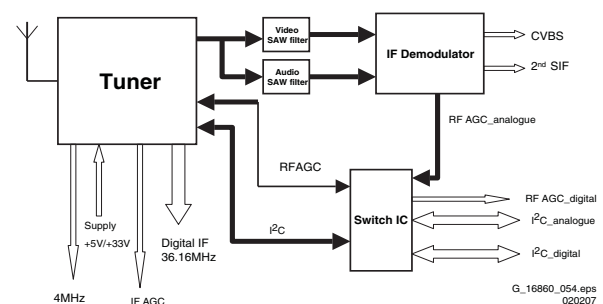


Figure 9-5 Tuner IF diagram

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 ² 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 ² 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

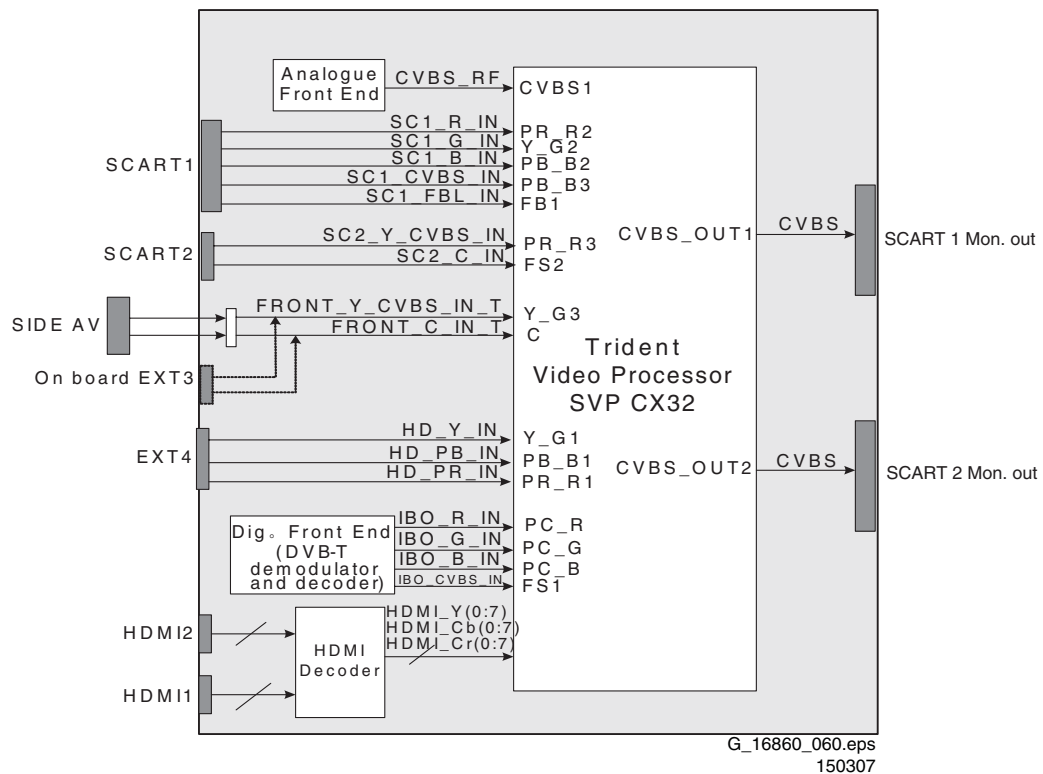


Figure 9-6 Block diagram video processing - EU version

"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.

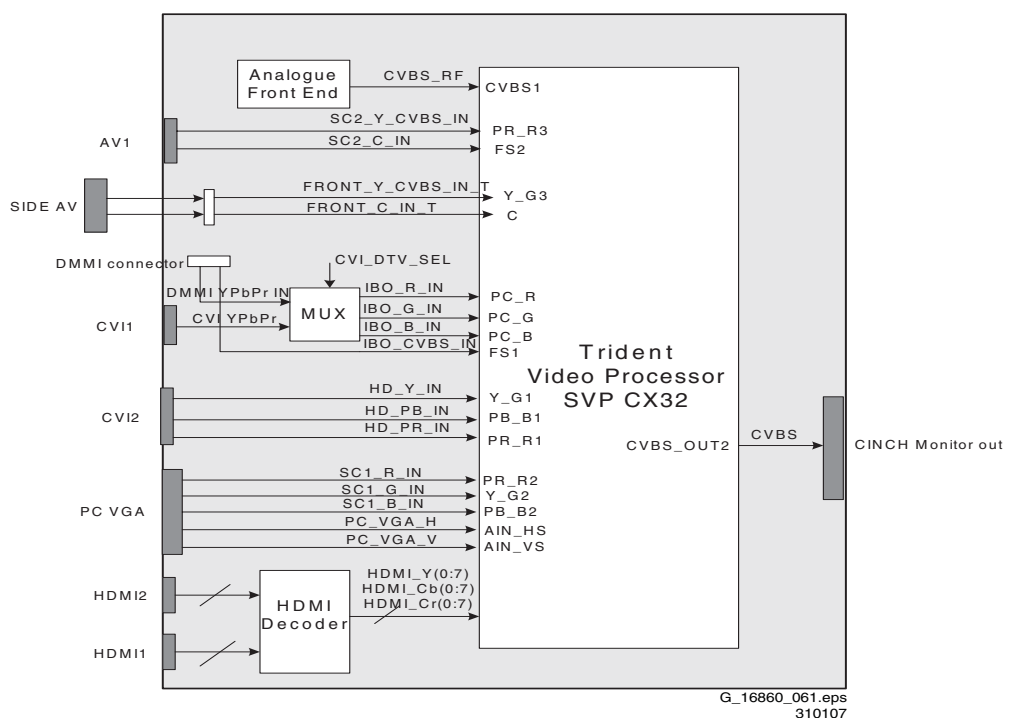


Figure 9-7 Block diagram video processing - AP version

"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.

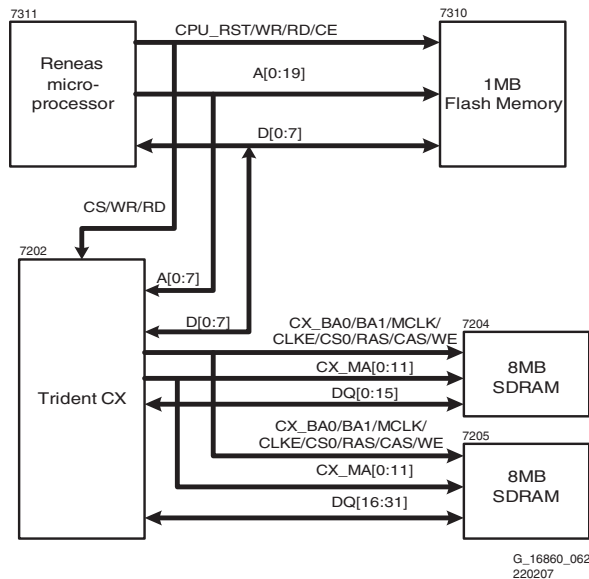


Figure 9-8 Memory block diagram

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 I²S-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 I²C-bus action) between mono/stereo/bilingual mode when the broadcast mode changes.

9.7.1 Region-dependent applications

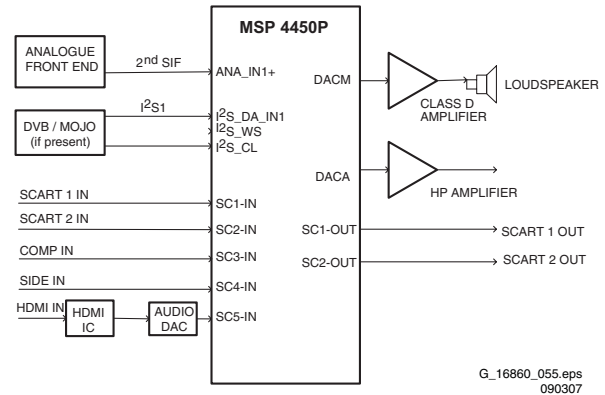


Figure 9-9 Block diagram audio processing - EU application

In EU applications, the MSP features:

- Sound IF input for signals coming from the analogue front-end
- Three I²S-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 I²S_DA_IN1, I²S_WS1 and I²S_CL1 lines. This ensures a "true digital path".

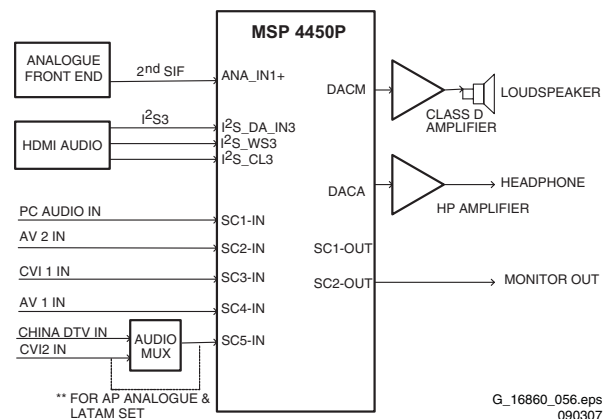


Figure 9-10 Block diagram audio processing - AP application

In AP applications, the MSP features:

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

- Three I²S-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_n: 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

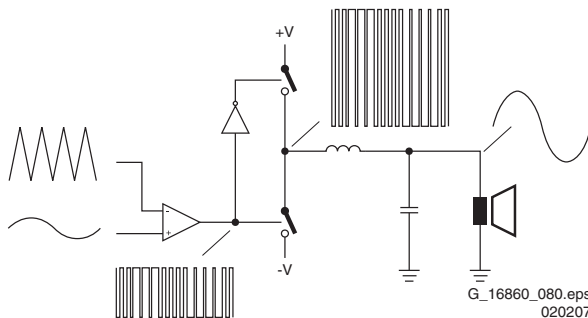


Figure 9-11 Principle Class-D Amplifier

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
- I²S 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.

