

Service Service Service



Service Manual

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1. Revision List

Manual xxxx xxx xxxx.0

- First release.

2. Technical Specs, Diversity, and Connections

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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. Here is product information available, as well as getting started, user manuals, frequently asked questions and software & drivers.

Table 2-1 Described Model Numbers:

Model Number	Styling	Published in
32PFL3008H/12	3000	3122 785 19420
32PFL3008K/12	3000	3122 785 19420
32PFL3008T/12	3000	3122 785 19420
32PFL3018H/12	3000	3122 785 19420
32PFL3018K/12	3000	3122 785 19420
32PFL3018T/12	3000	3122 785 19420
32PFL3028H/12	3000	3122 785 19420

Note: The given Model Numbers are subject to change.

2.2 Directions for Use

Directions for use can be downloaded from the following websites:

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

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

2.3 Connections

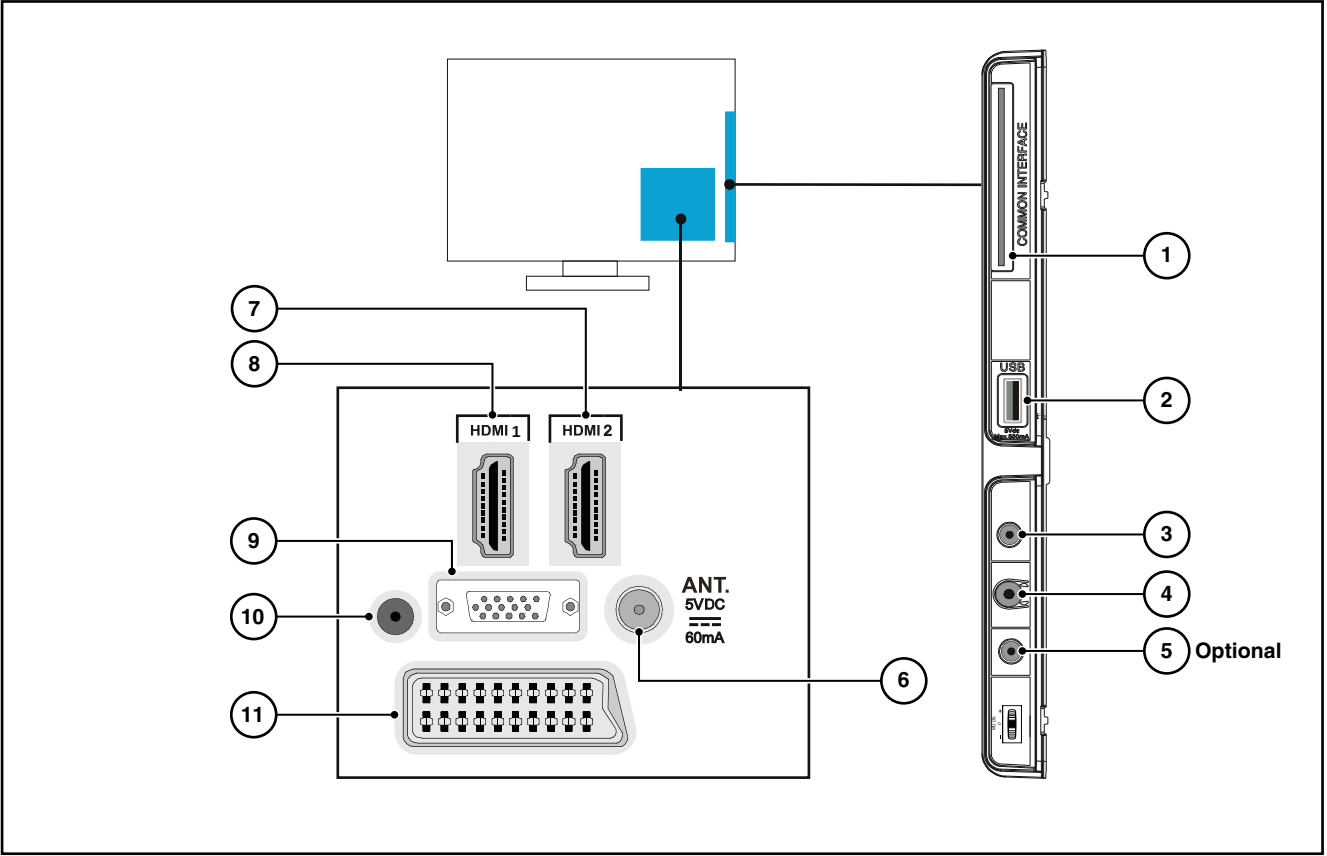


Figure 2-1 Connection overview (Thriller styling)

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

Wh - Audio - L 0.5 V_{RMS} / 10 kΩ
Rd - Audio - R 0.5 V_{RMS} / 10 kΩ



2.3.1 Side Connections

1 - Common Interface

68p - See figure 10-2-3



2 - USB2.0

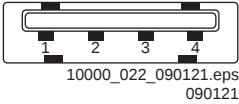
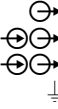


Figure 2-2 USB (type A)

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



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

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



4 - Head phone (Output)

Bk - Head phone 80 - 600 Ω / 10 mW



5 - EXT2: Video YPbPr - In, Audio - In

Gn - Video - Y 1 V_{PP} / 75 W
Bu - Video - Pb 0.7 V_{PP} / 75 W
Rd - Video - Pr 0.7 V_{PP} / 75 W



2.3.2 Rear Connections

6 - TV ANTENNA - In

Signal input from an antenna, cable or satellite.

7 - HDMI 2: Digital Video, Digital Audio - In

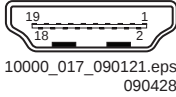
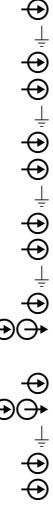


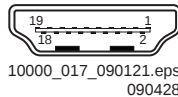
Figure 2-3 HDMI (type A) connector

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

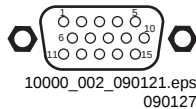


20 - Ground

Gnd

**8 - HDMI 1: 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	- ARC	Audio Return Channel	⊕
15	- DDC_SCL	DDC clock	⊕
16	- DDC_SDA	DDC data	⊕
17	- Ground	Gnd	⊥
18	- +5V		⊕
19	- HPD	Hot Plug Detect	⊕
20	- Ground	Gnd	⊥

9 - PC IN:VGA**Figure 2-5 VGA connector**

1	- Video Red	0.7 V _{PP} / 75 W	⊕
2	- Video Green	0.7 V _{PP} / 75 W	⊕
3	- Video Blue	0.7 V _{PP} / 75 W	⊕
4	- n.c.		
5	- Ground	Gnd	⊥
6	- Ground Red	Gnd	⊥
7	- Ground Green	Gnd	⊥

8 - Ground Blue

Gnd

9 - +5V_{DC}

+5 V



10 - Ground Sync

Gnd



11 - Ground Red

Gnd



12 - DDC_SDA

DDC data



13 - H-sync

0 - 5 V



14 - V-sync

0 - 5 V

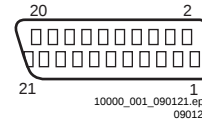


15 - DDC_SCL

DDC clock

**10 - Cinch: S/PDIF - Out**

Bk - Coaxial

0.4 - 0.6V_{PP} / 75 ohm**11 - EXT1: Video RGB/YC - In, CVBS - In/Out, Audio - In/Out****Figure 2-6 SCART connector**

1	- Audio R	0.5 V _{RMS} / 1 kΩ	⊕
2	- Audio R	0.5 V _{RMS} / 10 kΩ	⊕
3	- Audio L	0.5 V _{RMS} / 1 kΩ	⊕
4	- Ground Audio	Gnd	⊥
5	- Ground Blue	Gnd	⊥
6	- Audio L	0.5 V _{RMS} / 10 kΩ	⊕
7	- Video Blue/C-out	0.7 V _{PP} / 75 Ω	⊕⊕
8	- Function Select	0 - 2 V: INT 4.5 - 7 V: EXT 16:9 9.5 - 12 V: EXT 4:3	⊕
9	- Ground Green	Gnd	⊥
10	- n.c.		
11	- Video Green	0.7 V _{PP} / 75 Ω	⊕
12	- n.c.		
13	- Ground Red	Gnd	⊥
14	- Ground P50	Gnd	⊥
15	- Video Red/C	0.7 V _{PP} / 75 Ω	⊕
16	- Status/FBL	0 - 0.4 V: INT 1 - 3 V: EXT / 75 Ω	⊕
17	- Ground Video	Gnd	⊥
18	- Ground FBL	Gnd	⊥
19	- Video CVBS	1 V _{PP} / 75 Ω	⊕
20	- Video CVBS/Y	1 V _{PP} / 75 Ω	⊕
21	- Shield	Gnd	⊥

2.4 Chassis OverviewRefer to [9. Block Diagrams](#) for PWB/CBA locations.

3. Precautions, Notes, and Abbreviation List

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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: AG2B0335000001) indicates the number of the alternative B.O.M. (Bill Of Materials) that has been used for producing the specific TV set. In general, it is possible that the same TV model on the market is produced with e.g. two different types of displays, coming from two different suppliers. This will then

result in sets which have the same CTN (Commercial Type Number; e.g. 28PW9515/12) but which have a different B.O.M. number.

By looking at the third digit of the serial number, one can identify which B.O.M. is used for the TV set he is working with. If the third digit of the serial number contains the number "1" (example: 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: $9 \text{ plus } 26 = 35$ 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. SN is Lysomice, RJ is Kobierzyce), 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 2010 week 10 / 2010 week 17). The 6 last digits contain the serial number.



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

0/6/12 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
DMR	Digital Media Reader: card reader
MSD	Digital Multi Standard Decoding
DNM	Digital Natural Motion

DNR	Digital Noise Reduction: noise reduction feature of the set		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.
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.
		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
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		Latin America
DVB-C	Digital Video Broadcast - Cable	LATAM	Liquid Crystal Display
DVB-T	Digital Video Broadcast - Terrestrial	LCD	Light Emitting Diode
DVD	Digital Versatile Disc	LED	Monochrome TV system. Sound carrier distance is 6.5 MHz. L' is Band I, L is all bands except for Band I
DVI(-d)	Digital Visual Interface (d= digital only)	L/L'	LG.Philips LCD (supplier)
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	Loudspeaker
		LS	Low Voltage Differential Signalling
EDID	Extended Display Identification Data (VESA standard)	LVDS	Mega bits per second
		Mbps	Monochrome TV system. Sound carrier distance is 4.5 MHz
EEPROM	Electrically Erasable and Programmable Read Only Memory	M/N	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
EMI	Electro Magnetic Interference	MHEG	Microprocessor without Interlocked Pipeline-Stages; A RISC-based microprocessor
EPG	Electronic Program Guide		Matrix Output Processor
EPLD	Erasable Programmable Logic Device		Metal Oxide Silicon Field Effect Transistor, switching device
EU	Europe		Motion Pictures Experts Group
EXT	EXternal (source), entering the set by SCART or by cinches (jacks)		Multi Platform InterFace
FDS	Full Dual Screen (same as FDW)	MIPS	MUTE Line
FDW	Full Dual Window (same as FDS)		Mainstream TV: TV-mode with Consumer TV features enabled (iTV)
FLASH	FLASH memory		Not Connected
FM	Field Memory or Frequency Modulation	MOP	Near Instantaneous Compounded Audio Multiplexing. This is a digital sound system, mainly used in Europe.
		MOSFET	Negative Temperature Coefficient, non-linear resistor
FPGA	Field-Programmable Gate Array		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)
FTV	Flat TeleVision	MPEG	Non-Volatile Memory: IC containing TV related data such as alignments
Gb/s	Giga bits per second	MPIF	Open Circuit
G-TXT	Green TeleteXT	MUTE	On Screen Display
H	H_sync to the module	MTV	Over the Air Download. Method of software upgrade via RF transmission.
HD	High Definition		Upgrade software is broadcasted in TS with TV channels.
HDD	Hard Disk Drive	NC	On screen display Teletext and Control; also called Artistic (SAA5800)
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.	NTC	Project 50: communication protocol between TV and peripherals
		NTSC	Phase Alternating Line. Color system mainly used in West Europe (colour carrier = 4.433619 MHz) and South America (colour carrier
		NVM	PAL M = 3.575612 MHz and PAL N = 3.582056 MHz)
HDMI	High Definition Multimedia Interface		Printed Circuit Board (same as "PWB")
HP	HeadPhone	O/C	Pulse Code Modulation
I	Monochrome TV system. Sound carrier distance is 6.0 MHz	OSD	
		OAD	
I ² C	Inter IC bus		
I ² D	Inter IC Data bus		
I ² S	Inter IC Sound bus		
IF	Intermediate Frequency	OTC	
IR	Infra Red		
IRQ	Interrupt Request	P50	
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. SDI), is a digitized video format used for broadcast grade video.	PAL	
	Uncompressed digital component or digital composite signals can be used.	PCB	
		PCM	

