

Service  
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**Service**

# Service Manual

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# 1. Revision List

Manual xxxx xxx xxxx.0

- First release.

# 2. Technical Specifications and Connections

Index of this chapter:

[2.1 Technical Specifications](#)

[2.2 Directions for Use](#)

[2.3 Connections](#)

[2.4 Chassis Overview](#)

Notes:

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

## 2.1 Technical Specifications

For on-line product support please use the links in [Table 2-1](#). Here is product information available, as well as getting started, user manuals, frequently asked questions and software & drivers.

Table 2-1 Described Model numbers

CTN	Styling	Published in:
<a href="#">32PFL5604D/78</a>	P & S	3122 785 18700
<a href="#">42PFL5604D/78</a>	P & S	3122 785 18700
<a href="#">42PFL7404D/78</a>	Frame	3122 785 18700
<a href="#">47PFL5604D/78</a>	P & S	3122 785 18700
<a href="#">52PFL7404D/78</a>	Frame	3122 785 18700

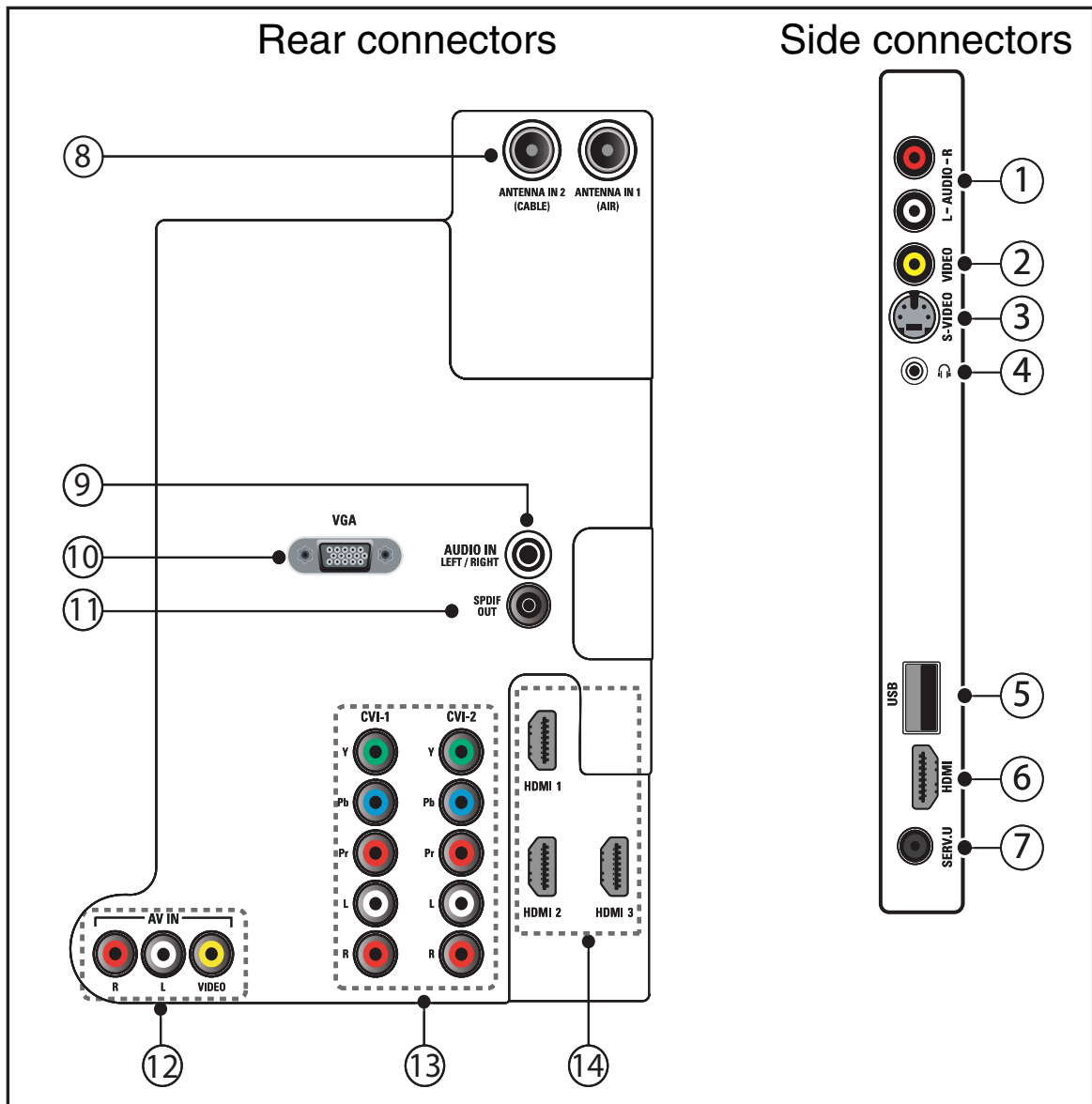
## 2.2 Directions for Use

You can download this information from the following websites:

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

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

2.3 Connections



18700\_001\_090828.eps  
090828

Figure 2-1 Connection overview

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

2.3.1 Side Connectors

**1 - Cinch: Audio - In**

Rd - Audio R	0.5 V <sub>RMS</sub> / 10 kΩ	⊕⊙
Wh - Audio L	0.5 V <sub>RMS</sub> / 10 kΩ	⊕⊙

**2 - Cinch: Video CVBS - In**

Ye - Video CVBS	1 V <sub>PP</sub> / 75 Ω	⊕⊙
-----------------	--------------------------	----

**3 - S-Video (Hosiden): Video Y/C - In**

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

**4 - Head phone (Output)**

Bk - Head phone	32 - 600 Ω / 10 mW	⊕⊕
-----------------	--------------------	----

**5 - USB2.0**

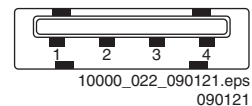


Figure 2-2 USB (type A)

1 - +5V	⊕⊕
2 - Data (-)	⊕⊙
3 - Data (+)	⊕⊙
4 - Ground	⊕⊕

**6 - HDMI: Digital Video, Digital Audio - In (see HDMI 1 & 2)**

**7 - Service Connector (UART)**

1 - Ground	Gnd	⊕⊕
2 - UART_TX	Transmit	⊕⊙
3 - UART_RX	Receive	⊕⊙

## 2.3.2 Rear Connectors

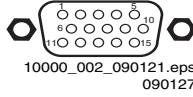
**8 - Aerial - In (Cable and Air)**- F-type Coax, 75  $\Omega$ **9 - Mini Jack: Audio - In**Wh - Audio L 0.5 V<sub>RMS</sub> / 10 k $\Omega$ Rd - Audio R 0.5 V<sub>RMS</sub> / 10 k $\Omega$ **10 - VGA: Video RGB - In**

Figure 2-3 VGA Connector

1	- Video Red	0.7 V <sub>PP</sub> / 75 $\Omega$	
2	- Video Green	0.7 V <sub>PP</sub> / 75 $\Omega$	
3	- Video Blue	0.7 V <sub>PP</sub> / 75 $\Omega$	
4	- n.c.		
5	- Ground	Gnd	
6	- Ground Red	Gnd	
7	- Ground Green	Gnd	
8	- Ground Blue	Gnd	
9	- +5V <sub>DC</sub>	+5 V	
10	- Ground Sync	Gnd	
11	- n.c.		
12	- DDC_SDA	DDC data	
13	- H-sync	0 - 5 V	
14	- V-sync	0 - 5 V	
15	- DDC_SCL	DDC clock	

**11 - Cinch: S/PDIF - Out**Bk - Coaxial 0.4 - 0.6V<sub>PP</sub> / 75 ohm**12 - Cinch: Video CVBS - In, Audio - In**Ye - Video CVBS 1 V<sub>PP</sub> / 75 ohmWh - Audio L 0.5 V<sub>RMS</sub> / 10 kohmRd - Audio R 0.5 V<sub>RMS</sub> / 10 kohm**13 - CVI-1 & 2: Cinch: Video YPbPr - In, Audio - In**Gn - Video Y 1 V<sub>PP</sub> / 75  $\Omega$ Bu - Video Pb 0.7 V<sub>PP</sub> / 75  $\Omega$ Rd - Video Pr 0.7 V<sub>PP</sub> / 75  $\Omega$ Wh - Audio - L 0.5 V<sub>RMS</sub> / 10 k $\Omega$ Rd - Audio - R 0.5 V<sub>RMS</sub> / 10 k $\Omega$ **14 - HDMI 1, 2, and 3: Digital Video, Digital Audio - In**

Figure 2-4 HDMI (type A) connector

1	- D2+	Data channel	
2	- Shield	Gnd	
3	- D2-	Data channel	
4	- D1+	Data channel	
5	- Shield	Gnd	
6	- D1-	Data channel	
7	- D0+	Data channel	
8	- Shield	Gnd	
9	- D0-	Data channel	
10	- CLK+	Data channel	
11	- Shield	Gnd	
12	- CLK-	Data channel	
13	- Easylink/CEC	Control channel	
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	

## 2.4 Chassis Overview

Refer to chapter [9. Block Diagrams](#) for PWB/CBA locations.

## 3. Precautions, Notes, and Abbreviation List

### Index of this chapter:

[3.1 Safety Instructions](#)

[3.2 Warnings](#)

[3.3 Notes](#)

[3.4 Abbreviation List](#)

### 3.1 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 MΩ and 12 MΩ.
  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.

### 3.2 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.
- 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.

### 3.3 Notes

#### 3.3.1 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 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.

#### 3.3.2 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 kΩ).
- Resistor values with no multiplier may be indicated with either an “E” or an “R” (e.g. 220E or 220R indicates 220 Ω).
- 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 on the Philips Spare Parts Web Portal.

#### 3.3.3 Spare Parts

For the latest spare part overview, consult your Philips Spare Part web portal.

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

##### Introduction

For more information on how to handle BGA devices, visit this URL: <http://www.atyourservice-magazine.com>. 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. Where applicable and available, this profile is added to the IC Data Sheet information section in this manual.

#### 3.3.5 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. 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.

#### 3.3.6 Alternative BOM identification

It should be noted that on the European Service website, “Alternative BOM” is referred to as “Design variant”.

The **third digit** in the serial number (example: AG2B033500001) 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: AG1B033500001), then the TV set has been manufactured according to B.O.M. number 1. If the third digit is a "2" (example: AG2B033500001), 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.



10000\_024\_090121.eps  
100105

Figure 3-1 Serial number (example)

### 3.3.7 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!

### 3.3.8 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.

## 3.4 Abbreviation List

O/6/12	SCART switch control signal on A/V board. 0 = loop through (AUX to TV), 6 = play 16 : 9 format, 12 = play 4 : 3 format
AARA	Automatic Aspect Ratio Adaptation: algorithm that adapts aspect ratio to remove horizontal black bars; keeps 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
AP	Asia Pacific
AR	Aspect Ratio: 4 by 3 or 16 by 9
ASF	Auto Screen Fit: algorithm that adapts aspect ratio to remove horizontal black bars without discarding video information
ATSC	Advanced Television Systems Committee, the digital TV standard in the USA
ATV	See Auto TV
Auto TV	A hardware and software control system that measures picture content, and adapts image parameters in a dynamic way
AV	External Audio Video
AVC	Audio Video Controller
AVIP	Audio Video Input Processor
B/G	Monochrome TV system. Sound carrier distance is 5.5 MHz
BDS	Business Display Solutions (iTV)
BLR	Board-Level Repair
BTSC	Broadcast Television Standard Committee. Multiplex FM stereo sound system, originating from the USA and used e.g. in LATAM and AP-NTSC countries
B-TXT	Blue TeleteXT
C	Centre channel (audio)
CEC	Consumer Electronics Control bus: remote control bus on HDMI connections
CL	Constant Level: audio output to connect with an external amplifier
CLR	Component Level Repair
ComPair	Computer aided rePair
CP	Connected Planet / Copy Protection
CSM	Customer Service Mode
CTI	Color Transient Improvement: manipulates steepness of chroma transients
CVBS	Composite Video Blanking and Synchronization
DAC	Digital to Analogue Converter
DBE	Dynamic Bass Enhancement: extra low frequency amplification
DCM	Data Communication Module. Also referred to as System Card or Smartcard (for iTV).
DDC	See "E-DDC"
D/K	Monochrome TV system. Sound carrier distance is 6.5 MHz
DFI	Dynamic Frame Insertion

DFU	Directions For Use: owner's manual		SDI), is a digitized video format used for broadcast grade video.
DMR	Digital Media Reader: card reader		Uncompressed digital component or digital composite signals can be used.
DMSD	Digital Multi Standard Decoding		The SDI signal is self-synchronizing, uses 8 bit or 10 bit data words, and has a maximum data rate of 270 Mbit/s, with a minimum bandwidth of 135 MHz.
DNM	Digital Natural Motion		
DNR	Digital Noise Reduction: noise reduction feature of the set		
DRAM	Dynamic RAM		
DRM	Digital Rights Management		
DSP	Digital Signal Processing		
DST	Dealer Service Tool: special remote control designed for service technicians	ITV	Institutional TeleVision; TV sets for hotels, hospitals etc.
DTCP	Digital Transmission Content Protection; A protocol for protecting digital audio/video content that is traversing a high speed serial bus, such as IEEE-1394	LS	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 customer's preferences
DVB-C	Digital Video Broadcast - Cable	LATAM	Latin America
DVB-T	Digital Video Broadcast - Terrestrial	LCD	Liquid Crystal Display
DVD	Digital Versatile Disc	LED	Light Emitting Diode
DVI(-d)	Digital Visual Interface (d= digital only)	L/L'	Monochrome TV system. Sound carrier distance is 6.5 MHz. L' is Band I, L is all bands except for Band I
E-DDC	Enhanced Display Data Channel (VESA standard for communication channel and display). Using E-DDC, the video source can read the EDID information from the display.	LPL	LG.Philips LCD (supplier)
EDID	Extended Display Identification Data (VESA standard)	LS	Loudspeaker
EEPROM	Electrically Erasable and Programmable Read Only Memory	LVDS	Low Voltage Differential Signalling
EMI	Electro Magnetic Interference	Mbps	Mega bits per second
EPG	Electronic Program Guide	M/N	Monochrome TV system. Sound carrier distance is 4.5 MHz
EPLD	Erasable Programmable Logic Device	MHEG	Part of a set of international standards related to the presentation of multimedia information, standardised by the Multimedia and Hypermedia Experts Group. It is commonly used as a language to describe interactive television services
EU	Europe		
EXT	EXTERNAL (source), entering the set by SCART or by cinches (jacks)		
FDS	Full Dual Screen (same as FDW)	MIPS	Microprocessor without Interlocked Pipeline-Stages; A RISC-based microprocessor
FDW	Full Dual Window (same as FDS)		
FLASH	FLASH memory		
FM	Field Memory or Frequency Modulation	MOP	Matrix Output Processor
FPGA	Field-Programmable Gate Array	MOSFET	Metal Oxide Silicon Field Effect Transistor, switching device
FTV	Flat TeleVision	MPEG	Motion Pictures Experts Group
Gb/s	Giga bits per second	MPIF	Multi Platform InterFace
G-TXT	Green TeleteXT	MUTE	MUTE Line
H	H_sync to the module	MTV	Mainstream TV: TV-mode with Consumer TV features enabled (iTV)
HD	High Definition		
HDD	Hard Disk Drive	NC	Not Connected
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.	NICAM	Near Instantaneous Compounded Audio Multiplexing. This is a digital sound system, mainly used in Europe.
HDMI	High Definition Multimedia Interface	NTC	Negative Temperature Coefficient, non-linear resistor
HP	HeadPhone	NTSC	National Television Standard Committee. Color system mainly used in North America and Japan. Color carrier NTSC M/N= 3.579545 MHz, NTSC 4.43= 4.433619 MHz (this is a VCR norm, it is not transmitted off-air)
I	Monochrome TV system. Sound carrier distance is 6.0 MHz	NVM	Non-Volatile Memory: IC containing TV related data such as alignments
I <sup>2</sup> C	Inter IC bus	O/C	Open Circuit
I <sup>2</sup> D	Inter IC Data bus	OSD	On Screen Display
I <sup>2</sup> S	Inter IC Sound bus	OAD	Over the Air Download. Method of software upgrade via RF transmission. Upgrade software is broadcasted in TS with TV channels.
IF	Intermediate Frequency	OTC	On screen display Teletext and Control; also called Artistic (SAA5800)
IR	Infra Red		
IRQ	Interrupt Request	P50	Project 50: communication protocol between TV and peripherals
ITU-656	The ITU Radio communication Sector (ITU-R) is a standards body subcommittee of the International Telecommunication Union relating to radio communication. ITU-656 (a.k.a.	PAL	Phase Alternating Line. Color system mainly used in West Europe (color carrier= 4.433619 MHz) and South America (color carrier PAL M=

	3.575612 MHz and PAL N= 3.582056 MHz)	SVHS	Super Video Home System
PCB	Printed Circuit Board (same as "PWB")	SW	Software
PCM	Pulse Code Modulation	SWAN	Spatial temporal Weighted Averaging Noise reduction
PDP	Plasma Display Panel	SXGA	1280 × 1024
PFC	Power Factor Corrector (or Pre-conditioner)	TFT	Thin Film Transistor
PIP	Picture In Picture	THD	Total Harmonic Distortion
PLL	Phase Locked Loop. Used for e.g. FST tuning systems. The customer can give directly the desired frequency	TMDS	Transmission Minimized Differential Signalling
POD	Point Of Deployment: a removable CAM module, implementing the CA system for a host (e.g. a TV-set)	TS	Transport Stream
POR	Power On Reset, signal to reset the uP	TXT	Teletext
PSDL	Power Supply for Direct view LED backlight with 2D-dimming	TXT-DW	Dual Window with Teletext
PSL	Power Supply with integrated LED drivers	UI	User Interface
PSLS	Power Supply with integrated LED drivers with added Scanning functionality	uP	Microprocessor
PTC	Positive Temperature Coefficient, non-linear resistor	UXGA	1600 × 1200 (4:3)
PWB	Printed Wiring Board (same as "PCB")	V	V-sync to the module
PWM	Pulse Width Modulation	VESA	Video Electronics Standards Association
QRC	Quasi Resonant Converter	VGA	640 × 480 (4:3)
QTNR	Quality Temporal Noise Reduction	VL	Variable Level out: processed audio output toward external amplifier
QVCP	Quality Video Composition Processor	VSB	Vestigial Side Band; modulation method
RAM	Random Access Memory	WYSIWYR	What You See Is What You Record: record selection that follows main picture and sound
RGB	Red, Green, and Blue. The primary color signals for TV. By mixing levels of R, G, and B, all colors (Y/C) are reproduced.	WXGA	1280 × 768 (15:9)
RC	Remote Control	XTAL	Quartz crystal
RC5 / RC6	Signal protocol from the remote control receiver	XGA	1024 × 768 (4:3)
RESET	RESET signal	Y	Luminance signal
ROM	Read Only Memory	Y/C	Luminance (Y) and Chrominance (C) signal
RSDS	Reduced Swing Differential Signalling data interface	YPbPr	Component video. Luminance and scaled color difference signals (B-Y and R-Y)
R-TXT	Red Teletext	YUV	Component video
SAM	Service Alignment Mode		
S/C	Short Circuit		
SCART	Syndicat des Constructeurs d'Appareils Radiorécepteurs et Téléviseurs		
SCL	Serial Clock I <sup>2</sup> C		
SCL-F	CLock Signal on Fast I <sup>2</sup> C bus		
SD	Standard Definition		
SDA	Serial Data I <sup>2</sup> C		
SDA-F	DAta Signal on Fast I <sup>2</sup> C bus		
SDI	Serial Digital Interface, see "ITU-656"		
SDRAM	Synchronous DRAM		
SECAM	SEquence Couleur Avec Mémoire. Color system mainly used in France and East Europe. Color carriers= 4.406250 MHz and 4.250000 MHz		
SIF	Sound Intermediate Frequency		
SMPS	Switched Mode Power Supply		
SoC	System on Chip		
SOG	Sync On Green		
SOPS	Self Oscillating Power Supply		
SPI	Serial Peripheral Interface bus; a 4-wire synchronous serial data link standard		
S/PDIF	Sony Philips Digital InterFace		
SRAM	Static RAM		
SRP	Service Reference Protocol		
SSB	Small Signal Board		
SSC	Spread Spectrum Clocking, used to reduce the effects of EMI		
STB	Set Top Box		
STBY	STand-BY		
SVGA	800 × 600 (4:3)		



# 4. Mechanical Instructions

**Index of this chapter:**

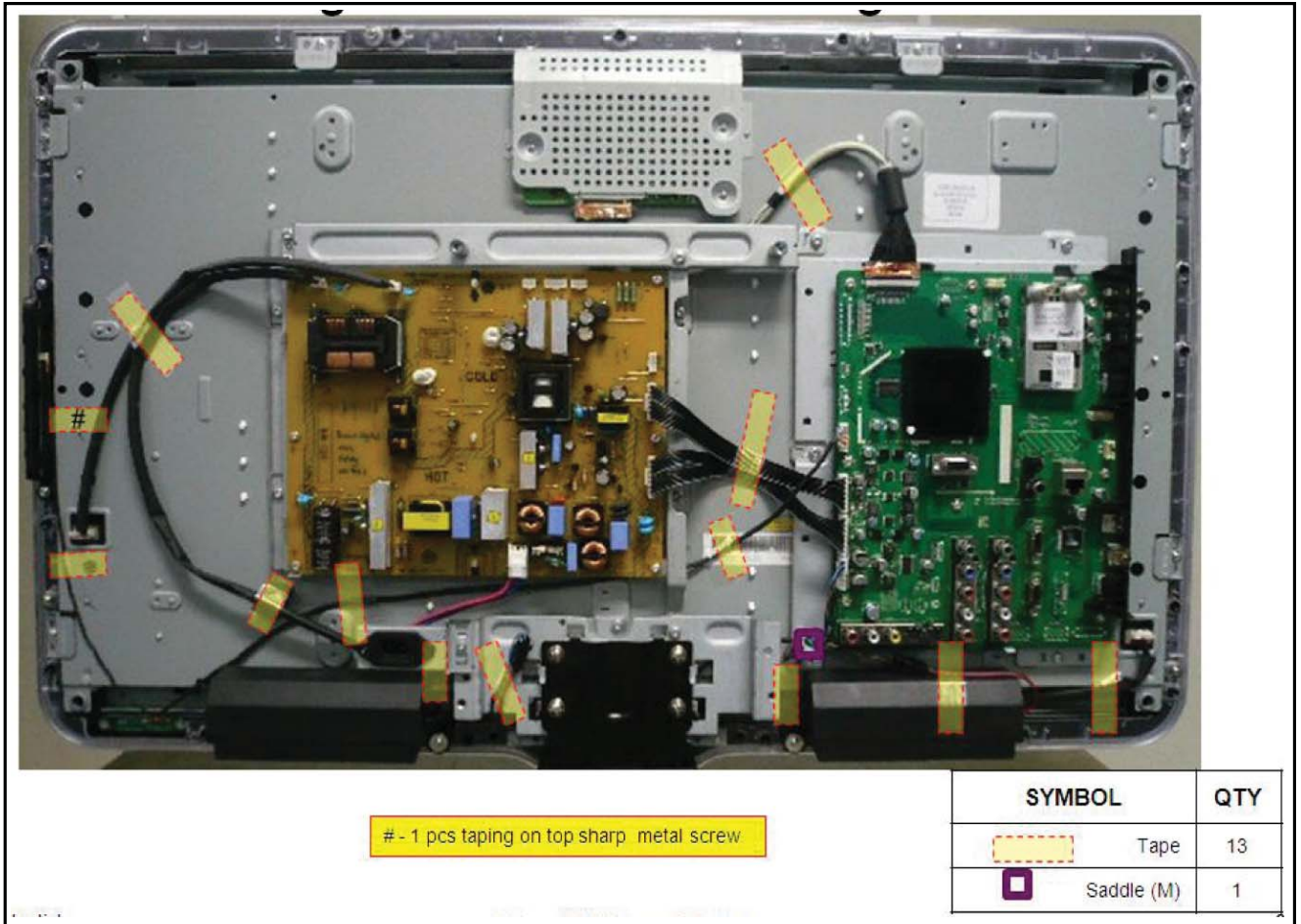
- [4.1 Cable Dressing](#)
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- [4.3 Assy/Panel Removal](#)
- [4.4 Set Re-assembly](#)

**Notes:**

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

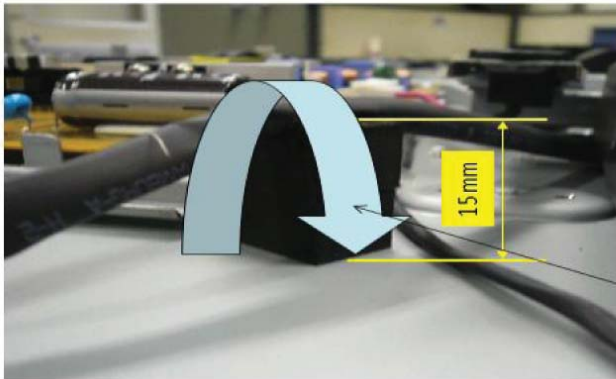
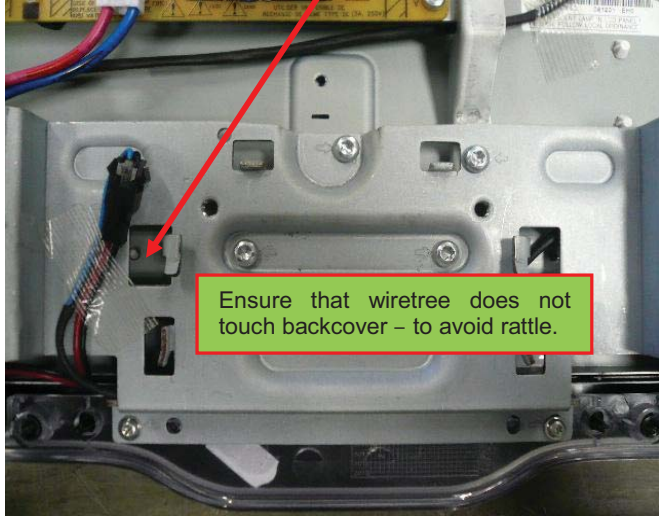
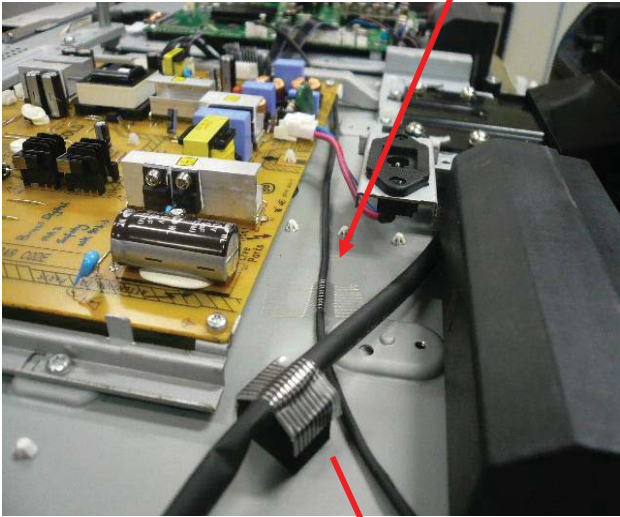
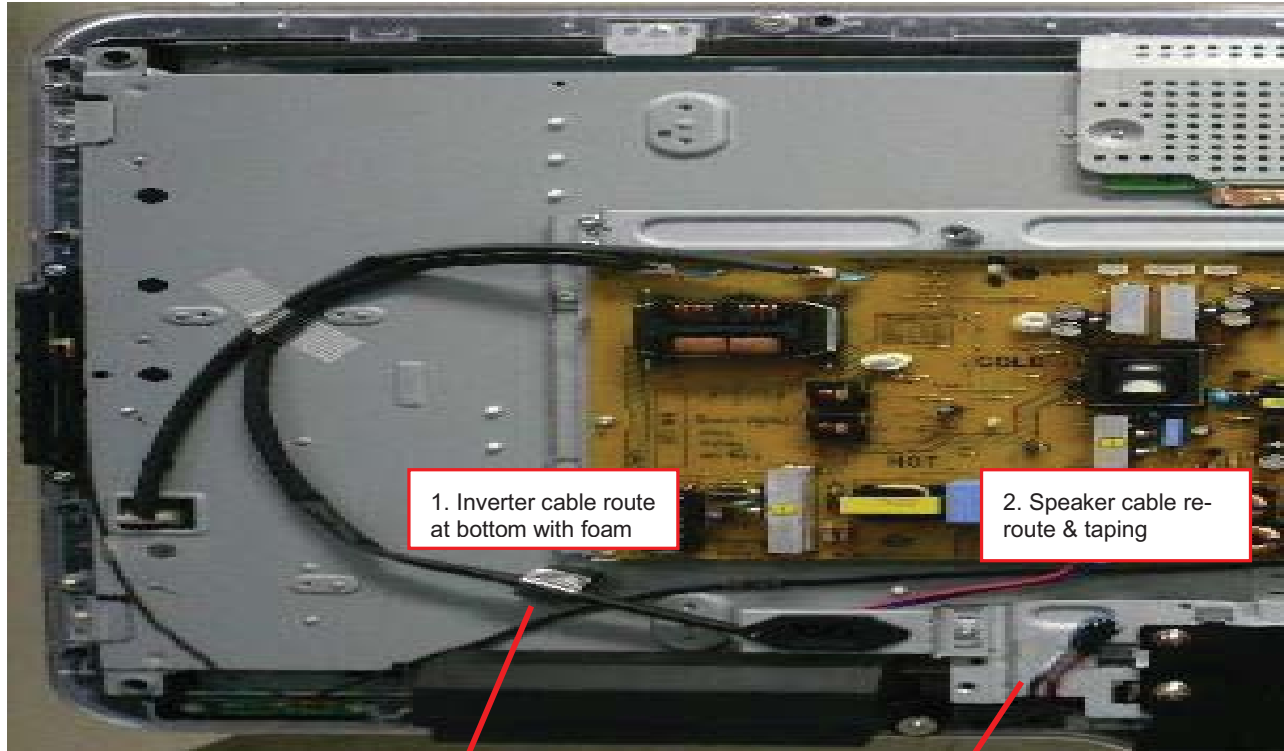
## 4.1 Cable Dressing

### 4.1.1 32PFL5604D/78

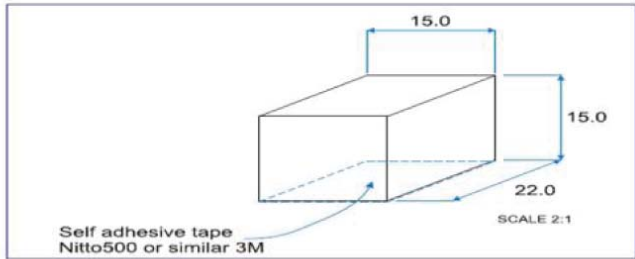


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Figure 4-1 General overview 32PFL5604D/78

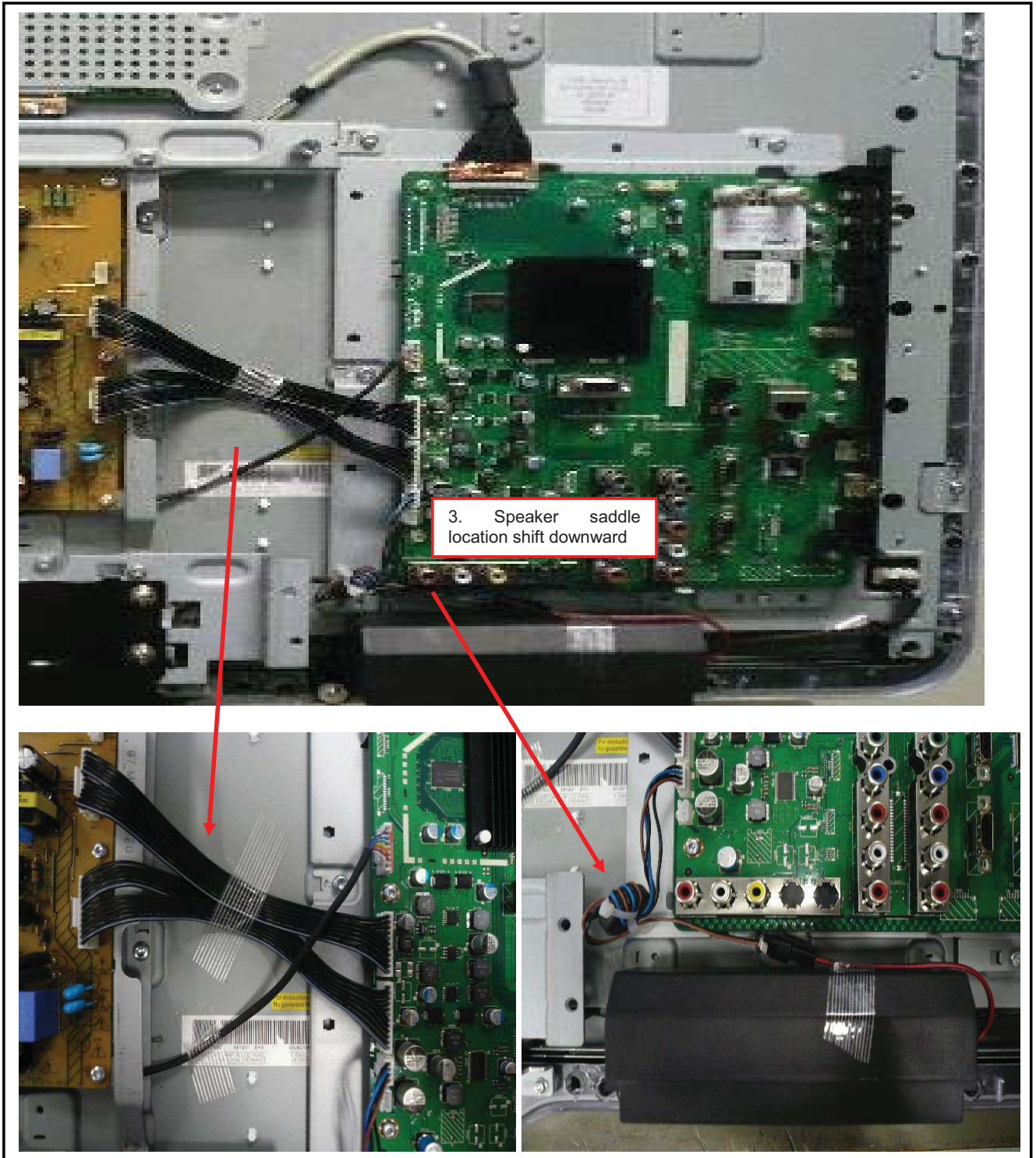


**FOAM BLOCK EVA 22X15X15 mm**  
Local part number: 3106 104 30711



Propose to use only **1x foam block** 15mm height. And add 1x tape to avoid the cable slip down.

