

Service
Service
Service

TPM21.1E

OA



Service Manual

Chassis name	Platform	Model name	
TPM21.1E OA	MT9970A	48OLED806/12	65OLED706/12
		48OLED936/12	65OLED806/12
		55OLED706/12	65OLED856/12
		55OLED806/12	65OLED876/12
		55OLED856/12	65OLED936/12
		55OLED876/12	65OLED986/12
		55OLED936/12	77OLED806/12

1. Product information	4
2. Precautions, Notes, and Abbreviation List	6
3. Mechanical Instructions	12
Cable dressing (48" OLED806 series)	12
Cable dressing (48" OLED936 series)	13
Cable dressing (55" OLED706 series)	14
Cable dressing (55" OLED8x6 series)	15
Cable dressing (55" OLED936 series)	16
Cable dressing (65" OLED706 series)	17
Cable dressing (65" OLED8x6 series)	18
Cable dressing (65" OLED936 series)	19
Cable dressing (65" OLED986 series)	20
Cable dressing (77" OLED806 series)	21
Assembly/Panel Removal	22
4. Service Modes	27
5. Software upgrading, Error Code and Set Option Code	31
6. Trouble Shooting	37
7. Electrical Diagram	40
8. IC Data Sheet	43
9. Circuit Diagrams	47
9.1 715GA942 PSU	47
9.2 715G9892 PSU	51
9.3 715GB390 SSB	55
9.4 715GB126 SSB	59
9.5 715GA039 IR Board	77
9.6 715GA334 Keyboard control panel	78
9.7 715GB157 AMBI Panel	79
9.8 715GB174 AMBI Panel	81
9.9 715GB205 AMBI Panel	83
9.10 715GB806 AMBI Panel	85
9.11 715GB129 AMBI Panel	87
9.12 715GB175 AMBI Panel	89
10. Styling Sheet	91
OLED806 series 48"	91
OLED936 series 48"	92
OLED706series 55"	93
OLED806 series 55"	94
OLED856/876 series 55"	95
OLED936 series 55"	96
OLED706 series 65"	97
OLED806 series 65"	98
OLED856/876 series 65"	99
OLED936 series 65"	100
OLED706 series 77"	101

11.Dismantling procedure for specific handling parts.....102

1. Product information

Product information is subject to change without notice.

For detailed product information, please visit www.philips.com/support

Display Type

Diagonal screen size

- 139 cm / 55 inch
- 164 cm / 65 inch

Display resolution

- 3840 x 2160
-

Operating System

Android OS :

Android 10

Reception

- Aerial input : 75 ohm coaxial (IEC75)
 - Tuner bands : Hyperband, S-Channel, UHF, VHF
 - DVB : DVB-T2, DVB-C (cable) QAM
 - Analogue video playback : SECAM, PAL
 - Digital video playback : MPEG2 SD/HD (ISO/IEC 13818-2), MPEG4 SD/HD (ISO/IEC 14496-10), HEVC*
 - Digital audio playback (ISO/IEC 13818-3)
 - Satellite aerial input : 75 ohm F-type
 - Input frequency range : 950 to 2150MHz
 - Input level range : 25 to 65 dBm
 - DVB-S/S2 QPSK, symbol rate 2 to 45M symbols, SCPC and MCPC
 - LNB : DiSEqC 1.0, 1 to 4 LNBs supported, Polarity selection 13/18V, Band selection 22kHz, Tone burst mode, LNB current 300mA max
-

Display Input Resolution

Supported Video only resolution

Resolution — Refresh rate

- 480i - 60 Hz
- 576i - 50 Hz
- 1080i - 50 Hz, 60 Hz

Supported Computer/Video resolution

Resolution — Refresh rate

- 640 x 480 - 60Hz
- 576p - 50Hz

- 720p - 50 Hz, 60 Hz
 - 1920 x 1080p - 24 Hz, 25 Hz, 30 Hz, 50 Hz, 60 Hz, 100 Hz, 120 Hz
 - 2560 x 1440 - 60 Hz, 120 Hz
 - 3840 x 2160p - 24 Hz, 25 Hz, 30 Hz, 50 Hz, 60 Hz, 100 Hz, 120 Hz
 - 4096 x 2160p - 24 Hz, 25 Hz, 30 Hz, 50 Hz, 60 Hz, 100 Hz, 120 Hz
-

Connectivity

Common

TV Side

- Common Interface slot: CI+/CAM
- Headphones - Stereo mini-jack 3.5mm
- USB 3 - USB 2.0
- USB 2 - USB 3.0
- HDMI 4 in - ARC - Ultra HD - HDR
- HDMI 3 in - ARC - Ultra HD - HDR

TV Bottom

- Digital audio out - Optical Toslink
 - Network LAN - RJ45
 - Satellite tuner
 - Antenna (75 ohm)
 - HDMI 1 in - ARC - Ultra HD - HDR
 - HDMI 2 in - ARC/eARC - Ultra HD - HDR
 - USB 1 - USB 2.0
-

Sound

Output power (RMS) : 50W

Dolby MS12 V2.5

- Dolby Atmos
 - DTS - HD (M6)
 - DTS Play-Fi
 - Surround Virtualizer + Height Virtualizer
 - Dolby Bass Enhancement
 - Dolby Dialogue Enhancement
 - Dolby Volume (AVL/Night Mode)
 - AI Sound
 - AI EQ
 - Mimi Health Hearing
-

Multimedia

Connections

USB 2.0 / USB 3.0

Ethernet LAN RJ-45

Wi-Fi 802.11a/b/g/n/ ac, Dual Band

BT 5.0

Supported USB file systems

FAT 16, FAT 32, NTFS

Playback formats

- Containers: PS, TS, M2TS, TTS, AVCHD, MP4, M4V, MKV, ASF, AVI, 3GP, Quicktime
- Video Codecs : AVI, MKV, H.264/MPEG-4 AVC, MPEG1, MPEG2, MPEG4, VP9, HEVC (H.265), AV1
- Audio Codecs : MP3, WAV, AAC, WMA (v2 up to v9.2), WMA-PRO (v9 and v10)

Subtitles :

- Formats : SRT, SUB, TXT, SMI
- Character encodings : UTF-8, Central Europe and Eastern Europe (Windows-1250), Cyrillic (Windows-1251), Greek (Windows-1253), Turkish (Windows-1254), Western Europe (Windows-1252)
- Maximum Supported Data Rate :
 - MPEG-4 AVC (H.264) is supported up to High Profile @ L5.1. 30Mbps
 - H.265 (HEVC) is supported up to Main / Main 10 Profile up to Level 5.1 40Mbps
 - VC-1 is supported up to Advanced Profile @ L3
- Image Codecs : JPEG, GIF, PNG, BMP, HEIF, 360 Photo

Supported media server software (DMS)

- You can use any DLNA V1.5 certified media server software (DMS class).
- You can use the Philips TV Remote app (iOS and Android) on mobile devices.

Performance may vary, depending on the capabilities of the mobile device and the software used.

Supported media server software (DMS)

- You can use any DLNA V1.5 certified media server software (DMS class).
- You can use the Philips TV Remote app (iOS and Android) on mobile devices.

Performance may vary, depending on the capabilities of the mobile device and the software used.

Power

- Mains power : AC 220-240V +/-10%
- Ambient temperature : 5°C to 35°C
- Power saving features : Eco mode, Picture mute (for radio), Auto switch-off timer, Eco settings menu.

2. Precautions, Notes, and Abbreviation List

2.1 Safety Instructions

Safety regulations require the following during a repair:

- Connect the set to the Mains/AC Power via an isolation transformer (> 800 VA).
- Replace safety components, indicated by the symbol ▲, only by components identical to the original ones. Any other component substitution (other than original type) may increase risk of fire or electrical shock hazard.

Safety regulations require that after a repair, the set must be returned in its original condition. Pay in particular attention to the following points:

- Route the wire trees correctly and fix them with the mounted cable clamps.
- Check the insulation of the Mains/AC Power lead for external damage.
- Check the strain relief of the Mains/AC Power cord for proper function.
- Check the electrical DC resistance between the Mains/AC Power plug and the secondary side (only for sets that have a Mains/AC Power isolated power supply):
 1. Unplug the Mains/AC Power cord and connect a wire between the two pins of the Mains/AC Power plug.
 2. Set the Mains/AC Power switch to the “on” position (keep the Mains/AC Power cord unplugged!).
 3. Measure the resistance value between the pins of the Mains/AC Power plug and the metal shielding of the tuner or the aerial connection on the set. The reading should be between 4.5 MΩ and 12 MΩ.
 4. Switch “off” the set, and remove the wire between the two pins of the Mains/AC Power plug.
- Check the cabinet for defects, to prevent touching of any inner parts by the customer.

2.2 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.

2.3 Notes

2.3.1 General

- Measure the voltages and waveforms with regard to the chassis (= tuner) ground (⊥), or hot ground (⌋), depending on the tested area of circuitry. The voltages and waveforms shown in the diagrams are indicative. Measure them in the Service Default Mode with a colour bar signal and stereo sound (L: 3 kHz, R: 1 kHz unless stated otherwise) and picture carrier at 475.25 MHz for PAL, or 61.25 MHz for NTSC (channel 3).
- Where necessary, measure the waveforms and voltages with (⌈) and without (⌋) aerial signal. Measure the voltages in the power supply section both in normal operation (Ⓢ) and in stand-by (Ⓢ). These values are indicated by means of the appropriate symbols.

2.3.2 Schematic Notes

- All resistor values are in ohms, and the value multiplier is often used to indicate the decimal point location (e.g. 2K2 indicates 2.2 kΩ).
- Resistor values with no multiplier may be indicated with either an “E” or an “R” (e.g. 220E or 220R indicates 220 Ω).
- All capacitor values are given in micro-farads ($\mu = \times 10^{-6}$), nano-farads ($n = \times 10^{-9}$), or pico-farads ($p = \times 10^{-12}$).
- Capacitor values may also use the value multiplier as the decimal point indication (e.g. 2p2 indicates 2.2 pF).
- An “asterisk” (*) indicates component usage varies. Refer to the diversity tables for the correct values.
- The correct component values are listed on the Philips Spare Parts Web Portal.

2.3.3 Spare parts

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

2.3.4 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.

2.3.5 Lead-free Soldering

Due to lead-free technology some rules have to be respected by the workshop during a repair:

- Use only lead-free soldering tin. If lead-free solder paste is required, please contact the manufacturer of your soldering equipment. In general, use of solder paste within workshops should be avoided because paste is not easy to store and to handle.
- Use only adequate solder tools applicable for lead-free soldering tin. The solder tool must be able:
 - To reach a solder-tip temperature of at least 400°C.
 - To stabilize the adjusted temperature at the solder-tip.
 - To exchange solder-tips for different applications.
- Adjust your solder tool so that a temperature of around 360°C - 380°C is reached and stabilized at the solder joint. Heating time of the solder-joint should not exceed ~ 4 sec. Avoid temperatures above 400°C, otherwise wear-out of tips will increase drastically and flux-fluid will be destroyed. To avoid wear-out of tips, switch “off” unused equipment or reduce heat.
- Mix of lead-free soldering tin/parts with leaded soldering tin/parts is possible but PHILIPS recommends strongly to avoid mixed regimes. If this cannot be avoided, carefully clear the solder-joint from old tin and re-solder with new tin.

2.3.6 Alternative BOM identification

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

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

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

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

Identification: The bottom line of a type plate gives a 14-digit serial number. Digits 1 and 2 refer to the production centre (e.g. 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.

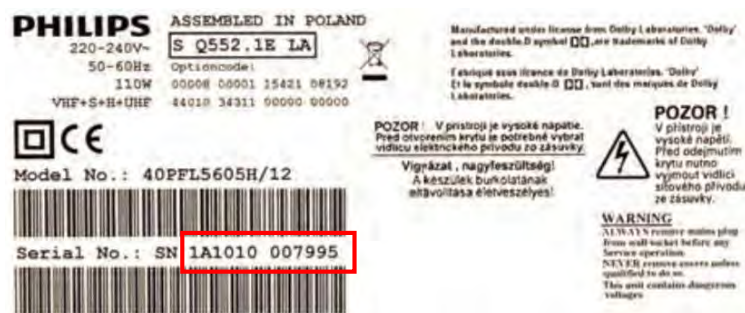


Figure 3-1 Serial number (example)

2.3.7 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!

2.3.8 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.

2.4 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
DNR	Digital Noise Reduction: noise reduction feature of the set
AARA	Automatic Aspect Ratio Adaptation: algorithm that adapts aspect ratio to remove horizontal black bars; keeps the original aspect ratio
ACI	Automatic Channel Installation: algorithm that installs TV channels directly from a cable network by means of a predefined TXT page
ADC	Analogue to Digital Converter
AFC	Automatic Frequency Control: control signal used to tune to the correct frequency
AGC	Automatic Gain Control: algorithm that controls the video input of the feature box
AM	Amplitude Modulation
AP	Asia Pacific
AR	Aspect Ratio: 4 by 3 or 16 by 9
ASF	Auto Screen Fit: algorithm that adapts aspect ratio to remove horizontal black bars without discarding video information
ATSC	Advanced Television Systems Committee, the digital TV standard in the USA
ATV	See Auto TV
Auto TV	A hardware and software control system that measures picture content, and adapts image parameters in a dynamic way
AV	External Audio Video
AVC	Audio Video Controller
AVIP	Audio Video Input Processor
B/G	Monochrome TV system. Sound carrier distance is 5.5 MHz
BDS	Business Display Solutions (iTV)
BLR	Board-Level Repair
BTSC	Broadcast Television Standard Committee. Multiplex FM stereo sound system,

B-TXT	originating from the USA and used e.g. in LATAM and AP-NTSC countries
C	Blue TeleteXT
CEC	Centre channel (audio)
	Consumer Electronics Control bus: remote control bus on HDMI connections
CL	Constant Level: audio output to connect with an external amplifier
CLR	Component Level Repair
ComPair	Computer aided rePair
CP	Connected Planet / Copy Protection
CSM	Customer Service Mode
CTI	Color Transient Improvement: manipulates steepness of chroma transients
CVBS	Composite Video Blanking and Synchronization
DAC	Digital to Analogue Converter
DBE	Dynamic Bass Enhancement: extra low frequency amplification
DCM	Data Communication Module. Also referred to as System Card or Smartcard (for iTV).
DDC	See "E-DDC"
D/K	Monochrome TV system. Sound carrier distance is 6.5 MHz
DFI	Dynamic Frame Insertion
DFU	Directions For Use: owner's manual
DMR	Digital Media Reader: card reader
DMSD	Digital Multi Standard Decoding
DNM	Digital Natural Motion
DRAM	Dynamic RAM
DRM	Digital Rights Management
DSP	Digital Signal Processing
DST	Dealer Service Tool: special remote control designed for service technicians
DTCP	Digital Transmission Content Protection; A protocol for protecting digital audio/video content that is traversing a high speed serial bus, such as IEEE-1394
DVB-C	Digital Video Broadcast - Cable
DVB-T	Digital Video Broadcast - Terrestrial
DVD	Digital Versatile Disc
DVI(-d)	Digital Visual Interface (d= digital only)
E-DDC	Enhanced Display Data Channel (VESA standard for communication channel and display). Using E-DDC, the video source can read the EDID information from the display.

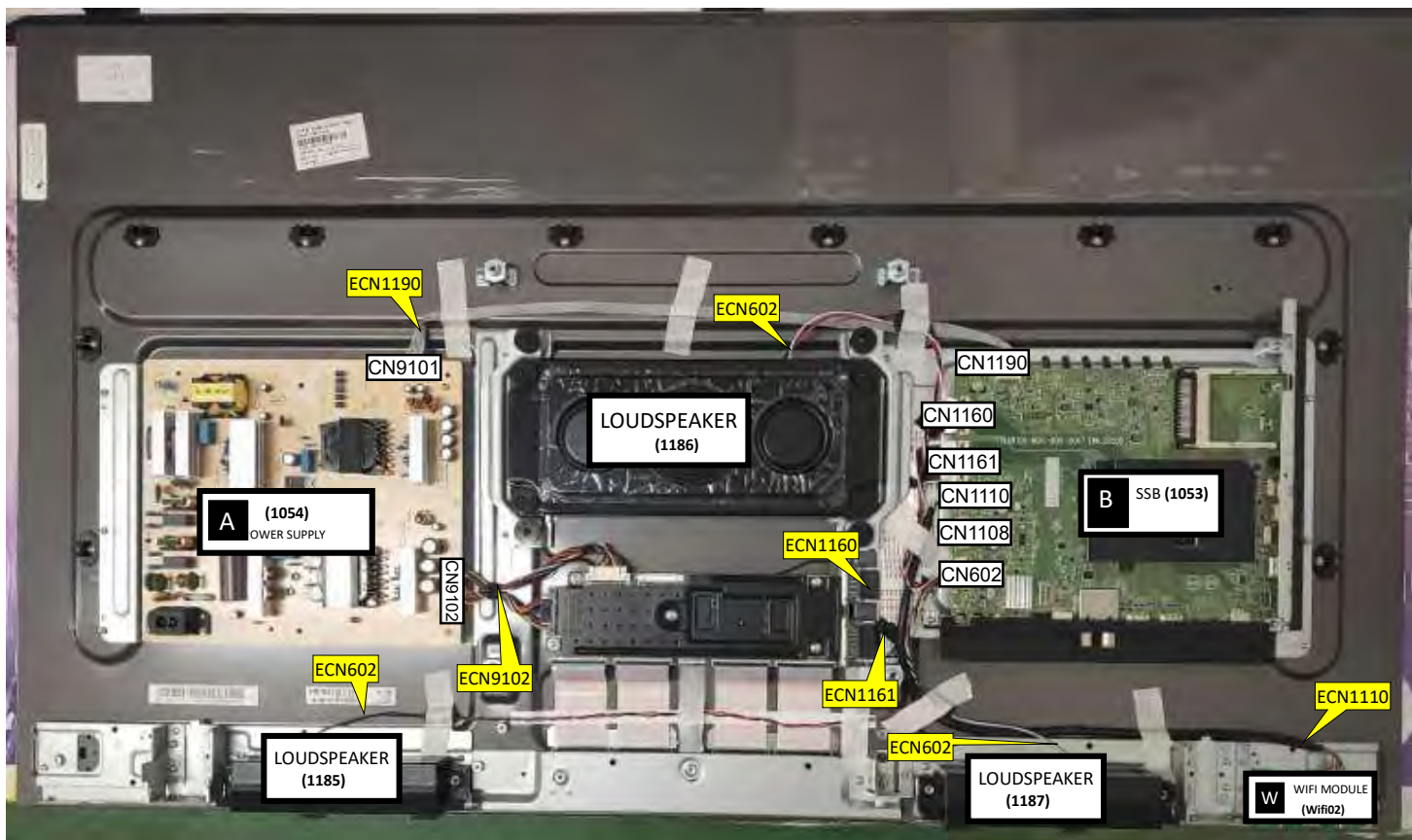
EDID	Extended Display Identification Data (VESA standard)		Uncompressed digital component or digital composite signals can be used. The SDI signal is self-synchronizing, uses 8 bit or 10 bit data words, and has a maximum data rate of 270 Mbit/s, with a minimum bandwidth of 135 MHz.
EEPROM	Electrically Erasable and Programmable Read Only Memory		
EMI	Electro Magnetic Interference		
EPG	Electronic Program Guide		
EPLD	Erasable Programmable Logic Device	iTV	Institutional TeleVision; TV sets for hotels, hospitals etc.
EU	Europe		
EXT	EXternal (source), entering the set by SCART or by cinches (jacks)	LS	Last Status; The settings last chosen by the customer and read and stored in RAM or in the NVM. They are called at start-up of the set to configure it according to the customer's preferences
FDS	Full Dual Screen (same as FDW)		
FDW	Full Dual Window (same as FDS)		
FLASH	FLASH memory		
FM	Field Memory or Frequency Modulation	LATAM	Latin America
FPGA	Field-Programmable Gate Array	LCD	Liquid Crystal Display
FTV	Flat TeleVision	LED	Light Emitting Diode
Gb/s	Giga bits per second	L/L'	Monochrome TV system. Sound carrier distance is 6.5 MHz. L' is Band I, L is all bands except for Band I
G-TXT	Green TeleteXT		
H	H_sync to the module		
HD	High Definition	LPL	LG.Philips LCD (supplier)
HDD	Hard Disk Drive	LS	Loudspeaker
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.	LVDS Mbps M/N MHEG MIPS	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
HDMI	High Definition Multimedia Interface		
HP	HeadPhone		
I	Monochrome TV system. Sound carrier distance is 6.0 MHz	MOP MOSFET	Matrix Output Processor Metal Oxide Silicon Field Effect Transistor, switching device
I²C	Inter IC bus		
I²D	Inter IC Data bus	MPEG	Motion Pictures Experts Group
I²S	Inter IC Sound bus	MPIF	Multi Platform InterFace
IF	Intermediate Frequency	MUTE	MUTE Line
IR	Infra Red	MTV	Mainstream TV: TV-mode with Consumer TV features enabled (iTV)
IRQ	Interrupt Request		
ITU-656	The ITU Radio communication Sector (ITU-R) is a standards body subcommittee of the International Telecommunication Union relating to radio communication. ITU-656 (a.k.a. SDI), is a digitized video format used for broadcast grade video.	NC NICAM NTC	Not Connected Near Instantaneous Compounded Audio Multiplexing. This is a digital sound system, mainly used in Europe. Negative Temperature Coefficient, non-linear resistor

NTSC	National Television Standard Committee. Color system mainly used in North America and Japan. Color carrier NTSC M/N= 3.579545 MHz, NTSC 4.43= 4.433619 MHz (this is a VCR norm, it is not transmitted off-air)	RAM	Random Access Memory
		RGB	Red, Green, and Blue. The primary color signals for TV. By mixing levels of R, G, and B, all colors (Y/C) are reproduced.
		RC	Remote Control
NVM	Non-Volatile Memory: IC containing TV related data such as alignments	RC5 / RC6	Signal protocol from the remote control receiver
O/C	Open Circuit	RESET	RESET signal
OSD	On Screen Display	ROM	Read Only Memory
OAD	Over the Air Download. Method of software upgrade via RF transmission. Upgrade software is broadcasted in TS with TV channels.	RSDS	Reduced Swing Differential Signalling data interface
		R-TXT	Red Teletext
		SAM	Service Alignment Mode
		S/C	Short Circuit
OTC	On screen display Teletext and Control; also called Artistic (SAA5800)	SCART	Syndicat des Constructeurs d'Appareils Radiorécepteurs et Téléviseurs
P50	Project 50: communication protocol between TV and peripherals	SCL	Serial Clock I ² C
		SCL-F	CLock Signal on Fast I ² C bus
PAL	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)	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"
PCB	Printed Circuit Board (same as "PWB")	SDRAM	Synchronous DRAM
PCM	Pulse Code Modulation	SECAM	SEquence Couleur Avec Mémoire. Colour system mainly used in France and East Europe. Colour carriers = 4.406250 MHz and 4.250000 MHz
PDP	Plasma Display Panel		
PFC	Power Factor Corrector (or Pre-conditioner)	SIF	Sound Intermediate Frequency
PIP	Picture In Picture	SMPS	Switched Mode Power Supply
PLL	Phase Locked Loop. Used for e.g. FST tuning systems. The customer can give directly the desired frequency	SoC	System on Chip
		SOG	Sync On Green
		SOPS	Self Oscillating Power Supply
POD	Point Of Deployment: a removable CAM module, implementing the CA system for a host (e.g. a TV-set)	SPI	Serial Peripheral Interface bus; a 4-wire synchronous serial data link standard
		S/PDIF	Sony Philips Digital InterFace
POR	Power On Reset, signal to reset the uP	SRAM	Static RAM
PSDL	Power Supply for Direct view LED backlight with 2D-dimming	SRP	Service Reference Protocol
		SSB	Small Signal Board
PSL	Power Supply with integrated LED drivers	SSC	Spread Spectrum Clocking, used to reduce the effects of EMI
PSLS	Power Supply with integrated LED drivers with added Scanning functionality		
		STB	Set Top Box
PTC	Positive Temperature Coefficient, non-linear resistor	STBY	STand-BY
		SVGA	800 × 600 (4:3)
PWB	Printed Wiring Board (same as "PCB")	SVHS	Super Video Home System
PWM	Pulse Width Modulation	SW	Software
QRC	Quasi Resonant Converter	SWAN	Spatial temporal Weighted Averaging Noise reduction
QTNR	Quality Temporal Noise Reduction		
QVCP	Quality Video Composition Processor	SXGA	1280 × 1024

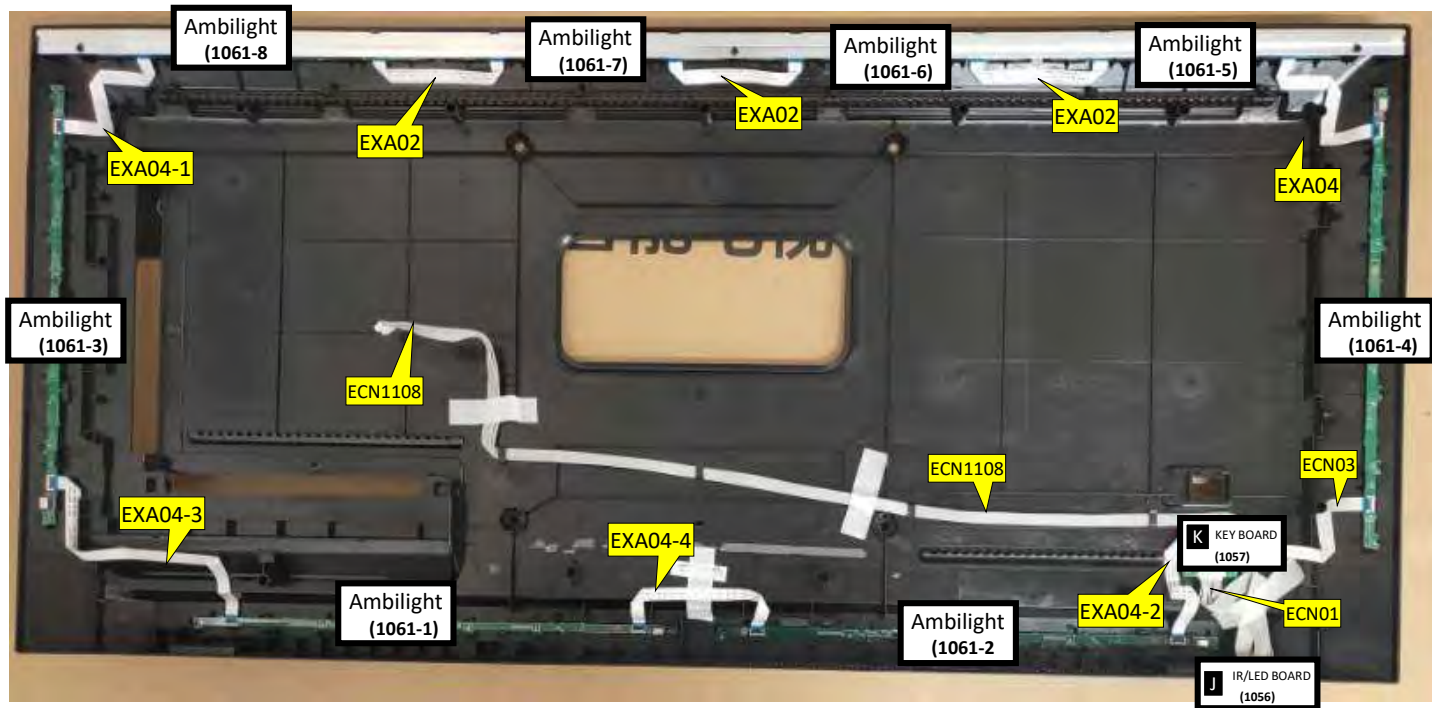
TFT	Thin Film Transistor		toward external amplifier
THD	Total Harmonic Distortion	VSB	Vestigial Side Band; modulation method
TMDS	Transmission Minimized Differential Signalling	WYSIWYR	What You See Is What You Record: record selection that follows main picture and sound
TS	Transport Stream		
TXT	TeleteXT	WXGA	1280 × 768 (15:9)
TXT-DW	Dual Window with TeleteXT	XTAL	Quartz crystal
UI	User Interface	XGA	1024 × 768 (4:3)
uP	Microprocessor	Y	Luminance signal
UXGA	1600 × 1200 (4:3)	Y/C	Luminance (Y) and Chrominance (C) signal
V	V-sync to the module		
VESA	Video Electronics Standards Association	YPbPr	Component video. Luminance and scaled color difference signals (B-Y and R-Y)
VGA	640 × 480 (4:3)		
VL	Variable Level out: processed audio output	YUV	Component video

3. Mechanical Instructions

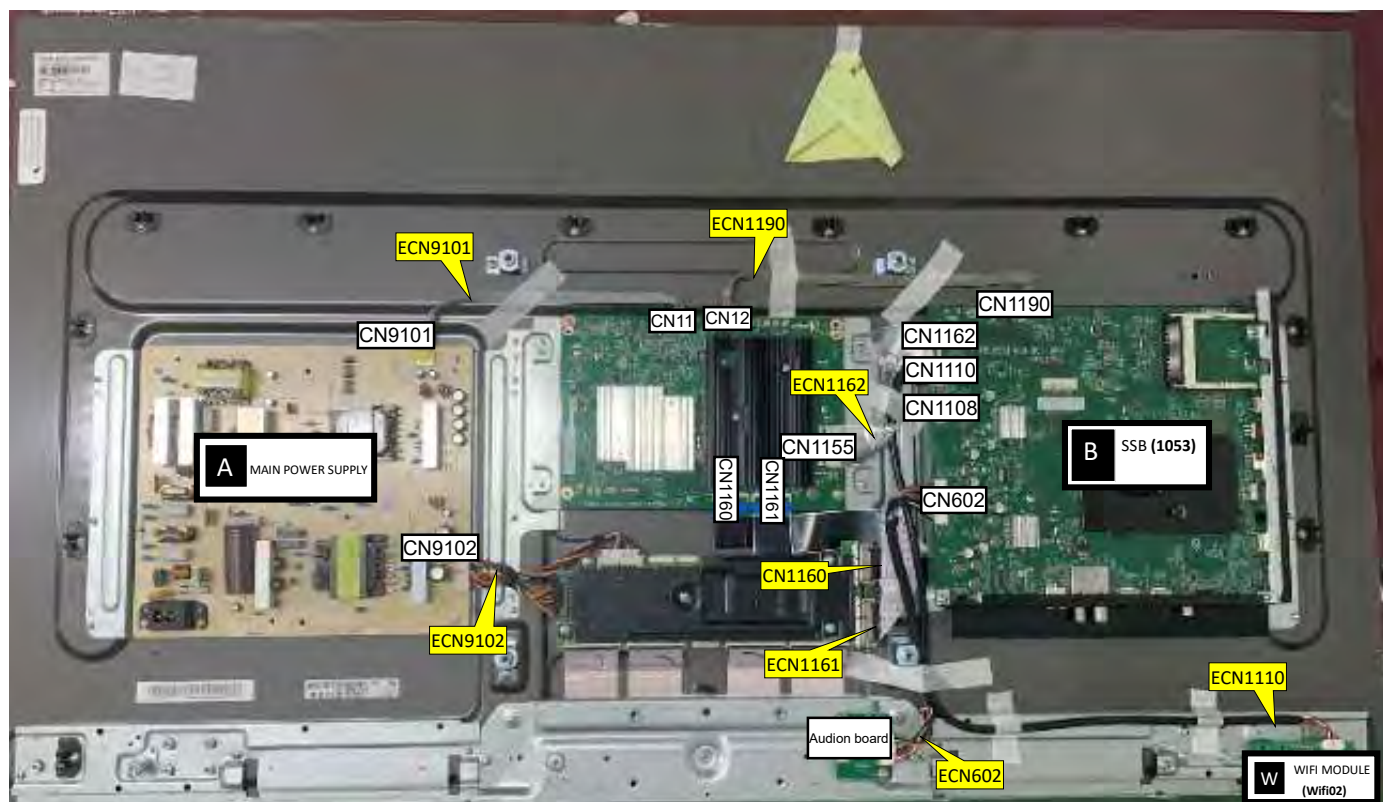
3.1 Cable Dressing



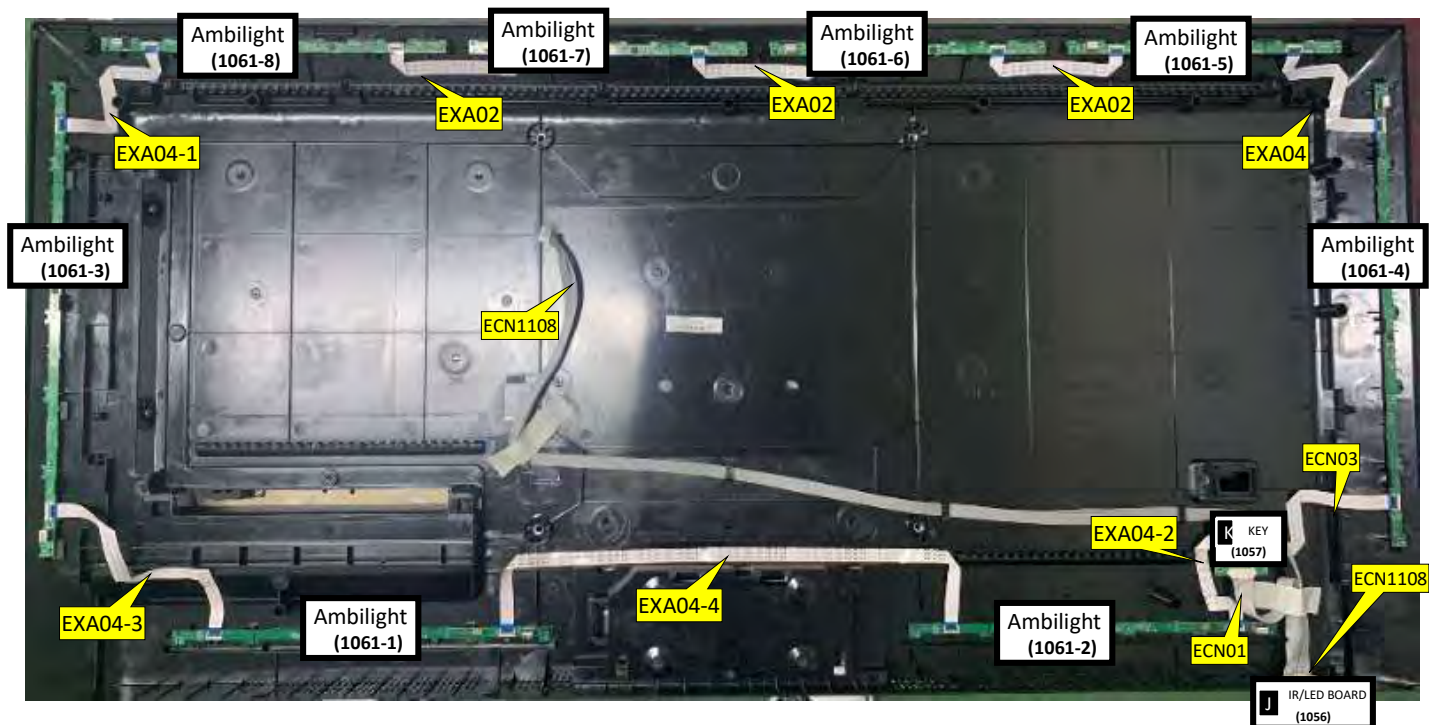
Cable dressing (48" OLED806 series)



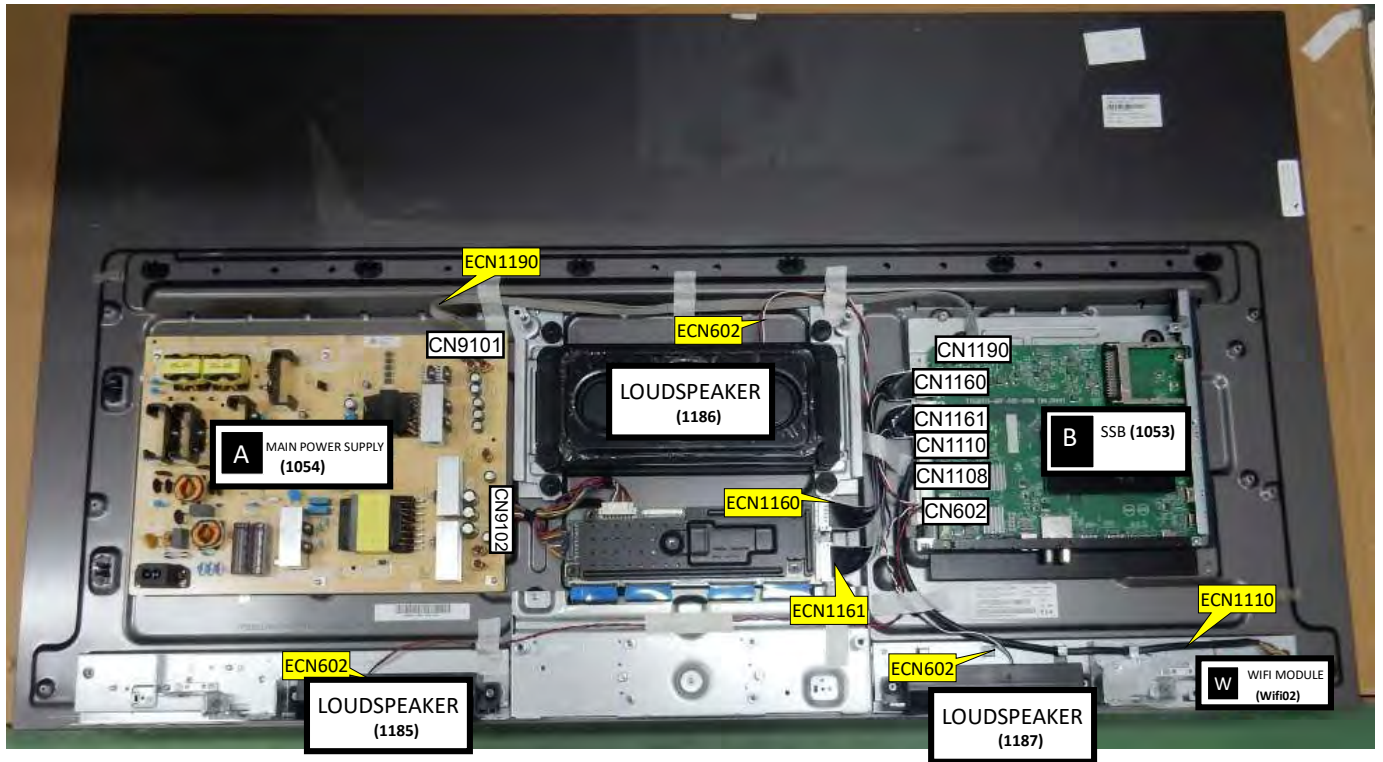
Back cover overview (48" OLED806 series)



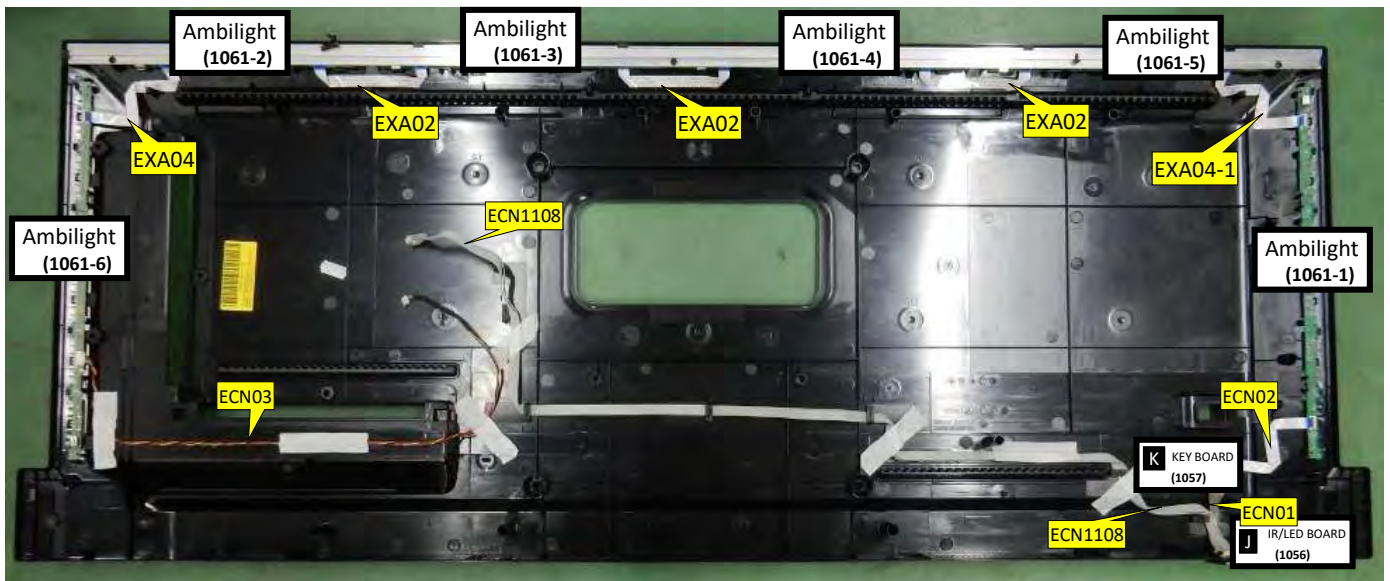
Cable dressing (48" OLED936 series)



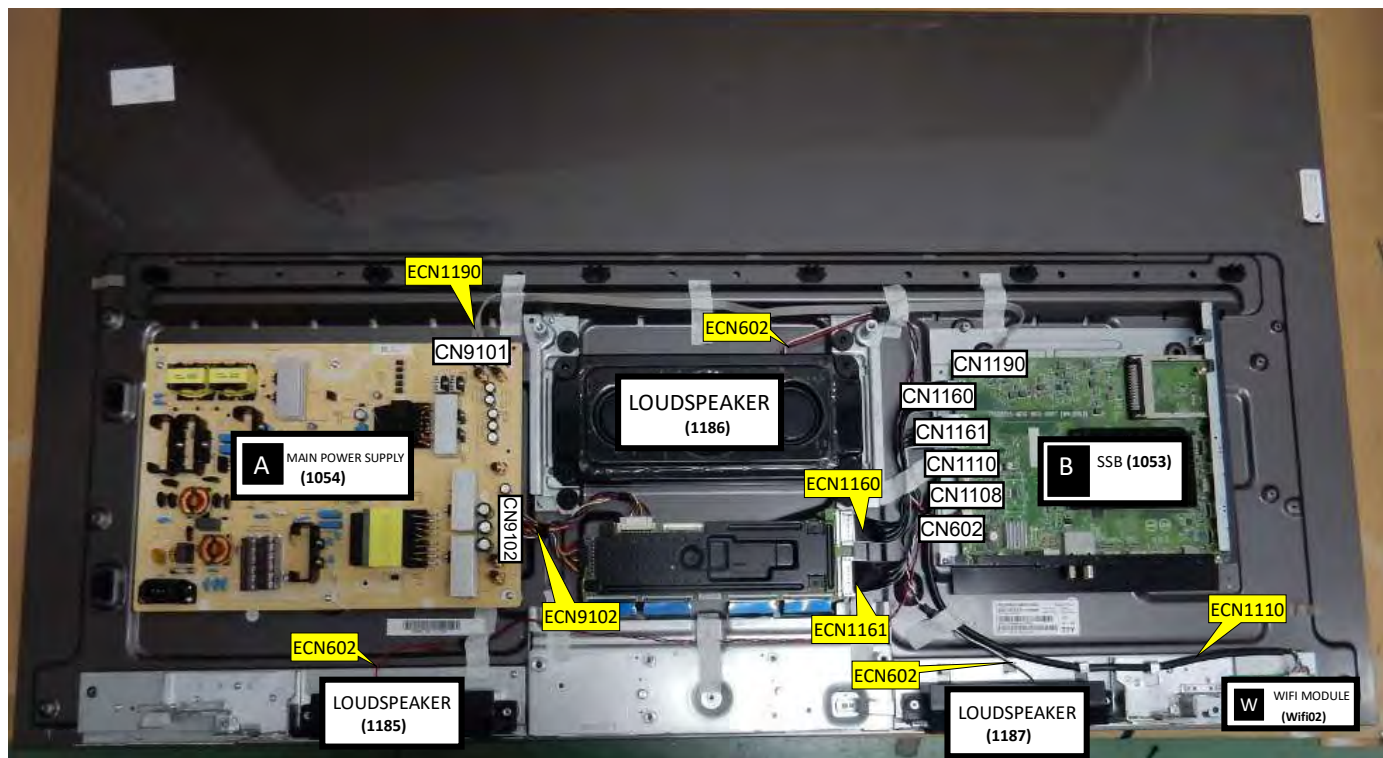
Back cover overview (48" OLED936 series)



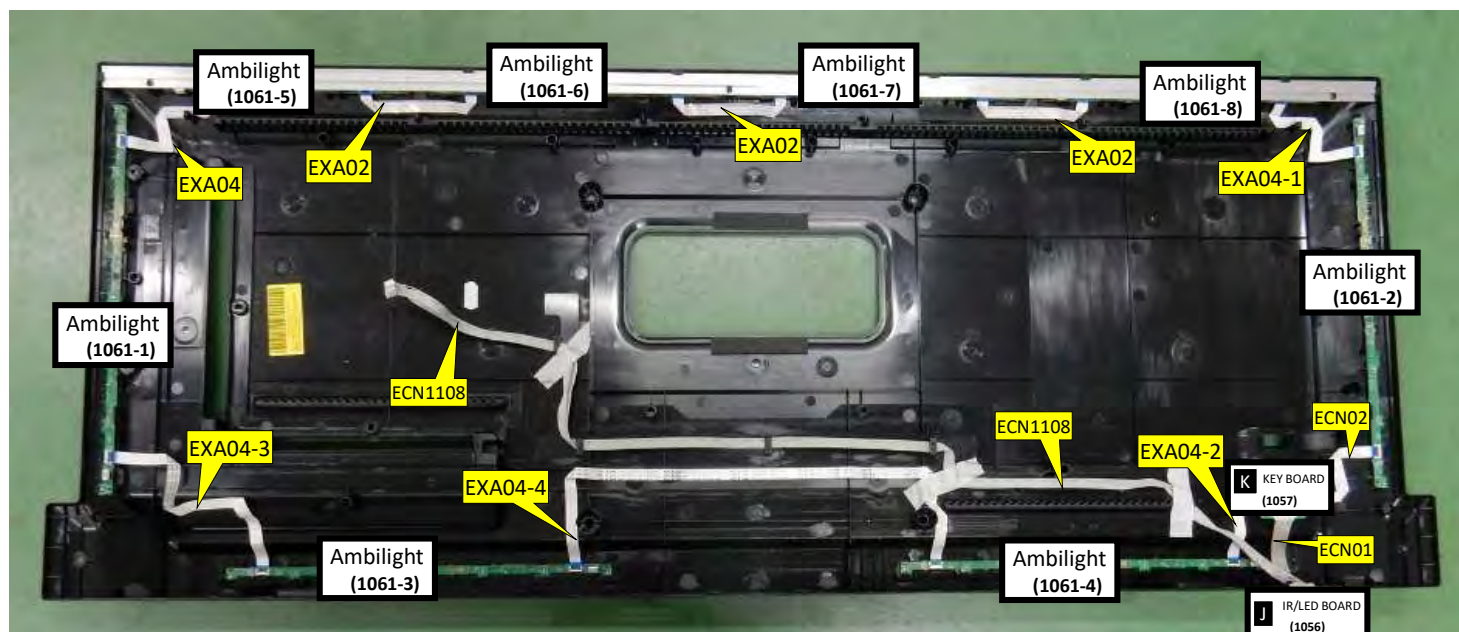
Cable dressing (55" OLED706 series)



