Colour Television

Chassis

TPM5.1E

LA

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Service Manual

Published by MB/WS 1070 BU TV Consumer Care, the Netherlands

Subject to modification

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PHILIPS

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:

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
32HFL3232D/10	Dali	3122 785 18852
32PFL3205H/12	Dali	3122 785 18850
32PFL3605H/12	Dali	3122 785 18850
42PFL3605H/12	Dali	3122 785 18850
47PFL3605H/12	Dali	3122 785 18851
47PFL3605H/60	Dali	3122 785 18851

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

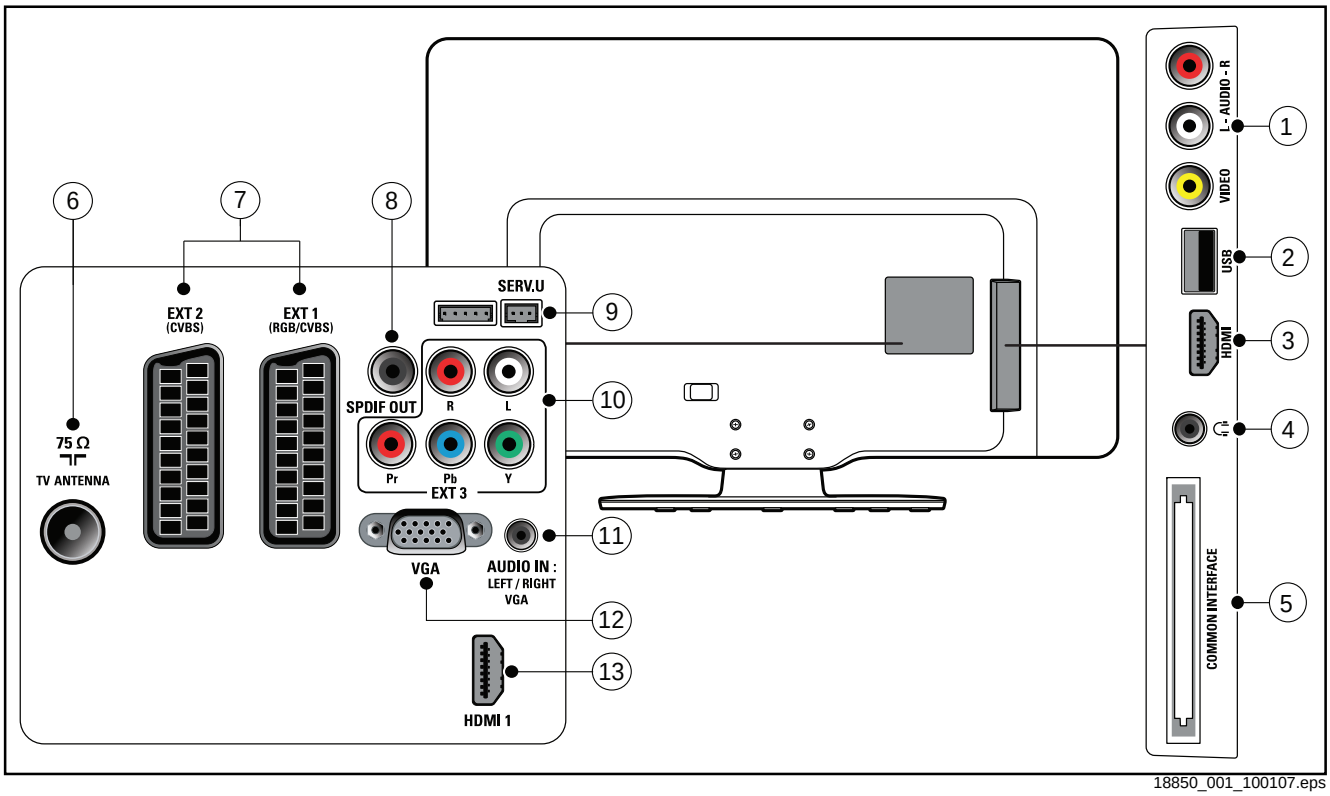

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Figure 2-1 Connection overview

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_{PP} / 75 Ω
Rd	- Audio R	0.5 V_{RMS} / 10 kΩ
Wh	- Audio L	0.5 V_{RMS} / 10 kΩ

2 - USB2.0

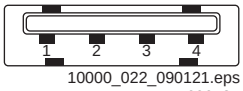

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Figure 2-2 USB (type A)

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

3 - HDMI: Digital Video, Digital Audio - In

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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

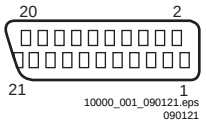

Figure 2-4 SCART connector

1	- Audio R	0.5 V_{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	

8 - Cinch: S/PDIF - Out

Bk	- Coaxial	0.4 - 0.6V_{PP} / 75 ohm	

9 - Service / UART

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

10 - EXT3: 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	
Wh	- Audio - L	0.5 V_{RMS} / 10 kW	
Rd	- Audio - R	0.5 V_{RMS} / 10 kW	

11 - Audio - In: Left / Right, VGA

Gn	- Audio L/R in	0.5 V_{RMS} / 10 kW	

12 - PC IN:VGA

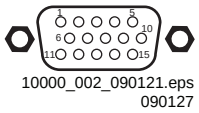

Figure 2-5 VGA connector

1	- Video Red	0.7 V_{PP} / 75 Ω	
2	- Video Green	0.7 V_{PP} / 75 Ω	
3	- Video Blue	0.7 V_{PP} / 75 Ω	
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	

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

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: AG**2**B0335000001) 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: AG**1**B033500001), then the TV set has been manufactured according to B.O.M. number 1. If the third digit is a “2” (example: AG**2**B0335000001), then the set has been produced according to B.O.M. no. 2. This is important for ordering the correct spare parts!
For the third digit, the numbers 1...9 and the characters A...Z can be used, so in total: 9 plus 26= 35 different B.O.M.s can be indicated by the third digit of the serial number.

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

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Figure 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
DMSD	Digital Multi Standard Decoding
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
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
DVB-C	Digital Video Broadcast - Cable
DVB-T	Digital Video Broadcast - Terrestrial
DVD	Digital Versatile Disc
DVI(-d)	Digital Visual Interface (d= digital only)
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.
EDID	Extended Display Identification Data (VESA standard)
EEPROM	Electrically Erasable and Programmable Read Only Memory
EMI	Electro Magnetic Interference
EPG	Electronic Program Guide
EPLD	Erasable Programmable Logic Device
EU	Europe
EXT	EXTernal (source), entering the set by SCART or by cinches (jacks)
FDS	Full Dual Screen (same as FDW)
FDW	Full Dual Window (same as FDS)
FLASH	FLASH memory
FM	Field Memory or Frequency Modulation
FPGA	Field-Programmable Gate Array
FTV	Flat TeleVision
Gb/s	Giga bits per second
G-TXT	Green TeleteXT
H	H_sync to the module
HD	High Definition
HDD	Hard Disk Drive
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.
HDMI	High Definition Multimedia Interface
HP	HeadPhone
I	Monochrome TV system. Sound carrier distance is 6.0 MHz
I^2C	Inter IC bus
I^2D	Inter IC Data bus
I^2S	Inter IC Sound bus
IF	Intermediate Frequency
IR	Infra Red
IRQ	Interrupt Request
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. Uncompressed digital component or digital composite signals can be used. 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.
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
LATAM	Latin America
LCD	Liquid Crystal Display
LED	Light Emitting Diode
L/L'	Monochrome TV system. Sound carrier distance is 6.5 MHz. L' is Band I, L is all bands except for Band I
LPL	LG.Philips LCD (supplier)
LS	Loudspeaker
LVDS	Low Voltage Differential Signalling
Mbps	Mega bits per second
M/N	Monochrome TV system. Sound carrier distance is 4.5 MHz
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
MIPS	Microprocessor without Interlocked Pipeline-Stages; A RISC-based microprocessor
MOP	Matrix Output Processor
MOSFET	Metal Oxide Silicon Field Effect Transistor, switching device
MPEG	Motion Pictures Experts Group
MPIF	Multi Platform InterFace
MUTE	MUTE Line
MTV	Mainstream TV: TV-mode with Consumer TV features enabled (iTV)
NC	Not Connected
NICAM	Near Instantaneous Compounded Audio Multiplexing. This is a digital sound system, mainly used in Europe.
NTC	Negative Temperature Coefficient, non-linear resistor
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)
NVM	Non-Volatile Memory: IC containing TV related data such as alignments
O/C	Open Circuit
OSD	On Screen Display
OAD	Over the Air Download. Method of software upgrade via RF transmission. Upgrade software is broadcasted in TS with TV channels.
OTC	On screen display Teletext and Control; also called Artistic (SAA5800)
P50	Project 50: communication protocol between TV and peripherals
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)
PCB	Printed Circuit Board (same as “PWB”)
PCM	Pulse Code Modulation
PDP	Plasma Display Panel
PFC	Power Factor Corrector (or Pre-conditioner)
PIP	Picture In Picture
PLL	Phase Locked Loop. Used for e.g. FST tuning systems. The customer can give directly the desired frequency
POD	Point Of Deployment: a removable CAM module, implementing the CA system for a host (e.g. a TV-set)
POR	Power On Reset, signal to reset the uP
PSDL	Power Supply for Direct view LED backlight with 2D-dimming
PSL	Power Supply with integrated LED drivers
PSLS	Power Supply with integrated LED drivers with added Scanning functionality
PTC	Positive Temperature Coefficient, non-linear resistor
PWB	Printed Wiring Board (same as “PCB”)
PWM	Pulse Width Modulation
QRC	Quasi Resonant Converter
QTNR	Quality Temporal Noise Reduction
QVCP	Quality Video Composition Processor
RAM	Random Access Memory
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.
RC	Remote Control
RC5 / RC6	Signal protocol from the remote control receiver
RESET	RESET signal
ROM	Read Only Memory
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^2C
SCL-F	CLock Signal on Fast I^2C bus
SD	Standard Definition
SDA	Serial Data I^2C
SDA-F	DAta Signal on Fast I^2C bus
SDI	Serial Digital Interface, see “ITU-656”
SDRAM	Synchronous DRAM
SECAM	SEequence 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)
SVHS	Super Video Home System
SW	Software
SWAN	Spatial temporal Weighted Averaging Noise reduction
SXGA	1280 × 1024
TFT	Thin Film Transistor
THD	Total Harmonic Distortion
TMDS	Transmission Minimized Differential Signalling
TS	Transport Stream
TXT	TeleteXT
TXT-DW	Dual Window with TeleteXT
UI	User Interface
uP	Microprocessor
UXGA	1600 × 1200 (4:3)
V	V-sync to the module
VESA	Video Electronics Standards Association
VGA	640 × 480 (4:3)
VL	Variable Level out: processed audio output toward external amplifier
VSB	Vestigial Side Band; modulation method
WYSIWYR	What You See Is What You Record: record selection that follows main picture and sound
WXGA	1280 × 768 (15:9)
XTAL	Quartz crystal
XGA	1024 × 768 (4:3)
Y	Luminance signal
Y/C	Luminance (Y) and Chrominance (C) signal
YPbPr	Component video. Luminance and scaled color difference signals (B-Y and R-Y)
YUV	Component video

4. Mechanical Instructions

Index of this chapter:

Notes:

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

4.1 Cable Dressing

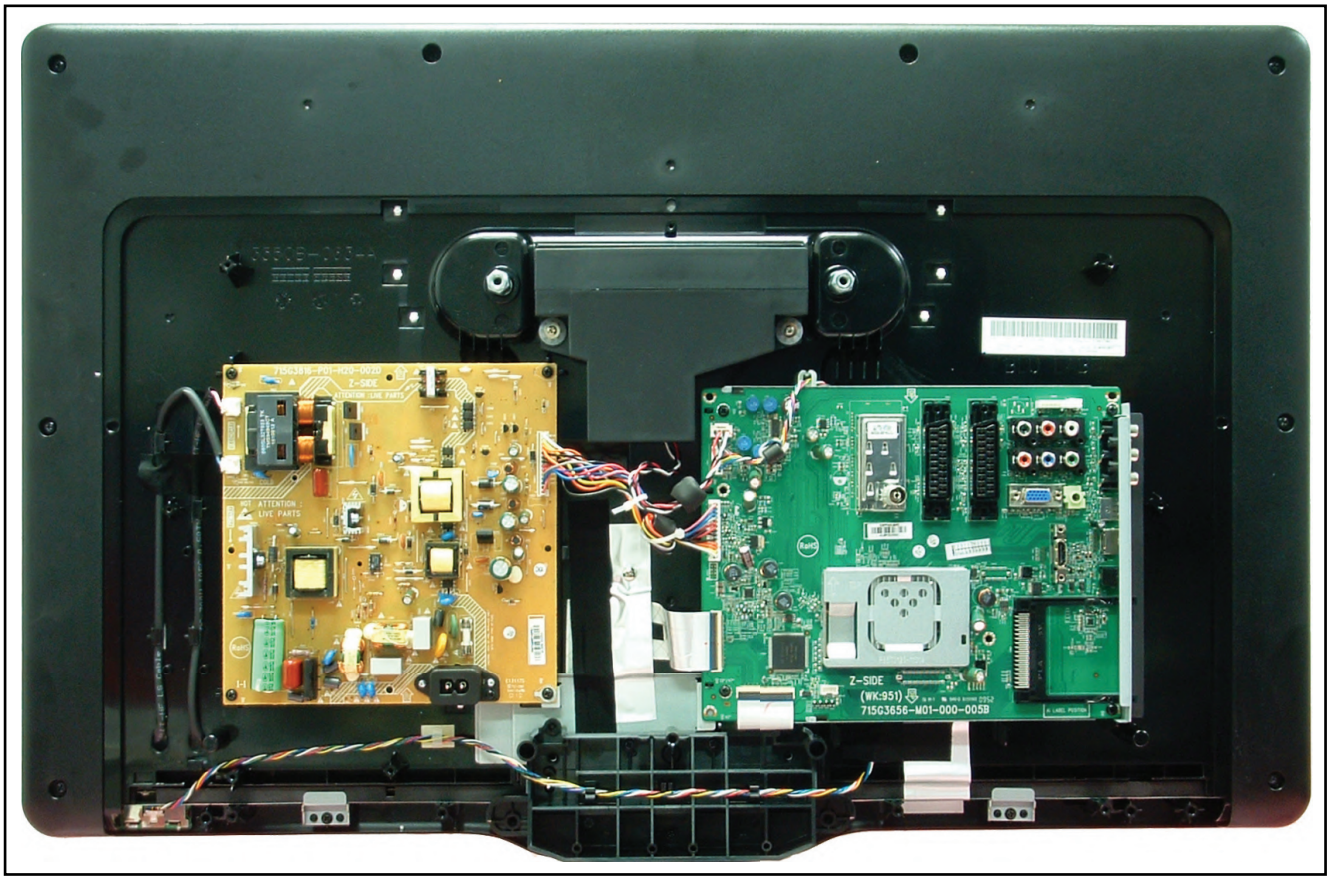

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Figure 4-1 Cable dressing (32")

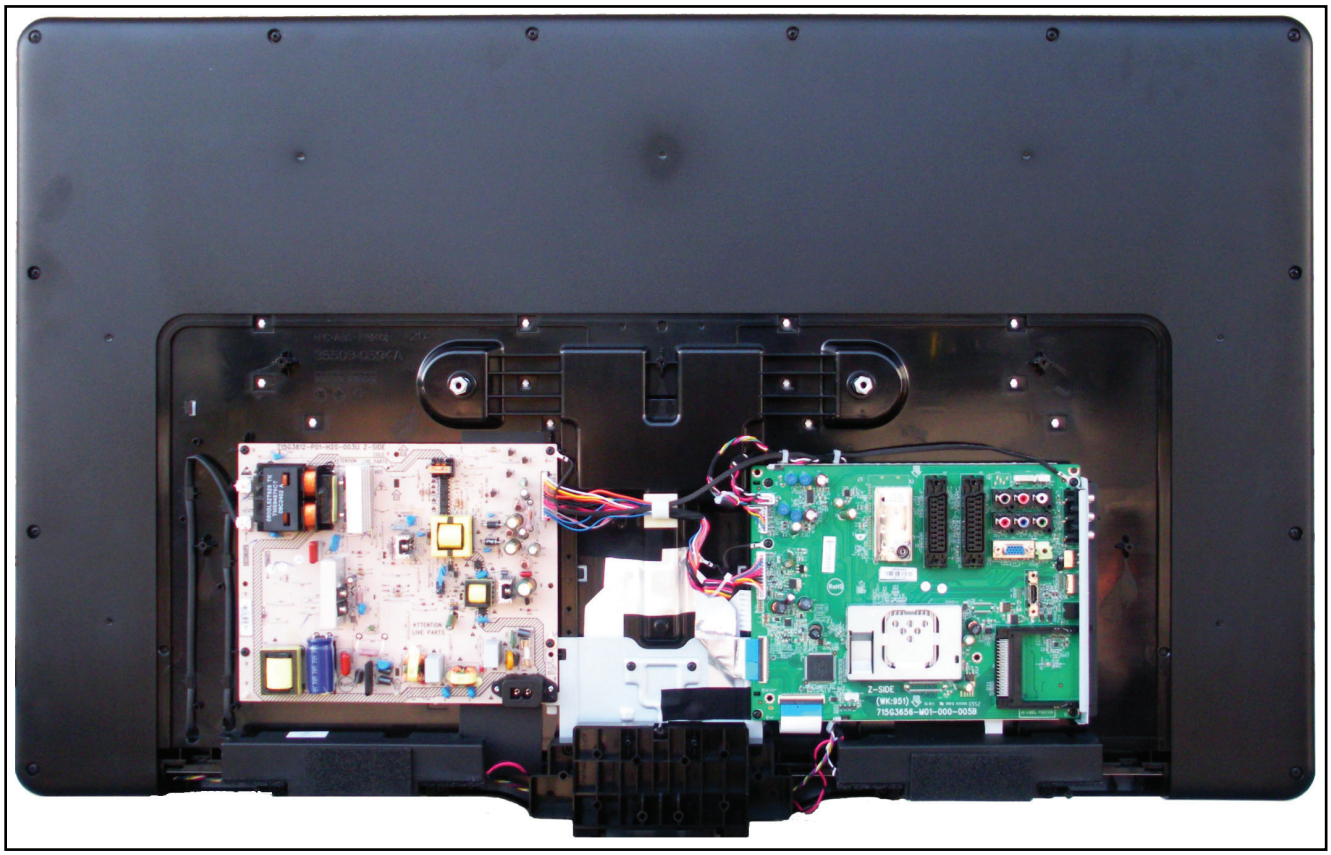

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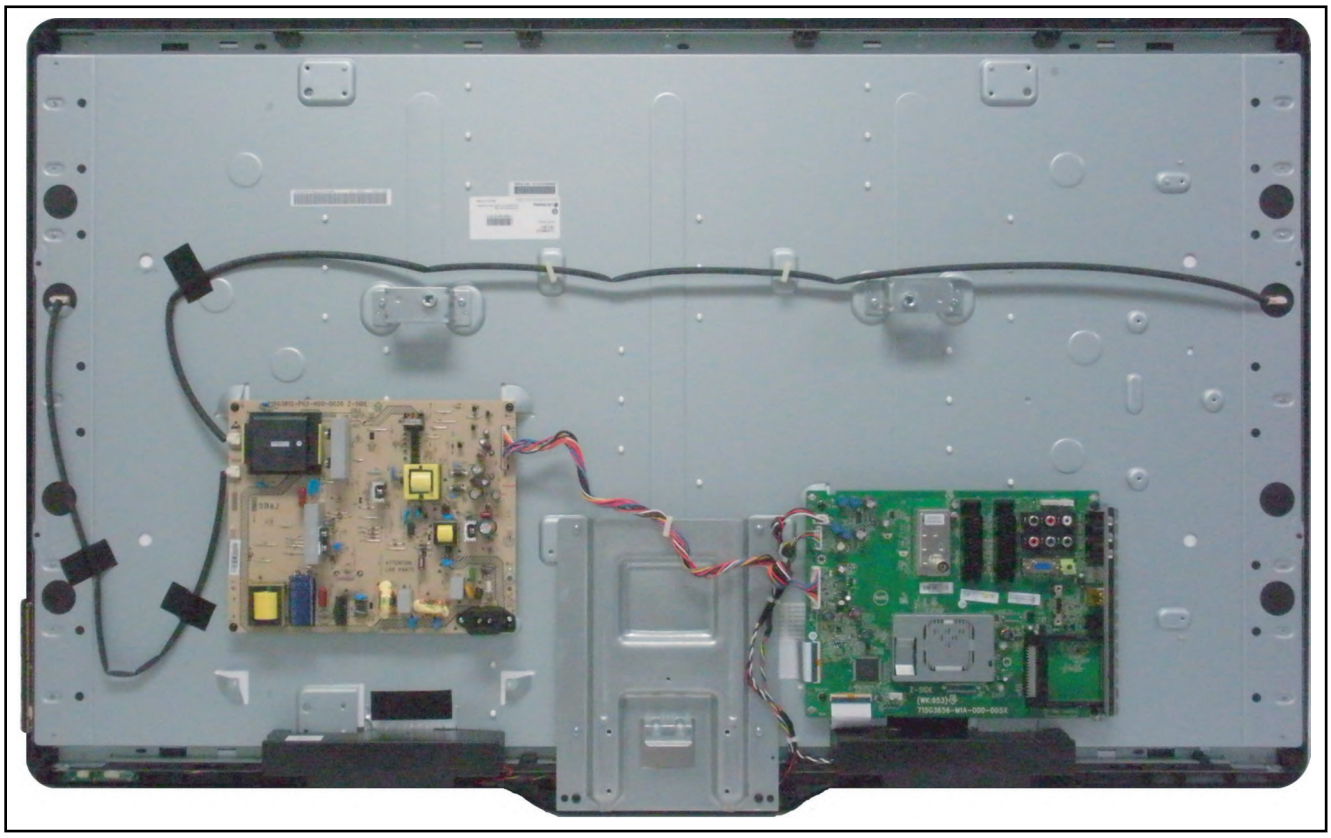
Figure 4-2 Cable dressing (42")



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 sidewards 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)

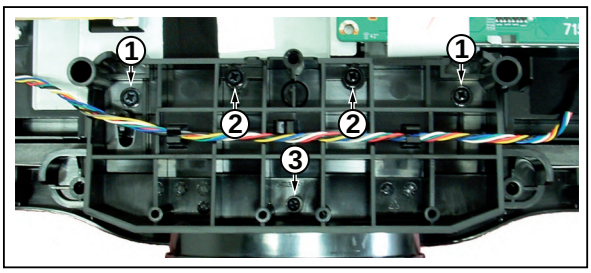
Caution: it is mandatory to remount all different screws at their original position during re-assembly. Failure to do so may result in damaging the PSU.

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

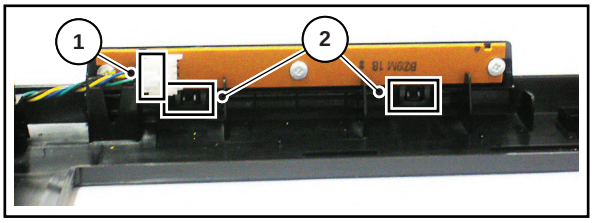
1. Release the IR/LED/Keyboard Control cable from its clamps.
2. Remove the fixation screw in the middle-bottom of the stand that secures the stand with the bezel, see Figure 4-4 [3].
3. Remove the clips at the bottom that secure the LCD panel with the bezel.
4. Remove the fixation screws that secure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

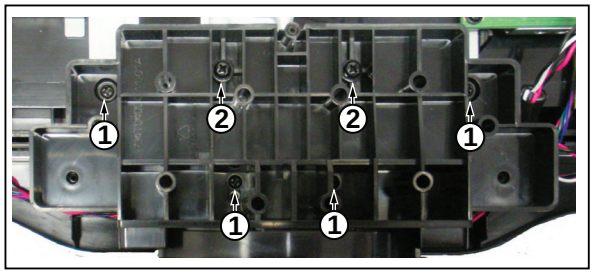
When defective, replace the whole unit.

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.

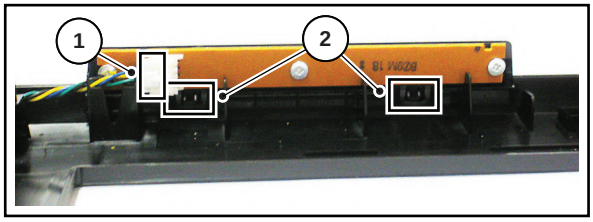
When defective, replace the whole unit.

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

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)

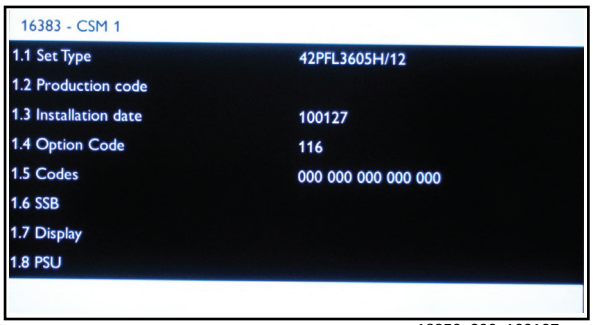
Purpose

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

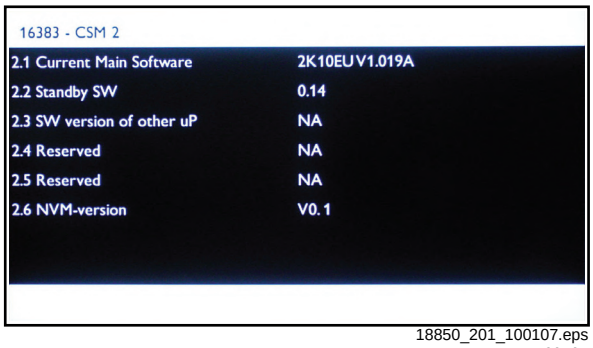
Key in the code “123654” via the standard RC transmitter.

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



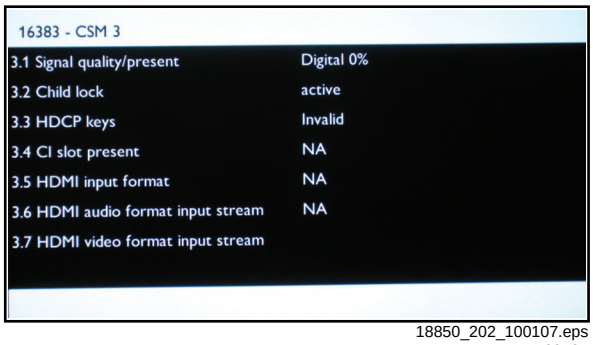
18850_200_100107.eps
100107

Figure 5-1 CSM Menu 1



18850_201_100107.eps
100107

Figure 5-2 CSM Menu 2



18850_202_100107.eps
100107

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^2C 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 µP** 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.

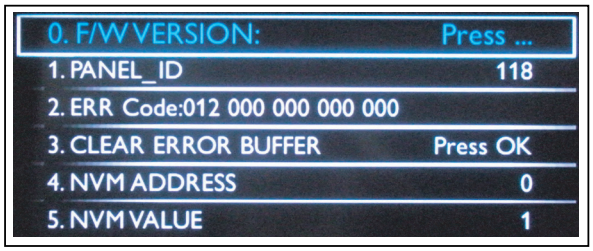
5.1.2 Service Alignment Mode (SAM)

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.

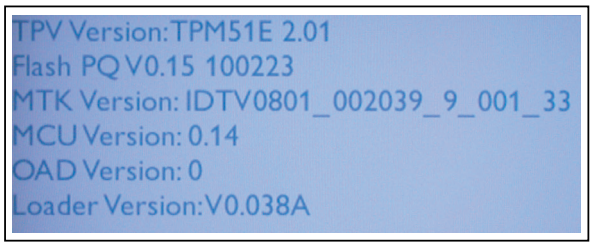
After entering the factory mode, the following screen is visible on the top and right of the panel.



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_Minmum	0 - 255	200	200	200	Minimum PWM value
27	Video_PWM_Maximun	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.

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:

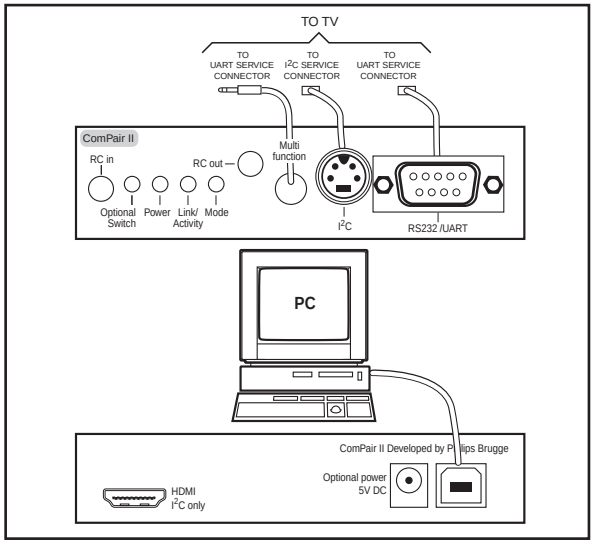
1. ComPair helps to quickly get an understanding on how to repair the chassis in a short and effective way.
2. ComPair allows very detailed diagnostics and is therefore capable of accurately indicating problem areas. No knowledge on I^2C or UART commands is necessary, because ComPair takes care of this.
3. ComPair speeds up the repair time since it can automatically communicate with the chassis (when the uP is working) and all repair information is directly available.
4. ComPair features TV software upgrade possibilities.

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.



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091118

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].

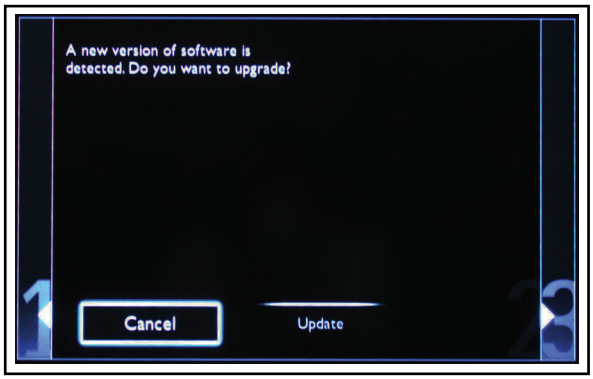
If the current software version of your TV is the same as the latest update file found on http://www.philips.com/support, it is not necessary to update the TV software.

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.