PDP	Plasma Display Panel	SWAN	Spatial temporal Weighted Averaging
PFC	Power Factor Corrector (or Pre-conditioner)	SXGA	Noise reduction 1280 × 1024
PIP	Picture In Picture	TFT	Thin Film Transistor
PLL	Phase Locked Loop. Used for e.g. FST tuning systems. The customer can give directly the desired frequency	THD	Total Harmonic Distortion
POD	Point Of Deployment: a removable CAM module, implementing the CA system for a host (e.g. a TV-set)	TMDs	Transmission Minimized Differential Signalling
POR	Power On Reset, signal to reset the uP	TS	Transport Stream
PSDL	Power Supply for Direct view LED backlight with 2D-dimming	TXT	TeleteXT
PSL	Power Supply with integrated LED drivers	TXT-DW	Dual Window with TeleteXT
PSLS	Power Supply with integrated LED drivers with added Scanning functionality	UI	User Interface
PTC	Positive Temperature Coefficient, non-linear resistor	uP	Microprocessor
PWB	Printed Wiring Board (same as "PCB")	UXGA	1600 × 1200 (4:3)
PWM	Pulse Width Modulation	V	V-sync to the module
QRC	Quasi Resonant Converter	VESA	Video Electronics Standards Association
QTNR	Quality Temporal Noise Reduction	VGA	640 × 480 (4:3)
QVCP	Quality Video Composition Processor	VL	Variable Level out: processed audio output toward external amplifier
RAM	Random Access Memory	VSB	Vestigial Side Band; modulation method
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.	WYSIWYR	What You See Is What You Record: record selection that follows main picture and sound
RC	Remote Control	WXGA	1280 × 768 (15:9)
RC5 / RC6	Signal protocol from the remote control receiver	XTAL	Quartz crystal
RESET	RESET signal	XGA	1024 × 768 (4:3)
ROM	Read Only Memory	Y	Luminance signal
RSDS	Reduced Swing Differential Signalling data interface	Y/C	Luminance (Y) and Chrominance (C) signal
R-TXT	Red TeleteXT	YPbPr	Component video. Luminance and scaled color difference signals (B-Y and R-Y)
SAM	Service Alignment Mode	YUV	Component video
S/C	Short Circuit		
SCART	Syndicat des Constructeurs d'Appareils Radiorécepteurs et Téléviseurs		
SCL	Serial Clock I ² C		
SCL-F	CLock Signal on Fast I ² C bus		
SD	Standard Definition		
SDA	Serial Data I ² C		
SDA-F	DAta Signal on Fast I ² C bus		
SDI	Serial Digital Interface, see "ITU-656"		
SDRAM	Synchronous DRAM		
SECAM	SEequence Couleur Avec Mémoire. Colour system mainly used in France and East Europe. Colour 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)		
SVHS	Super Video Home System		
SW	Software		

4. Mechanical Instructions

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[4.2 Service Positions](#)

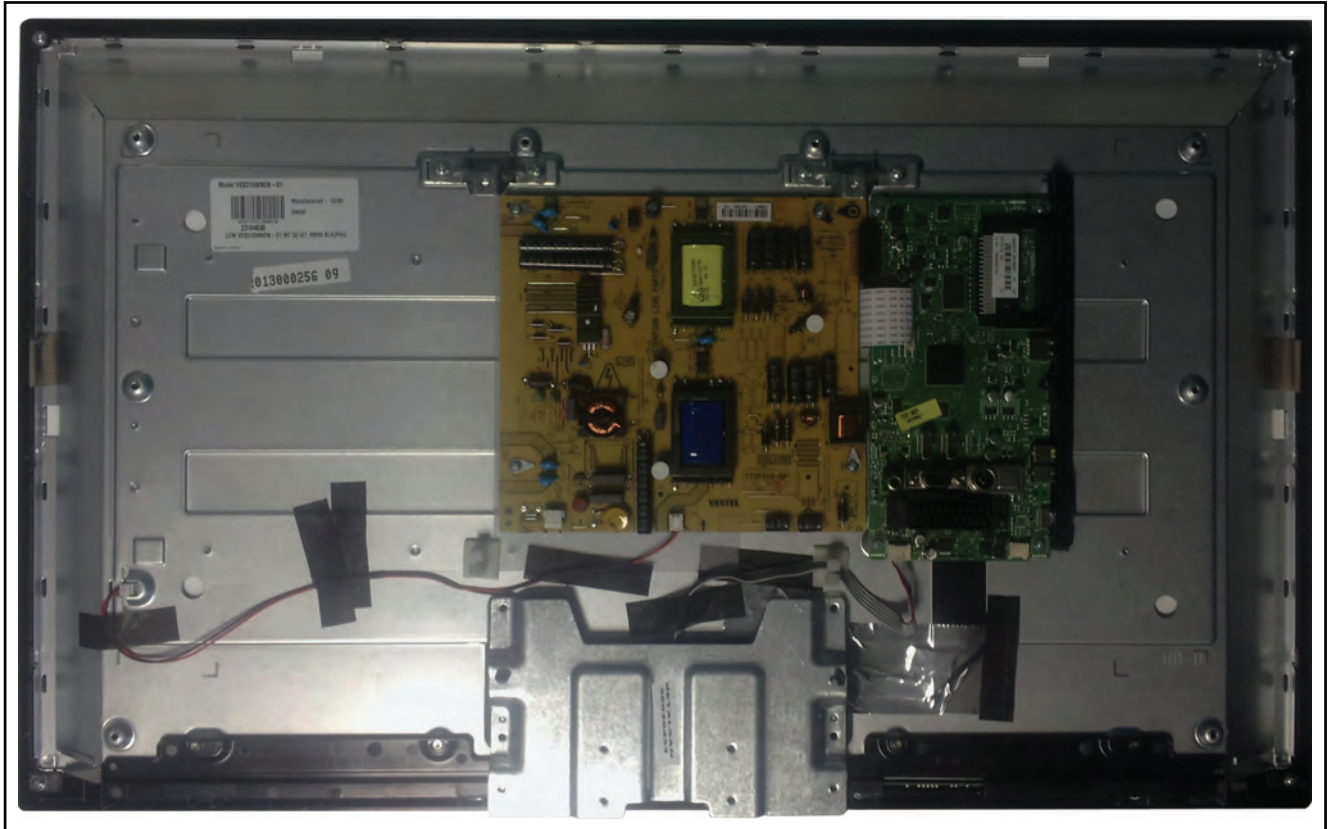
[4.3 Assembly/Panel Removal](#)

[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



19420_101_130312.eps
130312

Figure 4-1 Cable dressing (32" 3000 series)

4.2 Service Positions

For easy servicing of a TV set, the set should be put face down on a soft flat surface, foam buffers or other specific workshop tools. Ensure that a stable situation is created to perform measurements and alignments. When using foam bars take care that these always support the cabinet and **never** only the display. **Caution:** Failure to follow these guidelines can seriously damage the display! Ensure that ESD safe measures are taken.

to the SSB and PSU boards. Those need to be released before taking the cover off completely.

4.3 Assembly/Panel Removal

Instructions below apply to the 32PFL3606H/12, but will be similar for other models.

4.3.1 Rear Cover

Refer to [Figure 4-2](#) for details.

Warning: Disconnect the mains power cord before removing the rear cover.

1. Remove the screw [1] that secures the power cable.
2. Remove the screws [2] that fixate the stand and remove the stand.
3. Unscrew all the remaining screws [3] and [4].
4. At the indicated areas [5] the cover is secured by clips. Be careful with releasing those.
5. Lift the rear cover from the TV. Make sure that wires are not damaged while lifting the rear cover from the set. Be very careful while lifting the cover as there are cables connected



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130312

Figure 4-2 Rear cover removal

4.3.2 Speakers

1. Release the tapes which fixate the cabling.
2. Remove the screws of the speakers.
3. Take the speakers out.

When defective, replace the both units.

4.3.3 Power Supply Unit (PSU)

Caution: it is mandatory to remount all different screws at their original position during re-assembly. Failure to do so may result in damaging the PSU.

1. Release the Power board cables from their clamps.
2. Unplug power connectors from the SSB, as it is not unplug-able at the PSU itself (soldered connector).
3. Unplug all other connectors from the PSU.
4. Remove all fixation screws from the PSU.
5. The PSU can be taken out of the set now.

4.3.4 Small Signal Board (SSB)

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

1. Release the clips from both the LVDS Flat Foil connectors that connect with the SSB.

Caution: be careful, as these are very fragile connectors! Take the flat foils out of their connectors.

2. Release the clamps and unplug all other connectors.
3. Remove the fixation screw from the clamp near the bottom of the SSB, and take the clamp out.
4. Release the tape near the bottom side of the set from the LCD panel.
5. Remove all other fixation screws from the SSB.

6. Take out the SSB together with its shielding.
7. Remove the screw near the L/R audio connectors.
8. The SSB can now be shifted from the side connector cover, then lifted and taken out of the shielding.

4.3.5 IR/LED Board

1. Remove the speakers as described earlier.
2. Remove the stand as described earlier.
3. Release the clamps that hold the boards cable.
4. Remove the fixation screws that secure the LCD panel with the bezel.
5. Lift the LCD Panel from the bezel.
6. Gently release the clips that hold the board and take it out from the bezel.
7. Unplug both the connectors from the IR/LED board.

When defective, replace the whole unit.

4.3.6 LCD Panel

1. Remove the SSB as described earlier.
2. Remove the PSU as described earlier.
3. Remove the stand as described earlier.
4. Release the IR/LED board cable from its clamps and unplug the IR/LED board cable.
5. Remove the fixation screws, that secure the LCD panel with the bezel.
6. Lift the LCD Panel from the bezel.
7. Remove the fixation screws that secure the panel with the metal subframe.
8. Release the clips from both the LVDS Flat Foil connectors that connect with the LCD panel.

Caution: be careful, as these are very fragile connectors!

Take the flat foils out of their connectors.

When defective, replace the whole unit.

4.4 Set Re-assembly

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

Notes:

- While re-assembling, make sure that all cables are placed and connected in their original position. See [Figure 4-1](#).
- 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 Software Upgrading](#)
- [5.4 Error Codes](#)
- [5.5 Fault Finding and Repair Tips](#)

5.1 Test Points

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

Perform measurements under the following conditions:

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

5.2 Service Modes

The Service Mode feature is split into two parts:

- Service Alignment Mode (SAM).
- Customer Service Mode (CSM).

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

- Display information ("Service Menu" (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.

Note: For the new model range, a new remote control (RC) is used with some renamed buttons. This has an impact on the activation of the Service modes. For instance the old "MENU" button is now called "HOME" (or is indicated by a "house" icon).

5.2.1 General

Next items are applicable to all Service Modes or are general.

Life Timer

During the life time cycle of the TV set, a timer is kept (called "TV Life Time"). It counts the normal operation hours (not the Stand-by hours). The actual value of the timer is displayed in SDM and SAM in a decimal value. Every two soft-resets increase the hour by + 1. Stand-by hours are not counted.

Software Identification, Version, and Cluster

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

The screen will show: "AAAAAB-XX.YY", where:

- AAAAA is the chassis name: VES11E_2.1.4n.
- B is the region indication: E = Europe, A = AP/China, U = NAFTA, L = LATAM.
- XX is the main version number: this is updated with a major change of specification (incompatible with the previous software version). Numbering will go from 01 - 99 and AA - ZZ.
 - If the main version number changes, the new version number is written in the NVM.
 - If the main version number changes, the default settings are loaded.
- YY is the sub version number: this is updated with a minor change (backwards compatible with the previous

versions). Numbering will go from 00 - 99.