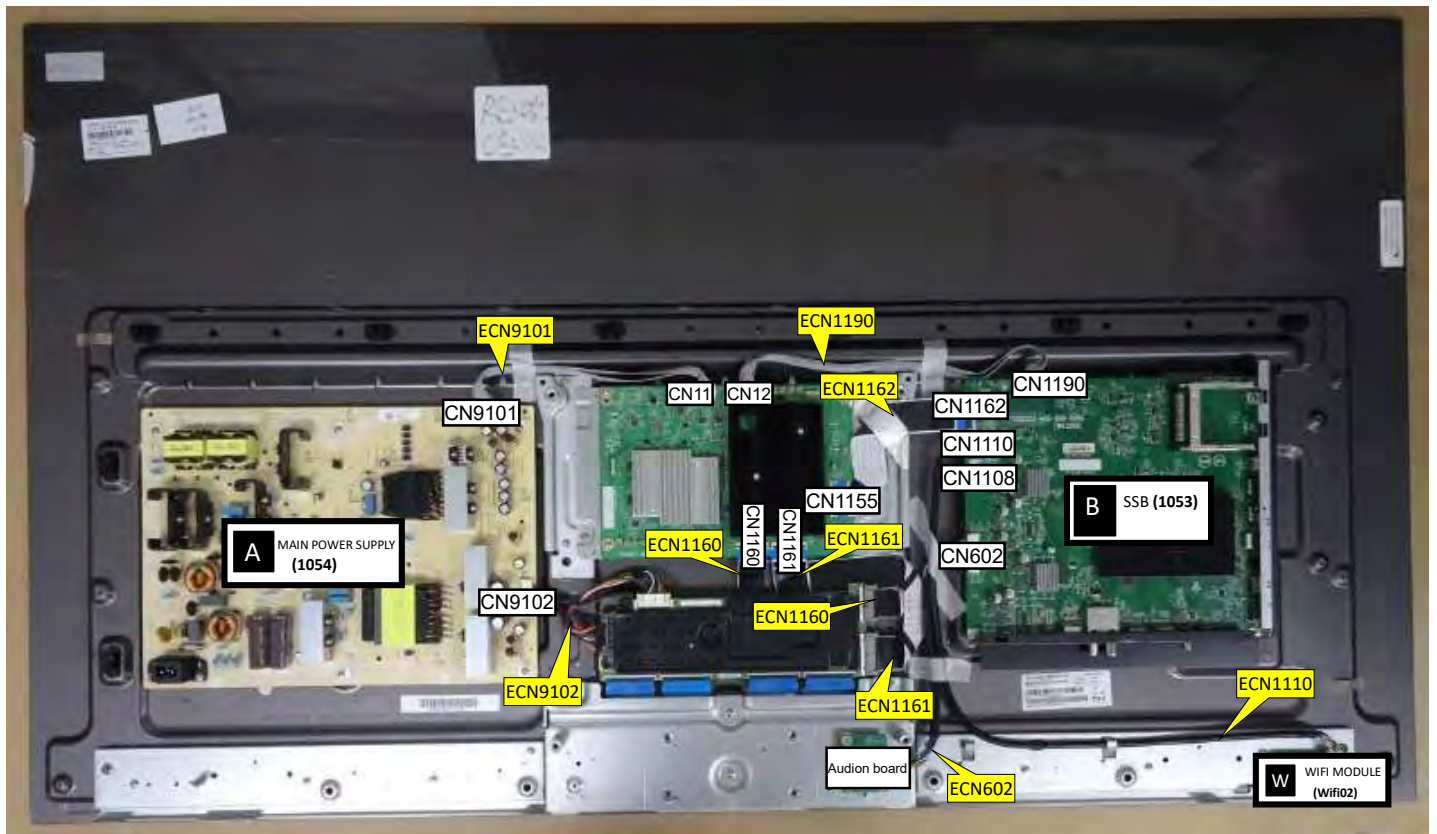
Back cover overview (55" OLED706 series)



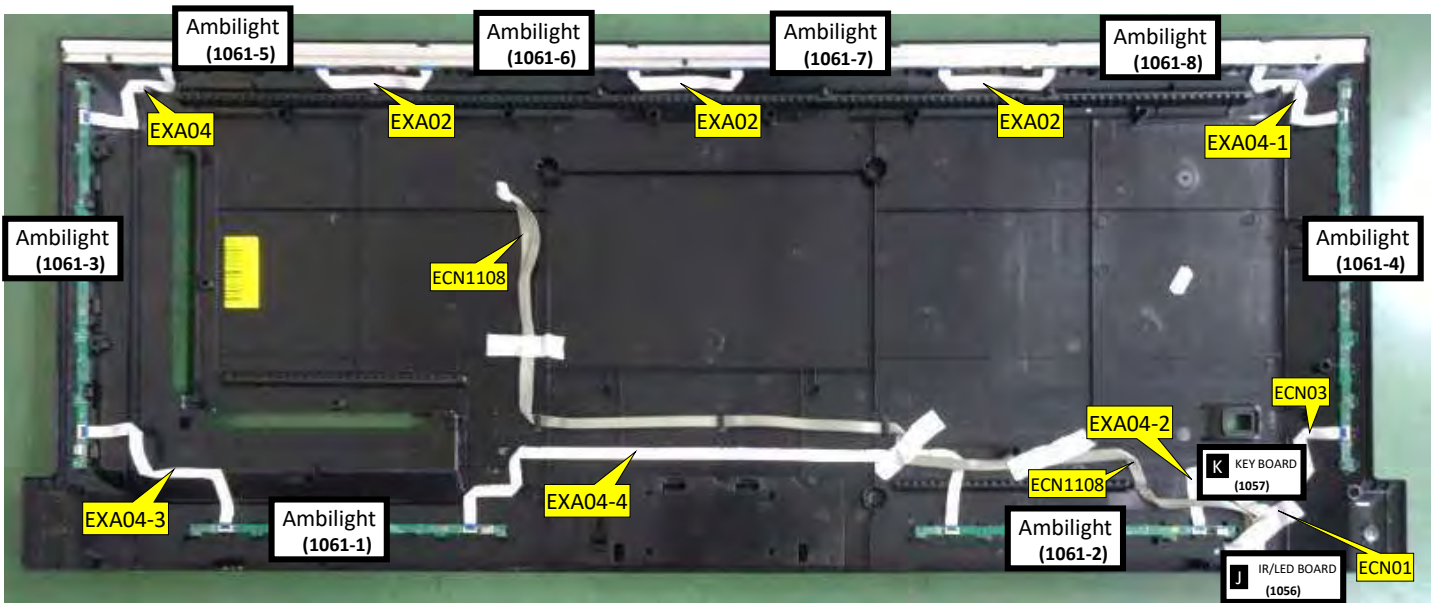
Cable dressing (55" OLED8x6 series)



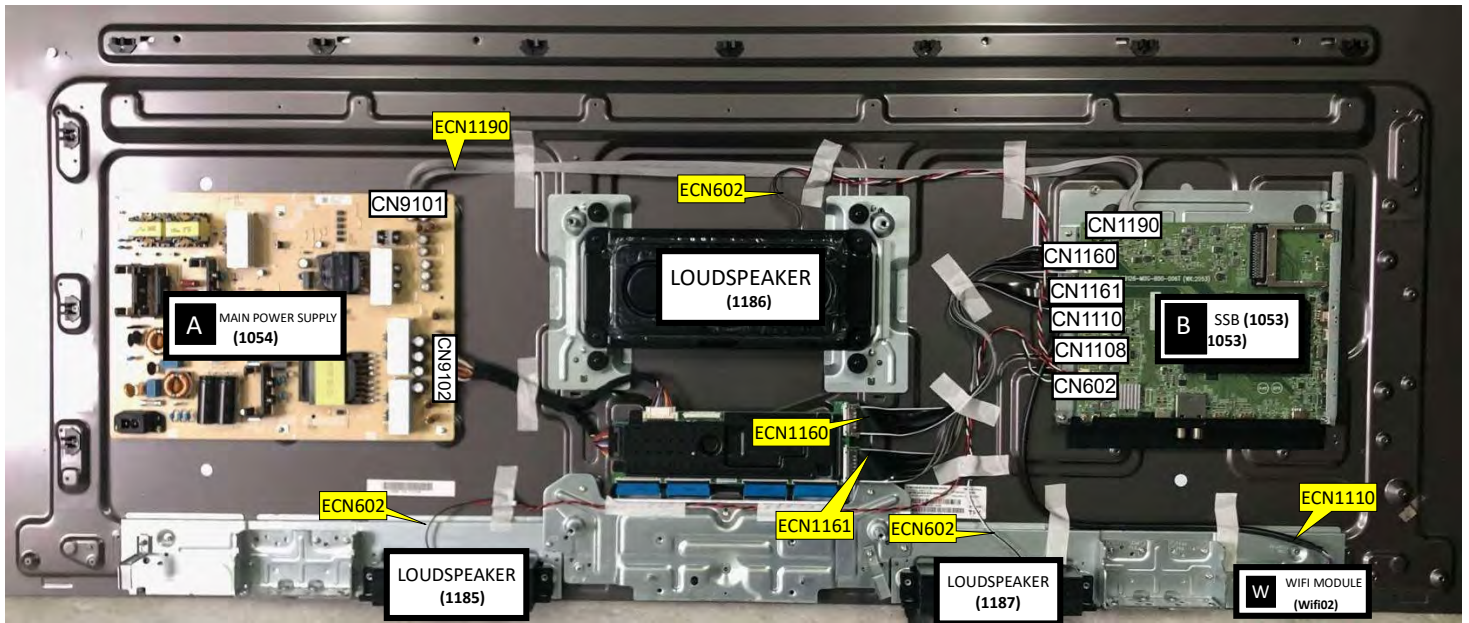
Back cover overview (55" OLED8x6 series)



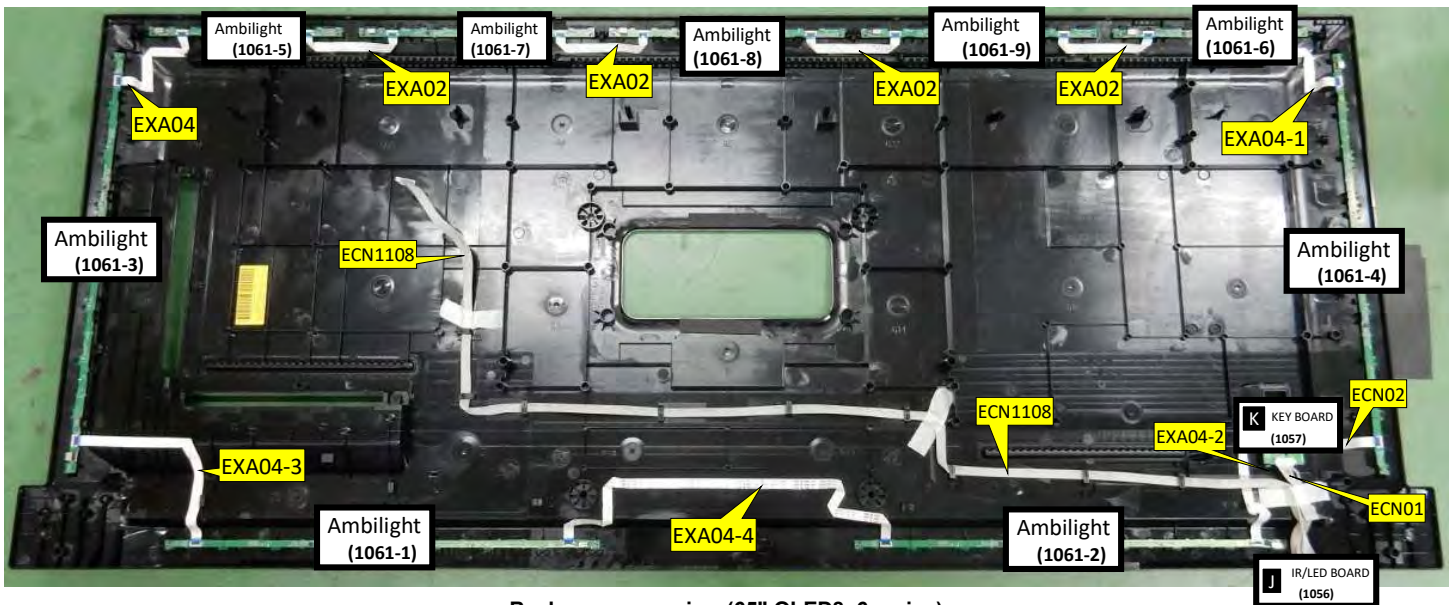
Cable dressing (55" OLED936 series)



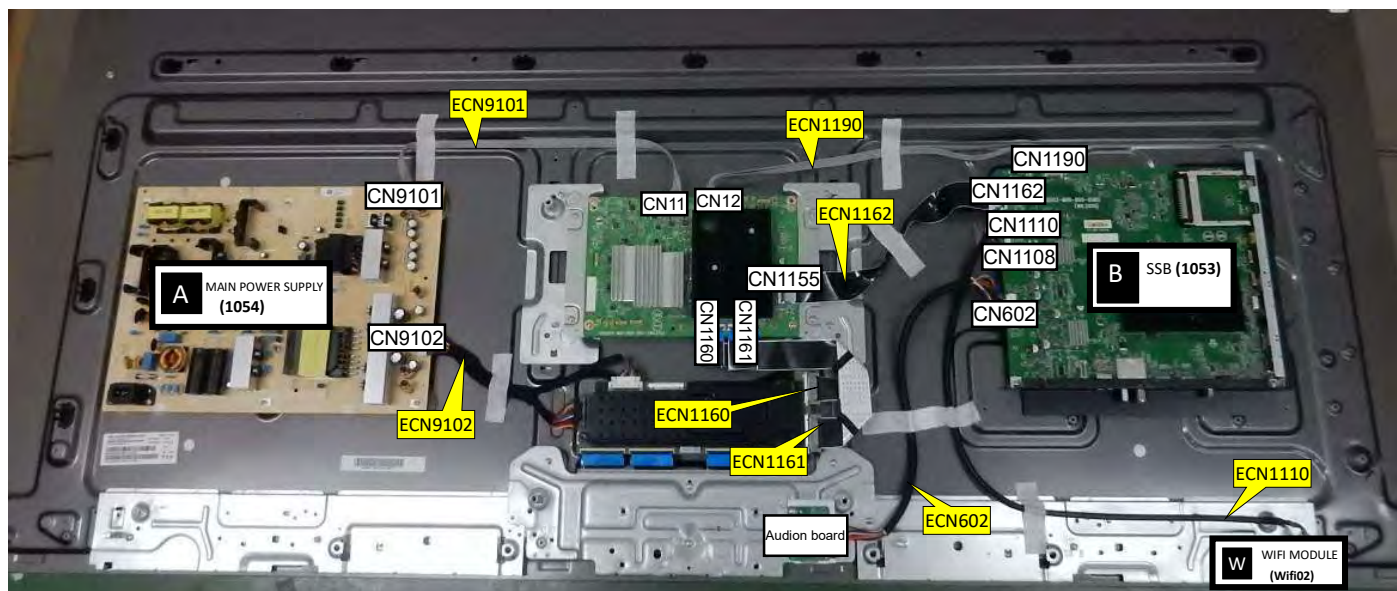
Back cover overview (55" OLED936 series)



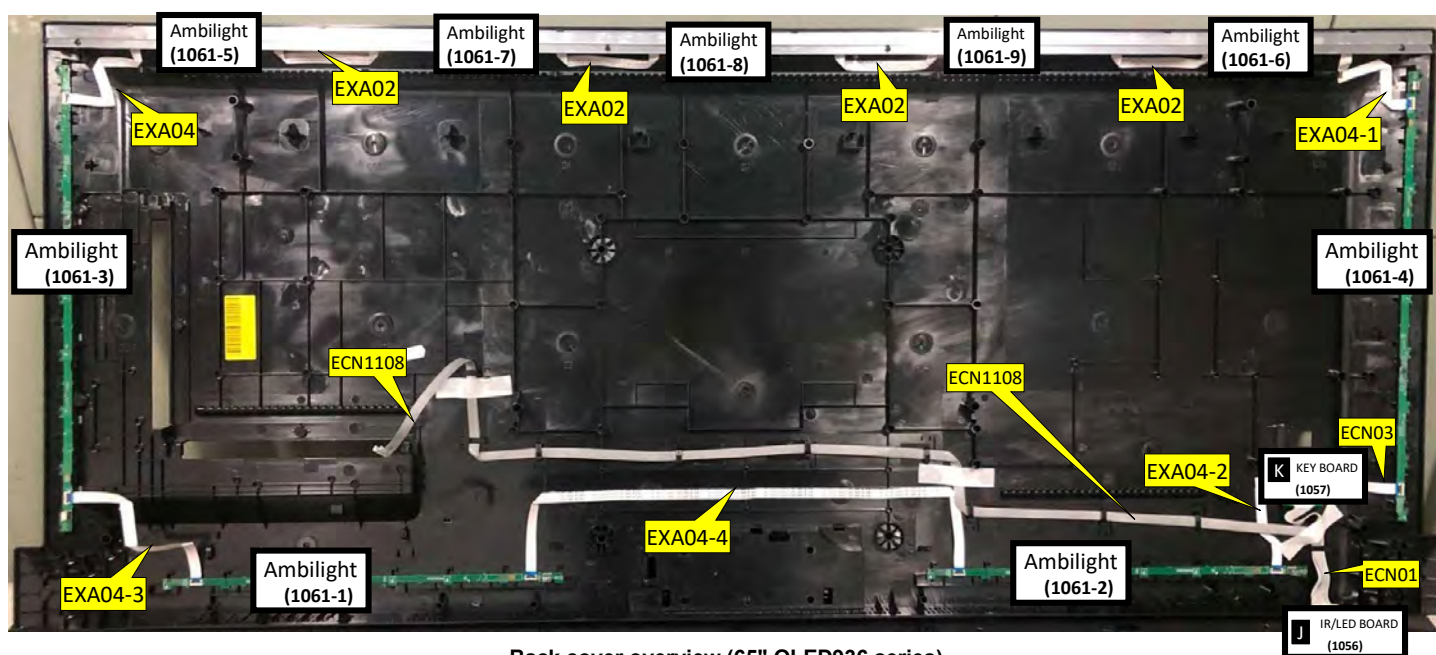
Cable dressing (65" OLED8x6 series)



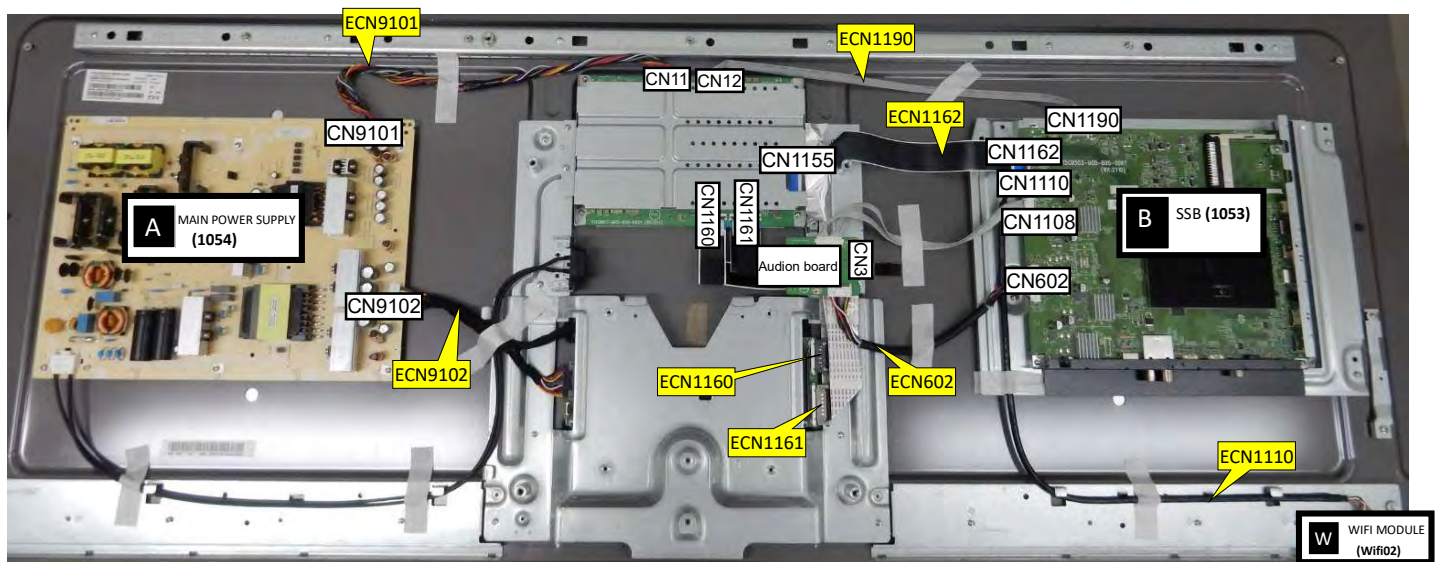
Back cover overview (65" OLED8x6 series)



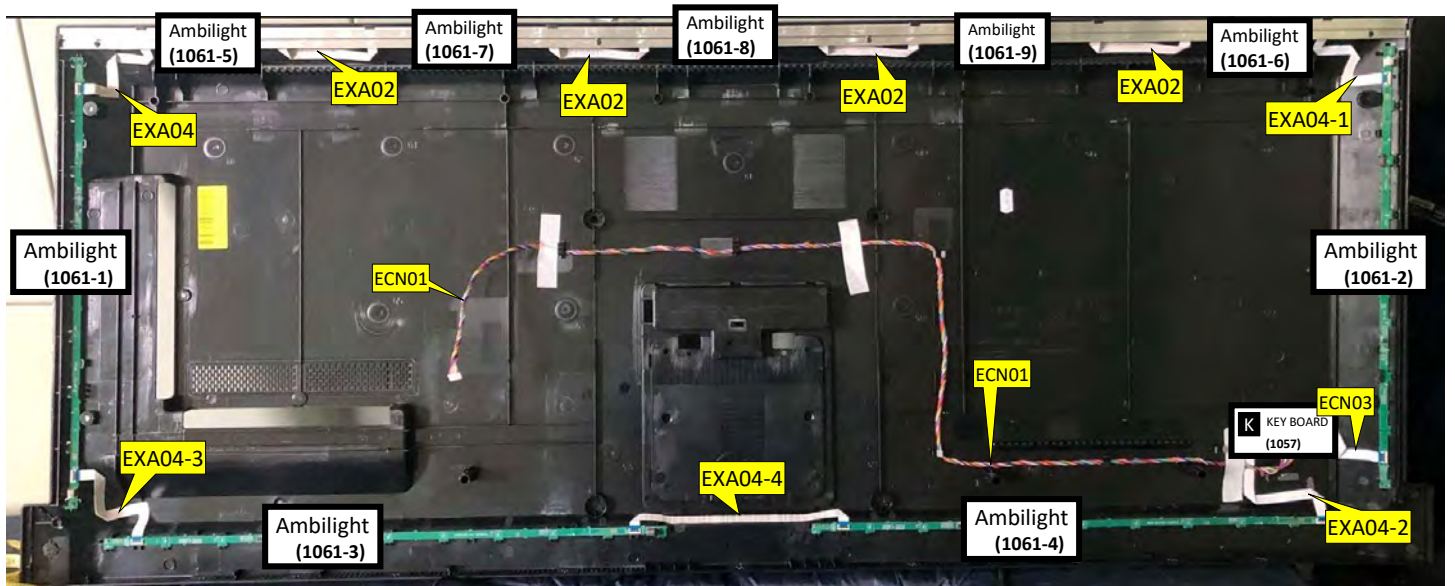
Cable dressing (65" OLED936 series)



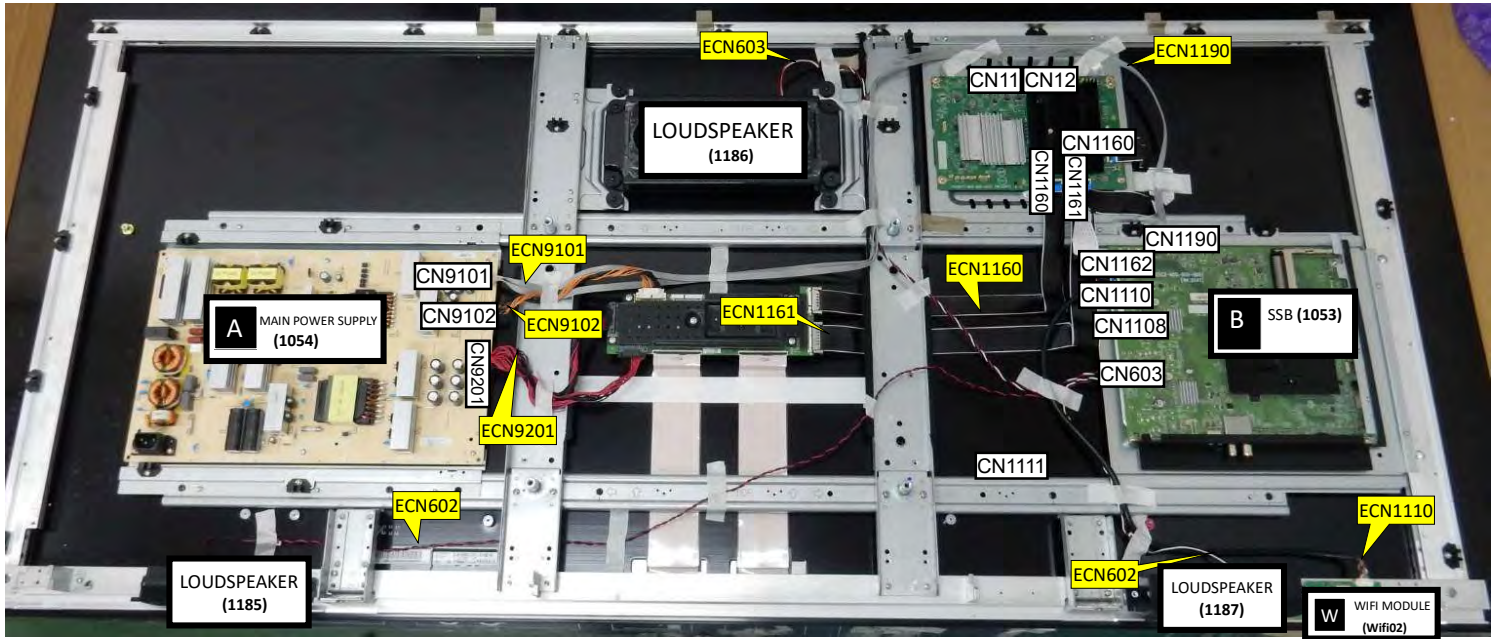
Back cover overview (65" OLED936 series)



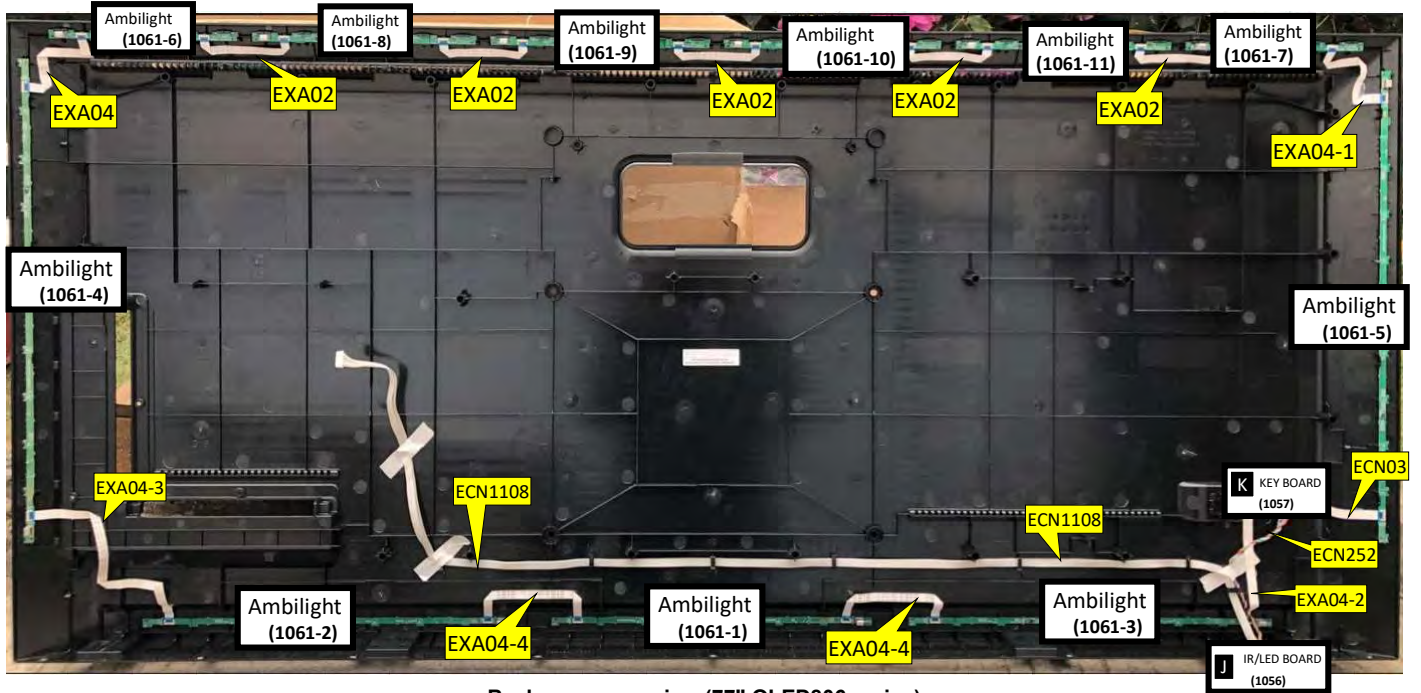
Cable dressing (65" OLED986 series)



Back cover overview (65" OLED986 series)



Cable dressing (77" OLED806 series)

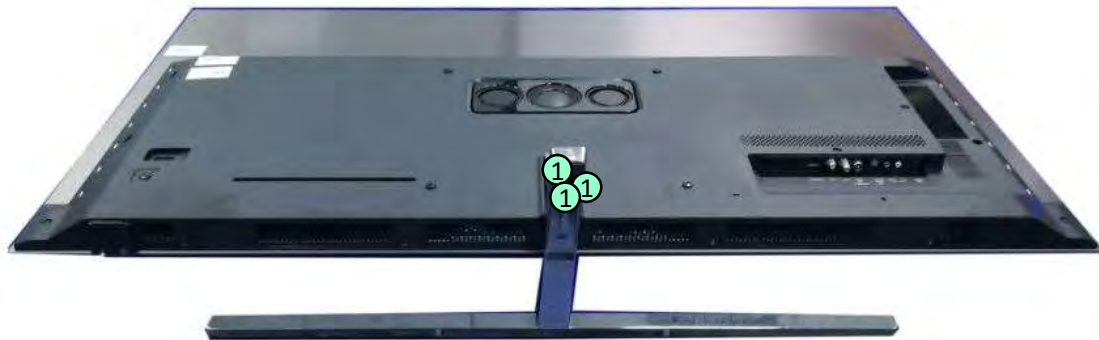


Back cover overview (77" OLED806 series)

3.2 Assembly/Panel Removal

3.2.1 Stand removal

1. Remove the fixation screws [1] that secure the stand.
2. Take the stand bracket out from the set.



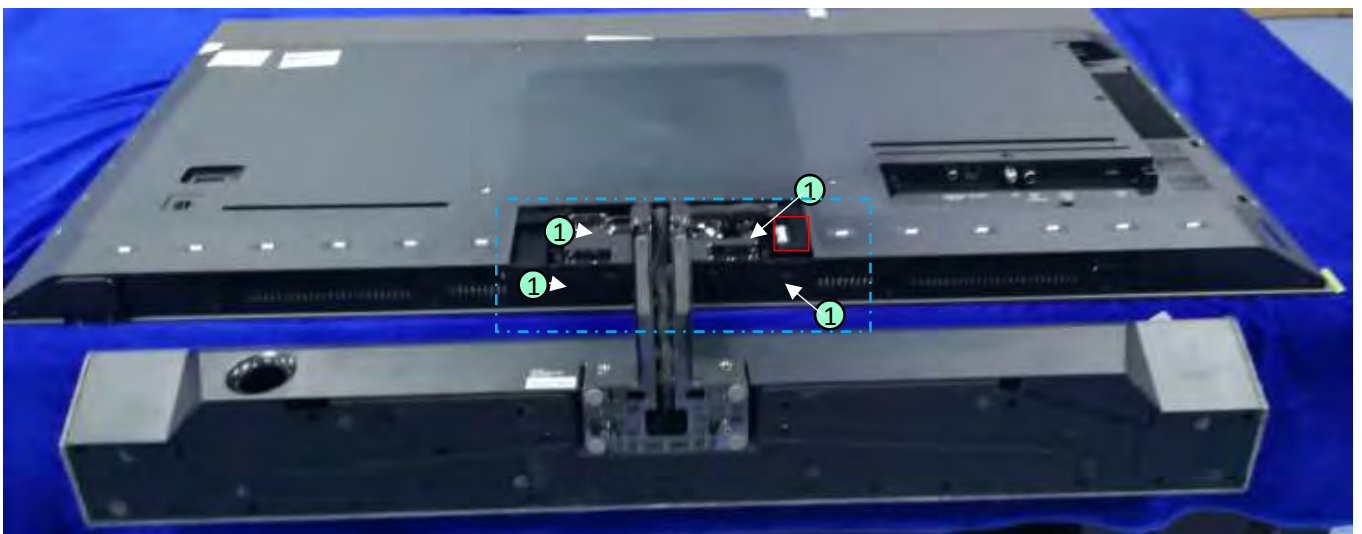
(55"/65" OLED8x6 Series stand removal)



(55"/65" OLED706 Series stand removal)

Stand removal and rear cover for 936 series

1. Remove the cover in the blue box first
2. Release the connector from the Audio Board in red box as following
3. Remove the fixation screws [1] that secure the stand.
4. Take the stand bracket out from the set as below indicated.



(48"/55"/65" OLED936 Series stand removal -1)



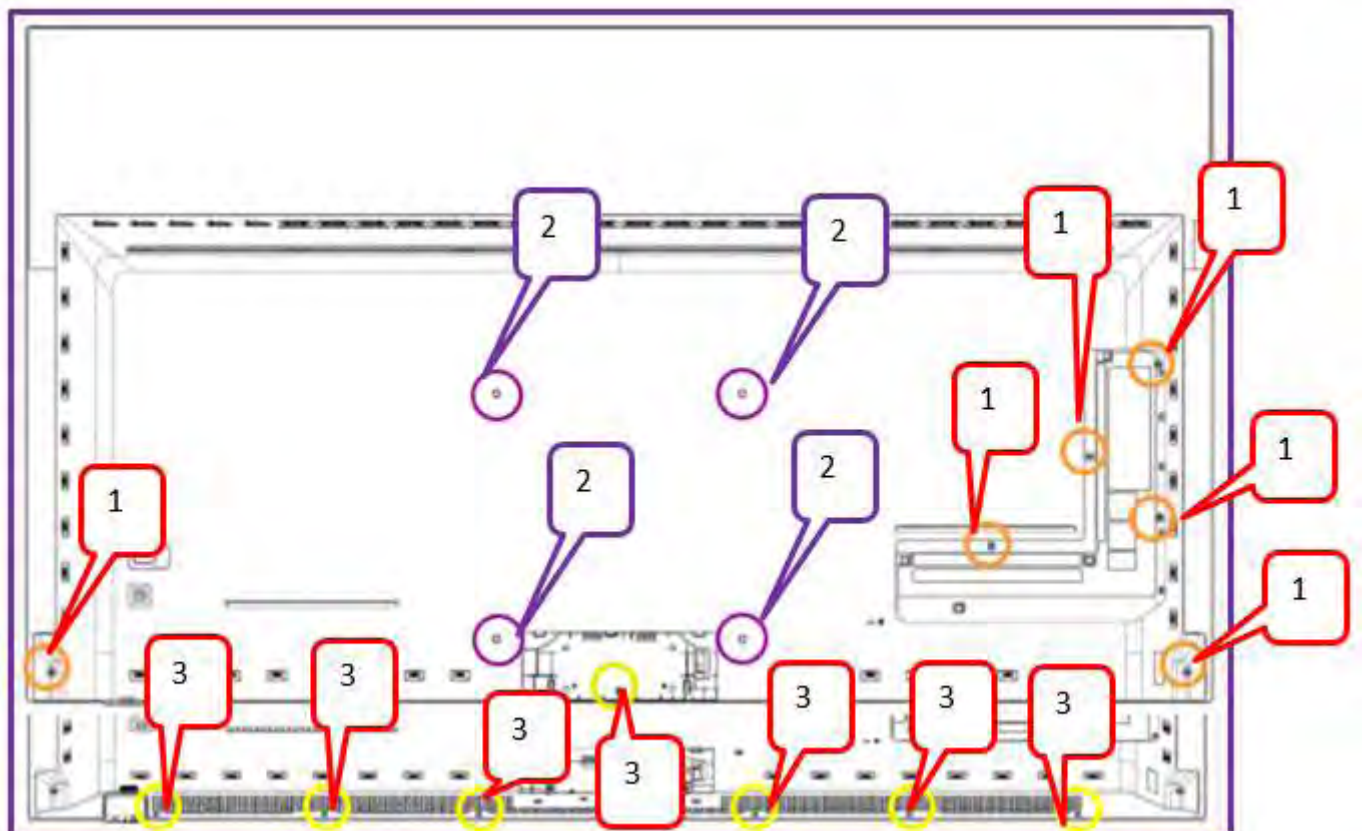
(48"/55"/65" OLED936 Series stand removal -2)

3.2.2 Rear Cover

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

1. Remove all fixation screws [1] ,[2]and [3] that secure the Back cover assy.
2. Unplug the connector that marked by red box below from SSB.
3. 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.

48"/55"/65" OLED936 series:

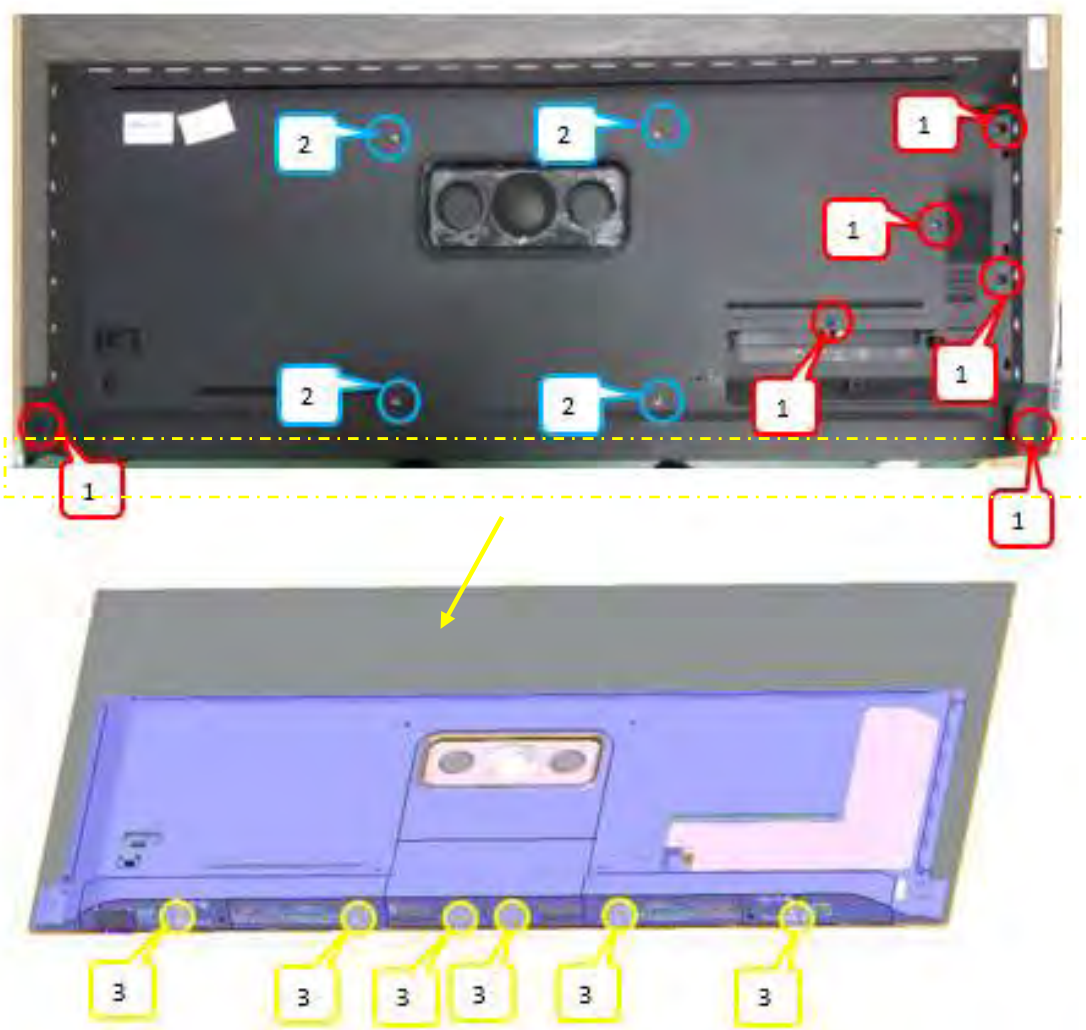


(48"/55"/65" OLED936 rear cover removal-1)

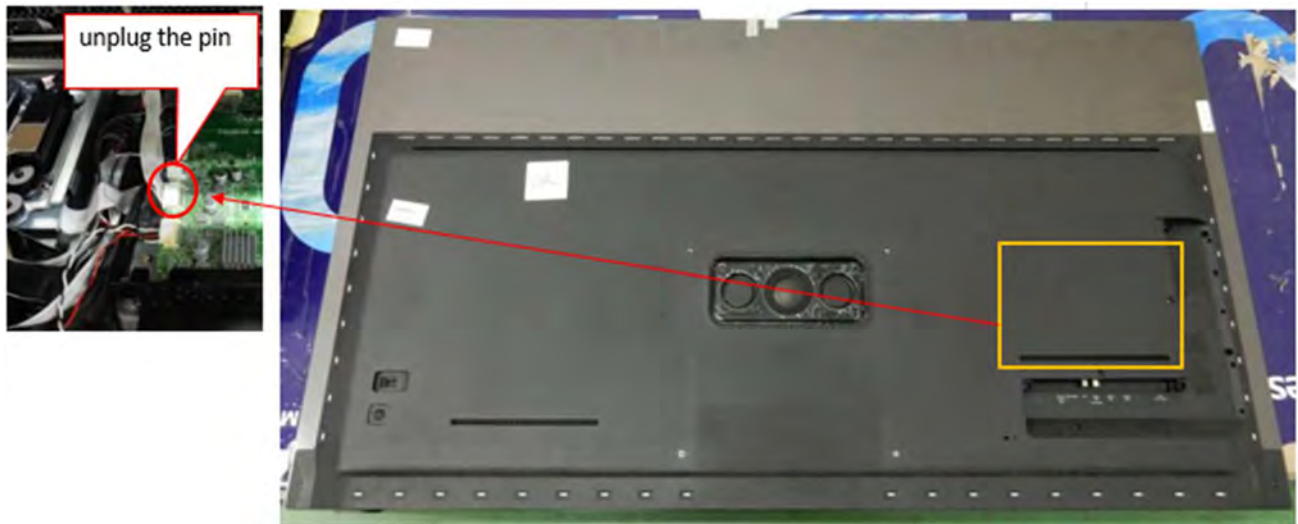


(48"/55"/65" OLED936 rear cover removal-2)

55"/65" OLED8x6/706 series:



(55"/65" OLED8x6/706 rear cover removal-1)

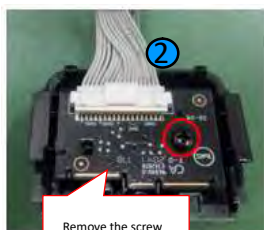
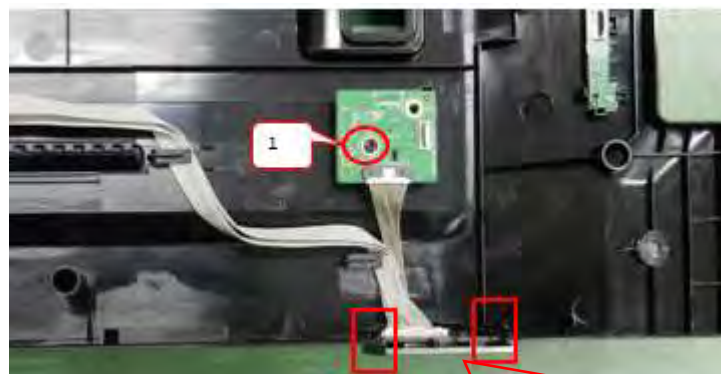


(55"/65" OLED8x6/706 rear cover removal-2)

3.2.4 IR Board Control Unit and Key board

1. Remove the fixation screws from the keyboard control panel [1] and take it out from the Back cover.
2. Take off the IR board from the hook which marker in red box below.
3. Remove the fixation screws from the IR board [2] and take it out from the IR lens.
4. Release the connector from the key Board and IR board.

Caution: be careful, the Keyboard is catch on the Back cover, please be careful to avoid damage the fragile connectors!
When defective, replace the whole unit.



Remove the screw



Release the connector



Release the connector

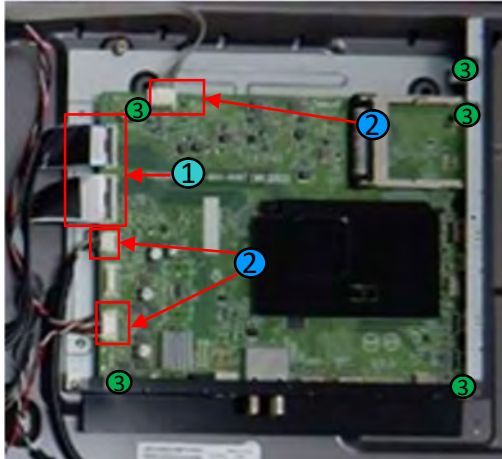


Release the connector

3.2.5 Small Signal Board (SSB)

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

1. Release the clips from 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.



3.2.6 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.

3.2.7 Speakers

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

3.2.8 WIFI module

1. Unplug the connector from the SSB.
2. Remove fixation screw that secure the WIFI module.

When defective, replace the whole unit.

3.2.9 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. Service Modes

4.1 Service Modes

The Service Mode feature is split into following parts:

- Service Alignment Mode (SAM).
- Factory Mode.
- Customer Service Mode (CSM). SAM and the Factory mode offer features, which can be used by the Service engineer to repair/align a TV set.

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

- Make alignments (e.g. White Tone), reset the error buffer(SAM and Factory Mode).
- Display information (“SAM” indication in upper right corner of screen, error buffer, software version, operating hours,options and option codes, sub menus).

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

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

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

4.2 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/OK**” 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.

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).

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.

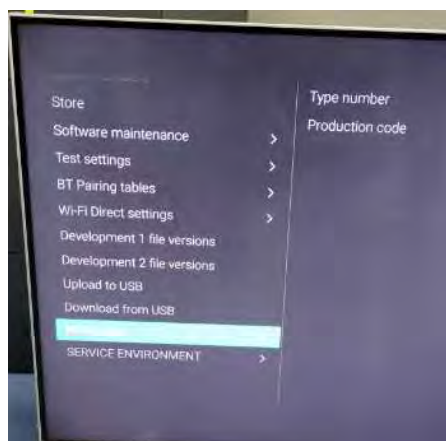
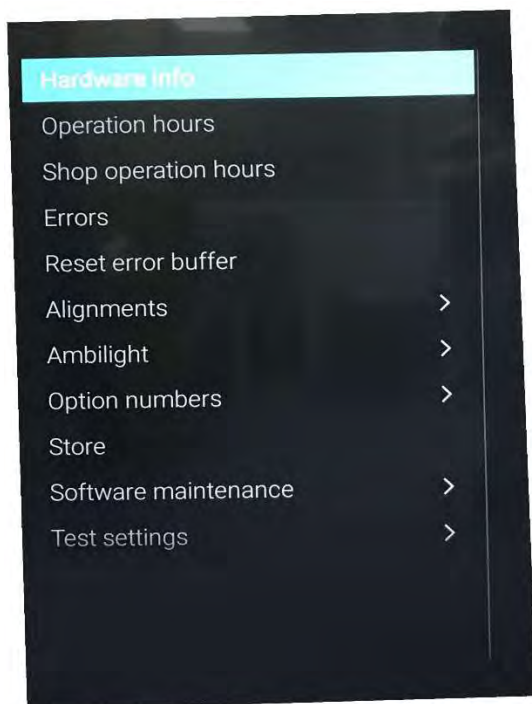
How to Exit SAM

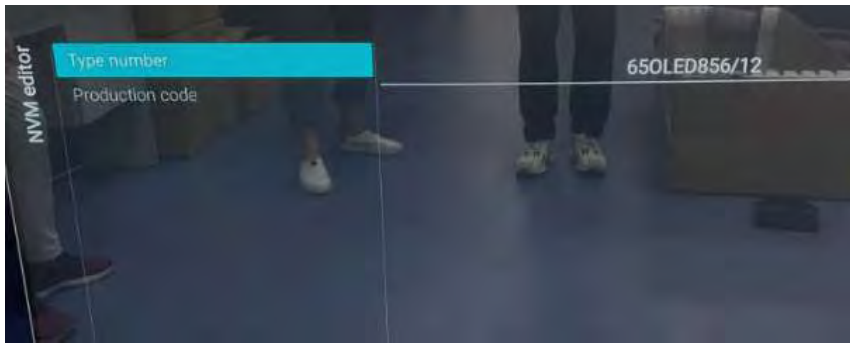
Use one of the following methods:

- 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.