Figure 4-2 PSU section 32PFL5604D/78

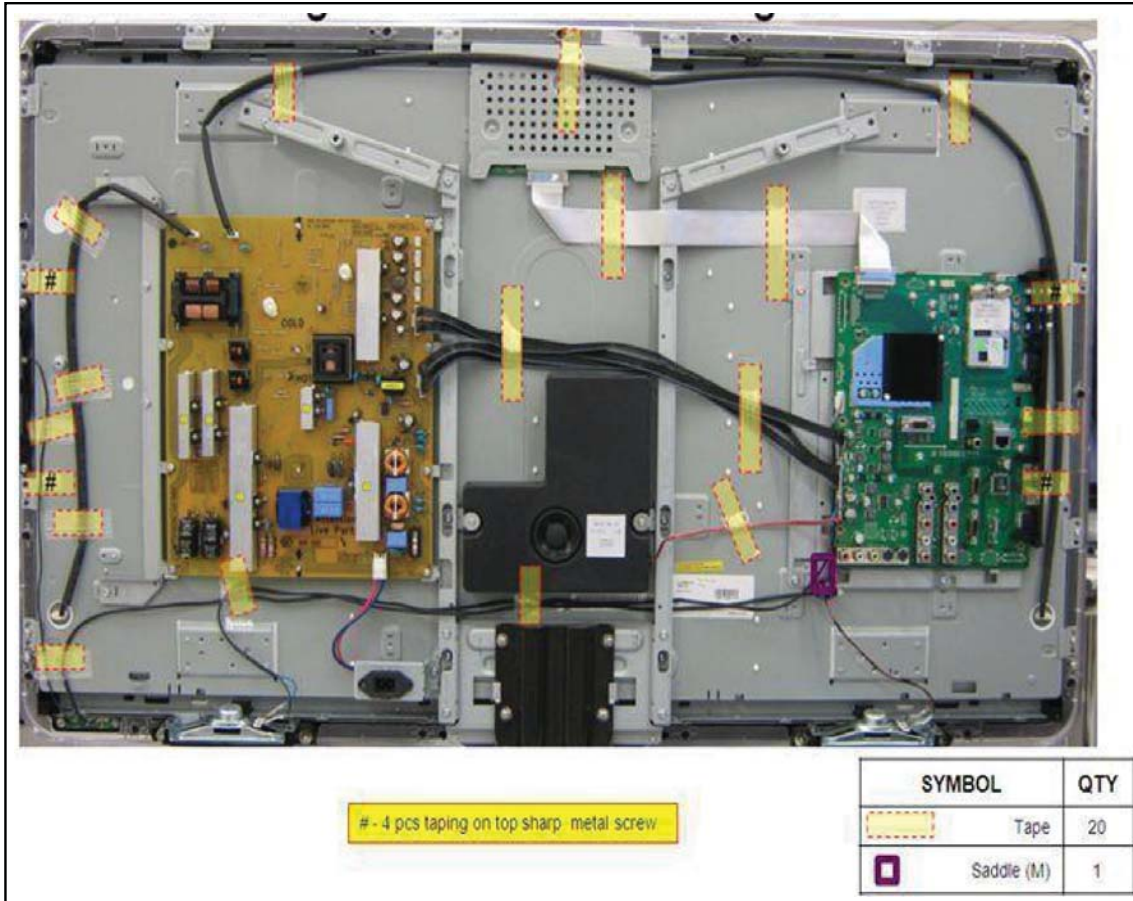


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Figure 4-3 SSB section 32PFL5604D/78

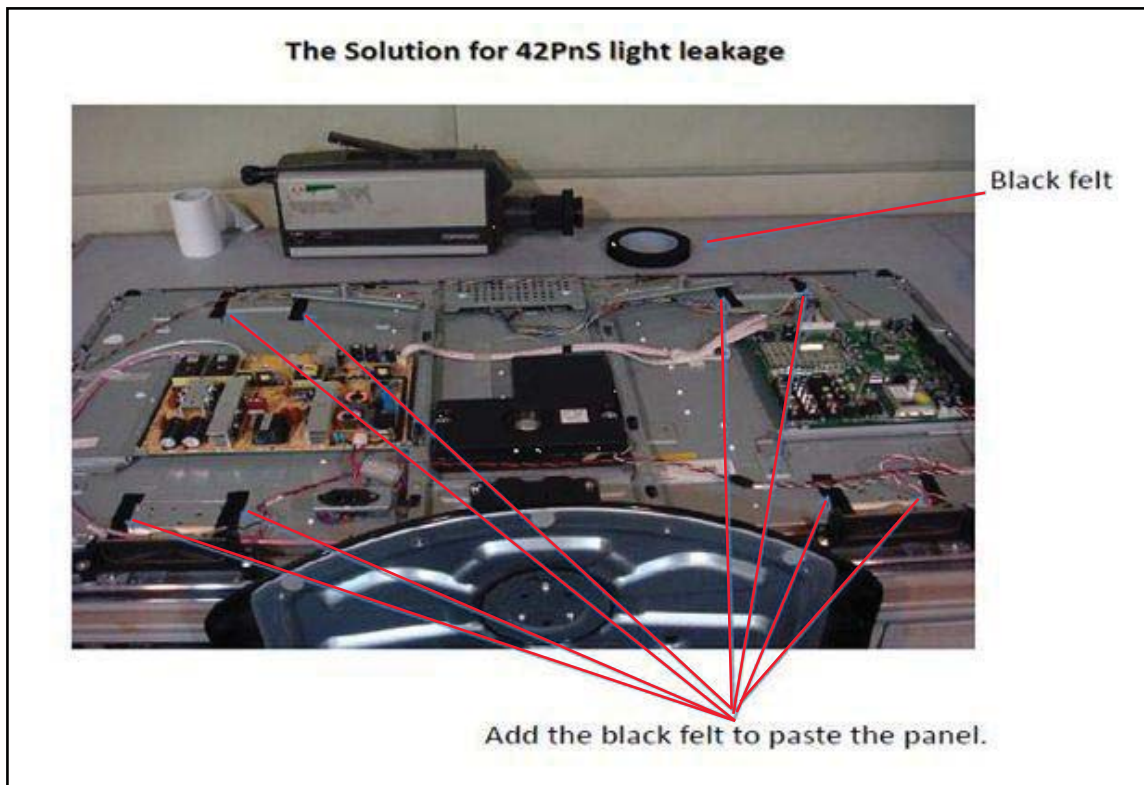


4.1.2 42PFL5604D/78



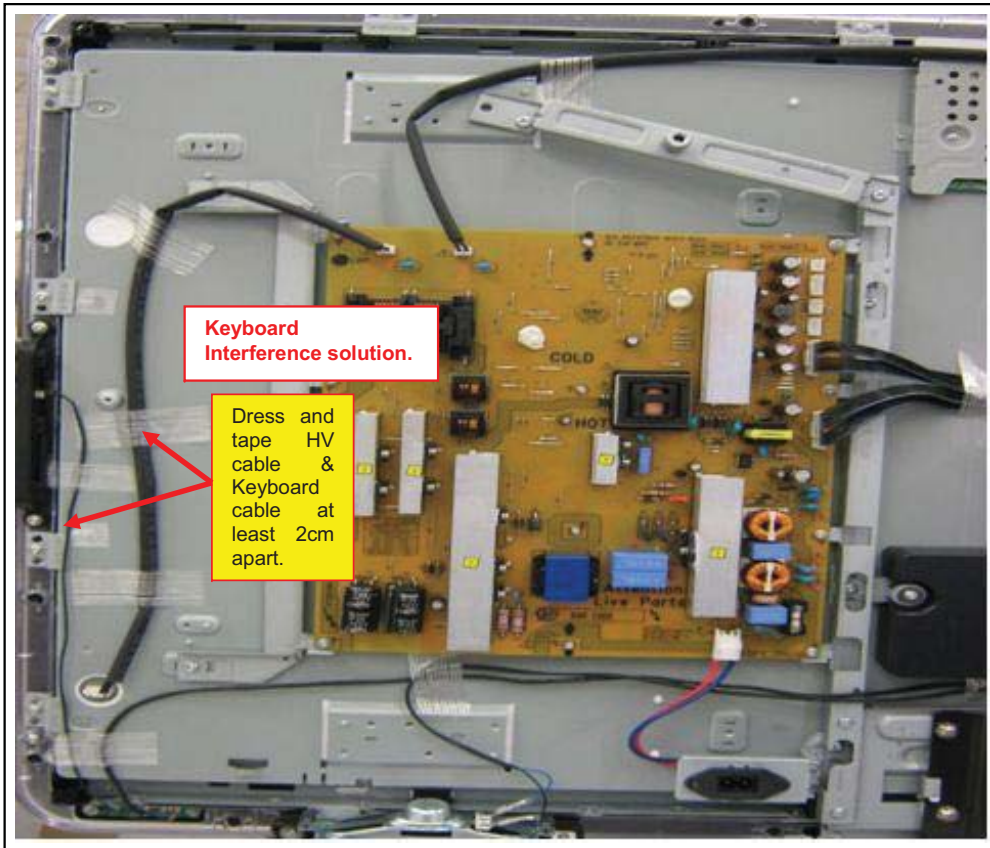
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Figure 4-4 General overview 42PFL5604D/78



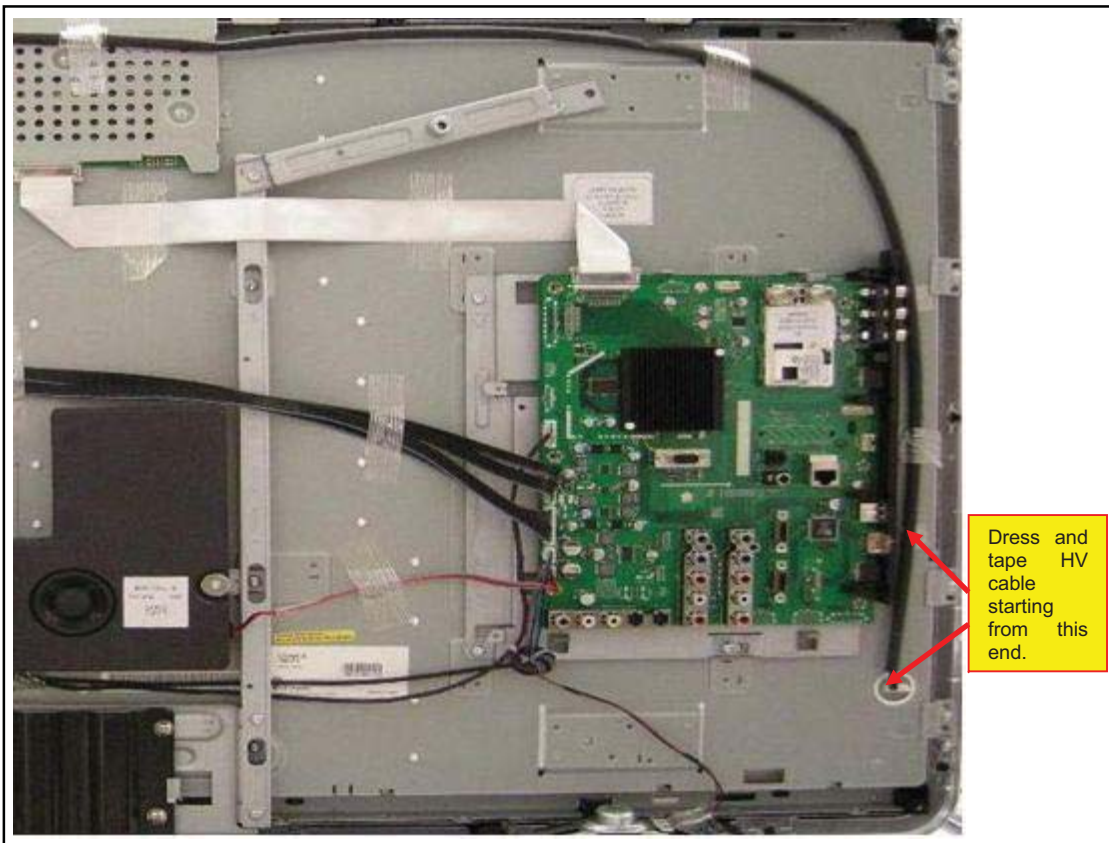
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Figure 4-5 Light leakage taping 42PFL5604D/78



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Figure 4-6 PSU section 42PFL5604D/78

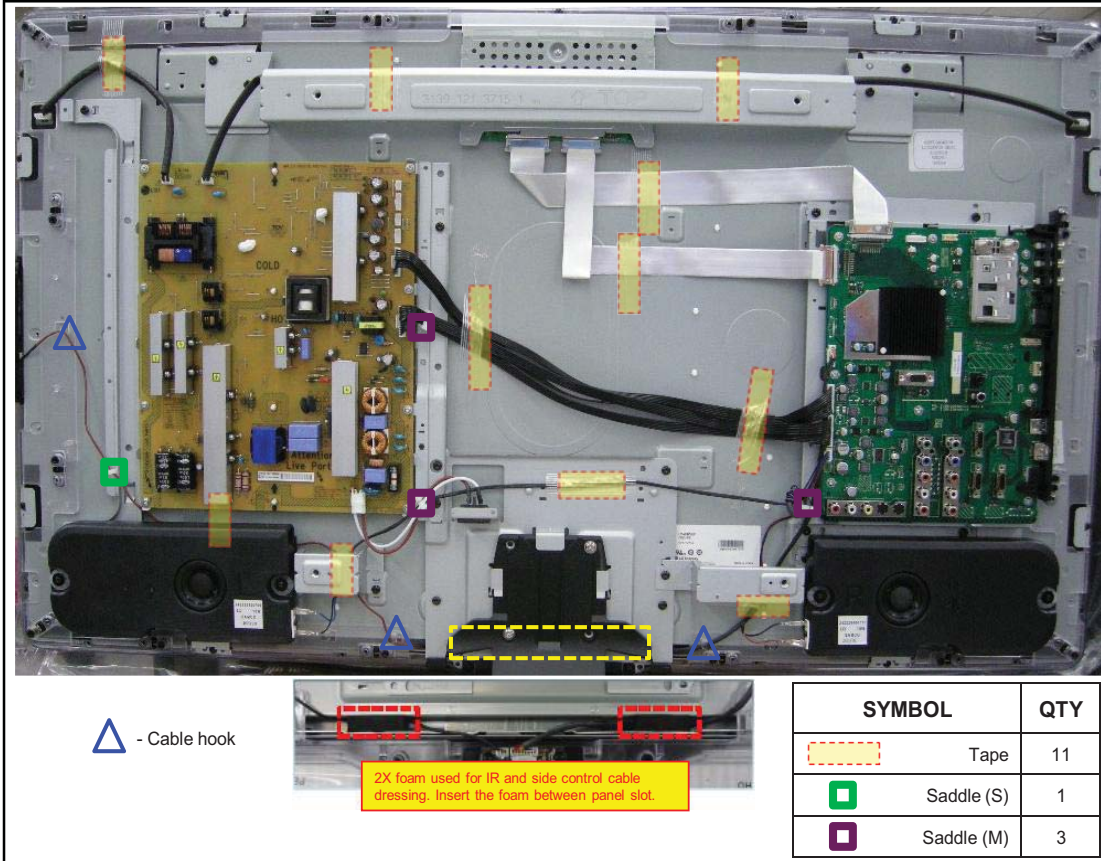


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Figure 4-7 SSB section 42PFL5604D/78

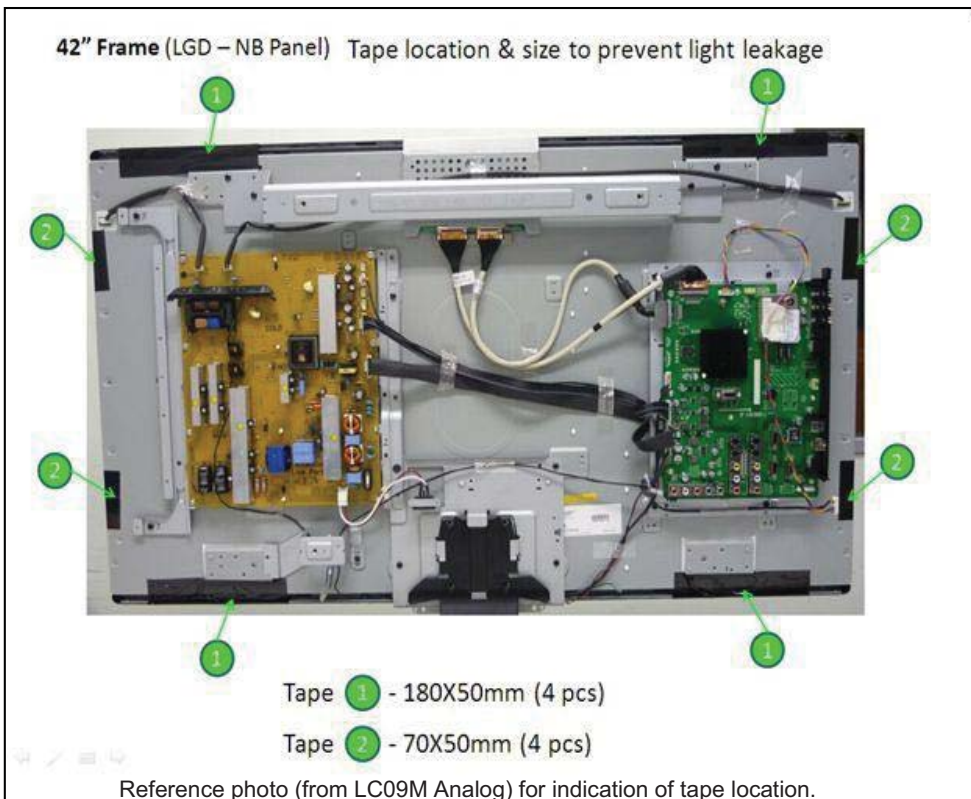


4.1.3 42PFL7404D/78



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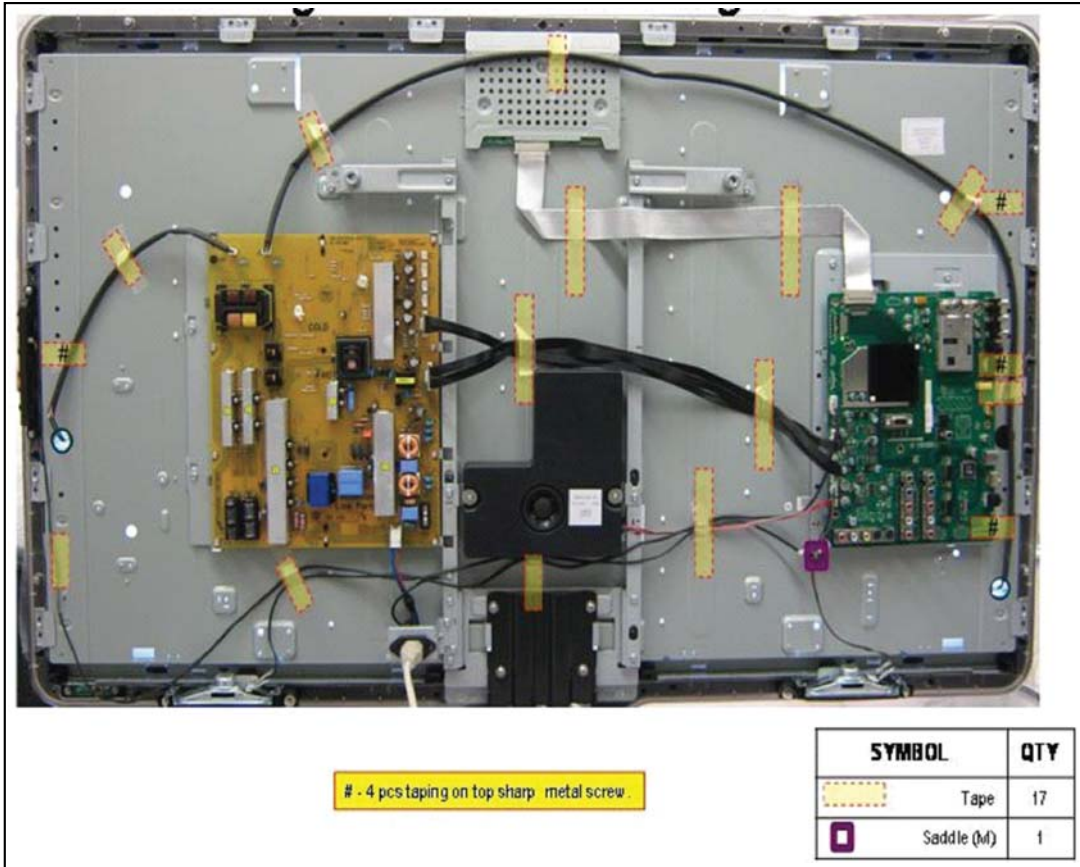
Figure 4-8 General overview 42PFL7404D/78



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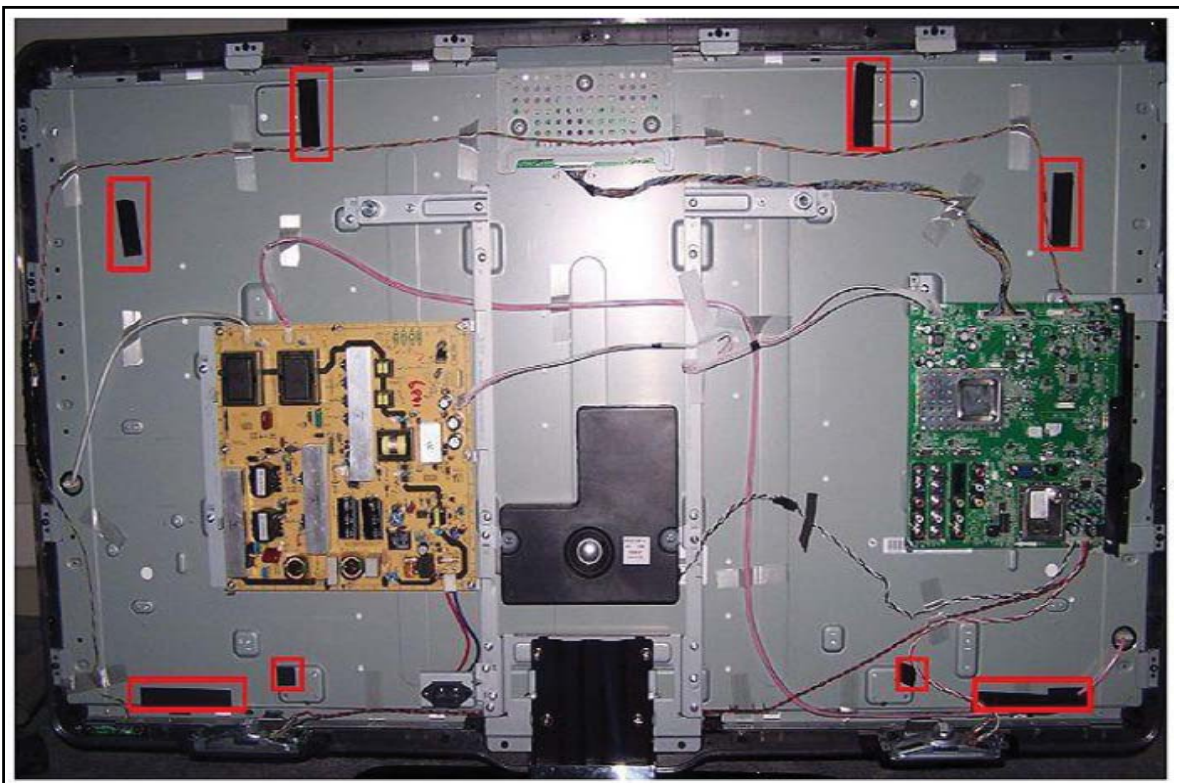
Figure 4-9 Light leakage taping 42PFL7404D/78

4.1.4 47PFL5604D/78



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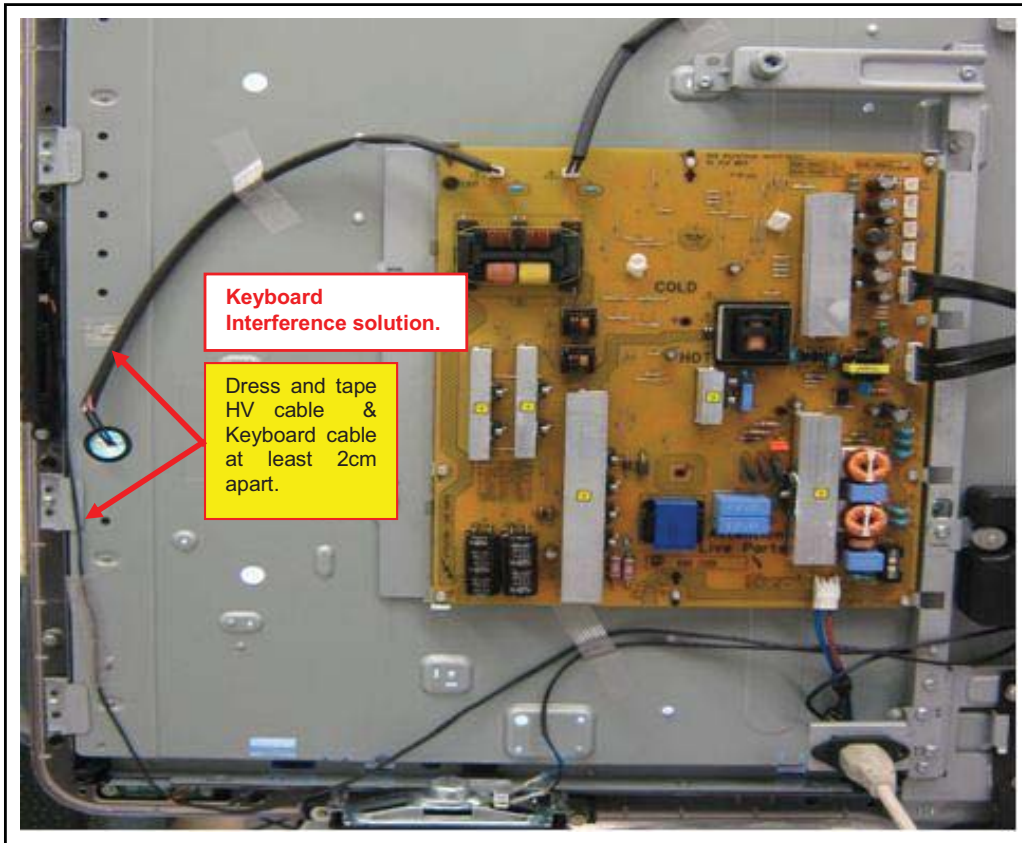
Figure 4-10 General overview 47PFL5604D/78



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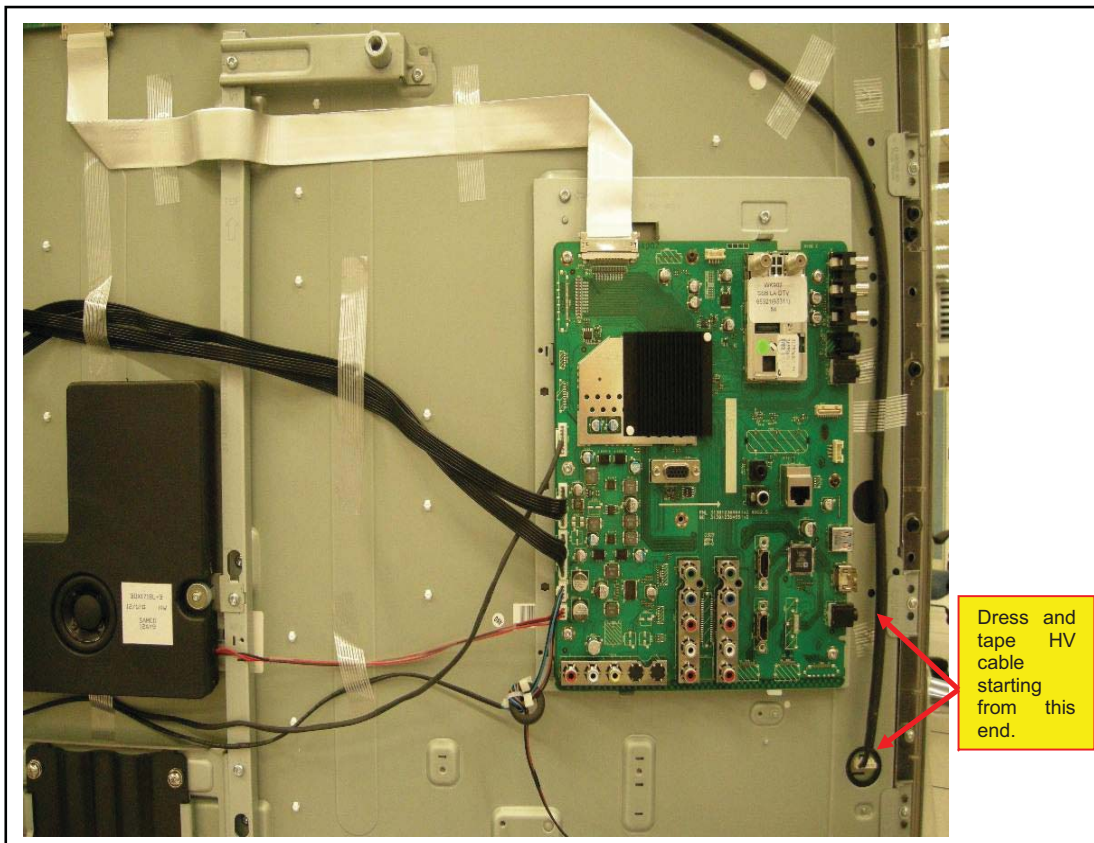
Figure 4-11 Light leakage taping 42PFL7404D/78





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Figure 4-12 PSU section 47PFL5604D/78

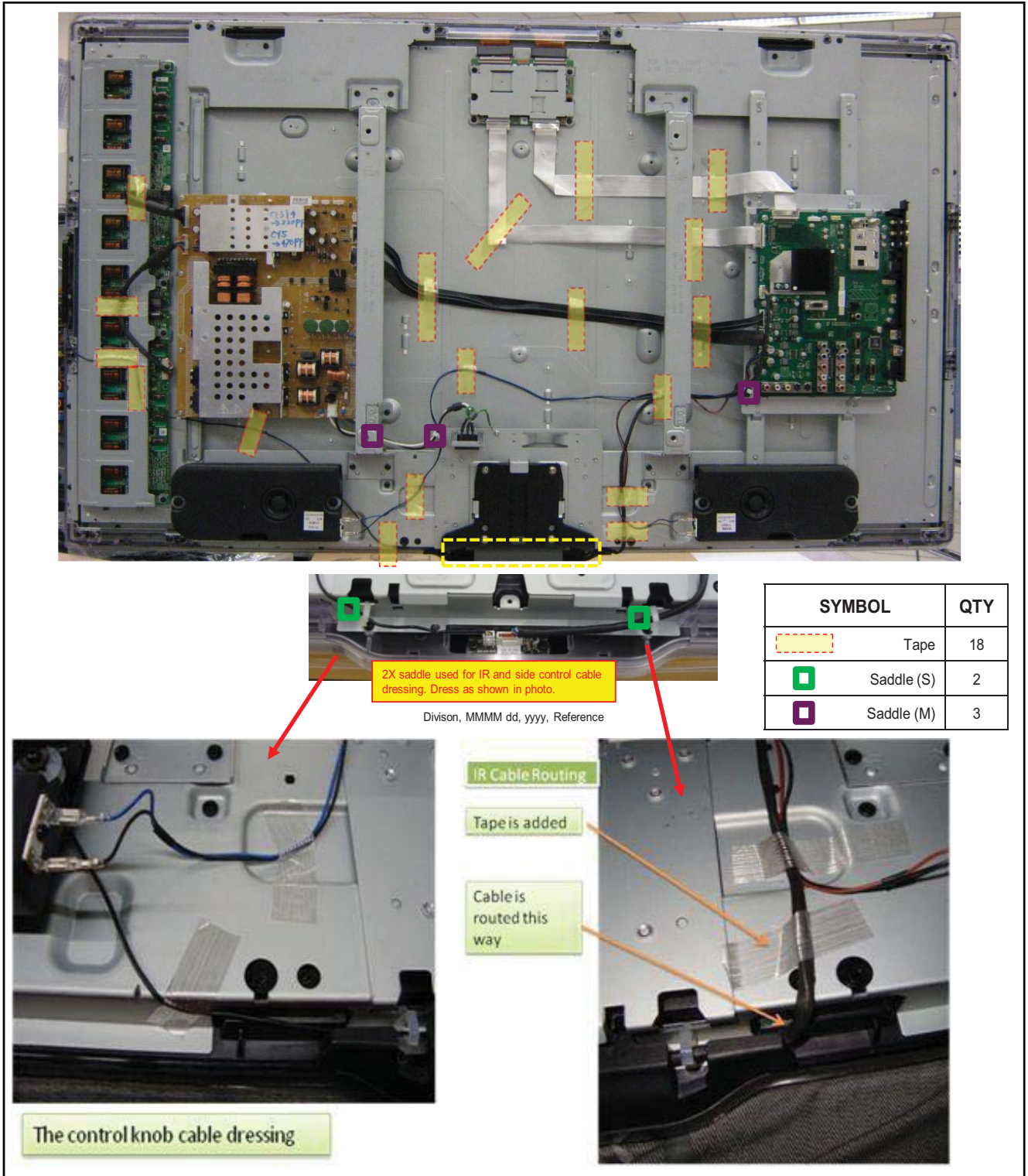


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Figure 4-13 SSB section 47PFL5604D/78