- If the sub version number changes, the new version number is written in the NVM.
- If the NVM is fresh, the software identification, version, and cluster will be written to NVM.

5.2.2 Service Alignment Mode (SAM)

Purpose

- To modify the NVM.
- Change and test video settings.
- View options.
- TV life time
- SW number
- Factory reset
- Diagnose features

Specifications

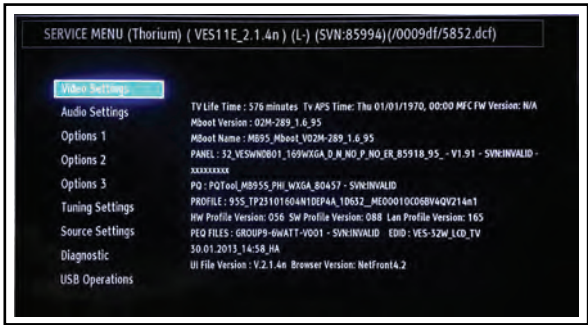
- Operation hours counter (maximum five digits displayed).
- Software version, error codes, and option settings display.
- Option settings.
- Software alignments (White Tone).
- NVM Editor.

How to Activate SAM

To activate SAM, use one of the following methods:

- Press menu button firstly. While main menu is on screen press 4725 consecutively. Do not allow the display to time out between entries while keying the sequence.

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



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130313

Figure 5-1 Example of SAM

How to Navigate

- In the SAM menu, select menu items with the UP/DOWN keys on the remote control transmitter. The selected item will be indicated. When not all menu items fit on the screen, use the UP/DOWN keys to display the next/previous menu items.
- With the "LEFT/RIGHT" keys, it is possible to:
 - Test certain values and turn them off.
 - Change the value of the selected menu item.

How to Store SAM Settings

All the changes which have been made are stored automatically. It is suffice to enter the new value and just exit.

How to Exit SAM

Use one the following method:

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

Note: When the TV is switched "off" by a power interrupt while in SAM, the TV will show up in "normal operation mode" as

soon as the power is supplied again. The error buffer will not be cleared.

5.2.3 Customer Service Mode (CSM)

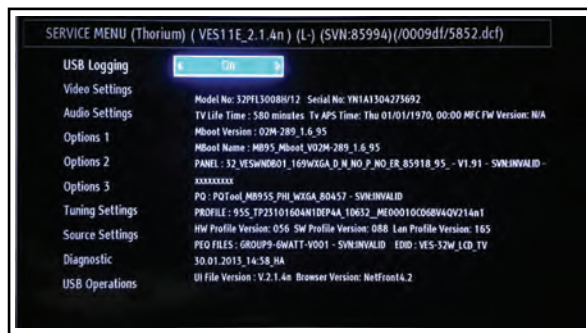
Purpose

The Customer Service Mode shows error codes and information on the TV's operation settings. The call centre can instruct the customer (by telephone) to enter CSM in order to identify the status of the set. This helps the call centre to diagnose problems and failures in the TV set 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.



19420_203_130313.eps
130313

Figure 5-2 CSM Menu

How to Activate CSM

Press the Menu button followed by "123654" buttons consecutively.

Note: Activation of the CSM is only possible if there is no (user) menu on the screen!

Contents of CSM

- USB Logging
- Video Settings
- Audio Settings
- Options 1
- Options 2
- Options 3
- Tuning Settings
- Source Settings
- Diagnostic
- USB Operations

How to Navigate

By means of the "CURSOR-DOWN/UP" knob (or the scroll wheel) on the RC-transmitter, can be navigated through the menus.

5.3 Software Upgrading

5.3.1 Description

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. A description on how to upgrade the main software can be found in the DFU or on the Philips website.

5.3.2 Introduction

Philips continuously tries to improve its products, and it's recommend that the TV software is updated when updates are available. Software update files can be obtained from the dealer or can be downloaded from the following websites:

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

Preparing a portable memory for software upgrade

The following requirements have to be met:

1. A personal computer connected to the Internet.
2. An archive utility that supports the ZIP-format (e.g. Win Zip for Windows or Stuffit for Mac OS).
3. A USB flash drive (preferably empty).

Note:

1. Only FAT/DOS-formatted flash drives are supported.
2. Only use software update files that can be found on the <http://www.philips.com/support> web site.

5.3.3 Check the current TV software version

Before starting the software upgrade procedure, it is advised to check that what the current TV software:

1. Press the Menu button followed by "1 2 3 6 5 4" buttons consecutively on the remote control.
2. Use the up/down cursor keys to find the software version. If the current software version of the TV is the same as the latest update file found on <http://www.philips.com/support>, it is not necessary to update the TV software.

5.3.4 Download the latest software

1. Point the web browser to <http://www.philips.com/support>.
2. Find information and software related to the TV.
3. Select the latest software update file and download it to the PC.
4. Insert a USB flash drive into one of the USB ports of the PC.
5. Decompress the downloaded ZIP file and copy the "autorun.upg" to the root directory of the USB flash drive.

5.3.5 Update the TV software

1. Unplug the mains power cord from your TV.
2. Insert the USB flash drive that contains the software update files.
3. Press and hold the OK button.
Note: If the USB flash drive is not detected after power up, disconnect it and re-insert it.
4. Plug the mains power cord back in while holding the OK button.
5. The led light will start to flash and blink.
6. The first time installation menu will appear.
7. Restart your TV. Your TV has now been updated.

Note:

- Do not remove the USB flash drive during the software update.
- If a power failure occurs during the update, do not remove the USB flash drive from the TV. The TV will continue the software update as soon as the power comes up again.
- If an error occurs during the update retry the procedure or contact the dealer.
- We do not recommend downgrading to an older version.
- Once the upgrade is finished, use the PC to remove the TV software from the USB portable memory.

5.3.6 How to Copy NVM Data to/from USB**Copy to USB**

There are two steps and both are independent of each other. Copy the updated welcome image to USB as "hotel_wel.png"

Copy from USB

There are two steps and both are independent of each other. If there is file named "hotel_wel.png" in directory "welcome_image". It is copied to TV to use as welcome image. Copy from USB device data to NVRAM. Just the reverse operation done by copy to USB call. Previously copied NVRAM files (Flashx.bin) are copied into TV. If there is no flash file or some of them are available on USB, the available ones are copied. If no USB is connected, nothing happens.

Note: For Clone function USB stick (Copy to USB - Copy from USB) must be formatted to FAT32. If USB is not formatted to FAT32 the other TVs will not accept cloned data and performance issues will result

5.4 Error Codes

This chassis does not contain error codes.

5.5 Fault Finding and Repair Tips**Note:**

- 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.

5.5.1 NVM Editor

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

Caution:

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

5.5.2 Load Default NVM Values

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

5.5.3 No Backlight Problem.

Backlight pin, dimming pin, backlight supply, stby on/off pin BACKLIGHT_ON/OFF pin should be high when the backlight is ON. R119 must be low when the backlight is OFF. If it is a problem, please check Q10 and the panel cables. Also it can

be tested in TP50 in main board. See figure [10-2-1 B01. HDMI/GPIO protection](#).

5.5.4 No Picture via HDMI input

Check if HDCP key is valid. This can be done in CSM.

5.5.5 TV Will Not Start-up from Stand-by

Possible Stand-by Controller failure. Re flash the SW.

5.5.6 CI Module Problem

Supply, supply control pin, detect pins, mechanical positions of pins. CI supply should be 5V when CI module inserted. If it is not 5V please check CI_PWR_CTRL, this pin should be low. See figure [10-2-7 B07. Audio. Headphone](#).

5.5.7 CSM

When CSM is activated and there is a USB memory stick connected to the TV, the software will dump the complete CSM content to the USB memory stick. The file (Csm.txt) will be saved in the root of the USB memory stick.

5.5.8 Loudspeakers

Make sure that the volume is set to minimum during disconnecting the speakers in the ON-state of the TV. The audio amplifier can be damaged by disconnecting the speakers during ON-state of the set!

5.5.9 Display Option Code

Attention: In case the SSB is replaced, always check the Panel Code in CSM, even when picture is available. Performance with the incorrect display option code can lead to unwanted side-effects for certain conditions.

5.5.10 Staying in Stand-by Mode

This problem indicates a short on V_{CC} voltages. Protect pin should be logic high while normal operation. When there is a short circuit protect pin will be logic low. If you detect logic low on protect pin, unplug the TV set and control voltage points with a multi-meter to find the shorted voltage to ground.

5.5.11 IR Problem

Check LED card supply on MB95 chassis.

5.5.12 No Signal Problem

Check tuner supply voltage; 5V_VCC, 3V3_TUNER and 1V8_TUNER. Check tuner options are correctly set in Service menu. Check AGC voltage at IF_AGC pin of tuner.

6. Alignments

Index of this chapter:

[6.1 General Alignment Conditions](#)

[6.2 Hardware Alignments](#)

[6.3 Software Alignments](#)

[6.4 Reset of Repaired SSB](#)

6.1 General Alignment Conditions

Perform all electrical adjustments under the following conditions:

- Power supply voltage: 90 - 264 V_{AC}, 50/ 60 ± 3 Hz.
- 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 heat sinks as ground.

- Test probe: R_i > 10 MΩ, C_i < 20 pF.

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 RGB Align and go to one of the sub menus. The alignments are explained below.

The following items can be aligned:

- White point

To store the data:

- Press OK on the RC **before the cursor is moved to the left.**
- Select "Store" and press OK on the RC.
- Switch the set to stand-by mode.

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

- **EU/AP-PAL models:** a PAL B/G TV-signal with a signal strength of at least 1 mV and a frequency of 475.25 MHz
- **US/AP-NTSC models:** an NTSC M/N TV-signal with a signal strength of at least 1 mV and a frequency of 61.25 MHz (channel 3).
- **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).

6.4 Reset of Repaired SSB

A very important issue towards a repaired SSB from a Service repair shop (SSB repair on component level) implies the reset of the NVM on the SSB.

A repaired SSB in Service should get the service Set type "00PF0000000000" and Production code "00000000000000". Also the virgin bit is to be set. To set all this, you can use the ComPair tool or use the "NVM editor" and "Dealer options" items in SAM (do not forget to "store").

After a repaired SSB has been mounted in the set (set repair on board level), the type number (CTN) and production code of the TV has to be set according to the type plate of the set. For this, you can use the NVM editor in SAM. The loading of the CTN and production code can also be done via ComPair (Model number programming).

In case of a display replacement, reset the "Operation hours display" to "0", or to the operation hours of the replacement display.

7. Circuit Descriptions

Index of this chapter:

[7.1 Introduction](#)

[7.2 Power Supply](#)

[7.3 Power Management](#)

[7.4 Circuit Description](#)

Notes:

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

7.1 Introduction

VES2.2E LA main board is driven by MStar SOC. This IC is a single chip IDTV solution that supports channel decoding, MPEG decoding, and media-centre functionality enabled by a high performance AV CODEC and CPU.

- Combo Front-End Demodulator
- A multi-standard A/V format decoder
- The MACEpro video processor
- Home theatre sound processor
- Internet and Variety of Connectivity Support
- Dual-stream decoder for 3D contents
- Multi-purpose CPU for OS and multimedia
- Peripheral and power management

7.1.1 VES2.2E LA Architecture Overview

For details about the chassis block diagrams refer to chapter [9. Block Diagrams](#).

7.1.2 SSB Cell Layout

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130315

Figure 7-1 SSB layout cells (top view)

7.2 Power Supply

7.2.1 Power Supply Unit

Before checking other parts first check whether fuse on the PSU is not broken. Always replace a defective fuse with one with the correct specifications! This part is available in the regular market.
Consult the Philips Service web portal for the order codes of the boards.

7.3 Power Management

The on-board DC/DC converters receive the following voltages from the PSU (depending on set execution):

- +3.3 VSB, for standby mode.
- +5 VSB, for standby mode.
- +12 VSB, for standby mode.
- +3.3 V, for on mode.
- +5 V, for on mode.
- +24 V, for on mode, audio power.

7.4 Circuit Description

7.4.1 System power

The main board power is received at connector CN2 from power board, to receive the power and signals from the PSU. See [Figure 7-2](#) for the correct pining.