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

SAM mode overview





Remark: Under main menu “NVM editor”, you can use the **UP/DOWN** keys to view and change the set Type number, the set Production Number or the 18AC of a part.(The NVM-editor still has the same function as before, alpha-numeric entry.)

4.3 Factory mode:

Purpose

- To perform extended alignments.

Specifications

- Displaying and or changing Panel ID information.
- Displaying and or changing Tuner ID information.
- Error buffer clearing.
- Various software alignment settings.
- Testpattern displaying.
- Public Broadcasting Service password Reset.
- etc.

How to Activate the Factory mode

To activate the Factory mode, use the following method:

- Press the following key sequence on the remote control transmitter: from the “**menu/home**” press “**1999**”, directly followed by the “**Back/Return**” button. Do not allow the display to time out between entries while keying the sequence.

After entering the Factory mode, we can see many items displayed, use the **UP/DOWN** keys to display the next/previous menu items

Factory mode overview



How to Exit the Factory mode

- 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.

4.4 Customer Service Mode (CSM)

Purpose

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

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

Specifications

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

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. Use the **Right/Left** keys to display the next/previous menu items.

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

CSM Overview



CSM 1		
1.1 Set type	:	650LED856/12
1.2 Production code	:	
1.3a OH-Home	:	1
1.3b OH-Shop	:	0
1.3c BL-OH	:	1
1.4a Options 1	:	00114 18481 33603 35776
1.4b Options 2	:	49421 63092 10508 28678

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.

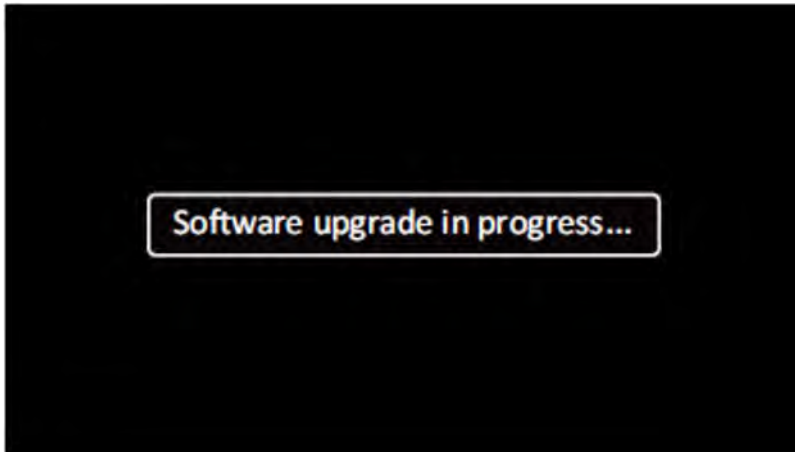
- Press the MENU/HOME button on the remote control transmitter.
- Press the POWER button on the remote control transmitter.
- Press the POWER button on the television set.

5. Software Upgrading, Error code and Panel Code

5.1 Software Upgrading

5.1.1. The following update is for .pkg file.

1. Rename the file to "upgrade_loader.pkg".
2. Prepare a USB memory (File format: FLAT, Size: 1G~8G).
3. Copy the software to USB flash disk (root directory).
4. Switch off the TV and Insert the USB memory stick that contains the software update files in one of the TV's USB 2.0 port.
Note: It contains USB3.0 port, if connect on it, the software may can't be detected.
5. Switch on the TV. The TV will detect the USB memory s tick automatically. Then a window jumps out as below:



6. When the TV software is updated, the TV will turn on again automatically. Remove your USB flash drive.
7. We can enter in CSM or Factory mode to check the current software version.

5.1.2. The following update is for .upg file.

Step 1: Ready for F/W Upgrade

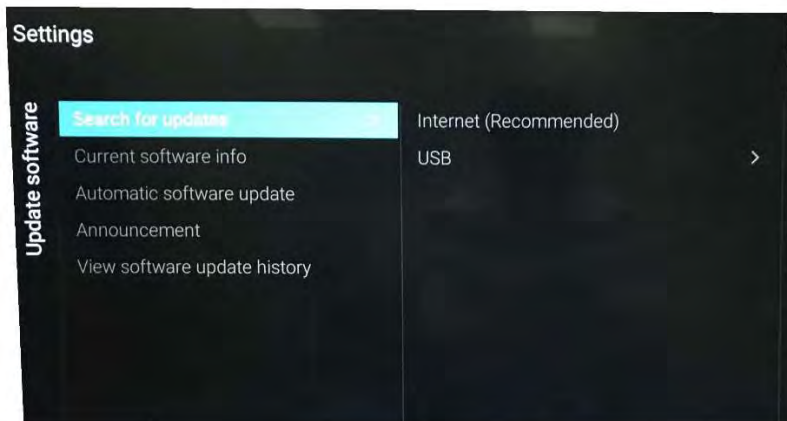
1. Rename the file to "autorun.upg".
2. Prepare a USB memory (File format: FLAT, Size: 2G~8G).
3. Copy the software to USB flash disk (root directory).
4. Switch on the TV and Insert the USB memory stick that contains the software update files in one of the TV's USB 2.0 port.

Note the version of this F/W before you change the software file name.

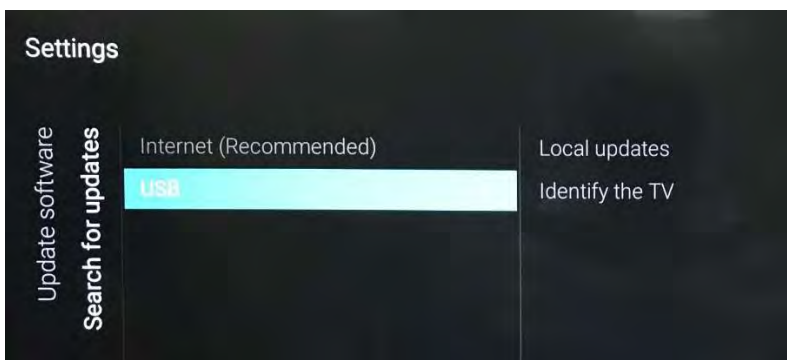


Step 2: F/W Upgrade

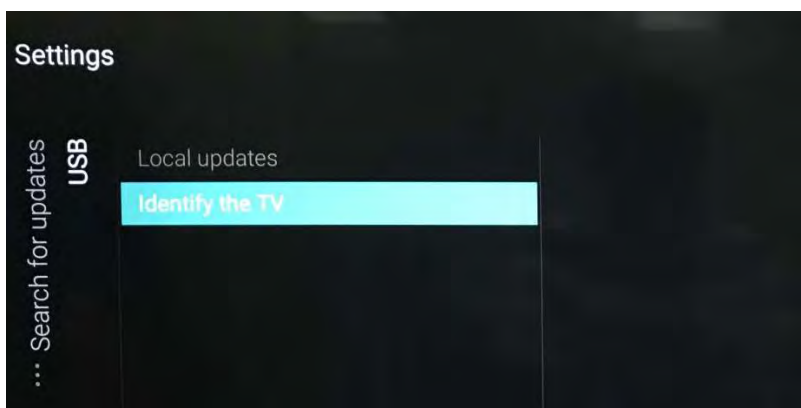
1. Press [Settings]> [update software], then Choose [Search for update] in the Settings menu, and press OK.



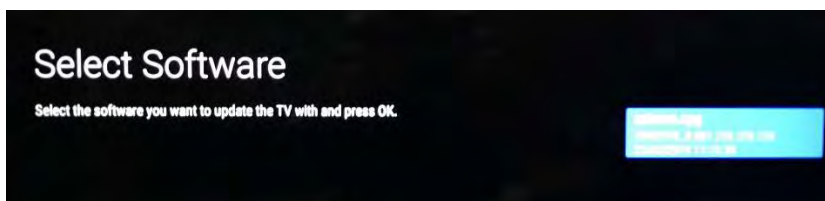
2. Choose [USB], then press OK.



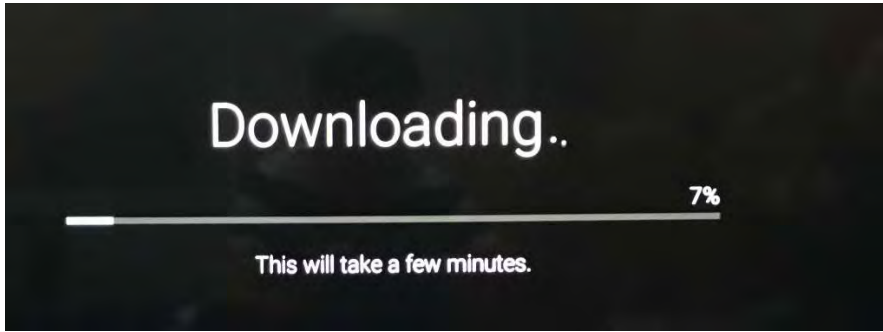
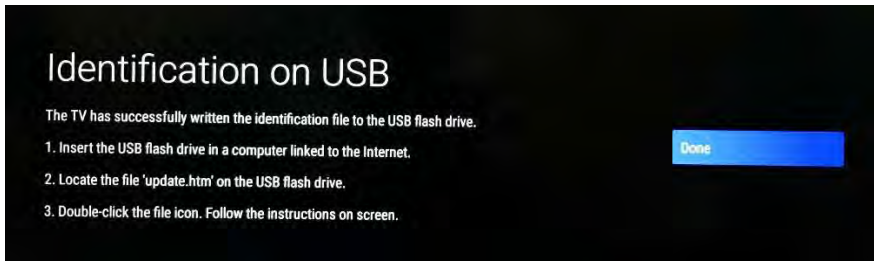
3. Choose [Identify], then press OK.



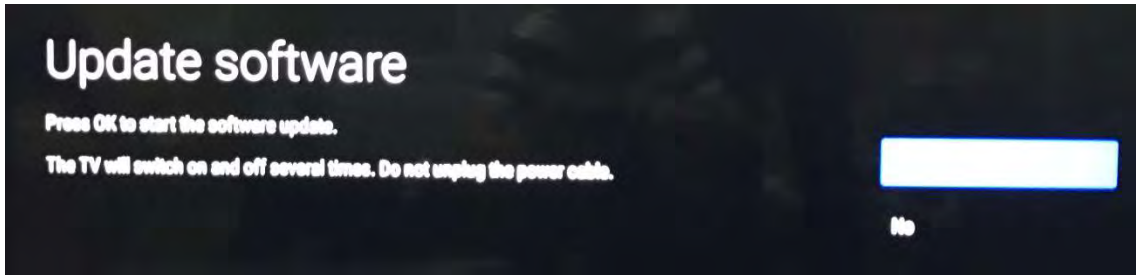
4. .Select the file that you downloaded and press OK



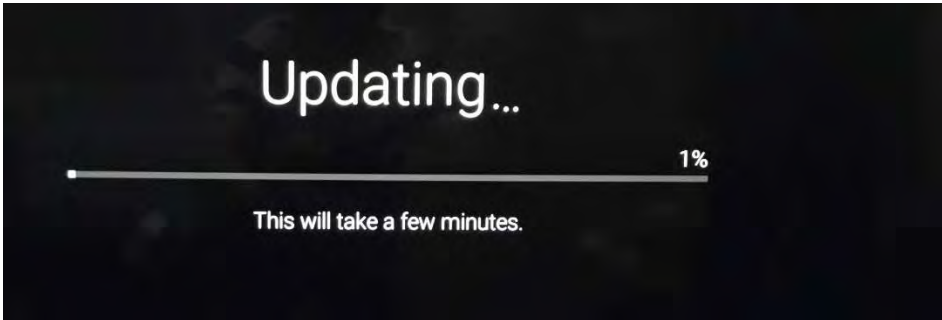
5. Identify the software and choose [Done], then choose [Start] on following step



6.Choos [Upadte] press OK start the softwear update.

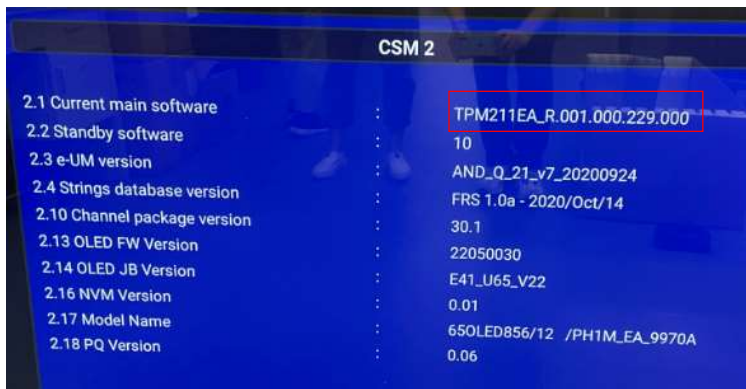


6. Upgrade in progress



Step 3: Check the SW version

1. After burning software, TV will restart
2. Press "123654", enter Customer Service Mode to check if the software version is correct.



Caution: Please make sure that software upgrade is finished before unplug the USB and AC power!

5.2 Error Code

5.2.1 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).

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.

5.2.2 How to Read the Error Buffer

You can read the error buffer in following ways:

- On screen via the SAM/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
- **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).

5.2.3 Error codes overview

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:

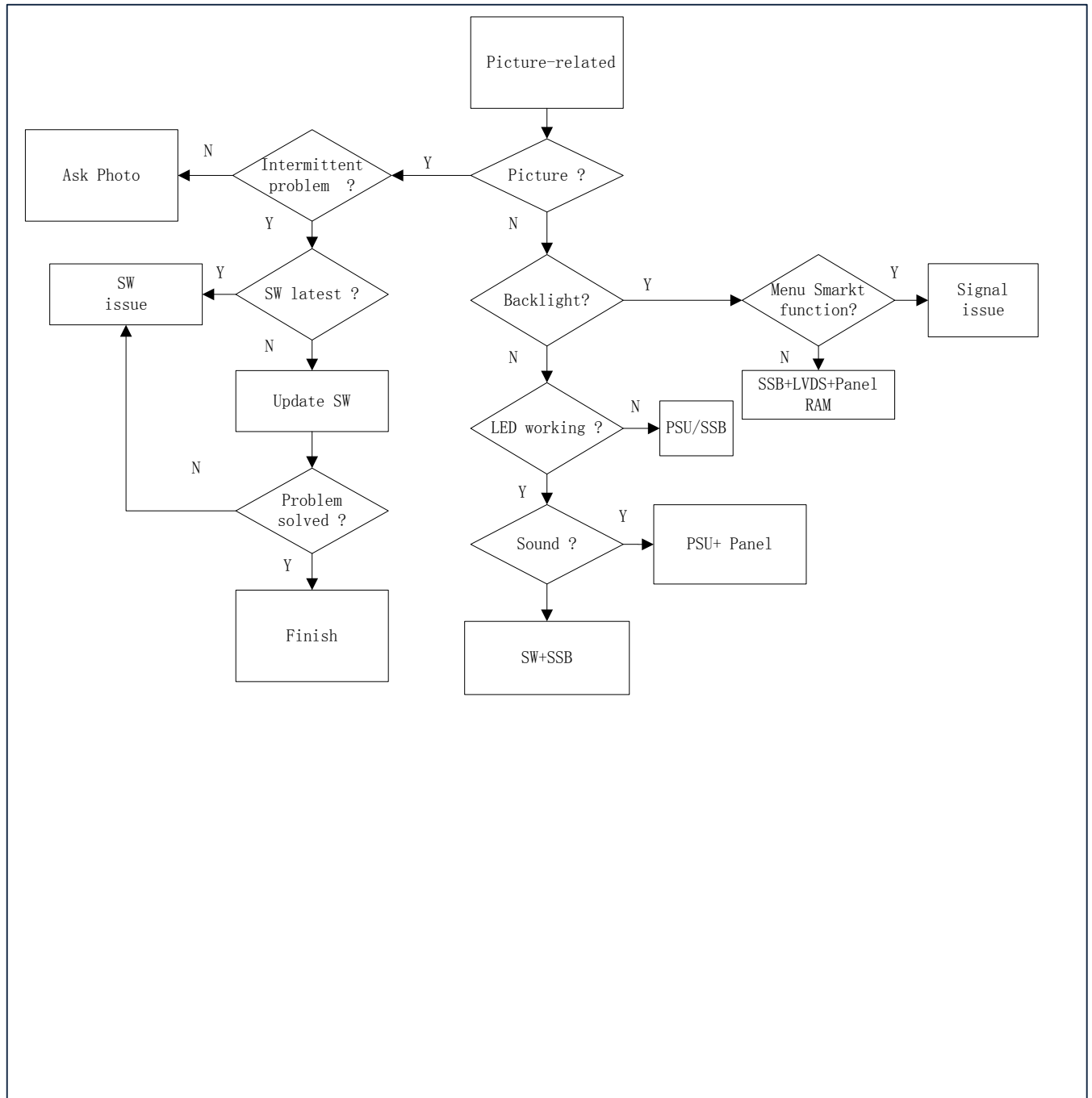
Description	LAYER 1 error	LAYER 2 error	Monitored	Error	I ² C address	EB: in error buffer	Device	Defective board
				Prot.		BL: Blinking LED		
I ² C BUSSES								
DSP bus (00)	2	11	SOC	E	00	BL/EB	SSB	Audio DSP
AMP bus (01)	2	12	SOC	E	01	BL/EB	SSB	Audio DSP
SSB bus (0F)	2	13	SOC	E	0F	BL/EB	SSB	SSB
BE bus (3F)	2	14	SOC	E	3F	BL/EB	SSB	SSB
FE bus (2F)	2	17	SOC	E	2F	BL/EB	SSB	SSB
DISP bus (30)	2	18	SOC	E	30	BL/EB	SSB	Display
AMBI bus (31)	2	19	SOC	E	31	BL/EB	SSB	Proj AL
SOC doesn't boot (HW cause)	2	15	St-by μ P	P	D4	BL	MT5593	SSB
Supply related								
12V	3	16	St-by μ P	P		BL		Supply
SSB								
I2C switch (SSB bus)	9	24	SOC	E	E0	EB	PCA9540	Audio DSP
I2C switch (BE bus)	2	25	SOC	E	E0	EB	PCA9540	SSB
Channel dec	2	27	SOC	E	C8-CE	EB	Silab Si216x	SSB
Boston (HDMI2.2)	2	29	SOC	E	40	EB	SIL 9777	SSB
Lnb controller	2	31	SOC	E	10	EB	LNBH 25	SSB
Tuner	2	34	SOC	E	C0	EB	Si2151/AV 2019	SSB
Tuner S2	2	36	SOC	E		EB		
Class - D 3 (DSP bus)	9	35	SOC	E	D8	EB	TAS 5760 LD	Audio DSP
Audio DSP	9	36	SOC	E	70	EB		Audio DSP
Class-D 1	2/9	37	SOC	E	D8	EB	TAS5760LD	SSB/Audio DSP
DSP EEPROM	9	38	SOC	E	A0	EB	Durango	Audio DSP
Class - D 2	2/9	39	SOC	E	DA	EB	TAS 5760 LD	SSB/Audio DSP
T° sensor SSB	2	42	SOC	E	98	EB	LM 75	T° sensor
Light sensor	6	43	SOC	E	52	EB	TSL2571	SET
B&O signal board	4	44	SOC	E		EB		
HDD XFS repair	8	45	SOC	E		EB		
DSP doesn't boot (SW cause)	9	52	SOC	E	70	EB	MT5593	Audio DSP
SOC doesn't boot (SW cause)	2	53	St-by μ P	P	D4	BL	MT5593	SSB
FRC	2	61	SOC	E	34	EB	NT72324/72333	SSB
ASIC	2	62	SOC	E	84	EB	ASIC	SSB
Display	5	63	SOC	E	34	EB	Innolux	Display

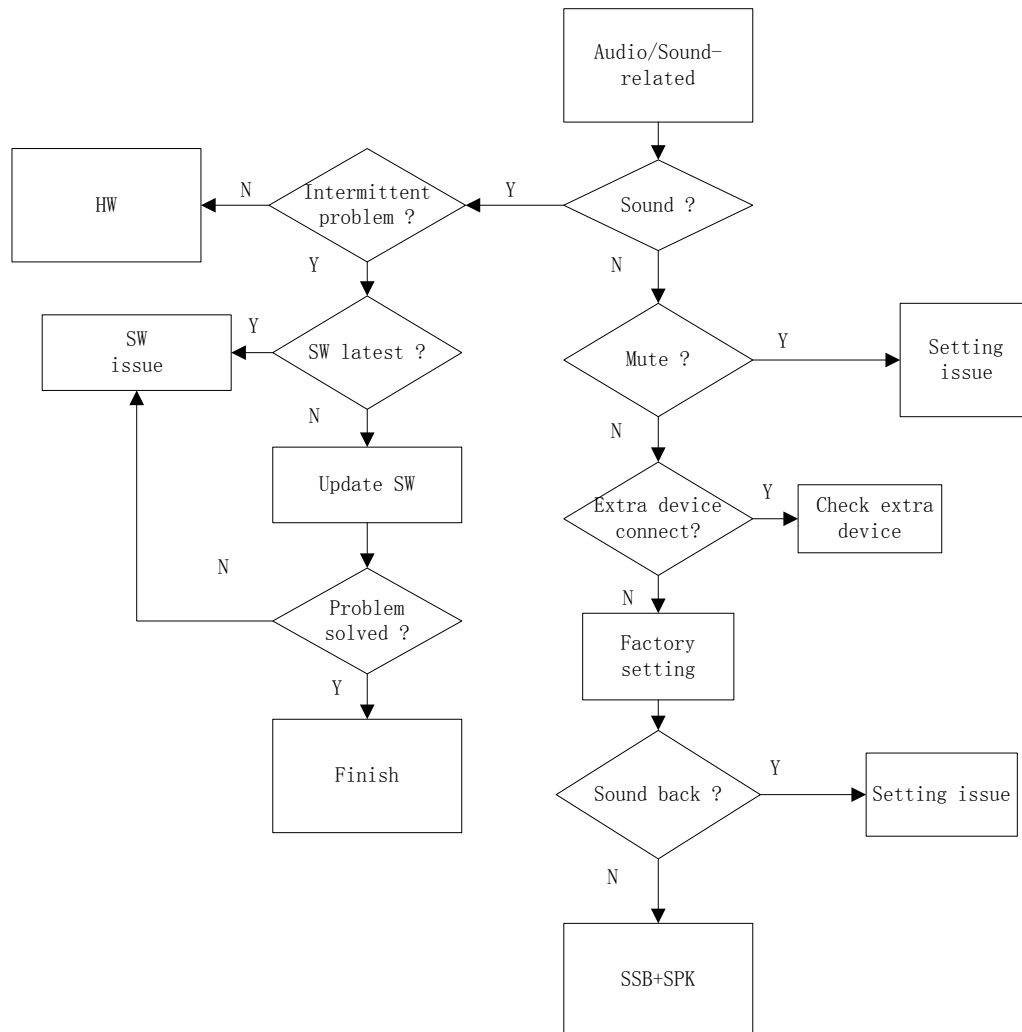
5.2.4 How to Clear the Error Buffer

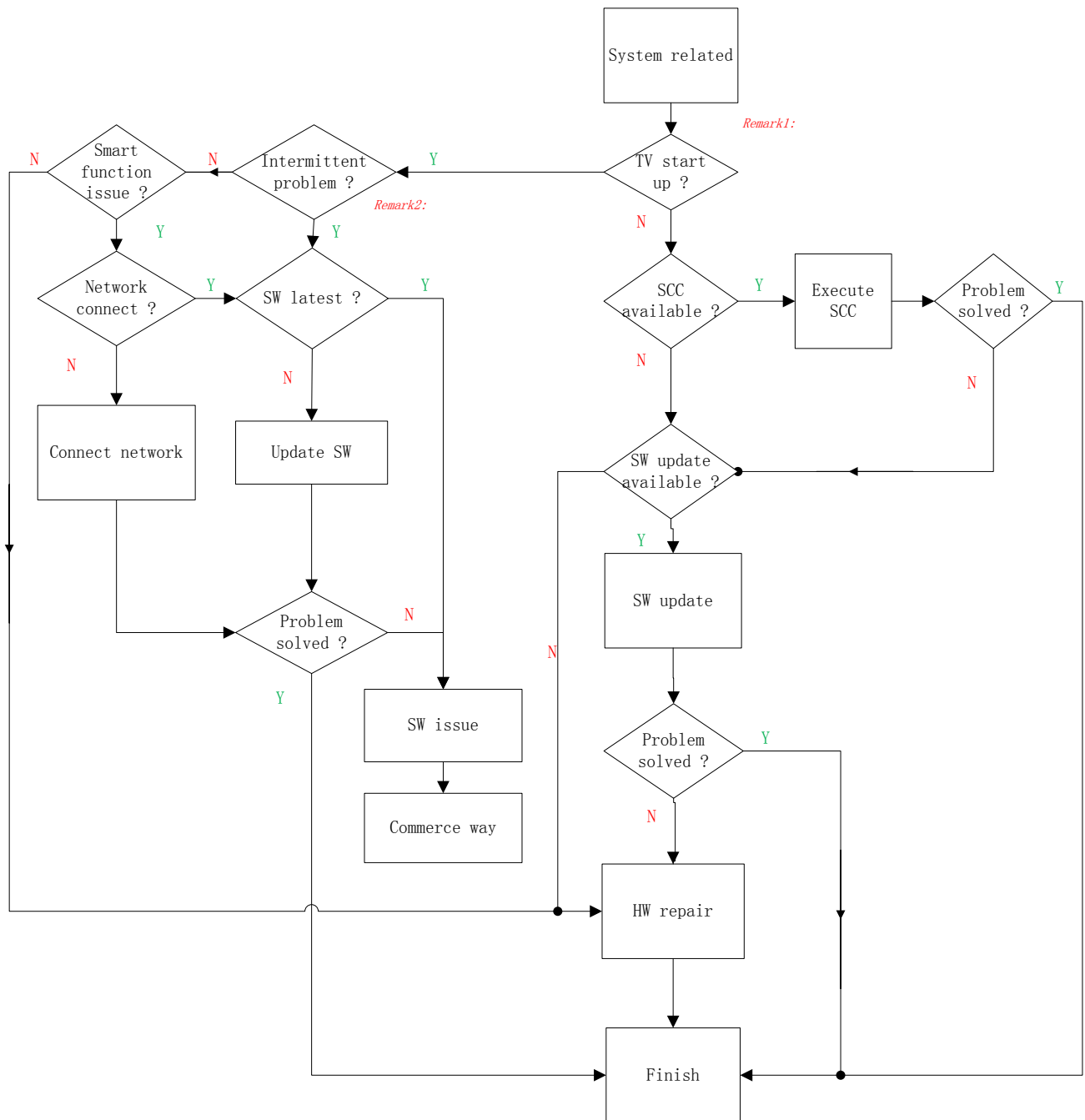
The error code buffer is cleared in the following cases:

- 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.







Remark1 : What is System related issue ?

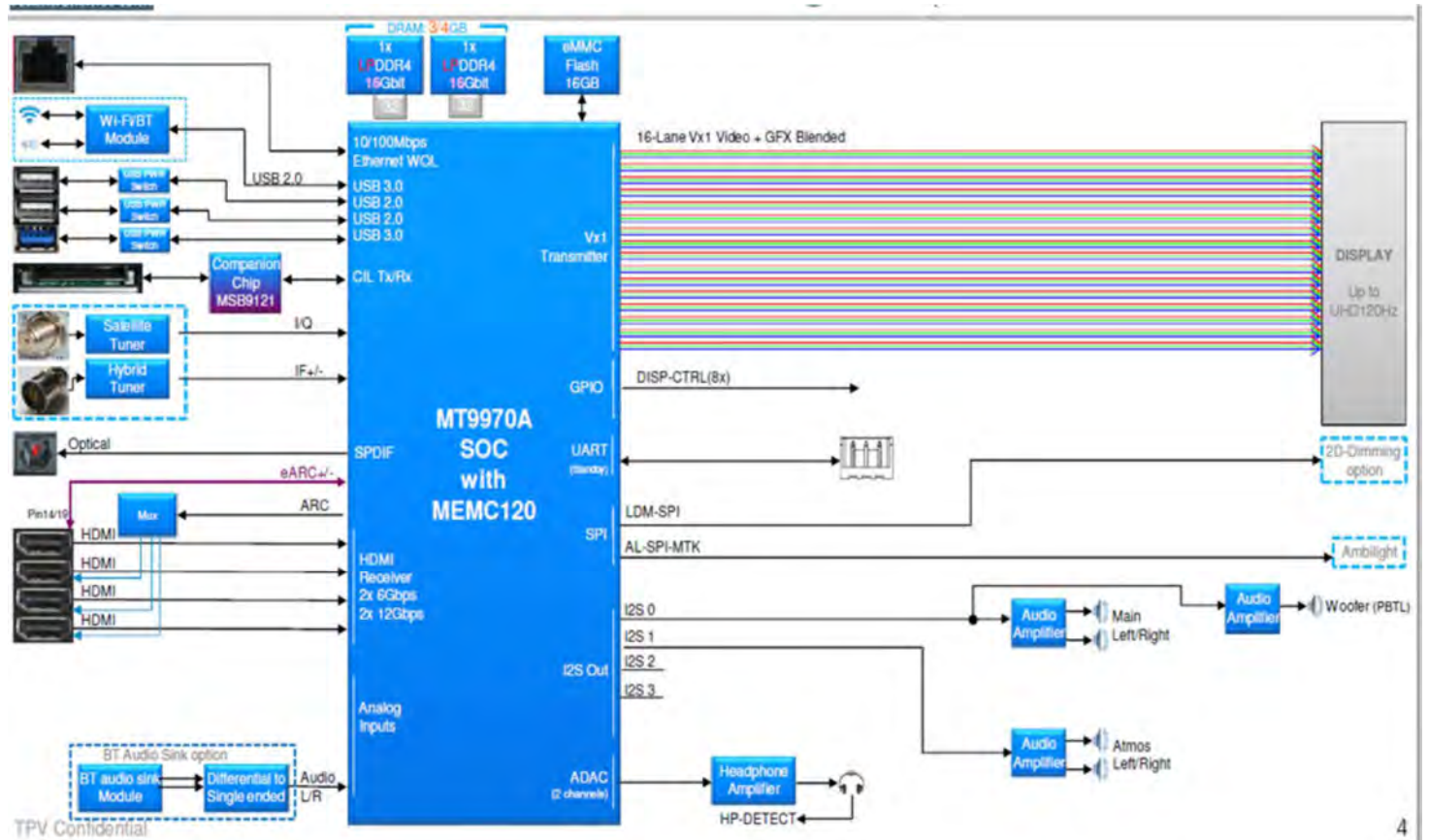
1. Permanent reboots
2. Intermittent reboots
3. No function, no standby LED (set dead)
4. No function, blinking LED
5. Set freezes, intermittently
6. Slow response to user interaction
7. Switches ON by itself
8. Switches Off by itself
9. Stuck in standby mode / unable to start up
10. Stuck on PHILIPS / ANDROID logo
11. CAM not recognized by TV
12. CAM authentication issue
13. Misc CAM issue
14. IP-EPG issues
15. BC-EPG issues
16. PVR issues w/ BC-EPG
17. PVR issues w/ IP-EPG
18. PVR issues / generic
19. EDFU-related issue
20. Features not available in UI / cannot be activated

Remark2 : How to judge intermittent issue ?

1. When the problem happened can be solved by:
 - 1) AC off AC on
 - 2) DC off DC on
 - 3) RC switch different source
2. The problem intermittent happened

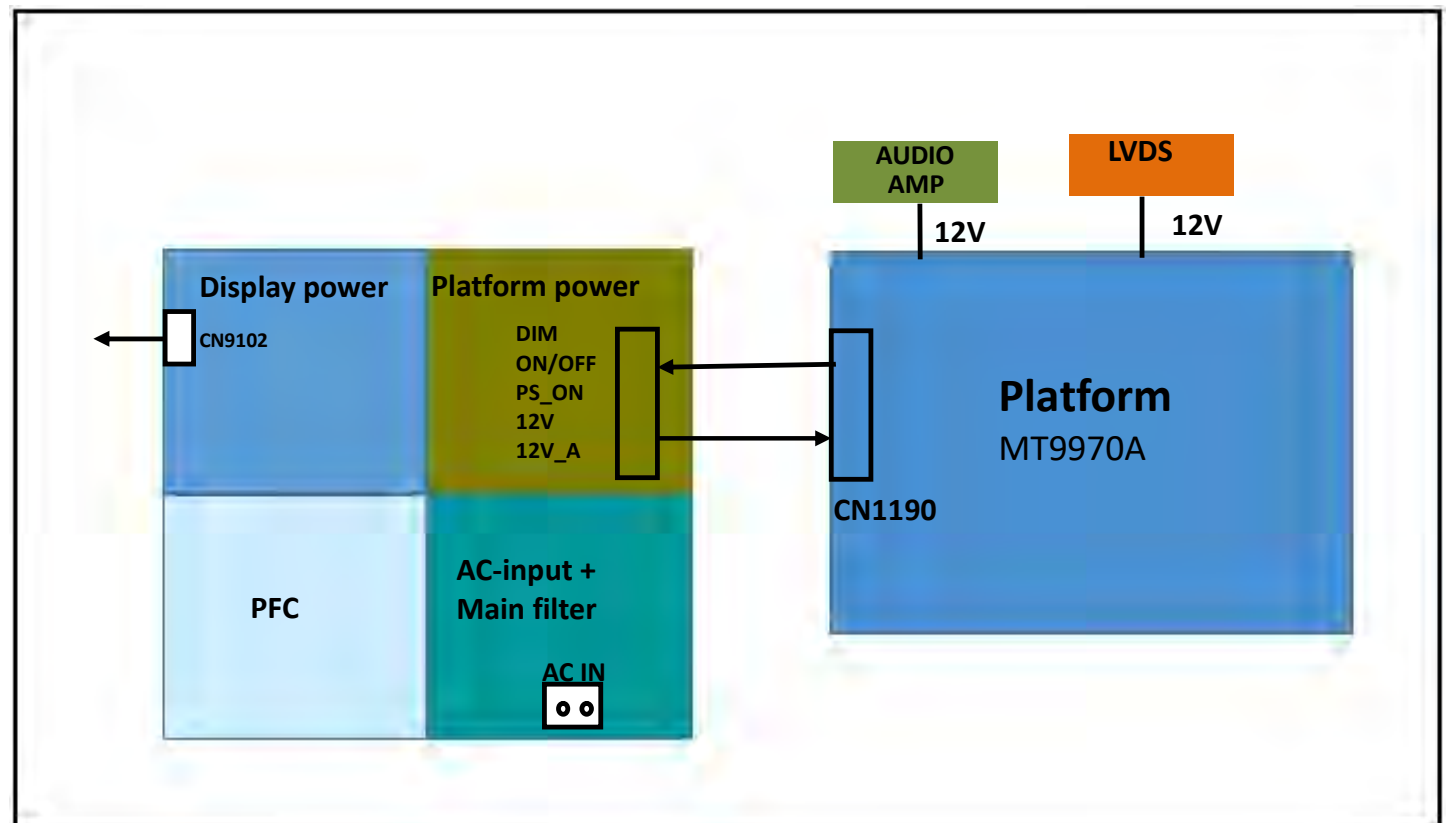
7. Electrical Diagram

7.1 Block diagram



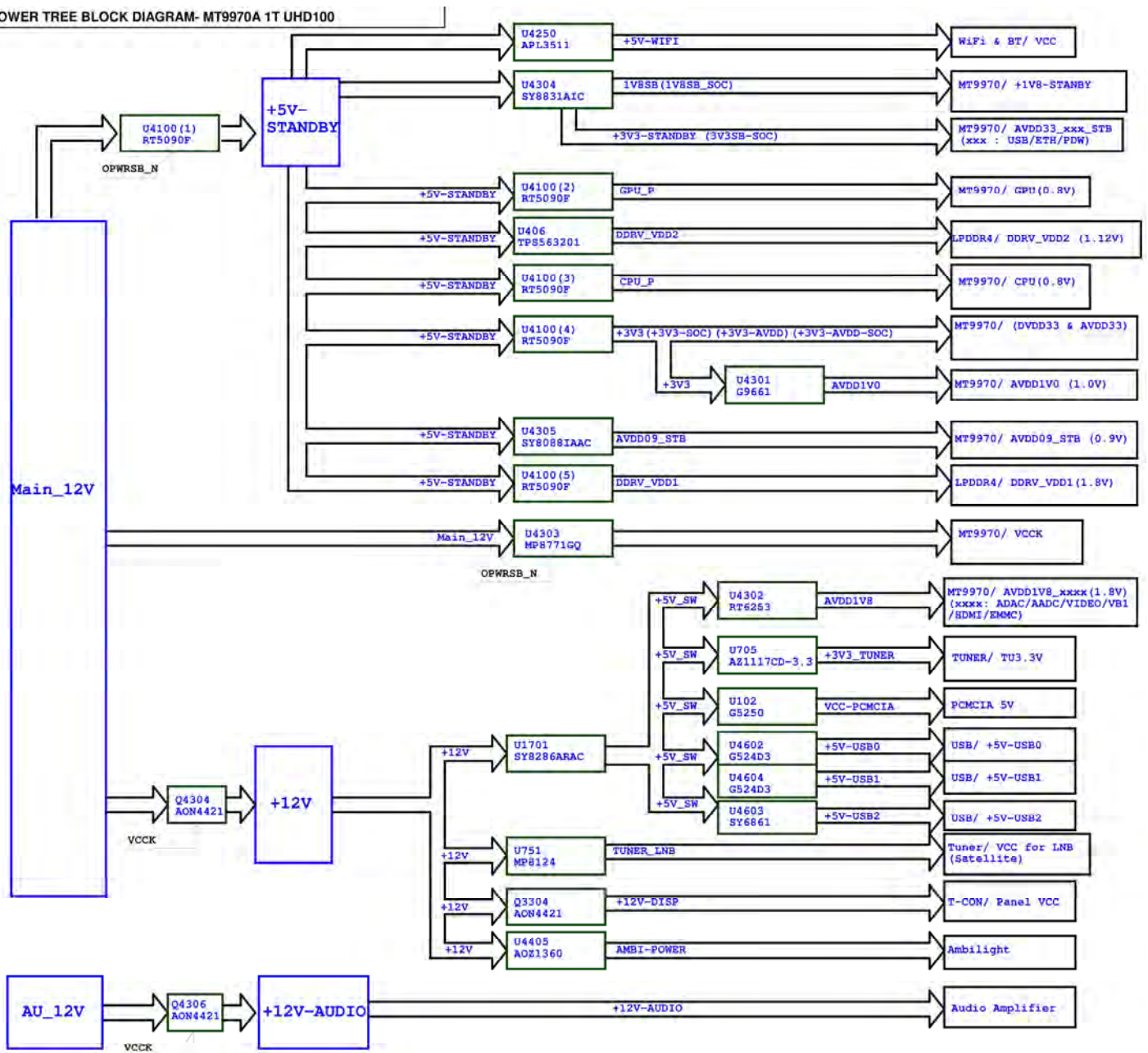
7.2 Power Supply

Power architecture of this platform.

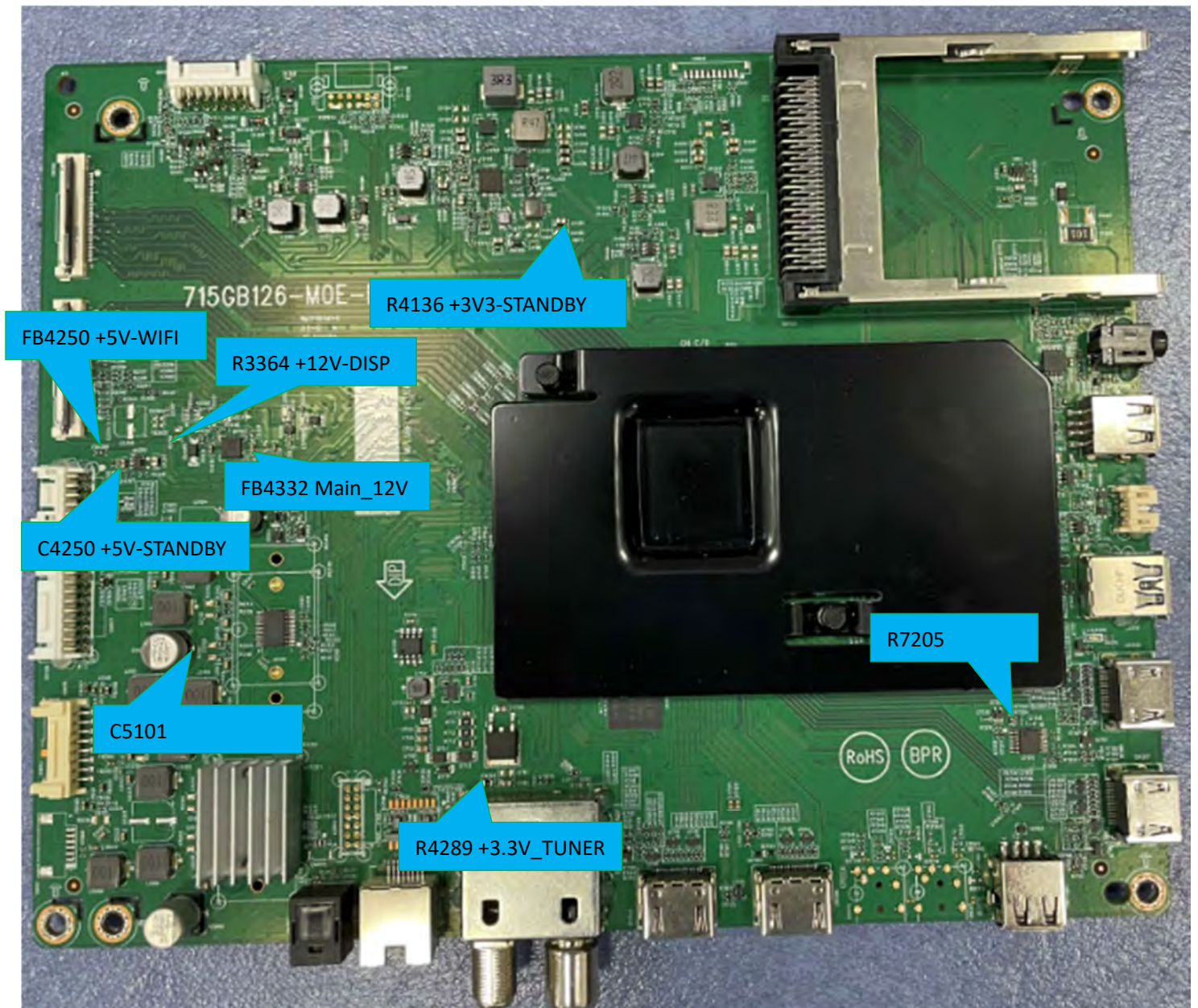


7.3 Power tree

2K21 POWER TREE BLOCK DIAGRAM- MT9970A 1T UHD100



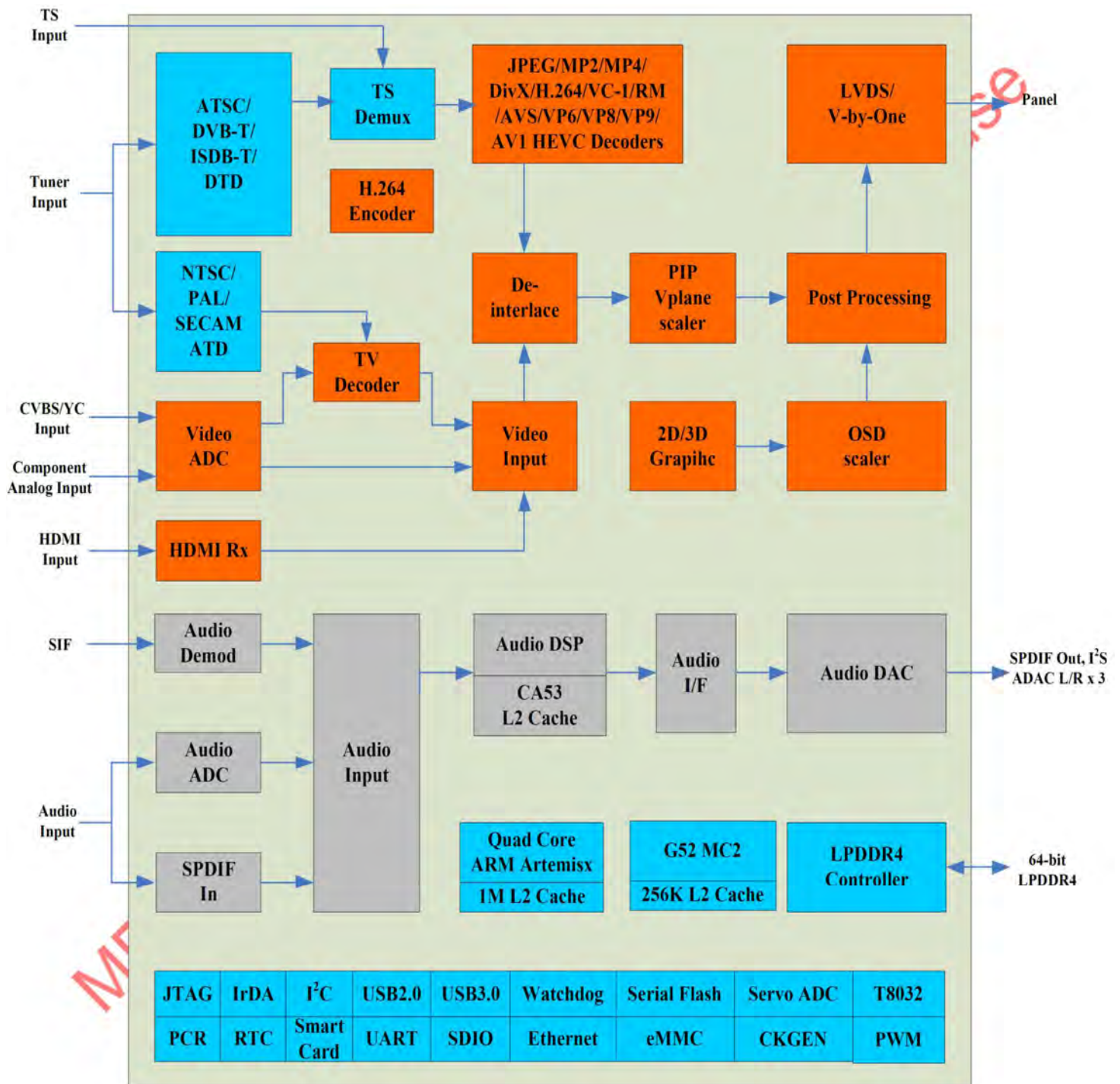
7.4 Power layout SSB



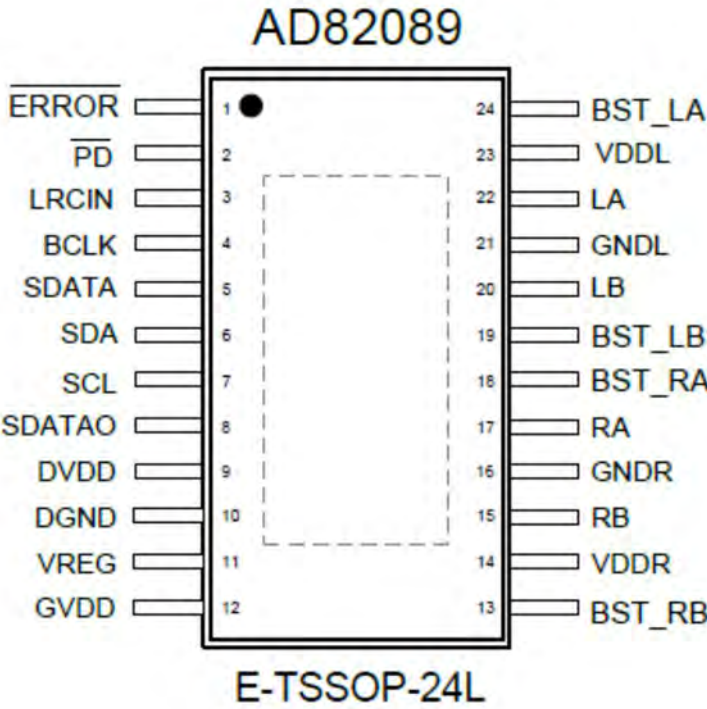
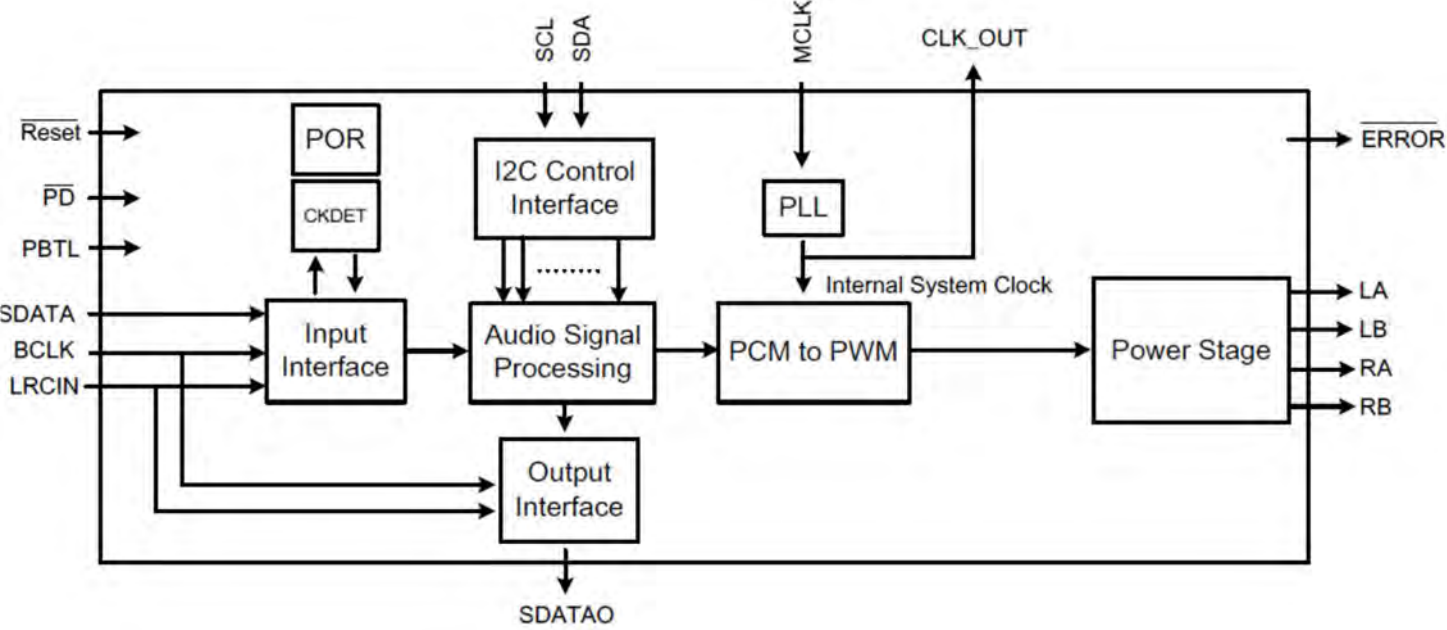
Power SSB Top View