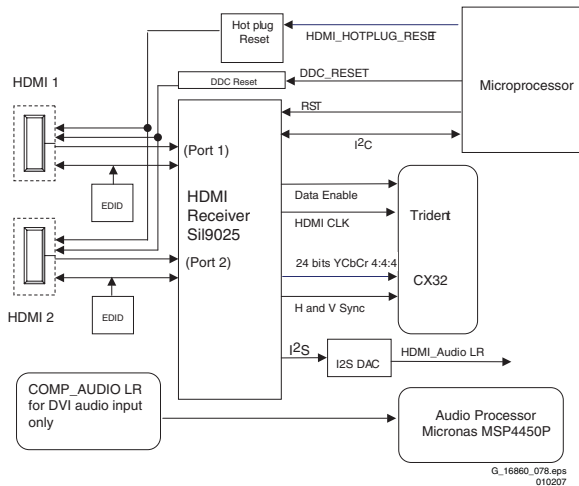


Figure 9-12 HDMI implementation

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

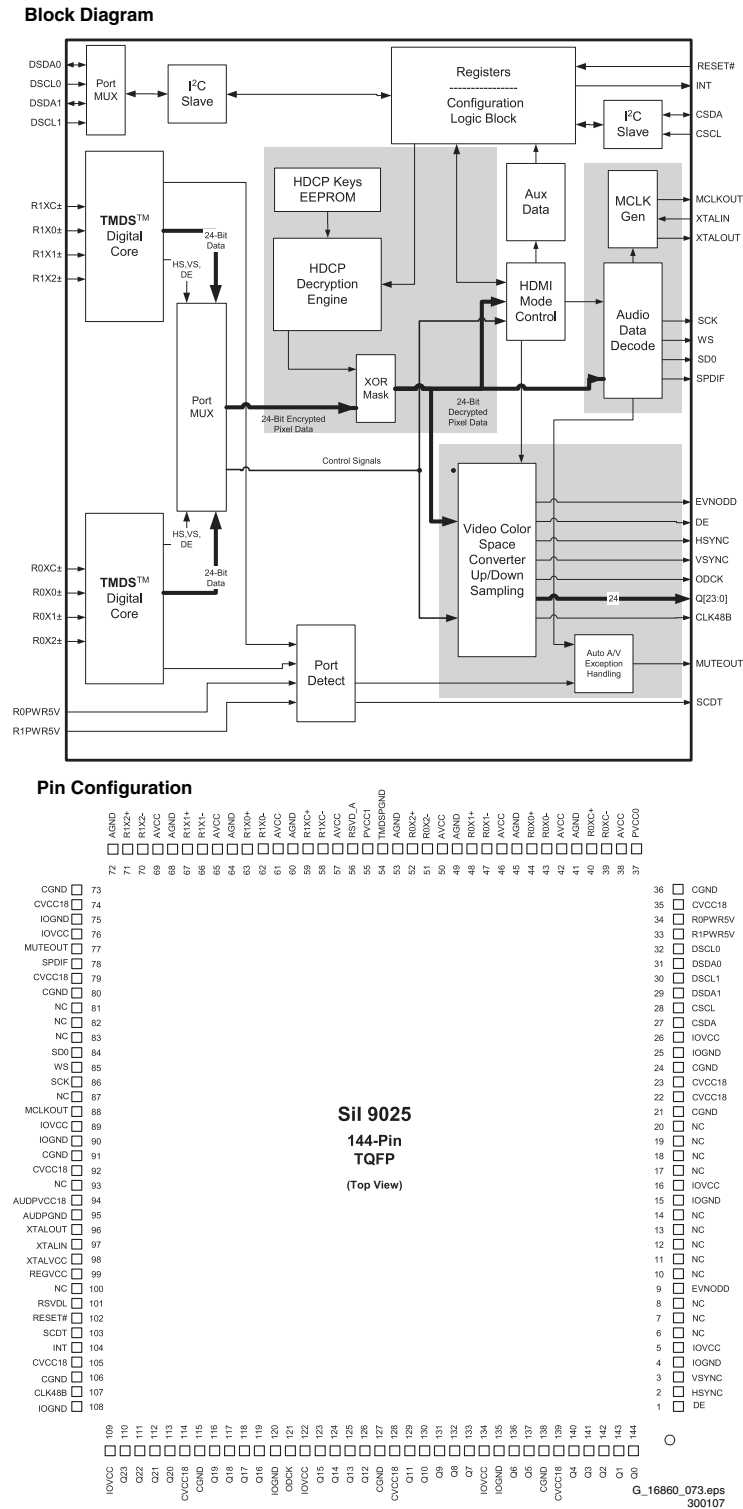
ED	Enhanced Definition: 480p, 576p	NC	Not Connected
EDID	Extended Display Identification Data (VESA standard)	NICAM	Near Instantaneous Compounded Audio Multiplexing. This is a digital sound system, used mainly in Europe.
EEPROM	Electrically Erasable and Programmable Read Only Memory	NTSC	National Television 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		
FLASH	FLASH memory	NVM	Non Volatile Memory: IC containing TV related data (for example, options)
FM	Field Memory / Frequency Modulation		
FMR	FM Radio	O/C	Open Circuit
FRC	Frame Rate Converter	ON/OFF LED	On/Off control signal for the LED
FTV	Flat TeleVision	OAD	Over the Air Download
H	H_sync to the module	OSD	On Screen Display
HD	High Definition: 720p, 1080i, 1080p	PAL	Phase Alternating Line. Colour system used mainly in Western Europe (colour carrier = 4.433619 MHz) and South America (colour carrier PAL M = 3.575612 MHz and PAL N = 3.582056 MHz)
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	Personal Computer
		PCB	Printed Circuit Board (or PWB)
		PDP	Plasma Display Panel
		PIG	Picture In Graphic
		PIP	Picture In Picture
		PLL	Phase Locked Loop. Used, for example, in FST tuning systems. The customer can directly provide the desired frequency
HDMI	High Definition Multimedia Interface, digital audio and video interface		
HP	Head Phone	PSU	Power Supply Unit
I	Monochrome TV system. Sound carrier distance is 6.0 MHz	PWB	Printed Wiring Board (or PCB)
I2C	Integrated IC bus	RAM	Random Access Memory
I2S	Integrated IC Sound bus	RC	Remote Control transmitter
IBO(Z)	Intelligent Bolt On module. Z= Zapper; module for DVB reception.	RC5 (6)	Remote Control system 5 (6), the signal from the remote control receiver
IC	Integrated Circuit	RF	Radio Frequency
IF	Intermediate Frequency	RGB	Red, Green, and Blue. The primary colour signals for TV. By mixing levels of R, G, and B, all colours (Y/C) are reproduced.
IPB	Integrated Power Board: a power supply with integrated backlight inverters.	RGBHV	Red, Green, Blue, Horizontal sync, and Vertical sync
IR	Infra Red	ROM	Read Only Memory
IRQ	Interrupt ReQuest	SAM	Service Alignment Mode
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 to the customers wishes	SC	SandCastle: two-level pulse derived from sync signals
		SC1-OUT	SCART output of the MSP audio IC
		SC2-OUT	SCART output of the MSP audio IC
LATAM	LATin America	S/C	Short Circuit
LC07	Philips chassis name for LCD TV 2007 project	SCL	Clock signal on I2C bus
LCD	Liquid Crystal Display	SD	Standard Definition: 480i, 576i
LED	Light Emitting Diode	SDA	Data signal on I2C bus
L/L'	Monochrome TV system. Sound carrier distance is 6.5 MHz. L' is Band I, L is all bands except for Band I	SDI	Samsung Display Industry
		SDM	Service Default Mode
LPL	LG Philips LCD	SDRAM	Synchronous DRAM
LS	Loud Speaker	SECAM	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.	SIF	Sound Intermediate Frequency
		SMPS	Switch Mode Power Supply
M/N	Monochrome TV system. Sound carrier distance is 4.5 MHz	SND	SouND
		SOPS	Self Oscillating Power Supply
MOSFET	Metal Oxide Semiconductor Field Effect Transistor	S/PDIF	Sony Philips Digital InterFace
		SRAM	Static RAM
MPEG	Motion Pictures Experts Group	SSB	Small Signal Board
MSP	Multi-standard Sound Processor: ITT sound decoder	STBY	Stand-by
		SVHS	Super Video Home System
MUTE	MUTE Line	SW	Sub Woofer / SoftWare
NAFTA	North American Free Trade Association: Trade agreement between Canada, USA and Mexico	THD	Total Harmonic Distortion
		TXT	TeleteXT
		uP	Microprocessor

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

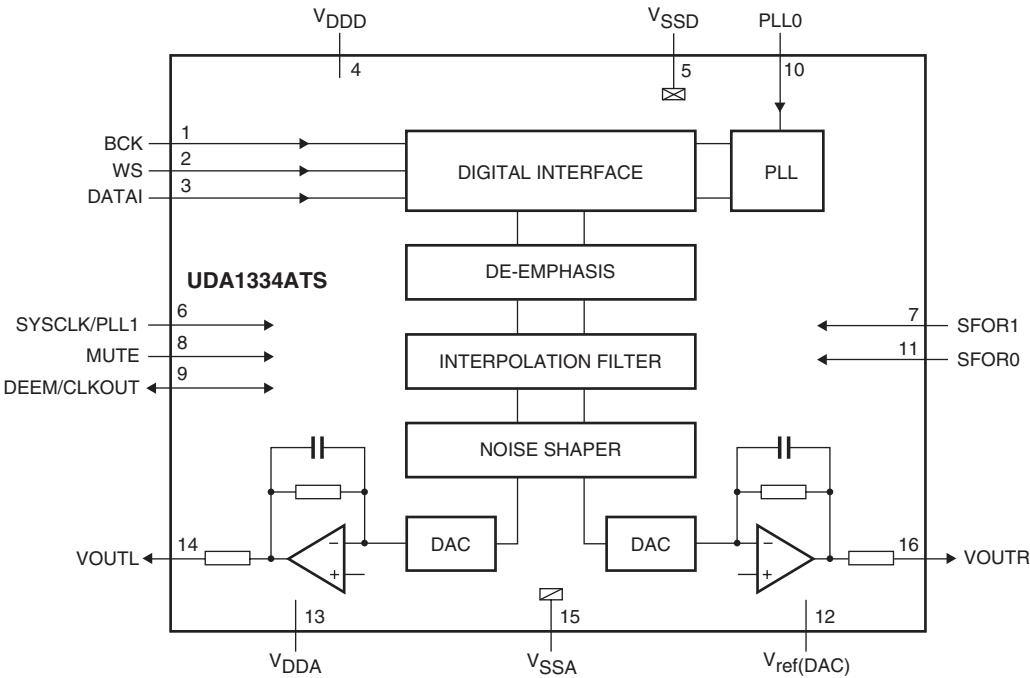
This section shows the internal block diagrams and pin layouts of ICs that are drawn as "black boxes" in the electrical diagrams (with the exception of "memory" and "logic" ICs).