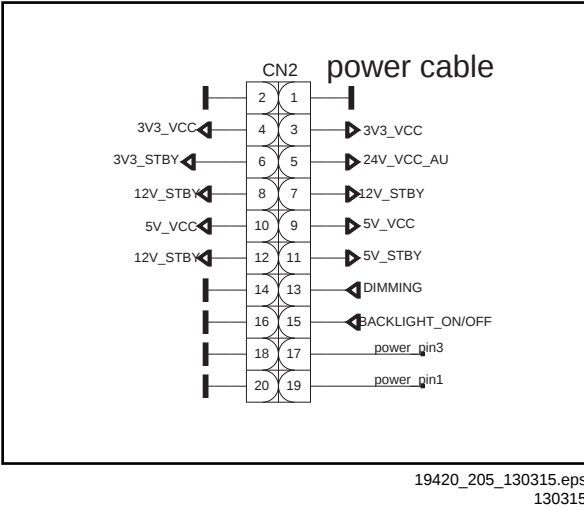


Figure 7-2 Connector CN2 overview

7.4.2 System power

The main board power is received at connector CN2 from power board, to receive the power and signals from the PSU. See [Figure 7-2](#) for the correct pining.

The output voltages to the chassis are:

- +5V / +3V3 / 12 V- STANDBY
- +5 V / +12V (on-mode)
- +24V for audio circuit, (on-mode)

7.2.2 USB Interface

The SOC has two input port for USB, therefore air mouse, internal wi-fi interface and USB2 are combined with HUB. This property is optional. If air mouse and wi-fi interfaces are not aligned, two USB are connected directly to main IC.

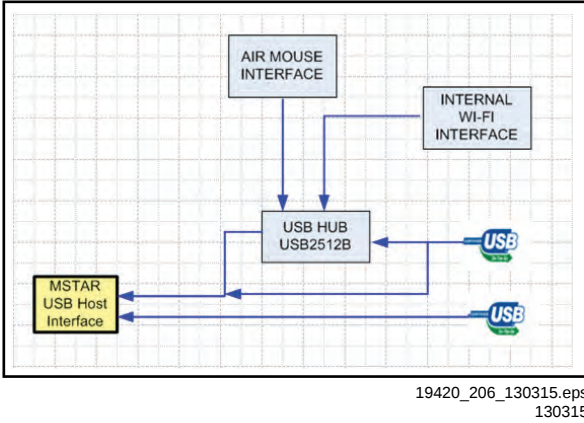


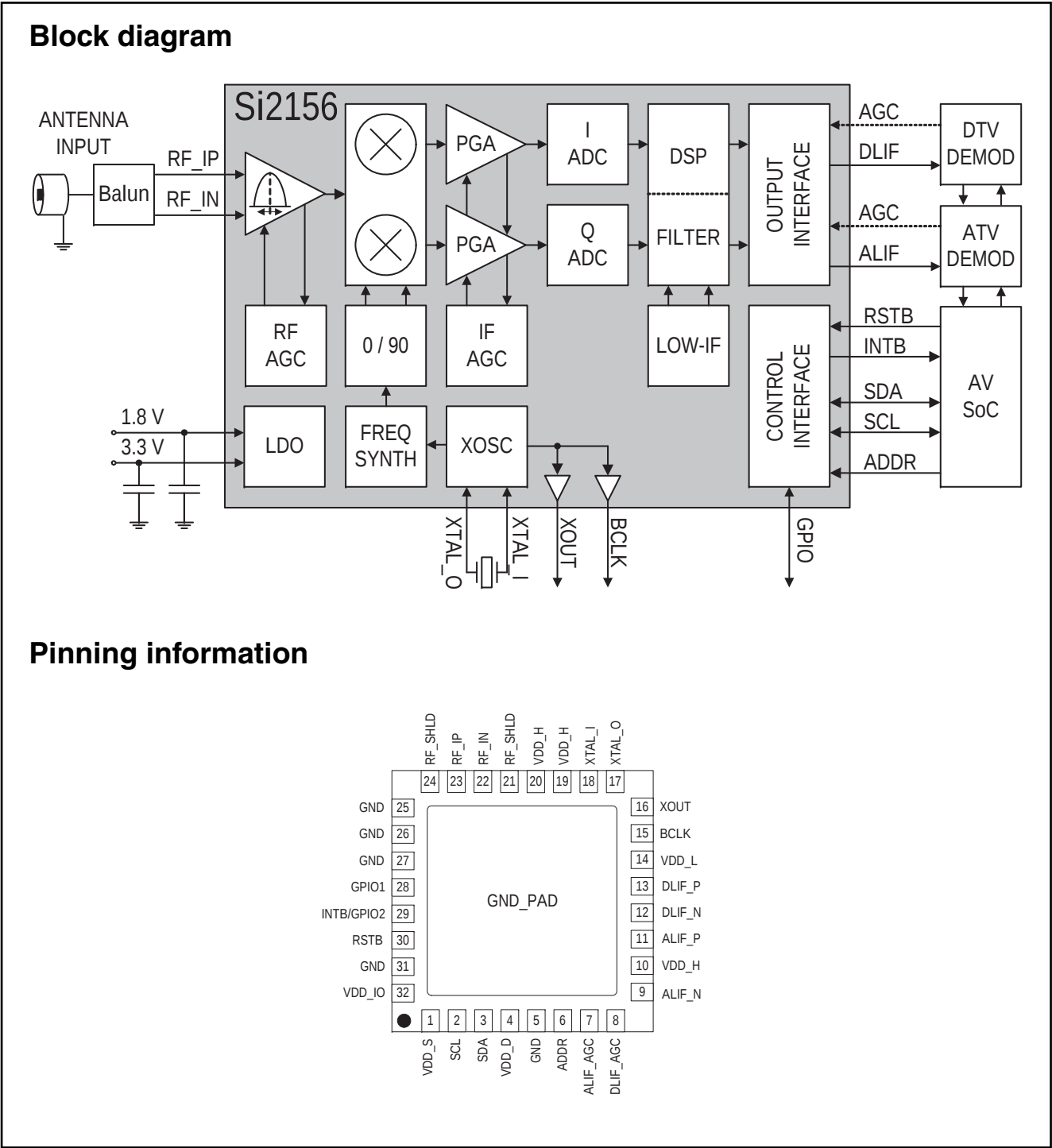
Figure 7-3 USB Interface

8. IC Data Sheets

This chapter shows the internal block diagrams and pin configurations of ICs that are drawn as “black boxes” in the

electrical diagrams (with the exception of “memory” and “logic” ICs).

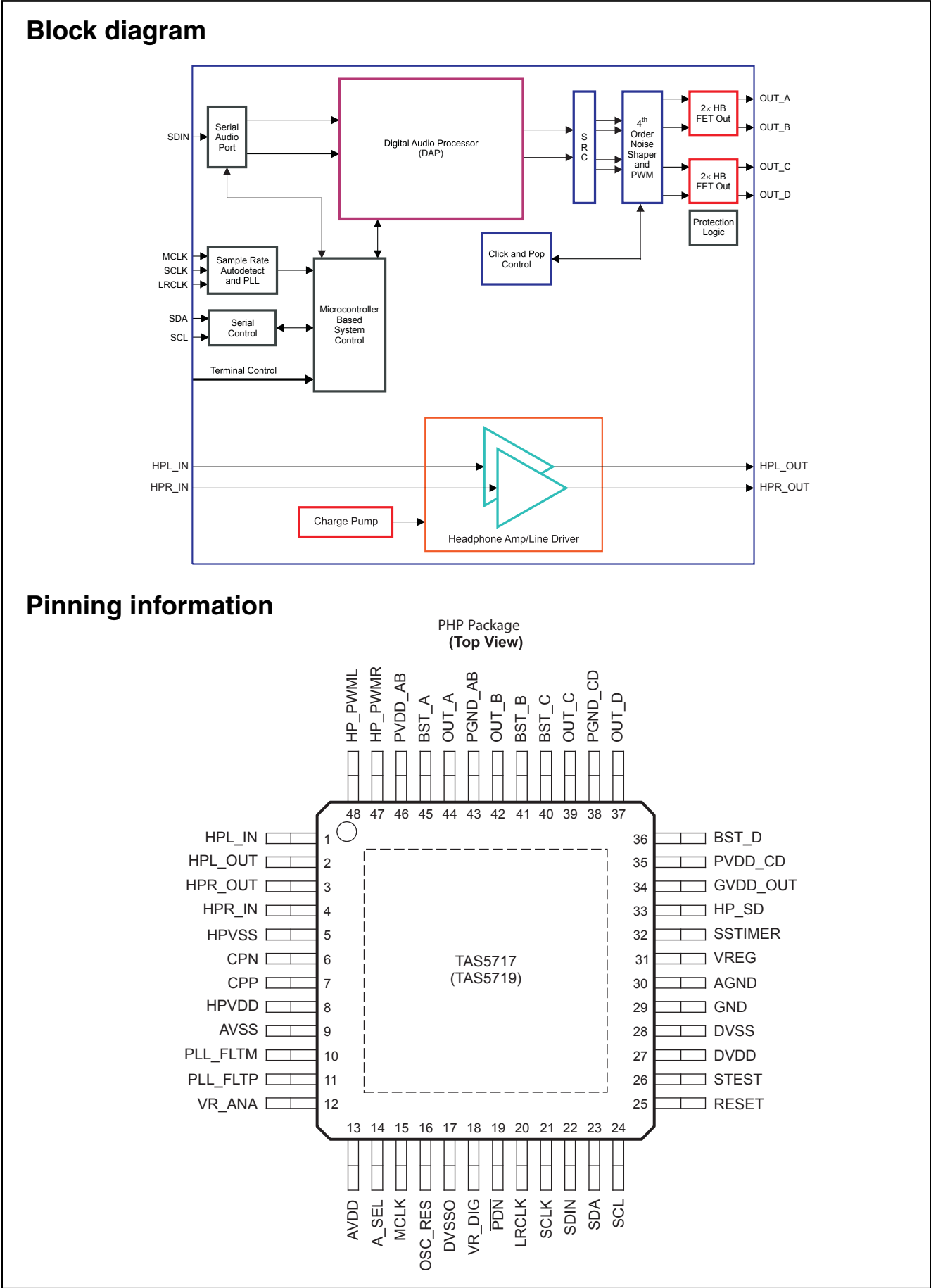
8.1 Diagram 10-2-4 B04, Tuner, USB, WiFi, Si2156 (U18)



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130314

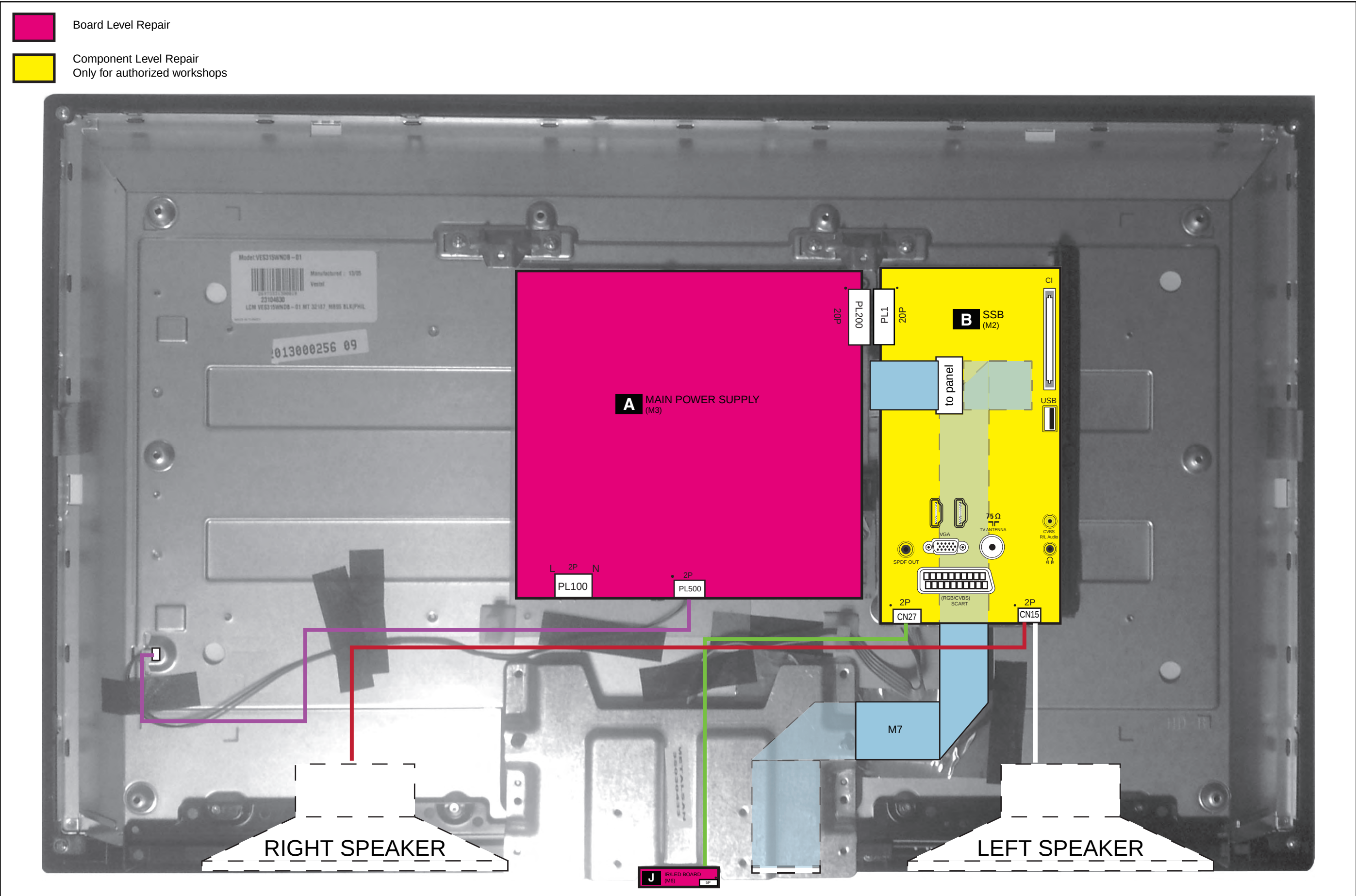
Figure 8-1 Internal block diagram and pin configuration