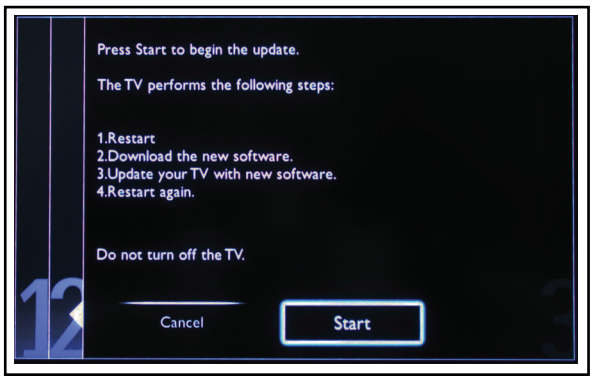
5.3.4 Update the TV software

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^2C 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:

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_{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.
  Caution: It is not allowed to use heatsinks as ground.
- Test probe: R_i > 10 MΩ, C_i < 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_{pp} for Y signal; 700 mV_{pp} 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^2 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

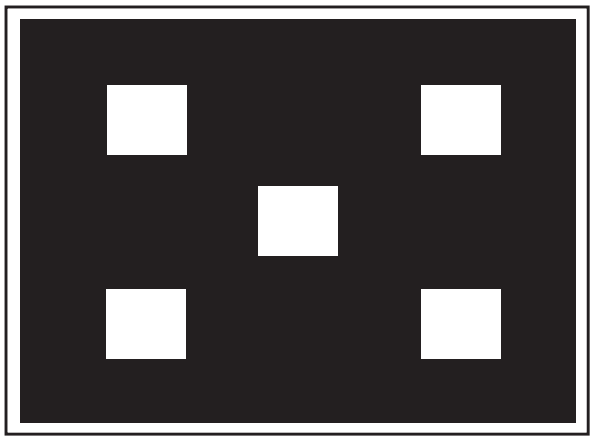
6.4.1 Display quality adjustment

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.



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090416

Figure 6-1 Five white blocks pattern

Input Signal Strength:
0.7 V_{p-p} 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

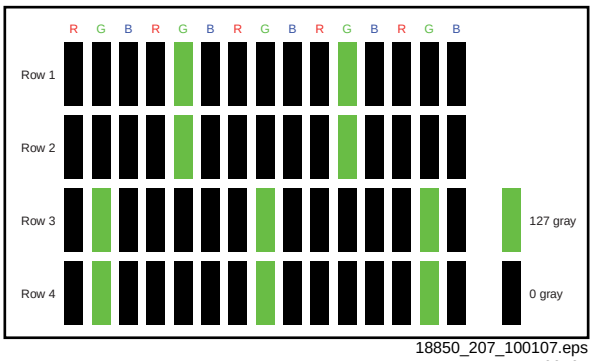
Equipment Requirements:
Chroma 2250 or equivalent PC signal generator.

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_{p-p} linear voltage.

Input Injection Point:
PC D-SUB input.

6.5.2 Alignment method



18850_207_100107.eps
100107

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^2C 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:

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.

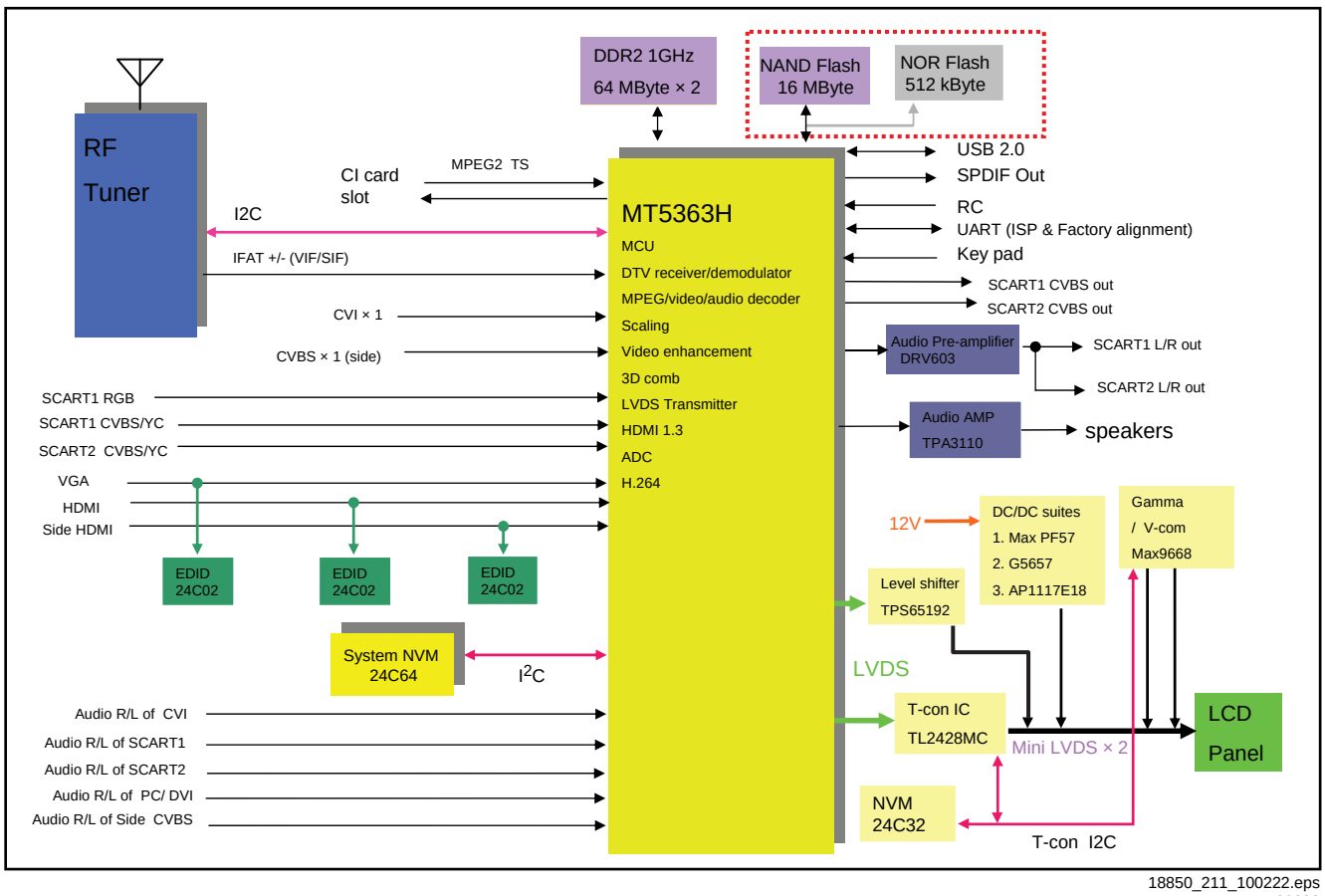
7.1.1 Implementation

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

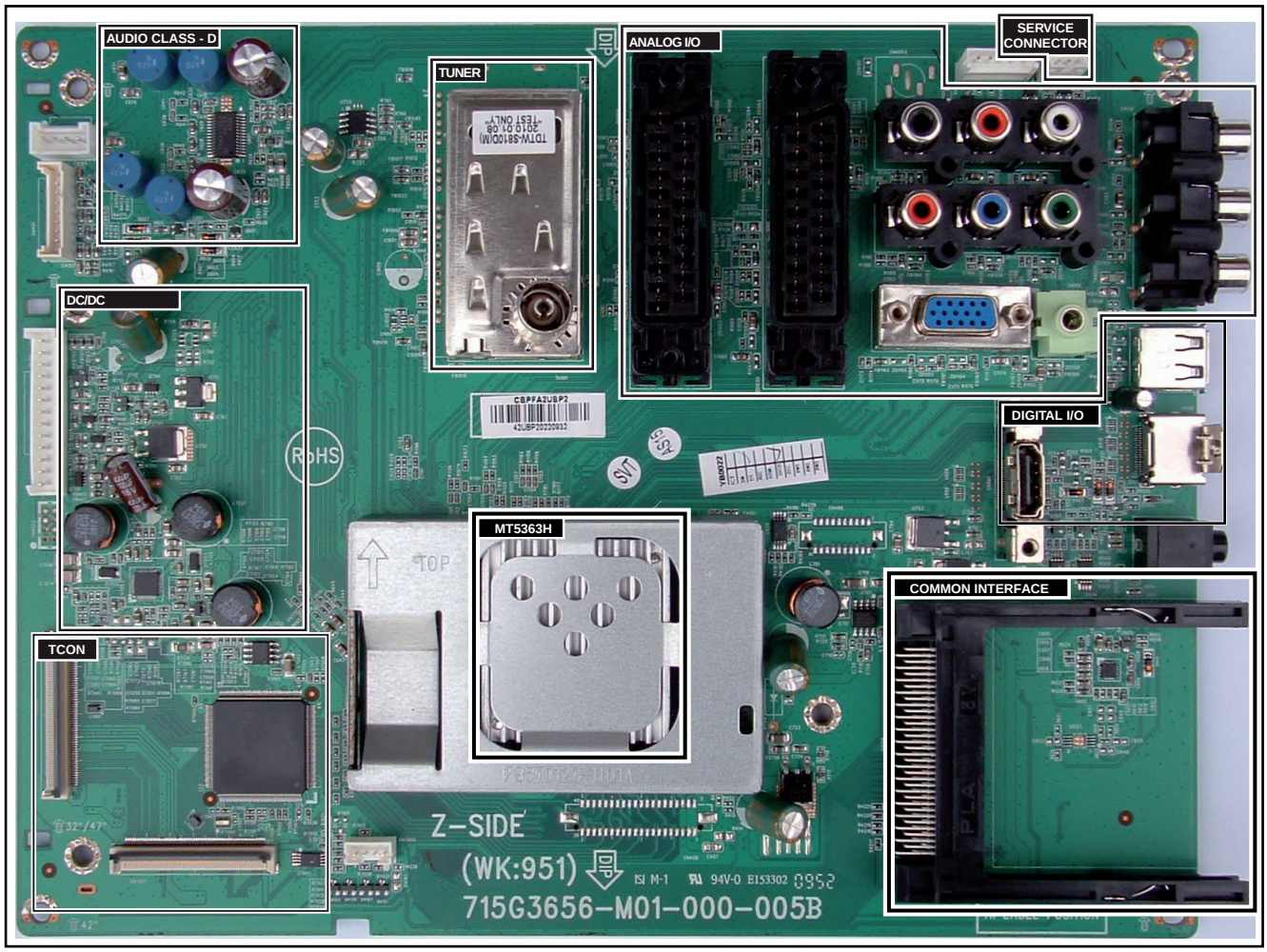
For details about the chassis block diagrams refer to chapter 9. Block Diagrams. An overview of the TPM5.1E LA architecture can be found in Figure 7-1.



18850_211_100222.eps
100222

Figure 7-1 Architecture of TPM5.1E LA

7.1.3 SSB Cell Layout

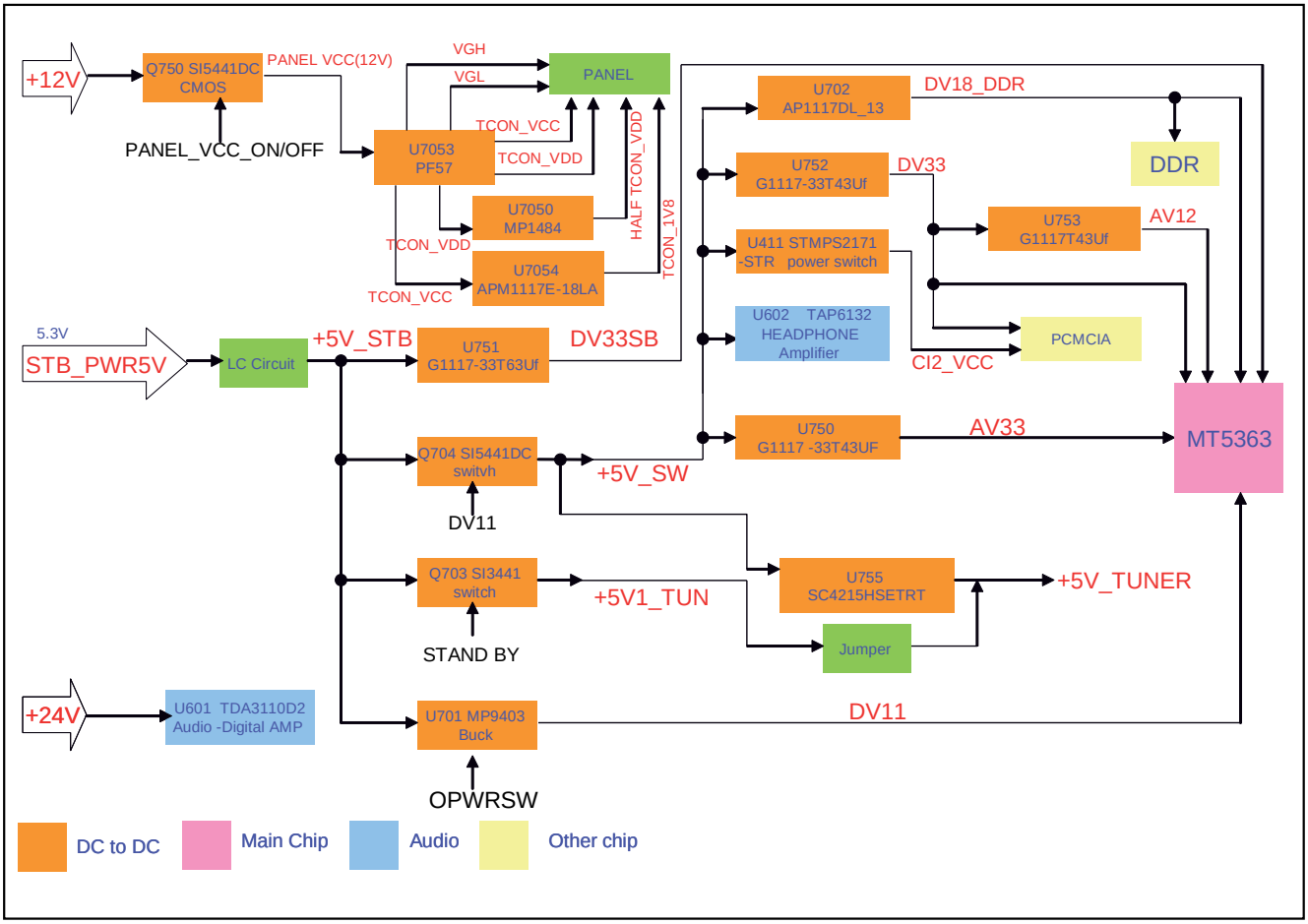


18850_208_100204.eps
100222

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).



18850_209_100204.eps
100210

Figure 7-3 Power Architecture

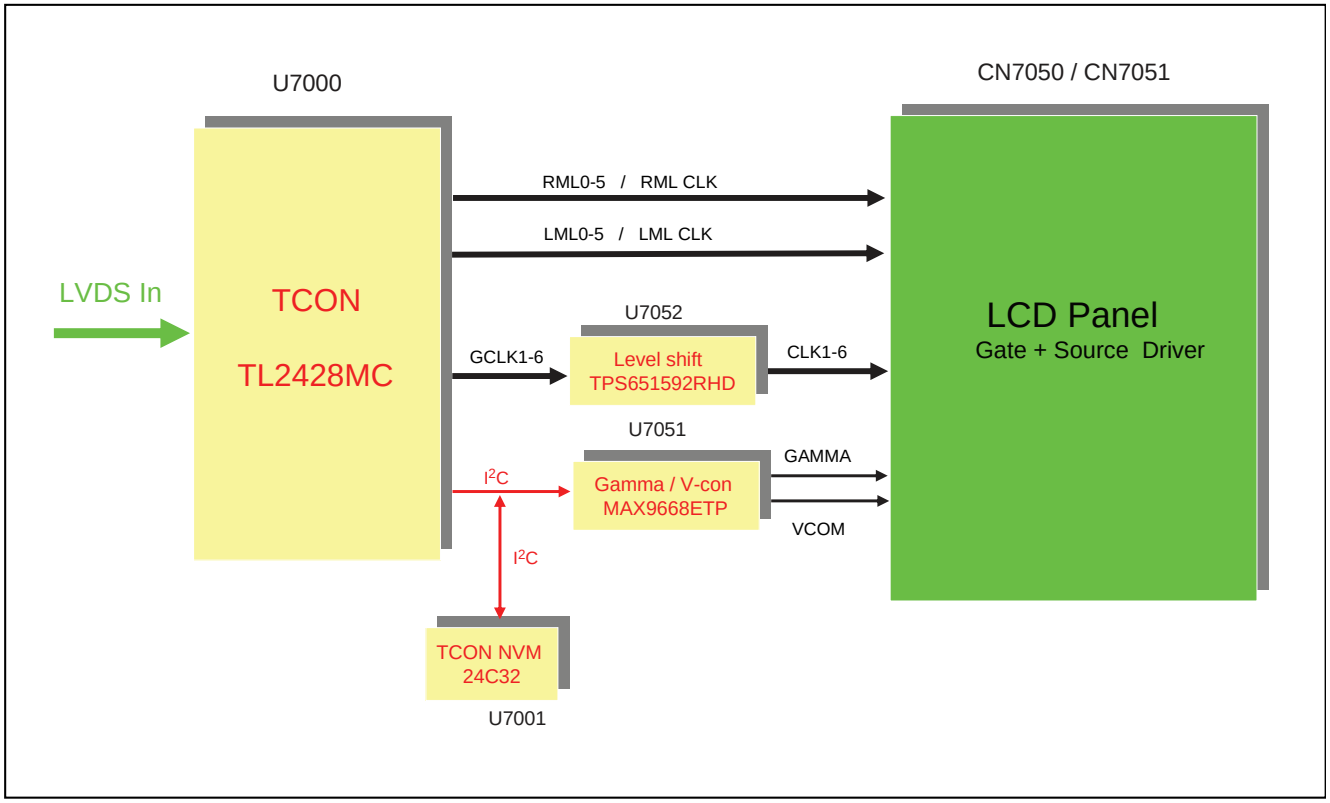
7.2.1 Power Supply Unit

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

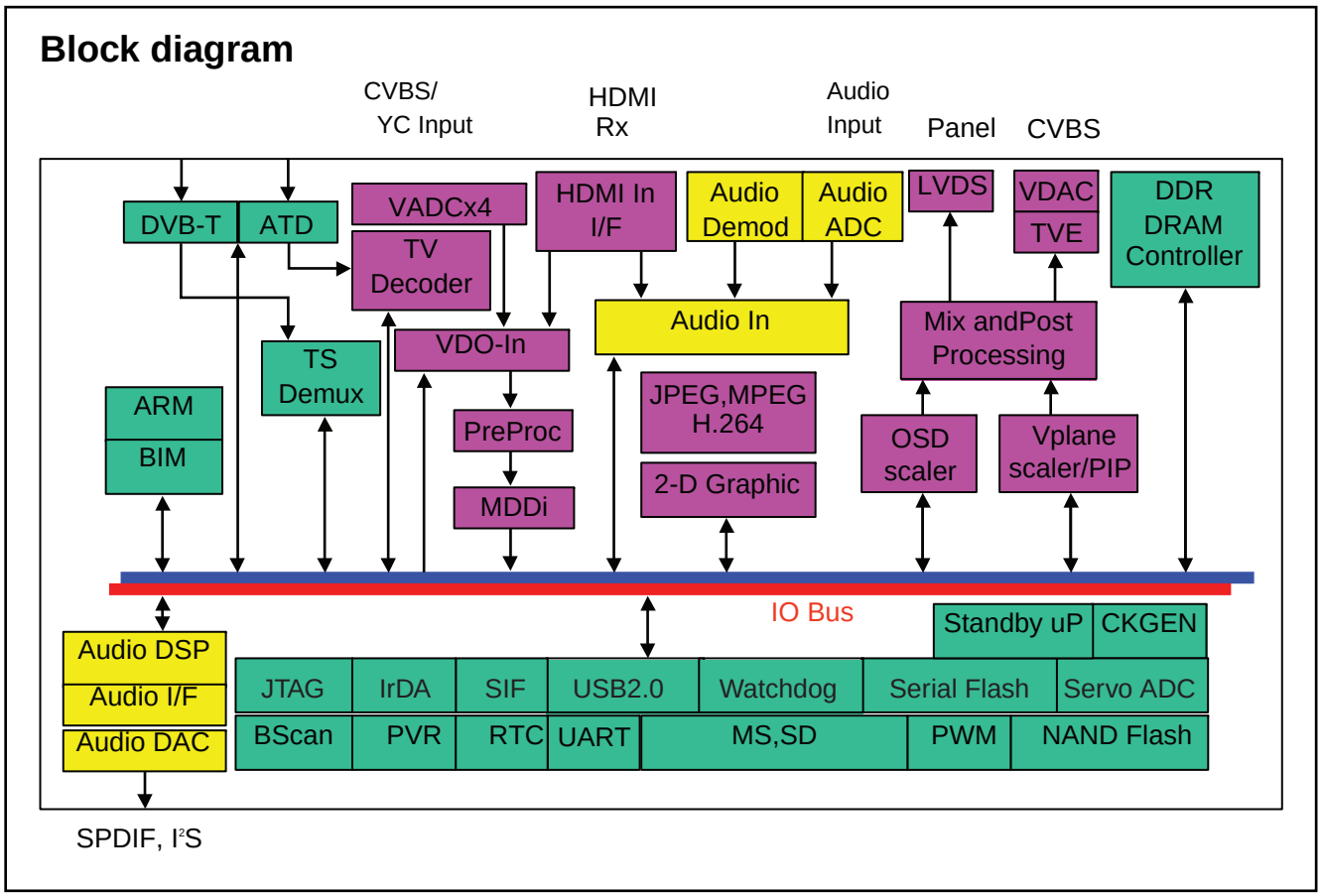
7.3.1 T-CON Unit

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

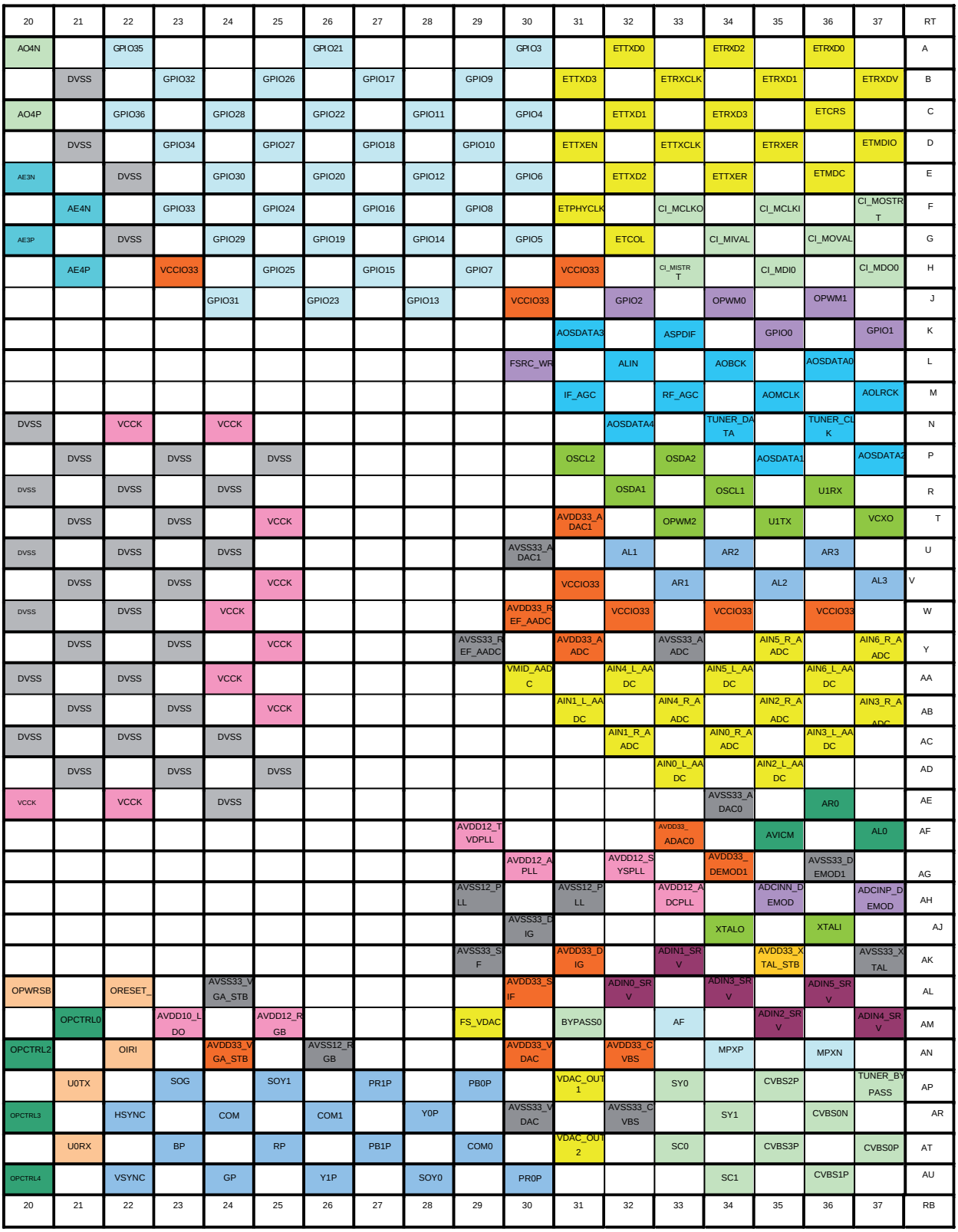
Pinning information

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		AO0P		AO2P		AO3P
E		RA12		VCC2IO		RDQ2		DVSS		RDQM0		VCC2IO		VCC2IO		AE0N		AE2N	
F	RA5		RA7		VCC2IO		RDQ7		DVSS		RDQ6		VCC2IO		AVDD33_LVDS		AE1N		AECKN
G		RA10		RA3		VCC2IO		DVSS		DVSS		RDQ3		VCC2IO		AE0P		AE2P	
H	RBA2		RBA0		RA1		VCC2IO				RDQ1		RDQ4		AVDD33_LVDS		AE1P		AECKP
J		RBA1		DVSS		DVSS								VCC2IO				AVSS33_LVDS	
K	RCKE		RWE_		MEMTN		MEMTP												
L		RCAS_		DVSS		DVSS													
M	RA13		RA2		RA4		RA6												TP_VPLL
N		RA11		RA0		RODT		RVREF						DVSS		AVDD12_LVDS		AVDD12_VPLL	
P	RA8		RCS_		RRAS_		RVREF						AVDD12_MEMPLL		DVSS		AVSS12_LVDS		AVSS12_VPLL
R		VCC2IO		VCC2IO		VCC2IO								DVSS		VCCK		DVSS	
T	RDQ19		RDQ20		RDQ30		RDQ25						AVSS12_MEMPLL		DVSS		DVSS		DVSS
U		RDQ22		RDQ17		RDQM3								VCCK		DVSS		DVSS	
V	RDQM2		RDQS2		RDQ28		RDQ27						VCCK		DVSS		DVSS		DVSS
W		RDQS2_		DVSS		DVSS								DVSS		DVSS		DVSS	
Y	RDQS3		DVSS		RDQ24		RDQ31						VCCK		VCCK		DVSS		DVSS
AA		RDQS3_		RDQ29		RDQ26								VCCK		DVSS		DVSS	
AB	RDQ16		RDQ23		REXTDN								DVSS		DVSS		DVSS		DVSS
AC		RDQ21		RDQ18		VCC2IO								DVSS		DVSS		DVSS	
AD	RCLK1		RCLK1_		VCC2IO		VCC2IO						DVSS		VCCK		VCCK		VCCK
AE		VCC2IO		VCC2IO		GPIO39		DVSS						VCCK		VCCK		VCCK	
AF	VCC2IO		VCC2IO		GPIO37		GPIO40		DVSS				VCCIO33-1		VCCIO33-1				
AG		GPIO38		GPIO41		GPIO42						VCCK							
AH	GPIO44		GPIO43		JTDO		VCCK												
AJ		JTDI		JTMS		VCCK		VCCK											
AK	JTRST_		JTCK		VCCK		VCCK												
AL		VCCK		VCCK		VCCK		VCCK		AVDD12_USB		HDMI_SCL2		HDMI_SDA2		PWR5V_1		HDMI_HPD1	
AM	VCCK		VCCK		VCCK		VCCK		AVSS12_USB		AVDD33_USB		AVDD33_HDMI		PWR5V_2		HDMI_SCL1		OPCTRL1
AN		VCCK		VCCK		POCE1_				USB_VRT		AVSS33_HDMI		HDMI_CEC		HDMI_HPD2		HDMI_SDA1	
AP	OSDA0		OSCL0		PDD1		PDD4		AVSS33_USB		AVDD12_HDMI		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_USB		AVSS33_USB		RX2_0B		RX2_2B		RX1_0B		RX1_2B
AU		POOE_		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

18850_301_100107.eps
100222

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
AO4N		GPIO35				GPIO21				GPIO3		ETTXD0		ETRXD2		ETRXD0		A
	DVSS		GPIO32		GPIO26		GPIO17		GPIO9		ETTXD3		ETRXCLK		ETRXD1		ETRXDV	B
AO4P		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_MISTRT		CI_MDI0		CI_MDO0	H
				GPIO31		GPIO23		GPIO13		VCCIO33		GPIO2		OPWM0		OPWM1		J
											AOSDATA3		ASPDIF		GPIO0		GPIO1	K
										FSRC_WR		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_ADAC1		OPWM2		U1TX		VCXO	T
DVSS		DVSS		DVSS						AVSS33_ADAC1		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_ADAC		AVSS33_ADAC		AIN5_R_ADAC		AIN6_R_ADAC	Y
DVSS		DVSS		VCCK						VMID_AADC		AIN4_L_AADC		AIN5_L_AADC		AIN6_L_AADC		AA
	DVSS		DVSS		VCCK						AIN1_L_AADC		AIN4_R_ADAC		AIN2_R_ADAC		AIN3_R_ADAC	AB
DVSS		DVSS		DVSS								AIN1_R_ADAC		AIN0_R_ADAC		AIN3_L_AADC		AC
	DVSS		DVSS		DVSS								AIN0_L_AADC		AIN2_L_AADC			AD
VCCK		VCCK		DVSS										AVSS33_ADAC0		AR0		AE
									AVDD12_TVDPLL				AVDD33_ADAC0		AVICM		AL0	AF
										AVDD12_APLL		AVDD12_SYSPLL		AVDD33_DEMOD1		AVSS33_DEMOD1		AG
									AVSS12_PLL		AVSS12_PLL		AVDD12_ADCPLL		ADCINN_DEMOD		ADCINP_DEMOD	AH
										AVSS33_DIG				XTALO		XTALI		AJ
									AVSS33_SF		AVDD33_DIG		ADIN1_SRV		AVDD33_XTAL_STB		AVSS33_XTAL	AK
OPWRSB		ORESET_		AVSS33_VGA_STB						AVDD33_SIF		ADIN0_SRV		ADIN3_SRV		ADIN5_SRV		AL
	OPCTRL0		AVDD10_LDO		AVDD12_RGB				FS_VDAC		BYPASS0		AF		ADIN2_SRV		ADIN4_SRV	AM
OPCTRL2		OIRI		AVDD33_VGA_STB		AVSS12_RGB				AVDD33_VDAC		AVDD33_CVBS		MPXP		MPXN		AN
	U0TX		SOG		SOY1		PR1P		PB0P		VDAC_OUT1		SY0		CVBS2P		TUNER_BYPASS	AP
OPCTRL3		HSYNC		COM		COM1		Y0P		AVSS33_VDAC		AVSS33_CVBS		SY1		CVBS0N		AR
	U0RX		BP		RP		PB1P		COM0		VDAC_OUT2		SC0		CVBS3P		CVBS0P	AT
OPCTRL4		VSYNC		GP		Y1P		SOY0		PR0P				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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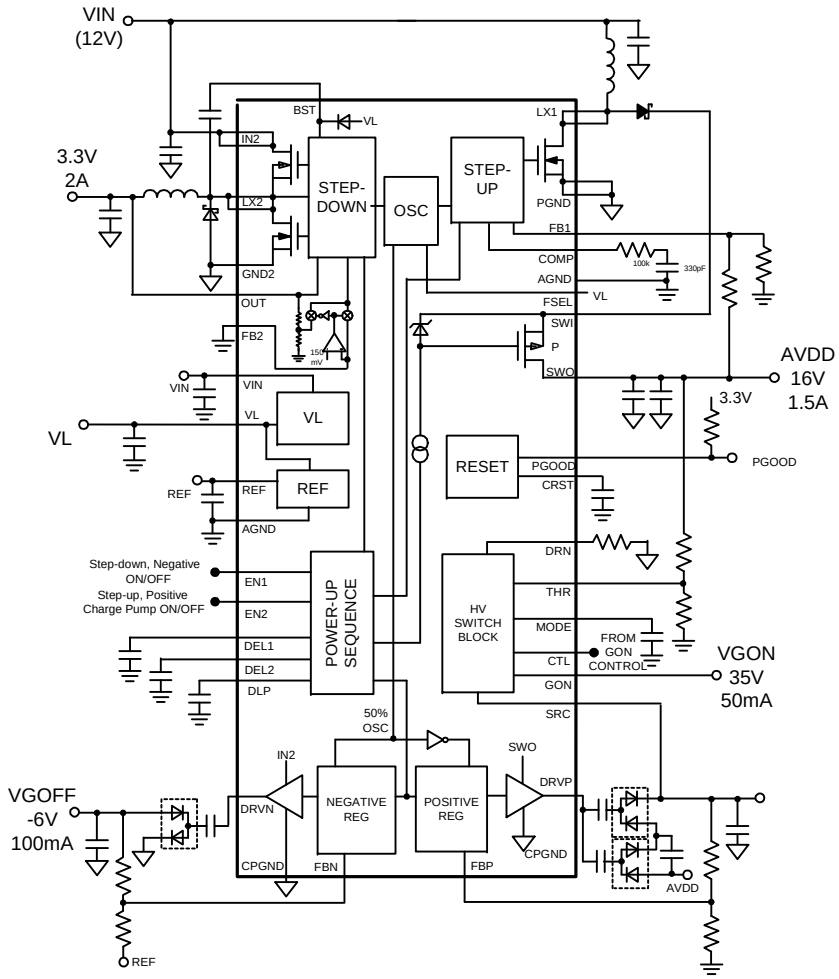
Figure 8-3 Pin configuration (2)

