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TPM10.1A
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Service Manual

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1. Revision List

Manual xxxx xxx xxxx.0

- First release.

Manual xxxx xxx xxxx.1

- Chapter 2:** Updated table [2.1 Technical Specifications](#).
- Chapter 4:** Added figure [4-3 Cable dressing \(42" 4208 series\)](#) and [4-4 Cable dressing \(46" 4208 series\)](#)
- Chapter 5:** Updated table [5-2 Factory mode overview](#).
- Chapter 6:** Updated table [6-2 White tone default settings](#) and [6-3 Display code overview](#).
- Chapter 9:** Added wire diagrams [9.3 Wiring diagram 4208 series 42"- 46"](#)
- Chapter 10:** Added circuit diagrams [10.3 A 715G5246 PSU](#).
- Chapter 11:** Added styling sheets [11.3 4208 series 42"- 46"](#).

2. Technical Specs, Diversity, and Connections

Index of this chapter:

- [2.1 Technical Specifications](#)
- [2.2 Directions for Use](#)
- [2.3 Connections](#)
- [2.4 Chassis Overview](#)

Notes:

- Figures can deviate due to the different set executions.

Table 2-1 Described Model Numbers and Diversity

2	4		9		10		11			
	Mechanics		Block Diagrams		Schematics		Styling			
CTN	Connection Overview		SSB Removal		Block Diagram		E (Keyboard/Leading Edge)			
	Wire Dressing	Rear Cover Removal								
32PFL4208/56	4-1	4-8	4-9	9.1	9.5	10.1	10.5	10.6	10.8	11.1
32PFL4208/98	4-1	4-8	4-9	9.1	9.5	10.1	10.5	10.6	10.8	11.1
32PFL4208S/98	4-1	4-8	4-9	9.1	9.5	10.1	10.5	10.6	10.8	11.1
39PFL4208/56	4-2	4-8	4-9	9.2	9.5	10.2	10.5	10.6	10.8	11.2
39PFL4208/98	4-2	4-8	4-9	9.2	9.5	10.2	10.5	10.6	10.8	11.2
39PFL4208S/98	4-2	4-8	4-9	9.2	9.5	10.2	10.5	10.6	10.8	11.2
42PFL4208/56	4-3	4-8	4-9	9.3	9.5	10.3	10.5	10.6	10.8	11.3
42PFL4208/98	4-3	4-8	4-9	9.3	9.5	10.3	10.5	10.6	10.8	11.3
42PFL4208S/98	4-3	4-8	4-9	9.3	9.5	10.3	10.5	10.6	10.8	11.3
42PFL5008D/56	4-5	4-8	4-9	9.4	9.5	10.4	10.5	10.7	10.8	11.4
42PFL5008D/98	4-5	4-8	4-9	9.4	9.5	10.4	10.5	10.7	10.8	11.4
42PFL5008S/98	4-5	4-8	4-9	9.4	9.5	10.4	10.5	10.7	10.8	11.4
46PFL4208/56	4-4	4-8	4-9	9.3	9.5	10.3	10.5	10.6	10.8	11.3
46PFL4208/98	4-4	4-8	4-9	9.3	9.5	10.3	10.5	10.6	10.8	11.3
46PFL4208S/98	4-4	4-8	4-9	9.3	9.5	10.3	10.5	10.6	10.8	11.3
46PFL5008D/56	4-6	4-8	4-9	9.4	9.5	10.4	10.5	10.7	10.8	11.4
46PFL5008D/98	4-6	4-8	4-9	9.4	9.5	10.4	10.5	10.7	10.8	11.4
46PFL5008S/98	4-6	4-8	4-9	9.4	9.5	10.4	10.5	10.7	10.8	11.4
50PFL5008D/98	4-7	4-8	4-9	9.4	9.5	10.4	10.5	10.7	10.8	11.4

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>

Manual xxxx xxx xxxx.2

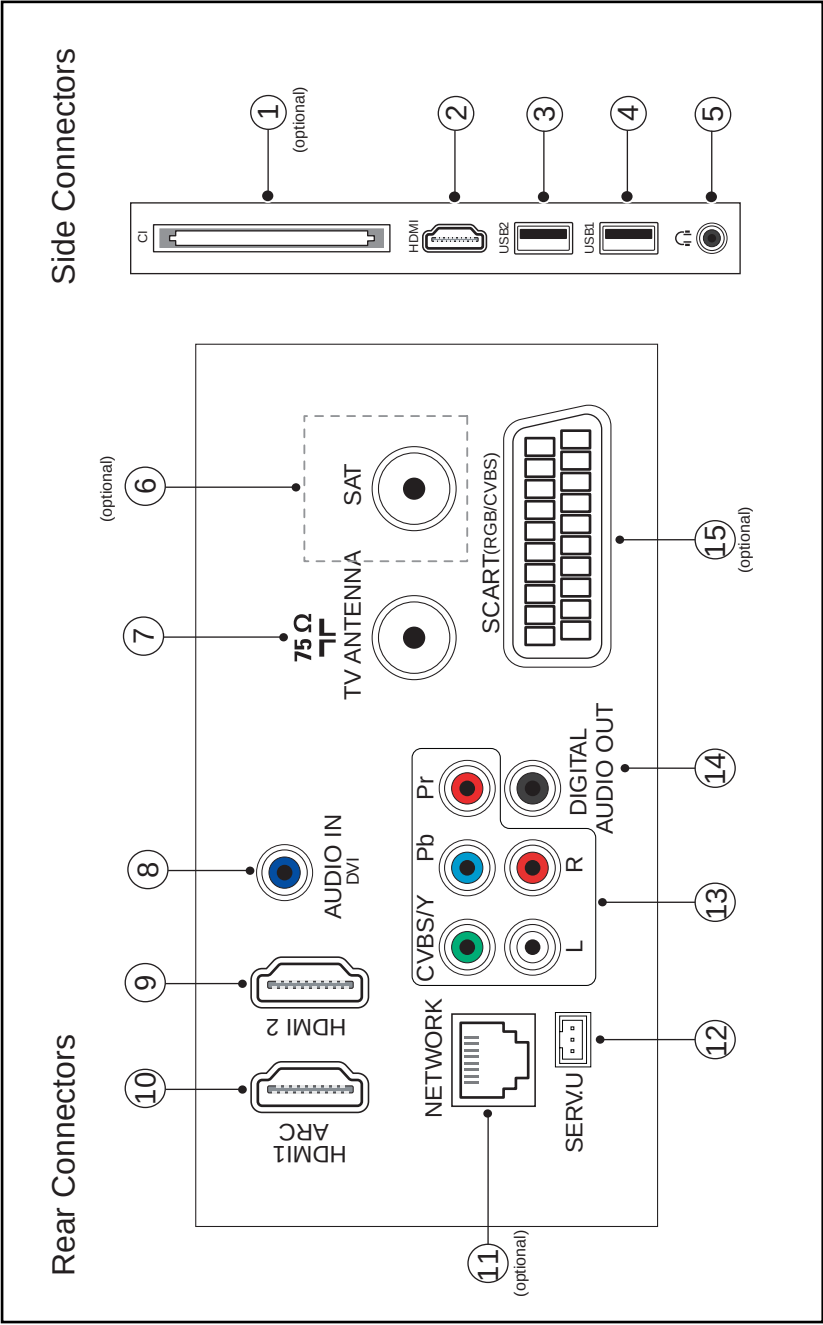
- Chapter 2:** Updated table [2.1 Technical Specifications](#).
- Chapter 4:** Added figure [4-5 Cable dressing \(42" 5008 series\)](#) and [4-6 Cable dressing \(46" 5008 series\)](#) and [4-7 Cable dressing \(50" 5008 series\)](#).
- Chapter 5:** Updated table [5-2 Factory mode overview](#).
- Chapter 6:** Updated table [6-2 White tone default settings](#) and [6-3 Display code overview](#).
- Chapter 9:** Added wire diagrams [9.4 Wiring diagram 5008 series 42"- 46" - 50"](#).
- Chapter 10:** Added circuit diagrams [10.4 A 715G5778 PSU](#) and [10.7 J 715G5330 IR/LED 5000 series](#).
- Chapter 11:** Added styling sheets [11.4 5008 series 42"- 46"-50"](#).

- Specifications are indicative (subject to change).

2.1 Technical Specifications

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

2.3 Connections



19440_001_130310.eps
130310

Figure 2-1 Connection overview

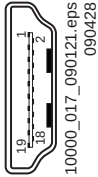
Note: The following connector colour abbreviations are used (acc. to DIN/IEC 757): Bk= Black, Bu= Blue, Gn= Green, Gy= Grey, Rd= Red, Wh= White, Ye= Yellow.

2.3.1 Side Connections

1 - Common Interface

68p - See figure 10-5-14

2 - HDMI: Digital Video - In, Digital Audio - In/Out



- | | |
|-------------------|-----------------|
| 1 - D2+ | Data channel |
| 2 - Shield | Gnd |
| 3 - D2- | Data channel |
| 4 - D1+ | Data channel |
| 5 - Shield | Gnd |
| 6 - D1- | Data channel |
| 7 - D0+ | Data channel |
| 8 - Shield | Gnd |
| 9 - D0- | Data channel |
| 10 - CLK+ | Data channel |
| 11 - Shield | Gnd |
| 12 - CLK- | Data channel |
| 13 - Easylink/CEC | Control channel |
| 14 - n.c. | |
| 15 - DDC_SCL | DDC clock |
| 16 - DDC_SDA | DDC data |
| 17 - Ground | Gnd |
| 18 - +5V | |
| 19 - HPD | Hot Plug Detect |

Figure 2-2 HDMI (type A) connector

20 - Ground

Gnd

3 - USB 2.0



Figure 2-3 USB (type A)

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

4 - USB1 2.0

See 3 - USB2 2.0

5 - Head phone (Output)

Bk - Head phone 80 - 600 Ω / 10 mW

2.3.2 Rear Connections

6 - SAT - In

Signal input from an SAT.

7 - TV ANTENNA - In

Signal input from an antenna, cable or satellite.

8 - Audio - In: Left / Right, VGA

Bu - Audio L/R in 0.5 V_{RMS} / 10 kΩ

9 - HDMI 2: Digital Video - In, Digital Audio - In/Out

See 10 - HDMI 1: Digital Video - In, Digital Audio with ARC - In/Out

10 - HDMI 1: Digital Video - In, Digital Audio with ARC - In/Out

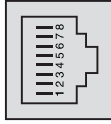


10000_017_090121.eps
090428

Figure 2-4 HDMI (type A) connector

1	- D2+	Data channel	⊕
2	- Shield	Gnd	⊖
3	- D2-	Data channel	⊕
4	- D1+	Data channel	⊖
5	- Shield	Gnd	⊕
6	- D1-	Data channel	⊖
7	- D0+	Data channel	⊕
8	- Shield	Gnd	⊖
9	- D0-	Data channel	⊕
10	- CLK+	Data channel	⊖
11	- Shield	Gnd	⊕
12	- CLK-	Data channel	⊖
13	- EasyLink/CEC	Control channel	⊕
14	- ARC	Audio Return Channel	⊖
15	- DDC_SCL	DDC clock	⊕
16	- DDC_SDA	DDC data	⊖
17	- Ground	Gnd	⊕
18	- +5V	Hot Plug Detect	⊖
19	- HPD	Gnd	⊕
20	- Ground		⊖

11 - RJ45: Ethernet



10000_025_090121.eps
120320

Figure 2-5 Ethernet connector

1	- TD+	Transmit signal	⊕
2	- TD-	Transmit signal	⊖
3	- RD+	Receive signal	⊕
4	- CT	Centre Tap: DC level fixation	⊖
5	- CT	Centre Tap: DC level fixation	⊕
6	- RD-	Receive signal	⊖
7	- GND	Gnd	⊕
8	- GND	Gnd	⊖

2.4 Chassis Overview

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

12 - Service / UART

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

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

Gn	- Video - Y	1 V _{PP} / 75 Ω	⊕
Bu	- Video - Pb	0.7 V _{PP} / 75 Ω	⊖
Rd	- Video - Pr	0.7 V _{PP} / 75 Ω	⊕

Wh	- Audio - L	0.5 V _{RMS} / 10 kW	⊕
Rd	- Audio - R	0.5 V _{RMS} / 10 kW	⊖

14 - Cinch: Digital Audio - Out

BK	- Coaxial	0.4 - 0.6V _{PP} / 75 Ω	⊕
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15 - EXT1: Video RGB/YC - In, CVBS - In/Out, Audio - In/Out

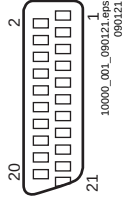


Figure 2-6 SCART connector

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

3. Precautions, Notes, and Abbreviation List

Index of this chapter:

- [3.1 Safety Instructions](#)
- [3.2 Warnings](#)
- [3.3 Notes](#)
- [3.4 Abbreviation List](#)

3.1 Safety Instructions

Safety regulations require the following **during** a repair:

- Connect the set to the Mains/AC Power via an isolation transformer ($> 800 \text{ VA}$).
- 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 $4.5 \text{ M}\Omega$ and $12 \text{ M}\Omega$.
 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 ($\perp$), or hot ground ($\swarrow$), 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 ($\overline{\text{T}}$) and without ($\overline{\text{X}}$) aerial signal. Measure the voltages in the power supply section both in normal operation ($\textcircled{\text{T}}$) and in stand-by ($\textcircled{\text{b}}$). 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 $2.2 \text{ k}\Omega$).
- Resistor values with no multiplier may be indicated with either an "E" or an "R" (e.g. 220E or 220R indicates 220Ω).
- 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 $\sim 4 \text{ sec}$. Avoid temperatures above 400°C ; otherwise wear-out of tips will increase drastically and flux-fluid will be destroyed. To avoid wear-out of tips, switch "off" unused equipment or reduce heat.
- Mix of lead-free soldering tin/parts with leaded soldering tin/parts is possible but PHILIPS recommends strongly to **avoid** mixed regimes. If this cannot be avoided, carefully clear the solder-joint from old tin and re-solder with new tin.

3.3.6 Alternative BOM identification

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

The **third digit** in the serial number (example:

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

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

By looking at the third digit of the serial number, one can identify which B.O.M. is used for the TV set he is working with. If the third digit of the serial number contains the number "1" (example: AG1B033500001), then the TV set has been manufactured according to B.O.M. number 1. If the third digit is a "2" (example: AG2B0335000001), then the set has been produced according to B.O.M. no. 2. This is important for ordering the correct spare parts!

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

Identification: The bottom line of a type plate gives a 14-digit serial number. Digits 1 and 2 refer to the production centre (e.g. SN is Lysomice, RJ is Kobierzyce), digit 3 refers to the B.O.M. code, digit 4 refers to the Service version change code, digits 5 and 6 refer to the production year, and digits 7 and 8 refer to production week (in example below it is 2010 week 10 / 2010 week 17). The 6 last digits contain the serial number.



Figure 3-1 Serial number (example)

3.3.7 Board Level Repair (BLR) or Component Level Repair (CLR)

If a board is defective, consult your repair procedure to decide if the board has to be exchanged or if it should be repaired on component level.

If your repair procedure says the board should be exchanged completely, do not solder on the defective board. Otherwise, it cannot be returned to the O.E.M. supplier for back charging!

3.3.8 Practical Service Precautions

- **It makes sense to avoid exposure to electrical shock.** While some sources are expected to have a possible dangerous impact, others of quite high potential are of limited current and are sometimes held in less regard.
- **Always respect voltages.** While some may not be dangerous in themselves, they can cause unexpected reactions that are best avoided. Before reaching into a powered TV set, it is best to test the high voltage insulation. It is easy to do, and is a good service precaution.

3.4 Abbreviation List

0/6/12 SCART switch control signal on A/V board. 0 = loop through (AUX to TV),

6 = play 16 : 9 format, 12 = play 4 : 3 format

Automatic Aspect Ratio Adaptation: algorithm that adapts aspect ratio to remove horizontal black bars; keeps the original aspect ratio

Automatic Channel Installation:

algorithm that installs TV channels directly from a cable network by means of a predefined TXT page

Analogue to Digital Converter

Automatic Frequency Control: control signal used to tune to the correct frequency

Automatic Gain Control: algorithm that controls the video input of the feature box

Amplitude Modulation

Asia Pacific

Aspect Ratio: 4 by 3 or 16 by 9

Auto Screen Fit: algorithm that adapts

aspect ratio to remove horizontal black bars without discarding video information

Advanced Television Systems

Committee, the digital TV standard in the USA

See Auto TV

A hardware and software control

system that measures picture content, and adapts image parameters in a dynamic way

External Audio Video

Audio Video Controller

Audio Video Input Processor

Monochrome TV system. Sound

carrier distance is 5.5 MHz

Business Display Solutions (iTV)

Board-Level Repair

Broadcast Television Standard

Committee. Multiplex FM stereo sound

system, originating from the USA and

used e.g. in LATAM and AP-NTSC

countries

Blue Teletext

Centre channel (audio)

Consumer Electronics Control bus:

remote control bus on HDMI

connections

Constant Level: audio output to

connect with an external amplifier

Component Level Repair

Computer aided rePair

Connected Planet / Copy Protection

Customer Service Mode

Color Transient Improvement:

manipulates steepness of chroma

transients

Composite Video Blanking and

Synchronization

Digital to Analogue Converter

Dynamic Bass Enhancement: extra

low frequency amplification

Data Communication Module. Also

referred to as System Card or

Smartcard (for iTV).

See "E-DDC"

Monochrome TV system. Sound

carrier distance is 6.5 MHz

Dynamic Frame Insertion

Directions For Use: owner's manual

Digital Media Reader: card reader

Digital Multi Standard Decoding

Digital Natural Motion

DNR	Digital Noise Reduction: noise reduction feature of the set	
DRAM	Dynamic RAM	
DRM	Digital Rights Management	
DSP	Digital Signal Processing	
DST	Dealer Service Tool: special remote control designed for service technicians	iTV
DTCP	Digital Transmission Content Protection; A protocol for protecting digital audio/video content that is traversing a high speed serial bus, such as IEEE-1394	LS
DVB-C	Digital Video Broadcast - Cable	LATAM
DVB-T	Digital Video Broadcast - Terrestrial	LCD
DVD	Digital Versatile Disc	LED
DVI(-d)	Digital Visual Interface (d= digital only)	L/L'
E-DDC	Enhanced Display Data Channel (VESA standard for communication channel and display). Using E-DDC, the video source can read the EDID information form the display.	LPL
EDID	Extended Display Identification Data (VESA standard)	LS
EEPROM	Electrically Erasable and Programmable Read Only Memory	LVDS
EMI	Electro Magnetic Interference	Mbps
EPG	Electronic Program Guide	M/N
EPLD	Erasable Programmable Logic Device	MHEG
EU	Europe	
EXT	EXternal (source), entering the set by SCART or by cinches (jacks)	
FDS	Full Dual Screen (same as FDW)	MIPS
FDW	Full Dual Window (same as FDS)	
FLASH	FLASH memory	
FM	Field Memory or Frequency Modulation	MOP
FPGA	Field-Programmable Gate Array	MOSFET
FTV	Flat TeleVision	
Gb/s	Giga bits per second	MPEG
G-TXT	Green TeleteXT	MPIF
H	H_sync to the module	MUTE
HD	High Definition	MTV
HDD	Hard Disk Drive	NC
HDCP	High-bandwidth Digital Content Protection: A "key" encoded into the HDMI/DVI signal that prevents video data piracy. If a source is HDCP coded and connected via HDMI/DVI without the proper HDCP decoding, the picture is put into a "snow vision" mode or changed to a low resolution. For normal content distribution the source and the display device must be enabled for HDCP "software key" decoding.	NICAM
HDMI	High Definition Multimedia Interface	NTC
HP	HeadPhone	NTSC
I	Monochrome TV system. Sound carrier distance is 6.0 MHz	
I ² C	Inter IC bus	NVM
I ² D	Inter IC Data bus	O/C
I ² S	Inter IC Sound bus	OSD
IF	Intermediate Frequency	OAD
IR	Infra Red	
IRQ	Interrupt Request	OTC
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.	P50
		PAL

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.

Institutional TeleVision; TV sets for hotels, hospitals etc.

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

Latin America

Liquid Crystal Display

Light Emitting Diode

Monochrome TV system. Sound carrier distance is 6.5 MHz. L' is Band I, L is all bands except for Band I

LG.Philips LCD (supplier)

Loudspeaker

Low Voltage Differential Signalling

Mega bits per second

Monochrome TV system. Sound carrier distance is 4.5 MHz

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

Microprocessor without Interlocked Pipeline-Stages; A RISC-based microprocessor

Matrix Output Processor

Metal Oxide Silicon Field Effect Transistor, switching device

Motion Pictures Experts Group

Multi Platform InterFace

MUTE Line

Mainstream TV: TV-mode with Consumer TV features enabled (iTV)

Not Connected

Near Instantaneous Compounded Audio Multiplexing. This is a digital sound system, mainly used in Europe.

Negative Temperature Coefficient, non-linear resistor

National Television Standard Committee. Color system mainly used in North America and Japan. Color carrier NTSC MN= 3.579545 MHz, NTSC 4.43= 4.433619 MHz (this is a VCR norm, it is not transmitted off-air)

Non-Volatile Memory: IC containing TV related data such as alignments

Open Circuit

On Screen Display

Over the Air Download. Method of software upgrade via RF transmission.

Upgrade software is broadcasted in TS with TV channels.

On screen display Teletext and Control; also called Artistic (SAA5800)

Project 50: communication protocol between TV and peripherals

Phase Alternating Line. Color system mainly used in West Europe (colour carrier = 4.433619 MHz) and South America (colour carrier

PAL M = 3.575612 MHz and PAL N = 3.582056 MHz)

Printed Circuit Board (same as "PWB")

Pulse Code Modulation

PDP	Plasma Display Panel	SWAN	Spatial temporal Weighted Averaging
PFC	Power Factor Corrector (or Pre-conditioner)	SXGA	Noise reduction
PIP	Picture In Picture	TFT	1280 × 1024
PLL	Phase Locked Loop. Used for e.g. FST tuning systems. The customer can give directly the desired frequency	THD	Thin Film Transistor
POD	Point Of Deployment: a removable CAM module, implementing the CA system for a host (e.g. a TV-set)	TMD5	Total Harmonic Distortion
POR	Power On Reset, signal to reset the uP	TS	Transmission Minimized Differential Signalling
PSDL	Power Supply for Direct view LED backlight with 2D-dimming	TXT	Transport Stream
PSL	Power Supply with integrated LED drivers	TXT-DW	Teletext
PSLS	Power Supply with integrated LED drivers with added Scanning functionality	UI	Dual Window with Teletext User Interface
PTC	Positive Temperature Coefficient, non-linear resistor	uP	Microprocessor
PWB	Printed Wiring Board (same as "PCB")	UXGA	1600 × 1200 (4:3)
PWM	Pulse Width Modulation	V	V-sync to the module
QRC	Quasi Resonant Converter	VESA	Video Electronics Standards Association
QTNR	Quality Temporal Noise Reduction	VGA	640 × 480 (4:3)
QVCP	Quality Video Composition Processor	VL	Variable Level out: processed audio output toward external amplifier
RAM	Random Access Memory	VSB	Vestigial Side Band; modulation method
RGB	Red, Green, and Blue. The primary color signals for TV. By mixing levels of R, G, and B, all colors (Y/C) are reproduced.	WYSIWYR	What You See Is What You Record: record selection that follows main picture and sound
RC	Remote Control	WXGA	1280 × 768 (15:9)
RC5 / RC6	Signal protocol from the remote control receiver	XTAL	Quartz crystal
RESET	RESET signal	XGA	1024 × 768 (4:3)
ROM	Read Only Memory	Y	Luminance signal
RSDS	Reduced Swing Differential Signalling data interface	Y/C	Luminance (Y) and Chrominance (C) signal
R-TXT	Red Teletext	YPbPr	Component video, Luminance and scaled color difference signals (B-Y and R-Y)
SAM	Service Alignment Mode	YUV	Component video
S/C	Short Circuit		
SCART	Syndicat des Constructeurs d'Appareils Radiorécepteurs et Téléviseurs		
SCL	Serial Clock I ² C		
SCL-F	Clock Signal on Fast I ² C bus		
SD	Standard Definition		
SDA	Serial Data I ² C		
SDA-F	Data Signal on Fast I ² C bus		
SDI	Serial Digital Interface, see "ITU-656"		
SDRAM	Synchronous DRAM		
SECAM	SEquence Couleur Avec Mémoire. Colour system mainly used in France and East Europe. Colour carriers = 4.406250 MHz and 4.250000 MHz		
SIF	Sound Intermediate Frequency		
SMPS	Switched Mode Power Supply		
SoC	System on Chip		
SOG	Sync On Green		
SOPS	Self Oscillating Power Supply		
SPI	Serial Peripheral Interface bus; a 4-wire synchronous serial data link standard		
S/PDIF	Sony Philips Digital InterFace		
SRAM	Static RAM		
SRP	Service Reference Protocol		
SSB	Small Signal Board		
SSC	Spread Spectrum Clocking, used to reduce the effects of EMI		
STB	Set Top Box		
STBY	Stand-BY		
SVGA	800 × 600 (4:3)		
SVHS	Super Video Home System		
SW	Software		

4. Mechanical Instructions

Index of this chapter:

- [4.1 Cable Dressing](#)
- [4.2 Service Positions](#)
- [4.3 Assembly/Panel Removal](#)
- [4.4 Set Re-assembly](#)

Notes:

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

4.1 Cable Dressing



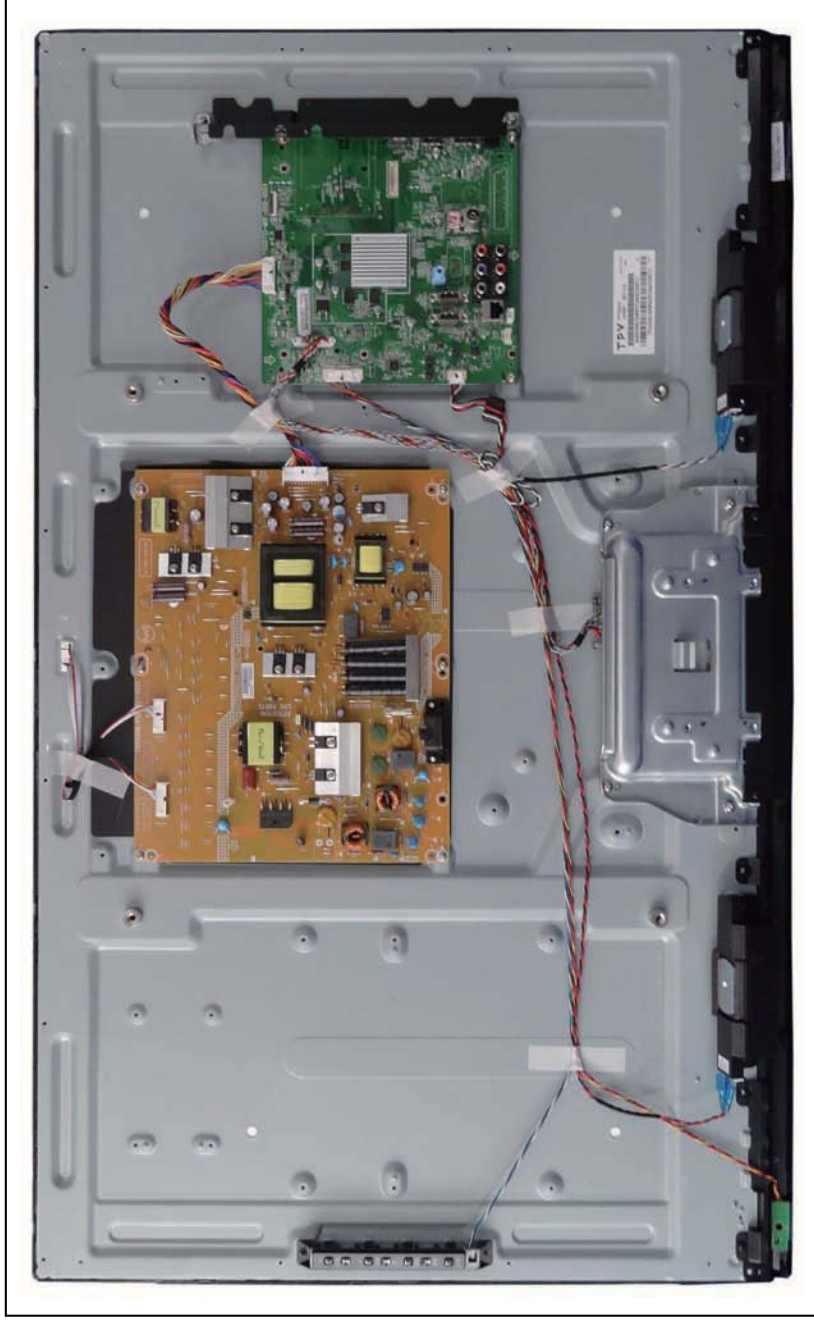
19440_100_130304.eps
130304

Figure 4-1 Cable dressing (32" 4208 series)



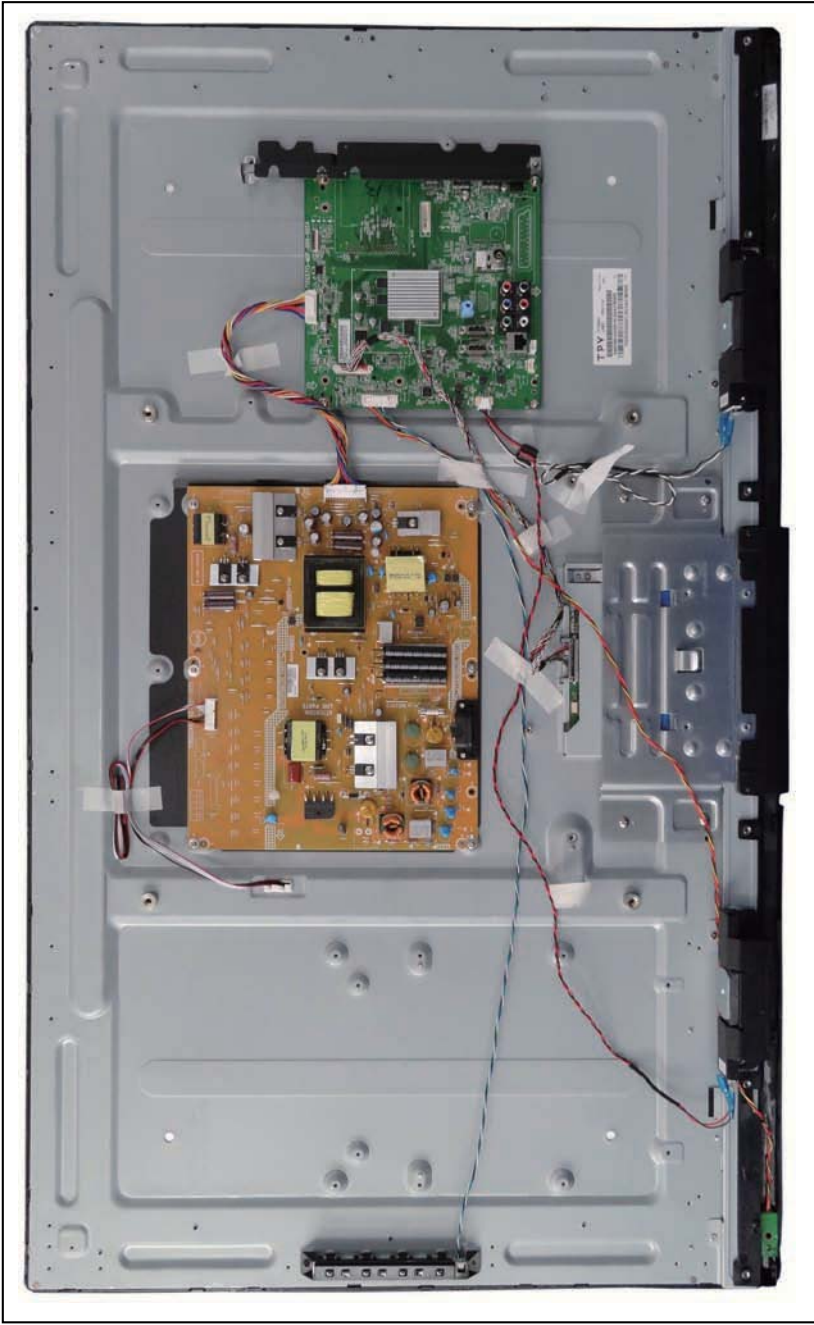
19440_101_130304.eps
130304

Figure 4-2 Cable dressing (39" 4208 series)



