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# Service Manual

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# 1. Revision List

## Manual xxxx xxx xxxx.0

- First release.

## Manual xxxx xxx xxxx.1

- Added models 47PFL3605H/xx to the manual
- **Chapter 2:** Added new models to [Table 2-1](#).
- **Chapter 4:** added wiring diagrams and mechanical information of 47" sets.
- **Chapter 4:** added information on returning a defect LCD panel.
- **Chapter 5:** Updated SAM contents.
- **Chapter 6:** Added table 6-2 White tone default settings and updated table 6-3 Panel codes overview.
- **Chapter 9:** Added 47" Wiring Diagram.
- **Chapter 11:** Added 47" Styling Sheet.

## Manual xxxx xxx xxxx.2

- Added models 32HFL3232D/10 and 32PFL3205H/12 to the manual
- **Chapter 2:** Added new models in [Table 2-1](#).
- **Chapter 5:** Updated SAM contents.
- **Chapter 6:** Add the panel codes in [Table 6-3](#).

# 2. Technical Specifications, 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).

## 2.2 Directions for Use

Directions for use can be downloaded from the following websites:

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

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

## 2.1 Technical Specifications

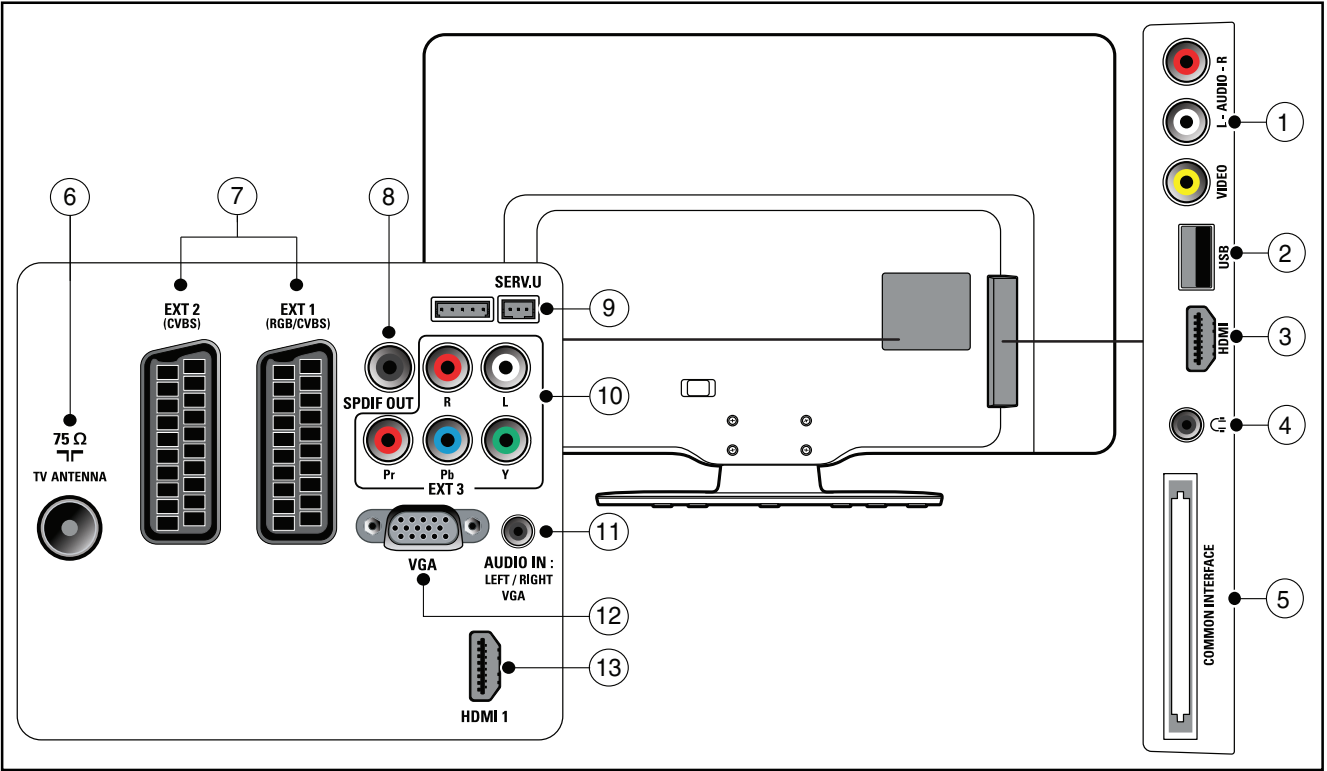
For on-line product support please use the links in. Here is product information available, as well as getting started, user manuals, frequently asked questions and software & drivers.

**Table 2-1 Described Model Numbers**

Model Number	Styling	Published in
<a href="#">32HFL3232D/10</a>	Dali	3122 785 18852
<a href="#">32PFL3205H/12</a>	Dali	3122 785 18850
<a href="#">32PFL3605H/12</a>	Dali	3122 785 18850
<a href="#">42PFL3605H/12</a>	Dali	3122 785 18850
<a href="#">47PFL3605H/12</a>	Dali	3122 785 18851
<a href="#">47PFL3605H/60</a>	Dali	3122 785 18851

**Note:** The given Model Numbers are subject to change.

## 2.3 Connections



18850\_001\_100107.eps  
100209

Figure 2-1 Connection overview

**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.

### 2.3.1 Side Connections

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

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



#### 2 - USB2.0

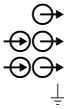


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090121

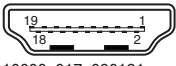
Figure 2-2 USB (type A)

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

Gnd



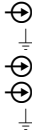
#### 3 - HDMI: Digital Video, Digital Audio - In



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090428

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 - n.c.
- 14 - n.c.
- 15 - DDC\_SCL DDC clock
- 16 - DDC\_SDA DDC data
- 17 - Ground Gnd
- 18 - +5V
- 19 - HPD Hot Plug Detect
- 20 - Ground Gnd



#### 4 - Head phone (Output)

Bk - Head phone 80 - 600 Ω / 10 mW



#### 5 - Common Interface

68p - See diagram B08 [SSB: CI card](#).



### 2.3.2 Rear Connections

#### 6 - TV ANTENNA - In

Signal input from an antenna, cable or satellite.

### 7 - EXT1 - 2: Video RGB/YC - In, CVBS - In/Out, Audio - In/Out

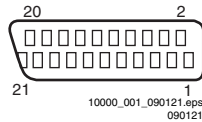


Figure 2-4 SCART connector

1	- Audio R	0.5 V <sub>RMS</sub> / 1 kΩ	⊕→
2	- Audio R	0.5 V <sub>RMS</sub> / 10 kΩ	⊕→
3	- Audio L	0.5 V <sub>RMS</sub> / 1 kΩ	⊕→
4	- Ground Audio	Gnd	⊕→
5	- Ground Blue	Gnd	⊕→
6	- Audio L	0.5 V <sub>RMS</sub> / 10 kΩ	⊕→
7	- Video Blue/C-out	0.7 V <sub>PP</sub> / 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 <sub>PP</sub> / 75 Ω	⊕→
12	- n.c.		⊕→
13	- Ground Red	Gnd	⊕→
14	- Ground P50	Gnd	⊕→
15	- Video Red/C	0.7 V <sub>PP</sub> / 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 <sub>PP</sub> / 75 Ω	⊕→
20	- Video CVBS/Y	1 V <sub>PP</sub> / 75 Ω	⊕→
21	- Shield	Gnd	⊕→

### 8 - Cinch: S/PDIF - Out

Bk	- Coaxial	0.4 - 0.6V <sub>PP</sub> / 75 ohm	⊕→
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### 9 - Service / UART

1	- Ground	Gnd	⊕→
2	- UART_TX	Transmit	⊕→

3	- UART_RX	Receive	⊕→
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### 10 - EXT3: Video YPbPr - In, Audio - In

Gn	- Video - Y	1 V <sub>PP</sub> / 75 W	⊕→
Bu	- Video - Pb	0.7 V <sub>PP</sub> / 75 W	⊕→
Rd	- Video - Pr	0.7 V <sub>PP</sub> / 75 W	⊕→

Wh	- Audio - L	0.5 V <sub>RMS</sub> / 10 kW	⊕→
Rd	- Audio - R	0.5 V <sub>RMS</sub> / 10 kW	⊕→

### 11 - Audio - In: Left / Right, VGA

Gn	- Audio L/R in	0.5 V <sub>RMS</sub> / 10 kW	⊕→
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### 12 - PC IN:VGA

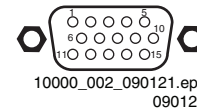


Figure 2-5 VGA connector

1	- Video Red	0.7 V <sub>PP</sub> / 75 Ω	⊕→
2	- Video Green	0.7 V <sub>PP</sub> / 75 Ω	⊕→
3	- Video Blue	0.7 V <sub>PP</sub> / 75 Ω	⊕→
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	- 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	⊕→

### 13 - HDMI 1: Digital Video, Digital Audio - In

See [3 - HDMI: Digital Video, Digital Audio - In.](#)

## 2.4 Chassis Overview

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

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

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

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



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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

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		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 form 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
PDP	Plasma Display Panel		Noise reduction
PFC	Power Factor Corrector (or Pre-conditioner)	SXGA	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
		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
		TXT	Teletext
POR	Power On Reset, signal to reset the uP	TXT-DW	Dual Window with Teletext
PSDL	Power Supply for Direct view LED backlight with 2D-dimming	UI	User Interface
PSL	Power Supply with integrated LED drivers	uP	Microprocessor
PSLS	Power Supply with integrated LED drivers with added Scanning functionality	UXGA	1600 × 1200 (4:3)
		V	V-sync to the module
PTC	Positive Temperature Coefficient, non-linear resistor	VESA	Video Electronics Standards Association
PWB	Printed Wiring Board (same as "PCB")	VGA	640 × 480 (4:3)
PWM	Pulse Width Modulation	VL	Variable Level out: processed audio output toward external amplifier
QRC	Quasi Resonant Converter	VSF	Vestigial Side Band; modulation method
QTNR	Quality Temporal Noise Reduction	WYSIWYR	What You See Is What You Record: record selection that follows main picture and sound
QVCP	Quality Video Composition Processor		
RAM	Random Access Memory	WXGA	1280 × 768 (15:9)
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.	XTAL	Quartz crystal
		XGA	1024 × 768 (4:3)
RC	Remote Control	Y	Luminance signal
RC5 / RC6	Signal protocol from the remote control receiver	Y/C	Luminance (Y) and Chrominance (C) signal
RESET	RESET signal	YPbPr	Component video. Luminance and scaled color difference signals (B-Y and R-Y)
ROM	Read Only Memory	YUV	Component video
RSDS	Reduced Swing Differential Signalling data interface		
R-TXT	Red Teletext		
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

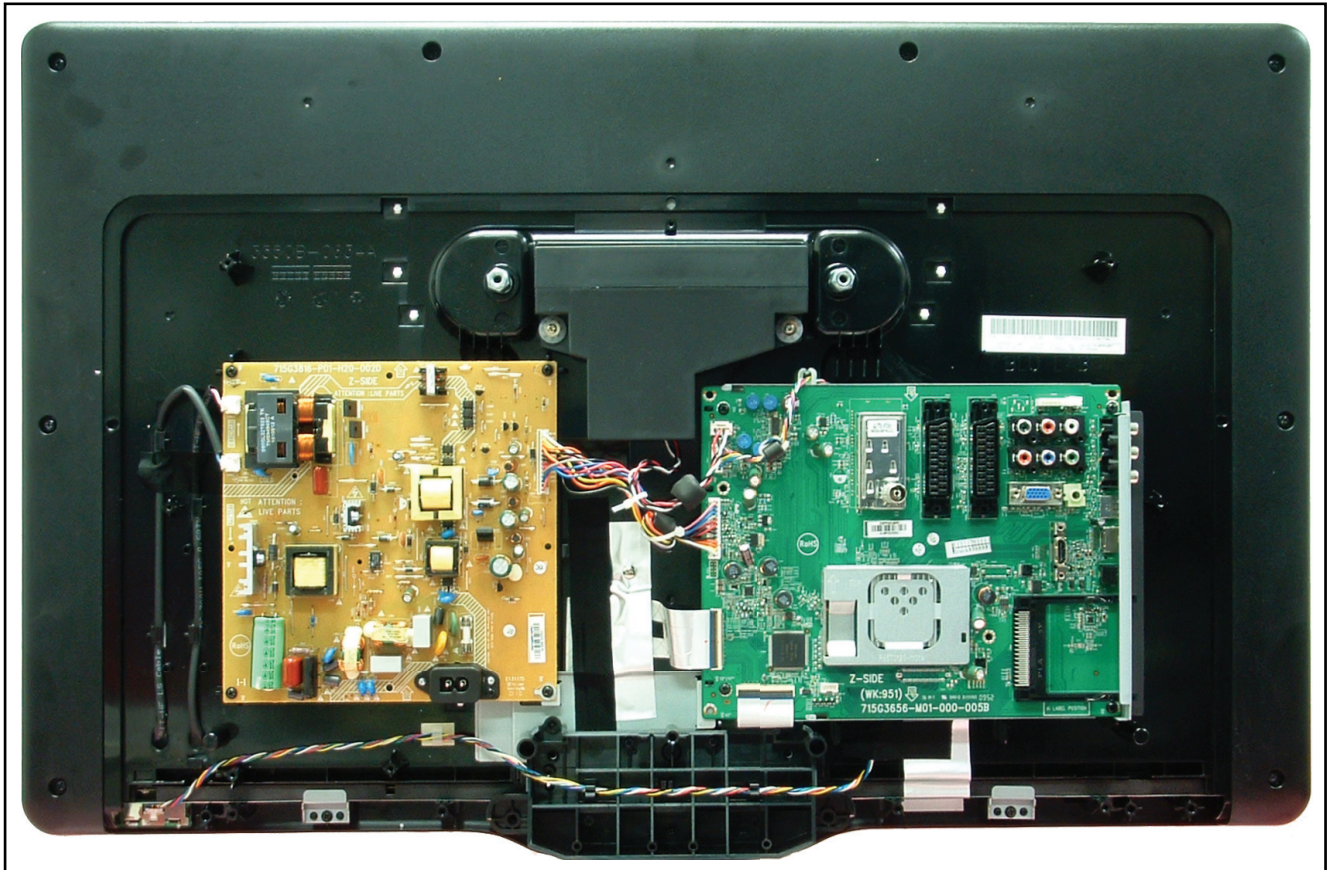
### Index of this chapter:

- [4.1 Cable Dressing](#)
- [4.2 Service Positions](#)
- [4.3 Assembly/Panel Removal 32"](#)
- [4.4 Assembly/Panel Removal 42"](#)
- [4.5 Returning a defect 32" or 42" LCD panel](#)
- [4.6 Assembly/Panel Removal 47"](#)
- [4.7 Set Re-assembly.](#)

### Notes:

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

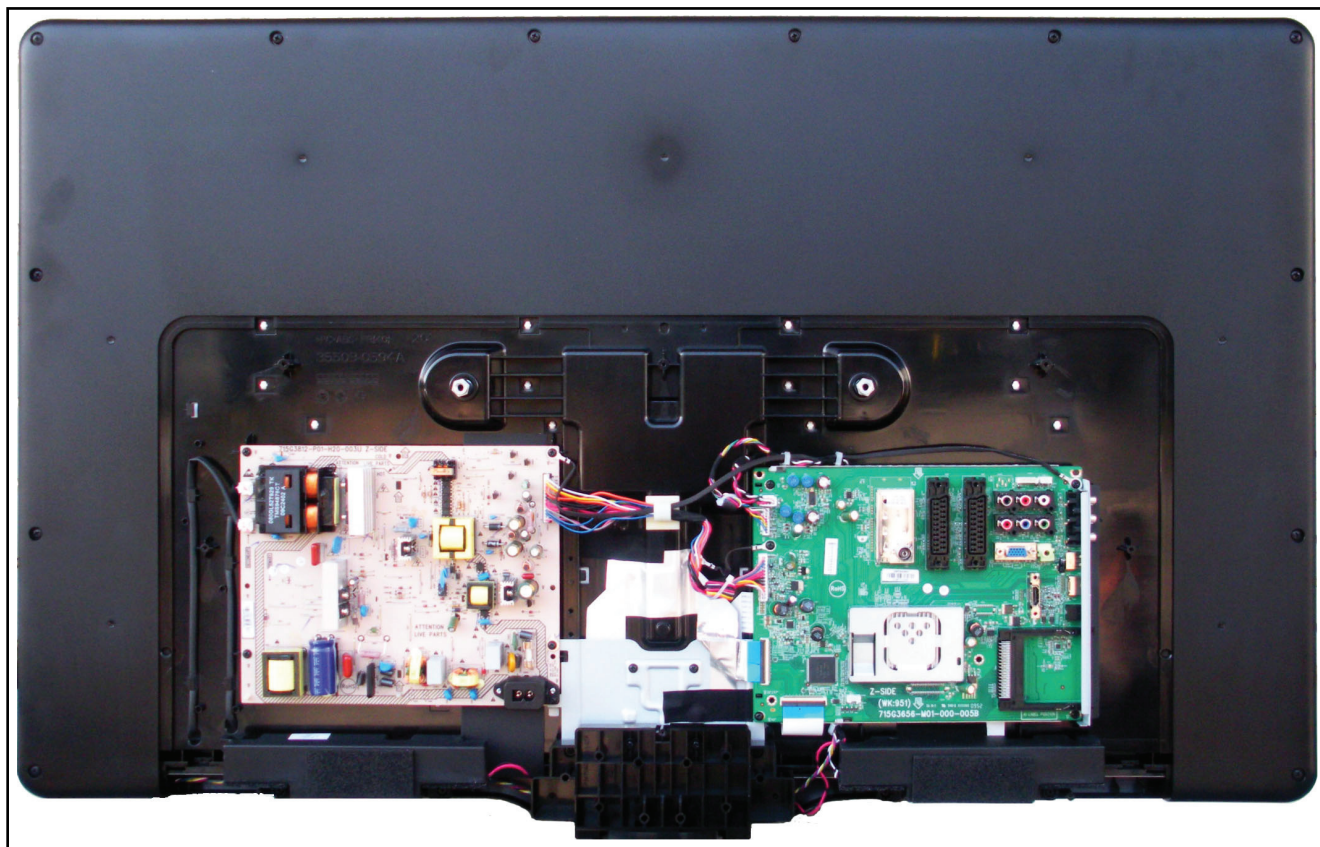
### 4.1 Cable Dressing



18850\_101\_100107.eps  
100202

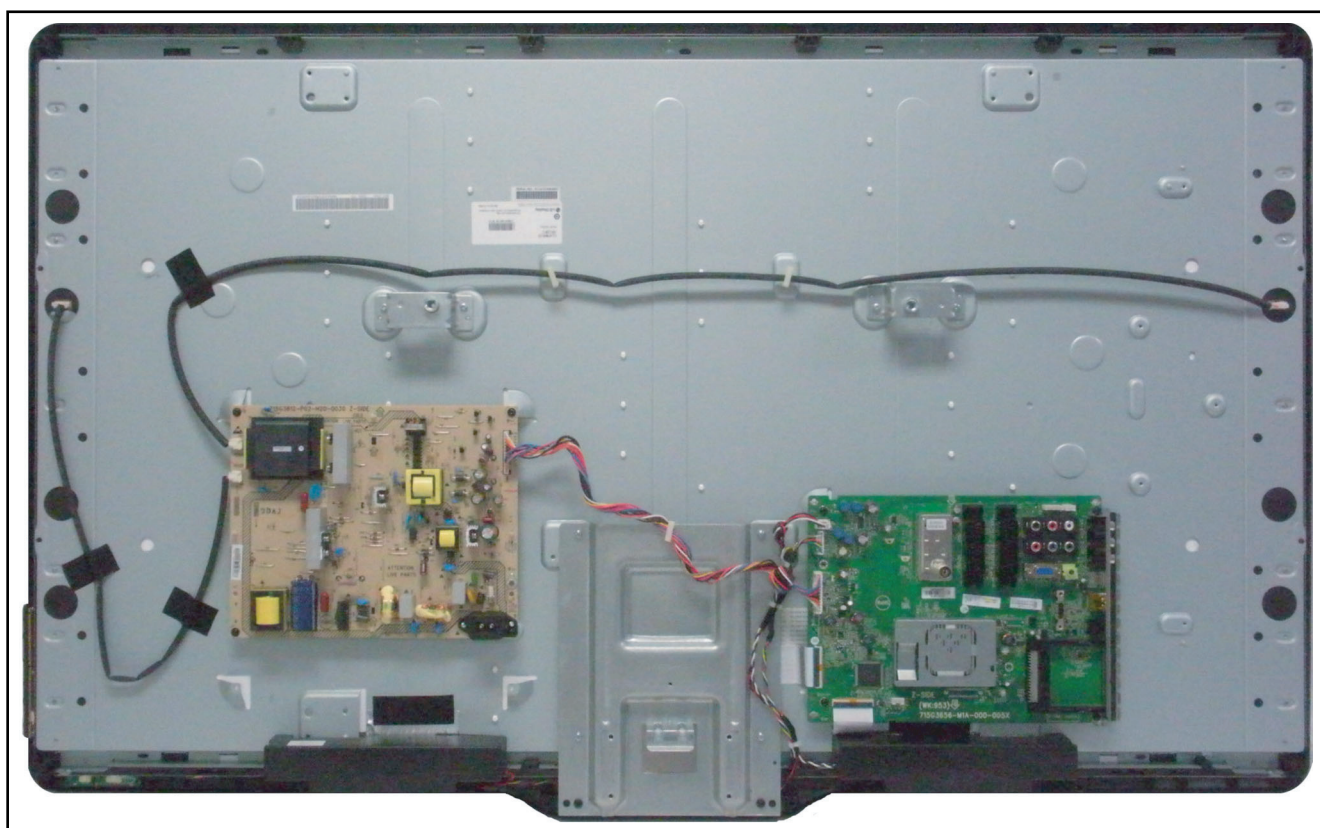
Figure 4-1 Cable dressing (32")





18850\_100\_100107.eps  
100209

Figure 4-2 Cable dressing (42")



18850\_103\_100505.eps  
100505

Figure 4-3 Cable dressing (47")

## 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.

## 4.3 Assembly/Panel Removal 32"

### 4.3.1 Rear Cover

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

1. Remove the fixation screws that secure the rear cover.
2. Lift the rear cover from the TV. Make sure that wires and flat foils are not damaged while lifting the rear cover from the set.

### 4.3.2 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.  
**Caution:** be careful, as these are very fragile connectors! Take the flat foils out of their connectors.
2. Unplug all other connectors.
3. Release the tape near the bottom side of the set from the LCD panel.
4. Remove all other fixation screws from the SSB.
5. Take out the SSB together with its shielding.
6. Remove the screws near the HDMI and L/R audio connectors.
7. The SSB can now be shifted sideways away from the side connector cover and take out of the shielding.  
**Caution:** be careful not to damage the thermal pad between the SSB and shielding.

### 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.

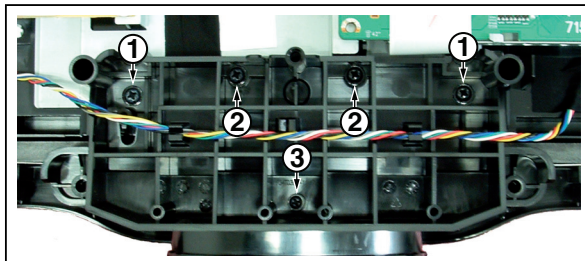
1. Unplug power connector from the SSB and remove the wire wrap from this cable.
  2. Unplug all other connectors from the PSU.
  3. Remove all fixation screws from the PSU.
  4. The PSU can now be taken out of the set.
- When defective, replace the whole unit.

#### 4.3.4 Stand removal

See [Figure 4-4](#).

**Caution:** it is mandatory to remount all different screws at their original position during re-assembly. Be sure to put the set in the Service Position.

1. Remove the SSB as described earlier up till step 5 and including step 5.
2. Remove the fixation screws [1], (M3).
3. Remove the fixation screws [2], (M4).
4. Remove the fixation screws [3], (Parker).
5. Take out the stand.



18850\_102\_100203.eps  
100203

Figure 4-4 Stand (32")

#### 4.3.5 Speakers

1. Unplug the speaker connector from the SSB and remove the wire wrap from this cable.
2. Remove the fixation screws from the speaker.
3. Take the speaker out.

When defective, replace the whole unit.

#### 4.3.6 Stand support plate

1. Release the IR/LED/Keyboard Control cable from its clamps and put it aside.
2. Remove the SSB as described earlier.
3. Remove the PSU as described earlier.
4. Remove the Stand as described earlier.
5. Release the tape and take out of the set.

#### 4.3.7 IR/LED Board

1. Release the IR/LED/Keyboard Control cable from its clamps.
2. Remove the fixation screw in the middle-bottom of the stand that secures the stand with the bezel, see [Figure 4-4](#) [3].
3. Remove the clips at the bottom that secure the LCD panel with the bezel.
4. Remove the fixation screws that secure the LCD panel with the bezel.
5. Remove the bezel from the set.
6. Unplug the connectors from the IR/LED board.
7. Release the clips that hold the board and take it from the bezel.

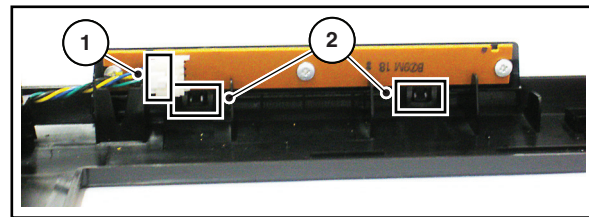
When defective, replace the whole unit.

#### 4.3.8 Keyboard Control Panel

1. Release the IR/LED/Keyboard Control cable from its clamps.
2. Remove the fixation screw in the middle-bottom of the stand that secures the stand with the bezel, see [Figure 4-4](#) [3].
3. Remove the clips at the bottom that secure the LCD panel with the bezel.
4. Remove the fixation screws that secure the LCD panel with the bezel.

5. Remove the bezel from the set.
6. Unplug the connectors from the IR/LED board.
7. See [Figure 4-5](#), unplug the connector [1] from the Keyboard Control Panel.
8. Release the clips that secure the Keyboard Control Panel [2].

When defective, replace the whole unit.



18850\_104\_100203.eps  
100203

Figure 4-5 Keyboard Control Panel (32")

#### 4.3.9 LCD Panel

1. Remove the SSB as described earlier.
2. Remove the PSU as described earlier.
3. Remove the speaker as described earlier.
4. Remove the stand as described earlier.
5. Remove the Stand support as described earlier.
6. Remove the clips at the bottom that secure the LCD panel with the bezel.
7. Remove the fixation screws that secure the LCD panel with the bezel.
8. Lift the LCD Panel from the bezel.

When defective, replace the whole unit.

### 4.4 Assembly/Panel Removal 42"

#### 4.4.1 Rear Cover

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

1. Remove the fixation screws that secure the rear cover.
2. Lift the rear cover from the TV. Make sure that wires and flat foils are not damaged while lifting the rear cover from the set.

#### 4.4.2 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.  
**Caution:** be careful, as these are very fragile connectors! Take the flat foils out of their connectors.
2. Unplug all other connectors.
3. Release the tape near the tuner from the LCD panel.
4. Release the tape near the processor shielding from the LCD panel.
5. Remove the fixation screw that connects the ground cable.
6. Remove all other fixation screws from the SSB.
7. Take out the SSB together with its shielding.
8. Remove the screws near the HDMI and L/R audio connectors.
9. The SSB can now be shifted sideways away from the side connector cover and take out of the shielding.

**Caution:** be careful not to damage the thermal pad between the SSB and shielding.



#### 4.4.3 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.

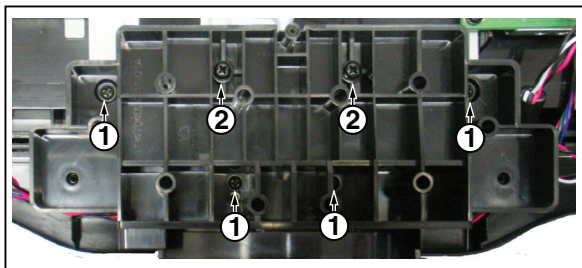
1. Unplug power connector from the SSB and take the cable out of the cable clamp.
  2. Unplug all other connectors from the PSU.
  3. Remove the fixation screw that connects the ground cable.
  4. Remove all fixation screws from the PSU.
  5. The PSU can now be taken out of the set.
- When defective, replace the whole unit.

