

# TCL

# SERVICE MANUAL

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40B3800/MT31LB-AP

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1. Caution.....
2. specification.....
3. Alignment Procedure.....
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**This manual is the latest at the time of printing, and does not include the modification which may be made after the printing, by the constant improvement of product**

# 1. CAUTION

**CAUTION:**

Use of controls, adjustments or procedures other than those specified herein may result in hazardous radiation exposure.

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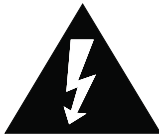


**CAUTION**  
**RISK OF ELECTRIC SHOCK DO NOT OPEN.**



**CAUTION: TO REDUCE THE RISK OF ELECTRICAL SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.**

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The lightning flash with arrowhead symbol, with an equilateral triangle is intended to alert the user to the presence of uninsulated “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock to the person.

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The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

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**WARNING: TO REDUCE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.**

# IMPORTANT SAFETY INSTRUCTIONS

## CAUTION:

Read all of these instructions. Save these instructions for later use. Follow all Warnings and Instructions marked on the audio equipment.

1. Read Instructions- All the safety and operating instructions should be read before the product is operated.
2. Retain Instructions- The safety and operating instructions should be retained for future reference.
3. Heed Warnings- All warnings on the product and in the operating instructions should be adhered to.
4. Follow Instructions- All operating and use instructions should be followed.

## FOR YOUR PERSONAL SAFETY

1. When the power cord or plug is damaged or frayed, unplug this television set from the wall outlet and refer servicing to qualified service personnel.
2. Do not overload wall outlets and extension cords as this can result in fire or electric shock.
3. Do not allow anything to rest on or roll over the power cord, and do not place the TV where power cord is subject to traffic or abuse. This may result in a shock or fire hazard.
4. Do not attempt to service this television set yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.
5. Never push objects of any kind into this television set through cabinet slots as they may touch dangerous voltage points or short out parts that could result in a fire or electric shock. Never spill liquid of any kind on the television set.
6. If the television set has been dropped or the cabinet has been damaged, unplug this television set from the wall outlet and refer servicing to qualified service personnel.
7. If liquid has been spilled into the television set, unplug this television set from the wall outlet and refer servicing to qualified service personnel.
8. Do not subject your television set to impact of any kind. Be particularly careful not to damage the picture tube surface.
9. Unplug this television set from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
- 10.1. Do not place this television set on an unstable cart, stand, or table. The television set may fall, causing serious injury to a child or an adult, and serious damage to the appliance. Use only with a cart or stand recommended by the manufacturer, or sold with the television set. Wall or shelf mounting should follow the manufacturer's instructions, and should use a mounting kit approved by the manufacturer.
- 10.2. An appliance and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart combination to overturn.



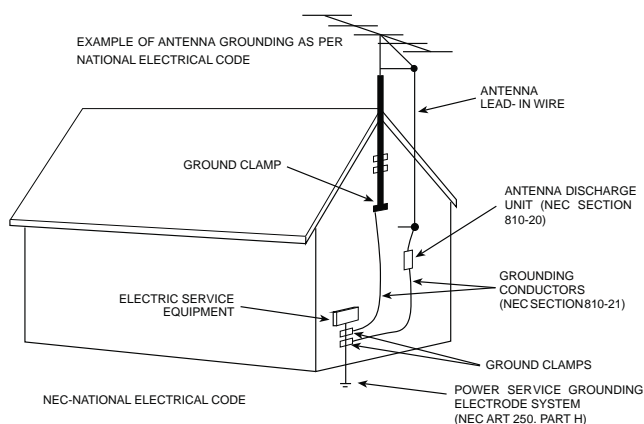
# PROTECTION AND LOCATION OF YOUR SET

11. • Do not use this television set near water ... for example, near a bathtub, washbowl, kitchen sink, or laundry tub, in a wet basement, or near a swimming pool, etc.
  - Never expose the set to rain or water. If the set has been exposed to rain or water, unplug the set from the wall outlet and refer servicing to qualified service personnel.
12. Choose a place where light (artificial or sunlight) does not shine directly on the screen.
13. Avoid dusty places, since piling up of dust inside TV chassis may cause failure of the set when high humidity persists.
14. The set has slots, or openings in the cabinet for ventilation purposes, to provide reliable operation of the receiver, to protect it from overheating. These openings must not be blocked or covered.
  - Never cover the slots or openings with cloth or other material.
  - Never block the bottom ventilation slots of the set by placing it on a bed, sofa, rug, etc.
  - Never place the set near or over a radiator or heat register.
  - Never place the set in a "built-in" enclosure, unless proper ventilation is provided.

# PROTECTION AND LOCATION OF YOUR SET

- 15.1. If an outside antenna is connected to the television set, be sure the antenna system is grounded so as to provide some protection against voltage surges and built up static charges, Section 810 of the National Electrical Code, NFPA No. 70-1975, provides information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna discharge unit, connection to grounding electrode, and requirements for the grounding electrode.

## EXAMPLE OF ANTENNA GROUNDING AS PER NATIONAL ELECTRICAL CODE INSTRUCTIONS



- 15.2. Note to CATV system installer : (Only for the television set with CATV reception)

This reminder is provided to call the CATV system installer's attention to Article 820-40 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

16. An outside antenna system should not be located in the vicinity of overhead power lines or other electric lights or power circuits, or where it can fall into such power lines or circuits. When installing an outside antenna system, extreme care should be taken to keep from touching such power lines or circuits as contact with them might be fatal.
17. For added protection for this television set during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna. This will prevent damage due to lightning and power-line surges.

## **OPERATION OF YOUR SET**

18. This television set should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supply at your home, consult your television dealer or local power company. For television sets designed to operate from battery power, refer to the operating instructions.
19. If the television set does not operate normally by following the operating instructions, unplug this television set from the wall outlet and refer servicing to qualified service personnel. Adjust only those controls that are covered in the operating instructions as improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the television set to normal operation.
20. When going on a holiday : If your television set is to remain unused for a period of time, for instance, when you go on a holiday, turn the television set “ off ” and unplug the television set from the wall outlet.

## **IF THE SET DOES NOT OPERATE PROPERLY**

21. If you are unable to restore normal operation by following the detailed procedure in your operating instructions, do not attempt any further adjustment. Unplug the set and call your dealer or service technician.
22. Whenever the television set is damaged or fails, or a distinct change in performance indicates a need for service, unplug the set and have it checked by a professional service technician.
23. It is normal for some TV sets to make occasional snapping or popping sounds, particularly when being turned on or off. If the snapping or popping is continuous or frequent, unplug the set and consult your dealer or service technician.

## **FOR SERVICE AND MODIFICATION**

24. Do not use attachments not recommended by the television set manufacturer as they may cause hazards.
25. When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer that have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock, or other hazards.
26. Upon completion of any service or repairs to the television set, ask the service technician to perform routine safety checks to determine that the television is in safe operating condition.



**Test & Alignment Specification (TAS)  
for MT5531  
EU/AU/RU Series  
Version 0.90**

- ➔ **MT31L:** Low Cost CCFL & LED Platform
- ➔ **MT31D:** Low Cost CCFL & LED Platform (for E3000 ID only)
- ➔ **MT31B:** Basic Entry Level LED Platform
- ➔ **MT31BT/LT/DT:** DVB-T2 Chassis LED Platform
- ➔ **MT31BS/LS:** DVB-S2 Chassis LED Platform
- ➔ **MT31LB:** DVB-T2 Chassis LED Platform for TOT

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CHECKED BY : \_\_\_\_\_ DATE : \_\_\_\_\_

APPROVED BY : \_\_\_\_\_ DATE : \_\_\_\_\_

## Disclosure

The information contained in this document is proprietary to TCL SZ FPD lab and shall not be disclosed by the recipient to third persons without the written permission of the team leader or GM of R&D.

## Revision History

Version	Issue Date	Description of changes
<b>v0.10</b>	2013-01-06	This is 1 <sup>st</sup> Draft version . Add MT31B For Entry Level LED . Add MT31L For Low Cost CCFL & LED Platform . Add MT31D For Low Cost CCFL & LED Platform base on E330
<b>v0.20</b>	2013-03-01	.Improve header information on MT5531 .Change Power Mode to Boot
<b>v0.30</b>	2013-03-18	. Delete offsets: +0.002 for "x" and +0.012 for "y" . Add Project White Balance Information
<b>v0.40</b>	2013-04-12	. Add MAC upgrade method by USB . Upgrade MTK Tool for MT31.
<b>v0.50</b>	2013-04-18	. Mr.Christian upgrade information .Add PQ engineer Note information .Add project White Balance Information .Add HDCP upgrade method.
<b>v0.60</b>	2013-04-23	<b>.WB adjust need to fix default G Gain</b> <b>.The signal level check has been down in R&amp;D, Factory should not adjust the scaling Brightness , scaling contrast and scaling saturation.</b>
<b>v0.70</b>	2013-05-23	.Add MT31BT/LT/DT DVB-T2 function chassis; .Add MT31BS/LS S2 DVB-S2 function chassis .Add AU/RU Market project information .Improve MT31 function information for EU / AU / RU .Add EU/AU project white balance information
<b>v0.80</b>	2013-06-11	.Add project White Balance Information
<b>v0.90</b>	2013-07-12	.Add project White Balance Information
<b>V0.91</b>	2013-09-02	Add MT31LB DVB-T2 for TOT information.

These chassis are designed for European LCD TV markets with MPEG4 for both TCL/THOMSON brands. The main chip is from Mediatek (MT5531 series) and support below feature matrix:

Class	Item	EU			AU	RU
		MT31B/L/D	MT31BT/LT/DT	MT31BS/LS	MT31B/L/D	MT31LB
<b>Input</b>  <b>&amp;</b>  <b>Output</b>	<b>ATV</b> ( PAL B/G D/K I, SECAM B/G D/K L/L)	√	√	√	√	√
	<b>DTV</b> MPEG-2, MPEG-4	DVB-T/C	DVB-T/C DVB-T2	DVB-T/C DVB-S2	DVB-T/C	DVB-T/C DVB-T2
	<b>HDMI - CEC</b>  (480i/p, 576i/p, 720p up to 1080i/p, compliant v1.4a with HDCP)	MT31B/D:2 MT31L:1	MT31B/D:2 MT31L:1	MT31B/D:2 MT31L:1	MT31B/D:2 MT31L:1	2
	<b>VGA</b>	1	1	1	1	1
	<b>VGA/CMP audio</b>	1	1	1	1	1
	<b>CMP</b>  (YPrPb can support from 480i up to 1080p, audio)	1	1	1	1	1
	<b>SCART1</b>  (CVBS & RGB &YC, audio)	√	√	√	N/A	N/A
	<b>Side AV or Back AV</b>  (CVBS, audio)	N/A	N/A	N/A	1	N/A
	<b>USB (2.0)</b>	1 Picture, Video, Audio Playback	1 Picture, Video, Audio Playback	1 Picture, Video, Audio Playback	1 Picture, Video, Audio Playback	1 Picture, Video, Audio Playback



	<b>SCART1 output</b> (CVBS, audio)	√	√	√	N/A	N/A
	<b>AV output (RCA)</b> (CVBS, audio)	N/A	N/A	N/A	√	N/A
	<b>Headphone output</b>	√	√	√	√	N/A
	<b>SPDIF output</b>	Coaxial	Coaxial	Coaxial	Coaxial	Coaxial
	<b>RJ-45</b>	IP Return	IP Return	IP Return	N/A	N/A
<b>Functions</b>	<b>MEMC</b>	N/A	N/A	N/A	N/A	N/A
	<b>OAD</b>	√	√	√	√	√
	<b>CI+1.3</b>	√	√	√	N/A	√
	<b>WIFI Ready</b>	N/A	N/A	N/A	N/A	N/A
	<b>DIVX</b>	N/A	N/A	N/A	N/A	√
	<b>DLNA (DMP)</b>	N/A	N/A	N/A	N/A	N/A
	<b>Internet</b>	N/A	N/A	N/A	N/A	N/A
	<b>Audio Return Channel</b>	√	√	√	√	√
<b>Others</b>	<b>Serial connector</b>	N/A	N/A	N/A	N/A	N/A
	<b>VGA connector</b>	P1000	P1000	P1000	P1000	P1000
	<b>I2C connector of MEMC module</b>	N/A	N/A	N/A	N/A	N/A

Class	Item	MT31B	MT31L	MT31D	
<b>IC Details &amp; Position</b>	<b>Main SW BIN image (NOR 64Mb Flash)</b>	U702	U702	U702	
	<b>System Memory</b>	Integrated to Flash	Integrated to Flash	Integrated to Flash	
	<b>HDMIx Switch</b>	Embedded to SoC	Embedded to SoC	Embedded to SoC	
	<b>EDID BIN image</b>	at Firmware On-Power	at Firmware On-Power	at Firmware On-Power	
	<b>VGA EDID BIN image</b>	at Firmware On-Power	at Firmware On-Power	at Firmware On-Power	

• **MT5531 FLASH Size and Key Blocks Location's Assignment**

2	<b>Id</b>	<b>Module</b>	<b>size</b>	<b>start_address</b>
3	nor_part_size0	loader	256K	0x0
4	nor_part_size1	image	0x670000	0x40000
5	nor_part_size2	ch_list	128K	0x6b0000
6	nor_part_size3	null	0	0x6d0000
7	nor_part_size4	ch_list2	128K	0x6d0000
8	nor_part_size5	null (prepared for default_db)	0	0x6f0000
9	nor_part_size6	ntfs	128K	0x6f0000
10	nor_part_size7	pq	512K	0x710000
11	nor_part_size8	ci+	128K	0x790000
12	nor_part_size9	hdcp_nor	64K	0x7b0000
13	nor_part_size10	eeprom_nor	256K	0x7c0000
14				

Note:

It is necessary to erase Flash before writing code file for reading in correctly EEPROM data.

- **Manufacturing Connectors Pinout**

VGA / P1000      Pin4:RXD   Pin11:TXD

- **USB to UART Bridge Adapter (Silicon Labs CP210 chipset series)**

To communicate with TV product for debugging, adjustment and so... it's required suitable 0..5V Serial Interface like following snapshot (further details are described on below sections):



**INFO:**

↪ All tests and measurements mentioned hereafter have to be carried out at a normal mains voltage (**220 ~ 240 VAC**)

↪ All voltages have to be measured with respect to ground, unless otherwise stated

↪ All final tests have to be done on a complete set including LCD panel in a room with temperature of **25+/-7C**

↪ The Picture Performance assessment such as White Balance (luminance and color temperature) has to be performed into subdued lighted room after at least **45min** of warm-up in order to avoid any temperature drift influence (colorimetry vs time)

## 1. PCB/SKD Assembly: Test & Alignment

### 1.1. Pre-Conditions and DC/DC Check

Before power on, please check the board according to the relevant block diagram and circuit diagram, and make sure that no serious issue or mistake can destroy the board. For example, the output of DC/DC and LDO should not be shorted to ground.

Supply a suited voltage and power-on, then check the voltage according to the relevant block diagram, circuit diagram and voltage specification within 5% margin.

For example, check SoC voltage (AV3V3, VCKK-1V2, etc.), DDR voltage (DDRV) , amplifier voltage (Main\_Power), etc... Only the standby voltage is necessary if there is no software in the flash.

### 1.2. SW Image download

Download the latest release SW from below FTP server:

- Link:xxxxx
- Username: xxxxx
- Password: xxxxx
- Folder: xxxxx

See Appendix (1) “How to upgrade FLASH SW using MTK tool”

See Appendix (2) “How to upgrade FLASH SW using USB”

#### ▪ OAD Transport Stream Image

To manage quicker mass reflashing, a predefined OAD DVB-T channel (freq:850MHz / bandwidth:8MHz) is embedded to SW core and only available into Factory mode. Some licensed IBL tools ('xxx2lli.exe', 'lli2dsm.exe', dsmmerge.exe, ...) from Intellabyte Inc. (<http://www.intellabyte.com/>) might be necessary to create appropriate DVB SSU TS. Over some predefine settings such as repeated datablock insertion, null packets size, ... (controllable in configuration file), here below are mandatory OUI entries structure to prepare DSM-CC carousel image format:

OUI Entry	MT31L	MT31B	MT31LB	
<b>CUST_OAD_OUI</b>	408BF6	408BF6	408BF6	
<b>CUST_OAD_HW_MODEL</b>	0x5881	0x5881	0x5881	
<b>CUST_OAD_HW_VERSION</b>	0x0001	0x0001	0x0001	
<b>CUST_OAD_SW_MODEL (x)</b>	0x <b>3101</b>	0x <b>3102</b>	0x <b>3102</b>	
<b>CUST_OAD_SW_VERSION (yyy)</b>	0x0xxx	0x0xxx	0x0xxx	

Note (1): SW Entry are referring to following PKG image file name “V8-0MT**310**x-LF1Vyyy.pkg”

Note (2): See enclosed necessary Data Broadcast Carousel configuration file format details (DBC)



TCL\_HW5881.pdf

To build an OAD TS, it's necessary to create a temporary common and interchangeable DSM file format using below command and arguments:

```
'bin2dsm.exe -v -v -v -m0,0,"TCL_HW5881",0 -n200 -z102400 -nz -o%FILE%.dsm -h"OUI=CUST_OAD_OUI
model=CUST_OAD_HW_MODEL version=CUST_OAD_HW_VERSION vm=0xffff" -s"OUI=CUST_OAD_OUI
model=CUST_OAD_SW_MODEL version=CUST_OAD_SW_VERSION vm=0xffff" %FILE%.pkg'
```

Then, OAD TS can be completed using below command and arguments:

```
'dsmsectn.exe -v -dvbssu -mpegts -patpmt -nit_ter -sdt -o%FILE%.ts -gTCL_HW5881.dbc %FILE%.dsm'
```

For more robustness, TS can be played with following presets such as modulation:QAM-64, guard interval:1/8, coding rate:2/3 to ensure ~22Mbps.

OAD reflashing process is managed within 4 steps operation: multiplex detection, DVB transfer, flashing and warm-start.

See Appendix (3) "How to upgrade FLASH SW using OAD"

### 1.3. UART & IR Parser

To use both UART and/or IR parser, TV has to be set in Factory mode with its VGA port well connected to suitable UART device or an IR emitter device correctly facing up TV (see below "Product Assembly - section 2.0" how to activate "Factory key").

The SoC's RS232 mode is automatically enabled at power-on and doesn't require any command initialization frame. <0x30 0x30 0x30 0x2E 0x30 0x65 0x30 0x74 0x30 0x0D 0xE2> from host to TV.

So correctly setup UART parser engine for further serial communication, it's necessary to send following command frame <0xAA 0x06 0x10 0x01 0xA7 0xEF> within following COM presets 115200/8/n/1; "PS" caption might be toggled and displayed on bottom left screen ("S" like Serial) if successful.

To communicate with TV depending on SIACP revision layout implementation, you may need to fulfill UART/IR commands protocol and format described on enclosed SIACP requirements document (rev. v5.9).



SIACP\_V5.9.pdf

### 1.4. ProjectID Modification

There are different IDs stored into system memory depending on different Panels settings and Models features, but there's only one key branching ProjectID that includes all. So, it's not recommended to modify PanelID with Hyper terminal as other ID features may not change!

To modify ProjectID, you need to go through "Factory menu→Other→Project info→Project ID", then spin left or right with RCU "◀/▶" key keys to suitable ID (Project name is dynamically refreshed).

See Appendix (4) "How to change ProjectID with RCU"

Here below is none exhaustive ProjectID table for reference. Project list and all relative information are dispatched and updated as a new firmware package is released.