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

Block diagram



Pinning information

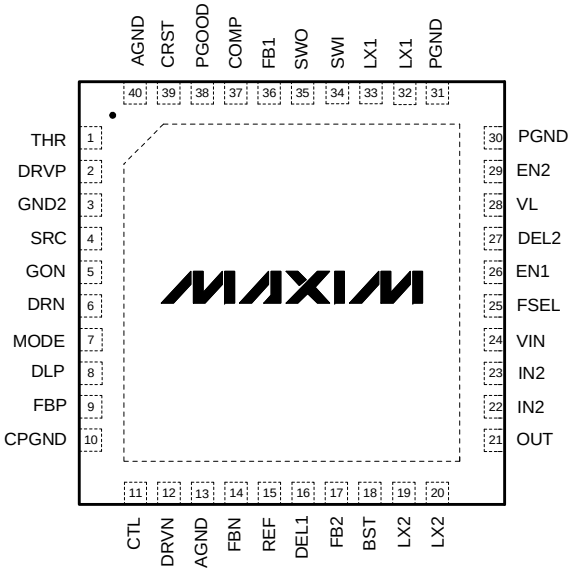


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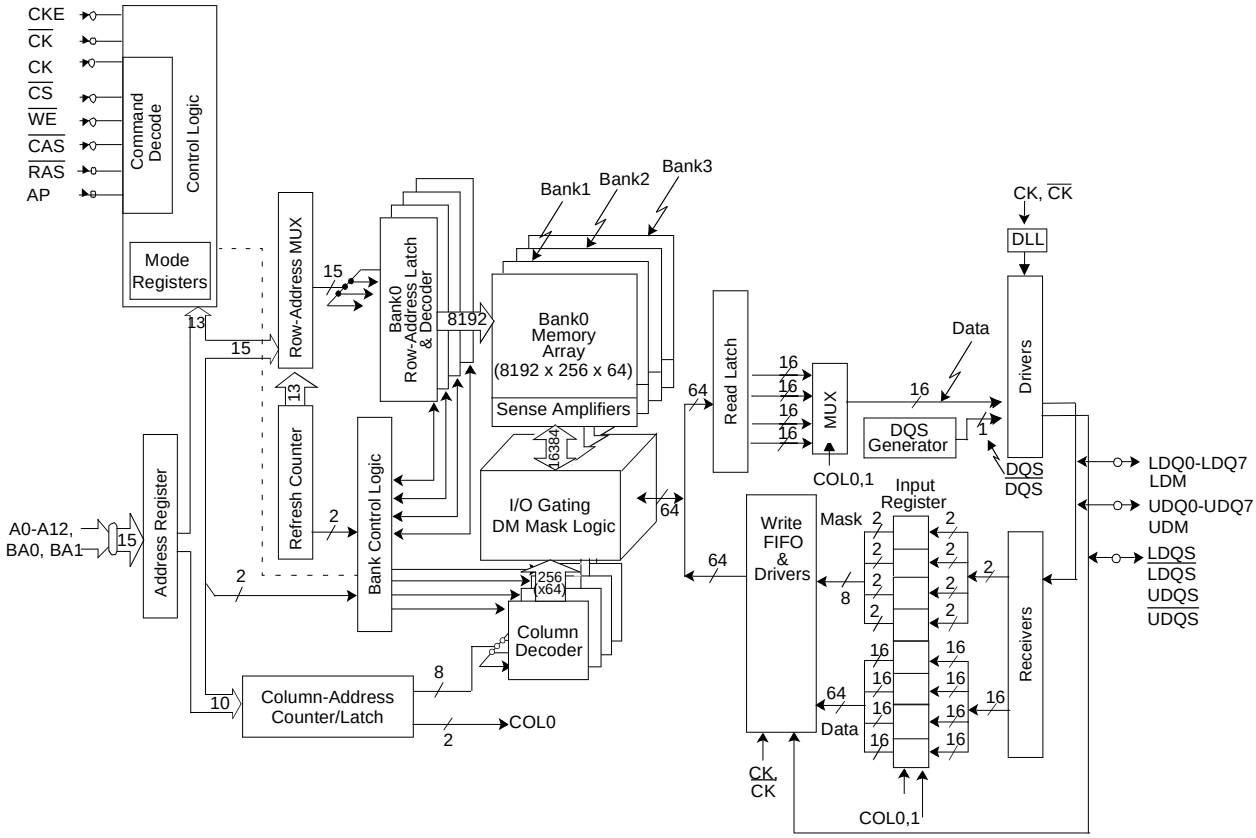
Figure 8-4 Internal block diagram and pin configuration

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

Block diagram



Note: This Functional Block Diagram is intended to facilitate user understanding of the operation of the device; it does not represent an actual circuit implementation.
Note: DM is a unidirectional signal (input only), but is internally loaded to match the load of the bidirectional DQ and DQS signals.

Pinning information

× 16

1	2	3		7	8	9
VDD	NC	VSS	A	VSSQ	$\overline{\text{UDQS}}$	VDDQ
DQ14	VSSQ	UDM	B	UDQS	VSSQ	DQ15
VDDQ	DQ9	VDDQ	C	VDDQ	DQ8	VDDQ
DQ12	VSSQ	DQ11	D	DQ10	VSSQ	DQ13
VDD	NC	VSS	E	VSSQ	$\overline{\text{LDQS}}$	VDDQ
DQ6	VSSQ	LDM	F	LDQS	VSSQ	DQ7
VDDQ	DQ1	VDDQ	G	VDDQ	DQ0	VDDQ
DQ4	VSSQ	DQ3	H	DQ2	VSSQ	DQ5
VDDL	VREF	VSS	J	VSSDL	CK	VDD
	CKE	$\overline{\text{WE}}$	K	$\overline{\text{RAS}}$	$\overline{\text{CK}}$	ODT
NC	BA0	BA1	L	$\overline{\text{CAS}}$	$\overline{\text{CS}}$	
	A10/AP	A1	M	A2	A0	VDD
VSS	A3	A5	N	A6	A4	
	A7	A9	P	A11	A8	VSS
VDD	A12	NC	R	NC	NC	

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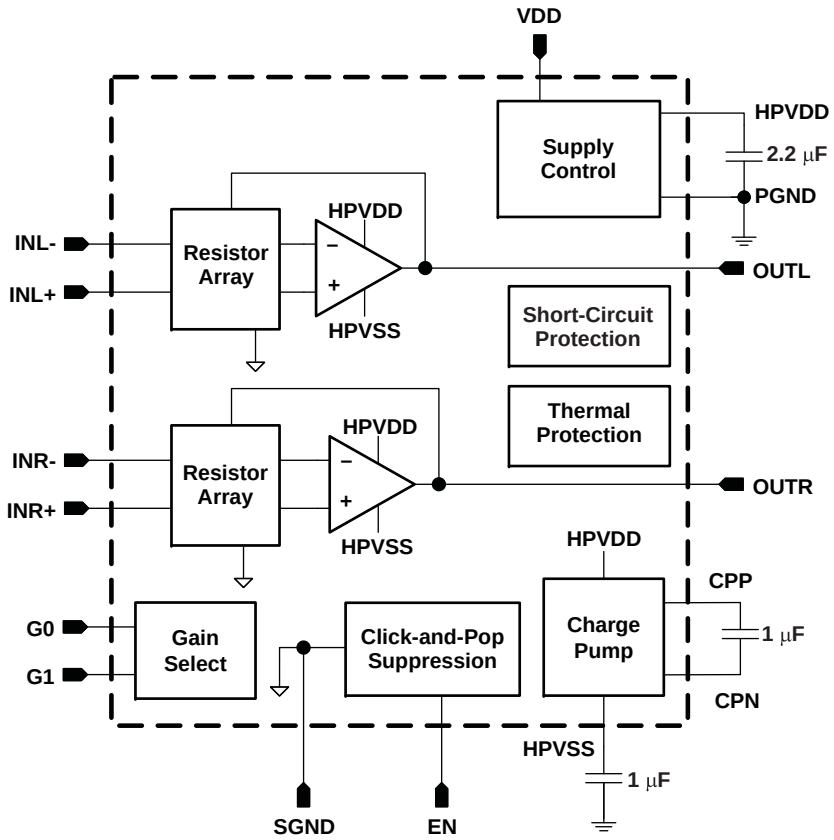
Figure 8-5 Internal block diagram and pin configuration

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

Block diagram



Pinning information

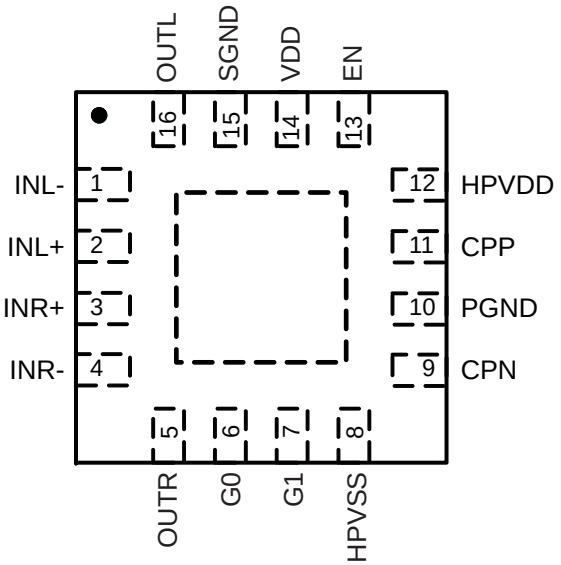


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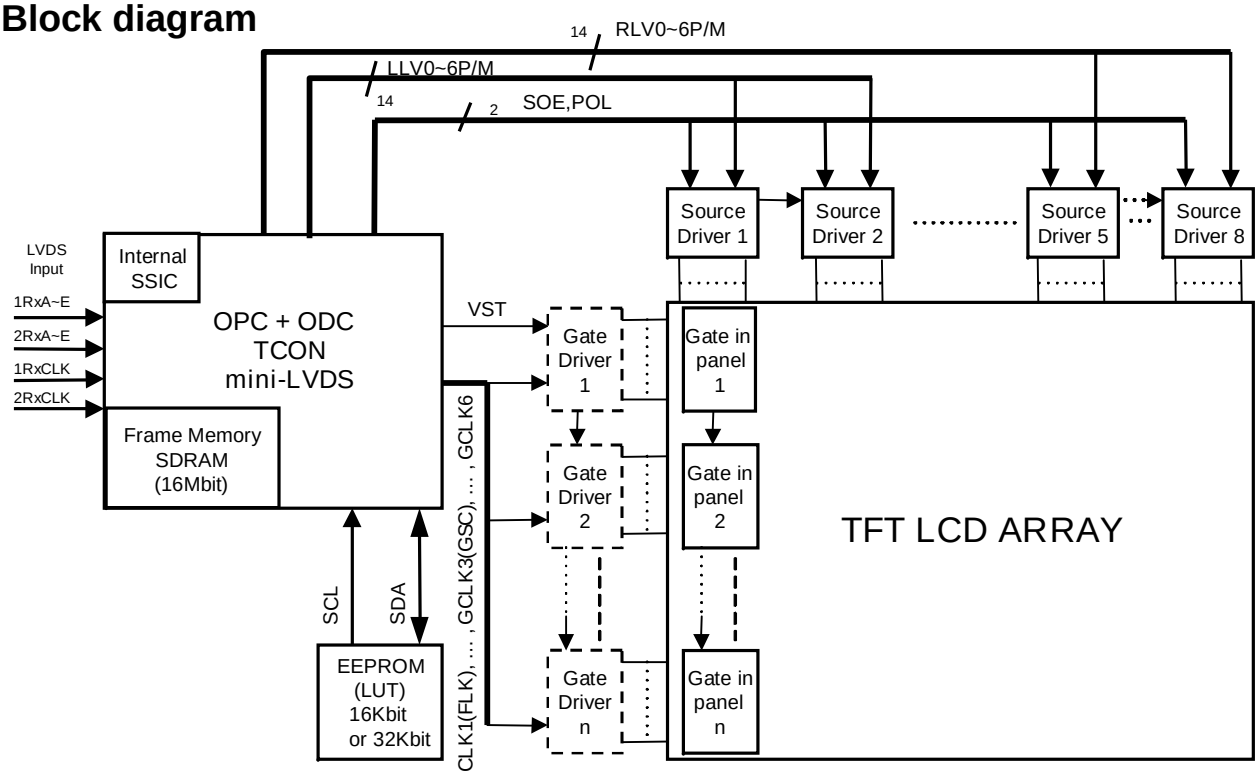
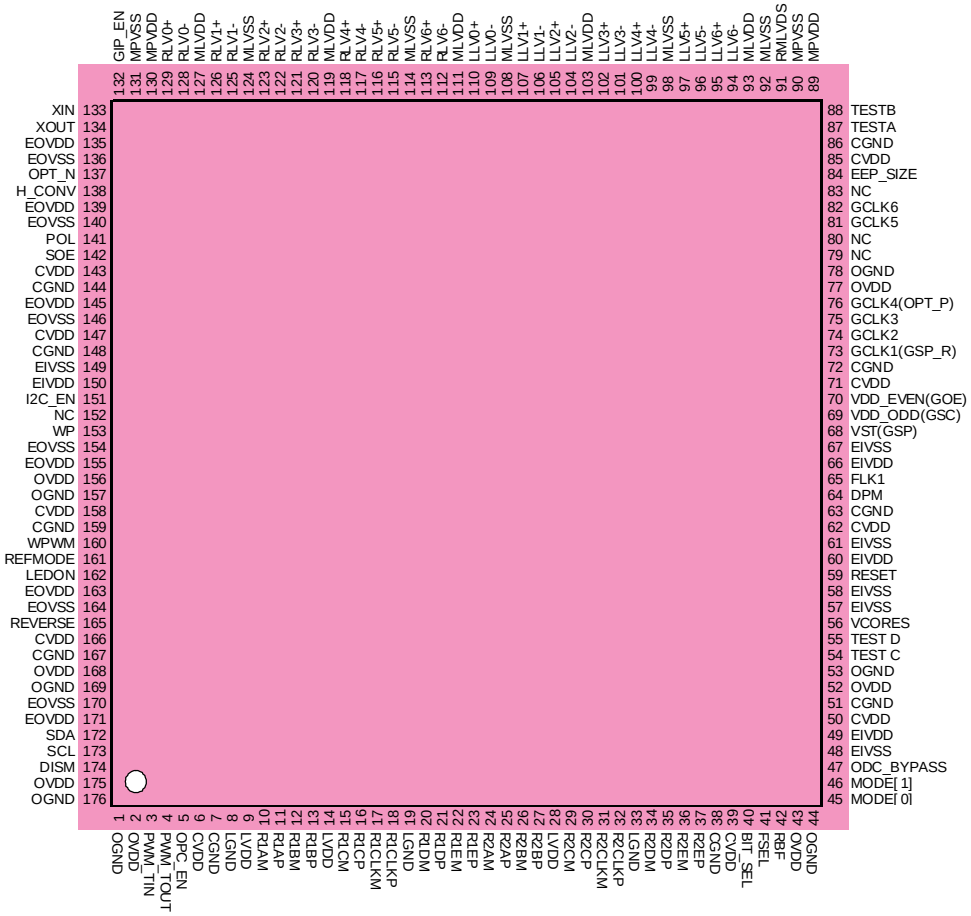
Figure 8-6 Internal block diagram and pin configuration

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

Block diagram



Pinning information

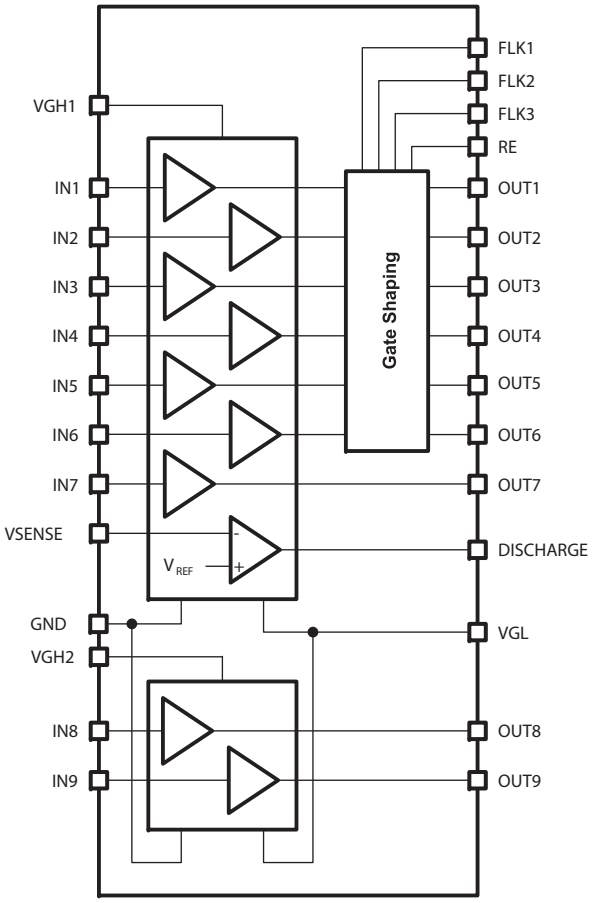


18850_305_100107.eps
100223

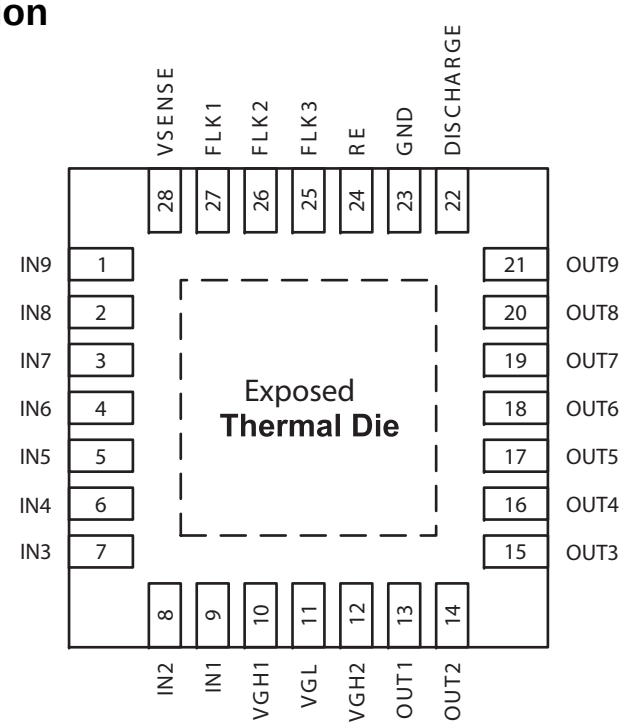
Figure 8-7 Internal block diagram and pin configuration

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

Block diagram



Pinning information

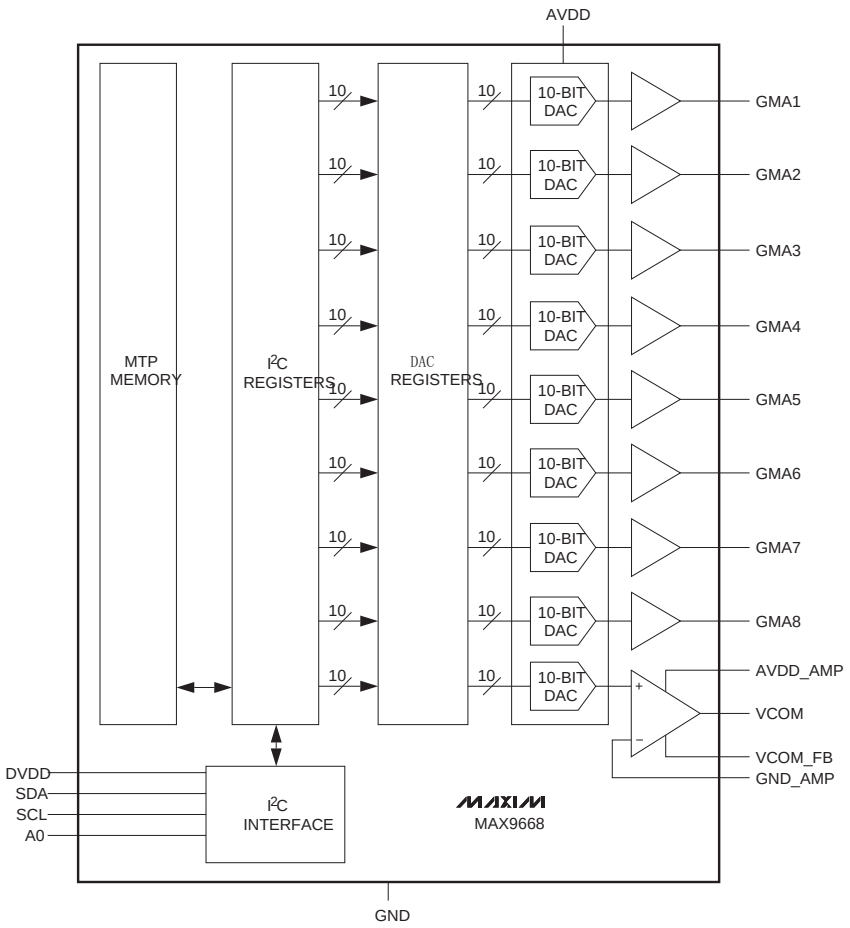


18850_306_100107.eps
100223

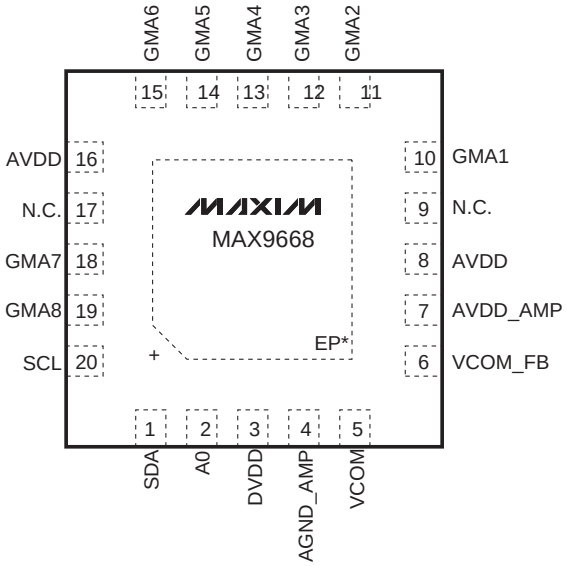
Figure 8-8 Internal block diagram and pin configuration

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

Block diagram



Pinning information



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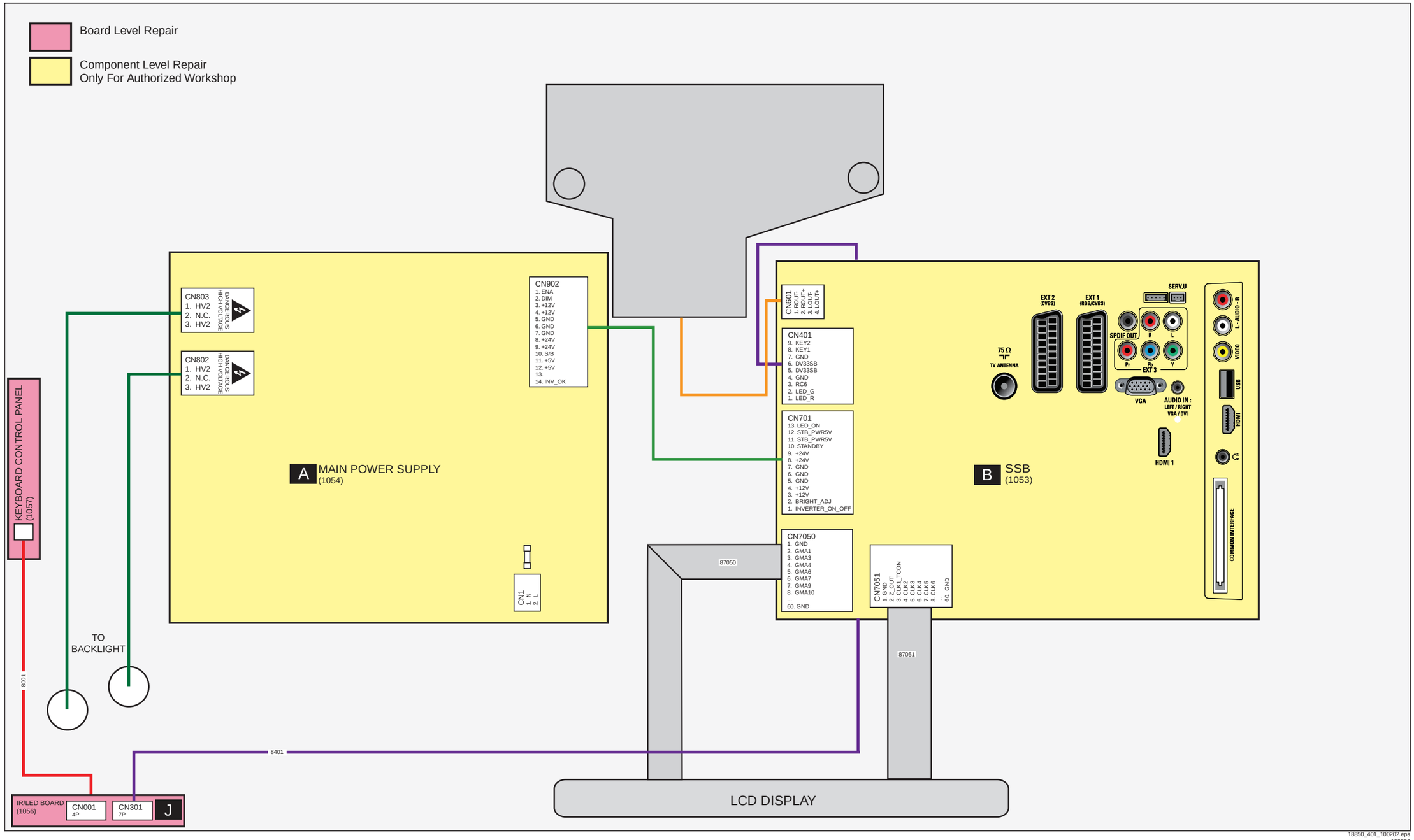
100223

Figure 8-9 Internal block diagram and pin configuration

9. Block Diagrams

Wiring Diagram 32"

WIRING DIAGRAM 32" (Dali)



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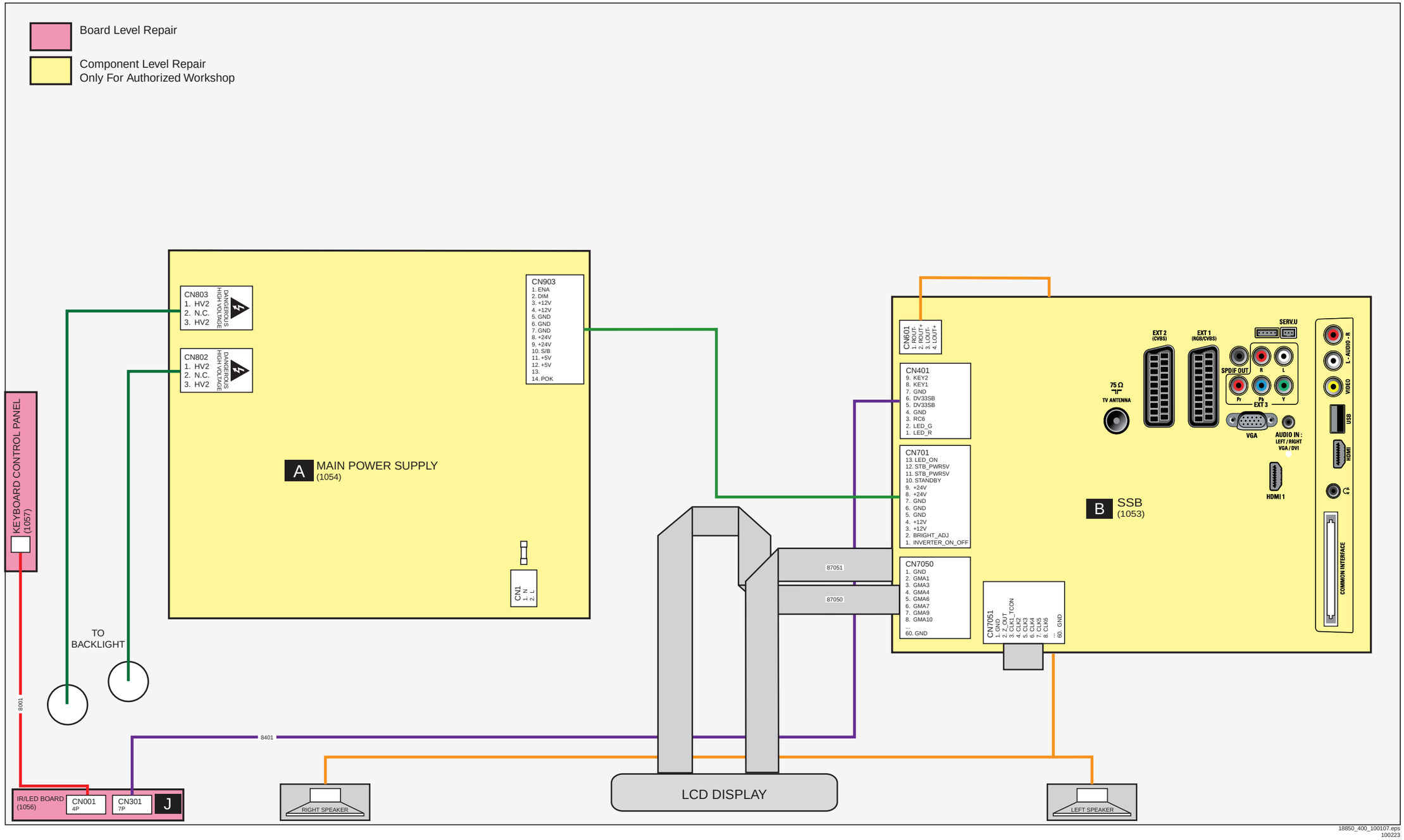
100226