8.2 Diagram [10-2-7 B07, Audio, Headphone](#), TAS5719 (IC U35)



9. Block Diagrams

9.1 Wiring diagram 3000 series 32"

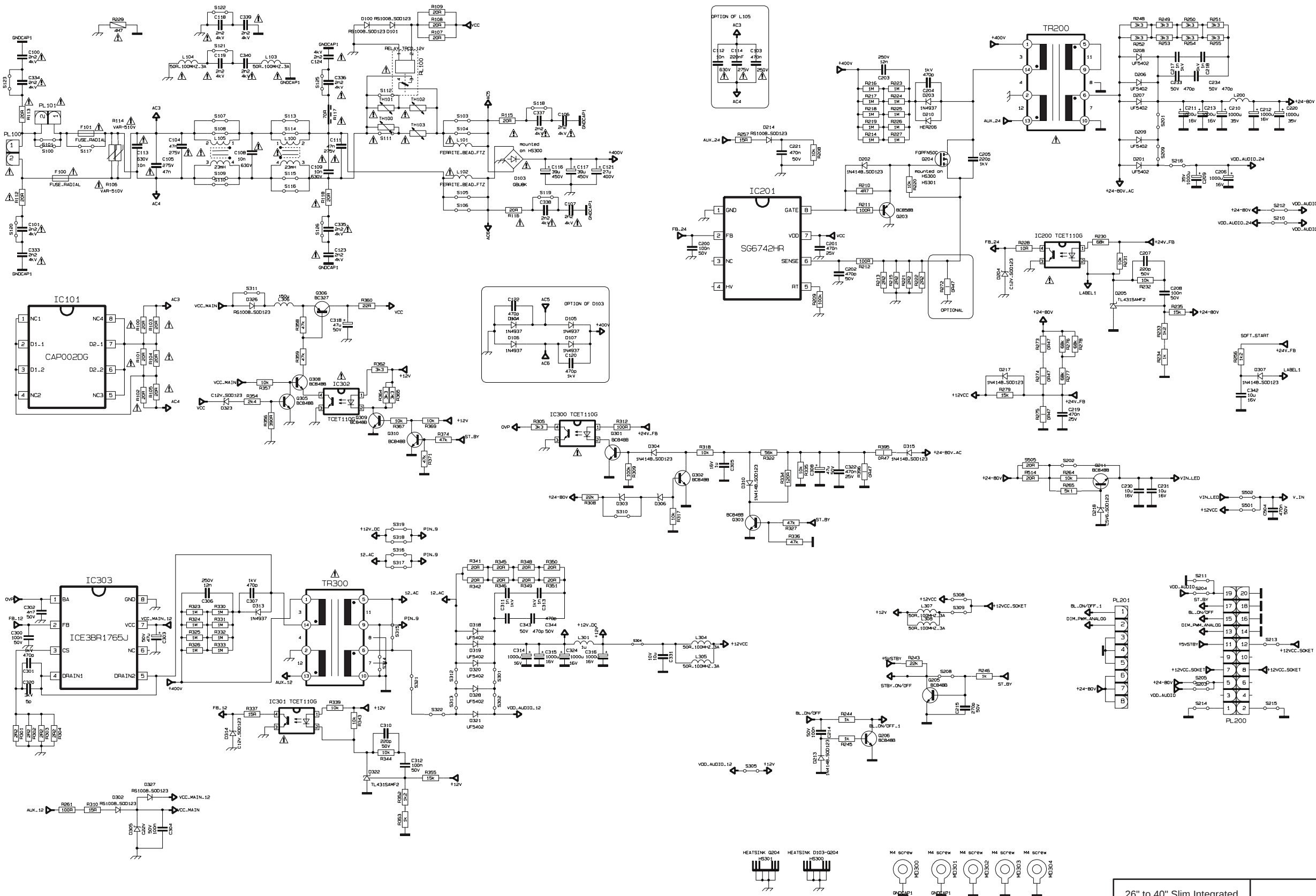


10. Circuit Diagrams and PWB Layouts

10.1 A 17ips19-5 26" to 40" LED Slim Integrated Power Supply

A01 26" to 40" Slim Integrated Power Supply

A01