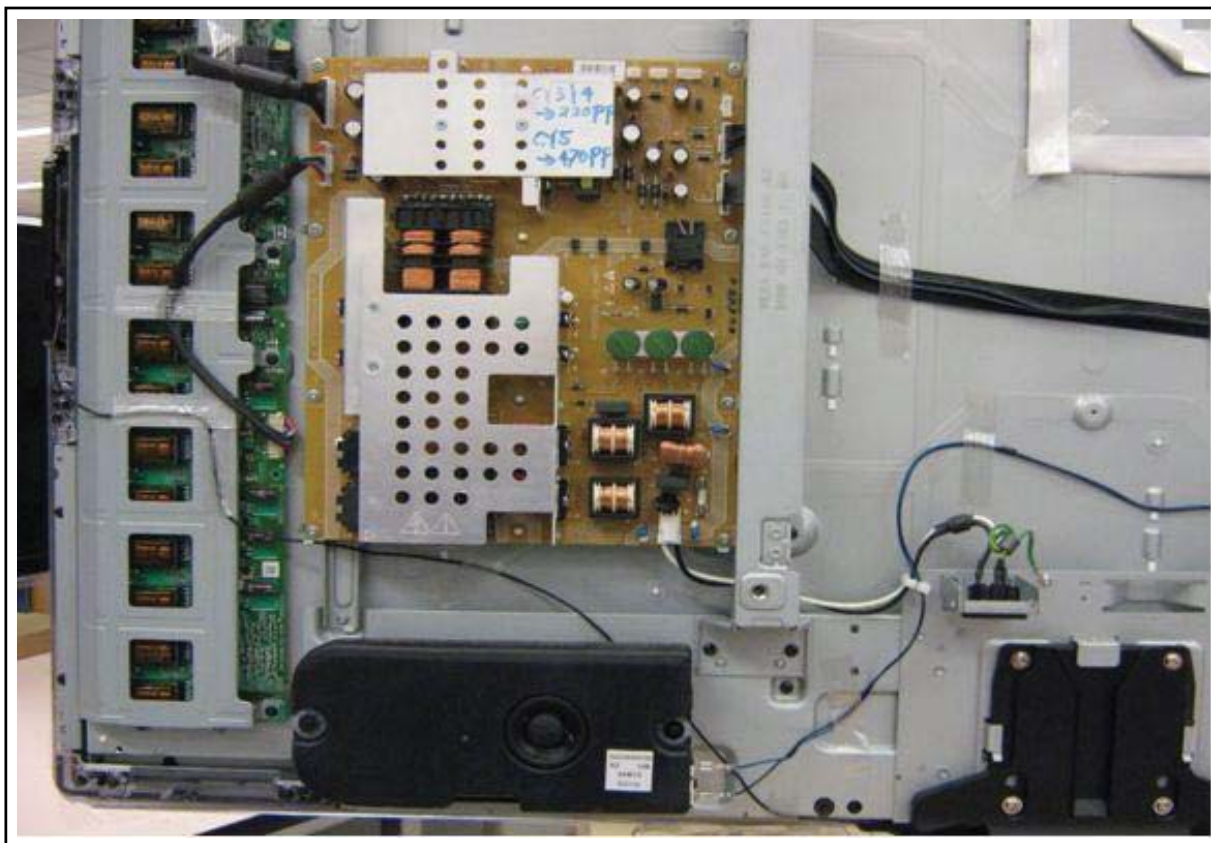


4.1.5 52PFL7404D/78



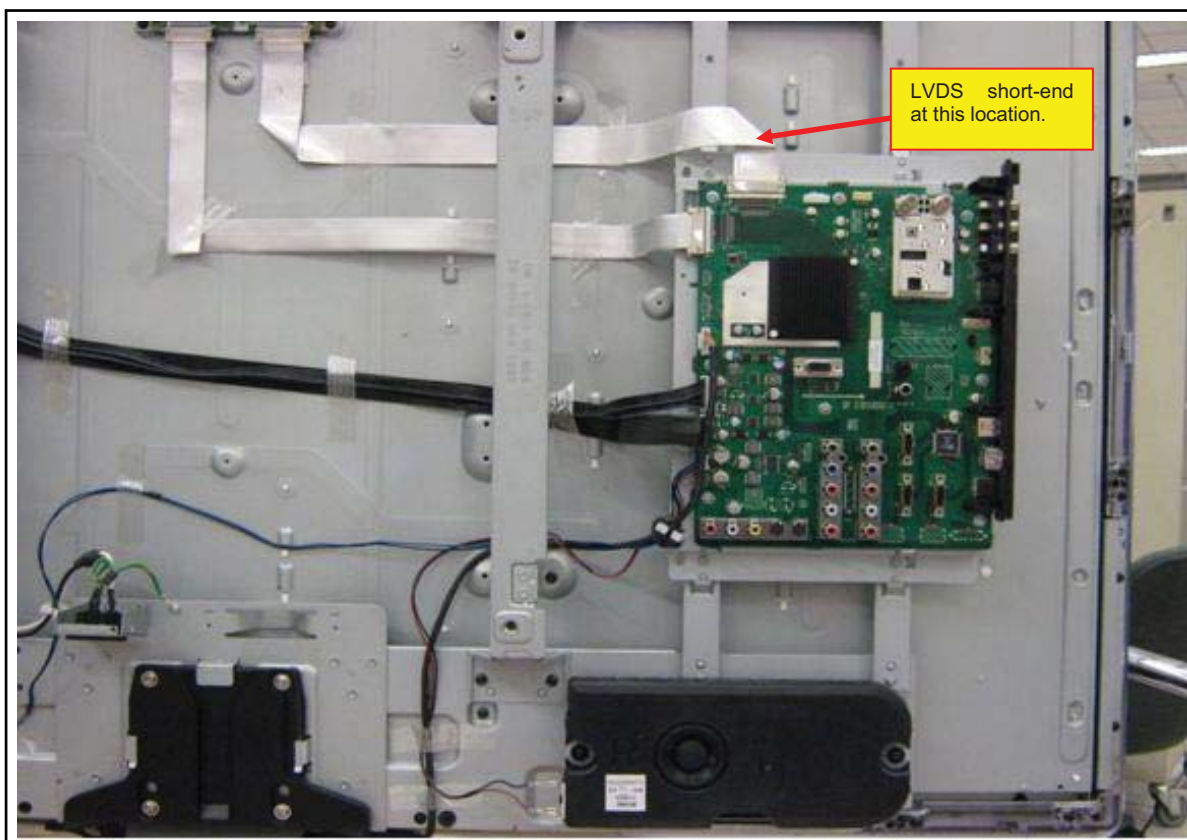
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Figure 4-14 General overview 52PFL7404D/78



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Figure 4-15 PSU section 52PFL7404D/78



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090824

Figure 4-16 SSB section 52PFL7404D/78

## 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).

### 4.2.1 Foam Bars

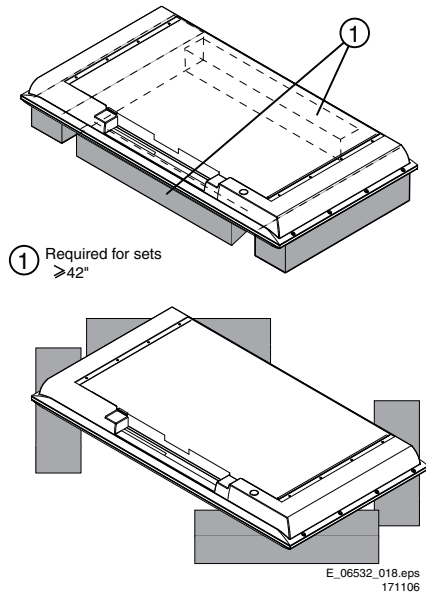


Figure 4-17 Foam bars

The foam bars (order code 3122 785 90580 for two pieces) can be used for all types and sizes of Flat TVs. See [Figure 4-17](#) 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.

## 4.3 Assy/Panel Removal

### 4.3.1 Rear Cover

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

**Note:** it is **not** necessary to remove the stand while removing the rear cover.

1. Remove all screws of the rear cover.
2. Lift the rear cover from the TV. Make sure that wires and flat coils are not damaged while lifting the rear cover from the set.

### 4.3.2 Speakers

Each speaker unit is mounted with two screws. If necessary, a sticker on the unit indicates if it is the right ("R") or left ("L") box, seen from the backside of the set, and sometimes an arrow points to the bottom of the set.

When defective, replace the whole unit.

### 4.3.3 Subwoofer (if present)

Remove the screws and take out the unit. Be careful to use the original screw and washer when re-assembling.

When defective, replace the whole unit.

### 4.3.4 IR & LED Board

1. Unplug all connectors.
  2. Remove the fixation screws.
  3. Take the board out.
- When defective, replace the whole unit.

### 4.3.5 Key Board Control Panel

4. Remove the fixation screws.
  5. Unplug the key board connector.
  6. Take the unit out.
- When defective, replace the whole unit.

### 4.3.6 Main Supply Panel

1. Unplug all connectors.
  2. Remove the fixation screws.
  3. Take the board out.
- When defective, replace the whole unit.

### 4.3.7 Small Signal Board (SSB)

**Caution:** It is mandatory to remount screws at their original position during re-assembly. Failure to do so may result in damaging the SSB.

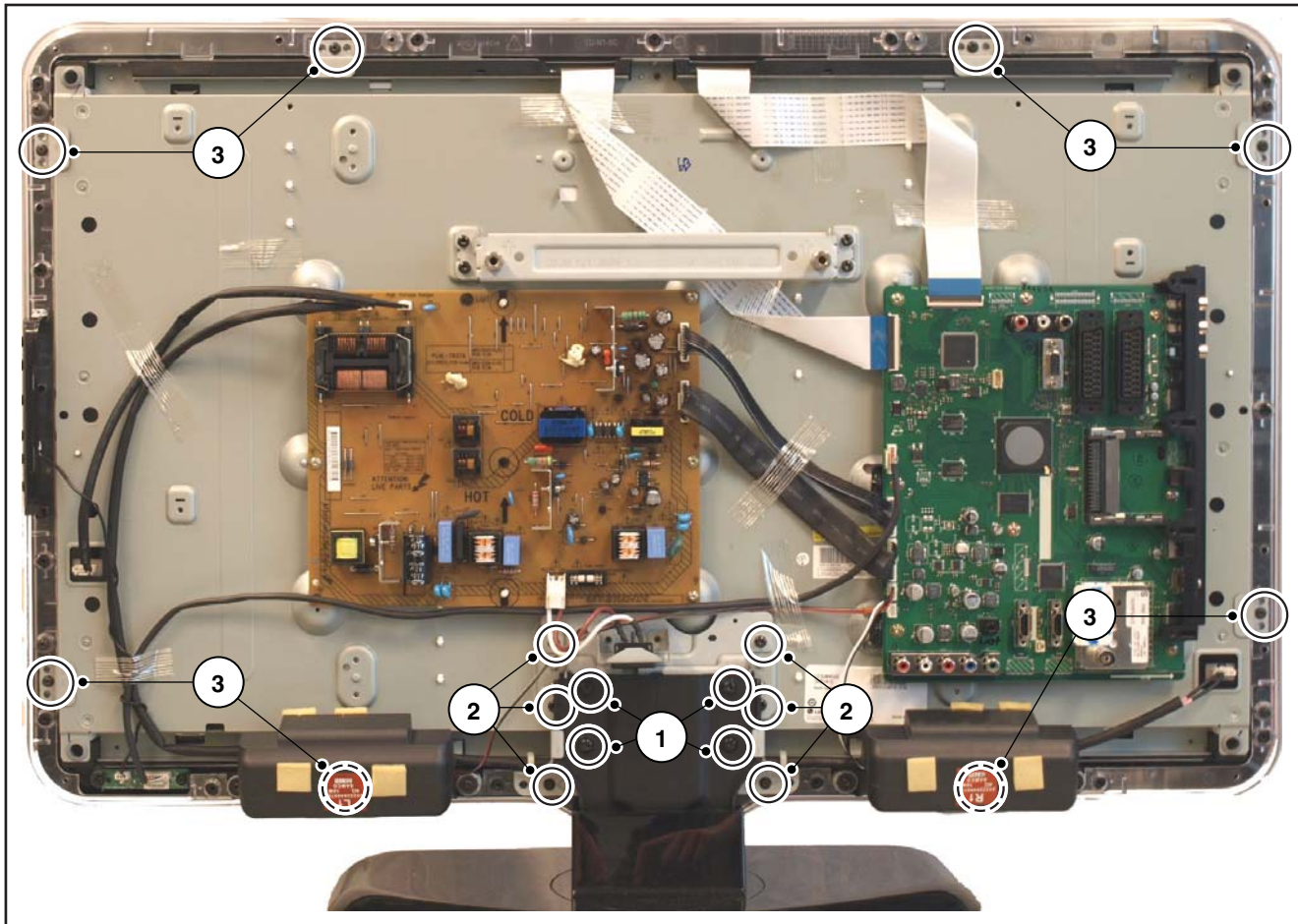
1. Unplug all connectors. Be careful with the fragile LVDS connector(s)!
2. Remove all screws that secure the board.
3. Take the SSB out of the set, together with the side cover.
4. To remove the side cover, push the clamp with e.g. a screwdriver in the middle of the cover and pull the cover sideways from the SSB.



### 4.3.8 LCD Panel

Refer to [Figure 4-18](#) for details. As every screen size has a (slightly) different mechanical construction (some have the boards directly mounted on the LCD display, others use brackets), we only describe one model. Disassembly method of other LCD panels is similar to the one described below (see also cable dressing pictures for more details).

1. Unplug all connectors.
2. Remove all boards as earlier described.
3. Remove the speakers as earlier described.
4. Remove the stand [1].
5. Remove all subframes from the LCD panel (e.g. [2]).
6. Remove the brackets [3] that secure the LCD Panel.
7. The LCD panel can now be lifted from the front cabinet.



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090709

Figure 4-18 LCD Panel removal (example model)

### 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 [4.1 Cable Dressing](#).
- Pay special attention not to damage the EMC foams on the SSB shields. Ensure that EMC foams are mounted correctly.

## 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](#)
- [5.6 Fault Finding and Repair Tips](#)
- [5.7 Software Upgrading](#)

### 5.1 Test Points

In the chassis schematics and layout overviews, the test points are mentioned. In the schematics, test points are indicated with “Fxxx” or “Ixxx”, 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: Color 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 is 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, sub menus).

The CSM is a Service Mode that can be enabled by the consumer. The CSM displays diagnosis information, which the customer can forward to the dealer or call centre. In CSM mode, “CSM”, is displayed in the top right corner of the screen. The information provided in CSM and the purpose of CSM is to:

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

ComPair Mode is used for communication between a computer and a TV on I2C /UART level and can be used by a Service engineer to quickly diagnose the TV set by reading out error codes, read and write in NVMs, communicate with ICs and the uP (PWM, registers, etc.), and by making use of a fault finding 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 Service Default Mode (SDM)

##### *Purpose*

Set the TV in SDM mode in order to be able to:

- Create a pre-defined 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 favorite”, “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 SDM*

For this chassis there are two kinds of SDM: an **analog SDM** and a **digital SDM**. Tuning will happen according [Table 5-1](#).

- **Analog SDM:** use the standard RC-transmitter and key in the code “062596”, directly followed by the “MENU” (or HOME) button.
 

**Note:** It is possible that, together with the SDM, the main menu will appear. To switch it “off”, push the “MENU” (or HOME) button again.
- **Digital SDM:** use the standard RC-transmitter and key in the code “062593”, directly followed by the “MENU” (or HOME) button.
 

**Note:** It is possible that, together with the SDM, the main menu will appear. To switch it “off”, push the “MENU” (or HOME) button again.
- **Analog SDM** can also be activated by grounding for a moment the solder pad on the SSB, with the indication “SDM” (see figure [Service mode pad](#)).

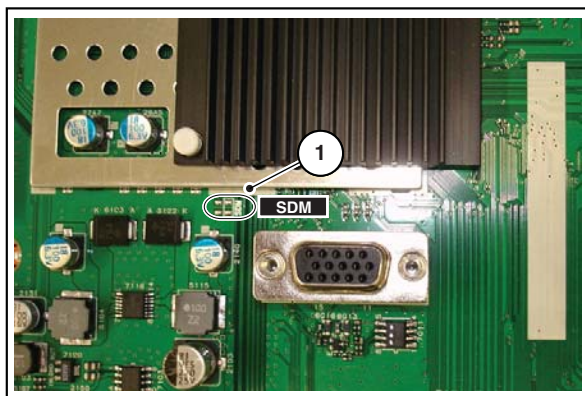
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090409

Figure 5-1 Service mode pad

After activating this mode, "SDM" will appear in the upper right corner of the screen (when a picture is available).

#### How to Navigate

When the "MENU" (or HOME) button is pressed on the RC transmitter, the TV set will toggle between the SDM and the normal user menu.

#### How to Exit SDM

Use one of the following methods:

- Switch the set to STAND-BY via the RC-transmitter.
- Via a standard customer RC-transmitter: key in "00"-sequence.

## 5.2.2 Service Alignment Mode (SAM)

#### Purpose

- To perform (software) alignments.
- To change option settings.
- To easily identify the used software version.
- To view operation hours.
- To display (or clear) the error code buffer.

#### How to Activate SAM

Via a standard RC transmitter: Key in the code "062596" directly followed by the "INFO" button. After activating SAM with this method a service warning will appear on the screen, continue by pressing the "OK" button on the RC.

#### Contents of SAM (see also Table 6-4)

##### Hardware Info.

- **A. SW Version.** Displays the software version of the main software (example: LC92L-1.2.3.4=AAAAB\_X.Y.W.Z).
  - **AAAA**= the chassis name.
  - **B**= the region (A= Asian Pacific, E= Europe, L= Latam, U= United States).
  - **X.Y.W.Z**= the software version, where X is the main version number (different numbers are not compatible with one another) and Y.W.Z is the sub version number (a higher number is always compatible with a lower number).
- **B. Standby Processor Version.** Displays the software version of the Stand-by processor.
- **C. Production Code.** Displays the production code of the TV, this is the serial number as printed on the back of the TV set. Note that if an NVM is replaced or is initialized after corruption, this production code has to be re-written to NVM. ComPair will foresee in a possibility to do this.
- **Operation Hours.** Displays the accumulated total of operation hours (not the stand-by hours). Every time the TV is switched "on/off", 0.5 hours is added to this number.

- **Errors** (followed by maximum 10 errors). The most recent error is displayed at the upper left (for an error explanation see section "5.4 Error Codes").
- **Reset Error Buffer.** When "cursor right" (or the "OK" button) is pressed and then the "OK" button is pressed, the error buffer is reset.
- **Alignments.** This will activate the "ALIGNMENTS" sub-menu. See chapter 6.3 Software Alignments.
- **Dealer Options.** Extra features for the dealers.
- **Options.** 6.4 Option Settings Extra features for Service. For more info regarding option codes, see chapter . Note that if the option code numbers are changed, these have to be confirmed with pressing the "OK" button before the options are stored. Otherwise changes will be lost.
- **Initialize NVM.** The moment the processor recognizes a corrupted NVM, the "initialize NVM" line will be highlighted. Now, two things can be done (dependent of the service instructions at that moment):
  - Save the content of the NVM via ComPair for development analysis, **before** initializing. This will give the Service department an extra possibility for diagnosis (e.g. when Development asks for this).
  - Initialize the NVM.

**Note:** When the NVM is corrupted, or replaced, there is a high possibility that no picture appears because the display code is not correct. So, before initializing the NVM via the SAM, a picture is necessary and therefore the correct display option has to be entered. To adapt this option bit, it is advised to use ComPair (the correct values for the options can be found in Table 6-3) or a method via a standard RC (described below).

**Changing the display option via a standard RC:** Key in the code "062598" directly followed by the "MENU" (or HOME) button and "XXX" (where XXX is the 3 digit decimal display code as mentioned in Table 6-3). Make sure to key in all three digits, also the leading zero's. If the above action is successful, the front LED will go out as an indication that the RC sequence was correct. After the display option is changed in the NVM, the TV will go to the Stand-by mode. If the NVM was corrupted or empty before this action, it will be initialized first (loaded with default values). This initializing can take up to 20 seconds.

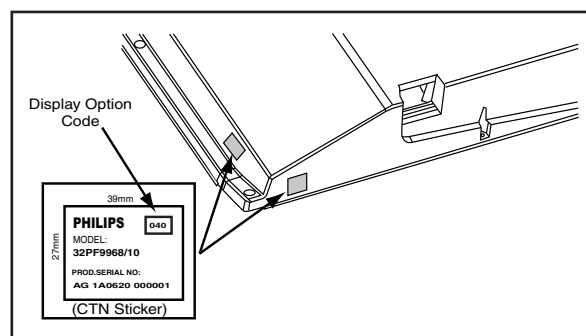
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090819

Figure 5-2 Location of Display Option Code sticker

- **Store - go right.** All options and alignments are stored when pressing "cursor right" (or the "OK" button) and then the "OK"-button.
- **SW Maintenance.**
  - **SW Events.** Not useful for Service purposes. In case of specific software problems, the development department can ask for this info.
  - **HW Events.** Not useful for Service purposes. In case of specific software problems, the development department can ask for this info.
- **Operation hours display.** Displays the accumulated total of display operation hours. So, this one keeps up the lifetime of the display itself, mainly to compensate the degeneration behavior.

- **Test settings.** For development purposes only.
- **Development file versions.** Not useful for Service purposes, this information is only used by the development department.
- **Upload to USB.** To upload several settings from the TV to an USB stick, which is connected to the SSB. The items are "Channel list", "Personal settings", "Option codes", "Display-related alignments" and "History list". **First a directory "repair" has to be created in the root of the USB stick.** To upload the settings select each item separately, press "cursor right" (or the "OK" button), confirm with "OK" and wait until "Done" appears. In case the download to the USB stick was not successful "Failure" will appear. In this case, check if the USB stick is connected properly and if the directory "repair" is present in the root of the USB stick. Now the settings are stored onto the USB stick and can be used to download onto another TV or other SSB. Uploading is of course only possible if the software is running and if a picture is available. This method is created to be able to save the customer's TV settings and to store them into another SSB.
- **Download to USB.** To download several settings from the USB stick to the TV, same way of working needs to be followed as with uploading. To make sure that the download of the channel list from USB to the TV is executed properly, it is necessary to restart the TV and tune to a valid preset if necessary.  
**Note:** The "History list item" can not be downloaded from USB to the TV. This is a "read-only" item. In case of specific problems, the development department can ask for this info.

#### How to Navigate

- In SAM, the menu items can be selected with the "CURSOR UP/DOWN" key on the RC-transmitter. The selected item will be highlighted. When not all menu items fit on the screen, move the "CURSOR UP/DOWN" key to display the next/previous menu items.
- With the "CURSOR LEFT/RIGHT" keys, it is possible to:
  - (De) activate the selected menu item.
  - (De) activate the selected sub menu.
- With the "OK" key, it is possible to activate the selected action.

#### How to Exit SAM

Use one of the following methods:

- Switch the TV set to STAND-BY via the RC-transmitter.
- Via a standard RC-transmitter, key in "00" sequence, or select the "BACK" key.

### 5.2.3 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 is visible).
- 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 a standard remote control transmitter: "123654" (do not allow the display to time out between entries while keying the sequence).

#### Contents of CSM

The contents are reduced to 3 pages: General, Software versions and Quality items. The group names itself are not shown anywhere in the CSM menu.

#### General

- **Set Type.** This information is very helpful for a helpdesk/workshop as reference for further diagnosis. In this way, it is not necessary for the customer to look at the rear of the TV-set. Note that if an NVM is replaced or is initialized after corruption, this set type has to be re-written to NVM. ComPair will foresee in a possibility to do this.
- **Production Code.** Displays the production code (the serial number) of the TV. Note that if an NVM is replaced or is initialized after corruption, this production code has to be re-written to NVM. ComPair will foresee a in possibility to do this.
- **Installed date.** Indicates the date of the first installation of the TV. This date is acquired via time extraction.
- **Options 1.** Gives the option codes of option group 1 as set in SAM (Service Alignment Mode).
- **Options 2.** Gives the option codes of option group 2 as set in SAM (Service Alignment Mode).
- **12NC SSB.** Gives an identification of the SSB as stored in NVM. Note that if an NVM is replaced or is initialized after corruption, this identification number has to be re-written to NVM. ComPair will foresee in a possibility to do this. This identification number is the 12nc number of the SSB.
- **12NC display.** Shows the 12NC of the display.
- **12NC supply.** Shows the 12NC of the supply.

#### Software versions

- **Current main SW.** Displays the built-in main software version. In case of field problems related to software, software can be upgraded. As this software is consumer upgradable, it will also be published on the Internet. Example: LC92L\_1.2.3.4
- **Ambilight SW.** Displays the Ambilight SW-version.

#### Quality items

- **Signal quality.** Poor / average / good
- **Child lock.** Not active / active. This is a combined item for locks. If any lock (Preset lock, child lock, lock after or parental lock) is active, the item shall show "active".
- **HDMI HDCP key.** Indicates if the HDMI keys (or HDCP keys) are valid or not. In case these keys are not valid and the customer wants to make use of the HDMI functionality, the SSB has to be replaced.
- **Ethernet MAC address.** Displays the MAC address present in the SSB.
- **BDS key.** Indicates if the "BDS level" key is valid or not.

#### How to Exit CSM

Press "MENU" (or HOME) / "Back" key on the RC-transmitter.



## 5.3 Service Tools

### 5.3.1 ComPair

#### Introduction

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

1. ComPair helps you to quickly get an understanding on how to repair the chassis in a short and effective way.
2. ComPair allows very detailed diagnostics and is therefore capable of accurately indicating problem areas. You do not have to know anything about I2C or UART commands yourself, because ComPair takes care of this.
3. ComPair speeds up the repair time since it can automatically communicate with the chassis (when the uP is working) and all repair information is directly available.
4. ComPair features TV software up possibilities.

#### Specifications

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

#### How to Connect

This is described in the ComPair chassis fault finding database.

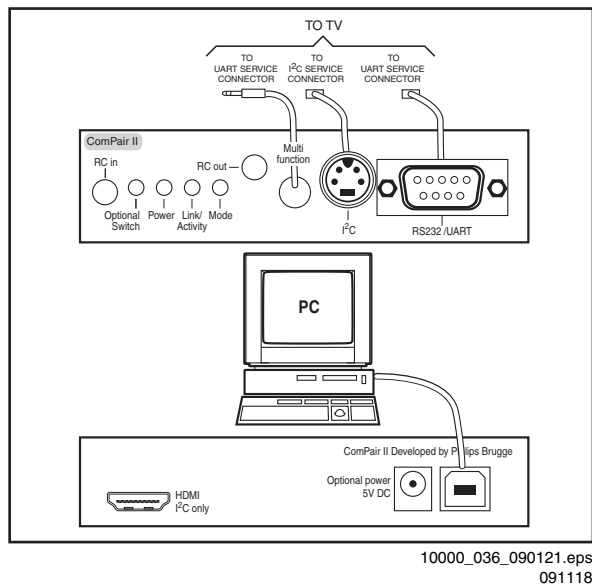


Figure 5-3 ComPair II interface connection

**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.
- ComPair UART interface cable: 3138 188 75051.
- Program software can be downloaded from the Philips Service portal.

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

## 5.4 Error Codes

### 5.4.1 Introduction

The error code buffer contains all detected errors since the last time the buffer was erased. The buffer is written from left to right, new errors are logged at the left side, and all other errors shift one position to the right.

When an error occurs, it is added to the list of errors, provided the list is not full. When an error occurs and the error buffer is full, then the new error is not added, and the error buffer stays intact (history is maintained).

To prevent that an occasional error stays in the list forever, the error is removed from the list after more than 50 hrs. of operation.

When multiple errors occur (errors occurred within a short time span), there is a high probability that there is some relation between them.

New in this chassis is the way errors are displayed:

- There is a simple blinking LED procedure for board level repair (home repair) so called **LAYER 1** errors, next to the existing errors which are **LAYER 2** errors (see [Table 5-3](#)).
  - **LAYER 1** errors are one digit errors (via CSM).
  - **LAYER 2** errors are 2 digit errors (via SAM/SDM).
- In protection mode:
  - From consumer mode: **LAYER 1**.
  - From SDM mode: **LAYER 2**.
- **In CSM mode:** When entering CSM: error **LAYER 1** will be displayed by blinking LED. Only the latest error is shown.
- **In SDM mode:** When SDM is entered via Remote Control code or the hardware pins, **LAYER 2** is displayed via blinking LED.
- **In the "ON" state:** with the RC commands "mute\_06250X\_OK", **LAYER 2** errors are displayed via blinking LED.
- Error display on screen:
  - In CSM no error codes are displayed on screen.
  - In SAM the complete error list is shown.

### 5.4.2 How to Read the Error Buffer

Use one of the following methods:

- On screen via the SAM (only when a picture is visible).  
E.g.:
  - **00 00 00 00 00**: No errors detected
  - **23 00 00 00 00**: Error code 23 is the last and only detected error.
  - **37 23 00 00 00**: Error code 23 was first detected and error code 37 is the last detected error.
  - Note that no protection errors can be logged in the error buffer.
- Via the blinking LED procedure. See section [5.4.3 How to Clear the Error Buffer](#).
- Via ComPair.

### 5.4.3 How to Clear the Error Buffer

Use one of the following methods:

- By activation of the "Reset error buffer" command in the SAM menu.
- With a normal RC, key in sequence "MUTE" followed by "062599" and "OK".
- If the content of the error buffer has not changed for 50+ hours, it resets automatically.



#### 5.4.4 Error Buffer

In case of non-intermittent faults, clear the error buffer before starting to repair (**before** clearing the buffer, write down the content, as this history can give significant information). This to ensure 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 code and not the actual cause (e.g. a fault in the protection detection circuitry can also lead to a protection).

Take notice that some errors need several minutes before they start blinking or before they will be logged. So in case of problems wait 2 minutes from start-up onwards, and then check if the front LED is blinking or if an error is logged.

**Table 5-3 Error code overview**

Description	Layer 1	Layer 2	Monitored by	Error/Prot	Error Buffer/Blinking LED	Device	Defective Board
<b>I2C Bus related:</b>							
I <sup>2</sup> C	2	14	ARM	E	BL / EB	SSB	SSB
uP does not boot	2	15	ARM	P	BL	MT5392	SSB
<b>Supply related:</b>							
DC on speaker	2	11	Stby $\mu$ P	P	BL	/	SSB
12V (*)	3	16	Stby $\mu$ P	P	BL	/	Supply
Inverter or display supply	3	17	ADC	E	EB	/	Supply
<b>IC related:</b>							
HDMI MUX	2	23	ARM	E	EB	ADV3002	SSB
HDMI EDID	2	24	ARM	E	EB	M24C02-WMN6	SSB
ARM (Ambilight)	8	28	ARM	E	EB	NXP LPC2103	AL-module or DC/DC
Tuner (Frontend)	2	34	ARM	E	EB	VA1G5BF8010	SSB
Main NVM	2	35	ARM	E	/	M24C64	SSB

#### Extra Info

- (\*) 12V is necessary to start up the ARM, the ARM boots the Stand-by processor.
  - If 12V fails during normal operation or in stand-by, the protection can be displayed via the "blinking LED".

- If the mains cord is disconnected and reconnected again, the ARM and Stand-by processor are not booted, 12V can not be detected, and no indication is possible.

## 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 color.

**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.

**Table 5-2 Layer 1 error codes**

Description	Layer 1 code	Remarks
SSB	2	
Display supply	3	If only one supply is used
Platform supply	4	No separate supply
Ambilight	8	

### 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.

## 5.6 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.

### 5.6.1 Software Protections

Most of the protections and errors use either the stand-by or the micro processor as detection device. Since in these cases, checking of observers, polling of ADCs, and filtering of input values are all heavily software based, these protections are referred to as software protections.

There are several types of software related protections, solving a variety of fault conditions:

- **Protections related to supplies:** check of the 12V.
- **Protections related to breakdown of the safety check mechanism.** E.g. since the protection detections are done by means of software, failing of the software will have to initiate a protection mode since safety cannot be guaranteed any more.

### **Remark on the Supply Errors**

The detection of a supply dip or supply loss during the normal playing of the set does not lead to a protection, but to a cold reboot of the set. If the supply is still missing after the reboot, the TV will go to protection.

### **Protections during Start-up**

During TV start-up, some voltages and IC observers are actively monitored to be able to optimise the start-up speed, and to assure good operation of all components. If these monitors do not respond in a defined way, this indicates a malfunction of the system and leads to a protection.

### 5.6.2 Hardware Protections

The only real hardware protection in this chassis is (in case of an audio problem) the audio protection circuit that will trigger the uP to switch "off" the TV.

### **Repair Tip**

- It is also possible that you have an audio DC protection because of an interruption in one or both speakers (the DC voltage that is still on the circuit cannot disappear through the speakers).

**Caution:** (dis)connecting the speaker wires during the ON state of the TV at high volume can damage the audio amplifier.

### 5.6.3 Logging

When something is wrong with the TV set (f.i. the set is rebooting) you can check for more information via the logging in Hyperterminal. The Hyperterminal is available in every Windows application via Programs, Accessories, Communications, Hyperterminal. Connect a "ComPair UART"-cable (3138 188 75051) from the service connector in the TV to the "multi function" jack at the front of ComPair II box.

Required settings in ComPair before starting to log:

- Start up the ComPair application.
- Select the correct database (open file "Q549.3E LA", this will set the ComPair interface in the appropriate mode).
- Close ComPair

After start-up of the Hyperterminal, fill in a name (f.i. "logging") in the "Connection Description" box, then apply the following settings:

1. COMx
2. Bits per second = 115200
3. Data bits = 8
4. Parity = none

5. Stop bits = 1
6. Flow control = none

During the start-up of the TV set, the logging will be displayed. This is also the case during rebooting of the TV set (the same logging appears time after time). Also available in the logging is the "Display Option Code" (useful when there is no picture), look for item "DisplayRawNumber" in the beginning of the logging. **Tip:** when there is no picture available during rebooting you are able to check for "error devices" in the logging (LAYER 2 error) which can be very helpful to determine the failure cause of the reboot. For protection state, there is no logging.

### 5.6.4 Display option code

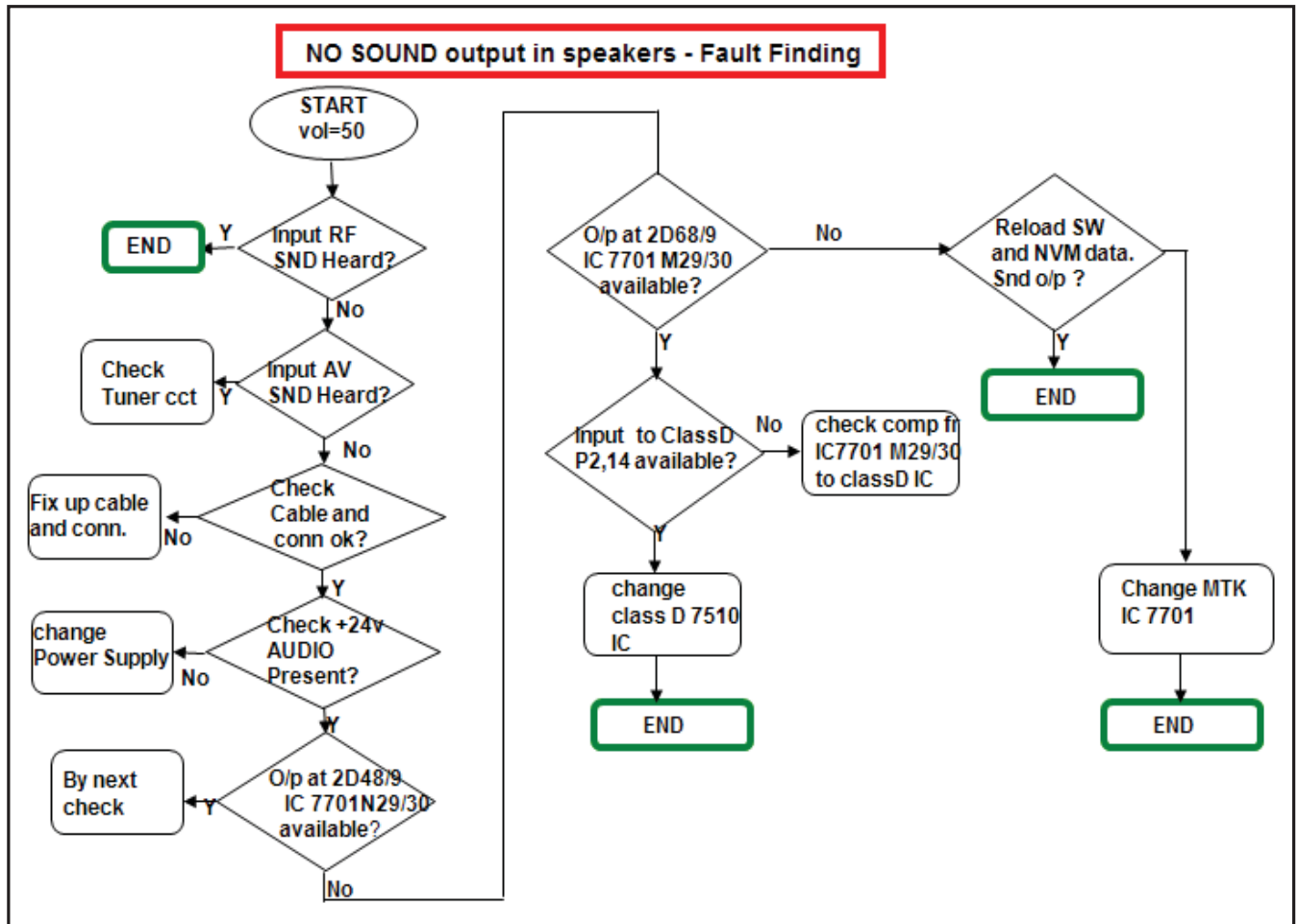
**Caution:** In case you have replaced the SSB, always check the display option code in SAM, even if you have picture. With a wrong display option code it is possible that you have picture, but that in certain conditions you have unwanted side-effects.