Wiring Diagram 42"

WIRING DIAGRAM 42" (Dali)



18850_400_100107.eps
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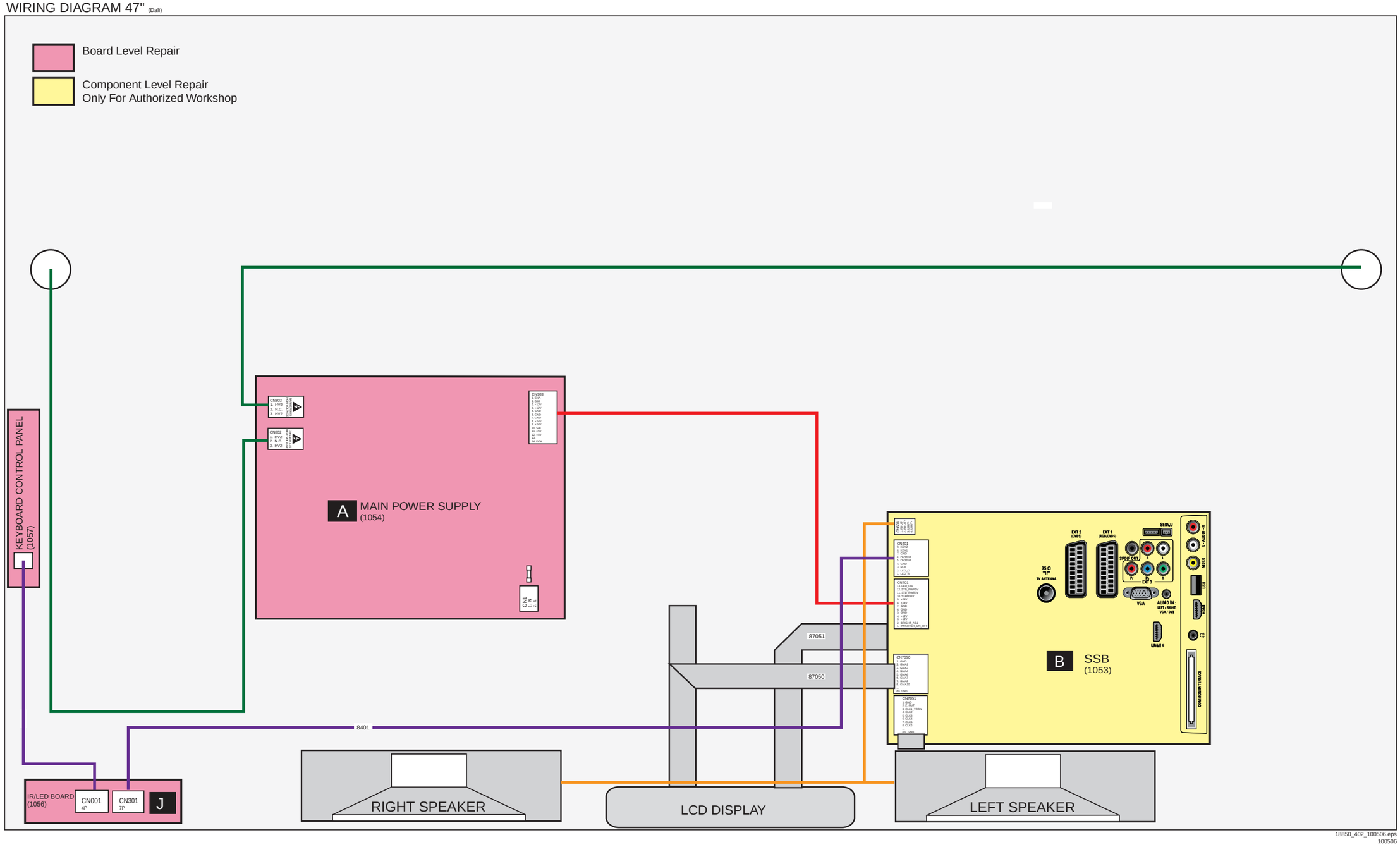
Wiring Diagram 47"

WIRING DIAGRAM 47" (Dali)



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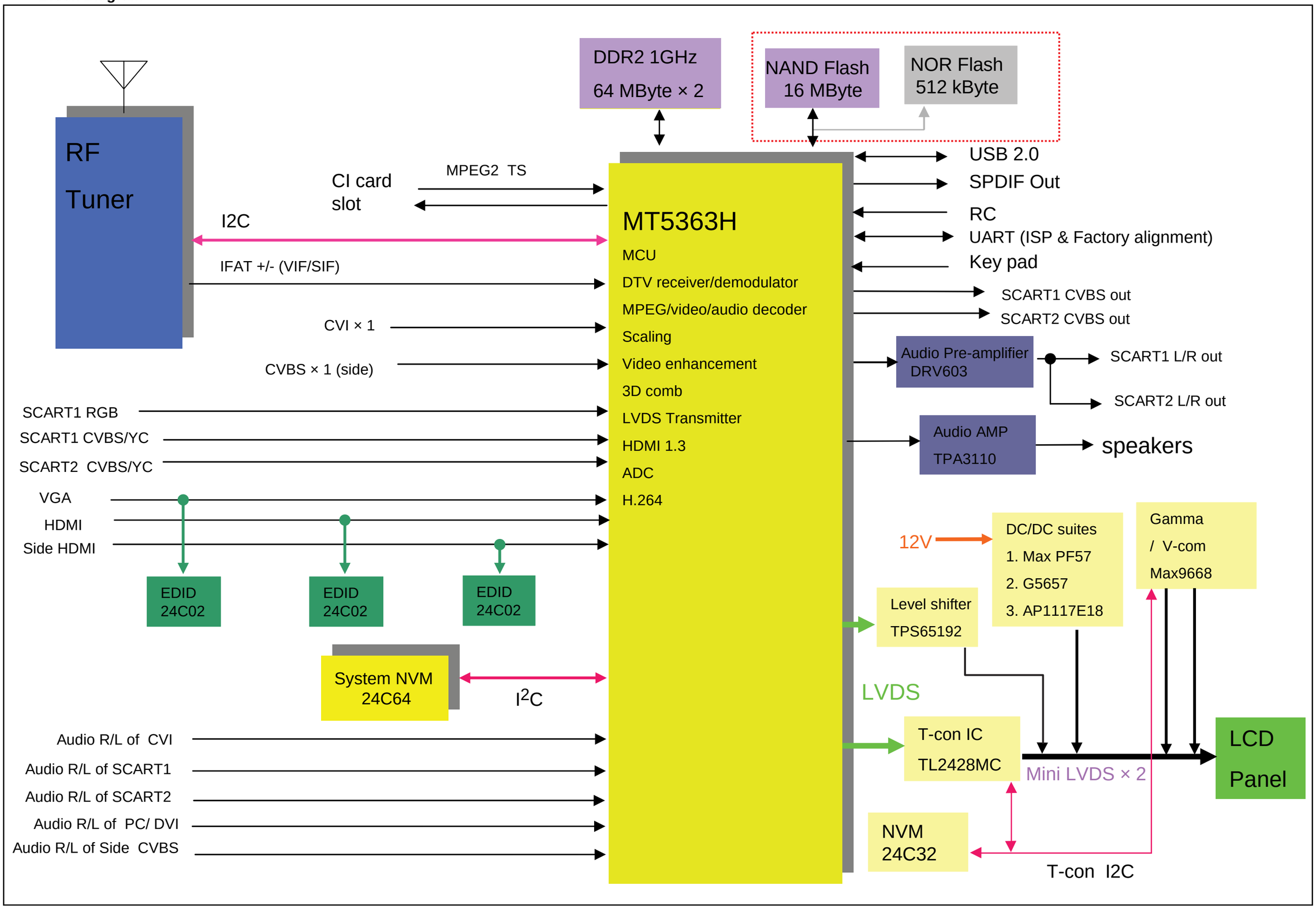
Block Diagram



18850_403_100107.eps
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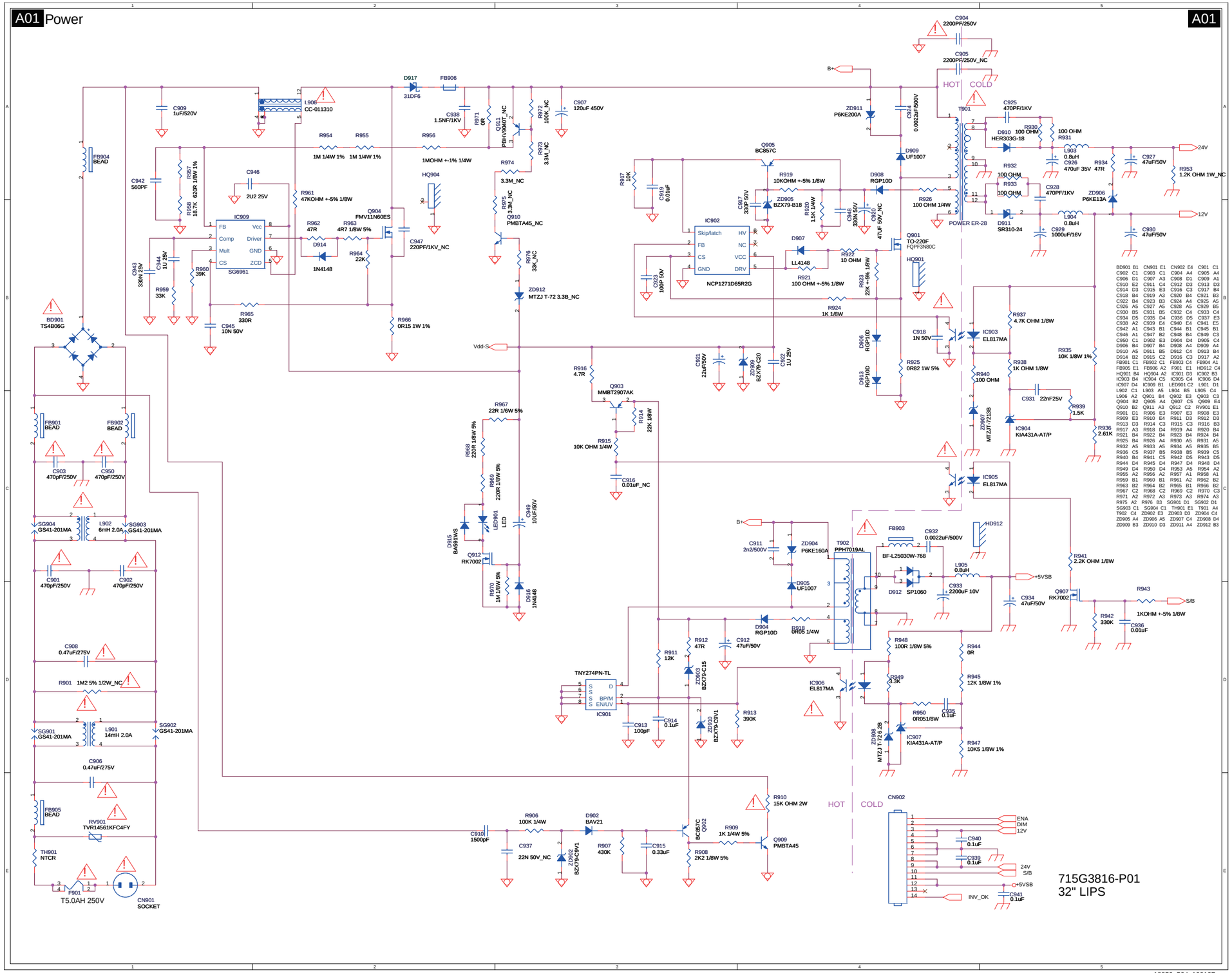
10. Circuit Diagrams and PWB Layouts

Power 32"



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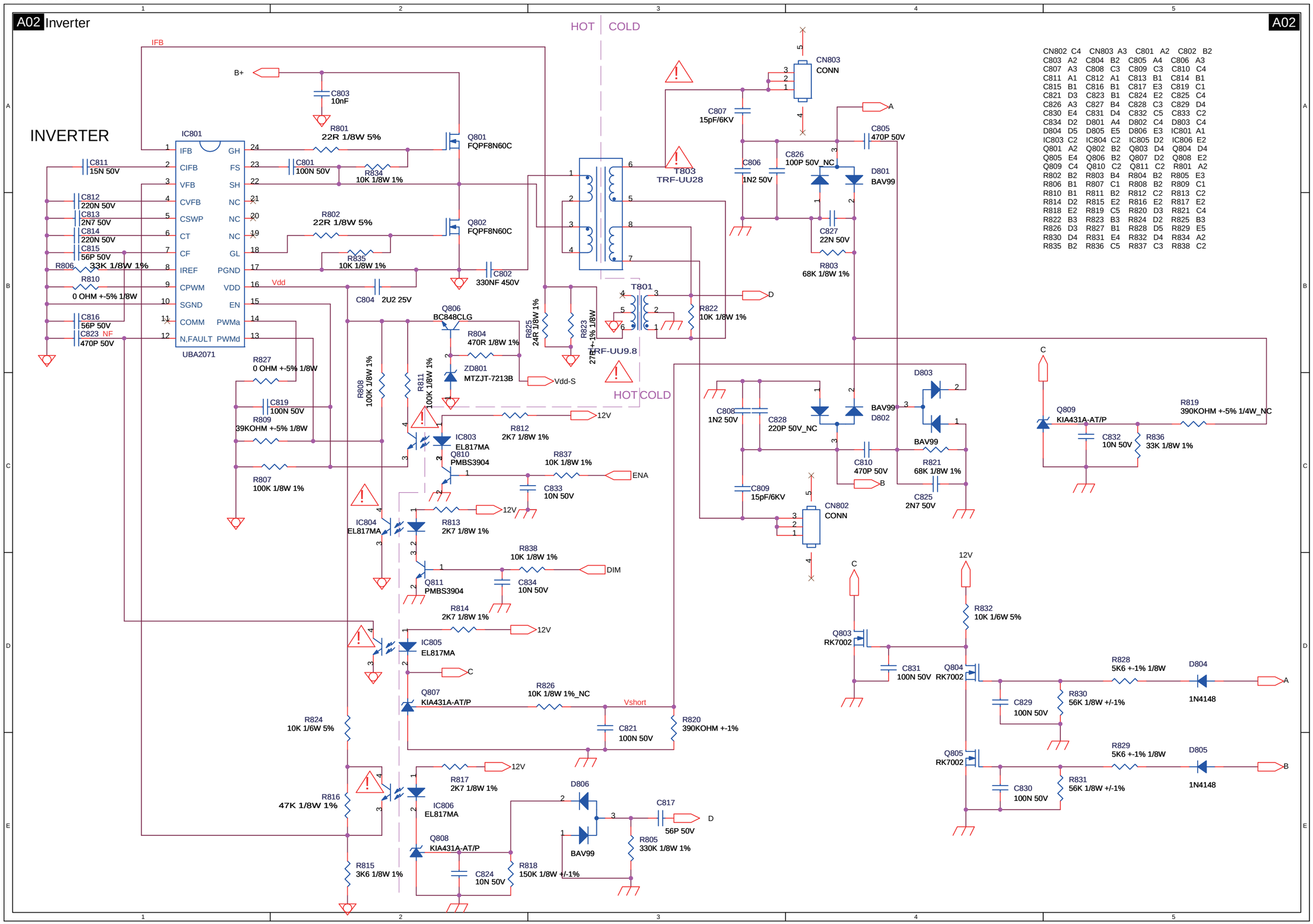
100107

Inverter 32"



CN802	C4	CN803	A3	C801	A2	C802	B2
C803	A2	C804	B2	C805	A4	C806	A3
C807	A3	C808	C3	C809	C3	C810	C4
C811	A1	C812	A1	C813	B1	C814	B1
C815	B1	C816	B1	C817	E3	C819	C1
C821	D3	C823	B1	C824	E2	C825	C4
C826	A3	C827	B4	C828	C3	C829	D4
C830	E4	C831	D4	C832	C5	C833	C2
C834	D2	D801	A4	D802	C4	D803	C4
D804	D5	D805	E5	D806	E3	IC801	A1
IC803	C2	IC804	C2	IC805	D2	IC806	E2
Q801	A2	Q802	B2	Q803	D4	Q804	D4
Q805	E4	Q806	B2	Q807	D2	Q808	E2
Q809	C4	Q810	C2	Q811	C2	R801	A2
R802	B2	R803	B4	R804	B2	R805	E3
R806	B1	R807	C1	R808	B2	R809	C1
R810	B1	R811	B2	R812	C2	R813	C2
R814	D2	R815	E2	R816	E2	R817	E2
R818	E2	R819	C5	R820	D3	R821	C4
R822	B3	R823	B3	R824	D2	R825	B3
R826	D3	R827	B1	R828	D5	R829	E5
R830	D4	R831	E4	R832	D4	R834	A2
R835	B2	R836	C5	R837	C3	R838	C2

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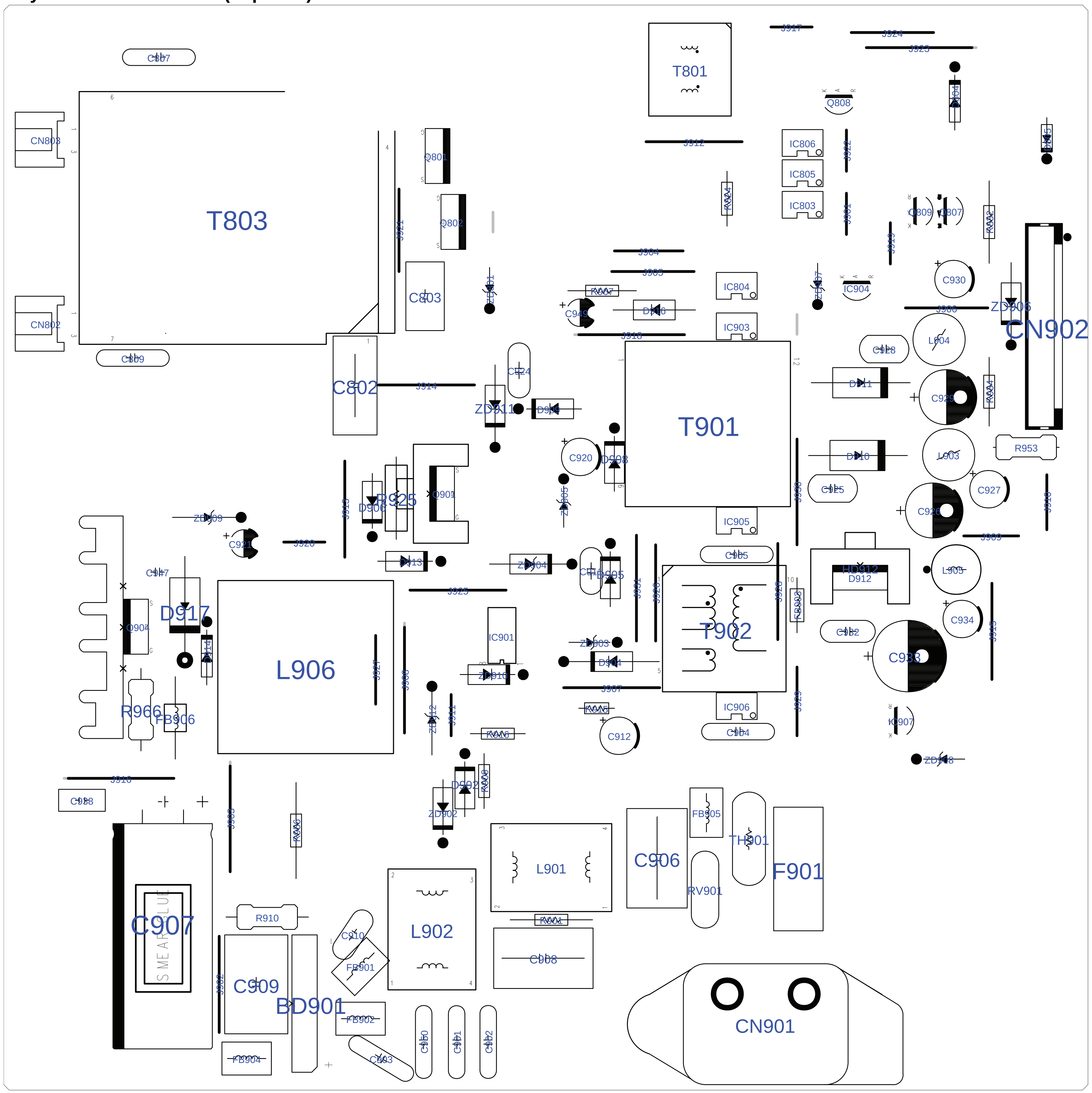
100107

Layout Power Board 32" (Top Side)



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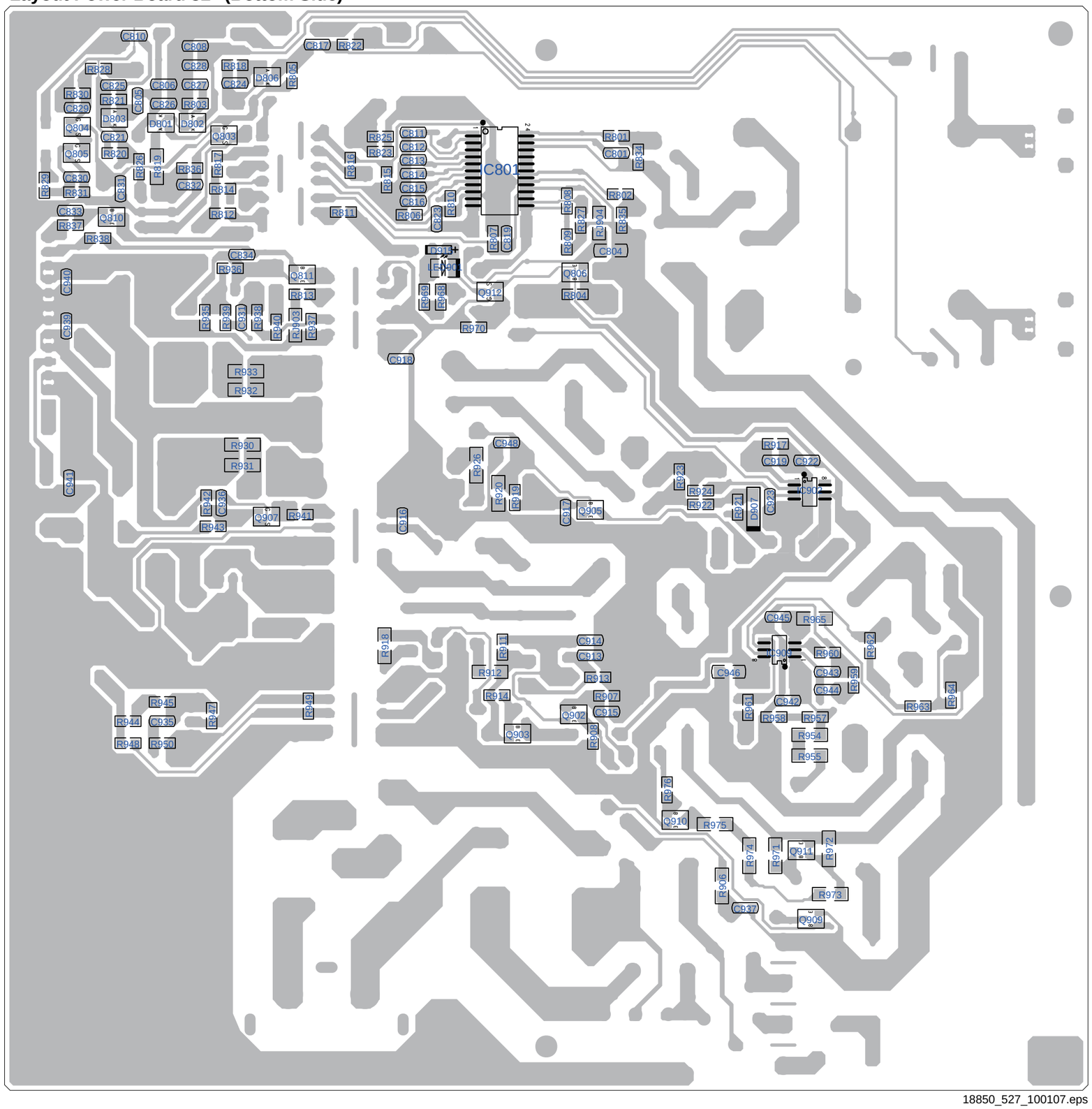
100308

Layout Power Board 32" (Bottom Side)



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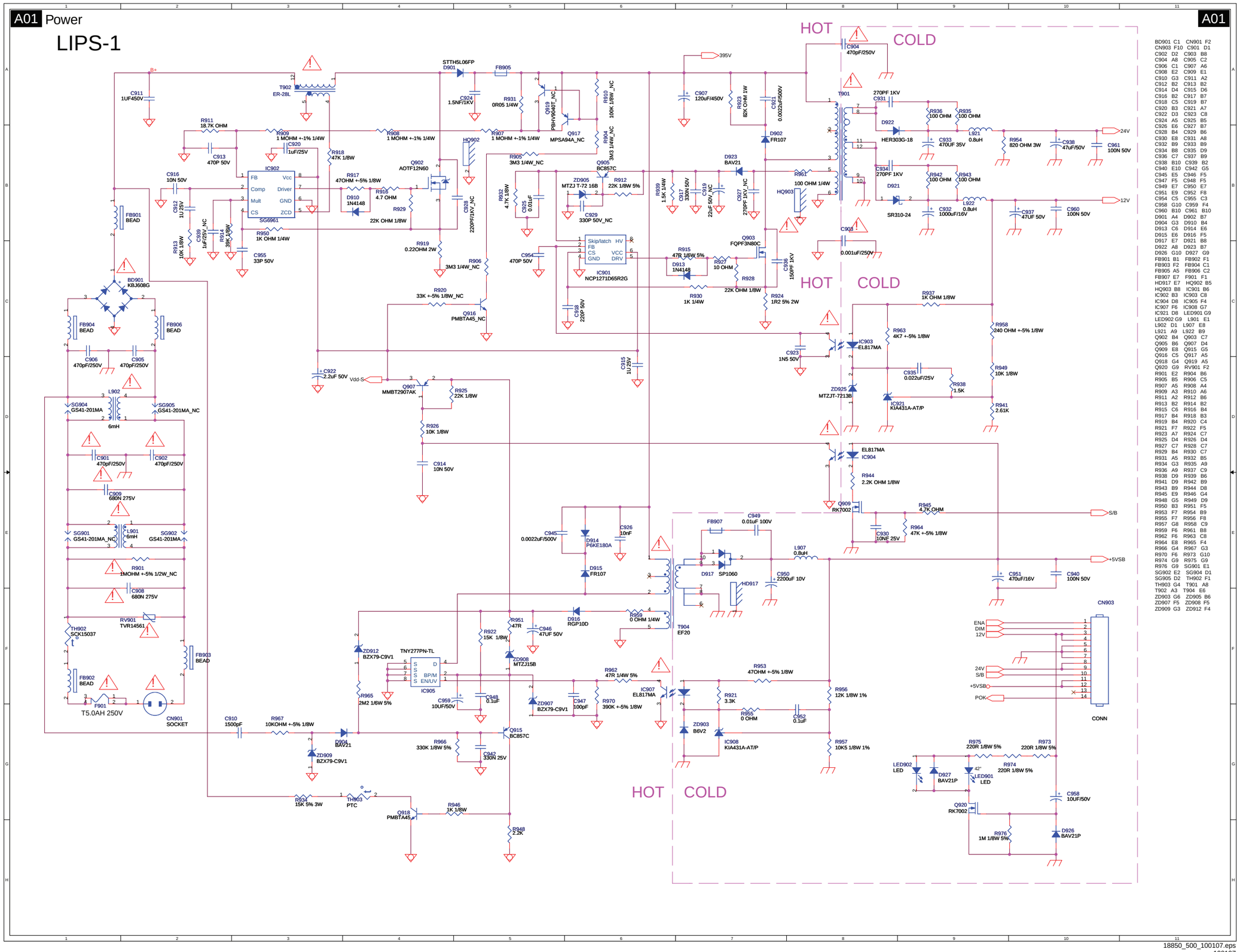
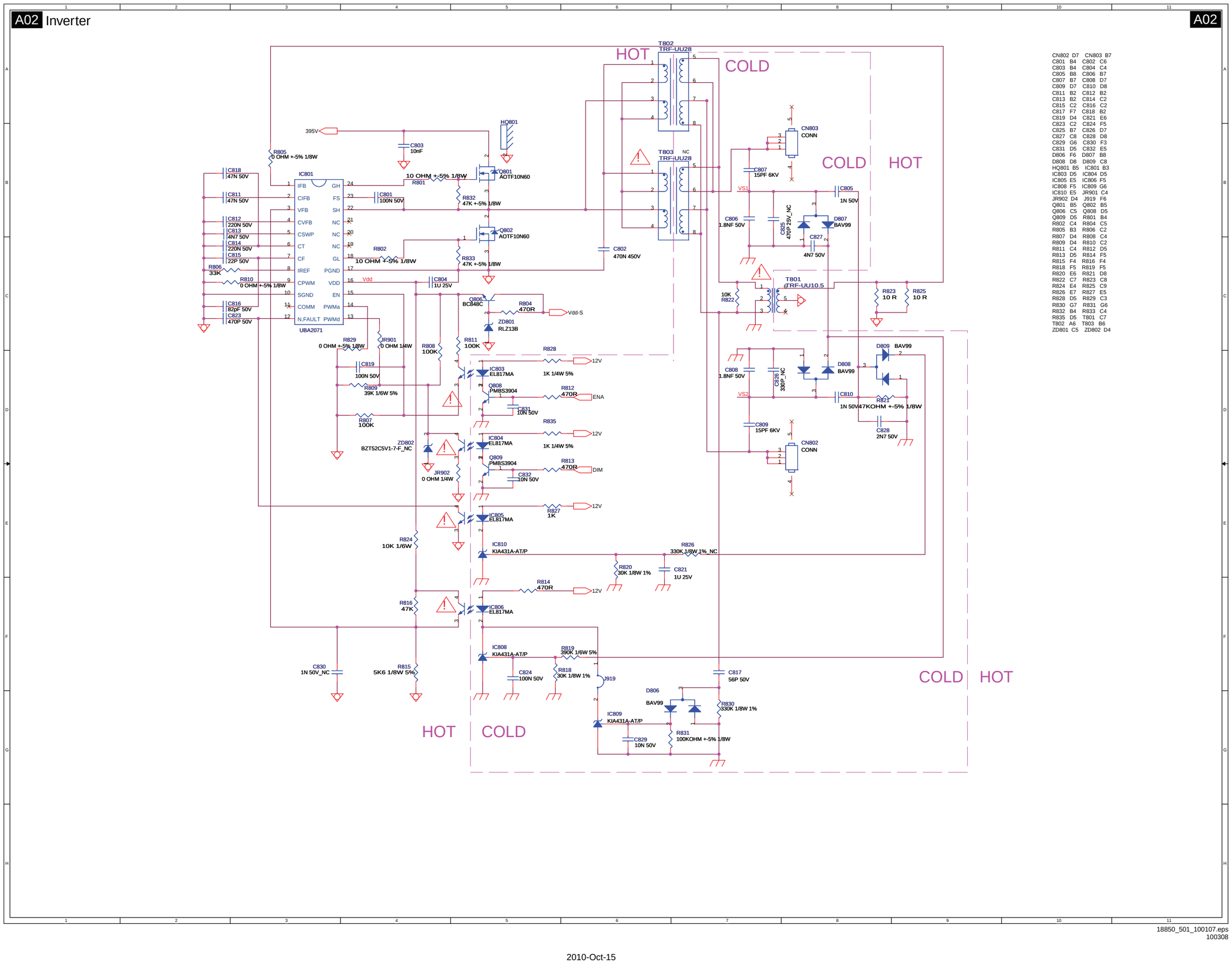
100107