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

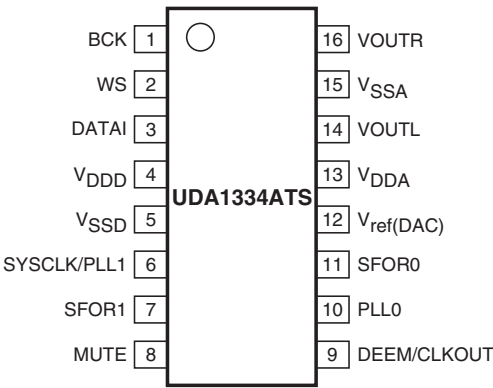


9.10.2 Diagram B06C, Type UDA1334ATS (IC7810) (audio DAC)

Block Diagram



Pin Configuration

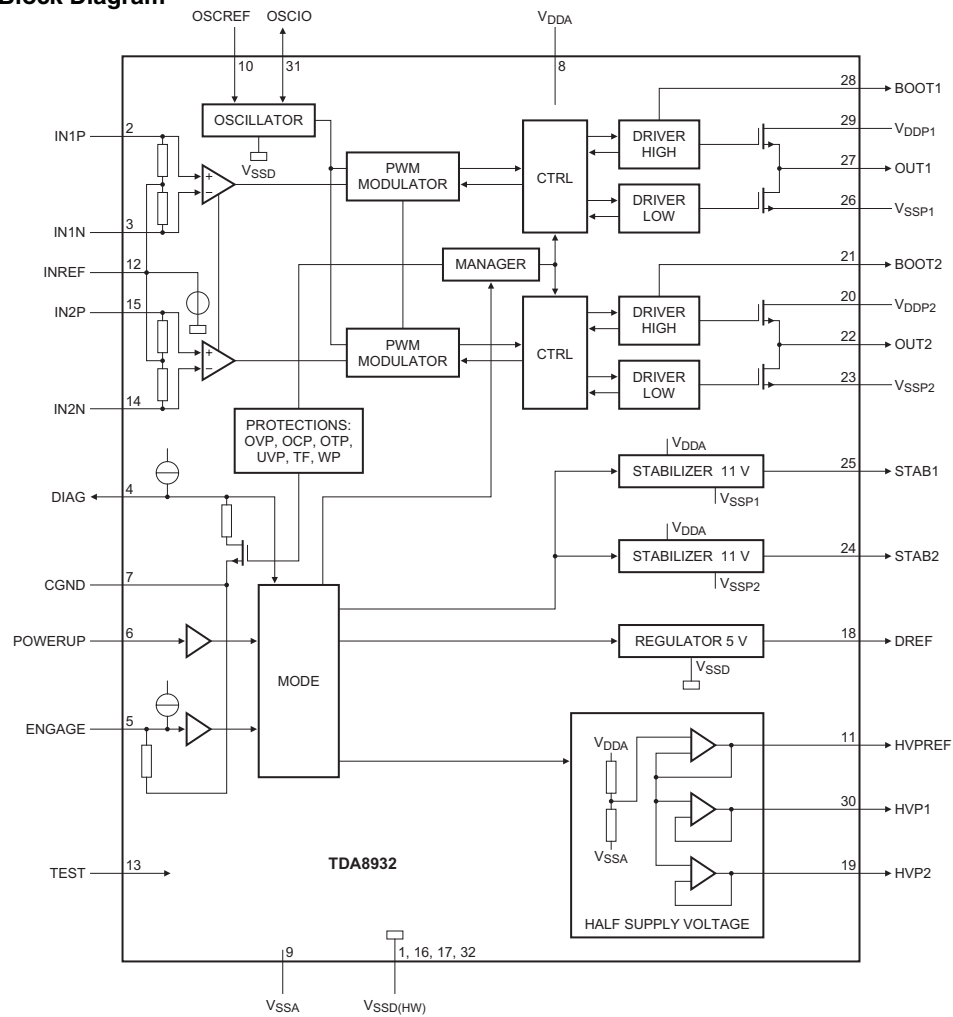


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Figure 9-14 Internal block diagram and pin configuration

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

Block Diagram



Pin Configuration

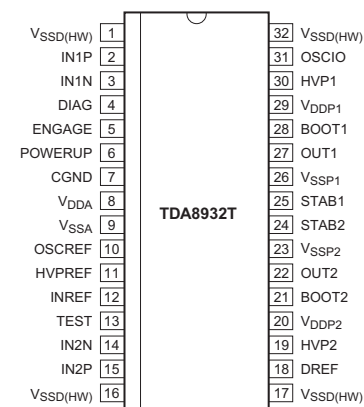


Figure 9-15 Internal block diagram and pin configuration

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

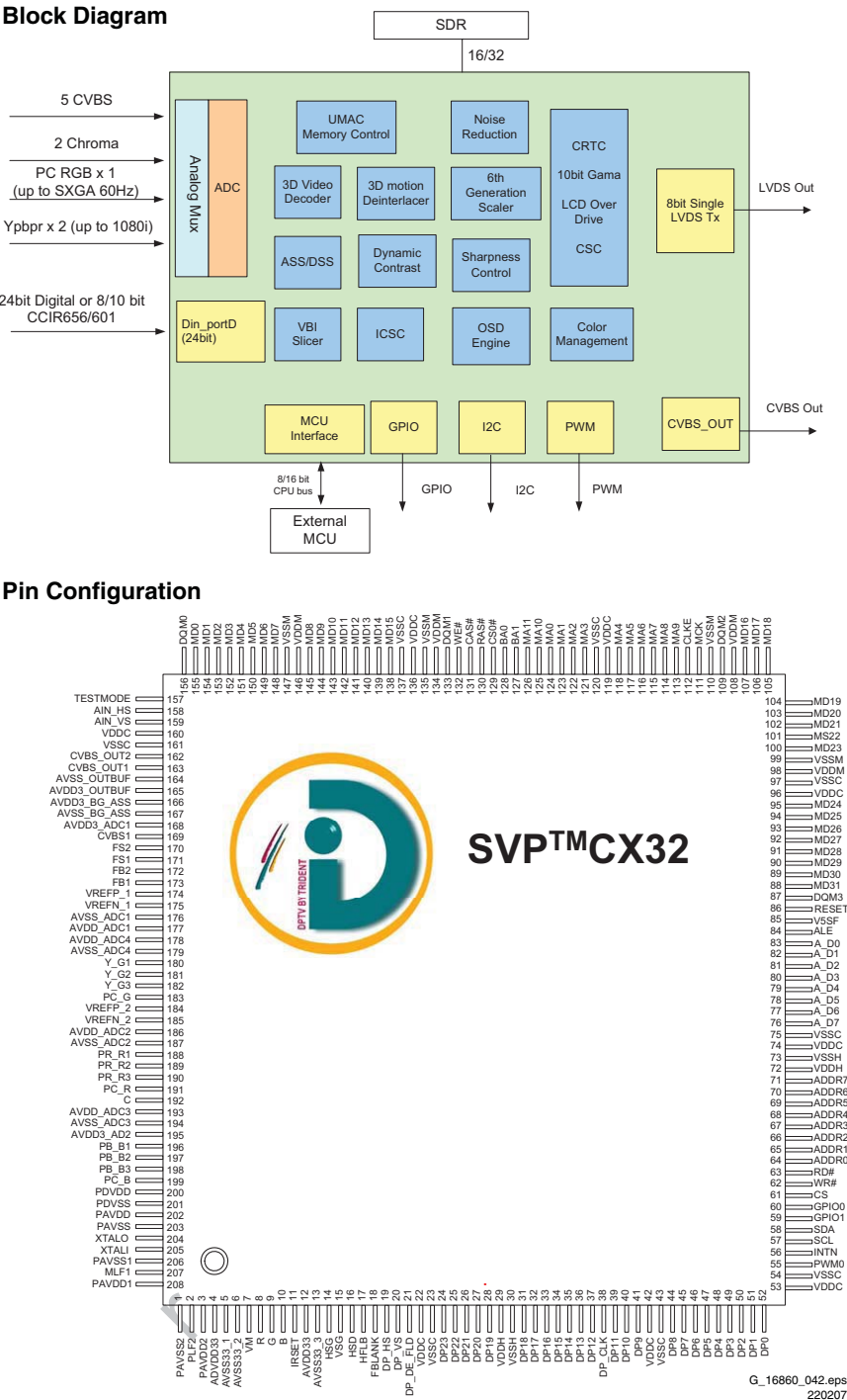
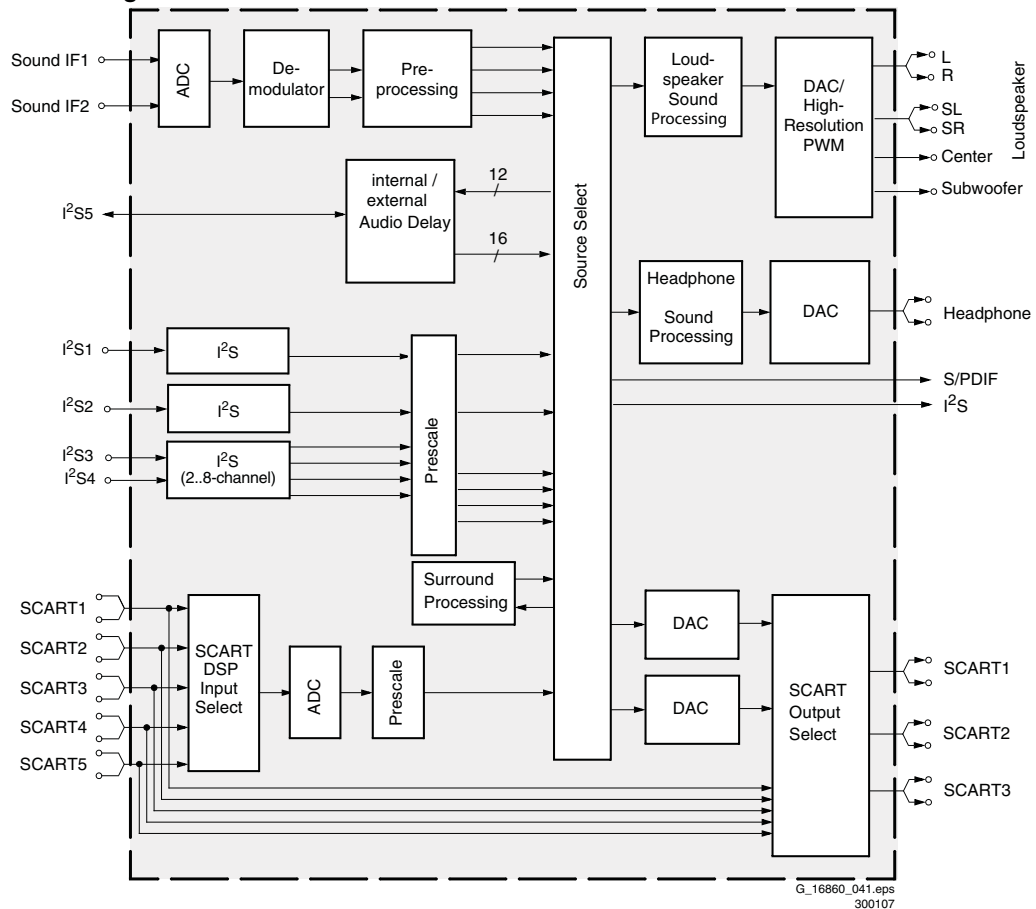