### 5.6.5 Trouble Shooting Tuner section

When there is no picture in analog RF mode:

1. Check whether picture is present in AV mode. If not, tuner section is okay. Check video processing section.
2. Check if option settings are correct.
3. Check if 5 V supply is available at test points F256, F228, F229 and F219, and if 33 V is available at test point F257.
4. Check if the I<sup>2</sup>C lines are working correctly (3.3 V).
5. Manually store a known channel and check if there is IF output at tuner pin 11. If not, tuner is faulty.
6. Feed in 105 dBuV at tuner pin 11 and check whether there is CVBS output from IF demodulator IC. If not, IF demodulator might be faulty. Check components in this area.

5.6.6 Trouble Shooting Sound section



18490\_209\_090409.eps  
090409

Figure 5-4 Fault finding tree sound section

## 5.6.7 Trouble Shooting HDMI section

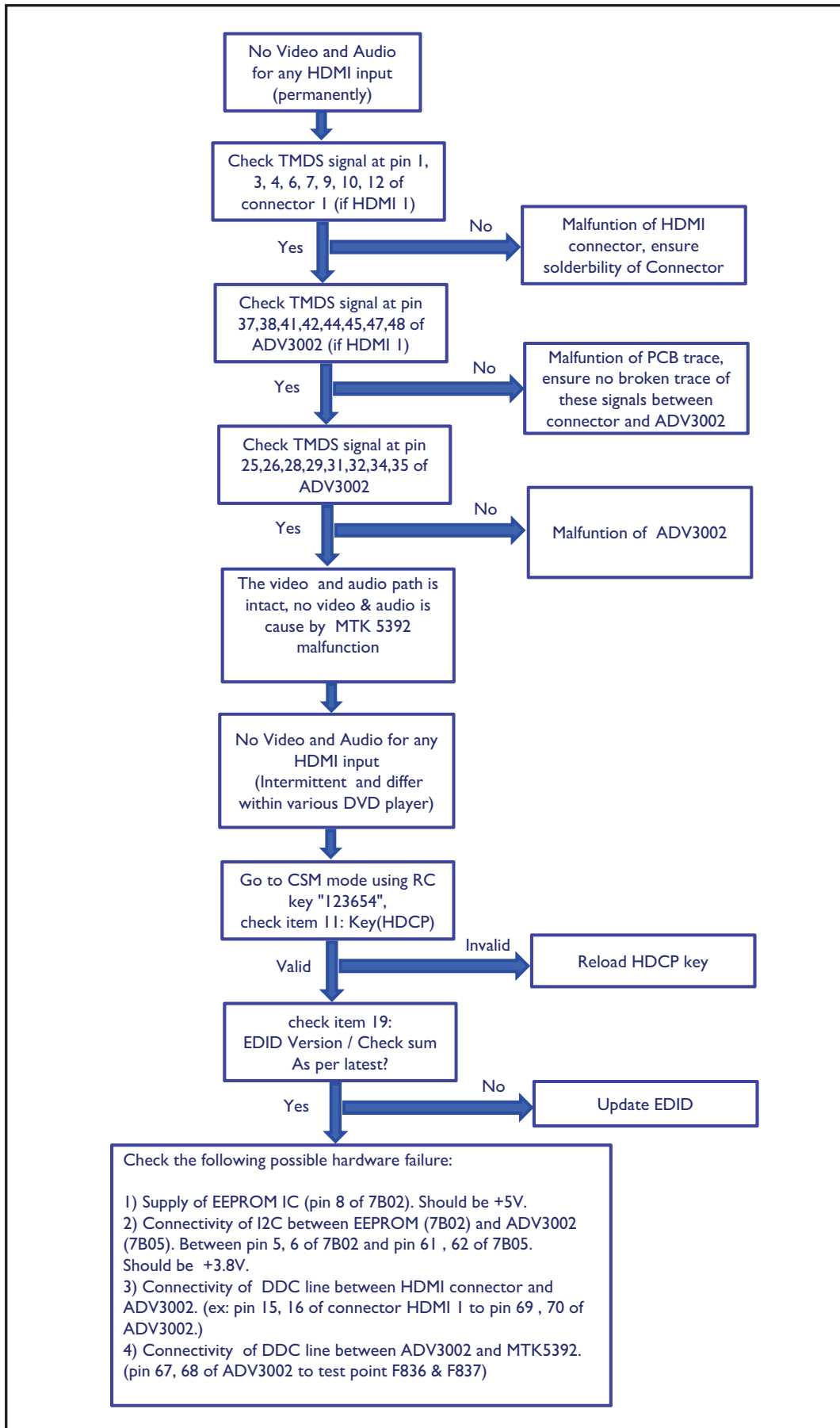
18490\_211\_090409.eps  
090409

Figure 5-5 Fault finding tree HDMI section

## 5.6.8 Start-up/Shut-down Flowcharts

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

### POWER STATES

In this chassis, there are six possible power states as follows:

- Power OFF
- Power ON
- STANDBY
- SEMI-STANDBY
- Special Panel Mode
- PROTECTION

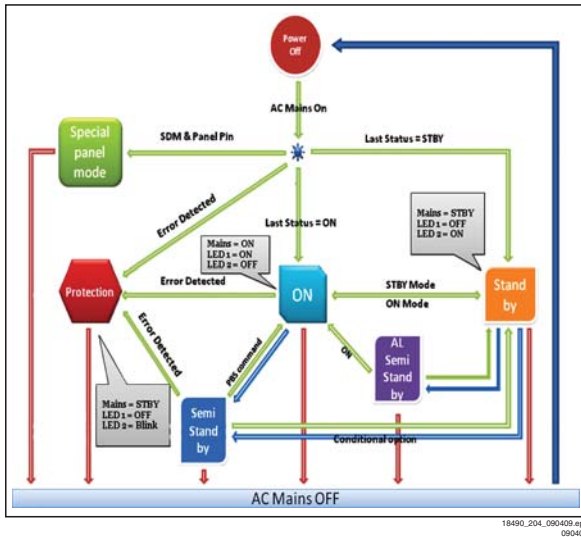


Figure 5-6 Power States

### POWER OFF

In "Power OFF" mode, the system is completely switched "off" from AC mains. When AC power is applied, the system checks for last status. Depending on the last standby status stored in the system EEPROM, this mode can then transit to "ON" or "STANDBY" mode.

### ON

This is the normal operating mode, indicated by the "on" LED. All the power supply lines are available and depending on the sub-mode, all the circuits in the system may be active. From this mode it shall be possible to transit to "STANDBY" and "PROTECTION" mode, or to "Power OFF" mode if AC mains are switched "off". The sub-modes are:

- Active Mode (Normal Consumer Mode)
- Service Modes
- Panel Modes
- Factory Modes

### STANDBY

The total power consumption of the system in this mode shall be equal or less than 150 mW. This state is indicated by white LED when AC mains is switched "on". Only the standby controller is operational in this state, where only +3V3stby power supply is available. From this mode it shall be possible to transit to the "ACTIVE" or "Power OFF" mode if AC mains are switched "off".

### SEMI-STANDBY

The semi-standby state is required to perform the following tasks:

- AmbiLight wakeup control
- PBS SemiStandby.

### SPECIAL PANEL MODE

The Special Panel Mode is **only** used during manufacturing process to program the system EEPROM. In this mode, the SDA0 and SCL0 ports of MT5392 are set to high impedance after SDM and PANEL pins are both detected as "low" during start-up. This mode can be exited using a power recycle.

### PROTECTION

This state is entered when an error has been detected at start-up or in the "ACTIVE" mode. All switched power supply lines are turned "off" with only +3V3stby remaining "on"; similar to "STANDBY" mode. This state is indicated by the blinking red front LED with the blinking sequence denoting the type of error detected.

When the system enters the protection mode due to a critical error, it should be turned "off" and the failure cause needs to be resolved. The system will function normally again after performing a power recycling once all protection causing failures have been resolved.

### START-UP SEQUENCE

There are two cases of start-up sequences, namely:

- AC On and
- Standby Wake-up.

See also [Figure 5-7](#).

### AC ON

In the case of start-up from AC mains, all PSU voltages start to turn "on" as the hardware default of the active "low" STANDBY (controlled by Standby Controller STANDBY signal) signal to the PSU is pulled "low" with respect to ground.

The MT5392 starts running boot loader once the hardware reset circuit is released. The system will then check the last standby status from the system EEPROM to determine whether to complete the system start-up (load image, turn on the audio, display etc) or proceed to standby and wait for wake-up command from user. The Standby Controller then proceeds to verify the power status of the +12V and sends the system to protection in case of any failures. Special Panel, SDM, and PANEL modes are detected as well.

### STANDBY WAKEUP

When the system receives a command to wake-up from standby, the Standby Controller sets the STANDBY signal "low" to turn "on" the switched power, and similarly detects for the presence of +12V. The MT5392 waits for +3V3\_SW to be available before loading its image. The significance of this voltage detection is due to the flash is also being powered by the same mentioned voltage.

The following figure shows the start-up flowchart for both "AC On" and "Standby Wake-up":

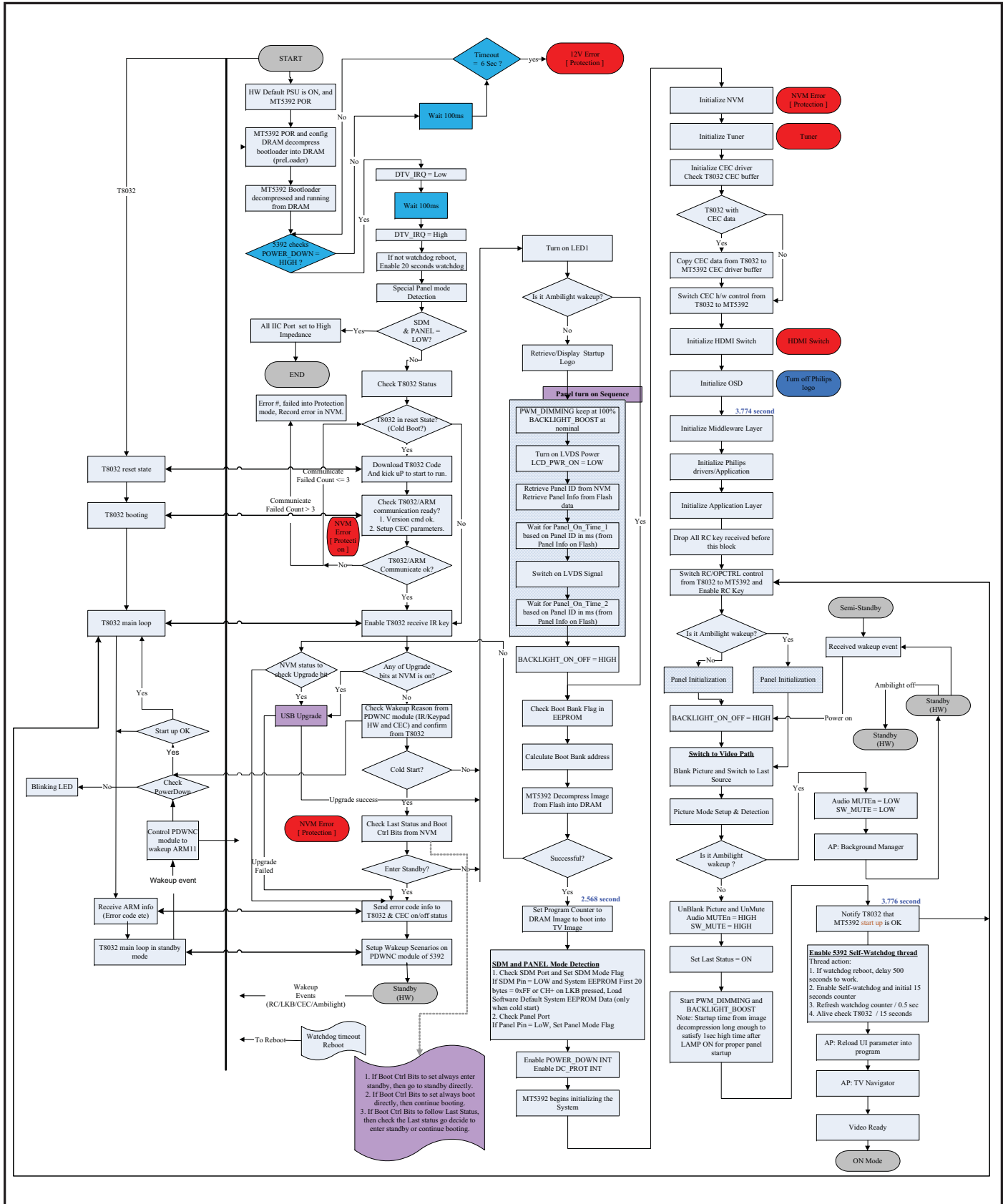
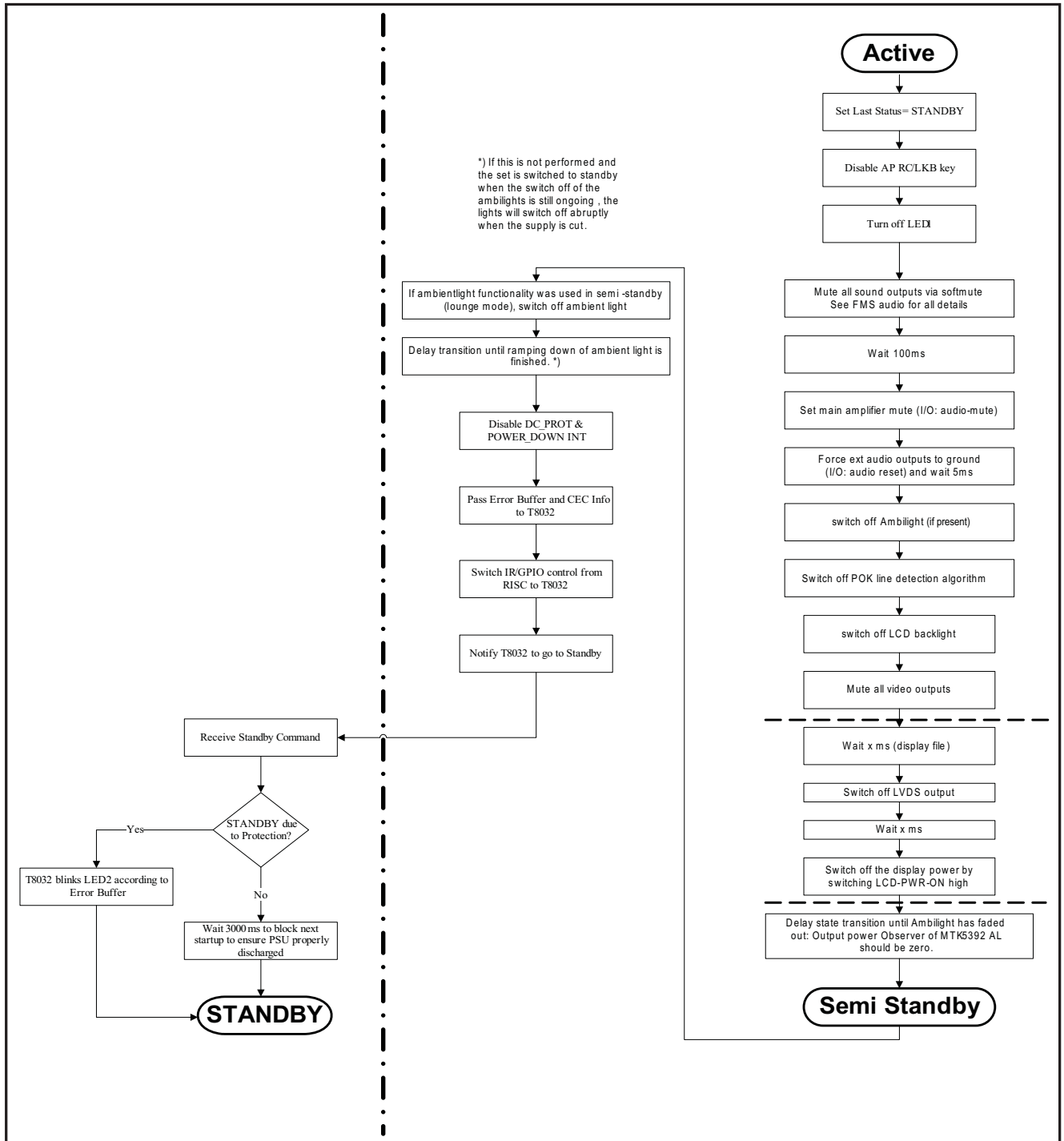


Figure 5-7 Start-up flowchart

**STANDBY SEQUENCE**

The following flowchart depicts the Standby (plus Semi-Standby condition) sequence:

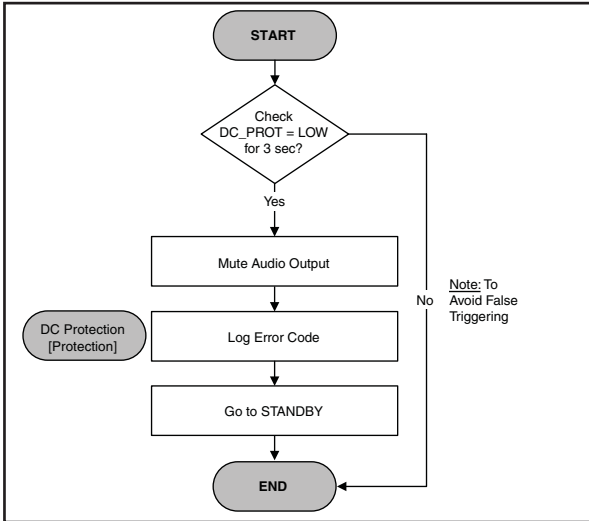


18700\_202\_090828.eps  
090828

Figure 5-8 Standby flowchart

**DC PROTECTION**

The following figure shows the DC\_PROT interrupt flowchart:



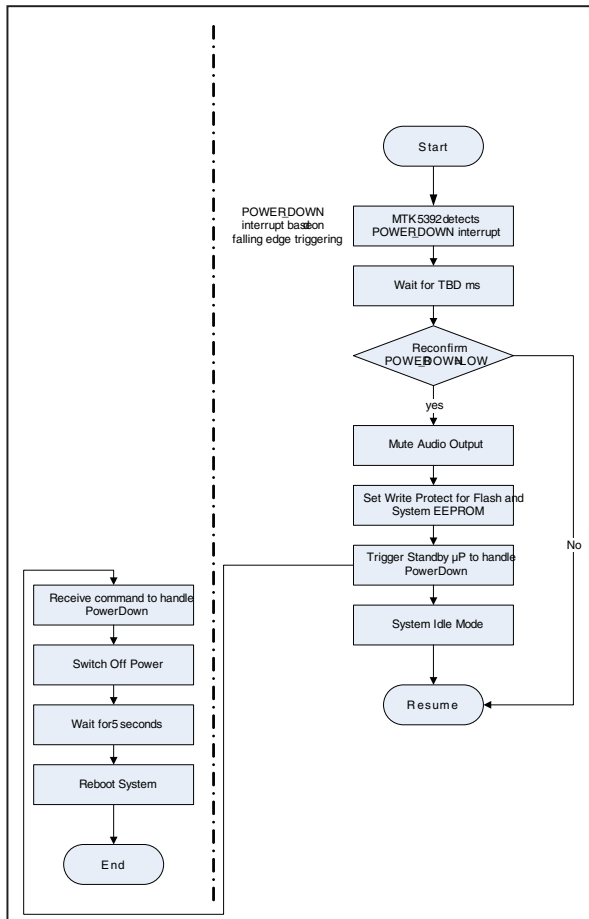
H\_17740\_037.eps  
240108

**Figure 5-9 DC Protection flowchart**

- Upon detection, the power detection circuitry should switch the low power DC/DC converters “off” and/or switch the MT5392 in reset.
- The SW detection is done on the T8032 (built-in stand-by microprocessor). The T8032 is fed by the stand-by voltage and is less critical to power drops than the +12V and derivatives.
- If T8032 detects a power drop, it shuts down the supplies immediately (enter HW stand-by mode), waits for 5 seconds and restarts the system.
- If the power drop is caused by a mains voltage drop, the system performs a cold boot which prevents a HW hangup due to the power drop. At the restart, if power is readily available again, the set will resume its function.
- If the power drop is caused by a failing supply, the failure will be detected during the restart and the appropriate error logging will be given.
- If the power drop is caused by mains voltage removal by the customer, the set will restart but will ‘die’ during the 5s wait time (specification of the power supplies).

**POWERDOWN SEQUENCE**

The following figure shows the power-down sequence flowchart:



18700\_201\_090828.eps  
090828

**Figure 5-10 Power-down flowchart**

- Power detection circuitry should be quick enough to rapidly detect any powerdip which is large enough to jeopardize the functionality of the set.



5.6.9 SSB replacement

Follow the instructions in the flowchart in case a SSB has to be swapped.

**Note:** flowchart below has originally been created for the Q5xx chassis, but can also be used for this LC9.2L chassis.

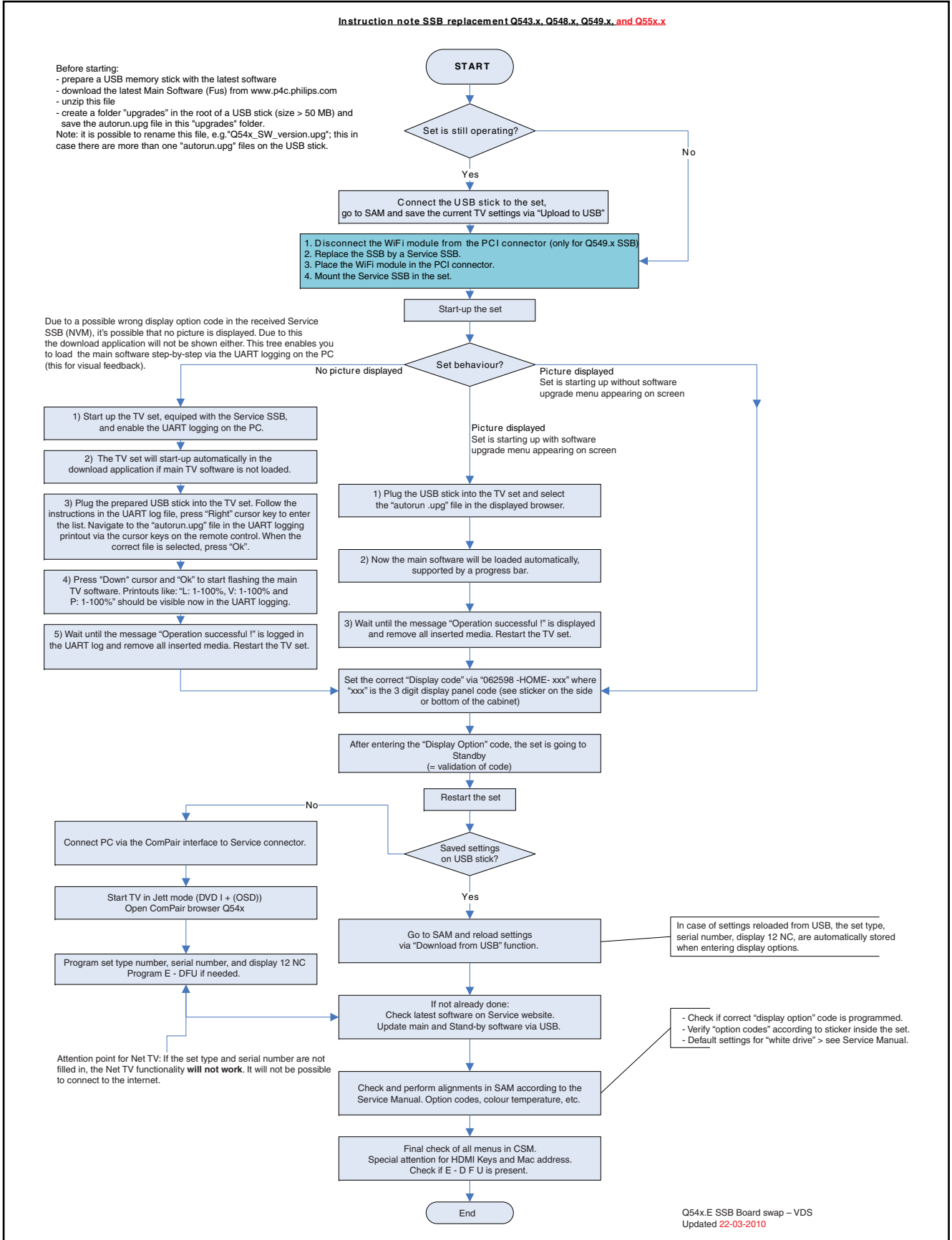


Figure 5-11 SSB replacement flowchart [1/2]

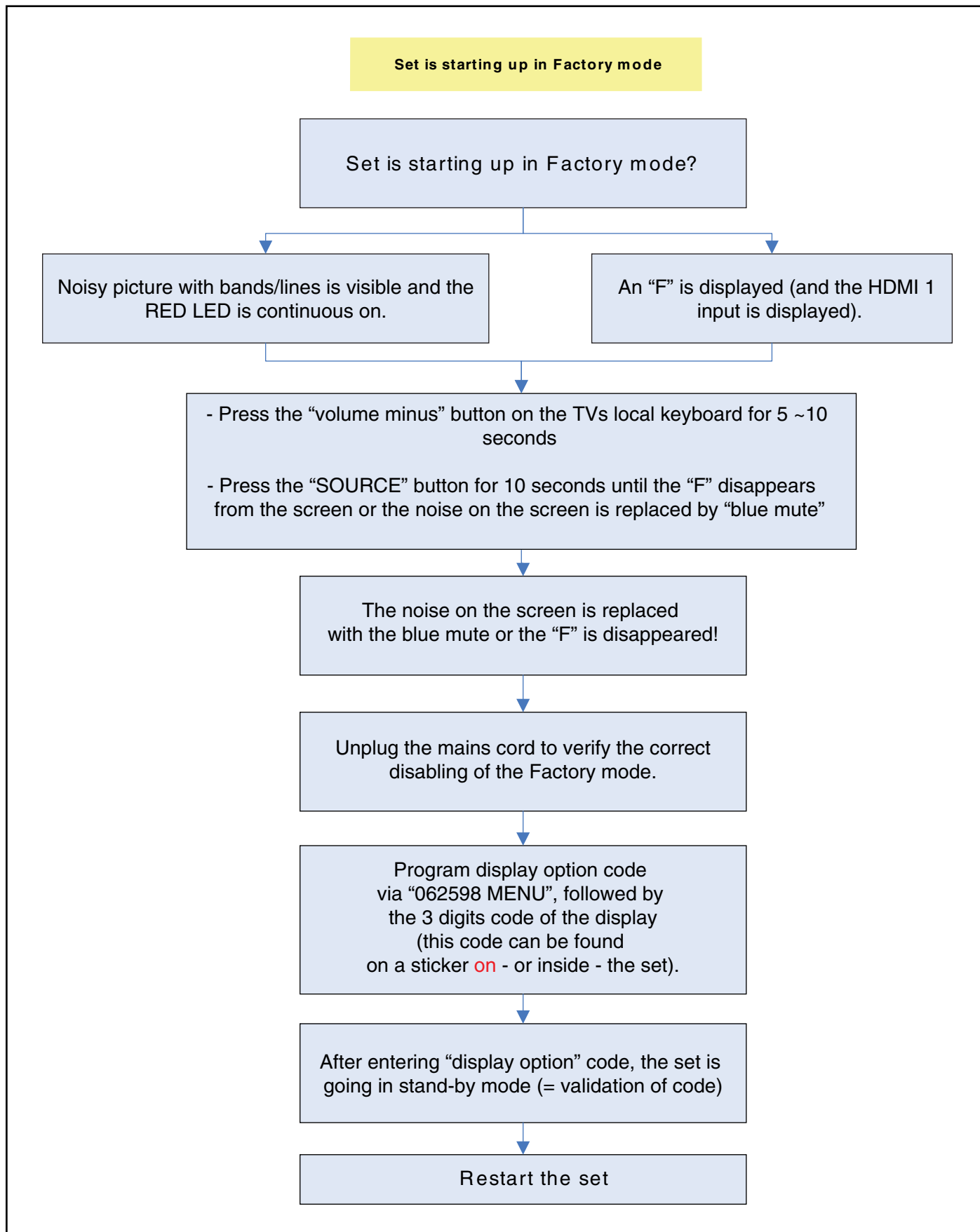
H\_16771\_007b.eps  
100322

Figure 5-12 SSB replacement flowchart [2/2]

## 5.7 Software Upgrading

### 5.7.1 Introduction

It is possible **for the user** to upgrade the **main** software via the USB port. This allows replacement of a software image in a stand alone set, without the need of an E-JTAG debugger. A description on how to upgrade the main software can be found in the DFU.

**Important:** When the NAND-Flash must be replaced, a new SSB must be ordered, due to the presence of the security keys! (copy protection keys, MAC address, ...).

Perform the following actions after SSB replacement:

1. Set the correct option codes (see sticker inside the TV).
2. Update the TV software => see the DFU for instructions.
3. Perform the alignments as described in chapter 6.
4. Check in CSM if the HDMI key, MAC address.. are valid.

For the correct order number of a new SSB, always refer to the Spare Parts list on the Philips Service web portal!

### 5.7.2 Software Upgrade

SW versions can be divided in three types:

- SW that can not crash the working of the set.
  - EDID NVM. If the download fails, the set is still running and the download can start again.
  - Main NVM: If the download fails the default NVM value can be loaded. NVM can be loaded via USB, be aware PCBA alignments stored in NVM will not be overridden.
- SW that is "fool proof": There is a backup version, a main interruption during upgrade shall not crash the normal working, a new upgrade can be started.
  - Main SW image: Upgradable via USB.
  - Standby SW.
  - ARM Ambilight (if applicable): Upgradable via USB.
- SW that is not "fool proof".
  - Bootloader: Upgradable via USB in SAM (Note: must be done by service personnel).

SW for all model numbers is loaded to the Philips Service portal (P4S) and contains the following software:

- Process\_NVM\_LC09Mxxx.bin: mainly for factory use to load main NVM. Can be used by service if applicable.
- LC09M\_VGAxxxx.bin: for loading VGA NVM using ComPair tool.
- LC09M\_HDMIxxxx.bin: for loading HDMI NVM via ComPair (HDMI MUX EDID) tool.
- The Autorun.upg file, which is available on P4C (the consumer web site), contains:
  - Main SW.
  - Standby SW.
  - Bootloader SW (via SAM upgradable).
  - Ambilight SW (if applicable).

# 6. Alignments

**Index of this chapter:**

- [6.1 General Alignment Conditions](#)
- [6.2 Hardware Alignments](#)
- [6.3 Software Alignments](#)
- [6.4 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.

## 6.1 General Alignment Conditions

Perform all electrical adjustments under the following conditions:

- Power supply voltage: 120 - 230 V<sub>AC</sub> / 50 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<sub>i</sub> > 10 Mohm, C<sub>i</sub> < 20 pF.
- Use an isolated trimmer/screwdriver to perform alignments.

## 6.2 Hardware Alignments

Not applicable.

## 6.3 Software Alignments

Put the set in SAM mode (see chapter [5. Service Modes, Error Codes, and Fault Finding](#)). The SAM menu will now appear on the screen. Select ALIGNMENTS and go to one of the sub menus. The alignments are explained below.

The following item can be aligned:

- Whitepoint.

To store the data:

- Press OK on the RC **before** the cursor is moved to the left.
- In main menu select "Store" and press OK on the RC.
- Press MENU on the RC to switch back to the main menu.
- Switch the set to stand-by mode.

For the next alignments, supply the following test signals via a video generator to the RF input:

- **LATAM** models: an NTSC M TV-signal with a signal strength of at least 1 mV and a frequency of 61.25 MHz (channel 3).

### 6.3.1 White Point

- Set "Active control" to "Off".
- Choose "TV menu", "TV Settings" and then "Picture" and set picture settings as follows:

Picture Setting	
Dynamic backlight	Off
Dynamic Contrast	Off
Colour Enhancement	Off
Picture Format	Unscaled
Light Sensor	Off

Picture Setting	
Brightness	50
Colour	0
Contrast	100

- Go to the SAM and select "Alignments"-> "White point".

**White point alignment LCD screens:**

- Use a 100% white screen as input signal and set the following values (in SAM mode):
  - "Color temperature" to "Cool".
  - "Whitepoint red", "Whitepoint green", and "Whitepoint blue" values to "127".
  - "Red BL offset" and "Green BL offset" values to "8".

**With a color analyzer:**

- Measure with a calibrated, contactless (max. 25 mm distance) color analyzer in the centre of the screen. Consequently, the measurement needs to be done in a dark environment.
- Adjust **one** or **two** registers (so holding one of the White point registers R, G or B on 127) to obtain the "Cool" x,y values (see [Table 6-1](#)). Tolerance: dx: ± 0.004, dy: ± 0.004.
- Repeat this step for the "Normal" and "Warm" color temperatures.
- When finished press "OK" on the RC and then press "Store" (in the SAM root menu) to store the aligned values into the NVM.
- Restore the initial picture settings after the alignments.

**Table 6-1 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

**Without a color analyzer,** you can use below default values. This is the next best solution. The default values are average values coming from production (statistics).

- Select a "Color Temperature" (e.g. "Cool", "Normal", or "Warm").
- Set the "Whitepoint Red", "- Green" and "- Blue" default values according to the values in the "Tint settings" table.
- When finished press "OK" on the RC, then press "Store" (in the SAM root menu) to store the aligned values into the NVM.
- Restore the initial picture settings after the alignments.

**Table 6-2 Tint settings (default values)**

Colour Temp.	R	G	B
<b>32-inch</b>			
Cool	121	127	119
Normal	125	127	106
Warm	127	121	74
<b>42-inch</b>			
Cool	127	122	112
Normal	122	122	127
Warm	127	111	70
<b>47-inch</b>			
Cool	127	121	118
Normal	127	116	100
Warm	127	107	62
<b>52-inch</b>			
Cool	127	121	118
Normal	127	116	100
Warm	127	107	62

## 6.4 Option Settings

### 6.4.1 Introduction

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

#### Notes:

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

### 6.4.2 Dealer Options

For dealer options, in SAM select “Dealer options”. See [Table 6-4](#).

### 6.4.3 (Service) Options

Select the sub menu's to set the initialisation codes (options) of the model number via text menus. See [Table 6-4](#).

### 6.4.4 Opt. No. (Option numbers)

Select this sub menu to set all options at once (expressed in two long strings of numbers).

An option number (or “option byte”) represents a number of different options. When you change these numbers directly, you can set all options very quickly. All options are controlled via eight option numbers.

When the NVM is replaced, all options will require resetting. To be certain that the factory settings are reproduced exactly, you must set both option number lines. You can find the correct

option numbers on a sticker inside the TV set and in Table “Option code overview”.

**Example:** The options sticker gives the following option numbers:

- 25604 00386 00235 56068
- 08395 05120 00000 00000

The first line (group 1) indicates hardware options 1 to 4. Example: option no. “2” contains the “cabinet type”.