8. IC Data Sheets

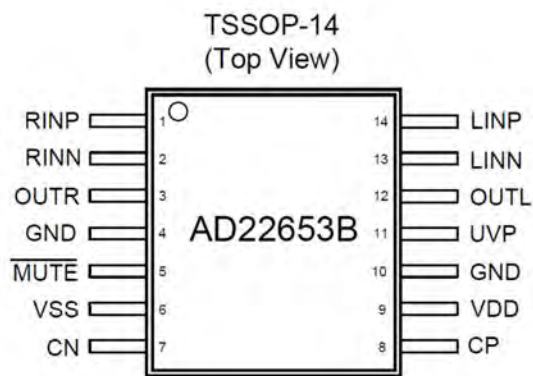
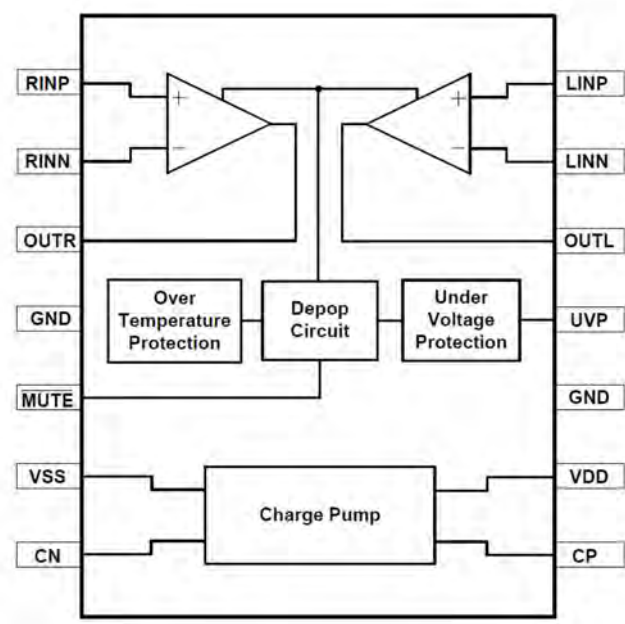
8.1 MT9970ATQQFC HFCBGA (IC U401--Scaler)



8.2 AD82089-QG24NRR (IC U5100--Audio)



8.3 AD22653B-QH14NAR (IC U5101--Audio)

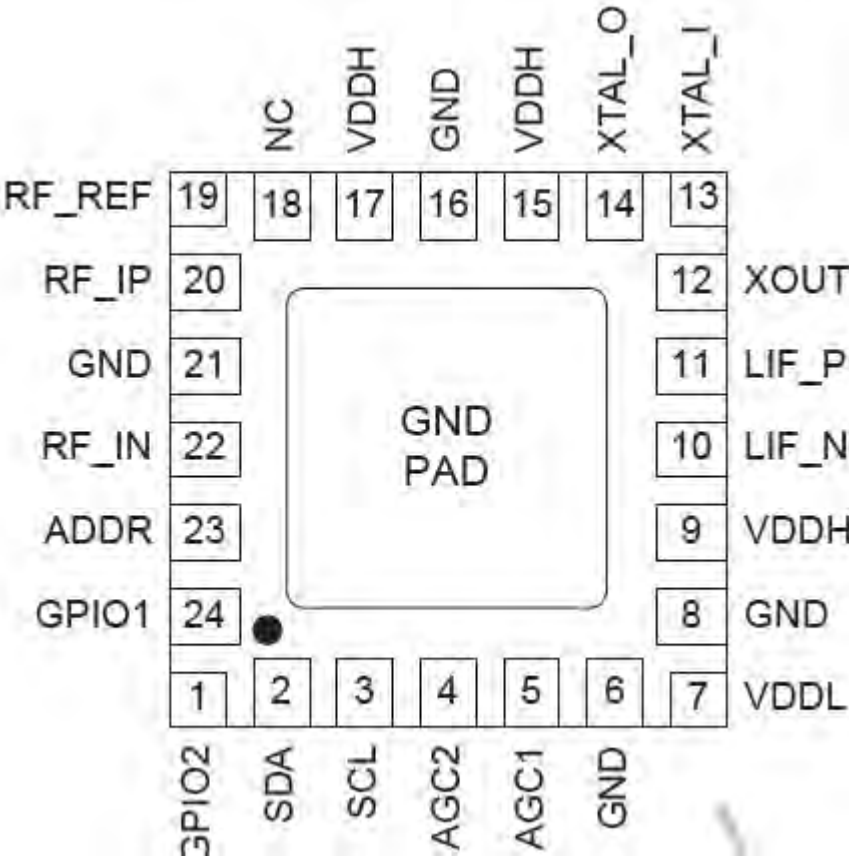
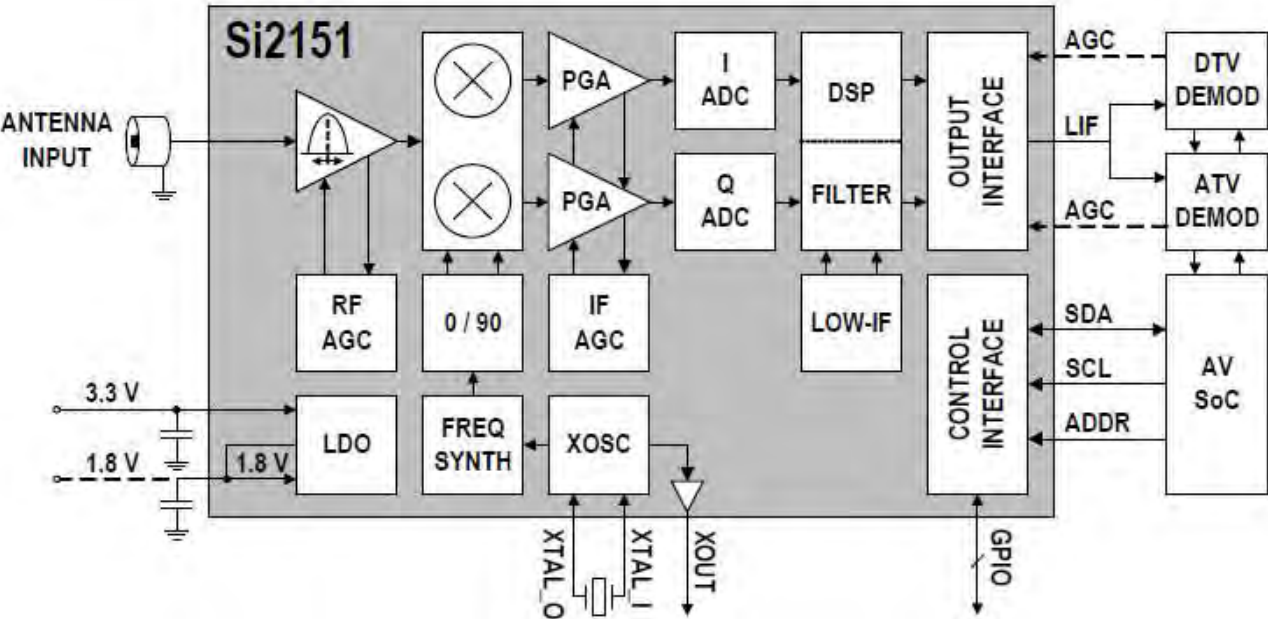


Pin Description

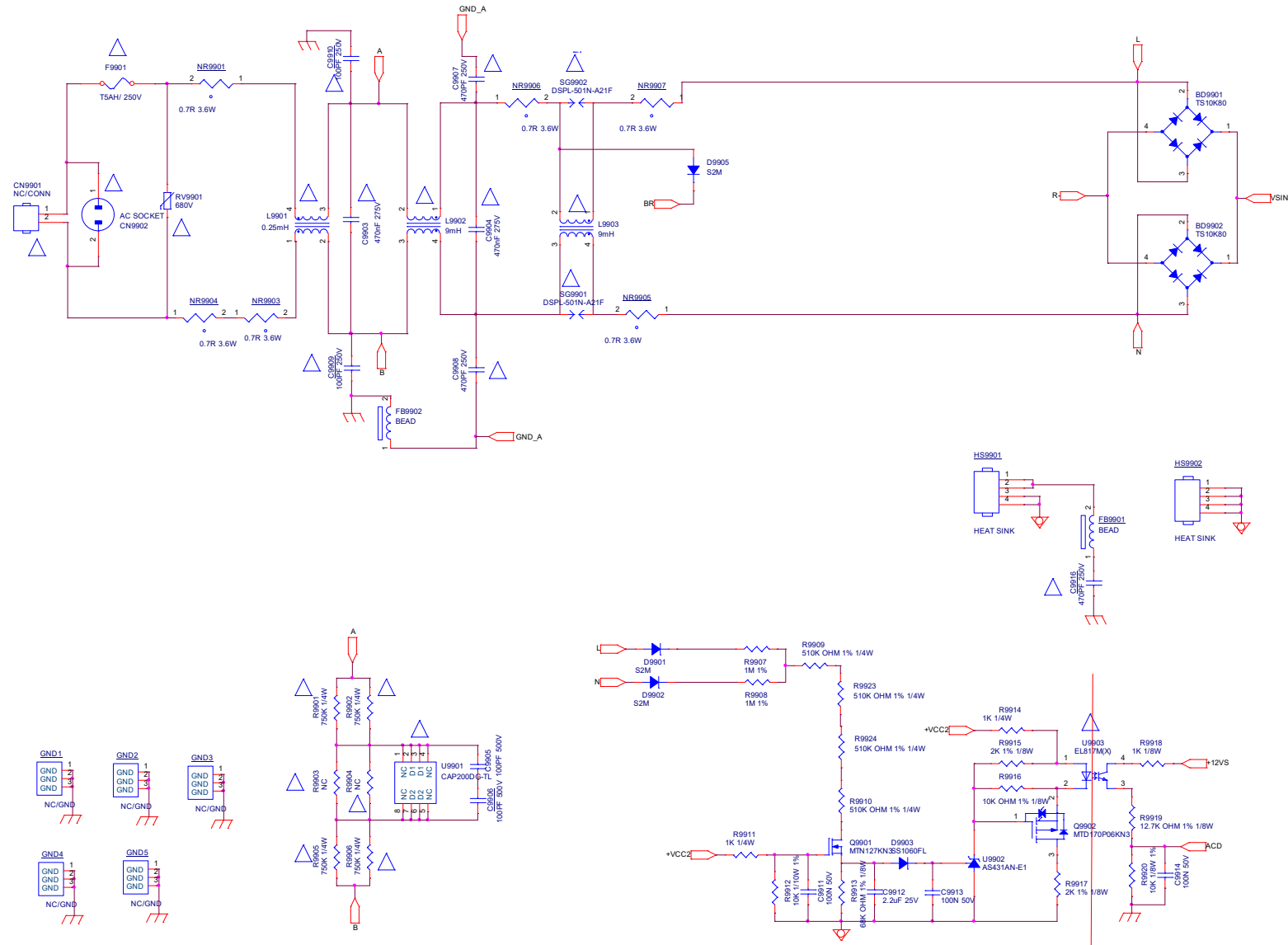
No.	Name	Type ⁽¹⁾	Pin Description
1	RINP	I	Right channel OP positive input
2	RINN	I	Right channel OP negative input
3	OUTR	O	Right channel OP output
4	SGND	P	Signal ground
5	MUTE	I	Mute, active low
6	PVSS	P	Supply voltage
7	CN	I/O	Charge-pump flying capacitor negative terminal
8	CP	I/O	Charge-pump flying capacitor positive terminal
9	PVDD	P	Positive supply
10	PGND	P	Power ground
11	UVP	I	Under-voltage protection input, internally pulled high
12	OUTL	O	Left channel OP output
13	LINN	I	Left channel OP negative input
14	LINP	I	Left channel OP positive input

(1) I=input, O=output, P=power

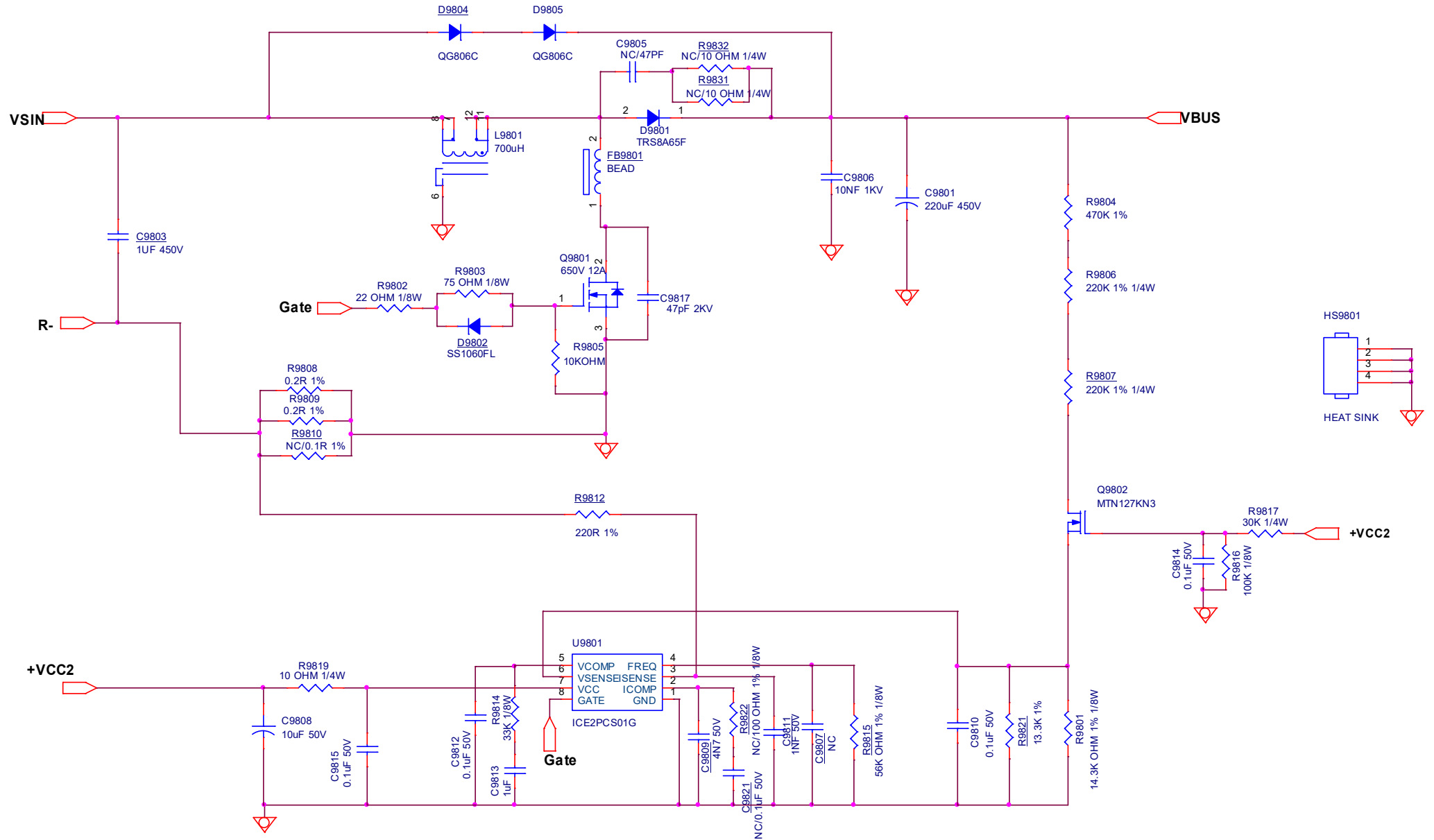
8.4 Si2151-A10-GMR (U301)