#### 4.4.4 Stand removal

See [Figure 4-4](#).

**Caution:** it is mandatory to remount all different screws at their original position during re-assembly. Be sure to put the set in the Service Position.

1. Remove the fixation screws [1], (Parker).
2. Remove the fixation screws [2], (M4).
3. Take out the stand.



18850\_105\_100203.eps  
100203

Figure 4-6 Stand (42")

#### 4.4.5 Speakers

1. Unplug the speaker connector from the SSB.
  2. Remove the stand, as described earlier.
  3. Take the speakers out together with their casing.
- When defective, replace the whole unit.

#### 4.4.6 Stand support plate

1. Remove the stand as described earlier.
2. Remove the SSB as described earlier.
3. Remove the PSU as described earlier.
4. Remove all fixation screws from the stand support plate and take it out of the set.

#### 4.4.7 IR/LED Board

1. Remove the stand as described earlier.
2. Remove the speakers as described earlier.
3. Remove the SSB as described earlier.
4. Remove the clips at the bottom that secure the LCD panel with the bezel.
5. Remove the fixation screws that secure the LCD panel with the bezel.
6. Lift the LCD Panel from the bezel.
7. Unplug the connectors from the IR/LED board.
8. Release the clips that hold the board and take it from the bezel.

When defective, replace the whole unit.

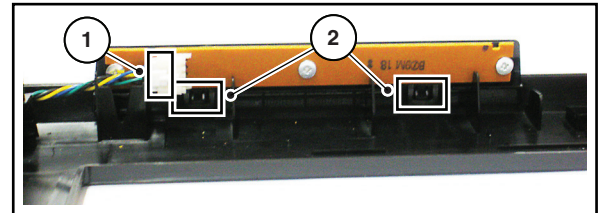
#### 4.4.8 Keyboard Control Panel

See [Figure 4-5](#).

1. Remove the stand as described earlier.
2. Remove the speakers as described earlier.

3. Remove the SSB as described earlier.
4. Remove the clips that secure the LCD panel with the bezel.
5. Remove the fixation screws that secure the LCD panel with the bezel.
6. Lift the LCD Panel from the bezel.
7. Unplug the connector [1] from the Keyboard Control Panel.
8. Release the clips that secure the Keyboard Control Panel [2].

When defective, replace the whole unit.



18850\_104\_100203.eps  
100203

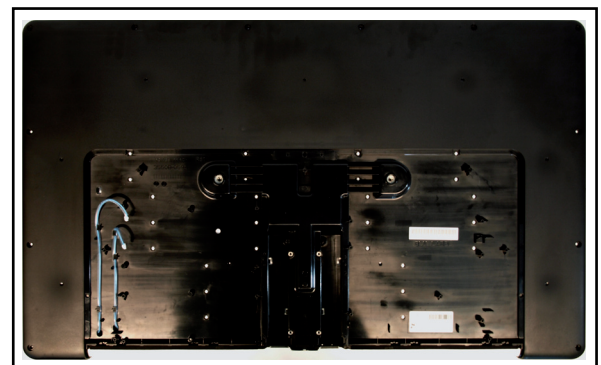
Figure 4-7 Keyboard Control Panel (42")

#### 4.4.9 LCD Panel

1. Remove the stand as described earlier.
  2. Remove the speakers as described earlier.
  3. Remove the SSB as described earlier.
  4. Remove the PSU as described earlier.
  5. Remove the Stand support as described earlier.
  6. Remove the clips that secure the LCD panel with the bezel.
  7. Remove the fixation screws that secure the LCD panel with the bezel.
  8. Lift the LCD Panel from the bezel.
- When defective, replace the whole unit.

### 4.5 Returning a defect 32" or 42" LCD panel

To return a defect LCD panel to the factory, all boards, cabling, mechanical supports, shieldings, clamps, spacers, the bezel and tapes have to be removed from the panel, see [Figure 4-8](#). Be sure to carefully pack the area's of the panel that are visible during normal use.



18931\_100\_100510.eps  
100510

Figure 4-8 LCD panel

### 4.6 Assembly/Panel Removal 47"

#### 4.6.1 Stand removal

**Caution:** it is mandatory to remount all different screws at their original position during re-assembly. Be sure to put the set in the Service Position.

1. Remove the fixation screws that secure the stand with the rear cover.
2. Take out the stand from the rear cover.

#### 4.6.2 Rear Cover

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

1. Remove the fixation screws that secure the rear cover.
2. Lift the rear cover from the TV. Make sure that wires and flat foils are not damaged while lifting the rear cover from the set.

#### 4.6.3 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.  
**Caution:** be careful, as these are very fragile connectors! Take the flat foils out of their connectors.
2. Unplug all other connectors.
3. Remove all other fixation screws from the SSB.
4. Take out the SSB together with side I/O BKT.
5. Remove the screws near the HDMI and L/R audio connectors.

#### 4.6.4 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. Unplug power connector from the SSB and take the cable out of the cable clamp.
  2. Unplug all other connectors from the PSU.
  3. Remove all fixation screws from the PSU.
  4. The PSU can now be taken out of the set.
- When defective, replace the whole unit.

#### 4.6.5 Stand support plate

1. Remove all fixation screws from the stand support plate and take it out of the set.

#### 4.6.6 Speakers

1. Unplug the speaker connector from the SSB.
  2. Remove the stand support plate as described earlier.
  3. Take the speakers out together with their casing.
- When defective, replace the whole unit.

#### 4.6.7 IR/LED Board

1. Release the clips that hold the board and take it out from the bezel.
  2. Unplug the connectors from the IR/LED board.
- When defective, replace the whole unit.

#### 4.6.8 Keyboard Control Panel

See [Figure 4-5](#).

3. Pull out the keyboard control from the panel.
  4. Unplug the cable from the keyboard control.
- When defective, replace the whole unit.

#### 4.6.9 LCD Panel

1. Remove the stand as described earlier.
  2. Remove the stand support plate as described earlier.
  3. Remove the speakers as described earlier.
  4. Remove the SSB as described earlier.
  5. Remove the PSU as described earlier.
  6. Remove the clips that secure the LCD panel with the bezel.
  7. Lift the LCD Panel from the bezel.
- When defective, replace the whole unit.

### 4.7 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](#) and [Figure 4-2](#).
- 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 Service Modes](#)

[5.2 Service Tools](#)

[5.3 Software Upgrading](#)

[5.4 Error Codes](#)

[5.5 Fault Finding and Repair Tips](#)

### 5.1 Service Modes

The Customer Service Mode (CSM) is used for communication between the call centre and the customer, while the Service Alignment Mode (SAM) offers several features for the service technician.

This chassis also offers the option of using ComPair, a hardware interface between a computer and the TV chassis. It offers the abilities of structured troubleshooting, error code reading, and software version read-out for all chassis.

#### 5.1.1 Customer Service Mode (CSM)

##### *Purpose*

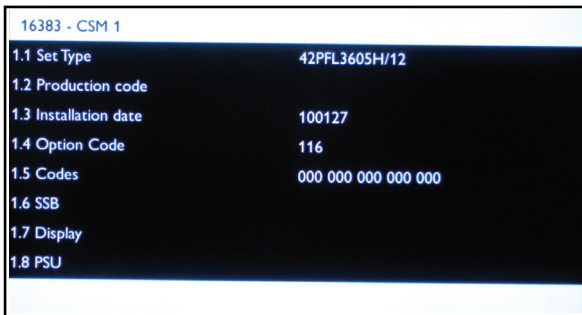
The Customer Service Mode shows error codes and information on the TV's operation settings. The call centre can instruct the customer (by telephone) to enter CSM in order to identify the status of the set. This helps the call centre to diagnose problems and failures in the TV set before making a service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

The CSM is a read-only mode; therefore, modifications are not possible in this mode.

##### *How to Activate CSM*

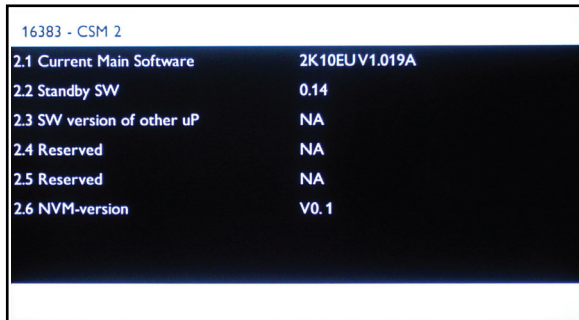
Key in the code "123654" via the standard RC transmitter.

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



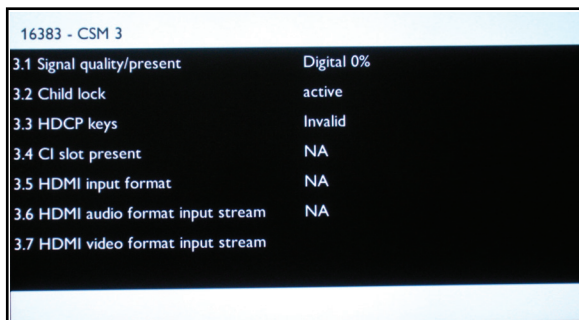
16383 - CSM 1	
1.1 Set Type	42PFL3605H/12
1.2 Production code	
1.3 Installation date	100127
1.4 Option Code	116
1.5 Codes	000 000 000 000 000
1.6 SSB	
1.7 Display	
1.8 PSU	

Figure 5-1 CSM Menu 1



16383 - CSM 2	
2.1 Current Main Software	2K10EUV1.019A
2.2 Standby SW	0.14
2.3 SW version of other uP	NA
2.4 Reserved	NA
2.5 Reserved	NA
2.6 NVM-version	V0.1

Figure 5-2 CSM Menu 2



16383 - CSM 3	
3.1 Signal quality/present	Digital 0%
3.2 Child lock	active
3.3 HDCP keys	Invalid
3.4 CI slot present	NA
3.5 HDMI input format	NA
3.6 HDMI audio format input stream	NA
3.7 HDMI video format input stream	

Figure 5-3 CSM Menu 3

##### *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.

##### *General*

- **1.1 Set Type** NVM read/write (max. 16 characters).
- **1.2 Production code** NVM read/write (max. 16 characters).
- **1.3 Installation date** Date the software was installed.
- **1.4 Option Code** Store in NVM (set feature grouping as option) panel code.
- **1.5 Codes** Error code Layer 2. Store in NVM. 10 error buffers: 000 = No problem, 011 = I<sup>2</sup>C bus error, 012 = tuner error, 013 = panel.
- **1.6 SSB** 12NC NVM read/write (12 characters).
- **1.7 Display** 12NC NVM read/write (12 characters).
- **1.8 PSU** 12NC NVM read/write (12 characters).
- **2.1 Current Main SW** Detects and displays software version.
- **2.2 Standby SW** Detects and displays software version.
- **2.3 SW version of other  $\mu$ P** Detects and displays software version.
- **2.4 Reserved** Not applicable.
- **2.5 Reserved** Not applicable.
- **2.6 NVM version** Detects and displays software version.
- **3.1 Signal Quality/Present** analog/digital signal strength.
- **3.2 Child lock** Detects and displays.
- **3.3 HDCP keys** Detects and displays.
- **3.4 CI slot present** Detects and displays.
- **3.5 HDMI input format** per Supported format. e.g. 576i 50 Hz, 576p 50 Hz, 720p 50 Hz, 1080i 50 Hz, 1080p 50 Hz.
- **3.6 HDMI audio format input stream** Per supported format e.g. Dolby TrueHD, DTS-HD Master Audio, MPCM.

- **3.7 HDMI video format input stream** Per Supported format. e.g. 576i 50 Hz, 576p 50 Hz, 720p 50 Hz, 1080i 50 Hz, 1080p 50 Hz

#### How to Exit CSM

Press "MENU" on the RC-transmitter.

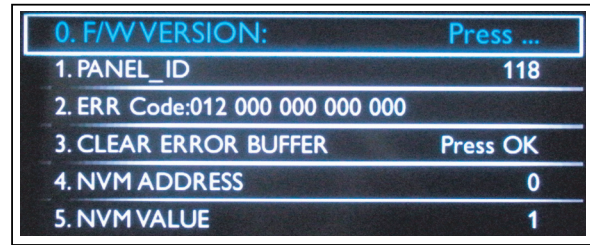
### 5.1.2 Service Alignment Mode (SAM)

#### How to enter

To enter the factory mode, use the following method:

- Press the following key sequence on the remote control transmitter: "062596" directly followed by the "INFO" button.

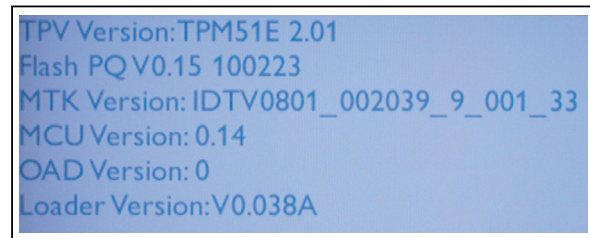
After entering the factory mode, the following screen is visible on the top and right of the panel.



18850\_203\_100202.eps  
100506

Figure 5-4 Example of SAM

Press "OK" to check the Version information of the software when you select the "F/W Version".



18850\_212\_100506.eps  
100512

Figure 5-5 Software Version information in SAM

Table 5-1 Contents of SAM

Number	Action Items	Range	Default Value			Description
			32"	42"	47"	
0	F/W Version		Press OK	Press OK	Press OK	Version description
1	Panel_ID		117	116	118	panel ID identify
2	Err Code:000 000 000 000 000		-	-	-	Show the latest 5 error code status
3	Clear Error Buffer		Press OK	Press OK	Press OK	Reset CSM ERROR Code to 0
4	NVM Address		0	0	0	The address in the NVM
5	NVM Value		1	1	1	The value in the NVM
6	NVM Store		Press OK	Press OK	Press OK	Store in the NVM
7	NVM Copy TV to USB		Press OK	Press OK	Press OK	Use this to copy the NVM data from the TV to the USB
8	NVM Read USB to TV		Press OK	Press OK	Press OK	Use this to copy the NVM data from the USB to the TV
9	CLR_Temp_R	0 - 255	127	127	128	Back-End Scaler R G B Gain NVM has for YPbPr four settings: NORMAL, WARM, COOL, CUSTOMER. Other source use offset with hardcoding.
10	CLR_Temp_G	0 - 255	121	123	128	
11	CLR_Temp_B	0 - 255	121	119	116	
12	Auto_Color		Press OK	Press OK	Press OK	PC: any pattern has black and white YPbPr: SMPTE bar (colour bar), any timing.
13	ADC_Gain_R	0 - 255	0	86	0	Analogue to Digital Converter Gain for Red, AutoColor affects this and it value is depends on the input
14	ADC_Gain_G	0 - 255	0	86	0	Analogue to Digital Converter Gain for Green, AutoColor affects this and it value is depends on the input
15	ADC_Gain_B	0 - 255	0	87	0	Analogue to Digital Converter Gain for Blue, AutoColor affects this and it value is depends on the input
16	ADC_Offset_R	0 - 255	128	113	128	Analogue to Digital Converter Offset for Red, AutoColor affects this and it value is depends on the input
17	ADC_Offset_G	0 - 255	128	109	128	Analogue to Digital Converter Offset for Green, AutoColor affects this and it value is depends on the input
18	ADC_Offset_B	0 - 255	128	100	128	Analogue to Digital Converter Offset for Blue, AutoColor affects this and it value is depends on the input
19	Virgin_Mode		Off	Off	Off	Reset the set to manufacturer's mode
20	Gamma_Table		On	On	On	use gamma table or not
21	E-Fuse		On	On	On	use efuse as default ADC value or not
22	Ageing Mode		Off	Off	Off	turn on ageing mode
23	Reset_PBS_PWD		Press OK	Press OK	Press OK	Clear EEP_OFFSET_BDS_PCODE_1_4, EEP_OFFSET_BDS_PCODE_2_4, EEP_OFFSET_BDS_PCODE_3_4, EEP_OFFSET_BDS_PCODE_4_4
24	V-COM		Press OK	Press OK	Press OK	This starts V-COM
25	Video_PWM_Medium	0 - 255	128	128	128	PWM value at contrast 50%
26	Video_PWM_Minimum	0 - 255	200	200	200	Minimum PWM value
27	Video_PWM_Maximum	0 - 255	0	0	0	Maximum PWM value
28	Video_PWM_Ratio_Top	0 - 100	60	60	60	PWM value at Best Power
29	Video_PWM_Ratio_Bottom	0 - 100	20	20	20	PWM value at Best Picture
30	Video_PWM_Ratio_STD	0 - 100	78	78	78	PWM value at standard
31	YPBPR_PHASE	0 - 255	InValid	InValid	InValid	480i, 480p, 576i, 576p, 720p 50 Hz, 720p 60 Hz, 1080i 25 Hz, 1080i 30 Hz, 1080p 24 Hz, 1080p 50 Hz, 1080p 60 Hz
32	AUD_GAIN_LINEIN	0 - 36	23	23	23	Audio gain by different sources

Number	Action Items	Range	Default Value			Description
			32"	42"	47"	
33	AUD_GAIN_HDMI	0 - 36	22	22	22	Audio gain for HDMI inputs
34	AUD_GAIN_ATV	0 - 36	23	23	23	Audio gain for analogue TV signals
35	AUD_GAIN_DTV	0 - 36	22	22	22	Audio gain for digital TV signal
36	AUD_GAIN_USB	0 - 36	22	22	22	Audio gain for the USB input
37	AUD_LIPSYNC_SPK	-272 - +272	250	250	100	Audio delay to the speaker, "+" is delay, "-" is ahead. NVM value = Delay (ms)/0.147
38	AUD_LIPSYNC_HP	-272 - +272	250	250	100	Audio delay to the head-phone, "+" is delay, "-" is ahead. NVM value = Delay (ms)/0.147
39	AUD_LIPSYNC_SPDIF	-272 - +272	250	250	100	Audio delay to the S/P-DIF output, "+" is delay, "-" is ahead. NVM value = Delay (ms)/0.147
40	Tuner_ID		95	95	95	Tuner Identification, 94: NXP 95: LG
41	OPT AV2 Scart2	0, 2	2	2	2	0: not available, 2: CVBS + YC
42	OPT HDMI2	0/1	1	1	1	On/Off
43	OPT Reset Option	0/1	Press OK	Press OK	Press OK	after reset, should restart the set immediately
44	Esticker NVM 1	0 - 61, 255	32	32	32	0-61: Icon number. 255: no icon
45	Esticker NVM 2	0 - 61, 255	40	40	40	0-61: Icon number. 255: no icon
46	Esticker NVM 3	0 - 61, 255	25	25	25	0-61: Icon number. 255: no icon
47	Esticker NVM 4	0 - 61, 255	35	35	35	0-61: Icon number. 255: no icon
48	Esticker NVM 5	0 - 61, 255	45	45	45	0-61: Icon number. 255: no icon
49	Esticker NVM 6	0 - 61, 255	65	65	65	0-61: Icon number. 255: no icon
50	Esticker NVM 7	0 - 61, 255	2	2	2	0-61: Icon number. 255: no icon
51	Esticker NVM 8	0 - 61, 255	48	48	48	0-61: Icon number. 255: no icon
52	Esticker NVM 9	0 - 61, 255	58	58	58	0-61: Icon number. 255: no icon
53	Esticker NVM 10	0 - 61, 255	64	64	64	0-61: Icon number. 255: no icon
54	Esticker NVM 11	0 - 61, 255	76	76	76	0-61: Icon number. 255: no icon
55	Esticker NVM 12	0 - 61, 255	77	77	77	0-61: Icon number. 255: no icon
56	Esticker NVM 13	0 - 61, 255	71	71	71	0-61: Icon number. 255: no icon
57	Esticker NVM 14	0 - 61, 255	74	74	74	0-61: Icon number. 255: no icon
58	Esticker NVM 15	0 - 61, 255	78	78	78	0-61: Icon number. 255: no icon
59	Esticker NVM 16	0 - 61, 255	70	70	70	0-61: Icon number. 255: no icon
60	Esticker NVM 17	0 - 61, 255	72	72	72	0-61: Icon number. 255: no icon
61	Esticker NVM 18	0 - 61, 255	255	255	255	0-61: Icon number. 255: no icon
62	Esticker NVM 19	0 - 61, 255	255	255	255	0-61: Icon number. 255: no icon
63	Esticker NVM 20	0 - 61, 255	255	255	255	0-61: Icon number. 255: no icon
64	Esticker Reset		Press OK	Press OK	Press OK	Executing this resets the e-sticker
65	Exit_Factory		Press OK	Press OK	Press OK	Exit factory mode

### How to Navigate

With the up/down cursor keys can be used to navigate through the menu, while with the Left/Right cursor the values can be changed.

### How to EXIT

Choose "EXIT", and press the "OK" button. Turn "Off" the TV via the side control key and then turn "On" the TV again.

**Notes:** (only applicable to xxHFL3232D/10)

- When the Hotel mode is active, the service modes CSM, SDM, SAM and ComPair are automatically disabled (this is to prevent hotel guests entering Philips service modes).
- In order to use the service modes and ComPair, Hotel mode must be disabled.
- To enable/disable the hotel mode, the hotel setup remote (green remote) is needed.

### Specifications

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

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

### How to Connect

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

## 5.2 Service Tools

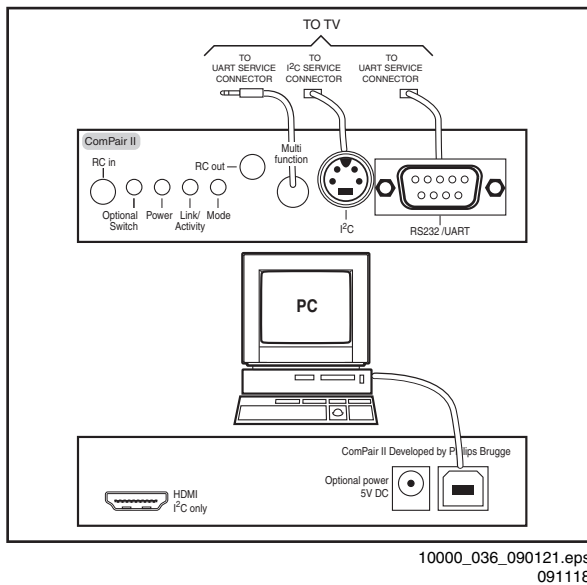
### 5.2.1 ComPair

#### Introduction

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

- ComPair helps to quickly get an understanding on how to repair the chassis in a short and effective way.
- ComPair allows very detailed diagnostics and is therefore capable of accurately indicating problem areas. No knowledge on I<sup>2</sup>C or UART commands is necessary, because ComPair takes care of this.
- 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.
- ComPair features TV software upgrade possibilities.





**Figure 5-6 ComPair II interface connection**

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

#### **How to Order**

ComPair II order codes:

- ComPair II interface: 3122 785 90630.
- Programming software can be downloaded from the Philips Service portal.
- ComPair UART interface cable for TPM5.1x xx. 3122 785 90630.

**Note:** While having problems, contact the local support desk.

## 5.3 Software Upgrading

### 5.3.1 Introduction

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

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

#### *Preparing a portable memory for software upgrade*

You require the following:

1. A personal computer connected to the Internet.
2. An archive utility that supports the ZIP-format (e.g. WinZip 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.

### 5.3.2 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 on your remote control.
2. Select "Setup" and press "OK", then select [Software update] > [Current software].

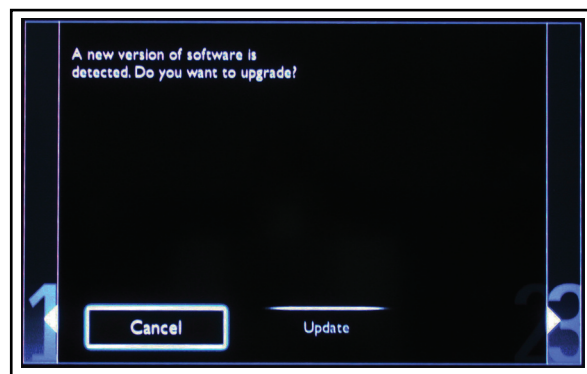
If the current software version of your TV is the same as the latest update file found on <http://www.philips.com/support>, it is not necessary to update the TV software.

### 5.3.3 Download the latest software

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

### 5.3.4 Update the TV software

1. Insert the USB flash drive that contains the software update file.
2. Then a window jumps out as [Figure 5-7](#).  
**Note:** If the USB flash drive is not detected after power up, disconnect it and re-insert it.
3. Select [Update] and press OK.
4. To proceed, In next menu select [Start] and press OK to start software updates. See [Figure 5-8](#).
5. Upgrading will now begins and the status of the updating progress will be displayed.
6. When the TV software is updated. Remove your USB flash drive, then select [Restart] and press OK to restart the TV. See [Figure 5-9](#).



18850\_204\_100204.eps  
100204

Figure 5-7 Update the TV software 1



18850\_205\_100204.eps  
100204

Figure 5-8 Update the TV software 2



18850\_206\_100204.eps  
100204

Figure 5-9 Update the TV software 3

#### **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 power comes back.
- If an error occurs during the update retry the procedure or contact your dealer.
- We do not recommend downgrading to an older version.
- Once the upgrade is finished, use your PC to remove the TV software from your USB portable memory.

## 5.4 Error Codes

The error code buffer contains all errors detected since the last time the buffer was erased. The buffer is written from left to right. When an error occurs that is not yet in the error code buffer, it is displayed at the left side and all other errors shift one position to the right.

Basically there are three kinds of error codes:

Error Code	Event
000	No problem
011	I <sup>2</sup> C bus error
012	Tuner error
013	LCD panel

## 5.5 Fault Finding and Repair Tips

### 5.5.1 Speakers

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!

### 5.5.2 Tuner

Attention: In case the tuner is replaced, always check the tuner options.



## 6. Alignments

### Index of this chapter:

- [6.1 General Alignment Conditions](#)
- [6.2 Hardware Alignments](#)
- [6.3 YPbPr Mode display adjustment](#)
- [6.4 PC mode display adjustment](#)
- [6.5 LCD Panel Flicker Adjustment](#)
- [6.6 Option Settings](#)
- [6.7 Serial Number Definition](#)

**Note:** The Service Alignment Mode (SAM) are described in chapter [5. Service Modes, Error Codes, and Fault Finding](#). 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: 195 - 264 V<sub>AC</sub>, 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.
- **Caution:** It is not allowed to use heatsinks as ground.
- Test probe: R<sub>i</sub> > 10 MΩ, C<sub>i</sub> < 20 pF.
- Use an isolated trimmer/screwdriver to perform alignments.

### 6.2 Hardware Alignments

Not applicable.

### 6.3 YPbPr Mode display adjustment

#### 6.3.1 General set-up

#### Equipment Requirements:

Minolta CA-110 or Equivalent Colour analyser. Quantum Data Pattern Generator 802G, 802BT or equivalent instrument.

#### Input requirements:

Input Signal Type: YPbPr signal

- 1080i mode, TVBar100 pattern by 802G or 802BT.
- Select Picture mode to User mode and check the x, y data.

#### Input Signal Strength:

1 V<sub>pp</sub> for Y signal; 700 mV<sub>pp</sub> for Pb & Pr signal

#### Input Injection Point:

YPbPr (RAC jack)

#### 6.3.2 Alignment method

Quantum Data Pattern Generator 802G or 802BT. Apply 1080i, and the pattern TVBAR100 shown as below.

#### Initial Set-up:

1. Select source as "EXT3".
2. Set Smart Picture mode as "Vivid" and off the "Dynamic contrast/Dynamic backlight".
3. Apply "TVBar100" pattern with colour bar pattern by signal generator.
4. Enter factory mode menu: press numeric keys "062596" + INFO key (FAC mode menu).