Project Name	Project ID	Panel
L39F3303F	001	PANEL_CMI_V390HJ1-P02
L39F3393F	002	PANEL_CMI_V390HJ1-P02
L32F3303	003	PANEL_SS_LSC320AN02
L32F3393	004	PANEL_SS_LSC320AN02
39FU5253C	005	PANEL_CMI_V390HJ1-LE1
39FU5253CW	006	PANEL_CMI_V390HJ1-LE1
39FU5243C	007	PANEL_CMI_V390HJ1-LE1
55FU4243C	008	PANEL_SS_LSC550HJ03_8
32HU5253C	010	PANEL_SS_LSC320AN02
32HU5253CW	011	PANEL_SS_LSC320AN02
32HU5243C	012	PANEL_SS_LSC320AN02
...		
L28T3540	087	

### 1.5. Functional Test

Once the boards (chassis, KB, IR, PSU...) and the panel are well interconnected, plug all suitable signals generator to relevant below inputs/outputs using respective test patterns format to check picture/sound quality:

Source	Test Signal	Test Pattern
<b>Analog /Digital Tuner</b> (VHF/UHF & CATV)	RF cable generator	2D - Movie 1280x720 2D - Static Picture 1920x1080 1. Frequency Range: full band 2. Standard: PAL / SECAM 3. DVB-T/C DVB-T2
<b>Satellite Tuner</b> (only for MT31BS)  - DiSEqC v1.0 (A, B, C, D) and Tone Burst (A, B) - Double LNB frequency (band change by 22KHz Tone)	Compliant DVB-S/S2 source from generator or dish antenna with switch	2D - Movie 720x576 1. Frequency Range: 950MHz..2150MHz 2. Symbol Rate Range: DVB-S 1..30MHz (for QPSK) DVB-S2 1..45MHz (for QPSK) 1..30MHz (for 8PSK) 3. LNB Voltage Range: Vertical 12.85V..14.2V Horizontal 17.6V..19.5V 4. 22KHz Tone Range Frequency 20.5KHz..23.5KHz Amplitude 400mV..900mV Current ≥400mA

<b>SPDIF</b> (optical / cinch)	Suitable Audio Amplifier	PCM or Dolby D+
<b>PCMCIA</b>	CI CAM card adaptor	Conax, Irdeto, Viaccess, ...
<b>SCART/AV IN</b> via adaptor on MT31B/T (CVBS & RGB & S-VIDEO)	Chroma/Fluke generator	PAL Half Color & Gray bars 720x576 Half Color & Gray bars
<b>SCART/AV OUT</b> via adaptor on MT31B/T (CVBS & Audio out)	Monitor	Suitable channel
<b>PC</b> (VGA)	Chroma/QuantumData generator	WXGA - 1368x768@60Hz Half Color & Gray bars
<b>CMP</b> via mini jack adaptor on MT31B/T (YPrPb & Audio)	Chroma/QuantumData generator	1920x1080i@60Hz Half Color & Gray bars
<b>HDMI</b>	Video & Audio with beyond HDMI 1.4a and HDCP compliant DVD/BD player	2D - Movie 1920x1080@p24Hz
	MHL	up to 720p
	ARC	PCM or Dolby D+
	CEC	One Touch Play/ Routing Control/ Sys Standby/ Sys Info/ Give Device Power Status/ Pass Through/ System Audio Control/ Audio Return Channel
<b>RJ-45</b>	IP Return	N/A
<b>Headphone</b>	RF signal	N/A
<b>Loud Speakers / Enclosures</b>	RF signal	Suitable channel

Picture/Video formats and Audio tones can be changed by the factory according to their own standard and broadcasted signals (ie: 1KHz & 3KHz, sweep, ...).

### **1.6. AD Calibration Test**

N/A

As SoC as built-in A/D self-calibration mechanism, there's not any ADC to perform.

### **1.7. DDC & EDID & T-Link Test**

The E-EDID data structures are according to VESA Enhanced EDID 1.4a (and EIA/CEA-861B for HDMI)..  
All VGA and HDMI structures have their own BIN profile which are part of firmware and uploaded at power-on.  
For EDID check, it's recommended to check whether the correct EDID is uploaded by checking corresponding EDID NVM Checksum or read them out to check bit by bit if it is in line with the released EDID bin file.

### **1.8. HDCP Upgrade and Test**

See Appendix (5) "**How to upgrade HDCP KEY by UART**"

For HDCP compliancy, it's needed to check whether the HDCP key has been well set by connecting suitable generator signal.

## **1.9. CI+ Key Upgrade, Activation and Test**

See Appendix (6) "**How to upgrade and activate CI Key using USB**"

See Appendix (7) "**How to upgrade and activate CI Key using MTK tool**"

## **1.10. IP Return Test**

### **Appendix (8) "How to upgrade MAC address using USB"**

All MT31 series platform support IP return function according to CI+ v1.3.

Here are some representative code example:

MAC Address
40-8B-F6-90-4D-53

**Note:**

Testing method is under completion.

## **2. Product Assembly (PA): Test and Alignment**

### **2.1. Factory Menu**

Follow the below steps to pop-up the Factory menu in case of "FactoryKey" is disabled:

- Press RCU "**MENU**" key to display main menu
- Select "**Picture**" and press "**OK**" key to enter into Picture submenu
- Scroll down to "**Contrast**" item
- Press the subsequence RCU keys "**9**", "**7**", "**3**" and "**5**"

In case of "**FactoryKey**" is enabled, just press RCU "**Return**" key to pop-up again the Factory menu.

The status of "**Factory Key**" can be changed in "**Factory Menu->Hotkey**"

Press RCU "**OK/▶**" key to enter the submenu.

Press RCU "**Menu**" key to go back to the root menu.

Press RCU "**◀/▶**" key to change the values.

Press RCU "**OK**" key run the function.

Press RCU "**Exit**" key exit the Factory menu.

- **Factory Captions Description**

While “**FactoryKey**” is enabled, there’re some toggled display informations (~2s) relative to SW, ProjectID, CI+, NetworkID to facilitate 100% quick screening without accessing to whatever else menu:

MV: OMT1003-LF1V074	➔	Firmware Version ( <b>MV</b> )	- ‘V8-0MTxxxx-LF1Vyyy’
ID: 010	➔	Project ID ( <b>ID</b> )	- range [000..999]
CI+: NO	➔	CI Key Activation flag ( <b>CI+</b> )	- ‘NO’= no key, ‘YES’= key activated
MAC: 00:1C:50:E2:B1:EC	➔	HDCP Key ( <b>HDCP</b> )	- ‘NULL’= no key, ‘YES’= key activated
PS	➔	PVR flag ( <b>ERG</b> )	- ‘OFF’= disabled, ‘ON’= enabled

**P** (Production/Factory mode flag) / **S** (Factory UART Parser mode flag) / **W** (Warm-Up mode flag)

## **2.2. Channel Map Preset**

Region channel Maps are stored in the firmware and can be directly preloaded via Factory menu. Other faster methods via UART/IR commands are available on enclosed SIACP requirements (rev. v5.9).

See Appendix (9) “**Factory Menu Description**”

## **2.3. Warm-up Test**

Following TCL standard and practices, it’s required minimum **15min** of **Warm-Up** that can be considered as Burn-In. Additional Aging for White Balance alignment is no more necessary due to consistent Picture Performance with Cloning usage.

This function is accessible by selecting “**Factory menu → Burning Mode**”, pressing RCU “**OK/▶**” key, to release/disable Burn-in mode, it’s just required to press “**Menu**” button from local keyboard. Other faster methods via UART/IR commands are available on enclosed SIACP requirements (rev. v5.9).

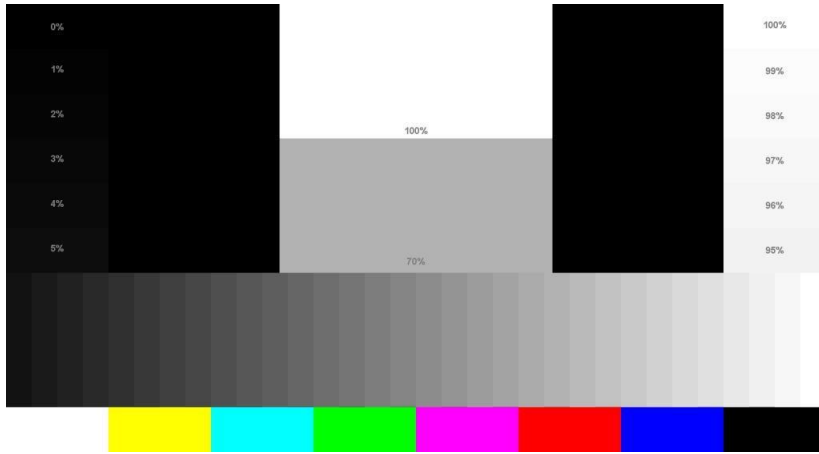
## **2.4. White Balance (WB) Cloning**

### ▪ **White Balance Touch-Up (Golden sample)**

As some color coordinates discrepancies can be noticed from panel batches to others, it may necessary to perform slight touch-up.

For Color temperature adjustment, switch TV on leading **HDMI** input where should be connected suitable generator providing following format **1280x720p@60Hz** test pattern. A 32 steps grey scale is recommended to assess relevant colorimetry tracking and low/high light saturation points.





Make sure Picture Preset is set to “**DYNAMIC**” mode, both “**Contrast**” and “**BackLight**” bargraph are set to “**100**” (maximum), “**Gamma**” bargraph are set to “**0**” (2.2 nominal) and that both “**Energy Saving**” and “**Light Sensor**” are set to “**Off**” from “**ECO Settings**” subsection.

Ensure that TV is in Factory mode to access to “**White Balance**” adjustment submenu, then scroll down to toggle off “**Pic. Enhance**” flag.

**PC VGA, CMP YPrPb, SCART RGB, CVBS\_PAL/SECAM Gain/Offset** matrix offsets locations are relative to **HDMI/DTV**.

**Warm** and **Cool** Tone are relatives to **Normal** mode. **WB adjust need to fix default G Gain .**

- “**Gain**” registers set need to be adjusted at 70IRE.
- “**Offsets**” registers set can be adjusted at 30IRE, but it’s not recommended to keep them defaulted.

Note: All matrix offsets locations can be individually fine-tuned.

▪ **Targets and Tolerances for all inputs**

**Note: The White balance value is right conformed by PQ Engineer , Except PQ Engineer, anybody can not change the white balance value and Default value.**

The measured and adjustable parameters should be mainly “**x**”, “**y**” coordinates (see “TCL EU Picture Quality Requirements for FPDs” for reference).

**The signal level check has been down in R&D, Factory should not adjust the scaling Brightness , scaling contrast and scaling saturation.**

The White Balance alignment should be performed using a well calibrated and contact less analyzer (ex: CA310). The analyzer may not touch the screen surface, and measurement must be performed in a dark environment keeping the probe(s) at 90+/-2° from the panel center.

The results should fulfill following TCL matching requirements (Minolta CA210-CH00 based):

Area	EU	White Balance			Default			Energy Efficiency
		COOL	NORMAL	WARM	COOL	NORMAL	WARM	
Project Name	Bom No.							
L19D3303	H3-19D33S2-WE1A (B) WAA	274, 294	283, 307	318, 350	-3, 0, 9	128, 128, 128	16, 0, -27	A
L19D3303	H3-19D33S2-WE1CWAA	268, 284	278, 298	313, 339	-3, 0, 9	128, 128, 128	16, 0, -27	A
19HU5253C	H3-19E53S2-EU1C (D) WAA	272, 296	282, 308	317, 347	-3, 0, 9	128, 128, 128	16, 0, -27	A
19HU5253C	H3-19E53S2-EU1A (B) WAA	274, 294	283, 307	318, 350	-3, 0, 9	128, 128, 128	16, 0, -27	A
19HU5253CW	H3-19E53S2-EU1BWAA	274, 294	283, 307	318, 350	-3, 0, 9	128, 128, 128	16, 0, -27	A
L19E4103	H3-19E41S2-WE1AWAA	290, 317	300, 330	338, 365	-3, 0, 9	130, 124, 128	16, 0, -27	A

Test and Alignment Specification for MT5331 Series (v0 91)

19HW4323	H3-19E41S2-WE1BWAA	290, 317	300, 330	338, 365	-3, 0, 9	130, 124, 128	16, 0, -27	A
19HW4323W	H3-19E41S2-WE1CWAA	290, 317	300, 330	338, 365	-3, 0, 9	130, 124, 128	16, 0, -27	A
L19E4153	H3-19E41S2-WE1DWAA	290, 317	300, 330	338, 365	-3, 0, 9	130, 124, 128	16, 0, -27	A
L19E4143	H3-19E41S2-WE1EWAA	290, 317	300, 330	338, 365	-3, 0, 9	130, 124, 128	16, 0, -27	A
L19E4133	H3-19E41S2-WE1FWAA	290, 317	300, 330	338, 365	-3, 0, 9	130, 124, 128	16, 0, -27	A
L23F3303	H3-23F33S2-WE1AWAA	270, 292	280, 302	315, 336	-3, 0, 9	128, 128, 128	16, 0, -27	A+
L23F3393	H3-23F33S2-WE1BWAA	270, 292	280, 302	315, 336	-3, 0, 9	128, 128, 128	16, 0, -27	A+
L24E4103F	H3-24E41S2-WE1AWAA	260, 275	270, 287	305, 325	-3, 0, 9	128, 128, 128	16, 0, -27	A
24FW4323	H3-24E41S2-WE1BWAA	260, 275	270, 287	305, 325	-3, 0, 9	128, 128, 128	16, 0, -27	A
24FW4323W	H3-24E41S2-WE1CWAA	260, 275	270, 287	305, 325	-3, 0, 9	128, 128, 128	16, 0, -27	A
L24E4153F	H3-24E41S2-WE1DWAA	260, 275	270, 287	305, 325	-3, 0, 9	128, 128, 128	16, 0, -27	A
L24E4143F	H3-24E41S2-WE1EWAA	260, 275	270, 287	305, 325	-3, 0, 9	128, 128, 128	16, 0, -27	A
L24E4133F	H3-24E41S2-WE1FWAA	260, 275	270, 287	305, 325	-3, 0, 9	128, 128, 128	16, 0, -27	A
L24E3500	H3-24E35S2-WE1AWAA	260, 275	267, 285	305, 325	-3, 0, 9	136, 128, 126	16, 0, -27	A
26HW4323	H3-26E41S2-WE1AWAA	262, 274	271, 287	305, 329	-3, 0, 9	128, 128, 128	16, 0, -27	A
26HW4323W	H3-26E41S2-WE1FWAA	262, 274	271, 287	305, 329	-3, 0, 9	128, 128, 128	16, 0, -27	A
L26E4133	H3-26E41S2-WE1BWAA	262, 274	271, 287	305, 329	-3, 0, 9	128, 128, 128	16, 0, -27	A
L26E4103	H3-26E41S2-WE1CWAA	262, 274	271, 287	305, 329	-3, 0, 9	128, 128, 128	16, 0, -27	A
L26E4143	H3-26E41S2-WE1DWAA	262, 274	271, 287	305, 329	-3, 0, 9	128, 128, 128	16, 0, -27	A
L26E4153	H3-26E41S2-WE1EWAA	262, 274	271, 287	305, 329	-3, 0, 9	128, 128, 128	16, 0, -27	A
L32F3303	H3-32F33Q9-WE1AWAA	270, 280	280, 290	315, 327	-3, 0, 9	128, 128, 131	16, 0, -27	A+
L32F3393	H3-32F33Q9-WE1BWAA	270, 280	280, 290	315, 327	-3, 0, 9	128, 128, 131	16, 0, -27	A+
L32HW3323	H3-32E33S3-WE1DWAA	270, 290	278, 302	315, 340	-3, 0, 9	123, 128, 130	16, 0, -27	A+
L32E4503	H3-32E45Q9-WE1AWAA	268, 286	278, 300	314, 340	-3, 0, 9	128, 128, 128	16, 0, -27	A+
LT-32HA48U	H3-32E45Q9-WE1BWAA	268, 286	278, 300	314, 340	-3, 0, 9	128, 128, 128	16, 0, -27	A+
32HU5253C	H3-32E33S3-WE1BWAA	268, 286	278, 300	314, 340	-3, 0, 9	128, 128, 128	16, 0, -27	A+
32HW3323	H3-32E33S3-WE1AWAA	268, 286	278, 300	314, 340	-3, 0, 9	128, 128, 128	16, 0, -27	A+
L32E3003	H3-32E33S3-WE1CWAA	268, 286	278, 300	314, 340	-3, 0, 9	128, 128, 128	16, 0, -27	A+
32HU5243C	H3-32E53Q9-WE1CWAA	268, 286	278, 300	314, 340	-3, 0, 9	128, 128, 128	16, 0, -27	A+
32HU5253C	H3-32E53Q9-WE1AWAA	268, 286	278, 300	314, 340	-3, 0, 9	128, 128, 128	16, 0, -27	A+
32HU5253CW	H3-32E53Q9-WE1BWAA	268, 286	278, 300	314, 340	-3, 0, 9	128, 128, 128	16, 0, -27	A+
L32E4503	H3-32E45Q9-WE1AWAA	268, 286	278, 300	314, 340	-3, 0, 9	128, 128, 128	16, 0, -27	A+
L32E4503	H3-32E45Q9-WE1CWAA	268, 286	278, 300	314, 340	-3, 0, 9	128, 128, 128	16, 0, -27	A+
L32E5503	H3-32F35Q9-WE1AWAA	266, 275	275, 286	312, 324	-3, 0, 9	128, 128, 128	16, 0, -27	A+
L32E3020	H3-32E30S3-WE1AWAA	265, 282	275, 295	314, 341	-3, 0, 9	128, 128, 131	16, 0, -27	A+
L39F3303F	H3-39F33Q9-WE1AWAA	270, 280	280, 290	315, 327	-3, 0, 9	128, 128, 128	16, 0, -27	A+
L39F3393F	H3-39F33Q9-WE1BWAA	270, 280	280, 290	315, 327	-3, 0, 9	128, 128, 128	16, 0, -27	A+
L39E3003F	H3-39E30S3-WE1AWAA	268, 265	278, 277	313, 317	-3, 0, 9	128, 128, 128	16, 0, -27	A+
39FU3253C	H3-39E33S3-WE1AWAA	268, 265	278, 277	313, 317	-3, 0, 9	128, 128, 128	16, 0, -27	A+
L39E4503F	H3-39E45Q9-WE1AWAA	270, 276	280, 290	315, 331	-3, 0, 9	128, 128, 128	16, 0, -27	A+
LT-39HG48U	H3-39E45Q9-WE1BWAA	270, 276	280, 290	315, 331	-3, 0, 9	128, 128, 128	16, 0, -27	A+
39FU5253C	H3-39E53Q9-WE1AWAA	270, 276	280, 290	315, 331	-3, 0, 9	128, 128, 128	16, 0, -27	A+
39FU5253CW	H3-39E53Q9-WE1BWAA	270, 276	280, 290	315, 331	-3, 0, 9	128, 128, 128	16, 0, -27	A+

Test and Alignment Specification for MT5331 Series (v0 91)

39FU5243C	H3-39E53Q9-WE1CWAA	270, 276	280, 290	315, 331	-3, 0, 9	128, 128, 128	16, 0, -27	A+
L40FW3323	H3-40E33S3-WE1AWAA	270, 280	280, 290	315, 327	-3, 0, 9	128, 128, 128	16, 0, -27	A+
40FU3253C	H3-40E30S3-WE1AWAA	263, 276	273, 287	310, 326	-3, 0, 9	128, 128, 128	16, 0, -27	A+
L40E3003F	H3-40E30S3-WE1BWAA	263, 276	273, 287	310, 326	-3, 0, 9	128, 128, 128	16, 0, -27	A+
40FW5554	H3-40E55R4-EU1AWAA	261, 272	275, 291	328, 351	-3, 0, 9	134, 128, 116	16, 0, -27	A
40FW5555	H3-40E55R3-EU1AWAA	255, 268	265, 278	292, 302	-3, 0, 6	132, 128, 120	12, 0, -12	A
46FU5554C	H3-46E53R4-WE1BWAA	263, 265	270, 275	302, 308	0, 0, 6	128, 128, 128	8, 0, -18	A+
46FU5555CS	H3-46E53R3-WE1AWAA	263, 265	270, 275	302, 308	0, 0, 6	128, 128, 128	8, 0, -18	A+
46FU5554CW	H3-46E53R4-WE1AWAA	263, 265	270, 275	302, 308	0, 0, 6	128, 128, 128	8, 0, -18	A+
46FW5565	H3-46E55R3-WE1AWAA	256, 269	264, 280	286, 302	-2, 0, 6	131, 128, 123	10, 0, -10	A+
46FW5564	H3-46E55R4-EU1AWAA	261, 276	270, 285	300, 319	-3, 0, 5	126, 128, 123	10, 0, -17	A+
48FU4243C	H3-48F33Q9-WE1AWAA	271, 276	280, 290	316, 327	-3, 0, 9	128, 128, 128	16, 0, -27	A+
50FU3253C	H3-50E30Q9-WE1AWAA	270, 271	280, 283	316, 322	-3, 0, 9	128, 128, 128	16, 0, -27	A+
55FU4243C	H3-55F33Q9-WE1AWAA	264, 281	273, 292	307, 329	-3, 0, 9	142, 128, 128	16, 0, -27	A+
55FW8785	H3-55V76R3-WE1AWAA	258, 278	270, 295	322, 353	-3, 0, 9	137, 128, 124	16, 0, -27	A+
55FW6763	H3-55E55R2-WE1AWAA	257, 277	267, 287	297, 317	-4, 0, 5	138, 128, 125	13, 0, -15	A++
32HW3324	H3-32F15U1-WE1AWAA	270, 290	280, 302	317, 341	-3, 0, 9	128, 128, 128	16, 0, -27	A+
32HW3323	H3-32E33S3-WE1MWAA	270, 290	280, 302	317, 341	-3, 0, 9	128, 128, 128	16, 0, -27	A+
32HU3253C	H3-32E33S3-WE1PWAA	270, 290	280, 302	317, 341	-3, 0, 9	128, 128, 128	16, 0, -27	A+
L32E3003	H3-32E33S3-WE1NWAA	270, 290	280, 302	317, 341	-3, 0, 9	128, 128, 128	16, 0, -27	A+
L32E3005	H3-32E30X1-WE1AWAA	270, 290	278, 302	315, 340	-3, 0, 9	123, 128, 130	16, 0, -27	A+
32HW3325	H3-32F15X1-WE1AWAA	270, 290	278, 302	315, 340	-3, 0, 9	123, 128, 130	16, 0, -27	A+