Figure 9-16 Internal block diagram and pin configuration

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

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

10. Spare Parts List

Sets Listed per Model Number (CTN)		
26PFL3312/10 (8670 000 30331)		
0815	Main software	Download from website
0816	Main NVM SW	Download from website
0821	HDMI-1 Software	Download from website
0822	HDMI-2 Software	Download from website
1004	9322 249 37682	LCD V260B1-L03
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 08891	Side IO Assy [D]
8002	3104 311 06951	Cable 2p3/180/2p
8304	3139 131 09451	Cable 11p/340/11p
8520	3104 311 10701	Cable 12p/680/12p
8521	3104 311 12441	Cable 14p/220/14p
8735	3139 131 08511	Cable 04p/400 820/2ft
8C01	3139 131 08551	Cable 9p/180/9p Bk
8G51	3139 131 08282	LVDS 30p/180/30p
8M01	3104 311 09961	Cable 3P/140/3P WH
8M20	3104 311 03811	Cable 7p/480/7p Wh
8P11	3139 131 08581	Cable 8p/220/8p Bk
5213 2422 264 00605 Loudsp. 6Ω 15W FR		
26PFL5322S/60 (8670 000 31269)		
0815	Main software	Download from website
0816	Main NVM SW	Download from website
0821	HDMI-1 Software	Download from website
0822	HDMI-2 Software	Download from website
1004	9322 249 37682	LCD V260B1-L03
1005	3139 128 78522	Power Supply Unit
1112	3139 268 53241	IR/LED Assy [J]
1114	3139 268 05921	Keyboard Assy [E]
1116	3139 268 53291	Side IO Assy [D]
8002	3104 311 06951	Cable 2p3/180/2p
8304	3139 131 09451	Cable 11p/340/11p
8521	3104 311 12441	Cable 14p/220/14p
8681	3104 311 04341	Cable 7p/560/7p Wh
8735	3139 131 08511	Cable 04p/400 820/2ft
8C01	3139 131 08551	Cable 9p/180/9p Bk
8G51	3139 131 08281	Cable 30p/180/30p Fi-x
8M01	3139 131 08601	Cable 3p/80/3p Bk
8P11	3139 131 08581	Cable 8p/220/8p Bk
5213 2422 264 00605 Loudsp. 6Ω 15W FR		
32PFL5322/10 (8670 000 25408)		
0815	Main software	Download from website
0816	Main NVM SW	Download from website
0821	HDMI-1 Software	Download from website
0822	HDMI-2 Software	Download from website
1004	9322 249 06682	LCD T315XW02VD
1005	3122 427 24431	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	3139 131 09411	Cable 11p/480/11p
8521	3104 311 12441	Cable 14p/220/14p
8735	3139 131 08671	Cable 4p/480 1000/2ft
8C01	3139 131 08541	Cable 9p/220/9p Bk
8G51	3139 131 08282	LVDS 30p/180/30p
8M01	3104 311 12371	Cable 3p/80/3p Wh
8M20	3104 311 04341	Cable 7p/560/7p Wh
8P11	3139 131 08581	Cable 8p/220/8p Bk
5200 3139 268 53991 Speaker Assy		
32PFL5322S/60 (8670 000 32381)		
0815	Main software	Download from website
0816	Main NVM SW	Download from website
0821	HDMI-1 Software	Download from website
0822	HDMI-2 Software	Download from website
1004	9322 249 09682	LCD LC420WX5-SLD1
1005	3122 427 24573	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]
8002	3104 311 08071	Cable 2P3/140
8304	3139 131 09441	Cable 11p/480/11p
8520	3104 311 08191	Cable 12p/1200/12p
8521	3104 311 12481	Cable 14p/400/14p Wh
8681	3104 311 04341	Cable 7p/560/7p Wh
8735	3139 131 08041	Cable 4p/560 820/2ft
8C01	3139 131 08531	Cable 9p/340/9p Bk
8G51	3139 131 08282	LVDS 30p/180/30p
8M01	3139 131 08601	Cable 3p/80/3p Bk
8P11	3139 131 08571	Cable 8p/340/8p Bk
5211 2422 264 00618 Loudsp. 6Ω 15W R		
5212 2422 264 00617 Loudsp. 6Ω 15W L		
42PFL3312/10 (8670 000 30334)		
0815	Main software	Download from website
0816	Main NVM SW	Download from website
0821	HDMI-1 Software	Download from website
0822	HDMI-2 Software	Download from website
1004	9322 249 09682	LCD LC420WX5-SLD1
1005	3122 427 24573	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]
8002	3104 311 08071	Cable 2P3/140
8304	3139 131 09441	Cable 11p/480/11p
8520	3104 311 08191	Cable 12p/1200/12p
8521	3104 311 12481	Cable 14p/400/14p Wh
8681	3104 311 04341	Cable 7p/560/7p Wh
8735	3139 131 08041	Cable 4p/560 820/2ft
8C01	3139 131 08531	Cable 9p/340/9p Bk
8G51	3139 131 08282	LVDS 30p/180/30p
8M01	3139 131 08601	Cable 3p/80/3p Bk
8P11	3139 131 08571	Cable 8p/340/8p Bk
5211 2422 264 00618 Loudsp. 6Ω 15W R		
5212 2422 264 00617 Loudsp. 6Ω 15W L		
42PFL5322S/60 (8670 000 32386)		
0815	Main software	Download from website
0816	Main NVM SW	Download from website
0821	HDMI-1 Software	Download from website
0822	HDMI-2 Software	Download from website
1004	9322 246 96682	LC370WX1-SLB1
1005	3122 427 24573	Power Supply Unit
1112	3139 268 53241	IR/LED Assy [J]
1114	3139 268 05921	Keyboard Assy [E]
1116	3139 268 53571	Side IO Assy [D]
8002	3139 131 08501	Cable 2p3/100/inlet
8304	3139 131 09411	Cable 11p/480/11p
8520	3104 311 08191	Cable 12p/1200/12p
8521	3104 311 12481	Cable 14p/400/14p Wh
8681	3104 311 04341	Cable 7p/560/7p Wh
8735	3139 131 08041	Cable 4p/560 820/2ft
8C01	3139 131 08531	Cable 9p/340/9p Bk
8G51	3139 131 08282	LVDS 30p/180/30p
8M01	3139 131 08601	Cable 3p/80/3p Bk
8P11	3139 131 08571	Cable 8p/340/8p Bk
5211 2422 264 00618 Loudsp. 6Ω 15W R		
5212 2422 264 00617 Loudsp. 6Ω 15W L		
42PFL5322S/60 (8670 000 32387)		
0815	Main software	Download from website
0816	Main NVM SW	Download from website
0821	HDMI-1 Software	Download from website
0822	HDMI-2 Software	Download from website
1004	9322 249 09682	LCD LC420WX5-SLD1
1005	3122 427 24573	Power Supply Unit
1012	3139 268 04441	IR/LED Assy LC07
1016	3139 268 08711	Side I/O Assy LC07
1112	3139 268 53241	IR/LED Assy [J]
1114	3139 268 05921	Keyboard Assy [E]
1116	3139 268 53641	Side IO Assy [D]
8002	3104 311 08071	Cable 2P3/140
8304	3139 131 09441	Cable 11p/480/11p
8520	3104 311 08191	Cable 12p/1200/12p
8521	3104 311 12481	Cable 14p/400/14p Wh
8681	3104 311 04341	Cable 7p/560/7p 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
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 15682	21p (SCART)
1504	2422 025 20251	SCART V 21p F Bk
1506	2422 025 15682	21p (SCART)
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	2422 025 09407	Connector 7p m
1P11	2422 025 08151	Connector 8p m
2112 2020 552 00211 22μF 10% 16V 1210		
2112 2020 552 00343 22μF 10% 16V		
2117 3198 017 31030 10nF 20% 50V 0603		
2118 3198 017 31030 10nF 20% 50V 0603		
2119 2020 552 96863 100nF 50V 0603		
2120 2020 552 00211 22μF 10% 16V 1210		