#### Alignment:

1. At SAM mode menu, select AUTO\_COLOR item. Then press "OK" key to adjust ADC\_GAIN\_R, ADC\_GAIN\_G, ADC\_GAIN\_B and ADC\_OFFSET\_R, ADC\_OFFSET\_G, ADC\_OFFSET\_B. Then store those values to NVM.
2. Apply 80% white pattern.
3. Set colour temperature to "NORMAL".
4. At FAC mode menu, adjust the CLR\_TEMP\_R, CLR\_TEMP\_G, CLR\_TEMP\_B values to meet "NORMAL" colour coordinates specification below. Then store those values to NVM (R/G/B gain value ≤ 128).
5. Set colour temperature to "COOL".
6. At FAC mode menu, adjust the CLR\_TEMP\_R, CLR\_TEMP\_G, CLR\_TEMP\_B values to meet "COOL" colour coordinates specification below. Then store those values to NVM (R/G/B gain value ≤ 128).
7. Set colour temperature to "WARM".
8. At FAC mode menu, adjust the CLR\_TEMP\_R, CLR\_TEMP\_G, CLR\_TEMP\_B values to meet "WARM" colour coordinates specification below. Then store those values to NVM (R/G/B gain value ≤ 128).

Colour temperature Normal/Warm/Cool (x, y) co-ordinates specification:

**Table 6-1 Reading with Minolta CA-210**

Picture Mode	Cool	Normal
Normal (9000K)	0.287 ± 0.003	0.296 ± 0.003
Cool (11000K)	0.276 ± 0.003	0.282 ± 0.003
Warm (6500K)	0.313 ± 0.003	0.329 ± 0.003

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

- Select a COLOUR TEMPERATURE (e.g. COOL, NORMAL, or WARM).
- Set the RED, GREEN and BLUE default values according to the values in [Table 6-2](#)
- When finished press OK on the RC, then press STORE (in the SAM root menu) to store the aligned values to the NVM.
- Restore the initial picture settings after the alignments.

**Table 6-2 White tone default settings**

Picture mode	Screen size	Colour temperature		
		Red	Green	Blue
Normal	32"	127	124	119
	42"	127	126	113
	47"	128	128	116
Cool	32"	119	114	127
	42"	125	121	127
	47"	120	124	128
Warm	32"	127	114	73
	42"	127	118	72
	47"	128	122	76

#### Caution:

- Use Minolta CA-210 for colour coordinates and luminance check.
- Luminance > 400 cd/m<sup>2</sup> in the centre of the screen when Brightness/Contrast/Video Contrast setting at 100 and CLR\_TEMP\_R/CLR\_TEMP\_G/CLR\_TEMP\_B = 128 for 32"/42"/47" panels.

## 6.4 PC mode display adjustment

### 6.4.1 Display quality adjustment

Use timing mode and use the POPO (pixel on pixel off) pattern to adjust the clock until no stripe and adjust the phase until clear picture ("Auto" will be done every time switching to PC mode and mode change).

### 6.4.2 WHITE-D adjustment

#### Equipment Requirements:

Minolta CA-210 or Equivalent Colour analyser, Chroma 2250 or equivalent PC signal generator.

#### Input requirements:

Input Signal Type: PC VGA signal, 1366 × 768/60 Hz PC mode with "five white block" pattern.

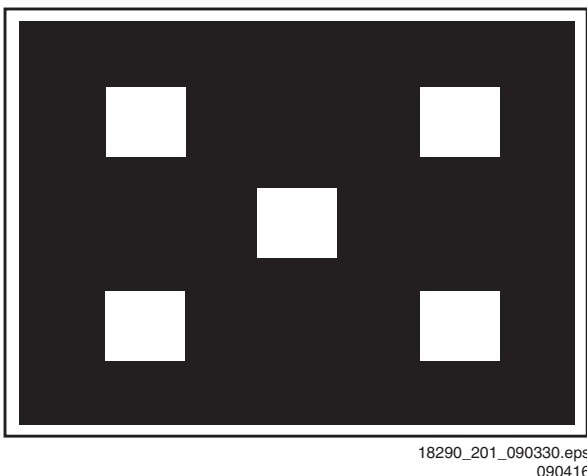


Figure 6-1 Five white blocks pattern

#### Input Signal Strength:

0.7 V<sub>p-p</sub> linear voltage.

#### Input Injection Point:

PC D-SUB input.

### 6.4.3 Alignment method

#### Initial Set-up:

1. Select source as "PC".
2. Set Contrast = 50 (Sharp) and Brightness=50 (Sharp), at normal menu mode.
3. Apply "5 white block" pattern by VGA pattern generator, see [Figure 6-1](#).
4. Enter factory mode menu: press numeric keys "062596" + INFO key (FAC mode menu).

### 6.4.4 Alignment

1. At FAC mode menu, select AUTO\_COLOR item. Then press "OK" key to adjust ADC\_GAIN\_R, ADC\_GAIN\_G, ADC\_GAIN\_B and ADC\_OFFSET\_R, ADC\_OFFSET\_G, ADC\_OFFSET\_B. Then store those values to NVM.

## 6.5 LCD Panel Flicker Adjustment

### 6.5.1 Flicker (V-COM) adjustment

#### Equipment Requirements:

Chroma 2250 or equivalent PC signal generator.

#### Input requirements:

Input Signal Type: PC VGA signal or software built-in test pattern, 1920 × 1080/60 Hz PC mode with "Pixel ON/OFF" pattern, see [Figure 6-2](#).

#### Input Signal Strength:

0.7 V<sub>p-p</sub> linear voltage.

#### Input Injection Point:

PC D-SUB input.

### 6.5.2 Alignment method

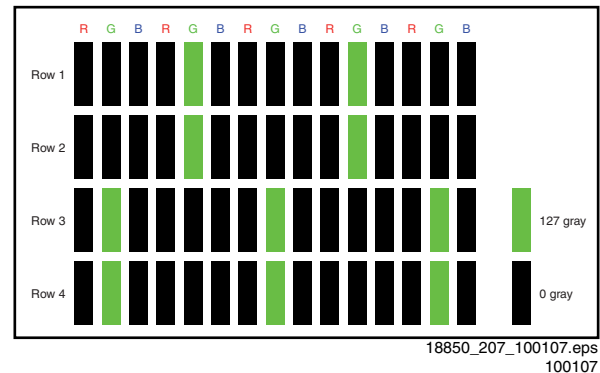


Figure 6-2 1920 × 1080 @ 60 Hz, Pixel ON/OFF pattern

#### Initial Set-up:

1. Select source as "VGA".
2. Apply "Pixel ON / OFF" pattern by signal generator or use a factory cone and to enable built-in "Pixel ON / OFF" pattern, see [Figure 6-2](#).
3. Enter factory mode menu: press numeric keys "062596" + INFO key (FAC mode menu).

### 6.5.3 Alignment

1. At FAC mode menu, select V-COM item. Then press "OK" key to start adjusting panel flicker. By pressing "<-" or ">-" key on RC to decrease or increase V-COM value, minimize panel flicker.

2. Once panel flicker is minimal, press "OK" key on RC to store V-COM value to V-COM IC's MTP and NVM.

**Caution:** Please note that P Gamma IC is 100 times-write ONLY. Make sure you get the optimum result before press "OK" to save the V-COM data.

## 6.6 Option Settings

### 6.6.1 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 by pressing the "OK" button on the RC **before** the cursor is moved to the left, select STORE in the SAM root menu and press "OK" on the RC.
- The new option setting is only active after the TV is switched "off"/"stand-by" and "on" again with the Mains switch (the NVM is then read again).

### 6.6.2 Reset Options

In SAM, after reset “Reset option code”, restart the set immediately.

### 6.6.3 Option Code Overview

**Table 6-3 Panel codes overview**

CTN_ALT BOM#	Panel Type	Panel ID
32HFL3232D/10_1	LG LC320WUY-SCB1	117
32PFL3205H/12_1	LG LC320WUY-SCB1	117
32PFL3605H/12_1	LG LC320WUY-SCB1	117
42PFL3605H/12_1	LG LC420WUY-SCB1	116
47PFL3605H/12_1	LG LC470WUG-SCB1	118
47PFL3605H/60_1	LG LC470WUG-SCB1	118

## 6.7 Serial Number Definition

**Table 6-4 BOM Code**

Panel Supplier	Code
AU	1
CPT	2
LPL (LG)	3
QDI	4
CMO	5
HSD	6
SVA	7

# 7. Circuit Descriptions

Index of this chapter:

- [7.1 Introduction](#)
- [7.2 Power Architecture](#)
- [7.3 T-CON Architecture](#)

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

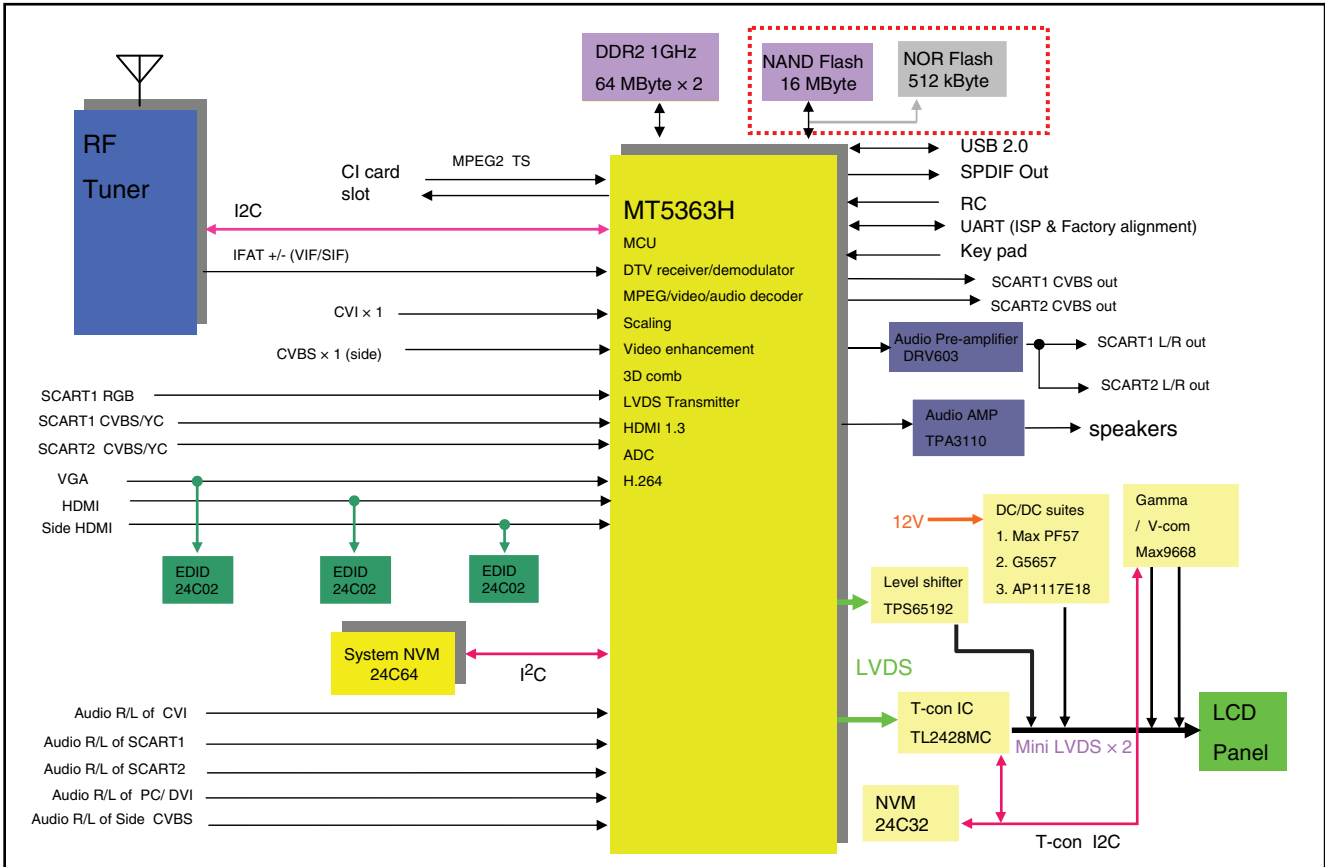
The TPM5.1E LA chassis is used the MT5363LICG main processing.

### 7.1.1 Implementation

- Key components of this chassis are:
- TPA3110D2 Audio Amplifier
  - NAND128W3A2BN6E NAND Flash
  - TDTW-S810D Tuner
  - NT5TU32M16CG-BD DDR Memory
  - TPA6132A2RTER Head phone Amplifier
  - TL2428MC T-CON IC

### 7.1.2 TPM5.1E Architecture Overview

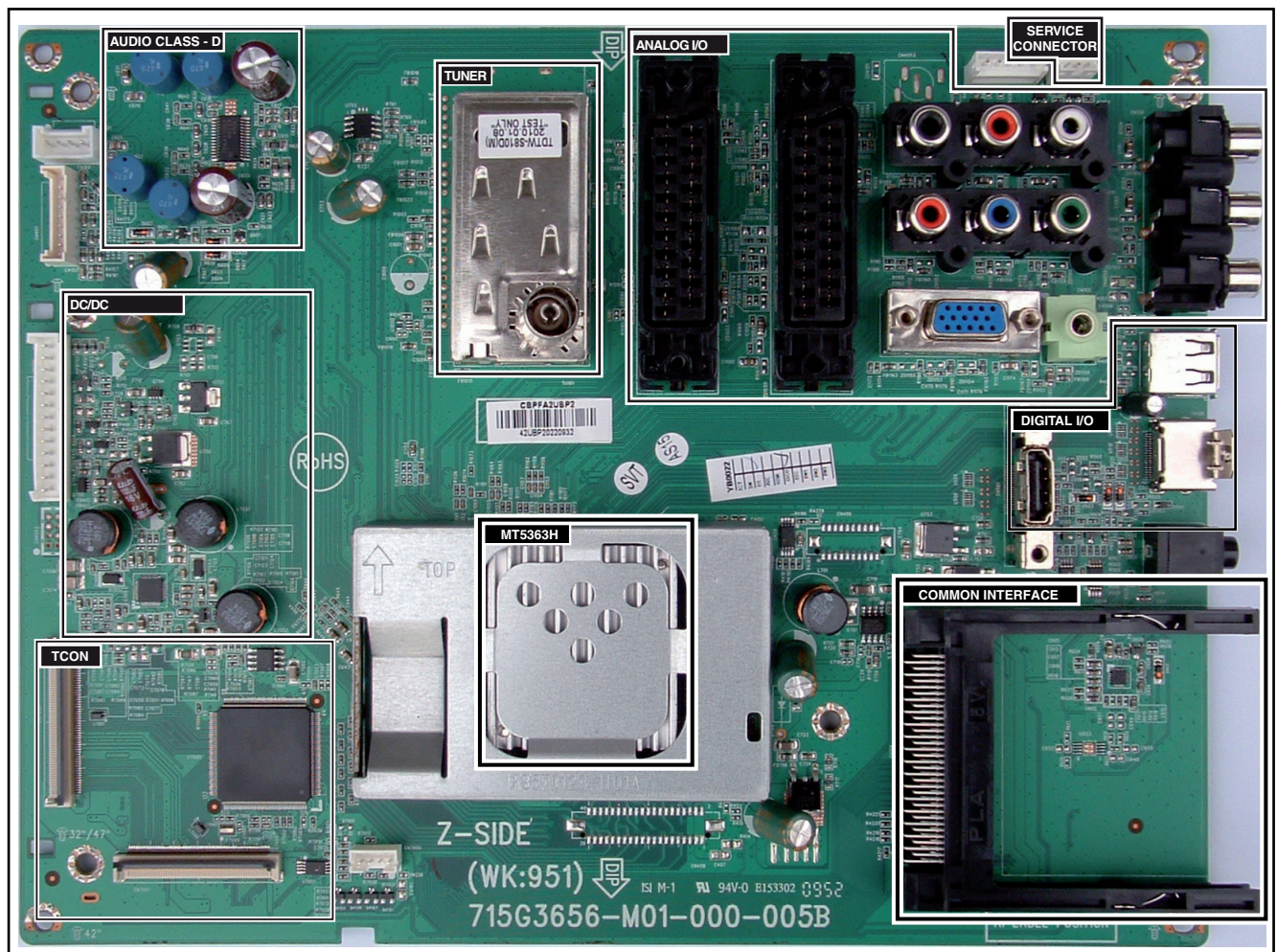
For details about the chassis block diagrams refer to chapter [9. Block Diagrams](#). An overview of the TPM5.1E LA architecture can be found in [Figure 7-1](#).



18850\_211\_100222.eps  
100222

Figure 7-1 Architecture of TPM5.1E LA

## 7.1.3 SSB Cell Layout



18850\_208\_100204.eps  
100222

Figure 7-2 SSB layout cells (top view)



## 7.2 Power Architecture

Refer to figure [Figure 7-3](#) for the power architecture of this platform (DC/DC power conversion).

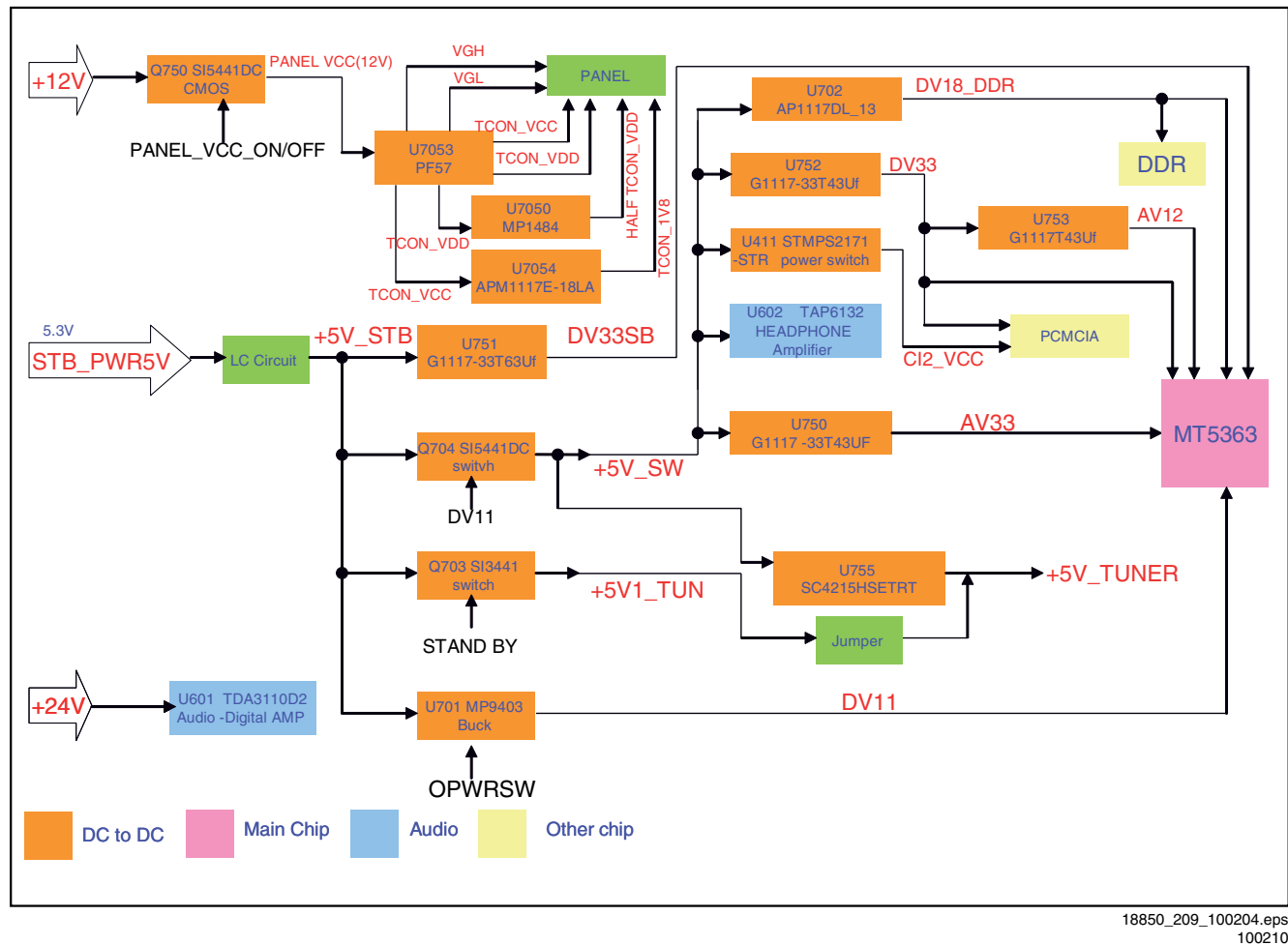


Figure 7-3 Power Architecture

### 7.2.1 Power Supply Unit

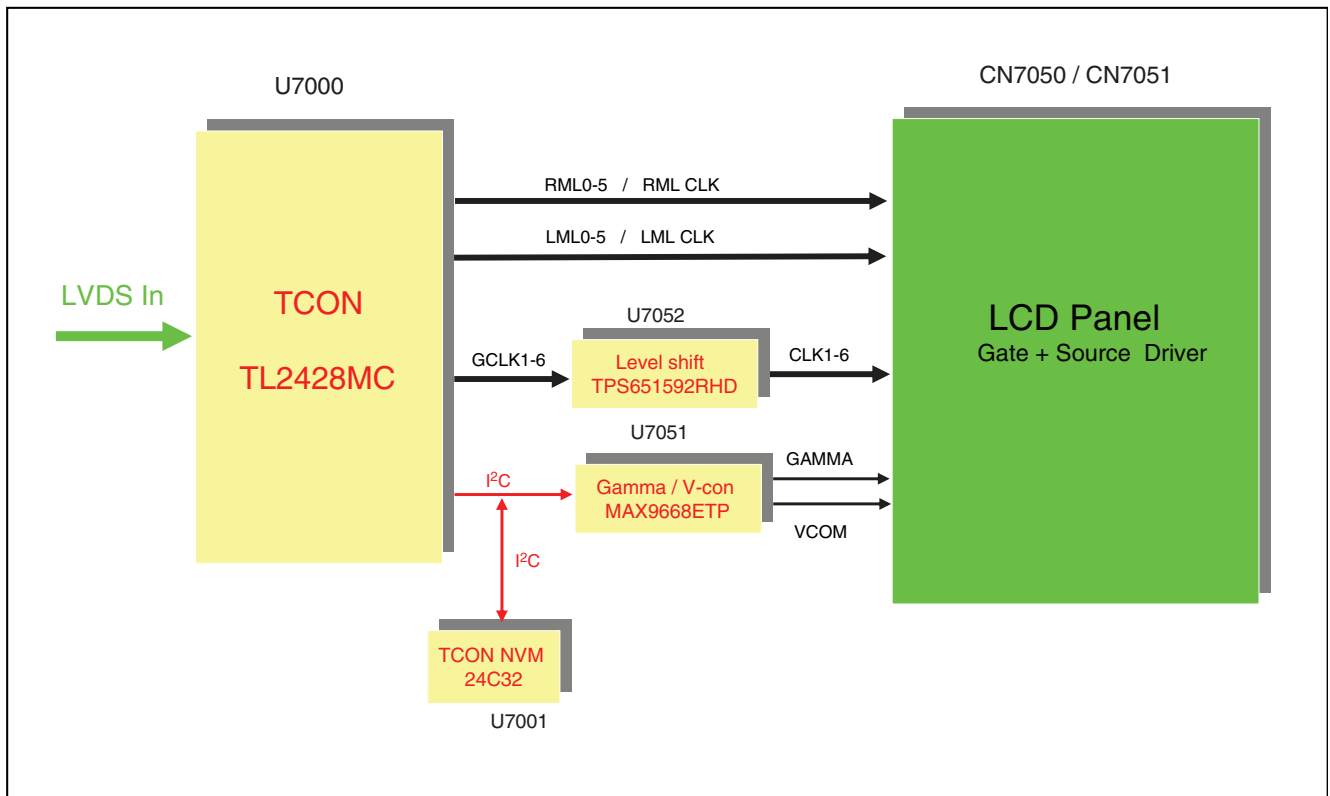
All power supplies are a black box for Service. When defective, a new board must be ordered and the defective one must be returned, unless the main fuse of the board is broken. Always replace a defective fuse with one with the correct specifications! This part is available in the regular market. Consult the Service website for the order codes of the boards.

The output voltages to the chassis are:

- +5-STANDBY (stand-by-mode only)
- +12V (on-mode)
- +24V (audio power)

### 7.3 T-CON Architecture

Refer to figure [Figure 7-4](#) for the power architecture of this platform.



18850\_210\_100204.eps  
100210

Figure 7-4 T-CON Architecture

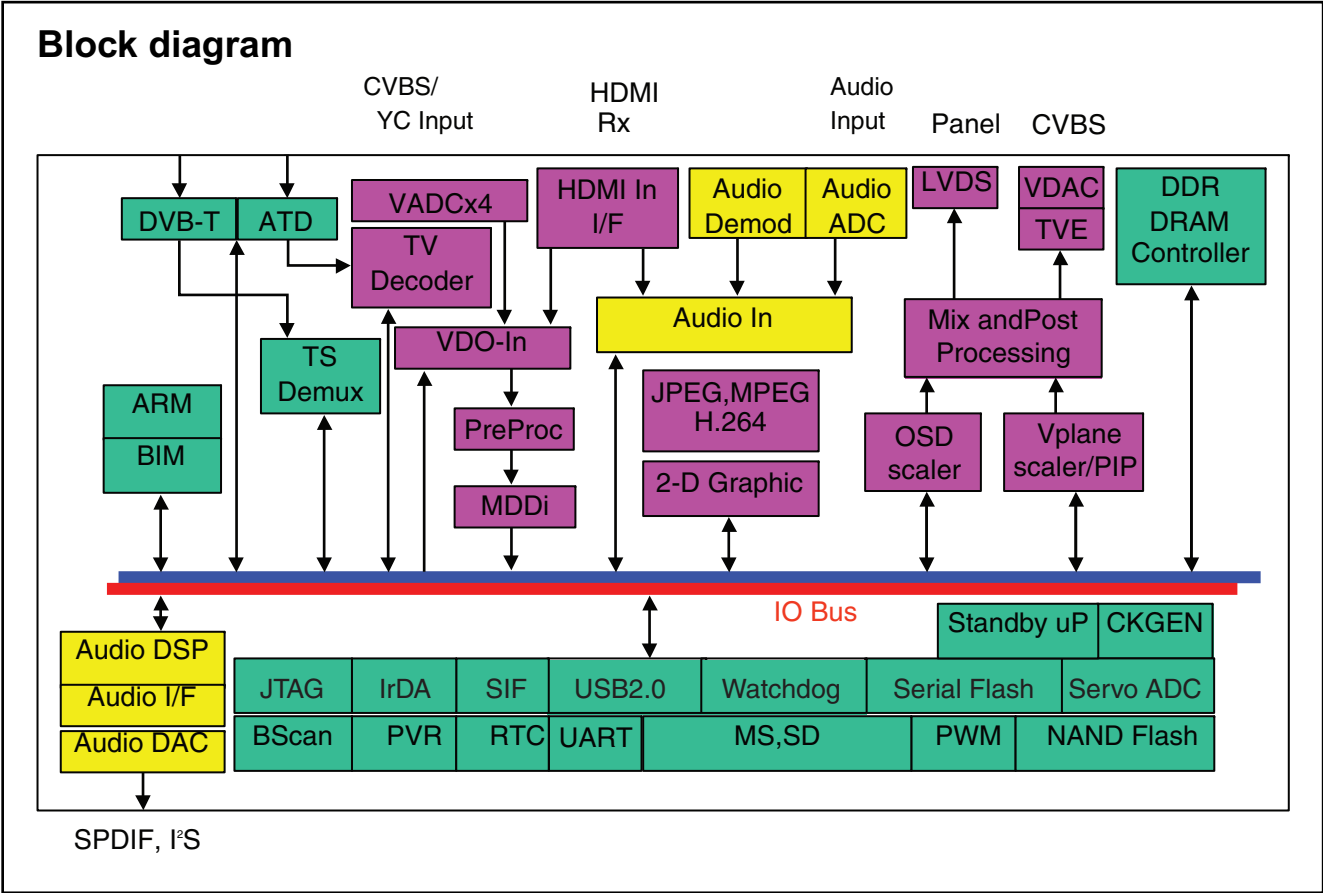
#### 7.3.1 T-CON Unit

The T-CON section includes the T-CON IC, a Level shift IC, a DC to DC conversion IC and a correction Gamma IC. The T-CON IC will transform the LVDS signal into a mini-LVDS signal with a 6 pairs Level shifter IC. This is a 9 channel level-shifter intended for use in LCD display applications such as TVs and monitors. The device converts the logic-level signals generated by the Timing Controller (T-CON) to the high-level signals used by the display panel. The gamma IC outputs eight voltage references for gamma correction in TFT LCDs and one voltage reference for VCOM. Each gamma reference voltage has its own 10-bit digital-to-analog converter (DAC) and buffer to ensure a stable voltage. The VCOM reference voltage has its own 10-bit DAC and an amplifier to ensure a stable voltage when critical levels and patterns are displayed. The DC to DC IC multiple-output power-supply controller generates all the supply rails for thin-film transistor (TFT) liquid-crystal display (LCD) panels in TVs and monitors operating from a regulated 12 V input. It includes a step-down and a step-up regulator, a positive and a negative charge pump, a dual-mode logic controlled high-voltage switch control block, and an adjustable timing power-good output. The positive and negative charge-pump regulators provide the TFT gate driver supply voltages.