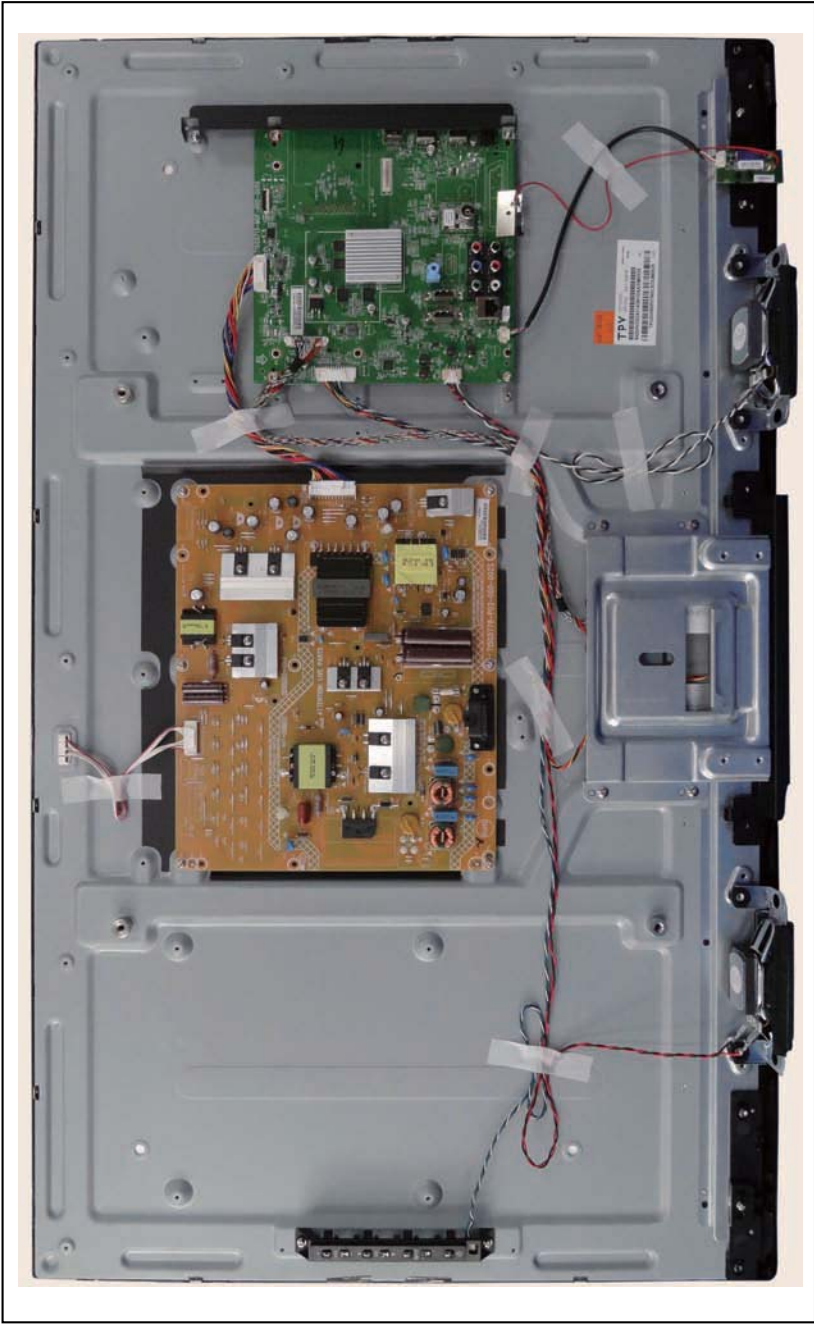
19441_100_130319.eps
130319

Figure 4-3 Cable dressing (42" 4208 series)



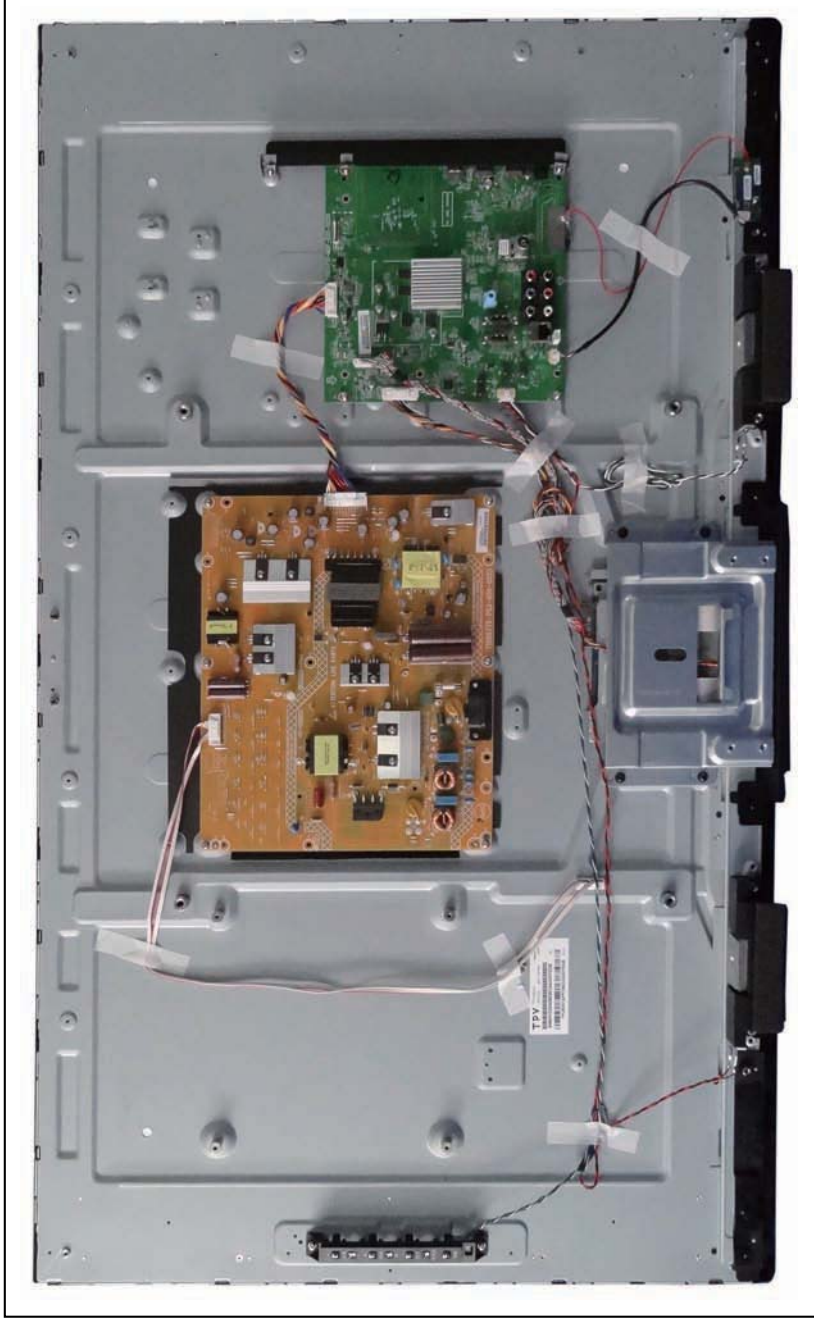
19441_101_130322.eps
130322

Figure 4-4 Cable dressing (46" 4208 series)



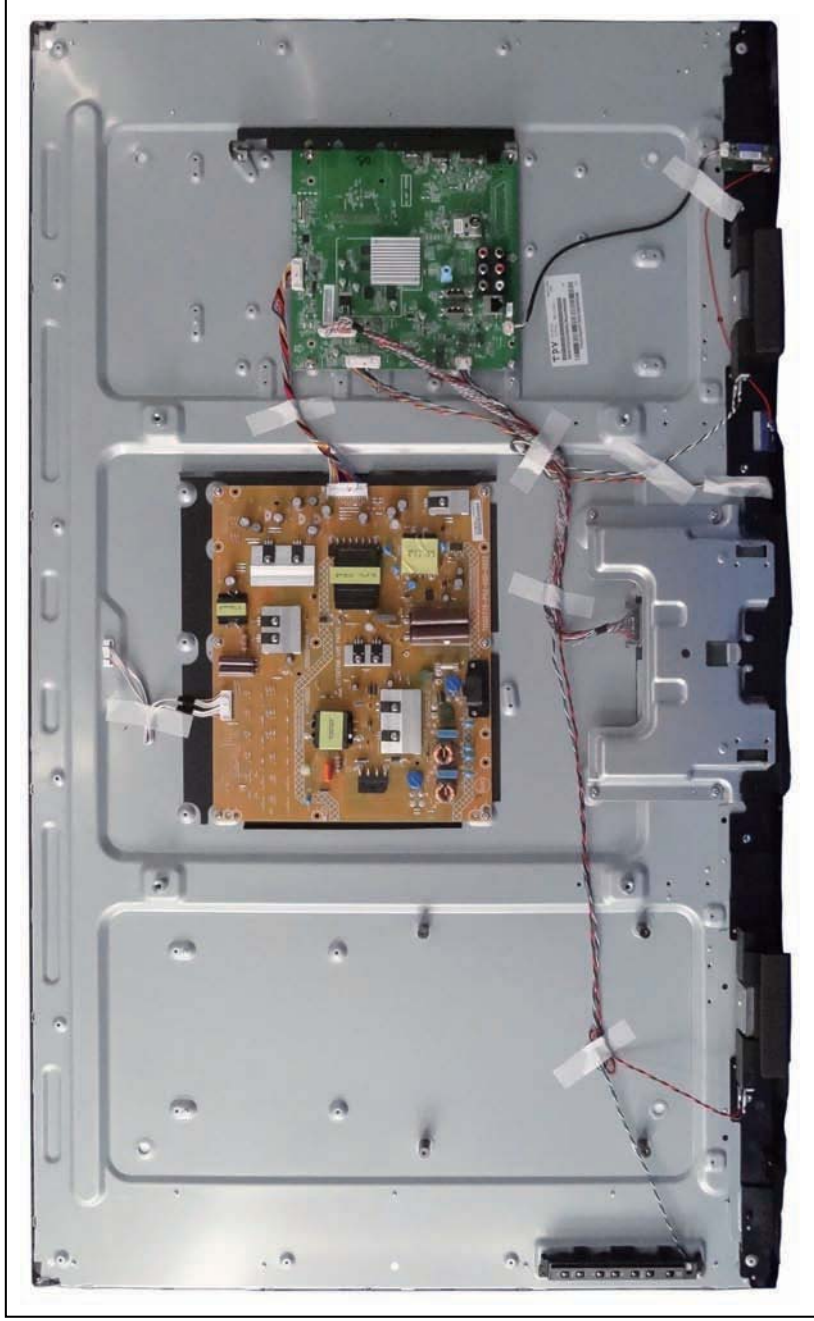
19442_100_130507.eps
130507

Figure 4-5 Cable dressing (42" 5008 series)



19442_101_130507.eps
130507

Figure 4-6 Cable dressing (46" 5008 series)



19442_102_130507.eps
130507

Figure 4-7 Cable dressing (50" 5008 series)

4.2 Service Positions

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

4.3 Assembly/Panel Removal

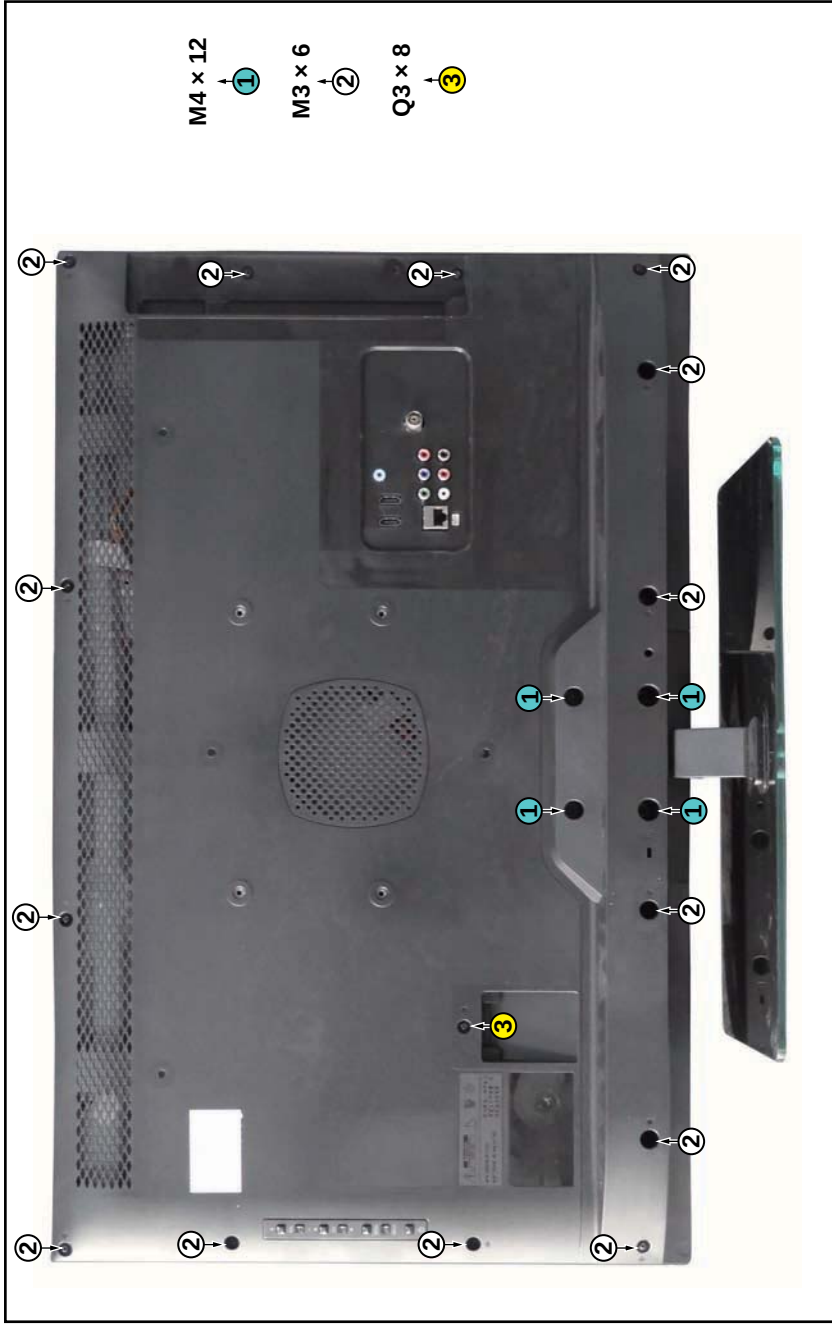
Instructions below apply to the 32PFL4208/98, but will be similar for other series models.

4.3.1 Rear Cover

Refer to [Figure 4-8](#) for details.

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

1. Remove fixation screws [1] that secure the base assy, pull out the base assy from the set. Then remove the fixation screws [2], [3], that secure the rear cover. Refer to [Figure 4-8](#) for details.
2. Gently lift the rear cover from the TV. Make sure that wires and cables are not damaged while lifting the rear cover from the set.



19440_102_130310.eps
130310

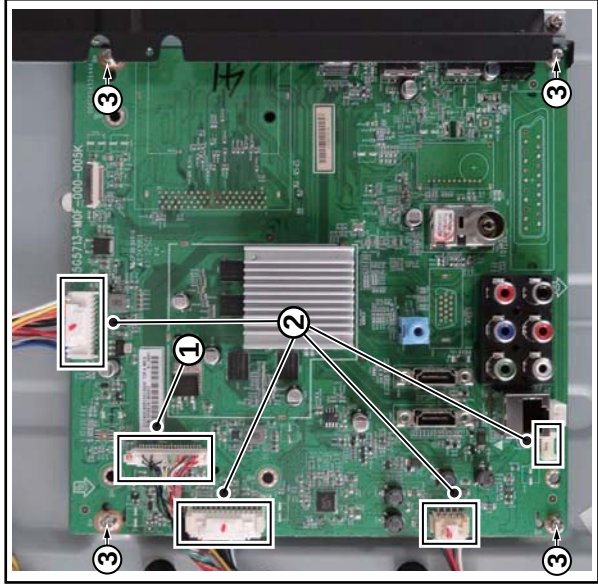
Figure 4-8 Rear cover removal

4.3.2 Small Signal Board (SSB)

Refer to [Figure 4-9](#) for details.

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 the LVDS connector that connect with the SSB [1].
Caution: be careful, as these are very fragile connectors!
2. Unplug all other connectors [2].
3. Remove all the fixation screws from the SSB [3].
4. The SSB can now be shifted from side connector cover, then lifted and taken out of the I/O bracket. Refer to [Figure 4-9](#) for details.



19440_103_130310.eps
130310

Figure 4-9 SSB removal

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. Gently unplug all connectors from the PSU.
2. Remove all fixation screws from the PSU.
3. The PSU can be taken out of the set now.

4.3.4 Speakers

1. Gently release the tapes that secures the speaker cables.
2. Unplug the speaker connectors from the SSB.
3. Take the speakers out.

When defective, replace the both units.

4.3.5 Keyboard Control unit

1. Unplug the connector from the keyboard control panel.
2. Gently push inwards the two clips at the PSU side of the unit. Release the unit at the PSU side and turn it away from the PSU. Now push it towards the PSU to release the catches at the other side of the unit. Take it out from the metal bracket.

When defective, replace the whole unit.

4.3.6 Stand bracket

1. Remove all fixation screws of the bracket.
2. Lift the bracket from the set.

4.3.7 IR/LED Panel

1. Remove the stand bracket, as described earlier.
2. Unplug the connector from the IR/LED panel.
3. Gently release the clip that holds the panel and take it out from the bezel.

When defective, replace the whole unit.

4.3.8 LCD Panel

1. Remove the SSB as described earlier.
2. Remove the PSU as described earlier.
3. Remove the keyboard control panel as described earlier.

4. Remove the stand bracket as described earlier.
 5. Remove the IR/LED as described earlier.
 6. Remove the fixations screws that fix the metal clamps to the front bezel. Take out those clamps.
 7. Remove all other metal parts not belonging to the panel.
 8. Lift the LCD Panel from the bezel.
- When defective, replace the whole unit.

4.4

Set Re-assembly

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

Notes:

- While re-assembling, make sure that all cables are placed and connected in their original position. See [Figure 4-8](#) and [Figure 4-9](#).
- Pay special attention not to damage the EMC foams on the SSB shields. Ensure that EMC foams are mounted correctly.

5. Service Modes, Error Codes, and Fault Finding

Index of this chapter:

- [5.1 Test Points](#)
- [5.2 Service Modes](#)
- [5.3 Stepwise Start-up](#)
- [5.4 Service Tools](#)
- [5.5 Software Upgrading](#)
- [5.6 Error Codes](#)
- [5.7 The Blinking LED Procedure](#)
- [5.8 Fault Finding and Repair Tips](#)

5.1 Test Points

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

Perform measurements under the following conditions:

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

5.2 Service Modes

The Service Mode feature is split into five parts:

- Service Default Mode (SDM).
- Service Alignment Mode (SAM).
- Factory Mode.
- Customer Service Mode (CSM).
- Computer Aided Repair Mode (ComPair).

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

- A pre-defined situation to ensure measurements can be made under uniform conditions (SDM).
- Activates the blinking LED procedure for error identification when no picture is available (SDM).
- Make alignments (e.g. White Tone), reset the error buffer (SAM and Factory Mode).
- Display information ("SDM" or "SAM" indication in upper right corner of screen, error buffer, software version, operating hours, options and option codes, sub menus).

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

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

ComPair Mode is used for communication between a computer and a TV on I²C /UART level and can be used by a Service engineer to quickly diagnose the TV set by reading out error codes, read and write in NVMs, communicate with ICs and the micro processor (PWM, registers, etc.), and by making use of a fault finding database. It will also be possible to up and download the software of the TV set via I²C with help of ComPair. To do this, ComPair has to be connected to the TV set via the ComPair connector, which will be accessible through the rear of the set (without removing the rear cover).

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

5.2.1 General

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

Life Timer

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

Software Identification, Version, and Cluster

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

- The screen will show: "AAAAB-X.YY", where:
- AAAA is the chassis name: TPM1011A x.yy.
 - B is the region indication: E = Europe, A = AP/China, U = NAFTA, L = LATAM.
 - X is the main version number: this is updated with a major change of specification (incompatible with the previous software version). Numbering will go from 1 - 99 and AA - ZZ.
 - If the main version number changes, the new version number is written in the NVM.
 - If the main version number changes, the default settings are loaded.
 - YYY is the sub version number: this is updated with a minor change (backwards compatible with the previous versions). Numbering will go from 000 - 999.
 - If the sub version number changes, the new version number is written in the NVM.
 - If the NVM is refreshed, the software identification, version, and cluster will also be written to NVM.

Display Option Code Selection

When after an SSB or display exchange, the display option code is not set properly, it will result in a TV with "no display". Therefore, it is required to set this display option code after such a repair.

To do so, press the following key sequence on a standard RC transmitter: "062598" directly followed by MENU and "xxx", where "xxx" is a 3 digit decimal value of the panel type: see column "Display Code" in [Table 6-3](#). When the value is accepted and stored in NVM, the set will switch to Stand-by, to indicate that the process has been completed. During this algorithm, the NVM-content must be filtered, because several items in the NVM are TV-related and not SSB related (e.g. Model and Prod. S/N). Therefore, "Model" and "Prod. S/N" data is changed into "See Type Plate". In case a call centre or consumer reads "See Type Plate" in CSM mode.

5.2.2 Service Default Mode (SDM)

Purpose

Set the TV in SDM mode in order to be able to create a predefined setting for measurements to be made. In this platform, a simplified SDM is introduced (without protection override and without tuning to a predefined frequency).

Specifications

- Set linear video and audio settings to 50%, but volume to 25%. Stored user settings are not affected.
- All service-unfriendly modes (if present) are disabled, since they interfere with diagnosing/repairing a set. These service unfriendly modes are:
 - (Sleep) timer.
 - Blue mute/Wall paper.
 - Auto switch "off" (when there is no "ident" signal).
 - Hotel or hospital mode.
 - Child lock or parental lock (manual or via V-chip).
 - Skipping, blanking of "Not favourite", "Skipped" or "Locked" presets/channels.
 - Automatic storing of Personal Preset or Last Status settings.

- Automatic user menu time-out (menu switches back/OFF automatically).
- Auto Volume levelling (AVL).

How to Activate SDM

To activate SDM, use the following methods:

- Press the following key sequence on the RC transmitter: "062596", directly followed by the "Home" button.

After activating this mode, "SDM" will appear in the upper left corner of the screen.

On Screen Menu

After activating SDM, the following items are displayed, with SDM in the upper right corner of the screen to indicate that the television is in Service Default Mode. Menu items and explanation:

- xxxx Operating hours (in decimal).
- **AAAA-B-X.YYY** See [Software Identification, Version, and Cluster](#) for the software name definition.
- **ERR** Shows all errors detected since the last time the buffer was erased in format <xxx> <xxx> <xxx> <xxx> <xxx> (five errors possible).
- **OP** Used to read-out the option bytes. In this chassis two times eight option codes are used.

How to Navigate

As this mode is read only, there is nothing to navigate. To switch to other modes, use one of the following methods:

- Command MENU from the user remote will exit SDM.
- To prevent the OSD from interfering with measurements in SDM, use the command "Adjust" or "Options" ("STATUS" or "INFO" for NAFTA and LATAM) from the user remote. This will switch the OSD "off" while remaining in the SDM mode. The "SDM" OSD is remains visible in the upper right corner of the screen. To exit SDM switch to "Stand-by"

- Press the following key sequence on the remote control transmitter: "062596" directly followed by the OK button to switch to SAM (do not allow the display to time out between entries while keying the sequence). Remarks: new remote

controls will not have I+ button, but an "INFO" button instead.

How to Exit SDM

- Switch the set to Stand-by, by pressing the standby button on the remote control transmitter or on the television set.
- Via a standard customer RC-transmitter: key in "00"-sequence.

Note: If the TV is switched "off" by a power interrupt while in SDM, the TV will show up in the last status of SDM menu as soon as the power is supplied again. The error buffer will not be cleared.

5.2.3 Service Alignment Mode (SAM)

Purpose

- To modify the NVM.
- To display/clear the error code buffer.
- To perform alignments.

Specifications

- Operation hours counter (maximum five digits displayed).
- Software version, error codes, and option settings display.
- Error buffer clearing.
- Option settings.
- Software alignments (White Tone).
- NVM Editor.
- Set screen mode to full screen (all content is visible).

How to Activate SAM

To activate SAM, use one of the following methods:

- Press the following key sequence on the remote control transmitter: "062596", directly followed by the "INFO" button. Do not allow the display to time out between entries while keying the sequence.
- Or via ComPair.

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

Table 5-1 SAM mode overview

Main Menu	Sub-menu 1	Sub-menu 2	Description
System Information	Op Hour		This represents the life timer. The timer counts normal operation hours, but does not count Stand-by hours.
	Main SW ID	e.g. "TPM1013E 1.049B"	See paragraph Software Identification, Version, and Cluster for the software name definition.
	ERR	e.g. "000 000 000 000 000"	Shows all errors detected since the last time the buffer was erased. Five errors possible.
	OP1	e.g. "032 224 048 000 038 128 192 015"	Used to read-out the option bytes. See paragraph 6.4 Option Settings in the Alignments section for a detailed description. Ten codes are possible.
	OP2	e.g. "159 255 127 061 235 004 000 000"	
Clear	Press [OK] to clean the Error Codes immediately		Erases the contents of the error buffer. Select this menu item and press the MENU RIGHT key on the remote control. The content of the error buffer is cleared.
Options	OP#1-OP#8	e.g. "032"	Option code
	Warm	R Gain G Gain B Gain	To align the White Tone. See paragraph 6.3 Software Alignments in the Alignments section for a detailed description
	Normal	R Gain G Gain B Gain	
	Cool	R Gain G Gain B Gain	
	Store		Store the RGB value
	Address		Select and fill the NVM address
	Value		Select and fill the NVM value
	Store		Store the value in the address
NVM editor	Copy Channel List to USB		To upload several settings from the TV to an USB stick
	Copy NVM to USB		
	Copy Readable Info to USB		
	Copy EDID to USB		

Main Menu	Sub-menu 1	Sub-menu 2	Description
Download from USB	Copy Channel List from USB		To download several settings from the USB stick to the TV
	Copy NVM from USB		
	Copy Readable Info from USB		
Initialize NVM	Copy EDID from USB		To initialize a (corrupted) NVM. Be careful, this will erase all settings.
	Press [OK] to Initialize NVM immediately		
Dealer Options	Set Virgin mode	Virgin mode:Off	Set Virgin mode
	Store	Press [OK] to store virgin mode immediately	Store the virgin mode in the address
Event Count	Software Events	0000 0000	Software Events
	Hardware Events	0000 0000	Hardware Events
	Clear Software Events	Press [OK] to clear software events immediately	Clear Software Events
	Clear Hardware Events	Press [OK] to clear hardware events immediately	Clear Hardware Events

How to Navigate

- In the SAM menu, select menu items with the UP/DOWN keys on the remote control transmitter. The selected item will be indicated. When not all menu items fit on the screen, use the UP/DOWN keys to display the next/previous menu items.
- With the "LEFT/RIGHT" keys, it is possible to:
 - (De) activate the selected menu item.
 - (De) activate the selected sub menu.
 - Change the value of the selected menu item.
- When you press the MENU button once while in top level SAM, the set will switch to the normal user menu (with the SAM mode still active in the background).
- Press the following key sequence on the remote control transmitter: "062596" directly followed by the "Home" button to switch to SDM (do not allow the display to time out between entries while keying the sequence).

How to Store SAM Settings

To store the settings changed in SAM mode (except the RGB Align settings), leave the top level SAM menu by using the POWER button on the remote control transmitter or the television set. The mentioned exceptions must be stored separately via the STORE button.

How to Exit SAM

- Use one of the following methods:
- Switch the set to STANDBY by pressing the mains button on the remote control transmitter or the television set.
 - Via a standard RC-transmitter, key in "00" sequence.

Table 5-2 Factory mode overview

Item	Item value	Default value					Description
0	FW VERSION	32"	39"	42"	46"	50"	Displays the software versions of the supplier, Flash PQ, Smart Picture, BL Dimming, Source Meter, the Picture Quality checksum, the Dimming library, the Source meter library, the Flash AQ, the MTK, MCU and OAD software versions.
1	PANEL_ID	Press OK					Displays and changes the Panel ID with the left and right cursor; be careful changing this, it can result in not correct displaying the screen!
2	TUNER_ID	See table 6-3 Display code overview					Displays and changes the Tuner ID with the left and right cursor. Not to be changed when the tuner is replaced with the correct service part.
3	DEMOD_TYPE	3	11	3	3	3	Choose demod type.
4	ERR Code: xxx xxx xxx xxx xxx	000 000 000 000 000					Values showing the last 5 errors during the last 50 hours of operation, according to table 5-4 Error code table
5	CLEAR ERROR BUFFER	Press OK					Selecting this clear all current error codes.
6	NVM ADDRESS	0					NVM address 0 to 8191. Use item 6 to change and 7 to store the data to the correct NVM address
7	NVM VALUE	various					Displays the value at the NVM address of item 5
8	NVM STORE	Press OK					Use this option to save the data of item 6 to NVM address of item 5
9	NVM COPY TV to USB	Press OK					Use this to store the NVM data to the REPAIR folder of a FAT formatted USB memory stick. The TV will write two files in the REPAIR folder of the memory stick. It will create this folder if it does not exist. The items are "Channel list", "Personal settings", "Option codes", "Display-related alignments" and "History list". In case the download to the USB stick was not successful "Failure" will appear. In this case, check if the USB stick is connected properly. Now the settings are stored onto the USB stick and can be used to download onto another TV or other SSB. Uploading is of course only possible if the software is running and if a picture is available. This method is created to be able to save the customer's TV settings and to store them into another SSB.
10	NVM READ USB to TV	Press OK					Use this to store the NVM data from the USB memory stick to the TV. The TV will save the two files which were created in item 8 to the NVM of the set. Use these options when replacing a SSB. When "USB to TV Success" is displayed remove the power and restart the TV

Item	Item value	Default value					Description
		32"	39"	42"	46"	50"	
11	RESET_PBS_PWD	Press OK					Use this to reset the Child Lock
12	DIM_LIB RESET	Press OK					Reset the Dimming
13	SRC_METER RESET	Press OK					Reset the Source meter
14	AMBLIGHT RESET	Press OK					Reset Ambilight
15	ACFG RESET	Press OK					Reset ACFG
16	CIPLUS QUERY	Press OK					Shows the Validity of the CI+ key and the supplier information
17	CIPLUS UPDATE	Press OK					Used to enter a new CI+ code into the NVM. This can only be used when no CI+ code exists in the NVM
18	EDID UPDATE	Press OK					Used to enter a new EDID codes into the NVM
19	TEST PATTERN	Press OK					With the "left" and "right" keys of the remote control various test patterns can be chosen
20	VIRGIN_MODE	Off					Use this to return the set to virgin mode. Depends whether the set has been used already.
21	E-Fuse	On					E-fuse mode
22	ORT_MODE	Off					ORT mode
23	VGA_UART_SWITCH	Off					When switched "on" the VGA port can be used for UART logging.
24	DRMWWARI	On					Use this to return the set to virgin mode. Depends whether the set has been used already.
25	AGEING_MODE	Off					Ageing mode
26	CLR_TEMP_R	128	128	128	99	128	Red colour temperature setting
27	CLR_TEMP_G	128	128	128	109	128	Green colour temperature setting
28	CLR_TEMP_B	128					Red colour temperature setting
29	AUTO_COLOR	Press OK					PC: any pattern that has black and white, YPbPr: SMPTE bar (colour bar), any timing.
30	ADC_GAIN_R	0					Red ADC gain
31	ADC_GAIN_G	0					Green ADC gain
32	ADC_GAIN_B	0					Blue ADC gain
33	ADC_OFFSET_R	128					Red ADC offset
34	ADC_OFFSET_G	128					Green ADC offset
35	ADC_OFFSET_B	128					Blue ADC offset
36	YPBPR_PHASE	Invalid					Not available for this chassis
37	AUD_GAIN_LINEIN	0					Line-in audio gain
38	AUD_GAIN_HDMI	0					HDMI audio gain
39	AUD_GAIN_ATV	0					Analogue TV audio gain
40	AUD_GAIN_DTV	0					Digital TV audio gain
41	AUD_GAIN_USB	0					USB audio gain
42	AQ_INDEX	11					Audio Quality index
43	AUDIO TEST MODE	Off					Used for audio testing during production
44	AUDIO CHANNEL TYPE	2.0					Defines the installed speaker system
45	DUMP PQ FROM TV	Press OK					Saves the picture quality data to a file "pq.bin" to the root of a FAT formatted USB memory stick
46	LOAD PQ to TV	Press OK					Loads the picture quality data from a file "pq.bin" in to the TV
47	DUMP AQ FROM TV	Press OK					Saves the audio quality data to a file "AQ.bin" to the root of a FAT formatted USB memory stick
48	LOAD AQ to TV	Press OK					Loads the audio quality data from a file "AQ.bin" in to the TV
49	FEF CHECK	Off					FEF Check
50	PANEL FLIP	On	On	On	On	Off	Flip panel
51	VGA_SOURCE	Off					Enable/Disable VGA source
52	HDMI2	On					Enable/Disable HDMI2 source
53	HDMI5IDE	On					Enable/Disable HDMI3 source
54	LIGHT SENEOR	Off					Light sensor
55	RESET_OPTION_CODE	Press OK					Reset Option Code
56	AMBLIGHT	Off	Off	Off	Off	On	Ambilight on/off
57	AMBLIGHT_DRIVER	AMS					Choose Ambilight driver type
58	3D	Off	Off	Off	Off	On	3D on/off
59	EXIT_FACTORY	Press OK					Exits the Factory mode

How to Exit the Factory mode

Use one of the following methods:

- Select EXIT_FACTORY from the menu and press the "OK" button.

Note: When the TV is switched "off" by a power interrupt, or normal switch to "stand-by" while in the factory mode, the TV will show up in "normal operation mode" as soon as the power is supplied again. The error buffer will not be cleared.

5.2.5 Customer Service Mode (CSM)

Purpose

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

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

Specifications

- Ignore "Service unfriendly modes".
- Line number for every line (to make CSM language independent).
- Set the screen mode to full screen (all contents on screen is visible).
- After leaving the Customer Service Mode, the original settings are restored.
- Possibility to use "CH+" or "CH-" for channel surfing, or enter the specific channel number on the RC.

How to Activate CSM

To activate CSM, press the following key sequence on a standard remote control transmitter: "123654" (do not allow the display to time out between entries while keying the sequence). After entering the Customer Service Mode, the following items are displayed.