2120	2020 552 00343	22µF 10% 16V	2279	2020 552 00291	10µF 20% 6V3 0603	2610	3198 017 32240	220nF 20% 10V 0603
2121	3198 016 31590	15pF 10% 50V 0603	2280	2020 552 00291	10µF 20% 6V3 0603	2612	3198 017 33320	3.3nF 50V 0603
2122	3198 016 31590	15pF 10% 50V 0603	2282	2020 552 00291	10µF 20% 6V3 0603	2801	3198 030 24790	1uF 5% 10V 0603
2123	3198 017 31520	1.5nF 20% 50V 0603	2284	2020 552 00291	10µF 20% 6V3 0603	2802	3198 017 31040	100nF 20% 50V 0603
2125	3198 017 44740	470nF 10V 0603	2286	2020 552 00291	10µF 20% 6V3 0603	2803	3198 017 31040	100nF 20% 50V 0603
2126	3198 017 42240	220nF 16V Y5V 0603	2287	2020 552 00291	10µF 20% 6V3 0603	2804	3198 017 31040	100nF 20% 50V 0603
2127	3198 016 32290	22pF 10% 50V 0603	2288	2020 552 00291	10µF 20% 6V3 0603	2805	3198 030 24790	1uF 5% 10V 0603
2128	3198 017 31030	10nF 20% 50V 0603	2289	2020 552 00291	10µF 20% 6V3 0603	2806	3198 023 41040	100nF 10% 100V 0603
2129	2020 552 00211	22µF 10% 16V 1210	2290	2020 552 00291	10µF 20% 6V3 0603	2807	3198 017 31040	100nF 20% 50V 0603
2129	2020 552 00343	22µF 10% 16V	2291	2020 552 00291	10µF 20% 6V3 0603	2808	3198 030 24790	1uF 5% 10V 0603
2130	3198 017 31030	10nF 20% 50V 0603	2292	2020 552 00291	10µF 20% 6V3 0603	2809	3198 017 41030	10nF 50V Y5V 0603
2131	2020 552 00211	22µF 10% 16V 1210	2293	2020 552 00291	10µF 20% 6V3 0603	2810	3198 017 41030	10nF 50V Y5V 0603
2131	2020 552 00343	22µF 10% 16V	2295	3198 017 31040	100nF 20% 50V 0603	2811	2020 552 00291	10µF 20% 6V3 0603
2132	2020 552 00211	22µF 10% 16V 1210	2296	3198 017 31040	100nF 20% 50V 0603	2812	2020 552 00291	10µF 20% 6V3 0603
2132	2020 552 00343	22µF 10% 16V	2297	2020 552 00134	22µF 20% 6.3V 0805	2813	3198 016 31890	18pF 1% 50V 0603
2133	3198 017 31030	10nF 20% 50V 0603	2297	3198 027 02290	Jumper 0603	2814	3198 017 31030	10nF 20% 50V 0603
2136	3198 017 44740	470nF 10V 0603	2298	3198 017 31040	100nF 20% 50V 0603	2815	3198 017 31030	10nF 20% 50V 0603
2137	3198 017 31030	10nF 20% 50V 0603	2310	3198 017 31040	100nF 20% 50V 0603	2816	3198 017 31020	1nF 20% 50V 0603
2138	3198 017 31030	10nF 20% 50V 0603	2311	2020 552 00291	10µF 20% 6V3 0603	2817	3198 017 31040	100nF 20% 50V 0603
2139	3198 016 33910	390pF 50V NPO 0603	2312	3198 017 31040	100nF 20% 50V 0603	2818	3198 023 41040	100nF 10% 100V 0603
2143	3198 017 31020	1nF 20% 50V 0603	2313	3198 017 31040	100nF 20% 50V 0603	2819	3198 023 41040	100nF 10% 100V 0603
2144	3198 017 31030	10nF 20% 50V 0603	2314	3198 016 31590	15pF 10% 50V 0603	2828	3198 016 31890	18pF 1% 50V 0603
2145	3198 017 31020	1nF 20% 50V 0603	2315	3198 017 31040	100nF 20% 50V 0603	2829	3198 023 41040	100nF 10% 100V 0603
2147	2238 786 19856	330nF 20% 160V 0603	2316	3198 016 31590	15pF 10% 50V 0603	2830	3198 023 41040	100nF 10% 100V 0603
2148	3198 017 31040	100nF 20% 50V 0603	2317	3198 017 31040	100nF 20% 50V 0603	2833	3198 023 41040	100nF 10% 100V 0603
2149	2020 552 00132	2.2µF 10% 10V	2318	3198 017 31040	100nF 20% 50V 0603	2835	3198 017 31040	100nF 20% 50V 0603
2151	3198 030 81090	10µF 20% 50V	2320	3198 017 31040	100nF 20% 50V 0603	2836	3198 017 31040	100nF 20% 50V 0603
2207	3198 017 31040	100nF 20% 50V 0603	2323	3198 017 31040	100nF 20% 50V 0603	2838	3198 023 41040	100nF 10% 100V 0603
2208	3198 030 41010	100µF 20% 16V	2327	3198 017 31030	10nF 20% 50V 0603	2839	3198 017 31040	100nF 20% 50V 0603
2209	3198 030 41010	100µF 20% 16V	2329	3198 017 31020	1nF 20% 50V 0603	2840	3198 023 41040	100nF 10% 100V 0603
2210	3198 017 31040	100nF 20% 50V 0603	2330	3198 017 31020	1nF 20% 50V 0603	2843	3198 017 31040	100nF 20% 50V 0603
2211	2020 552 00291	10µF 20% 6V3 0603	2331	3198 017 31020	1nF 20% 50V 0603	2844	3198 017 31040	100nF 20% 50V 0603
2212	3198 017 31040	100nF 20% 50V 0603	2332	3198 017 31020	1nF 20% 50V 0603	2845	3198 023 41040	100nF 10% 100V 0603
2213	3198 017 31040	100nF 20% 50V 0603	2333	3198 017 31020	1nF 20% 50V 0603	2847	3198 017 31020	1nF 20% 50V 0603
2214	3198 017 31040	100nF 20% 50V 0603	2335	3198 017 31020	1nF 20% 50V 0603	2848	3198 017 31020	1nF 20% 50V 0603
2215	3198 017 31040	100nF 20% 50V 0603	2336	3198 017 31020	1nF 20% 50V 0603	2849	3198 017 31020	1nF 20% 50V 0603
2216	2020 552 00291	10µF 20% 6V3 0603	2337	3198 017 31020	1nF 20% 50V 0603	2850	3198 017 31020	1nF 20% 50V 0603
2217	3198 017 31040	100nF 20% 50V 0603	2338	3198 017 32240	220nF 20% 10V 0603	2851	3198 017 31020	1nF 20% 50V 0603
2218	3198 017 31040	100nF 20% 50V 0603	2408	3198 017 34710	470pF 50V X7R 0603	2852	3198 017 31020	1nF 20% 50V 0603
2219	3198 017 31040	100nF 20% 50V 0603	2409	3198 017 31520	1.5nF 20% 50V 0603	2853	3198 017 31020	1nF 20% 50V 0603
2220	3198 017 31040	100nF 20% 50V 0603	2410	3198 030 41090	10µF 20% 16V	2854	3198 017 31020	1nF 20% 50V 0603
2221	3198 017 31040	100nF 20% 50V 0603	2411	2020 552 00291	10µF 20% 6V3 0603	2855	3198 016 31020	1nF 25V 0603
2222	3198 017 31040	100nF 20% 50V 0603	2412	3198 016 32210	220pF 10% 50V 0603	2856	3198 017 31020	1nF 20% 50V 0603
2223	3198 017 31040	100nF 20% 50V 0603	2413	3198 016 32210	220pF 10% 50V 0603	2857	3198 017 31020	1nF 20% 50V 0603
2224	3198 017 31040	100nF 20% 50V 0603	2414	2020 552 00291	10µF 20% 6V3 0603	2858	3198 017 31020	1nF 20% 50V 0603
2225	3198 017 31040	100nF 20% 50V 0603	2415	3198 016 33380	3.3pF 50V 0603	2859	3198 017 31020	1nF 20% 50V 0603
2226	3198 017 31040	100nF 20% 50V 0603	2416	3198 016 33380	3.3pF 50V 0603	2860	3198 017 31020	1nF 20% 50V 0603
2227	3198 017 31040	100nF 20% 50V 0603	2417	3198 017 33310	330pF 50V X7R 0603	2861	3198 017 31020	1nF 20% 50V 0603
2228	3198 017 31040	100nF 20% 50V 0603	2418	3198 017 33310	330pF 50V X7R 0603	2865	3198 016 31020	1nF 25V 0603
2229	2020 552 00134	22µF 20% 6.3V 0805	2419	3198 017 31040	100nF 20% 50V 0603	2866	3198 017 31020	1nF 20% 50V 0603
2229	3198 027 02290	Jumper 0603	2420	3198 030 41090	10µF 20% 16V	2867	3198 017 31020	1nF 20% 50V 0603
2230	2020 552 00291	10µF 20% 6V3 0603	2421	3198 016 33310	330pF 1% 50V 0603	2868	3198 017 31020	1nF 20% 50V 0603
2231	3198 017 31040	100nF 20% 50V 0603	2422	3198 016 33310	330pF 1% 50V 0603	2869	3198 017 31020	1nF 20% 50V 0603
2232	3198 017 31040	100nF 20% 50V 0603	2423	3198 030 41090	10µF 20% 16V	2870	3198 017 31020	1nF 20% 50V 0603
2233	3198 017 31040	100nF 20% 50V 0603	2424	2020 552 00291	10µF 20% 6V3 0603	2871	3198 017 31020	1nF 20% 50V 0603
2234	3198 017 31040	100nF 20% 50V 0603	2425	2020 552 00291	10µF 20% 6V3 0603	2872	3198 017 31020	1nF 20% 50V 0603
2235	3198 017 31040	100nF 20% 50V 0603	2426	2020 552 00291	10µF 20% 6V3 0603	2873	3198 017 31020	1nF 20% 50V 0603
2236	2020 552 00291	10µF 20% 6V3 0603	2427	2020 552 00291	10µF 20% 6V3 0603	2874	3198 016 31020	1nF 25V 0603
2237	3198 017 31040	100nF 20% 50V 0603	2428	3198 016 31010	100pF 10% 50V 0603	2875	3198 017 31020	1nF 20% 50V 0603
2238	3198 017 31040	100nF 20% 50V 0603	2429	3198 016 31010	100pF 10% 50V 0603	2876	3198 017 31020	1nF 20% 50V 0603
2239	3198 017 31040	100nF 20% 50V 0603	2430	3198 016 31010	100pF 10% 50V 0603	2901	3198 016 33390	33pF 50V NPO 0603
2240	3198 017 31040	100nF 20% 50V 0603	2431	3198 016 31010	100pF 10% 50V 0603	2902	3198 017 44740	470nF 10V 0603
2241	3198 017 31040	100nF 20% 50V 0603	2432	3198 016 35690	56pF 10% 50V 0603	2903	3198 030 41010	100µF 20% 16V
2242	3198 017 31040	100nF 20% 50V 0603	2433	3198 016 33310	330pF 1% 50V 0603	2904	3198 017 44740	470nF 10V 0603
2243	3198 017 31040	100nF 20% 50V 0603	2434	3198 016 33310	330pF 1% 50V 0603	2905	3198 016 33390	33pF 50V NPO 0603
2244	3198 017 31040	100nF 20% 50V 0603	2435	3198 016 33310	330pF 1% 50V 0603	2906	3198 030 41010	100µF 20% 16V
2245	3198 017 31040	100nF 20% 50V 0603	2436	2020 552 00291	10µF 20% 6V3 0603	2907	3198 017 44740	470nF 10V 0603
2246	2020 552 96749	20pF 5% 50V 0603	2437	2020 552 00291	10µF 20% 6V3 0603	2908	3198 017 32240	220nF 20% 10V 0603
2247	2020 552 96749	20pF 5% 50V 0603	2438	3198 017 31040	100nF 20% 50V 0603	2913	3198 017 32240	220nF 20% 10V 0603
2248	2020 552 96448	1µF 10% 16V 0805	2439	2020 552 00247	470nF 10% 25V	2940	3198 030 24790	1uF 5% 10V 0603
2250	3198 017 31040	100nF 20% 50V 0603	2440	2020 552 00247	470nF 10% 25V	2A01	3198 017 31040	100nF 20% 50V 0603
2251	3198 017 31040	100nF 20% 50V 0603	2441	3198 017 31520	1.5nF 20% 50V 0603	2A02	3198 017 31040	100nF 20% 50V 0603
2252	3198 017 31040	100nF 20% 50V 0603	2442	3198 017 34710	470pF 50V X7R 0603	2A04	2020 021 00215	220µF 20% 25V
2253	3198 017 31040	100nF 20% 50V 0603	2443	3198 017 31520	1.5nF 20% 50V 0603	2A08	2020 021 00215	220µF 20% 25V
2254	3198 017 31040	100nF 20% 50V 0603	2444	3198 017 34710	470pF 50V X7R 0603	2A09	3198 017 31040	100nF 20% 50V 0603
2255	3198 017 31040	100nF 20% 50V 0603	2445	3198 017 31040	100pF 10% 50V 0603	2A10	3198 017 31040	100nF 20% 50V 0603
2256	3198 017 31040	100nF 20% 50V 0603	2502	3198 017 33310	330pF 50V X7R 0603	2A11	2020 552 96807	1µF 10% 10V 0603
2257	3198 017 31040	100nF 20% 50V 0603	2506	3198 017 33310	330pF 50V X7R 0603	2A12	3198 016 32210	220pF 10% 50V 0603
2258	3198 017 31040	100nF 20% 50V 0603	2508	3198 017 33310	330pF 50V X7R 0603	2A13	3198 017 42240	220nF 16V Y5V 0603
2259	3198 017 31040	100nF 20% 50V 0603	2509					