8. IC Data Sheets

This section 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 B04 SSB: MT5363 By-pass/Trap, MT5363LICG BGA-522 (IC U401)



18850\_300\_100107.eps  
100222

Figure 8-1 Internal block diagram



## Pinning information

LT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
A		RCLK0_		RDQ10		RDQ15		RDQS0_		RDQ14		RDQ12				AO1N		AOCKN	
B	VCC2IO		RCLK0		RDQ8		RDQS1		RDQS0		RDQ11		VCC2IO		AO0N		AO2N		AO3N
C		VCC2IO		RDQ13		RDQS1_		DVSS		RDQM1		VCC2IO				AO1P		AOCKP	
D	RA9		VCC2IO		RDQ5		RDQ0		DVSS		RDQ9		VCC2IO		AO2P		AO2P		AO3P
E		RA12		VCC2IO		RDQ2		DVSS		RDQM0		VCC2IO		VCC2IO		AE0N		AE2N	
F	RA5		RA7		VCC2IO		RDQ7		DVSS		RDQ6		VCC2IO		AVDD33_L VDS		AE1N		AECKN
G		RA10		RA3		VCC2IO		DVSS		DVSS		RDQ3		VCC2IO		AE0P		AE2P	
H	RBA2		RBA0		RA1		VCC2IO				RDQ1		RDQ4		AVDD33_L VDS		AE1P		AECKP
J		RBA1		DVSS		DVSS								VCC2IO				AVSS33_L VDS	
K	RCKE		RWE_		MEMTN		MEMTP												
L		RCAS_		DVSS		DVSS													
M	RA13		RA2		RA4		RA6												TP_VPLL
N		RA11		RA0		RODT		RVREF						DVSS		AVDD12_L VDS		AVDD12_V PLL	
P	RA8		RCS_		RRAS_		RVREF						AVDD12_M EMPLL		DVSS		AVSS12_L VDS		AVSS12_V PLL
R		VCC2IO		VCC2IO		VCC2IO								DVSS		VCCCK		DVSS	
T	RDQ19		RDQ20		RDQ30		RDQ25						AVSS12_M EMPLL		DVSS		DVSS		DVSS
U		RDQ22		RDQ17		RDQM3								VCCCK		DVSS		DVSS	
V	RDQM2		RDQS2		RDQ28		RDQ27							VCCCK		DVSS		DVSS	
W		RDQS2_		DVSS		DVSS								DVSS		DVSS		DVSS	
Y	RDQS3		DVSS		RDQ24		RDQ31							VCCCK		VCCCK		DVSS	
AA		RDQS3_		RDQ29		RDQ26								VCCCK		DVSS		DVSS	
AB	RDQ16		RDQ23		REXTDN									DVSS		DVSS		DVSS	
AC		RDQ21		RDQ18		VCC2IO								DVSS		DVSS		DVSS	
AD	RCLK1		RCLK1_		VCC2IO		VCC2IO							DVSS		VCCCK		VCCCK	
AE		VCC2IO		VCC2IO		GPIO39		DVSS						VCCCK		VCCCK		VCCCK	
AF	VCC2IO		VCC2IO		GPIO37		GPIO40		DVSS					VCCIO33-1		VCCIO33-1			
AG		GPIO38		GPIO41		GPIO42							VCCCK						
AH	GPIO44		GPIO43		JTDO		VCCCK												
AJ		JTDI		JTMS		VCCCK		VCCCK											
AK	JTRST_		JTCK		VCCCK		VCCCK												
AL		VCCCK		VCCCK		VCCCK		VCCCK		AVDD12_U SB		HDMI_SCL 2		HDMI_SDA 2		PWR5V_1		HDMI_HPD 1	
AM	VCCCK		VCCCK		VCCCK		VCCCK		AVSS12_U SB		AVDD33_U SB		AVDD33_H DMI		PWR5V_2		HDMI_SCL 1		OPCTRL1
AN		VCCCK		VCCCK		POCE1_				USB_VRT		AVSS33_H DMI		HDMI_CEC		HDMI_HPD 2		HDMI_SDA 1	
AP	OSDA0		OSCL0		PDD1		PDD4		AVSS33_U SB		AVDD12_H DMI		RX2_0		RX2_2		RX1_0		RX1_2
AR		PDD0		PAALE		PDD2		PDD6		USB_DM		RX2_C		RX2_1		RX1_C		RX1_1	
AT	POCE0_		POWE_		PARB_		PDD5		AVSS33_U SB		AVSS33_U SB		RX2_0B		RX2_2B		RX1_0B		RX1_2B
AU		POCE_		PACLE		PDD3		PDD7		USB_DP		RX2_CB		RX2_1B		RX1_CB		RX1_1B	
AV	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19

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Figure 8-2 Pin configuration (1)

## Pinning information

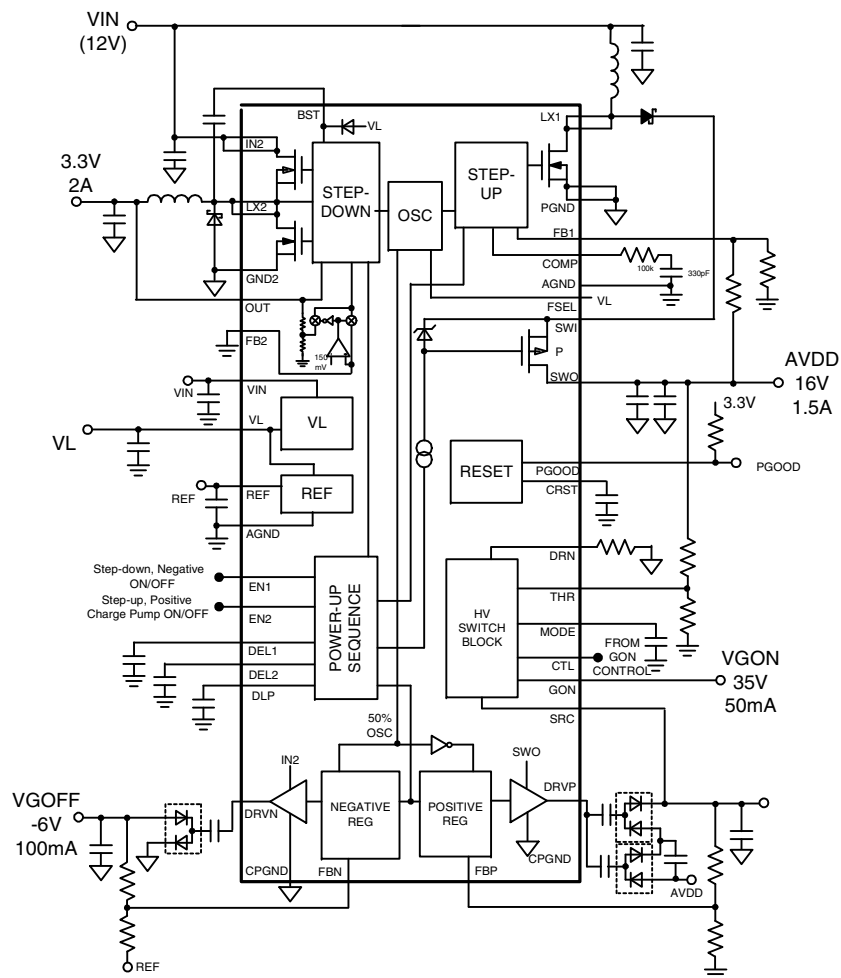
20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	RT	
AQ4N		GPIO35				GPIO21				GPIO3		ETTXD0		ETRXD2		ETRXD0		A	
	DVSS		GPIO32		GPIO26		GPIO17		GPIO9		ETTXD3		ETRXCLK		ETRXD1		ETRXDV	B	
AQ4P		GPIO36		GPIO28		GPIO22		GPIO11		GPIO4		ETTXD1		ETRXD3		ETCRS		C	
	DVSS		GPIO34		GPIO27		GPIO18		GPIO10		ETTXEN		ETTXCLK		ETRXER		ETMDIO	D	
AE3N		DVSS		GPIO30		GPIO20		GPIO12		GPIO6		ETTXD2		ETTXER		ETMDC		E	
	AE4N		GPIO33		GPIO24		GPIO16		GPIO8		ETPHYCLK		CI_MCLKO		CI_MCLKI		CI_MOSTRT	F	
AE3P		DVSS		GPIO29		GPIO19		GPIO14		GPIO5		ETCOL		CI_MIVAL		CI_MOVAL		G	
	AE4P		VCCIO33		GPIO25		GPIO15		GPIO7		VCCIO33		CI_MISTR T		CI_MDI0		CI_MDO0	H	
				GPIO31		GPIO23		GPIO13		VCCIO33		GPIO2		OPWM0		OPWM1		J	
											AOSDATA3		ASPDIF		GPIO0		GPIO1	K	
										FSRC_WF		ALIN		AOBCK		AOSDATA0		L	
											IF_AGC		RF_AGC		AOMCLK		AOLRCK	M	
DVSS		VCCK		VCCK								AOSDATA4		TUNER_DATA		TUNER_CLK		N	
	DVSS		DVSS		DVSS						OSCL2		OSDA2		AOSDATA1		AOSDATA2	P	
DVSS		DVSS		DVSS								OSDA1		OSCL1		U1RX		R	
	DVSS		DVSS		VCCK						AVDD33_A DAC1		OPWM2		U1TX		VCXO	T	
DVSS		DVSS		DVSS						AVSS33_A DAC1		AL1		AR2		AR3		U	
	DVSS		DVSS		VCCK						VCCIO33		AR1		AL2		AL3	V	
DVSS		DVSS		VCCK						AVDD33_REF_AADC		VCCIO33		VCCIO33		VCCIO33		W	
	DVSS		DVSS		VCCK					AVSS33_REF_AADC		AVDD33_A ADC		AVSS33_A ADC		AIN5_R_A ADC		AIN6_R_A ADC	Y
DVSS		DVSS		VCCK							VMID_AADC		AIN4_L_AADC		AIN5_L_AADC		AIN6_L_AADC	AA	
	DVSS		DVSS		VCCK						AIN1_L_AADC		AIN4_R_A ADC		AIN2_R_A ADC		AIN3_R_A ADC	AB	
DVSS		DVSS		DVSS								AIN1_R_A ADC		AIN0_R_A ADC		AIN3_L_AADC		AC	
	DVSS		DVSS		DVSS								AIN0_L_AADC		AIN2_L_AADC			AD	
VCCK		VCCK		DVSS										AVSS33_A DAC0		AR0		AE	
									AVDD12_T VPLL				AVDD33_A DAC0		AVICM		AL0	AF	
										AVDD12_A PLL		AVDD12_SYPLL		AVDD33_DEMOD1		AVSS33_DEMOD1		AG	
									AVSS12_P LL		AVSS12_P LL		AVDD12_A DCPLL		ADCINN_DEMOD		ADCINP_DEMOD	AH	
										AVSS33_D IG				XTALO		XTALI		AJ	
									AVSS33_SF		AVDD33_D IG		ADIN1_SR V		AVDD33_X TAL_STB		AVSS33_X TAL	AK	
OPWRSB		ORESET_		AVSS33_V GA_STB						AVDD33_SF		ADIN0_SR V		ADIN3_SR V		ADIN5_SR V		AL	
	OPCTRL0		AVDD10_L DO		AVDD12_R GB				FS_VDAC		BYPASS0		AF		ADIN2_SR V		ADIN4_SR V	AM	
OPCTRL2		OIRI		AVDD33_V GA_STB		AVSS12_R GB				AVDD33_V DAC		AVDD33_C VBS		MPXP		MPXN		AN	
	U0TX		SOG		SOY1		PR1P		PB0P		VDAC_OUT1		SY0		CVBS2P		TUNER_BYPASS	AP	
OPCTRL3		HSYNC		COM		COM1		Y0P		AVSS33_V DAC		AVSS33_C VBS		SY1		CVBS0N		AR	
	U0RX		BP		RP		PB1P		COM0		VDAC_OUT2		SC0		CVBS3P		CVBS0P	AT	
OPCTRL4		VSYNC		GP		Y1P		SOY0		PROP				SC1		CVBS1P		AU	
20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	RB	

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Figure 8-3 Pin configuration (2)

## 8.2 Diagram B14 SSB: T-CON power, PF57 TQFN-40 (IC U7053)

## Block diagram



## Pinning information

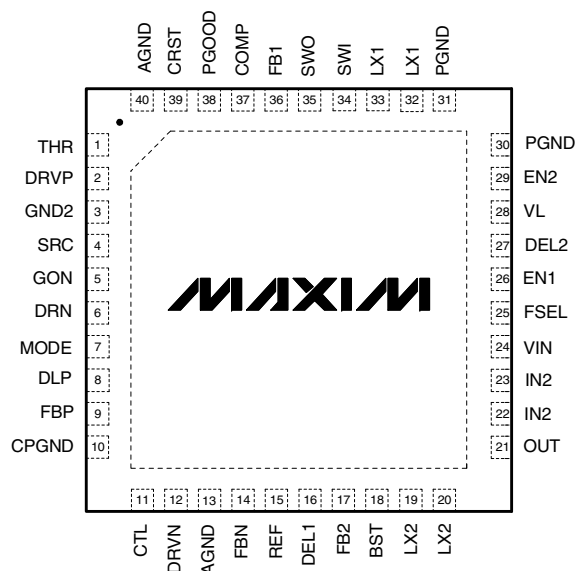
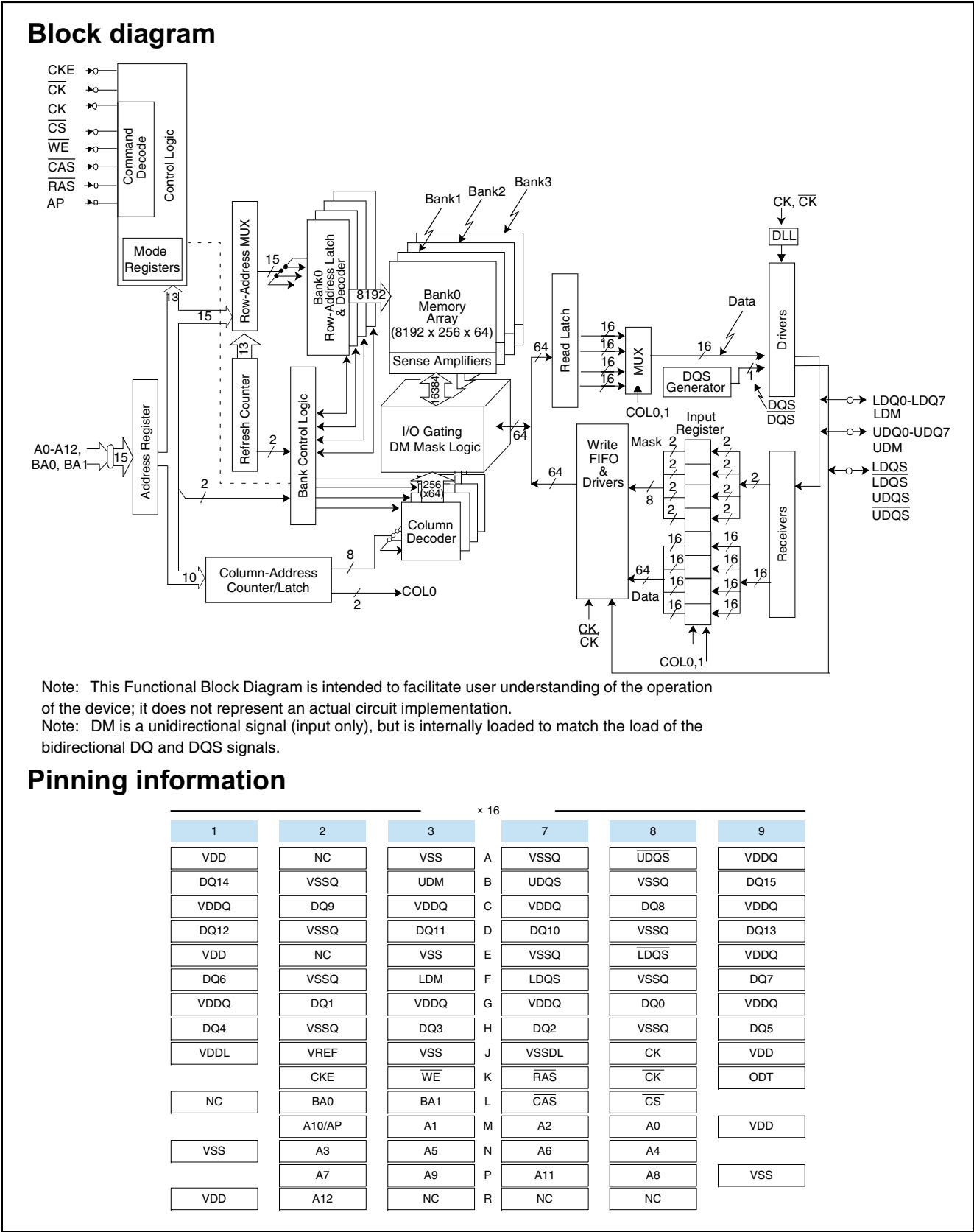


Figure 8-4 Internal block diagram and pin configuration

8.3 Diagram B06 SSB: DDR2 memory, NT5TU32M16CG-BD (IC U402, U403)

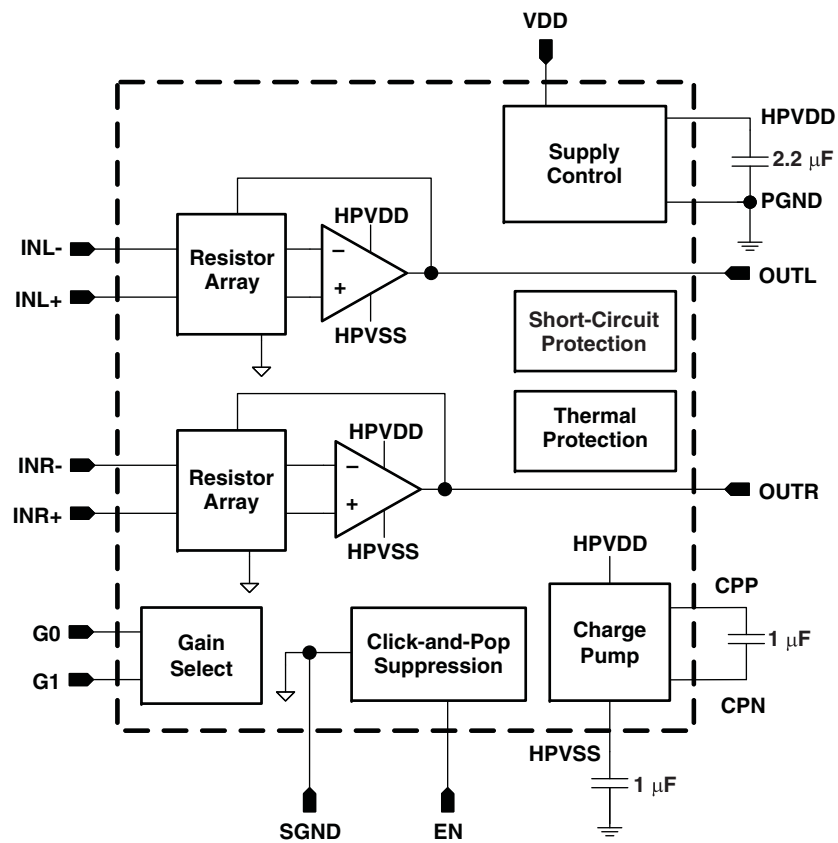


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100222

Figure 8-5 Internal block diagram and pin configuration

8.4 Diagram B12 [SSB: Audio Amp/Headphone out](#), TPA6132A2RTER 25mW QFN-16 (IC U602)

## Block diagram



## Pinning information

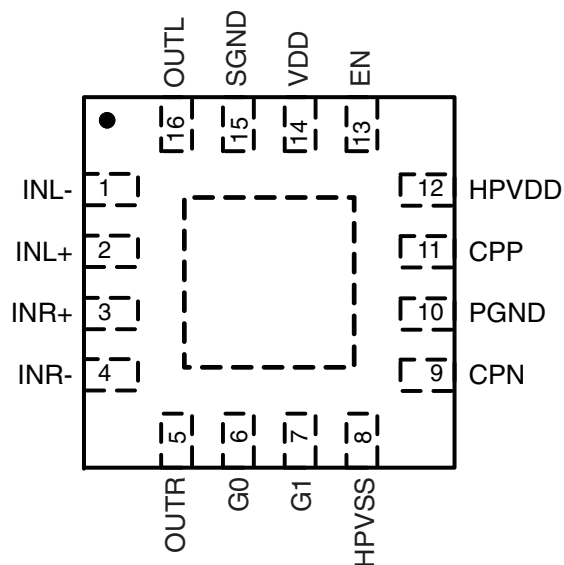
18850\_304\_100107.eps  
100809

Figure 8-6 Internal block diagram and pin configuration

8.5 Diagram B15 [SSB: T-CON main chip, TL2428MC LQPF-176 \(IC U7000\)](#)

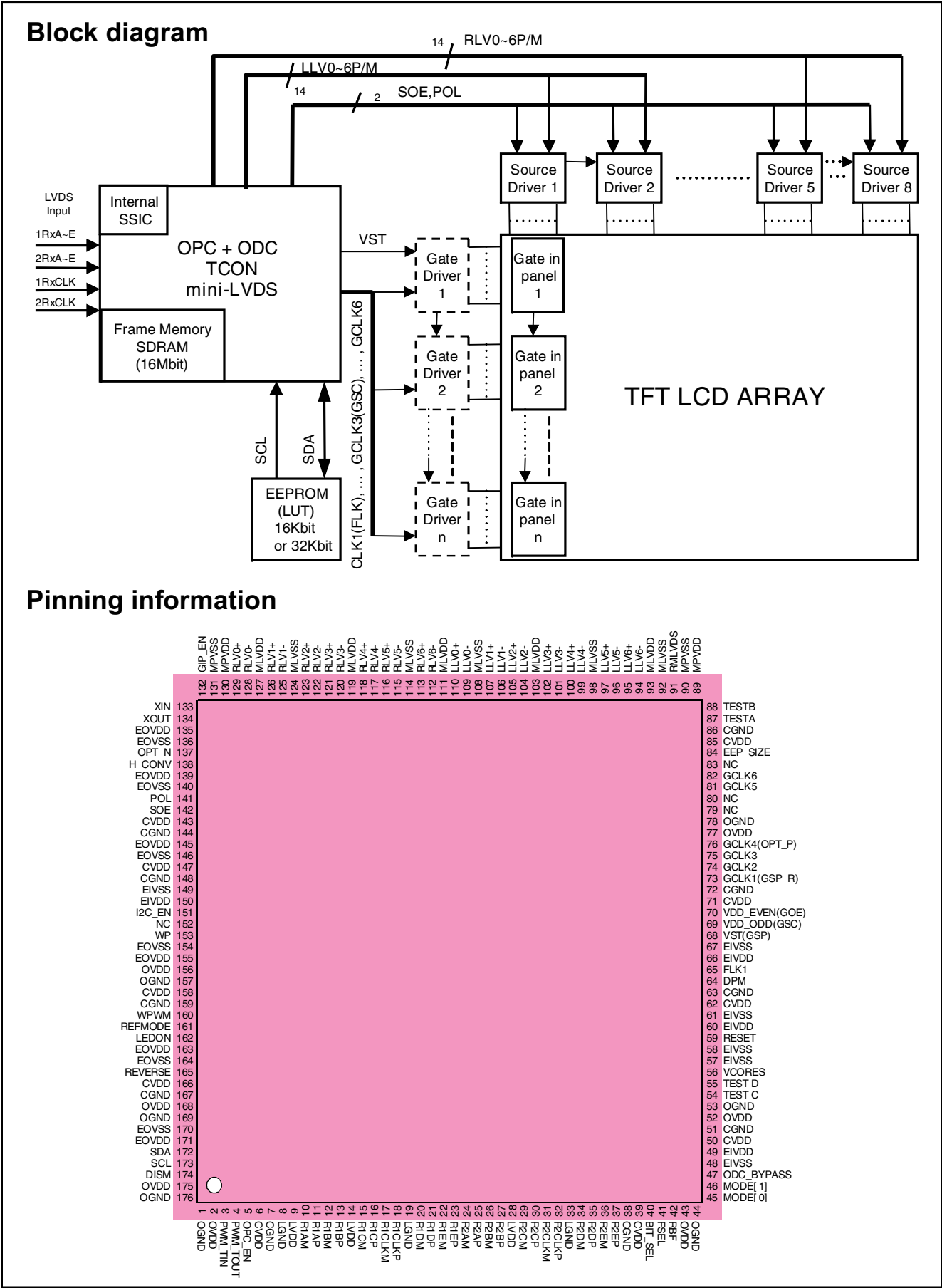
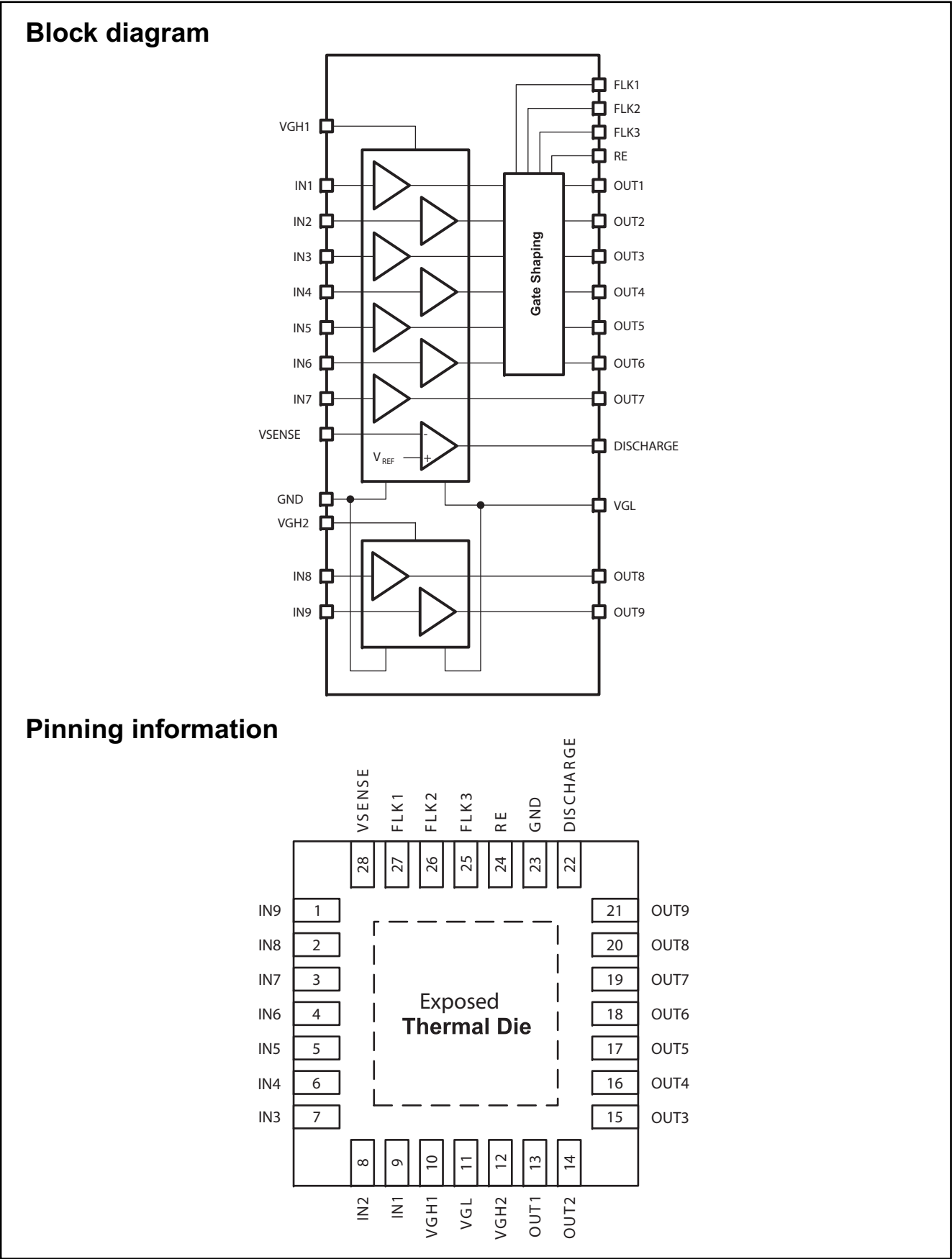