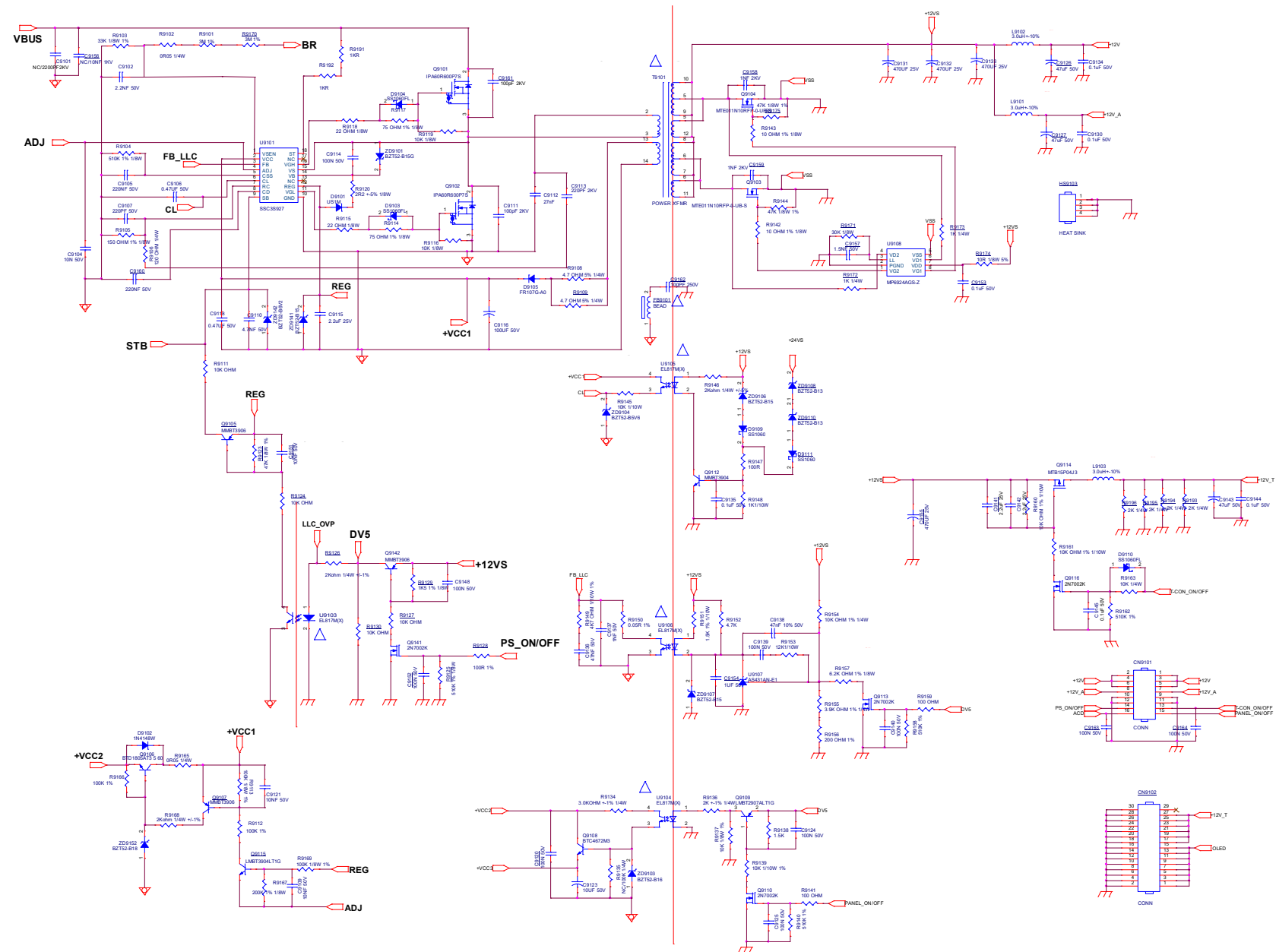
9-1-1 Input stage



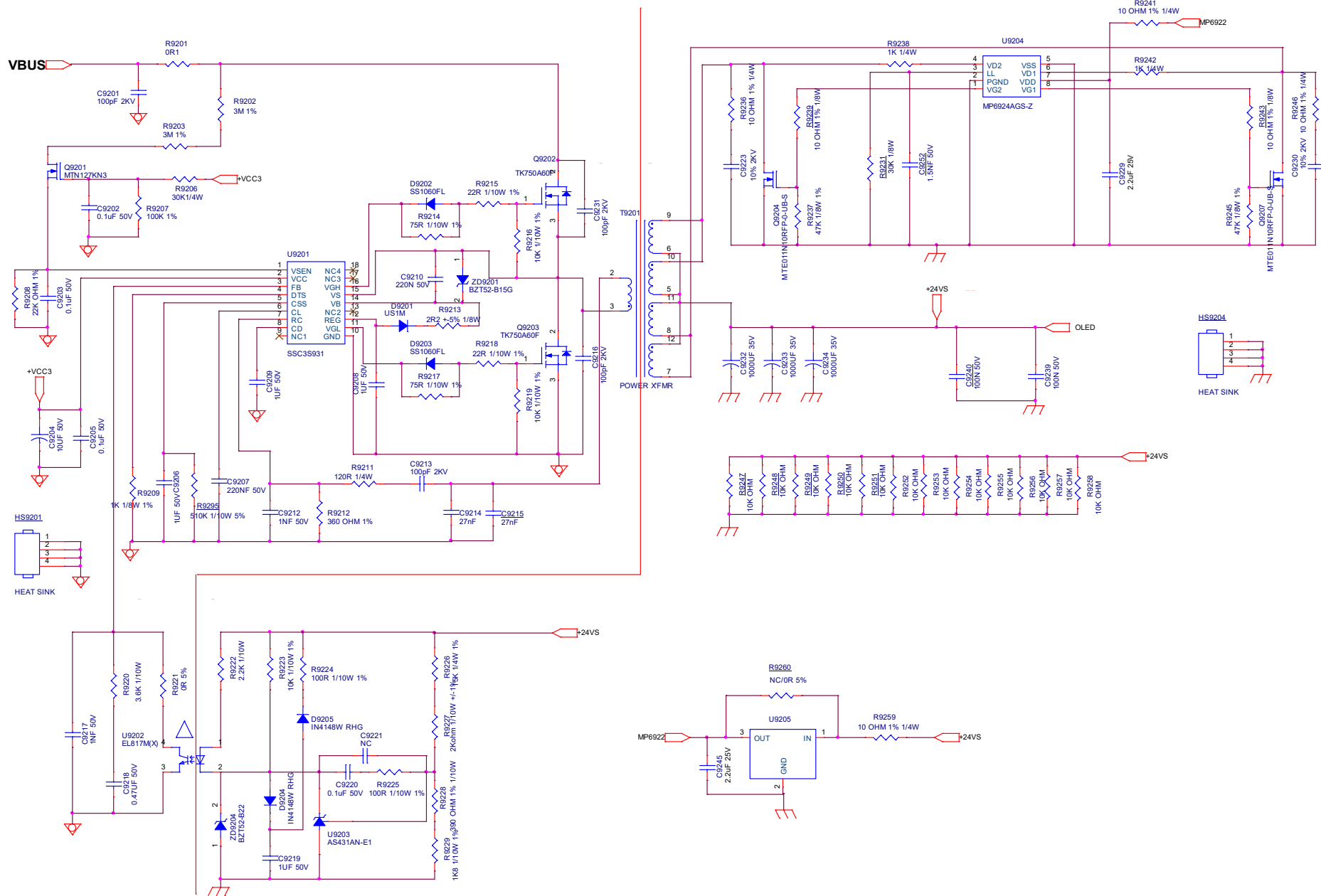
9-1-2 PFC stage



9-1-3 12V power stage

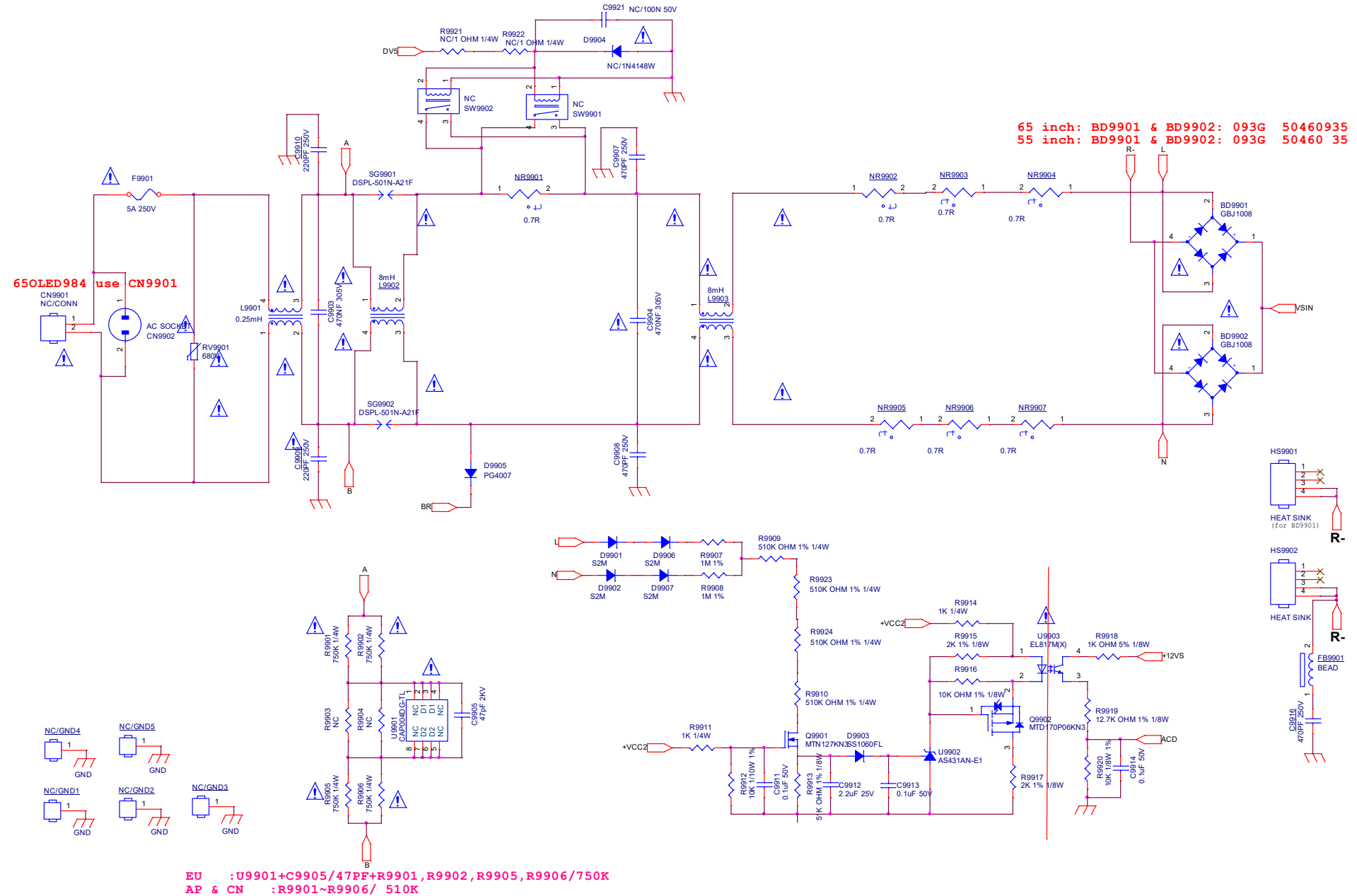


9-1-4 OLED power stage

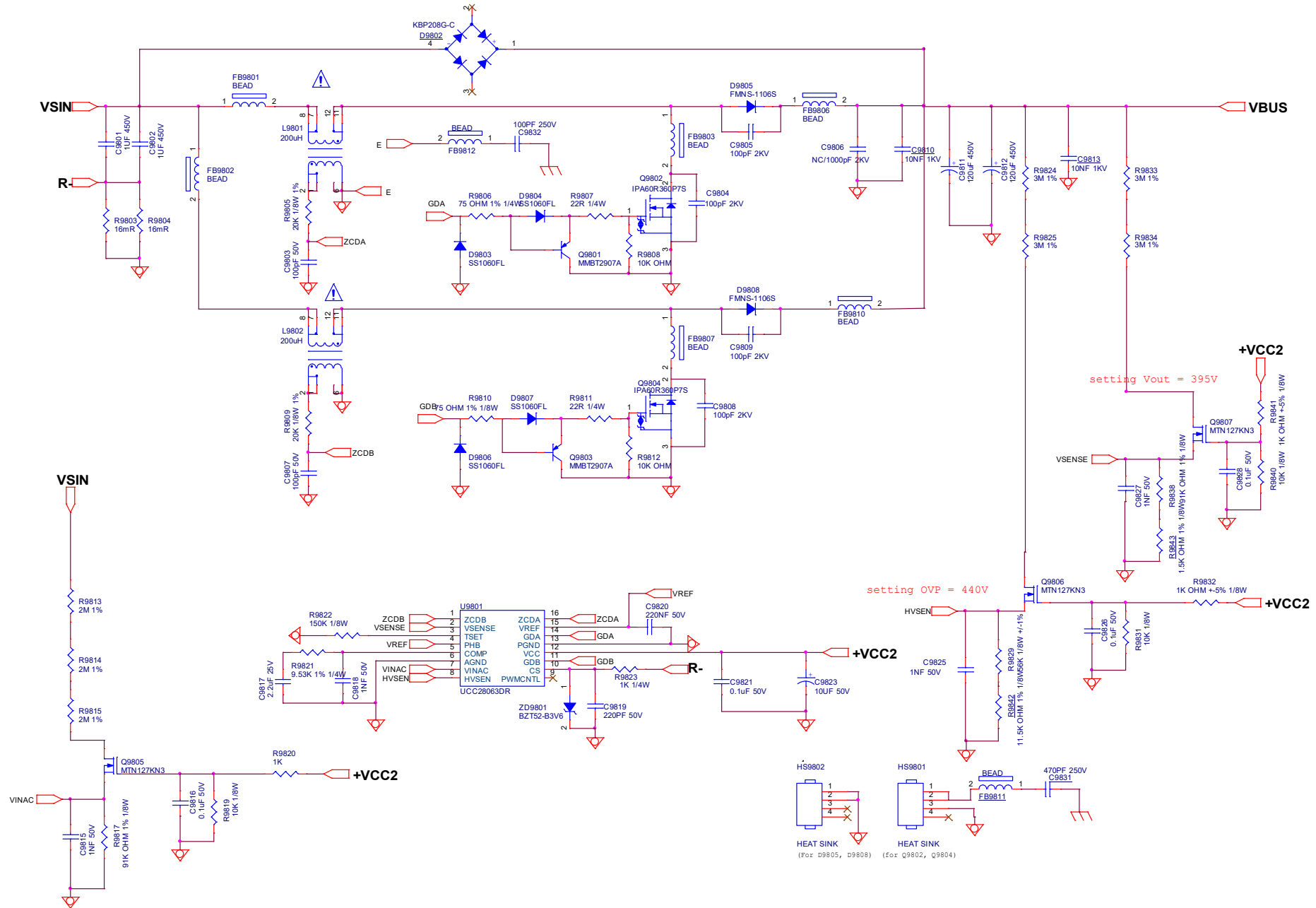


9.2 A 715G9892 PSU(For 55"/65" OLED8x6/706/9x6 Series)

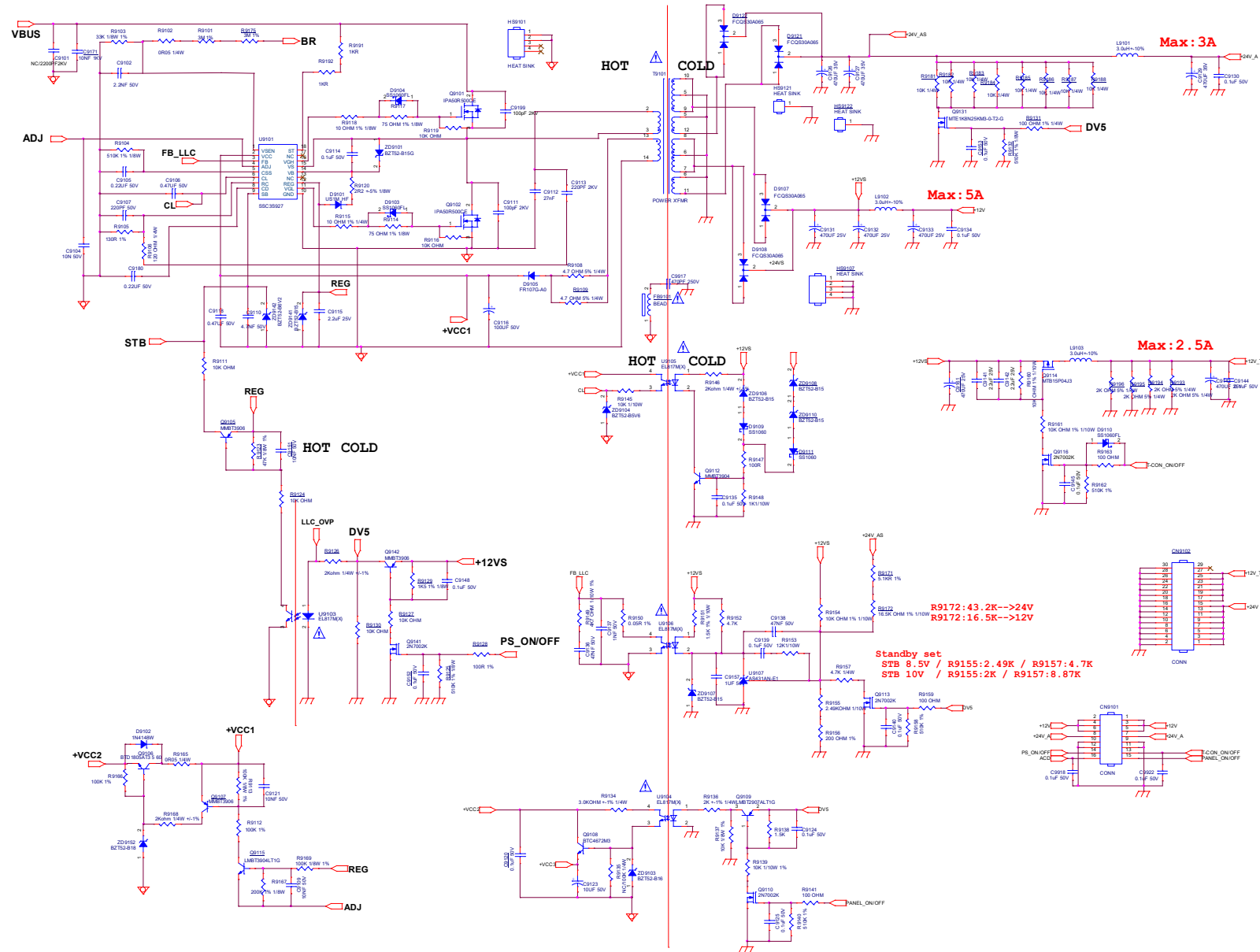
9-2-1 AC Input



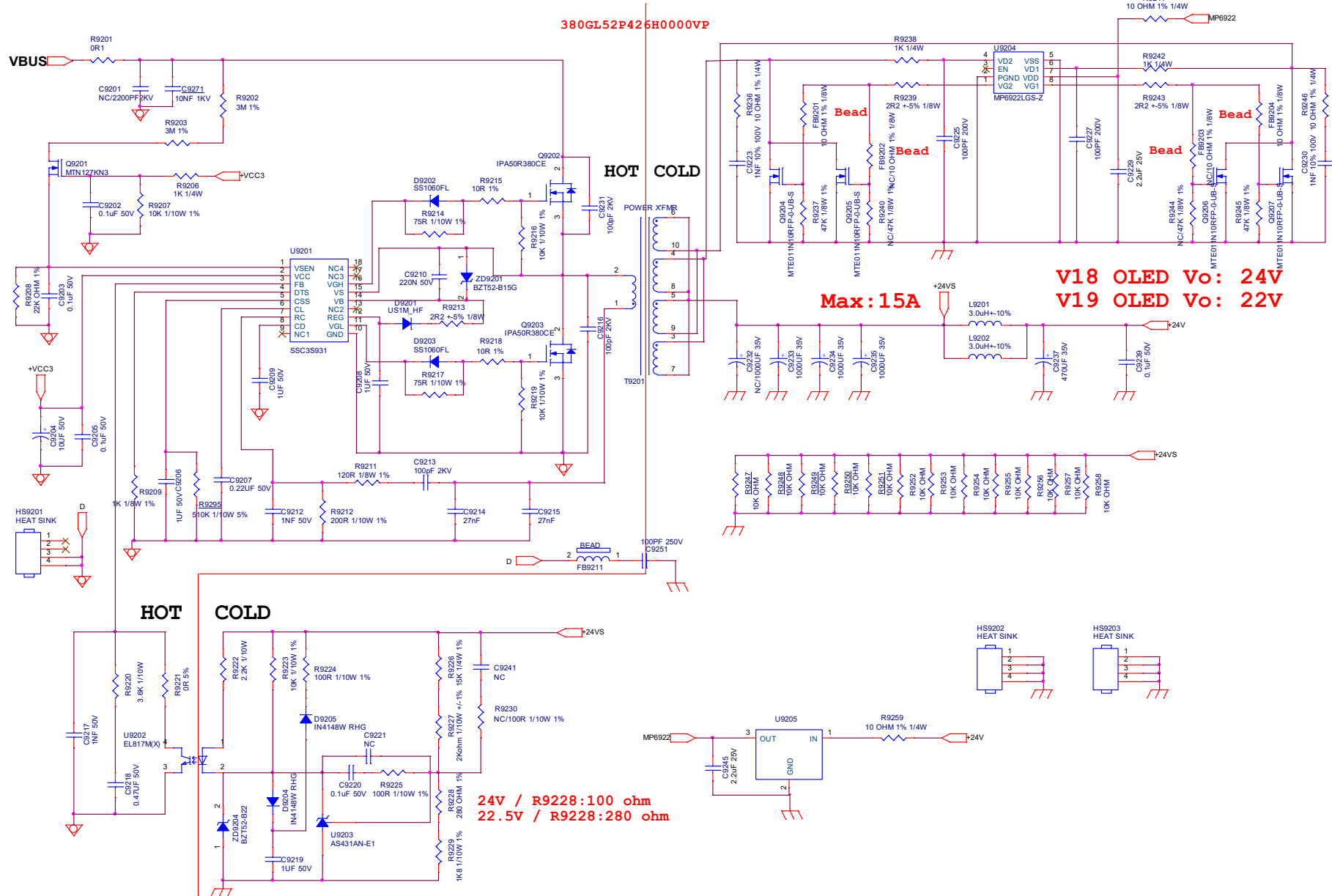
9-2-2 PFC stage



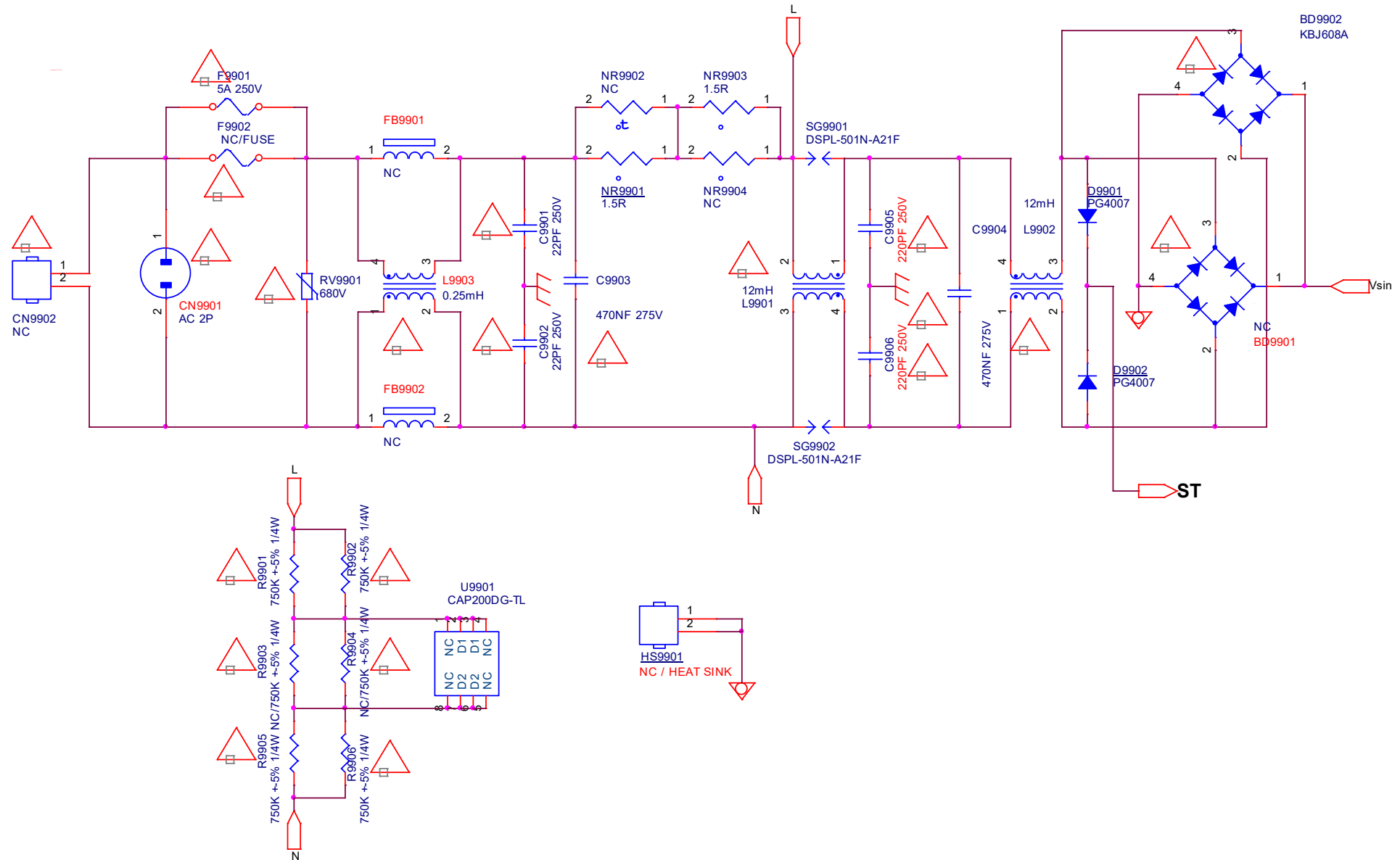
9-2-3 12V power stage



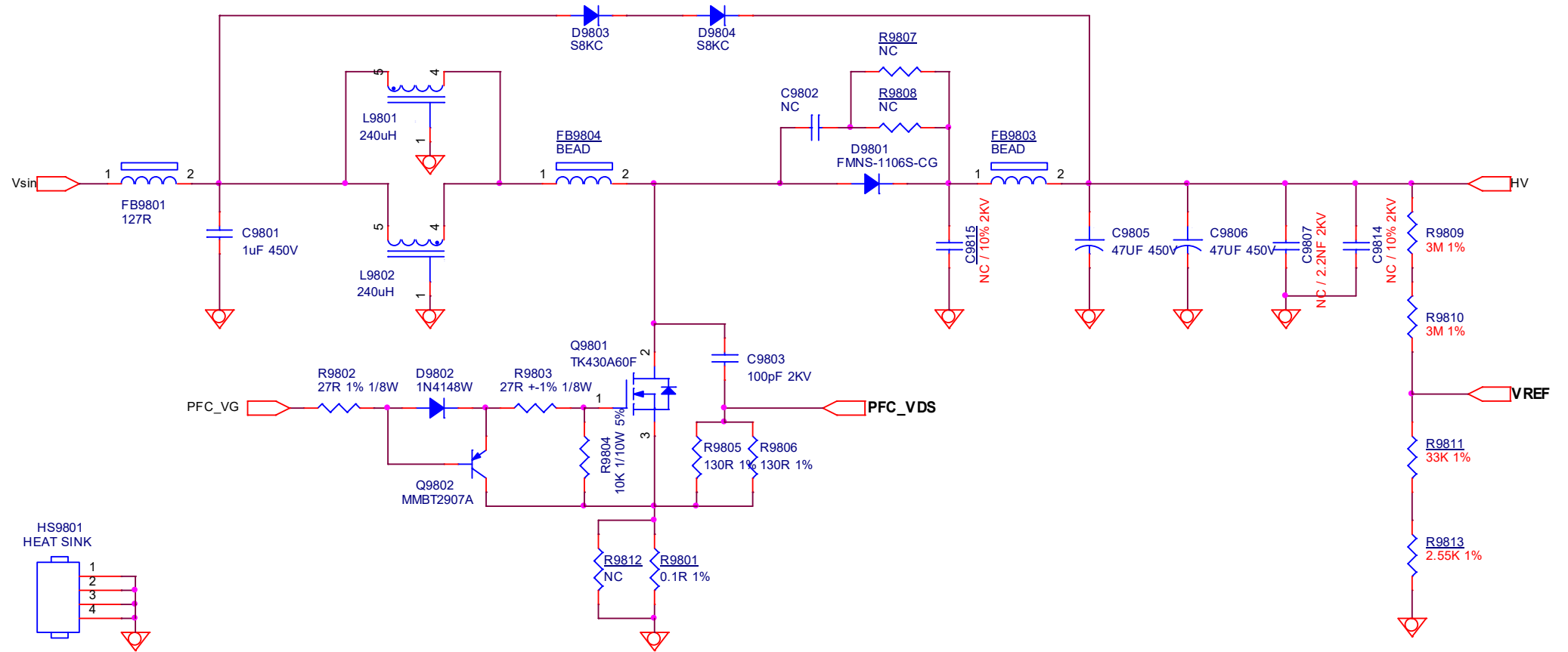
9-2-4 24V power stage



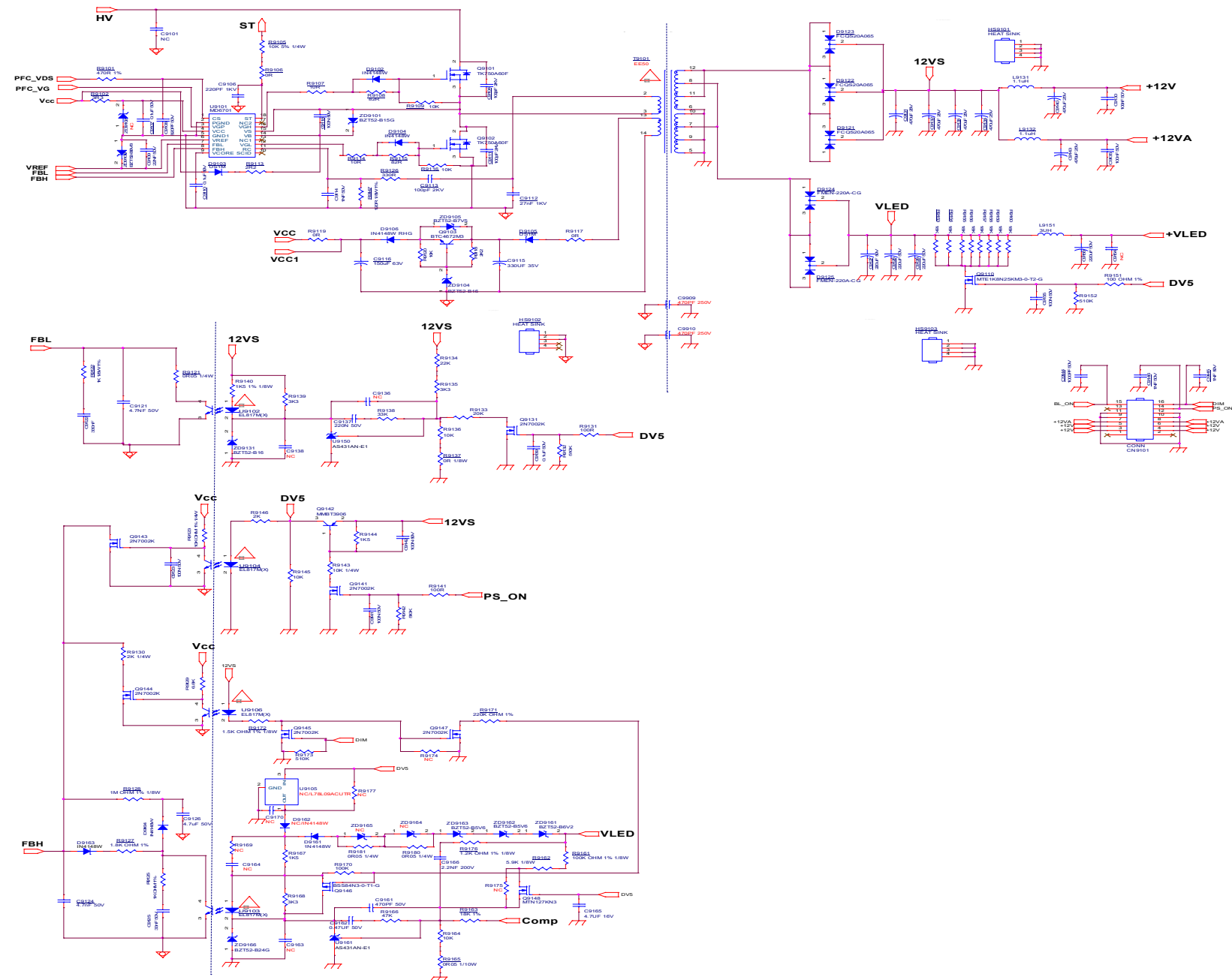
9-3-1 AC Input



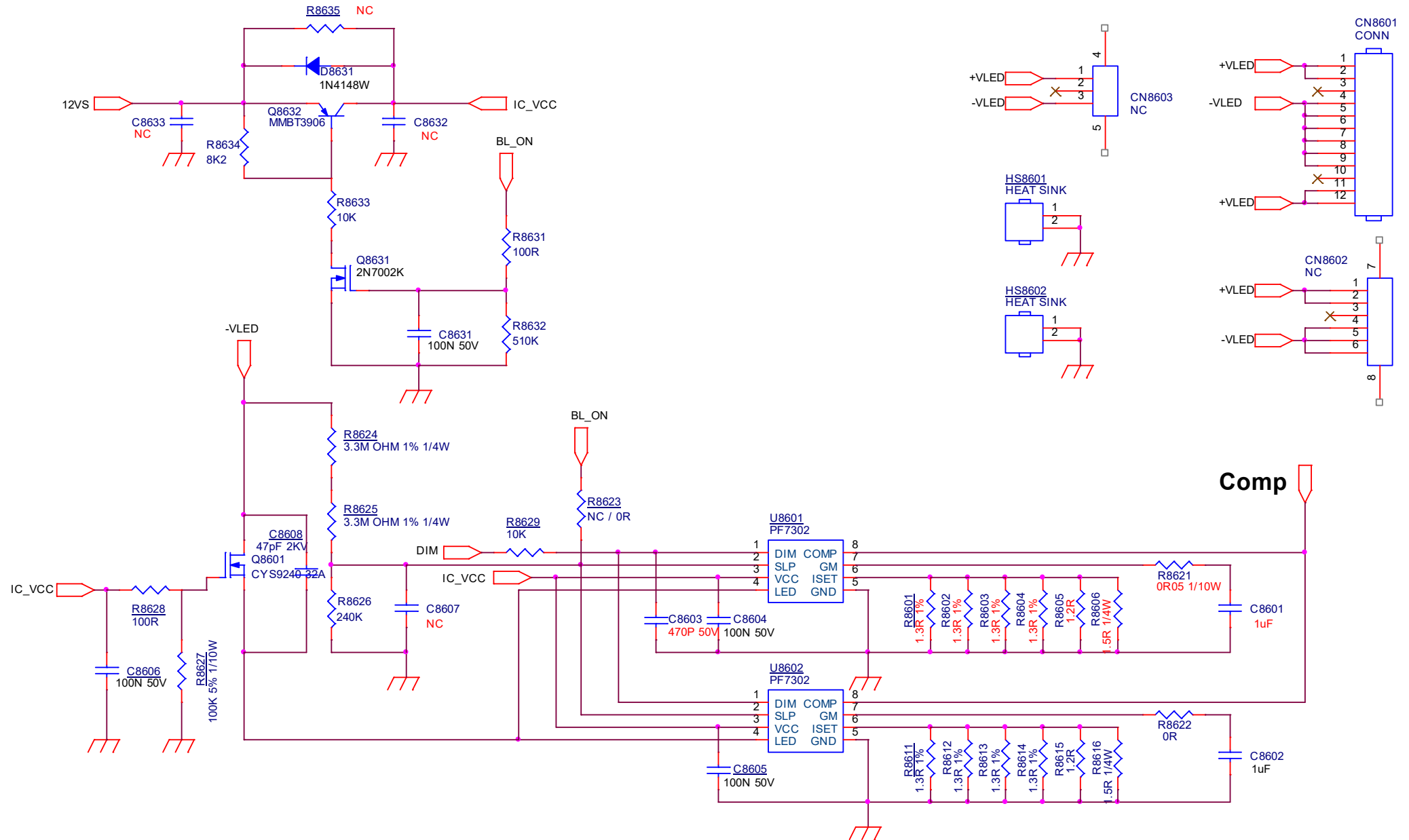
9-3-2 PFC with MD6701



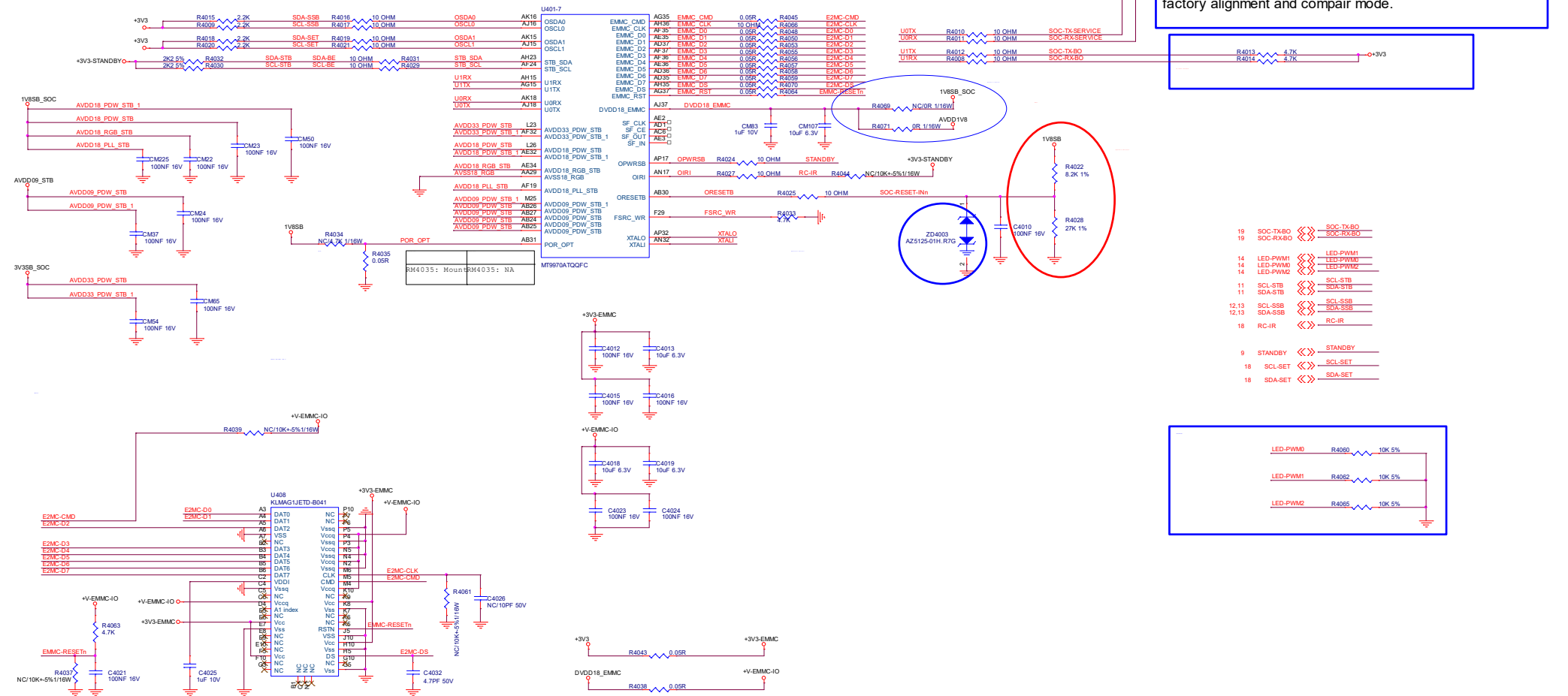
9-3-3 LLC with MD6701



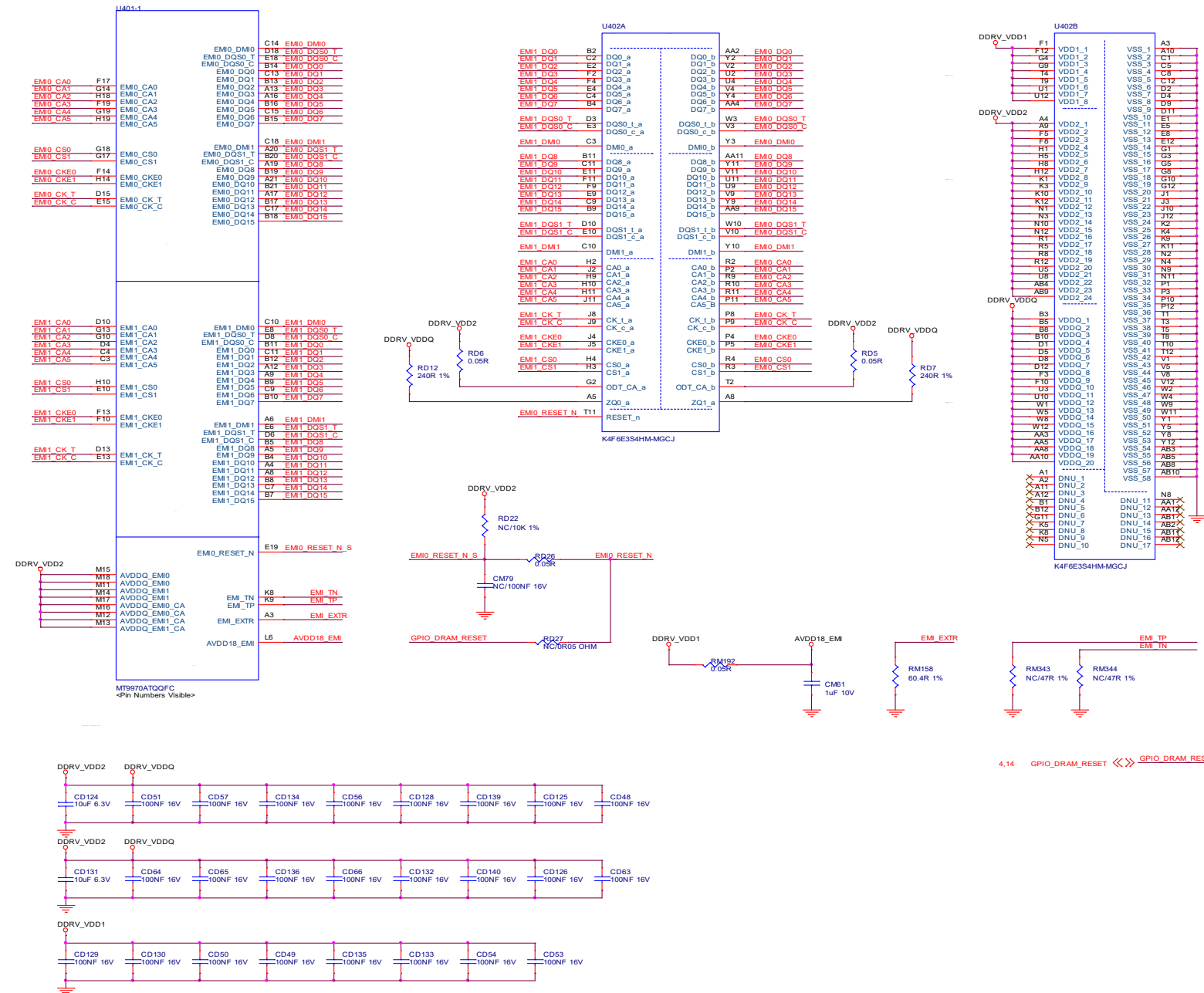
9-3-4 LED



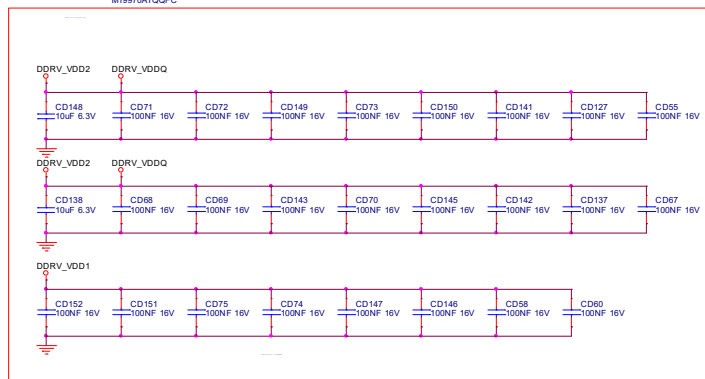
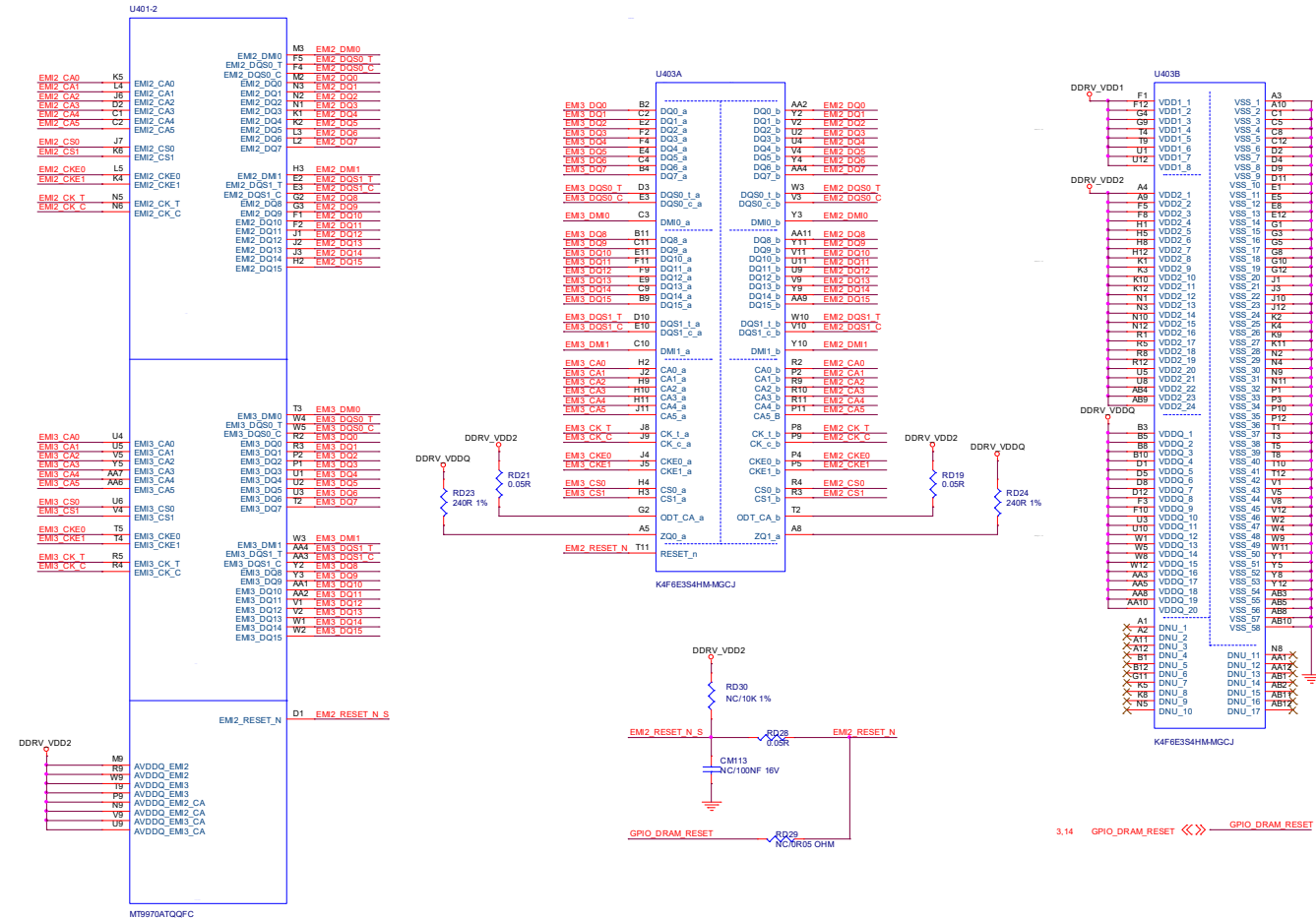
9-4-1 SOC-EMMC



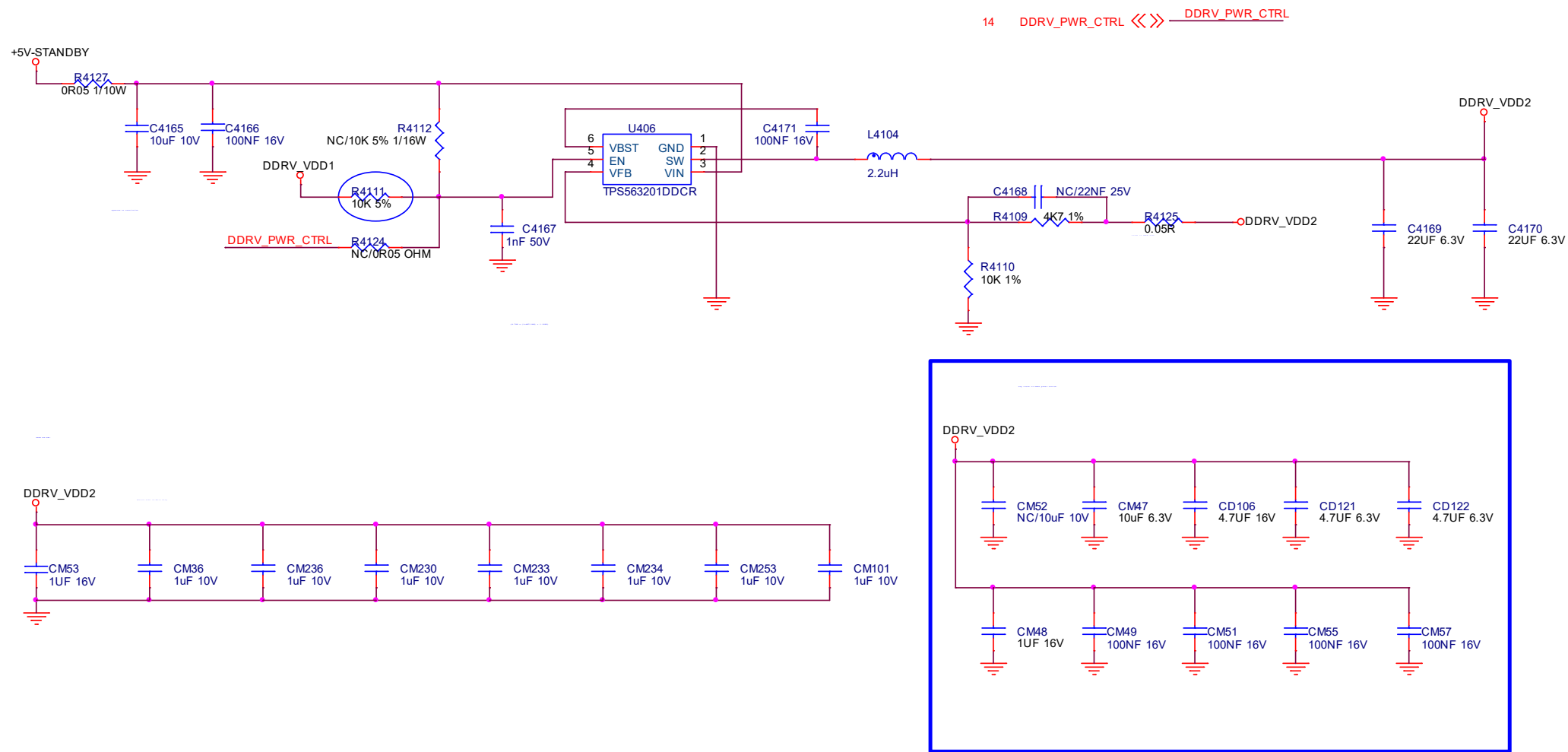
9-4-2 SOC-DDR4-1-2



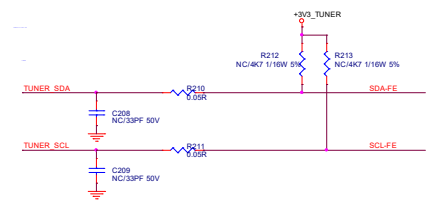
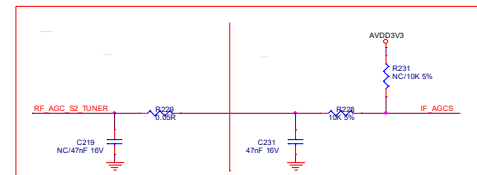
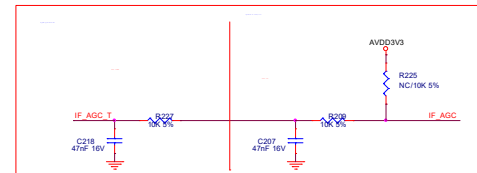
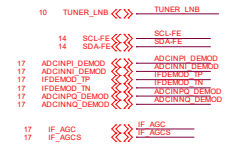
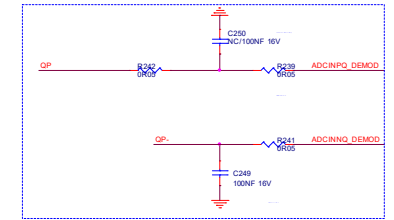
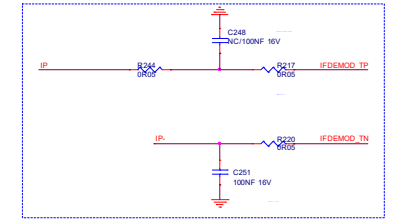
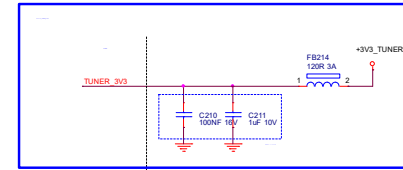
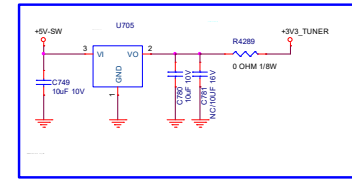
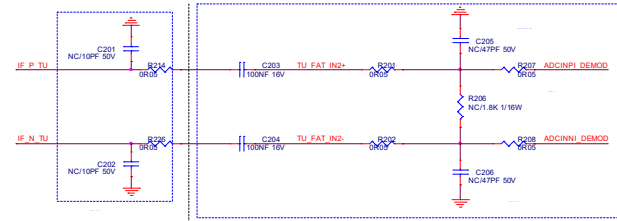
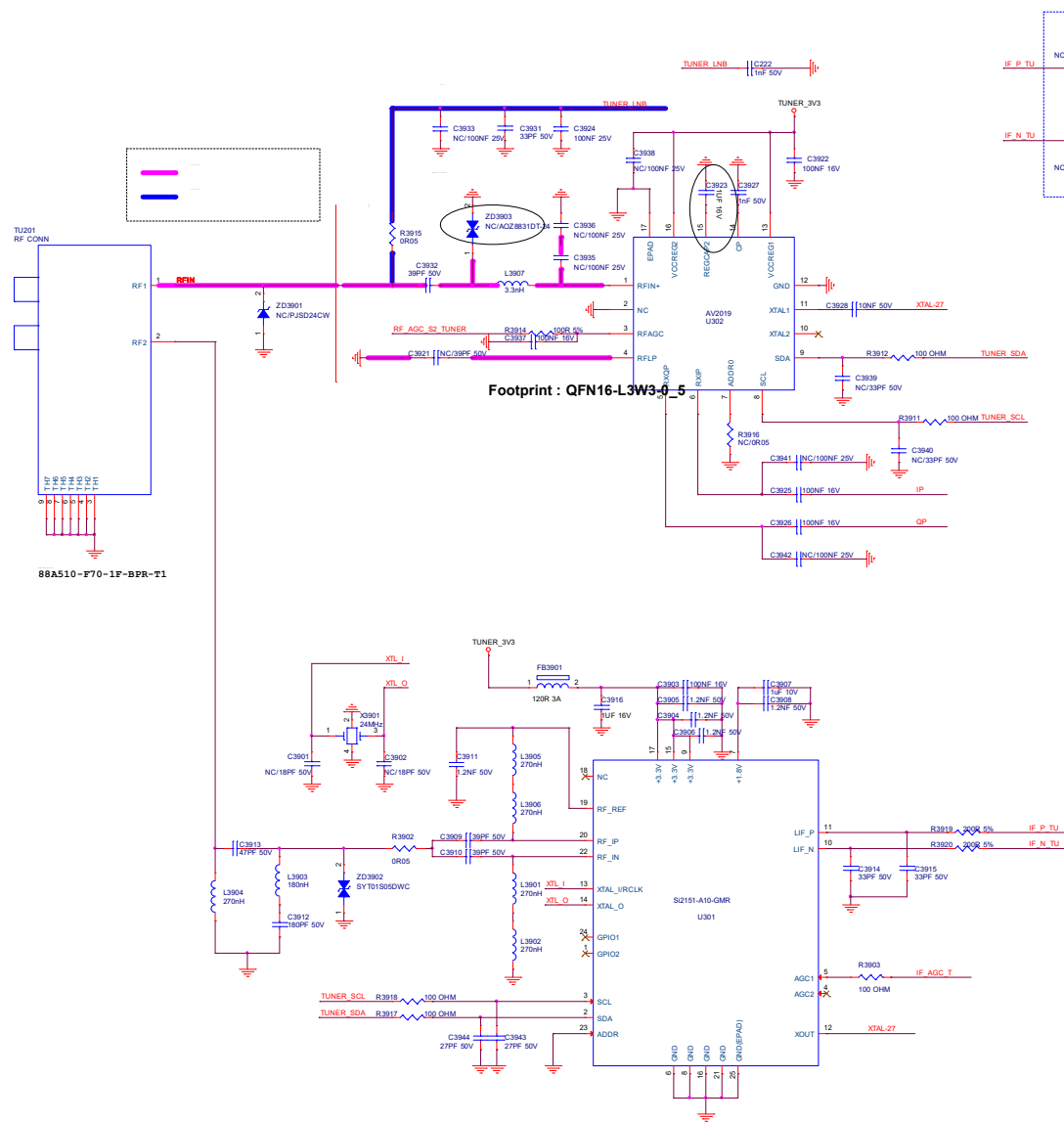
9-4-3 SOC-DDR4-3-4



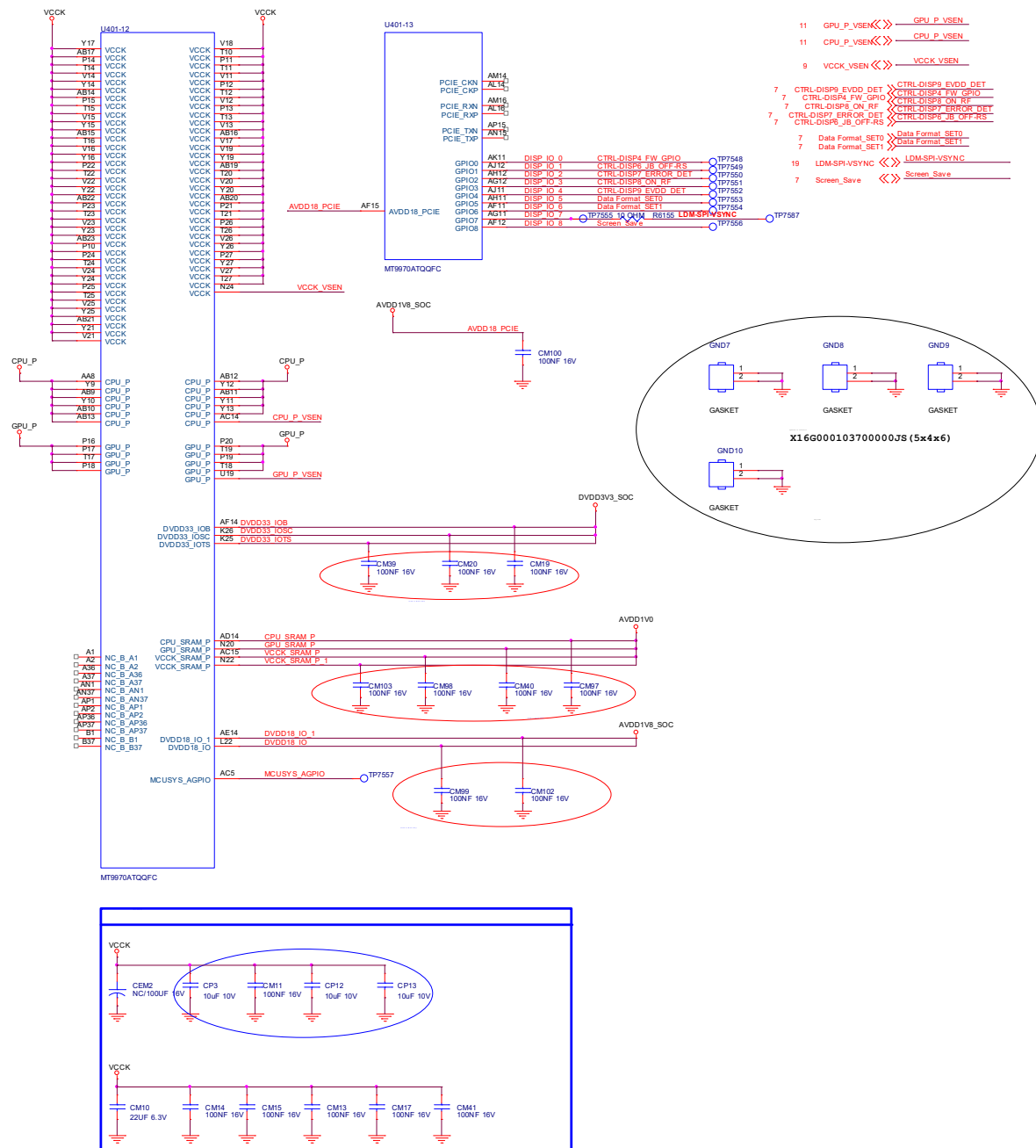
9-4-4 DDR POWER



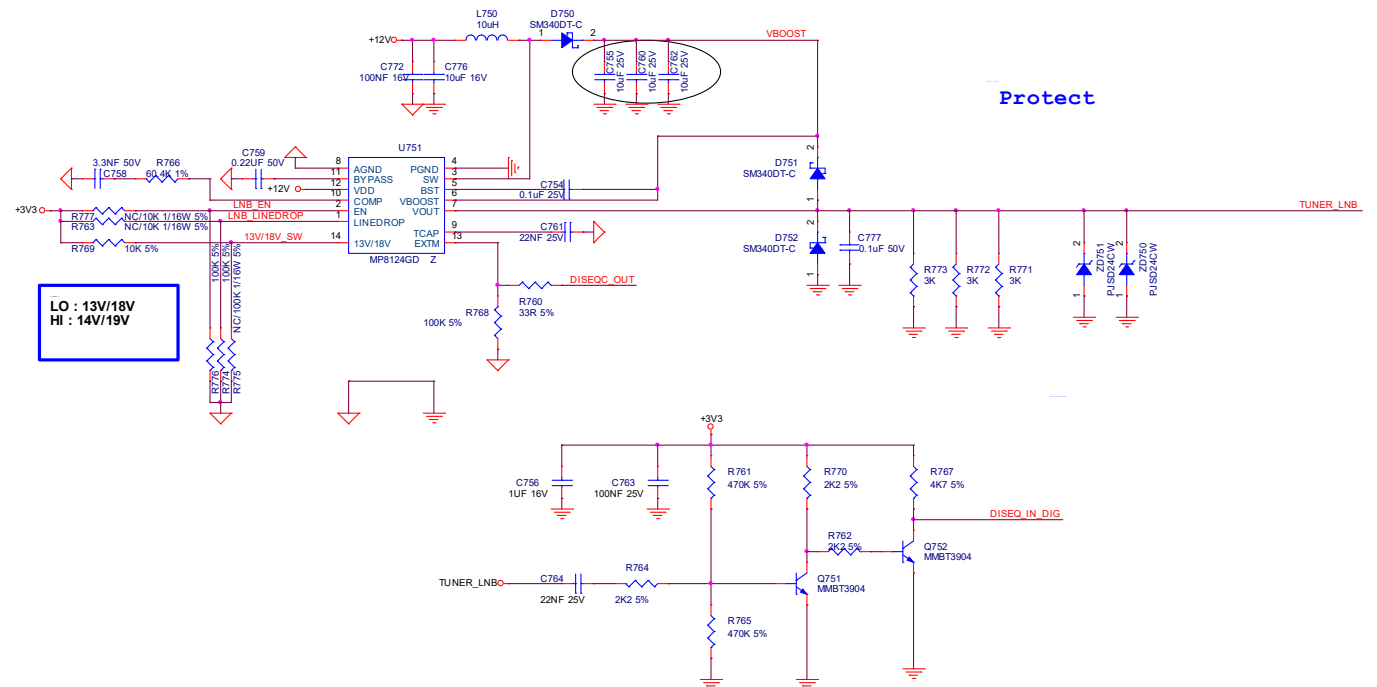
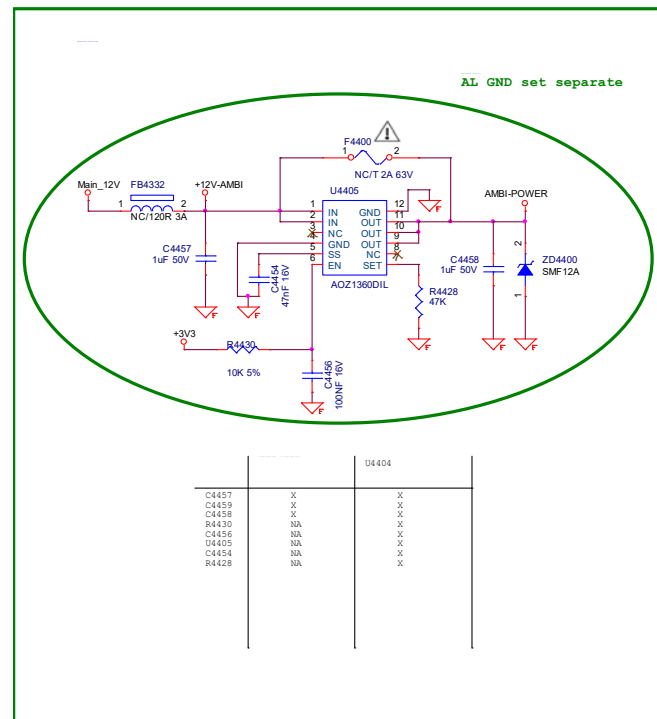
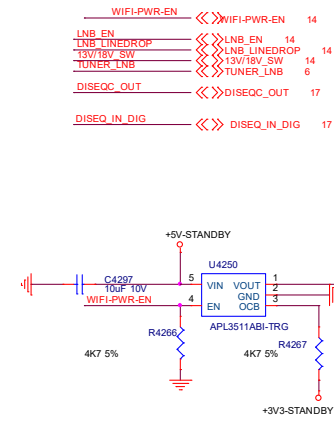
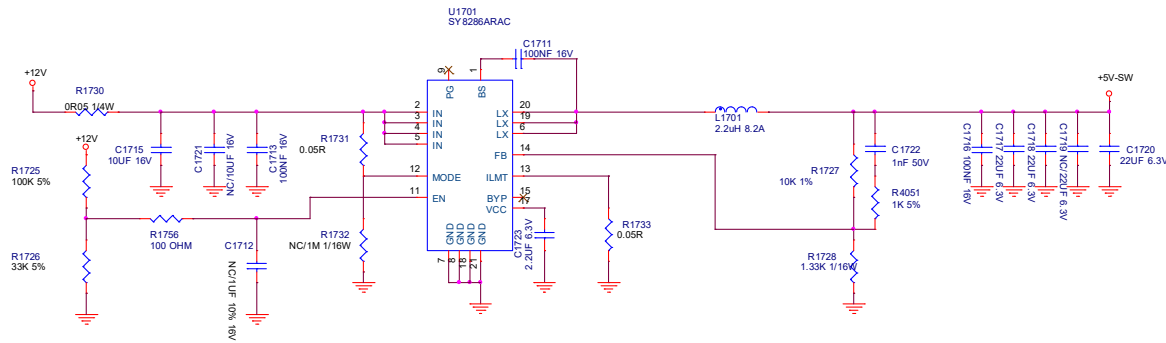
9-4-5 FE-TUNER-DEMOD



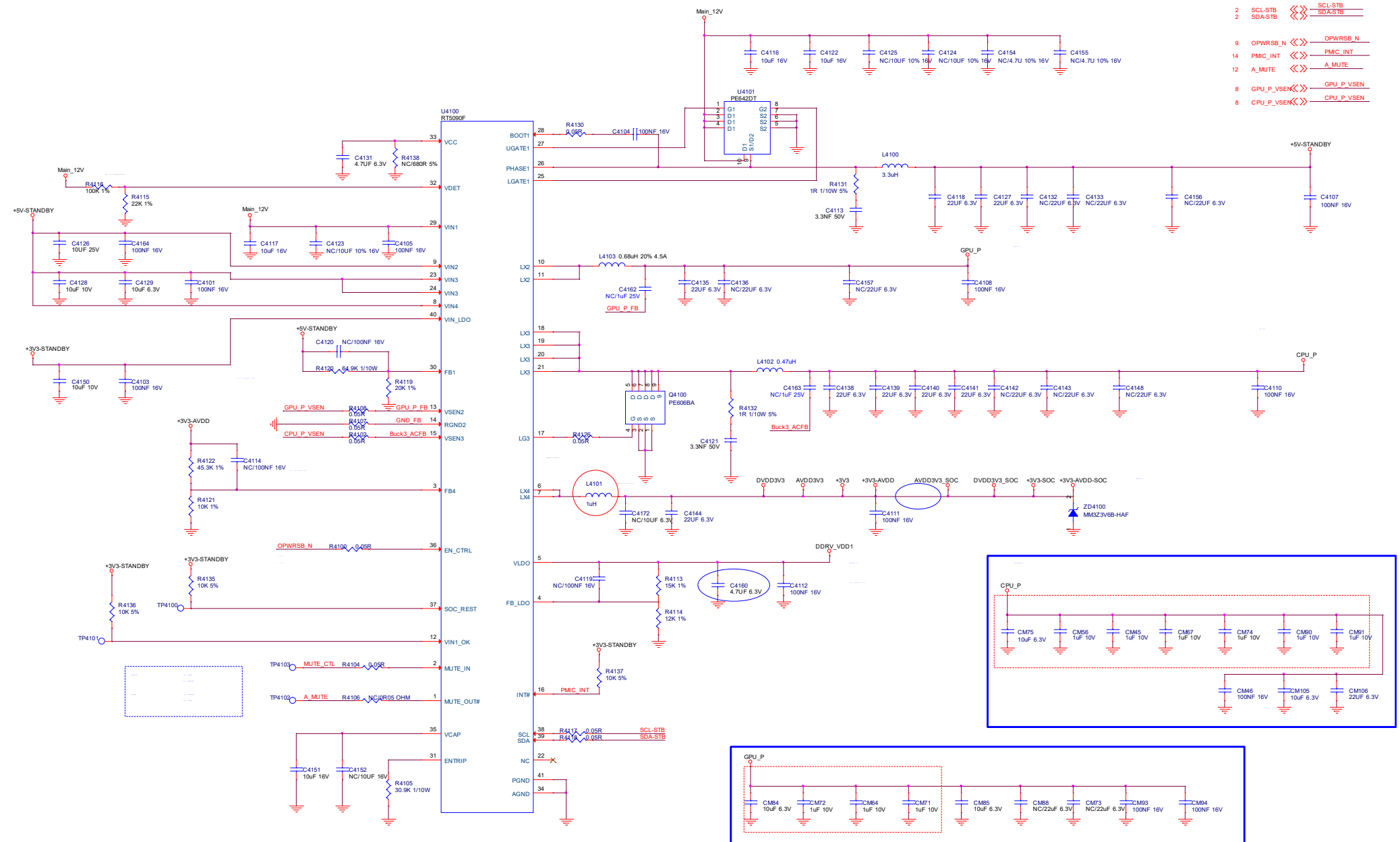
U401-11		U401-12		U401-13		U401-14		U401-15		U401-16		U401-17		U401-18		U401-19		U401-20		U401-21		U401-22		U401-23		U401-24		U401-25		U401-26		U401-27		U401-28		U401-29		U401-30		U401-31		U401-32		U401-33		U401-34		U401-35		U401-36		U401-37		U401-38		U401-39		U401-40		U401-41		U401-42		U401-43		U401-44		U401-45		U401-46		U401-47		U401-48		U401-49		U401-50		U401-51		U401-52		U401-53		U401-54		U401-55		U401-56		U401-57		U401-58		U401-59		U401-60		U401-61		U401-62		U401-63		U401-64		U401-65		U401-66		U401-67		U401-68		U401-69		U401-70		U401-71		U401-72		U401-73		U401-74		U401-75		U401-76		U401-77		U401-78		U401-79		U401-80		U401-81		U401-82		U401-83		U401-84		U401-85		U401-86		U401-87		U401-88		U401-89		U401-90		U401-91		U401-92		U401-93		U401-94		U401-95		U401-96		U401-97		U401-98		U401-99		U401-100		U401-101		U401-102		U401-103		U401-104		U401-105		U401-106		U401-107		U401-108		U401-109		U401-110		U401-111		U401-112		U401-113		U401-114		U401-115		U401-116		U401-117		U401-118		U401-119		U401-120		U401-121		U401-122		U401-123		U401-124		U401-125		U401-126		U401-127		U401-128		U401-129		U401-130		U401-131		U401-132		U401-133		U401-134		U401-135		U401-136		U401-137		U401-138		U401-139		U401-140		U401-141		U401-142		U401-143		U401-144	
---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	---------	--	----------	--	----------	--	----------	--	----------	--	----------	--	----------	--	----------	--	----------	--	----------	--	----------	--	----------	--	----------	--	----------	--	----------	--	----------	--	----------	--	----------	--	----------	--	----------	--	----------	--	----------	--	----------	--	----------	--	----------	--	----------	--	----------	--	----------	--	----------	--	----------	--	----------	--	----------	--	----------	--	----------	--	----------	--	----------	--	----------	--	----------	--	----------	--	----------	--	----------	--	----------	--	----------	--	----------	--	----------	--	----------	--