Area	AU (澳洲)	White Balance			Default			Energy Efficiency
Project Name	Bom No.	COOL	NORMAL	WARM	COOL	NORMAL	WARM	
L32E3020	H3-32E30S9-AACA0AA	265, 282	275, 295	314, 341	-3, 0, 9	128, 128, 131	16, 0, -27	6 star
L26E4100W	H3-26E41T5-AACA0AA	262, 274	271, 287	305, 329	-3, 0, 9	128, 128, 128	16, 0, -27	4 star
L26E4100G	H3-26E41T5-AACB0AA	262, 274	271, 287	305, 329	-3, 0, 9	128, 128, 128	16, 0, -27	4 star
L26E4100P	H3-26E41T5-AACCOAA	262, 274	271, 287	305, 329	-3, 0, 9	128, 128, 128	16, 0, -27	4 star
L26E4100B	H3-26E41T5-AACDOAA	262, 274	271, 287	305, 329	-3, 0, 9	128, 128, 128	16, 0, -27	4 star
L46E5510FDS	H3-46E55R5-AACA0AA	261, 276	270, 285	300, 319	-3, 0, 5	128, 128, 125	10, 0, -17	
L32E3020	H3-32E30S9-AACA0AA	265, 282	275, 295	314, 341	-3, 0, 9	128, 128, 131	16, 0, -27	5 star
L32E3020 (ID51)	H3-32E30S9-AACB0AA	270, 290	280, 302	317, 341	-3, 0, 9	128, 128, 128	16, 0, -27	5 star
L24E4100F	H3-24E41T5-AACA0AA	265, 278	275, 290	310, 330	-3, 0, 9	128, 128, 128	16, 0, -27	

Area	IR (伊朗)	White Balance			Default			Energy Efficiency
Project Name	Bom No.	COOL	NORMAL	WARM	COOL	NORMAL	WARM	
L46F3500F	H3-46F35V3-IRCB0AA	259, 271	268, 282	302, 319	-3, 0, 9	139, 128, 129	16, 0, -27	
L32F3500	H3-32F35V3-IRCD0AA	278, 285	286, 296	319, 330	-3, 0, 9	127, 128, 134	16, 0, -27	
L32F3520	H3-32F35V3-IRCC0AA	278, 285	286, 296	319, 330	-3, 0, 9	127, 128, 134	16, 0, -27	
L40F3500F	H3-40F35V3-IRCB0AA	272, 292	282, 302	316, 336	-3, 0, 9	128, 128, 128	16, 0, -27	
L28E3500	H3-28E35W4-IRCA0AA	270, 288	280, 298	316, 335	-3, 0, 9	128, 128, 115	16, 0, -27	

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Area	RU (俄罗斯)	White Balance			Default			
Project Name	Bom No.	COOL	NORMAL	WARM	COOL	NORMAL	WARM	Energy Efficiency
L32E5300 (俄罗斯)	H3-32E53T4-AACA0AA	270, 290	280, 300	315, 335	. -3, 0, 9	128, 128, 128	16, 0, -27	
L39E5300F (俄罗斯)	H3-39E53U3-UR1A0AA	260, 280	270, 288	305, 325	. -3, 0, 9	137, 128, 128	16, 0, -27	
L28T3540 (俄罗斯)	H3-28T354NKI-SCO	275, 289	285, 298	320, 335	-5, 0, 12	130, 128, 138	12, 0, -20	

▪ **Cloning**

To operate master/golden clone and reuse it further on demand, please to follow below Cloning SOP:



Cloning Procedure  
for MT5331 Series (v:

All underused BIN image files need to be used strictly with MT5331 SoC platform as depending on SW structure.

Other faster access methods via UART/IR commands are available on enclosed SIACP requirements (rev. v5.9).

**2.4. High Pot. and Insulating Resistance Tests**

At the end of the process, a “High Voltage” and an “Insulating Resistance” tests are required to fulfil Safety Electrical requirements (CEI 65065).

▪ **High Voltage Withstanding requirements**

- “Voltage” ⇒ **3500 VAC**
- “Max Leakage Current” ⇒ **10 mA**
- “Test Time” ⇒ **5 sec**

▪ **Insulating Resistance requirements**

- “Voltage” ⇒ **500 VDC**
- “Threshold Min” ⇒ **4M Ω**
- “Test Time” ⇒ **3 sec**

**2.5. SHOP-END Test**

At final process stage, it’s necessary to perform “Reset shop” before any packing to leave Factory mode and restore User default presets.

This function is accessible by selecting “Factory menu →Reset Shop”, then pressing RCU “OK/▶” key. Other faster methods via UART/IR commands are available on enclosed SIACP requirements (rev. v5.9).

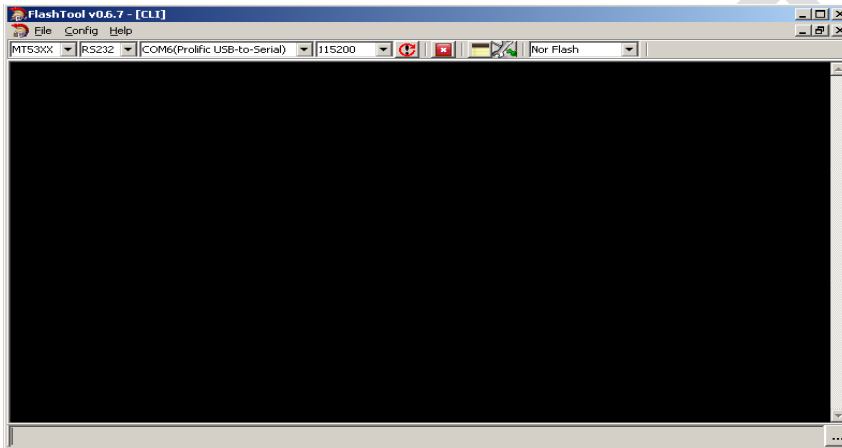
“ResetShop” presets should follow “MT5331\_EU\_OOB\_MenuSetting\_step1\_Base\_01.doc” document.

*Note:* A password might be required in case of Parental Control function is locked, use default “1234” password or “0423” super password to clean-up existing ones if forgotten.

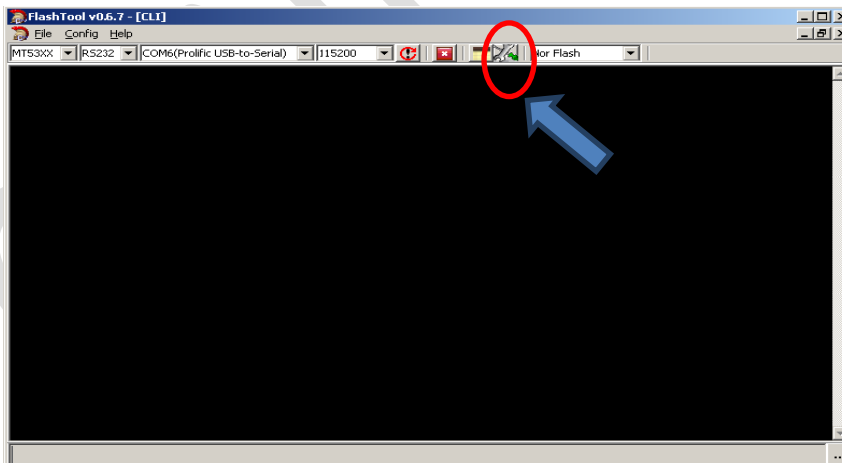
**END**

**Appendix (1) “How to upgrade SW FLASH using MTK tool”**

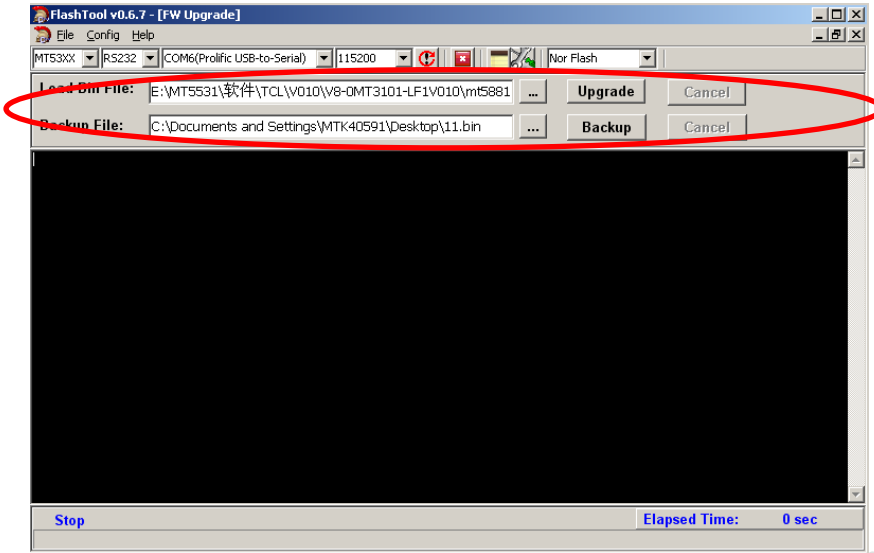
- Connect UART interface to suitable manufacturing TV input connector (note that PC connector requires TVs on “Factory mode”)
- Launch MTK tool with version above v0.6.7
- Set right SoC template (ex: MT53xx)



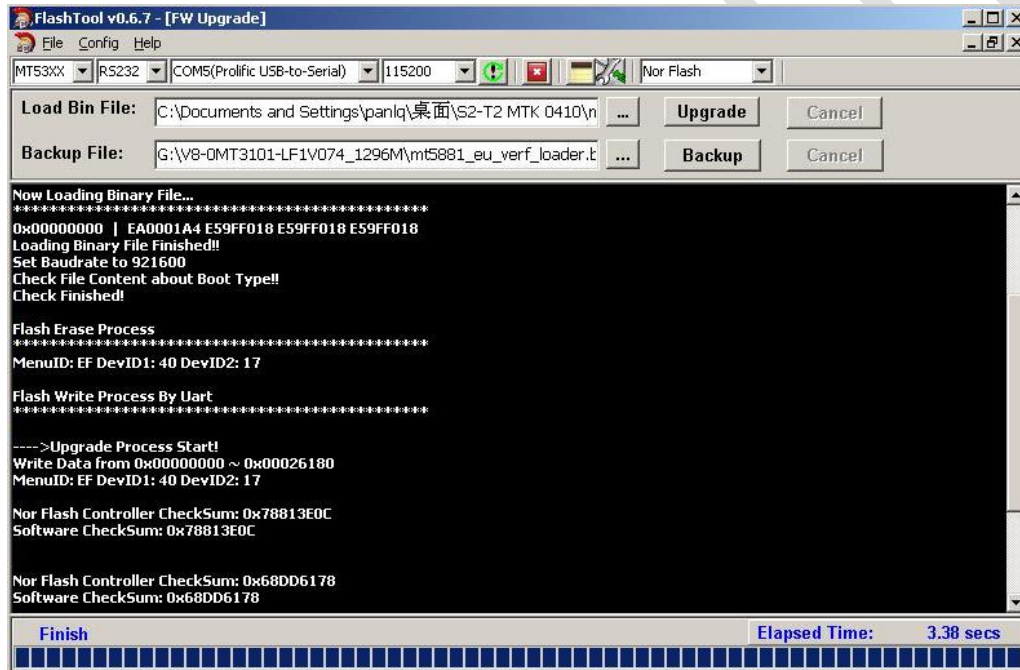
- Select “Tool” button



- Press “Browse” button to select the corresponding SW bin file to upload (ex: V8-0MT3101-LF1Vxxx.bin)
- Supply the SSB to required voltage
- Press “Upgrade” button and appear the below picture



- Select NOR flash type and press “OK” button to start downloading the SW and wait the gauge displayed “100%” that means the SW has been successfully downloaded. In the meanwhile, all operations such erasing flash and so... are parsed into the debug window script



- When upgrade is completed, remove UART connection
- Restart SSB (chassis) or TV and wait few seconds for Eeprom update
- Remember to perform “**Factory menu**→**Reset ALL**” and then press RCU “**OK/▶**” key if there’s not any subsequent cloning operation

## Appendix (2) “**How to upgrade FLASH SW using USB**”

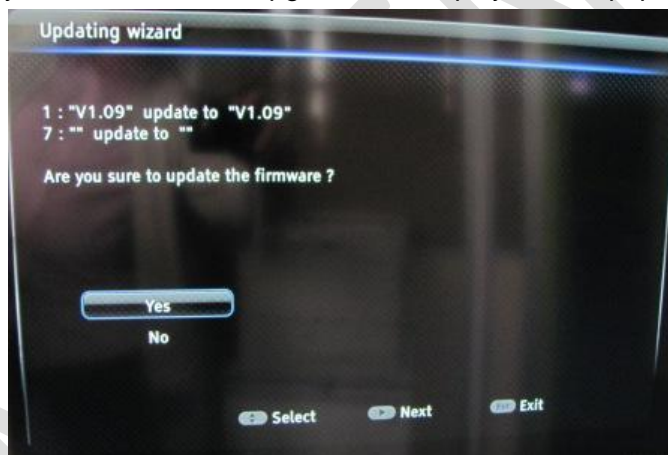
### A. Upgrade with Loader

- Power-off or switch TV to standby (LED should light on)
- Copy the corresponding SW PKG image (ex: “**V8-OMT310x-LF1Vxxx.pkg**”) into USB stick (pen drive) root path and rename it to “**upgrade.pkg**”
- Plug USB stick to the TV

- While power-on TV if previously off (LED status off), press “**Power**” button from local keyboard during few seconds to start upgrading process
- Release “**Power**” button once LED is blinking or USB stick starts blinking, TV is uploading SW BIN image
- When reflashing is successful, TV should restart automatically after ~2min  
*Info: If TV doesn't restart and LED is lightening on, an error may occurred during flashing, check the set, PKG file integrity and try again from 1<sup>st</sup> step*
- Remove USB stick
- Remember to perform “**Factory menu**→**Reset ALL**” or “**Factory menu**→**Reset Shop**” and then press RCU “**OK/▶**” key if there's not any subsequent cloning operation
- Switch off TV by removing AC cord
- Reconnect AC cord to restart TV and wait few seconds for Eeprom update  
*Note: If “Reset Shop” was performed, a “Welcome Setup” menu should be displayed, otherwise new SW version should be displayed into relevant Factory mode caption info or on bottom of “Factory menu”*

### B. Upgrade without Loader (Customer mode)

- Copy the corresponding SW PKG image (ex: “**V8-0MT310x-LF1Vxxx.pkg**”) into USB stick (pen drive) root path and rename it to “**upgrade.pkg**”
- Plug USB stick to the TV
- TV will automatically detect new SW to upgrade and displays below pop-up message:



- Press RCU “**OK/▶**” key to start upgrading process and follow instructions till reflashing is successful
- Remove USB stick
- Remember to perform “**Factory menu**→**Reset ALL**” or “**Factory menu**→**Reset Shop**” and then press RCU “**OK/▶**” key if there's not any subsequent cloning operation
- Switch off TV by removing AC cord
- Reconnect AC cord to restart TV and wait few seconds for Eeprom update  
*Note: If “Reset Shop” was performed, a “Welcome Setup” menu should be displayed, otherwise new SW version should be displayed into relevant Factory mode caption info or on bottom of “Factory menu”*

## Appendix (3) “How to upgrade FLASH SW using OAD”

### A. OAD Reflashing

- Power-on TV
- Set TV to Factory mode (enable Factory key) and/or Burn-in mode if necessary
- Connect RF antenna or whatever air antenna with suitable amplifier from any digital broadcasting system

(ex: DTA-115 Multi-Standard VHF/UHF Modulator - <http://www.dektec.com/products/PCI/DTA-115/>)

- Play DVB MPEG SSU TS, that includes suitable PKG SW image, with right presets (850MHz/8MHz/...) detailed on above 1.2 section
- Send OAD manufacturing IR code [08d/60d] (refer to SIACP document rev. v5.9 for further information) or go to “**Factory menu→Other→OAD update**“ and then press RCU “**OK/▶**” key
- OAD will start automatically and several pop-up messages such as scanning/searching, downloading and flashing will be skipped (acknowledged by default)



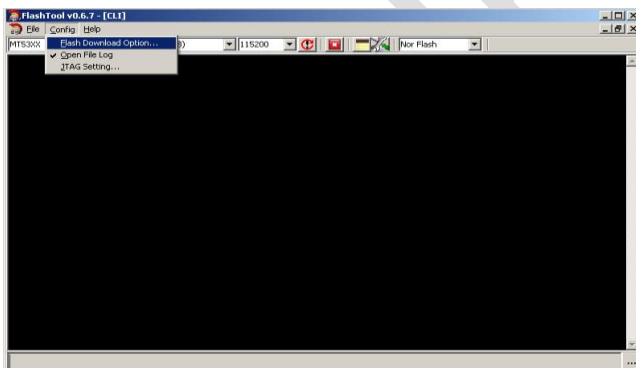
- Once upgrading completed, TV may restart automatically after warm start and implicit ResetAll (in case of NVM mapping/signature change) in previous Factory and/or Burn-in mode

#### Appendix (4) “How to change ProjectID with RCU”

- Process following subsequence IR codes to change projectID: **062598+MENU+xxx** (xxx:ProjectID, ex: 003)
- Restart TV

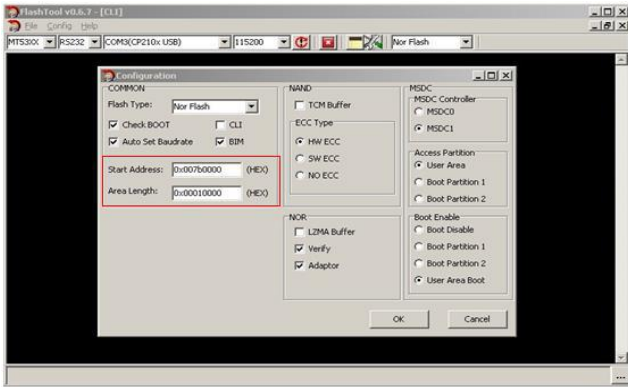
#### Appendix (5) “How to Upgrade HDCP KEY by UART”



- Connect UART interface to suitable manufacturing TV input connector
- Launch MTK tool with version above User Tool: FlashTo0l.exe
- Open Flash Tool, Select menu bar Configing Item. Select Flash Download option ..

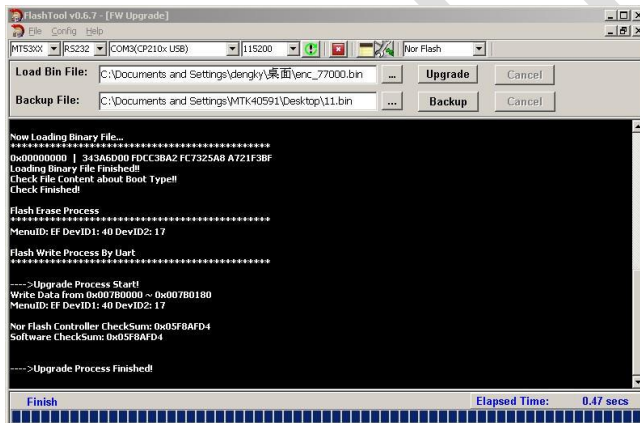
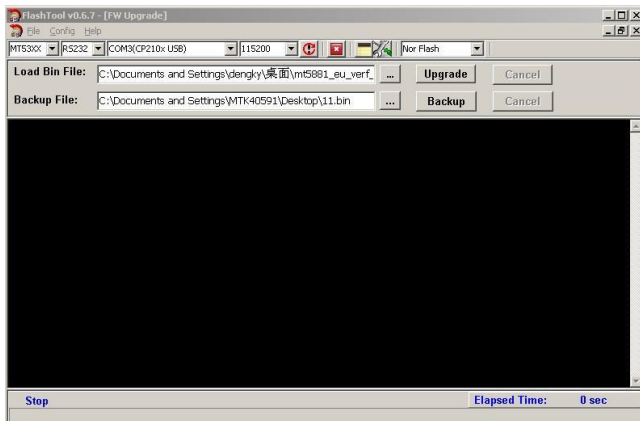


- Click on “Flash Download option” button and Into option menu.
- Setting Start Address:0x007b0000, Area Length:0x00010000. Select OK.





- Select menu upgrade icon  .and Load bin File need Hdcip key.
- Select Upgrade Icon  .

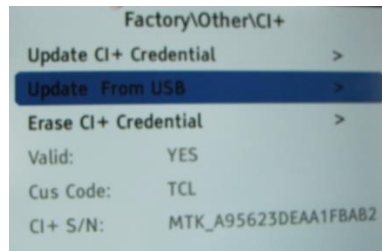


**Attention: If the upgrade is not successful, Press the computer ESC key when hold on TV, waiting for TV finish up after the upgrade.**

### Appendix (6) “How to upgrade CI Key using USB”

- Copy corresponding “\*.key” files into USB stick (pen drive) root path, and renamed them as following “TCL\_\*.key” if necessary
- Under USB root path, create a new folder named as “XX\_” (once the CI key is overwritten, the matching key file will be moved to this folder)
- Plug USB stick to the TV

- Go to “**Factory menu→Other→Update CI+ Credential→Update From USB**” and then press RCU “**OK/▶**” key



The “Valid” flag should now be enabled (turns to “Yes”), “Custom Code” should displayed “TCL” and “Serial Num.” field should updated with Key number.