Figure 8-7 Internal block diagram and pin configuration

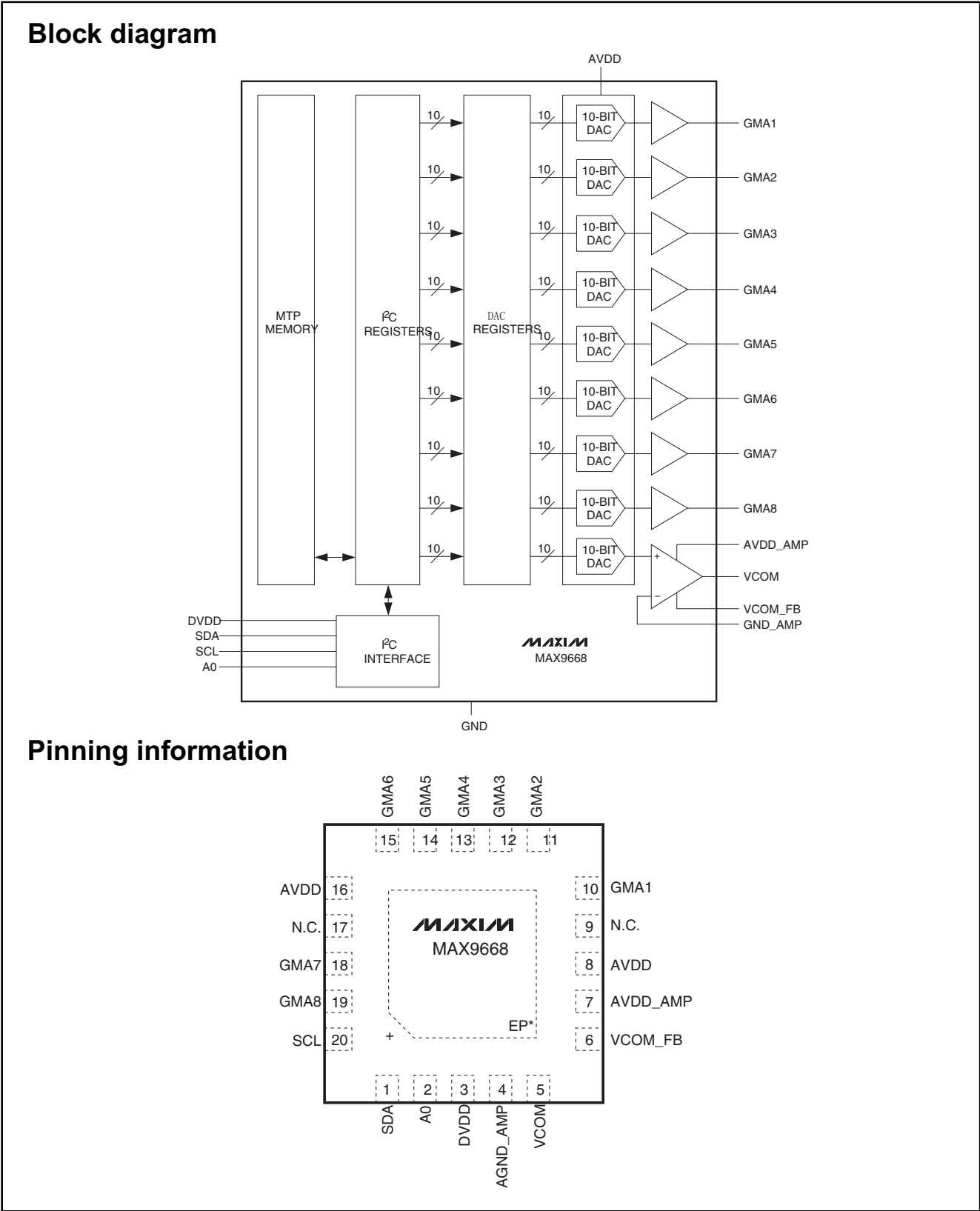
8.6 Diagram B14 [SSB: T-CON power](#), TPS65192RHDR QFN-28 (IC U7052)



18850\_306\_100107.eps  
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Figure 8-8 Internal block diagram and pin configuration

8.7    Diagram B14 [SSB: T-CON power](#), MAX9668ETP+ TQFN-EP-20 (IC U7051)



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100223

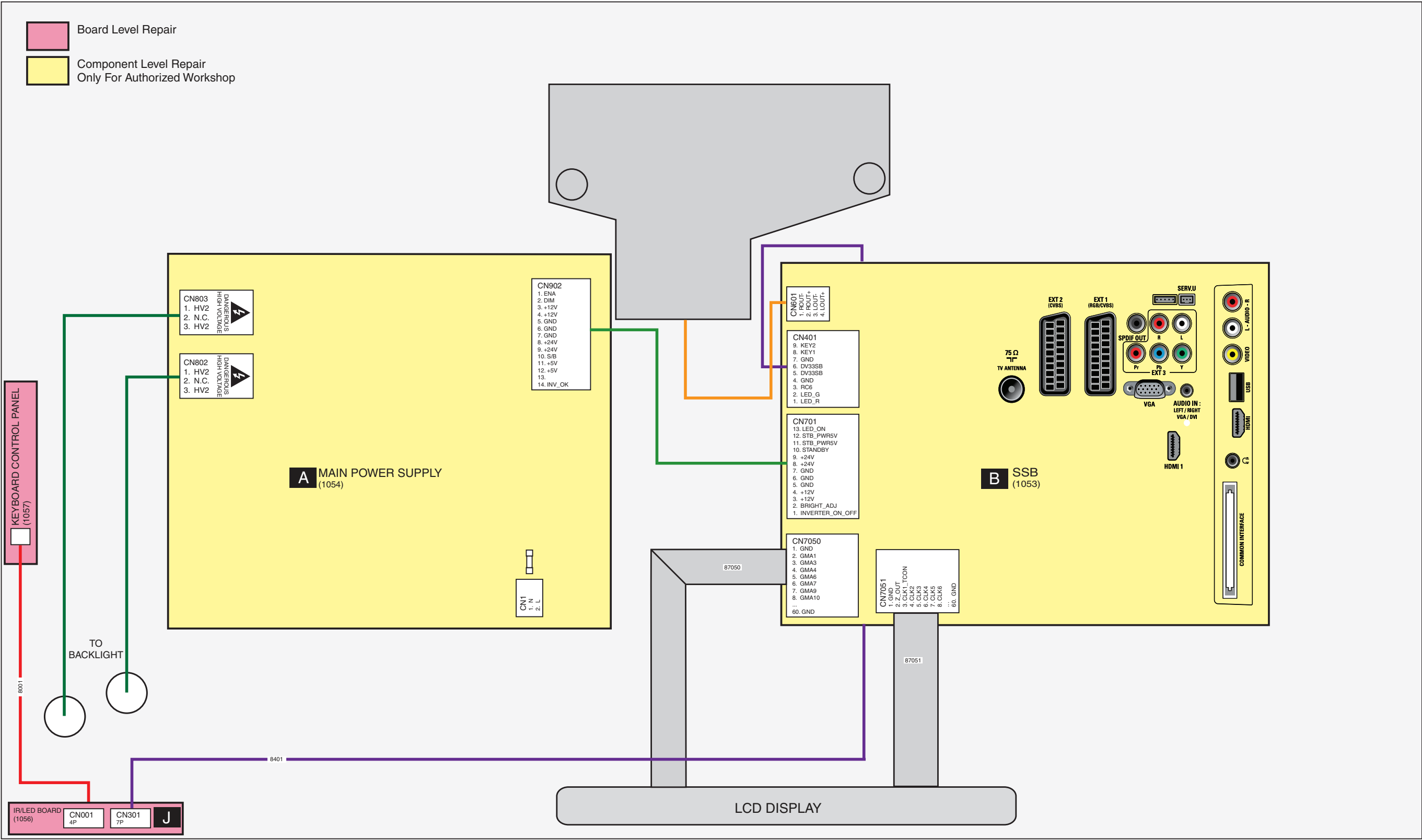
Figure 8-9 Internal block diagram and pin configuration



9. Block Diagrams

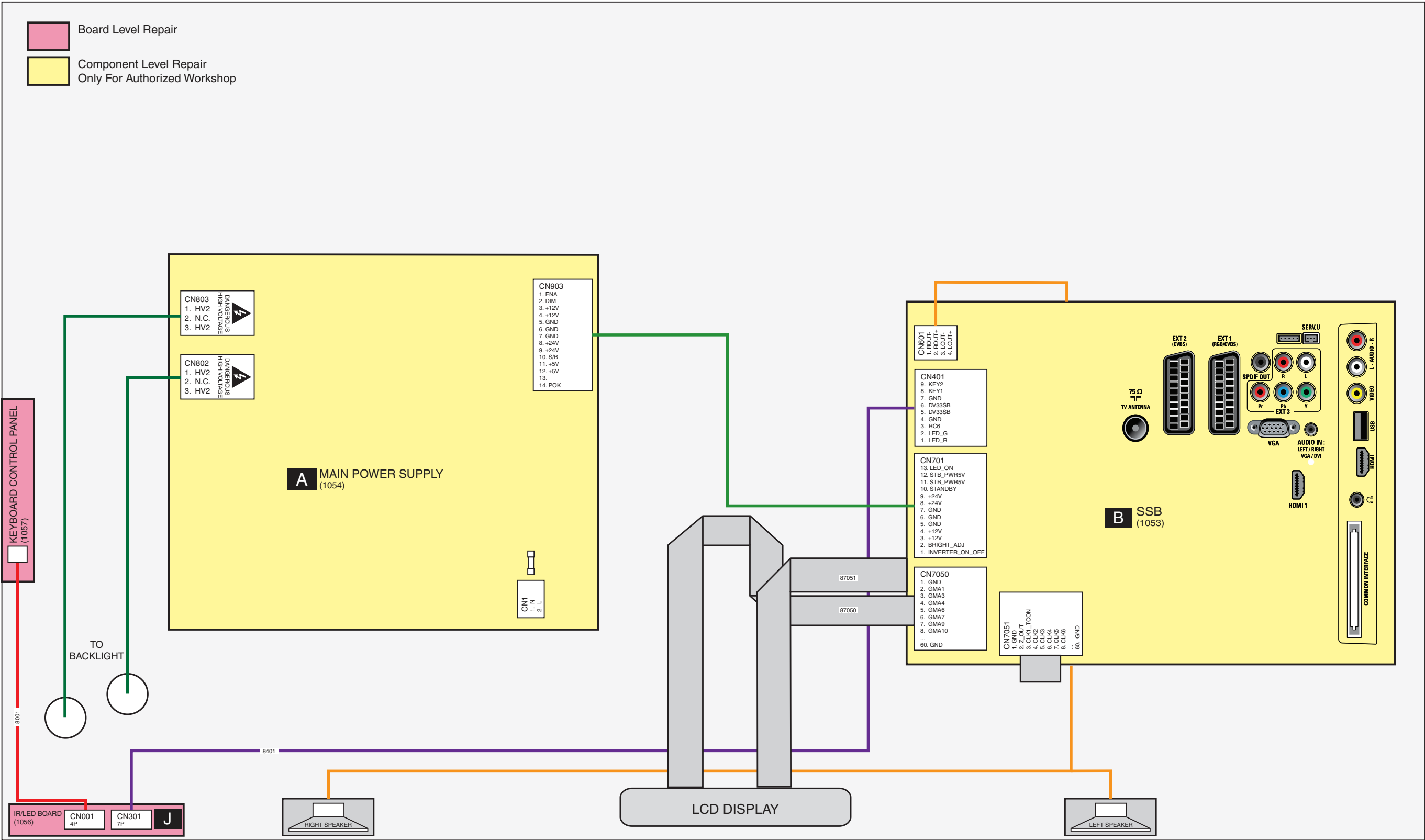
Wiring Diagram 32"

WIRING DIAGRAM 32" (Dali)



Wiring Diagram 42"

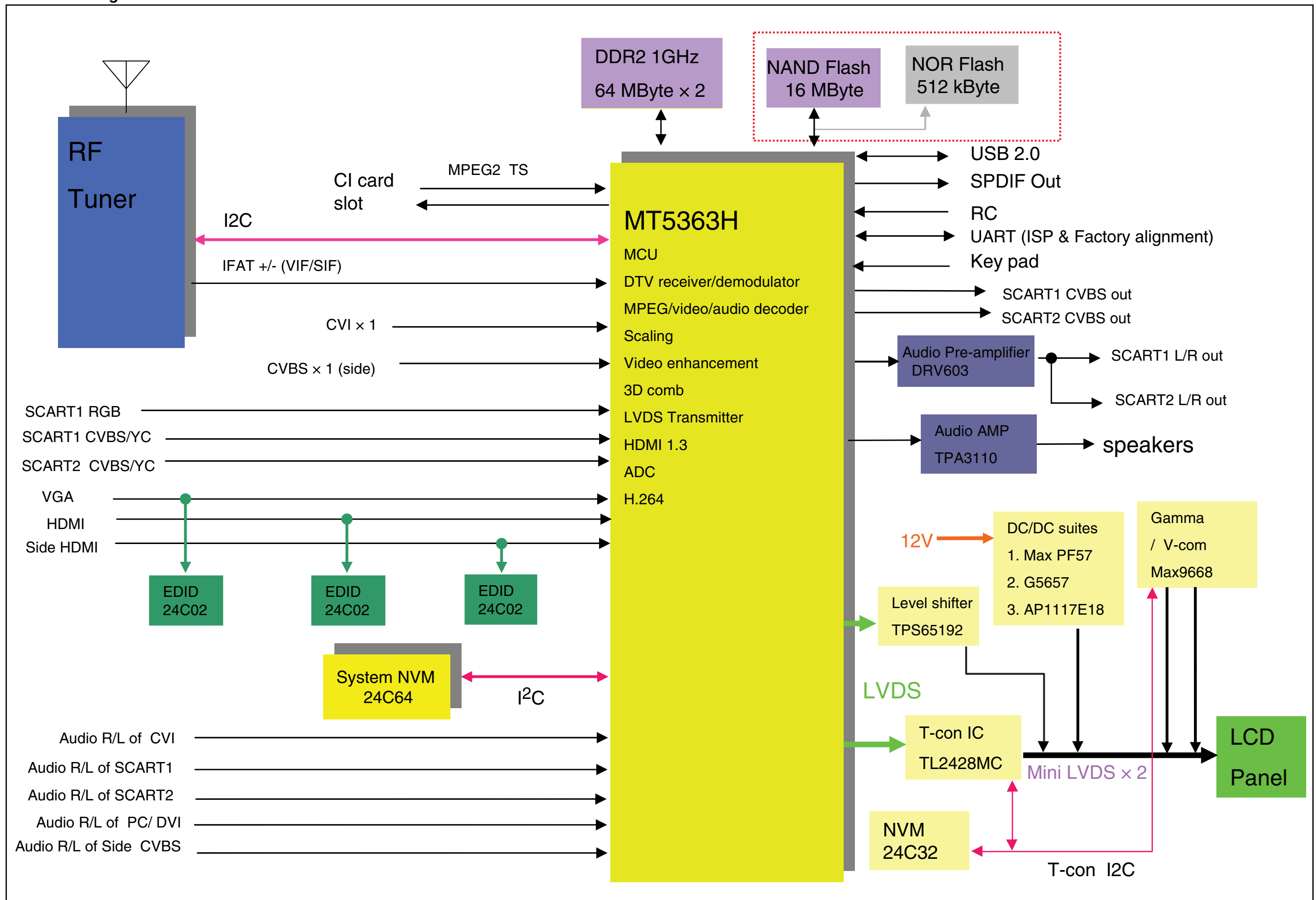
WIRING DIAGRAM 42" (Dali)



18850\_400\_100107.eps  
100223

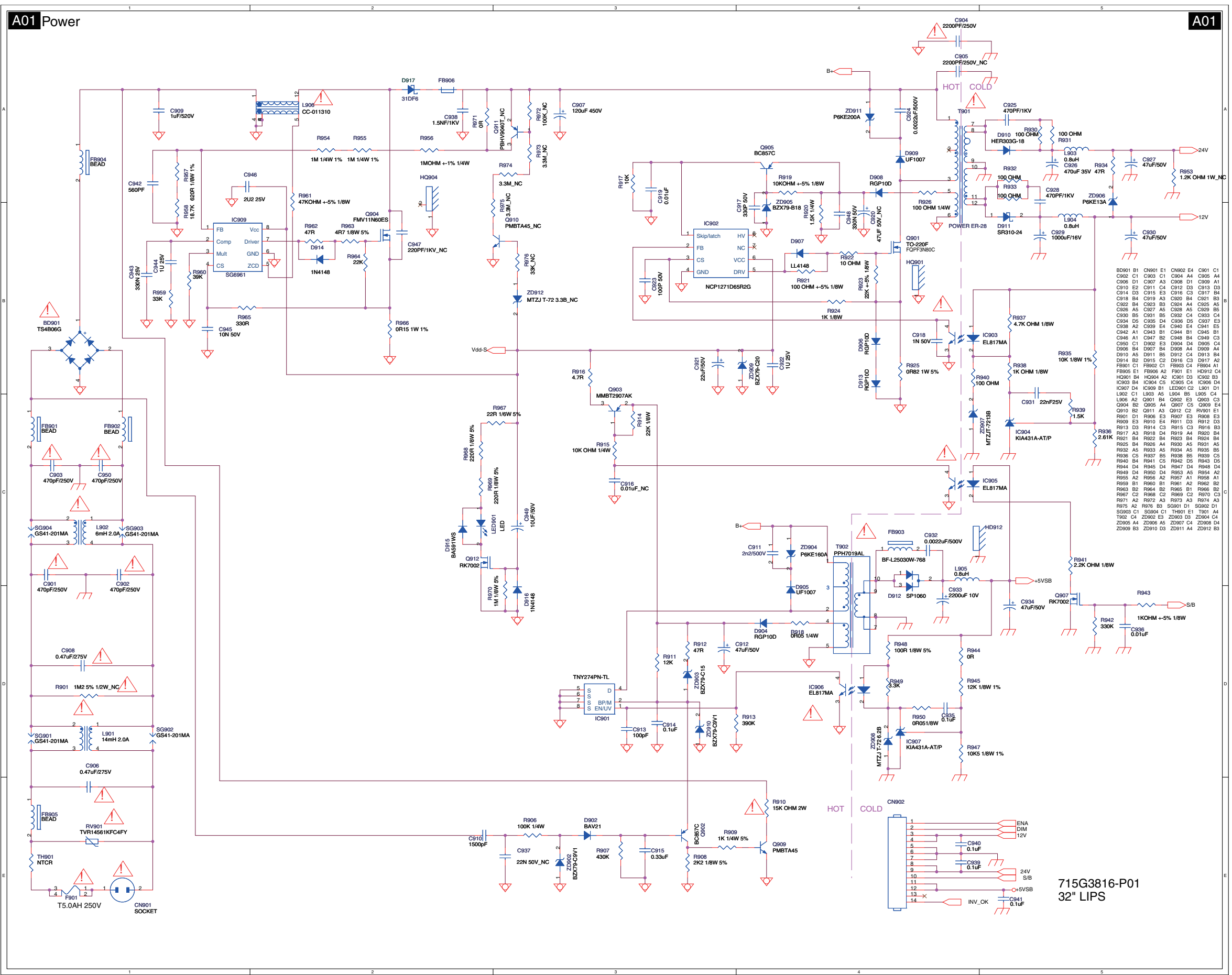


# Block Diagram



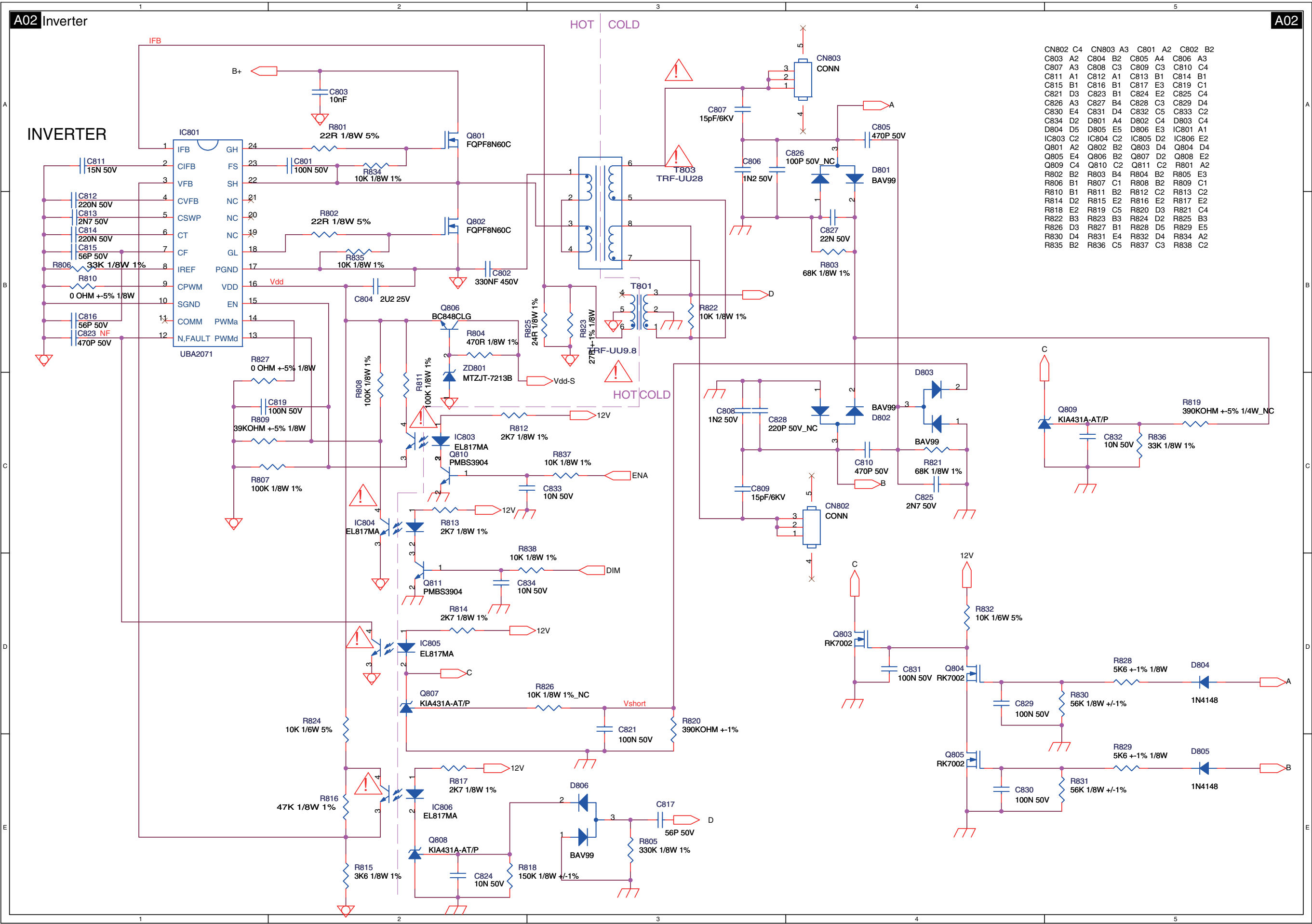
10. Circuit Diagrams and PWB Layouts

Power 32"