26" to 40" Slim Integrated Power Supply

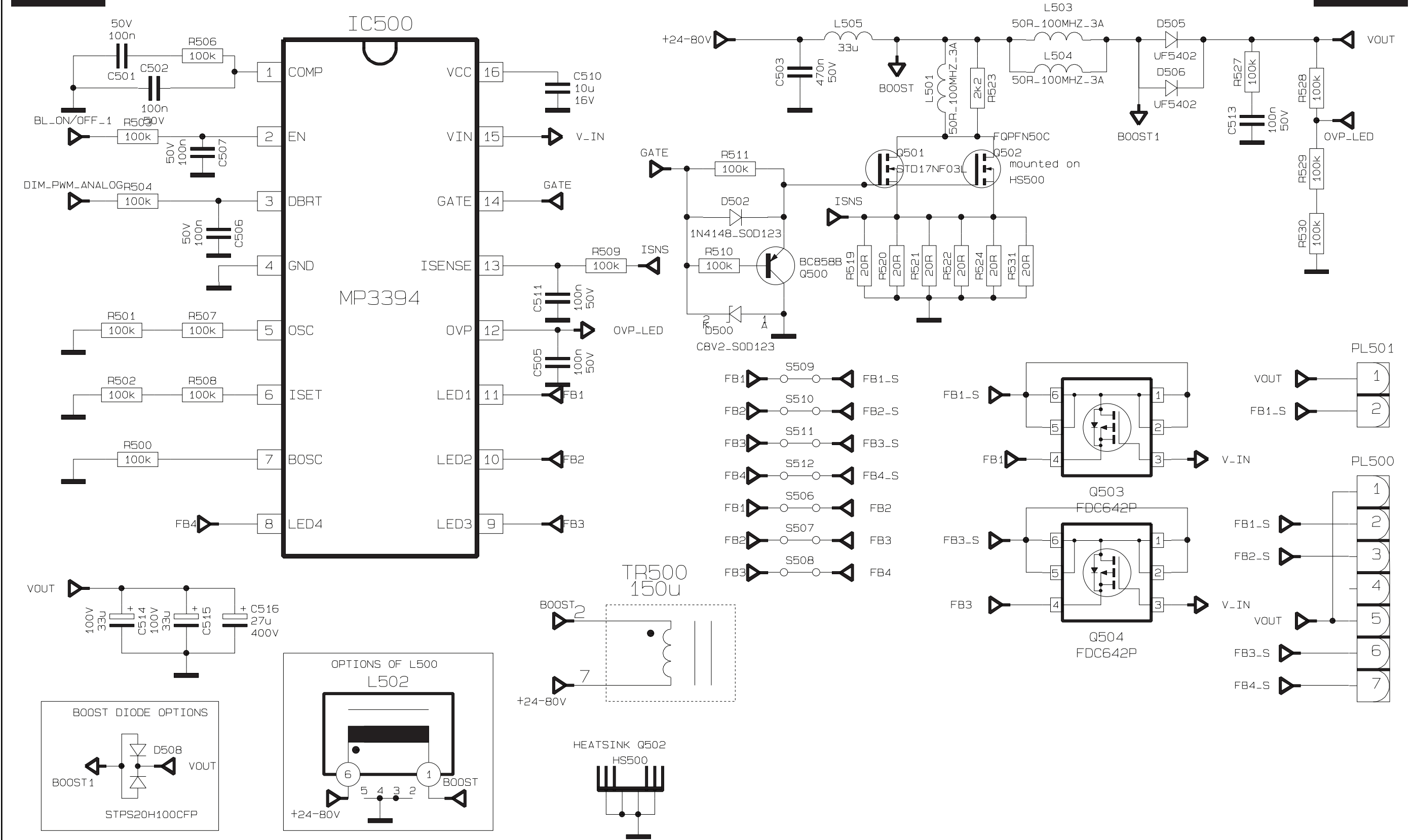
2722 171 9032

3	2011-05-02

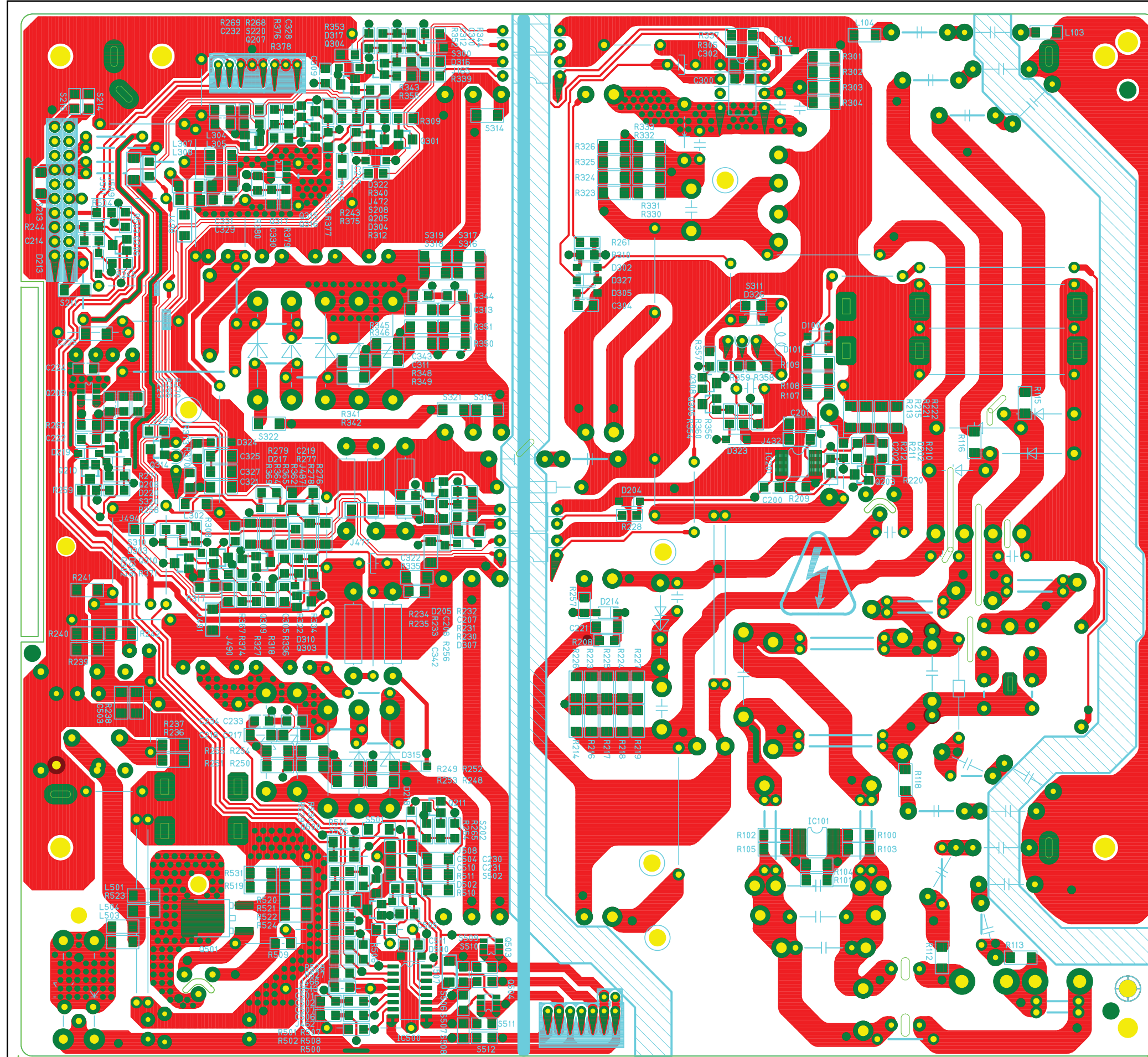
A02

26" to 40" Slim Integrated Power Supply

A02



10-1-4 Layout bottom

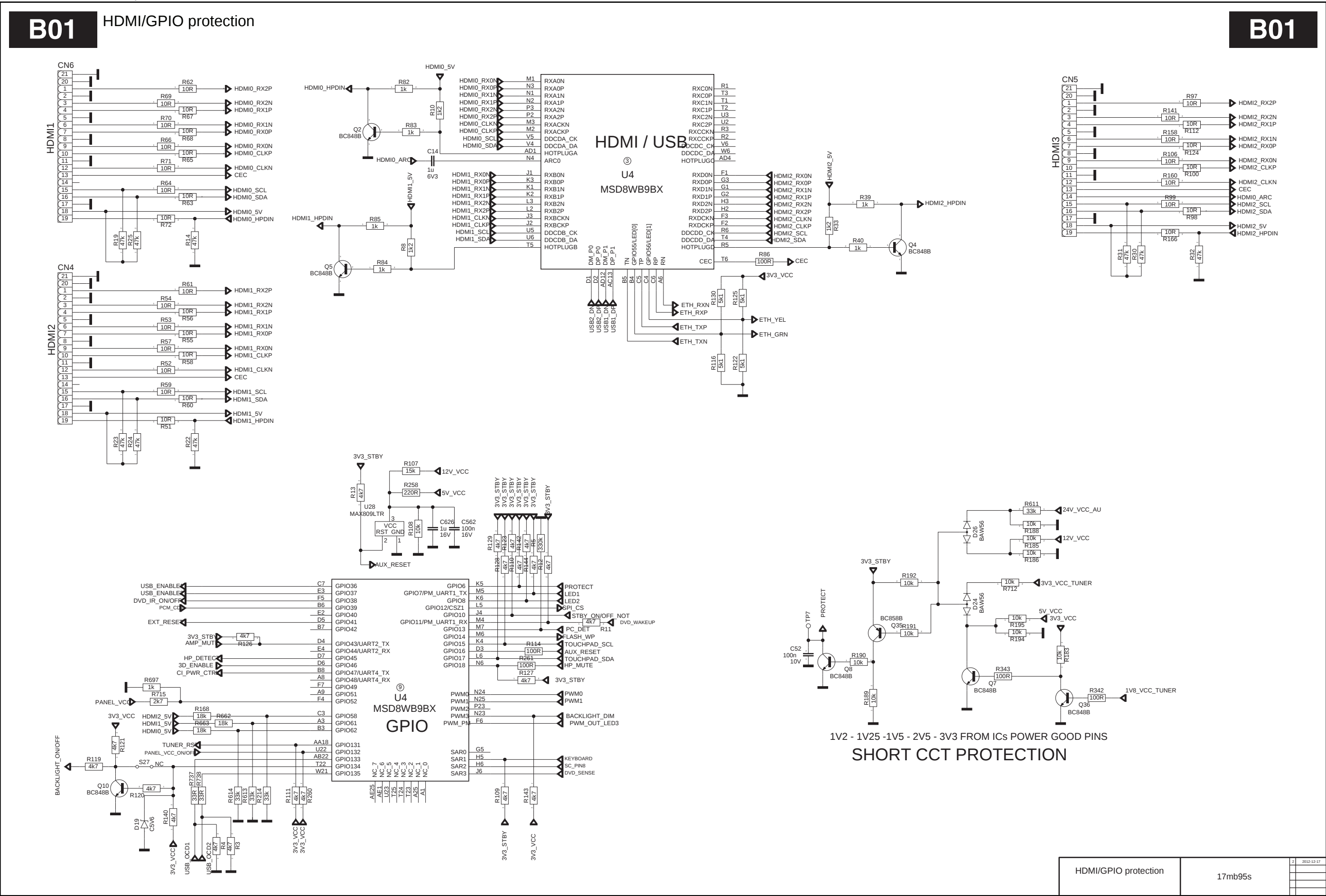


PSU Layout Bottom

17ips19-5