- Remove USB stick

*Note: If unfortunately the process failed, you may need to download new CI key and repeat operation again.*

### Appendix (7) “How to upgrade CI Key using MTK tool”

- Connect UART interface to suitable manufacturing TV input connector
- Launch MTK tool with version above v2.48-05
- Click on “Browse” button and select “All files(\*.\*)” filter, then browse any “\*.key” file like below snapshot
- Modify “Custom Burning Address:” to “790000”, then start to upgrade
- Restart TV
- Go to “**Factory menu→Other→Update CI+ Credential→Update CI+ Credential**”, then press RCU “**OK/▶**” key. The “Valid” flag should now be enabled (turns to “Yes”), “Custom Code” should display “TCL” and corresponding “Serial Number” should be updated as well like onto below snapshot:
- Remove UART connection

*Note: If unfortunately the process failed, you may need to download new CI key and repeat operation again.*

### Appendix (8) “How to upgrade MAC address using USB”

MAC for USB upgrade method as following:

- Create a new folder(name: **\_MAC**) in the USB disk root directory.
- Put the MAC file into the root directory of the USB disk
- Inster the USB disk into TV,in the factory menu,selected other->Update MAC address->Update From USB

**Appendix (9) “Factory Menu Description”**

**1-Hotkey submenu**

Item	Sub-item	Value	Note
Hotkey		Off/On	Enable Hotkey flag by pressing “◀▶” key to have possibility to access Factory menu with “RETURN” key (default is disabled)

**2-Warm-Up Mode submenu**

Item	Sub-item	Value	Note
Burning Mode		Off/On	Enable Burning mode by pressing “◀▶” key Press “Menu” key on local keyboard to exit the Burning mode

**3-ADC submenu (N/A - menu remains grayed)**

**4-White Balance submenu**

Item	Sub-item	Value	Note
White Balance	Source	HDMI/VGA/DTV PAL/SECAM NTSC/RGB/CMP	Select by pressing “◀▶” key
	Color Temperature	Normal Warm Cool	Select Tone by pressing “◀▶” key
	RED Gain	000..255	Set R Gain by pressing “◀▶” key (-127..+128 for offset)
	GREEN Gain	000..255	Set G Gain by pressing “◀▶” key (-127..+128 for offset)
	BLUE Gain	000..255	Set B Gain by pressing “◀▶” key (-127..+128 for offset)
	RED Offset	000..255	Set R Offset by pressing “◀▶” key (-127..+128 for offset)
	GREEN Offset	000..255	Set G Offset by pressing “◀▶” key (-127..+128 for offset)
	BLUE Offset	000..255	Set B Offset by pressing “◀▶” key (-127..+128 for offset)
	White Balance Init	>	Press “▶” key to initialize RGB Gain/Offset values
	Pic. Enhance	On/Off	Press “▶” key to disable all picture settings from Feature submenu. This should be done before any White Balance alignment (flag is restored to Off after Shop-End)
Picture Related	>	Press “▶” key to activate submenu	

Picture Related	Adaptive Luma Control	On/Off	Press “◀▶” key to enable/disable
	Backlight	000..100	Set BackLight by pressing “◀▶” key
	Dyn Backlight Control	0.. 2	Set BackLight Control Mode by pressing “◀▶” key
	Energy Save	Off Low High	Select by pressing “◀▶” key
	Set APL2 point value	000..255	Set APL2 point by pressing “◀▶” key
	Set B point value	000..255	Set B point by pressing “◀▶” key
	Set K point value	000..255	Set K point by pressing “◀▶” key
	BL_OSD	000..255 (060d)	Set Backlight OSD by pressing “◀▶” key
	APL1_VAL	000..255 (020d)	Set APL1 value by pressing “◀▶” key
	Scaling Brightness	000..255	Set ScBrigh by pressing “◀▶” key (-127..+128 for offset)
	Scaling Contrast	000..255	Set ScCont by pressing “◀▶” key (-127..+128 for offset)
	Scaling Saturation	000..255	Set ScSat by pressing “◀▶” key (-127..+128 for offset)
	Lightsensor Setting Page	>	Press “▶” key to activate submenu
	Lightsensor Setting	Lightsensor Val	On/Off
LS_MAX		000..255 (230d)	Set Max Lightsensor threshold by pressing “◀▶” key
LS_MINI		000..255 (002d)	Set Min Lightsensor threshold by pressing “◀▶” key
BL_MAX		000..255 (100d)	Set Max Backlight threshold by pressing “◀▶” key
BL_MINI		000..255 (035d)	Set Max Backlight threshold by pressing “◀▶” key
LS_ADC		000..255 (000d)	Set Lightsensor ADC value by pressing “◀▶” key

**5-Reset Shop** submenu

Item	Sub-item	Value	Note
Reset Shop		>	Press “OK▶” key to remove Factory presets (channel Maps, bargraph context, ...) and restore User OOB settings. All adjustments are not impacted!

**6-Reset ALL submenu**

Item	Sub-item	Value	Note
Reset ALL		>	Press "OK▶" key to default NVM according to selected Project ID (all adjustments are defaulted, channel Maps are cleared, Hotkey is enabled, ...)

**7-Pre-Frequency submenu**

Item	Sub-item	Value	Note
Pre Frequency	Pre-Frequency Poland	>	Press "OK▶" key to preload EU Channel Map
	Pre-Frequency Huizhou	>	Press "OK▶" key to preload CN Channel Map
	Pre-Frequency Thailand	>	Press "OK▶" key to preload TH Channel Map

**8-Power Mode submenu**

Item	Sub-item	Value	Note
Power Mode		Always On Standby Last Status	Select starting sequence by pressing "◀▶" key - Always On: Force TV to start - Standby: Force TV to standby - Last Status: Force TV to standby or to start depending on latest operation

**9-USB Clone Mode submenu**

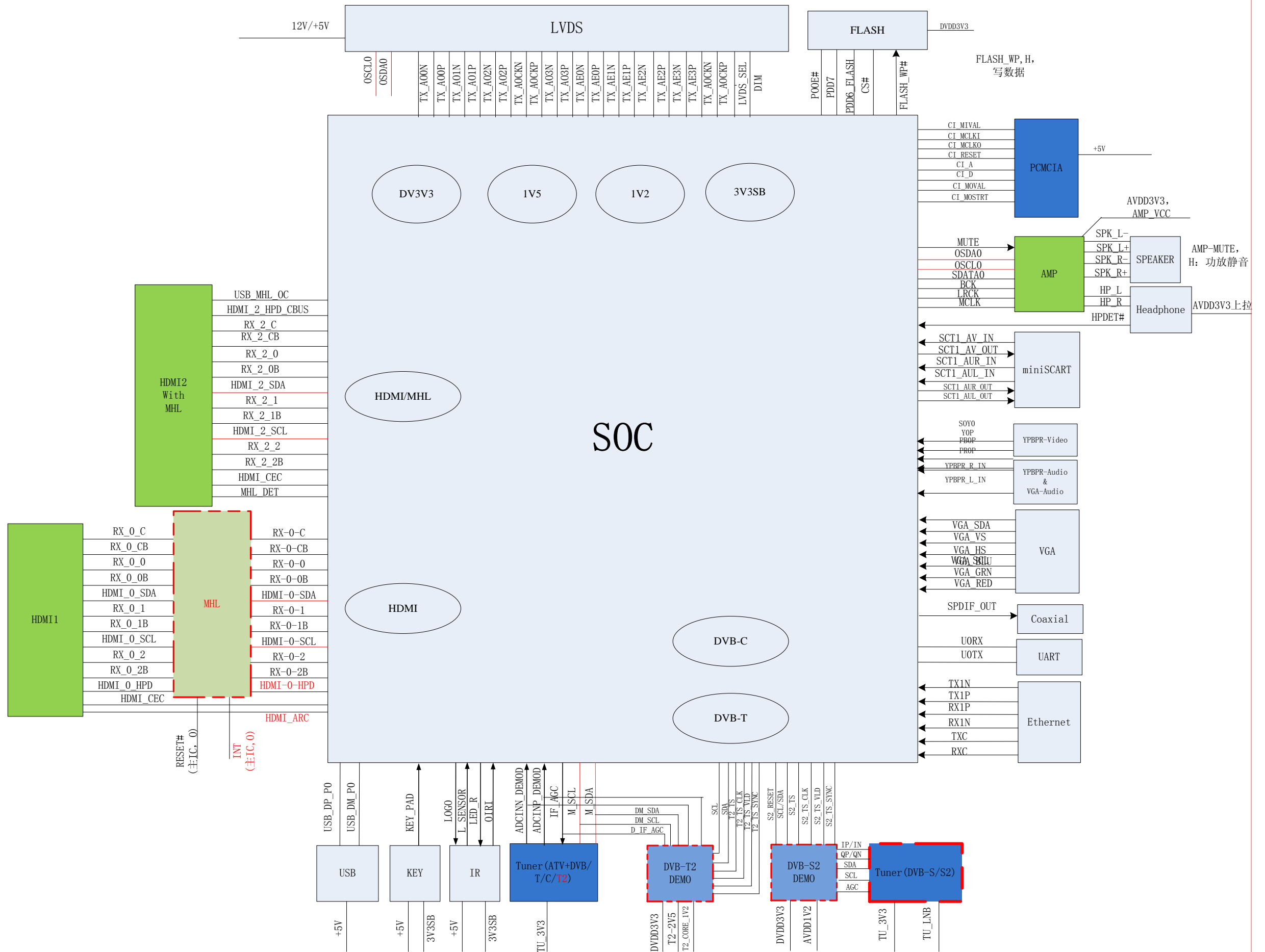
Item	Sub-item	Value	Note
USB Clone	USB Clone Mode	All ChannelList EEPROM User Setting	Select by pressing "◀▶" key
	TV TO USB	DO	Press "OK▶" to copy TV template context to USB depending on Cloning mode
	USB TO TV	DO	Press "OK▶" to copy USB template context to TV depending on Cloning mode

## 0-Other submenu

Item	Sub-item	Value	Note
Upgrade CI+ Credential	Update CI+ Credential	>	Press "OK▶" key to active CI+ key
	Update from USB	>	Press "OK▶" key to copy CI+ key from USB
	Erase CI+ Credential	>	Press "OK▶" key to remove CI+ key
	Valid	***	Show the CI+ status (NO by default)
	Cus Code	***	Show the CI+ custom code
	CI+ S/N	***	Show the CI+ serial number
Project Info	Project ID	000..999	Select ProjectID by pressing "◀▶" key
	Project Name	***	Info
	Panel ID	***	Info
	Panel Name	***	Info
	Version	***	Info (ex: V8-MT25F0x-LF1Vxxx)
	Date	***	Info
	Time	***	Info
	MTK Version	***	Info (ex: _002204_4_001_1_002..)
	RCU	***	Info
	PSU	***	Info
	Region	***	Info
Product S/N	***	Info	
Update MAC address	Update from USB	>	Press "OK▶" key to copy MAC address from USB
	Written status	***	Show the writing status (NO by default)
	MAC address	***	Show the MAC address (NULL by default)
	PC Link Check	DO	Press "OK▶" to check IP address detection and control MAC, DID, and UID integrity
Auto Standby		Off 4 hours 6 hours 8 hours	Select ErP Auto Switch-Off mode by pressing "◀▶" key
MT31BOP		On/Off	Enable/Disable by pressing "◀▶" key
MT31BFS		On/Off	Enable/Disable by pressing "◀▶" key
Event By Event		On/Off	Enable/Disable by pressing "◀▶" key
OAD Update		>	Press "OK▶" to start OAD Upgrade process
WSS&ATF		On/Off	Enable/Disable by pressing "◀▶" key

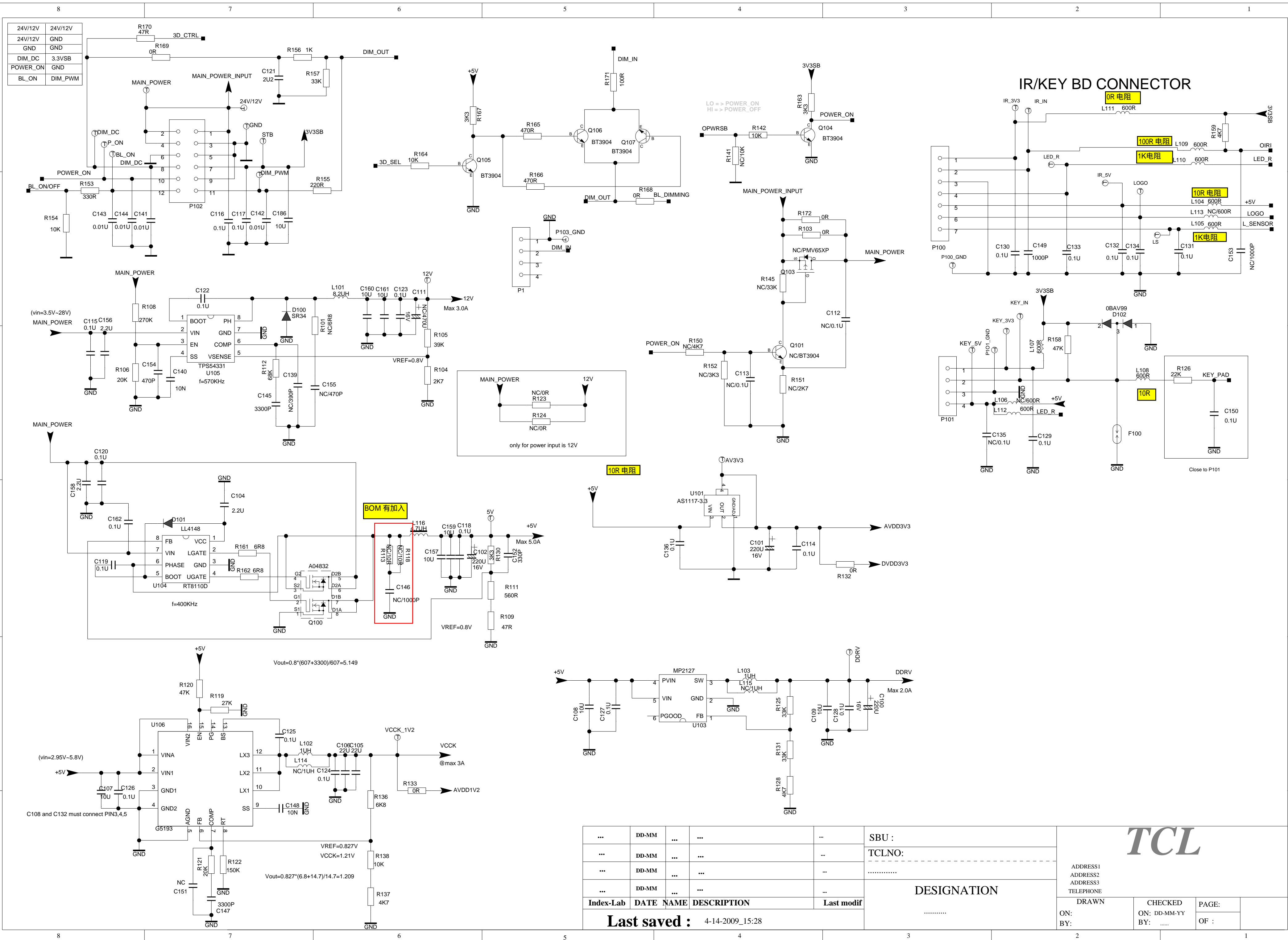
Note: A quick access to suitable submenu item can be achieved by pressing it prefixed RCU key number (ex: pressing “9” to directly highlight “USB Clone” item).

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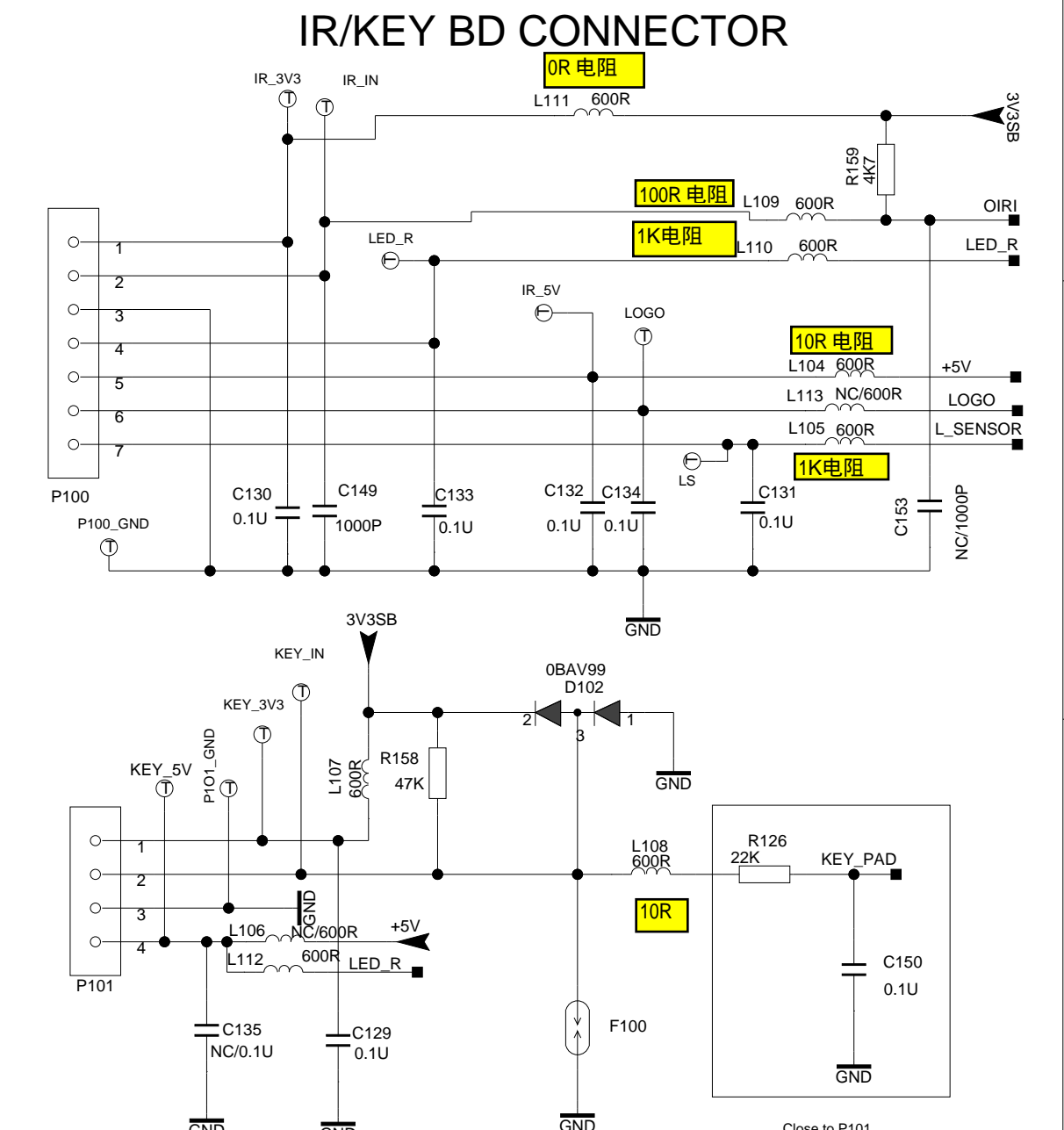




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24V/12V	24V/12V
24V/12V	GND
DIM_DC	3.3VSB
POWER_ON	GND
BL_ON	DIM_PWM