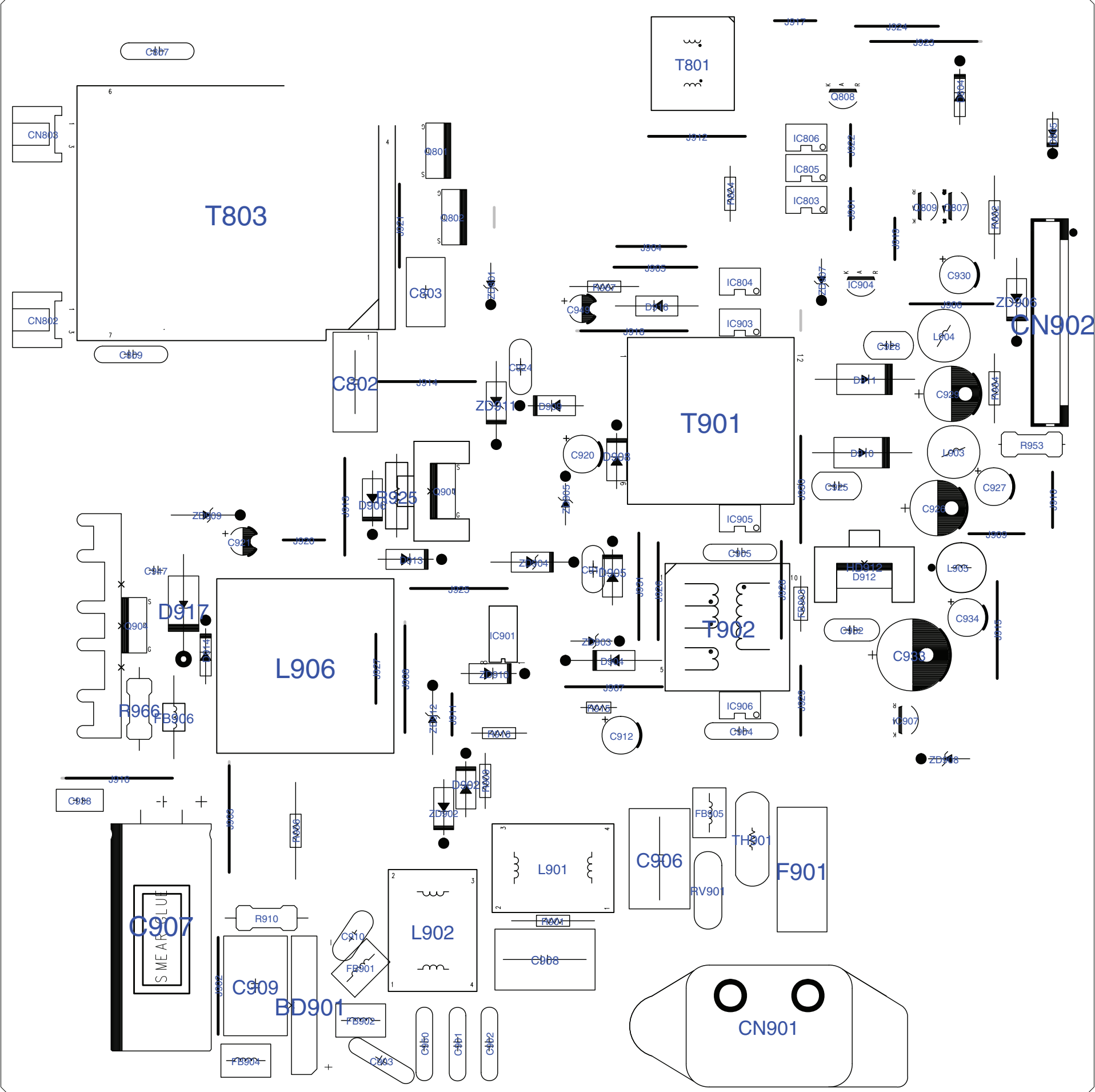




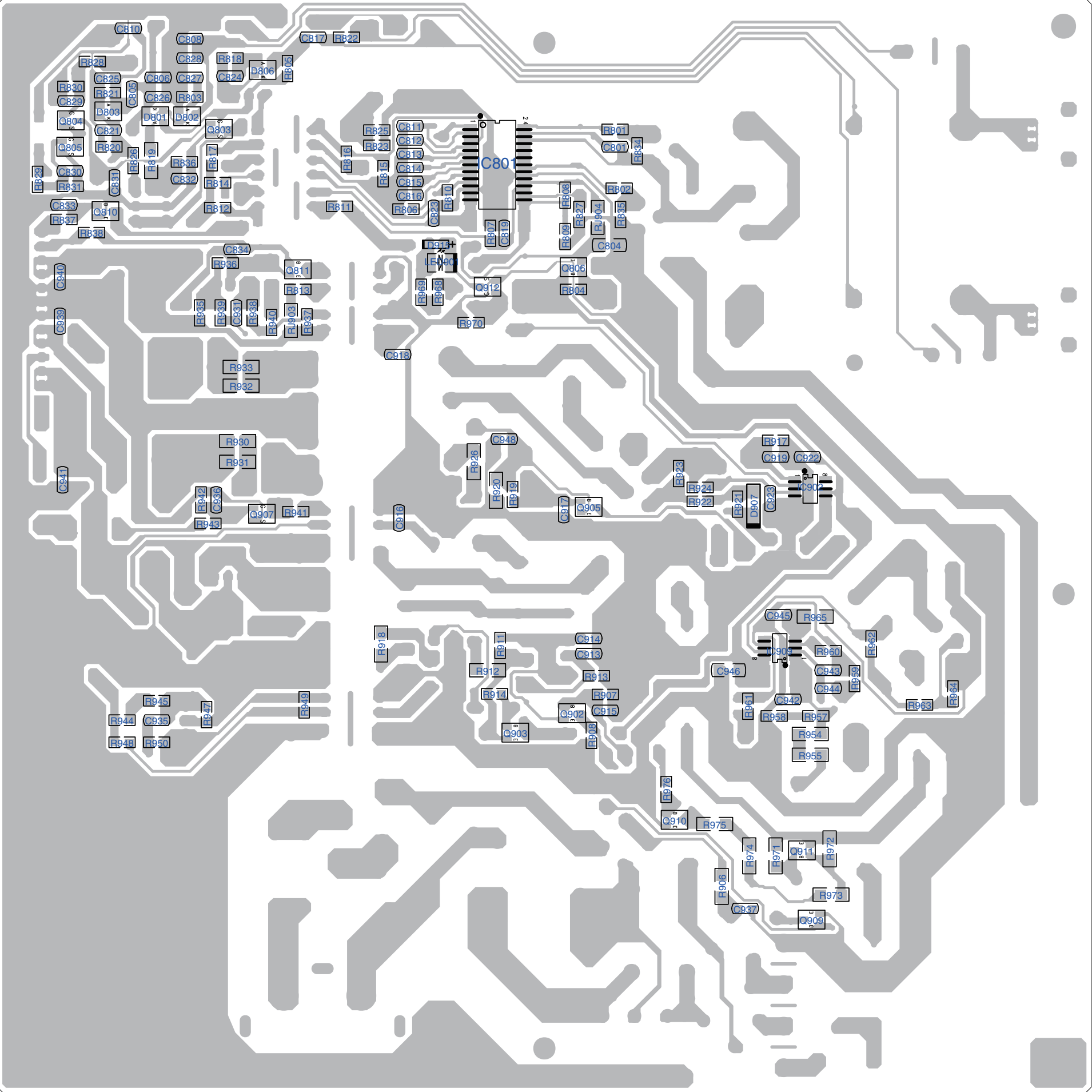
Inverter 32"



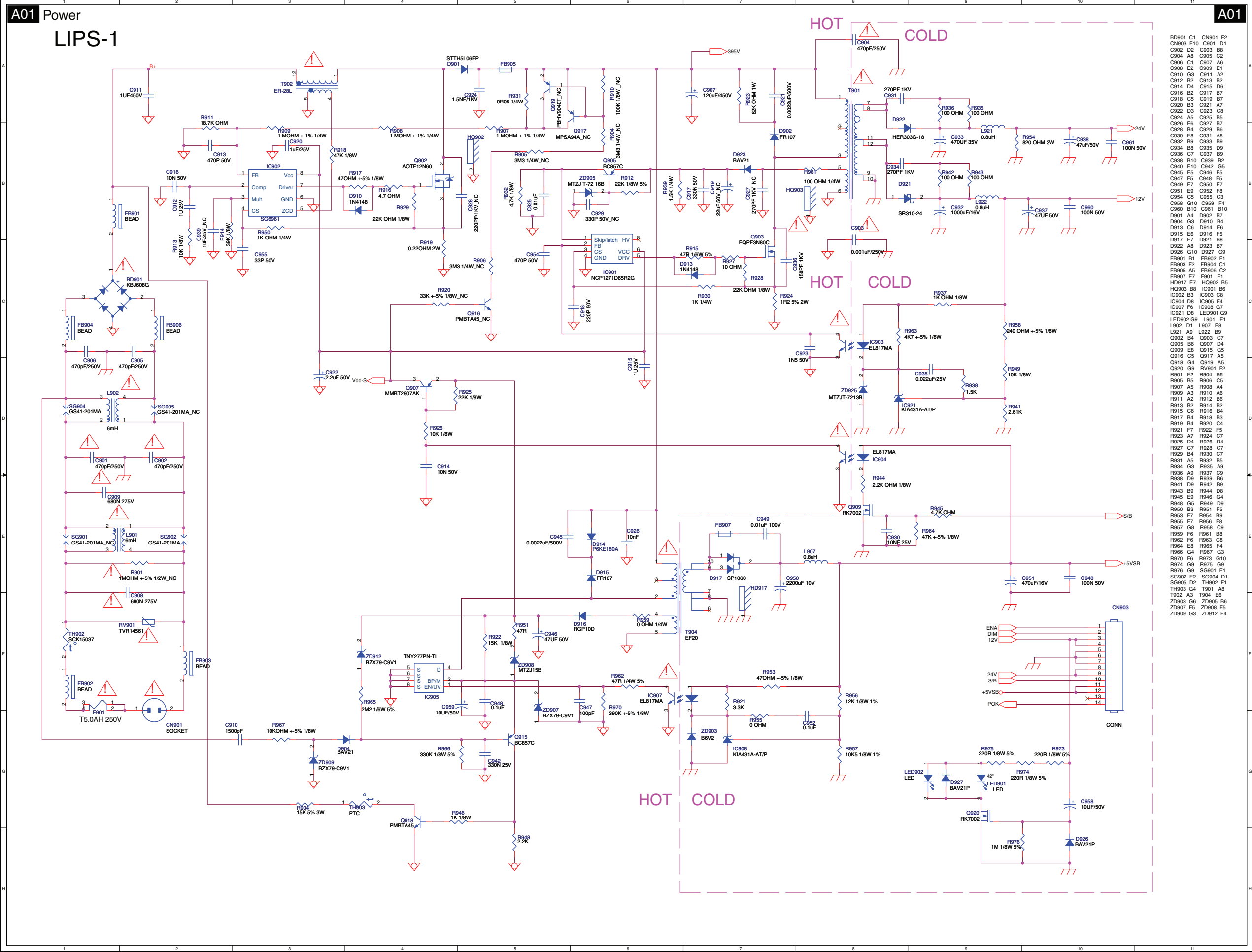
Layout Power Board 32" (Top Side)



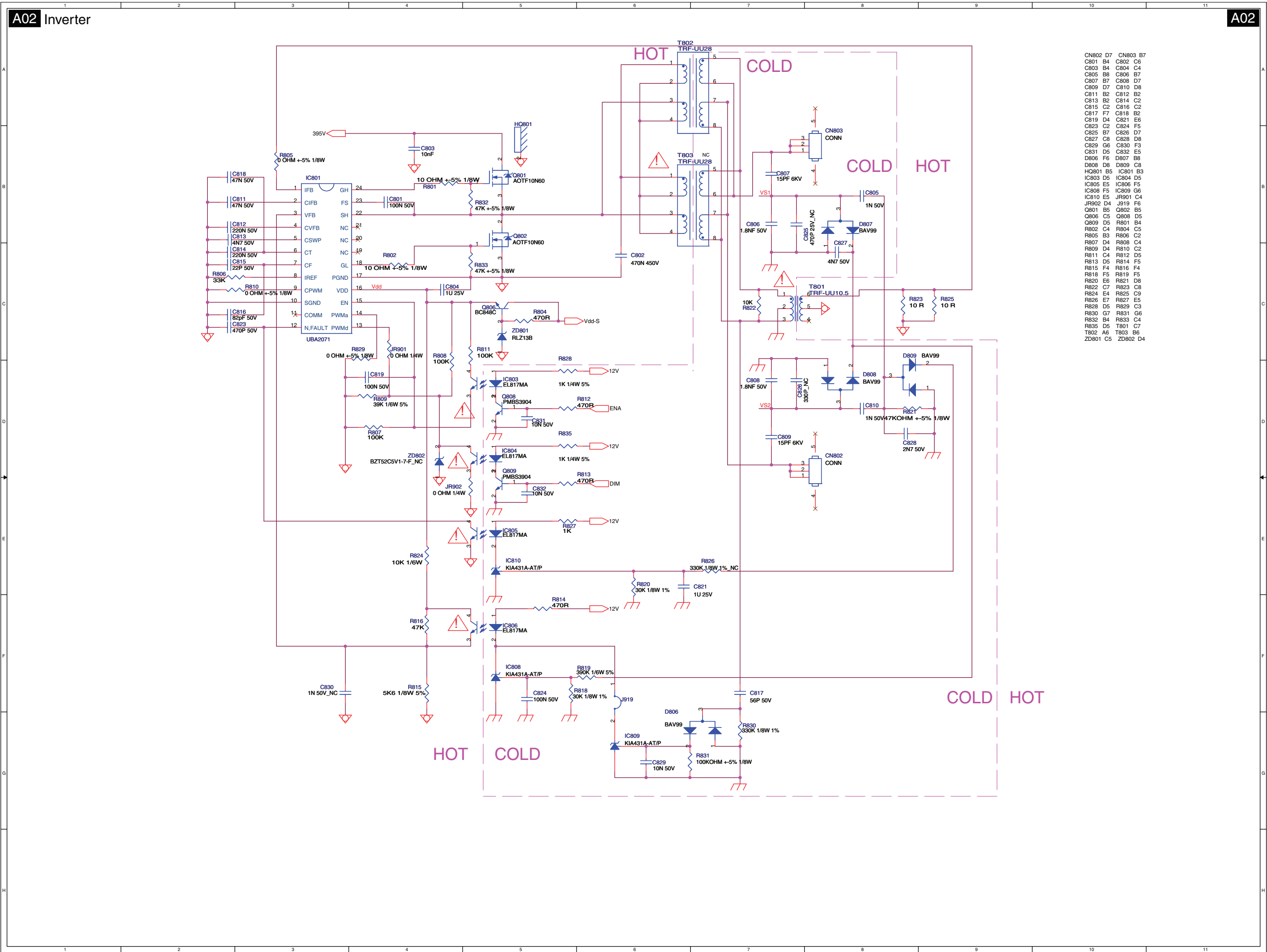
Layout Power Board 32" (Bottom Side)



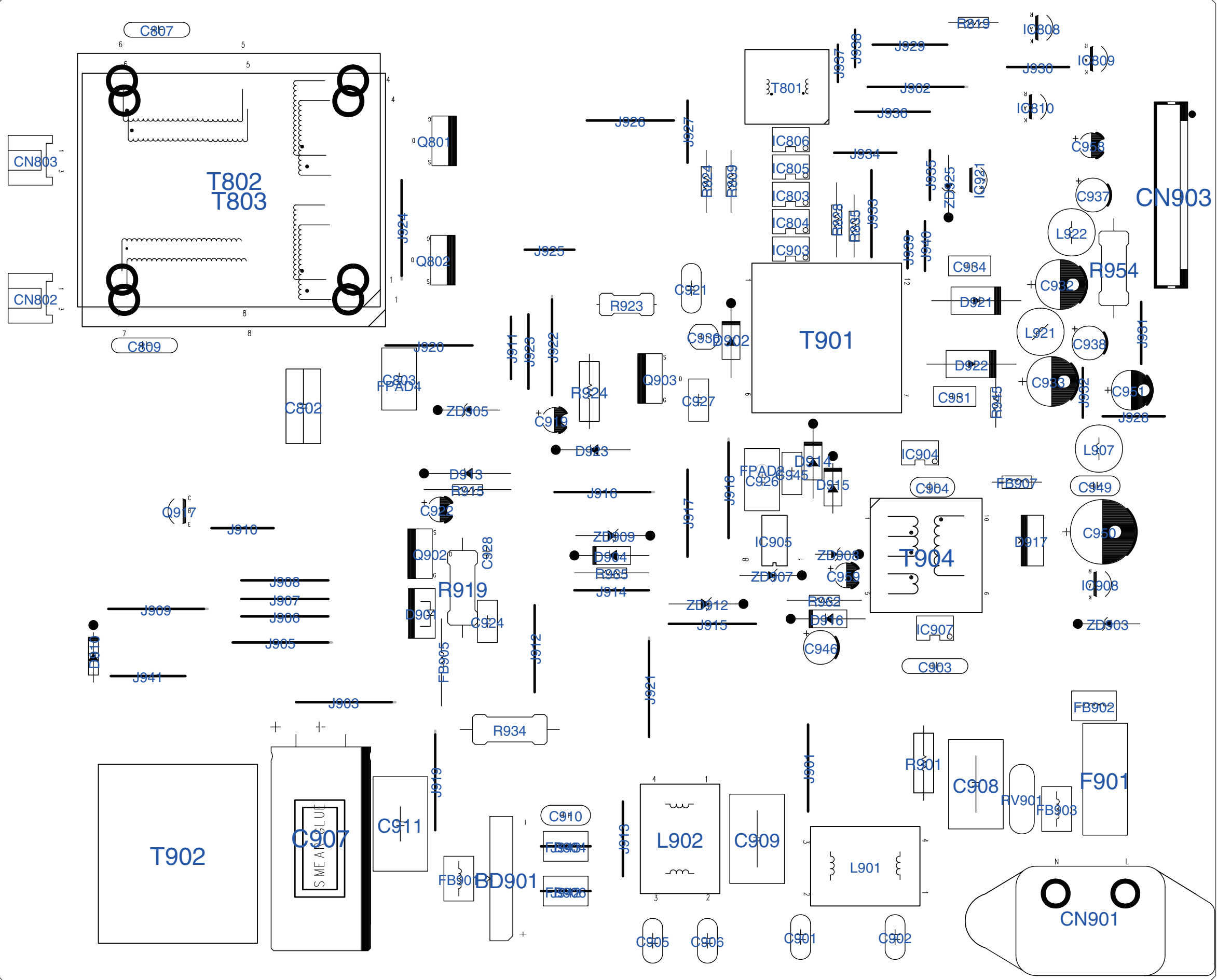
Power 42" & 47"



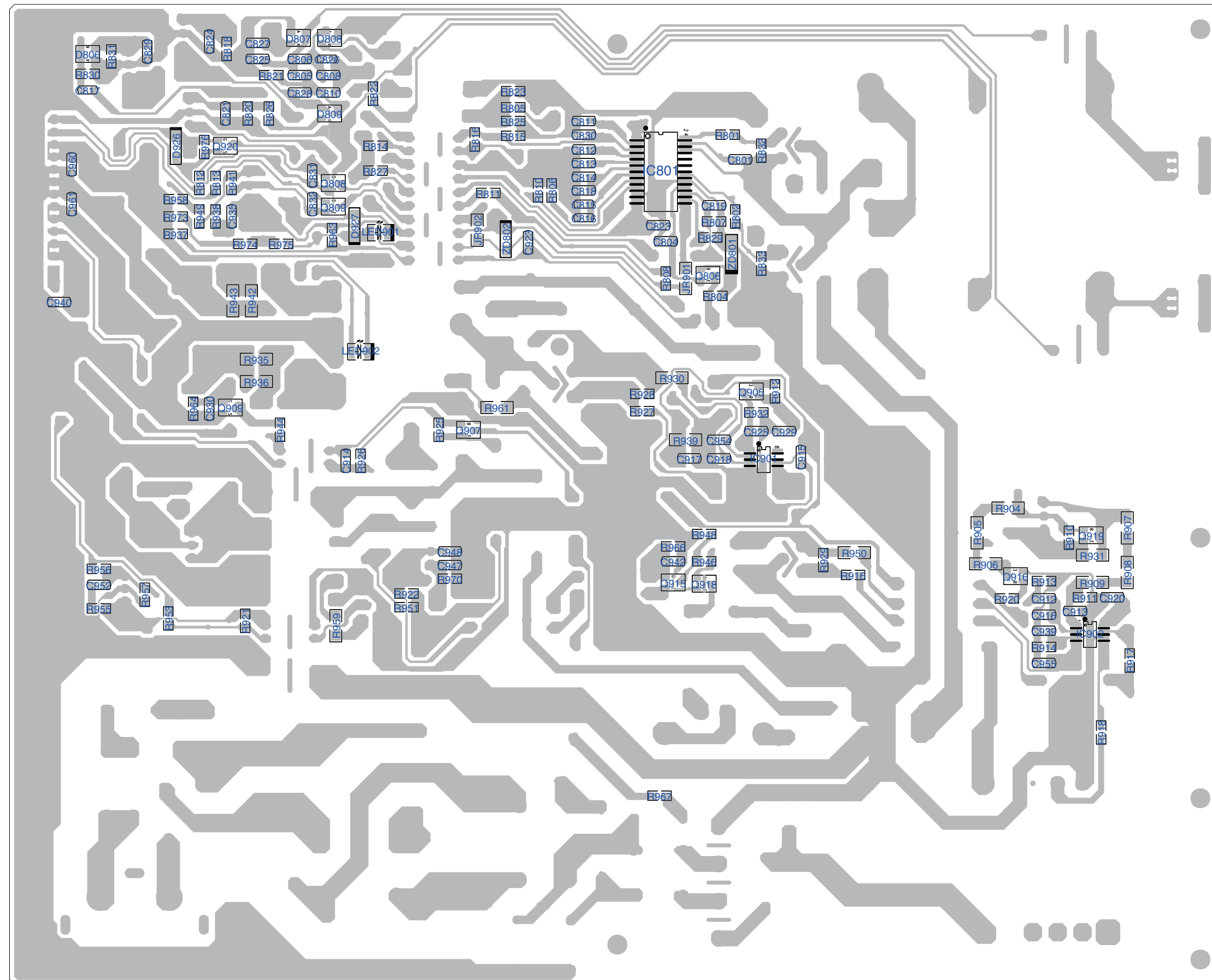
Inverter 42" & 47"



Layout Power Board, 42" & 47" (Top Side)





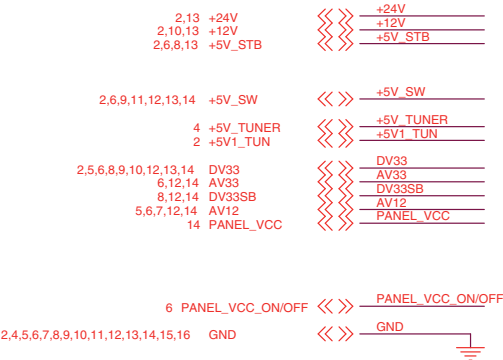
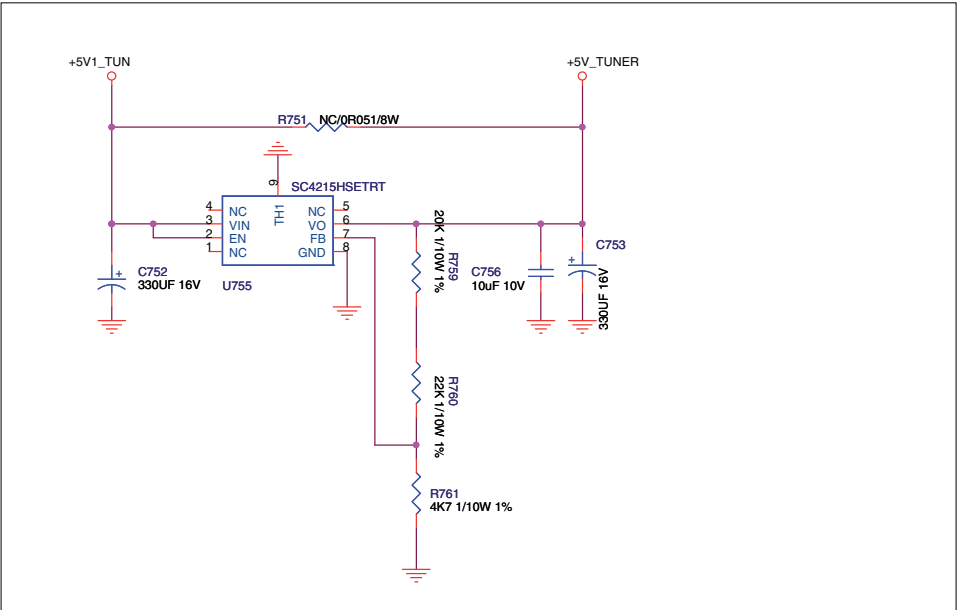
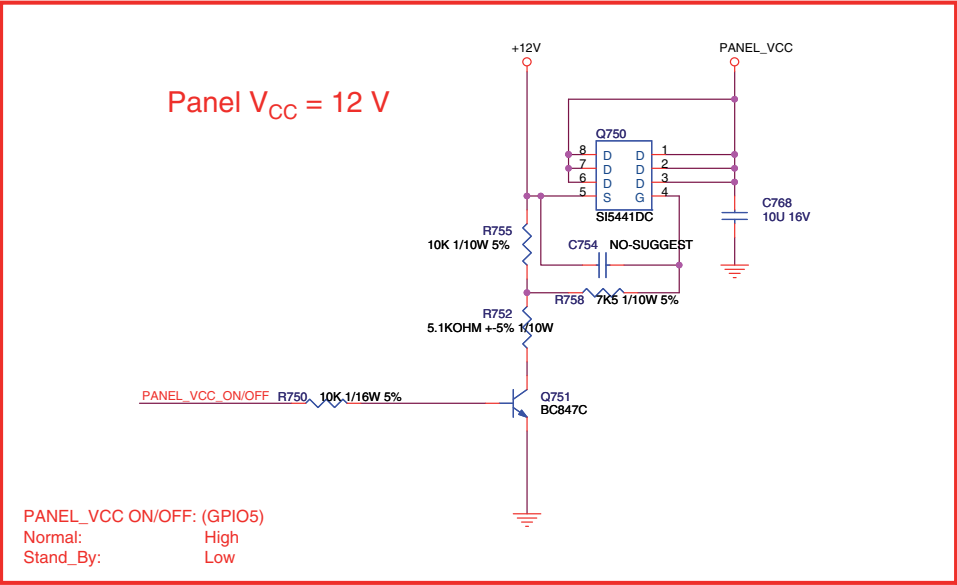
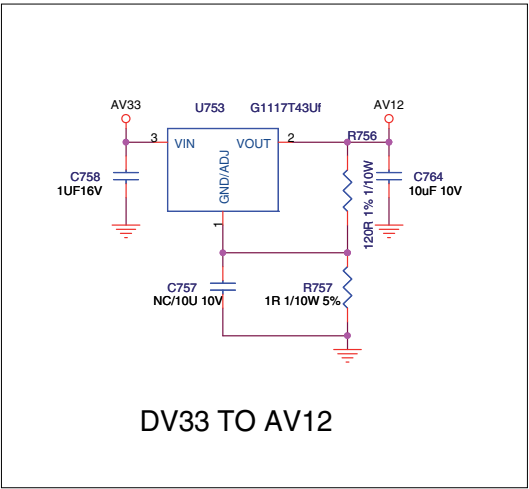
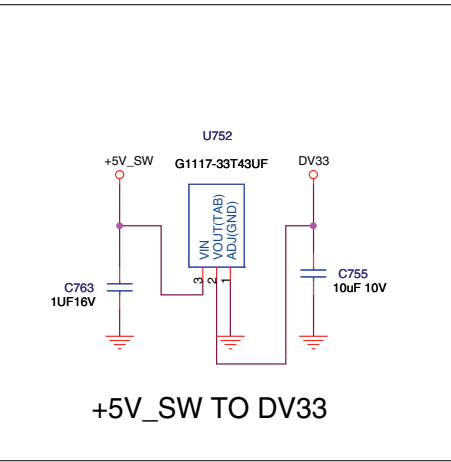
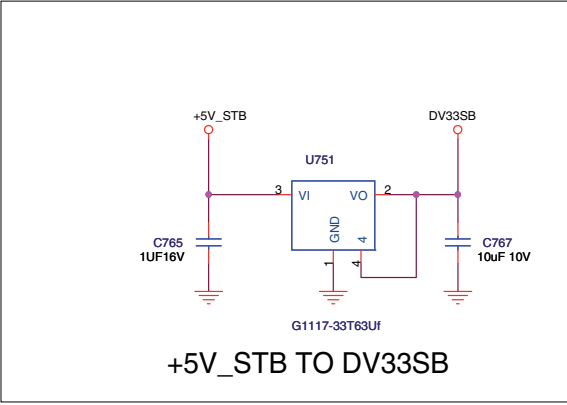
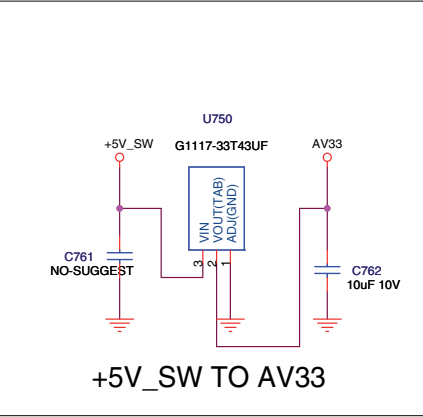




SSB: Power-2

B02 POWER-2

B02

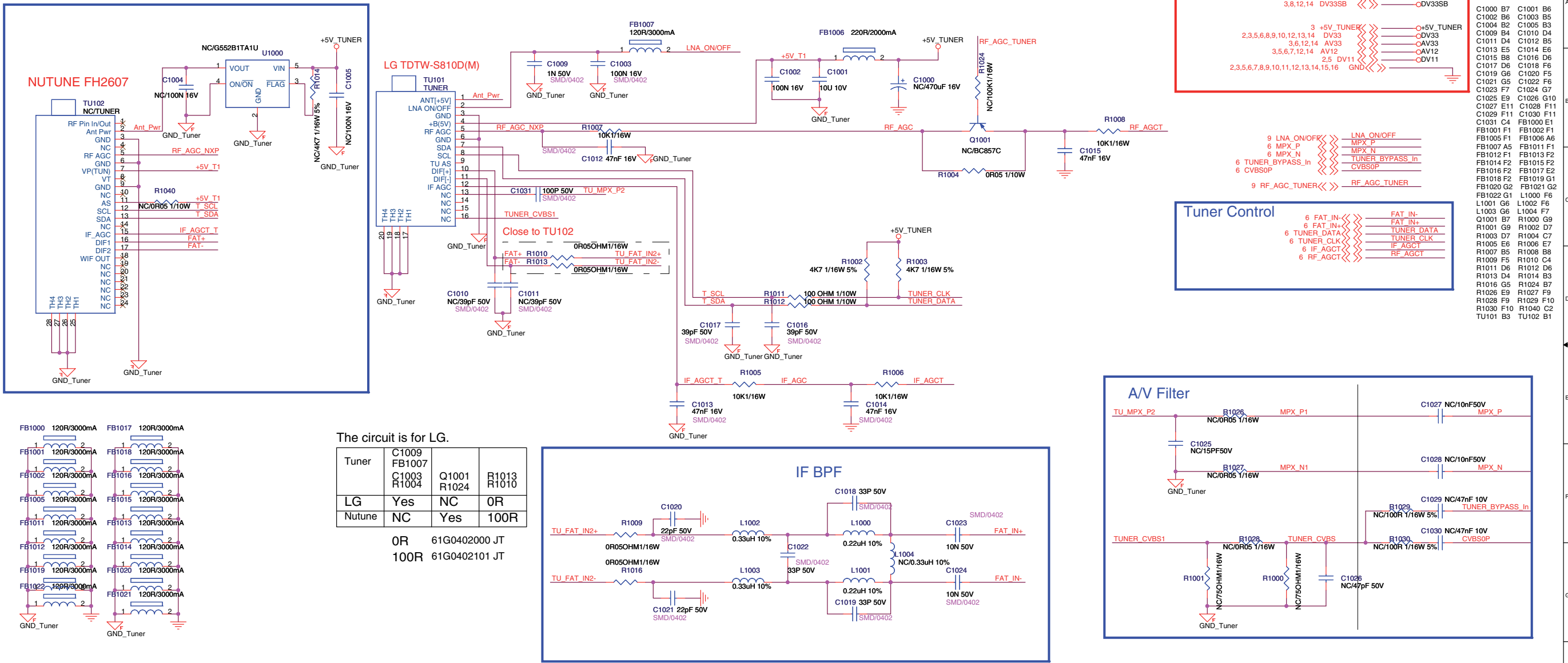


C752	E6	C753	E7
C754	C8	C755	E2
C756	E7	C757	E3
C758	E3	C761	C1
C762	C2	C763	E1
C764	E4	C765	C3
C767	C4	C768	B8
C750	B8	C751	C7
R750	C6	R751	E6
R752	C7	R755	B7
R756	E4	R757	E4
R758	C8	R759	E7
R760	F7	R761	F7
U750	B1	U751	B4
U752	E1	U753	D3