The second line (group 2) indicates software options 5 to 8.

Example: option no. “5” contains the “display code”.

Every 5-digit number represents 16 bits (so the maximum value will be 65536 if all options are set).

When all the correct options are set, the sum of the decimal values of each Option Byte (OB) will give the option number. See [Table 6-3](#) for the options. Always refer to the sticker in the TV-set as leading.

#### Diversity

Not all sets with the same Commercial Type Number (CTN) necessarily have the same option code!

#### Use of Alternative BOM

An alternative BOM number usually indicates the use of an alternative display. This results in another Display Code thus in another Option code. Refer to chapter [3. Precautions, Notes, and Abbreviation List](#).

### 6.4.5 Option code overview

**Table 6-3 Option code overview (subject to change)**

Model Number	Option Codes	Displ. Code
32PFL5604D/78	25604 00385 00235 56068 08396 05120 00000 00000	204
42PFL5604D/78	25604 00386 00235 56068 08397 05120 00000 00000	205
42PFL7404D/78	09220 00899 00239 56068 08375 05120 00000 00000	183
47PFL5604D/78	25604 00386 00235 56068 08395 05120 00000 00000	203
52PFL7404D/78	09220 00899 00239 56068 08400 05120 00000 00000	208

## 6.5 Total Overview SAM modes

**Table 6-4 SAM mode overview (usage is model dependent)**

Main Menu	Sub-menu 1	Sub-menu 2	Sub-menu 3	Description		
Hardware Info	A. SW VERSION	e.g. “QL92L_1.33.0.0”		Displays TV & Standby SW version and CTN serial number.		
	B. Standby processor version	e.g. “STDBY_88.68.0.0”				
	C. Production code	e.g. “VN010935123456”				
Operation hours				Displays the accumulated total of operation hours. TV switched “on/off” & every 0.5 hours is increase one		
Errors				Displayed the most recent errors.		
Reset error buffer				Clears all content in the error buffer.		
Alignment	Tuner AGC			RF-AGC Take over point adjustment (AGC default value is 80)		
	White point	Colour temperature	Normal	3 different modes of colour temperature can be selected		
			Warm			
			Cool			
	White point red	White point green	White point blue	Red black level offset	LCD White Point Alignment. For values, see <a href="#">Table 6-2</a> .	
						Green black level offset

Main Menu	Sub-menu 1	Sub-menu 2	Sub-menu 3	Description
Dealer options	Personal options	Picture mute	Off/On	Select Picture mute On/Off. Picture is muted / not muted in case no input signal is detected at input connectors.
		Virgin mode	Off/On	Select Virgin mode On/Off. TV starts up / does not start up (once) with a language selection menu after the mains switch is turned "on" for the first time (virgin mode)
		E-sticker	Off/On	Select E-sticker On/Off (USPs on-screen)
		Auto store mode	None	
			PDC/VPS	
TXT page				
PDC/VPS/TXT				
Options	Digital broadcast	DVB	Off/On	Select DVB On/Off
		DVB - T installation	Off/On or Country dependent	Select DVB T installation On/Off or by country
		DVB - T light	Off/On	Select DVB T light On/Off
		DVB - C	Off/On	Select DVB C On/Off
		DVB - C installation	Off/On or Country dependent	Select DVB C installation On/Off or by country
		Over the air download	Off/On or Country dependent	Select Over the air download On/Off or by country
		8 days EPG	Off/On	Select 8 day EPG On/Off
	Digital features	USB	Off/On	Select USB On/Off
		Ethernet	Off/On	Select Ethernet On/Off
		Wi-Fi	Off/On	Select Wi-Fi On/Off
		DLNA	Off/On	Select DLNA On/Off
		On-line service	Off	On-line service is Off
		PTP (Picture Transfer Protocol)	Off/On	Select PTP On/Off
		Update assistant	Off/On	Select Update assistant On/Off
		Internet software update	Off	Internet software update is Off
	Data	EPG	Off/On	Select EPG On/Off
		TvTv EPG	Off/On	Select TvTv EPG On/Off
	Display	Screen	e.g. "130 - LGD WUE SAA1 42"	Displayed the panel code & type model.
		Dimming backlight	Off/On	Select Dimming Backlight On/Off
		LightGuide	Off/On	Select LightGuide On/Off
		Display fans	Not present/Present	Select Display fans Present/Not present.
		Temperature sensor	Sensor present in display (only for 21:9)	N.A.
		Temperature LUT	0	N.A.
		E-box & monitor	Off/On	Select E-box & monitor On/Off
	Video reproduction	Picture processing	None/PNX5100	Select Picture processing None/PNX5100 (Q549.xE chassis).
		MOP local contrast	Off/On	Select MOP local contrast On/Off
		Light sensor	Off/On	Select Light sensor On/Off
		Light sensor type	0/1/2/3	Select Light sensor type form 0 to 3 (for difference styling).
		Pixel Plus type	Pixel Plus HD	
			Perfect Pixel HD	
			Pixel Precise HD	
		Pixel Plus	Off/On	Select Pixel Plus On/Off
		Ambilight	Off/Mono/Stereo/Triple/Quad/Pixelated quad	Select type of Ambilight modules use.
		Ambilight technology	CCFL/LED	Select Ambilight technology.
		Ambilight driver	Pacific 3/MOP/DFI	Select Ambilight driver.
		Pacific 3	Not present/Present	Select Pacific 3 presence.
		MOP	Not present/Present	Select MOP presence.
	MOP ambilight	Off/On	Select MOP ambilight On/Off	

Main Menu	Sub-menu 1	Sub-menu 2	Sub-menu 3	Description
	Audio reproduction	Acoustic system		Cabinet design used for setting dynamic audio parameters
	Source selection	EXT1/AV1 type	SCART CVBS RGB LR	Select input source when connected with external equipment
			CVBS Y/C YPbPr LR	
			CVBS Y/C YPbPr HV LR	
			(CVBS) YPbPr LR	
		EXT2/AV2 type	SCART CVBS RGB LR	Select input source when connected with external equipment
			CVBS Y/C LR	
			(CVBS) YPbPr LR	
			CVBS Y/C LR	
		EXT3/AV3 type	None	Select input source when connected with external equipment
			CVBS	
			CVBS LR	
			YPbPr	
			YPbPr LR	
		VGA	Off/On	Select VGA On/Off
		SIDE I/O	Off/On	Select SIDE I/O On/Off
		HDMI 1	Off/On	Select HDMI 1 On/Off
		HDMI 2	Off/On	Select HDMI 2 On/Off
	HDMI 3	Off/On	Select HDMI 3 On/Off	
	HDMI 4	Off/On	Select HDMI 4 On/Off	
HDMI side	Off/On	Select HDMI side On/Off		
HDMI CEC	Off/On	Select HDMI CEC On/Off		
HDMI CEC RC pass through	Off/On	Select HDMI CEC RC pass through On/Off		
HDMI CEC Pixel Plus link	Off/On	Select Pixel Plus link On/Off		
USB version	USB 1.0/USB 2.0	Select USB version		
S/PDIF inputs	None/1 connector	Select no. of inputs		
Miscellaneous		Region	Europe/AP-PAL-MULTI/Australia	Select Region/country
		ATSC/DVB-T	Off/On	Select feature On/Off
		Over the air download (AOD)	Off/On	Select feature On/Off
		DVB-T installation	Off/Country dependent/On	Select feature On/Off
		DVB-C	Off/On	Select feature On/Off
		DVB-C installation	Off/Country dependent/On	Select feature On/Off
		MPEG4	Off/On	Select feature On/Off
		Tuner type	HD1816-MK1/TD1716-MK4/etc.	Select type of Tuner used
		Nyquist SAW filter	Off/On	Select feature On/Off
		I2C configuration	With PCA9540/9515/channel dec.	Select configuration
		Channel decoder	TDA10048/etc.	Select channel decoder
		Remote control assistant	Off/On	Select feature On/Off
		System RC support	Off/On	Select System RC support On/Off
		Embedded user manual	Off/On	Select Embedded user manual On/Off
		Start-up screen	Off/On	Select Start-up screen On/Off
		Wallpaper	Off/On	Select Wallpaper On/Off
		Hotel mode	Off	Hotel mode is Off
		Video playback	Off/On	Select feature On/Off
Update assistant	Off/On	Select feature On/Off		
Board identifier	TV520/82 / TV520/82M	Select chassis		
Light guide	Off/On	Select feature On/Off		
Option number	Group 1	e.g. "08192.02181.01387.45160"		The first line (group 1) indicates HW options 1 - 4
	Group 2	e.g. "10185.12448.00164.00000"		The second line (group 2) indicates SW options 5 - 8
	Store			Store after changing
Initialise NVM				N.A.
Store				Select Store in the SAM root menu after making <b>any</b> changes
SW maintenance	Software events	Display		Displayed information is for development purposes
		Clear		
		Test reboot		
	Hardware events	Display		Displayed information is for development purposes
		Clear		
Operation hours display		0003		In case the display must be swapped for repair, you can reset the "Display operation hours" to "0". So, this one does keeps up the lifetime of the display itself (mainly to compensate the degeneration behaviour)
Test settings	Digital info			Displayed information is for development purposes.
	Install start frequency	000		Install start frequency from "0" MHz
	Install end frequency	999		Install end frequency as 999 MHz
	Default install frequency			
	Installation	Digital only		Select Digital only or Digital + Analogue before installation.
	Digital + Analogue			

Main Menu	Sub-menu 1	Sub-menu 2	Sub-menu 3	Description
Development file versions	Development 1 file version	Display parameters DISPT 3.26.8.7		Displayed information is for development purposes.
		Acoustics parameters ACSTS 3.6.6.5		
		PQ - PRFPP 1.26.10.4		
		Ambilight parameters PRFAM 2.6.1.3		
	Development 2 file version	12NC one zip software		Displayed information is for development purposes.
		Initial main software		
		NVM version Q5492_0.4.0.0		
		Flash units SW Q5492_0.26.15.0		
Upload to USB	Channel list		To upload several settings from the TV to an USB stick	
	Personal settings			
	Option codes			
	Display-related alignment			
	History list			
Download from USB	Channel list		To download several settings from the USB stick to the TV.	
	Personal settings			
	Option codes			
	Display-related alignments			



## 7. Circuit Descriptions

### Index of this chapter:

[7.1 Introduction](#)

[7.2 PSU](#)

### Notes:

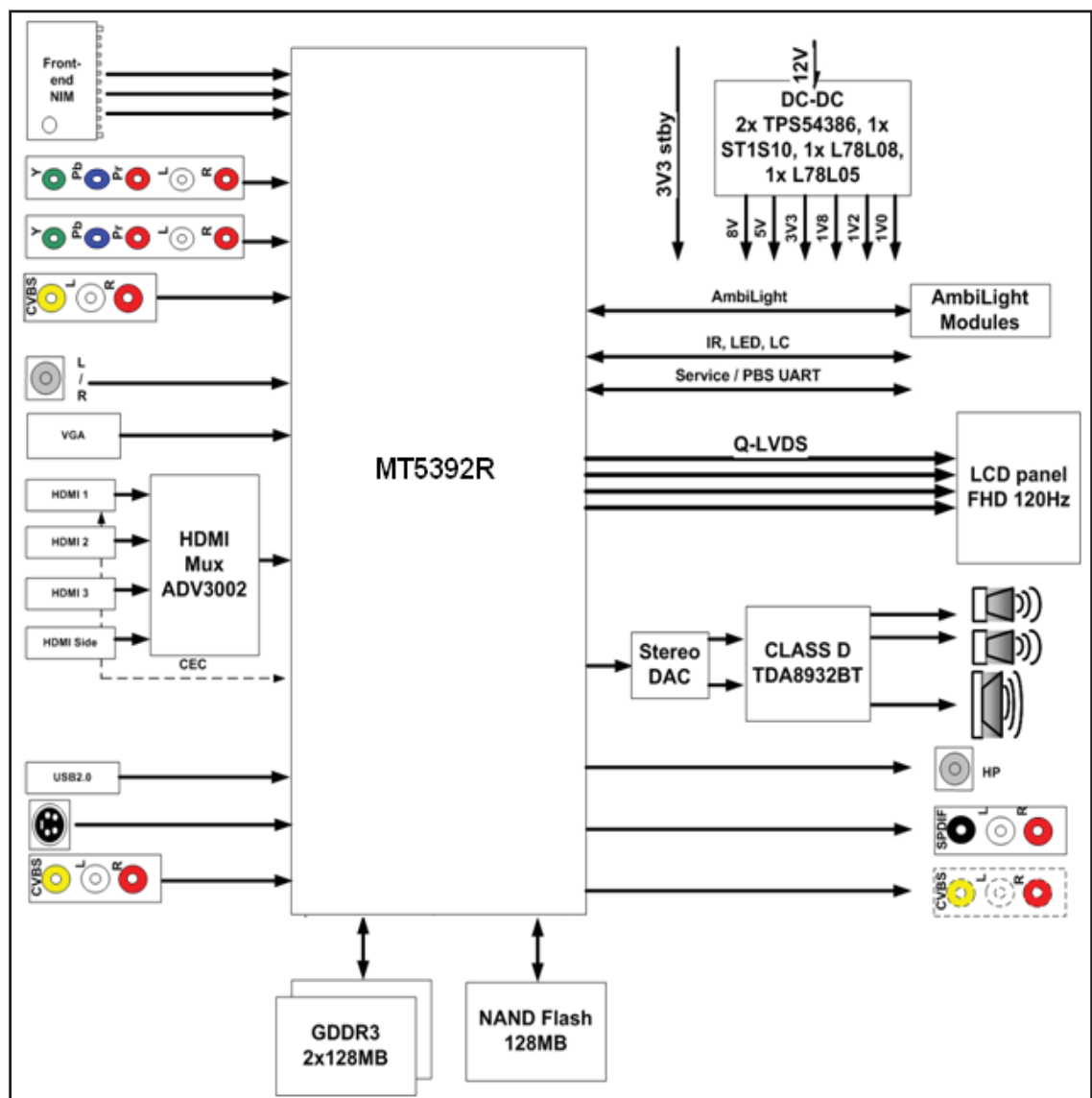
- Only **new** circuits (circuits that are not published recently) are described.
- Figures can deviate slightly from the actual situation, due to different set executions.
- For a good understanding of the following circuit descriptions, please use chapter [9. Block Diagrams](#) and [10. Circuit Diagrams and PWB Layouts](#). Where necessary, you will find a separate drawing for clarification.

### 7.1 Introduction

The LC9.2L LA chassis is a digital derivative from the LC9.1A LA chassis. Only the DTM part (digital Brazil) is different, but is all incorporated in the MT5392 (+ other tuner). For all other circuitry, refer to the LC9.1A LA Service Manual.

#### 7.1.1 Architecture Overview

For details about the chassis block diagrams refer to chapter [Block Diagrams](#). An overview of the architecture can be found in figure [7-1 Architecture](#).



18700\_203\_090828.eps  
090828

Figure 7-1 Architecture

## 7.1.2 SSB Cell Layout

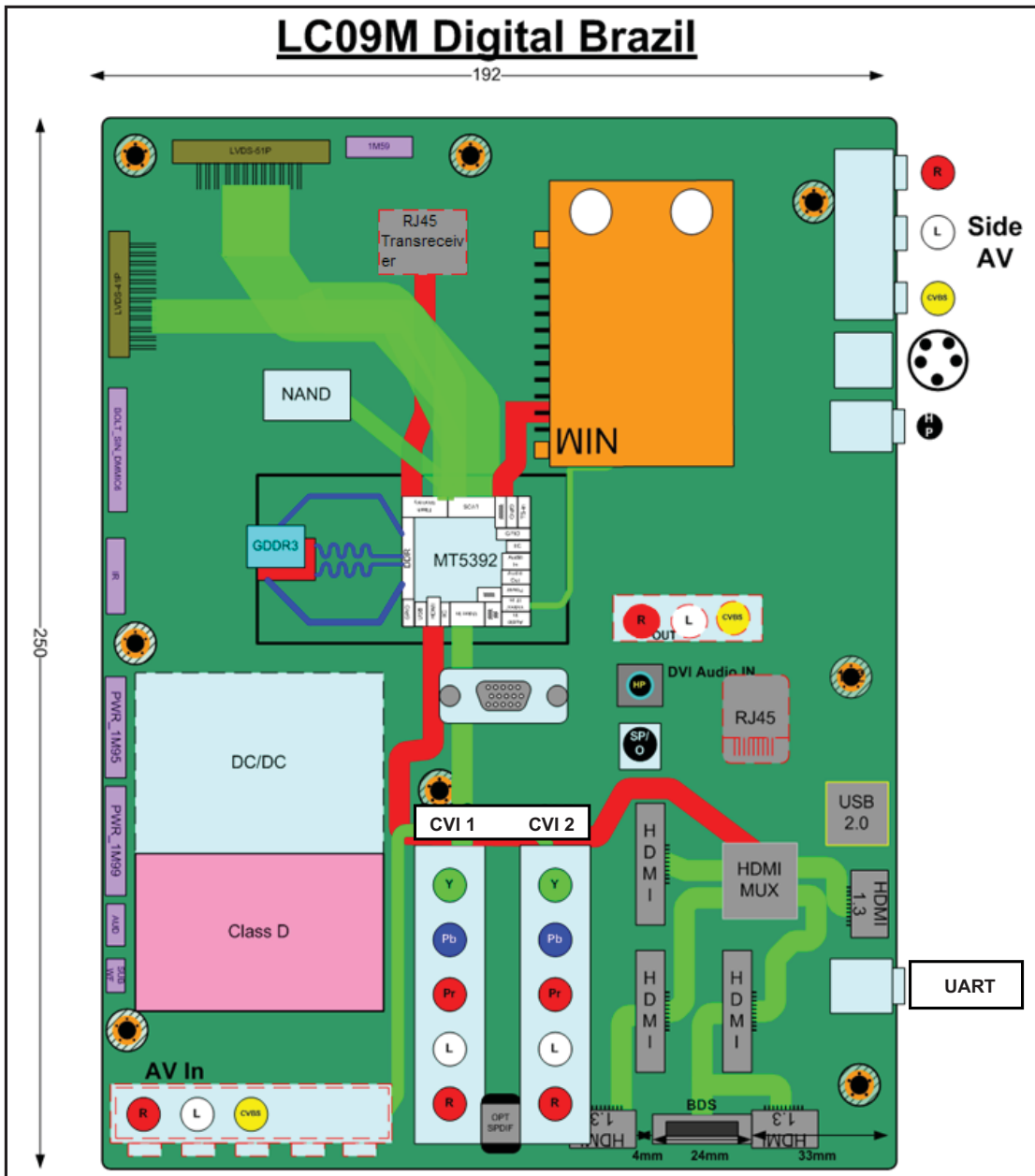
18700\_204\_090828.eps  
090828

Figure 7-2 SSB cell layout

## 7.2 PSU

All PSUs are so-called IPBs (Integrated Power Boards). That are PSUs with integrated LCD inverters.

The power supplies are a black box for Service. When defective, a new board must be ordered and the defective one must be returned, unless the main fuse of the board is broken. Always replace a defective fuse with one with the correct specifications! This part is available in the regular market. For an overview of the output voltages of the Power Supplies, refer to the wiring diagrams in chapter [Block Diagrams](#).

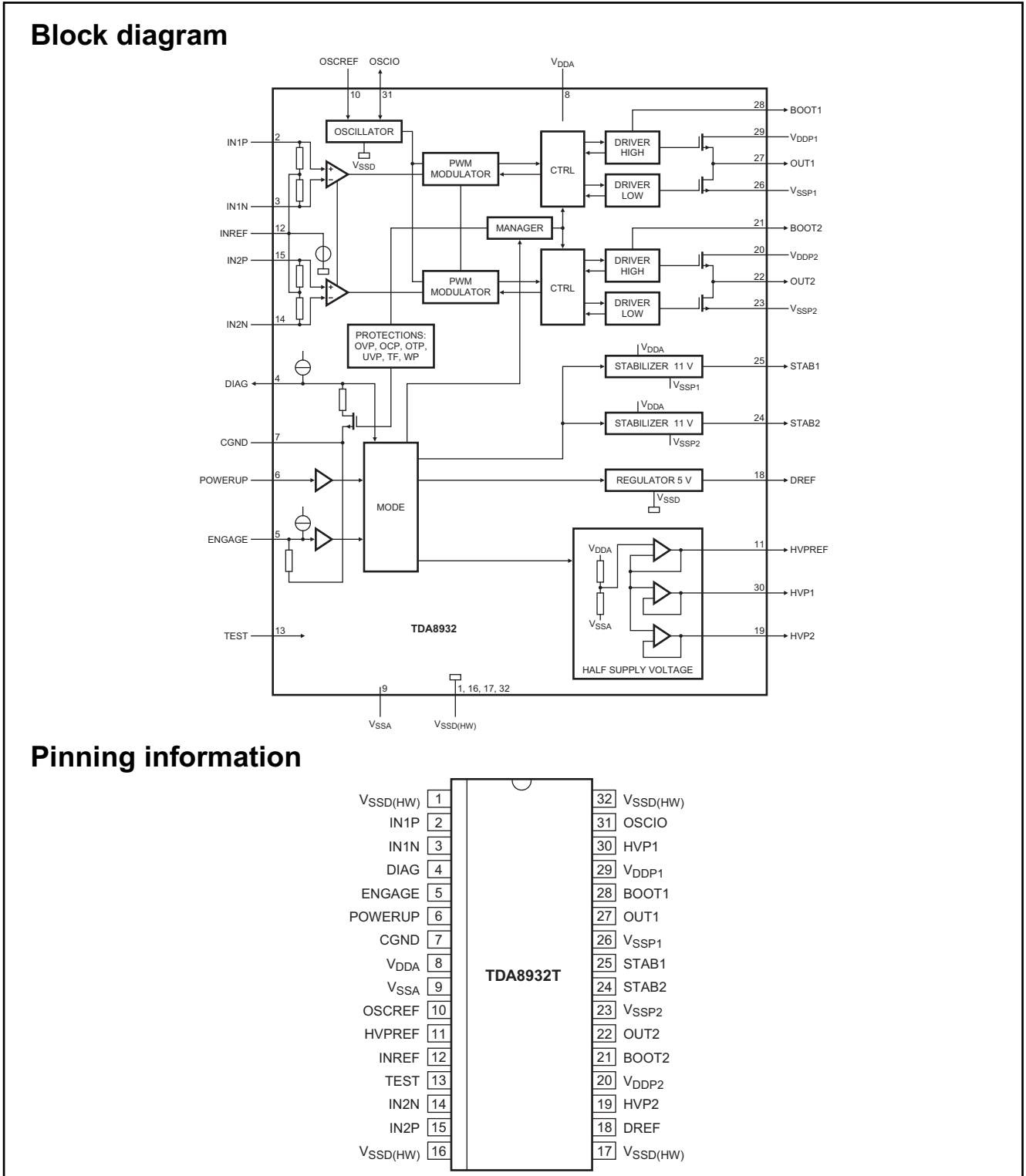
The following PSUs are used:

- 32-inch/50Hz: LGIT PLHL-T810B (155 W).
- 42-inch/50Hz: LGIT PLHL-T814B (205 W).
- 47-inch/50Hz: LGIT PLHL-T819B (270 W).
- 42-inch/100Hz: LGIT PLHL-T814A (220 W).
- 52-inch/100Hz: Delta DPS-411AP-3A (280 W).

# 8. 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).

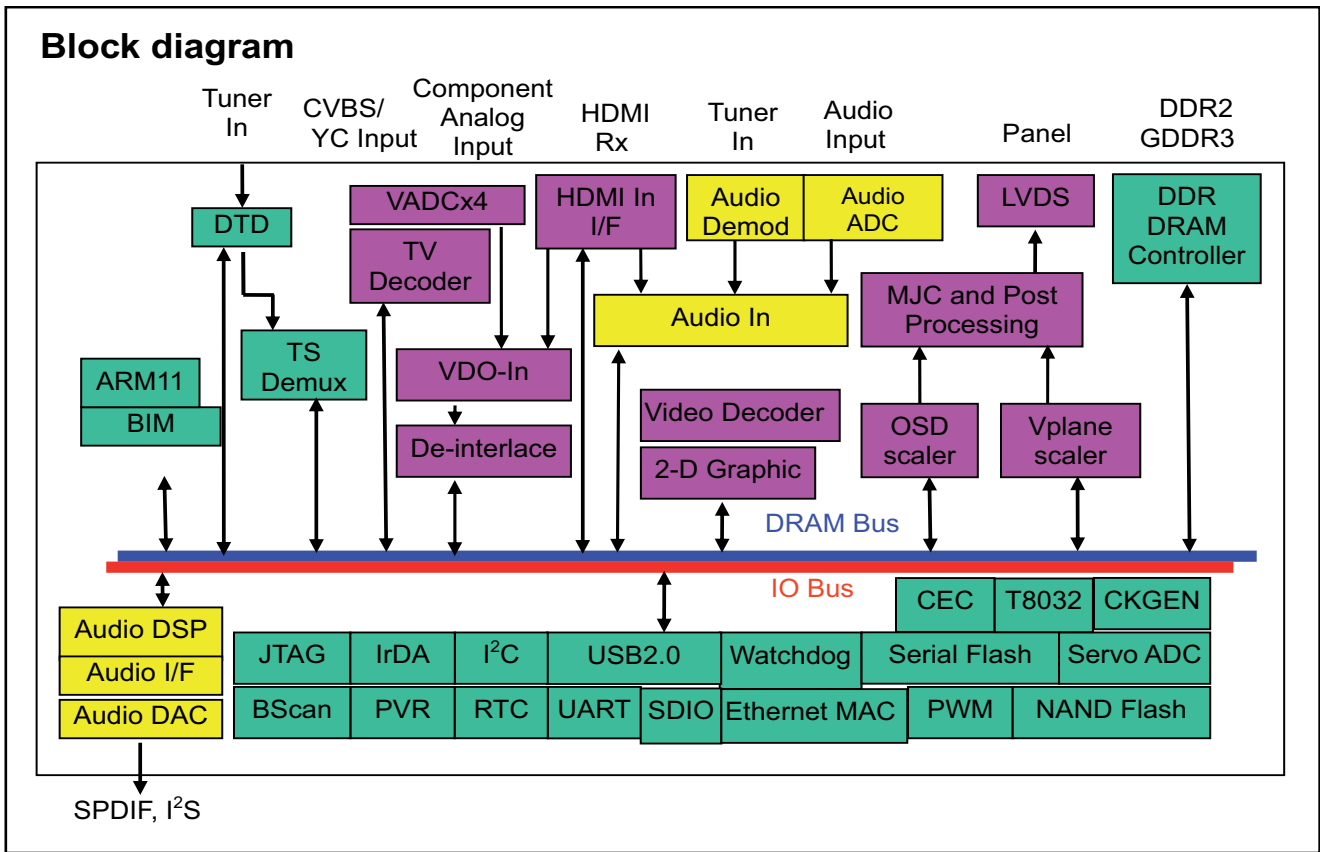
## 8.1 Diagram B03, Type TDA8932BT (IC7510), Audio Amplifier



G\_16860\_045.eps  
100326

Figure 8-1 Internal block diagram and pin configuration

8.2 Diagram B04x, Type MT5392 (IC7701), CPU / Demodulator / Decoder

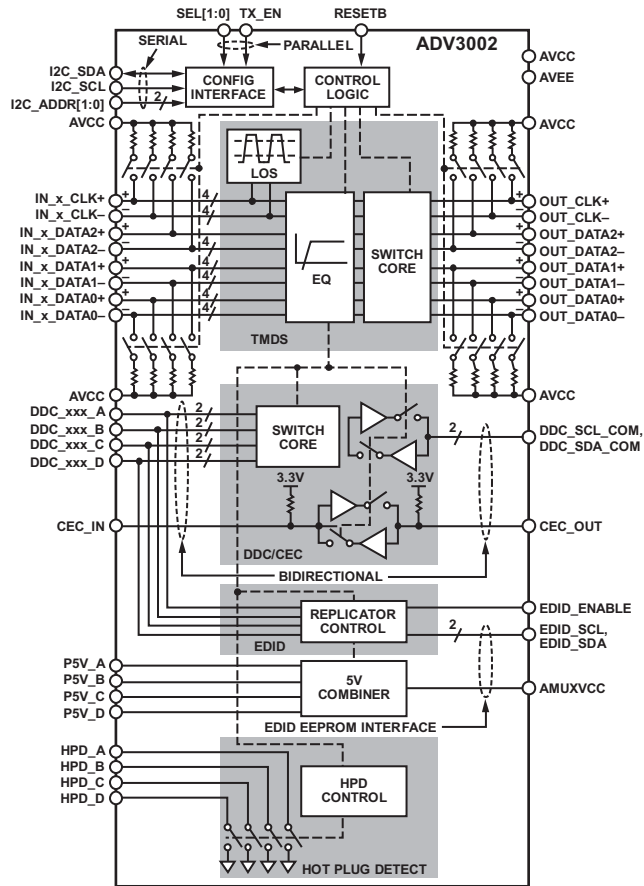


18700\_302\_090828.eps  
100326

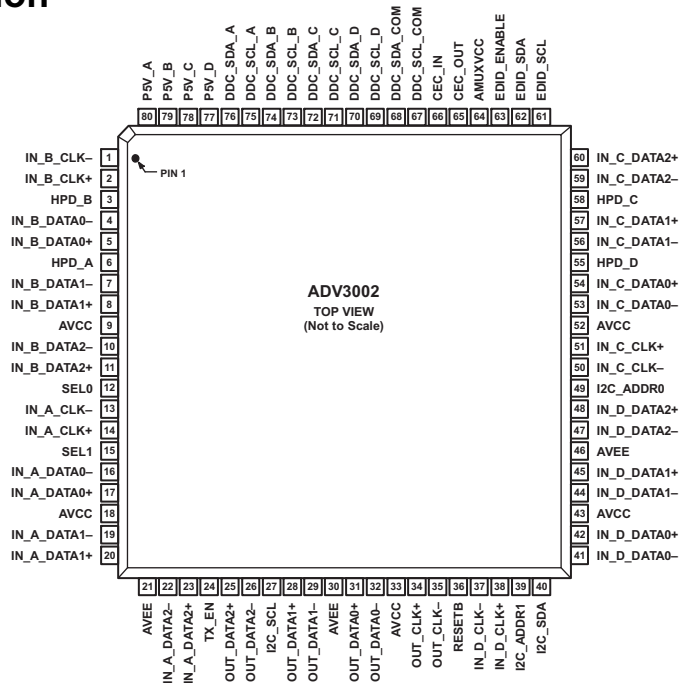
Figure 8-2 Internal block diagram

8.3 Diagram B05, Type ADV3002 (IC7B05), HDMI MUX

Block diagram



Pinning information



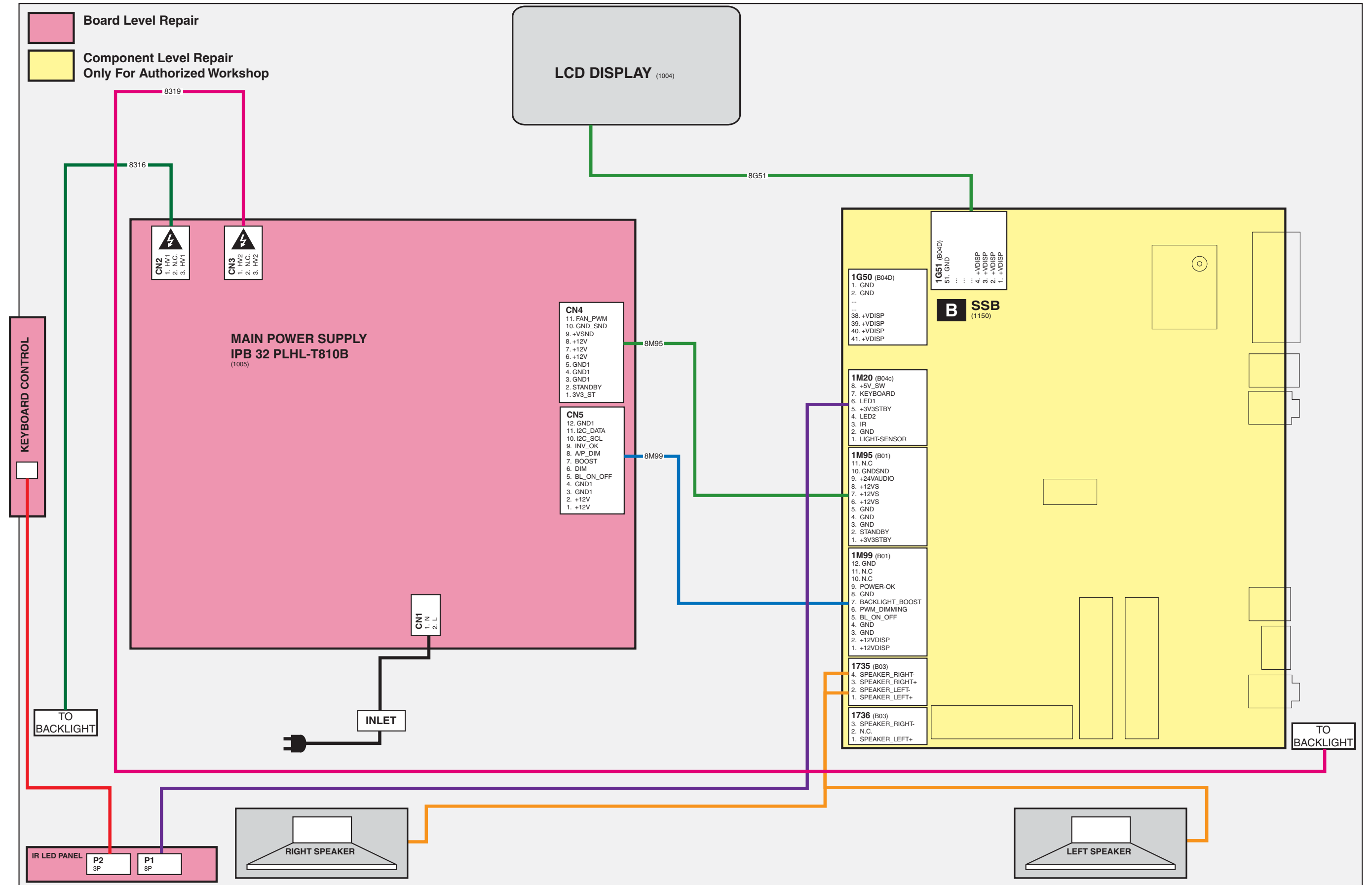
18700\_301\_090828.eps  
100326

Figure 8-3 Internal block diagram and pin configuration

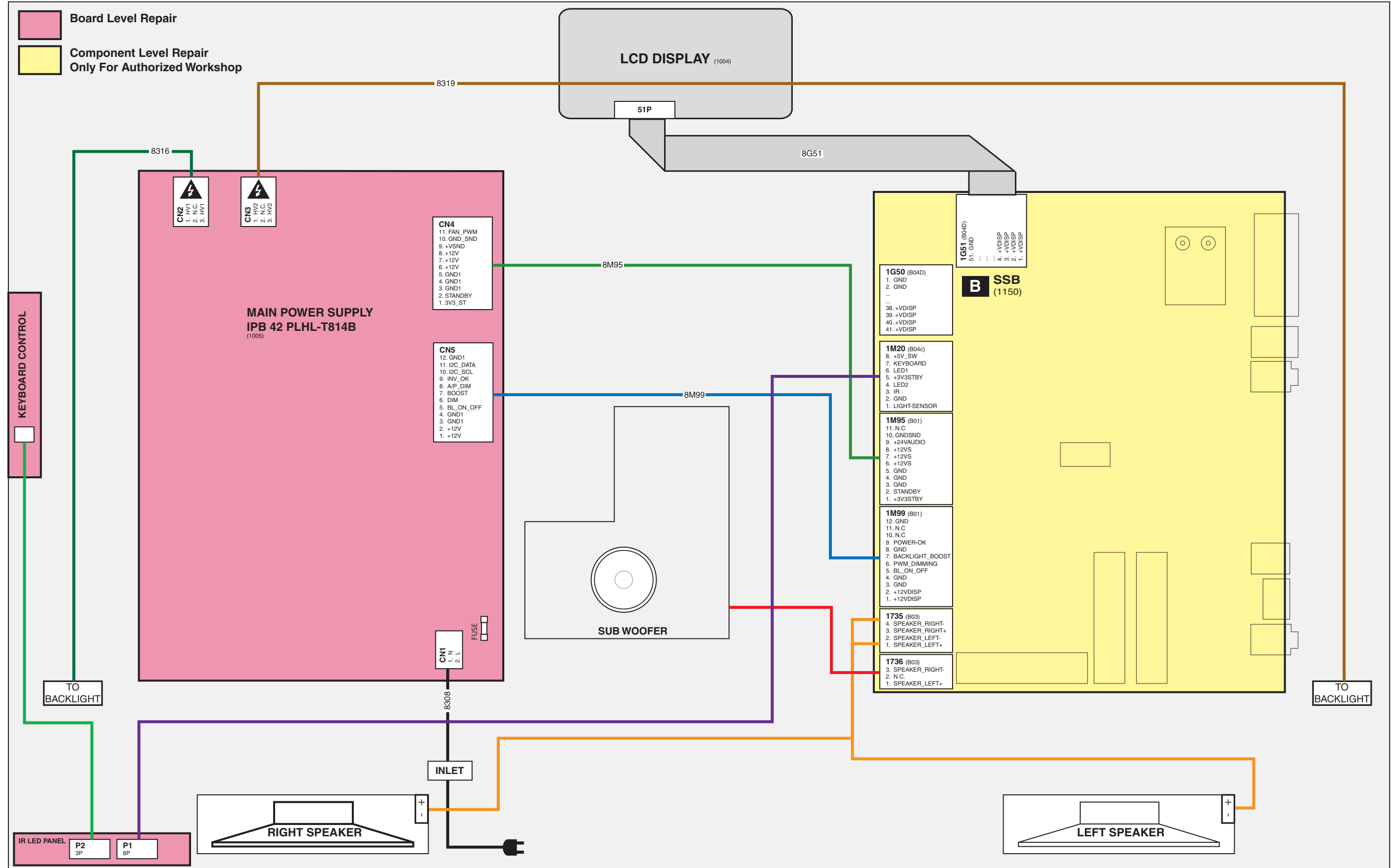


# 9. Block Diagrams

Wiring Diagram 32" (P & S)  
WIRING DIAGRAM 32" (P&S)