2A29	3198 017 31040	100nF 20% 50V 0603	3271	3198 031 12290	4*22 Ohm 5% 1206	3521	3198 021 31020	1kΩ 5% 0.062W 0603
2A30	3198 017 31040	100nF 20% 50V 0603	3300	3198 021 31220	1.2kΩ 5% 0.062W 0603	3522	3198 021 36890	68Ω 5% 0.062W 0603
2A31	3198 016 31020	1nF 25V 0603	3303	3198 021 31010	100Ω 5% 0.062W 0603	3523	3198 021 31010	100Ω 5% 0.062W 0603
2A32	3198 016 31020	1nF 25V 0603	3305	3198 021 33320	3.3kΩ 5% 0.062W 0603	3524	3198 021 31590	15Ω 5% 0.062W 0603
2A33	3198 017 31040	100nF 20% 50V 0603	3308	3198 021 33320	3.3kΩ 5% 0.062W 0603	3525	3198 021 31020	1kΩ 5% 0.062W 0603
2A34	3198 017 31040	100nF 20% 50V 0603	3310	3198 021 31020	1kΩ 5% 0.062W 0603	3526	3198 021 37590	75Ω 5% 0603
2A35	3198 016 31020	1nF 25V 0603	3313	3198 021 33310	330Ω 5% 0.062W 0603	3528	3198 021 31010	100Ω 5% 0.062W 0603
2A36	3198 016 31020	1nF 25V 0603	3314	3198 021 31030	10kΩ 5% 0.062W 0603	3529	3198 021 31010	100Ω 5% 0.062W 0603
2A37	3198 017 42240	220nF 16V Y5V 0603	3315	3198 021 31010	100Ω 5% 0.062W 0603	3530	3198 021 37590	75Ω 5% 0603
2A38	3198 017 42240	220nF 16V Y5V 0603	3316	3198 021 31030	10kΩ 5% 0.062W 0603	3531	3198 021 37590	75Ω 5% 0603
2A40	2020 552 00247	470nF 10% 25V	3318	3198 021 31010	100Ω 5% 0.062W 0603	3532	3198 021 31020	1kΩ 5% 0.062W 0603
2A41	2020 552 96807	1μF 10% 10V 0603	3319	3198 021 31030	10kΩ 5% 0.062W 0603	3533	3198 021 37590	75Ω 5% 0603
2A45	3198 016 31020	1nF 25V 0603	3320	3198 021 31010	100Ω 5% 0.062W 0603	3535	3198 021 36890	68Ω 5% 0.062W 0603
2A46	3198 024 44730	47nF 50V 0603	3322	3198 021 31010	100Ω 5% 0.062W 0603	3536	3198 021 31020	1kΩ 5% 0.062W 0603
2A47	3198 024 44730	47nF 50V 0603	3323	3198 021 31010	100Ω 5% 0.062W 0603	3537	3198 021 31020	1kΩ 5% 0.062W 0603
2B10	3198 030 41010	100μF 20% 16V	3324	3198 021 33310	330Ω 5% 0.062W 0603	3538	3198 021 34720	4.7kΩ 5% 0603
2B11	3198 017 31030	10nF 20% 50V 0603	3325	3198 021 31030	10kΩ 5% 0.062W 0603	3540	3198 021 34720	4.7kΩ 5% 0603
2B12	2020 552 00211	22μF 10% 16V 1210	3329	3198 021 31010	100Ω 5% 0.062W 0603	3545	3198 021 31010	100Ω 5% 0.062W 0603
2B12	2020 552 00343	22μF 10% 16V	3336	3198 021 31010	100Ω 5% 0.062W 0603	3546	3198 021 37590	75Ω 5% 0603
2B13	2020 012 00003	470μF 16V 20% SMD	3338	3198 021 31010	100Ω 5% 0.062W 0603	3550	3198 021 32730	27kΩ 5% 0603
2B14	3198 017 32210	220pF 20% 50V 0603	3339	3198 021 31010	100Ω 5% 0.062W 0603	3551	3198 021 36820	6.8kΩ 5% 0.062W 0603
2B15	3198 017 32230	22nF 20% 25V 0603	3340	3198 021 31010	100Ω 5% 0.062W 0603	3552	3198 021 31010	100Ω 5% 0.062W 0603
2B17	3198 017 31040	100nF 20% 50V 0603	3341	3198 021 31010	100Ω 5% 0.062W 0603	3553	3198 021 37590	75Ω 5% 0603
2B18	3198 030 41090	10μF 20% 16V	3342	3198 021 31010	100Ω 5% 0.062W 0603	3554	3198 021 36890	68Ω 5% 0.062W 0603
2B19	3198 030 72290	22μF 20% 35V	3343	3198 021 31010	100Ω 5% 0.062W 0603	3555	3198 021 36890	68Ω 5% 0.062W 0603
2B20	3198 016 31010	100pF 10% 50V 0603	3345	3198 021 31010	100Ω 5% 0.062W 0603	3601	3198 021 37590	75Ω 5% 0603
2B21	3198 030 41090	10μF 20% 16V	3346	3198 021 31010	100Ω 5% 0.062W 0603	3603	3198 021 37590	75Ω 5% 0603
2B22	3198 030 74780	4u7 20% 35V	3347	3198 021 31030	10kΩ 5% 0.062W 0603	3605	3198 021 37590	75Ω 5% 0603
2B24	3198 030 44790	47μF 20% 16V SMD	3348	3198 021 34790	47Ω 5% 0603	3607	3198 021 31510	150Ω 5% 0.062W 0603
2B25	3198 017 31040	100nF 20% 50V 0603	3349	3198 021 31030	10kΩ 5% 0.062W 0603	3608	3198 021 33330	33kΩ 5% 0.062W 0603
2C55	3198 017 31020	1nF 20% 50V 0603	3350	3198 021 31030	10kΩ 5% 0.062W 0603	3611	3198 021 31510	150Ω 5% 0.062W 0603
2C56	3198 017 31020	1nF 20% 50V 0603	3351	3198 021 33320	3.3kΩ 5% 0.062W 0603	3612	3198 021 33330	33kΩ 5% 0.062W 0603
2C57	3198 017 31020	1nF 20% 50V 0603	3352	3198 021 33320	3.3kΩ 5% 0.062W 0603	3617	3198 021 31010	100Ω 5% 0.062W 0603
2L24	3198 017 32240	220nF 20% 10V 0603	3353	3198 021 31030	10kΩ 5% 0.062W 0603	3618	3198 021 31010	100Ω 5% 0.062W 0603
2L25	3198 017 32240	220nF 20% 10V 0603	3354	3198 021 31010	100Ω 5% 0.062W 0603	3619	3198 021 31010	100Ω 5% 0.062W 0603
			3355	3198 021 31010	100Ω 5% 0.062W 0603	3801	3198 021 34730	47kΩ 5% 0603
			3356	3198 021 31010	100Ω 5% 0.062W 0603	3802	3198 021 34730	47kΩ 5% 0603
			3357	3198 021 31010	100Ω 5% 0.062W 0603	3803	3198 021 31080	1Ω 5% 0603
			3361	3198 021 31010	100Ω 5% 0.062W 0603	3804	3198 021 31080	1Ω 5% 0603
			3364	3198 021 31010	100Ω 5% 0.062W 0603	3805	3198 021 32210	220Ω 5% 0603
			3365	3198 021 31010	100Ω 5% 0.062W 0603	3806	3198 021 32210	220Ω 5% 0603
			3366	3198 021 31030	10kΩ 5% 0.062W 0603	3807	3198 031 13390	4 x 33Ω 5% 1206
			3368	3198 021 31010	100Ω 5% 0.062W 0603	3809	3198 021 31030	10kΩ 5% 0.062W 0603
			3370	3198 021 31010	100Ω 5% 0.062W 0603	3810	3198 021 34720	4.7kΩ 5% 0603
			3372	3198 021 34720	4.7kΩ 5% 0603	3811	3198 021 34720	4.7kΩ 5% 0603
			3373	3198 021 31010	100Ω 5% 0.062W 0603	3815	3198 021 31050	1MΩ 5% 0603
			3375	3198 021 34720	4.7kΩ 5% 0603	3819	3198 021 33390	33Ω 5% 0.062W 0603
			3377	3198 021 33320	3.3kΩ 5% 0.062W 0603	3828	3198 021 34720	4.7kΩ 5% 0603
			3378	3198 021 31010	100Ω 5% 0.062W 0603	3830	3198 021 34720	4.7kΩ 5% 0603
			3379	3198 021 33320	3.3kΩ 5% 0.062W 0603	3831	3198 021 34730	47kΩ 5% 0603
			3380	3198 021 31010	100Ω 5% 0.062W 0603	3832	3198 021 34730	47kΩ 5% 0603
			3381	3198 021 32290	22Ω 5% 0603	3833	3198 021 34720	4.7kΩ 5% 0603
			3382	3198 021 31010	100Ω 5% 0.062W 0603	3834	3198 021 34720	4.7kΩ 5% 0603
			3383	3198 021 34730	47kΩ 5% 0603	3835	3198 021 33390	33Ω 5% 0.062W 0603
			3384	3198 021 32290	22Ω 5% 0603	3846	3198 021 34720	4.7kΩ 5% 0603
			3385	3198 021 34730	47kΩ 5% 0603	3850	3198 021 31030	10kΩ 5% 0.062W 0603
			3386	3198 021 31010	100Ω 5% 0.062W 0603	3851	3198 031 13390	4 x 33Ω 5% 1206
			3387	3198 021 31010	100Ω 5% 0.062W 0603	3852	3198 031 13390	4 x 33Ω 5% 1206
			3388	3198 021 31010	100Ω 5% 0.062W 0603	3853	3198 031 13390	4 x 33Ω 5% 1206
			3389	3198 021 34790	47Ω 5% 0603	3854	3198 031 13390	4 x 33Ω 5% 1206
			3390	3198 021 34790	47Ω 5% 0603	3855	3198 031 13390	4 x 33Ω 5% 1206
			3391	3198 021 34790	47Ω 5% 0603	3856	3198 031 13390	4 x 33Ω 5% 1206
			3393	3198 021 31530	15kΩ 5% 0603	3857	3198 021 33390	33Ω 5% 0.062W 0603
			3394	3198 021 32230	22kΩ 5% 0603	3858	3198 021 33390	33Ω 5% 0.062W 0603
			3395	3198 021 31520	1.5kΩ 5% 0.062W 0603	3859	3198 021 33390	33Ω 5% 0.062W 0603
			3396	3198 021 31020	1kΩ 5% 0.062W 0603	3860	3198 021 33390	33Ω 5% 0.062W 0603
			3397	3198 021 34730	47kΩ 5% 0603	3862	3198 021 31020	1kΩ 5% 0.062W 0603
			3398	3198 021 31040	100kΩ 5% 0.062W 0603	3863	3198 021 32220	2.2kΩ 5% 0603
			3399	3198 021 31030	10kΩ 5% 0.062W 0603	3864	3198 021 31010	100Ω 5% 0.062W 0603
			3402	2120 108 94132	1Ω 1206	3877	3198 021 32220	2.2kΩ 5% 0603
			3402	2322 750 61008	1Ω 5% 1206 Fuse	3880	3198 021 31020	1kΩ 5% 0.062W 0603
			3410	3198 021 31010	100Ω 5% 0.062W 0603	3881	3198 021 32220	2.2kΩ 5% 0603
			3411	3198 021 31010	100Ω 5% 0.062W 0603	3882	3198 021 31010	100Ω 5% 0.062W 0603
			3417	3198 021 31010	100Ω 5% 0.062W 0603	3883	3198 021 32220	2.2kΩ 5% 0603
			3418	3198 021 31010	100Ω 5% 0.062W 0603	3896	3198 021 31010	100Ω 5% 0.062W 0603
			3419	3198 021 31010	100Ω 5% 0.062W 0603	3897	3198 021 31010	100Ω 5% 0.062W 0603
			3420	3198 021 31010	100Ω 5% 0.062W 0603	3901	3198 021 34730	47kΩ 5% 0603
			3500	3198 021 31510	150Ω 5% 0.062W 0603	3902	2322 702 60124	120k Ohm 5% 0603
			3502	3198 021 31510	150Ω 5% 0.062W 0603	3904	3198 021 33390	33Ω 5% 0.062W 0603
			3503	3198 021 31510	150Ω 5% 0.062W 0603	3905	3198 021 34730	47kΩ 5% 0603
			3506	3198 021 31510	150Ω 5% 0.062W 0603	3906	3198 021 31040	100kΩ 5% 0.062W 0603
			3507	3198 021 31510	150Ω 5% 0.062W 0603	3907	3198 021 31040	100kΩ 5% 0.062W 0603
			3508	3198 021 33330	33kΩ 5% 0.062W 0603	3908	2322 702 60124	120k Ohm 5% 0603
			3510	3198 021 31510	150Ω 5% 0.062W 0603	3910	3198 021 33390	33Ω 5% 0.062W 0603
			3511	3198 021 33330	33kΩ 5% 0.062W 0603	3911	3198 021 31030	10kΩ 5% 0.062W 0603
			3512	3198 021 31510	150Ω 5% 0.062W 0603	3912	3198 021 31030	10kΩ 5% 0.062W 0603
			3513	3198 021 33330	33kΩ 5% 0.062W 0603	3913	3198 021 31020	1kΩ 5% 0.062W 0603
			3514	3198 021 31510	150Ω 5% 0.062W 0603	3914	3198 021 31020	1kΩ 5% 0.062W 0603
			3515	3198 021 33330	33kΩ 5% 0.062W 0603	3915	3198 021 31020	1kΩ 5% 0.062W 0603
			3516	3198 021 31010	100Ω 5% 0.062W 0603	3916	3198 021 31020	1kΩ 5% 0.062W 0603
			3517	3198 021 37590	75Ω 5% 0603	3917	3198 021 31020	1kΩ 5% 0.062W 0603
			3518	3198 021 32730	27kΩ 5% 0603	3918	3198 021 31020	1kΩ 5% 0.062W 0603
			3519	3198 021 31590	15Ω 5% 0.062W 0603	3934	3198 021 34720	4.7kΩ 5% 0603
			3520	3198 021 36820	6.8kΩ 5% 0.062W 0603	3935	3198 021 34720	4.7kΩ 5% 0603