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

Contents of CSM

- **1.1 Set Type** This information is very helpful for a helpdesk/workshop as reference for further diagnosis. In this way, it is not necessary for the customer to look at the rear of the TV-set. Note that if an NVM is replaced or is initialized after corruption, this set type has to be re-written to NVM.
- **1.2 Production code** Displays the production code (the serial number) of the TV. Note that if an NVM is replaced or is initialized after corruption, this production code has to be re-written to NVM.
- **1.3 Installation date** Indicates the date of the first installation of the TV. This date is acquired via time extraction.
- **1.4 Option Code 1** Gives the option codes of option group 1 as set in SAM.
- **1.5 Option Code 2** Gives the option codes of option group 2 as set in SAM.
- **1.6 SSB** Gives an identification of the SSB as stored in NVM. Note that if an NVM is replaced or is initialized after corruption, this identification number has to be re-written to NVM. This identification number is the 12NC number of the SSB.
- **1.7 Display** 12NC NVM read/write.
- **1.8 PSU** 12NC NVM read/write.
- **2.1 Current Main SW** Displays the built-in main software version. In case of field problems related to software, software can be upgraded. As this software is consumer upgradeable, it will also be published on the internet.
- **2.2 Standby SW** Displays the built-in stand-by processor software version. Upgrading this software will be possible via USB.
- **2.3 Panel Code** Displays the Display Code number.
- **2.4 NVM version** Detects and displays NVM version.
- **2.5 Error Codes** Detects and displays errors.
- **3.1 Signal Quality** Analog/digital signal strength.
- **3.2 Child lock** Not active/active. This is a combined item for locks. If any lock (channel lock, parental lock) is active, it is indicated as "active".
- **3.3 HDCP keys** Indicates the validity of the HDMI keys (or HDCP keys). In case these keys are not valid and the customer wants to make use of the HDMI functionality, the SSB has to be replaced.
- **3.4 Ethernet MAC address** A Media Access Control address (MAC address) is a unique identifier assigned to network interfaces for communications on the physical network segment.
- **3.5 Wireless MAC address** Wireless Media Access Control address.

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.

How to Exit CSM

To exit CSM, use one of the following methods.

- Press the MENU/HOME button on the remote control transmitter.
- Press the POWER button on the remote control transmitter.
- Press the POWER button on the television set.

5.3 Stepwise Start-up

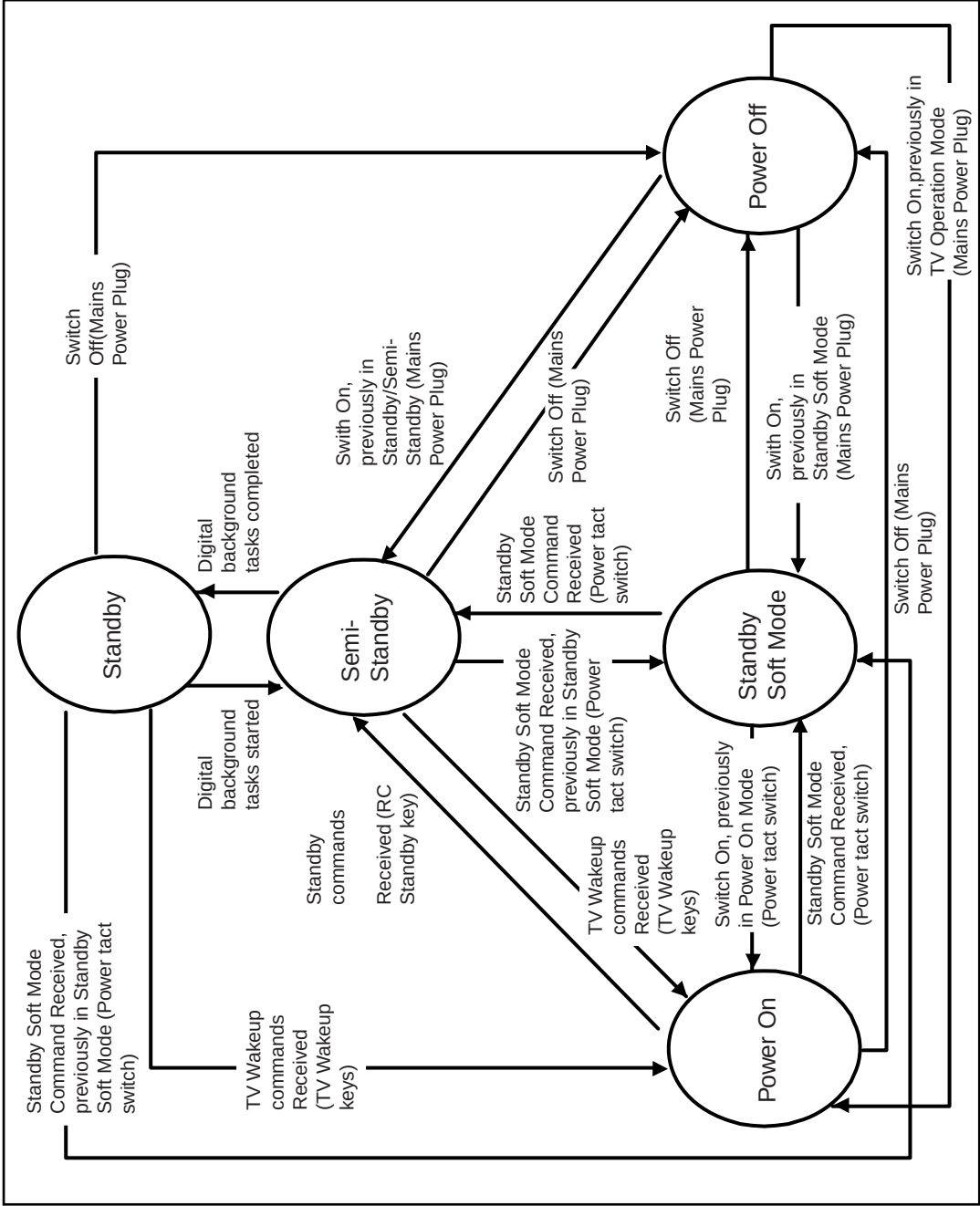


Figure 5-1 Stepwise Start-up

5.4 Service Tools

5.4.1 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 I²C 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 micro processor is working) and all repair information is directly available.
4. ComPair features TV software up possibilities.

Specifications

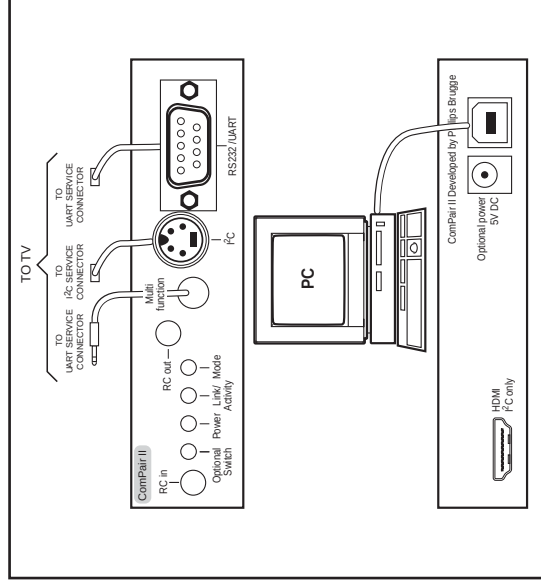
ComPair consists of a Windows based fault finding program and an interface box between PC and the (defective) product.

The 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.



10000_036_090121.eps
091118

Figure 5-2 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 can be blown!

How to Order

ComPair II order codes:

- ComPair II interface: 3122 785 91020.
- Software is available via the Philips Service web portal.
- ComPair UART interface cable for TPM10.1x xx.
(using DB9 to 2mm pitch JST connector): 3122 785 90630.

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

5.5 Software Upgrading

5.5.1 Description

It is possible for the user to upgrade the main software via the USB port. This allows replacement of a software image in a stand alone set. A description on how to upgrade the main software can be found in the DFU or on the Philips website.

5.5.2 Introduction

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

Preparing a portable memory for software upgrade

The following requirements have to be met:

1. A personal computer connected to the internet.
2. An archive utility that supports the ZIP-format (e.g. WinZip for Windows or Stuffit for Mac OS).
3. A FAT formatted USB memory stick (preferably empty).

Note:

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

5.5.3 Check the current TV software version

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

1. Press the "1 2 3 6 5 4" button on the remote control to enter the CSM mode.
2. Use the up/down cursor keys to select "Current Main Software".

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

5.5.4 Download the latest software

1. Open the internet page <http://www.philips.com/support>.
2. Find information and software related to the TV.
3. Select the latest software update file and download it to the PC.
4. Insert the USB memory stick into one of the USB ports of the PC.
5. Decompress the downloaded ZIP file and copy it to the root directory of the USB flash drive.

5.5.5 Update the TV software

1. Turn the TV on and wait for it to boot completely.
2. Insert the USB memory stick that contains the software update files in one of the TV's USB ports.
3. The TV will detect the USB memory stick automatically. Then a window jumps out as [Figure 5-3](#).
Note: If the USB flash drive is not detected after power up, disconnect it and re-insert it.
4. Select [Update] and press OK. See [Figure 5-3](#).
5. To proceed, in next menu select [Start] and press OK to start software updates. See [Figure 5-4](#).
6. Upgrading will now begins and the status of the updating progress will be displayed.
7. When the TV software is updated. Remove your USB flash drive, then select [Restart] and press OK to restart the TV. See [Figure 5-5](#).

- **FUS_clustername_version.zip:** Contains the "autorun.upg" which is needed to upgrade the TV main software and the software download application.
- **NVM_clustername_version.zip:** Default NVM content. Must be programmed via ComPair.

5.5.7

How to Copy NVM Data to/from USB

When copying data to and from a USB memory stick, the folder "repair" is used. When inserting an empty USB memory stick, and downloading data to the stick, the TV will create this folder. When sending data from a USB memory stick to a TV, the intended data must be available in the "repair" folder.

Note that when copying EDID data to the TV, all necessary EDID files must be in this folder.

Service mode overview for your reference.

Table 5-3 Service mode overview

Service Modes	Description
SAM	Service alignment mode
Factory Mode	Used for extended alignments
SDM	Service default Mode
CSM	3-page compact CSM pages. There will be CSM dump to USB-stick upon entering CSM-mode
USB SW upgradeable	SW-upgrading of flash memories MTK-chips MT5366 can be done via USB. The main SW can be upgraded via Autorun.upg
NVM-Editor in SAM	NVM-editor will function as in the past: Address and Value field is a decimal value via digit entry
Service Data	New Service data in SAM for CTN, Prod. no., 12NC programming with virtual keyboard
USB copy/paste in SAM	Channel list, NVM data, Readable info, EDID
UART logging	There will be printout available in UART. No specifications of the printout, per MTK provision/definition.
Blind SAM	RC sequence "062598" + "Menu" + "Panel code"
Clear Buffer	RC sequence "062599" + "OK" or via SAM

5.6 Error Codes

5.6.1 Introduction

Error codes are required to indicate failures in the TV set. In principle a unique error code is available for every:

- Activated (SW) protection.
- Failing I²C device.
- General I²C error.

The last five errors, stored in the NVM, are shown in the Service menu's. This is called the error buffer.

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

An error will be added to the buffer if this error differs from any error in the buffer. The last found error is displayed on the left.

An error with a designated error code **never** leads to a deadlock situation. It must always be diagnosable (e.g. error buffer via OSD or blinking LED or via ComPair).

In case a failure identified by an error code automatically results in other error codes (cause and effect), only the error code of the MAIN failure is displayed.

5.6.2 How to Read the Error Buffer

You can read the error buffer in three ways:

- On screen via the SAM/SDM/CSM (if you have a picture).
Example:
 - **ERROR: 000 000 000 000 000:** No errors detected
 - **ERROR: 013 000 000 000 000:** Error code 13 is the last and only detected error



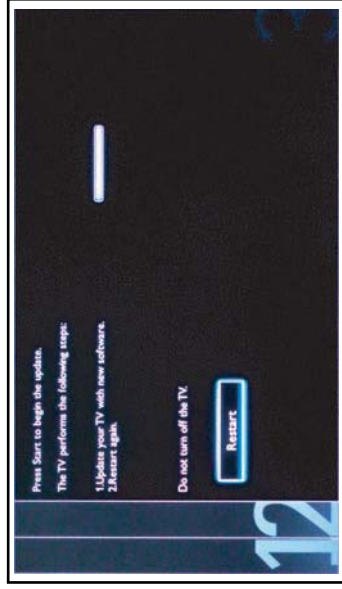
19080_207_110324.eps
110324

Figure 5-3 Update the TV software [1/3]



19080_208_110324.eps
110324

Figure 5-4 Update the TV software [2/3]



19080_209_110324.eps
110324

Figure 5-5 Update the TV software [3/3]

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

5.5.6 Content and Usage of the One-Zip Software File

Below you find a content explanation of the One-Zip file, and instructions on how and when to use it. Only files that are relevant for Service are mentioned here.

- **EDID_clustername.zip:** Contains the EDID content of the different EDID NVMs. See ComPair for further instructions.

- **ERROR: 034 013 000 000 000:** Error code 13 was detected first and error code 34 is the last detected (newest) error
- Via the blinking LED procedure (when you have no picture). See paragraph [5.7 The Blinking LED Procedure](#).
- Via ComPair.

5.6.3 Error codes

In this chassis only "layer 2" error codes are available and point to problems on the SSB. They are triggered by LED blinking when CSM is activated. Only the following layer 2 errors are defined:

Table 5-4 Error code table

Layer-2 error code	Defective device
13	General I ² C bus error on the SSB
16	+12 V missing or low, PSU defective
27	Channel decoder error on the SSB
34	Tuner I ² C bus error on the SSB
35	EEPROM I ² C error on SSB, M24C64

5.6.4 How to Clear the Error Buffer

The error code buffer is cleared in the following cases:

- By using the CLEAR command in the SAM menu
- By using the CLEAR command in the Factory mode:
- By using the following key sequence on the remote control transmitter: **"062599"** directly followed by the **OK** button.
- If the contents of the error buffer have not changed for 50 hours, the error buffer resets automatically.

Note: If you exit SAM by disconnecting the mains from the television set, the error buffer is not reset.

5.7 The Blinking LED Procedure

5.7.1 Introduction

The software is capable of identifying different kinds of errors. Because it is possible that more than one error can occur over time, an error buffer is available, which is capable of storing the last five errors that occurred. This is useful if the OSD is not working properly.

Errors can also be displayed by the blinking LED procedure. The method is to repeatedly let the front LED pulse with as many pulses as the error code number, followed by a period of 1.5 seconds in which the LED is "off". Then this sequence is repeated.

Example (1): error code 4 will result in four times the sequence LED "on" for 0.25 seconds / LED "off" for 0.25 seconds. After this sequence, the LED will be "off" for 1.5 seconds. Any RC command terminates the sequence. Error code LED blinking is in red color.

Example (2): the content of the error buffer is "12 9 6 0 0" After entering SDM, the following occurs.

- 1 long blink of 5 seconds to start the sequence.
- 12 short blinks followed by a pause of 1.5 seconds.
- 9 short blinks followed by a pause of 1.5 seconds.
- 6 short blinks followed by a pause of 1.5 seconds.
- 1 long blink of 1.5 seconds to finish the sequence.
- The sequence starts again with 12 short blinks.

5.7.2 Displaying the Entire Error Buffer

Additionally, the entire error buffer is displayed when Service Mode "SDM" is entered.

5.8 Fault Finding and Repair Tips

Note:

- It is assumed that the components are mounted correctly with correct values and no bad solder joints.
- Before any fault finding actions, check if the correct options are set.

5.8.1 NVM Editor

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

Caution:

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

5.8.2 Load Default NVM Values

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

5.8.3 No Picture

When you have no picture, first make sure you have entered the correct display code. See paragraph [6.4 Option Settings](#) for the instructions. See also [Table 6-3](#).

5.8.4 Unstable Picture via HDMI input

Check (via ComPair or factory mode) if HDMI EDID data is properly programmed.

5.8.5 No Picture via HDMI input

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

5.8.6 TV Will Not Start-up from Stand-by

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

5.8.7 Audio Amplifier

The Class D-IC U606 has a powerpad for cooling. When the IC is replaced it must be ensured that the powerpad is very well pushed to the PWB while the solder is still liquid. This is needed to insure that the cooling is guaranteed, otherwise the Class D-IC could break down in short time.

5.8.8 CSM

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

5.8.9 Loudspeakers

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

5.8.10 Display option code

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

6. Alignments

Index of this chapter:

- [6.1 General Alignment Conditions](#)
- [6.2 Hardware Alignments](#)
- [6.3 Software Alignments](#)
- [6.4 Option Settings](#)
- [6.5 Reset of Repaired SSB](#)

6.1

General Alignment Conditions

Perform all electrical adjustments under the following conditions:

- Power supply voltage: 90 - 264 V_{AC}, 50/ 60 ± 3 Hz.
- Connect the set to the mains via an isolation transformer with low internal resistance.
- Allow the set to warm up for approximately 15 minutes.
- Measure voltages and waveforms in relation to correct ground (e.g. measure audio signals in relation to AUDIO_GND).
- Caution:** It is not allowed to use heat sinks as ground.
- Test probe: R_i > 10 MΩ, C_i < 20 pF.
- Use an isolated trimmer/screwdriver to perform alignments.

6.2

Hardware Alignments

Not applicable.

6.3

Software Alignments

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

The following items can be aligned:

- White point.

To store the data:

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

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

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

6.3.1

RGB Alignment

Before alignment, set the picture as follows:

Picture Setting	
Dynamic backlight	Off
Dynamic Contrast	Off
Color Enhancement	Off
Picture Format	Unscaled
Light Sensor	Off
Brightness	50
Color	0
Contrast	100

White Tone Alignment:

- Activate SAM.
- Select "RGB Align." and choose a color temperature.
- Use a 100% white screen as input signal and set the following values:
 - "Red BL Offset" and "Green BL Offset" to "7" (if present).
 - All "White point" values initial to "128".

In case you have a colour analyser:

- Measure with a calibrated (phosphor- independent) color analyser (e.g. Minolta CA-210) in the centre of the screen. Consequently, the measurement needs to be done in a dark environment.
- Adjust the correct x, y coordinates (while holding one of the White point registers R, G or B on max. value) by means of decreasing the value of one or two other white points to the correct x, y coordinates (see Table [6-1 White D alignment values](#)). Tolerance: dx: ± 0.003, dy: ± 0.003.
- Repeat this step for the other colour Temperatures that need to be aligned.
- When finished return to the SAM root menu and press STANDBY on the RC to store the aligned values to the NVM.

Table 6-1 White D alignment values

Value	Cool (12000 K)	Normal (9000 K)	Warm (6500 K)
x	0.276	0.287	0.313
y	0.282	0.296	0.329

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

6.3.2 Display Adjustment

You can use the default values. The default values are average values coming from production.

- Enter SAM mode.
- 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 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 (9000K)	32PFL4208	128	118	121
	39PFL4208	128	127	113
	42PFL4208	128	120	123
	42PFL5008	128	121	120
	46PFL4208	99	109	128
	46PFL5008	128	117	110
Cool (11 000K)	50PFL5008	128	114	97
	32PFL4208	118	114	128
	39PFL4208	117	128	128
	42PFL4208	128	113	103
	42PFL5008	118	117	128
	46PFL4208	116	120	128
Warm (6500K)	46PFL5008	128	125	127
	50PFL5008	128	121	117
	32PFL4208	128	104	82
	39PFL4208	128	112	71
	42PFL4208	128	94	61
	42PFL5008	128	104	75
	46PFL4208	128	121	99
	46PFL5008	128	110	66
	50PFL5008	128	101	58

This group setting of colour temperature will be applied automatically to the TV / VGA / HDMI / AV sources.

6.4 Option Settings

6.4.1 Introduction

The microprocessor communicates with a large number of I²C ICs in the set. To ensure good communication and to make digital diagnosis possible, the microprocessor has to know which ICs to address. The presence / absence of these MT5366 ICs 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 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).

6.4.2 Option Code Overview

Enter SAM mode to check the option codes. they could be edited in the NVM.

6.4.3 Display Code Overview

Press the following key sequence on a standard RC transmitter: "062598" directly followed by MENU and "xxx", where "xxx" is a 3 digit decimal value of the panel type: see column "Display Code" in [Table 6-3](#). After resetting the Display Code, restart the set immediately.

Table 6-3 Display code overview

CTN ALT BOM#	Panel Type	Display Code
32PFL4208	TPT315B5-A041	208
39PFL4208	TPT390J1-HJ1L02	209
42PFL4208	TPT420H2-HVN01	210
42PFL5008	TPT420H2-HVD02	173
46PFL4208	TPT460H1-HM01	213
46PFL5008	TPT460H1-HVD02	211
50PFL5008	TPT500J1-HVD02	212

6.5 Reset of Repaired SSB

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

A repaired SSB in Service should get the service Set type "00PF000000000" and Production code "00000000000000". Also the virgin bit is to be set. To set all this, you can use the ComPair tool or use the "NVM editor" and "Dealer options" items in SAM (do not forget to "store").

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

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

6.5.1 Reset of Repaired SSB

Instruction:

After NVM replacement, reload MAC address via SAM menu. This ensures the correct MAC address to be available in CSM for future repair actions.

Way of working:

- After the NVM has been replaced, go to SAM and scroll to the <Reload MAC address> .
- Select the item and press <OK> on the RC.

Notes:

- Only applicable to all related models that are "Smart TV level 0" enabled (only YouTube access). For models without internet connection feature, **no action** is needed.
- HDCP keys are located in the NVM. If you are loading NVM with the ComPair tool, there is warning message displayed.

New NVM EEPROMs are shipped with pre-loaded HDCP keys.

6.5.2 SSB Identification

SSB's of this chassis are identified by a "715" code on the SSB. 715Axxx-Nnn-MMM-OOOO

- **715** main category, Printed Wiring Board
 - **Axxx** sub category, sequential coding number
 - **Nnn** Version code
 - **N** Development number
 - **nn** Production number
 - **MMM** Mounting variation code
 - **OOOO** Optional variation code
- Make sure when replacing an SSB the SSB identification codes match the replacement panel.³

7. Circuit Descriptions

Index of this chapter:

- [7.1 Introduction](#)
- [7.2 Power Supply](#)
- [7.3 DC/DC converters](#)
- [7.4 Front-End Analogue and DVB-T, DVB-C, ISDB-T reception](#)
- [7.5 HDMI](#)
- [7.6 Video and Audio Processing – MTK5580MPOI](#)

7.1 Introduction

The TPM10.1A LA is a new chassis launched in Europe in 2013. The whole range is covered by MT5580.

The major delta versus its predecessor ATV with also multi-media, CEC, DLNA, Smart TV, Skype, WIFI functionality.

The TPM10.1A LA chassis comes with the following stylings:

- series xxPFL4200
- series xxPFL500x

7.1.1 Implementation

Key components of this chassis are:

- MT5580MPOI PBGA-511 TV Processor
- TDSY-G230D EUROP Tuner for H/T series (DVB-T/C, T2 analogue)
- GL850G-OHG for USB HUB
- STA381BWTR 20W VQFN-48 for AUDIO Amplifier
- IC G5250M1T1U 1A SOT23-5 for Wi-Fi Power Control

7.1.2 TPM10.1A LA Architecture Overview

For details about the chassis block diagrams refer to

[9. Block Diagrams](#). An overview architecture can be found in [Figure 7-1](#).

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.

7.1.3 SSB Cell Layout

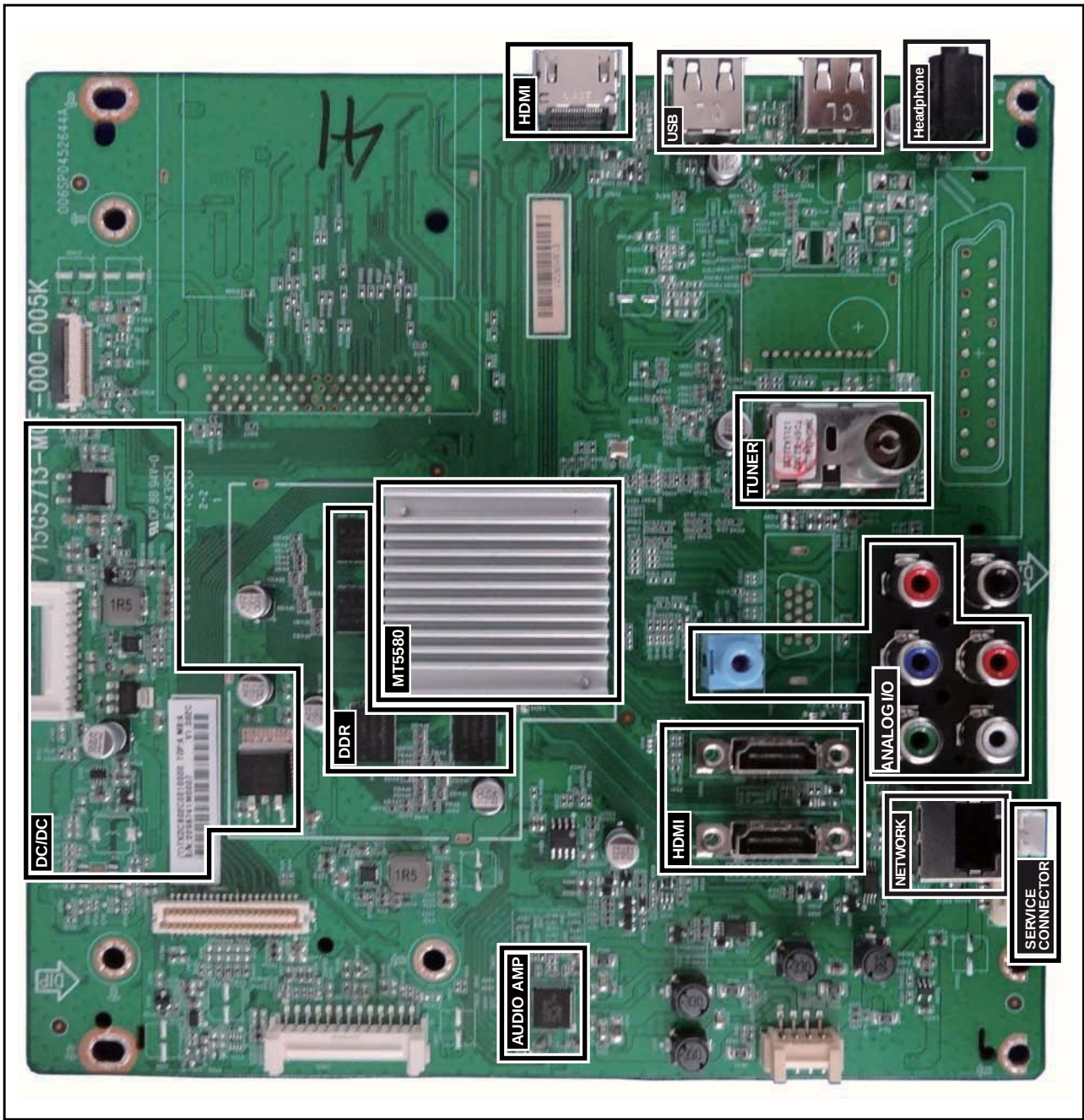
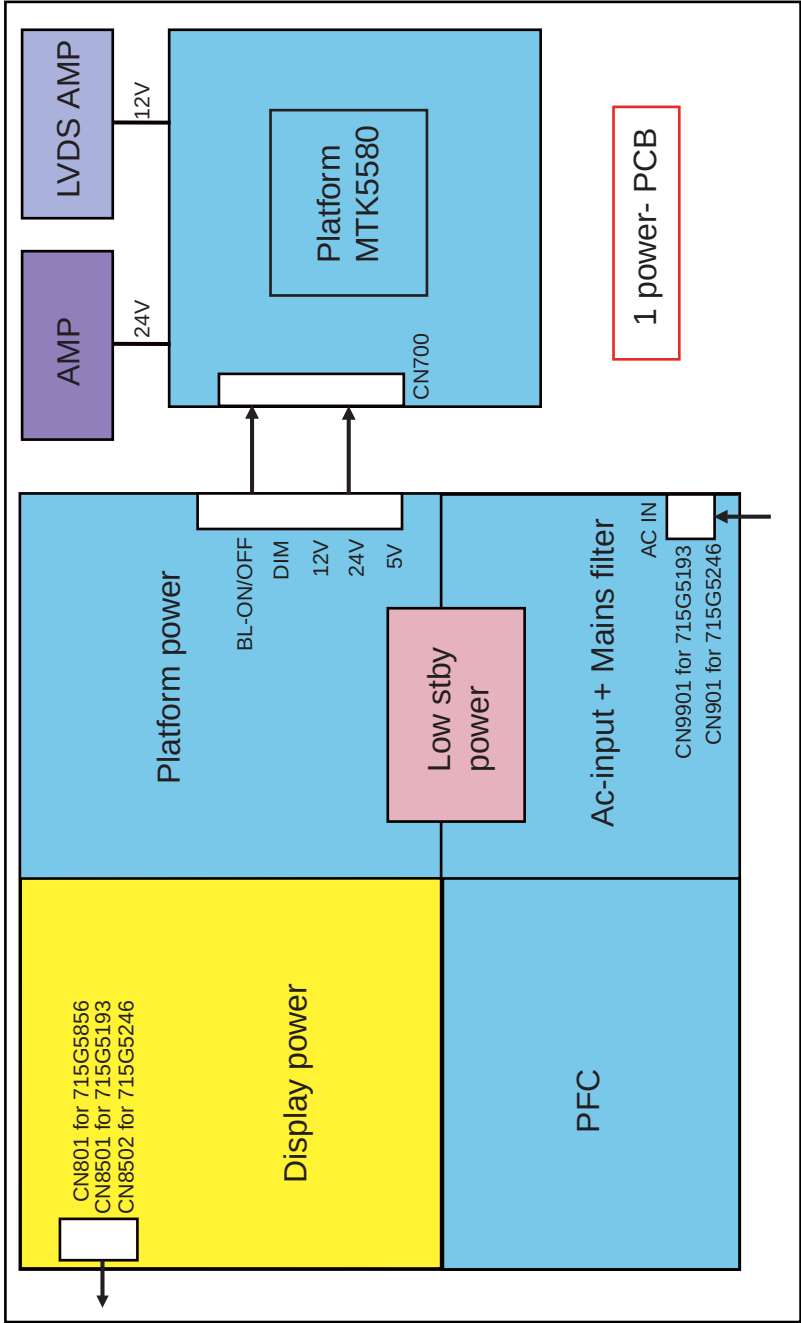


Figure 7-1 SSB layout cells (top view)

7.2 Power Supply

Refer to figure [Figure 7-2](#) for the power architecture of this platform.



19441_200_130325.eps
130325

Figure 7-2 Power Architecture

7.2.1 Power Supply Unit

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

- Important delta's with the AP TPM10.1A series platform are:
- New power architecture for LED backlight
 - "Boost"-signal is now a PWM-signal + continuous variable.

The control signals are:

- Stand-by
- Lamp "on/off"
- DIM (PWM) (not for PSDL)

In this manual, no detailed information is available because of design protection issues.

The output voltages to the chassis are:

- +3V3-STANDBY (Stand-by mode only)
- +12V (on-mode)
- +Vsnd (+24V) (audio power) (on-mode)
- +24V (bolt-on power) (on-mode)
- Output to the display; in case of
 - IPB: High voltage to the LCD panel
 - PSL and PSL S (LED-driver outputs)
 - PSDL (high frequent) AC-current.

7.2.2 Diversity

The diversity in power supply units is mainly determined by the diversity in displays.

The following displays can be distinguished:

- CCFL/EEFL backlight: power panel is conventional IPB
- LED backlight:
 - side-view LED without scanning: PSL power panel
 - side-view LED with scanning: PSL S power panel
 - direct-view LED without 2D-dimming: PSL power panel
 - direct-view LED with 2D-dimming: PSDL power panel.

PSL stands for **Power Supply** with integrated LED-drivers.
PSLS stands for a **Power Supply** with integrated LED-drivers with added **Scanning** functionality (added microcontroller).
PSDL stands for a **Power Supply** for **Direct-view LED** backlight with 2D-dimming.

7.2.3 Connector overview

Table 7-1 Connector overview

Number	Connector			
	CN8501	CN902	CN801	CN9101
Descriptio n	to panel	to SSB	to panel	to SSB
Pin	12	13	12	13
1	LED-S	n.c.	VLED+	n.c.
2	n.c.	5V	n.c.	+5.2V
3	LED-1	5V	LED5	+5.2V
4	LED-2	PS_ON	LED3	PS_ON
5	LED-3	+24V	LED1	+24V
6	n.c.	+24V	n.c.	+24V
7	n.c.	GND	n.c.	GND

- TUNER DVB-T/T2/C, PAL/SECAM TDSY-G230D
- MT5580MPOI PBGA-511

Below find a block diagram of the front-end application for DVB-T/C DTV.

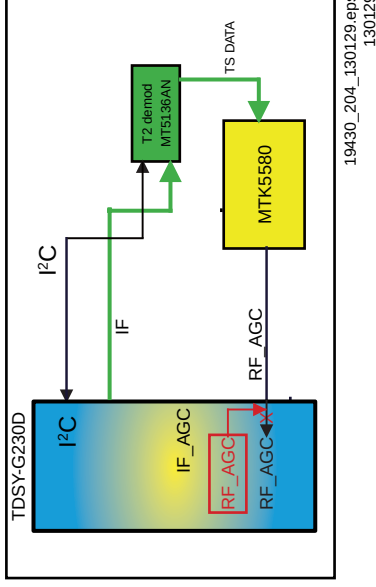


Figure 7-5 Front-End DVB-T2 DTV block diagram

7.5

HDMI

Refer to figure [7-6 HDMI input configuration](#) for the application.