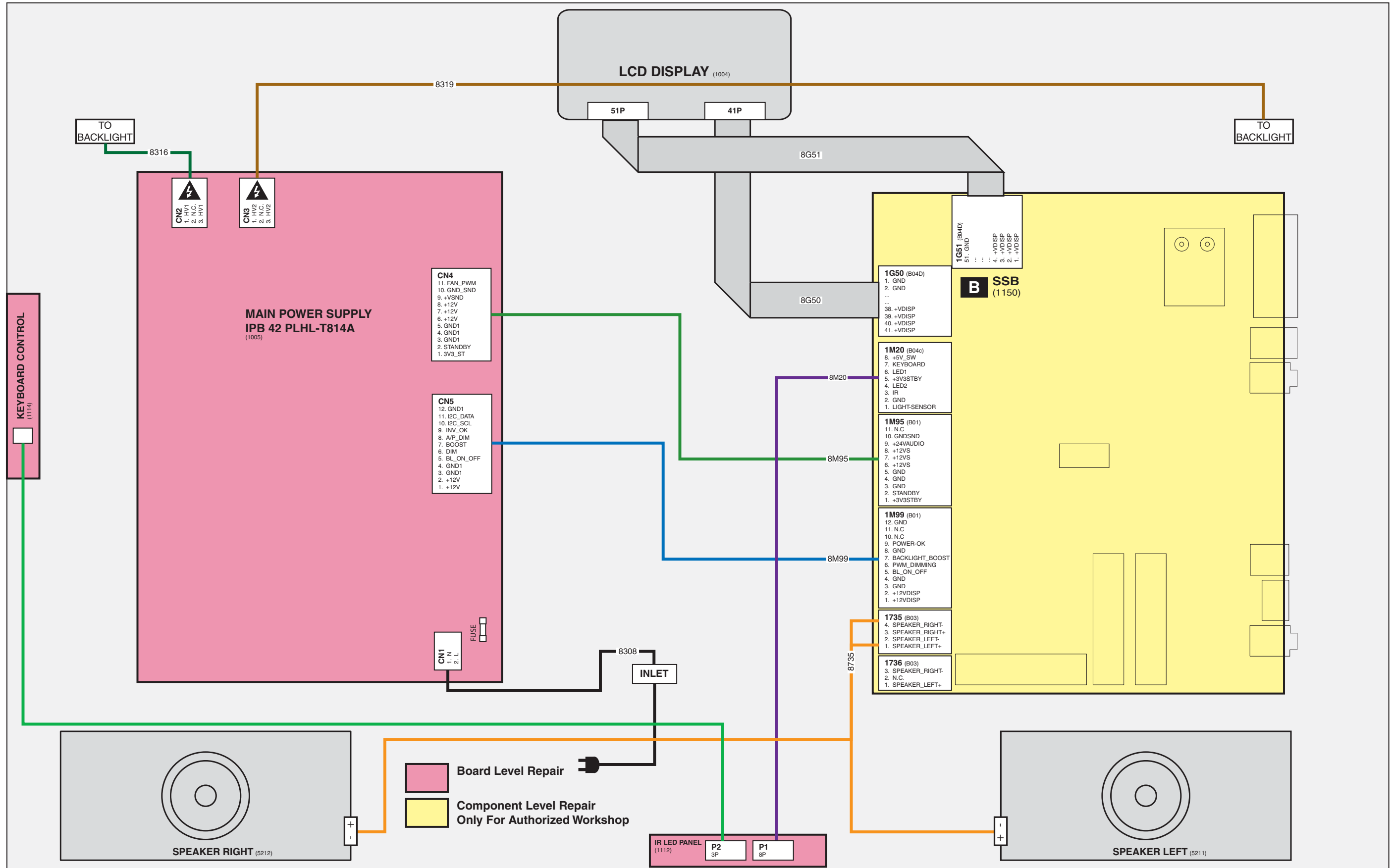


**Wiring Diagram 42" (P & S)**  
**WIRING DIAGRAM 42" (P&S)**

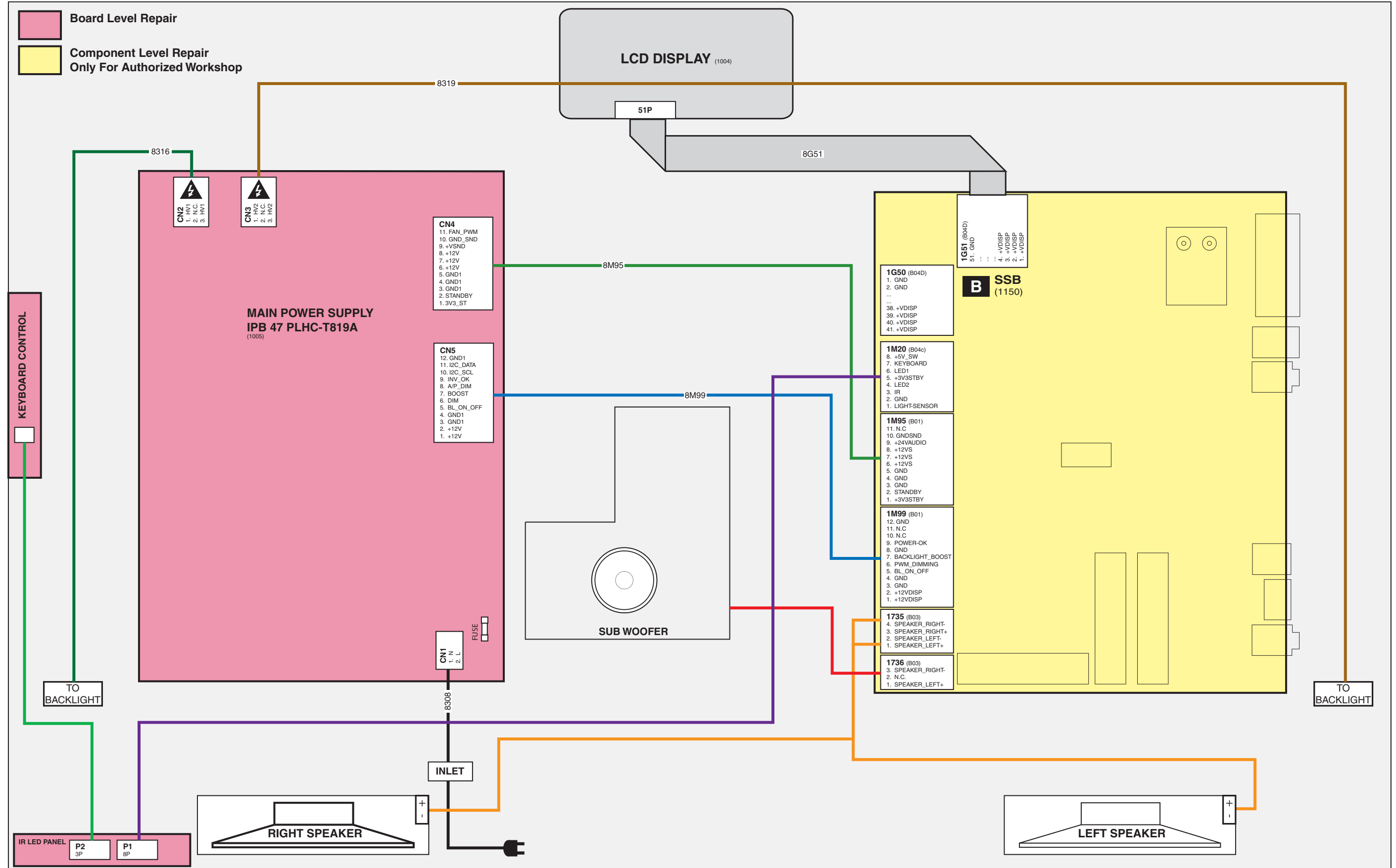




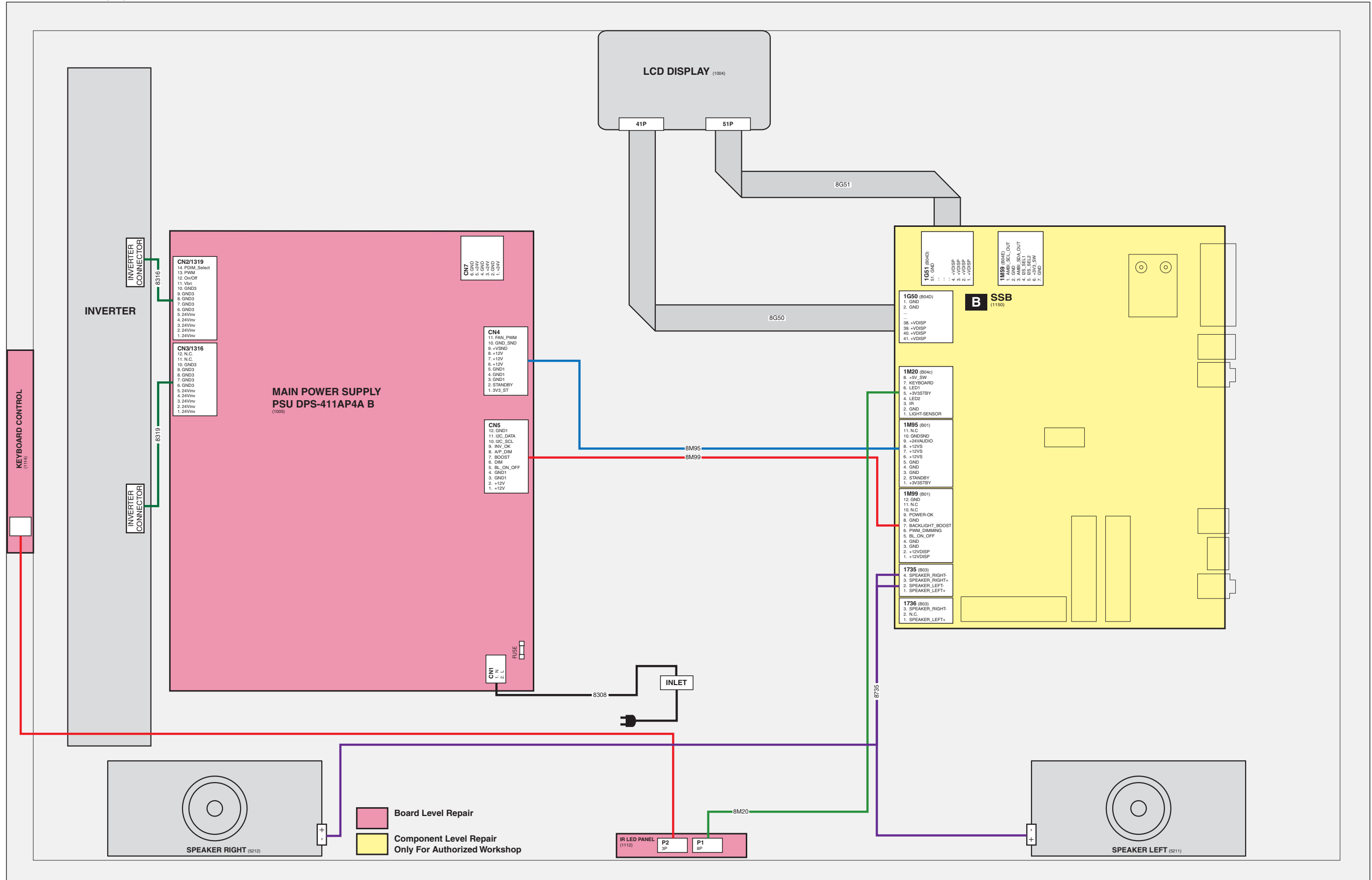
**Wiring Diagram 42"(Frame)**  
**WIRING DIAGRAM 42" (FRAME)**



**Wiring Diagram 47"(P & S)**  
**WIRING DIAGRAM 47" (P&S)**



**Wiring Diagram 52"(Frame)**  
 WIRING DIAGRAM 52" (FRAME)

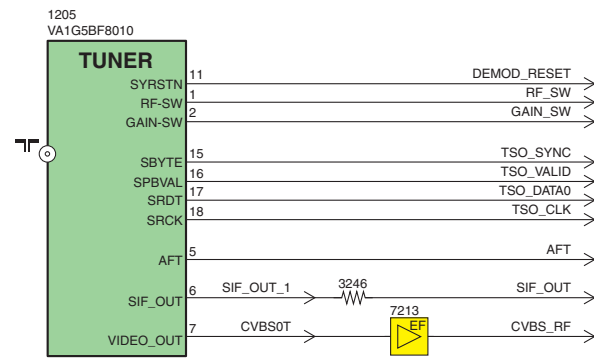


Board Level Repair  
 Component Level Repair  
 Only For Authorized Workshop

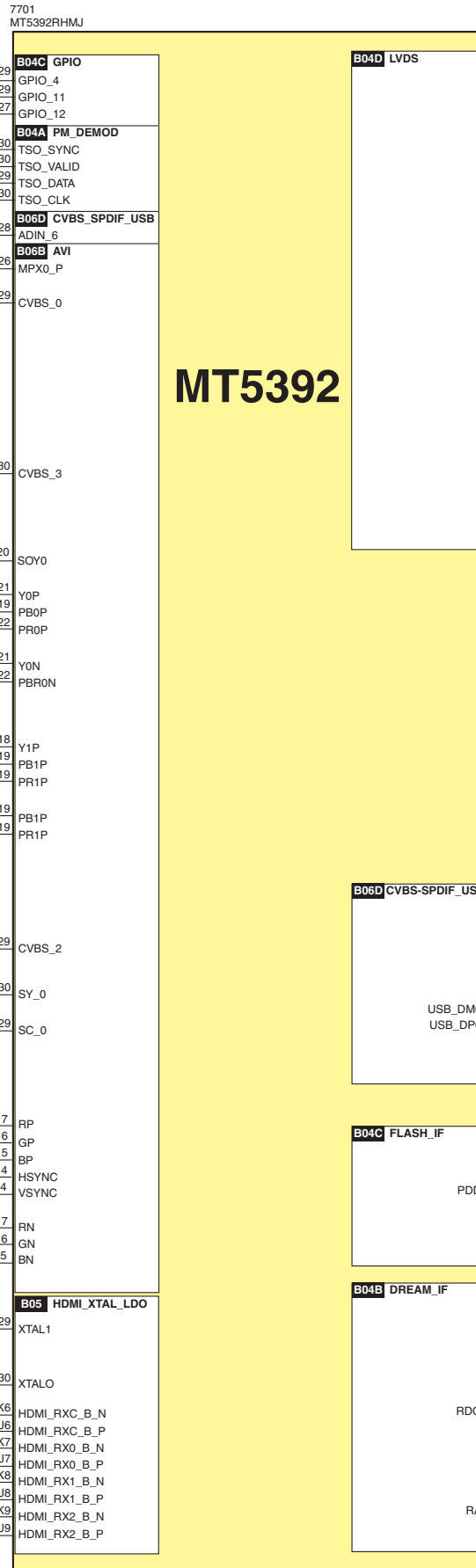
### Block Diagram Video

#### VIDEO

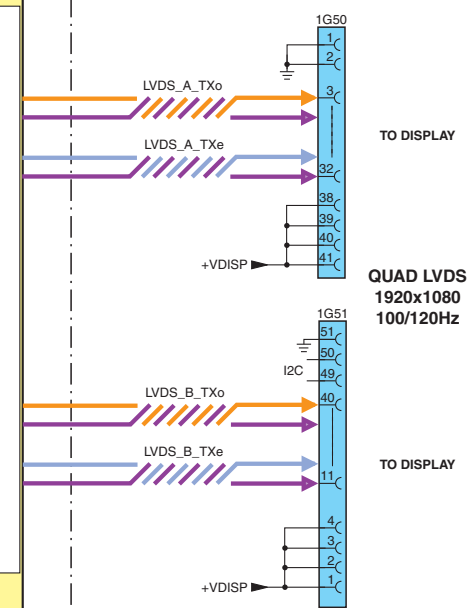
##### B02A TUNER & ANALOG DEMOD



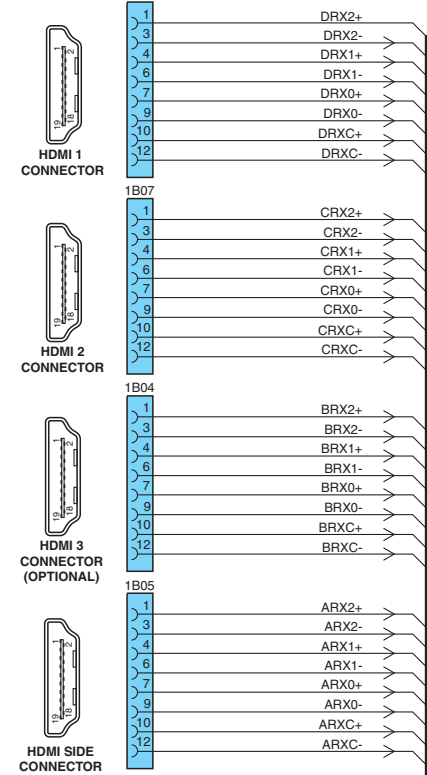
##### B04 MT5392:



##### B04D DISPLAY INTERFACE - LVDS



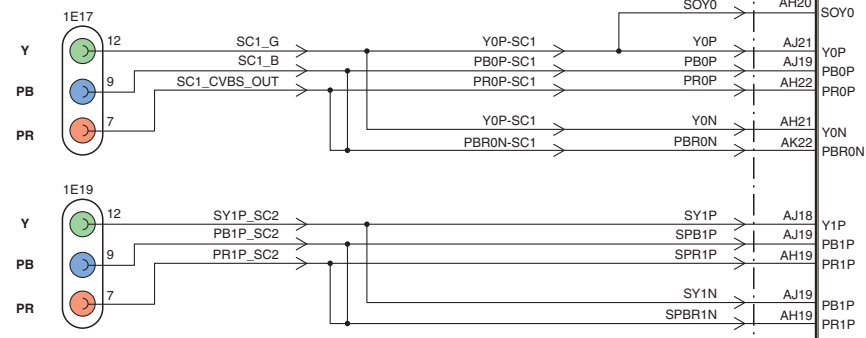
##### B05 HDMI & MUX



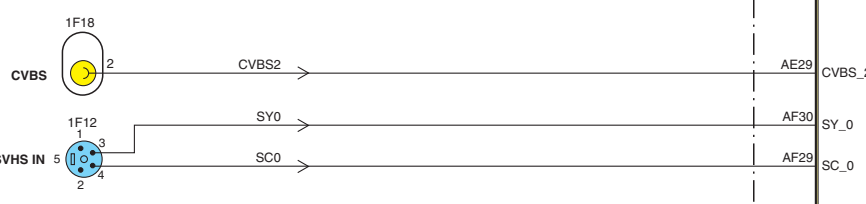
##### B06B ANALOG I/O - YPBPR



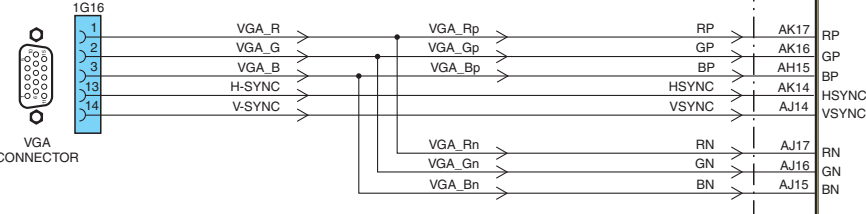
##### B06C ANALOG I/O - CINCH



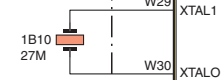
##### B06D SIDE-AV & USB



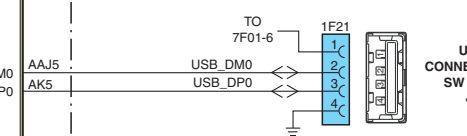
##### B06E VGA



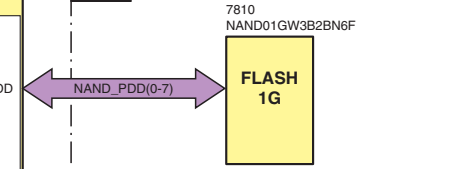
##### B05 HDMI\_XTAL\_LDO



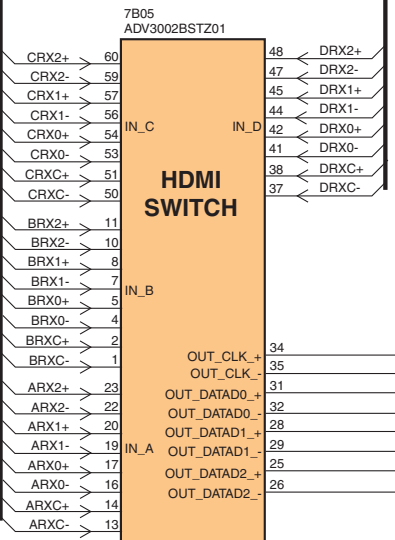
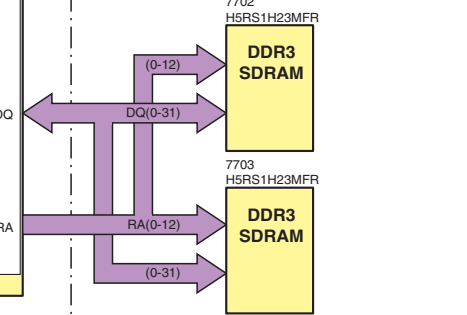
##### B06D SIDE-AV & USB



##### B04C FLASH & EJTAG

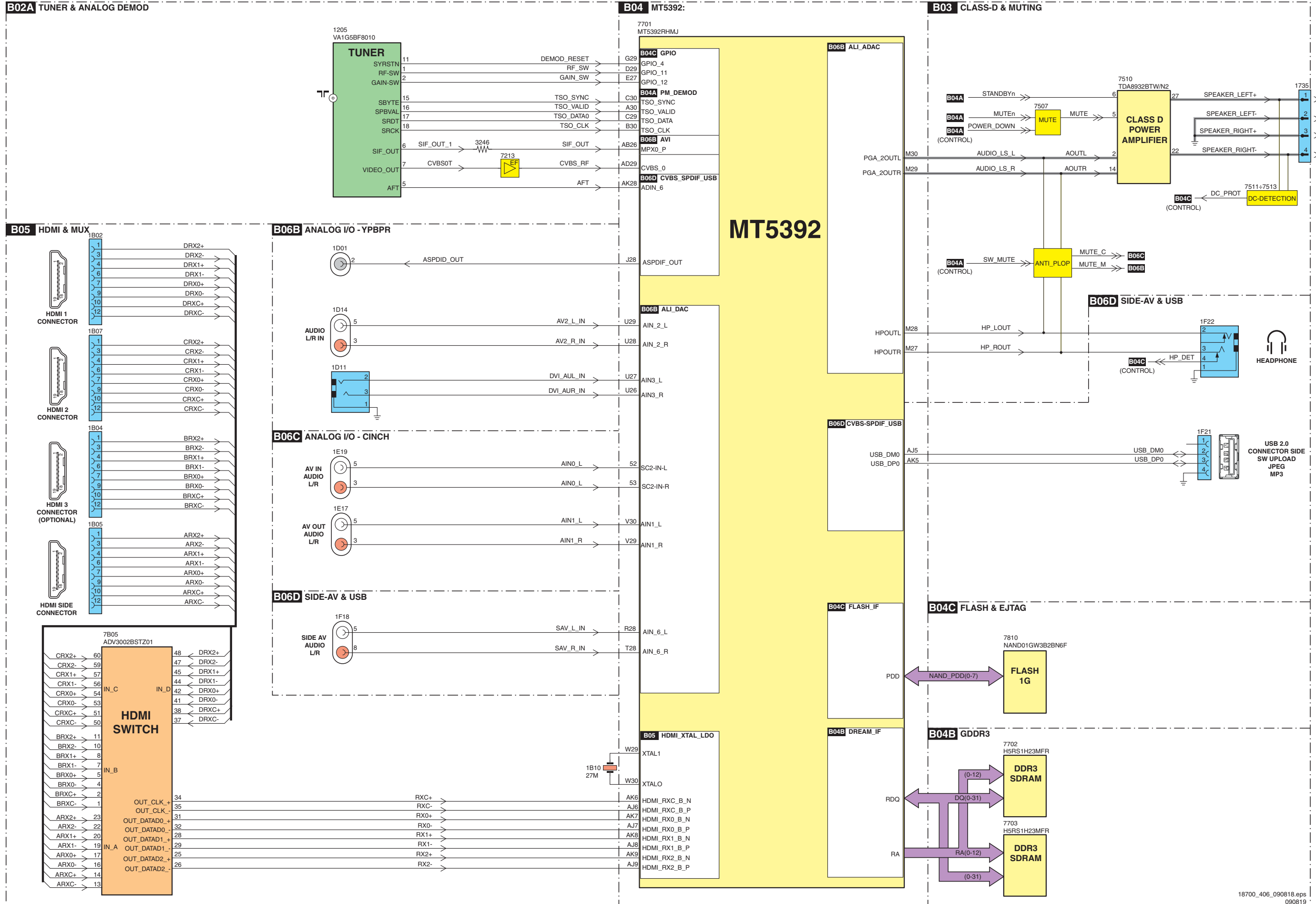


##### B04B GDDR3



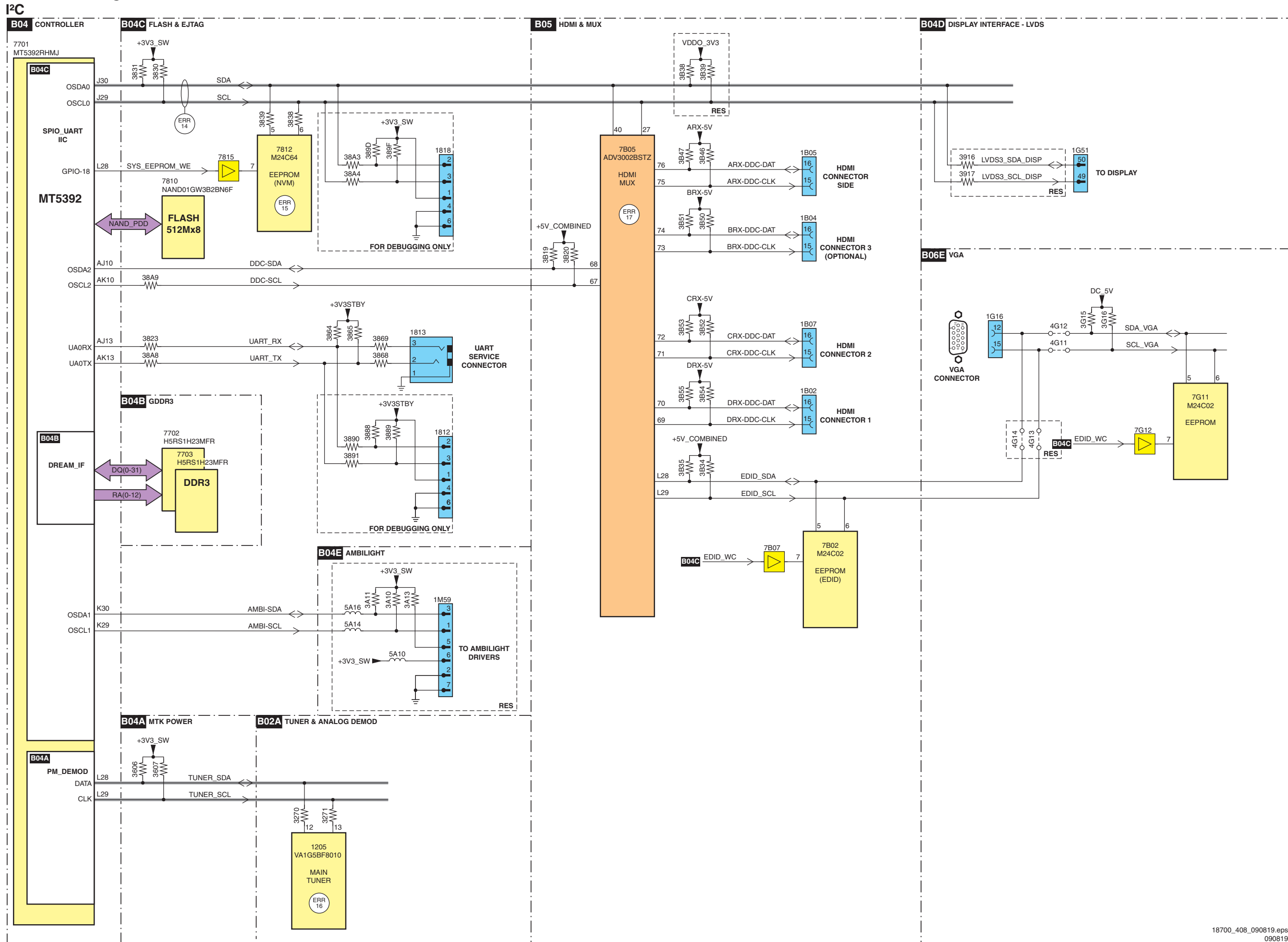
# Block Diagram Audio

## AUDIO

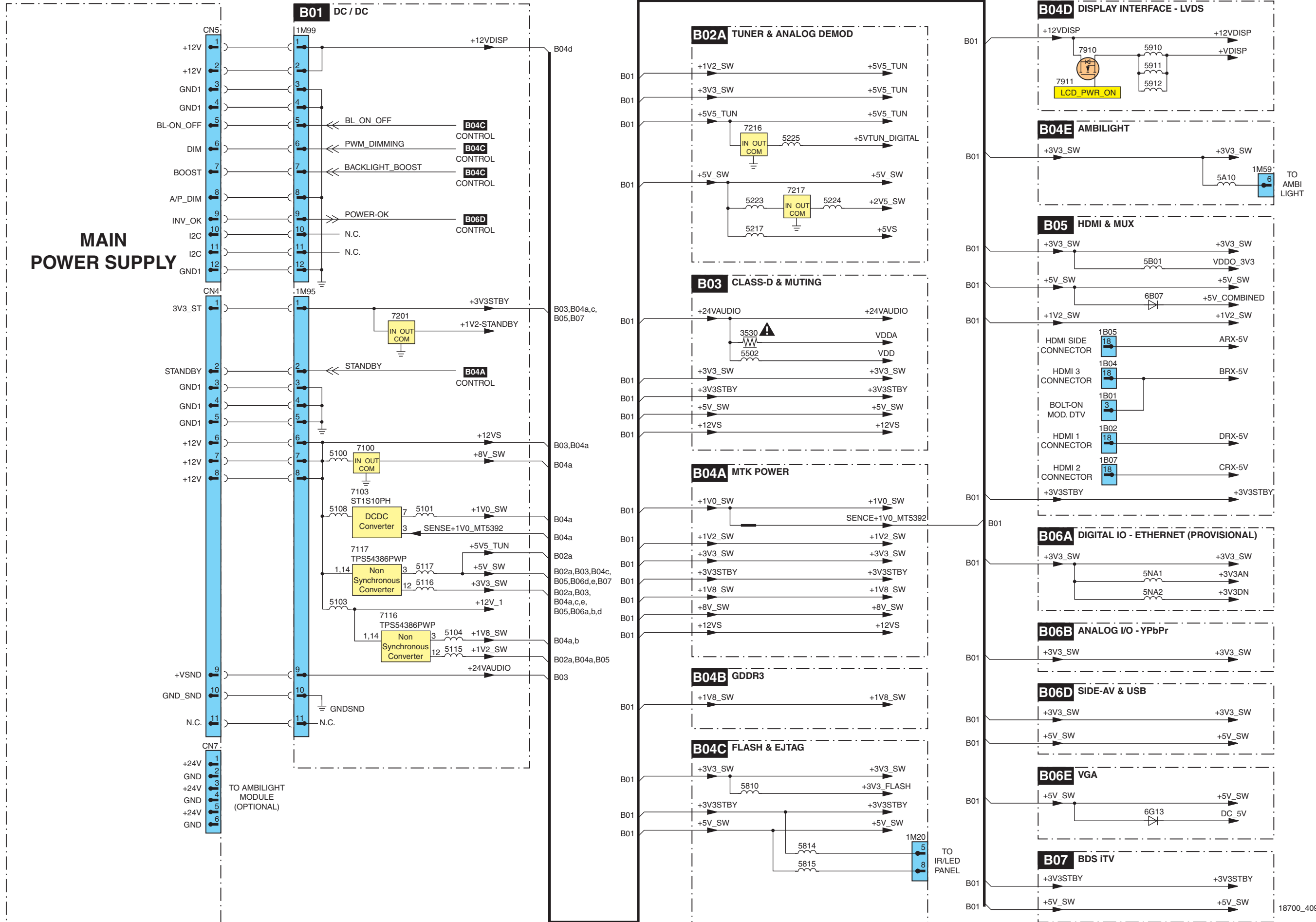




### Block Diagram I<sup>2</sup>C



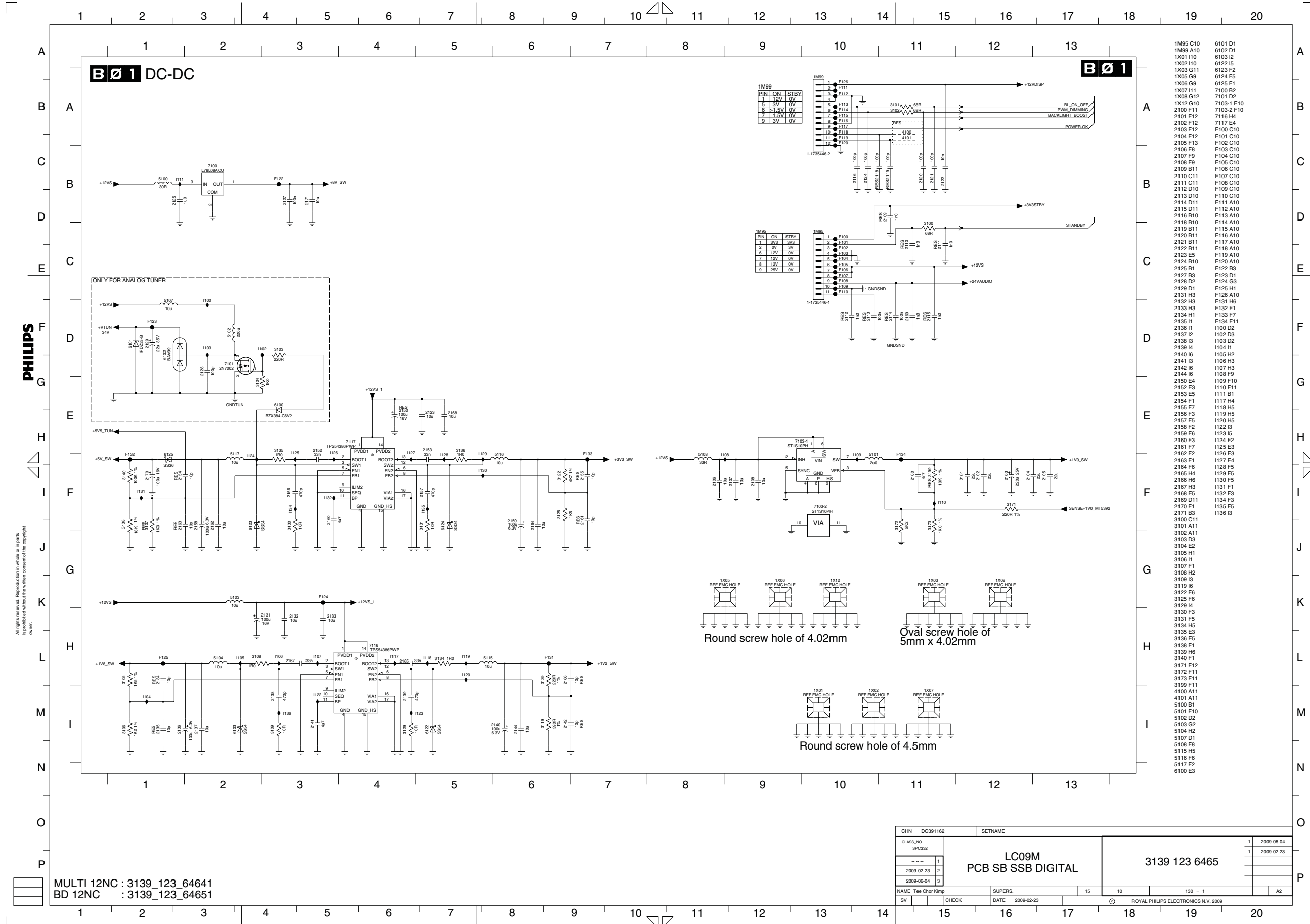
**Supply Lines Overview**  
**SUPPLY LINES OVERVIEW**