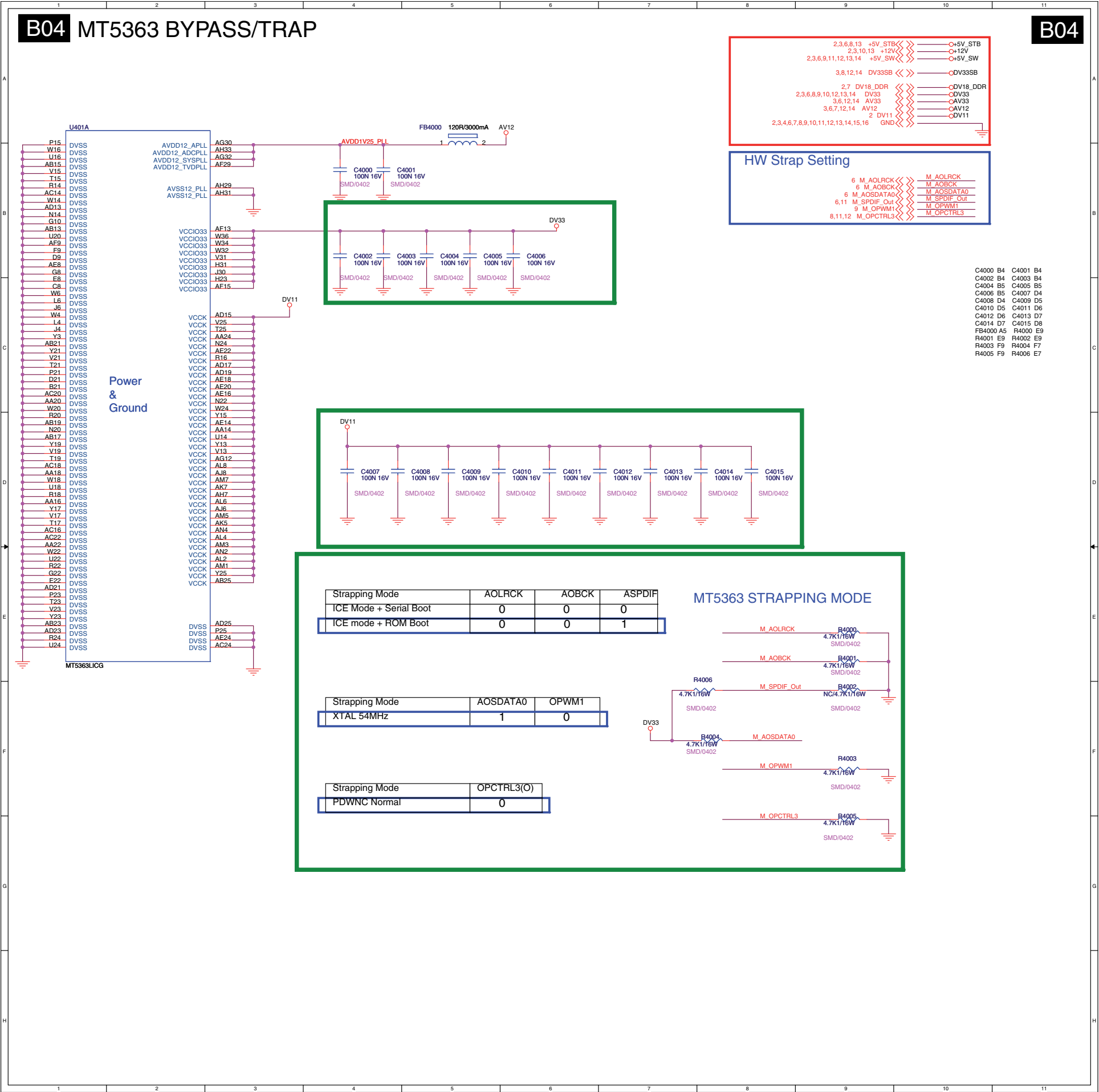
SSB: Tuner

B03 TUNER

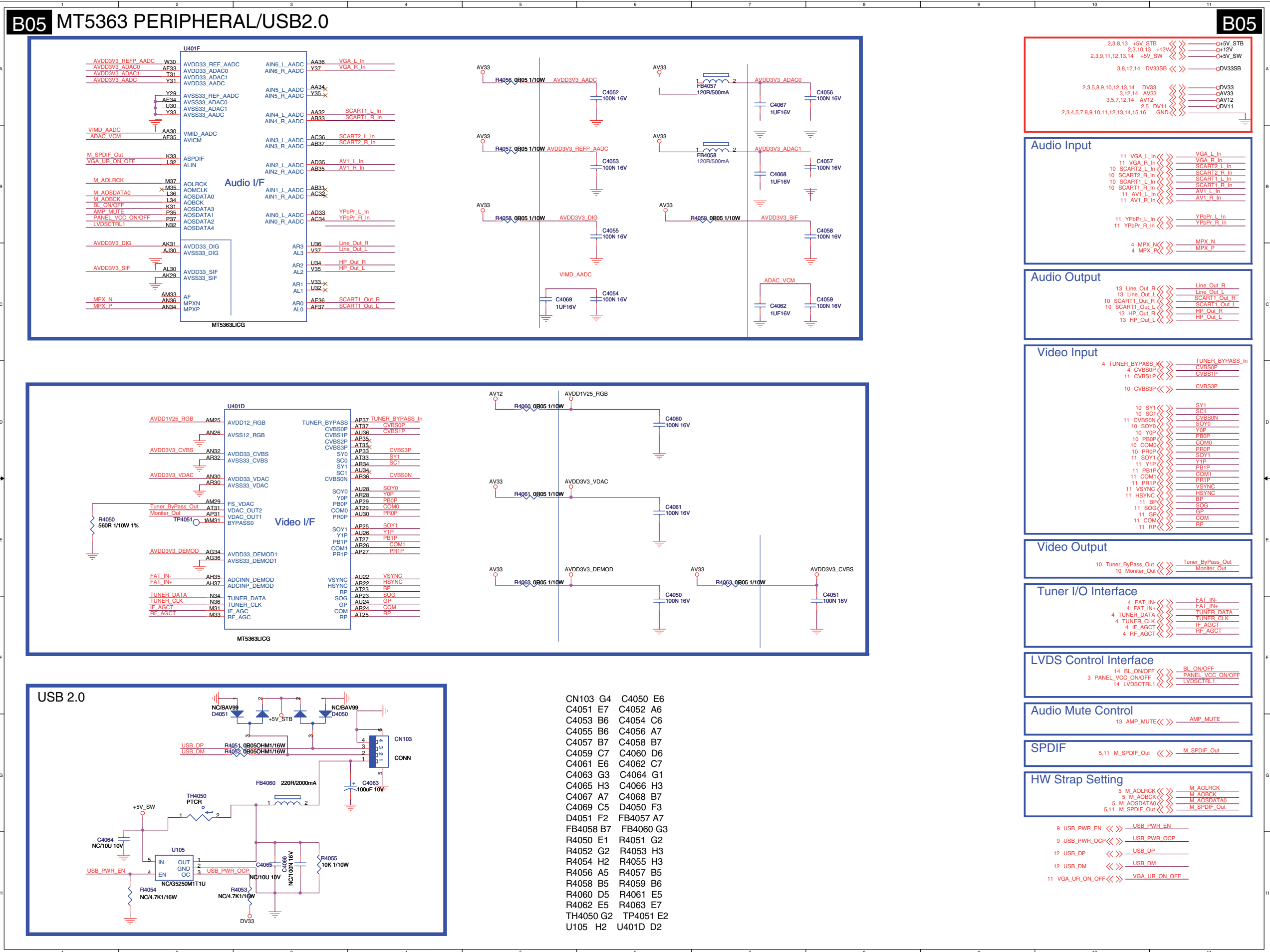
B03



**SSB: MT5363 By-pass/Trap**

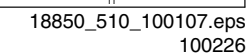


## SSB: MT5363 peripheral/USB2.0



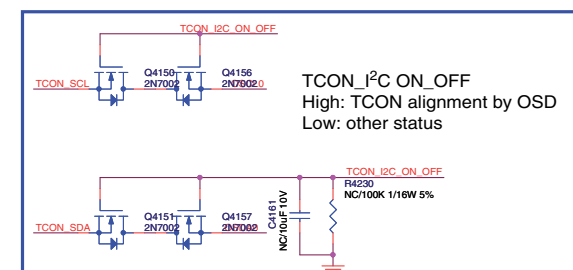


## B06 DDR2 MEMORY

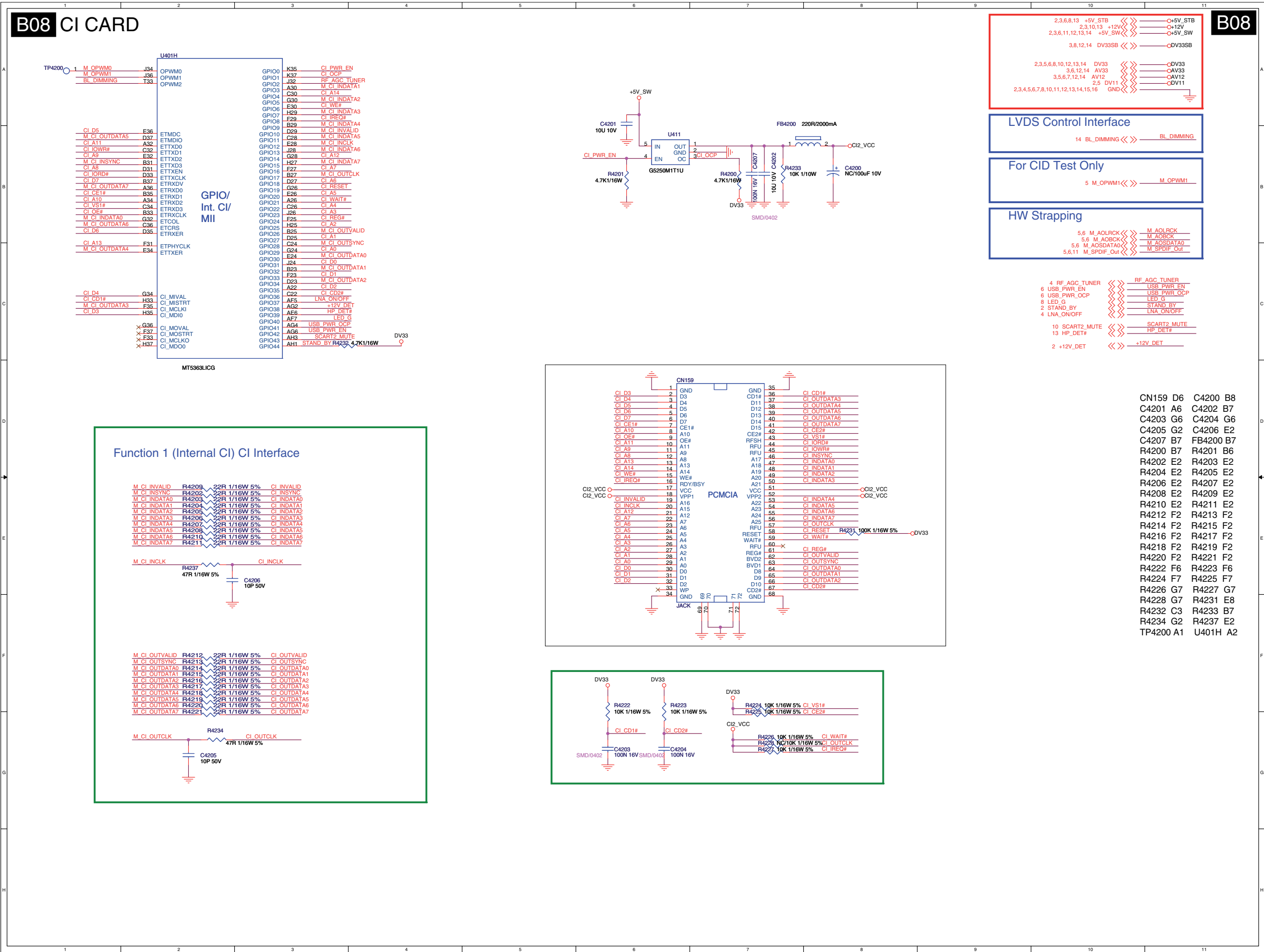


## B07 FLASH/JTAG/UART/IR

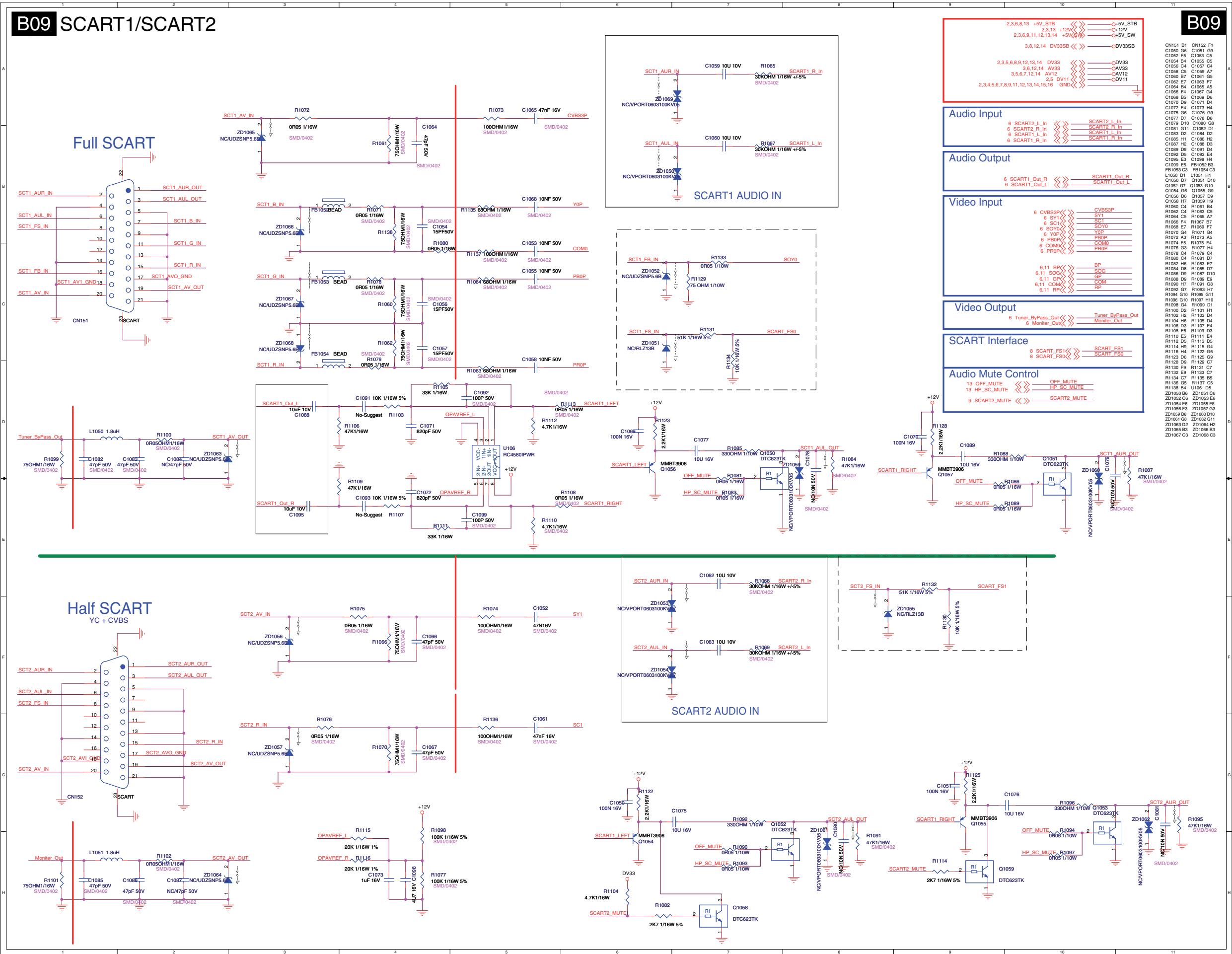
**B07**



SSB: CI card

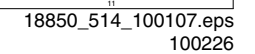


SSB: Scart1/Scart2



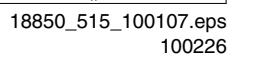
## B10 YPBPR/VGA INPUT

## B10





**B11** HDMI 1/ HDMI 2

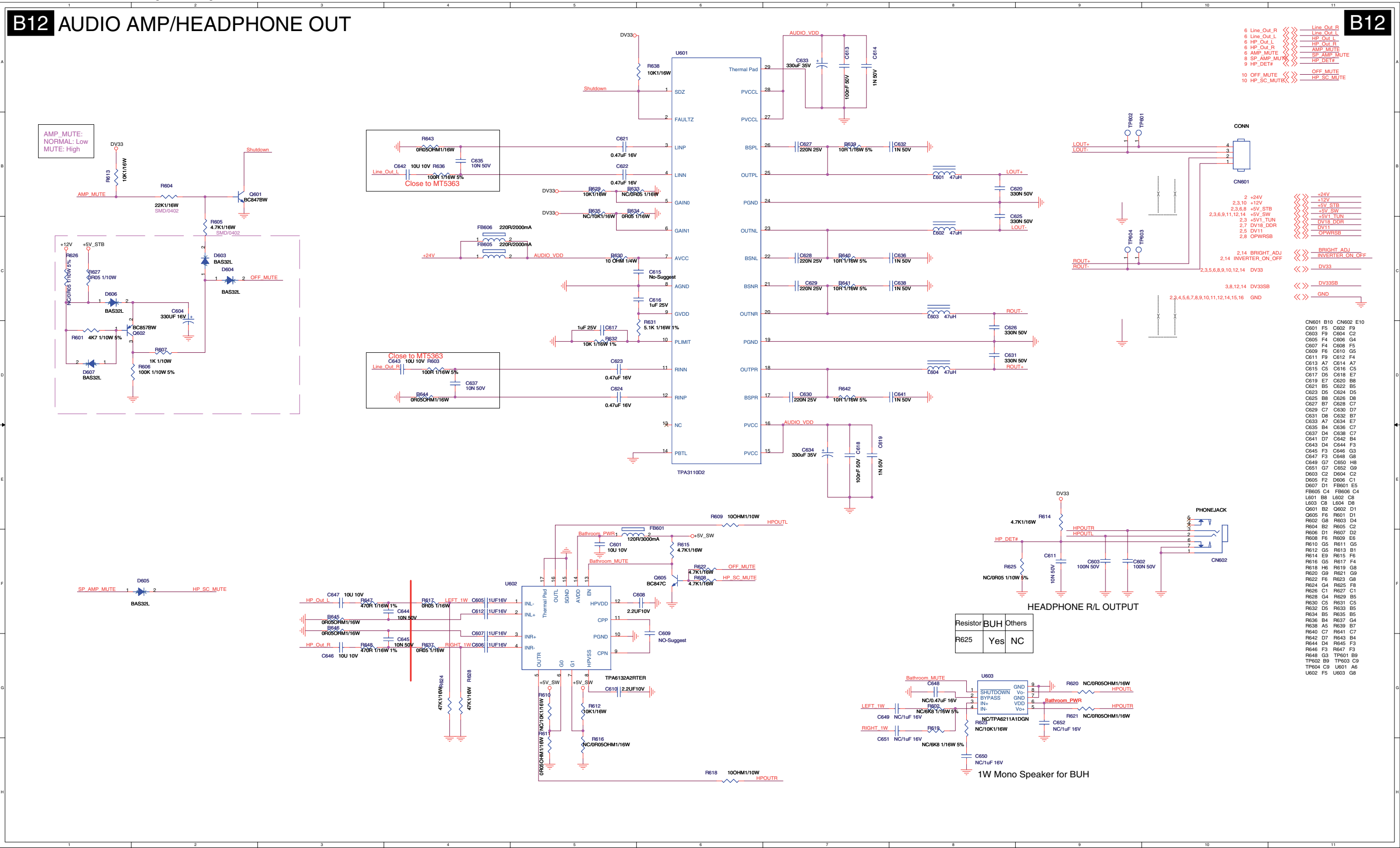




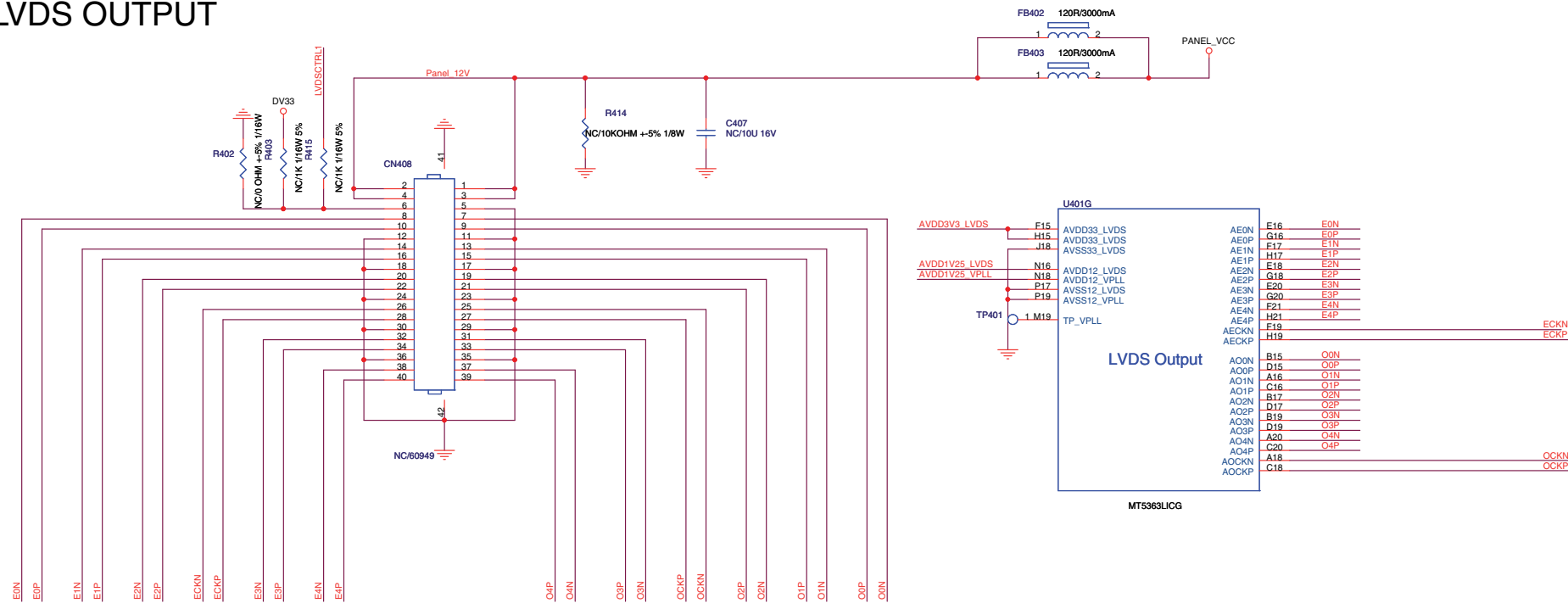
SSB: Audio Amp/Headphone out

B12 AUDIO AMP/HEADPHONE OUT

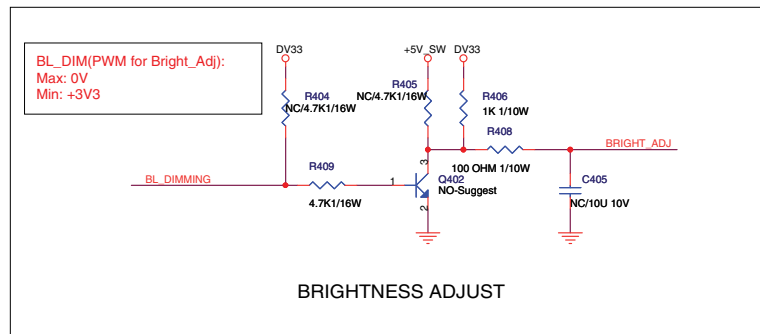
B12



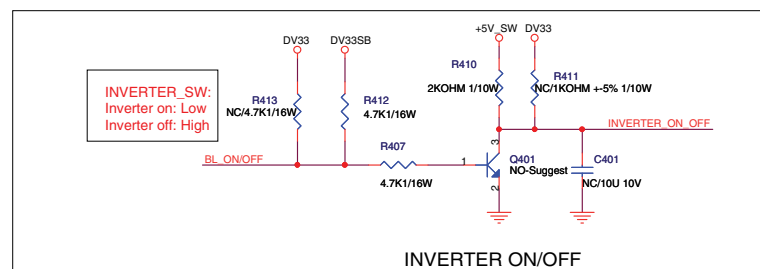
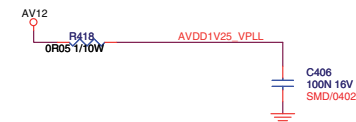
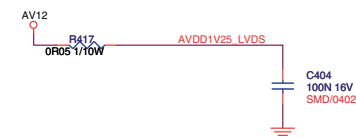
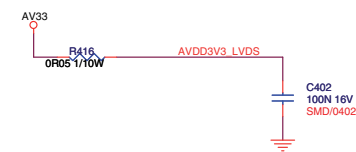
## B13 LVDS OUTPUT