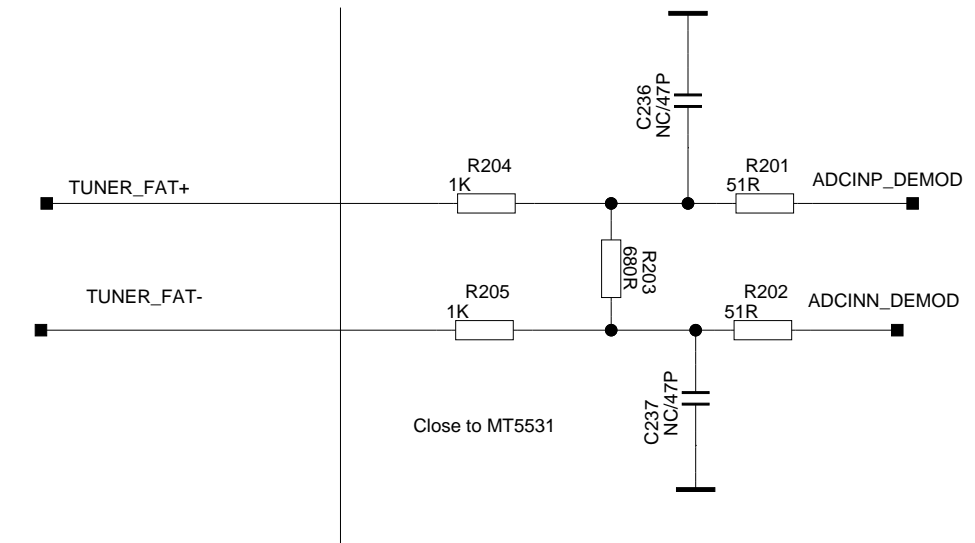
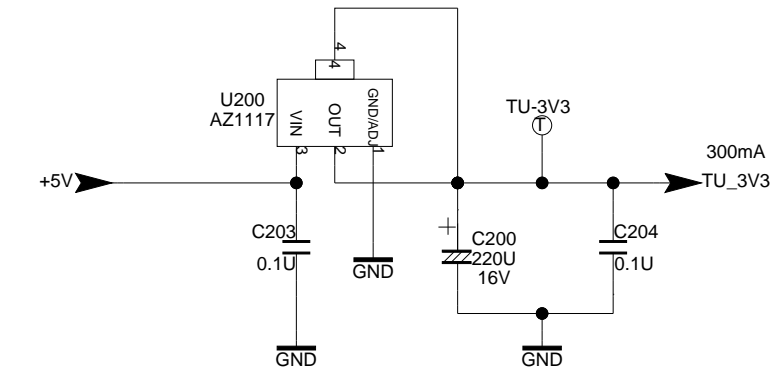
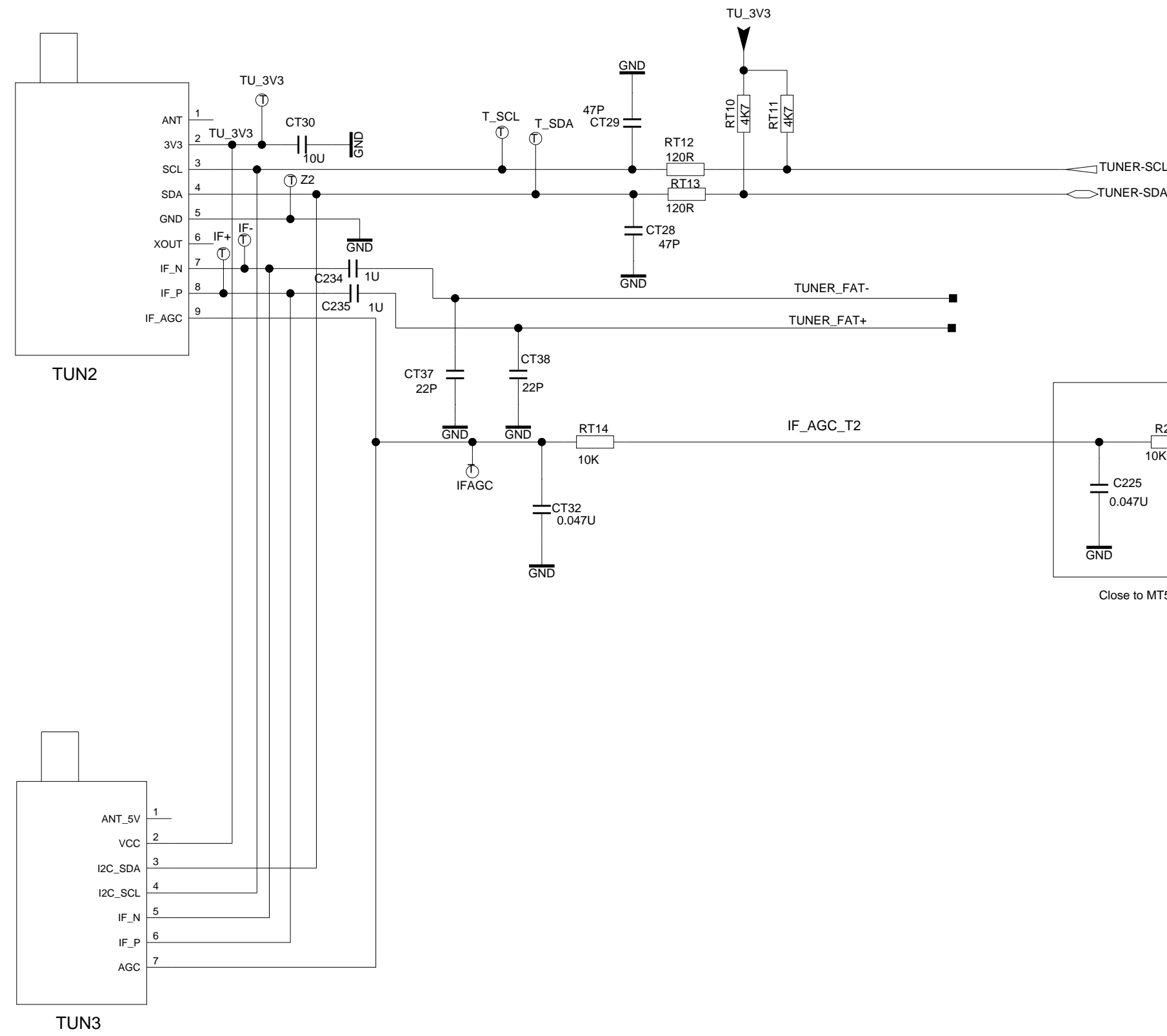



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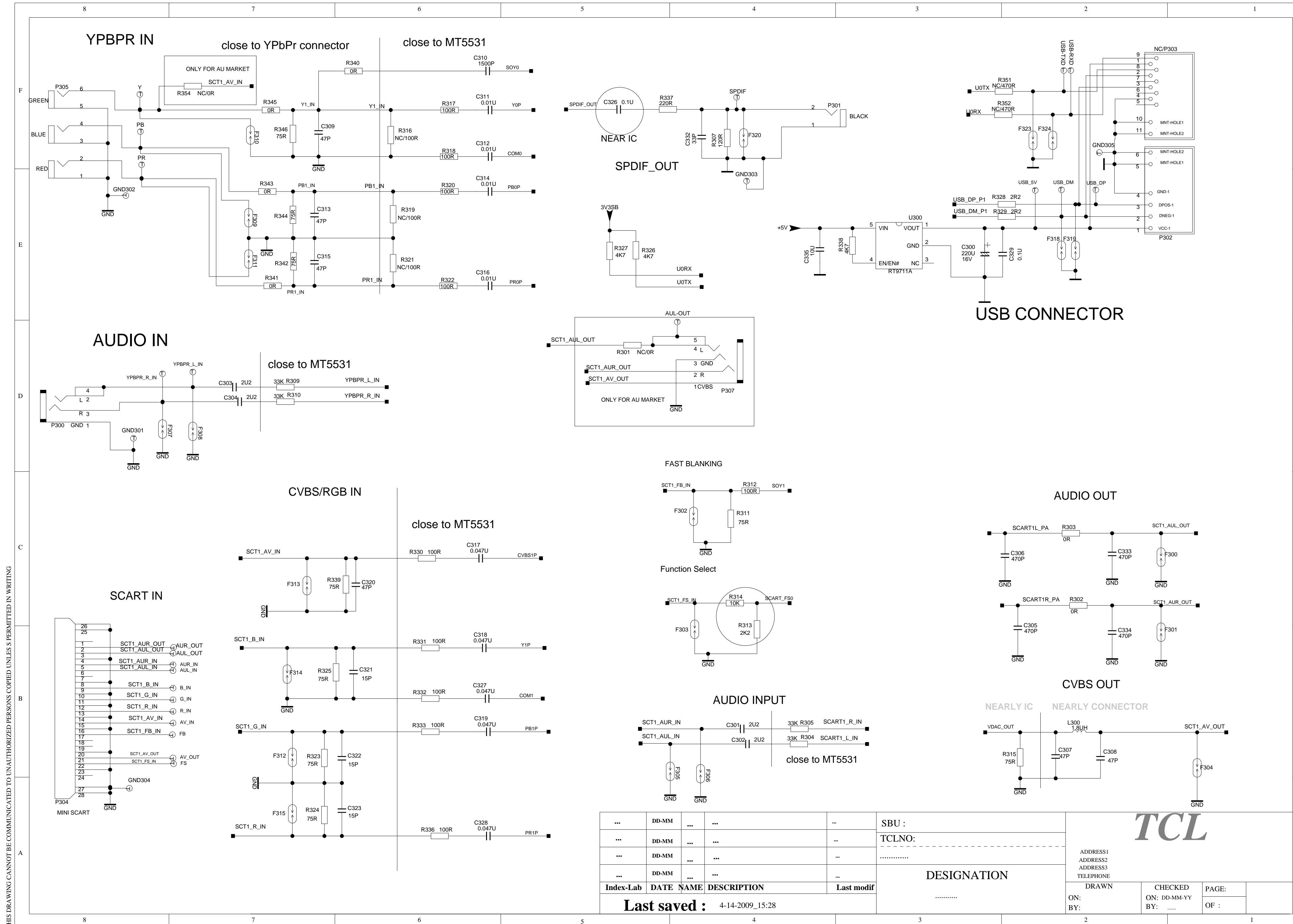
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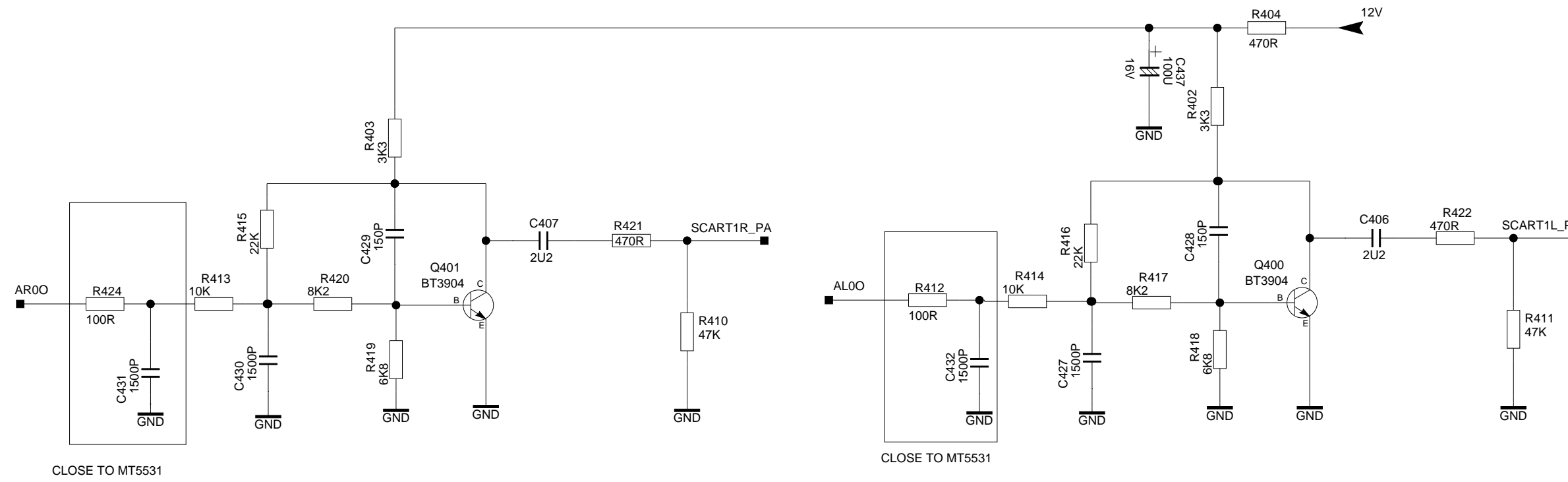


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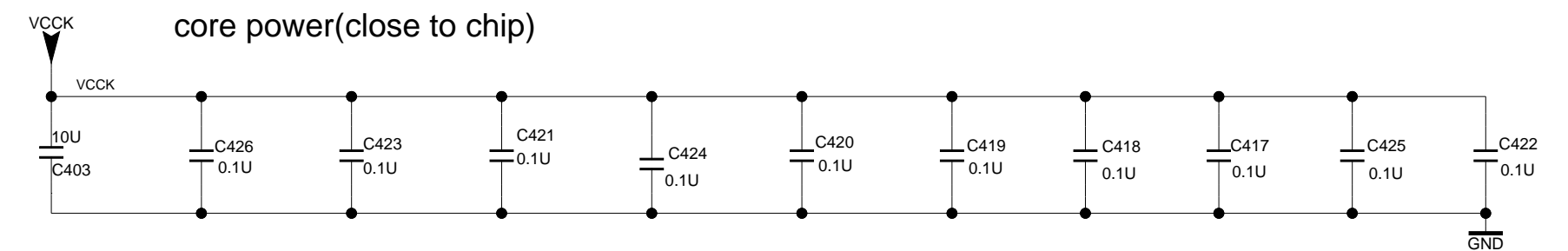
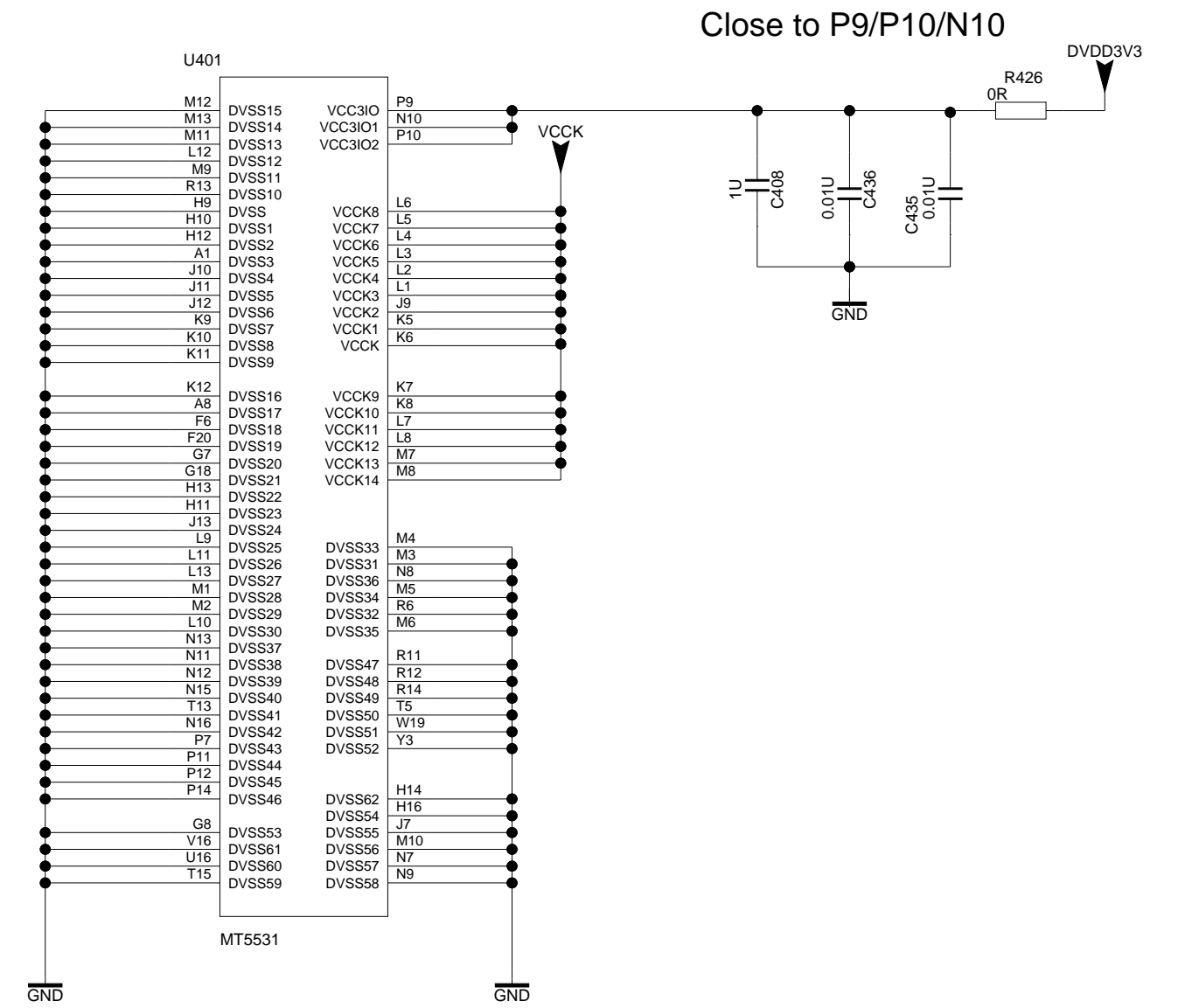
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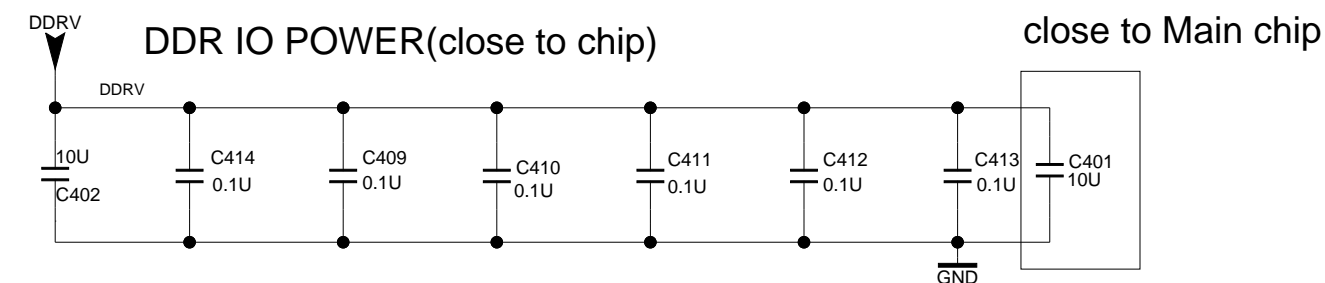
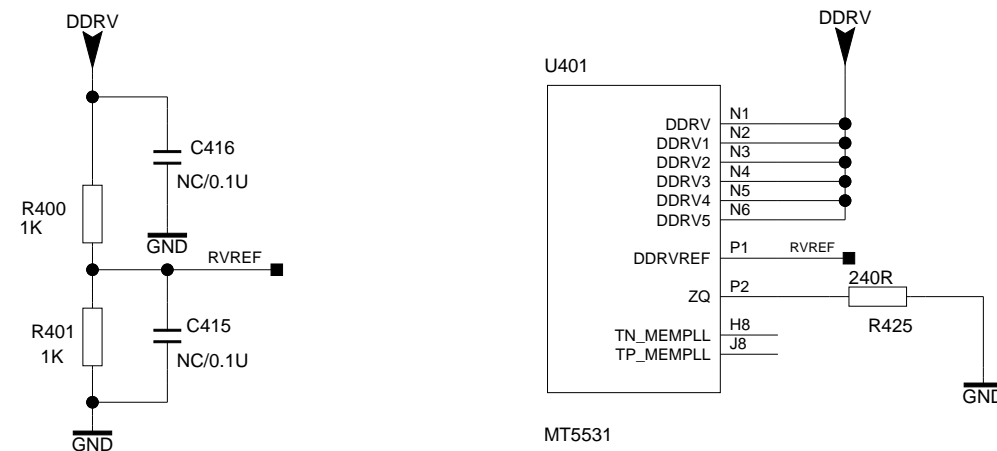
### SCART1 Audio Output