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130311

10.2 B 17mb95s-2 SSB
10-2-1 B01, HDMI/GPIO protection

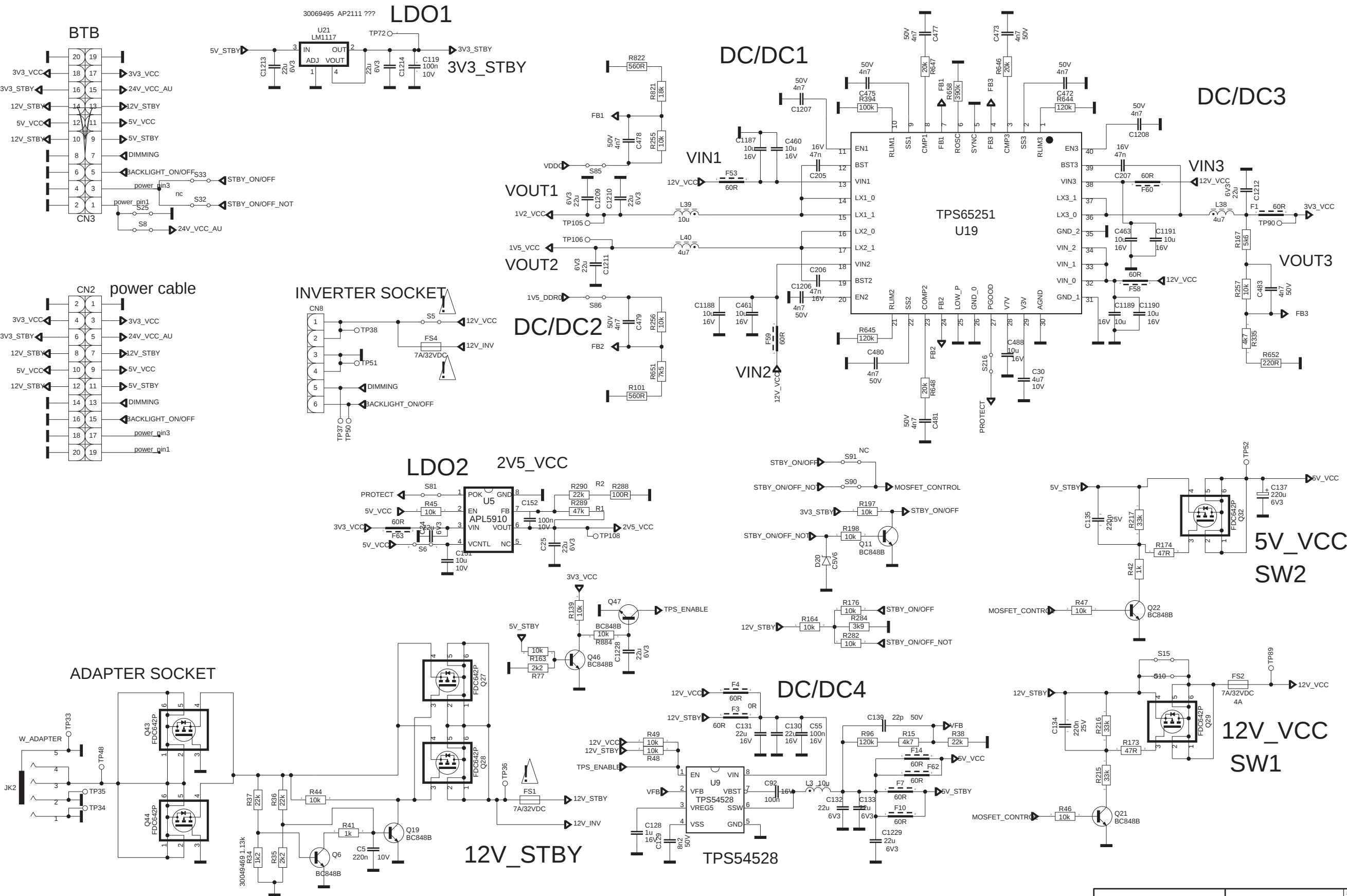




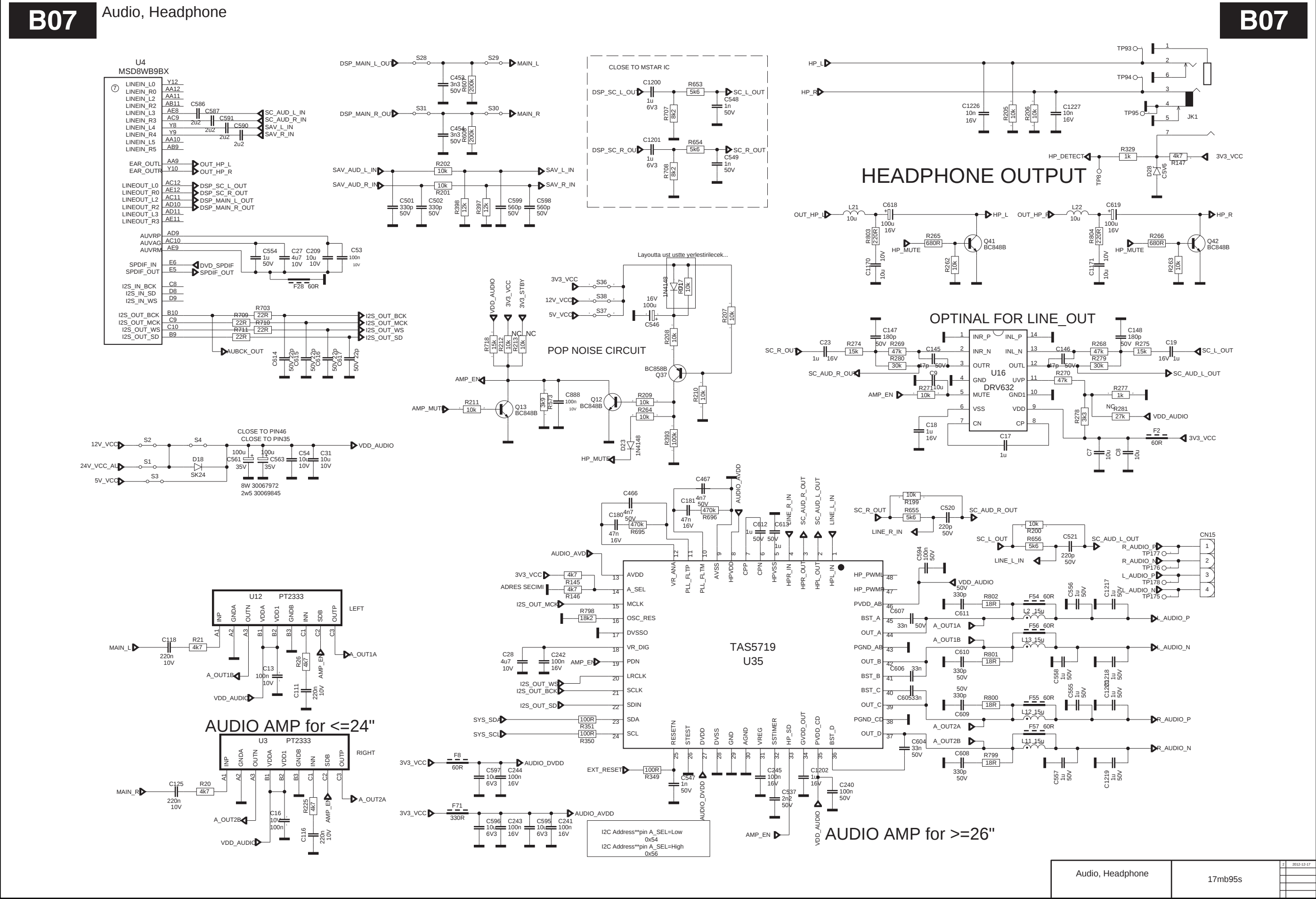
B05

Power

B05



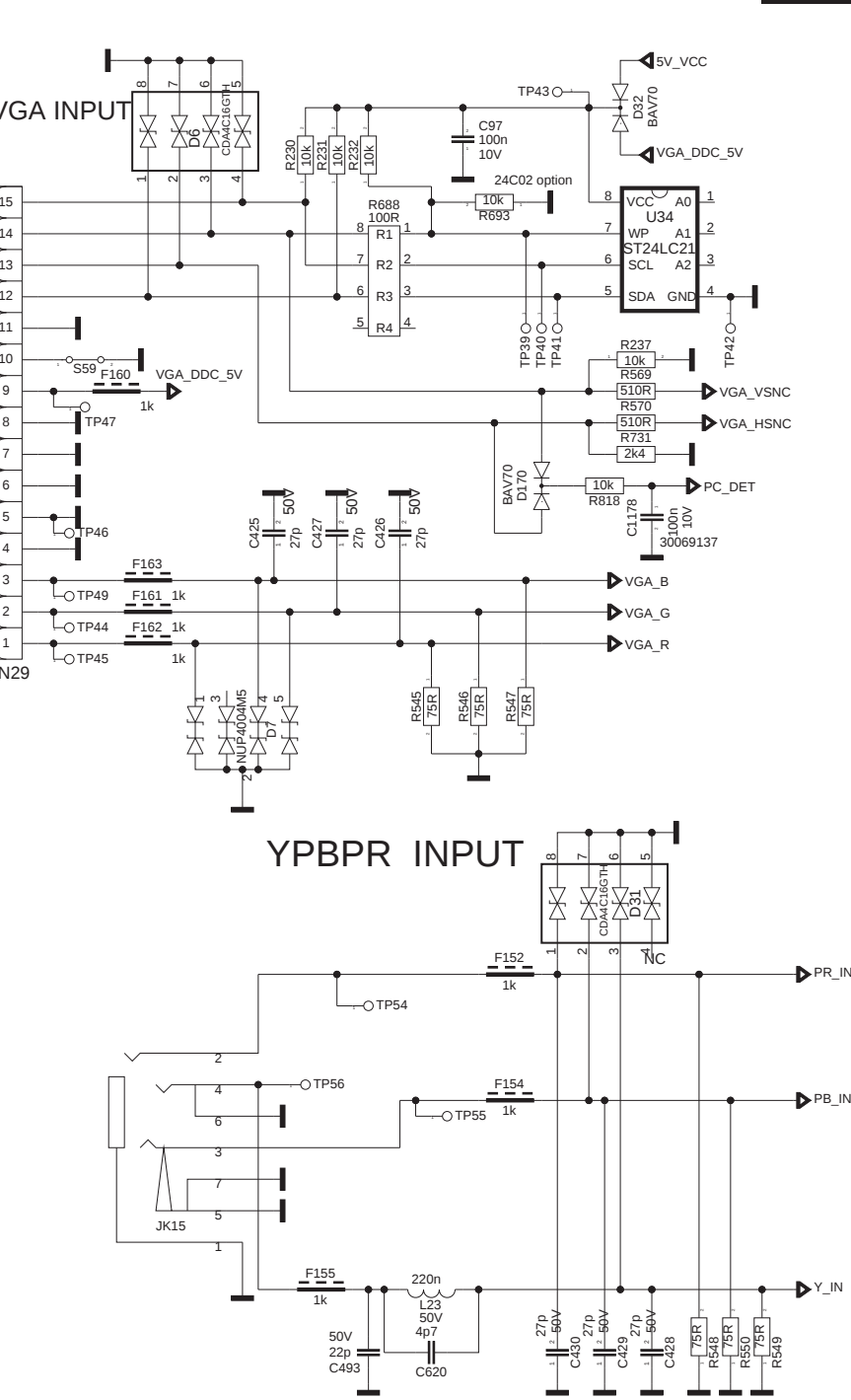
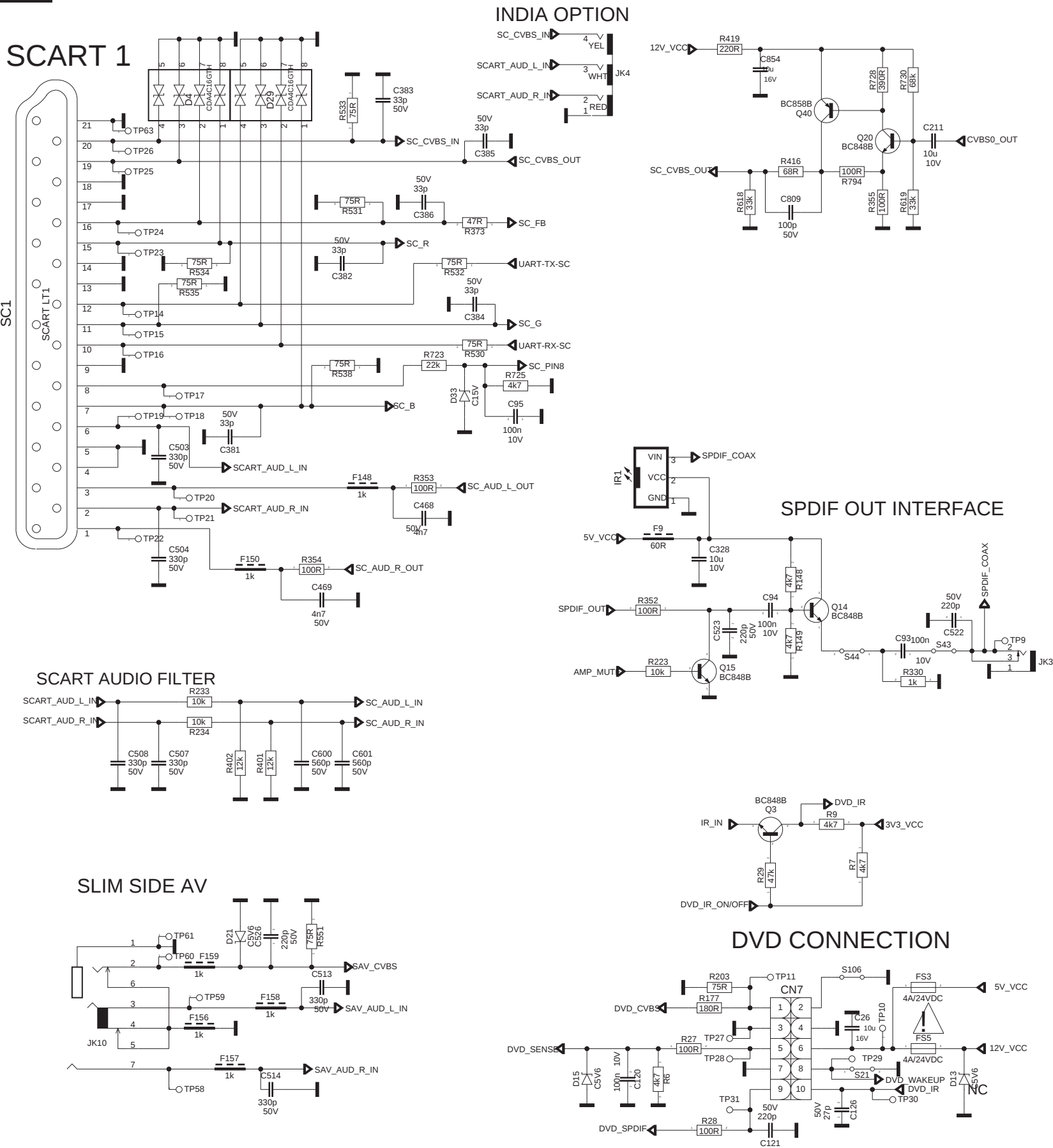
Power	17mb95s	2	2012-12-17