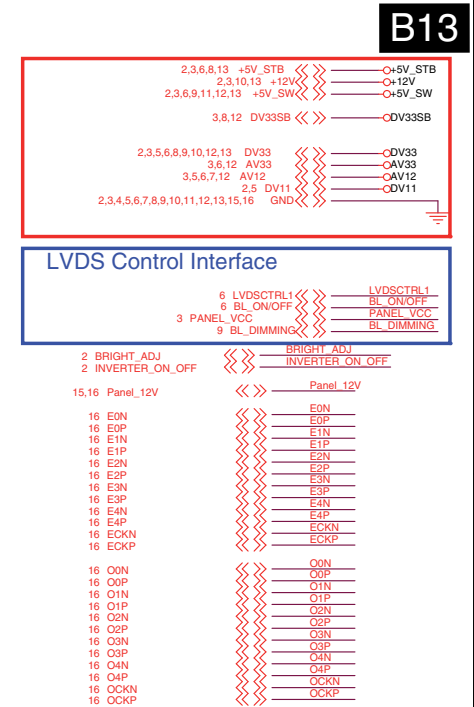
- FOR FULL HD PANEL -



BL CONTROL	R408	R406	C405
PWM CONTROL	100R	1K	N/C
DC CONTROL	5K6	1K	10U



INVERTER ON/OFF	R410	R411
3V3	N/C	1K
5V	2K	N/C

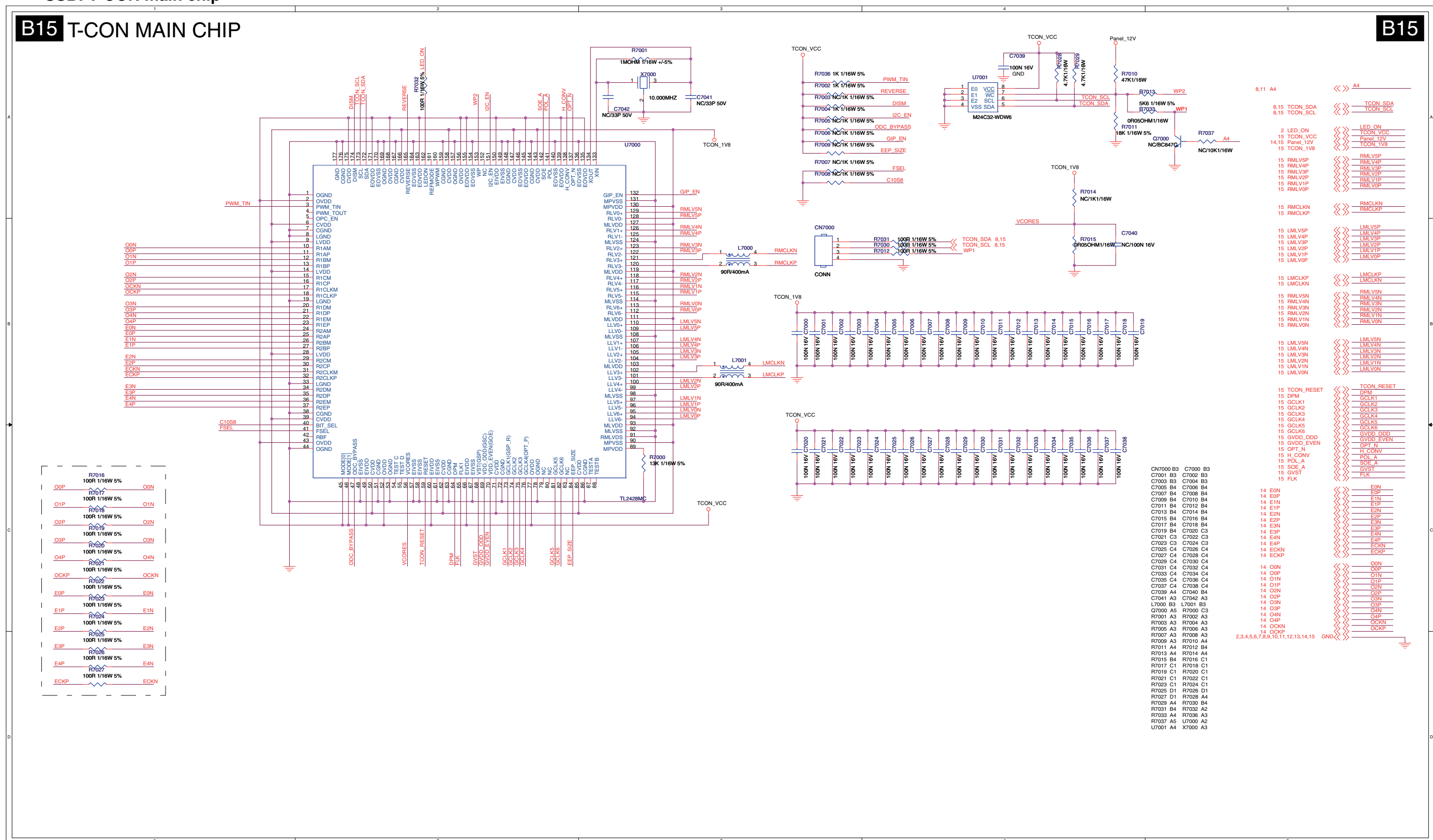


CN408	A3	C401	G3
C402	E7	C404	F7
C405	E3	C406	F7
C407	A4	FB402	A6
FB403	A6	Q401	G3
Q402	E2	R402	A2
R403	A2	R404	E2
R405	E2	R406	E3
R407	G2	R408	E3
R409	E2	R410	F3
R411	F3	R412	F2
R413	F2	R414	A4
R415	A3	R416	E6
R417	E6	R418	F6
TP401	B6	U401G	B6

**B14** T-CON POWER



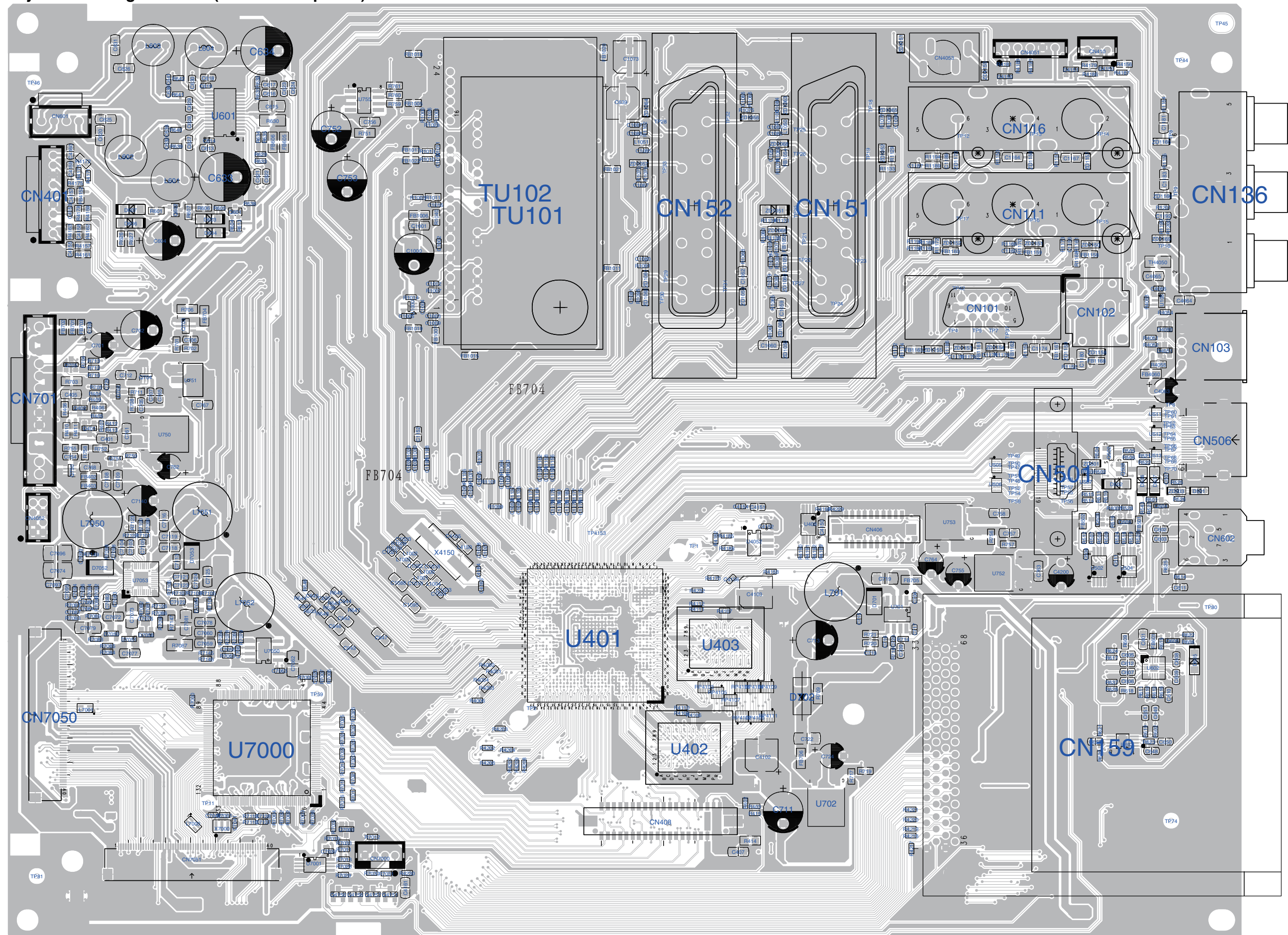
## B15 T-CON MAIN CHIP



2010-Oct-15

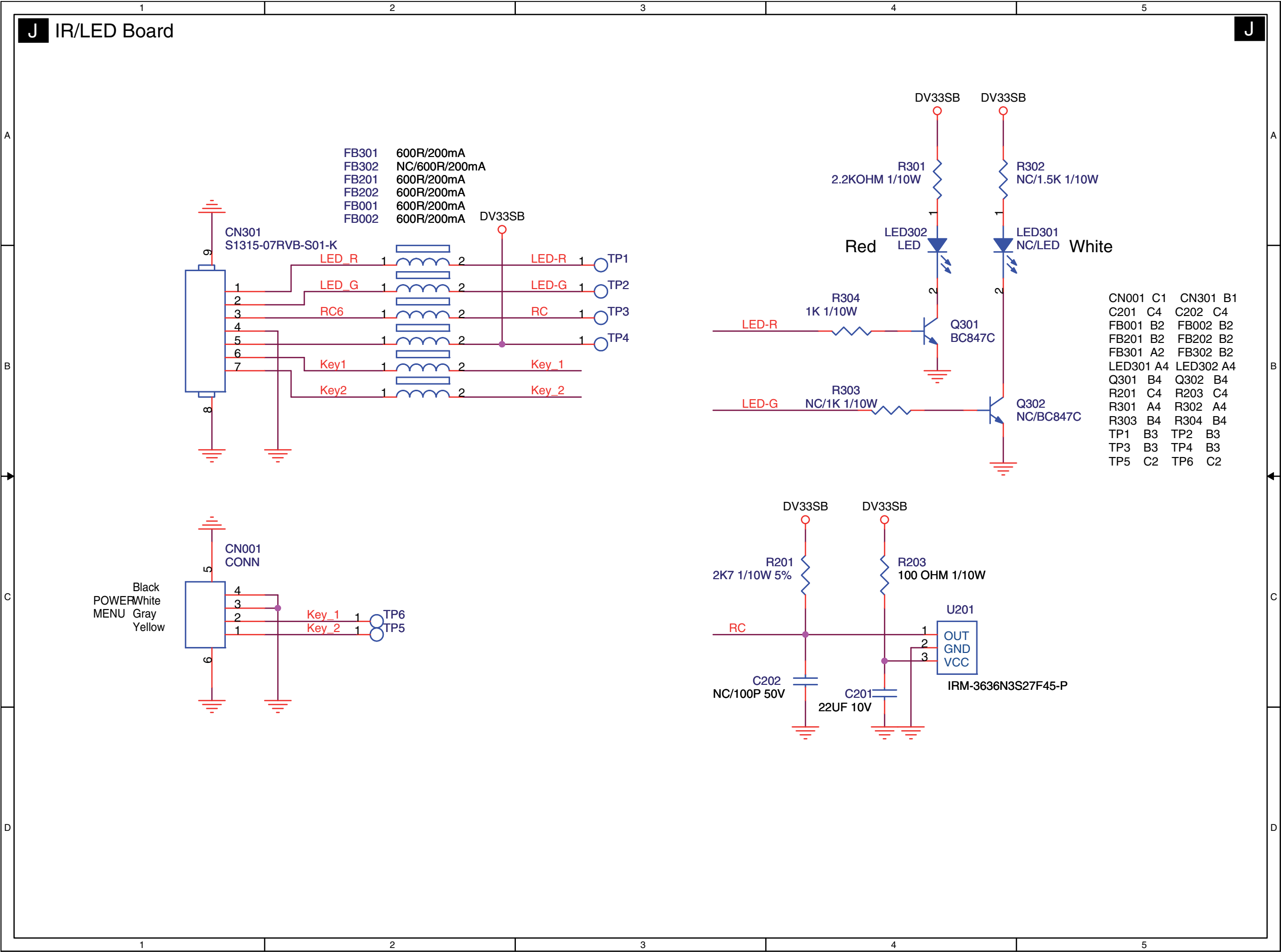


## Layout Small Signal Board (Overview Top Side)



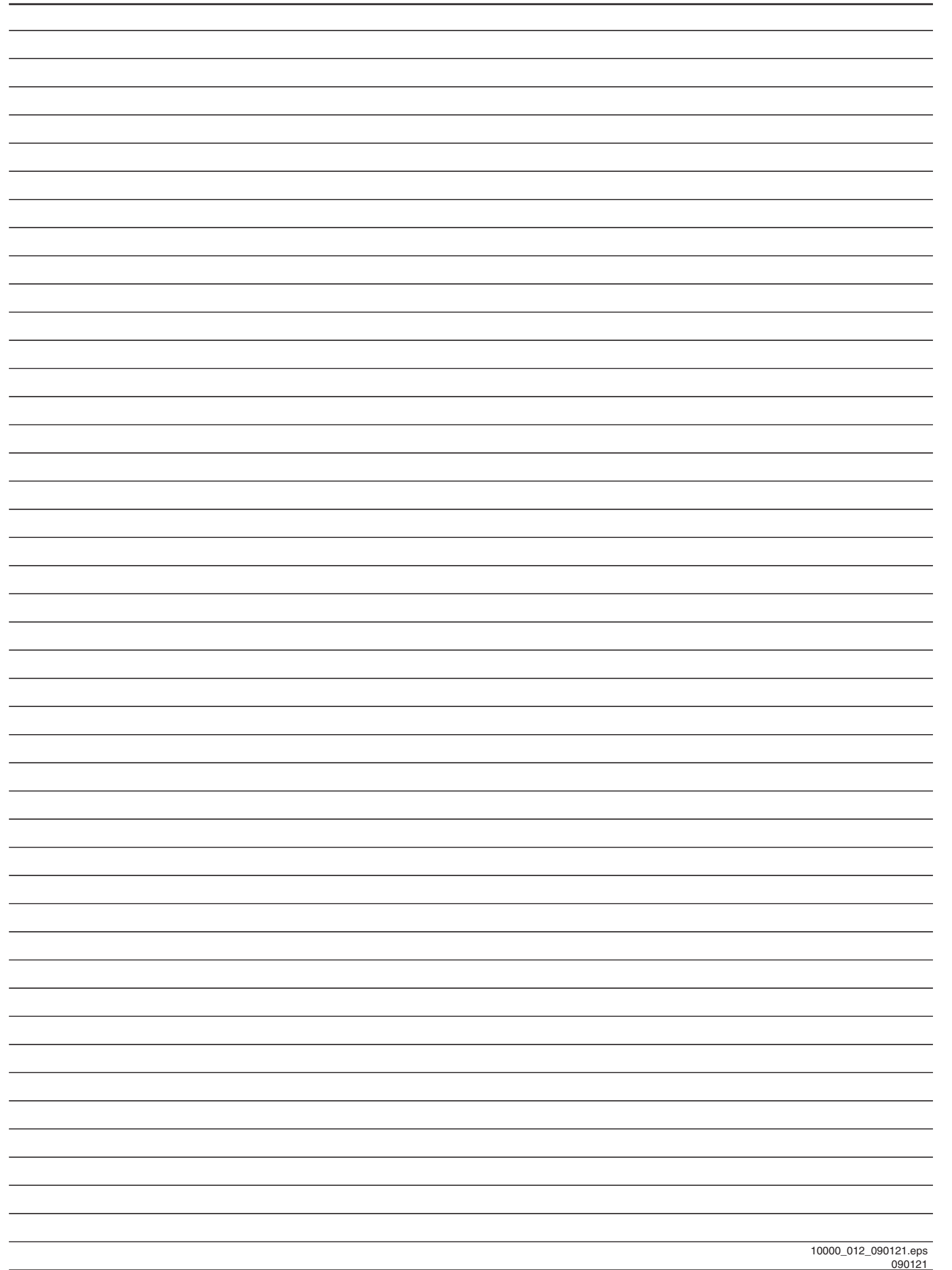


IR/LED Board





**Personal Notes:**

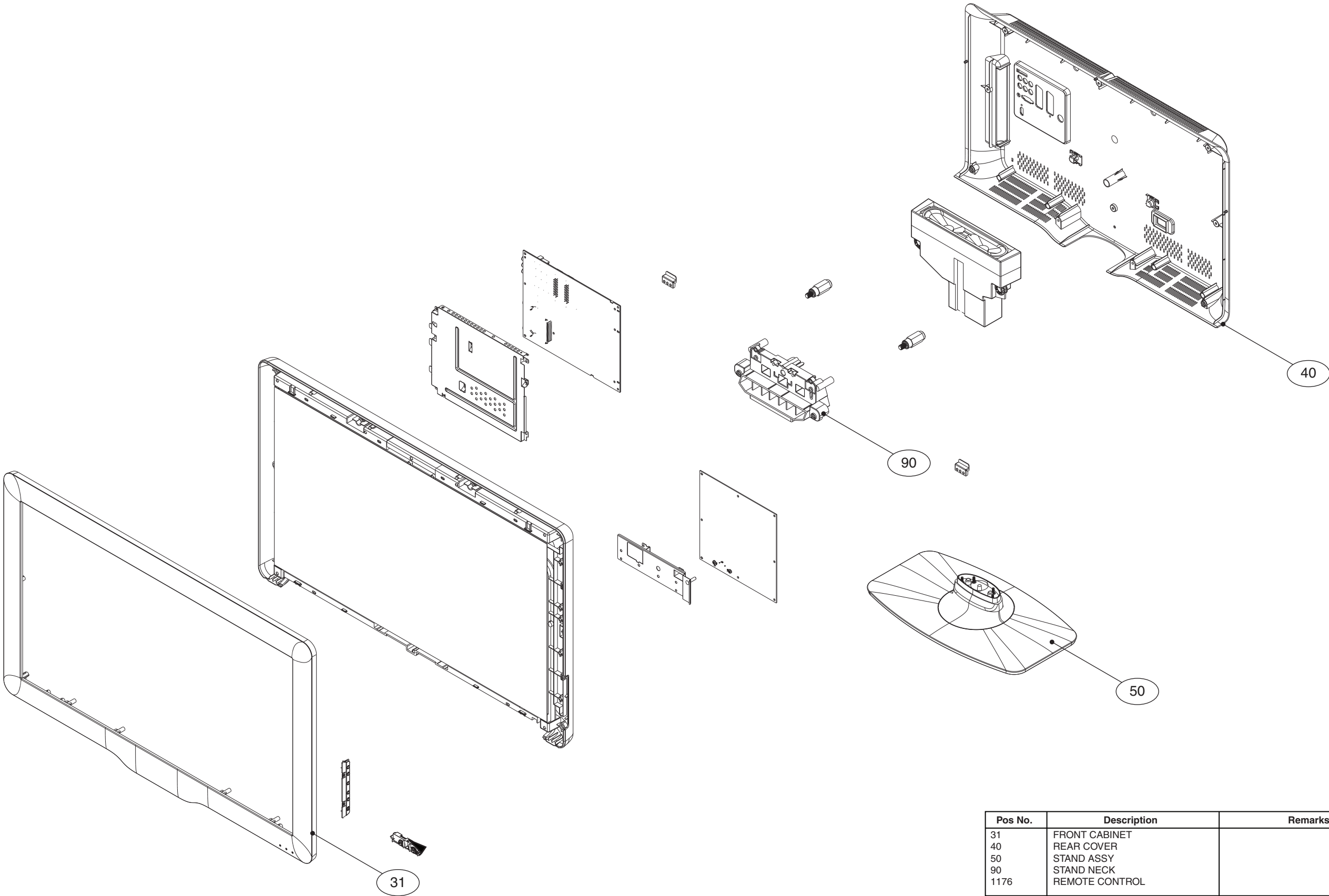


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090121

11. Styling Sheets

Styling Sheet 32"

DALI 32"

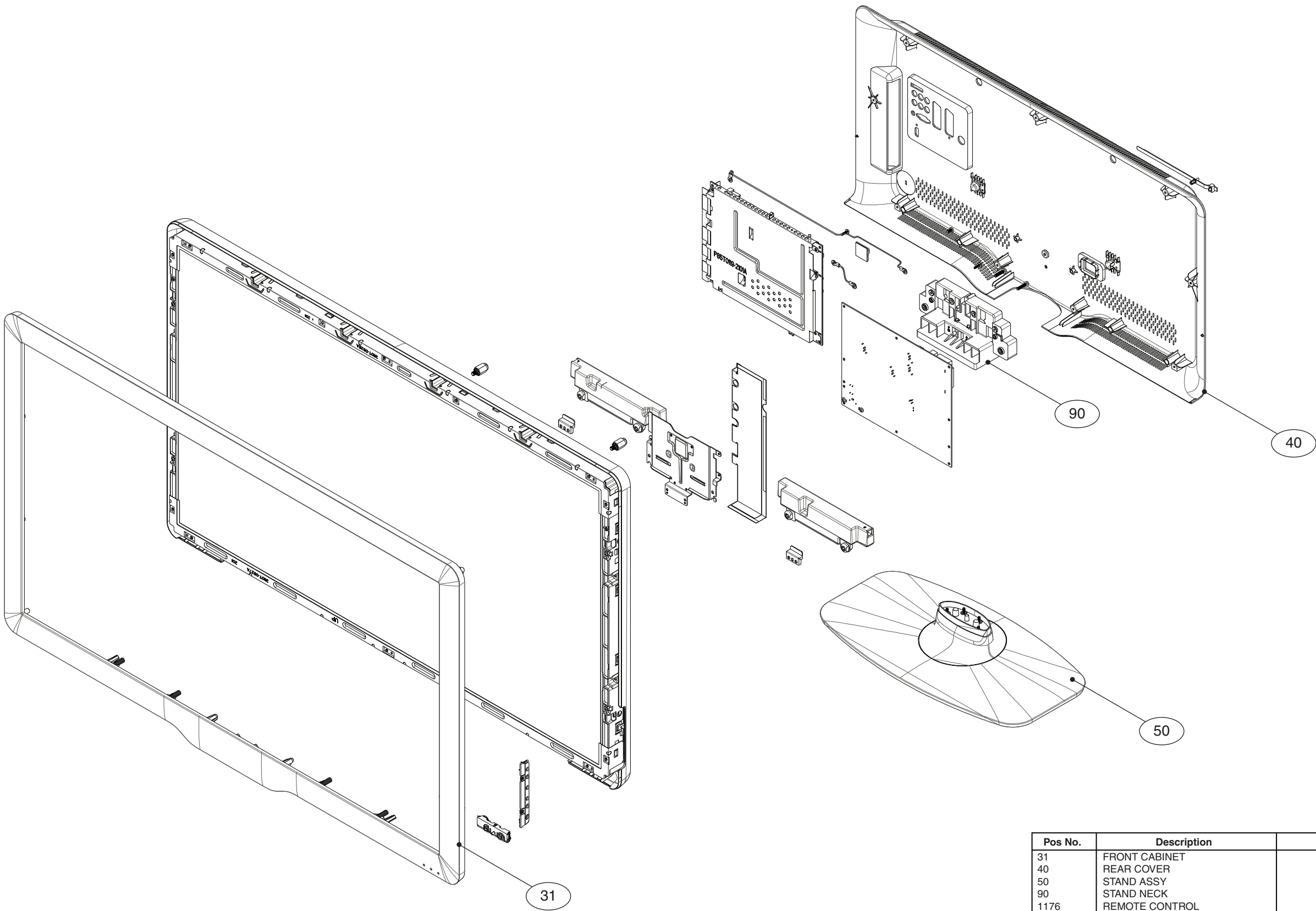


Pos No.	Description	Remarks
31	FRONT CABINET	
40	REAR COVER	
50	STAND ASSY	
90	STAND NECK	
1176	REMOTE CONTROL	

FOR ELECTRICAL PARTS/ASSEMBLIES SEE WIRING DIAGRAM CHAPTER 9

Styling Sheet 42"

DALI 42"

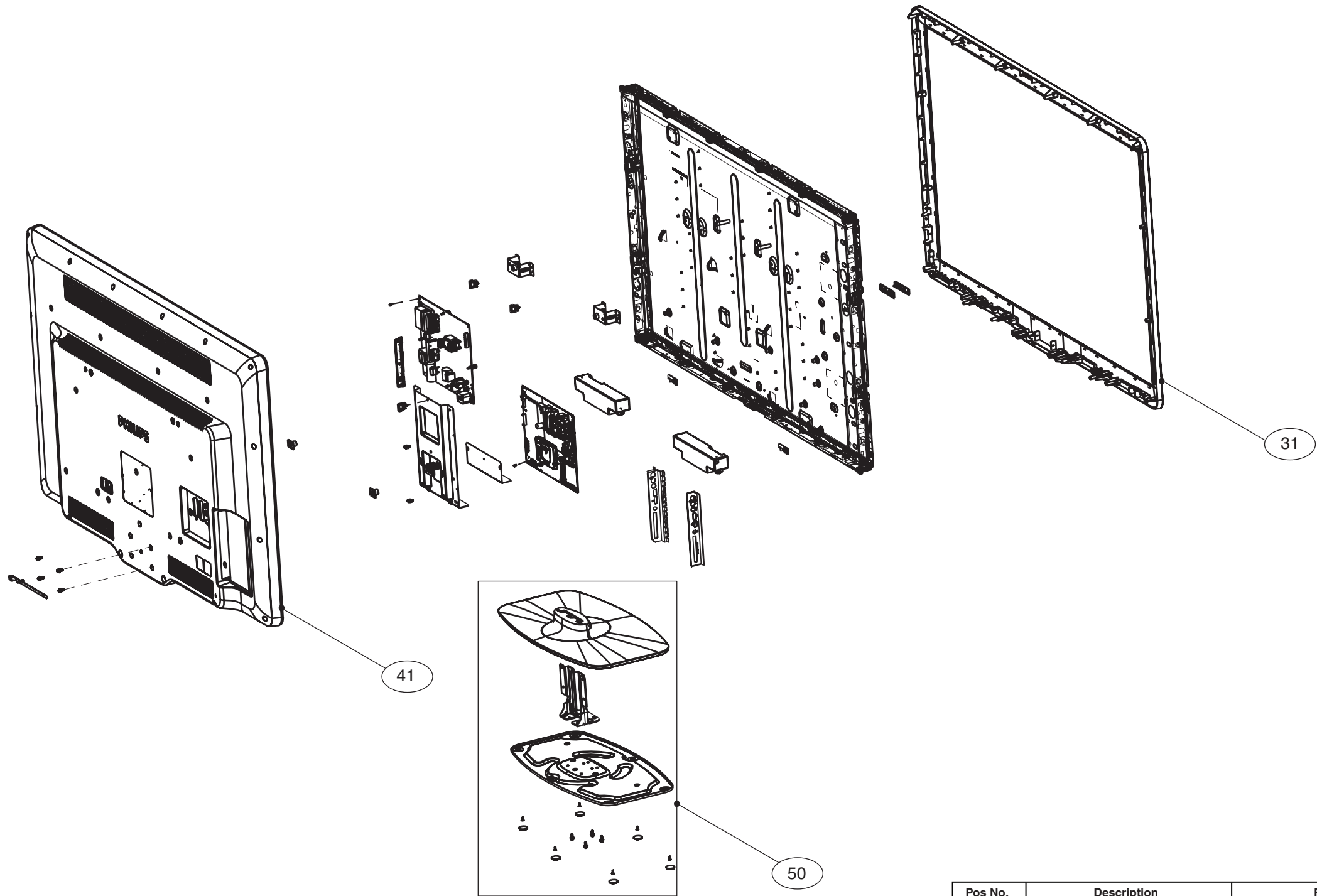


Pos No.	Description	Remarks
31	FRONT CABINET	
40	REAR COVER	
50	STAND ASSY	
90	STAND NECK	
1176	REMOTE CONTROL	

FOR ELECTRICAL PARTS/ASSEMBLIES SEE WIRING DIAGRAM CHAPTER 9

Styling Sheet 47"

DALI 47"



Pos No.	Description	Remarks
31	FRONT CABINET	
41	REAR COVER	
50	STAND ASSY	
1176	REMOTE CONTROL	

FOR ELECTRICAL PARTS/ASSEMBLIES SEE WIRING DIAGRAM CHAPTER 9