### POWER INTERFACE



### DDR3 POWER



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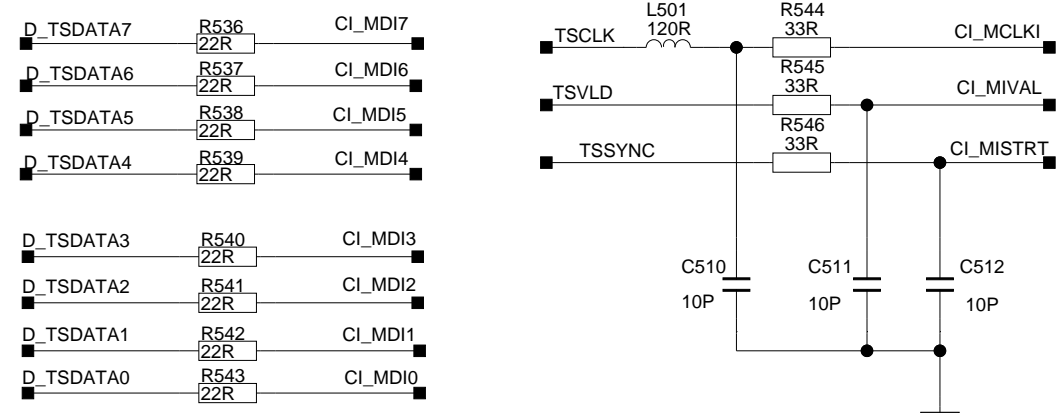
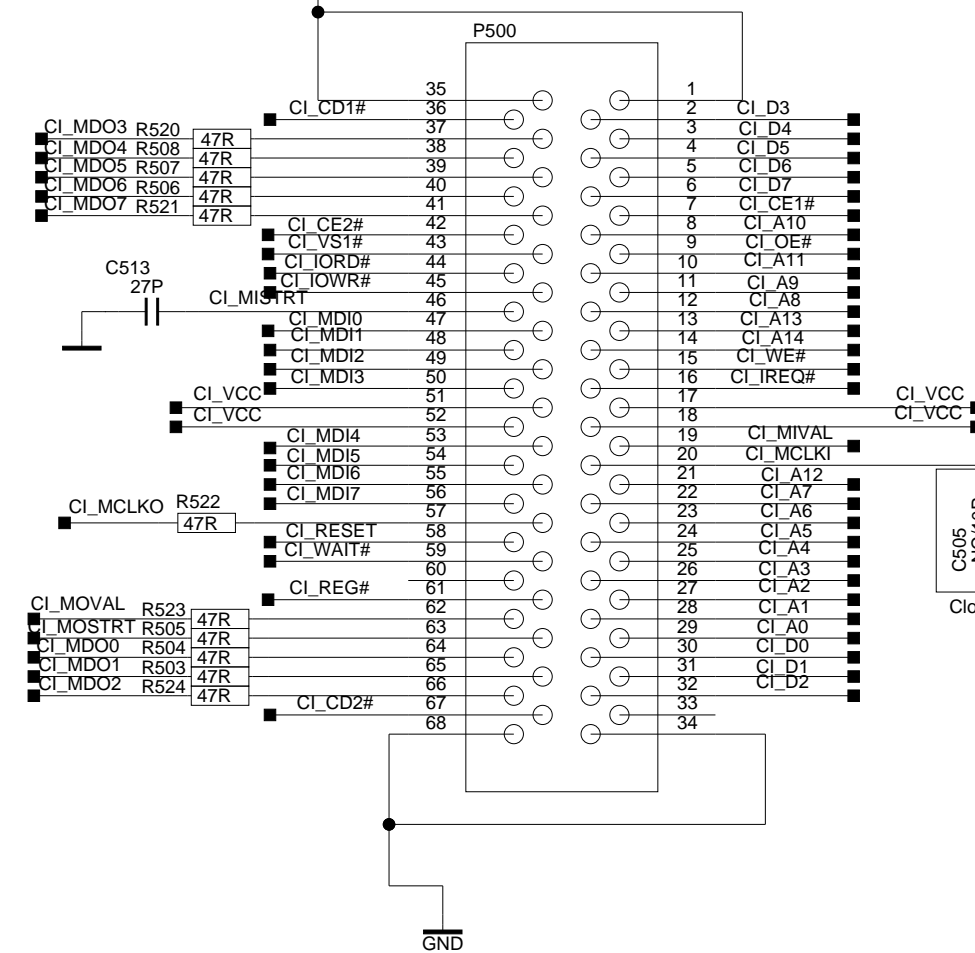
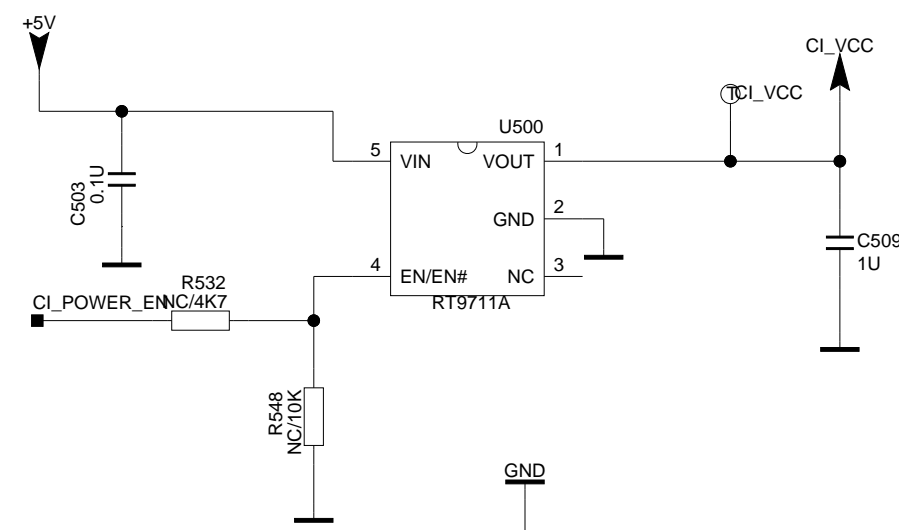
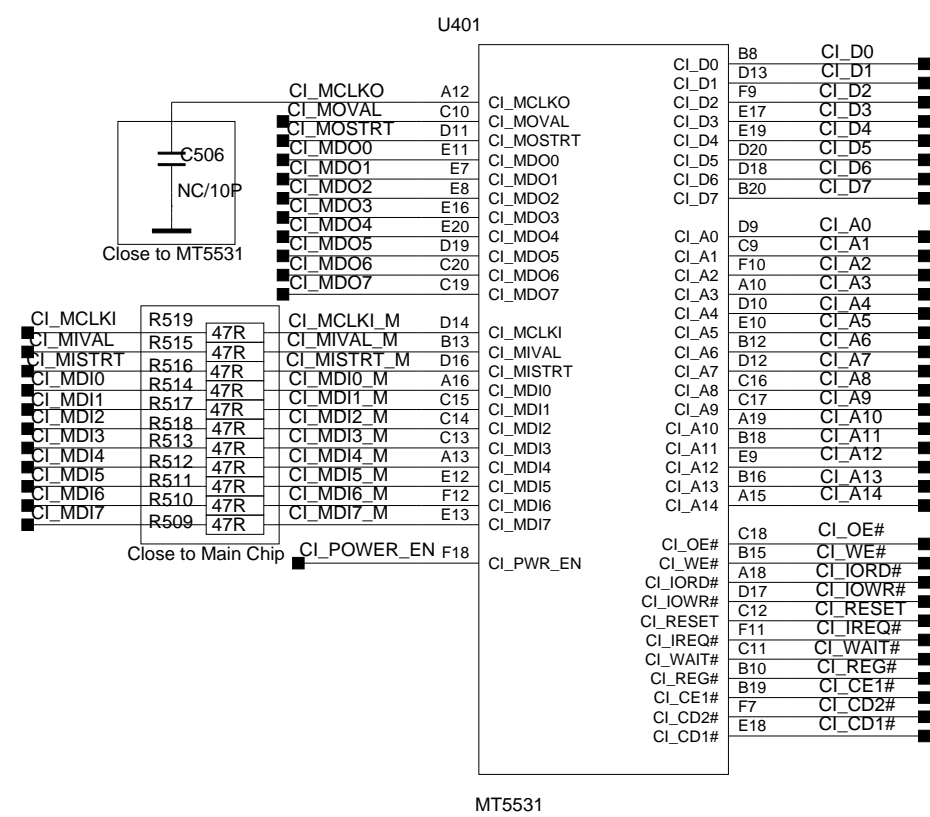
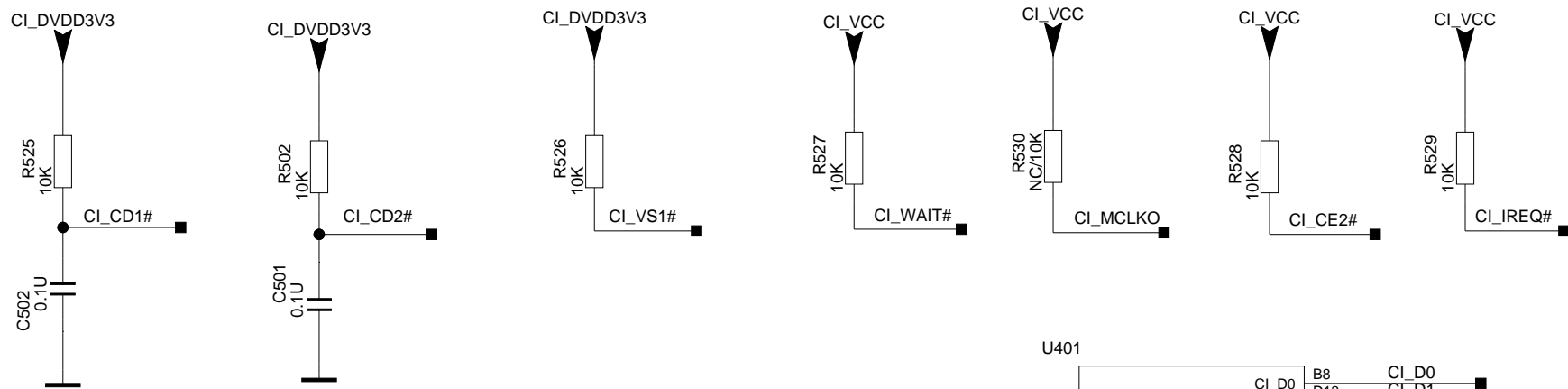
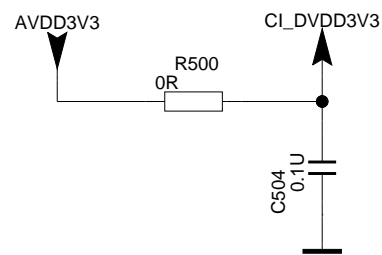
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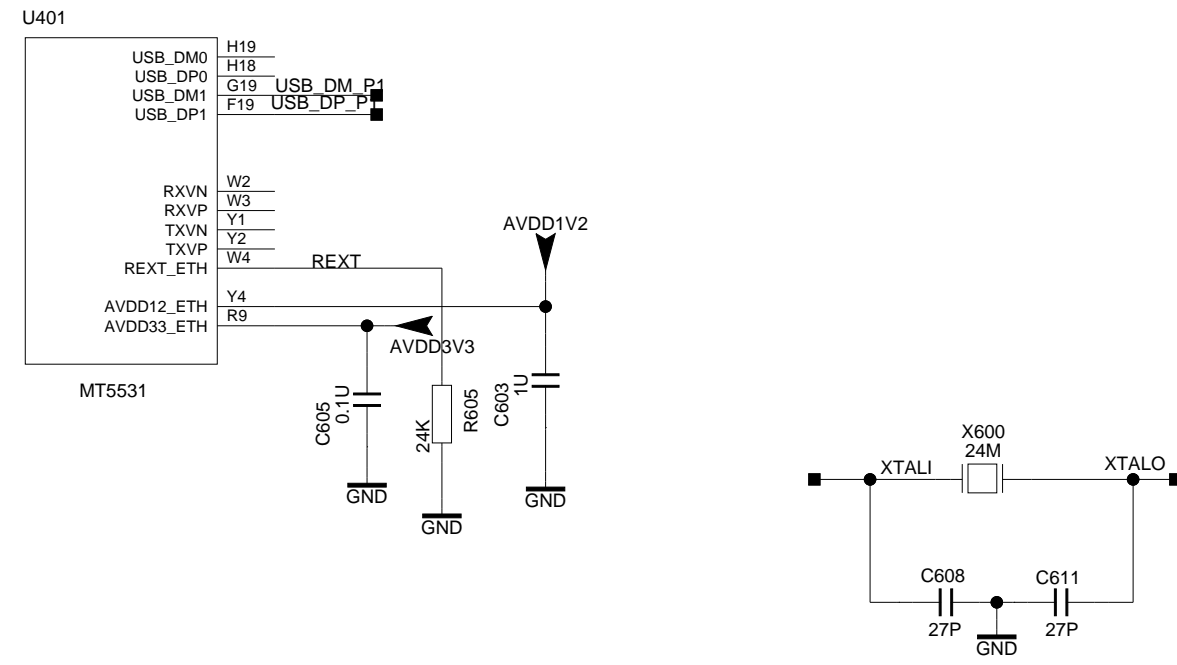
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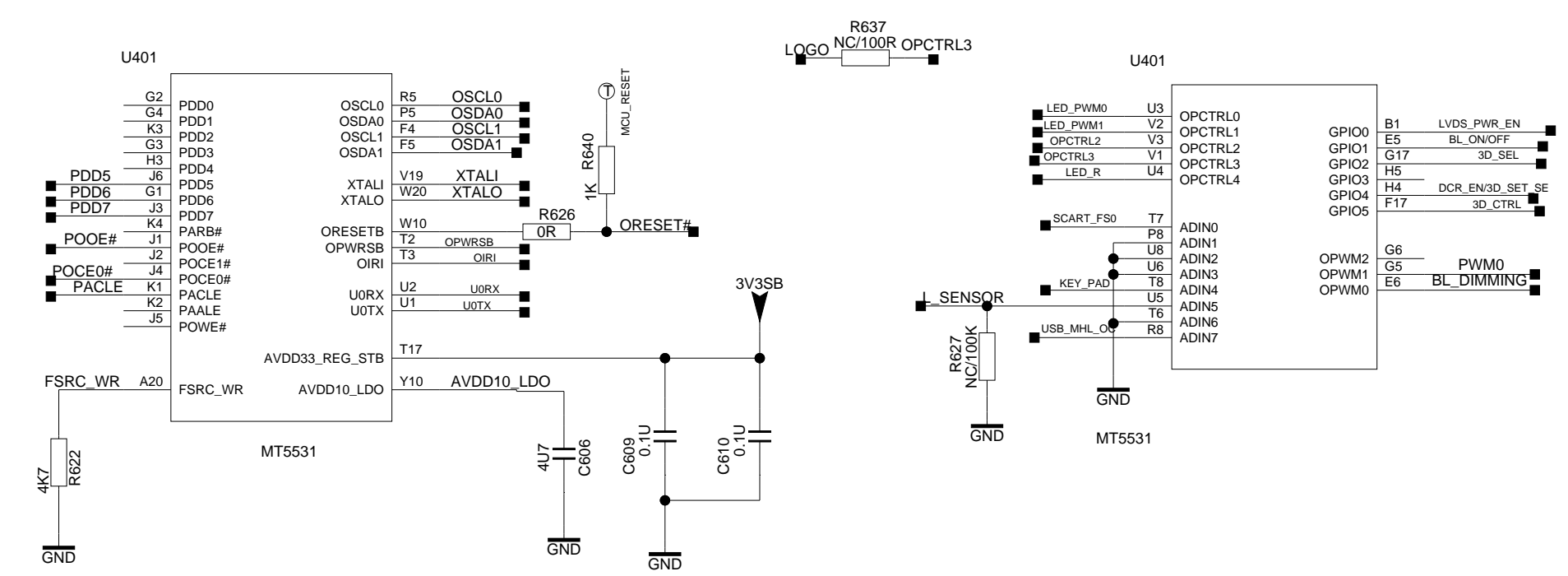
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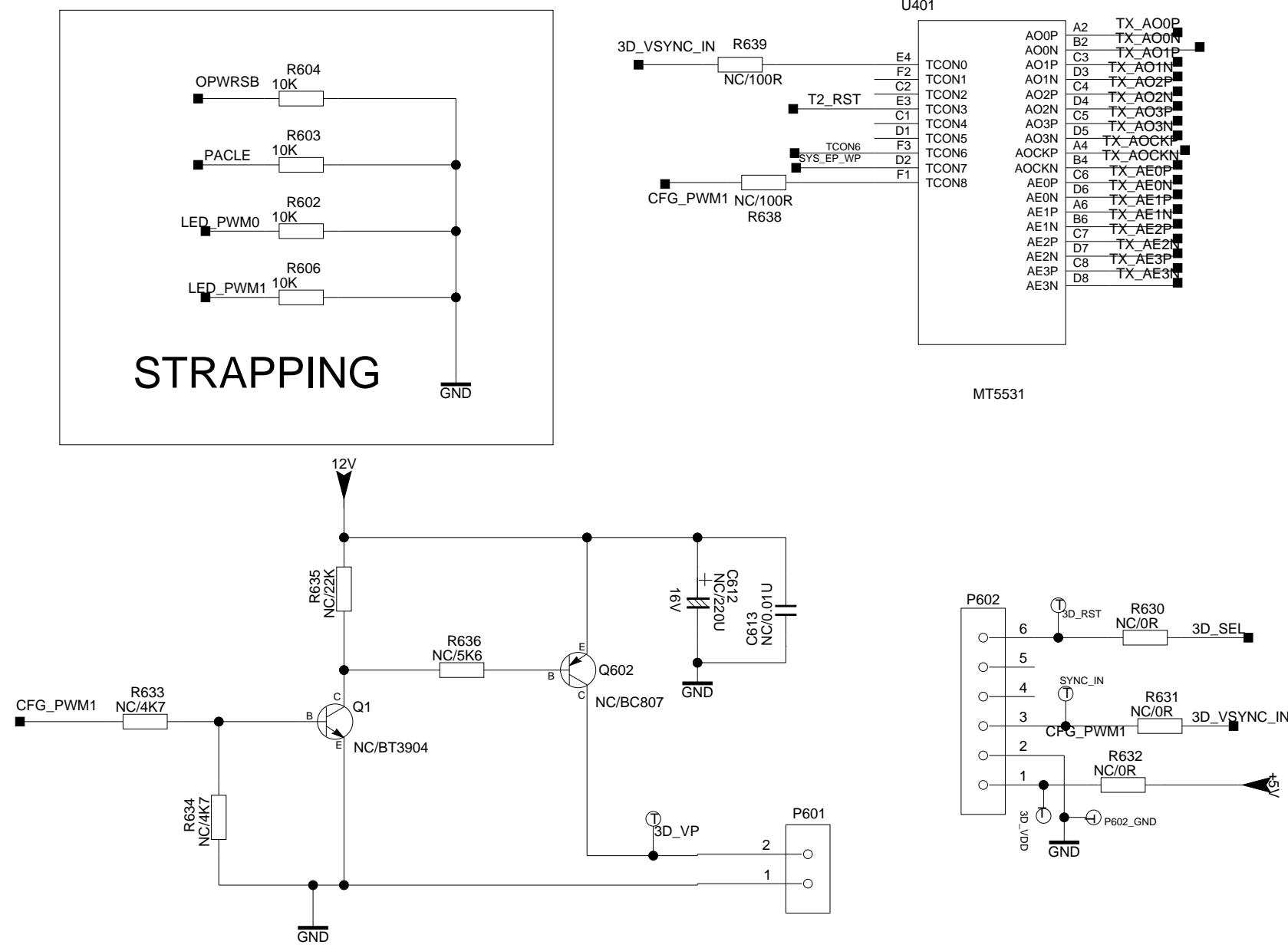
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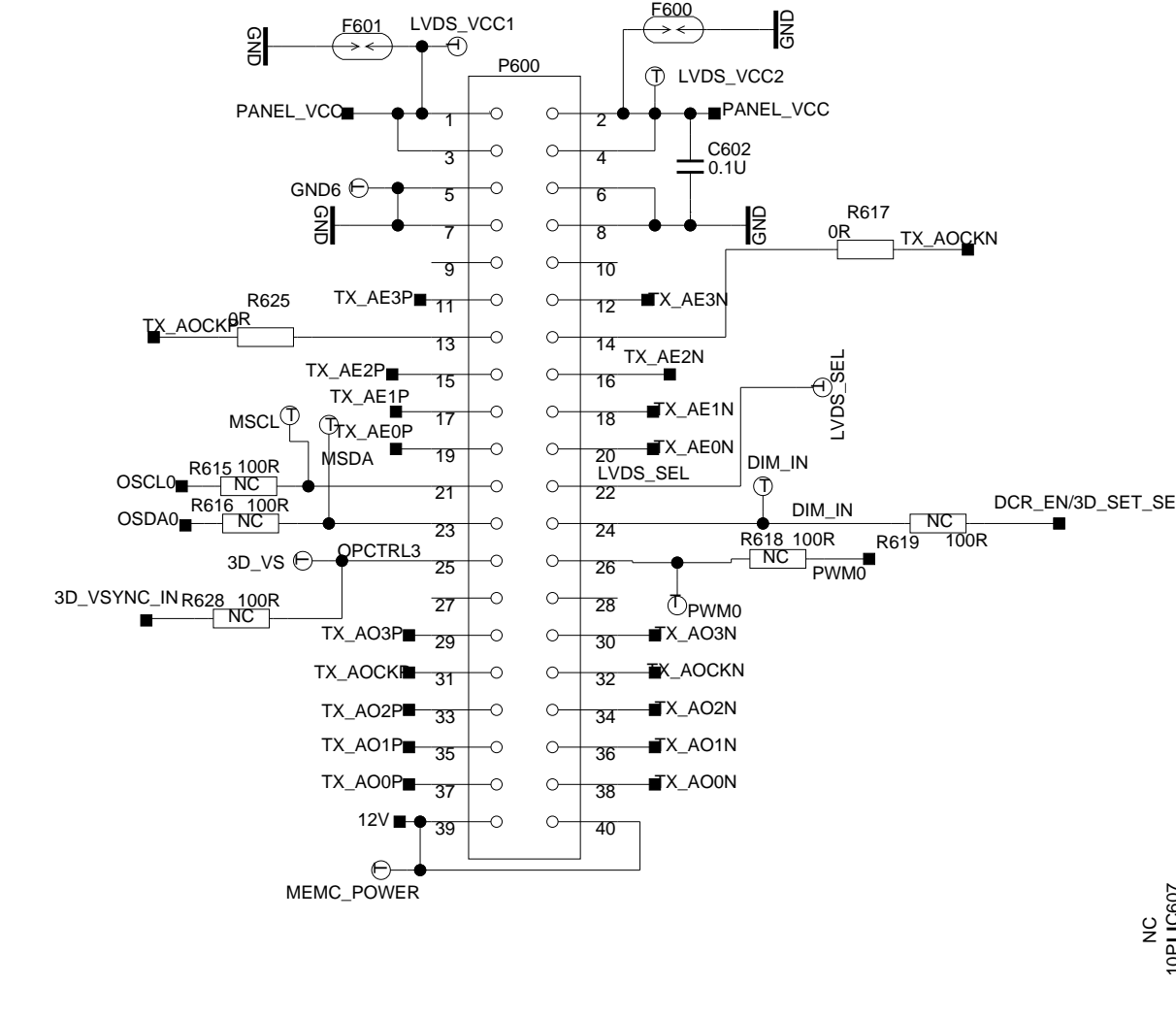
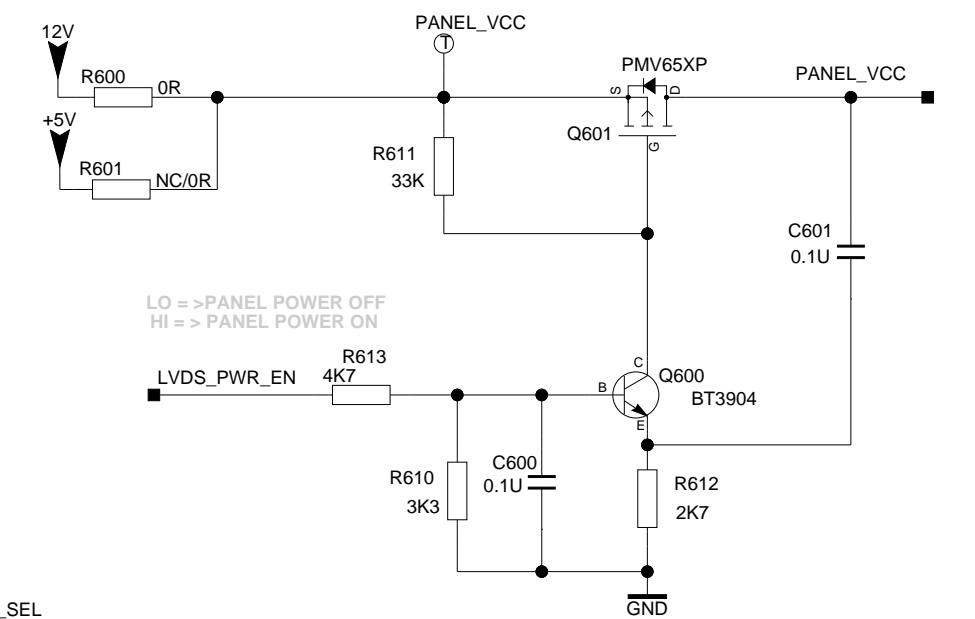
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# STRAPPING