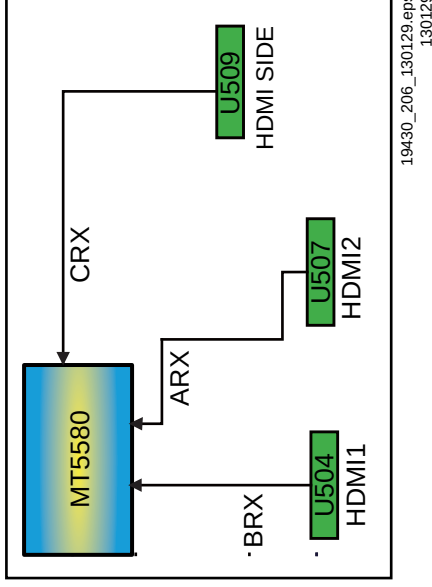


Figure 7-6 HDMI input configuration

The following HDMI connector can be used:

- HDMI 1: HDMI input (TV digital interface support HDCP) with digital audio / PC DVI input/ARC
- HDMI 2: HDMI input (TV digital interface support HDCP) with digital audio / PC DVI input
- HDMI input (TV digital interface support HDCP) with digital audio / PC DVI input
- +5V detection mechanism
- Stable clock detection mechanism
- Integrated EDID
- HPD control
- Sync detection
- TMDS output control
- CEC control

7.6

Video and Audio Processing - MTK5580MPOI

The MTK5580MPOI is the main audio and video processor (or System-on-Chip) for this platform. It has the following features:

- Multi-standard digital video decoder (MPEG-2, H.264, MPEG-4)
- Integrated DVB-T/DVB-C/DVB-S channel decoder
- Integrated CI+
- Integrated motion accurate picture processing
- High definition ME/MC
- Extended colour gamut and colour booster
- Integrated USB2.0 host controller
- Improved MPEG artefact reduction

- Security for customers own code/settings (secure flash).

The MTK5580MPOI combines front-end video processing functions, such as DVB-T channel decoding, MPEG-2/H.264 decoding, analog video decode and HDMI reception, with advanced back-end video picture improvements. High flat panel screen resolutions and refresh rates are supported with formats including 1366 × 768 @ 60Hz and 1920 × 1080 @ 60Hz. The combination of Ethernet, CI+ and H.264 supports new TV experiences with IPTV and VOD. On top of that, optional support is available for 2D dimming in combination with LED backlights for optimum contrast and power savings up to 50%.

For a functional diagram of the MTK5580MPOI, refer to [Figure 8-3](#).

8.2 Diagram 10-5-2 System Power 2, B02,LNBH25PQR (IC U751)

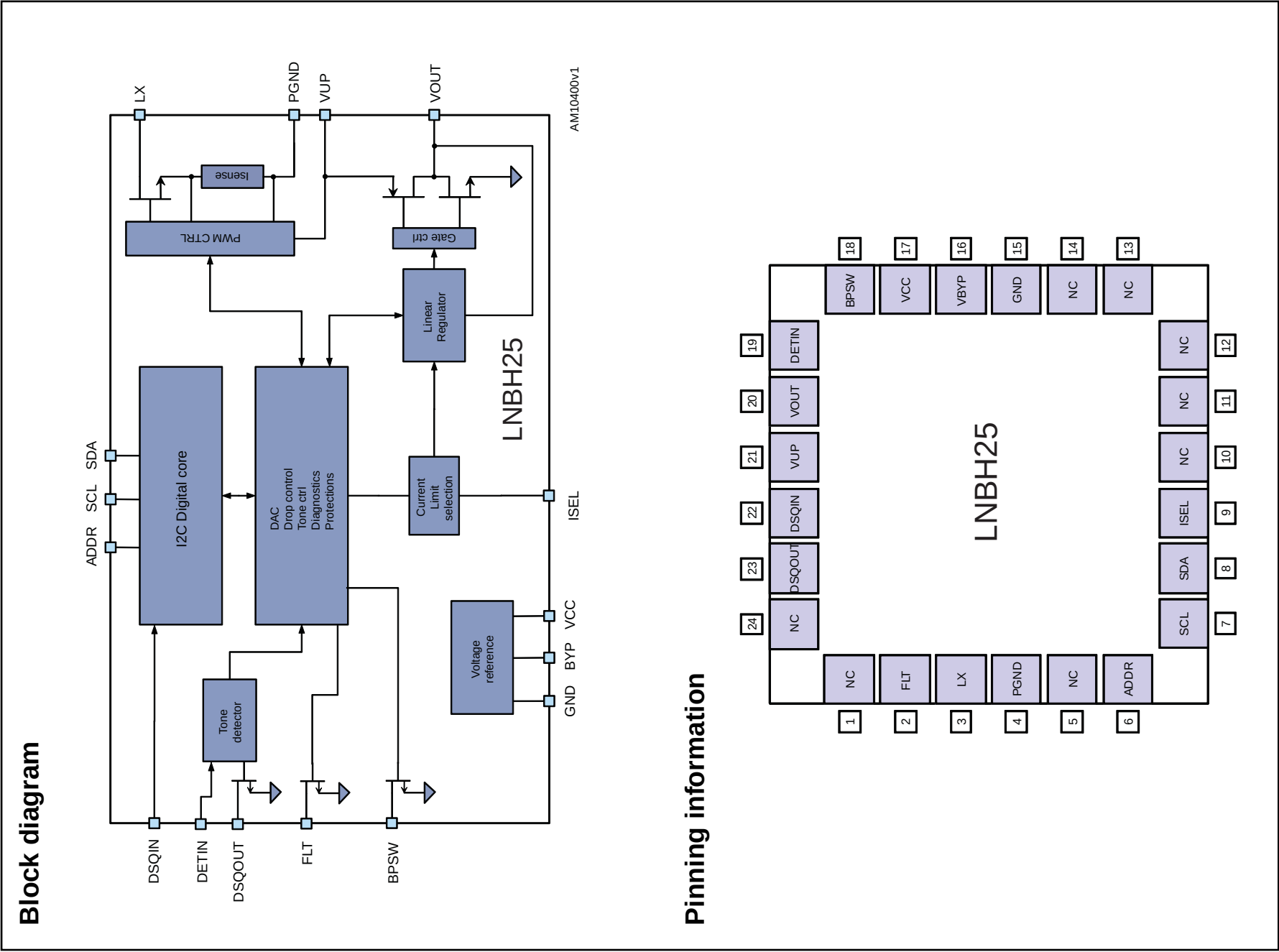


Figure 8-2 Internal block diagram and pin configuration

19430_301_130116.eps
130116

8.3 Diagram 10-5-3 Peripheral, B03,MT5580MPOI (IC U401)

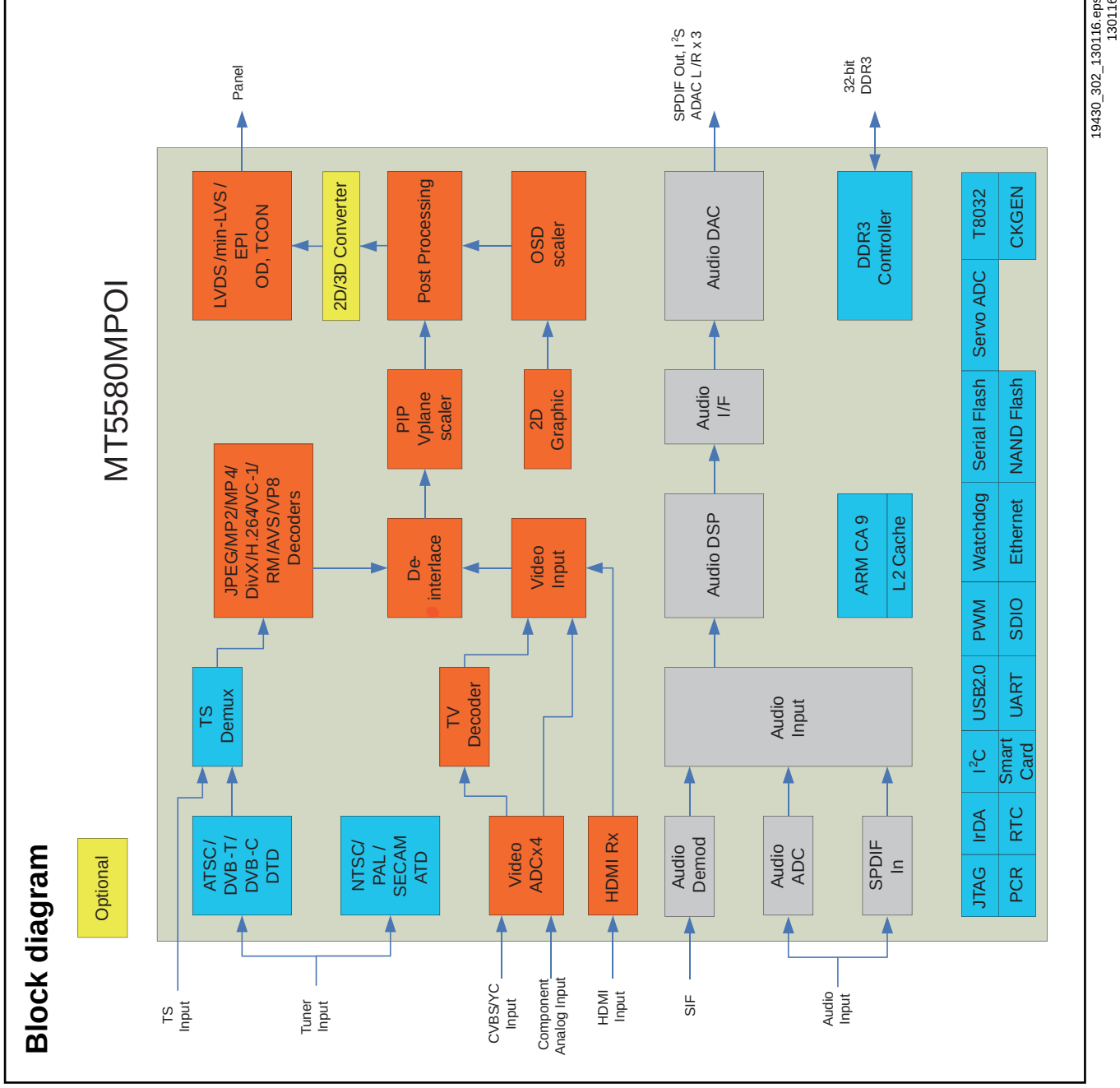


Figure 8-3 Internal block diagram

Pinning Information

MT5580MPOI

511	1	2	3	4	5	6	7	8	9	10	11	12	13
A	R0D1	PRAS#	RCSX#		DDR3_R ST#	PA9	PBA2		R0Q19		R0QS3	RCLK1#	R0QS2
B	R0D6	PCAS#	RCS#		RA7	PA3	PBA0		R0Q17	R0QM2	R0QS3#	RCLK1	R0QS7#
C	R0D0	R0Q4	RWE#	RA5	RA2	RA13	RA8	R0Q21	R0Q23	AVDD33_ MEMPL L	DVSS	DVSS	R0QM3
D	R0QS0#	R0QS0	R0Q2	RA0	RA11	RA6	RA14	RA1	PBA1	R0Q24			R0Q28
E	RCLK0#	RCLK0	RVPREF	R0Q11	DVSS	RA12	RA4		RCKE	R0Q26		R0Q30	R0Q31
F	R0QS1	R0QS1#			R0Q9	DVSS	DVSS	DVSS	RA10				R0Q29
G	DVSS	R0QM0	R0Q13	R0Q15	R0QM1		DVSS	DVSS	DVSS	AVSS33_ MEMPLL	MEMTP	MEMTN	
H		R0Q3	R0Q1	R0Q10	R0Q12	DVSS	DDR3						
J	R0Q5	R0Q7	R0Q14	R0Q8	DDR3	DVSS			DVSS	VCCK	VCCK	DVSS	DVSS
K	DDR3	DDR3	DDR3	DDR3	DDR3	DDR3	DDR3		DVSS	DVSS	DVSS	DVSS	DVSS
L	VCCK	VCCK	VCCK	VCCK	VCCK	VCCK	VCCK	VCCK	DVSS	DVSS	DVSS	DVSS	DVSS
M	VCCK	VCCK	VCCK	VCCK	VCCK	VCCK	VCCK	VCCK	DVSS	DVSS	DVSS	DVSS	DVSS
N		AVDD33_ HDMI_R X	HDMI_1_ RX_CB	HDMI_1_ RX_C	VCCK	VCCK	AVSS33_ HDMI_L X	VCCK	VCCK	DVSS	DVSS	DVSS	DVSS
P			HDMI_1_ RX_0B	HDMI_1_ RX_0	HDMI_1_ SCL	HDMI_1_ SDA	GPI00	DVSS	VCCK	DVSS	DVSS	DVSS	DVSS
R	HDMI_1_ RX_1B	HDMI_1_ RX_1	HDMI_1_ RX_2B	HDMI_1_ RX_2		OSCL0	OSDA0		VCCK	DVSS	DVSS	DVSS	DVSS
T			HDMI_2_ RX_CB	HDMI_2_ RX_C	HDMI_2_ SCL	HDMI_2_ SDA	HDMI_2_ HPD	HDMI_1_ HPD	VCCK	DVSS	DVSS	DVSS	DVSS
U	HDMI_2_ RX_0B	HDMI_2_ RX_0	HDMI_2_ RX_1B	HDMI_2_ RX_1	HDMI_2_ HDMI_C EC	GPI07	GPI02	DVSS	DVSS	VCCK	VCCK	VCCK	VCCK
V			HDMI_2_ RX_2B	HDMI_2_ RX_2		GPI08		DVSS	AVSS33_ ELDO	AVSS33_ VGA_ST B	ADIN1_S RV	DVSS	AVSS12_ RGB
W	AVDD12_ HDMI_R X	AVDD12_ HDMI_R X	HDMI_3_ SCL	HDMI_3_ SDA	HDMI_3_ HPD		GPI05	AVSS33_ COM		U0TX		ADIN0_S RV	
Y	PDD7	PDD6	PDD5		GPI03	GPI09	OPCTRL_2	AVSS33_ LD	OPWRS_3	U0RX		OPCTRL_3	
AA		PDD4	PDD3	VCC3IO_3	PAALE	ADIN3_S RV	GPI01		ADIN2_S RV	OPCTRL_4			
AB	PDD1	PDD2	VCC3IO_3	ASPDIF_3	PACLE	POWE#	ADIN4_S RV	OPCTRL_1	ADIN5_S RV	OIRI		BP	RP
AC	PARB#	PDD0	GPI06	POCE0#	POCE#	POCE1#	ACSDAT_3	AOBCK	OPCTRL_0	VSYNC	H SYNC	SOG	SOY1
AD	GPI04	RXVN_1	TXVN_0	AVDD33_3		ACSDAT_3	AOLOCK	AOMCLK	VGA_SD_3	AVDD10_3		COM	
AE	REXT	RXVP_1	TXVP_0	AVDD10_3		ALIN		ORESET_3	VGA_SC_3	AVDD33_3		GP	
	1	2	3	4	5	6	7	8	9	10	11	12	13

Figure 8-4 Pin configuration [1/2]

Pinning Information

MT5580MPOI

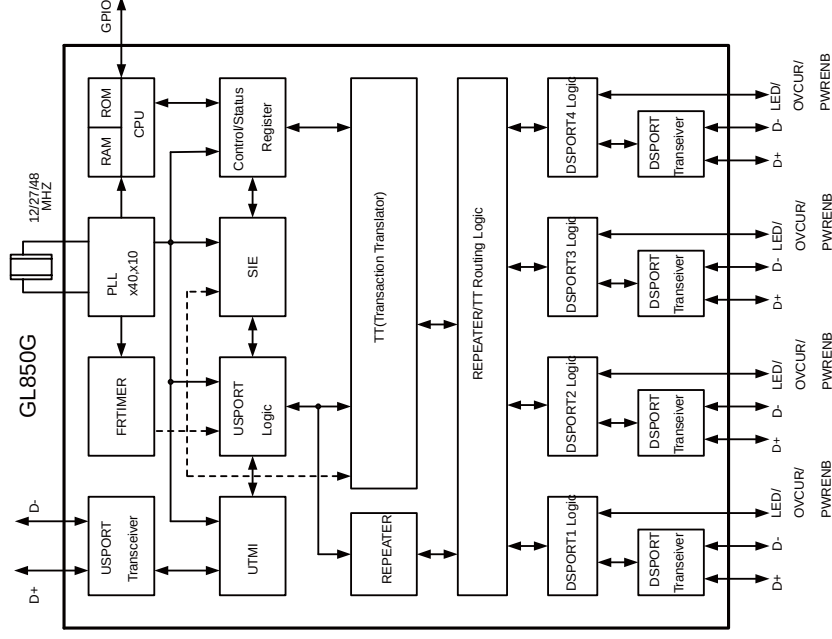
14	15	16	17	18	19	20	21	22	23	24	25	
RDQ16		AO0P	AO1P	AO2P	AOCKP	AO3P	AO4P	AO5P	AVDD33_L_VDSA	TC0N5	TC0N12	A
RDQ18	RDQ20	AO0N	AO1N	AO2N	AOCKN	AO3N	AO4N	AO5N	AVDD12_L_VDSA	TC0N3	TC0N7	B
RDQ22		AE1N	AE1P	AECKN	AECKP	AE4N	AE4P	TC0N0	TC0N1	TC0N8	TC0N4	C
	DVSS	AE0P	AE2N		AE3N		AE5N	TC0N6	TC0N11	TC0N2	TC0N10	D
RDQ27	DVSS	AE0N	AE2P		AE3P	AVSS33_L_VDSA	AE5P	OPWM2	OPWM3	TC0N9	VCC3K0	E
RDQ25	DVSS		AVSS33_L_VDSA				FSRC_VR	OPWM6	OPWM1			F
DVSS	AVSS33_C_PUPLL	AVSS33_L_VDSA					OPWM4	OPWM5	OPWM0	CIGPIO52	CIGPIO36	G
VCCK	AVSS12_L_VDSA	CIGPIO5	CIGPIO55	CIGPIO6	CIGPIO12	CIGPIO35	CIGPIO34	CIGPIO0	CIGPIO26	CIGPIO28	CIGPIO27	H
DVSS	VCCK	DVSS	DVSS		CIGPIO44	CIGPIO49	CIGPIO24	CIGPIO23	CIGPIO45			J
DVSS	DVSS	VCCK	DVSS	CIGPIO8	CIGPIO14				CIGPIO1	CIGPIO46	CIGPIO2	K
DVSS	DVSS	DVSS	DVSS	DVSS				CIGPIO48	CIGPIO4	CIGPIO56	CIGPIO3	L
DVSS	DVSS	DVSS	DVSS	CIGPIO17	IF_AGC	RF_AGC	OSCL2	OSDA2	CIGPIO25			M
DVSS	DVSS	DVSS	DVSS	CIGPIO47	CIGPIO43	CIGPIO11	CIGPIO9	CIGPIO50	CIGPIO15	CIGPIO20	CIGPIO19	N
DVSS	DVSS	DVSS	AVSS33_U_SB	CIGPIO10					CIGPIO7	CIGPIO13	AVDD33_USB	P
DVSS	DVSS	DVSS	AVSS33_H_DMI_3_RX							GPIO10	GPIO11	R
DVSS	DVSS	DVSS	VCCK	CIGPIO41	CIGPIO33	CIGPIO32	CIGPIO40	CIGPIO39		USB_DP_P1	USB_DM_P1	T
VCCK	VCCK	VCCK	DVSS	CIGPIO38	CIGPIO30	CIGPIO31	CIGPIO21	CIGPIO22	CIGPIO16	USB_DP_P0	USB_DM_P0	U
AVSS33_V_DAC	AVSS33_P_ILG	AVSS33_D_EMOD	AVSS33_H_PA	CIGPIO37						HDMI_3_R_X_2B	HDMI_3_R_X_2	V
MPXP	AVSS33_V_DAC_BG	CVBS0P	AVSS33_C_VBS_1	DVSS	AVSS33_A_DAC					HDMI_3_R_X_1B	HDMI_3_R_X_1	W
VDACY_O_UT		CVBS3P	AVSS33_C_VBS_2	AVSS33_A_ADC	CIGPIO29	CIGPIO54	CIGPIO53	CIGPIO51		HDMI_3_R_X_0B	HDMI_3_R_X_0	Y
VDACX_O_UT	CVBS_CO_M	CVBS2P	AVSS33_C_LN	AVSS33_C_ADC			CIGPIO18		CIGPIO42	HDMI_3_R_X_CB	HDMI_3_R_X_C	AA
Y1P	SOY0	CVBS1P	AIN2_L_A_ADC	AIN2_L_A_ADC	AIN1_L_A_ADC	AIN3_L_A_ADC	AIN1_R_A_ADC	AIN2_R_A_ADC	AIN4_R_A_ADC	AVDD12_HDMI_3_R_X	AVDD33_HDMI_3_R_X_C	AB
PR1P	Y0P	COM0	AVDD12_RGB_EMOD	AVSS12_D_EMOD	AIN4_L_A_ADC	AIN4_L_A_ADC		AIN3_R_A_ADC		AL1_ADA_C	AR2_ADA_C	AC
COM1	PB0P	PB0P	AVDD33_VIDEO	AVDD12_DEMOD	ADCMP_D_EMOD	AVSS33_X_TAL_STB	XTALO	AVDD33_AADC	VMI0_AA_DC	AL2_ADA_C	AR0_ADA_C	AD
PB1P		PROP	AVDD33_PLL	AVDD33_DEMOD	ADCINN_DEMOD	AVDD33_XTAL_STB	XTALI	AVDD33_HPA	AVDD33_ADAC	AL0_ADA_C	AR1_ADA_C	AE
14	15	16	17	18	19	20	21	22	23	24	25	

Figure 8-5 Pin configuration [2/2]

19430_304_130116.eps
130116

8.4 Diagram [10-5-4 Connector/USB B04, GL850G-OHG \(IC U4100\)](#)

Block diagram



Pinning information

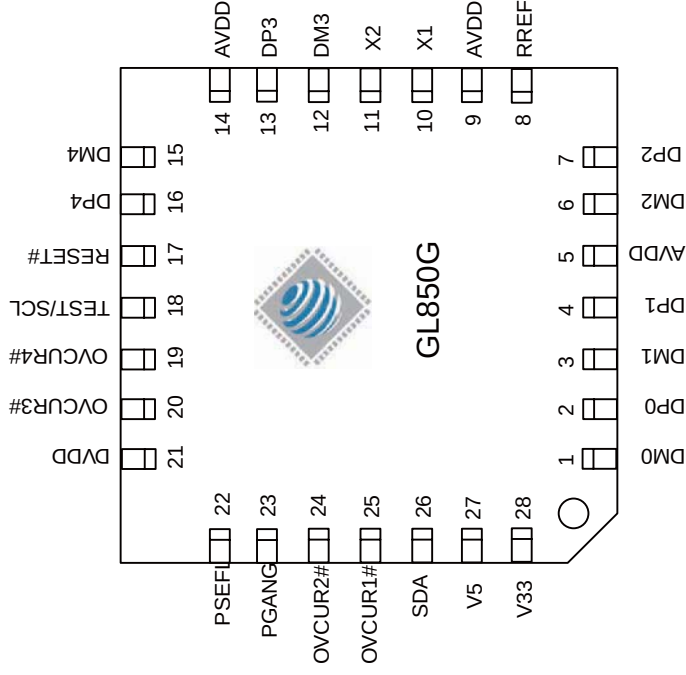
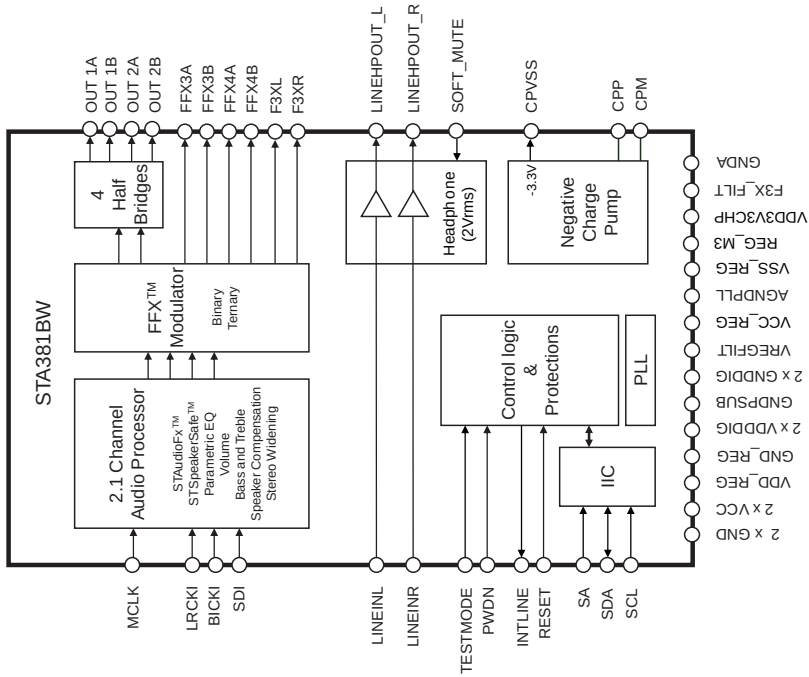


Figure 8-6 Internal block diagram and pin configuration

8.5 Diagram 10-5-6 Speaker/Headphone B06, STA381BWTR (IC U602)

Block diagram



Pinning information

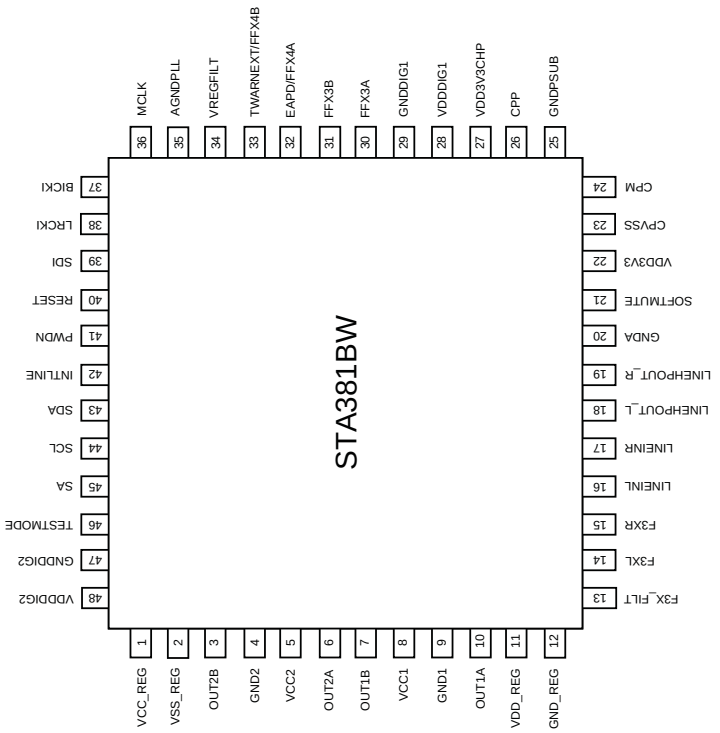


Figure 8-7 Internal block diagram and pin configuration

8.6 Diagram 10-5-11 T2 Demod/CI Card B11, MT5136AN (IC U103)

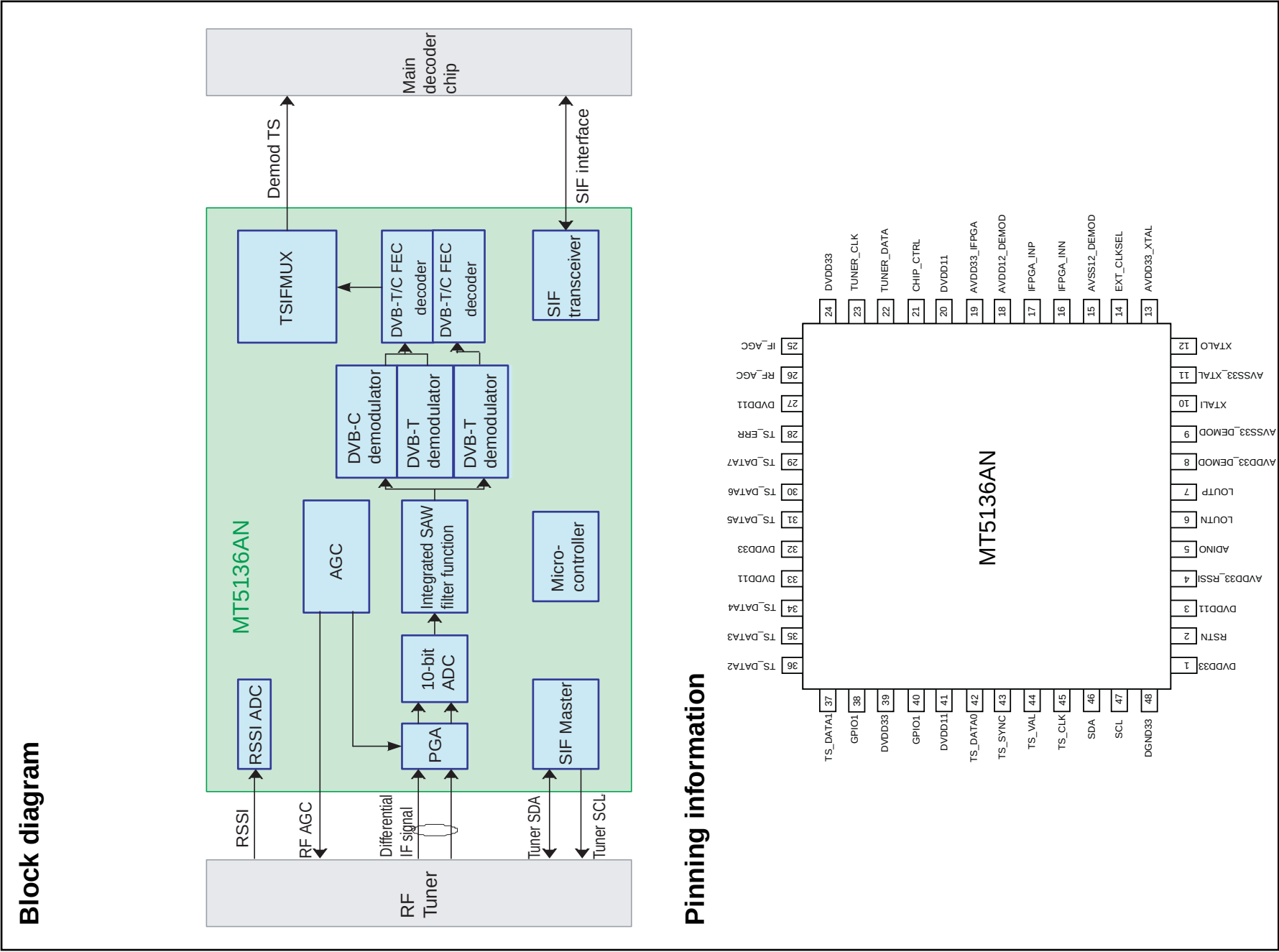


Figure 8-8 Internal block diagram and pin configuration

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130129

8.7 Diagram 10-5-13 DVB T2/C/S2 Tuner B13, AVL6211LA (IC U104)

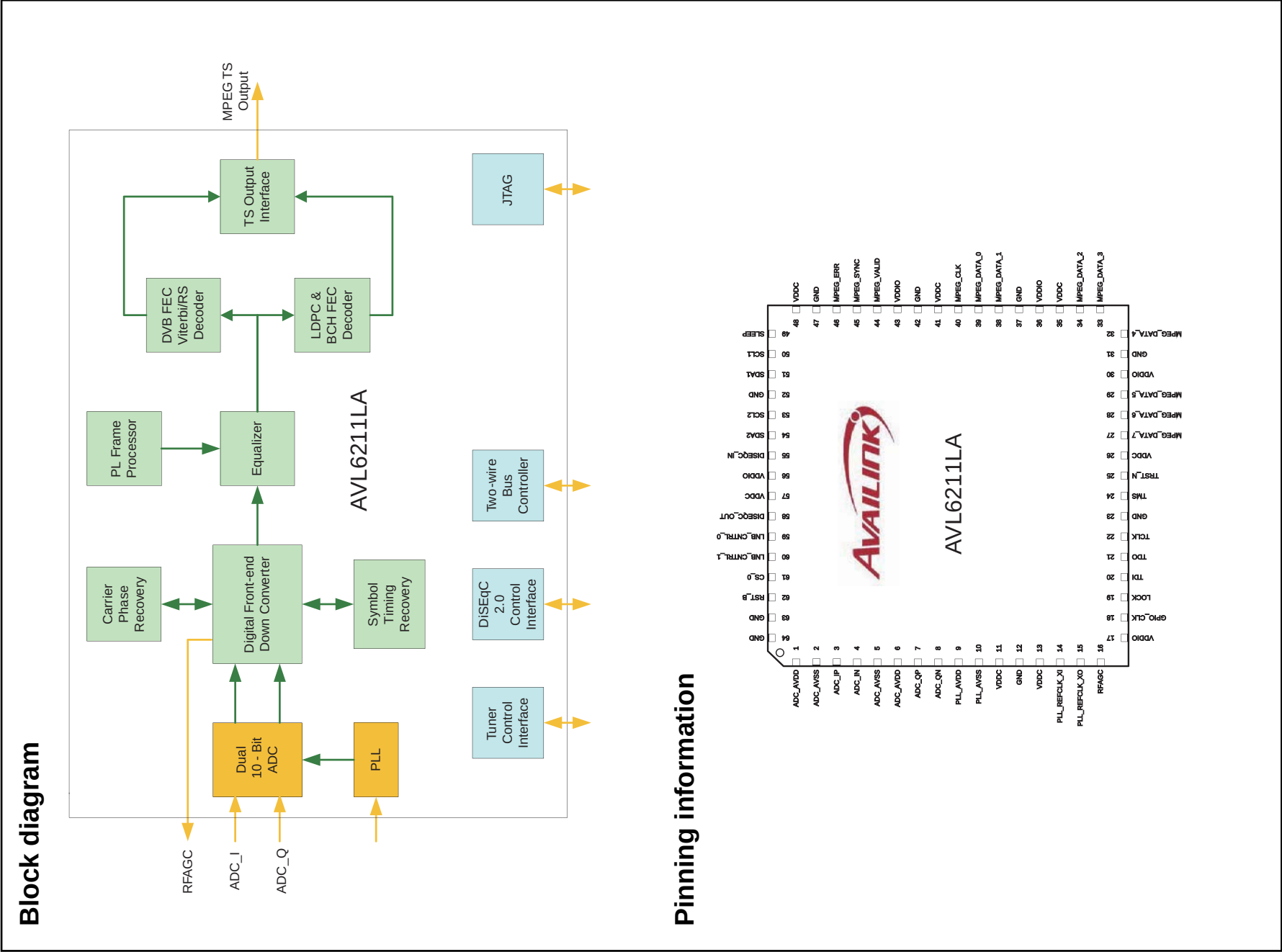


Figure 8-9 Internal block diagram and pin configuration

9. Block Diagrams

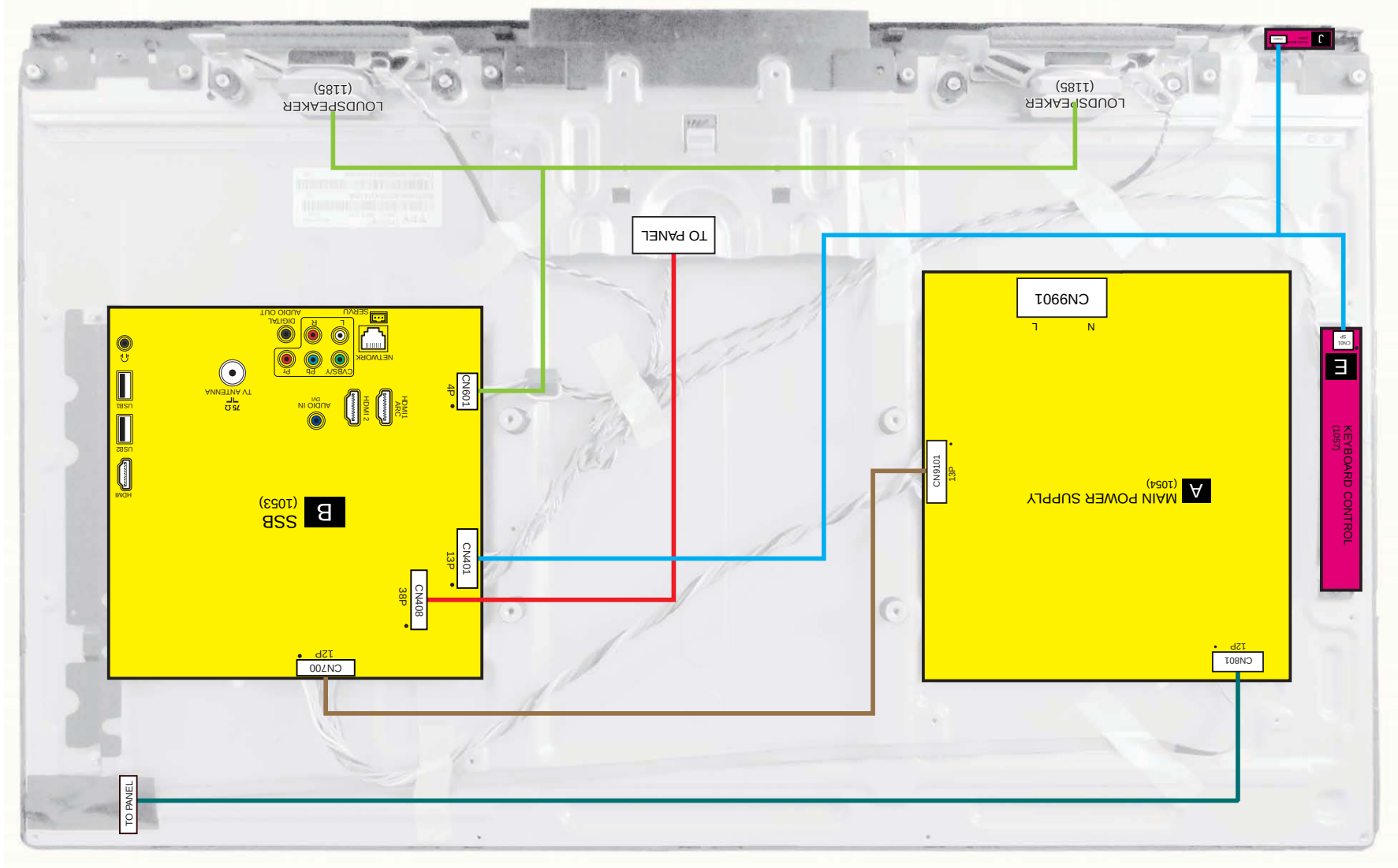
Wiring diagram 4208 series 32"