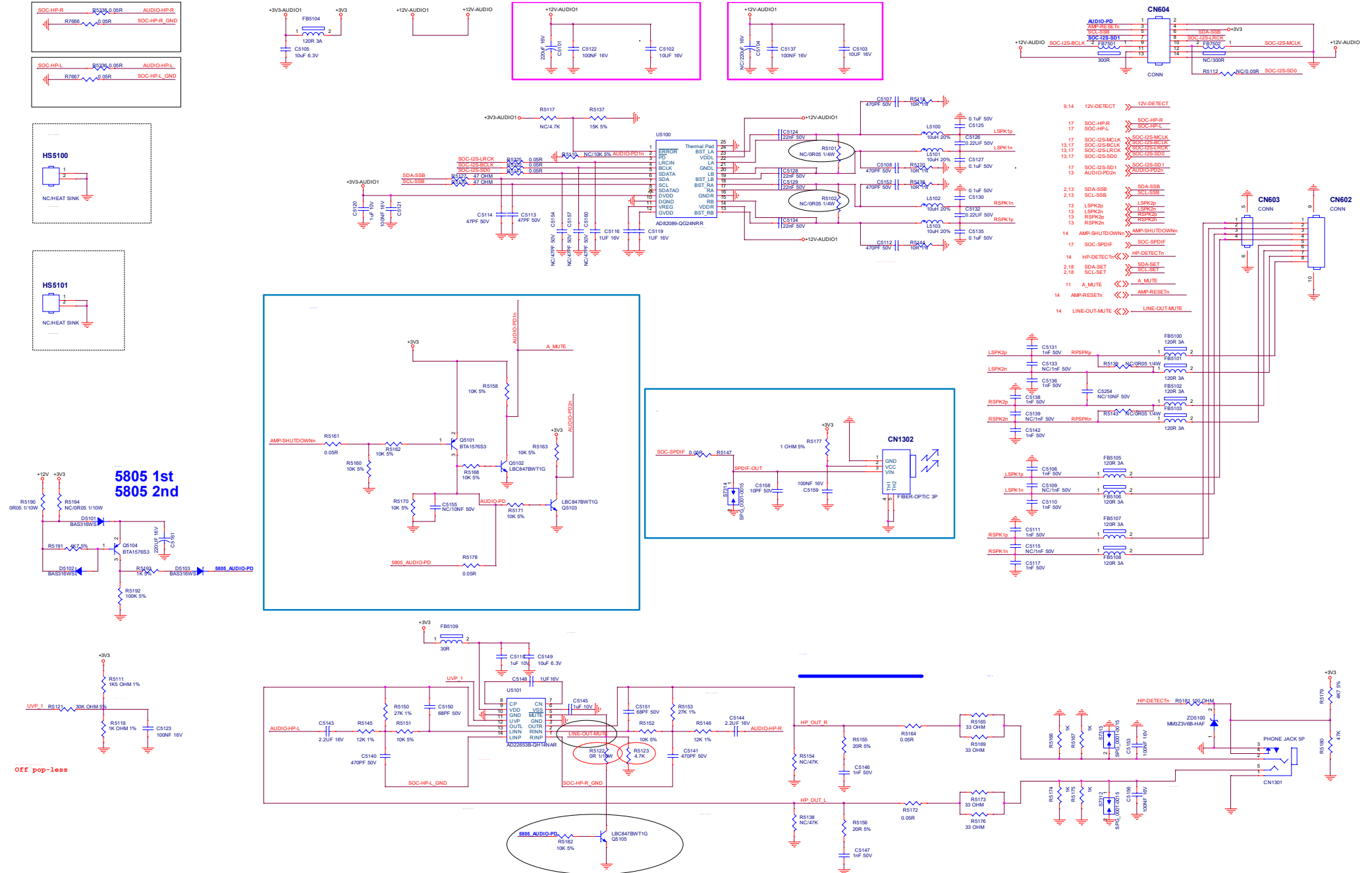
9-4-9 DCDC-SYSTEM-POWER2



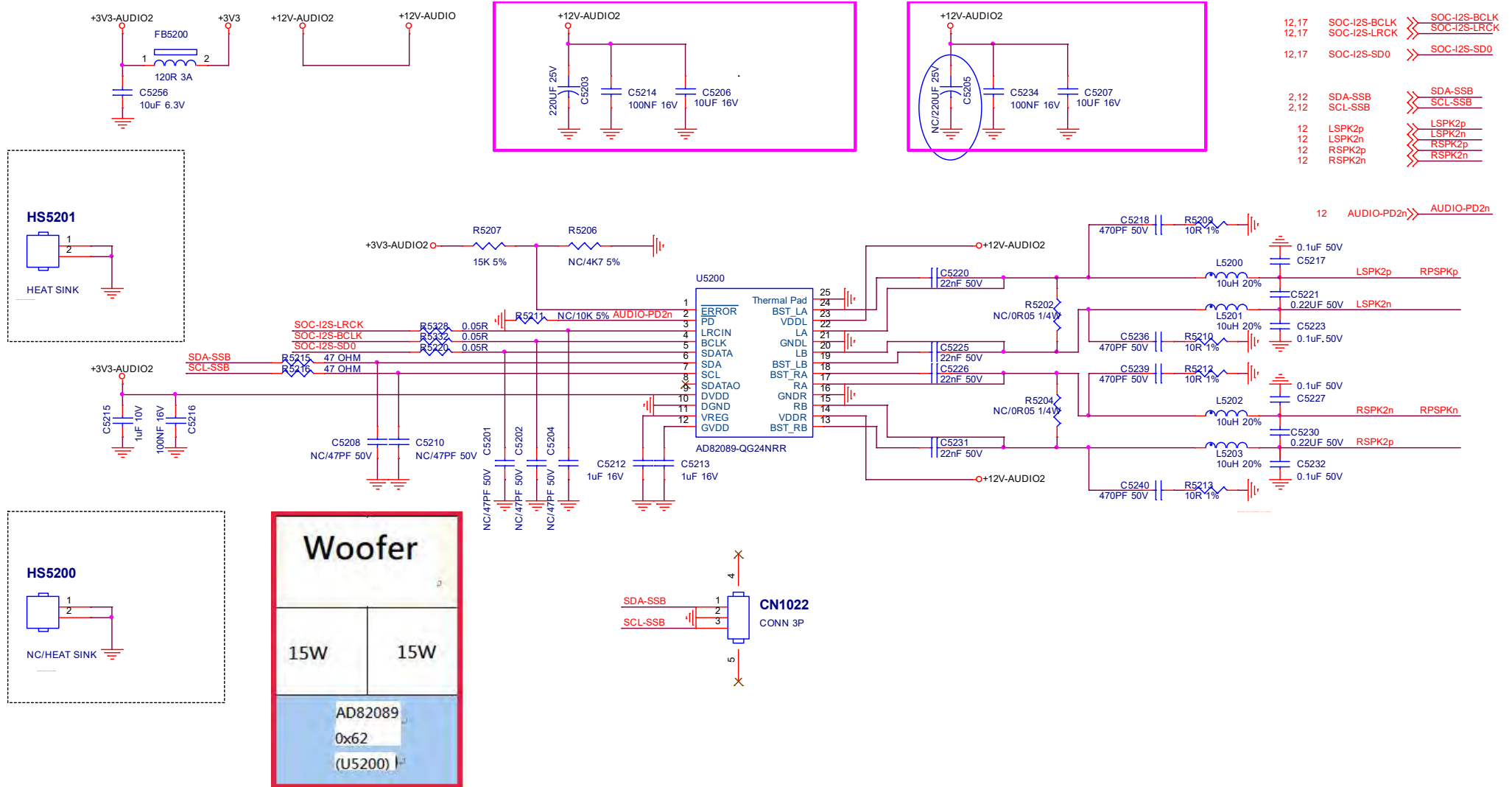
9-4-10 DCDC-SYSTEM-POWER3



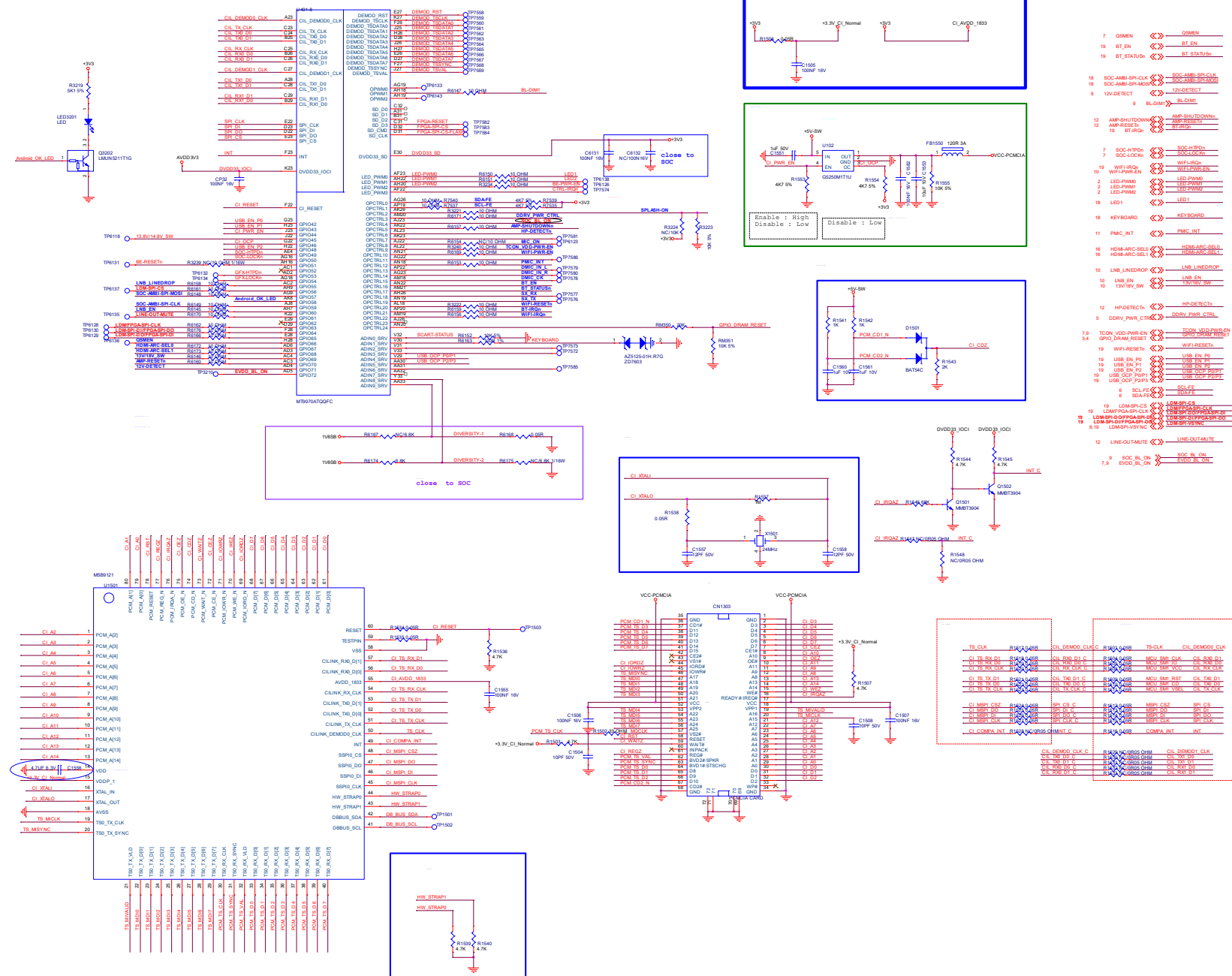
9-4-11 AUDIO-1st-CLASS-D-AMP



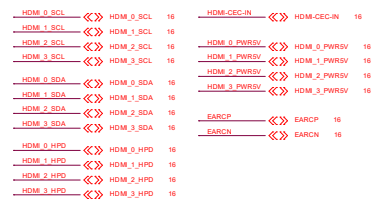
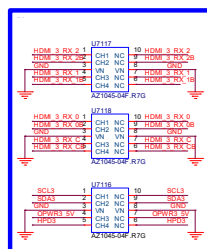
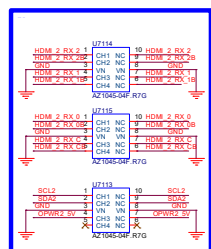
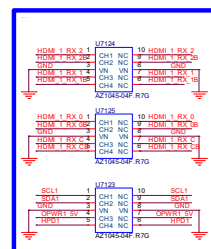
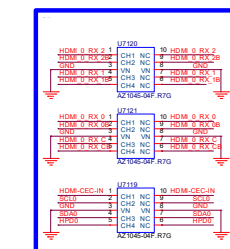
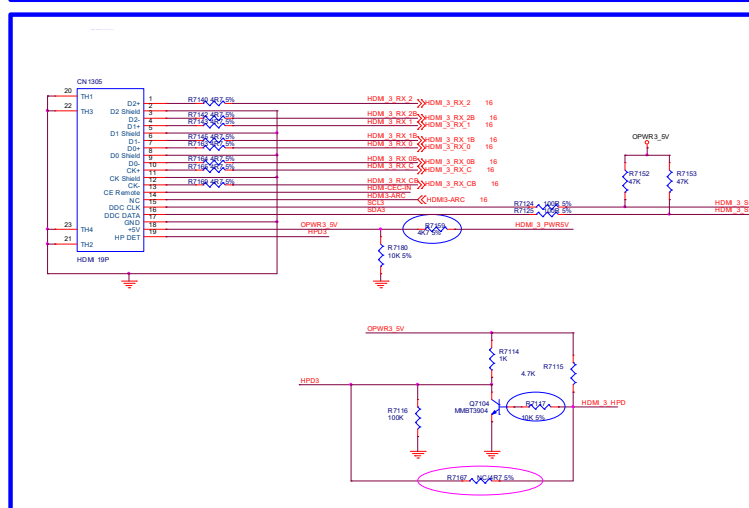
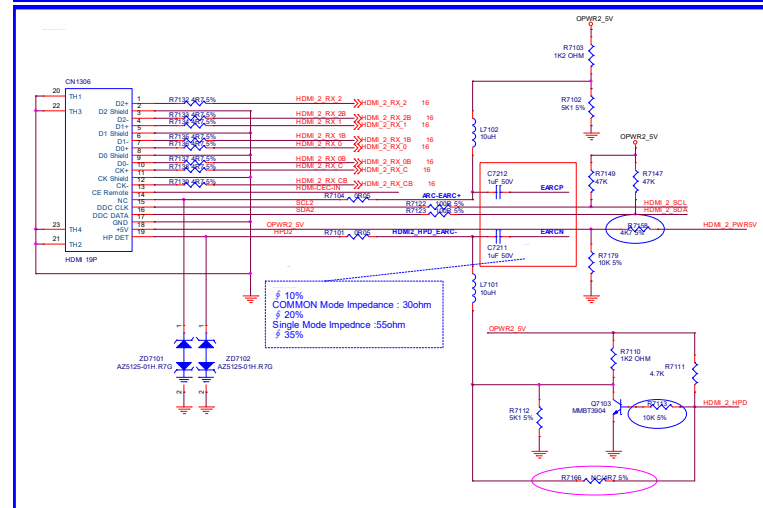
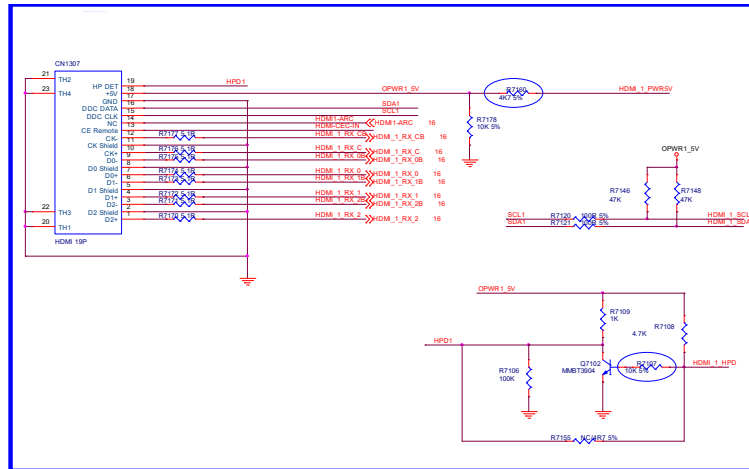
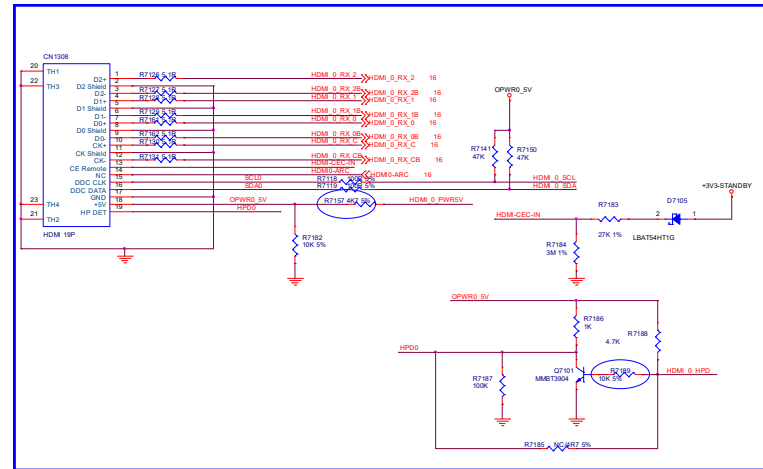
9-4-12 AUDIO-2nd-CLASS-D-AMP



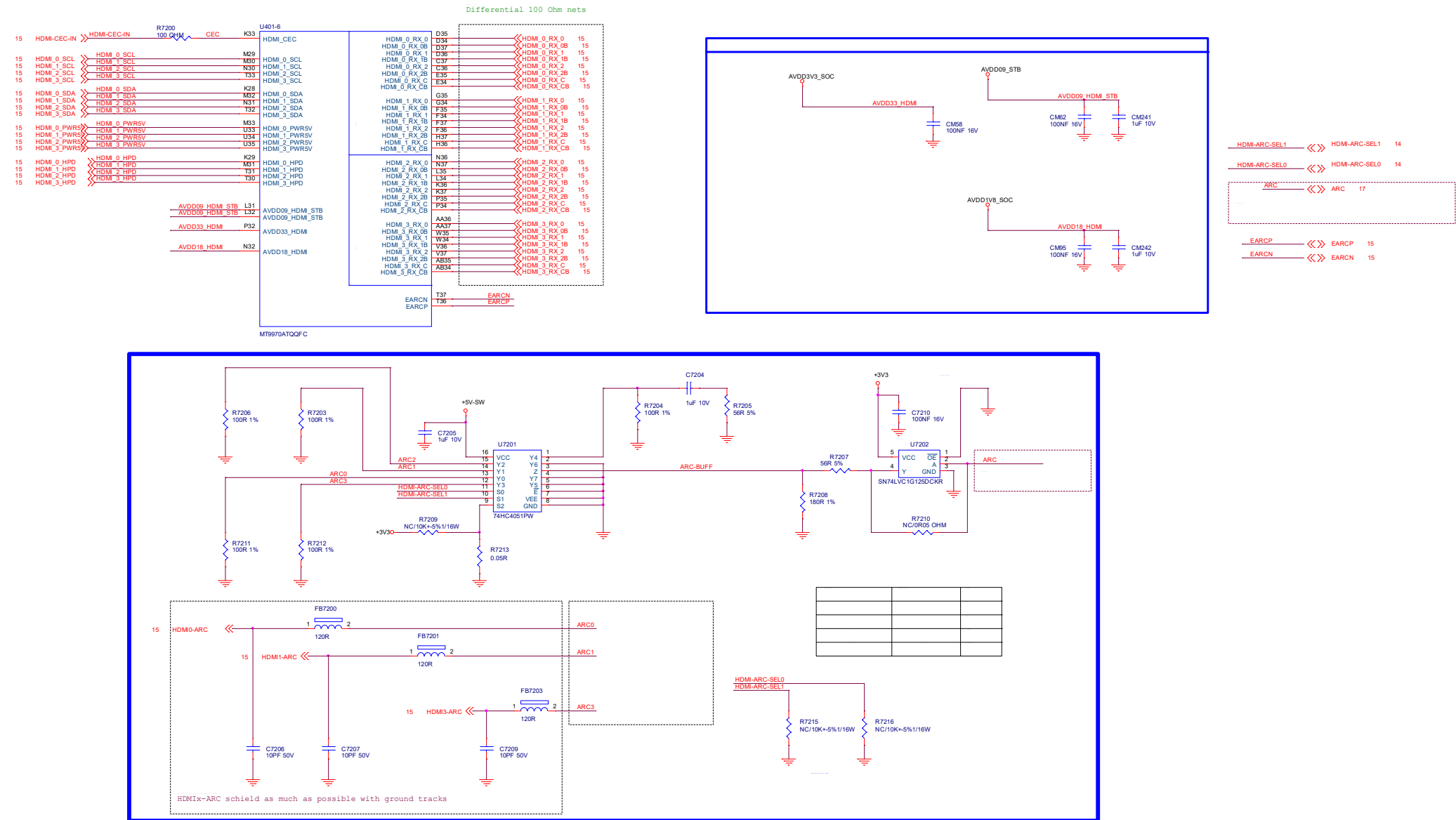
9-4-13 PCMCIA



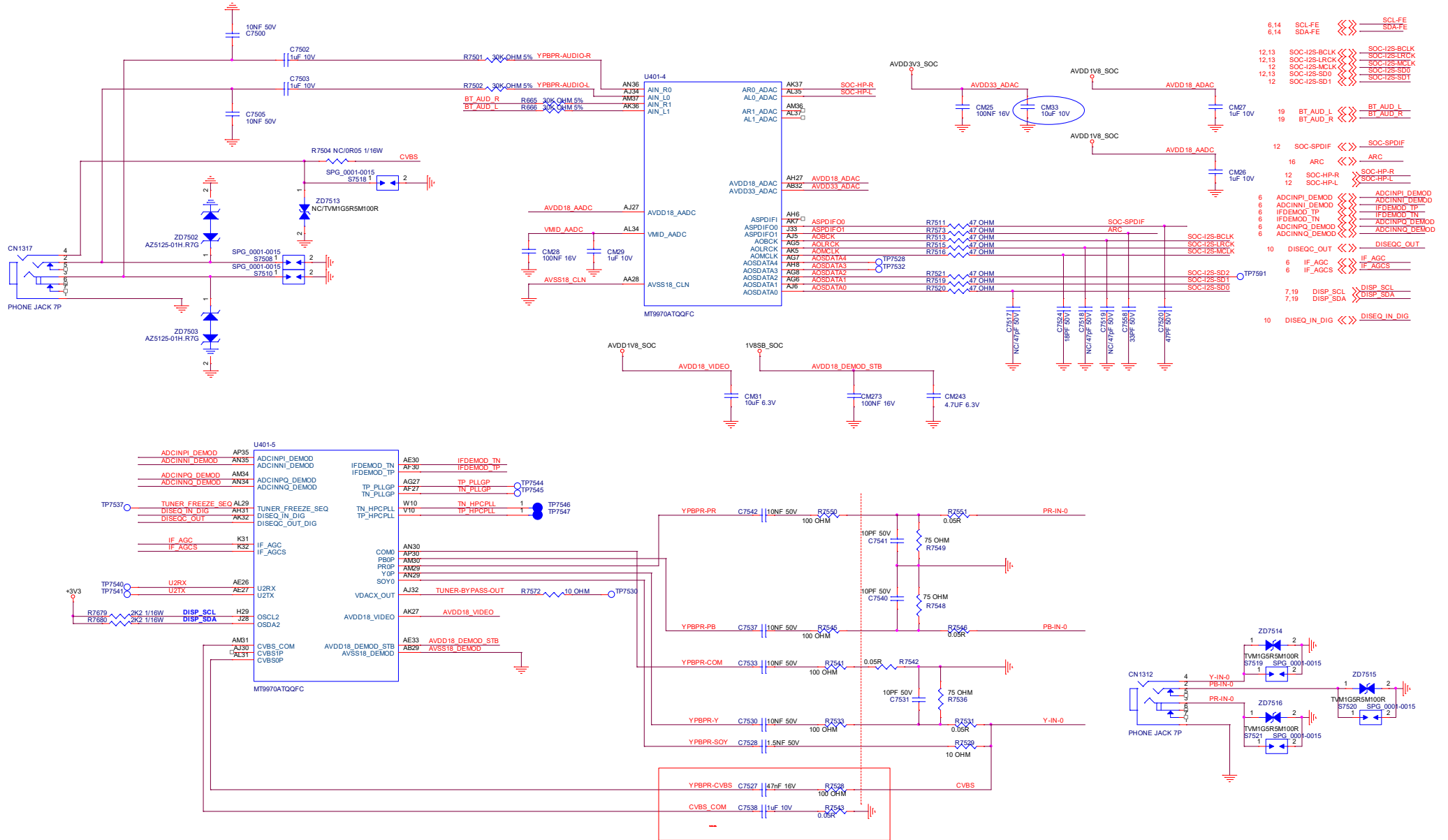
9-4-14 HDMI-INPUTS



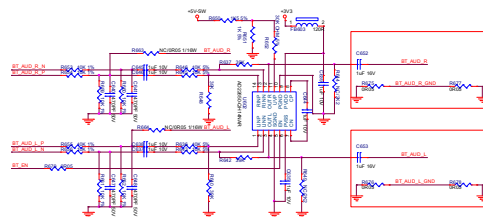
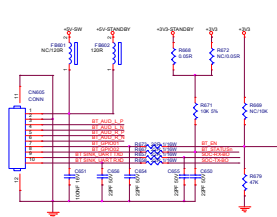
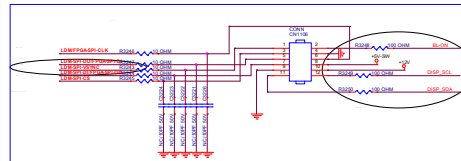
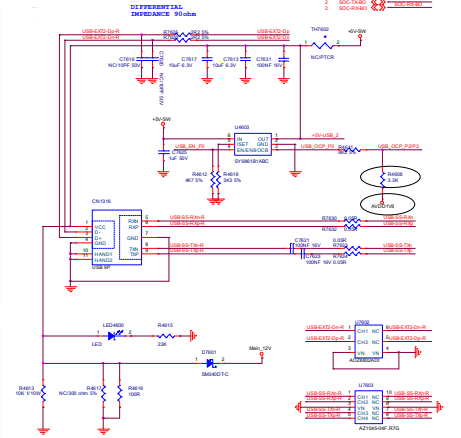
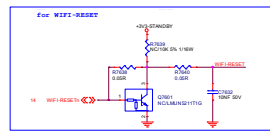
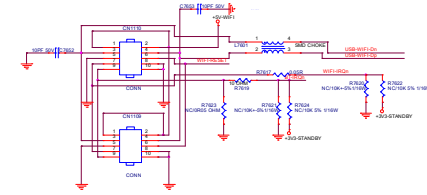
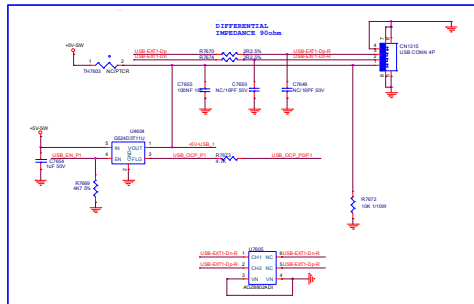
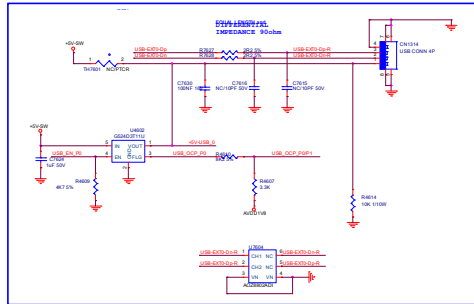
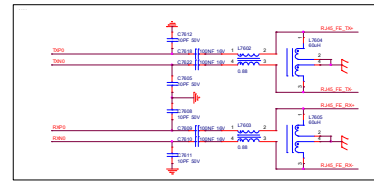
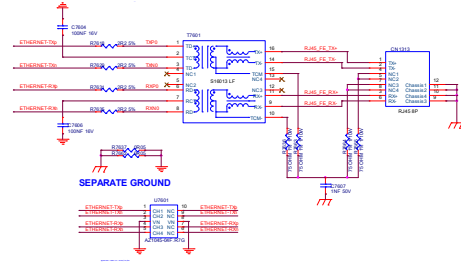
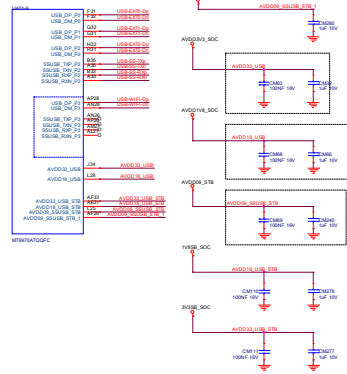
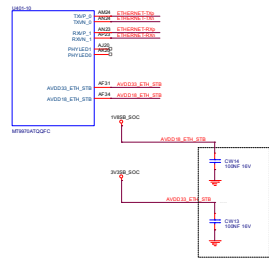
9-4-15 HDMI-SOC-ARC



9-4-16 SCART-YPbPr-CVBS

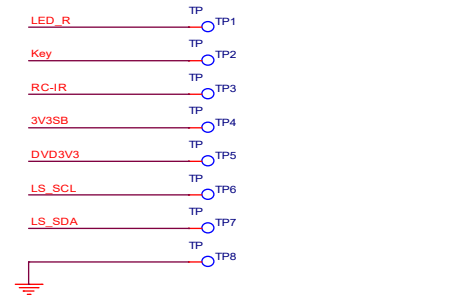
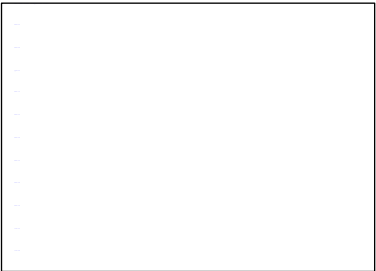
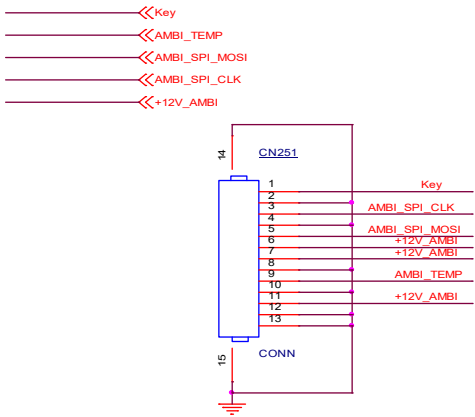
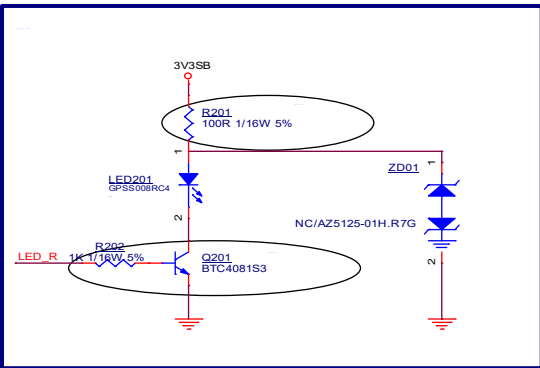
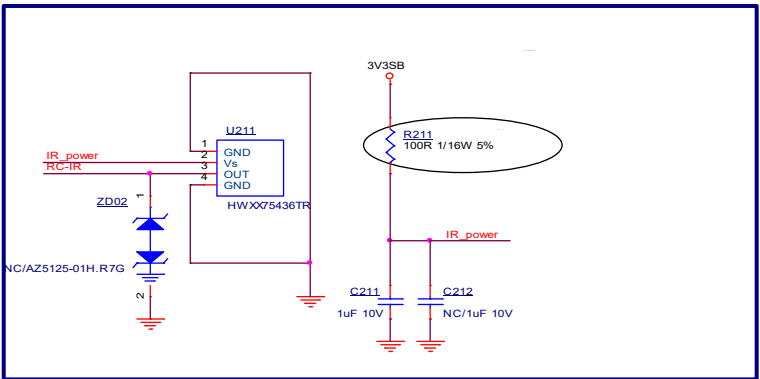
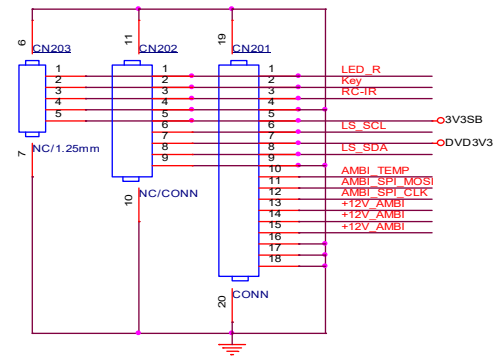
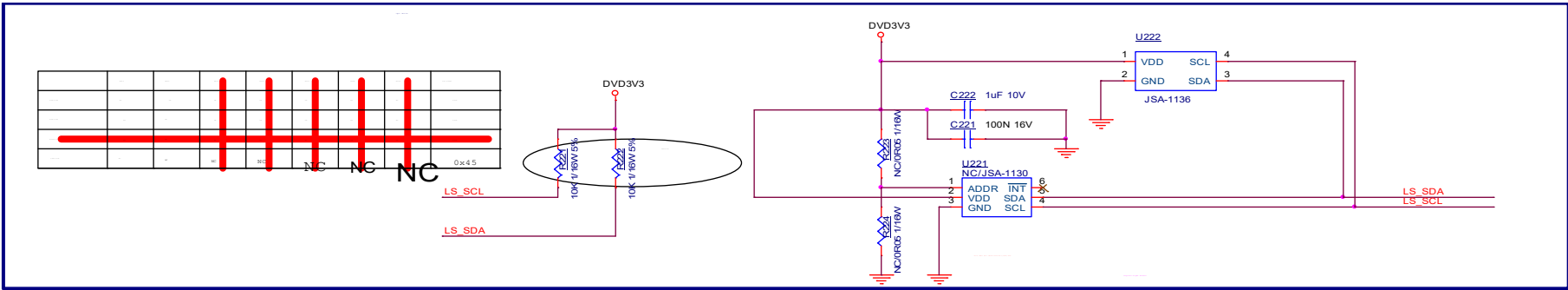


9-4-18 CTRL-ETHERNET-PHY



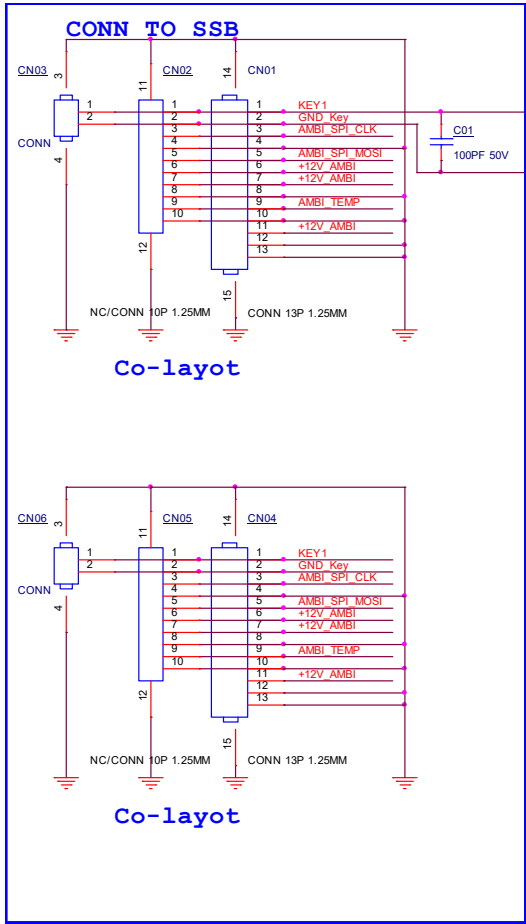
9.5 E 715GA039 IR Board (For 48"/55"/65" OLED706/8x6/936 Series)

9-5-1 IR&STB LED&Light sensor

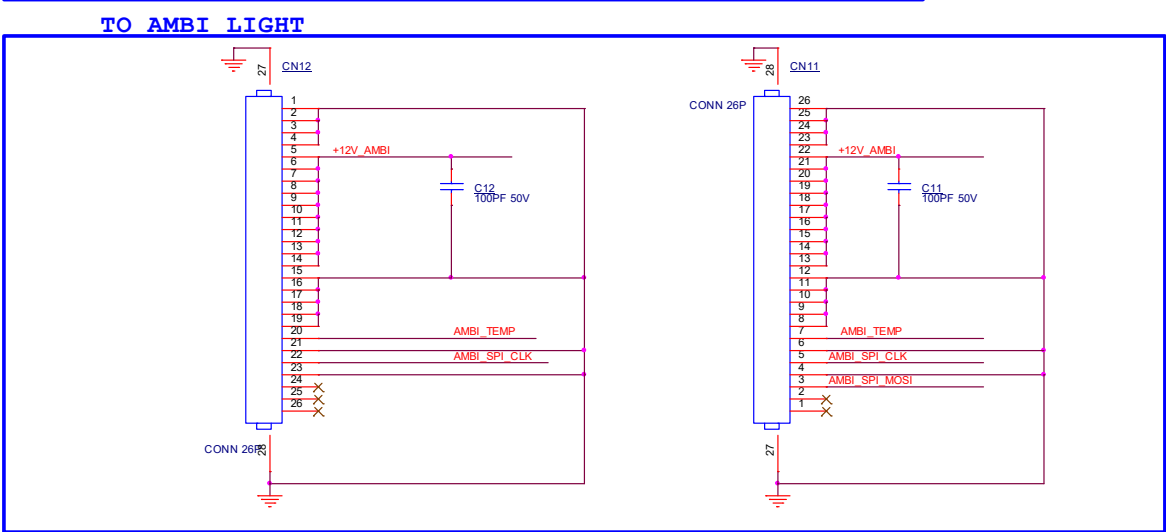
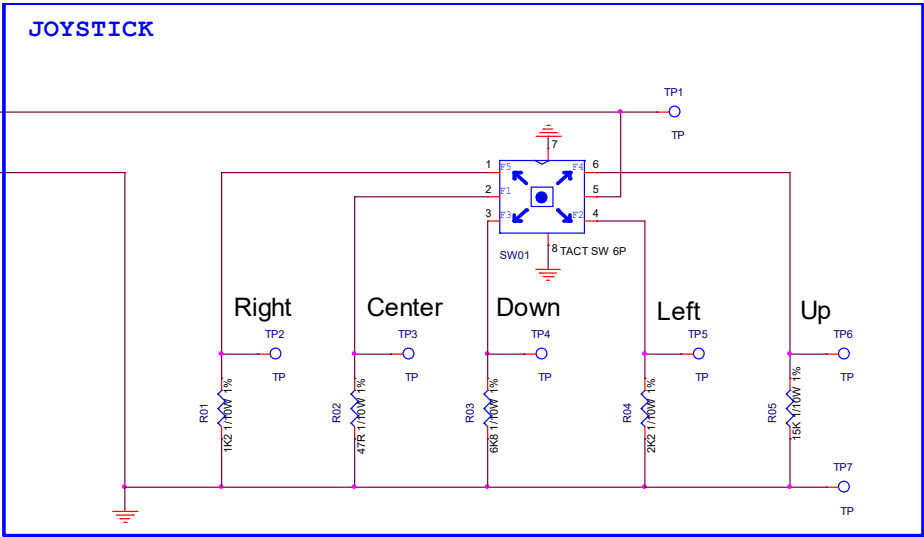


9.6 E 715GA334 Keyboard control panel (For 48"/55"/65" OLED706/8x6/9x6 Series)

9-6-1 Key



Parts loaction
Top:CN01/CN02/CN03/R01/R02/R03/CN11/CN12
Bottom:CN04/CN05/CN06/C01/R04/R05/C11/C12



Joystick key define

Direction	switch	Key function	Resistance	Voltage	Range
Center	2-5 short	Menu	0R	0V	0.0 to 0.22 V
Right	1-5 short	CH+	1K2	0.5V	0.39 to 0.60 V
Left	4-5 short	CH-	2K2	0.81V	0.67 to 0.95 V
Down	3-5 short	VOL-	6K8	1.65V	1.41 to 1.87 V
Up	6-5 short	VOL+	15K	2.27V	1.93 to 2.58 V
NA	NA	No function	NA	3.3V	3.135 to 3.465V

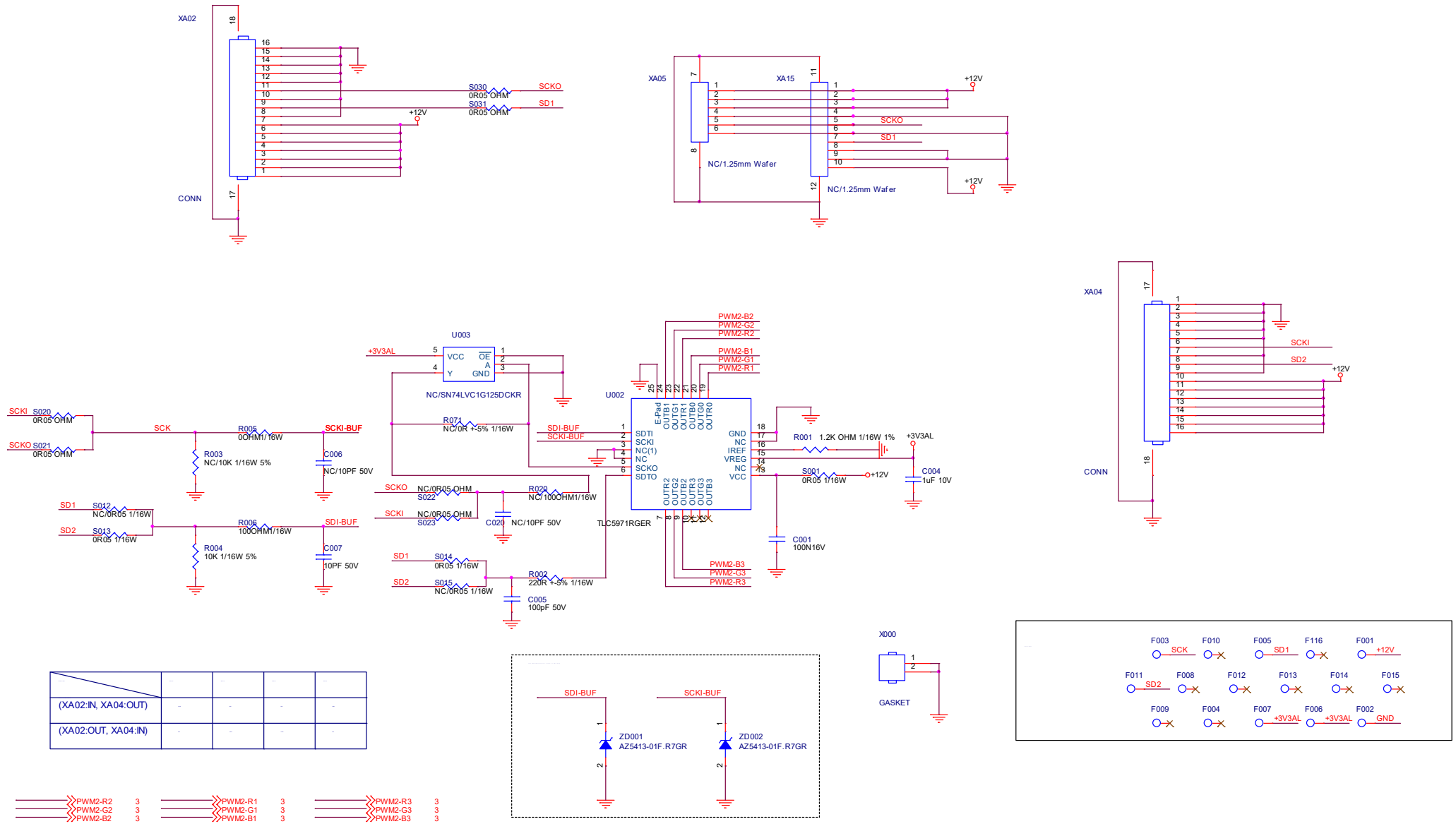
Joystick circuit diagram

	pin1	pin2	pin3	pin4	pin5	pin6
F1		○			○	
F2				○	○	
F3			○		○	
F4					○	○
F5	○				○	

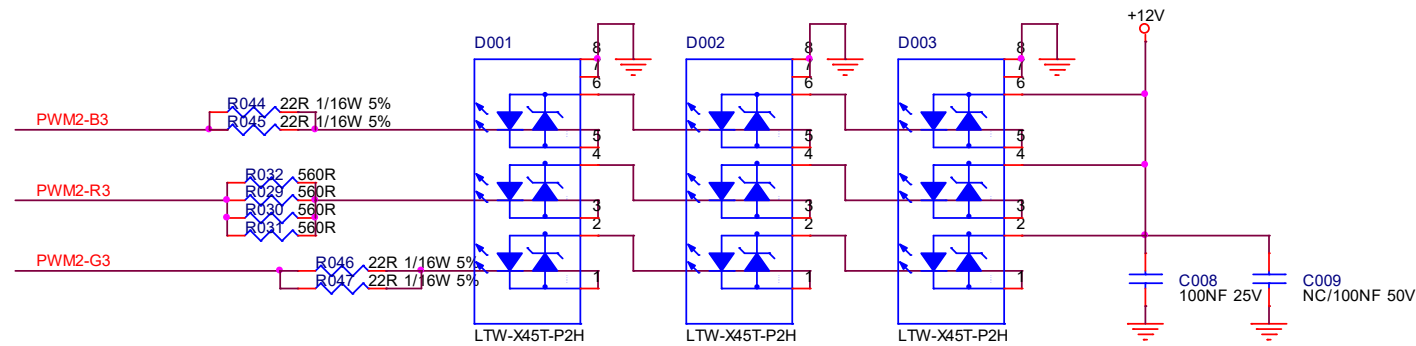
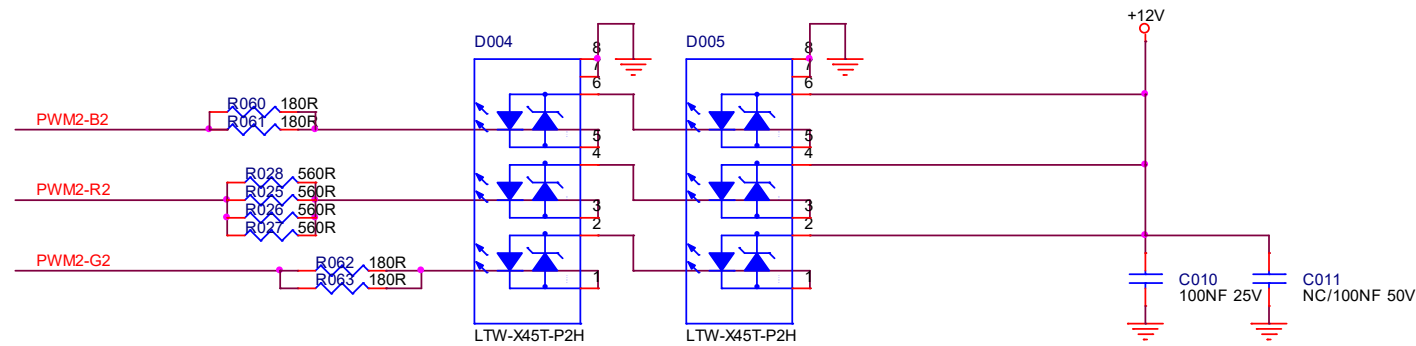
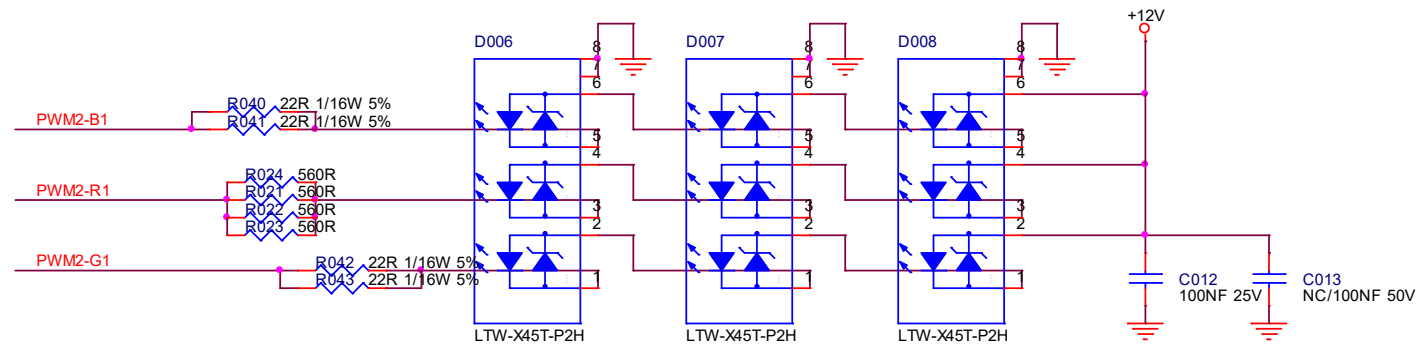
Joystick diversity for AL