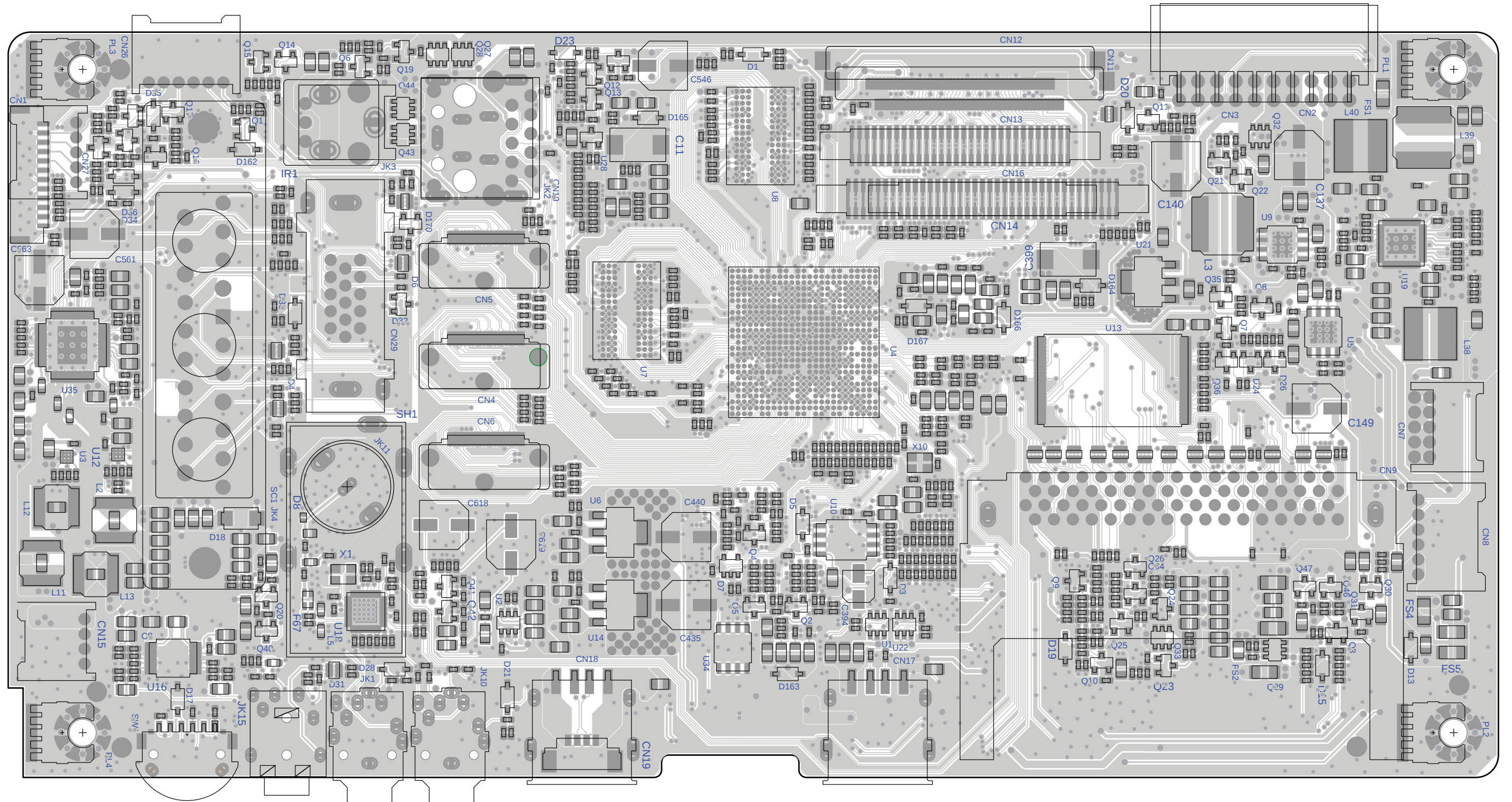
B09

Audio/video I/O, DVD

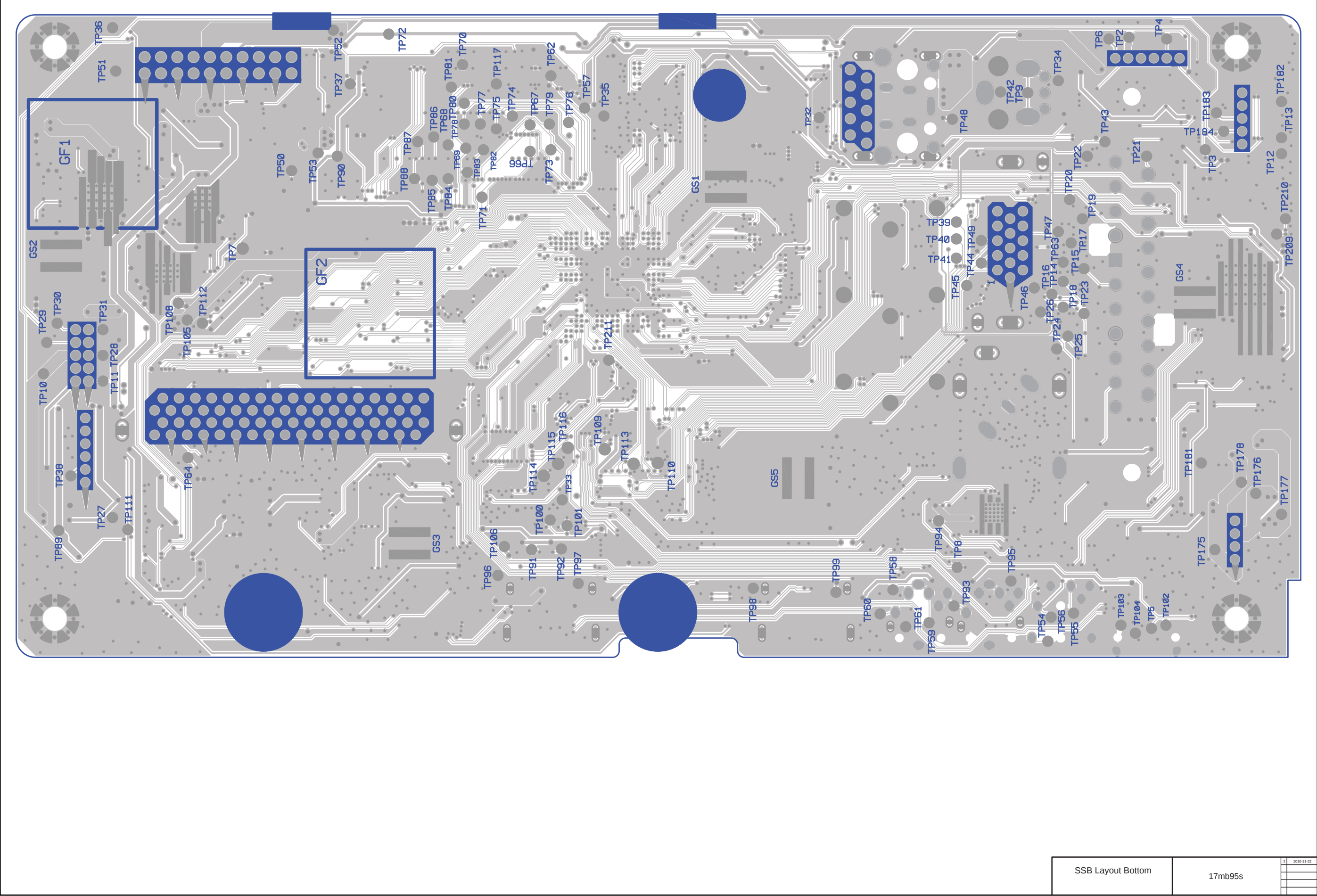
B09



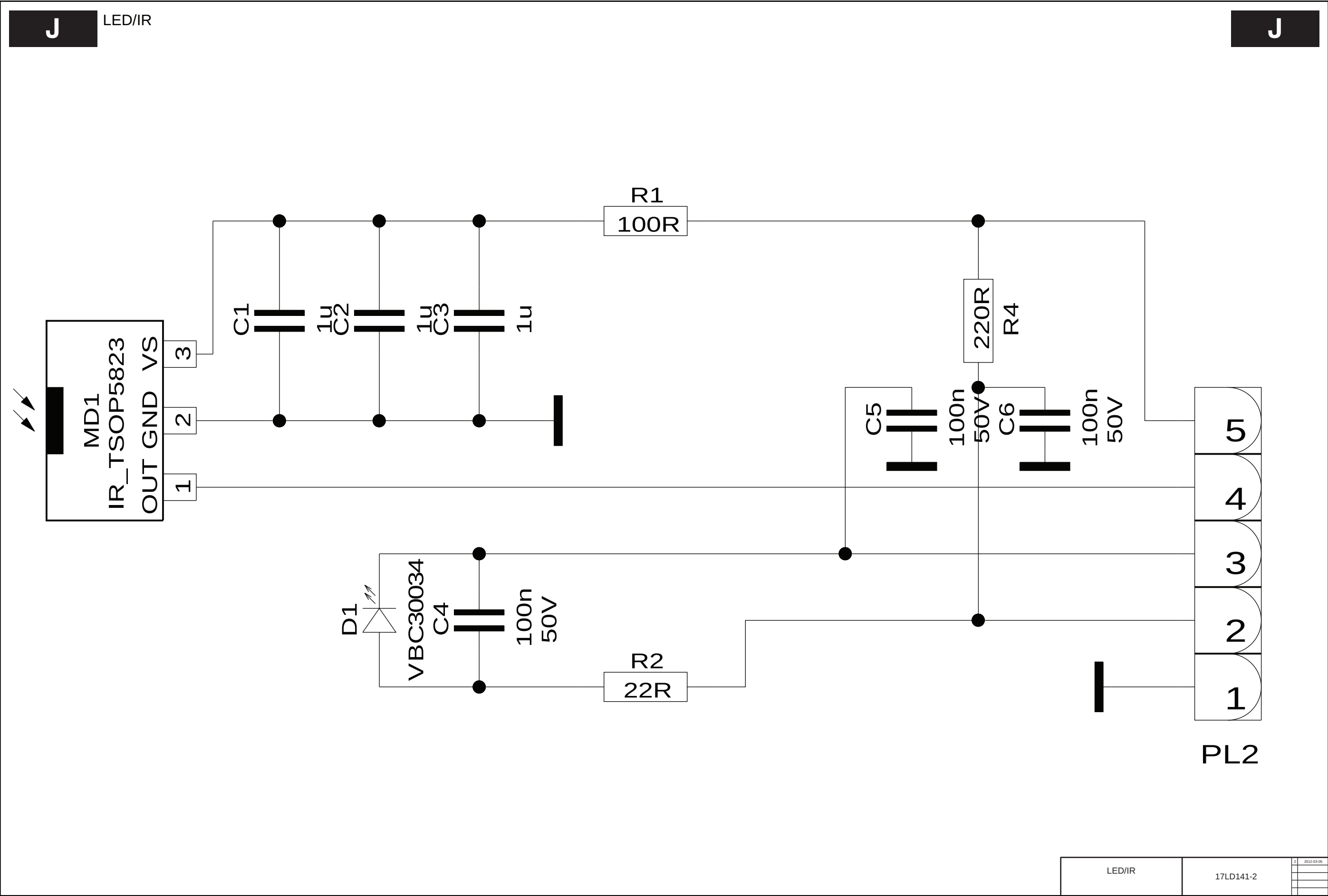
10-2-10 Layout top



10-2-11 Layout bottom



10.3 J 17LD141-2 IR/LED
10-3-1 IR/LED

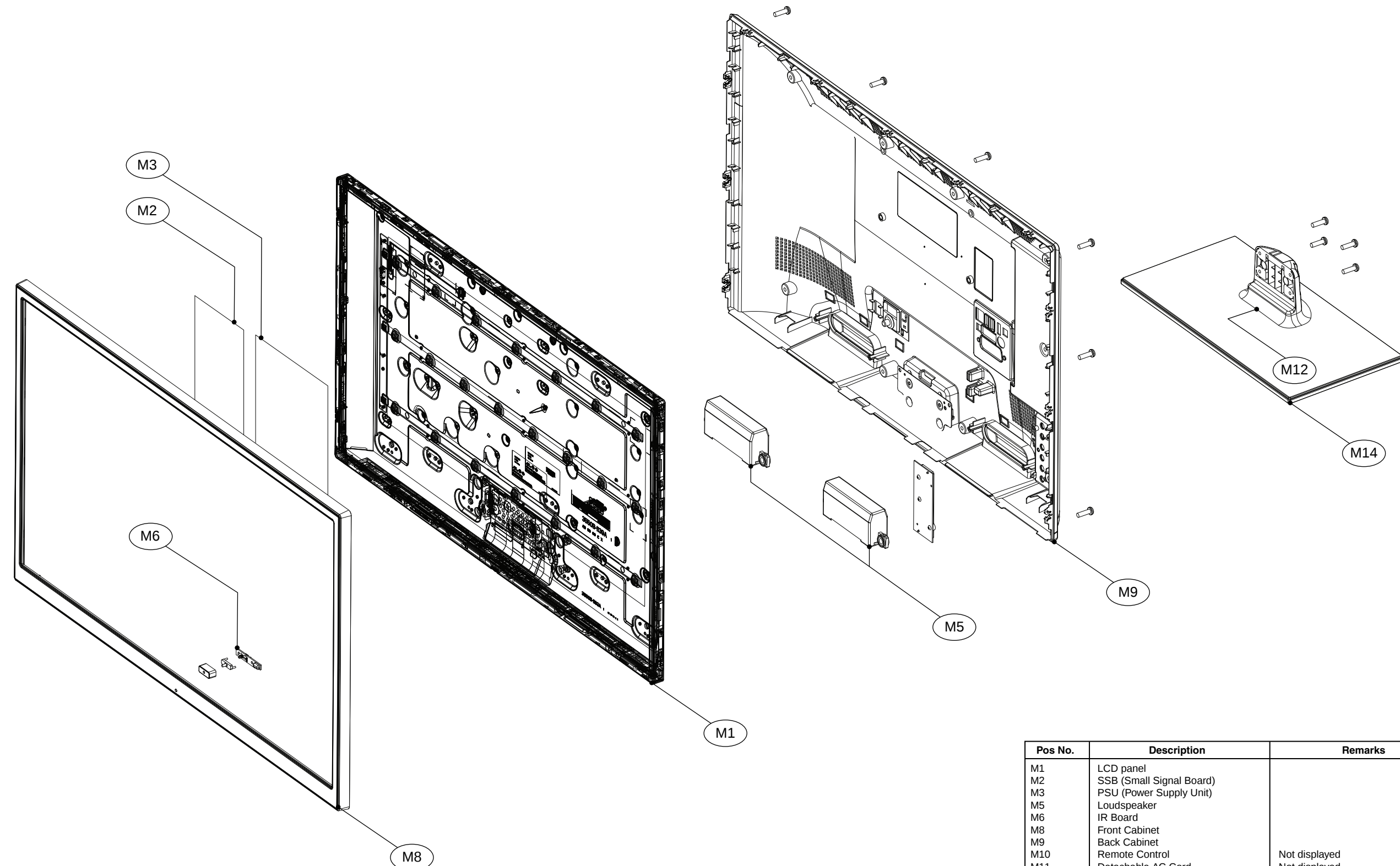


LED/IR	17LD141-2	2	2012-03-05

11. Styling Sheets

11.1 3000 series 32"

3000 series 32"



Pos No.	Description	Remarks
M1	LCD panel	
M2	SSB (Small Signal Board)	
M3	PSU (Power Supply Unit)	
M5	Loudspeaker	
M6	IR Board	
M8	Front Cabinet	
M9	Back Cabinet	
M10	Remote Control	Not displayed
M11	Detachable AC Cord	Not displayed
M12	Stand (Neck)	
M14	Stand (Base)	

FOR ELECTRICAL PARTS/ASSEMBLIES SEE WIRING DIAGRAM CHAPTER 9