WIRING DIAGRAM 32" (4208 series)

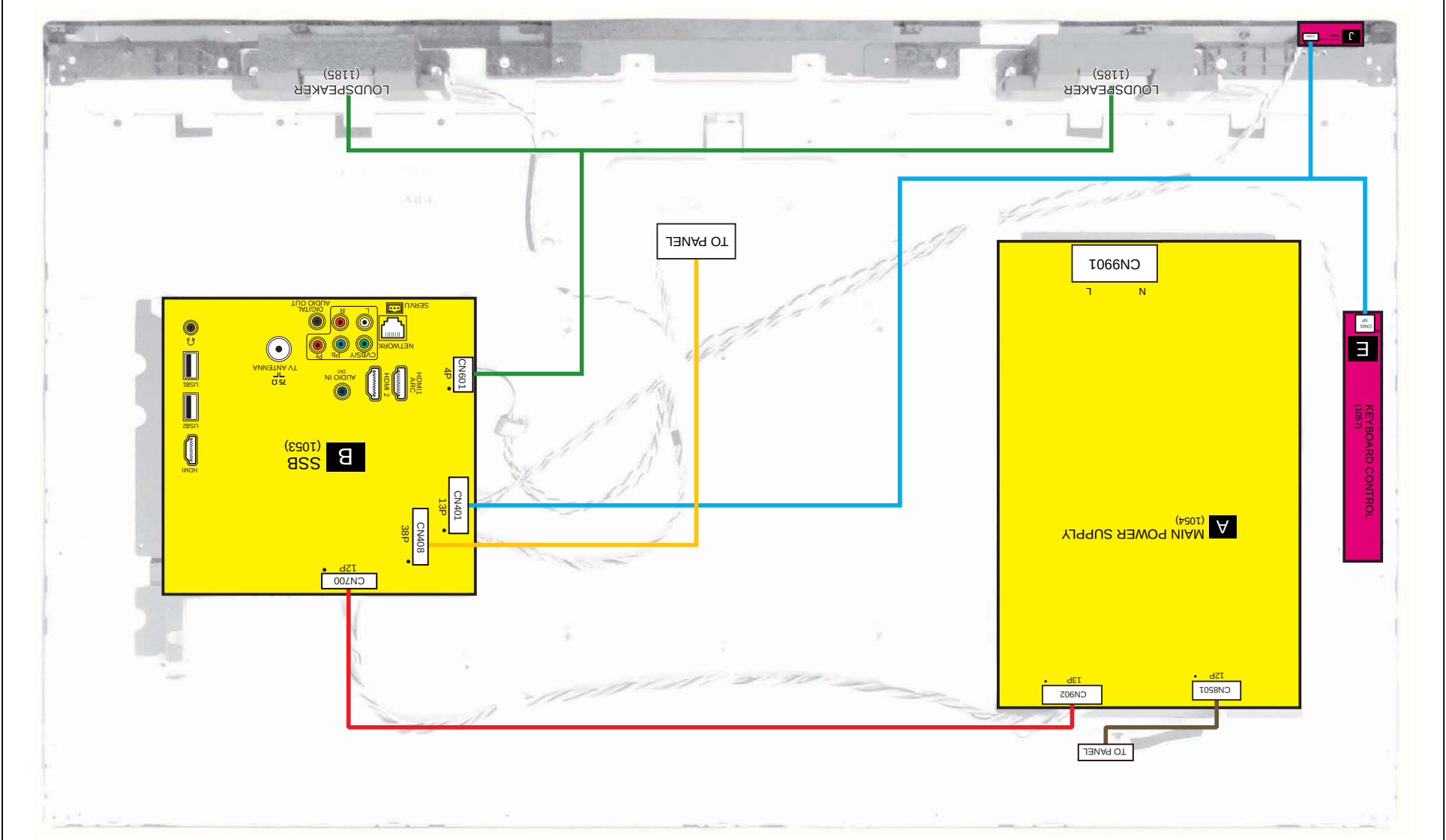


Only for authorized workshops

See note in Chapter 7 about cable position numbers



Wiring diagram 4208 series 39"



See note in Chapter 7 about cable position numbers

Component Level Repair
Only for authorized workshops

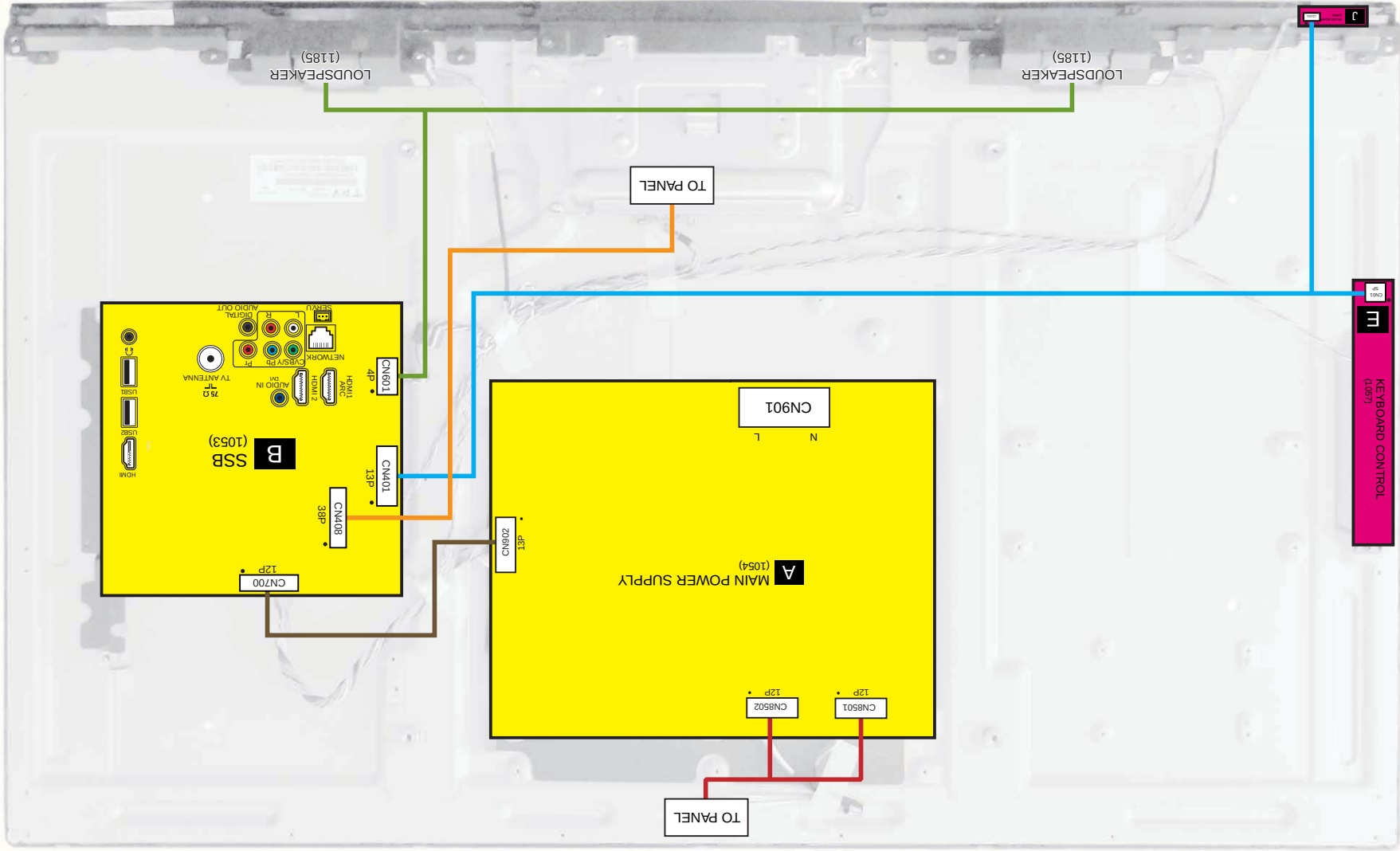
Board Level Repair

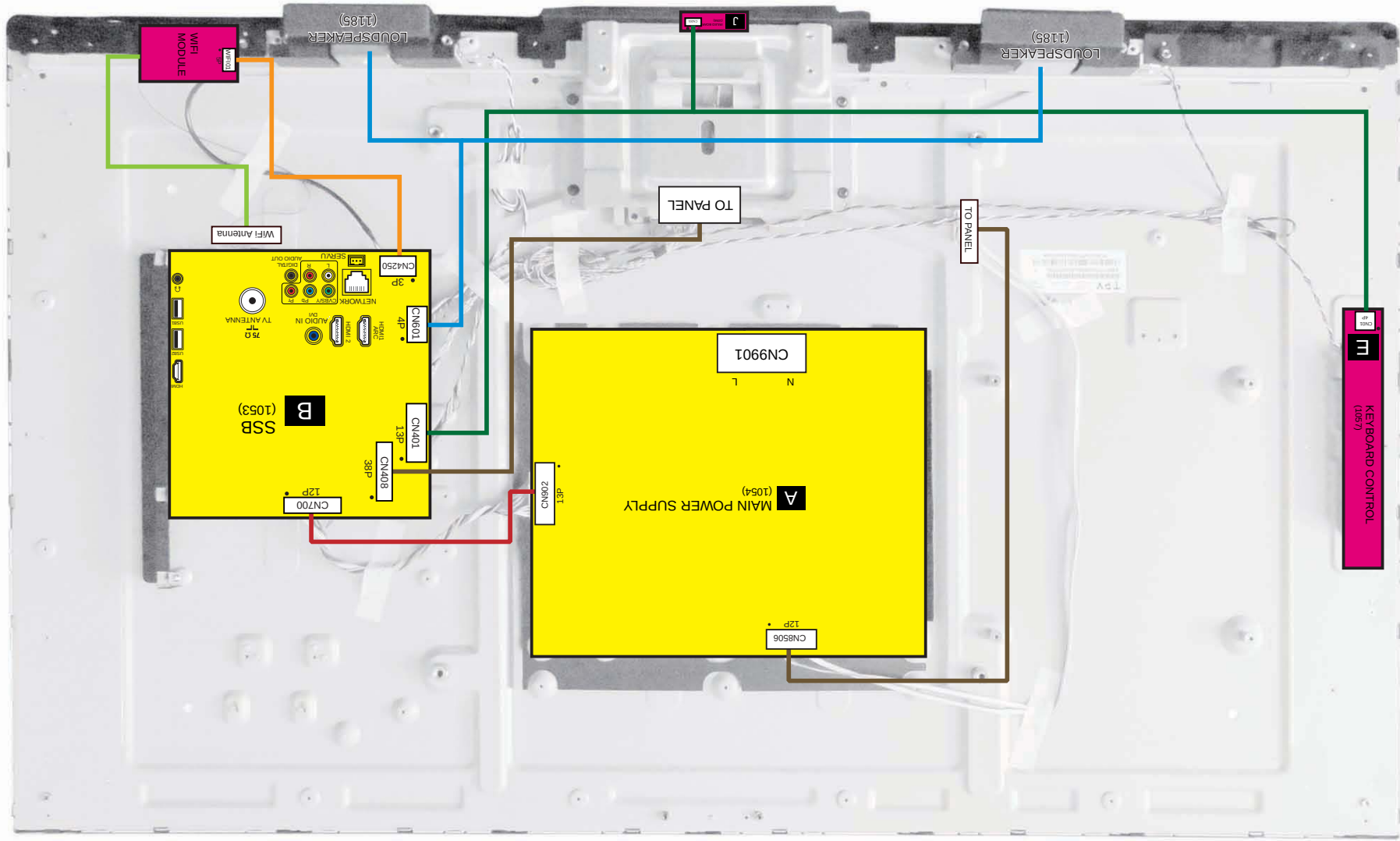
19440_401_130304.eps
130304

Wiring diagram 4208 series 42" - 46" (4208 series)

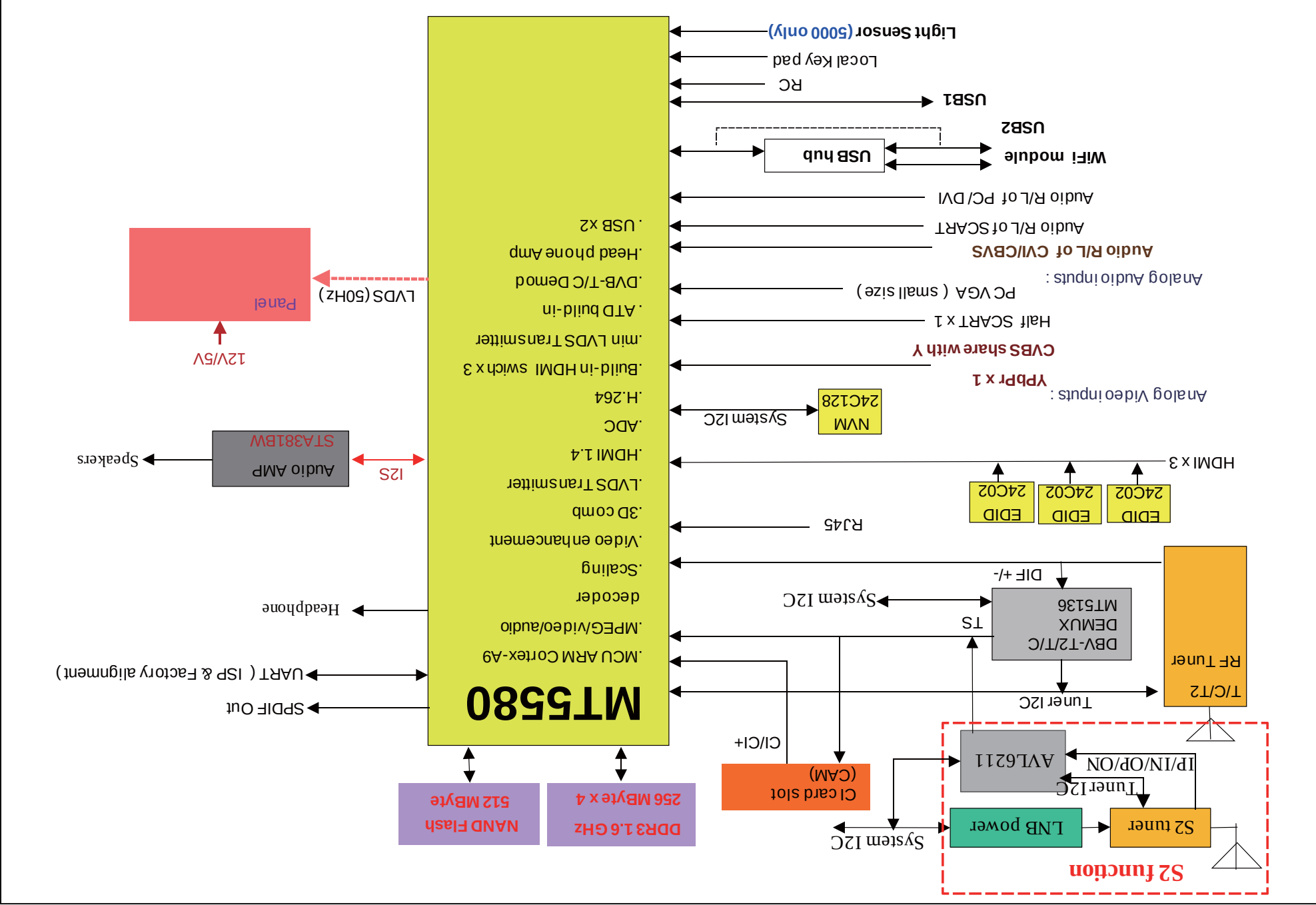
See note in Chapter 7 about cable position numbers

Board Level Repair
Component Level Repair
Only for authorized workshops

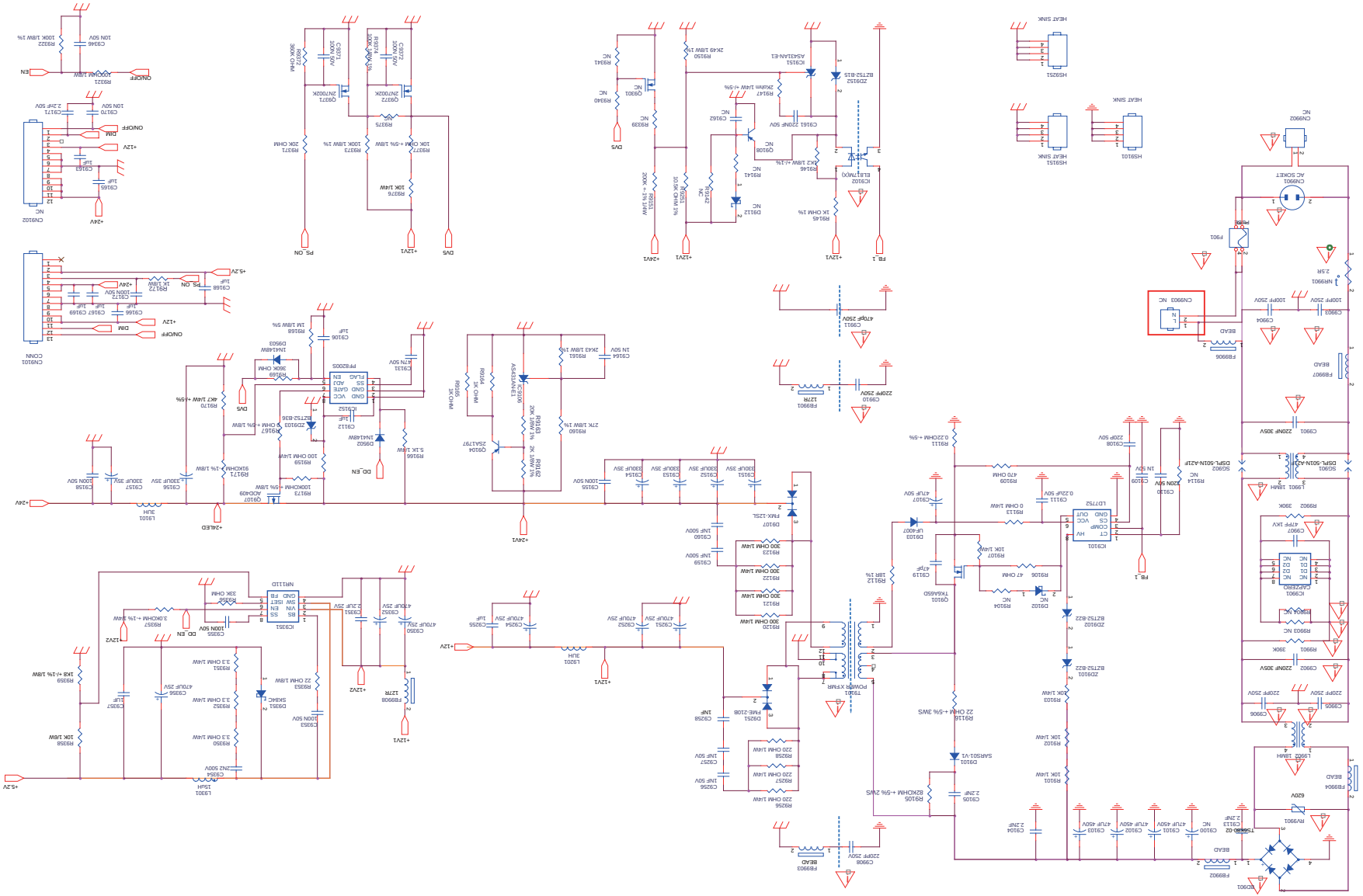




See note in Chapter 7 about cable position numbers



10. Circuit Diagrams and PWB Layouts

10.1 A 715G5856 PSU
10-1-1 PowerA01
Power

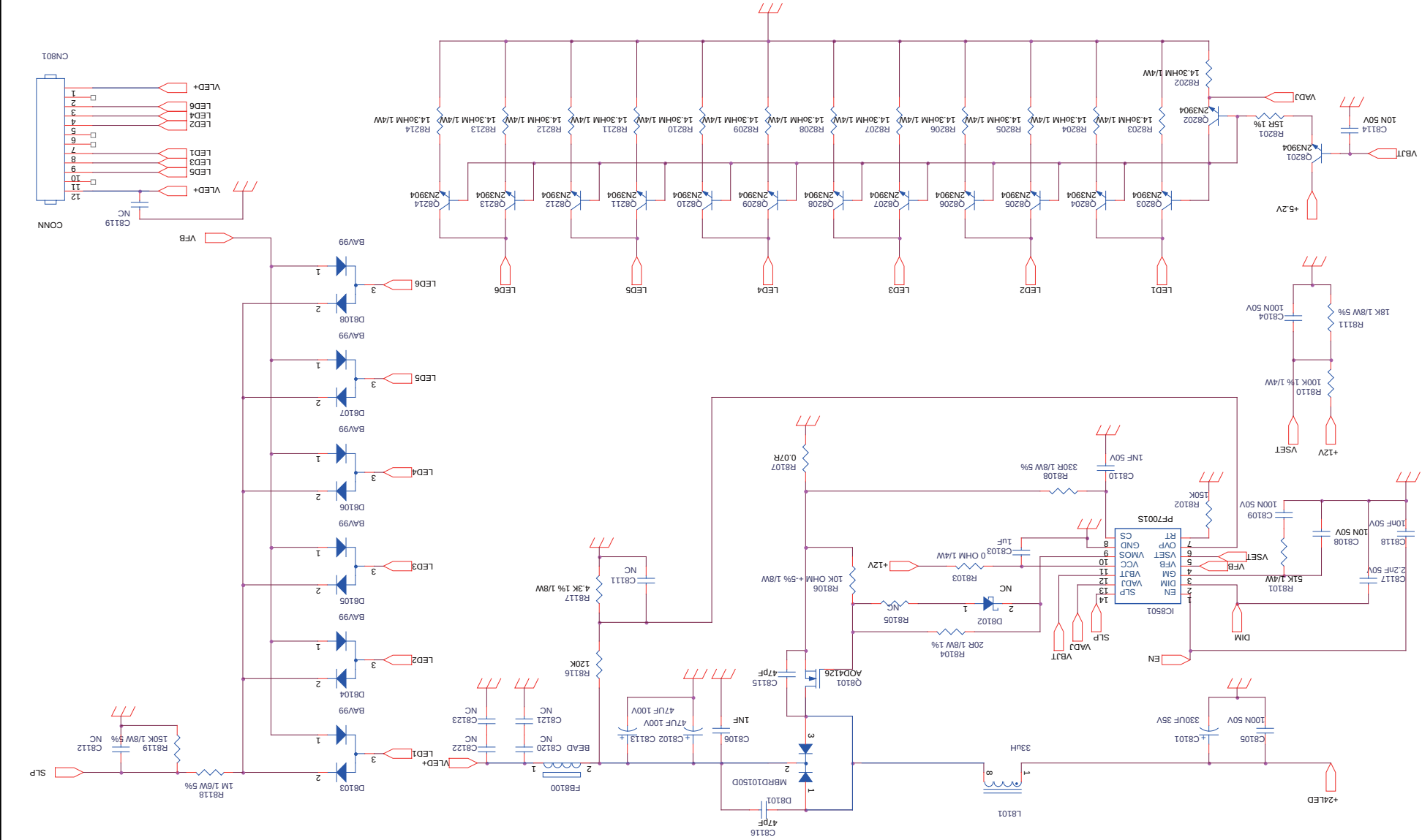
Power

715G5856

19440_500_130228.eps

2013-Jun-14 back to library

A01



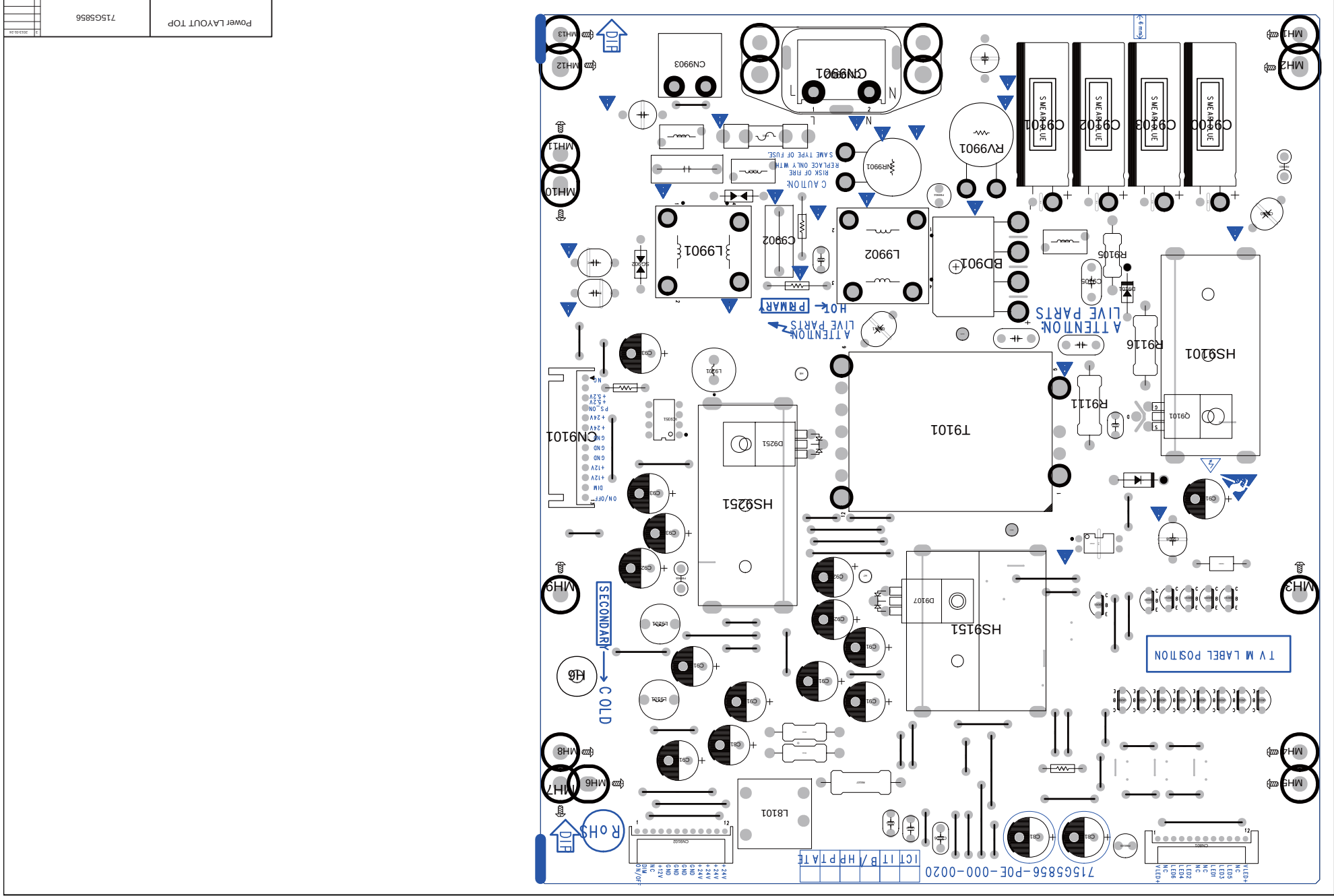
LED DRIVER

715G5856

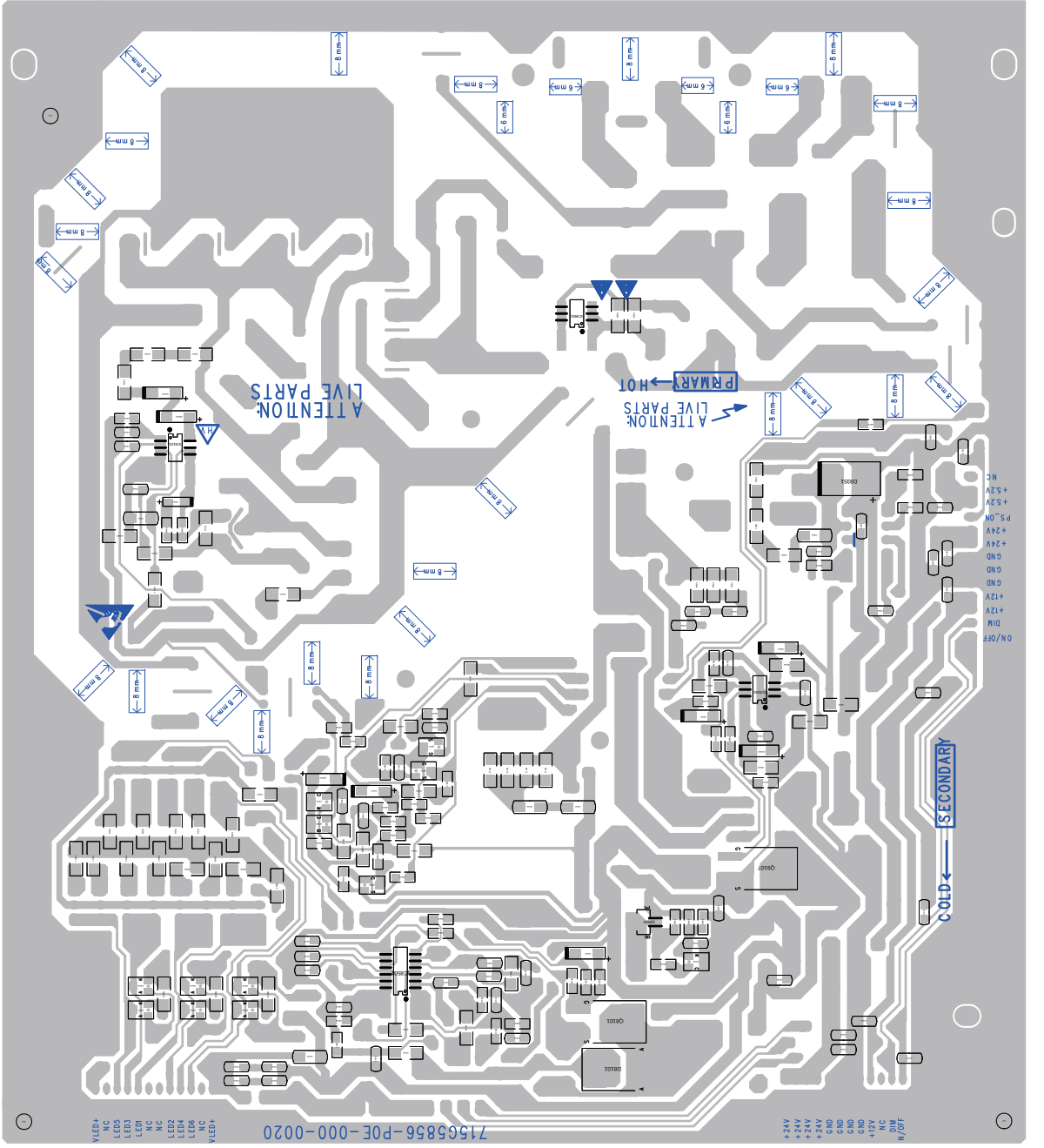
Pinout diagram of the CN819 connector. The connector is shown on the left with pins numbered 1 to 12. On the right, the signal names are listed: VLED+, LED6, LED4, LED2, LED1, LED3, LED5, and VLED+. Pin 12 is connected to a ground symbol labeled 'NC' and 'CN819'.