Power 42" & 47"


A01 Power
LIPS-1
A01
HOT
COLD
HOT
COLD
HOT
COLD
T5.0AH 250V
CN901 SOCKET
CONN
18850_500_100107.eps
100107

Inverter 42" & 47"

A02 Inverter



CN802 D7 CN803 B7
C801 B4 C802 C6
C803 B4 C804 C4
C805 B8 C806 B7
C807 B7 C808 D7
C809 D7 C810 D8
C811 B2 C812 B2
C813 B2 C814 C2
C815 C2 C816 C2
C817 F7 C818 B2
C819 D4 C821 E6
C823 C2 C824 F5
C825 B7 C826 D7
C827 C8 C828 D8
C829 G6 C830 F3
C831 D5 C832 E5
D806 F6 D807 B8
D808 D8 D809 C8
HQ801 B5 IC801 B3
IC803 D5 IC804 D5
IC805 E5 IC806 F5
IC808 F5 IC809 G6
IC810 E5 JR901 C4
JR902 D4 J919 F6
Q801 B5 Q802 B5
Q806 C5 Q808 D5
Q809 D5 R801 B4
R802 C4 R804 C5
R805 B3 R806 C2
R807 D4 R808 C4
R809 D4 R810 C2
R811 C4 R812 D5
R813 D5 R814 F5
R815 F4 R816 F4
R818 F5 R819 F5
R820 E6 R821 D8
R822 C7 R823 C8
R824 E4 R825 C9
R826 E7 R827 E5
R828 D5 R829 C3
R830 G7 R831 G6
R832 B4 R833 C4
T801 C7 T802 A6
T803 B6 ZD801 C5
ZD802 D4

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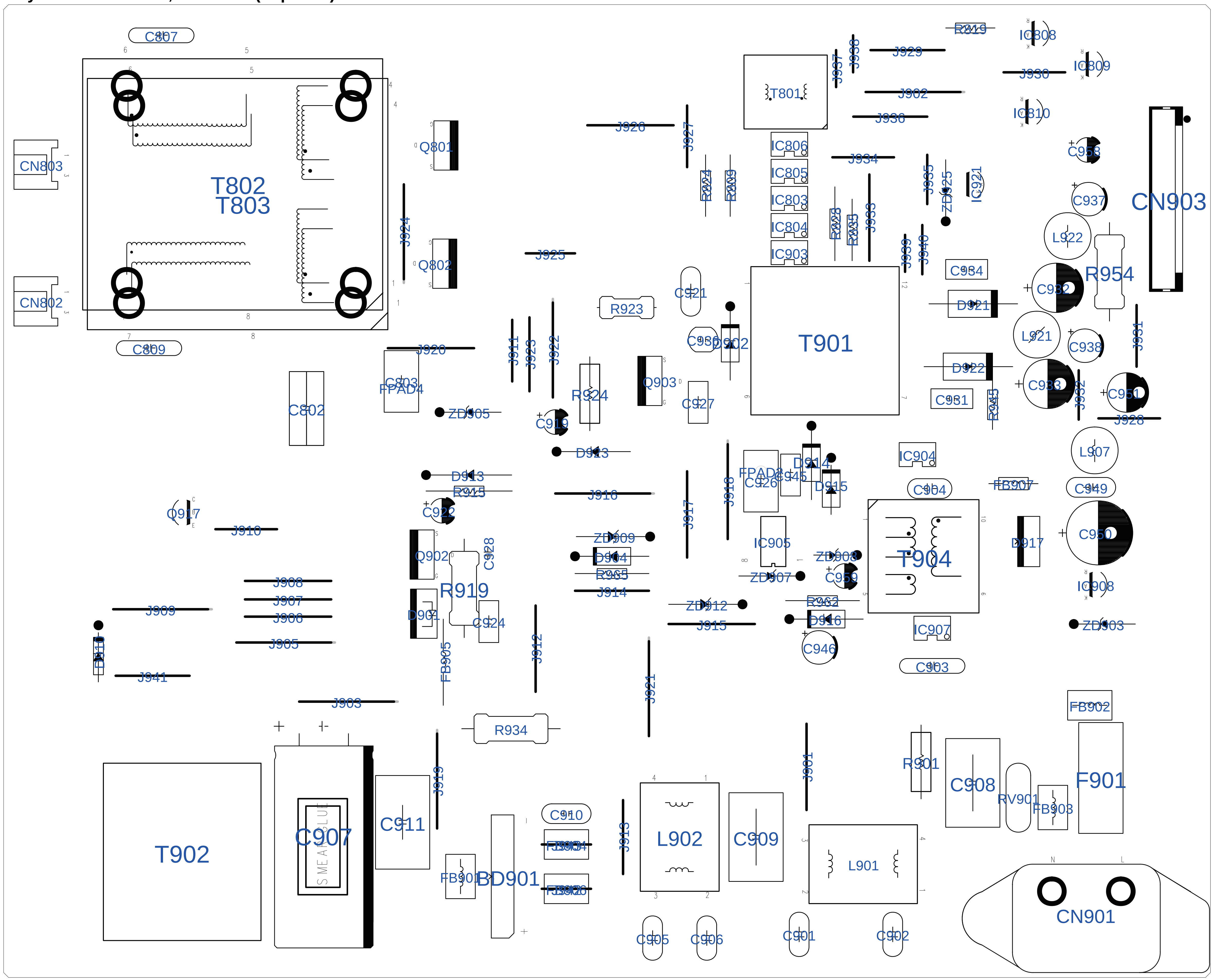
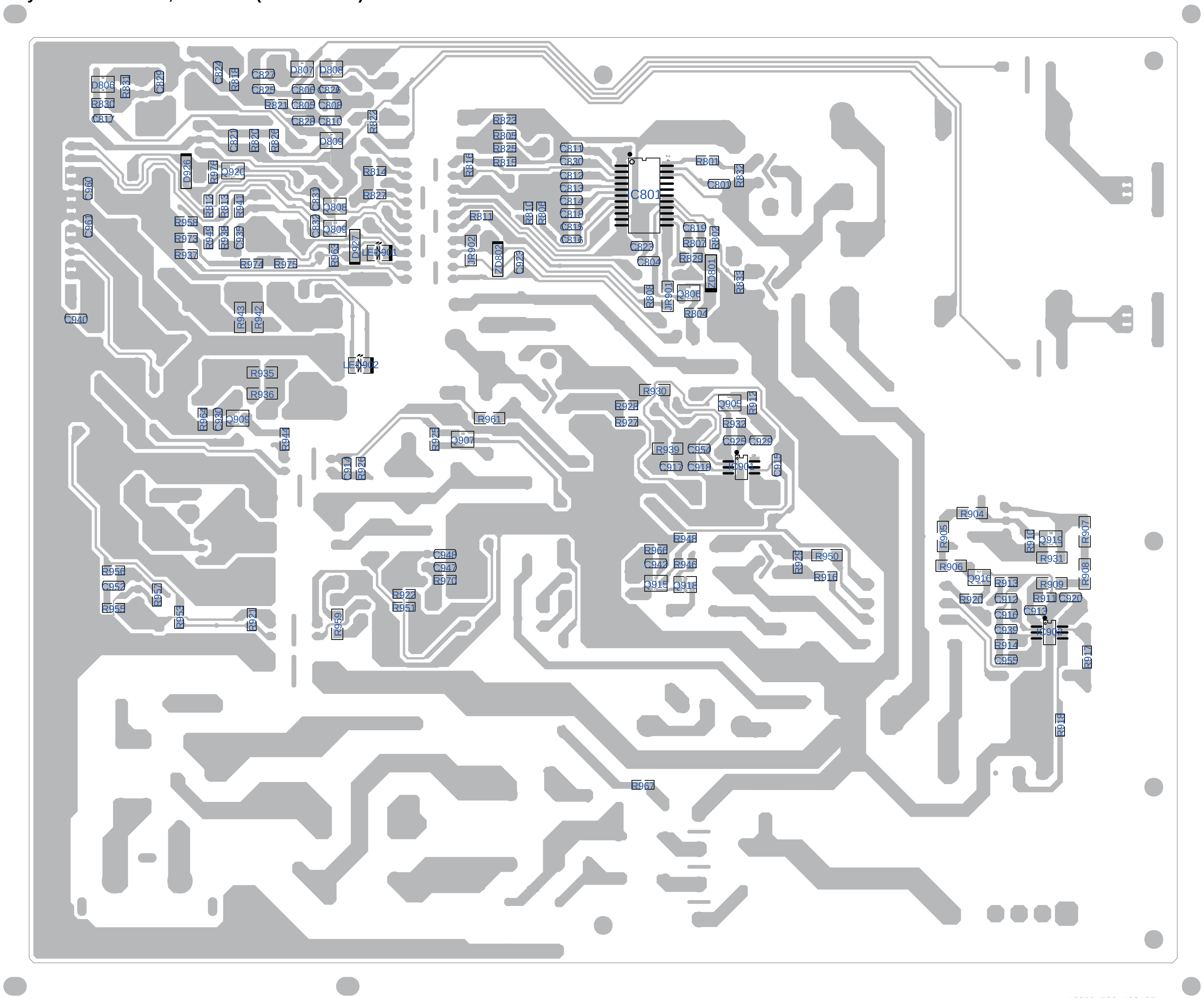
100308

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



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



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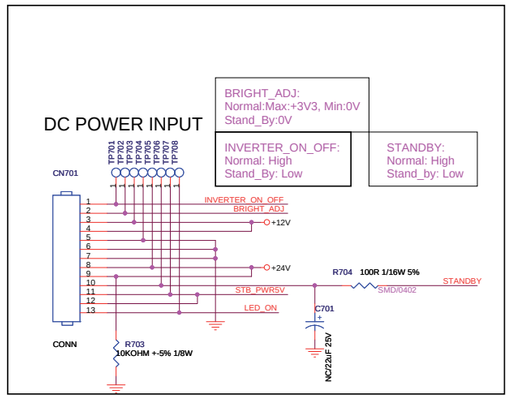
100202

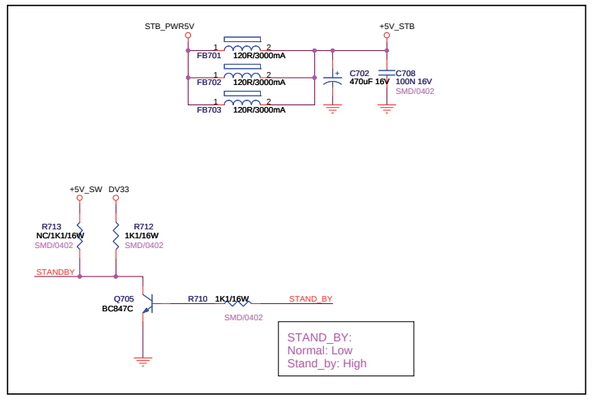
SSB: Power-1

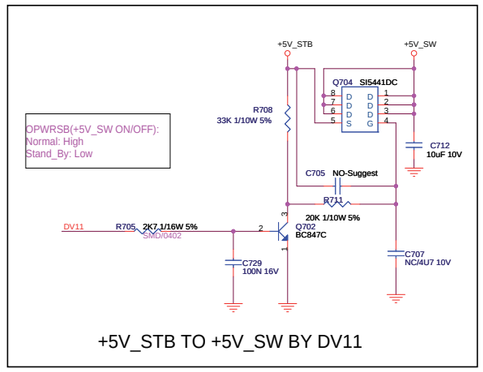
B01 POWER-1

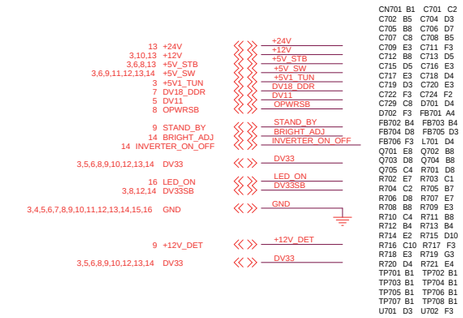
EU MT5363 - 4 LAYERS 42" DTV

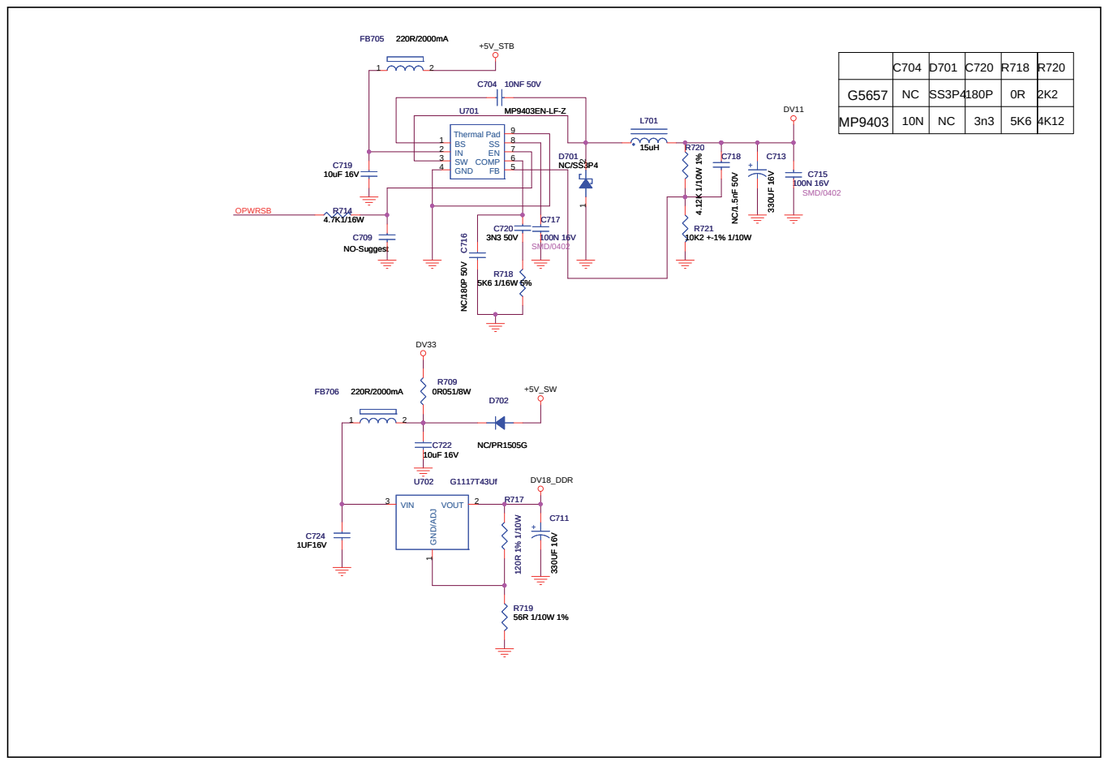
B01



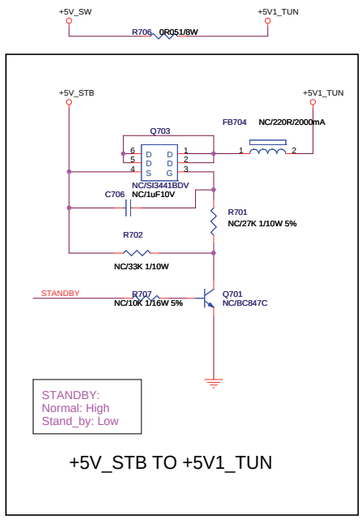


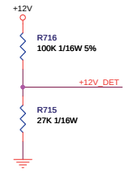






	C704	D701	C720	R718	R720
G5657	NC	SS3P4	180P	0R	2K2
MP9403	10N	NC	3n3	5K6	4K12





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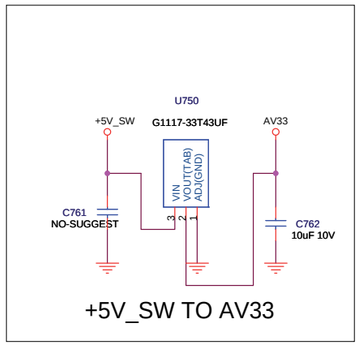
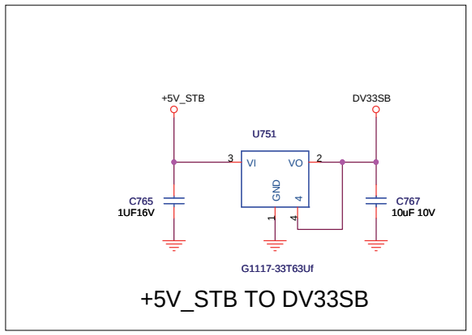
SSB: Power-2

B02 POWER-2

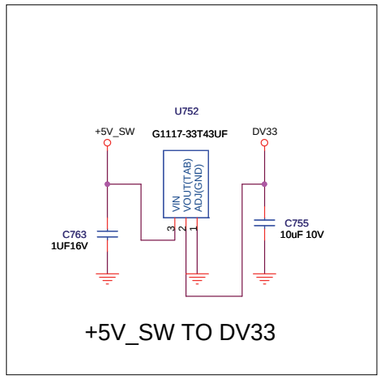
B02



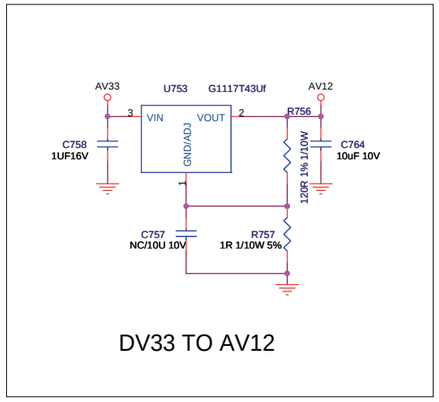
+5V_SW TO AV33



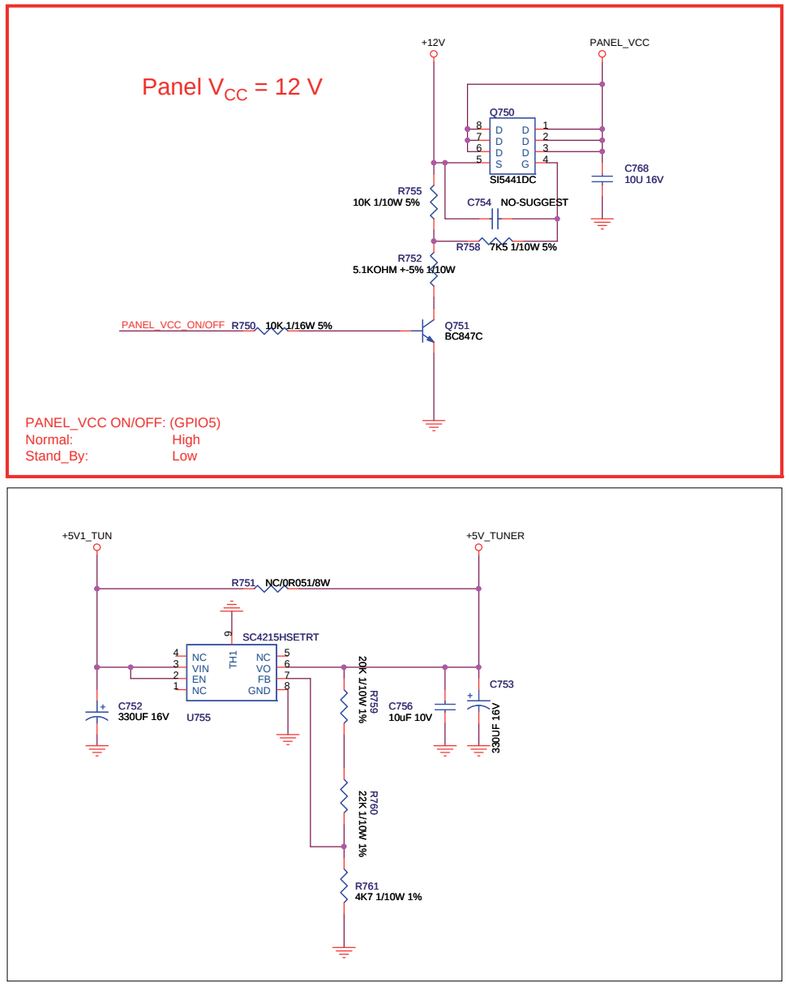
+5V_STB TO DV33SB



+5V_SW TO DV33



DV33 TO AV12



2,13 +24V
2,10,13 +12V
2,6,8,13 +5V_STB
→ +24V, +12V, +5V_STB

2,6,9,11,12,13,14 +5V_SW
→ +5V_SW

4 +5V_TUNER
2 +5V1_TUN
→ +5V_TUNER, +5V1_TUN

2,5,6,8,9,10,12,13,14 DV33
6,12,14 AV33
8,12,14 DV33SB
5,6,7,12,14 AV12
14 PANEL_VCC
→ DV33, AV33, DV33SB, AV12, PANEL_VCC

6 PANEL_VCC_ON/OFF
→ PANEL_VCC_ON/OFF

2,4,5,6,7,8,9,10,11,12,13,14,15,16 GND
→ GND

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
Q750	B8	Q751	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

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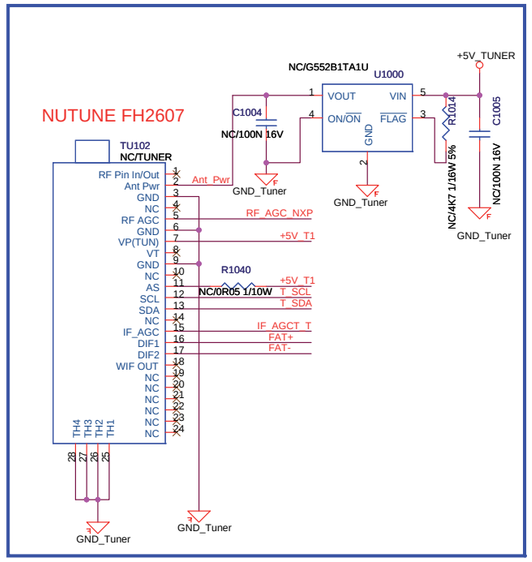
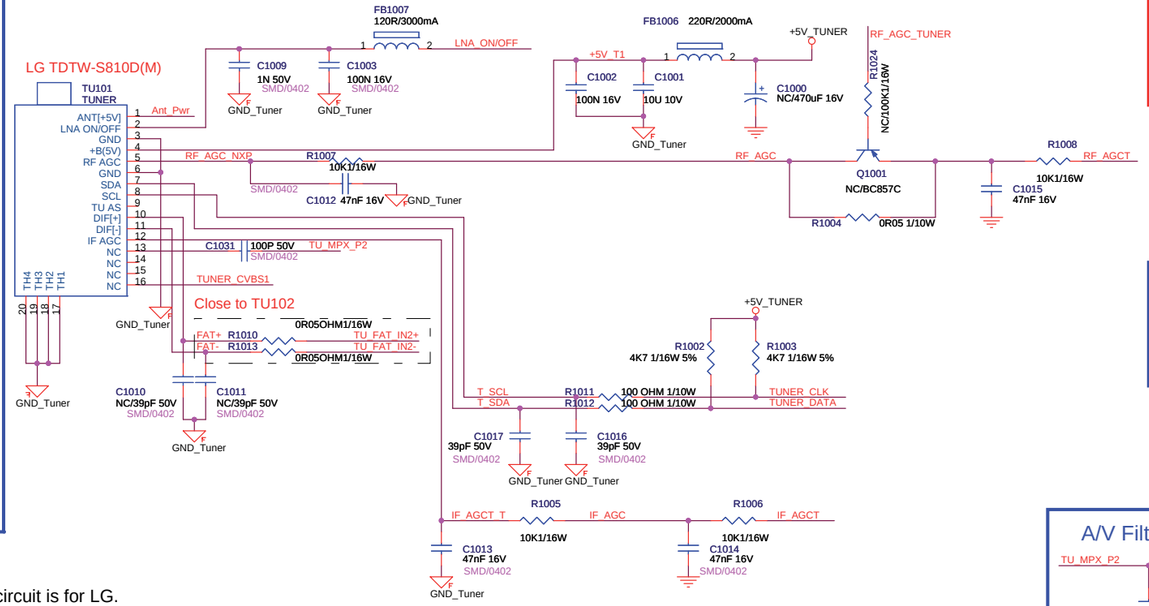
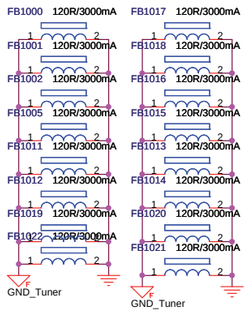
100308

SSB: Tuner

B03 TUNER





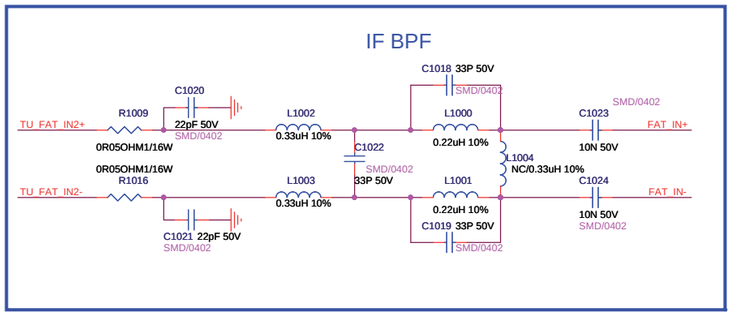


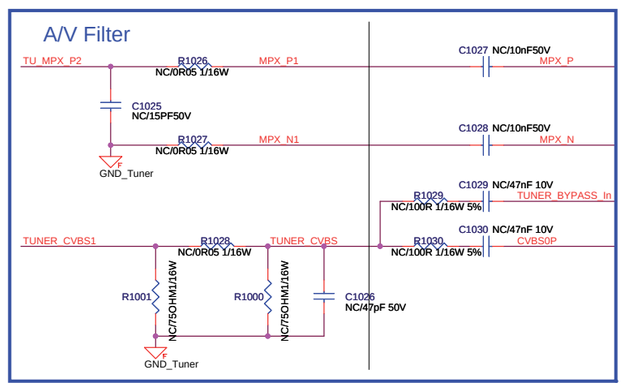
The circuit is for LG.