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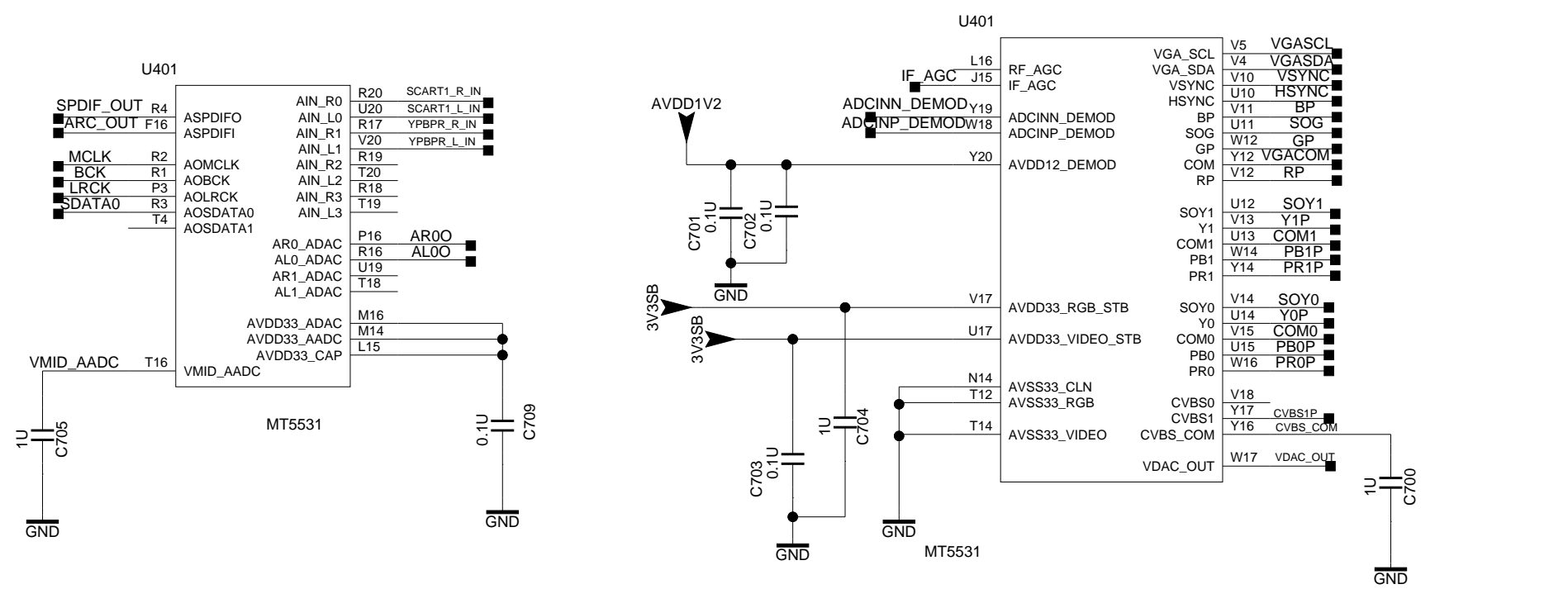


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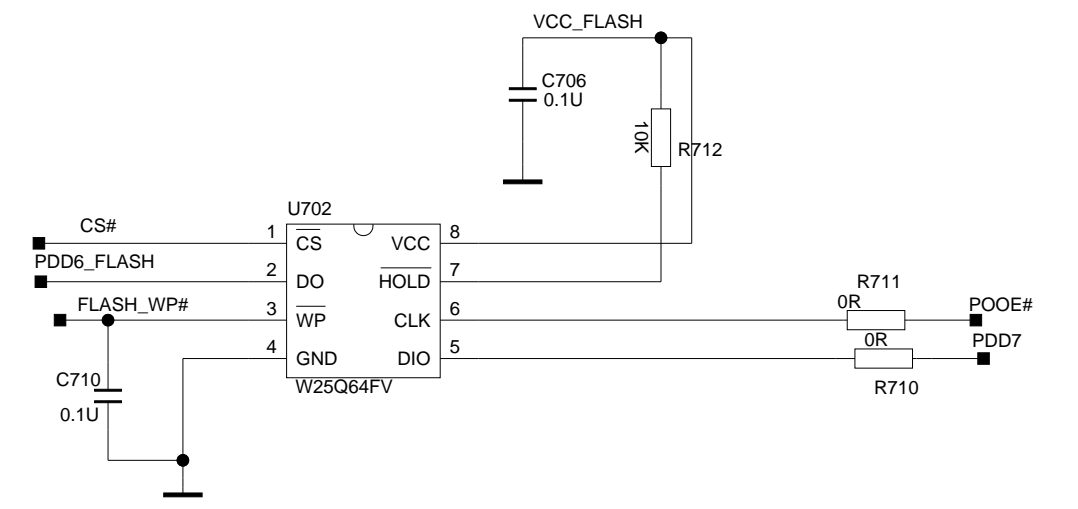
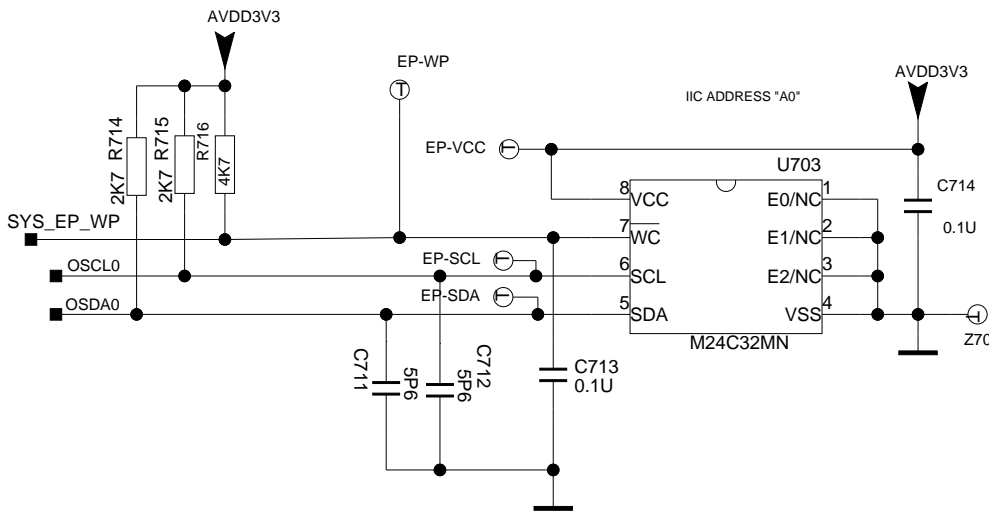
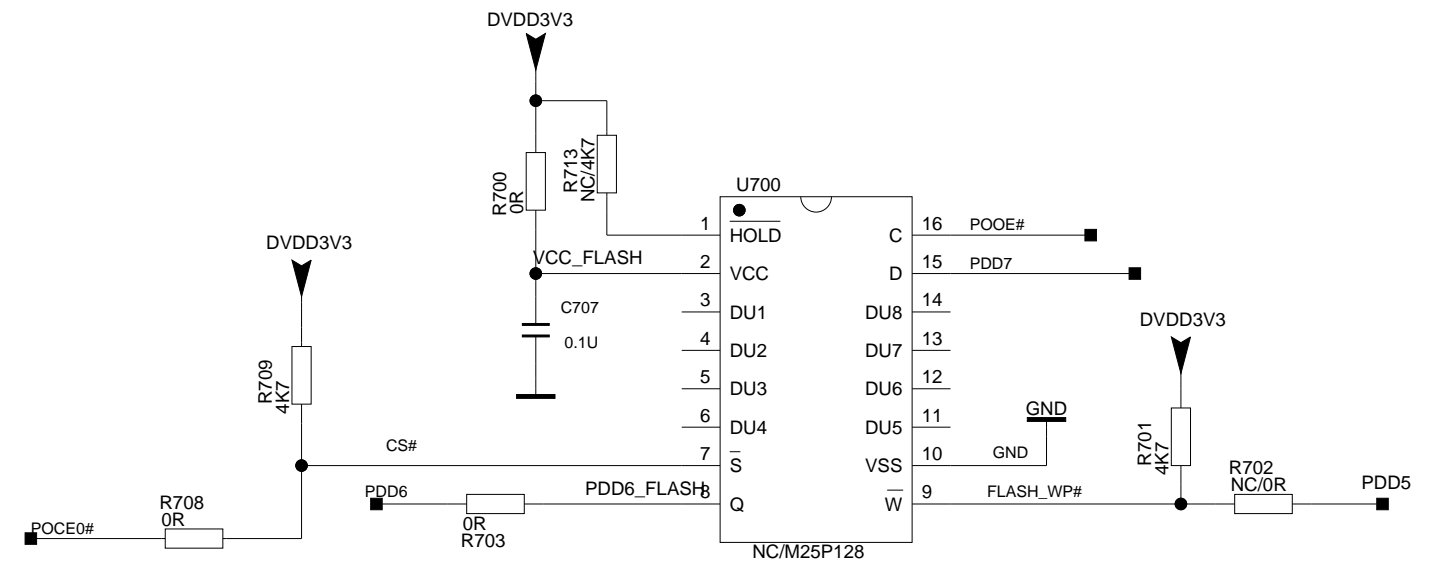
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# Audio&Video



## Serial Flash

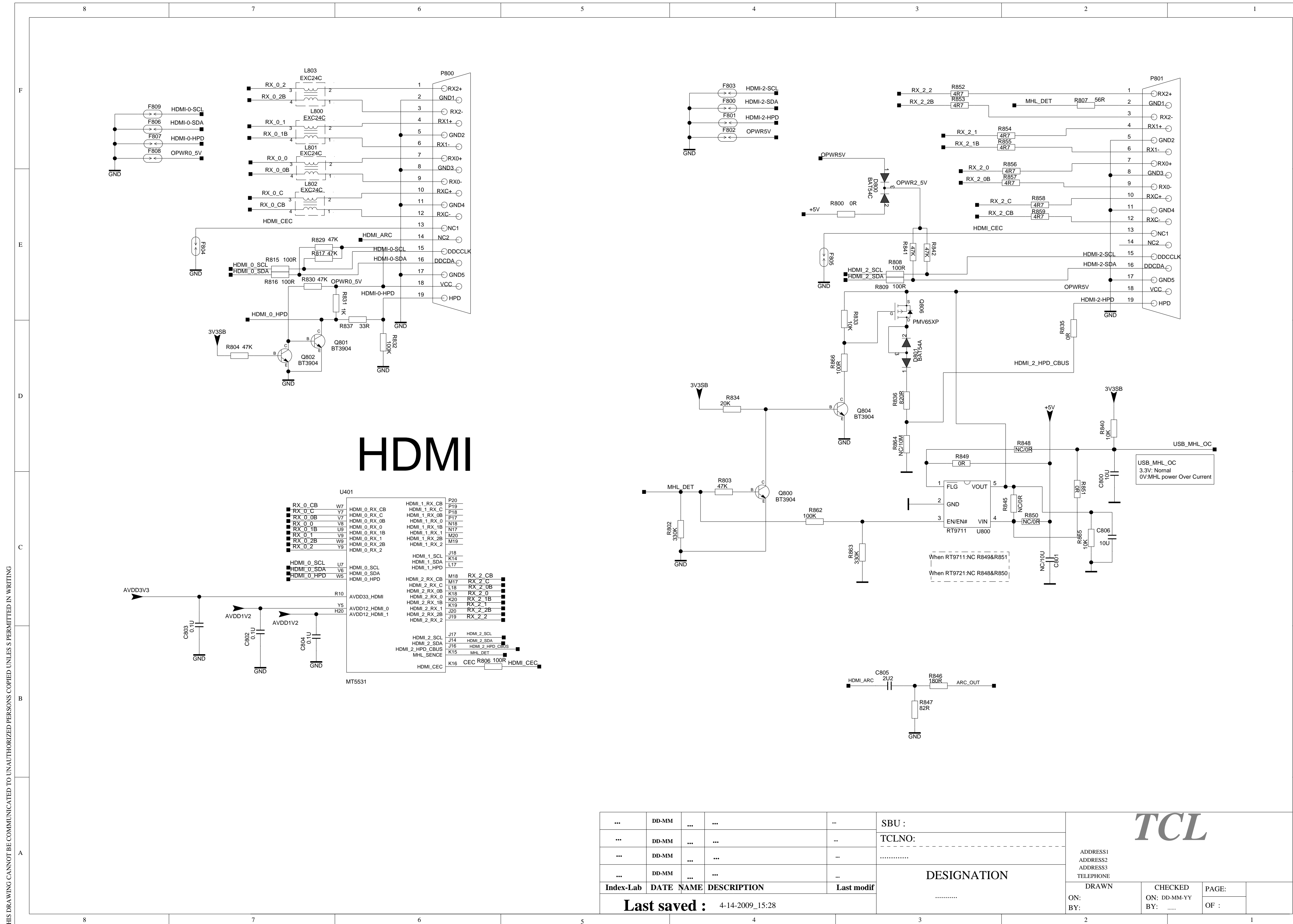


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# HDMI

U401

RX_0_CB	W7	HDMI_0_RX_CB	P20
RX_0_C	V7	HDMI_0_RX_C	P19
RX_0_0B	V7	HDMI_0_RX_0B	P18
RX_0_0	V8	HDMI_0_RX_0	P17
RX_0_1B	U9	HDMI_0_RX_1B	N18
RX_0_1	V9	HDMI_0_RX_1	N17
RX_0_2B	W9	HDMI_0_RX_2B	M20
RX_0_2	Y9	HDMI_0_RX_2	M19
HDMI_0_SCL	U7	HDMI_0_SCL	J18
HDMI_0_SDA	V6	HDMI_0_SDA	K14
HDMI_0_HPDP	W5	HDMI_0_HPDP	L17
		HDMI_1_RX_CB	M18
		HDMI_1_RX_C	M17
		HDMI_1_RX_0B	L18
		HDMI_1_RX_0	K18
		HDMI_1_RX_1B	K20
		HDMI_1_RX_1	K19
		HDMI_1_RX_2B	J20
		HDMI_1_RX_2	J19
		HDMI_2_RX_CB	J17
		HDMI_2_RX_C	J14
		HDMI_2_RX_0B	J16
		HDMI_2_RX_0	K15
		HDMI_2_RX_1B	K15
		HDMI_2_RX_1	K15
		HDMI_2_RX_2B	K15
		HDMI_2_RX_2	K15
		HDMI_2_SCL	J17
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		HDMI_CEC	K16