	CN03	C07	R9	R10
AL2	N	N	N	N
AL3/AL4	Y	Y	Y	Y

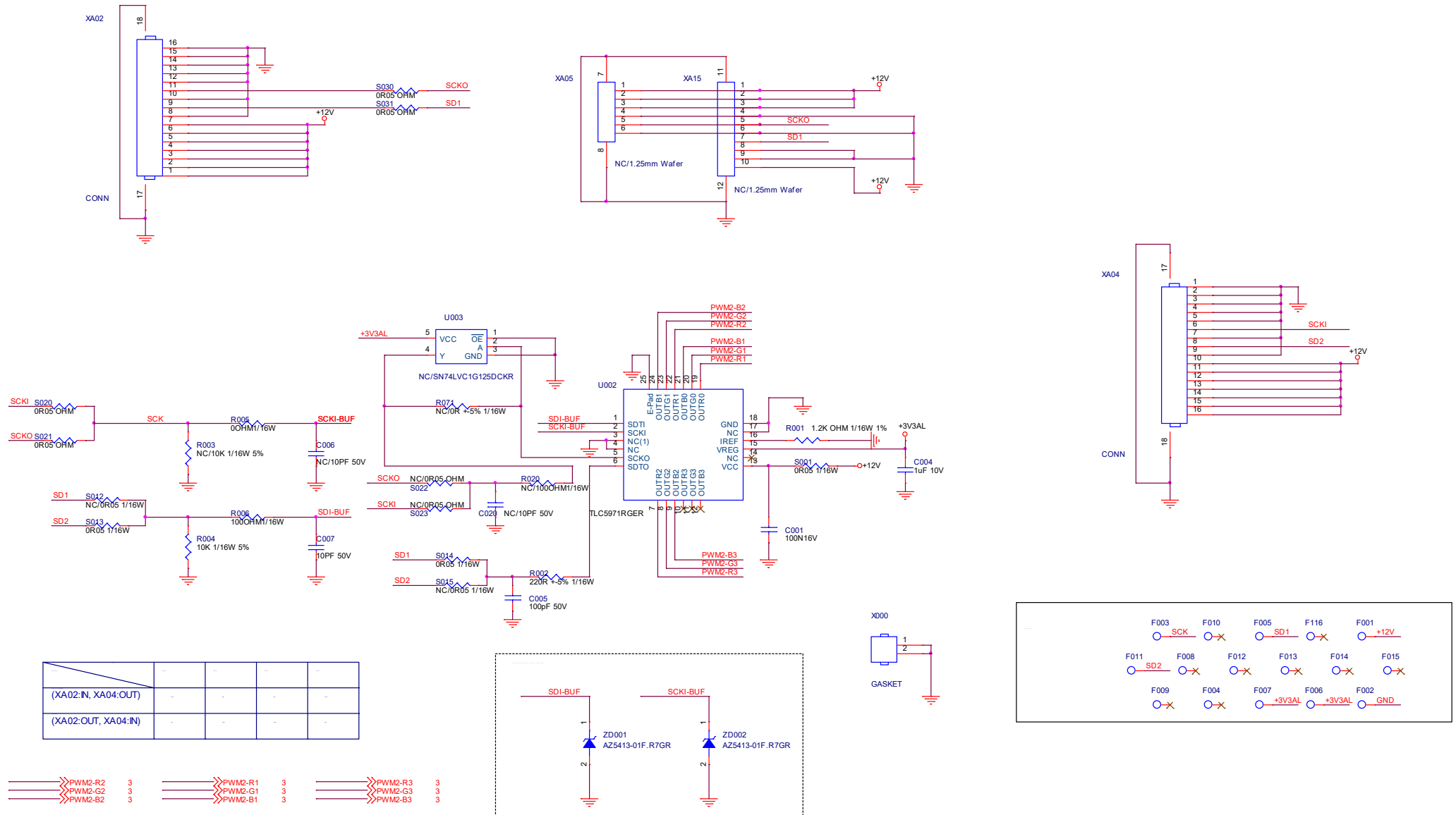
9-7-1 TLC5971



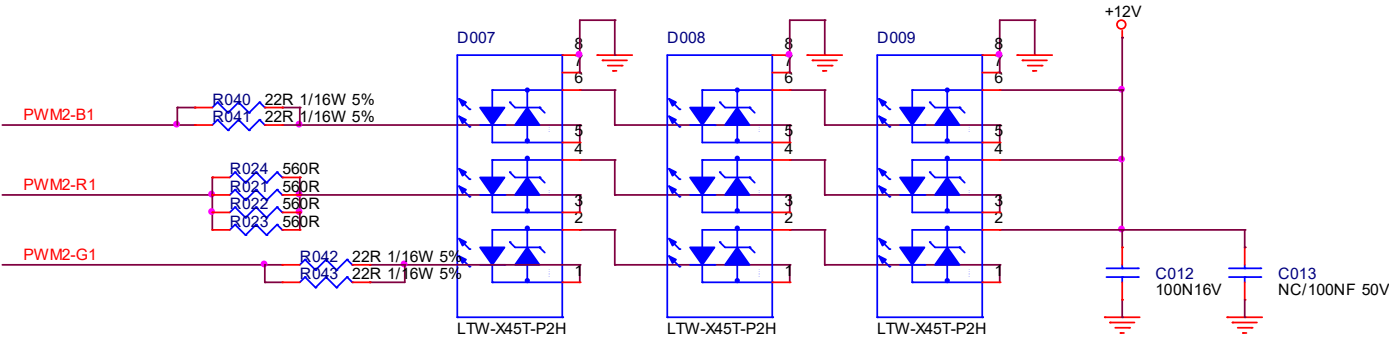
9-7-2 Ambilight 8-LED



9-8-1 TLC5971



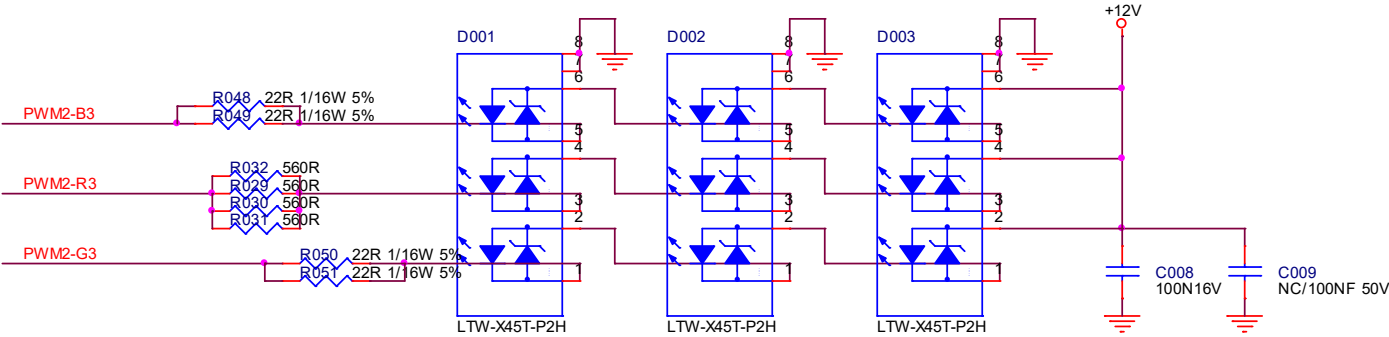
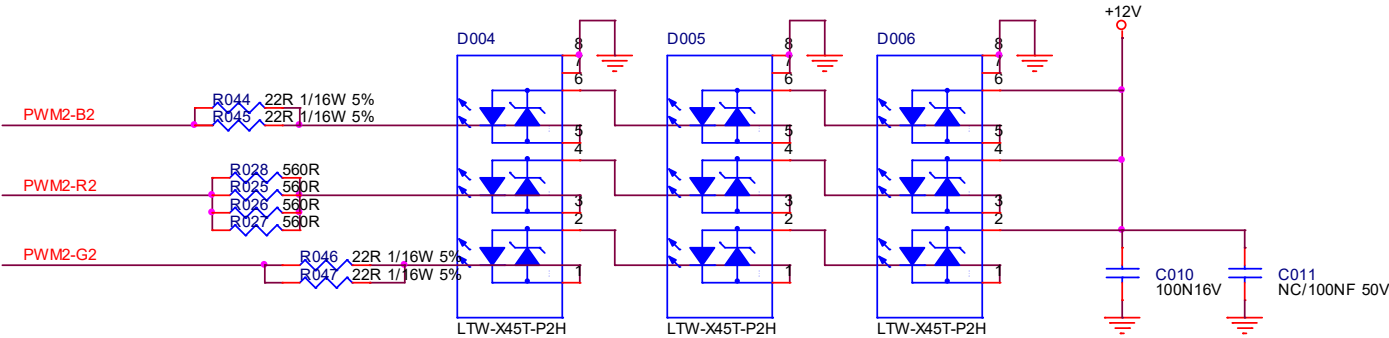
9-8-2 Ambilight 9-LED



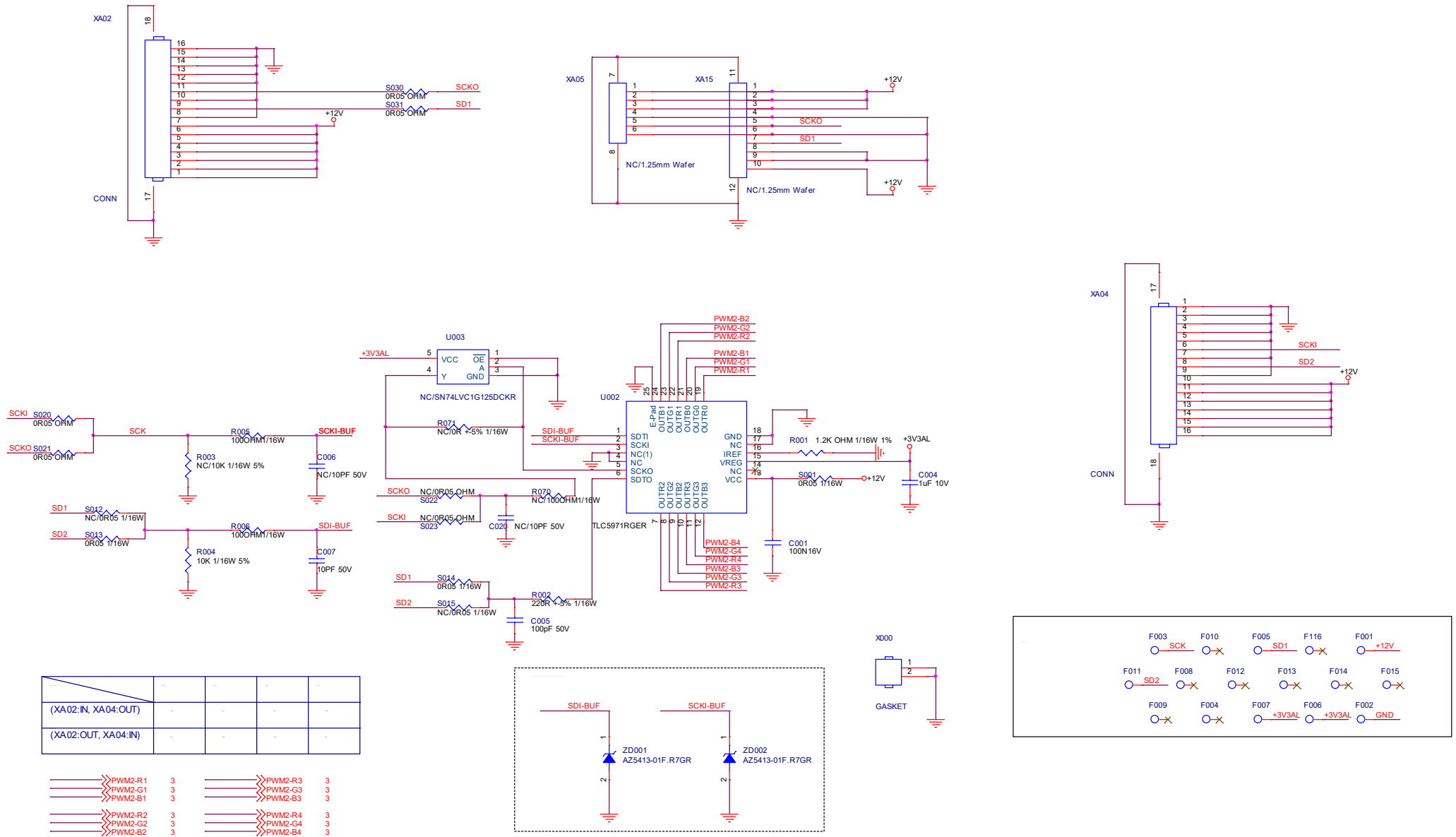
PWM2-R1 2
PWM2-G1 2
PWM2-B1 2

PWM2-R2 2
PWM2-G2 2
PWM2-B2 2

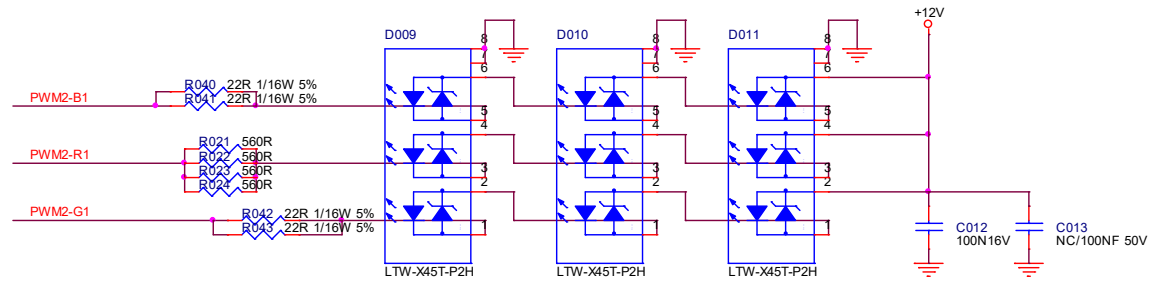
PWM2-R3 2
PWM2-G3 2
PWM2-B3 2



9-9-1 TLC5971



9-9-2 Ambilight 11-LED

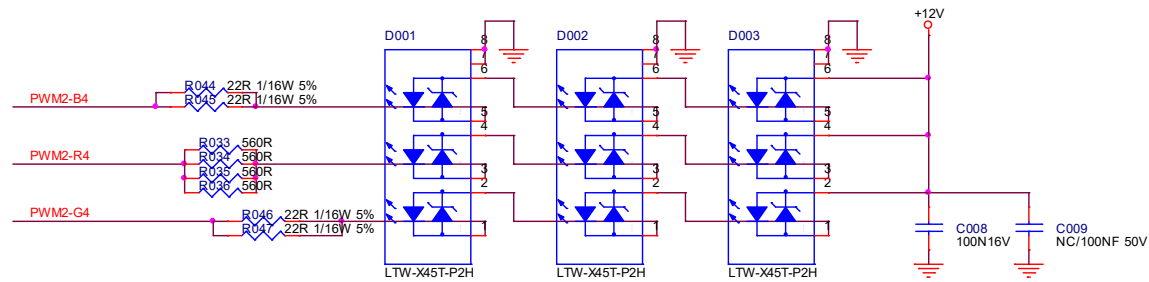
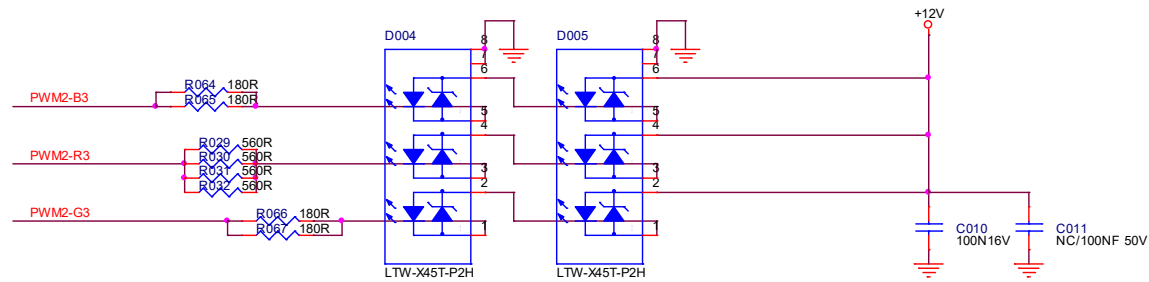
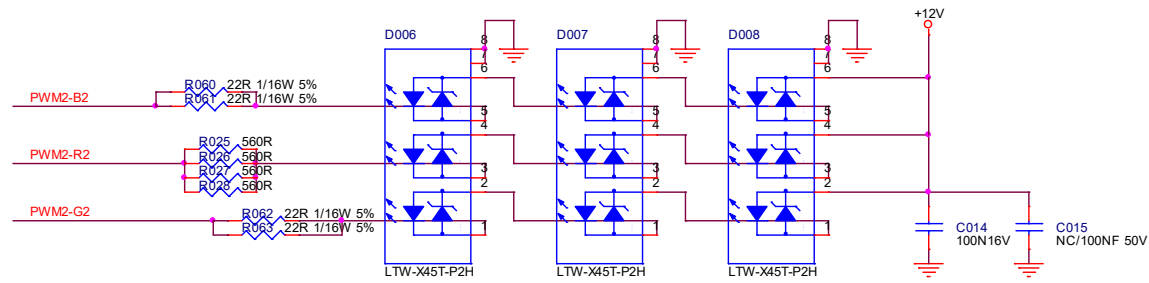


>>PWM2-R1 2
 >>PWM2-G1 2
 >>PWM2-B1 2

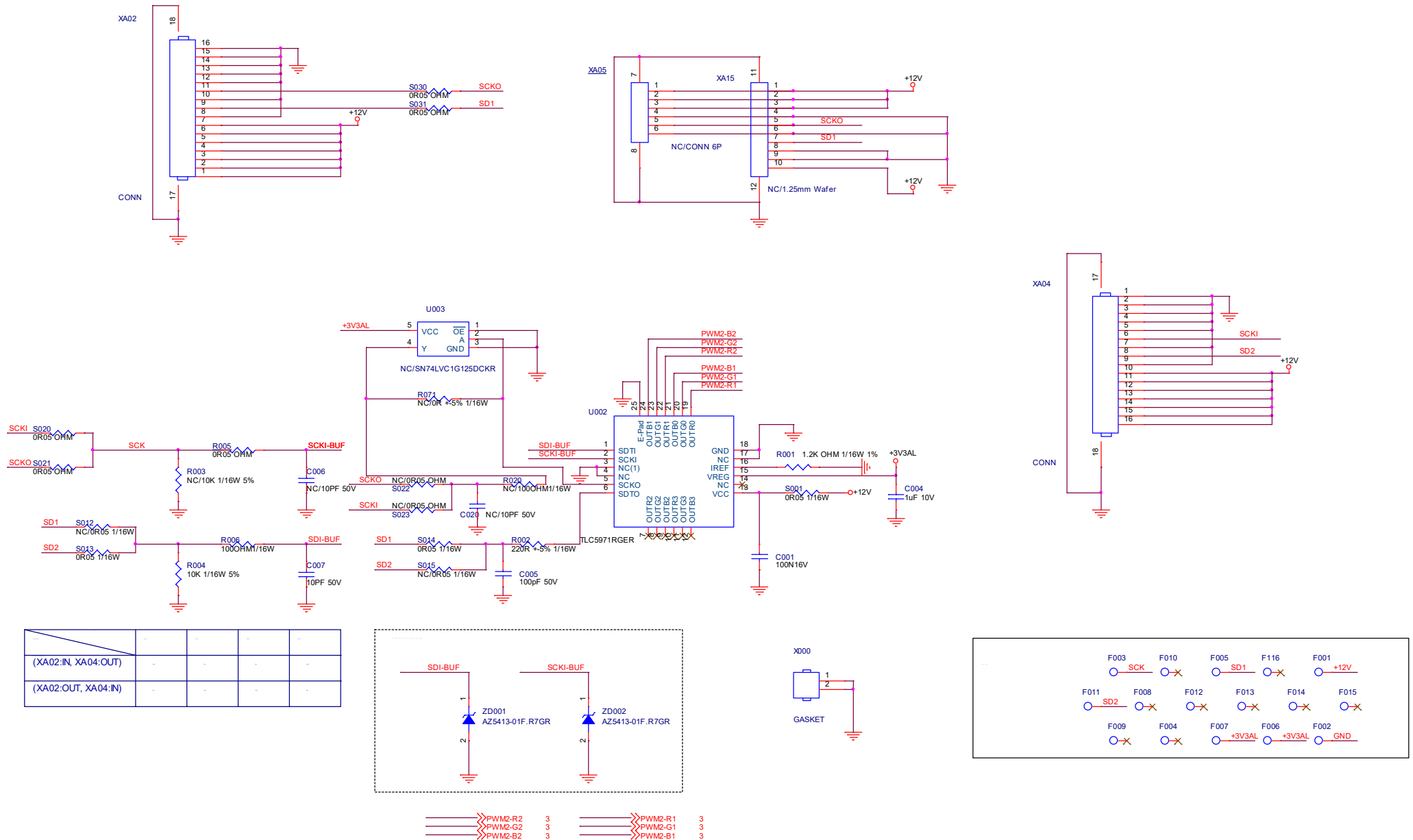
>>PWM2-R2 2
 >>PWM2-G2 2
 >>PWM2-B2 2

>>PWM2-R3 2
 >>PWM2-G3 2
 >>PWM2-B3 2

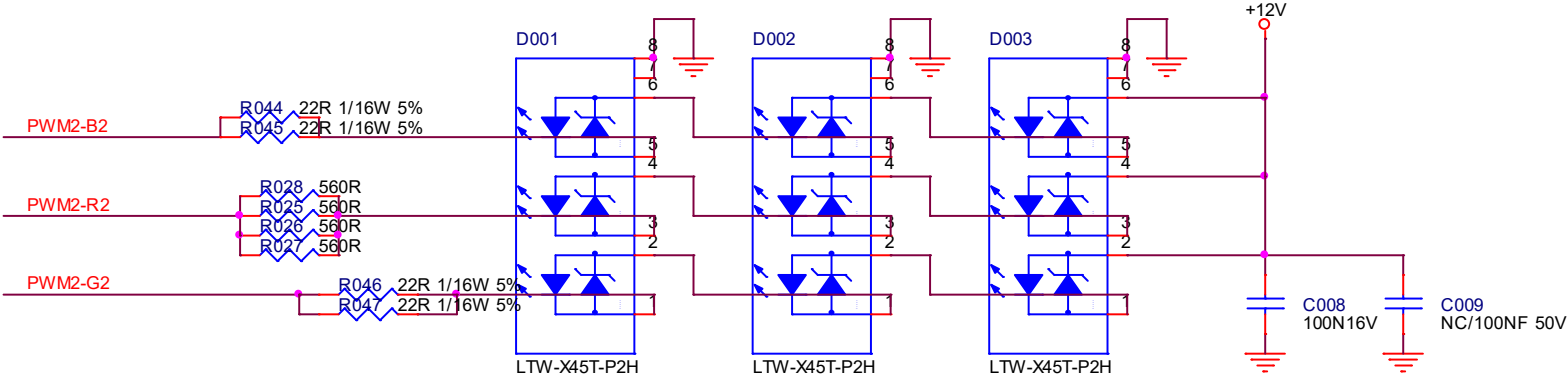
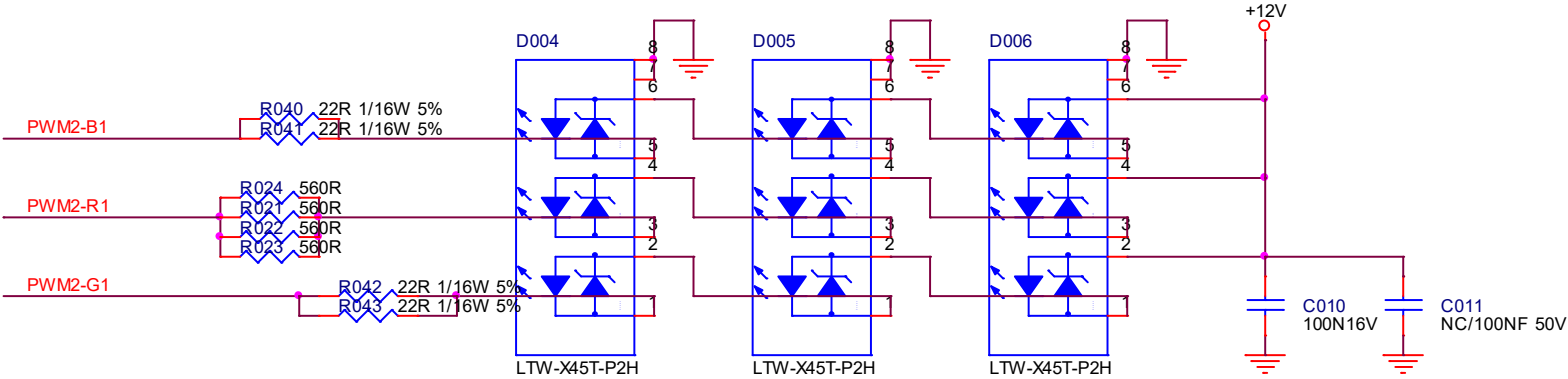
>>PWM2-R4 2
 >>PWM2-G4 2
 >>PWM2-B4 2



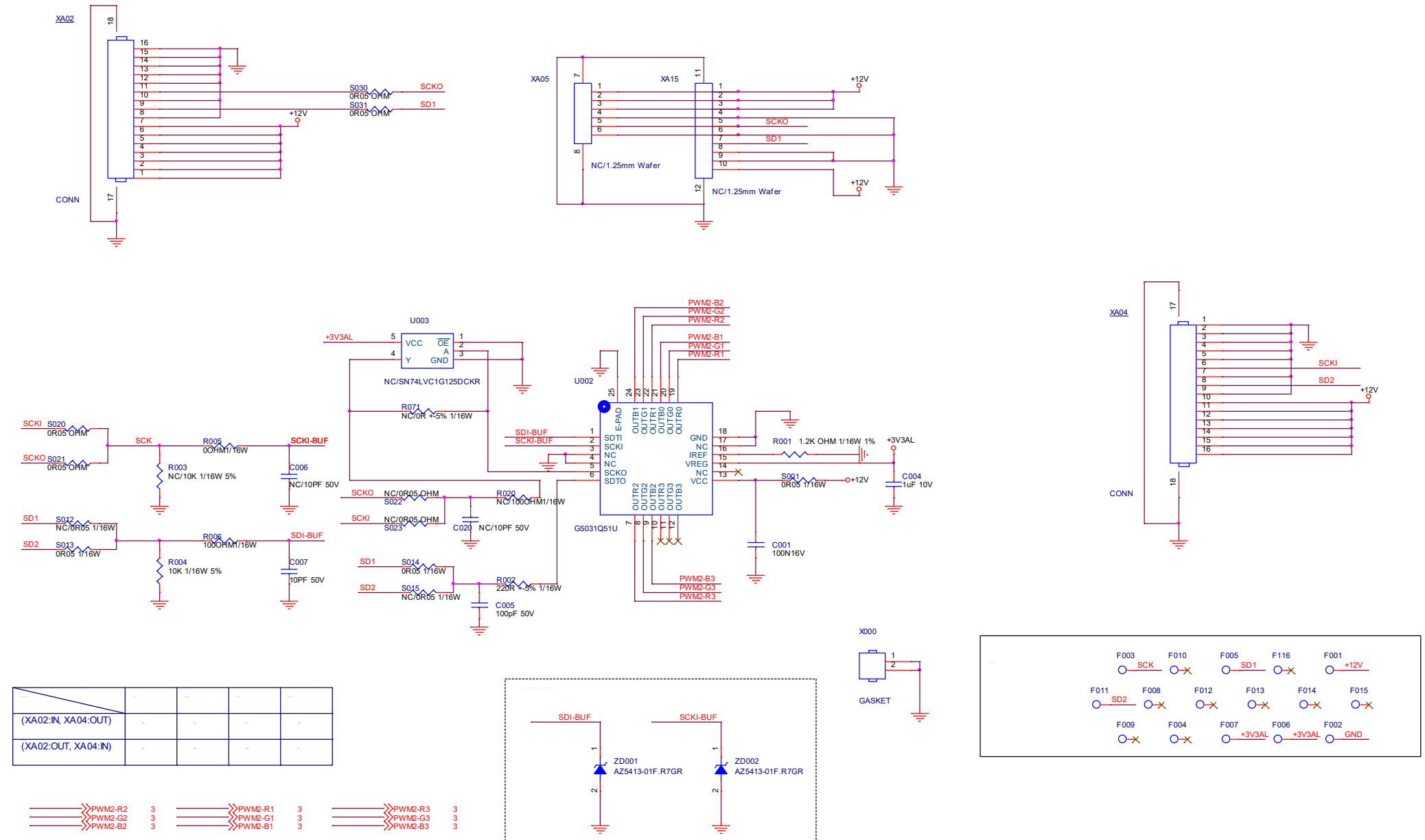
9-10-1 TLC5971



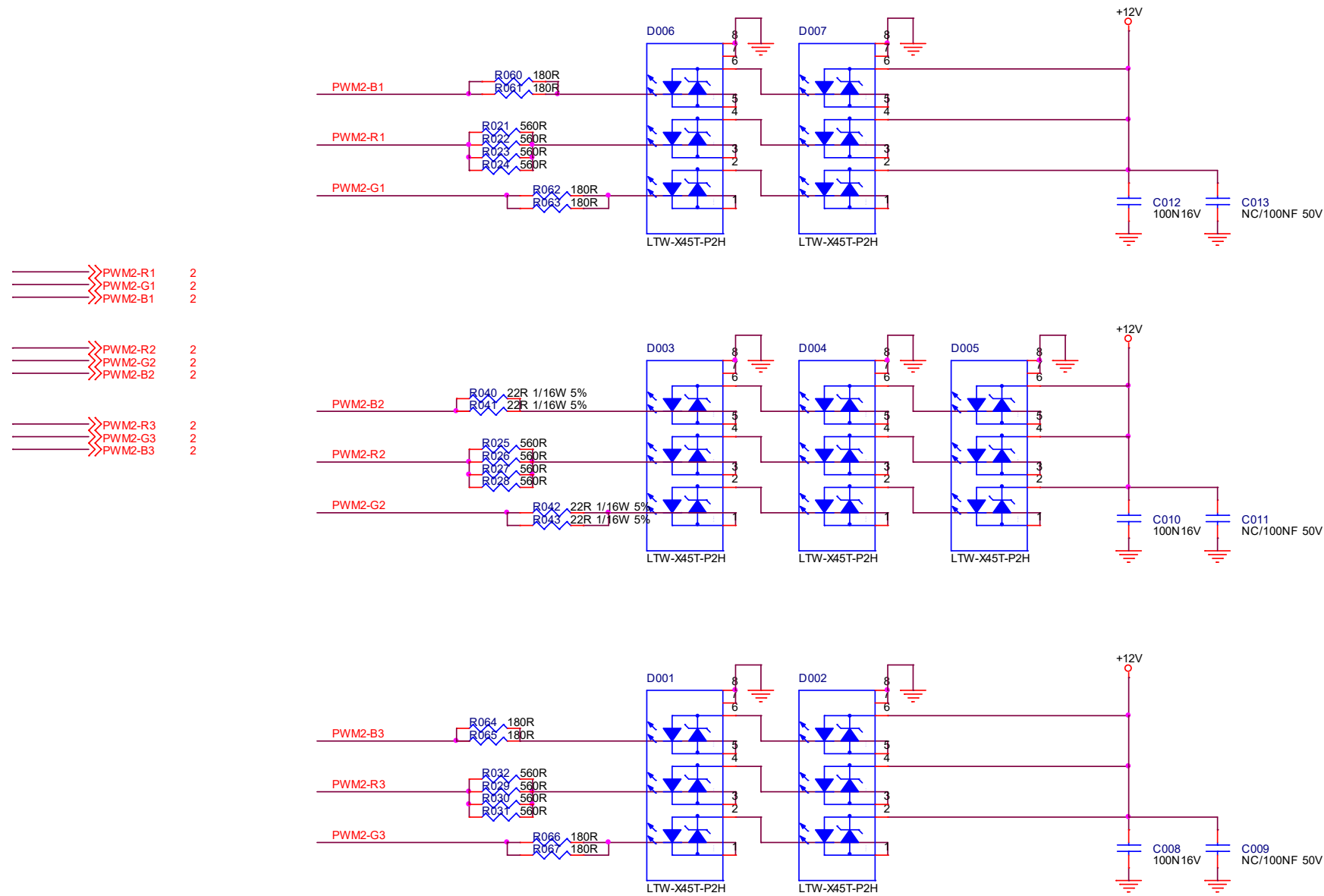
9-10-2 Ambilight 6-LED



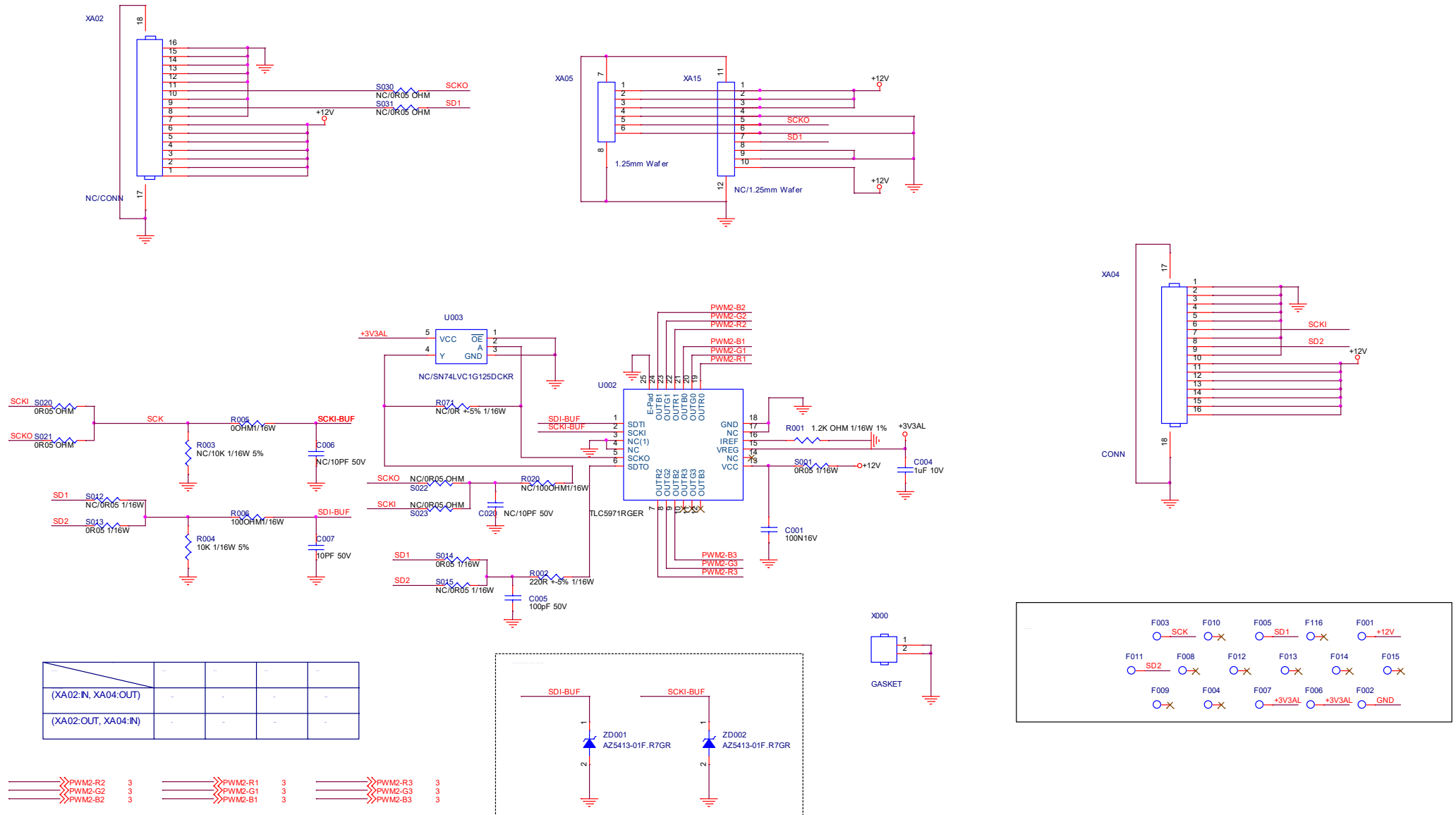
9-11-1 TLC5971



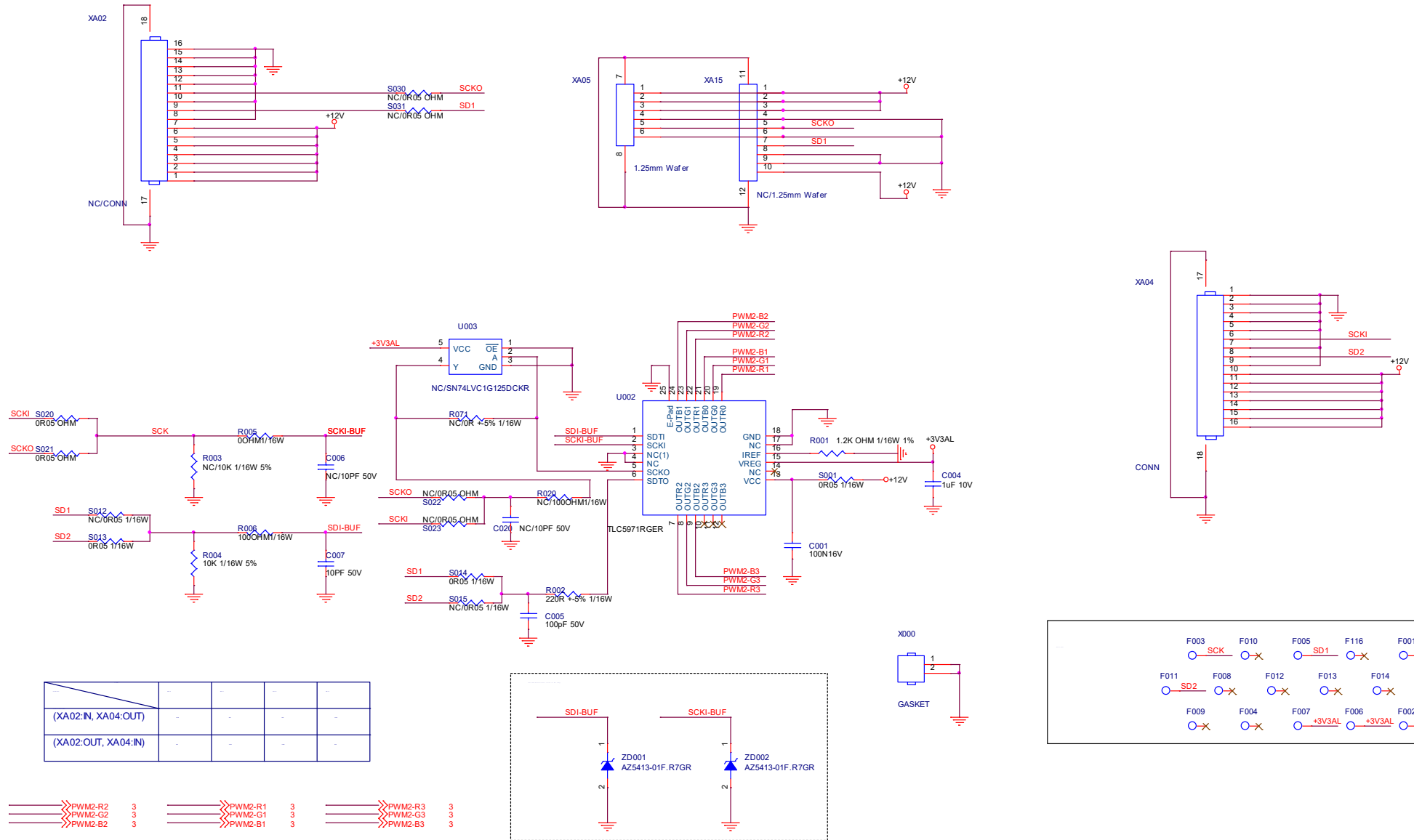
9-11-2 Ambilight 7-LED



9-12-1 TLC5971

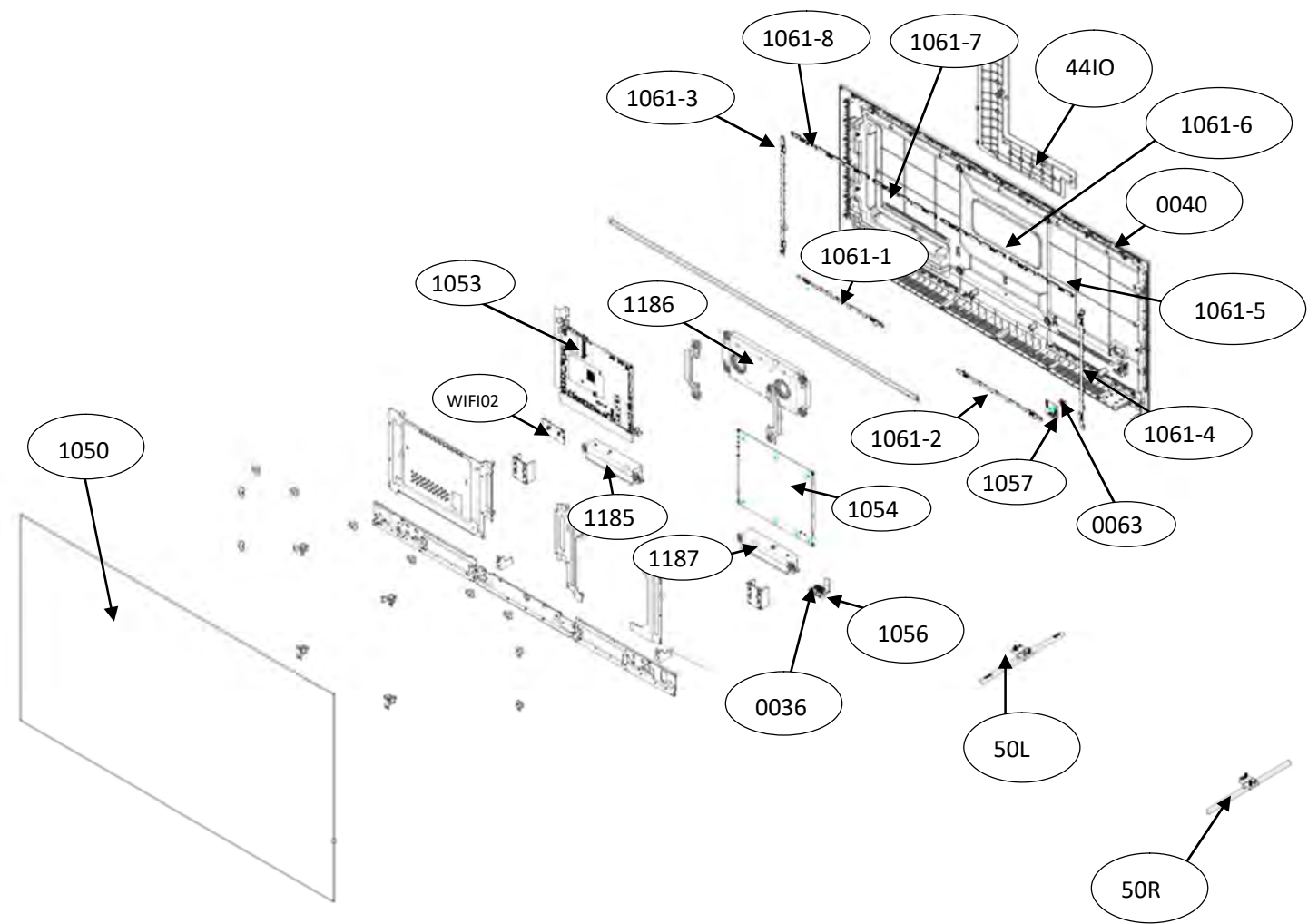


9-12-2 Ambilight 9-LED



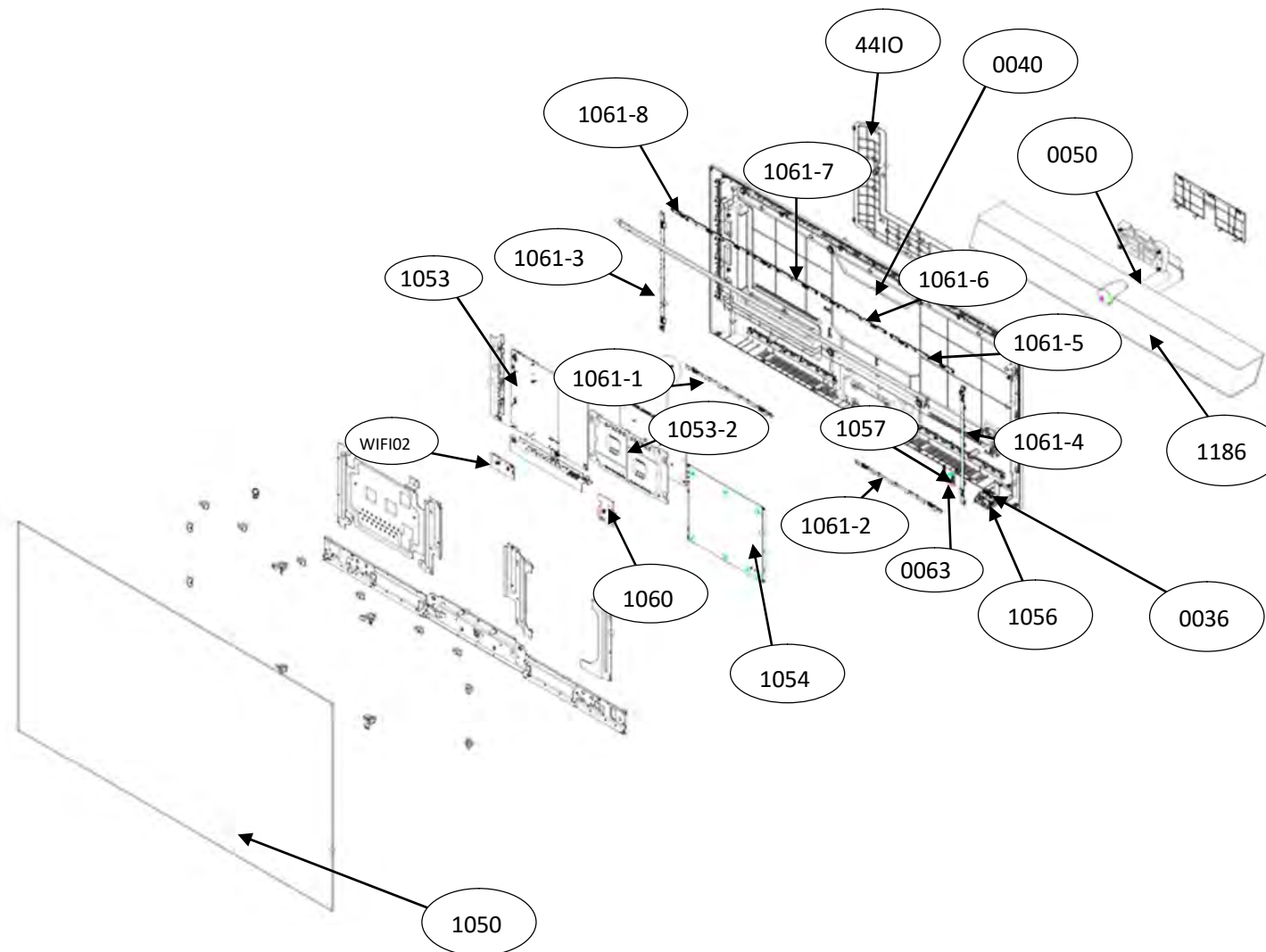
10. Styling Sheets

10.1 OLED806 series 48"



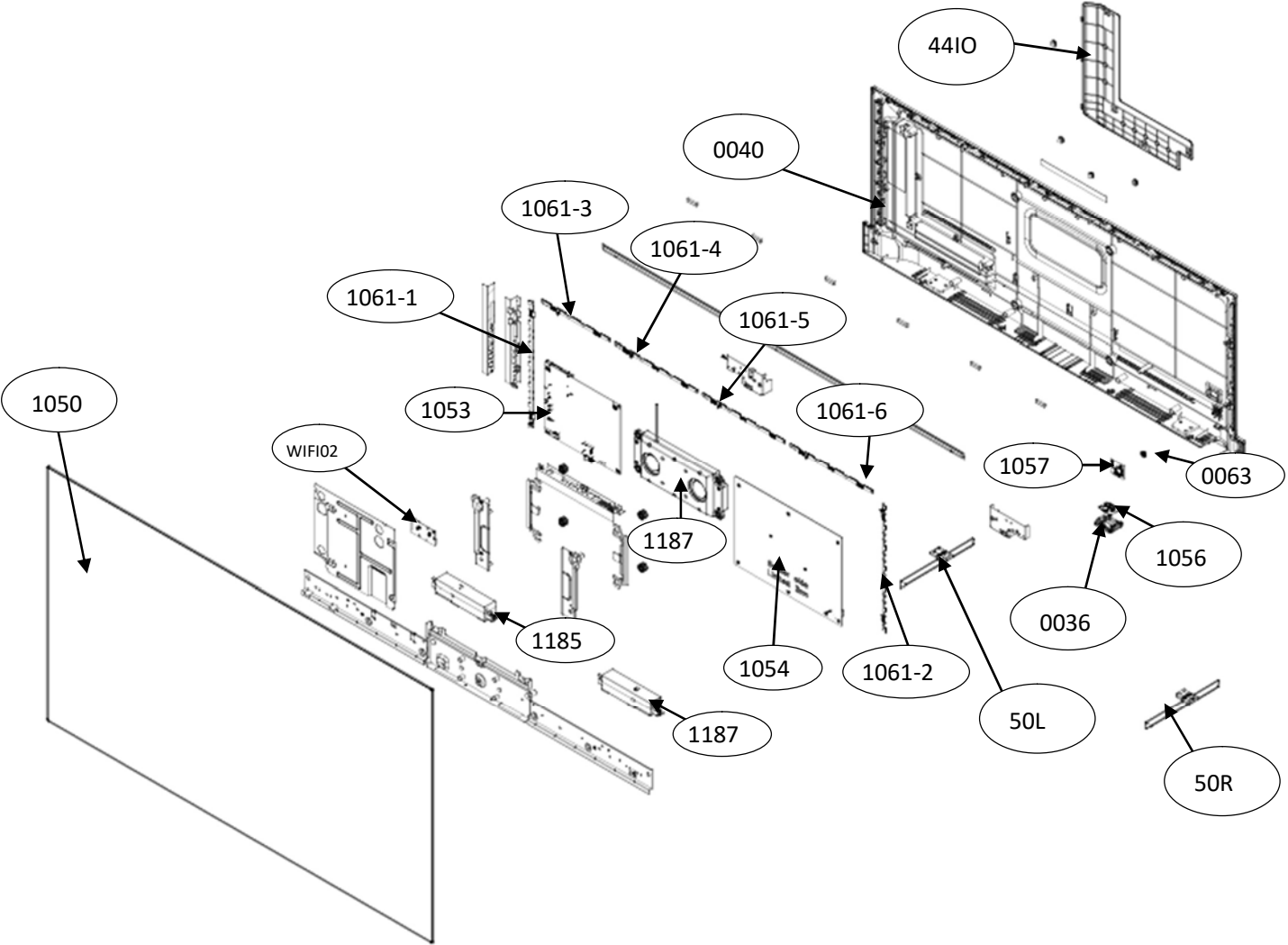
Pos NO	Description	Remark
36	LENS	
40	REAR COVER	
44IO	COVER IO	
50L	EDGE STAND – L	
50R	EDGE STAND – R	
63	KEY_FUNCTION	
1050	LCD PANEL	
1053	MAINB BOARD	
1054	POWER BOARD	
1056	IR BOARD	
1057	KEY BOARD	
1061-1	AMBI-LIGHT BOARD	
1061-2	AMBI-LIGHT BOARD	
1061-3	AMBI-LIGHT BOARD	
1061-4	AMBI-LIGHT BOARD	
1061-5	AMBI-LIGHT BOARD	
1061-6	AMBI-LIGHT BOARD	
1176	REMOTE PHILIP'S	Not displayed
1185	Speaker	
1186	SOUND BAR	
1187	Speaker	
WiFi02	WIFI/BT USB	