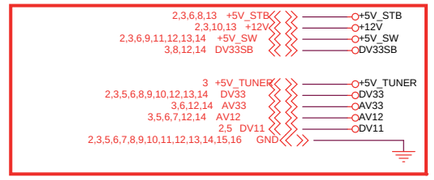
Tuner	C1009 FB1007 C1003 R1004	Q1001 R1024	R1013 R1010
LG	Yes	NC	0R
Nutune	NC	Yes	100R

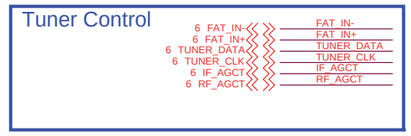
0R 61G0402000 JT

100R 61G0402101 JT









B03

C1000 B7 C1001 B6
C1002 B6 C1003 B5
C1004 B2 C1005 B3
C1009 B4 C1010 D4
C1011 D4 C1012 B5
C1013 E5 C1014 E6
C1015 B8 C1016 D6
C1017 D6 C1018 F6
C1019 G6 C1020 F5
C1021 G5 C1022 F6
C1023 F7 C1024 G7
C1025 E9 C1026 G10
C1027 E11 C1028 F11
C1029 F11 C1030 F11
C1031 C4 FB1000 E1
FB1001 F1 FB1002 F1
FB1005 F1 FB1006 A6
FB1007 A5 FB1011 F1
FB1012 F1 FB1013 F2
FB1014 F2 FB1015 F2
FB1016 F2 FB1017 E2
FB1018 F2 FB1019 G1
FB1020 G2 FB1021 G2
FB1022 G1 L1000 F6
L1001 G6 L1002 F6
L1003 G6 L1004 F7
Q1001 B7 R1000 G9
R1001 G9 R1002 D7
R1003 D7 R1004 C7
R1005 E6 R1006 E7
R1007 B5 R1008 B8
R1009 F5 R1010 C4
R1011 D6 R1012 D6
R1013 D4 R1014 B3
R1016 G5 R1024 B7
R1026 E9 R1027 F9
R1028 F9 R1029 F10
R1030 F10 R1040 C2
TU101 B3 TU102 B1

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SSB: MT5363 By-pass/Trap

B04 MT5363 BYPASS/TRAP

B04

U401A

Power & Ground

MT5363LICG

+5V_STB
+12V
+5V_SW
DV33SB
DV18_DDR
DV33
AV33
AV12
DV11
GND

HW Strap Setting

M_AOLRCK
M_AOBCK
M_AOSDATA0
M_SPDIF_Out
M_OPWM1
M_OPCTRL3

C4000 B4 C4001 B4
C4002 B4 C4003 B4
C4004 B5 C4005 B5
C4006 B5 C4007 D4
C4008 D4 C4009 D5
C4010 D5 C4011 D6
C4012 D6 C4013 D7
C4014 D7 C4015 D8
FB4000 A5 R4000 E9
R4001 E9 R4002 E9
R4003 F9 R4004 F7
R4005 F9 R4006 E7

Strapping Mode	AOLRCK	AOBCK	ASPDIF
ICE Mode + Serial Boot	0	0	0
ICE mode + ROM Boot	0	0	1

Strapping Mode	AOSDATA0	OPWM1
XTAL 54MHz	1	0

Strapping Mode	OPCTRL3(O)
PDWNC Normal	0

MT5363 STRAPPING MODE

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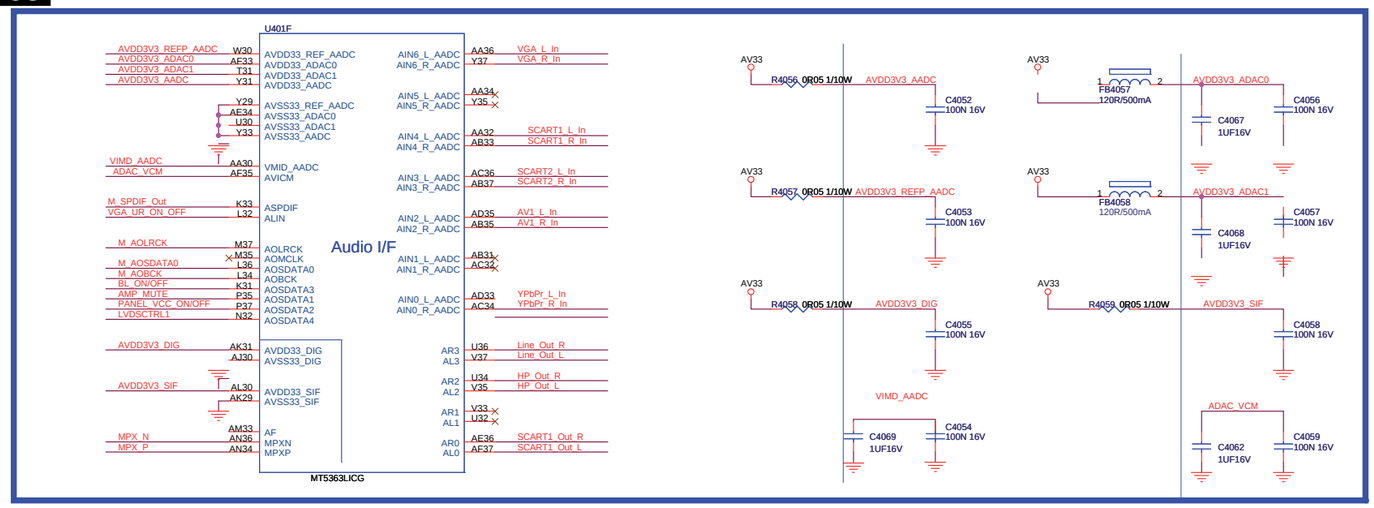
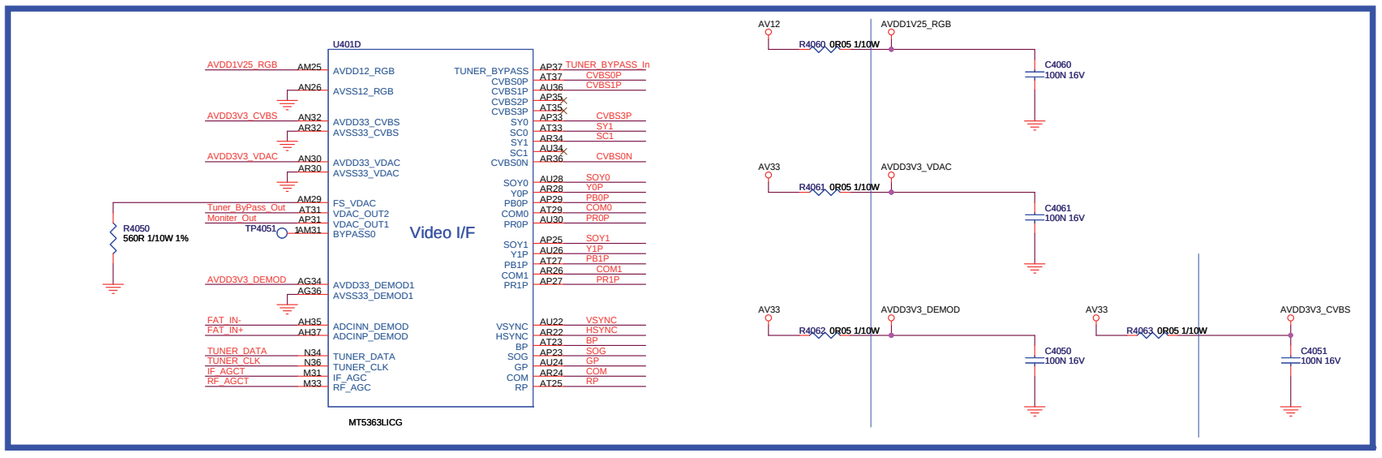
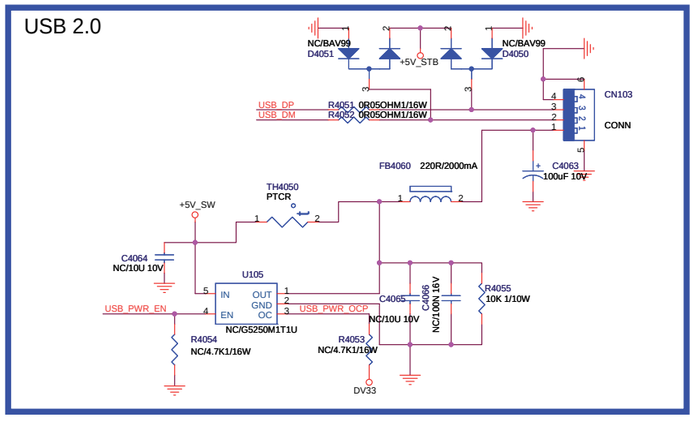
100226

SSB: MT5363 peripheral/USB2.0

B05 MT5363 PERIPHERAL/USB2.0







CN103 G4 C4050 E6
C4051 E7 C4052 A6
C4053 B6 C4054 C6
C4055 B6 C4056 A7
C4057 B7 C4058 B7
C4059 C7 C4060 D6
C4061 E6 C4062 C7
C4063 G3 C4064 G1
C4065 H3 C4066 H3
C4067 A7 C4068 B7
C4069 C5 D4050 F3
D4051 F2 FB4057 A7
FB4058 B7 FB4060 G3
R4050 E1 R4051 G2
R4052 G2 R4053 H3
R4054 H2 R4055 H3
R4056 A5 R4057 B5
R4058 B5 R4059 B6
R4060 D5 R4061 E5
R4062 E5 R4063 E7
TH4050 G2 TP4051 E2
U105 H2 U401D D2

B05

2,3,8,13 +5V_STB → +5V_STB
2,3,10,13 +12V → +12V
2,3,9,11,12,13,14 +5V_SW → +5V_SW
3,8,12,14 DV33SB → DV33SB
2,3,5,8,9,10,12,13,14 DV33 → DV33
3,12,14 AV33 → AV33
3,5,7,12,14 AV12 → AV12
2,5 DV11 → DV11
2,3,4,5,7,8,9,10,11,12,13,14,15,16 GND

Audio Input

11 VGA_L_In → VGA_L_In
11 VGA_R_In → VGA_R_In
10 SCART2_L_In → SCART2_L_In
10 SCART2_R_In → SCART2_R_In
10 SCART1_L_In → SCART1_L_In
10 SCART1_R_In → SCART1_R_In
11 AV1_L_In → AV1_L_In
11 AV1_R_In → AV1_R_In
11 YPbPr_L_In → YPbPr_L_In
11 YPbPr_R_In → YPbPr_R_In
4 MPX_N → MPX_N
4 MPX_P → MPX_P

Audio Output

13 Line_Out_R → Line_Out_R
13 Line_Out_L → Line_Out_L
10 SCART1_Out_R → SCART1_Out_R
10 SCART1_Out_L → SCART1_Out_L
13 HP_Out_R → HP_Out_R
13 HP_Out_L → HP_Out_L

Video Input

4 TUNER_BYPASS_IN → TUNER_BYPASS_In
4 CVBS0P → CVBS0P
11 CVBS1P → CVBS1P
10 CVBS3P → CVBS3P
10 SY1 → SY1
10 SC1 → SC1
11 CVBS0N → CVBS0N
10 SOY0 → SOY0
10 Y0P → Y0P
10 PB0P → PB0P
10 COM0 → COM0
10 PR0P → PR0P
11 SOY1 → SOY1
11 Y1P → Y1P
11 PB1P → PB1P
11 COM1 → COM1
11 PR1P → PR1P
11 VSYNC → VSYNC
11 HSYNC → HSYNC
11 BP → BP
11 SOG → SOG
11 GP → GP
11 COM → COM
11 RP → RP

Video Output

10 Tuner_ByPass_Out → Tuner_ByPass_Out
10 Moniter_Out → Moniter_Out

Tuner I/O Interface

4 FAT_IN- → FAT_IN-
4 FAT_IN+ → FAT_IN+
4 TUNER_DATA → TUNER_DATA
4 TUNER_CLK → TUNER_CLK
4 IF_AGCT → IF_AGCT
4 RF_AGCT → RF_AGCT

LVDS Control Interface

14 BL_ON/OFF → BL_ON/OFF
3 PANEL_VCC_ON/OFF → PANEL_VCC_ON/OFF
14 LVDSCTRL1 → LVDSCTRL1

Audio Mute Control

13 AMP_MUTE → AMP_MUTE

SPDIF

5,11 M_SPDIF_Out → M_SPDIF_Out

HW Strap Setting

5 M_AOLRCK → M_AOLRCK
5 M_AOBCK → M_AOBCK
5 M_AOSDATA0 → M_AOSDATA0
5,11 M_SPDIF_Out → M_SPDIF_Out

9 USB_PWR_EN → USB_PWR_EN
9 USB_PWR_OCP → USB_PWR_OCP
12 USB_DP → USB_DP
12 USB_DM → USB_DM
11 VGA_UR_ON_OFF → VGA_UR_ON_OFF

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100226

SSB: DDR2 memory

B06 DDR2 MEMORY

B06

DDR2 Interface

U401B

DV18_DDR

VCC2IO ×36

AV1V25_MEMPLL P13 AVDD12_MEMPLL
T13 AVSS12_MEMPLL

DRAM

TP4100 1 K5 MEMTN
TP4101 1 K7 MEMTP

RVREF3 P7 RVREF
N8 RVREF

RCKE K1 RCKE

RCLK0 B3 RCLK0
RCLK0# A2 RCLK0#

RCLK1 AD1 RCLK1
RCLK1# AD3 RCLK1#

RODT N6 RODT
RRAS# P5 RRAS#
RCAS# L2 RCAS#
RCS# P3 RCS#
RWE# K3 RWE#

R4108 100OHM1/16W AB5 REXTDN

RBA0 H3 RBA0
RBA1 J2 RBA1
RBA2 H1 RBA2

MT5363LICG

RDQM0 E10 RDQM0
RDQS0 B9 RDQS0
RDQS0# A8 RDQS0#
RDQ0 D7 RDQ0
RDQ1 H11 RDQ1
RDQ2 E6 RDQ2
RDQ3 G12 RDQ3
RDQ4 H13 RDQ4
RDQ5 D5 RDQ5
RDQ6 E11 RDQ6
RDQ7 F7 RDQ7

RDQM1 C10 RDQM1
RDQS1 B7 RDQS1
RDQS1# C6 RDQS1#
RDQ8 B5 RDQ8
RDQ9 D11 RDQ9
RDQ10 A4 RDQ10
RDQ11 B11 RDQ11
RDQ12 A12 RDQ12
RDQ13 C4 RDQ13
RDQ14 A10 RDQ14
RDQ15 A6 RDQ15

RDQM2 V1 RDQM2
RDQS2 V3 RDQS2
RDQS2# W2 RDQS2#
RDQ16 AB1 RDQ16
RDQ17 U4 RDQ17
RDQ18 AC4 RDQ18
RDQ19 T1 RDQ19
RDQ20 T3 RDQ20
RDQ21 AC2 RDQ21
RDQ22 U2 RDQ22
RDQ23 AB3 RDQ23

RDQM3 U6 RDQM3
RDQS3 Y1 RDQS3
RDQS3# AA2 RDQS3#
RDQ24 Y5 RDQ24
RDQ25 T7 RDQ25
RDQ26 AA6 RDQ26
RDQ27 V7 RDQ27
RDQ28 V5 RDQ28
RDQ29 AA4 RDQ29
RDQ30 T5 RDQ30
RDQ31 Y7 RDQ31

RA0 N4 RA0
RA1 H5 RA1
RA2 M3 RA2
RA3 G4 RA3
RA4 M5 RA4
RA5 F1 RA5
RA6 M7 RA6
RA7 F3 RA7
RA8 P1 RA8
RA9 D1 RA9
RA10 G2 RA10
RA11 N2 RA11
RA12 E2 RA12
RA13 M1 RA13

DV18_DDR
R4104 1K 1/10W 1%
RVREF3
R4105 1K 1/10W 1%
C4117 100N 16V SMD/0402

U402

RDQ0 G8 DQ0 — A0 M8 1_A0
RDQ1 G2 DQ1 — A1 M3 1_A1
RDQ2 H7 DQ2 — A2 M7 1_A2
RDQ3 H3 DQ3 — A3 N2 1_A3
RDQ4 H1 DQ4 — A4 N8 1_A4
RDQ5 H9 DQ5 — A5 N3 1_A5
RDQ6 F1 DQ6 — A6 N7 1_A6
RDQ7 F9 DQ7 — A7 P2 1_A7
RDQ8 C8 DQ8 — A8 P8 1_A8
RDQ9 C2 DQ9 — A9 P3 1_A9
RDQ10 D7 DQ10 — A10/AP M2 1_A10
RDQ11 D3 DQ11 — A11 P7 1_A11
RDQ12 D1 DQ12 — A12 R2 1_A12
RDQ13 D9 DQ13 — NC/A13 R8 1_A13
RDQ14 B1 DQ14 — NC/A14 R3
RDQ15 B9 DQ15 — NC/N15 R7
NC A2 — BA0 L2 1_BA0
NC E2 — BA1 L3 1_BA1
RDQS1 B7 — BA2 L1 1_BA2
RDQS1# A8 UDQS — NC/BA2 J8
RDQS0 F7 UDQS — CK K8 CLK0
RDQS0# E8 LDQS — CK K8 CLK0#
RDQM1 B3 LDQS — CS L8 1_CS#
RDQM0 F3 UDM — CAS L7 1_CAS#
RVREF1 J2 LDM — ODT K9 1_ODT
1_CKE K2 VREF — RAS K7 1_RAS#
CKE — WE K3 1_WE#
VDD A1 — VSS A3
VDD A9 — VSS A7
VDD C1 — VSS B2
VDD C3 — VSS B8
VDD C7 — VSS D2
VDD C9 — VSS D8
VDD E1 — VSS E3
VDD E9 — VSS E7
VDD G1 — VSS F2
VDD G3 — VSS F8
VDD G7 — VSS H2
VDD G9 — VSS H8
VDDL J1 — VSS J3
VDD J9 — VSSDL J7
VDD M9 — VSS N1
VDD R1 — VSS P9

NT5TU32M16CG-BD

DDR#1

RP4100 56R 1/16W 5%
1_A8 1 8 RA8
1_A13 2 7 RA13
1_A0 3 6 RA0
1_CAS# 4 5 RCAS#

RP4101 56R 1/16W 5%
1_A9 1 8 RA9
1_A12 2 7 RA12
1_A7 3 6 RA7
1_A5 4 5 RA5

RP4102 56R 1/16W 5%
1_A2 1 8 RA2
1_A6 2 7 RA6
1_A4 3 6 RA4
1_A11 4 5 RA11

RP4108 56R 1/16W 5%
1_BA2 8 1 RBA2
1_A1 7 2 RA1
1_A10 6 3 RA10
1_A3 5 4 RA3

RP4110 56R 1/16W 5%
1_WE# 8 1 RWE#
1_CKE 7 2 RCKE
1_BA1 6 3 RBA1
1_BA0 5 4 RBA0

RP4111 56R 1/16W 5%
RODT 1 8 1_ODT
RRAS# 2 7 1_RAS#
RCS# 3 6 1_CS#
4 5

DV18_DDR
NEAR IC
RCLK0 R4109 22R 1/16W 5% CLK0
R4106 100OHM1/16W
RCLK0# R4110 22R 1/16W 5% CLK0#

DV18_DDR
R4103 1K 1/10W 1%
R4102 1K 1/10W 1%
RVREF1
C4101 100N 16V SMD/0402

U403

RDQ16 G8 DQ0 — A0 M8 2_A0
RDQ17 G2 DQ1 — A1 M3 2_A1
RDQ18 H7 DQ2 — A2 M7 2_A2
RDQ19 H3 DQ3 — A3 N2 2_A3
RDQ20 H1 DQ4 — A4 N8 2_A4
RDQ21 H9 DQ5 — A5 N3 2_A5
RDQ22 F1 DQ6 — A6 N7 2_A6
RDQ23 F9 DQ7 — A7 P2 2_A7
RDQ24 C8 DQ8 — A8 P8 2_A8
RDQ25 C2 DQ9 — A9 P3 2_A9
RDQ26 D7 DQ10 — A10/AP M2 2_A10
RDQ27 D3 DQ11 — A11 P7 2_A11
RDQ28 D1 DQ12 — A12 R2 2_A12
RDQ29 D9 DQ13 — NC/A13 R8 2_A13
RDQ30 B1 DQ14 — NC/A14 R3
RDQ31 B9 DQ15 — NC/N15 R7
NC A2 — BA0 L2 2_BA0
NC E2 — BA1 L3 2_BA1
RDQS3 B7 — BA2 L1 2_BA2
RDQS3# A8 UDQS — NC/BA2 J8 CLK1
RDQS2 F7 UDQS — CK K8 CLK1#
RDQS2# E8 LDQS — CK K8 CLK1
RDQM3 B3 LDQS — CS L8 2_CS#
RDQM2 F3 UDM — CAS L7 2_CAS#
RVREF2 J2 LDM — ODT K9 2_ODT
2_CKE K2 VREF — RAS K7 2_RAS#
CKE — WE K3 2_WE#
VDD A1 — VSS A3
VDD A9 — VSS A7
VDD C1 — VSS B2
VDD C3 — VSS B8
VDD C7 — VSS D2
VDD C9 — VSS D8
VDD E1 — VSS E3
VDD E9 — VSS E7
VDD G1 — VSS F2
VDD G3 — VSS F8
VDD G7 — VSS H2
VDD G9 — VSS H8
VDDL J1 — VSS J3
VDD J9 — VSSDL J7
VDD M9 — VSS N1
VDD R1 — VSS P9

NT5TU32M16CG-BD

DDR#2

RP4104 56R 1/16W 5%
2_CAS# 1 8 RCAS#
2_A0 2 7 RA0
2_A13 3 6 RA13
2_A8 4 5 RA8

RP4105 56R 1/16W 5%
2_A3 1 8 RA3
2_A10 2 7 RA10
2_A1 3 6 RA1
2_BA2 4 5 RBA2

RP4103 56R 1/16W 5%
2_BA0 1 8 RBA0
2_BA1 2 7 RBA1
2_CKE 3 6 RCKE
2_WE# 4 5 RWE#

RP4106 56R 1/16W 5%
2_A11 1 8 RA11
2_A4 2 7 RA4
2_A6 3 6 RA6
2_A2 4 5 RA2

RP4107 56R 1/16W 5%
2_A9 1 8 RA9
2_A12 2 7 RA12
2_A7 3 6 RA7
2_A5 4 5 RA5

RP4109
RCS# 5 4 2_CS#
RRAS# 6 3 2_RAS#
RODT 7 2 2_ODT
8 1
56R 1/16W 5%

DV18_DDR
NEAR IC
RCLK1 R4111 22R 1/16W 5% CLK1
R4107 100OHM1/16W
RCLK1# R4112 22R 1/16W 5% CLK1#

DV18_DDR
R4100 1K 1/10W 1%
R4101 1K 1/10W 1%
RVREF2
C4100 100N 16V SMD/0402

2,3,6,8,13 +5V_STB → +5V_STB
2,3,10,13 +12V → +12V
2,3,6,9,11,12,13,14 +5V_SW → +5V_SW
3,8,12,14 DV33SB → DV33SB
2 DV18_DDR → DV18_DDR
2,3,5,6,8,9,10,12,13,14 DV33 → DV33
3,6,12,14 AV33 → AV33
3,5,6,12,14 AV12 → AV12
2,5 DV11 → DV11
2,3,4,5,6,8,9,10,11,12,13,14,15,16 GND

C4100 D8 C4101 D5
C4102 G1 C4103 H1
C4104 G2 C4105 G2
C4106 G2 C4107 G2
C4108 G3 C4109 H3
C4110 G4 C4111 G5
C4112 H2 C4113 H2
C4114 H2 C4115 H2
C4116 G5 C4117 F2
C4118 G3 C4119 G3
C4120 G4 C4121 G6
C4122 G6 C4123 G6
C4124 G7 C4125 G7
C4126 G7 C4127 H3
C4128 H3 C4129 H4
C4130 F6 FB4100 F6
RP4100 A5 RP4101 B5
RP4102 B5 RP4103 B8
RP4104 A8 RP4105 B8
RP4106 B8 RP4107 C8
RP4108 B5 RP4109 B8
RP4110 C5 RP4111 C5
R4100 D8 R4101 D8
R4102 D5 R4103 D5
R4104 F1 R4105 F2
R4106 D4 R4107 D7
R4108 E1 R4109 D4
R4110 D4 R4111 D7
R4112 D7 TP4100 C1
TP4101 C1 U401B A1
U402 A4 U403 A7

AV1V25_MEMPLL

AV12 FB4100 120R/500mA 1 2 AV1V25_MEMPLL
C4130 10NF 50V SMD/0402

DRAM DE-CAP.

DV18_DDR
C4102 100uF 16V
C4104 100N 16V SMD/0402
C4105 100N 16V SMD/0402
C4106 100N 16V SMD/0402
C4107 100N 16V SMD/0402
C4108 100N 16V SMD/0402
C4118 100N 16V SMD/0402
C4119 100N 16V SMD/0402
C4120 100N 16V SMD/0402

DV18_DDR
C4103 100uF 16V
C4113 100N 16V SMD/0402
C4114 100N 16V SMD/0402
C4112 100N 16V SMD/0402
C4115 100N 16V SMD/0402
C4109 100N 16V SMD/0402
C4127 100N 16V SMD/0402
C4128 100N 16V SMD/0402
C4129 100N 16V SMD/0402

MT5363 DE-CAP.

DV18_DDR
C4110 10U 10V
C4116 NO-Suggest SMD/0402
C4111 NO-Suggest SMD/0402
C4122 100N 16V SMD/0402
C4121 100N 16V SMD/0402
C4123 100N 16V SMD/0402
C4124 100N 16V SMD/0402
C4125 100N 16V SMD/0402
C4126 100N 16V SMD/0402

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SSB: Flash/JTAG/UART/IR

B07 FLASH/JTAG/UART/IR

B07

STB I/F & Peripheral

U401C — MT5363LICG

AVDD3V3_REG, 1V0SB, AVDD3V3_XTAL, E_FUSE, RC6, LED_R, LCD_Clock_SDA, LCD_Clock_SCL, M_OPCTRL3, TP4153, PAALE, PACLE, PARB#, POWE#, POCE0#, POCE1#, POCE#, PDD0–PDD7

ORESET#, OPWRSB, XTALO, XTALI, VCXO, ADIN5_SRV, ADIN4_SRV, ADIN3_SRV, ADIN2_SRV, ADIN1_SRV, ADIN0_SRV, U0RX, U0TX, U1RX, U1TX, JTDO, JTMS, JTCK, JTDI, JTRST#, OSCL2, OSDA2, OSCL1, OSDA1, OSCL0, OSDA0

R4151 0R05 1/10W; R4194 4.7K1/16W; R4155 10K1/16W; R4195 0R05 1/10W; R4152 1 OHM 1/10W; R4170 10K1/16W; R4184 4.7K1/16W

TP4152, TP4154, TP4153

SP_AMP_MUTE, KEY_UP_DN_DCSW, KEY_MENU_L_R_SOURCE, SCART_FS1, SCART_FS0, TCON_I2C_ON_OFF, VCOM_I2C_ON_OFF, SYS_EEPROM_WP

C4166 100N 16V SMD/0402; C4169 100N 16V; C4167 No-Suggest; C4168 4.7UF 10V

512KB Nor Flash for Boot Code

U4052 — CS_ VCC, SO HOLD, WP SCK, GND SI — NC/MX25L4005AMI-12G

POCE0#, PDD0, Flash_WP#, R4188 4.7K1/16W, R4185 4.7K1/16W, C4152 NC/100N 16V SMD/0402

X4150

54MHz, CL=10P, C4163 10P 50V, C4164 10P 50V, L4150 0U82, C4165 1000pF 50V

OXTALI, OXTALO

SERVICE CONNECTOR

R4186 4.7K1/16W, R4187 4.7K1/16W, R4156 100 OHM 1/10W, U0TX, U0RX, R4179

BAV99 D4151, BAV99 D4152, CONN, CN410

16MB Nand Flash

U4051 NAND128W3A2BN6E — NAND FLASH

PDD7–PDD0, PACLE, PAALE, POCE1#, POCE#, POWE#, Flash_WP#, PARB#

R4158 330 OHM 1/16W, R4182 4.7K1/16W, C4156 100N 16V SMD/0402, C4154 100N 16V SMD/0402, C4151 NO-SUGGEST

SYSTEM EEPROM

SYS_EEPROM_WP: LO = > WP, HI = > WRITE

R4189 4.7K1/16W, R4190 4.7K1/16W, R4191 4.7K1/16W, R4199 100R 1/16W 5%, R4192 0R05 1/16W, U409 M24C64-WDW6TP, C4150 NO-SUGGEST, R4229 NC/0R05OHM1/16W

I2C ADDRESS "A2"

For LCD Clock

CN4052 NC/CONN

LCD_Clock_SCL, LCD_Clock_SDA, +5V_STB, R4160 100 OHM 1/10W, R4197 100 OHM 1/10W, R4196 4.7K1/16W, R4195 4.7K1/16W

iTV

BAV99 D4150, CN4051, R4181 100OHM1/16W, R4183 NC/0 OHM +-5% 1/16W, R4193 NC/0 OHM +-5% 1/16W

TO KEY PAD BOARD

R4173 3.9K1/16W, R4171 3.9K1/16W, R4175 100R 1/10W 1%, R4172 100R 1/10W 1%, KEY_UP_DN_DCSW, KEY_MENU_L_R_SOURCE, Key1, Key2, C4159 100N 50V, C4160 100N 50V

Reset IC

+5V_STB, R4153 NC/10K 1/10W 1%, R4150 0 OHM +-5% 1/10W, U410 MAX809STRG, R4154 NC/39K 1/10W 1%, ORESET#, R4180 100K1/16W

TO IR/KEY BOARD

LED_G#: Enable: Low; Disable(Stand_By): High

LED_R#: Enable(Stand_By): Low; Disable: High

LED_G: For flash function when press remote control

R4163 16K 1/10W 5%, R4161 1K 1/10W, FB4152 600R/200mA, R4157 100R 1/10W 5%, R4162 16K 1/10W 5%, R4178 0R05 1/10W, R4159 100R 1/10W 5%, C4158 2U2 16V, C4163 NC/100N 50V, C4155 100N 50V, C4157 100N 50V

ZD4150 NC/UDZSNP5.6B, ZD4151 NC/UDZSNP5.6B, NC/PHONEJACK, CN4053, CN401, CONN

IR Link

JTAG

R4164 10K1/16W, R4169 10K1/16W, R4174 10K1/16W, R4177 10K1/16W, R4166 10K1/16W SMD/0402, R4165 1K 1/16W 5% SMD/0402, TVTREF#1, JTRST#, JTDI, JTMS, JTCK, JTDO, R4176 33 OHM 1/16W, JTAG_DBGRQ, JTAG_DBGACK, R4167 NC/10K1/16W SMD/0402, R4168 NC/10K1/16W SMD/0402, CN406, NC/CONN

Audio Mute/Digital Amp Control

13 SP_AMP_MUTE

SCART Interface

10 SCART_FS1, 10 SCART_FS0

Other Control Interface

2 OPWRSB, 5,11,12 M_OPCTRL3

HW Strap Pins

5,11,12 M_OPCTRL3

VCOM_I²C ON_OFF

High: VCOM alignment by PC
Low: other status

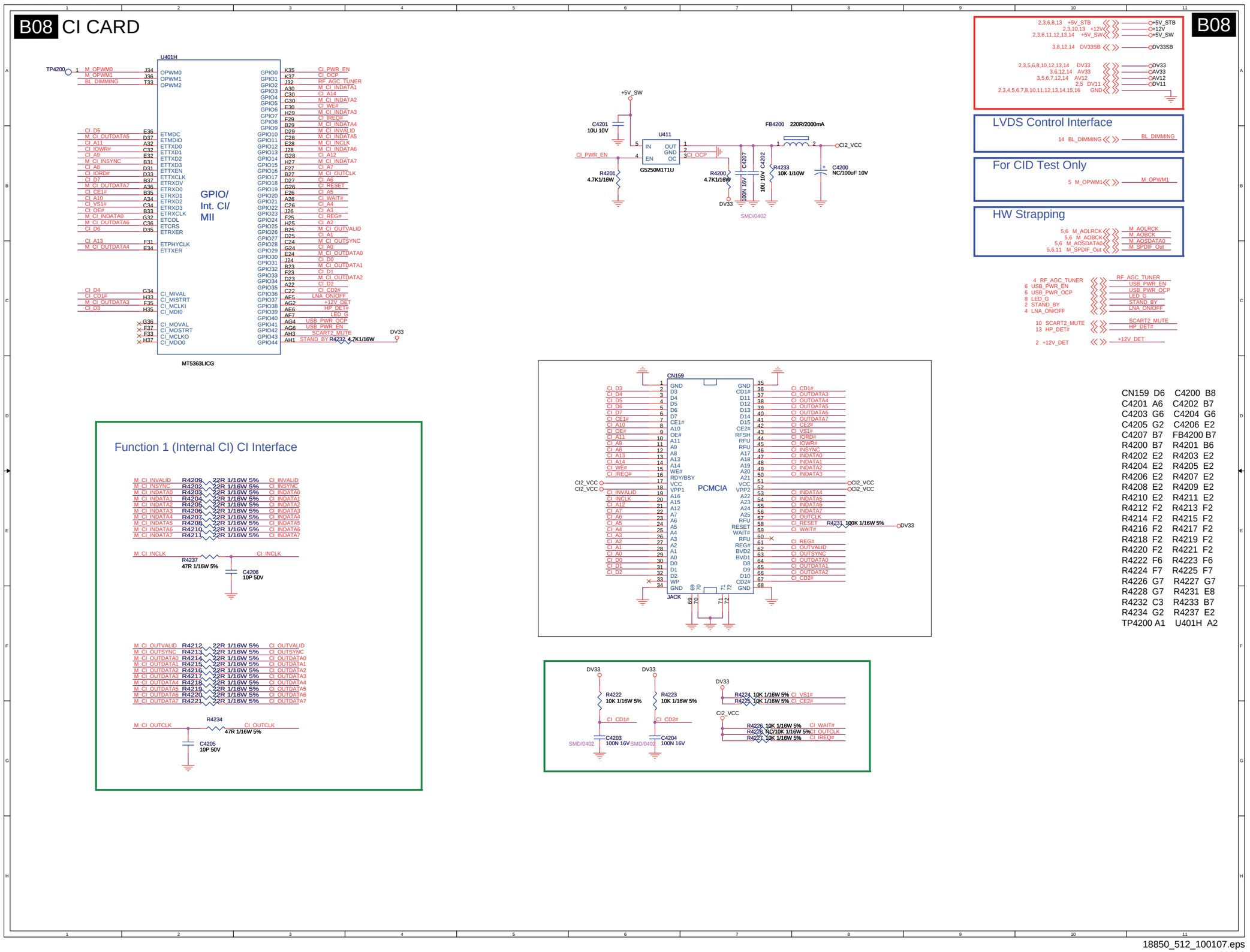
A4, R4238 NC/0R05 1/16W, VCOM_I2C_ON_OFF, TCON_SCL, TCON_SDA, VGASCL, VGASDA, Q4152 NC/2N7002 SOT-23, Q4154 NC/2N7002 SOT-23, Q4153 NC/2N7002 SOT-23, Q4155 NC/2N7002 SOT-23, R4235 NC/0R05 1/16W, TCON_I2C_ON_OFF