—WW—

3937	3198 021 31030	10kΩ 5% 0.062W 0603
3938	3198 021 31030	10kΩ 5% 0.062W 0603
3942	3198 021 31020	1kΩ 5% 0.062W 0603
3943	3198 021 31030	10kΩ 5% 0.062W 0603
3A01	2120 108 94133	R Fuse 10Ω
3A01	2322 750 61009	Fuse 10Ω 5% 1206
3A02	2120 108 94133	R Fuse 10Ω
3A02	2322 750 61009	Fuse 10Ω 5% 1206
3A03	3198 021 31030	10kΩ 5% 0.062W 0603
3A04	3198 021 31230	12kΩ 5% 0.062W 0603
3A05	2322 762 60229	22Ω 5% 1005
3A06	3198 021 31030	10kΩ 5% 0.062W 0603
3A07	3198 021 31030	10kΩ 5% 0.062W 0603
3A08	3198 021 31230	12kΩ 5% 0.062W 0603
3A09	3198 021 31090	10Ω 5% 0.062W 0603
3A11	3198 021 31030	10kΩ 5% 0.062W 0603
3A12	3198 021 31050	1MΩ 5% 0603
3A13	3198 021 33930	39kΩ 5% 0.062W 0605
3A14	2322 762 60229	22Ω 5% 1005
3A15	3198 021 31050	1MΩ 5% 0603
3A17	3198 021 31090	10Ω 5% 0.062W 0603
3A19	3198 021 31030	10kΩ 5% 0.062W 0603
3A26	3198 021 32230	22kΩ 5% 0603
3A27	3198 021 32240	220kΩ 5% 0603
3A28	3198 021 32240	220kΩ 5% 0603
3A29	3198 021 34730	47kΩ 5% 0603
3A30	3198 021 34730	47kΩ 5% 0603
3A31	3198 021 31030	10kΩ 5% 0.062W 0603
3B11	3198 021 34720	4.7kΩ 5% 0603
3B12	2322 704 64701	470 Ohm 1% 0603
3B13	3198 021 32210	220Ω 5% 0603
3B14	2322 704 61002	1kΩ 1%
3B15	3198 021 31020	1kΩ 5% 0.062W 0603
3B17	3198 021 36820	6.8kΩ 5% 0.062W 0603
3B18	3198 021 36820	6.8kΩ 5% 0.062W 0603
3B19	3198 021 31030	10kΩ 5% 0.062W 0603
3L01	3198 021 34720	4.7kΩ 5% 0603
3L02	3198 021 31010	100Ω 5% 0.062W 0603
3L04	3198 021 31520	1.5kΩ 5% 0.062W 0603
3L05	3198 021 31010	100Ω 5% 0.062W 0603
3L10	2120 108 94132	1Ω 1206
3L10	2322 750 61008	1Ω 5% 1206 Fuse
3L11	3198 021 31010	100Ω 5% 0.062W 0603
3L15	3198 021 33310	330Ω 5% 0.062W 0603
3L22	3198 021 90030	Jumper 0603
3L23	3198 021 90030	Jumper 0603
4110	3198 021 90030	Jumper 0603
4111	3198 021 90030	Jumper 0603
4112	3198 021 90030	Jumper 0603
4113	3198 021 90030	Jumper 0603
4114	3198 021 90030	Jumper 0603
4120	3198 021 90030	Jumper 0603
4121	3198 021 90030	Jumper 0603
4122	3198 021 90030	Jumper 0603
4123	3198 021 90030	Jumper 0603
4124	3198 021 90030	Jumper 0603
4204	3198 021 90030	Jumper 0603
4205	3198 021 90030	Jumper 0603
4206	3198 021 90030	Jumper 0603
4309	3198 021 90030	Jumper 0603
4310	3198 021 90030	Jumper 0603
4316	3198 021 90030	Jumper 0603
4401	3198 021 90030	Jumper 0603
4402	3198 021 90030	Jumper 0603
4403	3198 021 90030	Jumper 0603
4406	3198 021 90030	Jumper 0603
4407	3198 021 90030	Jumper 0603
4408	3198 021 90030	Jumper 0603
4411	3198 021 90030	Jumper 0603
4803	3198 021 90030	Jumper 0603
4901	3198 021 90030	Jumper 0603
4902	3198 021 90030	Jumper 0603
4903	3198 021 90030	Jumper 0603
4C55	3198 021 90030	Jumper 0603
4C56	3198 021 90030	Jumper 0603
4C61	3198 021 90030	Jumper 0603
4C62	3198 021 90030	Jumper 0603
4L20	3198 021 90030	Jumper 0603
4L21	3198 021 90030	Jumper 0603
4L24	3198 021 90030	Jumper 0603
4L25	3198 021 90030	Jumper 0603

5111	2422 536 01057	0.39μH 5% 0603
5112	2422 549 44197	Bead 220Ω at 100MHz
5114	2422 536 01521	10μH 10% 1207
5115	2422 536 01521	10μH 10% 1207
5118	2422 549 44197	Bead 220Ω at 100MHz
5210	2422 549 42979	100MHz 60Ω 0603
5212	2422 549 42979	100MHz 60Ω 0603
5213	2422 549 42979	100MHz 60Ω 0603
5214	2422 549 42979	100MHz 60Ω 0603

5215	2422 549 44197	Bead 220Ω at 100MHz
5216	2422 549 43276	100MHz 30Ω 0603
5216	2422 549 43769	Bead 30Ω at 100MHz
5217	2422 549 44197	Bead 220Ω at 100MHz
5218	2422 549 42979	100MHz 60Ω 0603
5219	2422 549 42979	100MHz 60Ω 0603
5220	2422 549 42979	100MHz 60Ω 0603
5221	2422 549 42979	100MHz 60Ω 0603
5222	2422 549 42979	100MHz 60Ω 0603
5223	2422 549 42979	100MHz 60Ω 0603
5224	2422 549 42979	100MHz 60Ω 0603
5225	2422 549 42979	100MHz 60Ω 0603
5226	2422 549 42979	100MHz 60Ω 0603
5227	2422 549 42979	100MHz 60Ω 0603
5228	2422 549 42979	100MHz 60Ω 0603
5301	2422 549 42979	100MHz 60Ω 0603
5302	2422 549 42979	100MHz 60Ω 0603
5304	2422 549 01397	Bead 220Ω at 100MHz
5401	3198 018 90030	120Ω 100MHz 0603
5402	3198 018 90030	120Ω 100MHz 0603
5403	3198 018 62290	22μH 5% 1008
5810	3198 018 90030	120Ω 100MHz 0603
5811	3198 018 90030	120Ω 100MHz 0603
5812	3198 018 90030	120Ω 100MHz 0603
5813	3198 018 90030	120Ω 100MHz 0603
5814	3198 018 90030	120Ω 100MHz 0603
5815	3198 018 90030	120Ω 100MHz 0603
5816	3198 018 90030	120Ω 100MHz 0603
5817	3198 018 90030	120Ω 100MHz 0603
5818	3198 018 90030	120Ω 100MHz 0603
5A03	2422 536 01564	22μH 20%
5A04	2422 536 01564	22μH 20%
5A05	3198 018 90060	Bead 30Ω at 100MHz
5A06	3198 018 90060	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	68μH 20%
5B10	2422 536 01495	22μH 10%
5B11	2422 536 01495	22μH 10%