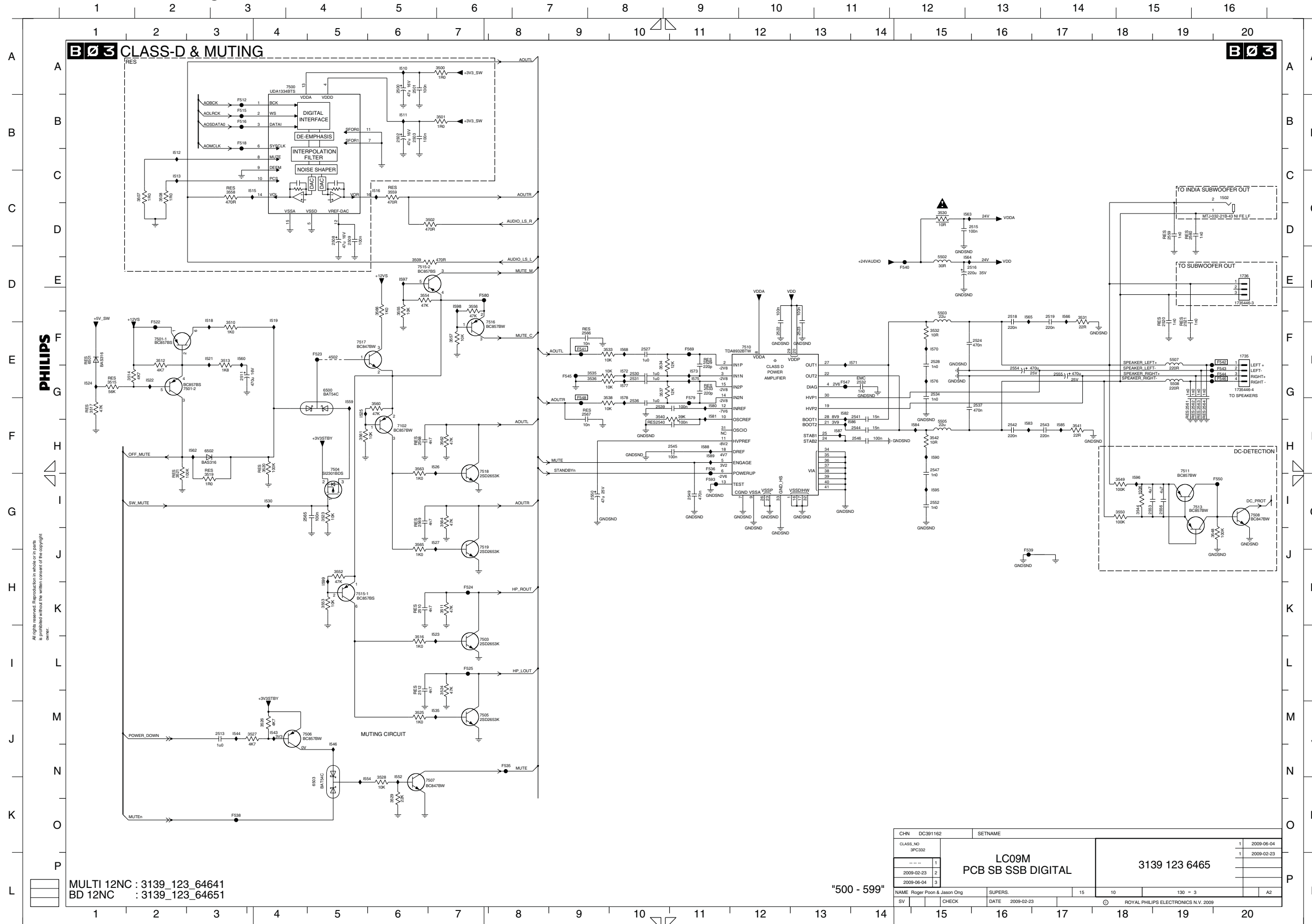
# 10. Circuit Diagrams and PWB Layouts

## SSB: DC/DC





**SSB: Class-D & Muting**



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MULTI 12NC : 3139\_123\_64641  
BD 12NC : 3139\_123\_64651

CHN	DC391162	SETNAME	
CLASS_NO	3PC332		
		<b>LC09M</b>	
		<b>PCB SB SSB DIGITAL</b>	
			<b>3139 123 6465</b>
NAME	Roger Poon & Jason Ong	SUPERS.	15
SV	CHECK	DATE	2009-02-23
			ROYAL PHILIPS ELECTRONICS N.V. 2009

- 1502 C16
- 1736 E16
- 1736 D16
- 2500 A5
- 2501 A5
- 2502 B5
- 2503 B5
- 2508 C4
- 2509 C4
- 2510 H5
- 2511 E3
- 2512 I5
- 2513 J3
- 2515 C13
- 2516 D13
- 2518 D13
- 2520 D15
- 2521 D15
- 2522 E10
- 2523 E10
- 2524 E13
- 2527 E9
- 2528 E12
- 2529 E9
- 2530 E8
- 2531 E8
- 2532 E11
- 2533 E9
- 2534 E12
- 2536 F8
- 2537 F13
- 2539 F8
- 2540 F8
- 2541 F11
- 2542 F13
- 2543 F14
- 2544 F11
- 2545 F9
- 2546 F11
- 2547 F12
- 2549 G9
- 2550 G8
- 2551 G8
- 2552 G12
- 2553 G15
- 2554 E13
- 2555 E14
- 2556 G15
- 2559 C15
- 2560 C16
- 2561 F15
- 2562 F16
- 2563 F16
- 2564 F16
- 2565 G4
- 2566 E7
- 2567 F7
- 2568 F5
- 2569 G5
- 3000 A6
- 3001 B6
- 3502 C5
- 3507 C2
- 3508 C2
- 3509 C2
- 3510 E3
- 3511 H6
- 3512 E2
- 3513 E3
- 3514 E1
- 3515 E1
- 3516 I5
- 3517 F11
- 3519 F2
- 3520 F3
- 3521 F2
- 3522 G4
- 3523 H4
- 3524 H4
- 3525 J5
- 3526 J3
- 3527 J3
- 3528 K5
- 3529 K5
- 3530 C12
- 3531 D14
- 3532 E8
- 3533 E8
- 3534 E8
- 3535 E8
- 3536 F8
- 3537 E8
- 3538 F8
- 3540 F8
- 3541 F14
- 3542 F12
- 3544 G15
- 3548 G16
- 3549 G15
- 3550 G15
- 3552 H4
- 3553 H4
- 3554 D5
- 3555 D5
- 3556 D6
- 3557 E6
- 3558 C3
- 3559 C5
- 3560 F5
- 3561 F5
- 3562 F6
- 3563 F5
- 3564 G6
- 3565 G5
- 3566 D5
- 4502 E4
- 5502 D12
- 5503 D12
- 5505 F12
- 5507 E15
- 5508 E15
- 6500 E4
- 6501 E1
- 6502 F2
- 6503 K4
- 7102 F5
- 7500 A4
- 7501-1 E2
- 7501-2 E2
- 7503 I6
- 7504 F4
- 7505 J6
- 7506 J4
- 7507 K5
- 7508 G16
- 7510 E10
- 7511 F15
- 7513 G16
- 7515-1 H5
- 7515-2 D5
- 7516 D6
- 7517 E4
- 7518 F6
- 7519 G6
- F515 B3
- F516 B3
- F518 B3
- F523 E4
- F524 H6
- F525 H6
- F535 J6
- F536 F9
- F538 K3
- F539 H13
- F540 D12
- F541 E7
- F542 E16
- F543 E16
- F544 E16
- F545 E7
- F546 E16
- F547 E11
- F548 F7
- F550 G16
- F569 E9
- F579 E9
- F580 D6
- F583 G9
- F585 E9
- F586 D6
- F589 G9
- F590 G9
- F591 G9
- F592 G9
- F593 G9
- F594 G9
- F595 G9
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- F800 G9









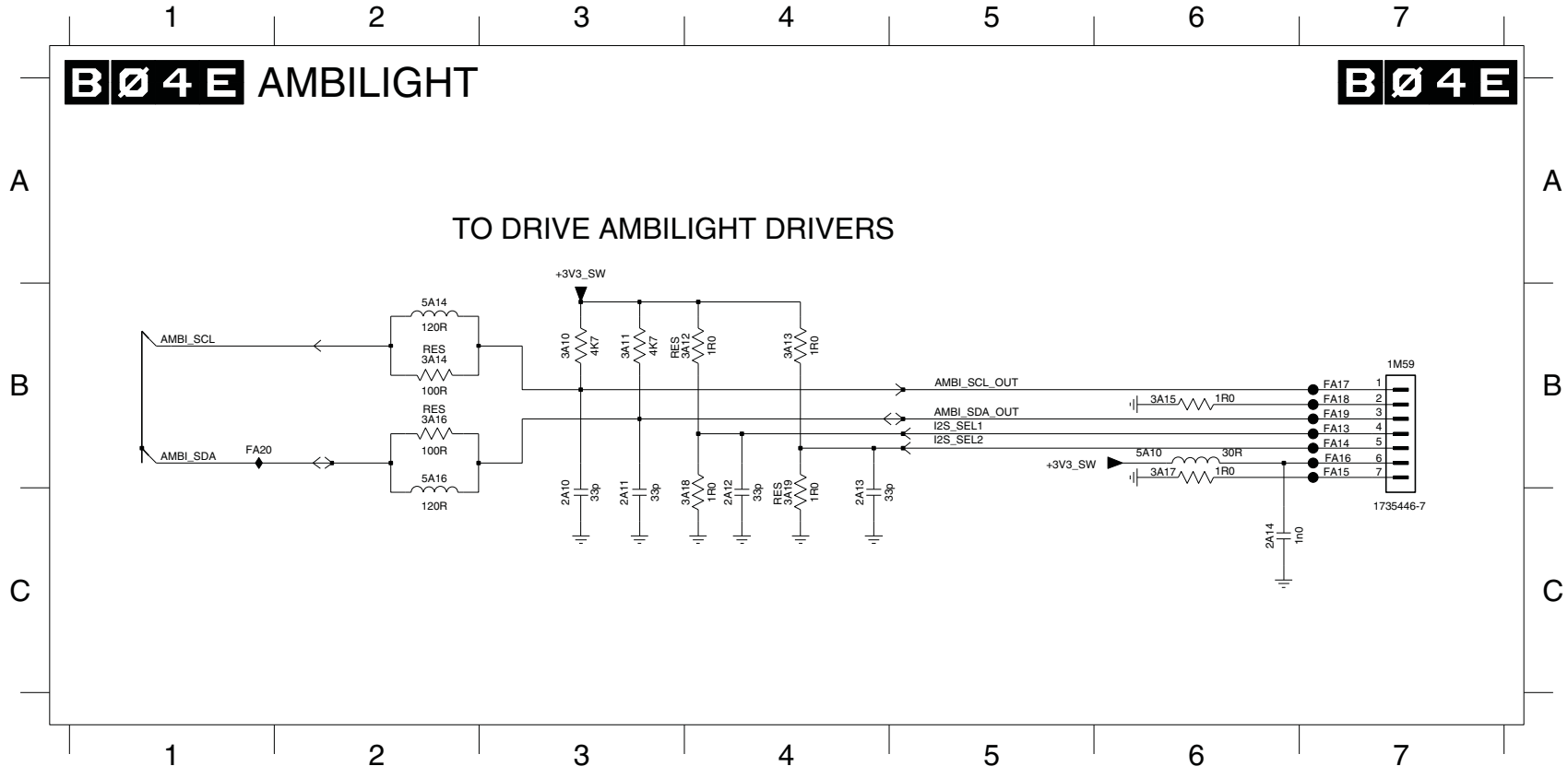




**SSB: Ambilight**

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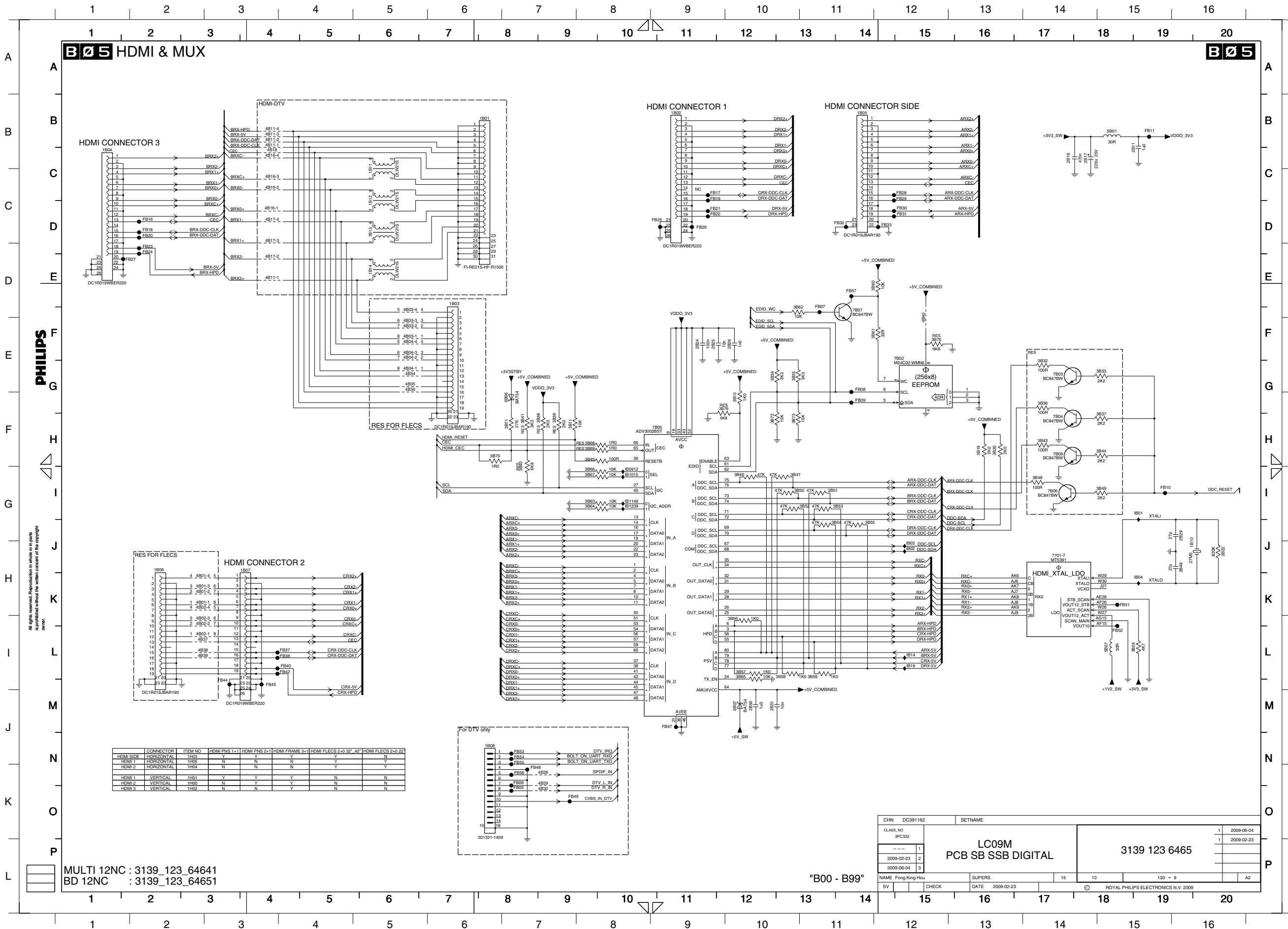
- 1M59 B7
- 2A10 C3
- 2A11 C3
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- 3A12 B4
- 3A13 B4
- 3A14 B2
- 3A15 B6
- 3A16 B2
- 3A17 B6
- 3A18 C4
- 3A19 C4
- 5A10 B6
- 5A14 B2
- 5A16 B2
- FA13 B7
- FA14 B7
- FA15 B7
- FA16 B7
- FA17 B7
- FA18 B7
- FA19 B7
- FA20 B1

MULTI 12NC : 3139\_123\_64641  
BD 12NC : 3139\_123\_64651

"A00 - A99"

CHN	DC391162	SETNAME	
CLASS_NO	3PC332		
		LC09M	1 2009-06-04
		PCB SB SSB DIGITAL	1 2009-02-23
			3139 123 6465
NAME	Fong King Hou	SUPERS.	15
SV	CHECK	DATE	2009-02-23
			ROYAL PHILIPS ELECTRONICS N.V. 2009

SSB: HDMI & MUX



HDMI SIDE	CONNECTOR	ITEM NO	HDMI PINS 1-11	HDMI PINS 13-19	HDMI FRAME 3-1	HDMI FLECS 2+0 32'	HDMI FLECS 2+0 22'
HDMI 1	HORIZONTAL	1H03	Y	Y	Y	Y	N
HDMI 2	HORIZONTAL	1H05	N	N	N	Y	Y
HDMI 3	HORIZONTAL	1H04	N	N	N	N	Y
HDMI 1	VERTICAL	1H07	Y	Y	Y	N	N
HDMI 2	VERTICAL	1H08	N	N	Y	N	N
HDMI 3	VERTICAL	1H02	N	N	Y	N	N

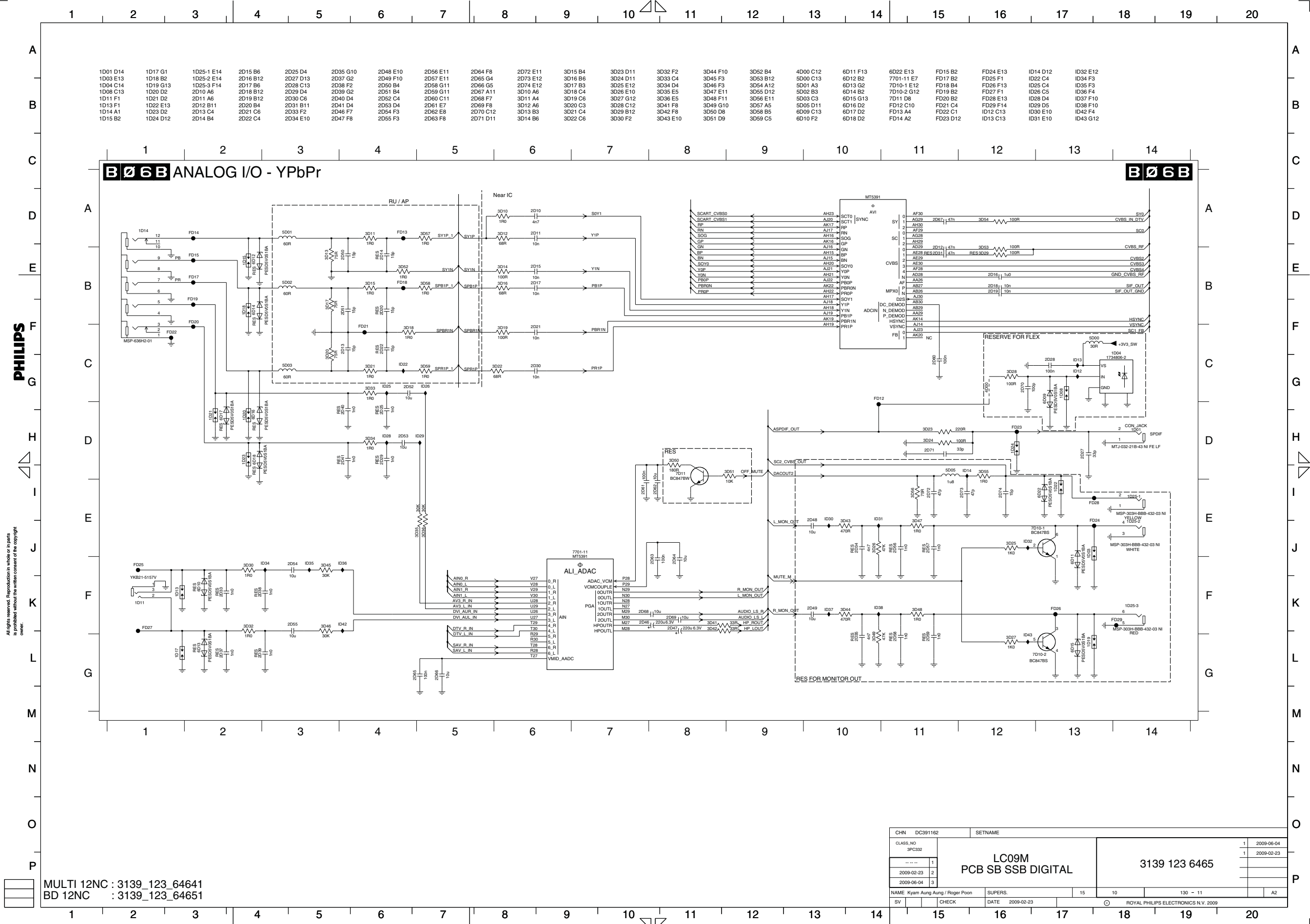
MULTI 12NC : 3139\_123\_64641  
 BD 12NC : 3139\_123\_64651

CHN	DC391162	SETNAME	
CLASS_NO	3PC392		
NAME	Fong King Hui	SUPERS.	15
DATE	2009-02-23		
CHECK			
DATE	2009-02-23		
CLASS_NO	3139 123 6465		
NAME	LC09M		
	PCB SB SSB DIGITAL		
DATE	2009-06-04		
CLASS_NO	3139 123 6465		
NAME	Fong King Hui	SUPERS.	10
DATE	2009-02-23		
CHECK			
DATE	2009-02-23		
CLASS_NO	3139 123 6465		
NAME	LC09M		
	PCB SB SSB DIGITAL		
DATE	2009-06-04		

- 1B01 B6
- 1B02 B9
- 1B03 D6
- 1B04 B1
- 1B05 B11
- 1B06 H2
- 1B07 H3
- 1B08 J6
- 1B10 H16
- 1B11 B5
- 1B12 C5
- 1B13 C5
- 1B14 D5
- 2B11 B15
- 2B16 B14
- 2B17 B14
- 2B24 E9
- 2B25 E9
- 2B26 E10
- 2B29 G16
- 2B48 H16
- 2B50 J10
- 2B51 J10
- 3B10 F10
- 3B11 F7
- 3B19 F13
- 3B33 E15
- 3B32 H16
- 3B32 E14
- 3B33 E15
- 3B34 E10
- 3B35 E10
- 3B36 F14
- 3B37 F15
- 3B38 F7
- 3B39 F7
- 3B40 F7
- 3B41 F7
- 3B43 F14
- 3B44 F15
- 3B45 F8
- 3B46 G10
- 3B47 G10
- 3B48 G14
- 3B49 G15
- 3B50 G10
- 3B51 G11
- 3B52 G11
- 3B53 G11
- 3B54 G11
- 3B55 G11
- 3B56 I10
- 3B57 I10
- 3B58 I10
- 3B59 I11
- 3B60 D12
- 3B61 E12
- 3B62 D10
- 3B63 G8
- 3B64 G8
- 3B65 I10
- 3B66 G8
- 3B67 G8
- 3B68 F8
- 3B69 F8
- 3B70 F6
- 3B71 F7
- 3B72 F10
- 3B73 F10
- 3B75 E12
- 3B76 F9
- 4B01 H2
- 4B01-2 H2
- 4B01-3 H2
- 4B01-4 H2
- 4B02-1 H2
- 4B02-2 H2
- 4B02-3 H2
- 4B02-4 H2
- 4B03-1 E5
- 4B03-2 E5
- 4B03-3 E5
- 4B03-4 D5
- 4B04-1 E5
- 4B04-2 E5
- 4B04-3 E5
- 4B04-4 E5
- 4B11-1 B3
- 4B11-2 B3
- 4B11-3 B3
- 4B11-4 B3
- 4B16-1 C3
- 4B16-2 C3
- 4B16-3 C3
- 4B16-4 B3
- 4B17-1 D3
- 4B17-2 D3
- 4B17-3 C3
- 4B17-4 C3
- 4B18 B3
- 4B28 K7
- 4B29 K7
- 4B30 K7
- 4B34 E5
- 4B35 E5
- 4B36 E5
- 4B37 I2
- 4B38 I2
- 4B39 I2
- 4B40 D12
- 5B01 B15
- 5B07 I15
- 5B06 F7
- 5B07 J10
- 7701-7 H14
- 7B02 E12
- 7B03 E14
- 7B04 F14
- 7B05 F9
- 7B06 G14
- 7B07 D11
- 7B09 F14
- FB05 K7
- FB06 K7
- FB07 D11
- FB08 E11
- FB09 F11
- FB10 G15
- FB11 B15
- FB16 C2
- FB17 C9
- FB18 C2
- FB19 C9
- FB20 C2
- FB21 C9
- FB22 C9
- FB23 D2
- FB24 D2
- FB25 C9
- FB26 C9
- FB27 D2
- FB28 C12
- FB29 C12
- FB30 C12
- FB31 C12
- FB32 C11
- FB33 C12
- FB37 L4
- FB38 L4
- FB40 L4
- FB42 L4
- FB43 L3
- FB45 I3
- FB47 J9
- FB48 K7
- FB49 K7
- FB51 H15
- FB52 I15
- FB53 J7
- FB54 J7
- FB55 J7
- FB56 K7
- FB57 D11
- FB58 H12
- FB59 H12
- FB64 H5
- FB65 H5
- FB66 G8
- FB67 G8
- FB68 F8
- FB69 F8
- FB70 F6
- FB71 F7
- FB72 F10
- FB73 F10
- FB75 E12
- FB76 F9
- IB01 G15
- IB02 H12
- IB03 H12
- IB04 H15
- IB05 G8
- IB10 G8
- IB11 G8
- IB12 G8
- IB14 H12
- IB16 I12



SSB: Analog I/O - YPbPr



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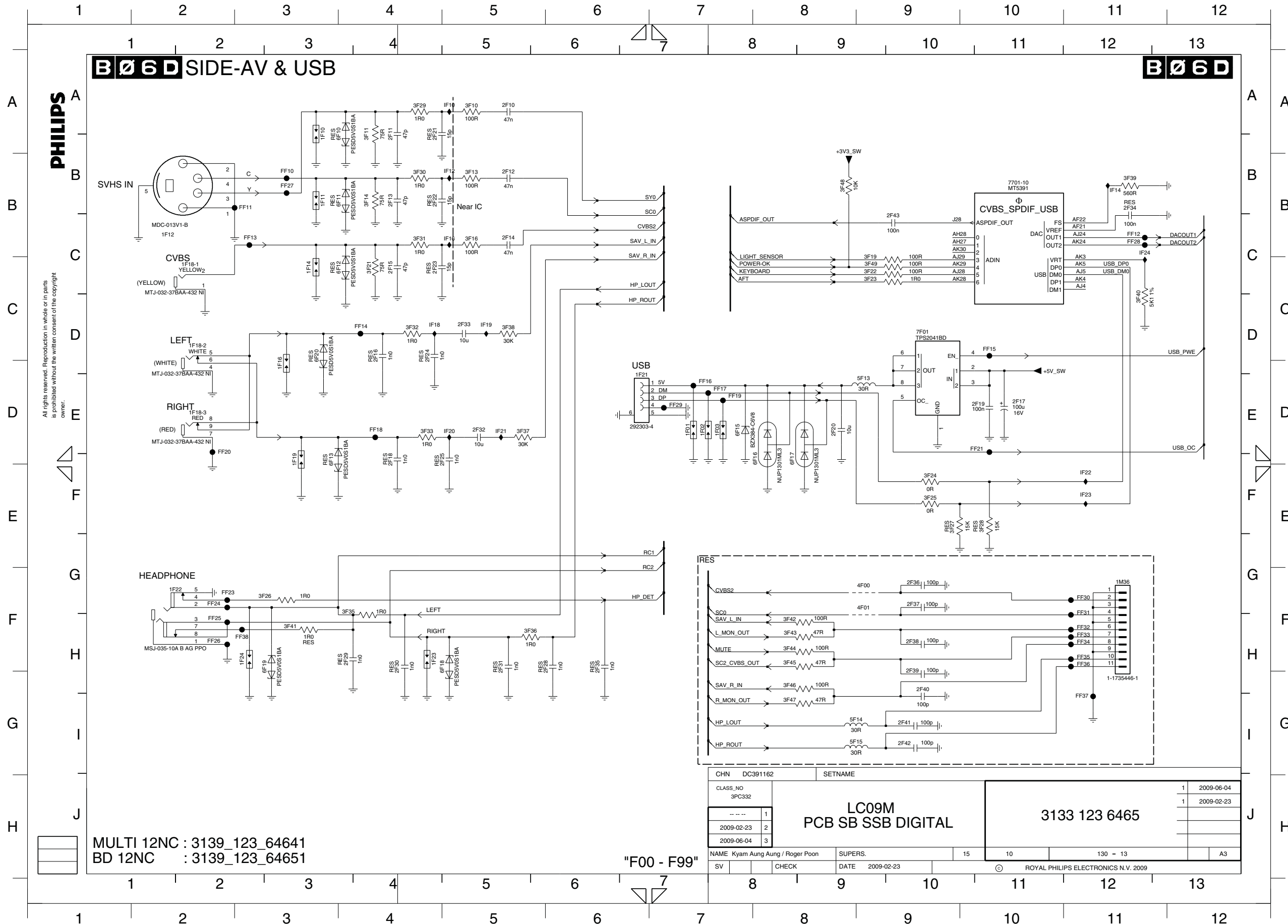
MULTI 12NC : 3139\_123\_64641  
BD 12NC : 3139\_123\_64651

CHN	DC91162	SETNAME	
CLASS_NO	3PC332		
		LC90M	
		PCB SB SSB DIGITAL	
			3139 123 6465
NAME	Kyam Aung Aung / Roger Poon	SUPERS.	15
SV	CHECK	DATE	2009-02-23
			130 - 11
			A2
			ROYAL PHILIPS ELECTRONICS N.V. 2009