A02
LED DRIVER

A02



10-1-4 Power layout bottom

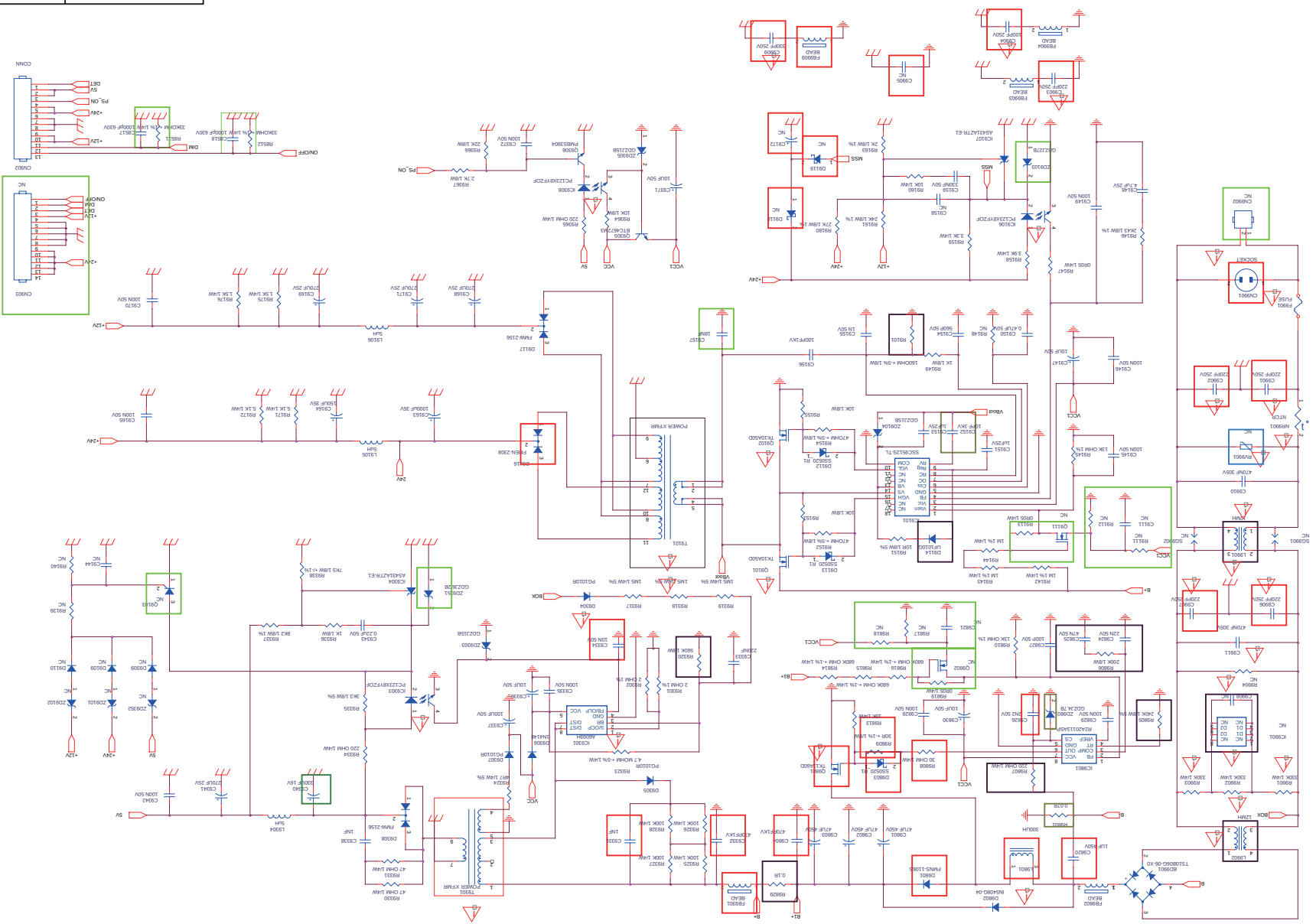


Power Layout Bottom

71565856

19440_503_130228 49S
130228

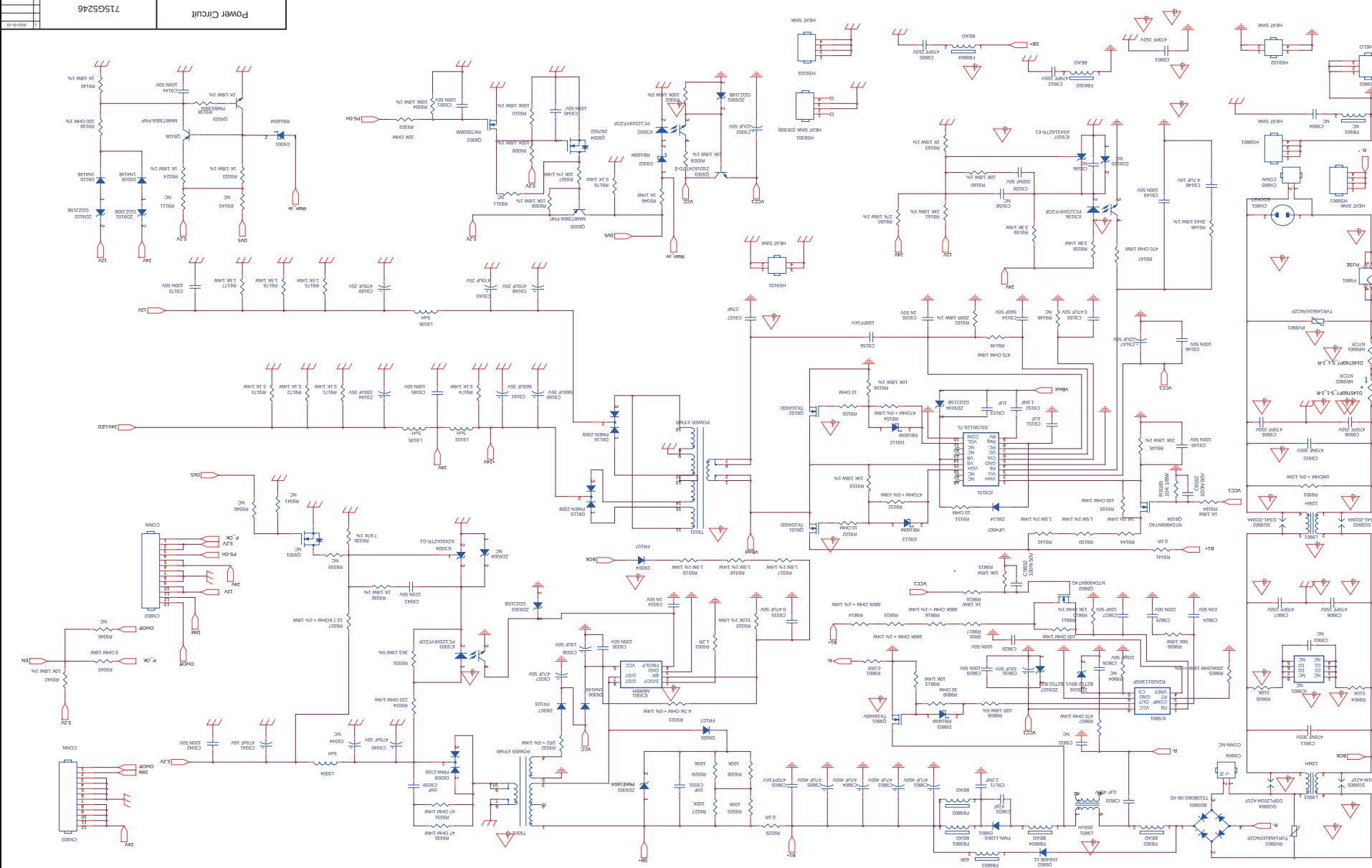
2013-Jun-14 back to
liv table



715G5193

A01

Power Circuit



A01

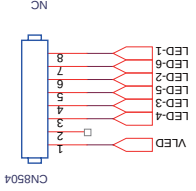
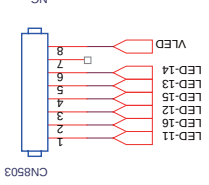
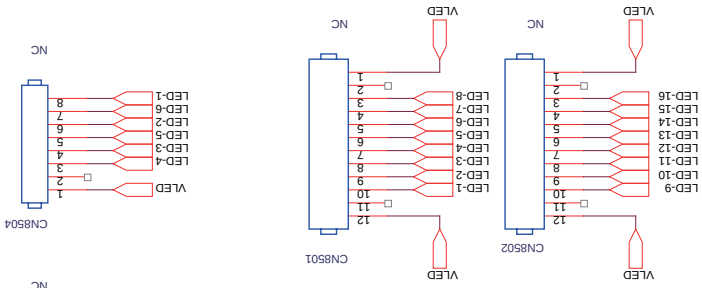
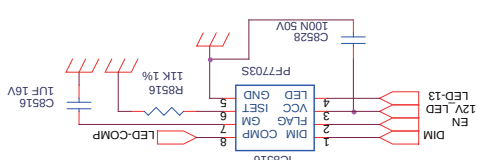
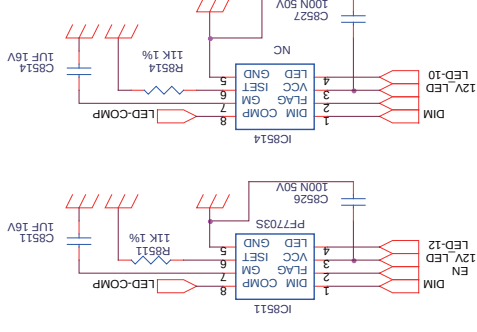
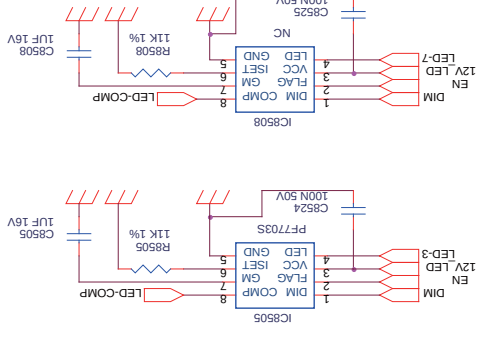
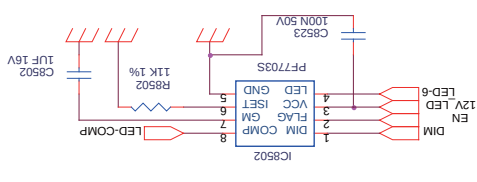
Power Circuit

715G5246

19240_506_120213 gps
120320

2013-Jun-14 back to
10 label







MI LABEL POSITION

ATTENTION: LIVE PARTS

CAUTION: RISK OF FIRE REPLACE ONLY WITH SAME TYPE OF FUSE.

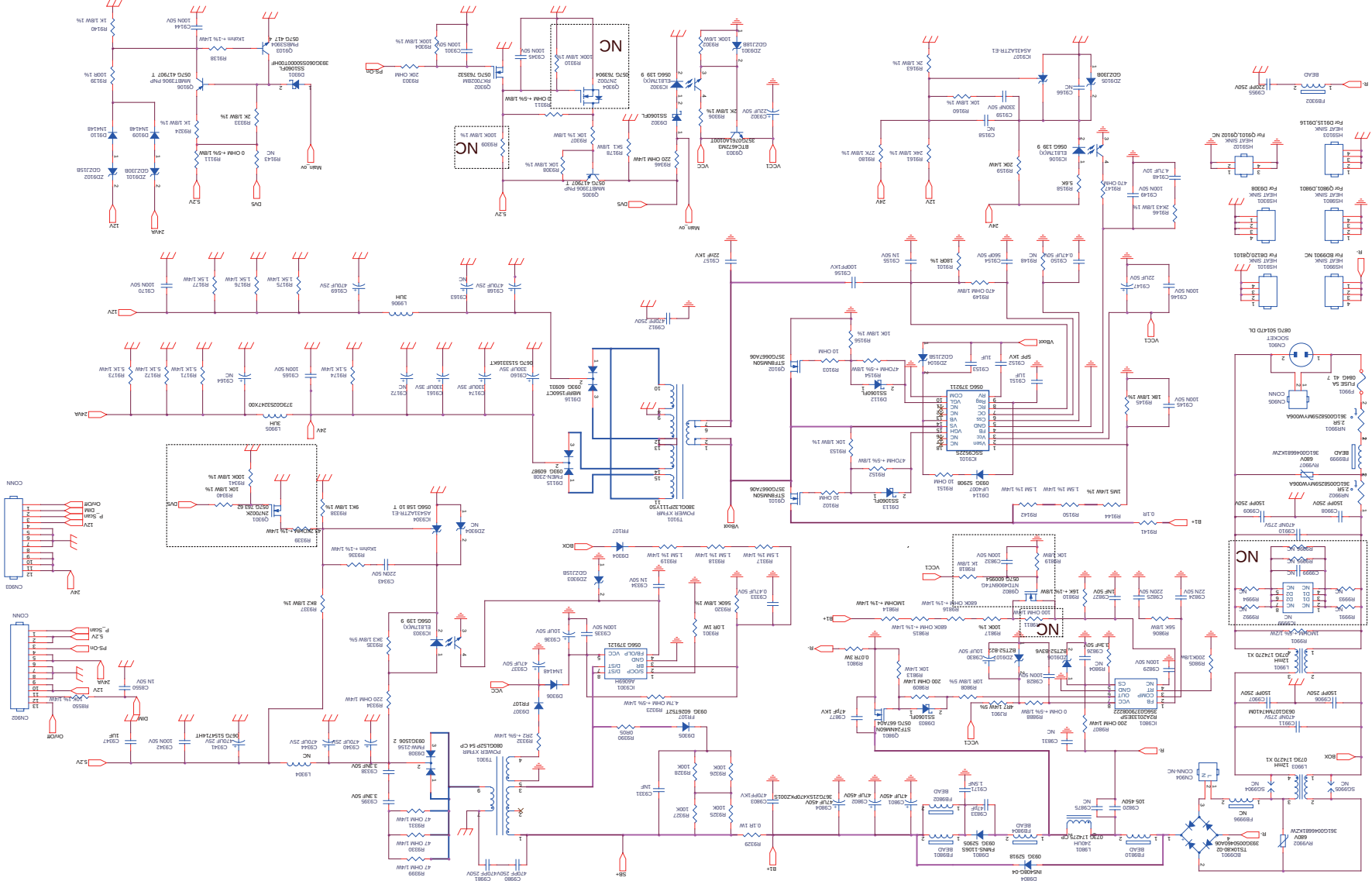
ATTENTION: VUE PARTIS

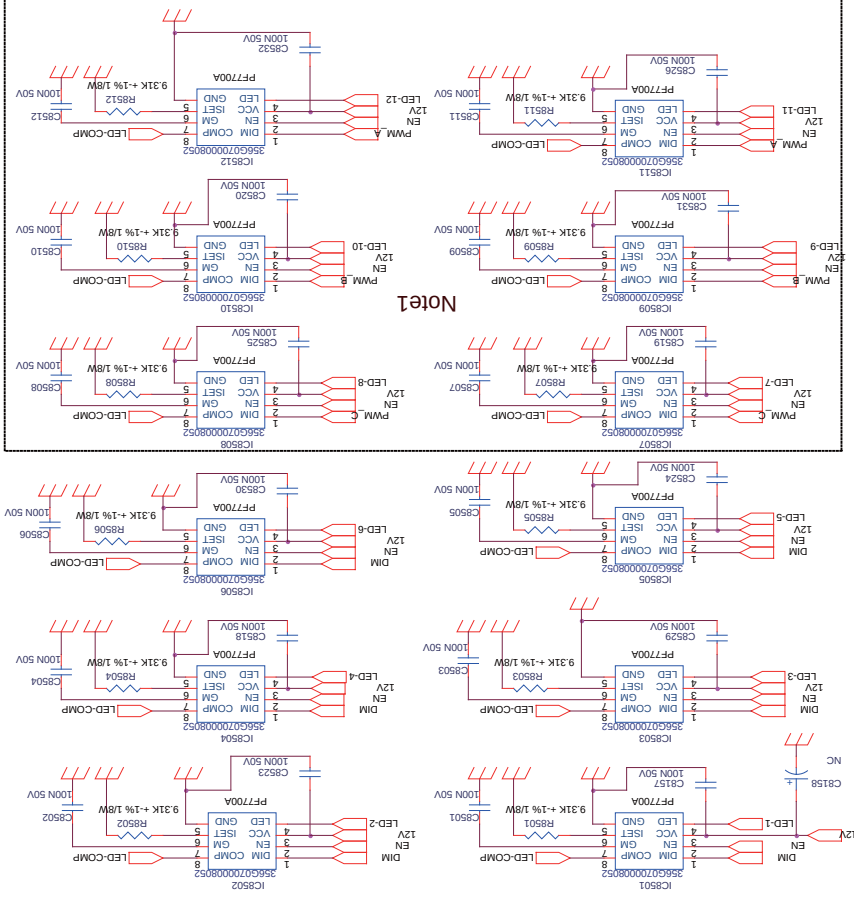
715G5246



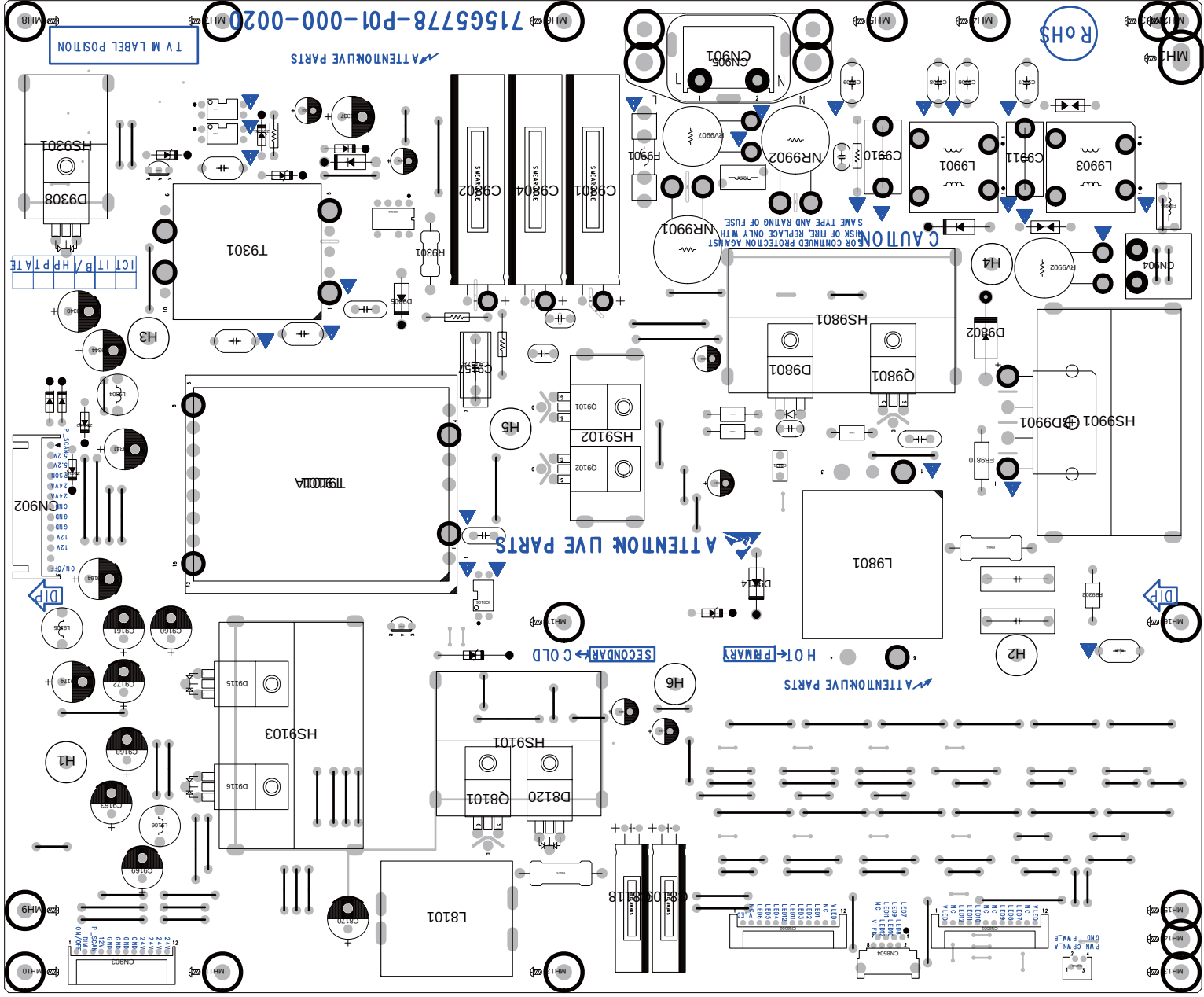
2013-Jun-14
back to
div table

A01
Power Circuit





19430_501_130114.eps
130114



Power layout top

715G5778

TV M LABEL POSITION

ATTENTION LIVE PARTS

715G5778-P01-000-0020

RoHS

CAUTION FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH SAME TYPE AND RATING OF FUSE

ATTENTION LIVE PARTS

ATTENTION LIVE PARTS

SECONDARY COLD

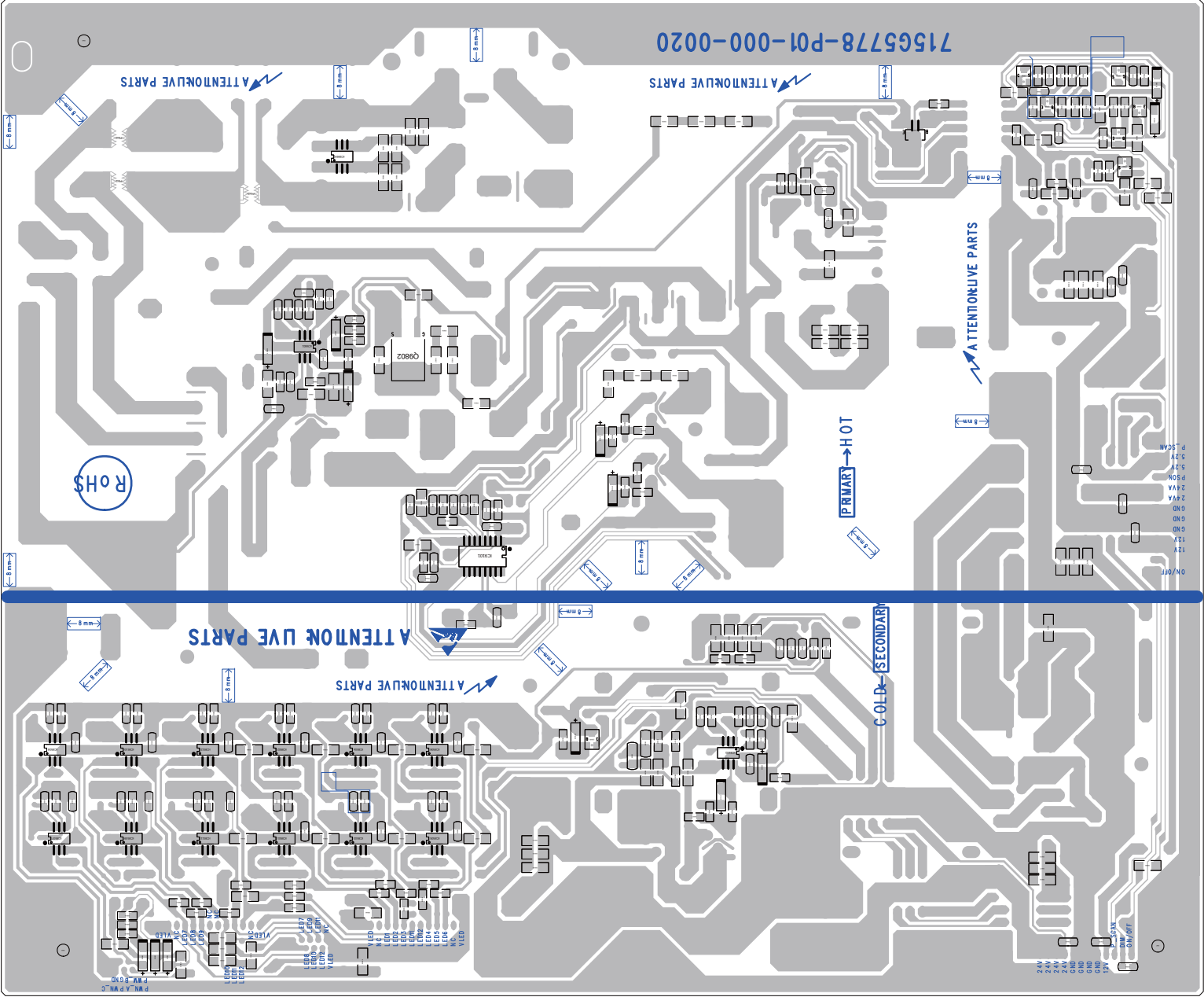
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DIP

DIP

DIP

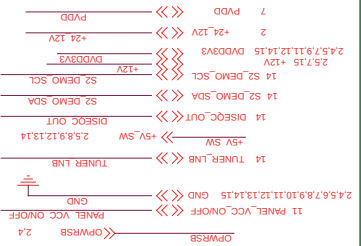
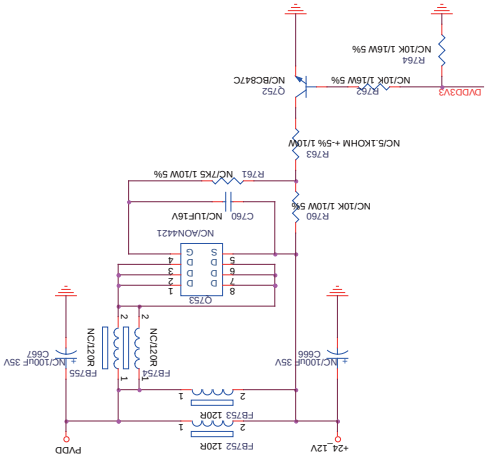
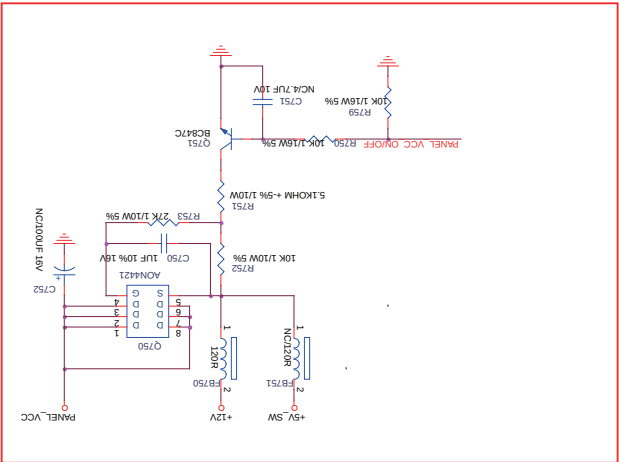
IC TIT B/H/P/P/ATE



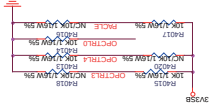
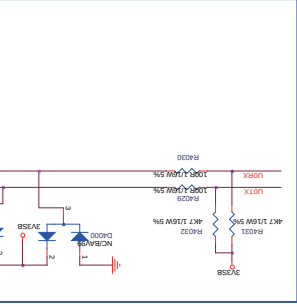
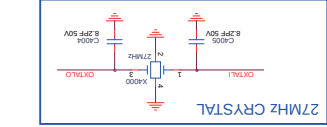
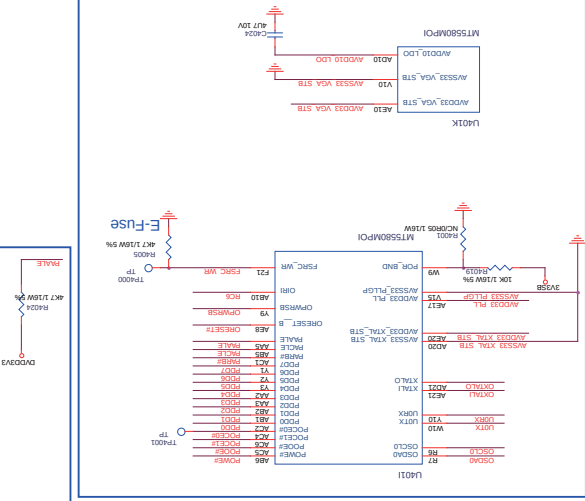
Power layout bottom

715G5778

19430_503_130115.eps
130115

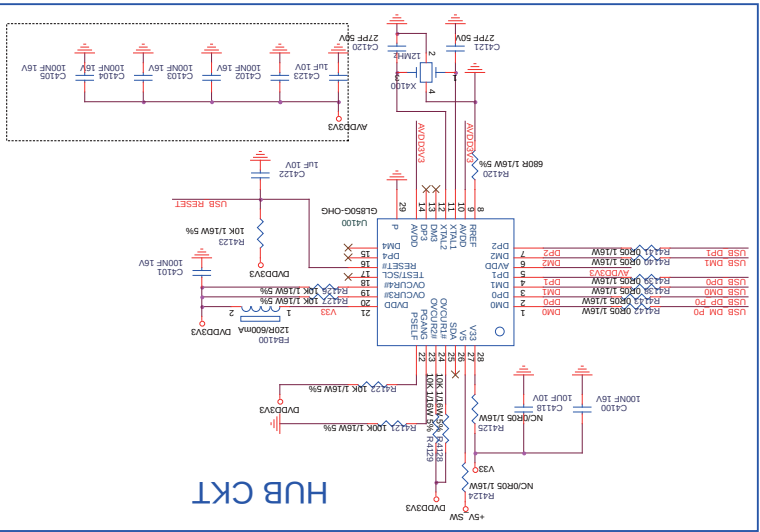
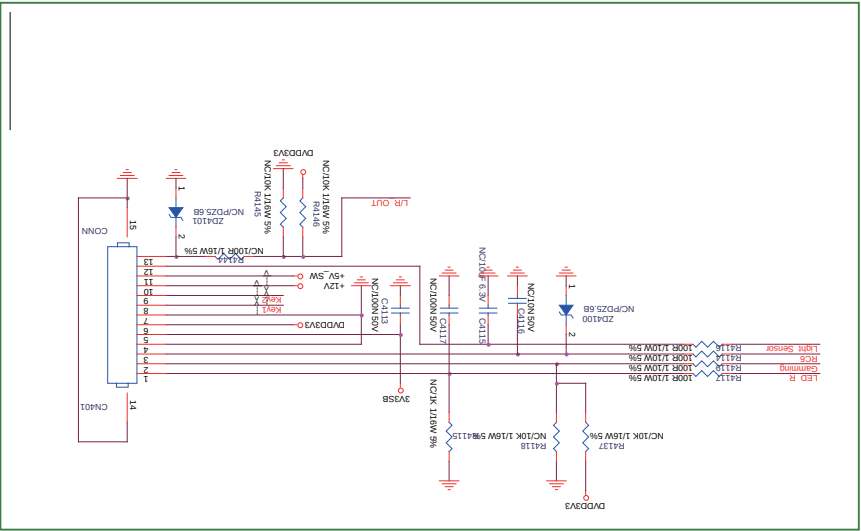


System Power 2	715G5713	2003-12-15
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50-51-5200	2