10.2 OLED936 series 48"



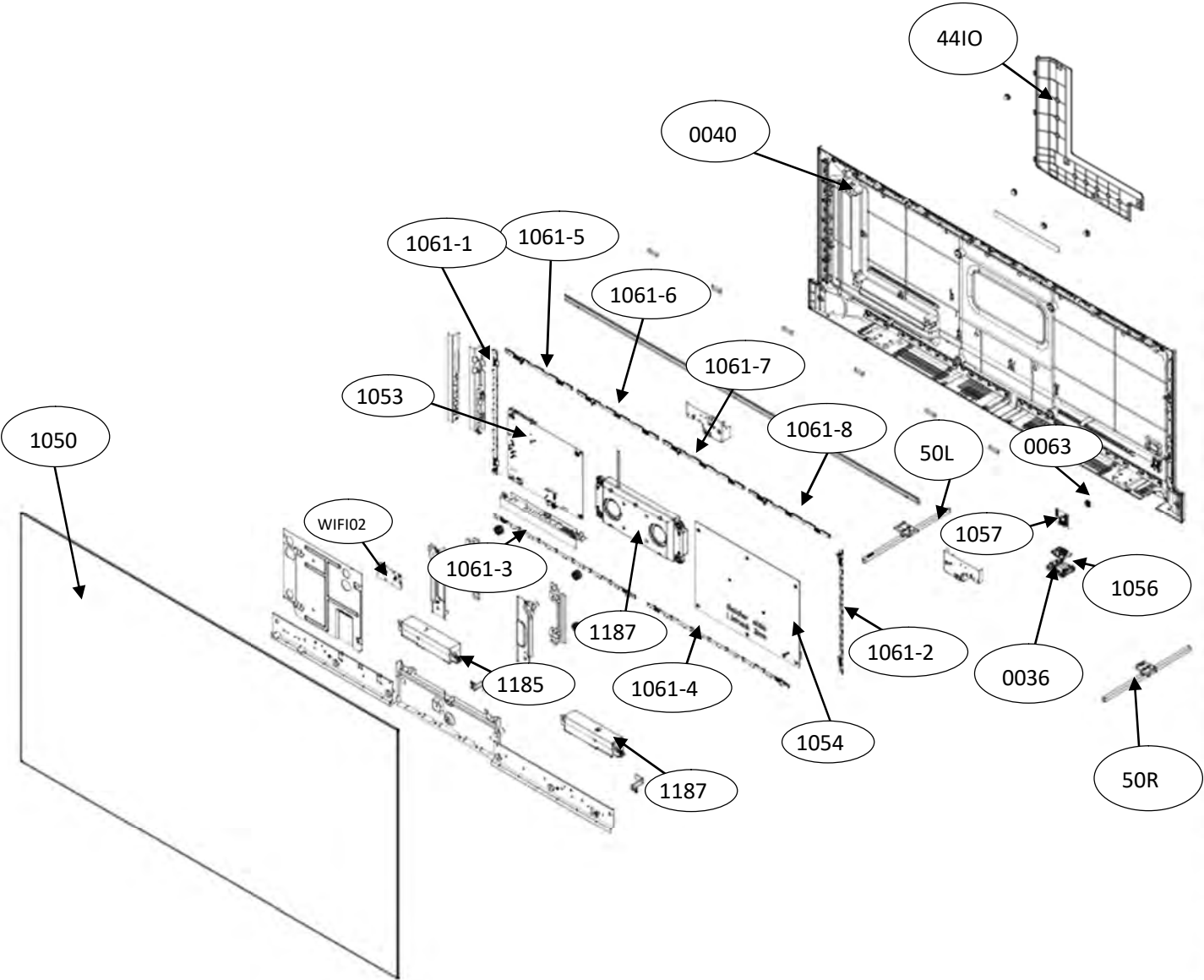
Pos NO	Description	Remark
36	LENS	
40	REAR COVER	
44IO	COVER IO	
50	STAND	
63	KEY_FUNCTION	
1050	LCD PANEL	
1053	MAINB BOARD	
1053-2	PQ BOARD	
1054	POWER BOARD	
1056	IR BOARD	
1057	KEY BOARD	
1060	AUDIO BOARD	
1061-1	AMBI-LIGHT BOARD	
1061-2	AMBI-LIGHT BOARD	
1061-3	AMBI-LIGHT BOARD	
1061-4	AMBI-LIGHT BOARD	
1061-5	AMBI-LIGHT BOARD	
1061-6	AMBI-LIGHT BOARD	
1061-7	AMBI-LIGHT BOARD	
1061-8	AMBI-LIGHT BOARD	
1176	REMOTE PHILIPS	Not displayed
1186	SOUND BAR	
WiFi02	WIFI/BT USB	

10.3 OLED706 series 55"



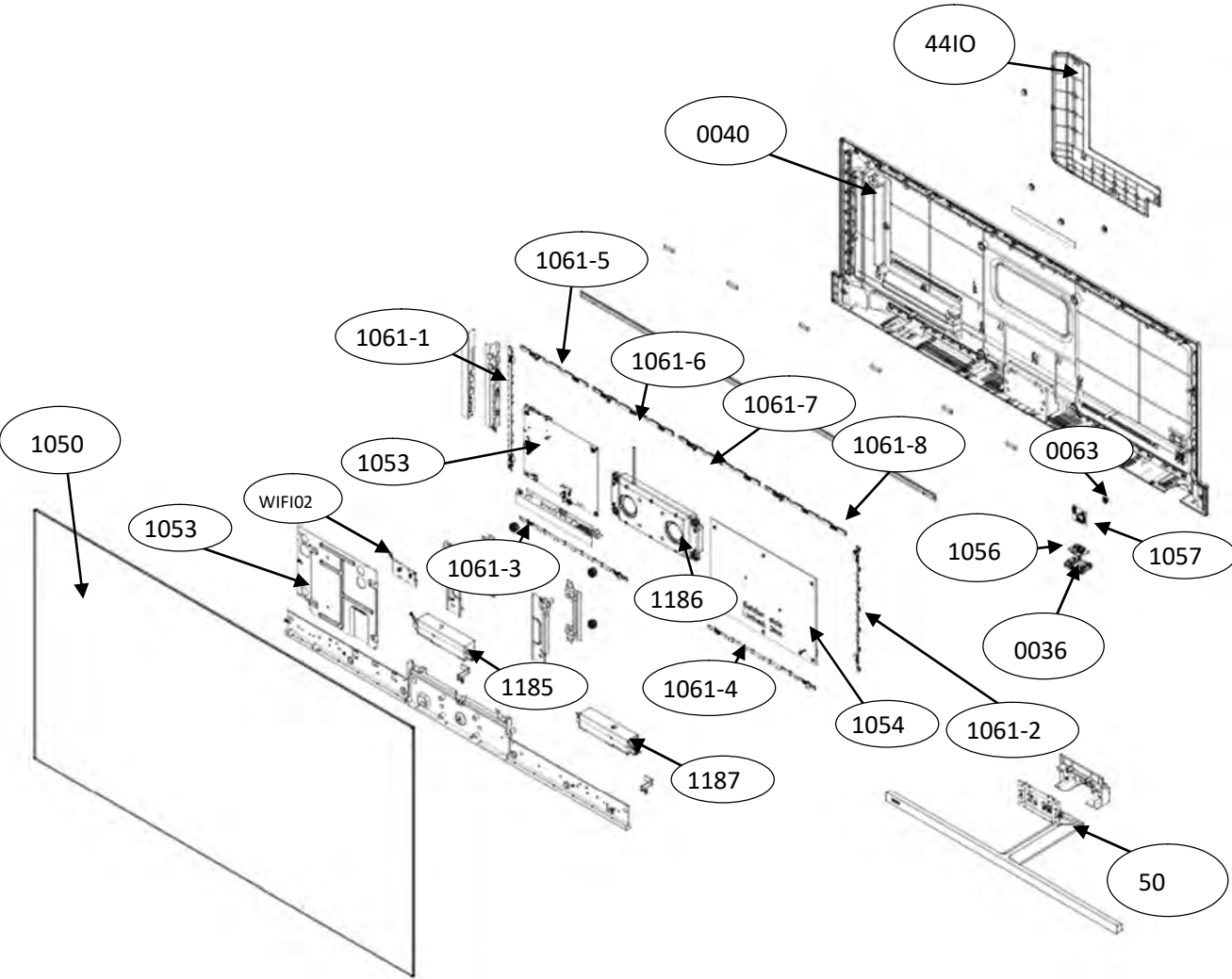
Pos NO	Description	Remark
36	LENS	
40	REAR COVER	
44IO	COVER IO	
50L	EDGE STAND – L	
50R	EDGE STAND – R	
63	KEY_FUNCTION	
1050	LCD PANEL	
1053	MAINB BOARD	
1054	POWER BOARD	
1056	IR BOARD	
1057	KEY BOARD	
1061-1	AMBI-LIGHT BOARD	
1061-2	AMBI-LIGHT BOARD	
1061-3	AMBI-LIGHT BOARD	
1061-4	AMBI-LIGHT BOARD	
1061-5	AMBI-LIGHT BOARD	
1061-6	AMBI-LIGHT BOARD	
1176	REMOTE PHILIPS	Not displayed
1185	Speaker	
1186	SOUND BAR	
1187	Speaker	
WiFi02	WIFI/BT USB	

10.4 OLED806 series 55"



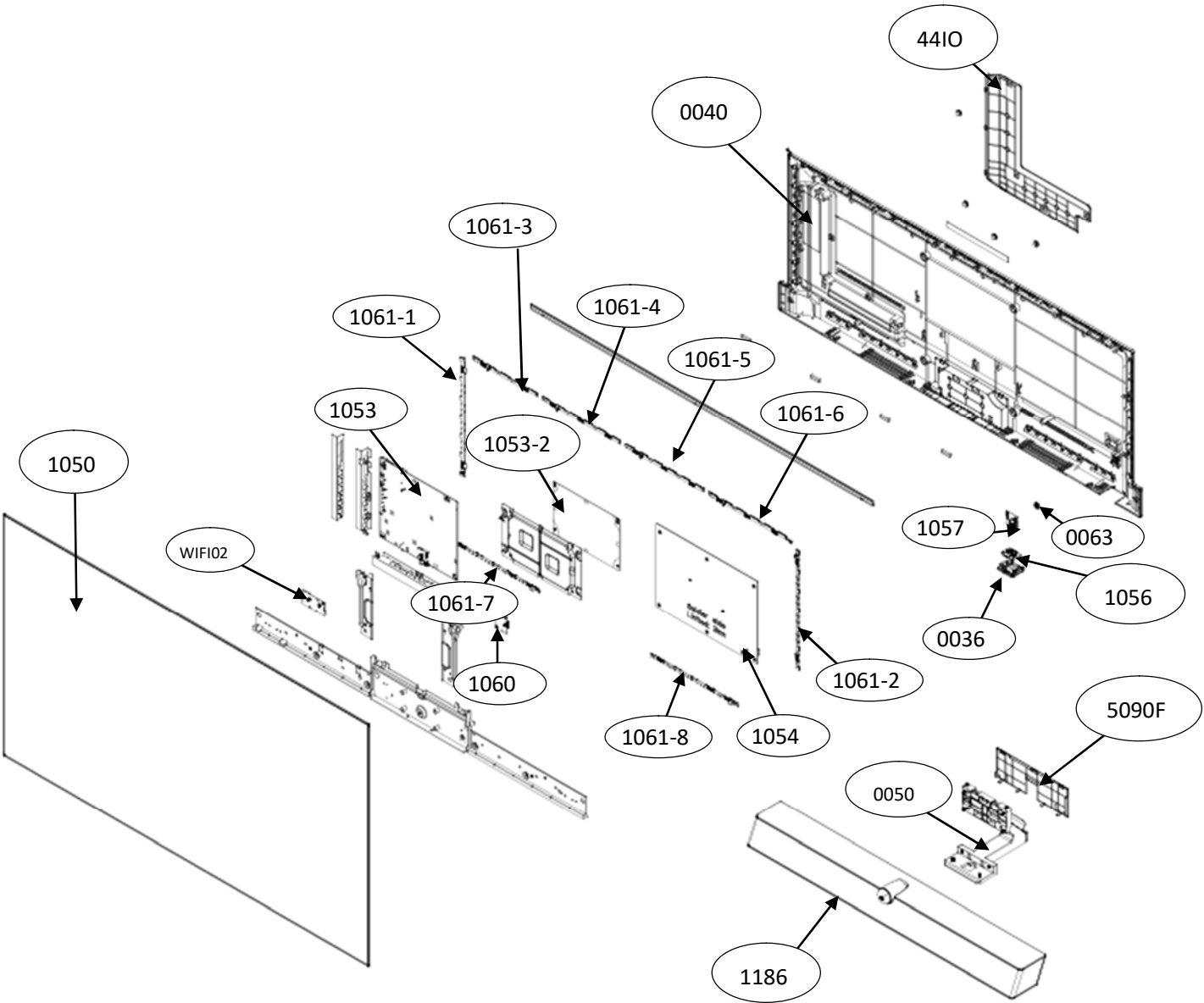
Pos NO	Description	Remark
36	LENS	
40	REAR COVER	
44IO	COVER IO	
50L	EDGE STAND – L	
50R	EDGE STAND – R	
63	KEY_FUNCTION	
1050	LCD PANEL	
1053	MAINB BOARD	
1054	POWER BOARD	
1056	IR BOARD	
1057	KEY BOARD	
1060	AUDIO BOARD	
1061-1	AMBI-LIGHT BOARD	
1061-2	AMBI-LIGHT BOARD	
1061-3	AMBI-LIGHT BOARD	
1061-4	AMBI-LIGHT BOARD	
1061-5	AMBI-LIGHT BOARD	
1061-6	AMBI-LIGHT BOARD	
1061-7	AMBI-LIGHT BOARD	
1061-8	AMBI-LIGHT BOARD	
1176	REMOTE PHILIPS	Not displayed
1185	Speaker	
1186	SOUND BAR	
1187	Speaker	
WiFi02	WIFI/BT USB	

10.5 OLED856/876 series 55"



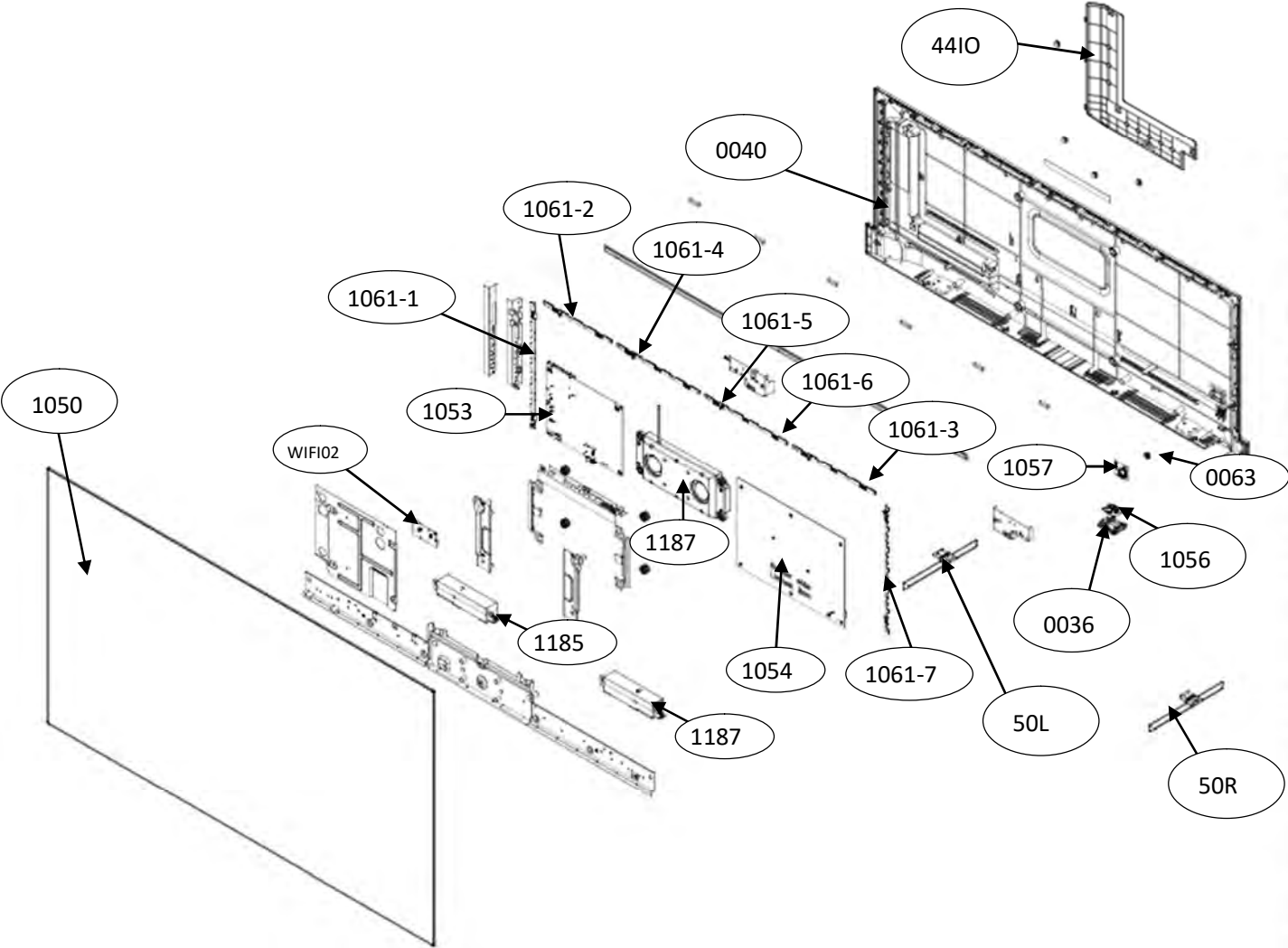
Pos NO	Description	Remark
36	LENS	
40	REAR COVER	
4410	COVER IO	
50	STAND	
63	KEY_FUNCTION	
1050	LCD PANEL	
1053	MAINB BOARD	
1054	POWER BOARD	
1056	IR BOARD	
1057	KEY BOARD	
1060	AUDIO BOARD	
1061-1	AMBI-LIGHT BOARD	
1061-2	AMBI-LIGHT BOARD	
1061-3	AMBI-LIGHT BOARD	
1061-4	AMBI-LIGHT BOARD	
1061-5	AMBI-LIGHT BOARD	
1061-6	AMBI-LIGHT BOARD	
1061-7	AMBI-LIGHT BOARD	
1061-8	AMBI-LIGHT BOARD	
1176	REMOTE PHILIPS	Not displayed
1185	Speaker	
1186	SOUND BAR	
1187	Speaker	
WiFi02	WIFI/BT USB	

10.6 OLED936 series 55"



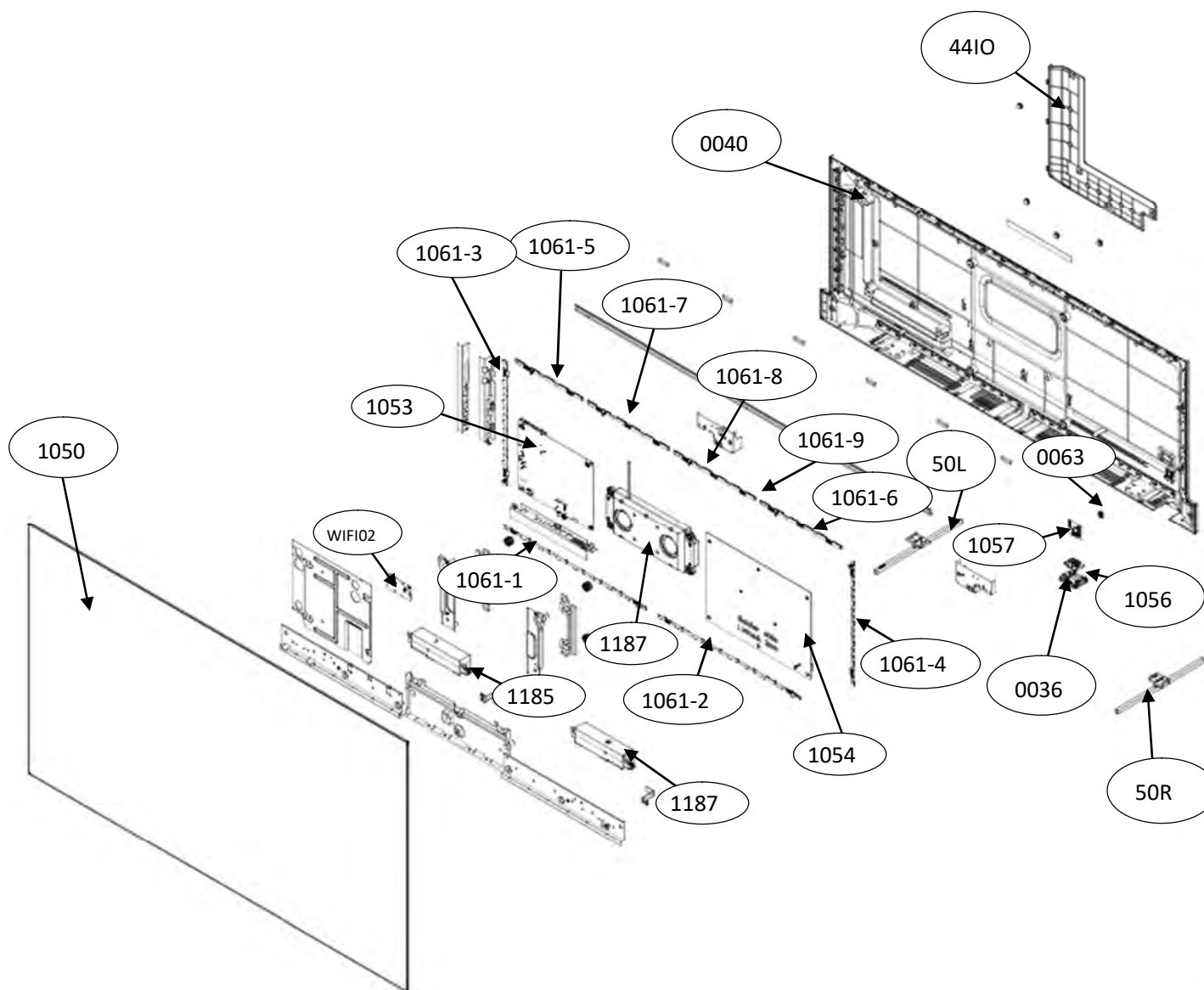
Pos NO	Description	Remark
36	LENS	
40	REAR COVER	
44IO	COVER IO	
50	STAND	
63	KEY_FUNCTION	
1050	LCD PANEL	
1053	MAINB BOARD	
1053-2	PQ BOARD	
1054	POWER BOARD	
1056	IR BOARD	
1057	KEY BOARD	
1060	AUDIO BOARD	
1061-1	AMBI-LIGHT BOARD	
1061-2	AMBI-LIGHT BOARD	
1061-3	AMBI-LIGHT BOARD	
1061-4	AMBI-LIGHT BOARD	
1061-5	AMBI-LIGHT BOARD	
1061-6	AMBI-LIGHT BOARD	
1061-7	AMBI-LIGHT BOARD	
1061-8	AMBI-LIGHT BOARD	
1176	REMOTE PHILIPS	Not displayed
1186	SOUND BAR	
WiFi02	WIFI/BT USB	

10.7 OLED706 series 65"



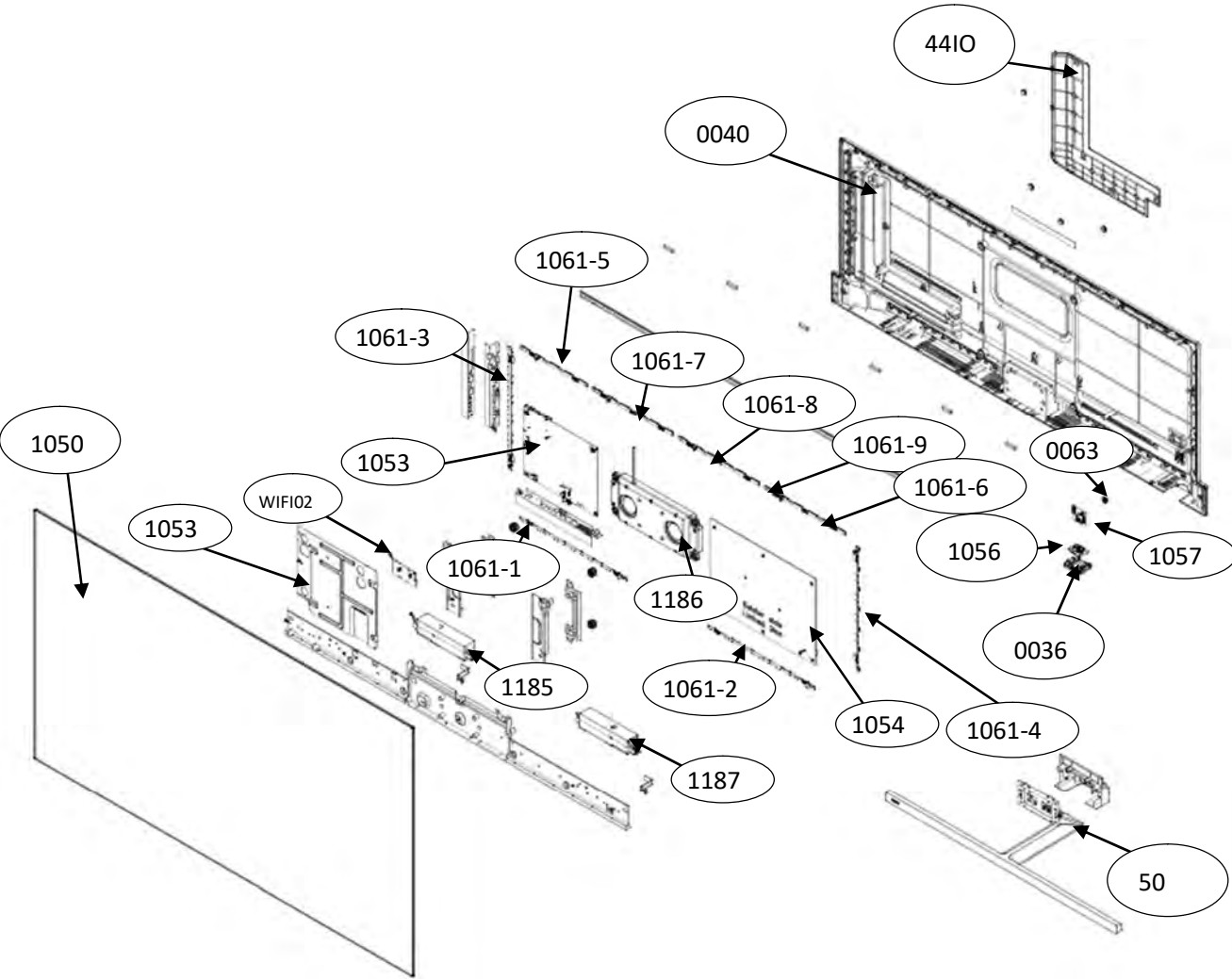
Pos NO	Description	Remark
36	LENS	
40	REAR COVER	
44IO	COVER IO	
50L	EDGE STAND – L	
50R	EDGE STAND – R	
63	KEY_FUNCTION	
1050	LCD PANEL	
1053	MAINB BOARD	
1054	POWER BOARD	
1056	IR BOARD	
1057	KEY BOARD	
1060	AUDIO BOARD	
1061-1	AMBI-LIGHT BOARD	
1061-2	AMBI-LIGHT BOARD	
1061-3	AMBI-LIGHT BOARD	
1061-4	AMBI-LIGHT BOARD	
1061-5	AMBI-LIGHT BOARD	
1061-6	AMBI-LIGHT BOARD	
1176	REMOTE PHILIPS	Not displayed
1185	Speaker	
1186	SOUND BAR	
1187	Speaker	
WiFi02	WIFI/BT USB	

10.8 OLED806 series 65"



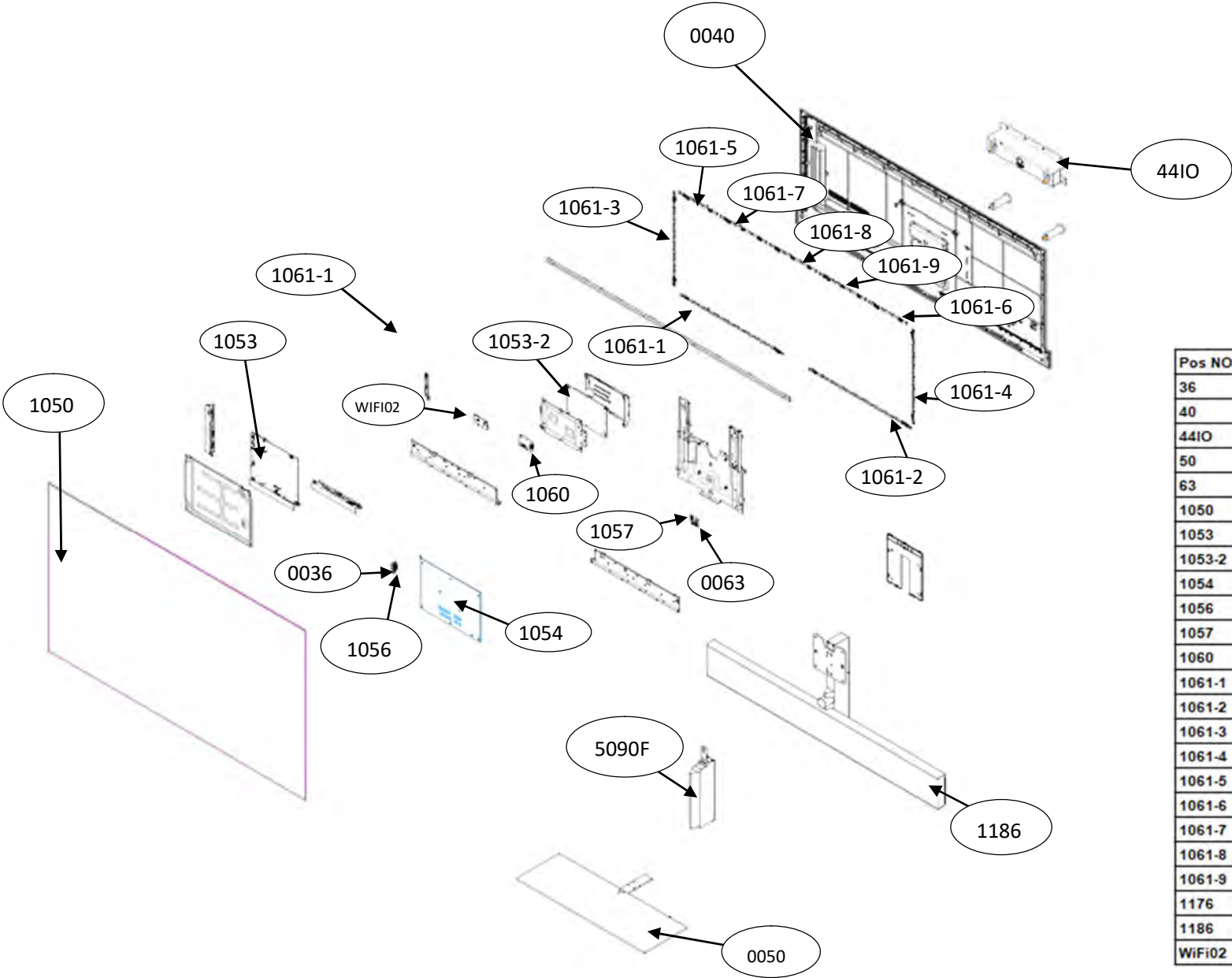
Pos NO	Description	Remark
36	LENS	
40	REAR COVER	
44IO	COVER IO	
50L	EDGE STAND – L	
50R	EDGE STAND – R	
63	KEY_FUNCTION	
1050	LCD PANEL	
1053	MAINB BOARD	
1054	POWER BOARD	
1056	IR BOARD	
1057	KEY BOARD	
1060	AUDIO BOARD	
1061-1	AMBI-LIGHT BOARD	
1061-2	AMBI-LIGHT BOARD	
1061-3	AMBI-LIGHT BOARD	
1061-4	AMBI-LIGHT BOARD	
1061-5	AMBI-LIGHT BOARD	
1061-6	AMBI-LIGHT BOARD	
1061-7	AMBI-LIGHT BOARD	
1061-8	AMBI-LIGHT BOARD	
1061-9	AMBI-LIGHT BOARD	
1176	REMOTE PHILIPS	Not displayed
1185	Speaker	
1186	SOUND BAR	
1187	Speaker	
WiFi02	WIFI/BT USB	

10.9 OLED856/876 series 65"



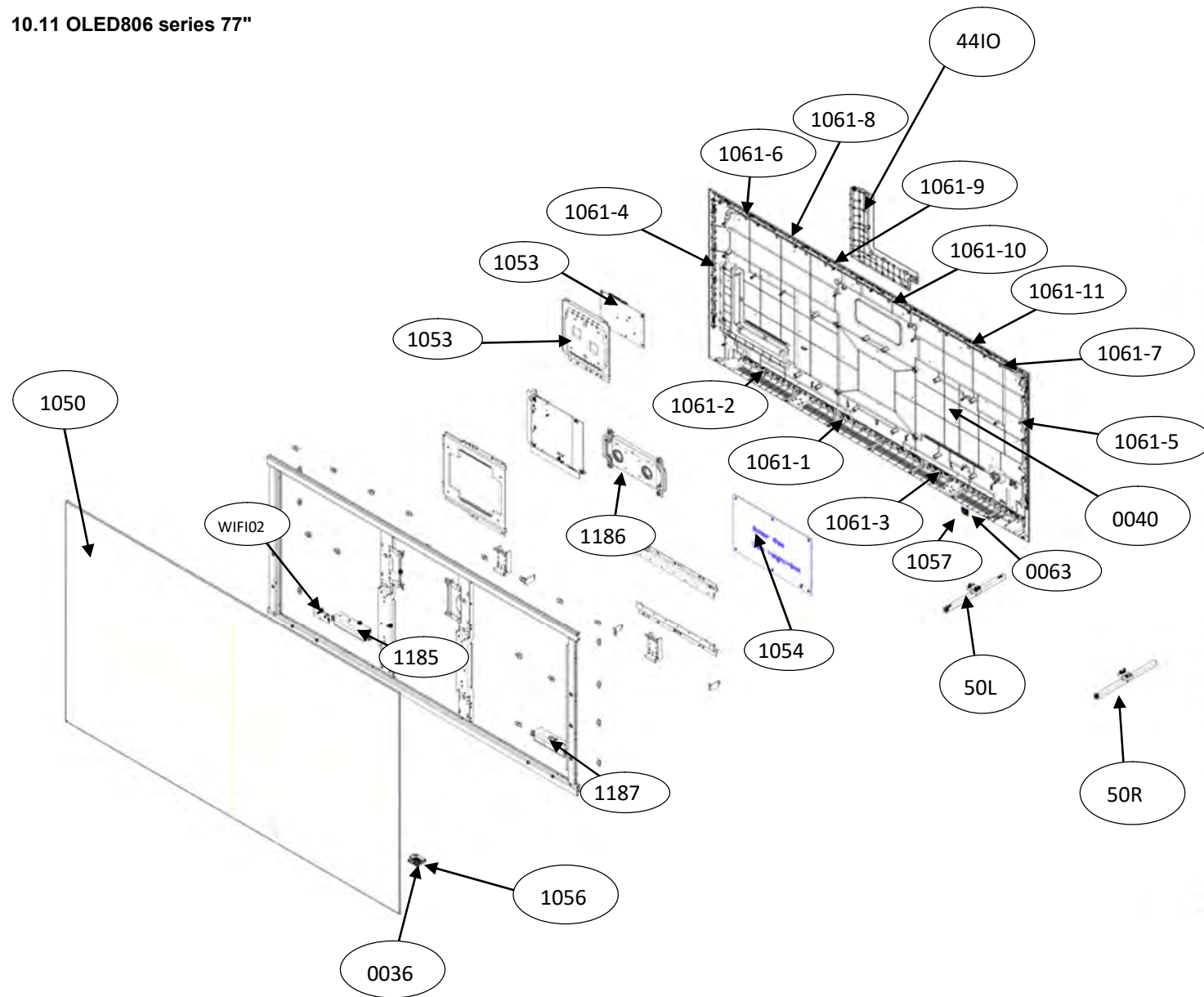
Pos NO	Description	Remark
36	LENS	
40	REAR COVER	
4410	COVER IO	
50	STAND	
63	KEY_FUNCTION	
1050	LCD PANEL	
1053	MAINB BOARD	
1054	POWER BOARD	
1056	IR BOARD	
1057	KEY BOARD	
1060	AUDIO BOARD	
1061-1	AMBI-LIGHT BOARD	
1061-2	AMBI-LIGHT BOARD	
1061-3	AMBI-LIGHT BOARD	
1061-4	AMBI-LIGHT BOARD	
1061-5	AMBI-LIGHT BOARD	
1061-6	AMBI-LIGHT BOARD	
1061-7	AMBI-LIGHT BOARD	
1061-8	AMBI-LIGHT BOARD	
1061-9	AMBI-LIGHT BOARD	
1176	REMOTE PHILIPS	Not displayed
1185	Speaker	
1186	SOUND BAR	
1187	Speaker	
WiFi02	WIFI/BT USB	

10.10 OLED936 series 65"



Pos NO	Description	Remark
36	LENS	
40	REAR COVER	
44IO	COVER IO	
50	STAND	
63	KEY_FUNCTION	
1050	LCD PANEL	
1053	MAINB BOARD	
1053-2	PQ BOARD	
1054	POWER BOARD	
1056	IR BOARD	
1057	KEY BOARD	
1060	AUDIO BOARD	
1061-1	AMBI-LIGHT BOARD	
1061-2	AMBI-LIGHT BOARD	
1061-3	AMBI-LIGHT BOARD	
1061-4	AMBI-LIGHT BOARD	
1061-5	AMBI-LIGHT BOARD	
1061-6	AMBI-LIGHT BOARD	
1061-7	AMBI-LIGHT BOARD	
1061-8	AMBI-LIGHT BOARD	
1061-9	AMBI-LIGHT BOARD	
1176	REMOTE PHILIPS	Not displayed
1186	SOUND BAR	
WIFI02	WIFI/BT USB	

10.11 OLED806 series 77"



Pos NO	Description	Remark
36	LEN \$	
40	REAR COVER	
44IO	COVER IO	
50L	EDGE STAND - L	
50R	EDGE STAND - R	
63	KEY_FUNCTION	
1050	LCD PANEL	
1053	MAINB BOARD	
1053-2	PQ BOARD	
1054	POWER BOARD	
1056	IR BOARD	
1057	KEY BOARD	
1061-1	AMBI-LIGHT BOARD	
1061-2	AMBI-LIGHT BOARD	
1061-3	AMBI-LIGHT BOARD	
1061-4	AMBI-LIGHT BOARD	
1061-5	AMBI-LIGHT BOARD	
1061-6	AMBI-LIGHT BOARD	
1061-7	AMBI-LIGHT BOARD	
1061-8	AMBI-LIGHT BOARD	
1061-9	AMBI-LIGHT BOARD	
1061-10	AMBI-LIGHT BOARD	
1061-11	AMBI-LIGHT BOARD	
1176	REMOTE PHILIP \$	Not displayed
1185	Speaker	
1186	SOUND BAR	
1187	Speaker	
WiFi02	WiFi/BT USB	

11. Dismantling procedure for specific handling parts

As complete appliances, LCDs are deemed to be hazardous waste (e.g. 16 02 13*, 20 01 35*) in the EU according to the German Waste Catalogue Ordinance. These appliances may only be handled by authorized handling plants.

LCDs must be stored in accordance with the requirements stipulated in Appendix VIII (1) or (2) of Directive 2012/12/EU and must, amongst other things, be stored in a weatherproof manner. Containers with covers must be used when storing and transporting LCDs.

Which appliances?

- **LCDs (TVs, Monitors) using either Light Emitting Diode (LED) or Cold Cathode Fluorescent Light (CCFL) sources.**

Requirements according to ANNEX VII of DIRECTIVE 2012/19/EU on waste electrical and electronic equipment (WEEE)

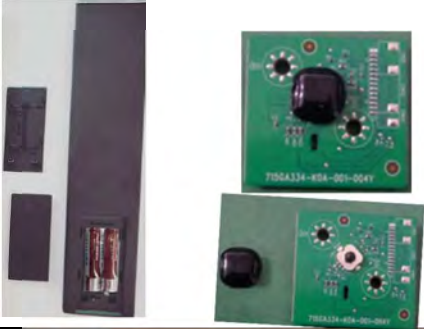



Materials and components with hazardous content

LCDs may contain hazardous substances like Pb and BFRs which are covered by exemptions under the RoHS directive. However, the majority is present in the printed circuit boards assembly. In order to reduce emissions as much as possible, a complete disposal of the old appliance is required. This treatment may only be performed in authorized handling plants.

No.	Substance	relevant
a)	mercury containing components, such as switches or backlighting lamps	N/A
b)	batteries	✓
c)	printed circuit boards of mobile phones generally, and of other devices if the surface of the printed circuit board is greater than 10 square centimetres	✓
d)	toner cartridges, liquid and paste, as well as colour toner	N/A
e)	plastic containing brominated flame retardants	N/A
f)	asbestos waste and components which contain asbestos	N/A
g)	cathode ray tubes	N/A
h)	chlorofluorocarbons (CFC), hydrochlorofluorocarbons (HCFC) or hydrofluorocarbons (HFC), hydrocarbons (HC)	N/A
i)	gas discharge lamps	N/A
j)	liquid crystal displays (together with their casing where appropriate) of a surface greater than 100 square centimetres and all those back-lighted with gas discharge lamps	✓
k)	external electric cables	✓
l)	components containing refractory ceramic fibres as described in Commission Directive 97/69/EC of 5 December 1997 adapting to technical progress for the 23rd time Council Directive 67/548/EEC on the approximation of the laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substance	N/A
m)	components containing radioactive substances with the exception of components that are below the exemption thresholds set in Article 3 of and Annex I to Council Directive 96/29/Euratom of 13 May 1996 laying down basic safety standards for the protection of the health of workers and the general public against the dangers arising from ionizing radiation	N/A
n)	electrolyte capacitors containing substances of concern (height > 25 mm, diameter > 25 mm or proportionately similar volume)	✓

	These substances, mixtures and components shall be disposed of or recovered in compliance with Directive 2008/98/EC	
o)	cathode ray tubes: the fluorescent coating has to be removed	N/A
p)	equipment containing gases that are ozone depleting or have a global warming potential (GWP) above 15, such as those contained in foams and refrigeration circuits: the gases must be properly extracted and properly treated. Ozone-depleting gases must be treated in accordance with Regulation (EC) No 1005/2009	N/A
q)	gas discharge lamps: the mercury shall be removed	N/A

Below is a sample for you to follow

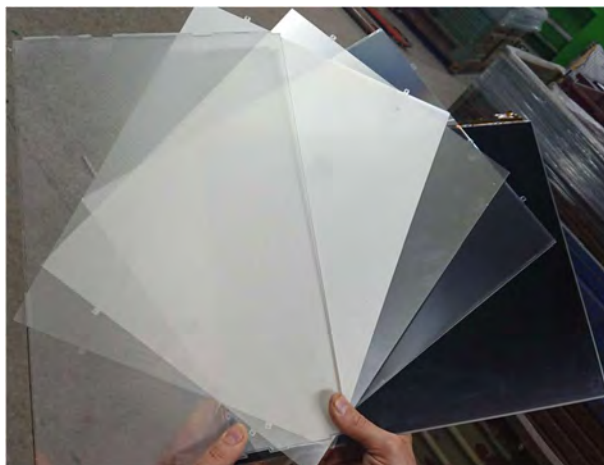
Necessary information according to ANNEX VII of DIRECTIVE 2012/19/ on waste electrical and electronic equipment (WEEE)		
<p>Batteries can easily be removed from the remote control or printed circuit board assembly once the back cover of the remote control or product has been removed.</p>		
<p>The back cover of the display can easily be removed by hand and screw driver.</p>		
<p>Once removed this will expose the accessible electronic units (printed circuit boards),</p>		
<p>which can now be easily removed with appropriate tools.</p>		
<p>The diffusion panels can be accessed by lifting the inner casing, typically held in place with clips which</p>		

can be removed with appropriate tools.

The panel consists of several plastic sheets which can be processed.



A final consideration is that of the back light which must be removed prior to processing. These may be present along either the bottom, or either side of the display as a strip of lights.



Lighting may be arranged across the entire back board of the display.

Displays of this kind will have either Light Emitting Diodes (LEDs) or Cold Cathode Fluorescent Lights (CCFL).



Plastic parts can contain brominated flame retardants

A Power cord or other external cables plugged into the back of the LCD can easily be removed by hand and/or screwdriver; 2 types of connection of power cord are typical as shown in the pictures.



Capacitors > 25 mm are located in the power supply units and can be removed by nipper. Possible it can be difficult to remove by nipper due to shorter leads. In this case, the capacitors can be removed by melting the solder which fixes the capacitors.