TCON_I²C ON_OFF

High: TCON alignment by OSD
Low: other status

TCON_I2C_ON_OFF, TCON_SCL, TCON_SDA, Q4150 2N7002, Q4156 2N7002, Q4151 2N7002, Q4157 2N7002, C4161 NC/10uF 10V, R4230 NC/100K 1/16W 5%

SSB: CI card



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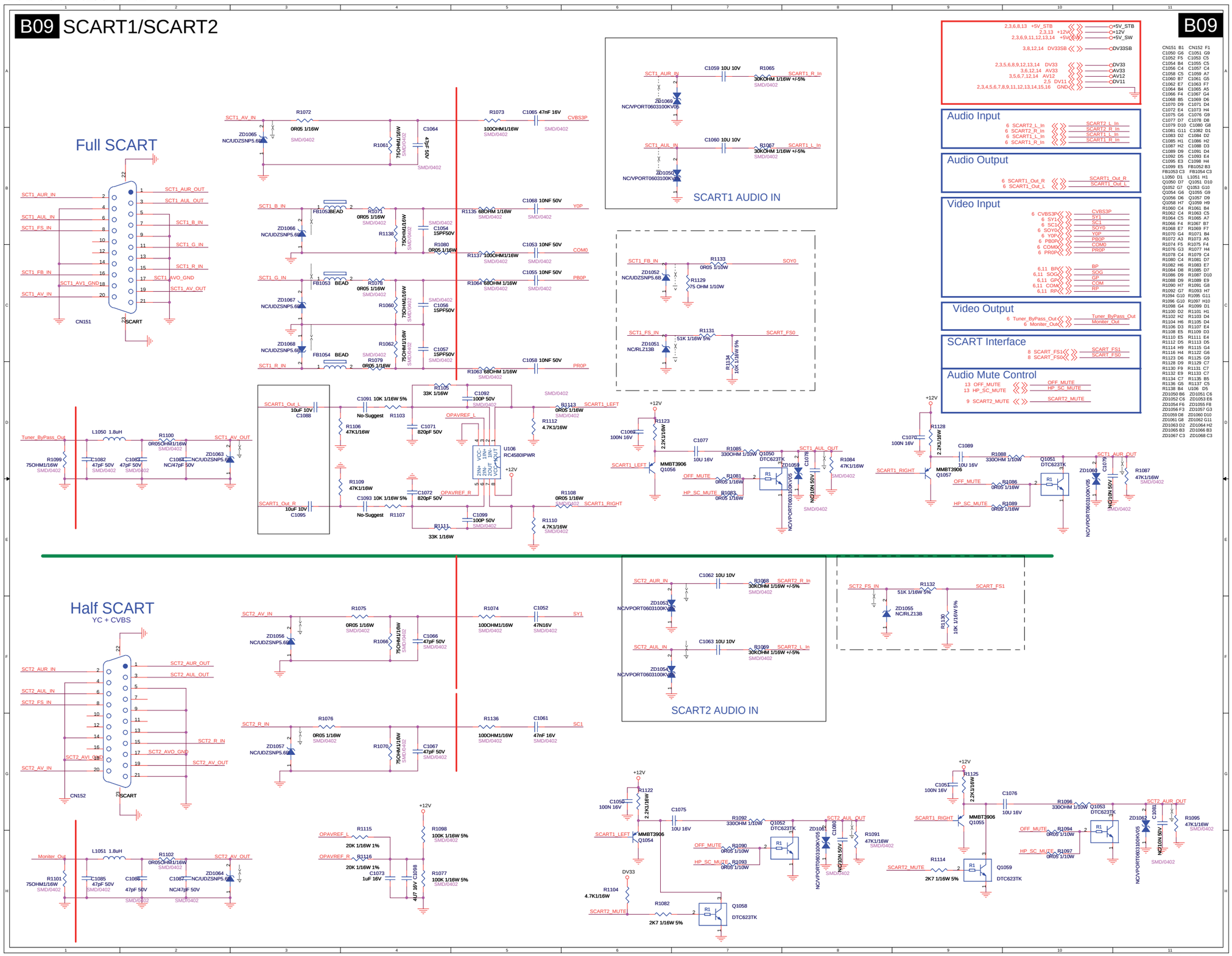
SSB: Scart1/Scart2



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100226

SSB: YPbPr/VGA input

B10 YPBPR/VGA INPUT

B10

YPbPr L/R INPUT

CN111 JACK: Y_IN_1, PB_IN_1, PR_IN_1

CN116 JACK: YPbPrL_IN, YPbPrR_IN, SPDIF_OUT

AV1 (Component1)

Y_IN_1 → FB1158 BEAD → R1168 18 OHM +-5% 1/10W → ZD1150 NC/UDZSNP5.6B; R1161 56R 1/16W 1% → C1156 15PF50V; R1156 0R05 1/16W → C1153 1.5nF 50V → SOY1; R1158 68OHM 1/16W → C1154 10NF 50V → Y1P

PB_IN_1 → FB1159 BEAD → R1170 18 OHM +-5% 1/10W → ZD1151 NC/UDZSNP5.6B; R1166 56R 1/16W 1% → C1160 15PF50V; R1173 0R05 1/16W → R1162 100OHM1/16W → C1157 10NF 50V → COM1; R1164 68OHM 1/16W → C1159 10NF 50V → PB1P

PR_IN_1 → FB1160 BEAD → R1172 18 OHM +-5% 1/10W → ZD1152 NC/UDZSNP5.6B; R1169 56R 1/16W 1% → C1162 15PF50V; R1171 68OHM 1/16W → C1163 10NF 50V → PR1P

AV1 AUDIO

YPbPrR_IN → ZD1156 NC/VPORT0603100KV05 → C1164 10U 10V → R1150 30KOHM 1/16W +/-5% → YPbPr_R_In

YPbPrL_IN → ZD1157 NC/VPORT0603100KV05 → C1167 10U 10V → R1151 30KOHM 1/16W +/-5% → YPbPr_L_In

VGA AUDIO

VGA_AudioRIN → ZD1158 NC/VPORT0603100KV05 → FB1168 600R/200mA → C1180 10U 10V → R1152 30KOHM 1/16W +/-5% → VGA_R_In

VGA_AudioLIN → ZD1159 NC/VPORT0603100KV05 → FB1167 600R/200mA → C1174 10U 10V → R1153 30KOHM 1/16W +/-5% → VGA_L_In

VGA IN

GRN → FB1161 BEAD → ZD1153 NC/UDZSNP5.6B; R1179 75OHM1/16W → C1170 5pF 50V; R1180 68OHM 1/16W → C1173 1.5nF 50V → SOG; R1177 0R05OHM1/16W → C1178 10NF 50V → GP

GRN_GND → R1186 0R05OHM1/16W → R1181 100OHM1/16W → C1176 10NF 50V → COM

BLU → FB1162 BEAD → ZD1154 NC/UDZSNP5.6B; R1176 75OHM1/16W → C1171 5pF 50V; R1175 68OHM 1/16W → C1175 10NF 50V → BP

BLU_GND

RED → FB1163 BEAD → ZD1155 NC/UDZSNP5.6B; R1174 75OHM1/16W → C1172 5pF 50V; R1178 68OHM 1/16W → C1179 10NF 50V → RP

RED_GND

A4 → R1188 NC/100R 1/16W 5%

R1190 0R05OHM1/16W

M_OPCTRL3 → R1159 10K 1/16W 5% → Q1150 BC847C

VGA_PLUGPWR → C1161 100N 16V → U110 M24C02-WDW6P (E0 E1 E2 VSS VCC WC SCL SDA) → VGASCL, VGASDA

VGA_PLUGPWR → R1157 10K 1/16W

VGA/Audio L/R INPUT

CN101 DB15: RED, RED_GND, GRN, GRN_GND, BLU, BLU_GND, VGASDA_IN, HSYNC#, VSYNC#, VGASCL_IN

+5V_SW → D1159 BAS32L → VGA_PLUGPWR

D1160 BAS32L; ZD1164 NC/UDZSNP5.6B

2N7002 Q1151 → U0RX → R1165 NC/100R 1/16W 5%

2N7002 Q1152 → U0TX → 10uF 16V C7141; 10K1/16W R7144; R1167 NC/100R 1/16W 5%

VGA_UR_ON_OFF

PHONEJACK CN102: VGA_AudioRIN, VGA_AudioLIN

SIDE AV

CN136 JACK: AV3_CVBS_IN, AV3_AudioLIN, AV3_AudioRIN

AV3(CVBS)_Audio R/L

CVBS (Side)

AV3_CVBS_IN → ZD1169 NC/UDZSNP5.6B; R1200 0R05OHM1/16W → R1199 75OHM1/16W; C1192 47pF 50V; R1201 0R05OHM1/16W; R1198 100OHM1/16W → C1191 47nF 16V → CVBS1P; C1152 → CVBS0N NO-SUGGEST

SPDIF

SPDIF_OUT → ZD1170 NC/VPORT0603100KV05; C1189 33P 50V; R1194 100 OHM 1/10W; R1189 240R 1/10W 5%; C1187 100N 16V → M_SPDIF_Out

AV_AUDIO (Side)

AV3_AudioRIN → ZD1165 NC/VPORT0603100KV05 → C1181 10U 10V → R1154 30KOHM 1/16W +/-5% → AV1_R_In

AV3_AudioLIN → ZD1166 NC/VPORT0603100KV05 → C1183 10U 10V → R1155 30KOHM 1/16W +/-5% → AV1_L_In

2,3,6,8,13 +5V_STB; 2,3,10,13 +12V; 2,3,6,9,12,13,14 +5V_SW → C+5V_STB, C+12V, C+5V_SW

3,8,12,14 DV33SB → CDV33SB

2,3,5,6,8,9,10,12,13,14 DV33; 3,6,12,14 AV33; 3,5,6,7,12,14 AV12; 2,5 DV11; 2,3,4,5,6,7,8,9,10,12,13,14,15,16 GND → CDV33, CAV33, CAV12, CDV11

Audio Input: 6 VGA_L_In, 6 VGA_R_In → VGA_L_In, VGA_R_In

Video Input: 6 VSYNC, 6 HSYNC, 6 BP, 6 SOG, 6 GP, 6 COM, 6 RP → VSYNC, HSYNC, BP, SOG, GP, COM, RP

Other Control Interface: 5,8,12 M_OPCTRL3 → M_OPCTRL3

Audio Input: 6 CVBS0N, 6 AV1_L_In, 6 AV1_R_In → CVBS0N, AV1_L_In, AV1_R_In; 6 YPbPr_L_In, 6 YPbPr_R_In → YPbPr_L_In, YPbPr_R_In; 4,6 MPX_N, 4,6 MPX_P → MPX_N, MPX_P

Video Input: 6 CVBS1P, 6 SOY1, 6 Y1P, 6 PB1P, 6 COM1, 6 PR1P → CVBS1P, SOY1, Y1P, PB1P, COM1, PR1P

8 U0RX, 8 U0TX → U0RX, U0TX

8 VGASCL, 8 VGASDA → VGASCL, VGASDA

8 VCOM_I2C_ON_OFF → VCOM_I2C_ON_OFF

5,6 M_SPDIF_Out → M_SPDIF_Out

8,16 A4, 6 VGA_UR_ON_OFF → A4, VGA_UR_ON_OFF

HSYNC# → R1187 0R05OHM1/16W → ZD1160 NC/UDZSNP5.6B; FB1164 BEAD → R1184 2K 1/16W 5%; C1155 NC/5PF 50V → HSYNC

VGASCL_IN → ZD1162 NC/UDZSNP5.6B; R1160 100OHM1/16W → VGASCL; R1163 10K1/16W → VGA_PLUGPWR

VSYNC# → ZD1161 NC/UDZSNP5.6B; R1197 0R05OHM1/16W → FB1165 BEAD → R1185 2K 1/16W 5%; C1158 NC/5PF 50V → VSYNC

VGASDA_IN → ZD1163 NC/UDZSNP5.6B; R1183 100OHM1/16W → VGASDA; R1182 10K1/16W → VGA_PLUGPWR

CN101 C1, CN102 E1
CN111 A1, CN116 B1
CN136 E1, C1152 F6
C1153 A5, C1154 A5
C1155 D10, C1156 A4
C1157 A5, C1158 E10
C1159 B5, C1160 B4
C1161 D6, C1162 B4
C1163 B5, C1164 A7
C1167 B7, C1170 C5
C1171 D5, C1172 E5
C1173 C6, C1174 C8
C1175 D6, C1176 C6
C1178 C6, C1179 D6
C1180 C8, C1181 G6
C1183 H6, C1187 G3
C1189 G2, C1191 F6
C1192 F5, C7141 D3
D1159 C3, D1160 C3
FB1158 A3, FB1159 B3
FB1160 B3, FB1161 C4
FB1162 D4, FB1163 D4
FB1164 D9, FB1165 E9
FB1167 C8, FB1168 C8
Q1150 E8, Q1151 D1
Q1152 D2, R1150 A7
R1151 B7, R1152 C8
R1153 C8, R1154 G6
R1155 H6, R1156 A5
R1157 D8, R1158 A5
R1159 E7, R1160 D11
R1161 A4, R1162 A5
R1163 D11, R1164 B5
R1165 D1, R1166 B4
R1167 D2, R1168 A4
R1169 B4, R1170 B4
R1171 B5, R1172 B4
R1173 A4, R1174 E5
R1175 D5, R1176 D5
R1177 C5, R1178 D5
R1179 C5, R1180 C5
R1181 C5, R1182 E11
R1183 E11, R1184 D9
R1185 E9, R1186 C5
R1187 D9, R1188 E6
R1189 G2, R1190 E6
R1194 G2, R1197 E9
R1198 F6, R1199 F5
R1200 F5, R1201 F6
R7144 D3, U110 E7
ZD1150 A3, ZD1151 B3
ZD1152 B3, ZD1153 C4
ZD1154 D4, ZD1155 E4
ZD1156 A6, ZD1157 B6
ZD1158 C7, ZD1159 C7
ZD1160 D8, ZD1161 E8
ZD1162 D11, ZD1163 E11
ZD1164 D2, ZD1165 G4
ZD1166 H4, ZD1169 F4

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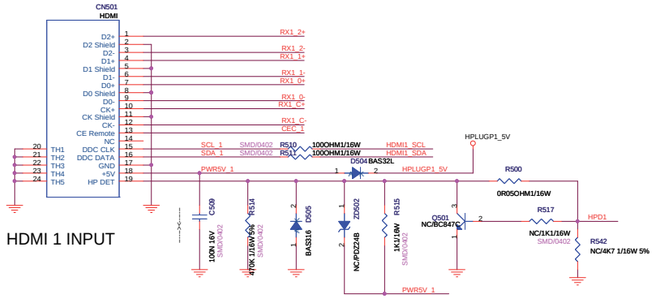
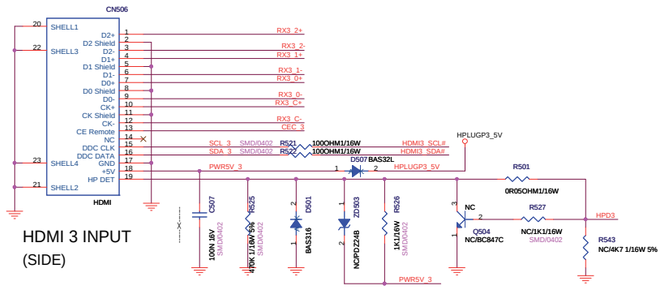
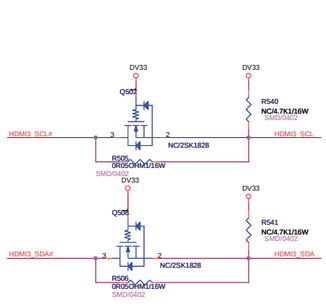
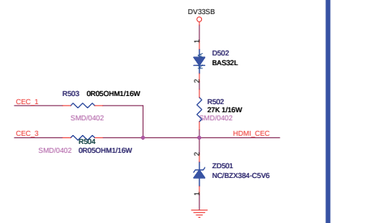
SSB: HDMI 1/ HDMI 2

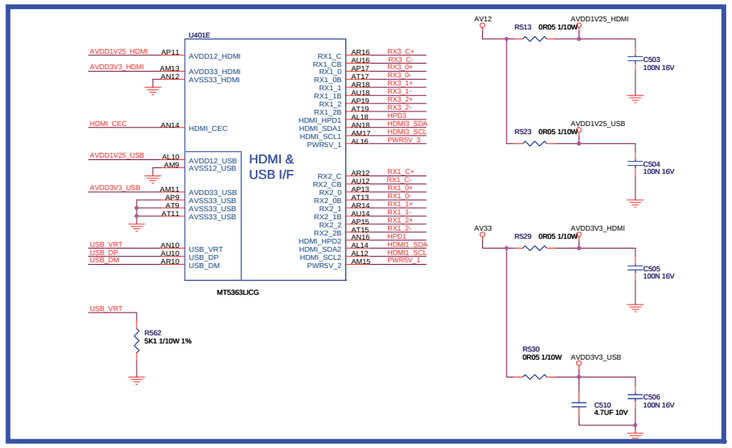
B11 HDMI 1/ HDMI 2



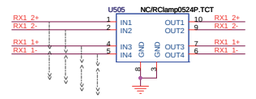


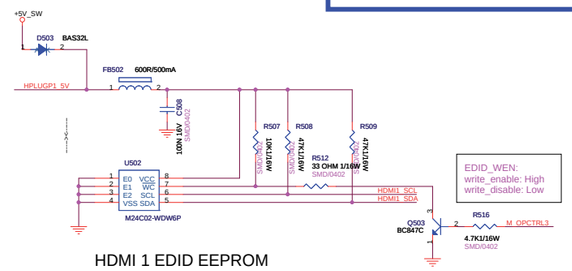




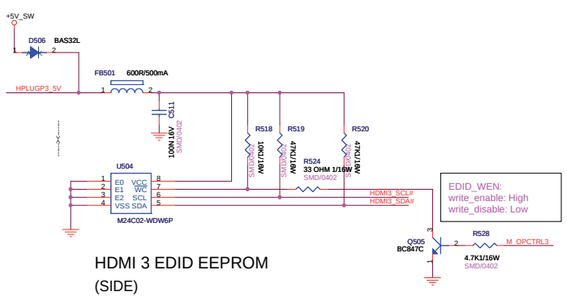


HDMI1 ESD PROTECTER



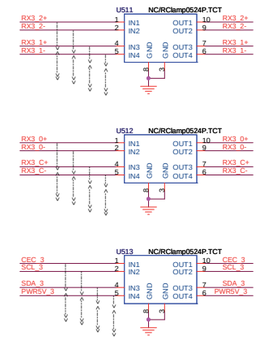


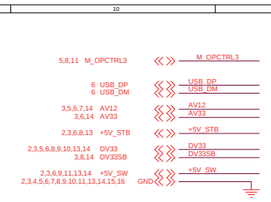
HDMI 1 EDID EEPROM



HDMI 3 EDID EEPROM
(SIDE)

HDMI3 ESD PROTECTER (SIDE)





CN501 A1 CN506 C1
C503 A9 C504 A9
C505 B9 C506 C9
C507 D2 C508 C5
C509 B2 C510 C8
C511 E5 D501 D2
D502 A5 D503 C4
D504 B2 D505 B2
D506 E4 D507 D2
FB501 E5 FB502 C5
Q501 B3 Q502 E2
Q503 D6 Q504 D3
Q505 F6 Q508 F2
R500 B3 R501 D3
R502 A5 R503 A5
R504 A5 R505 E2
R506 F2 R507 D5
R508 D6 R509 D6
R510 B2 R511 B2
R512 D6 R513 A8
R514 B2 R515 B3
R516 D6 R517 B3
R518 E5 R519 E5
R520 E6 R521 C2
R522 D2 R523 A8
R524 F6 R525 D2
R526 D3 R527 D3
R528 F6 R529 B8
R530 C8 R540 E3
R541 F3 R542 B4
R543 D4 R562 B6
U401E A7 U502 D5
U504 F5 U505 C8
U506 D8 U507 E8
U511 E8 U512 F8
U513 G8 ZD501 B5
ZD502 B2 ZD503 D2

SSB: Audio Amp/Headphone out

B12 AUDIO AMP/HEADPHONE OUT

B12

AMP_MUTE:
NORMAL: Low
MUTE: High

DV33 R613 10K1/16W AMP_MUTE R604 22K1/16W SMD/0402 Q601 BC847BW Shutdown R605 4.7K1/16W SMD/0402

+12V +5V_STB R626 NC/0R05 1/10W 5% R627 0R05 1/10W D606 BAS32L D603 BAS32L D604 BAS32L OFF_MUTE C604 330UF 16V R601 4K7 1/10W 5% Q602 BC857BW R607 1K 1/10W R606 100K 1/10W 5% D607 BAS32L

D605 SP_AMP_MUTE HP_SC_MUTE BAS32L

U601 TPA3110D2

DV33 R638 10K1/16W Shutdown SDZ FAULTZ LINP LINN GAIN0 GAIN1 AVCC AGND GVDD PLIMIT RINN RINP NC PBTL

R643 0R05OHM1/16W C621 0.47uF 16V C635 10N 50V C642 10U 10V R636 10R 1/16W 5% C622 0.47uF 16V Line_Out_L Close to MT5363

DV33 R629 10K1/16W R633 NC/0R05 1/16W DV33 R635 NC/10K1/16W R634 0R05 1/16W

FB606 220R/2000mA FB605 220R/2000mA +24V AUDIO_VDD R630 10 OHM 1/4W C615 No-Suggest C616 1uF 25V 1uF 25V C617 R632 10K 1/16W 1% R631 5.1K 1/16W 1%

Close to MT5363 C643 10U 10V R603 100R 1/16W 5% Line_Out_R C637 10N 50V R644 0R05OHM1/16W C623 0.47uF 16V C624 0.47uF 16V

Thermal Pad PVCCL PVCCL BSPL OUTPL PGND OUTNL BSNL BSNR OUTNR PGND OUTPR BSPR PVCC

AUDIO_VDD C633 330uF 35V C613 100nF 50V C614 1N 50V

C627 220N 25V R639 10R 1/16W 5% C632 1N 50V L601 47uH LOUT+ C620 330N 50V C625 330N 50V LOUT-

L602 47uH C628 220N 25V R640 10R 1/16W 5% C636 1N 50V C629 220N 25V R641 10R 1/16W 5% C638 1N 50V L603 47uH ROUT- C626 330N 50V C631 330N 50V ROUT+ L604 47uH C630 220N 25V R642 10R 1/16W 5% C641 1N 50V

AUDIO_VDD C634 330uF 35V C618 100nF 50V C619 1N 50V

6 Line_Out_R Line_Out_R
6 Line_Out_L Line_Out_L
6 HP_Out_L HP_Out_L
6 HP_Out_R HP_Out_R
6 AMP_MUTE AMP_MUTE
8 SP_AMP_MUTE SP_AMP_MUTE
9 HP_DET# HP_DET#
10 OFF_MUTE OFF_MUTE
10 HP_SC_MUTE HP_SC_MUTE

TP602 TP601 LOUT+ LOUT- CONN CN601 TP604 TP603 ROUT+ ROUT-

2 +24V +24V
2,3,10 +12V +12V
2,3,6,8 +5V_STB +5V_STB
2,3,6,9,11,12,14 +5V_SW +5V_SW
2,3 +5V1_TUN +5V1_TUN
2,7 DV18_DDR DV18_DDR
2,5 DV11 DV11
2,8 OPWRSB OPWRSB
2,14 BRIGHT_ADJ BRIGHT_ADJ
2,14 INVERTER_ON_OFF INVERTER_ON_OFF
2,3,5,6,8,9,10,12,14 DV33 DV33
3,8,12,14 DV33SB DV33SB
2,3,4,5,6,7,8,9,10,11,12,14,15,16 GND GND

CN601 B10 CN602 E10
C601 F5 C602 F9
C603 F9 C604 C2
C605 F4 C606 G4
C607 F4 C608 F5
C609 F6 C610 G5
C611 F9 C612 F4
C613 A7 C614 A7
C615 C5 C616 C5
C617 D5 C618 E7
C619 E7 C620 B8
C621 B5 C622 B5
C623 D5 C624 D5
C625 B8 C626 D8
C627 B7 C628 C7
C629 C7 C630 D7
C631 D8 C632 B7
C633 A7 C634 E7
C635 B4 C636 C7
C637 D4 C638 C7
C641 D7 C642 B4
C643 D4 C644 F3
C645 F3 C646 G3
C647 F3 C648 G8
C649 G7 C650 H8
C651 G7 C652 G9
D603 C2 D604 C2
D605 F2 D606 C1
D607 D1 FB601 E5
FB605 C4 FB606 C4
L601 B8 L602 C8
L603 C8 L604 D8
Q601 B2 Q602 D1
Q605 F6 R601 D1
R602 G8 R603 D4
R604 B2 R605 C2
R606 D1 R607 D2
R608 F6 R609 E6
R610 G5 R611 G5
R612 G5 R613 B1
R614 E9 R615 F6
R616 G5 R617 F4
R618 H6 R619 G8
R620 G9 R621 G9
R622 F6 R623 G8
R624 G4 R625 F8
R626 C1 R627 C1
R628 G4 R629 B5
R630 C5 R631 C5
R632 D5 R633 B5
R634 B5 R635 B5
R636 B4 R637 G4
R638 A5 R639 B7
R640 C7 R641 C7
R642 D7 R643 B4
R644 D4 R645 F3
R646 F3 R647 F3
R648 G3 TP601 B9
TP602 B9 TP603 C9
TP604 C9 U601 A6
U602 F5 U603 G8

U602 TPA6132A2RTER

HP_Out_L C647 10U 10V R647 470R 1/16W 1% C644 10N 50V R645 0R05OHM1/16W R646 0R05OHM1/16W C645 10N 50V HP_Out_R C646 10U 10V R648 470R 1/16W 1% R617 0R05 1/16W LEFT_1W RIGHT_1W R637 0R05 1/16W C605 1UF/16V C612 1UF/16V C607 1UF/16V C606 1UF/16V R624 47K1/16W R628 47K1/16W

INL- INL+ INR+ INR- Thermal Pad OUTL SGND AVDD EN HPVDD CPP PGND CPN OUTR G0 G1 HPVSS

C608 2.2UF10V C609 NO-Suggest C610 2.2UF10V +5V_SW R610 NC/10K1/16W R611 0R05OHM1/16W R612 10K1/16W R616 NC/0R05OHM1/16W

FB601 120R/3000mA Bathroom_PWR C601 10U 10V +5V_SW R615 4.7K1/16W Bathroom_MUTE R622 4.7K1/16W OFF_MUTE Q605 BC847C R608 4.7K1/16W HP_SC_MUTE

R609 10OHM1/10W HPOUTL R618 10OHM1/10W HPOUTR

DV33 R614 4.7K1/16W HPOUTR HPOUTL HP_DET# R625 NC/0R05 1/10W 5% C611 10N 50V C603 100N 50V C602 100N 50V PHONEJACK CN602

HEADPHONE R/L OUTPUT

Resistor	BUH	Others
R625	Yes	NC

U603 SHUTDOWN BYPASS IN+ IN- GND Vo- GND VDD Vo+ NC/TPA6211A1DGN

Bathroom_MUTE C648 NC/0.47uF 16V LEFT_1W C649 NC/1uF 16V R602 NC/6K8 1/16W 5% RIGHT_1W C651 NC/1uF 16V R619 NC/6K8 1/16W 5% R623 NC/10K1/16W C650 NC/1uF 16V R620 NC/0R05OHM1/16W HPOUTL Bathroom_PWR R621 NC/0R05OHM1/16W HPOUTR C652 NC/1uF 16V

1W Mono Speaker for BUH

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SSB: LVDS output

B13 LVDS OUTPUT

B13

FB402 120R/3000mA
FB403 120R/3000mA
PANEL_VCC
Panel_12V
LVDSCTRL1
DV33
R402 NC/0 OHM +-5% 1/16W
R403 NC/1K 1/16W 5%
R413 NC/1K 1/16W 5%
R414 NC/10KOHM +-5% 1/8W
C407 NC/10U 16V
CN408
NC/60949

U401G
MT5363LICG
LVDS Output
AVDD3V3_LVDS
AVDD1V25_LVDS
AVDD1V25_VPLL
TP401
TP_VPLL

E0N E0P E1N E1P E2N E2P ECKN ECKP E3N E3P E4N E4P O4N O4P O3N O3P OCKP OCKN O2N O2P O1N O1P O0N O0P

FOR WXGA PANEL
FOR FULL HD PANEL

2,3,6,8,13 +5V_STB → +5V_STB
2,3,10,13 +12V → +12V
2,3,6,9,11,12,13 +5V_SW → +5V_SW
3,8,12 DV33SB → DV33SB
2,3,5,6,8,9,10,12,13 DV33 → DV33
3,6,12 AV33 → AV33
3,5,6,7,12 AV12 → AV12
2,5 DV11 → DV11
2,3,4,5,6,7,8,9,10,11,12,13,15,16 GND

LVDS Control Interface
6 LVDSCTRL1 ↔ LVDSCTRL1
6 BL_ON/OFF ↔ BL_ON/OFF
3 PANEL_VCC ↔ PANEL_VCC
9 BL_DIMMING ↔ BL_DIMMING
2 BRIGHT_ADJ ↔ BRIGHT_ADJ
2 INVERTER_ON_OFF ↔ INVERTER_ON_OFF
15,16 Panel_12V ↔ Panel_12V
16 E0N … 16 OCKP ↔ E0N … OCKP

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

BL_DIM(PWM for Bright_Adj):
Max: 0V
Min: +3V3

DV33 R404 NC/4.7K1/16W
+5V_SW DV33 R405 NC/4.7K1/16W
R406 1K 1/10W
R408
BRIGHT_ADJ
BL_DIMMING R409 4.7K1/16W
Q402 NO-Suggest
100 OHM 1/10W
C405 NC/10U 10V

BRIGHTNESS ADJUST

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

INVERTER_SW:
Inverter on: Low
Inverter off: High

DV33 R413 NC/4.7K1/16W
DV33SB R412 4.7K1/16W
+5V_SW DV33 R410 2KOHM 1/10W
R411 NC/1KOHM +-5% 1/10W
INVERTER_ON_OFF
BL_ON/OFF R407 4.7K1/16W
Q401 NO-Suggest
C401 NC/10U 10V

INVERTER ON/OFF

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

AV33 R416 0R05 1/10W AVDD3V3_LVDS C402 100N 16V SMD/0402
AV12 R417 0R05 1/10W AVDD1V25_LVDS C404 100N 16V SMD/0402
AV12 R418 0R05 1/10W AVDD1V25_VPLL C406 100N 16V SMD/0402