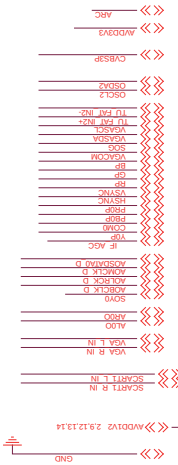
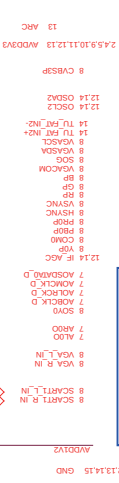
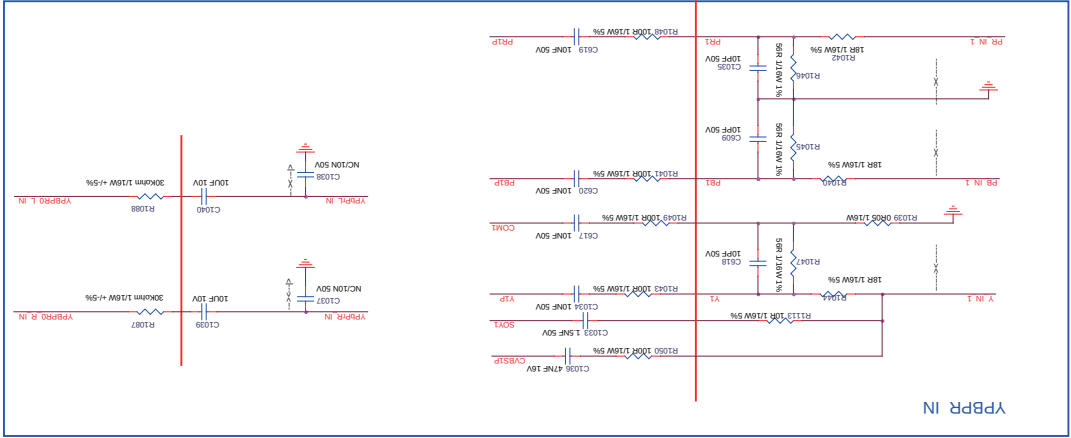
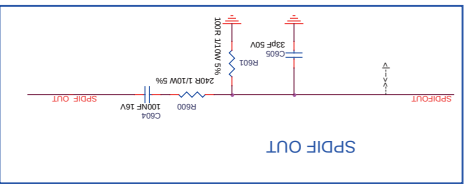
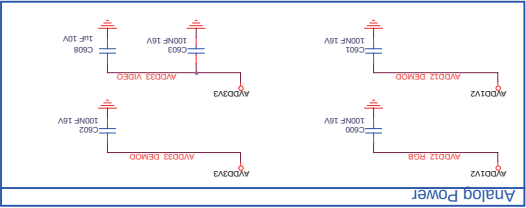
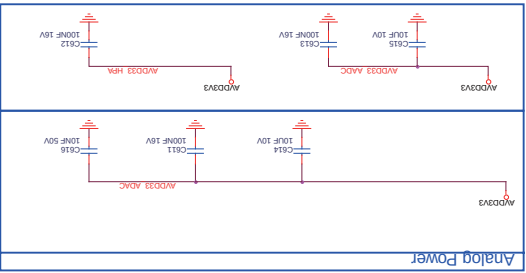
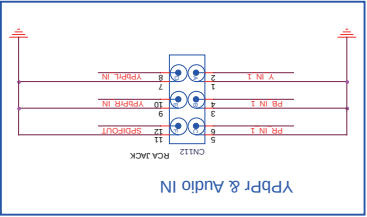
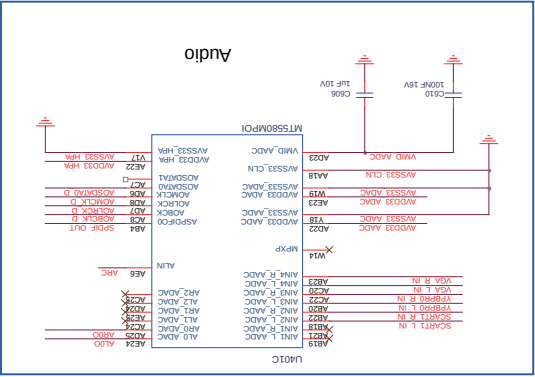
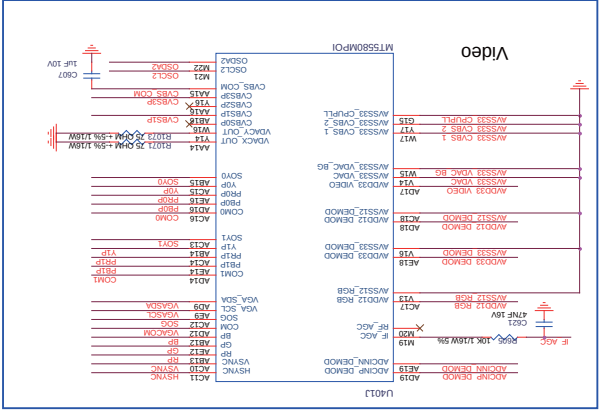
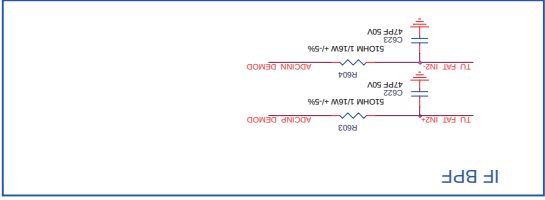
Connector/USB

[illegible]

B05

Audio/Video IO/SPDIF

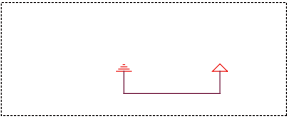
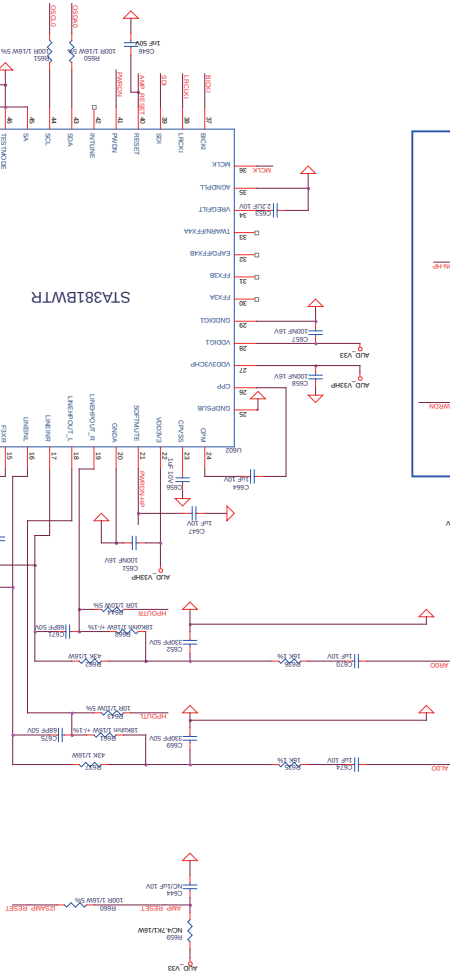
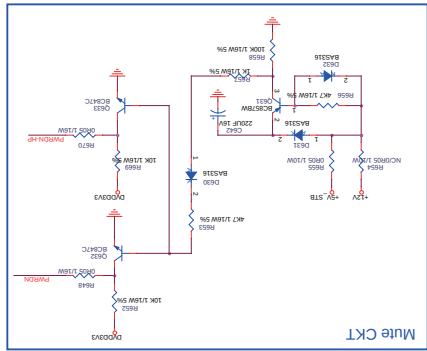
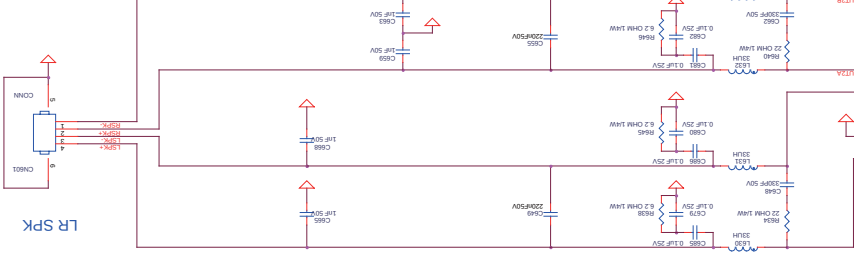
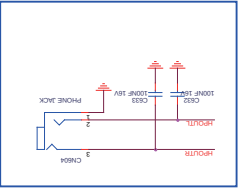
Audio/Video IO/SPDIF	715G5T13
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B05

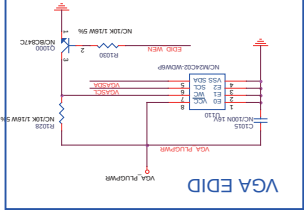
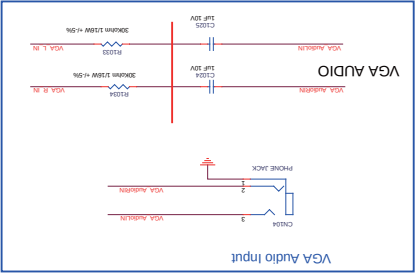
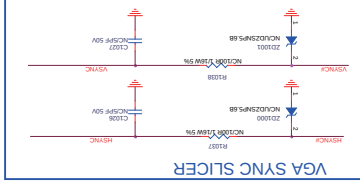
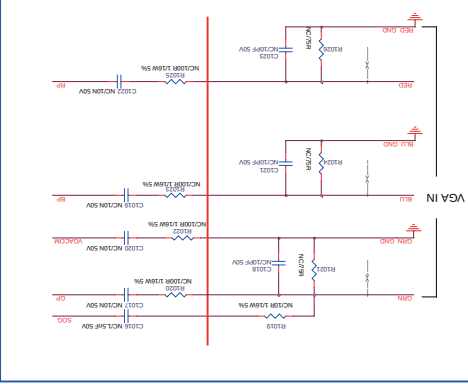
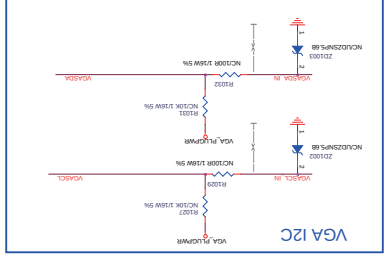
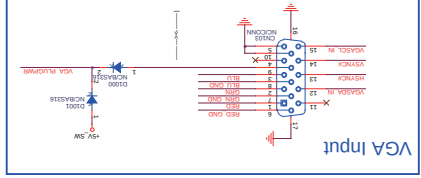
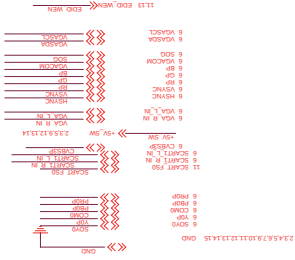
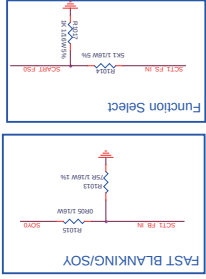
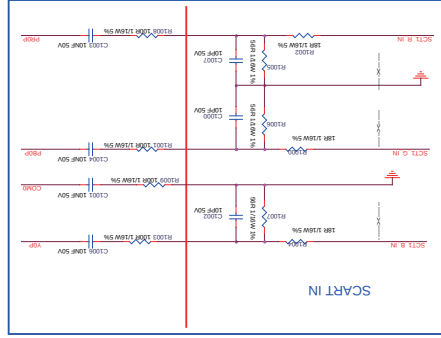
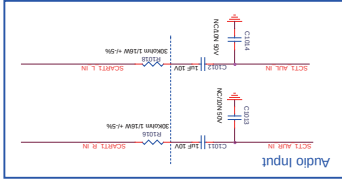
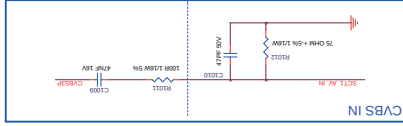
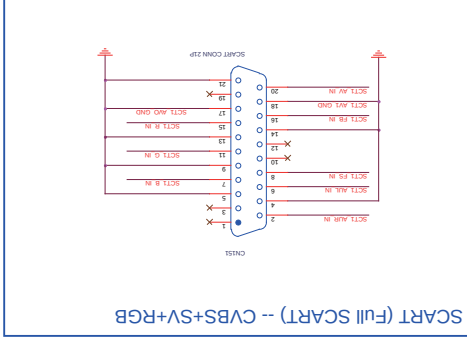
B06 Speaker/Headphone

B06



B07

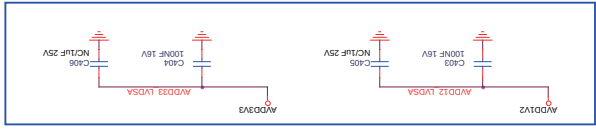
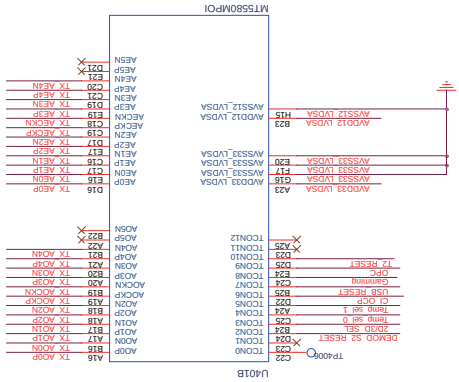
SCART/VGA Input



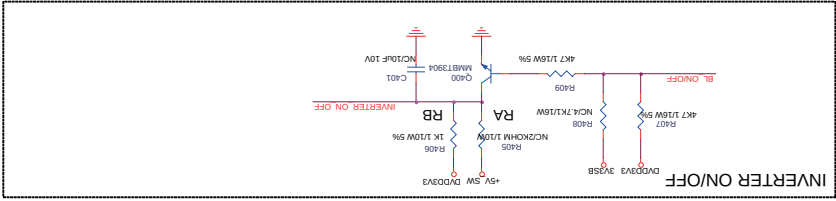
SCART/VGA Input

715G5713

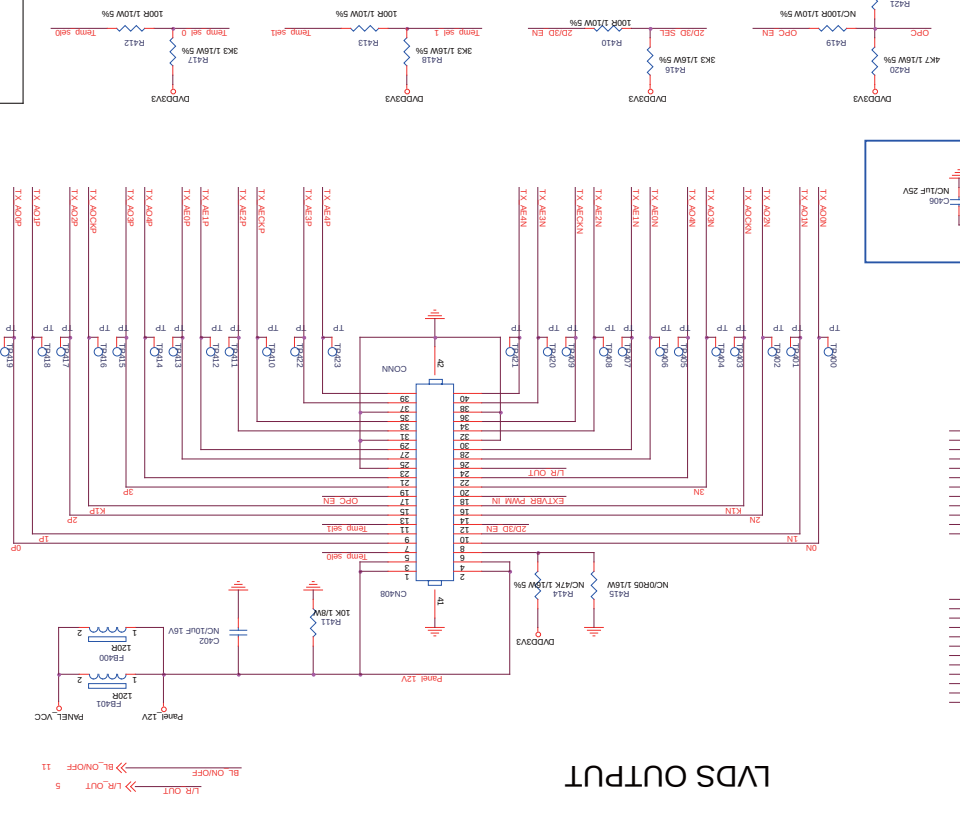
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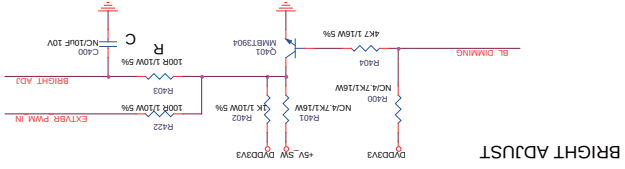
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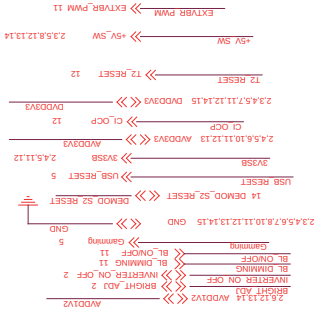
INVERTER ON/OFF



LVDS OUTPUT



BRIGHT ADJUST

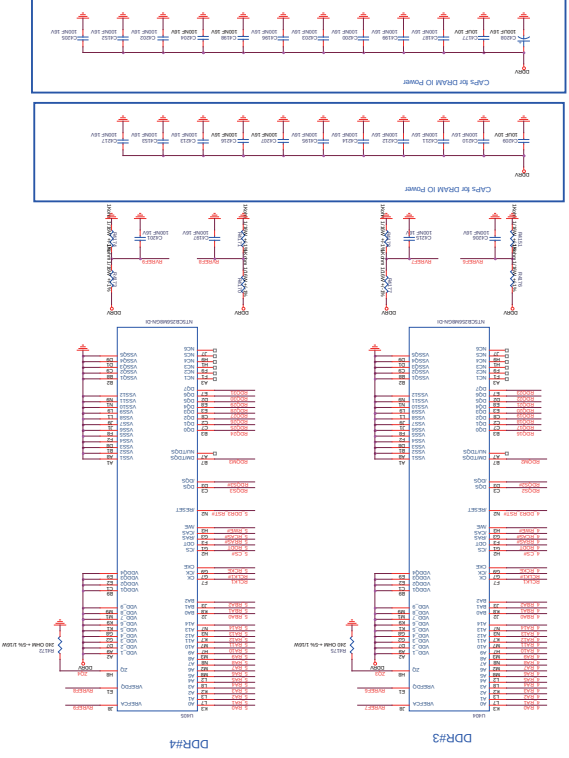
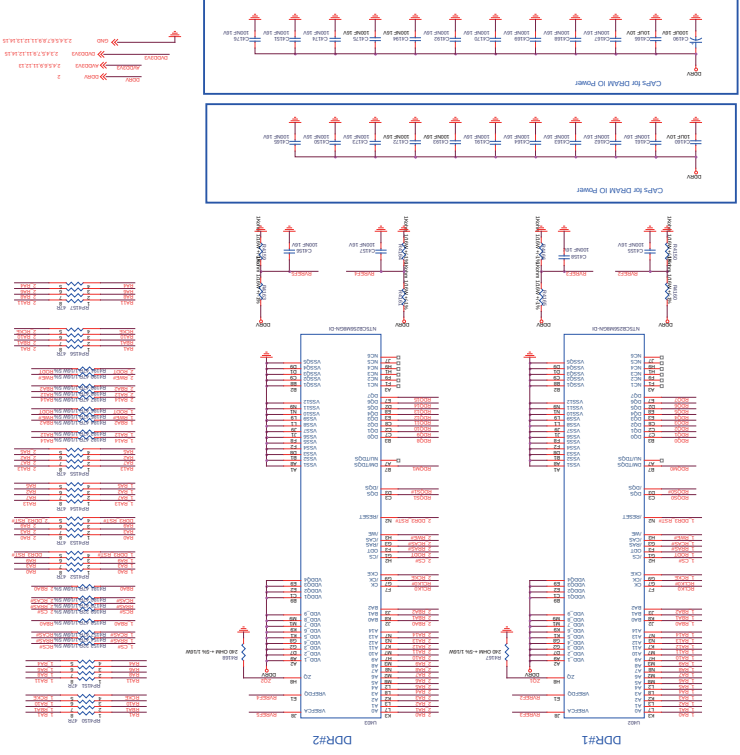
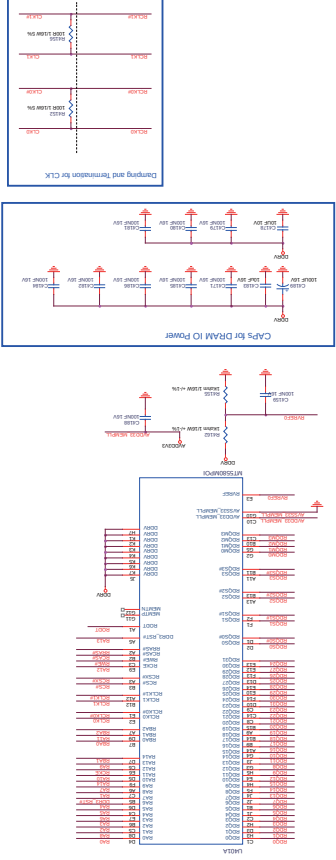


LVDS

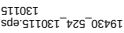
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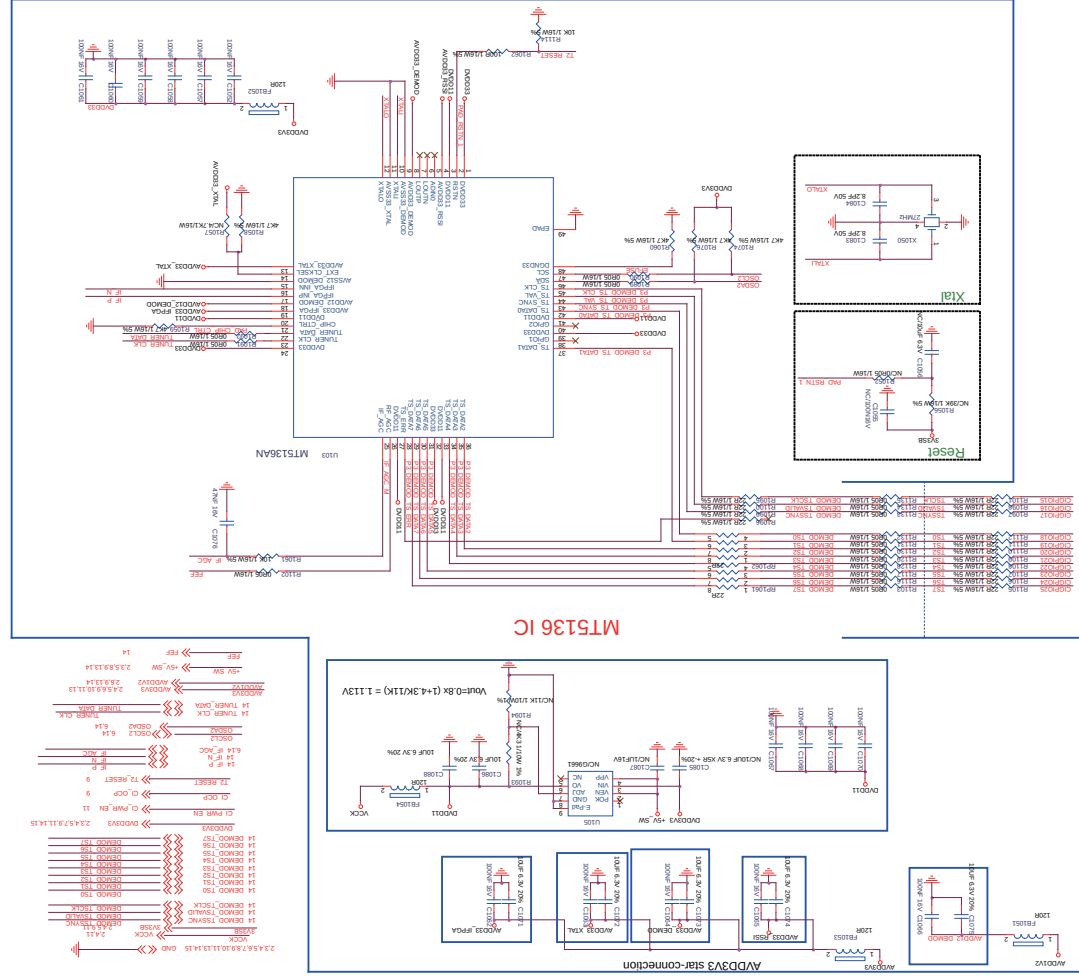
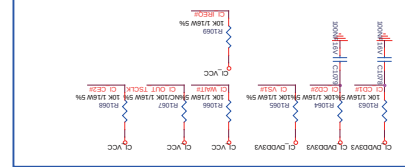
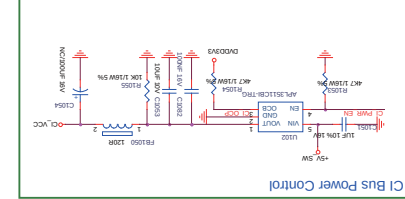
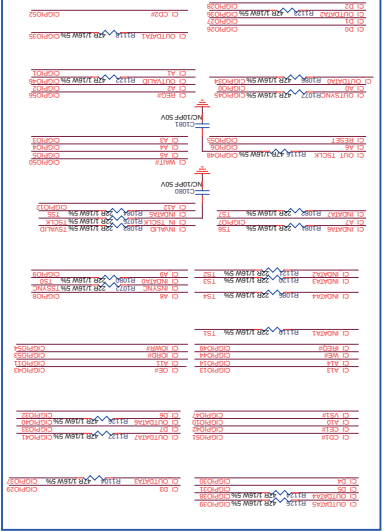
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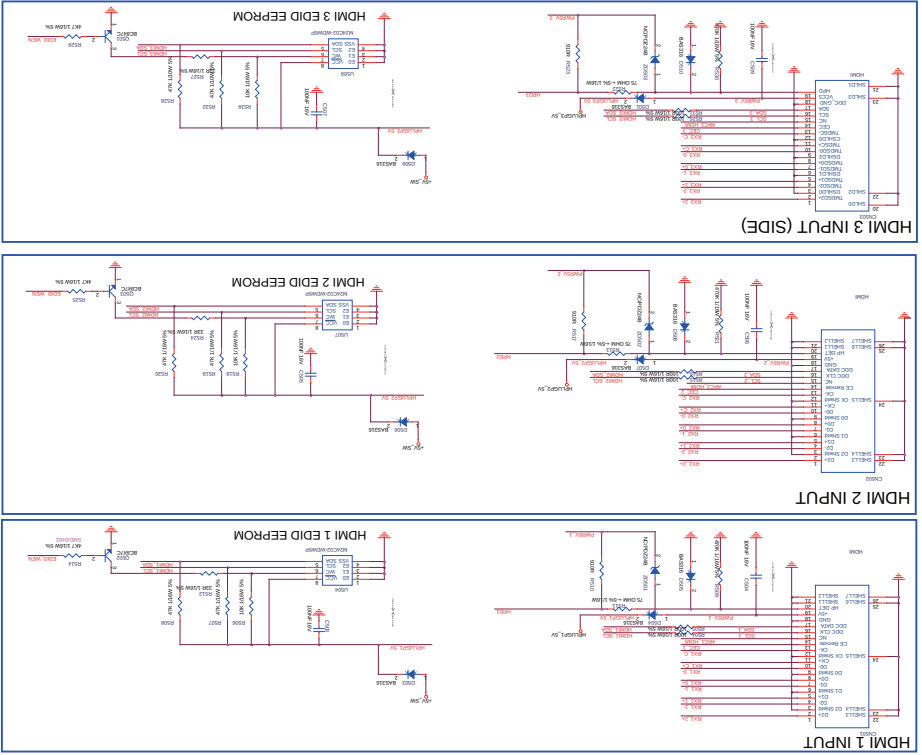
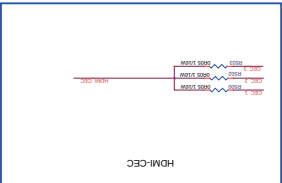
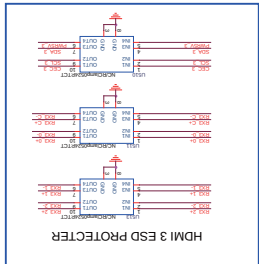
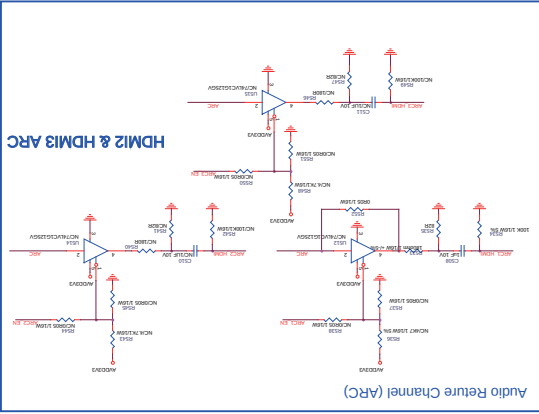
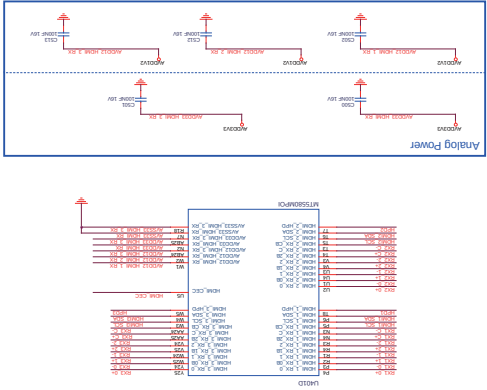


DRAM Interface	715G5713
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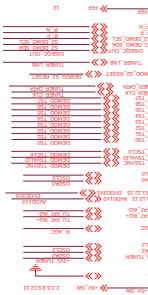
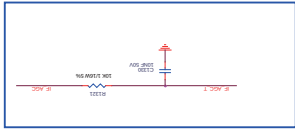
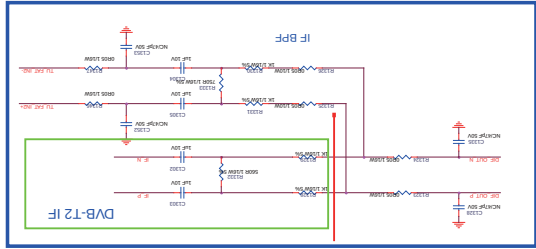
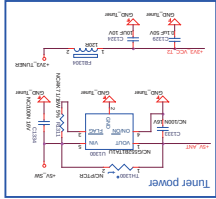
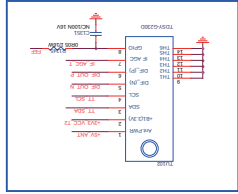
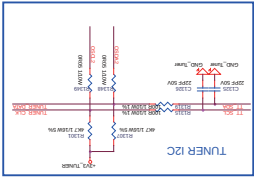


B12 HDMI SW/Connector



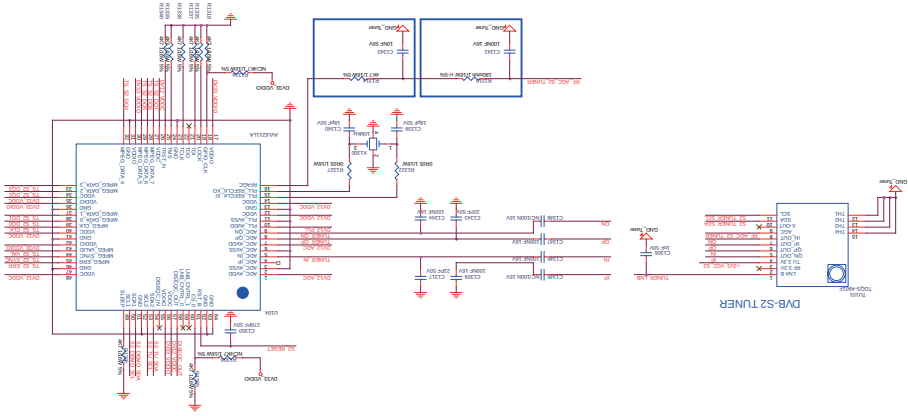
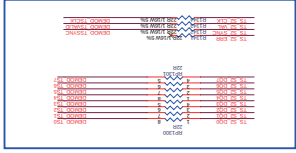
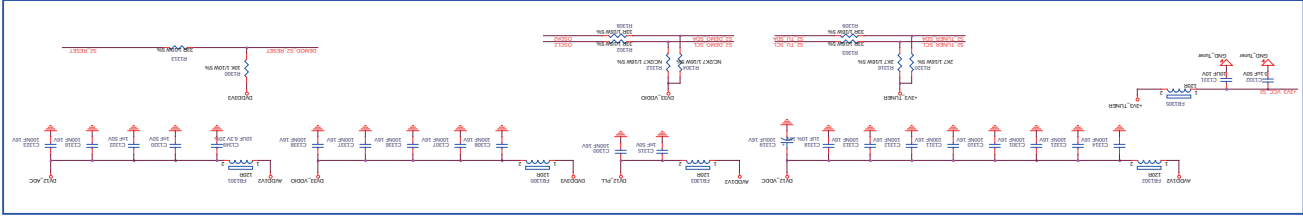
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DVB T2/C/S2 Tuner



DVB-T/C/T2 TUNER CIRCUIT

DVB-S/S2 TUNER & Demodulator CIRCUIT



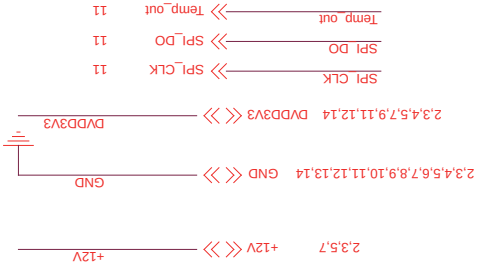
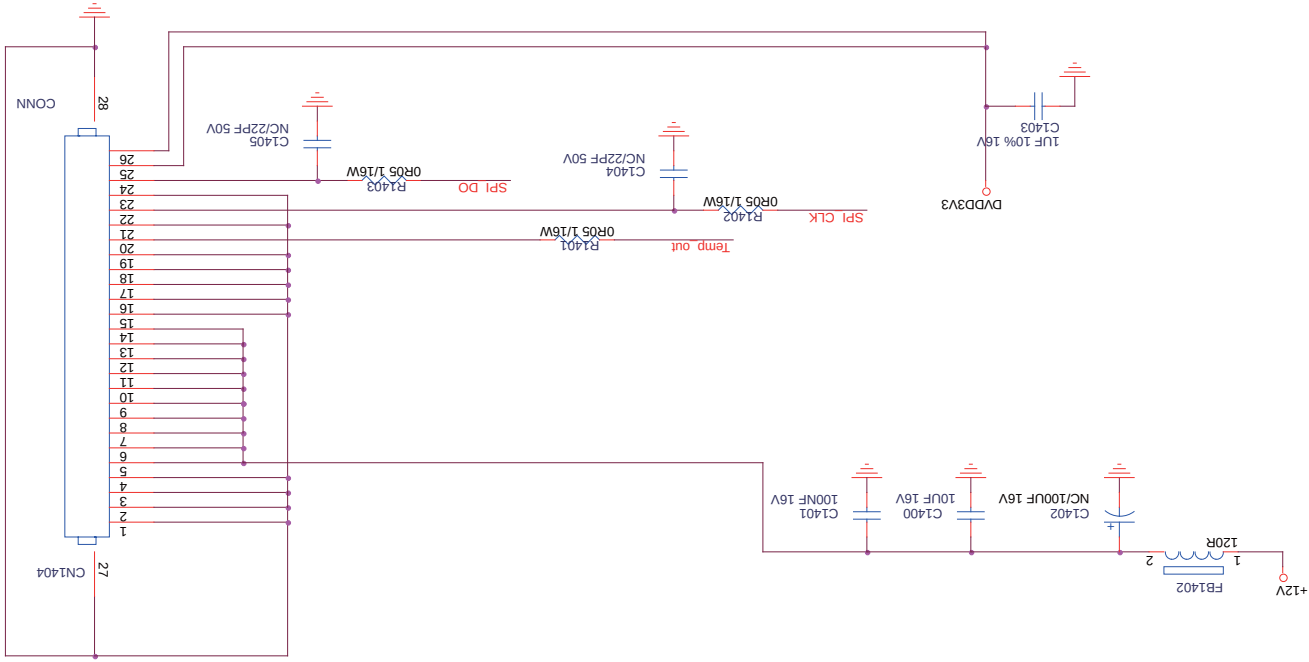
DVB T2/C/S2 Tuner