6103	9322 107 37685	1SS356
6110	3198 010 10630	BAS316
6202	3198 020 55680	BZX384-C5V6
6301	3198 010 10630	BAS316
6306	3198 020 56880	BZX384-C6V8
6307	3198 020 56880	BZX384-C6V8
6318	9340 548 54115	PDZ6.2B
6511	9340 580 04115	PESD5V0S1BA
6512	9322 205 95685	1N4148WS-V
6513	9322 205 95685	1N4148WS-V
6517	9340 580 04115	PESD5V0S1BA
6801	3198 010 10660	BAT54
6802	3198 010 10660	BAT54
6830	3198 010 10660	BAT54
6831	3198 010 10660	BAT54
6914	3198 010 10660	BAT54
6916	3198 010 10630	BAS316
6919	3198 010 10630	BAS316
6B01	3198 010 10720	SS24
6B02	3198 020 53390	BZX384C33
6B03	3198 010 10620	BAV99



7109	3198 010 42030	BC847B
7113	9352 723 71118	TDA9886T/V4
7114	3198 010 42030	BC847B
7133	9322 104 47668	L78M05CDT
7202	9322 240 94671	SVP CX32-LF
7203	3198 010 42310	BC847BW
7204	9322 245 45668	SVP CX32-LF
7205	9322 245 45668	SVP CX32-LF
7206	3198 010 42310	BC847BW
7208	3198 010 44110	DTC114ET
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 36215	Pow FET SMBSH111
7320	9340 560 36235	BSH111
7321	9340 560 36215	Pow FET SMBSH111
7321	9340 560 36235	BSH111
7322	3198 010 44110	DTC114ET
7323	9322 246 85685	NL27WZ08USG

7410	9322 198 11685	L78L08ACU
7411	9322 243 36671	MSP4450P-VK-E8
7500	3198 010 42030	BC847B
7502	3198 010 42320	BC857BW
7503	3198 010 42030	BC847B
7504	3198 010 42320	BC857BW
7810	9352 668 39118	UDA1334ATS/N2
7811		For SW see item 0822
7812	9340 125 00215	BSN20
7813	9340 125 00215	BSN20
7814	3198 010 42310	BC847BW
7816	3198 010 42310	BC847BW
7817	9322 245 55671	SI19025CTU
7824	9340 125 00215	BSN20
7825	9340 125 00215	BSN20
7850		For SW see item 0821
7851	9340 125 00215	BSN20
7852	9340 125 00215	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 42118	TDA8932T/N1
7A05	3198 010 42320	BC857BW
7A06	3198 010 42310	BC847BW
7A07	3198 010 42310	BC847BW
7B01	9322 202 34668	LS973D
7B02	9322 119 88668	LD1117DT33C
7B03	9340 034 70215	2N7002
7B04	9322 175 62685	Cable 09P/220/09P
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	2422 026 04747	Socket phone 1p f
1304	2422 025 10655	Connector 11p m



2301	3198 016 34790	47pF 10% 50V 0603
2302	3198 016 34790	47pF 10% 50V 0603
2303	3198 016 32290	22pF 10% 50V 0603
2304	3198 016 34790	47pF 10% 50V 0603
2305	3198 016 31020	1nF 25V 0603
2306	3198 016 31020	1nF 25V 0603
2307	3198 017 32230	22nF 20% 25V 0603
2308	3198 017 32230	22nF 20% 25V 0603
2309	3198 017 31030	10nF 20% 50V 0603
2310	3198 017 31030	10nF 20% 50V 0603
2311	3198 016 36890	68pF 50V 0603
2313	3198 016 31020	1nF 25V 0603
2314	3198 016 31020	1nF 25V 0603



3301	3198 021 37590	75Ω 5% 0603
3302	3198 021 37590	75Ω 5% 0603
3303	3198 021 31090	10Ω 5% 0.062W 0603
3304	3198 021 31010	100Ω 5% 0.062W 0603
3305	3198 021 31090	10Ω 5% 0.062W 0603
3306	3198 021 31010	100Ω 5% 0.062W 0603
3308	3198 021 31510	150Ω 5% 0.062W 0603
3309	3198 021 33330	33kΩ 5% 0.062W 0603
3310	3198 021 31510	150Ω 5% 0.062W 0603
3311	3198 021 33330	33kΩ 5% 0.062W 0603
3312	3198 021 31030	10kΩ 5% 0.062W 0603
3313	3198 021 31030	10kΩ 5% 0.062W 0603
4308	3198 018 90030	120Ω 100MHz 0603
4309	3198 018 90030	120Ω 100MHz 0603



6301	9322 202 10685	DF3A6.8FUG
6302	9322 202 10685	DF3A6.8FUG
6303	9322 202 10685	DF3A6.8FUG
6304	9322 202 10685	DF3A6.8FUG

6305	9322 202 10685	DF3A6.8FUG
6306	9322 202 10685	DF3A6.8FUG
6307	9322 202 10685	DF3A6.8FUG

Keyboard & Control Panel [E]

Various

1011	2422 128 02742	Switch tact SKQNAB
1012	2422 128 02742	Switch tact SKQNAB
1013	2422 128 02742	Switch tact SKQNAB
1014	2422 128 02742	Switch tact SKQNAB
1015	2422 128 02742	Switch tact SKQNAB
1016	2422 128 02742	Switch tact SKQNAB
1M01	2422 025 10775	Connector 3p m



2001	3198 016 34710	470pF 10% 50V 0603
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3010	3198 021 33910	390Ω 5% 0.062W 0603
3011	3198 021 35610	560Ω 5% 0.062W 0603
3012	3198 021 31820	1.8kΩ 5% 0.062W 0603
3013	3198 021 31510	150Ω 5% 0.062W 0603
3014	3198 021 38210	820Ω 5% 0.062W 0603
3015	3198 021 90030	Jumper 0603
3016	3198 021 90030	Jumper 0603
3017	3198 021 90030	Jumper 0603
4001	3198 021 90030	Jumper 0603



6011	3198 020 53980	BZX384-C2V9
6012	3198 020 53980	BZX384-C2V9
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 18146	Connector 3p m Wh
1M20	2422 025 18151	Connector 7p m Wh



2001	2020 552 00134	22μF 20% 6.3V 0805
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3010	3198 021 33310	330Ω 5% 0.062W 0603
3011	3198 021 36820	6.8kΩ 5% 0.062W 0603
3012	3198 021 31230	12kΩ 5% 0.062W 0603
3013	3198 021 38210	820Ω 5% 0.062W 0603
3014	3198 021 31030	10kΩ 5% 0.062W 0603
3019	3198 021 31510	150Ω 5% 0.062W 0603
3020	3198 021 31510	150Ω 5% 0.062W 0603
4001	3198 021 90030	Jumper 0603
4002	3198 021 90030	Jumper 0603
4004	3198 021 90030	Jumper 0603
4005	3198 021 90030	Jumper 0603
4010	3198 021 90030	Jumper 0603
4012	3198 021 90030	Jumper 0603
4015	3198 021 90030	Jumper 0603
4017	3198 021 90030	Jumper 0603
4019	3198 021 90030	Jumper 0603



6010	9322 243 77676	LED L-174A2PBC
6011	9322 244 07676	LED L-174A2IT-TNB5-19
6012	3198 020 54780	BZX384-C4V7



7010	9322 243 06671	IR Receiver
7011	3198 010 42030	BC847B
7012	3198 010 42030	BC847B

Niks

Various

0050	3139 120 01971	WORDMARK NI 62X12
0121	3139 123 11761	MICROFIBER CLOTH (15 X 15)
0179	3139 124 68181	LENS ME7
0179	3139 124 71791	Lens
0259	3139 128 78181	SMALLWARE BAG STAND 32 ME7
0259	3139 128 78191	SCR BAG STAND 37-50 ME7
0259	3139 128 78201	SMALLWARE BAG STAND 32ME7/V
0259	3139 128 78641	SMALLWARE BAG STAND 26/V
0259	3139 128 78741	SCR BAG STAND 37-50 ME7 /V
0404	3111 254 30351	ADHESIVE FOAM 100X6X0.5
0410	3111 254 30371	ADHESIVE FOAM 293X6X0,5
0429	3139 123 23231	PANEL FOAM 8.0X15X45
0455	3139 123 23111	EMC FOAM -3106 -L160
0485	3139 123 22931	EMC FOAM 12.7X6.4 L:42MM
0485	3139 123 22941	EMC FOAM 12.7X12.7 L:42MM
0487	3139 123 11931	FOAM 40X20X10 MM
0570	2422 015 00193	SADDLEWIRENY66NT 11MM5 B
0571	2422 015 00192	SADDLEWIRENY66NT 17MM B
0572	2422 015 00192	SADDLEWIRENY66NT 17MM B
0572	2422 015 00193	SADDLEWIRENY66NT 11MM5 B
0575	2422 015 00193	SADDLEWIRENY66NT 11MM5 B
0581	2422 015 00192	SADDLEWIRENY66NT 17MM B
0581	2422 015 00193	SADDLEWIRENY66NT 11MM5 B
1085	3139 238 14161	PROD ASSY RC2023601/01 PKD
8191	2422 070 98259	Mains cord EU 2.5A 1.8m
8191	4622 001 50945	Mainscord 1.8mtr 2p
8192	2422 070 98251	Mains cord UK 2.5A 2m



3002	2138 101 13228	RST CRB CFR-12 A 2R2 PM5 A
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11. Revision List

Manual xxxx xxx xxxx.0

- First release.

Manual xxxx xxx xxxx.1

- All chapters: minor textual updates.
- All chapters updated with **PFL3312/10 models (so-called "Promo" sets).

Manual xxxx xxx xxxx.2

- All chapters: minor textual updates.
- Chapter 8: Tabel "Option Codes...." updated with **PFL ******S/60** models.
- Chapter 10: Parts List updated with **PFL ******S/60** models.