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SSB: T-CON power

B14 T-CON POWER

B14

	C7061	R7053
RT8250 G5795	4N7	15K
MP1484	3N3	5K6

	32"	42"	47"
TCON_VDD	16.03	16.5	15.86
H_VDD	8.01	8.0	8.0
VGH	27.19	23.19	32.0
VGL	-4.94	-5.3	-4.94

Unit : V

Item	32"	42"	47"
R7091	43k/1%/0402(61G04024302FT)	39k/1%/0402(61G04023902FY)	137k/1%/0402(61G04021373FT)
R7147	6.8k/1%/0603(61G06036801FT)	47k/1%/0603(61G06034702FT)	NC
R7097	16k/1%/0402(61G04021602FT)	56k/1%/0402(61G04025602FI)	36k/1%/0402(61G04023602FT)
R7086	348k/1%/0402(61G04023483FT)	150k/1%/0402(61G04021503FY)	210K/1%/0402(61G04022103FT)
R7126	16.9k/1%/0402(61G04021692FT)	10k/1%/0402(61G04021002FY)	10k/1%/0402(61G04021002FY)
R7106	36k/1%/0402(61G04023602FT)	27k/1%/0402(61G04022702FT)	36k/1%/0402(61G04023602FT)
R7107	187k/1%/0402(61G04021873FY)	150k/1%/0402(61G04021503FY)	187k/1%/0402(61G04021873FY)
R7062	1k/1%/0402(61G04021001FY)	1.6k/1%/0402(61G0402162JY)	1k/1%/0402(61G04021001FY)
R7092	150k/1%/0402(61G04021503FY)	150k/1%/0402(61G04021503FY)	158k/1%/0402(61G04021583FT)
R7093	18k/1%/0402(61G04021802FT)	18k/1%/0402(61G04021802FT)	15k/1%/0402(61G04021502FY)
R7050	20R/5%/0402(61G0402200 JY)	20R/5%/0402(61G0402200 JY)	10R/5%/0402(61G0402100 JY)
R7056	20R/5%/0402(61G0402200 JY)	20R/5%/0402(61G0402200 JY)	10R/5%/0402(61G0402100 JY)
R7072	1K/5%/0402(61G0402102 JT)	1K/5%/0402(61G0402102 JT)	0R/0402(61G0402000 JY)
R7141	20R/5%/0402(61G0402200 JY)	20R/5%/0402(61G0402200 JY)	0R/0402(61G0402000 JY)
R7142	560R/5%/0402(61G0402561 JT)	560R/5%/0402(61G0402561 JT)	15k/5%/0402(61G0402153 JT)
R7074	10R/5%/0402(61G0402100 JY)	10R/5%/0402(61G0402100 JY)	0R/0402(61G0402000 JY)
R7075	10R/5%/0402(61G0402100 JY)	10R/5%/0402(61G0402100 JY)	0R/0402(61G0402000 JY)
R7070	20R/5%/0402(61G0402200 JY)	20R/5%/0402(61G0402200 JY)	0R/0402(61G0402000 JY)
R7107	150k/1%/0402(61G04021503FY)	150k/1%/0402(61G04021503FY)	187K/1%/0402(61G04021873FT)
R7110	NC	NC	0R/0402(61G0402000 JY)
C7068	100N/X7R/0402(65G040210412K Y)	100N/X7R/0402(65G040210412K Y)	10U
C7138	NC	NC	15PF/NPO/0402(65G040215031J Y)

Close to Pin22/23

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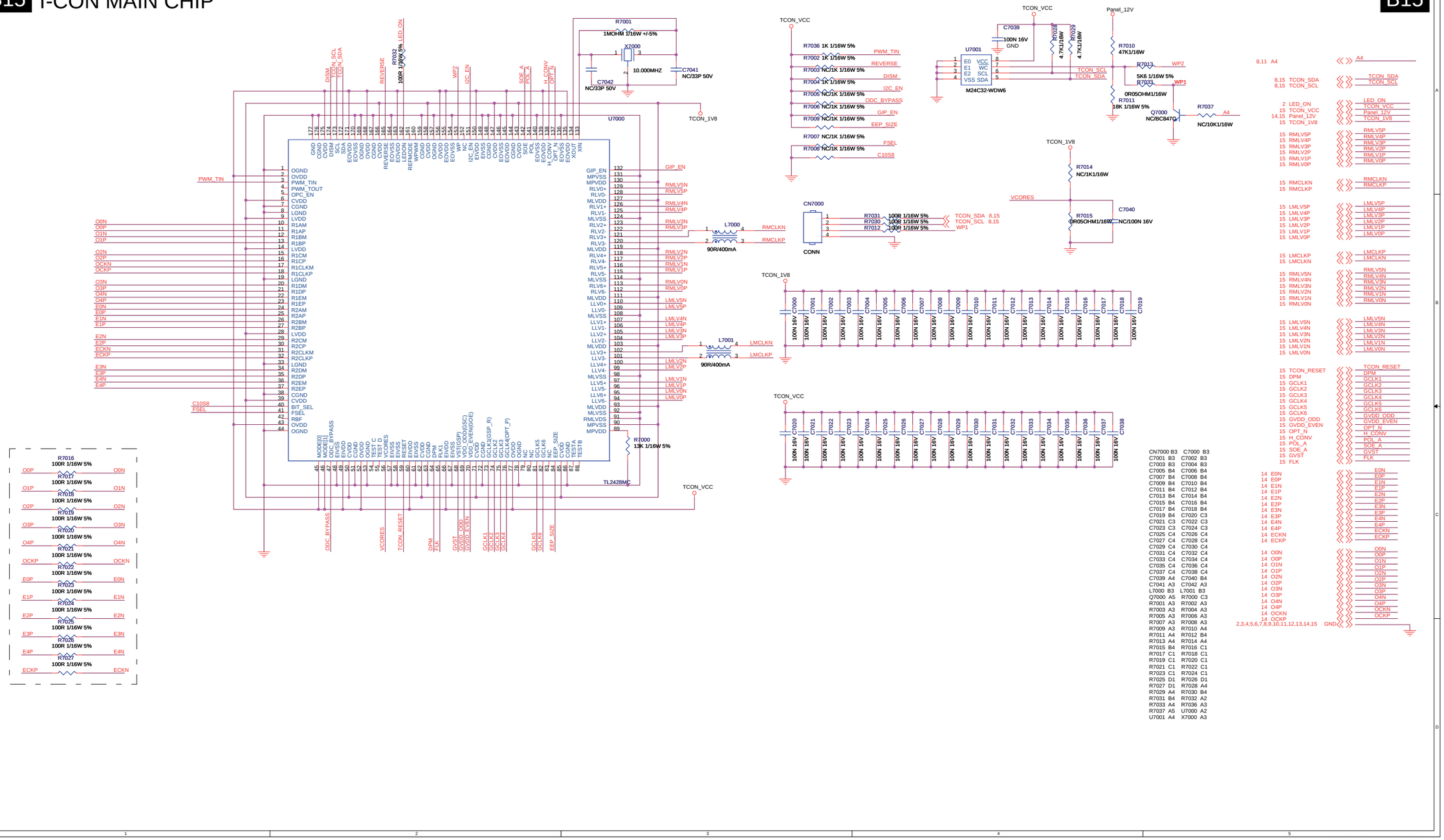
100226

SSB: T-CON main chip

B15 T-CON MAIN CHIP

B15



C7000	B3	C7002	B3
C7001	B3	C7004	B3
C7003	B3	C7006	B4
C7005	B4	C7008	B4
C7007	B4	C7010	B4
C7009	B4	C7012	B4
C7011	B4	C7014	B4
C7013	B4	C7016	B4
C7015	B4	C7018	B4
C7017	B4	C7020	C3
C7019	B4	C7022	C3
C7021	C3	C7024	C3
C7023	C3	C7026	C4
C7025	C4	C7028	C4
C7027	C4	C7030	C4
C7029	C4	C7032	C4
C7031	C4	C7034	C4
C7033	C4	C7036	C4
C7035	C4	C7038	C4
C7037	C4	C7040	B4
C7039	A4	C7042	A3
L7000	B3	L7001	B3
Q7000	A5	R7000	C3
R7001	A3	R7002	A3
R7003	A3	R7004	A3
R7005	A3	R7006	A3
R7007	A3	R7008	A3
R7009	A3	R7010	A4
R7011	A4	R7012	B4
R7013	A4	R7014	A4
R7015	B4	R7016	C1
R7017	C1	R7018	C1
R7019	C1	R7020	C1
R7021	C1	R7022	C1
R7023	C1	R7024	C1
R7025	D1	R7026	D1
R7027	D1	R7028	A4
R7029	A4	R7030	B4
R7031	B4	R7032	A2
R7033	A4	R7036	A3
R7037	A5	U7000	A2
U7001	A4	X7000	A3

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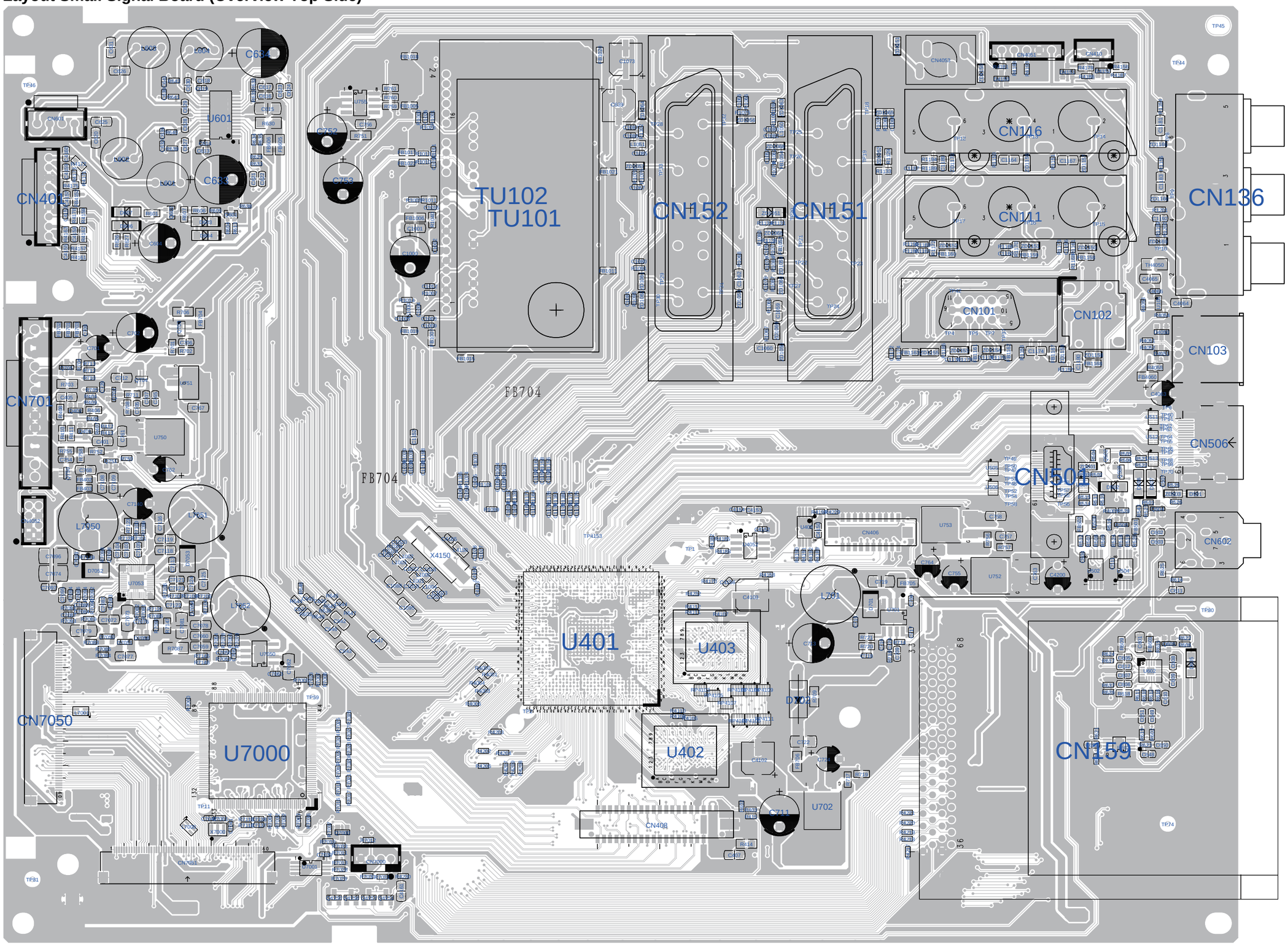
100226

Layout Small Signal Board (Overview Top Side)



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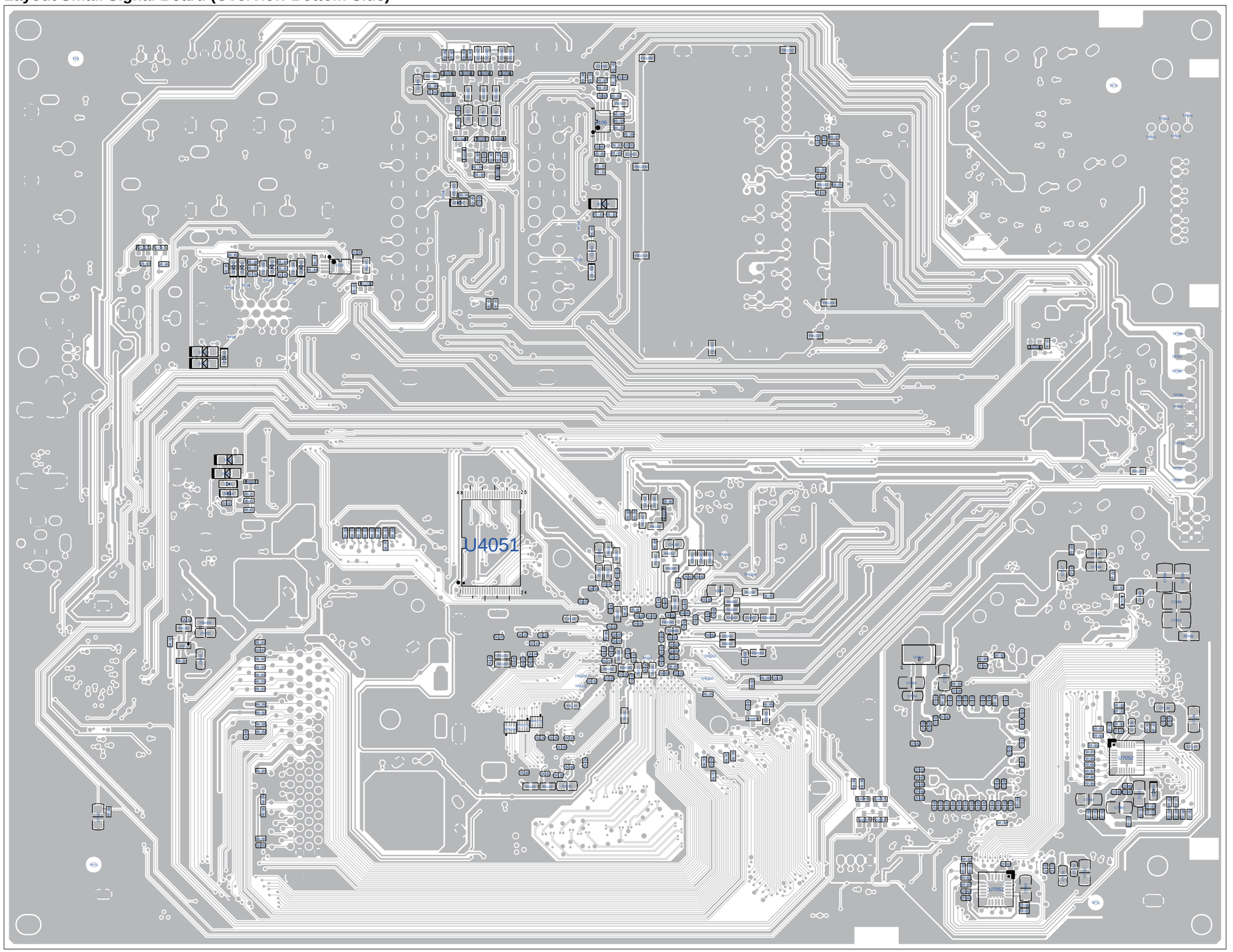
100305

Layout Small Signal Board (Overview Bottom Side)



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100208

IR/LED Board

J IR/LED Board J

FB301 600R/200mA
FB302 NC/600R/200mA
FB201 600R/200mA
FB202 600R/200mA
FB001 600R/200mA
FB002 600R/200mA

CN301
S1315-07RVB-S01-K

LED_R
LED_G
RC6
Key1
Key2

DV33SB

LED-R TP1
LED-G TP2
RC TP3
Key_1 TP4
Key_2

DV33SB DV33SB

R301
2.2KOHM 1/10W

R302
NC/1.5K 1/10W

LED302
LED
Red

LED301
NC/LED
White

R304
1K 1/10W

LED-R

Q301
BC847C

R303
NC/1K 1/10W

LED-G

Q302
NC/BC847C

CN001	C1	CN301	B1
C201	C4	C202	C4
FB001	B2	FB002	B2
FB201	B2	FB202	B2
FB301	A2	FB302	B2
LED301	A4	LED302	A4
Q301	B4	Q302	B4
R201	C4	R203	C4
R301	A4	R302	A4
R303	B4	R304	B4
TP1	B3	TP2	B3
TP3	B3	TP4	B3
TP5	C2	TP6	C2

CN001
CONN

POWER MENU
Black
White
Gray
Yellow

Key_1 TP6
Key_2 TP5

DV33SB DV33SB

R201
2K7 1/10W 5%

R203
100 OHM 1/10W

RC

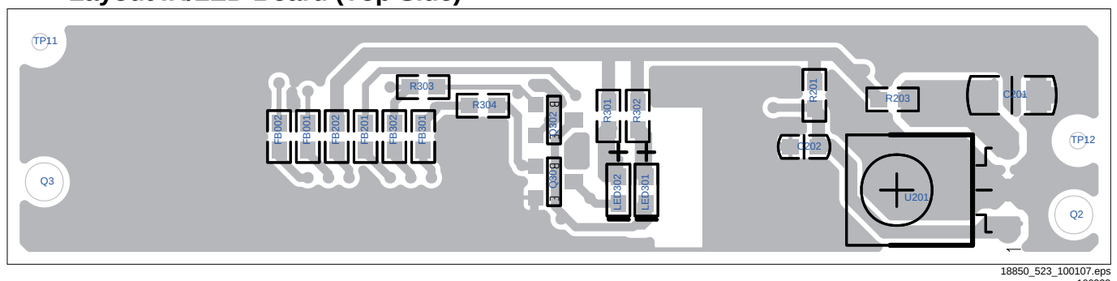
U201
OUT
GND
VCC
IRM-3636N3S27F45-P

C202
NC/100P 50V

C201
22UF 10V

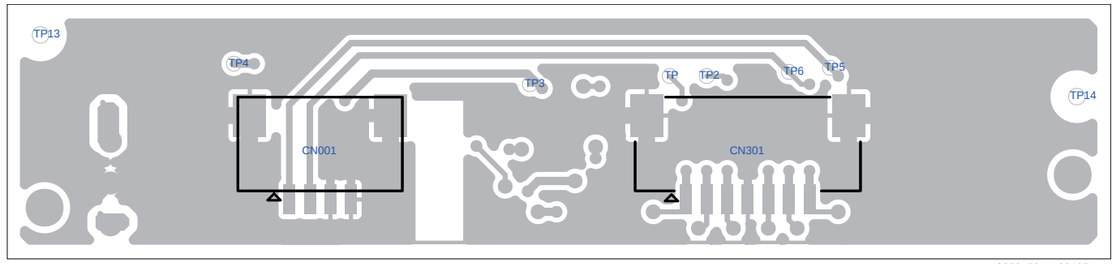
18850_522_100107.eps
100226

Layout IR/LED Board (Top Side)



18850_523_100107.eps
100223

Layout IR/LED Board (Bottom Side)



18850_524_100107.eps
100304

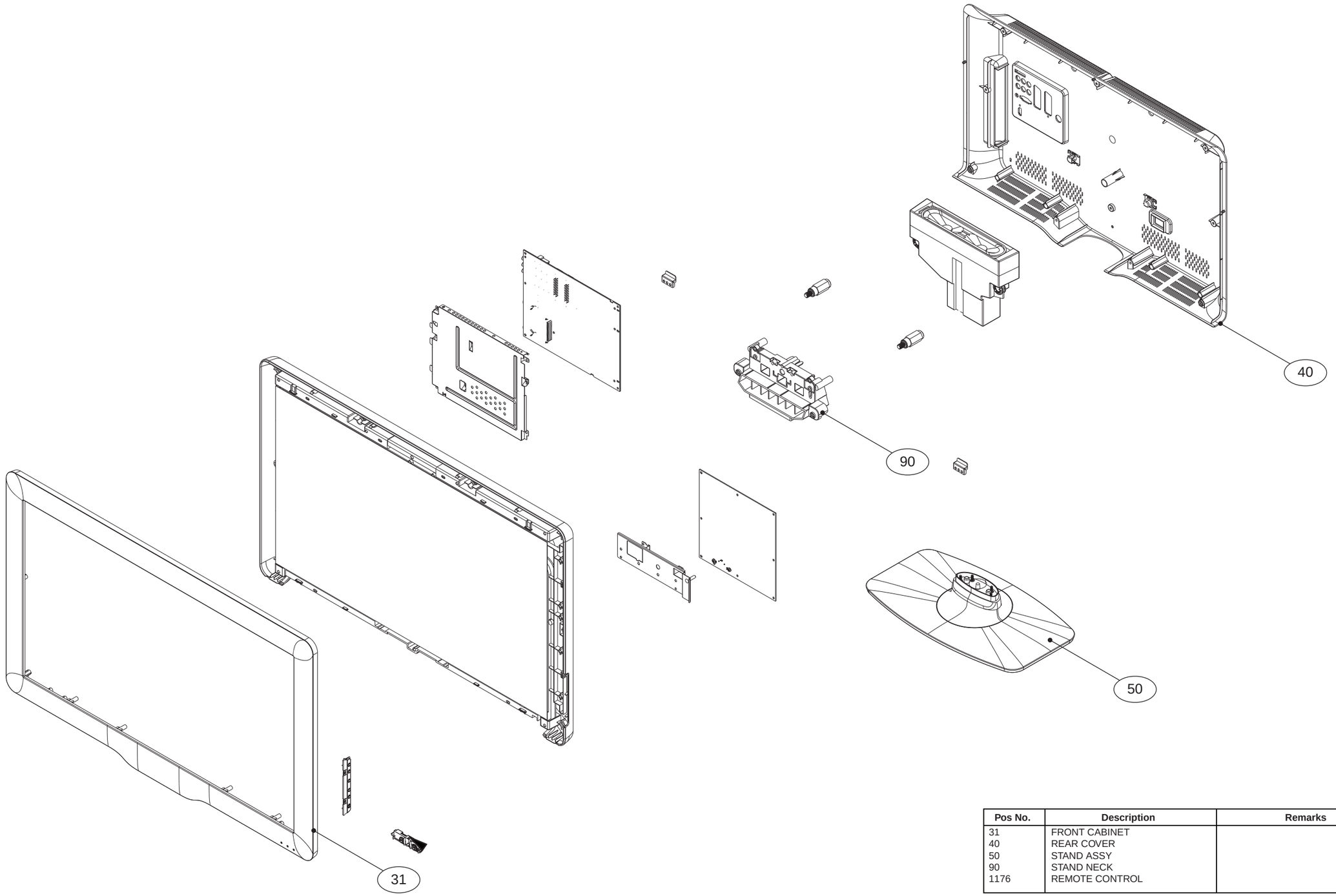
Personal Notes:

10000_012_090121.eps
090121

11. Styling Sheets

Styling Sheet 32"

DALI 32"



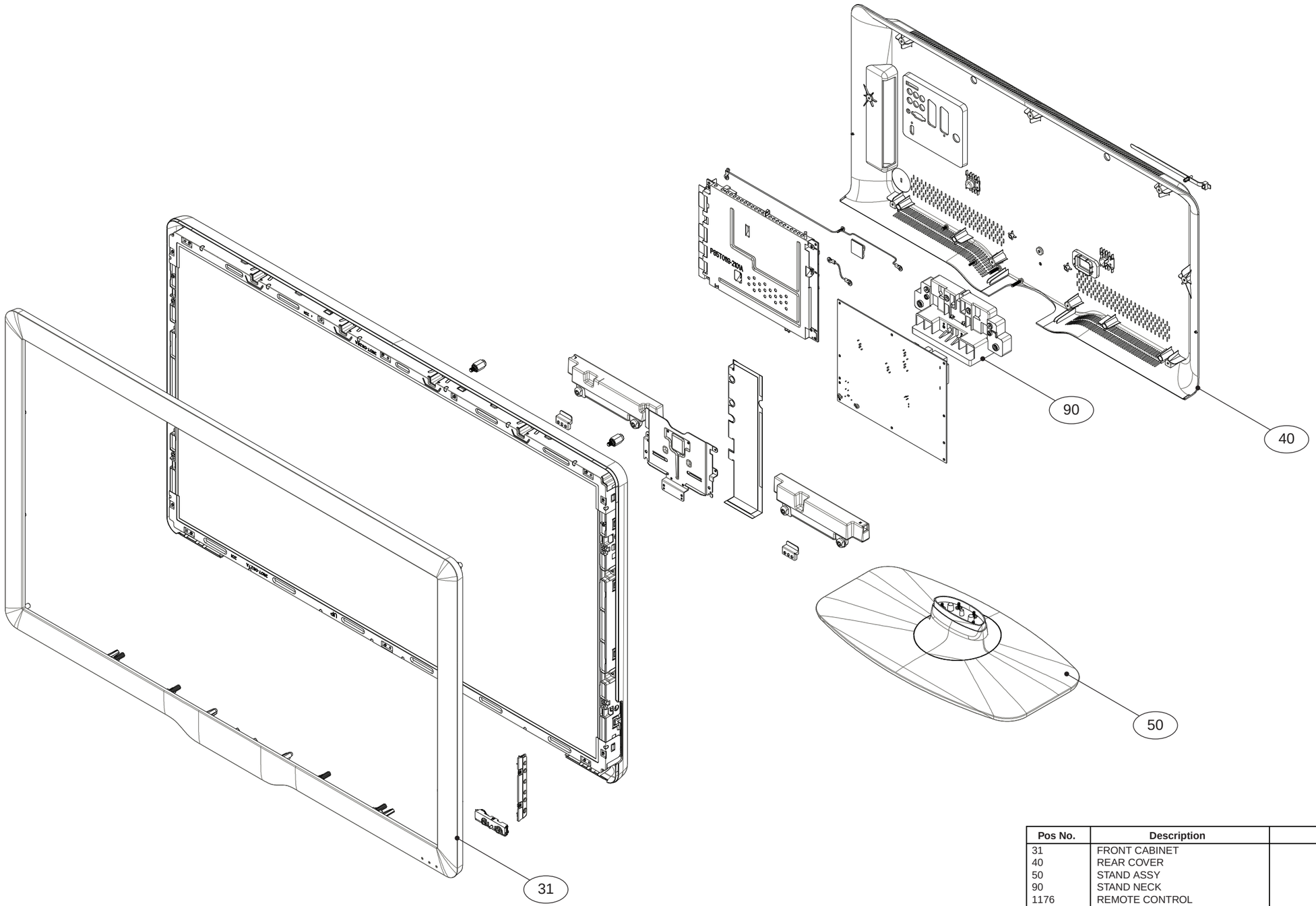
Pos No.	Description	Remarks
31	FRONT CABINET	
40	REAR COVER	
50	STAND ASSY	
90	STAND NECK	
1176	REMOTE CONTROL	

FOR ELECTRICAL PARTS/ASSEMBLIES SEE WIRING DIAGRAM CHAPTER 9

18850_800_100309.eps
100309

Styling Sheet 42"

DALI 42"



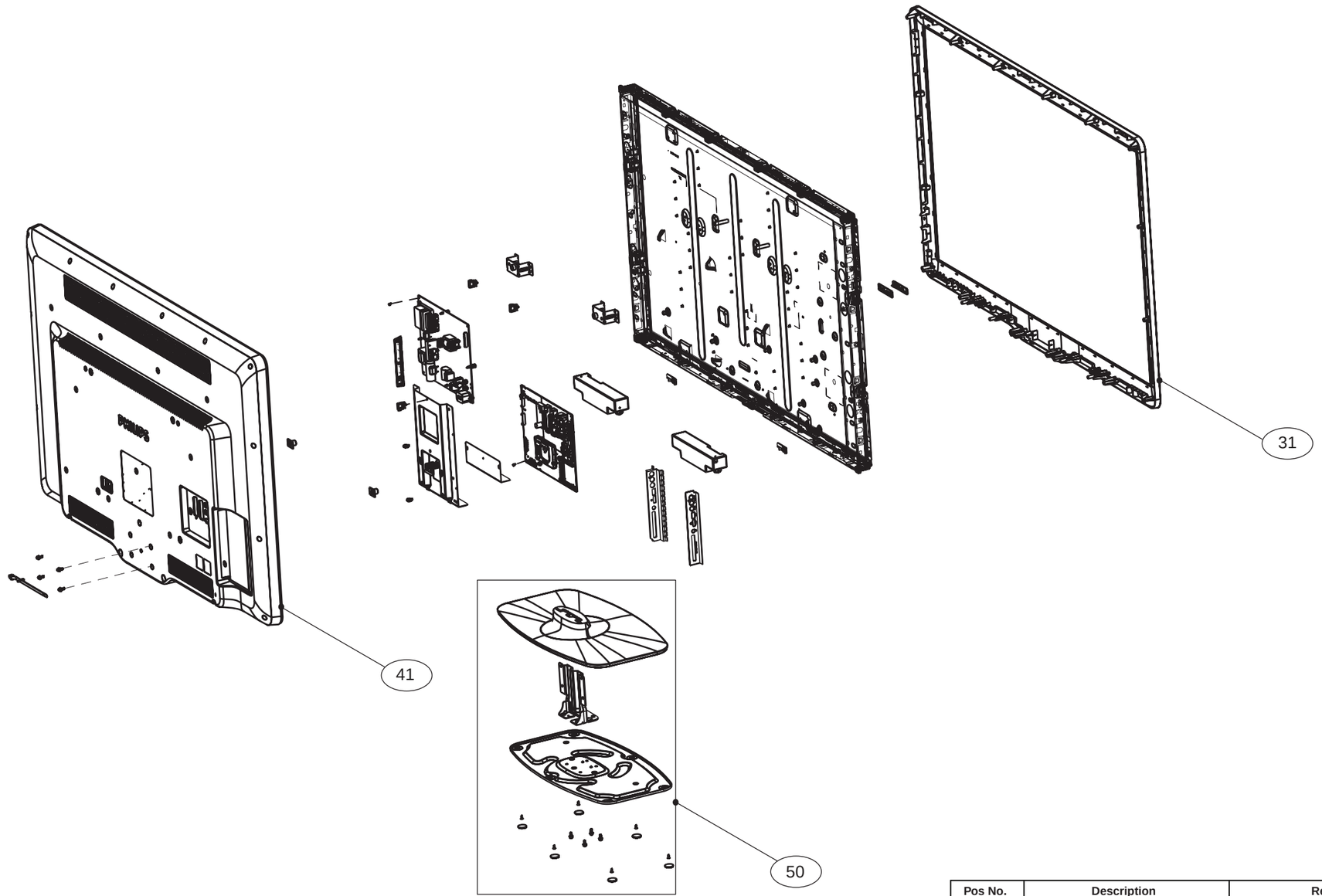
Pos No.	Description	Remarks
31	FRONT CABINET	
40	REAR COVER	
50	STAND ASSY	
90	STAND NECK	
1176	REMOTE CONTROL	

FOR ELECTRICAL PARTS/ASSEMBLIES SEE WIRING DIAGRAM CHAPTER 9

18850_801_100309.eps
100309

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

18850_802_100507.eps
100512