715GS713

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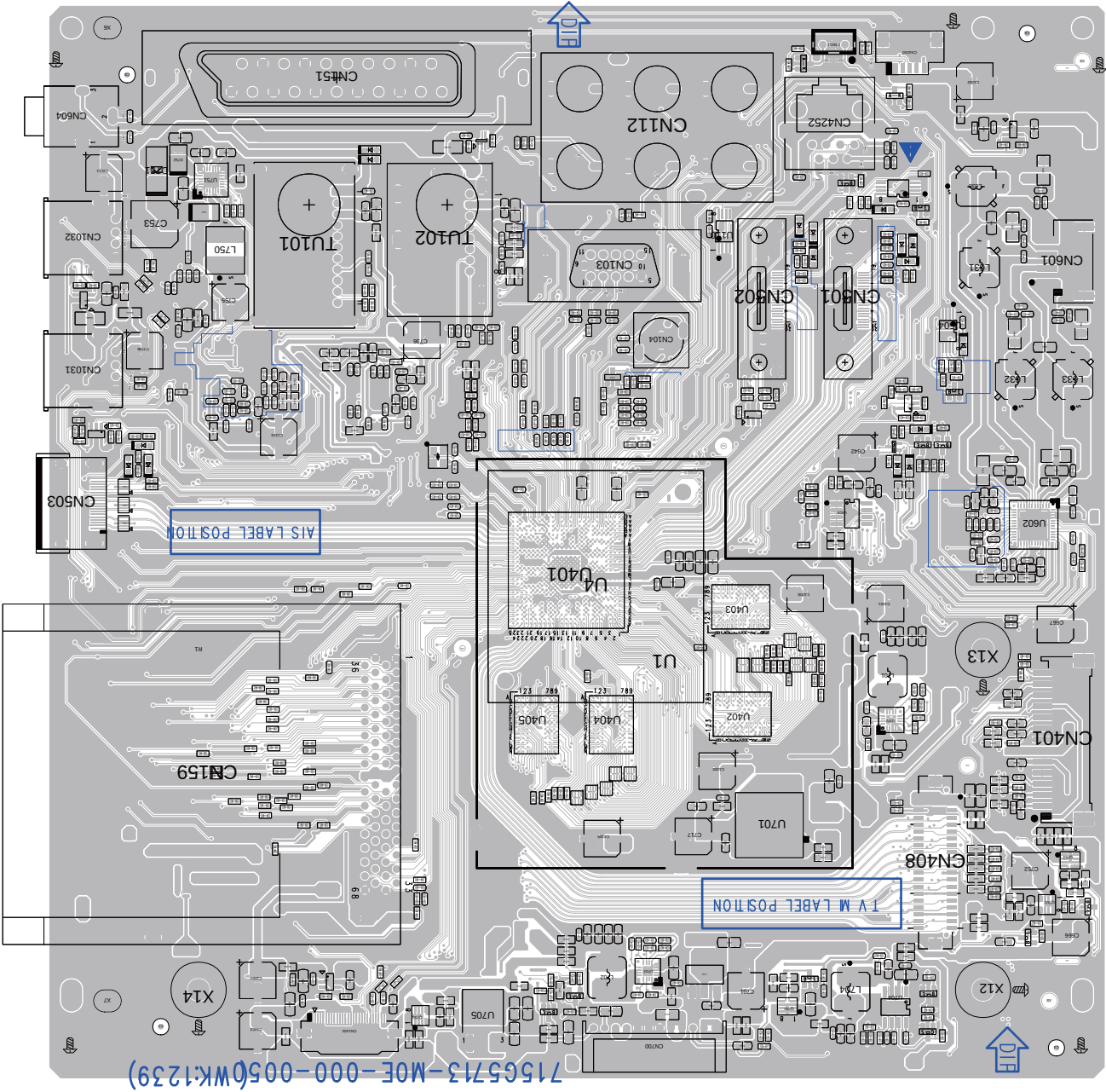
B13

B14 Ambient Light



B14

715G5713
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71565713-MOE-000-0050(WK1239)

SSB layout top

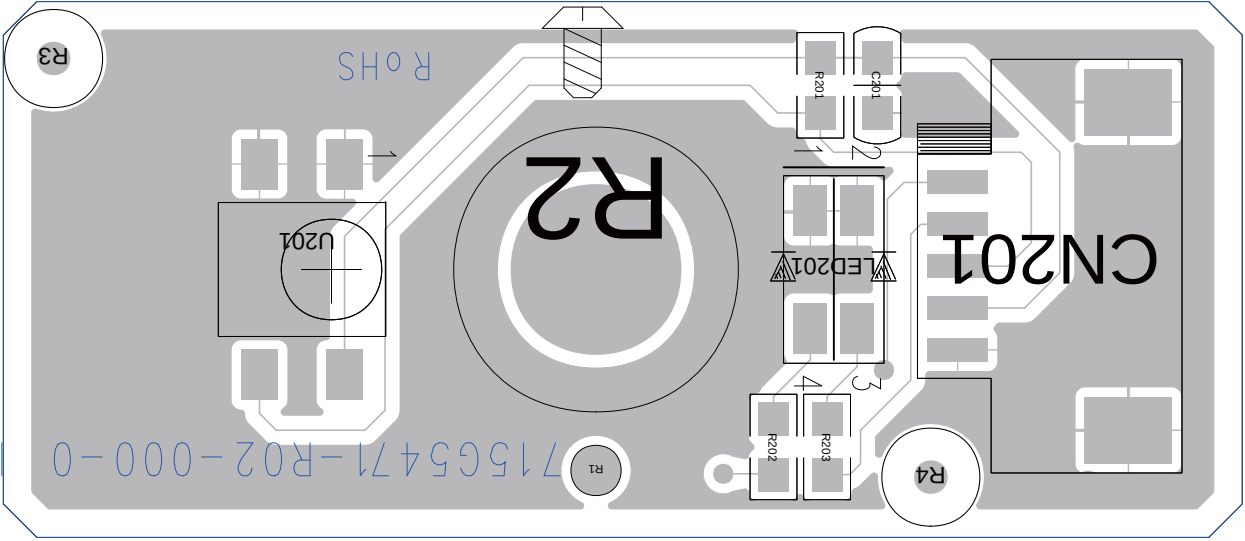
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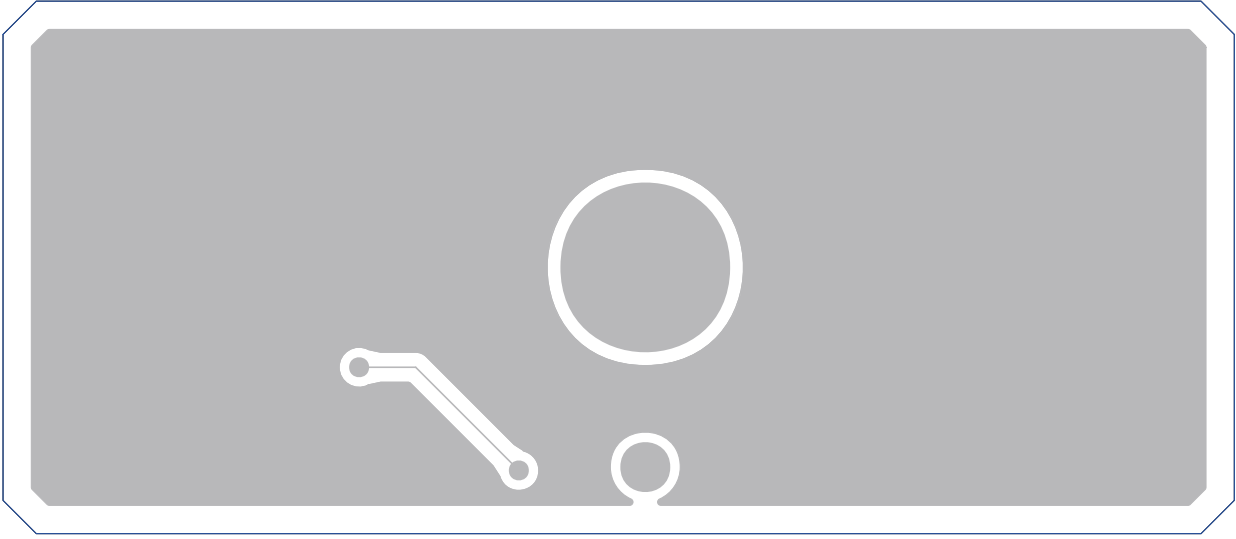




Layout IR/LED Board (Top Side)



Layout IR/LED Board (Bottom Side)

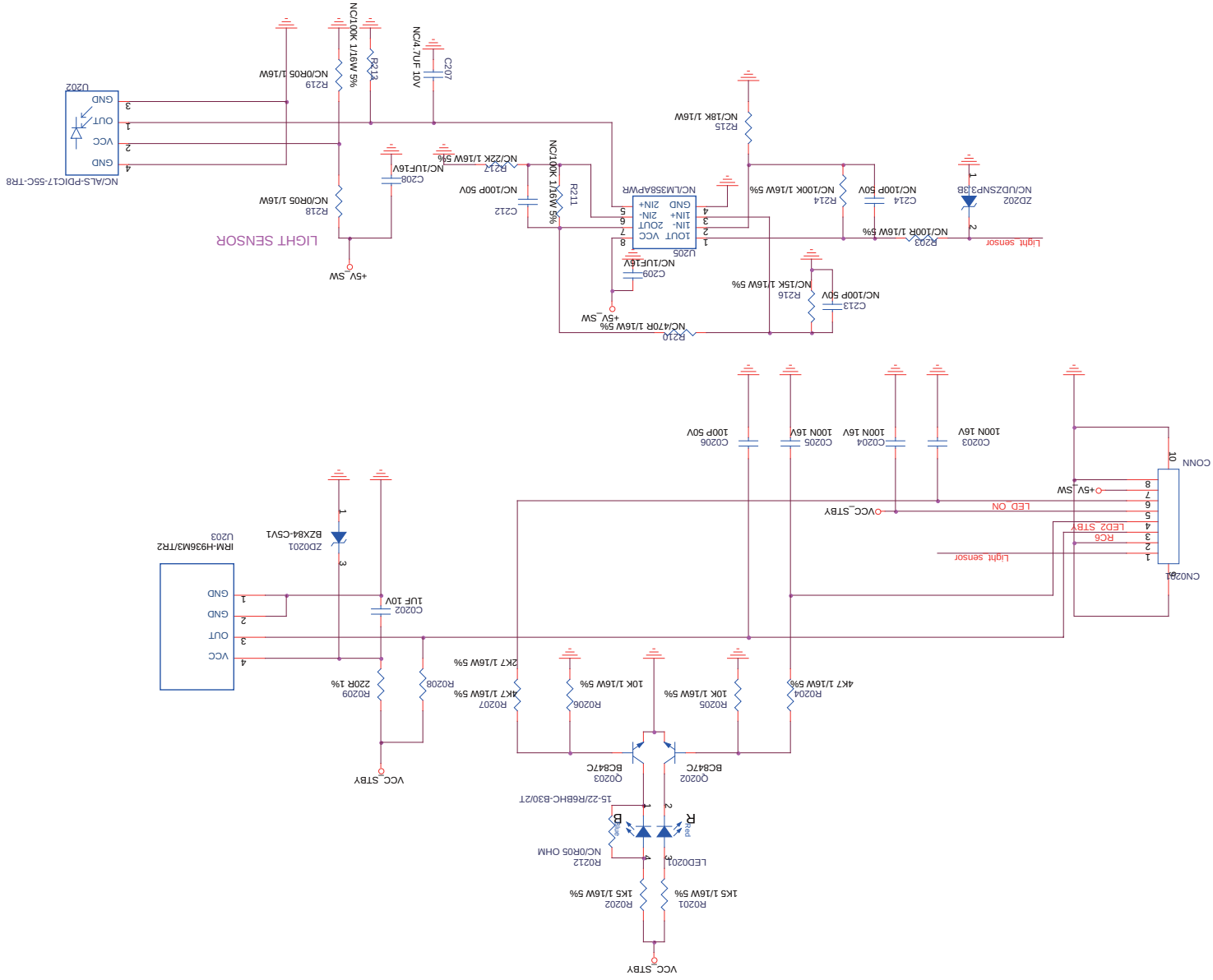


IR/LED board
layout top/bottom

715G5471

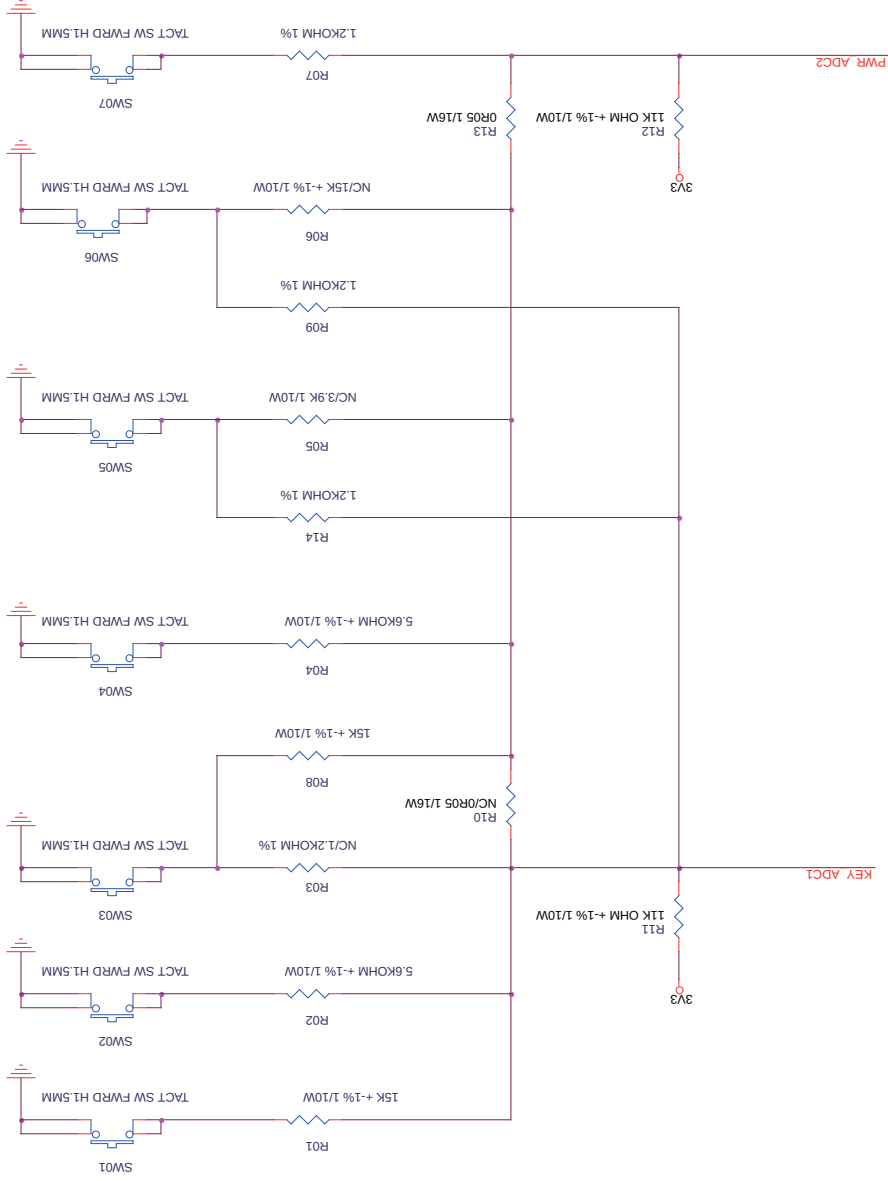
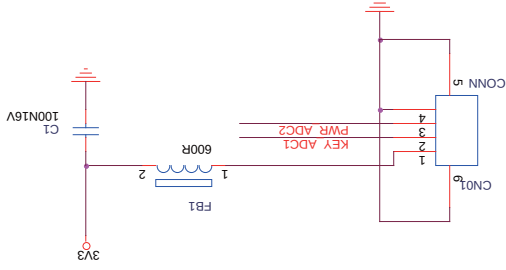
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Key pad

E



Key pad

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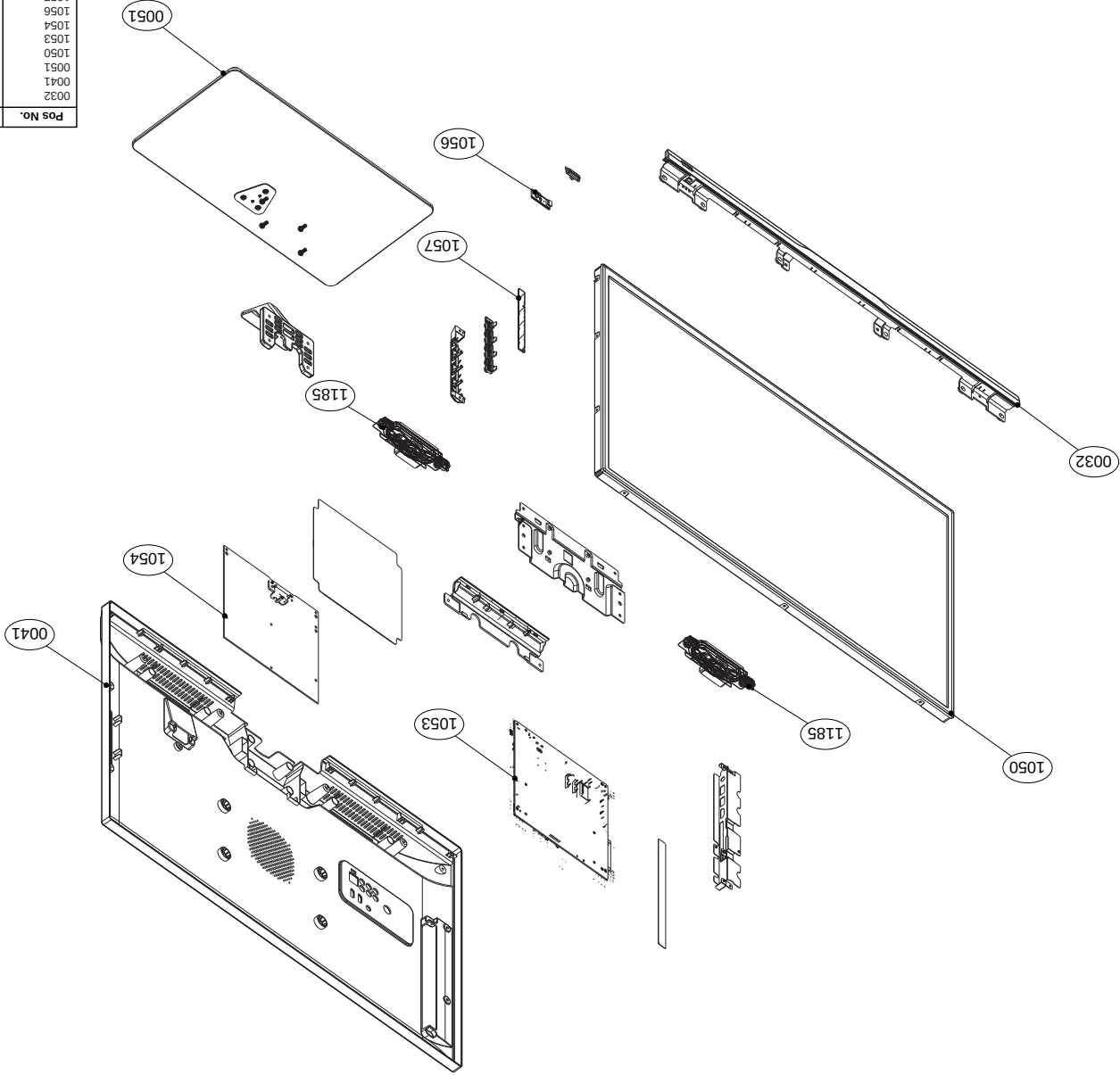
2013-Jun-14
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130305

11. Styling Sheets

11.1 4208 series 32"

4208 series 32"

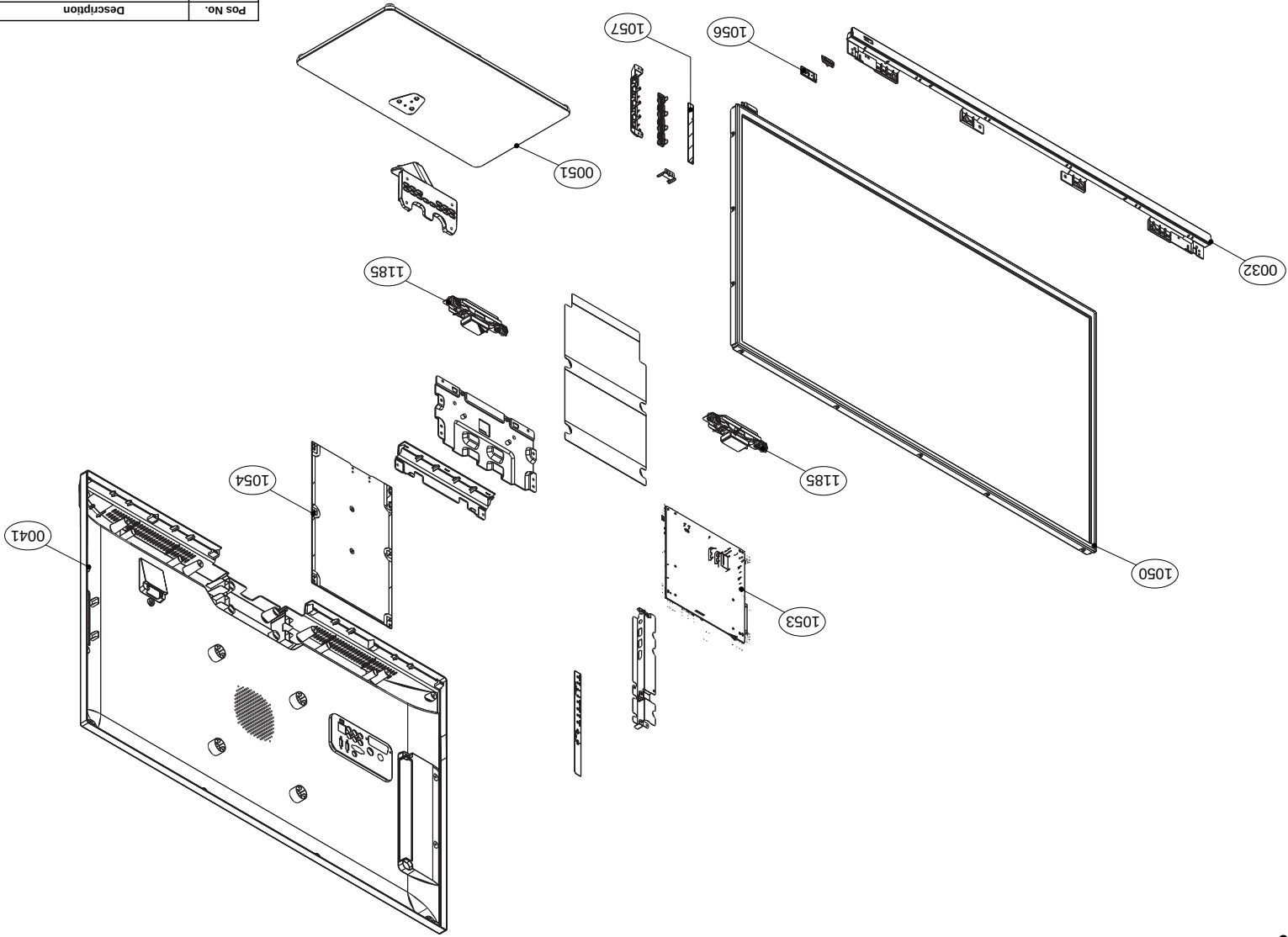


Pos No.	Description	Remarks
0032	Deco bezel	
0041	Rear cover	
0051	Base	
1050	Display panel	
1053	Panel SSB	
1054	Power Supply Unit	
1056	IR/LED panel	
1057	Key-board control panel	
1176	Remote control	
1185	Speakers	
		Not displayed

FOR ELECTRICAL PARTS/ASSEMBLIES SEE WIRING DIAGRAM CHAPTER 9

19440_800_130314.eps
130314

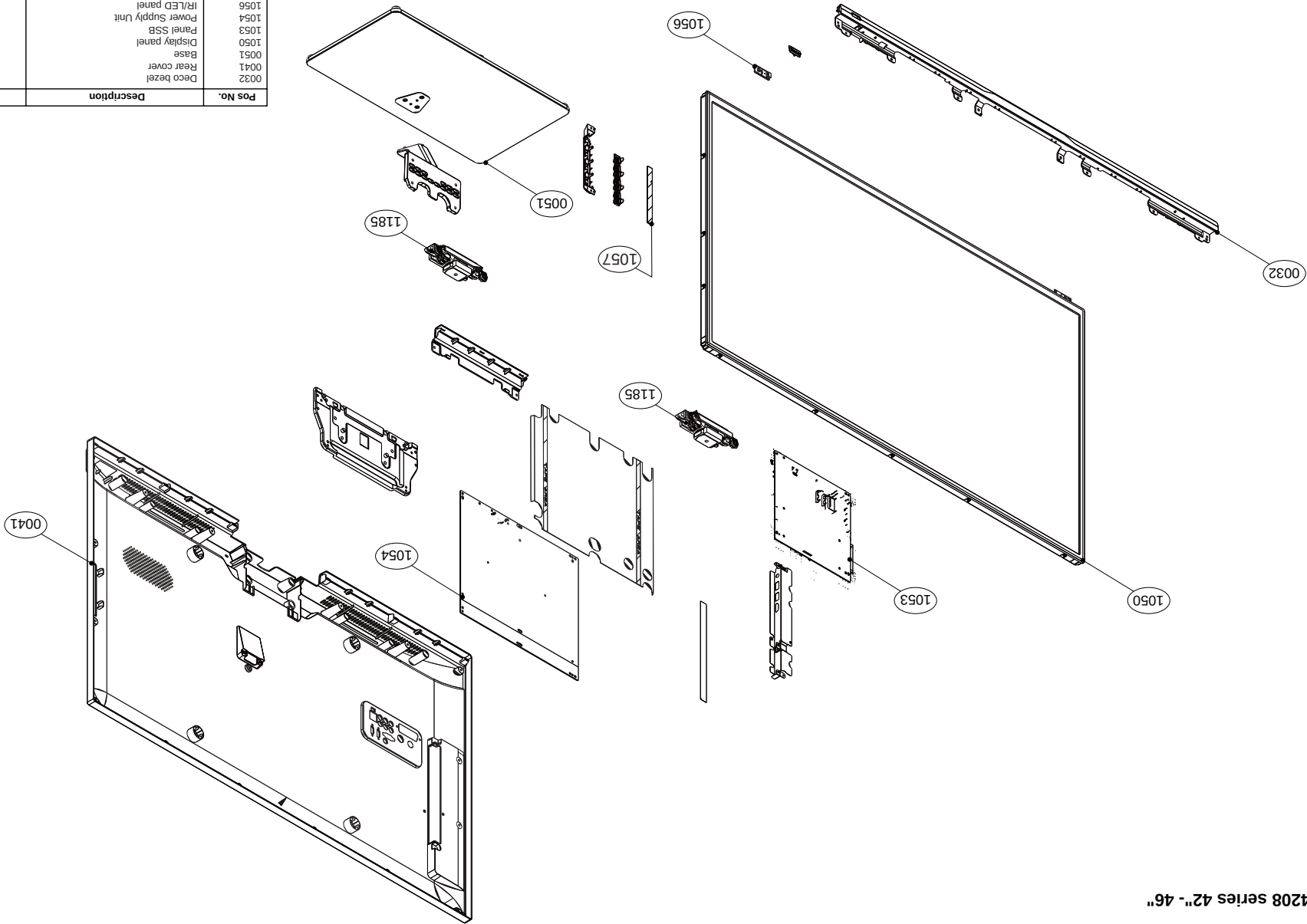
4208 series 39"



Pos No.	Description	Remarks
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0041	Rear cover	
0051	Base	
1050	Display panel	
1053	Panel SSB	
1054	Power Supply Unit	
1056	IR/LED panel	
1057	Keyboard control panel	
1176	Remote control	
1185	Speakers	
		Not displayed

19440_801_130314.eps
130314

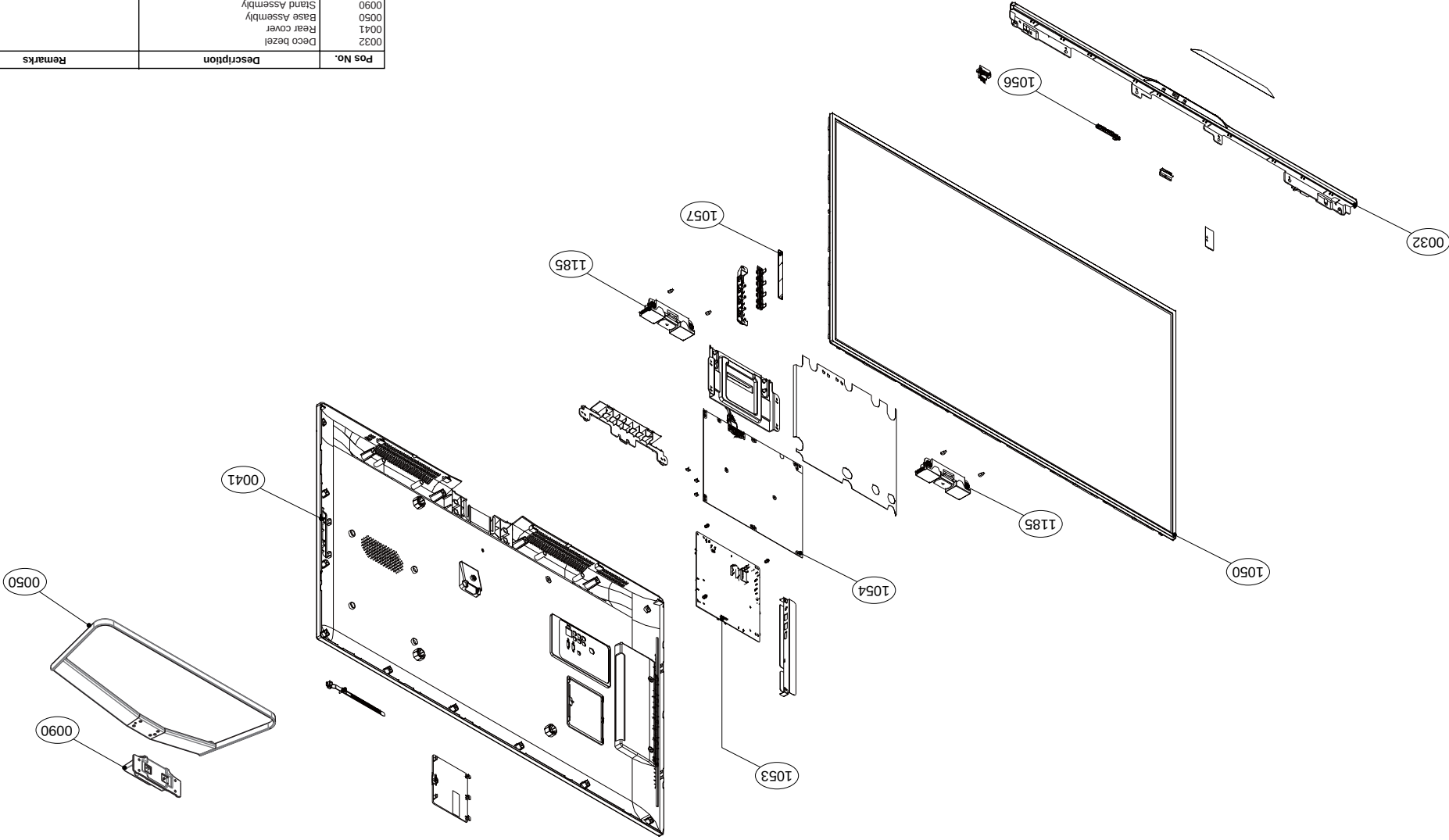
4208 series 42" - 46"



Pos No.	Description	Remarks
0032	Deco bezel	Not displayed
0041	Rear cover	
0051	Base	
1050	Display panel	
1053	Panel SSB	
1054	Power Supply Unit	
1056	IR/LED panel	
1057	Keyboard control panel	
1176	Remote control	
1185	Speakers	

FOR ELECTRICAL PARTS/ASSEMBLIES SEE WIRING DIAGRAM CHAPTER 9

5008 series 42"-46"-50"



Pos No.	Description	Remarks
0032	Deco bezel	
0041	Rear cover	
0050	Base Assembly	
0090	Stand Assembly	
1050	Display panel	
1053	Panel SSB	
1054	Power Supply Unit	
1056	IR/LED panel	
1057	Keyboard control panel	
1176	Remote control	
1185	Speaker	
		Not displayed

FOR ELECTRICAL PARTS/ASSEMBLIES SEE WIRING DIAGRAM CHAPTER 9

194442_800_130520 eps
130520