**SSB: Side - A/V & USB**

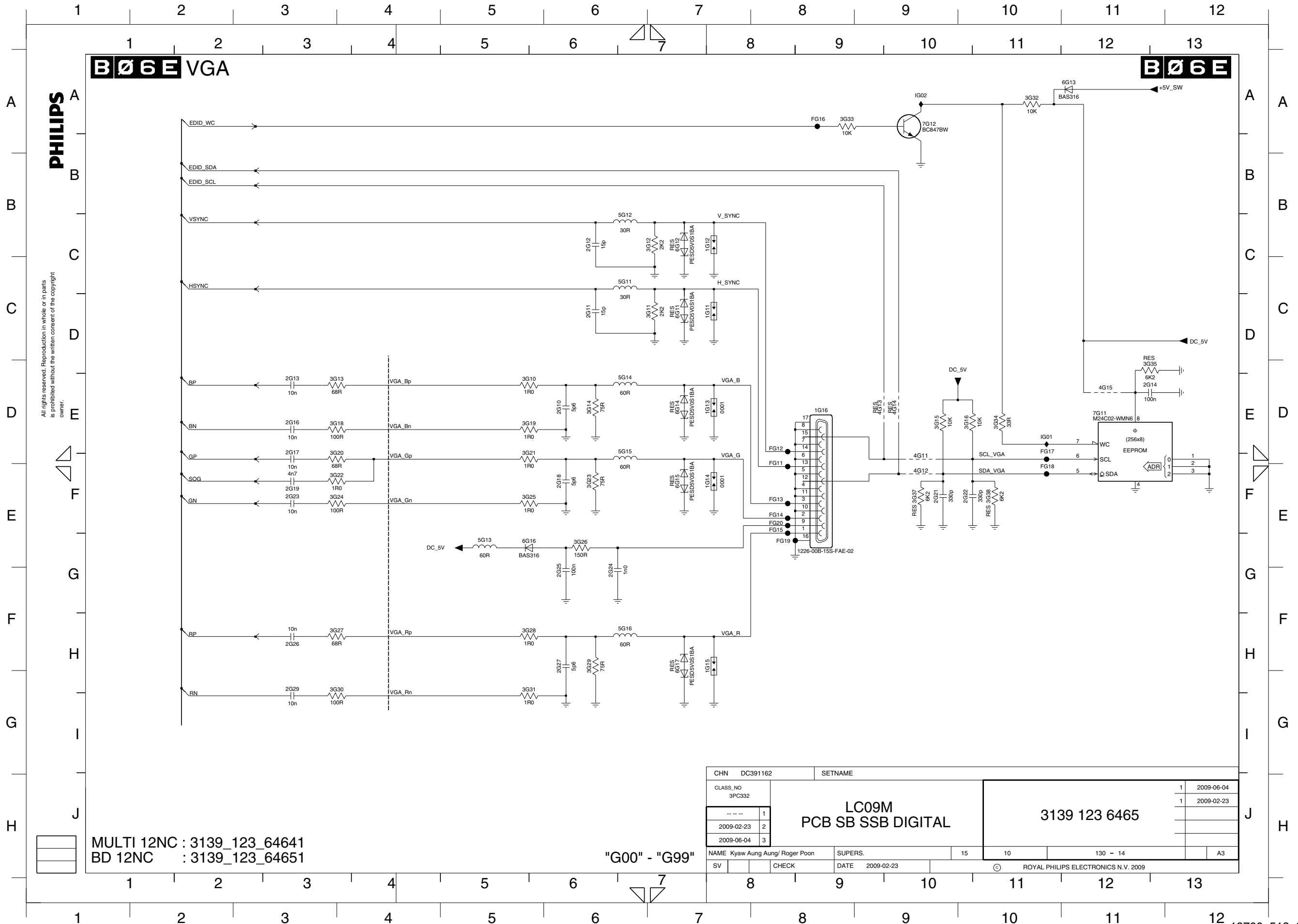


- 1F01 D7
- 1F02 D7
- 1F03 D7
- 1F10 A3
- 1F11 B3
- 1F12 B2
- 1F14 C3
- 1F16 D3
- 1F18-1 C2
- 1F18-2 C2
- 1F18-3 D2
- 1F19 D3
- 1F21 D6
- 1F22 F2
- 1F23 F4
- 1F24 F3
- 1M36 F11
- 2F10 A5
- 2F11 A4
- 2F12 B5
- 2F13 B4
- 2F14 B5
- 2F15 C4
- 2F16 C4
- 2F17 D10
- 2F18 D4
- 2F19 D10
- 2F20 D8
- 2F21 A4
- 2F22 B4
- 2F23 C4
- 2F24 C4
- 2F25 D5
- 2F28 F6
- 2F29 F4
- 2F30 F4
- 2F31 D5
- 2F32 F5
- 2F33 C5
- 2F34 B11
- 2F35 F6
- 2F36 F9
- 2F37 F9
- 2F38 F9
- 2F39 G9
- 2F40 G9
- 2F41 G9
- 2F42 G9
- 2F43 B9
- 3F10 A5
- 3F11 A4
- 3F13 B5
- 3F14 B4
- 3F16 B5
- 3F19 C9
- 3F21 C4
- 3F22 C9
- 3F23 C9
- 3F24 E9
- 3F25 E9
- 3F26 F3
- 3F27 E9
- 3F28 E10
- 3F29 A4
- 3F30 B4
- 3F31 B4
- 3F32 C4
- 3F33 D4
- 3F35 F4
- 3F36 F5
- 3F37 D5
- 3F38 C5
- 3F39 B11
- 3F40 C11
- 3F41 F3
- 3F42 F8
- 3F43 F8
- 3F44 F8
- 3F45 F8
- 3F46 G8
- 3F47 G8
- 3F48 B8
- 3F49 C9
- 4F00 F9
- 4F01 F9
- 5F13 D9
- 5F14 G9
- 5F15 G9
- 6F10 A4
- 6F11 B4
- 6F12 C4
- 6F13 D3
- 6F15 D7
- 6F16 D8
- 6F17 D8
- 6F18 F5
- 6F19 F3
- 6F20 C3
- 7F01 C9
- FF10 B3
- FF11 B3
- FF12 B11
- FF13 B3
- FF14 C4
- FF15 C10
- FF16 D7
- FF17 D7
- FF18 D4
- FF19 D7
- FF21 D10
- FF22 D2
- FF23 F2
- FF24 F2
- FF25 F2
- FF26 F2
- FF27 B3
- FF28 B11
- FF29 D7
- FF30 F11
- FF31 F11
- FF32 F11
- FF33 F11
- FF34 F11
- FF35 F11
- FF36 F11
- FF37 G11
- FF38 F3
- FF39 F3
- FF40 A5
- FF41 B5
- FF42 B5
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- FF94 B5
- FF95 B5
- FF96 B5
- FF97 B5
- FF98 B5
- FF99 B5

MULTI 12NC : 3139\_123\_64641  
BD 12NC : 3139\_123\_64651

"F00 - F99"

**SSB: VGA**



- 1G11 C7
- 1G12 B7
- 1G13 D7
- 1G14 E7
- 1G15 F7
- 1G16 D8
- 2G10 D6
- 2G11 C6
- 2G12 B6
- 2G13 D3
- 2G14 D11
- 2G16 D3
- 2G17 D3
- 2G18 E6
- 2G19 E3
- 2G21 E9
- 2G22 E10
- 2G23 E3
- 2G24 F6
- 2G25 F6
- 2G26 F3
- 2G27 F6
- 2G29 G3
- 3G10 D5
- 3G11 C7
- 3G12 B7
- 3G13 D4
- 3G14 D6
- 3G15 D9
- 3G16 D10
- 3G18 D4
- 3G19 D5
- 3G20 D4
- 3G21 D5
- 3G22 E4
- 3G23 E6
- 3G24 E4
- 3G25 E5
- 3G26 E6
- 3G27 F4
- 3G28 F5
- 3G29 F6
- 3G30 G4
- 3G31 G5
- 3G32 A10
- 3G33 A8
- 3G34 D10
- 3G35 D11
- 3G37 E9
- 3G38 E10
- 4G11 D9
- 4G12 E9
- 4G13 D9
- 4G14 D9
- 4G15 D11
- 5G11 C6
- 5G12 B6
- 5G13 E5
- 5G14 D6
- 5G15 D6
- 5G16 F6
- 6G11 C7
- 6G12 B7
- 6G13 A11
- 6G14 D7
- 6G15 E7
- 6G16 E5
- 6G17 F7
- 7G11 D11
- 7G12 A9
- FG11 E8
- FG12 D8
- FG13 E8
- FG14 E8
- FG15 E8
- FG16 A8
- FG17 D10
- FG18 E10
- FG19 E8
- FG20 E8
- IG01 D10
- IG02 A9

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MULTI 12NC : 3139\_123\_64641  
BD 12NC : 3139\_123\_64651

"G00" - "G99"

CHN	DC391162	SETNAME	
CLASS_NO	3PC332		
		LC09M	
		PCB SB SSB DIGITAL	
			3139 123 6465
NAME	Kyaw Aung Aung/ Roger Poon	SUPERS.	15
SV	CHECK	DATE	2009-02-23
			ROYAL PHILIPS ELECTRONICS N.V. 2009

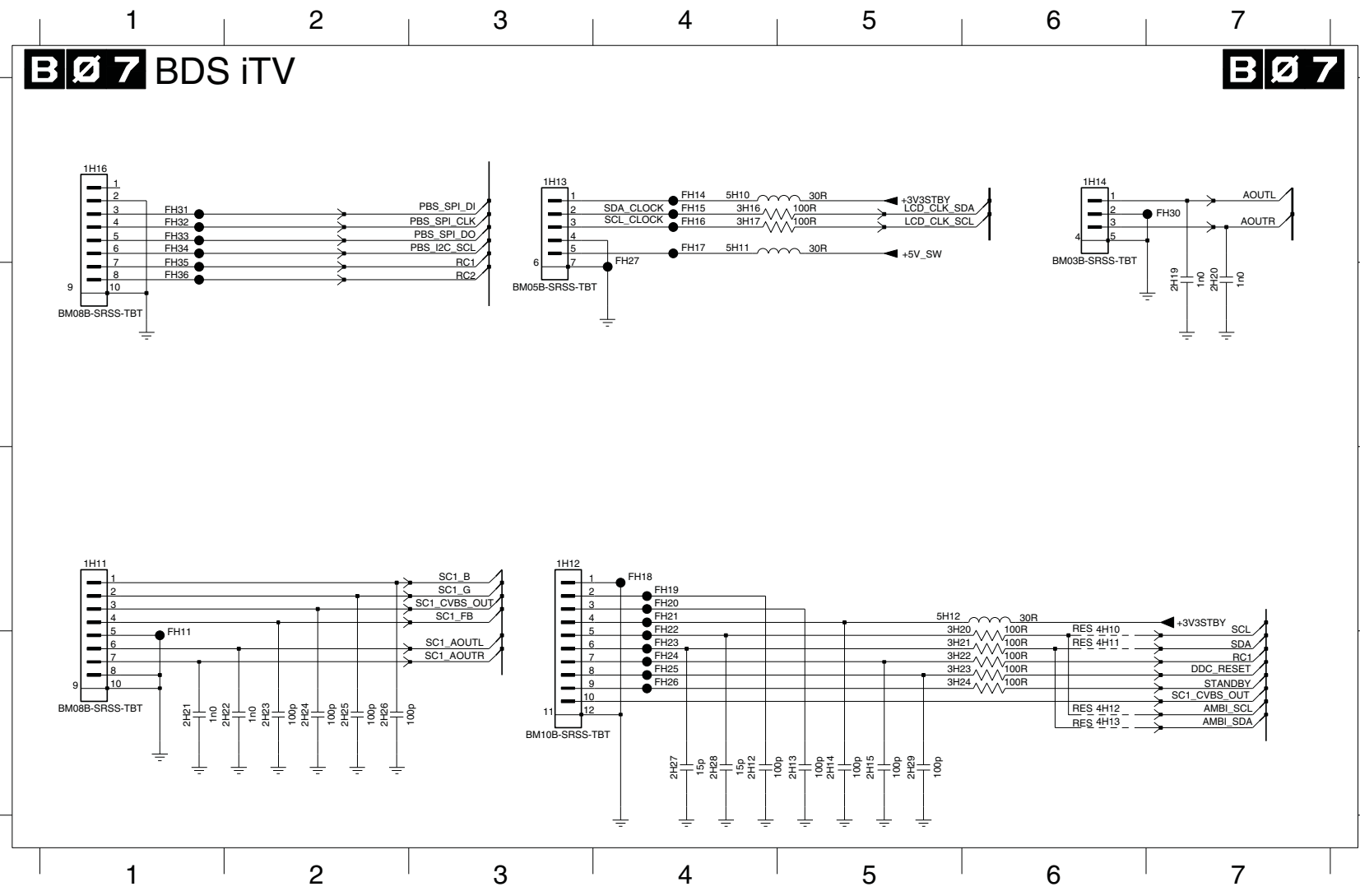
**SSB: BDS iTV**

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1 2 3 4 5 6 7 8 9 10 11 12 13

A B C D E F G H I J



- 1H11 C1
- 1H12 C3
- 1H13 A3
- 1H14 A6
- 1H16 A1
- 2H12 D4
- 2H13 D5
- 2H14 D5
- 2H15 D5
- 2H19 B7
- 2H20 B7
- 2H21 D1
- 2H22 D2
- 2H23 D2
- 2H24 D2
- 2H25 D2
- 2H26 D2
- 2H27 D4
- 2H28 D4
- 2H29 D5
- 3H16 A4
- 3H17 A4
- 3H20 D5
- 3H21 D5
- 3H22 D5
- 3H23 D5
- 3H24 D5
- 4H10 D6
- 4H11 D6
- 4H12 D6
- 4H13 D6
- 5H10 A4
- 5H11 A4
- 5H12 C5
- FH11 D1
- FH14 A4
- FH15 A4
- FH16 A4
- FH17 A4
- FH18 C4
- FH19 C4
- FH20 C4
- FH21 C4
- FH22 D4
- FH23 D4
- FH24 D4
- FH25 D4
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- FH30 A7
- FH31 A1
- FH32 A1
- FH33 A1
- FH34 A1
- FH35 B1
- FH36 B1

MULTI 12NC : 3139\_123\_64641  
 BD 12NC : 3139\_123\_64651

"H00" - "H99"

CHN	DC391162	SETNAME	
CLASS_NO	3PC332		
		LC09M	3139 123 6465
		PCB SB SSB DIGITAL	
NAME	Alexi Jebakumar	SUPERS.	15
SV	CHECK	DATE	2009-02-23
			ROYAL PHILIPS ELECTRONICS N.V. 2009



## SSB: SRP List

Netname	Diagram	Diagram	Diagram	Diagram	Diagram	Diagram	Diagram	Diagram	Diagram	Diagram	Diagram	Diagram	
+12VDISP	B01 (1 x)	AOLRCK	B03 (1 x)	DACOUT2	B06B (1 x)	JTRST	B04C (2 x)	MII-RXD(0)	B04C (1 x)	RC2	B06D (1 x)	SY1P	B06C (1 x)
+12VDISP	B04D (1 x)	AOLRCK	B04C (1 x)	DACOUT2	B06D (1 x)	KEYBOARD	B04C (1 x)	MII-RXD(0)	B06A (1 x)	RC2	B07 (1 x)	SY1P_1	B06B (1 x)
+12V	B01 (5 x)	AOMCLK	B03 (1 x)	DC_5V	B06E (3 x)	KEYBOARD	B06D (1 x)	MII-RXD(1)	B04C (1 x)	RF_SW	B02A (1 x)	SY1P_1	B06C (2 x)
+12VS	B03 (2 x)	AOMCLK	B04C (1 x)	DC_PROT	B03 (1 x)	L_MON_OUT	B06B (2 x)	MII-RXD(1)	B06A (1 x)	RF_SW	B04C (1 x)	TPIM	B06A (2 x)
+12VS	B04A (1 x)	AOSDATA0	B01 (1 x)	DC_PROT	B04C (1 x)	L_MON_OUT	B06C (1 x)	MII-RXD(2)	B04C (1 x)	RJLED_G	B06A (1 x)	TPIP	B06A (2 x)
+12VS_1	B01 (2 x)	AOSDATA0	B04C (1 x)	DDC_RESET	B04C (1 x)	L_MON_OUT	B06D (1 x)	MII-RXD(2)	B06A (1 x)	RJLED_Y	B06A (1 x)	TPOM	B06A (2 x)
+1V0_SW	B01 (1 x)	AOUCL	B03 (3 x)	DDC_RESET	B05 (1 x)	LAN-RST	B04C (1 x)	MII-RXD(3)	B04C (1 x)	RN	B06B (1 x)	TPOP	B06A (2 x)
+1V0_SW	B04A (1 x)	AOUCL	B07 (1 x)	DDC_RESET	B07 (1 x)	LAN-RST	B06A (1 x)	MII-RXD(3)	B06A (1 x)	RN	B06E (1 x)	TSO_CLK	B02A (1 x)
+1V2_SW	B01 (1 x)	AOUCL	B03 (3 x)	DDC_SCL	B04C (1 x)	LCD_CLK_SCL	B04A (1 x)	MII-RX-DV	B04C (1 x)	RP	B06B (1 x)	TSO_CLK	B04A (1 x)
+1V2_SW	B04A (1 x)	AOUCL	B07 (1 x)	DDC_SCL	B05 (2 x)	LCD_CLK_SCL	B07 (1 x)	MII-RX-DV	B06A (1 x)	RP	B06E (1 x)	TSO_DATA0	B02A (1 x)
+1V2_SW	B01 (1 x)	ARX0-	B05 (2 x)	DDC_SDA	B04C (1 x)	LCD_CLK_SDA	B04A (1 x)	MII-RX-ER	B04C (1 x)	RX0-	B05 (1 x)	TSO_DATA0	B04A (1 x)
+1V2_SW	B02A (1 x)	ARX0+	B05 (2 x)	DDC_SDA	B05 (2 x)	LCD_CLK_SDA	B07 (1 x)	MII-RX-ER	B06A (1 x)	RX0+	B05 (1 x)	TSO_SYNC	B02A (1 x)
+1V2_SW	B04A (2 x)	ARX1-	B05 (2 x)	DEMOD_RESET	B02A (1 x)	LCD_PWR_ON	B04C (1 x)	MII-TXCLK	B04C (1 x)	RX1-	B05 (1 x)	TSO_SYNC	B04A (1 x)
+1V2_SW	B05 (1 x)	ARX1+	B05 (2 x)	DEMOD_RESET	B04C (1 x)	LCD_PWR_ON	B04C (1 x)	MII-TXCLK	B06A (1 x)	RX1+	B05 (1 x)	TSO_VALID	B02A (1 x)
+1V8_SW	B01 (1 x)	ARX2-	B05 (2 x)	DM	B06D (1 x)	LED1	B04A (1 x)	MII-TXD(0)	B04C (1 x)	RX2-	B05 (1 x)	TSO_VALID	B04A (1 x)
+1V8_SW	B04A (1 x)	ARX2+	B05 (2 x)	DP	B06D (1 x)	LED1	B04C (1 x)	MII-TXD(0)	B06A (1 x)	RX2+	B05 (1 x)	TUNER_SCL	B02A (2 x)
+1V8_SW	B04B (9 x)	ARX-5V	B04A (1 x)	DRX0-	B05 (2 x)	LED2	B04A (1 x)	MII-TXD(1)	B06A (1 x)	RXC-	B05 (1 x)	TUNER_SDA	B02A (2 x)
+24VAUDIO	B01 (1 x)	ARX-5V	B05 (2 x)	DRX0+	B05 (2 x)	LED2	B04C (1 x)	MII-TXD(1)	B06A (1 x)	RXC+	B05 (1 x)	UART_RX	B04C (3 x)
+24VAUDIO	B03 (1 x)	ARXC-	B05 (2 x)	DRX1-	B05 (2 x)	LIGHT_SENSOR	B04C (1 x)	MII-TXD(2)	B04C (1 x)	S0Y1	B06B (1 x)	UART_TX	B04C (3 x)
+2V5_SW	B02A (2 x)	ARXC+	B05 (2 x)	DRX1+	B05 (2 x)	LIGHT_SENSOR	B06D (1 x)	MII-TXD(2)	B06A (1 x)	SAV_L_IN	B06B (1 x)	USB_OC	B04C (1 x)
+3V3_FLASH	B04C (3 x)	ARX-DDC-CLK	B05 (2 x)	DRX2-	B05 (2 x)	LVDS_A_TXe0n	B04D (2 x)	MII-TXD(3)	B04C (1 x)	SAV_L_IN	B06D (2 x)	USB_OC	B06D (1 x)
+3V3_SW	B01 (1 x)	ARX-DDC-DAT	B05 (2 x)	DRX2+	B05 (2 x)	LVDS_A_TXe0p	B04D (2 x)	MII-TXD(3)	B06A (1 x)	SAV_R_IN	B06B (1 x)	USB_PWE	B04C (1 x)
+3V3_SW	B02A (5 x)	ARX-HPD	B05 (2 x)	DRX-5V	B04C (1 x)	LVDS_A_TXe1n	B04D (2 x)	MII-TXEN	B04C (1 x)	SAV_R_IN	B06D (2 x)	USB_PWE	B06D (1 x)
+3V3_SW	B03 (2 x)	ASPDIF_OUT	B06B (1 x)	DRX-5V	B05 (2 x)	LVDS_A_TXe1p	B04D (2 x)	MII-TXEN	B06A (1 x)	SC0	B06B (1 x)	VDD	B03 (2 x)
+3V3_SW	B04A (5 x)	ASPDIF_OUT	B06C (1 x)	DRXC-	B05 (2 x)	LVDS_A_TXe2n	B04D (2 x)	MUTE	B03 (2 x)	SC0	B06D (2 x)	VDDA	B03 (2 x)
+3V3_SW	B04C (24 x)	ASPDIF_OUT	B06D (1 x)	DRXC+	B05 (2 x)	LVDS_A_TXe2p	B04D (2 x)	MUTE	B06D (1 x)	SC1_AOOUTL	B07 (1 x)	VDDO_3V3	B05 (3 x)
+3V3_SW	B04E (2 x)	AUDIO_LS_L	B03 (1 x)	DRX-DDC-CLK	B05 (2 x)	LVDS_A_TXe3n	B04D (3 x)	MUTE_C	B03 (1 x)	SC1_AOOUTR	B07 (1 x)	VSYNC	B06B (1 x)
+3V3_SW	B05 (2 x)	AUDIO_LS_L	B06B (1 x)	DRX-DDC-DAT	B05 (1 x)	LVDS_A_TXe3p	B04D (2 x)	MUTE_C	B06C (1 x)	SC1_B	B06C (1 x)	VSYNC	B06C (1 x)
+3V3_SW	B06A (2 x)	AUDIO_LS_R	B06A (1 x)	DRX-HPD	B05 (2 x)	LVDS_A_TXe4n	B04D (2 x)	MUTE_M	B03 (1 x)	SC1_B	B07 (1 x)	VSYNC	B06E (1 x)
+3V3_SW	B06B (1 x)	AUDIO_LS_R	B06B (1 x)	DTV_IRQ	B04A (1 x)	LVDS_A_TXe4p	B04D (2 x)	MUTE_M	B06B (1 x)	SC1_CVBS_OUT	B06C (1 x)	Y0N	B06B (1 x)
+3V3_SW	B06C (1 x)	AV3_L_IN	B06B (1 x)	DTV_IRQ	B05 (1 x)	LVDS_A_TXeCLKn	B04D (2 x)	MUTEn	B03 (1 x)	SC1_CVBS_OUT	B07 (2 x)	Y0N	B06C (1 x)
+3V3_SW	B06D (1 x)	AV3_R_IN	B06B (1 x)	DTV_L_IN	B05 (1 x)	LVDS_A_TXeCLKp	B04D (2 x)	MUTEn	B04A (1 x)	SC1_FB	B06B (1 x)	Y0P	B06B (1 x)
+3V3AN	B06A (3 x)	BACKLIGHT_BOOST	B01 (1 x)	DTV_L_IN	B06B (1 x)	LVDS_A_TXo0n	B04D (2 x)	NAND_PALE	B04C (2 x)	SC1_FB	B07 (1 x)	Y0P	B06C (1 x)
+3V3DN	B06A (14 x)	BACKLIGHT_BOOST	B04C (1 x)	DTV_R_IN	B05 (1 x)	LVDS_A_TXo0p	B04D (2 x)	NAND_PARB	B04C (2 x)	SC1_G	B06C (1 x)	Y0P-SC1	B06C (1 x)
+3V3STBY	B01 (1 x)	BL_ON_OFF	B01 (1 x)	DTV_R_IN	B06B (1 x)	LVDS_A_TXo1n	B04D (2 x)	NAND_PCLE	B04C (2 x)	SC1_G	B07 (1 x)	Y1N	B06B (1 x)
+3V3STBY	B03 (2 x)	BL_ON_OFF	B04C (1 x)	DVI_AUL_IN	B06B (1 x)	LVDS_A_TXo1p	B04D (2 x)	NAND_PDD(0)	B04C (3 x)	SC2_CVBS_OUT	B06B (1 x)	Y1P	B06B (1 x)
+3V3STBY	B04A (9 x)	BN	B06B (1 x)	DVI_AUR_IN	B06B (1 x)	LVDS_A_TXo2n	B04D (2 x)	NAND_PDD(1)	B04C (3 x)	SC2_CVBS_OUT	B06C (1 x)		
+3V3STBY	B04C (5 x)	BN	B06E (1 x)	EDID_SCL	B05 (1 x)	LVDS_A_TXo2p	B04D (2 x)	NAND_PDD(2)	B04C (2 x)	SC2_CVBS_OUT	B06D (1 x)		
+3V3STBY	B05 (1 x)	BOLT_ON_UART_RXD	B04C (1 x)	EDID_SCL	B06E (1 x)	LVDS_A_TXo3n	B04D (3 x)	NAND_PDD(3)	B04C (2 x)	SCART_CVBS0	B06B (1 x)		
+3V3STBY	B07 (2 x)	BOLT_ON_UART_RXD	B05 (1 x)	EDID_SDA	B05 (1 x)	LVDS_A_TXo3p	B04D (2 x)	NAND_PDD(4)	B04C (2 x)	SCART_CVBS0	B06C (1 x)		
+5V_COMBINED	B05 (8 x)	BOLT_ON_UART_TXD	B04C (1 x)	EDID_SDA	B06E (1 x)	LVDS_A_TXo4n	B04D (2 x)	NAND_PDD(5)	B04C (2 x)	SCART_CVBS1	B06C (1 x)		
+5V_SW	B01 (1 x)	BOLT_ON_UART_TXD	B05 (1 x)	EDID_WC	B04C (1 x)	LVDS_A_TXo4p	B04D (2 x)	NAND_PDD(6)	B04C (2 x)	SCART_CVBS1	B06C (1 x)		
+5V_SW	B02A (3 x)	BP	B06B (1 x)	EDID_WC	B05 (1 x)	LVDS_A_TXoCLKn	B04D (2 x)	NAND_PDD(7)	B04C (2 x)	SCL	B04C (3 x)		
+5V_SW	B03 (1 x)	BP	B06E (1 x)	EDID_WC	B06E (1 x)	LVDS_A_TXoCLKp	B04D (2 x)	NAND_POCE	B04C (2 x)	SCL	B04D (1 x)		
+5V_SW	B04A (4 x)	BRX0-	B05 (2 x)	FRONTEND_SCL	B02A (1 x)	LVDS_B_TXe0n	B04D (2 x)	NAND_POCE	B04C (3 x)	SCL	B05 (1 x)		
+5V_SW	B04C (1 x)	BRX0+	B05 (2 x)	FRONTEND_SCL	B04A (1 x)	LVDS_B_TXe0p	B04D (2 x)	NAND_POE	B04C (2 x)	SCL	B07 (1 x)		
+5V_SW	B04D (1 x)	BRX1-	B05 (2 x)	FRONTEND_SDA	B02A (1 x)	LVDS_B_TXe1n	B04D (2 x)	NAND_POE	B04C (2 x)	SDA	B04C (3 x)		
+5V_SW	B05 (1 x)	BRX1+	B05 (2 x)	FRONTEND_SDA	B04A (1 x)	LVDS_B_TXe1p	B04D (2 x)	OFF_MUTE	B06B (1 x)	SDA	B04D (1 x)		
+5V_SW	B06D (1 x)	BRX2-	B05 (2 x)	GAIN_SW	B02A (1 x)	LVDS_B_TXe2n	B04D (2 x)	OFF_MUTE	B06B (1 x)	SDA	B05 (1 x)		
+5V_SW	B06E (1 x)	BRX2+	B05 (2 x)	GAIN_SW	B04C (1 x)	LVDS_B_TXe2p	B04D (2 x)	PB0P	B06B (1 x)	SDA	B07 (1 x)		
+5V5_TUN	B01 (1 x)	BRX-5V	B04A (1 x)	GN	B06B (1 x)	LVDS_B_TXe3n	B04D (3 x)	PB0P-SC1	B06C (1 x)	SENSE+1V0_MT5392	B01 (1 x)		
+5V5_TUN	B02A (1 x)	BRX-5V	B05 (2 x)	GN	B06E (1 x)	LVDS_B_TXe3p	B04D (2 x)	PB1P	B06B (1 x)	SENSE+1V0_MT5392	B04A (2 x)		
+5VS	B02A (2 x)	BRXC-	B05 (2 x)	GND_CVBS_RF	B02A (1 x)	LVDS_B_TXe4n	B04D (2 x)	PBRON	B06B (1 x)	SERIAL_POCE	B04C (2 x)		
+5VTUN_DIGITAL	B02A (2 x)	BRXC+	B05 (2 x)	GND_CVBS_RF	B06B (1 x)	LVDS_B_TXe4p	B04D (2 x)	PBRON	B06C (1 x)	SIF_OUT	B02A (1 x)		
+8V_SW	B01 (1 x)	BRX-DDC-CLK	B05 (2 x)	GNDLAN	B06A (10 x)	LVDS_B_TXeCLKn	B04D (2 x)	PBR1N	B06B (1 x)	SIF_OUT	B06B (1 x)		
+VDISP	B04D (3 x)	BRX-DDC-DAT	B05 (2 x)	GNDNSD	B01 (2 x)	LVDS_B_TXeCLKp	B04D (2 x)	PBS_I2C_SCL	B04C (1 x)	SIF_OUT_1	B02A (2 x)		
+VTUN	B01 (1 x)	BRX-HPD	B05 (2 x)	GNDNSD	B03 (26 x)	LVDS_B_TXo0n	B04D (2 x)	PBS_I2C_SCL	B07 (1 x)	SIF_OUT_GND	B02A (1 x)		
5V	B06D (1 x)	CEC	B05 (4 x)	GNdTUN	B01 (1 x)	LVDS_B_TXo0p	B04D (2 x)	PBS_SPI_CLK	B04C (1 x)	SIF_OUT_GND	B06B (1 x)		
AFT	B02A (1 x)	CRX0-	B05 (2 x)	GP	B06B (1 x)	LVDS_B_TXo1n	B04D (2 x)	PBS_SPI_CLK	B07 (1 x)	SOG	B06B (1 x)		
AFT	B06D (1 x)	CRX0+	B05 (2 x)	GP	B06E (1 x)	LVDS_B_TXo1p	B04D (2 x)	PBS_SPI_DI	B04C (1 x)	SOG	B06E (1 x)		
AIN0_L	B06B (1 x)	CRX1-	B05 (2 x)	HDMI_CEC	B04A (1 x)	LVDS_B_TXo2n	B04D (2 x)	PBS_SPI_DI	B07 (1 x)	SOY0	B06B (1 x)		
AIN0_L	B06C (1 x)	CRX1+	B05 (2 x)	HDMI_CEC	B05 (1 x)	LVDS_B_TXo2p	B04D (2 x)	PBS_SPI_DO	B04C (1 x)	SOY0	B06C (1 x)		
AIN0_L-SC2	B06C (1 x)	CRX2-	B05 (2 x)	HDMI_RESET	B04C (1 x)	LVDS_B_TXo3n	B04D (3 x)	PBS_SPI_DO	B07 (1 x)	SPB1P	B06B (1 x)		
AIN0_R	B06B (1 x)	CRX2+	B05 (2 x)	HDMI_RESET	B05 (1 x)	LVDS_B_TXo3p	B04D (2 x)	PGA0OUTL-SC1	B06C (1 x)	SPB1P	B06C (1 x)		
AIN0_R	B06C (1 x)	CRX-5V	B04A (1 x)	HP_DET	B04C (1 x)	LVDS_B_TXo4n	B04D (2 x)	PGA0OUTR-SC1	B06C (1 x)	SPB1P_1	B06B (1 x)		
AIN0_R-SC2	B06C (1 x)	CRX-5V	B05 (2 x)	HP_DET	B06D (1 x)	LVDS_B_TXo4p	B04D (2 x)	POWER_DOWN	B03 (1 x)	SPB1P_1	B06C (2 x)		
AIN1_L	B06B (1 x)	CRXC-	B05 (2 x)	HP_DETECT	B04C (1 x)	LVDS_B_TXoCLKn	B04D (2 x)	POWER_DOWN	B04A (1 x)	SPDIF_IN	B04C (1 x)		
AIN1_L	B06C (1 x)	CRXC+	B05 (2 x)	HP_LOUT	B03 (1 x)	LVDS_B_TXoCLKp	B04D (2 x)	POWER_OK	B01 (1 x)	SPDIF_IN	B05 (1 x)		
AIN1_L-SC1	B06C (1 x)	CRX-DDC-CLK	B05 (2 x)	HP_LOUT	B06B (1 x)	LVDS_SELECT	B04C (1 x)	POWER_OK	B06D (1 x)	SPR1P	B06B (1 x)		
AIN1_R	B06B (1 x)	CRX-DDC-DAT	B05 (2 x)	HP_LOUT	B06D (2 x)	LVDS_SELECT	B04D (1 x)	PR0P	B06B (1 x)	SPR1P	B06C (1 x)		
AIN1_R	B06C (1 x)	CRX-HPD	B05 (2 x)	HP_ROUT	B03 (1 x)	MII-COL	B04C (1 x)	PR0P	B06C (1 x)	SPR1P_1	B06B (1 x)		
AIN1_R-SC1	B06C (1 x)	CVBS_IN_DTV	B05 (1 x)	HP_ROUT	B06B (1 x)	MII-COL	B06A (1 x)	PR0P-SC1	B06C (1 x)	SPR1P_1	B06C (2 x)		
AMBI_SCL	B04C (1 x)	CVBS_IN_DTV	B06B (1 x)	HP_ROUT	B06D (2 x)	MII-CRS	B04C (1 x)	PR1P	B06B (1 x)	STANDBY	B01 (1 x)		
AMBI_SCL	B04E (1 x)	CVBS_RF	B02A (1 x)	HSYNC	B06B (1 x)	MII-CRS	B06A (1 x)	PWM_DIMMING	B01 (1 x)	STANDBY	B04A (1 x)		
AMBI_SCL	B07 (1 x)	CVBS_RF	B06B (1 x)	HSYNC	B06C (1 x)	MII-MDC	B04C (1 x)	PWM_DIMMING	B04C (1 x)	STANDBY	B07 (1 x)		
AMBI_SCL_OUT	B04E (1 x)	CVBS_SC1	B06C (1 x)	HSYNC	B06E (1 x)	MII-MDC	B06A (1 x)	R_MON_OUT	B06B (2 x)	STANDBYn	B03 (1 x)		
AMBI_SDA	B04C (1 x)	CVBS_SC2	B06C (1 x)	I2S_SEL1	B04E (1 x)	MII-MDINT	B04C (1 x)	R_MON_OUT	B06C (1 x)	STANDBYn	B04A (1 x)		
AMBI_SDA	B04E (1 x)	CVBS0T	B02A (2 x)	I2S_SEL2	B04E (1 x)	MII-MDINT	B06A (1 x)	R_MON_OUT	B06D (1 x)	SW_MUTE	B03 (1 x)		
AMBI_SDA	B07 (1 x)	CVBS2	B06B (1 x)	JTCK	B04C (2 x)	MII-MDIO	B04C (1 x)	RC1	B04C (1 x)	SW_MUTE	B04A (1 x)		
AMBI_SDA_OUT	B04E (1 x)	CVBS2	B06D (2 x)	JTDI	B06D (2 x)	MII-MDIO	B06A (1 x)	RC1	B06D (1 x)	SY0	B06B (1 x)		
AOBCK	B03 (1 x)	DACOUT1	B06C (1 x)	JTDO	B04C (2 x)	MII-RXCLK	B04C (1 x)	RC1	B07 (2 x)	SY0	B06D (1 x)		
AOBCK	B04C (1 x)	DACOUT1	B06D (1 x)	JTMS	B04C (2 x)	MII-RXCLK	B06A (1 x)	RC2	B04C (1 x)	SY1P	B06B (1 x)		