MT5531

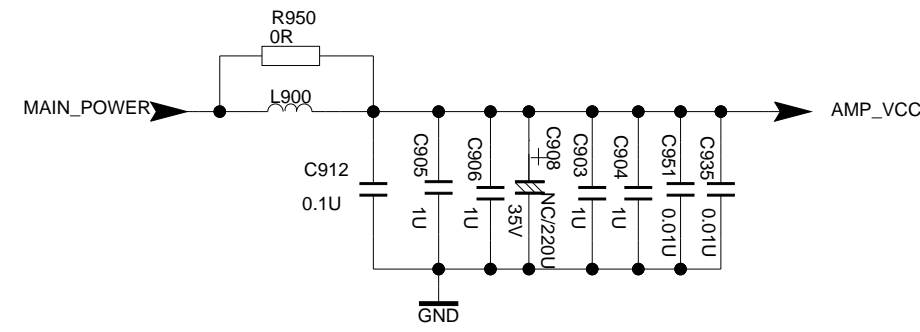
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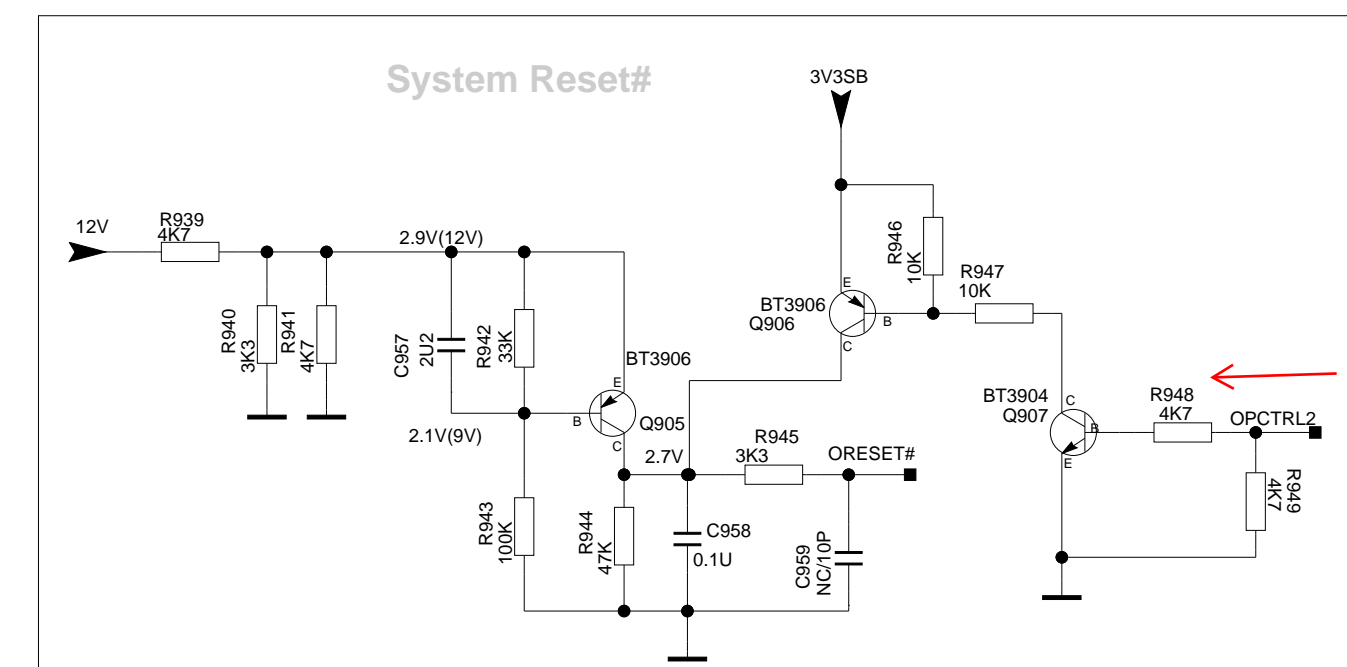
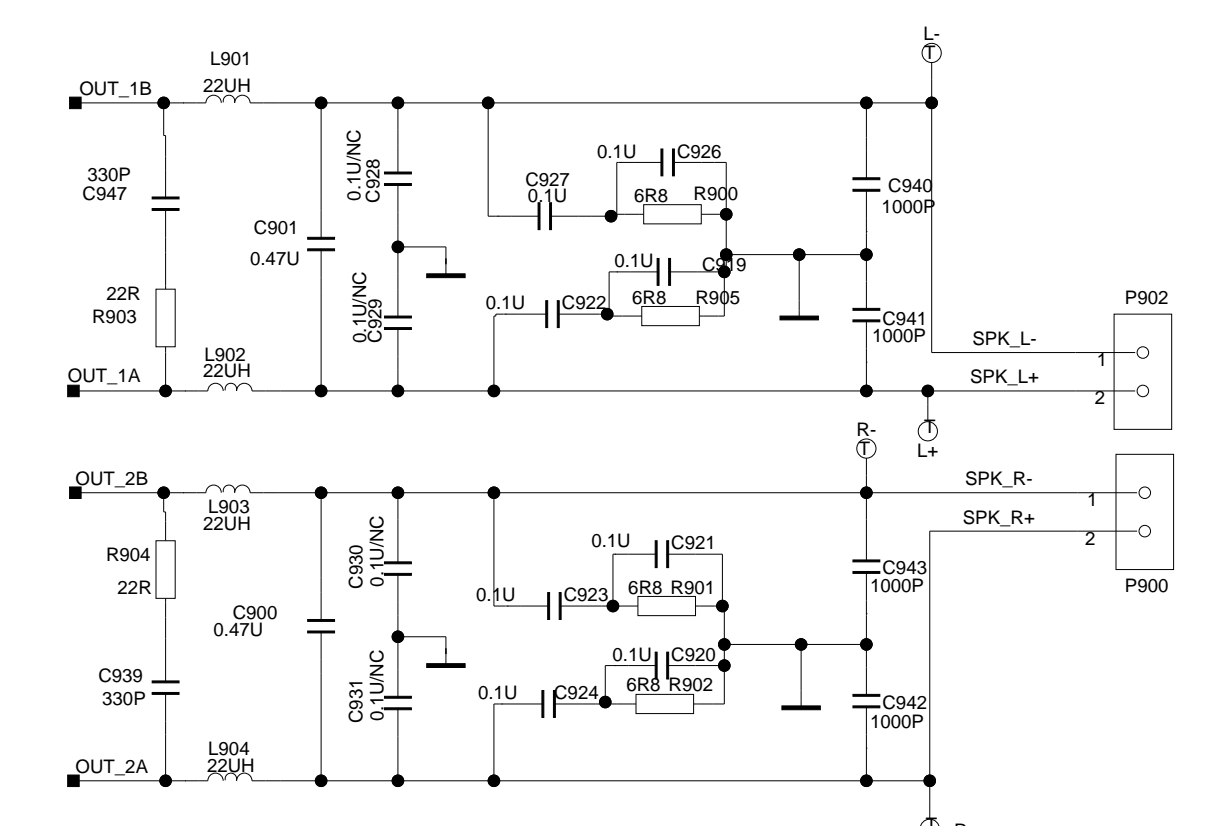
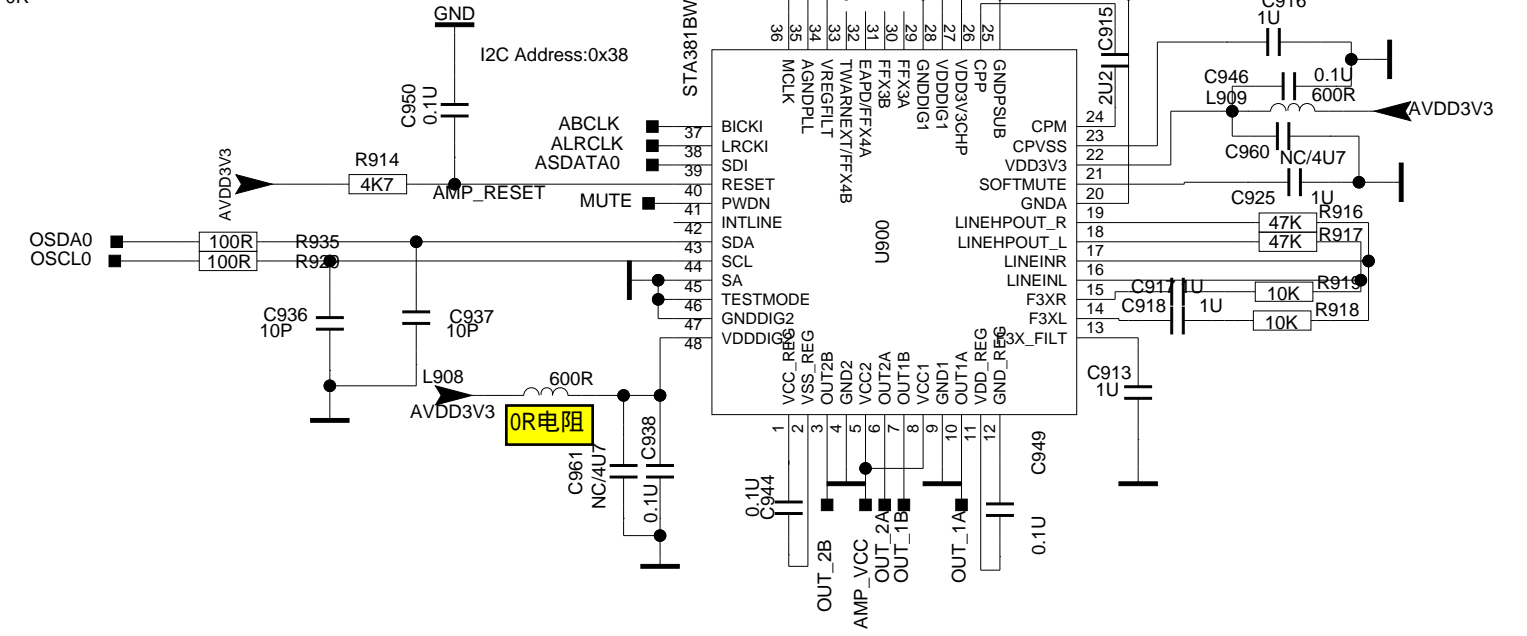
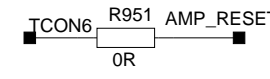
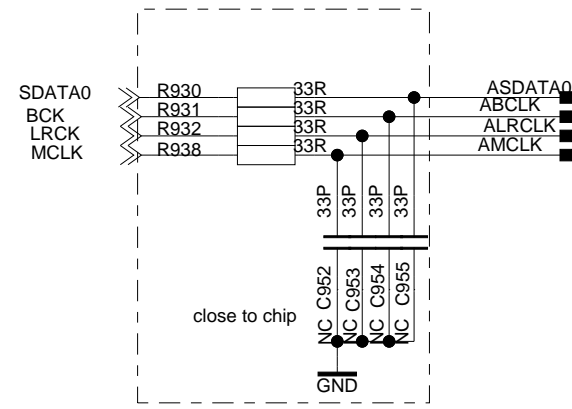
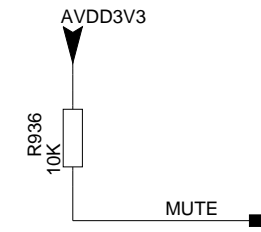
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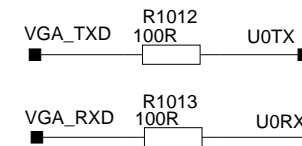
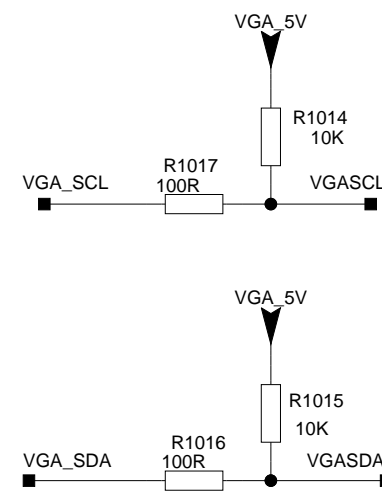
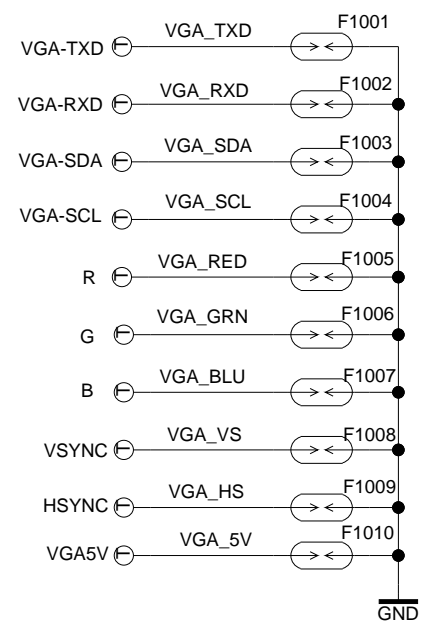
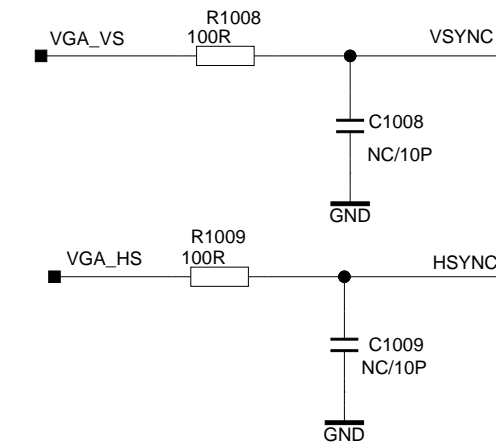
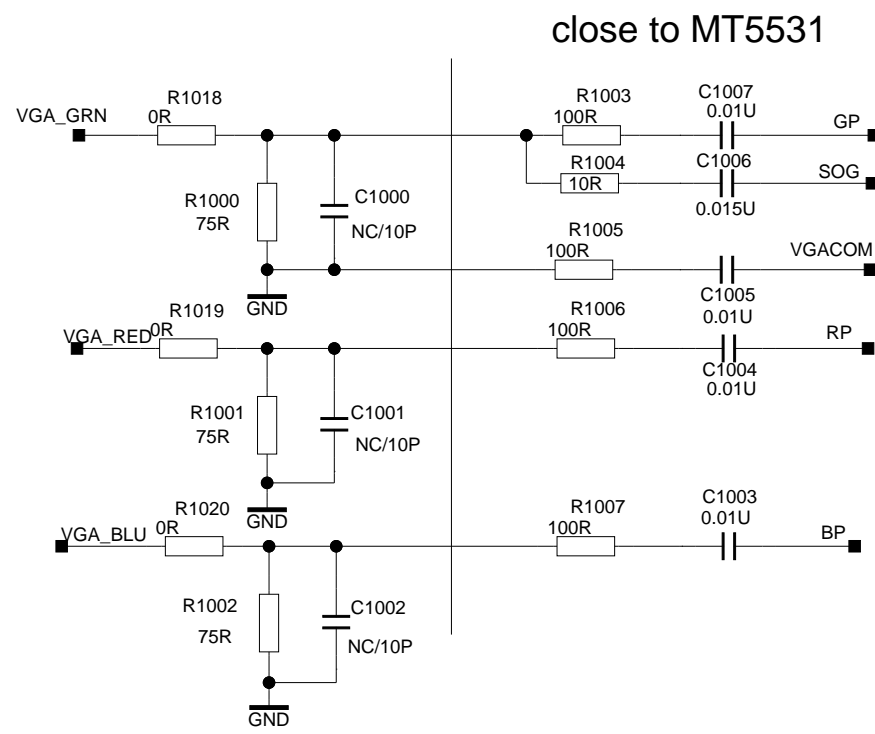
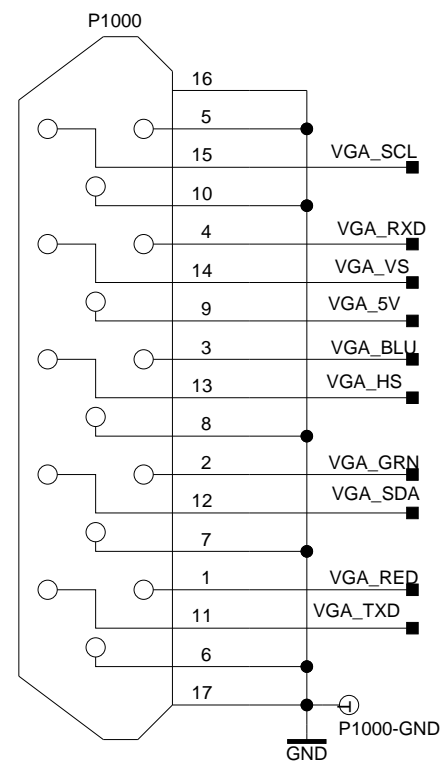
RESET&MUTE CIRCUIT



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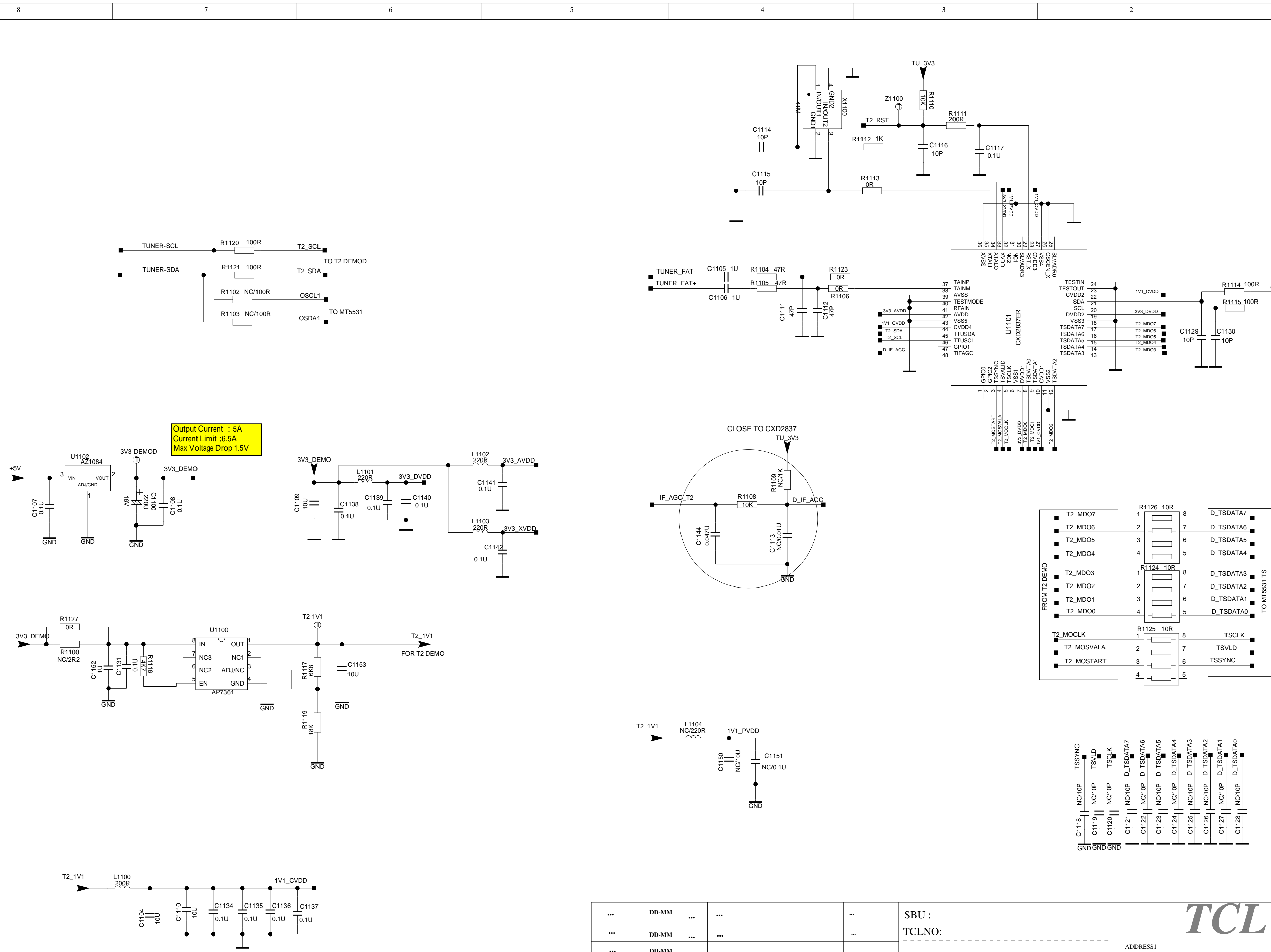
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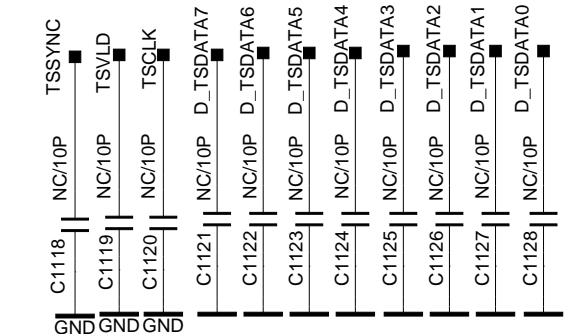
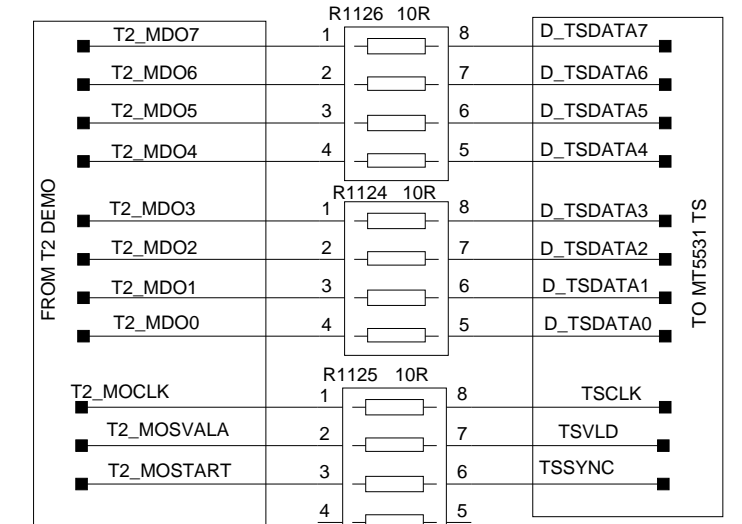
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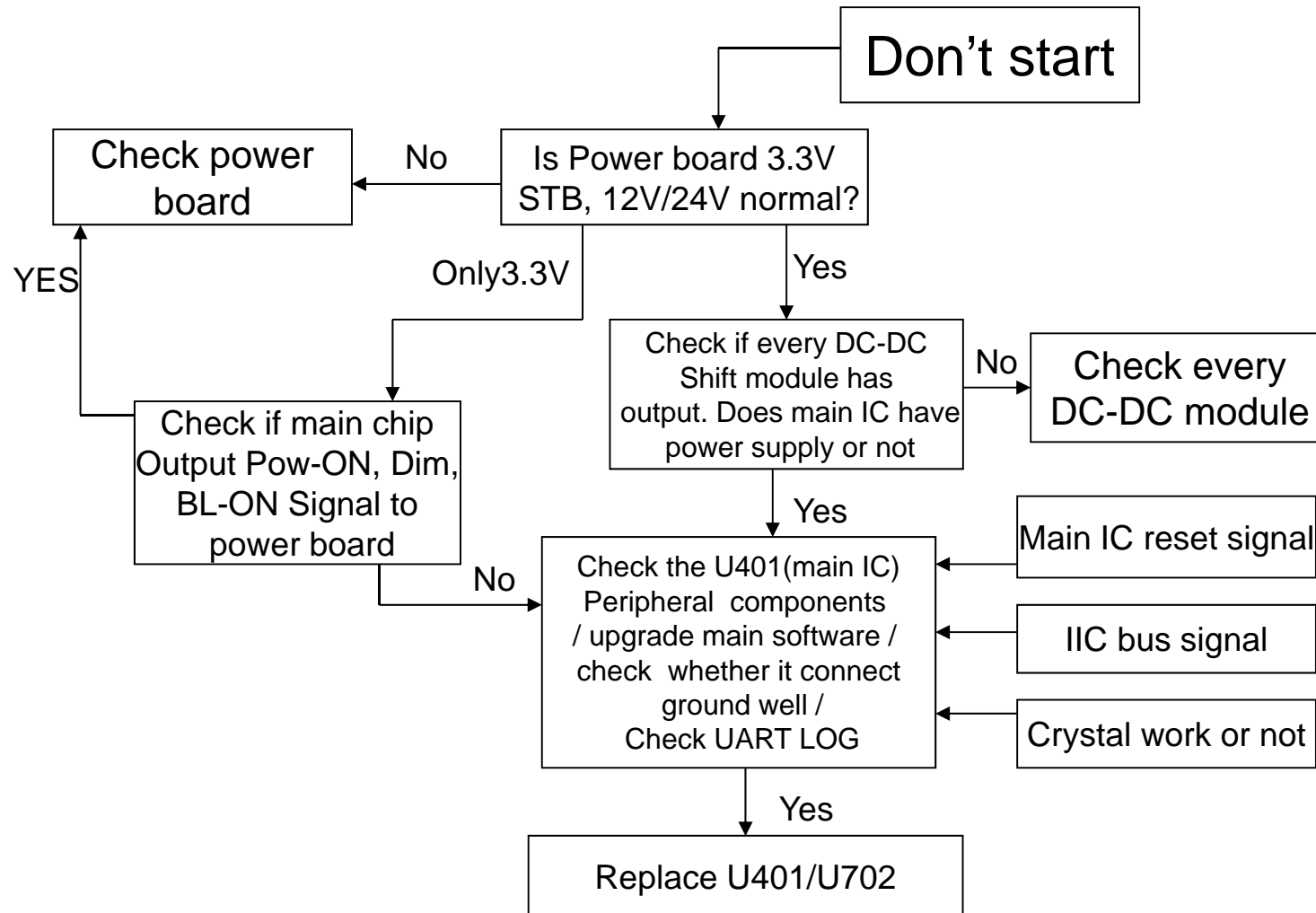


**Output Current : 5A  
Current Limit : 6.5A  
Max Voltage Drop 1.5V**

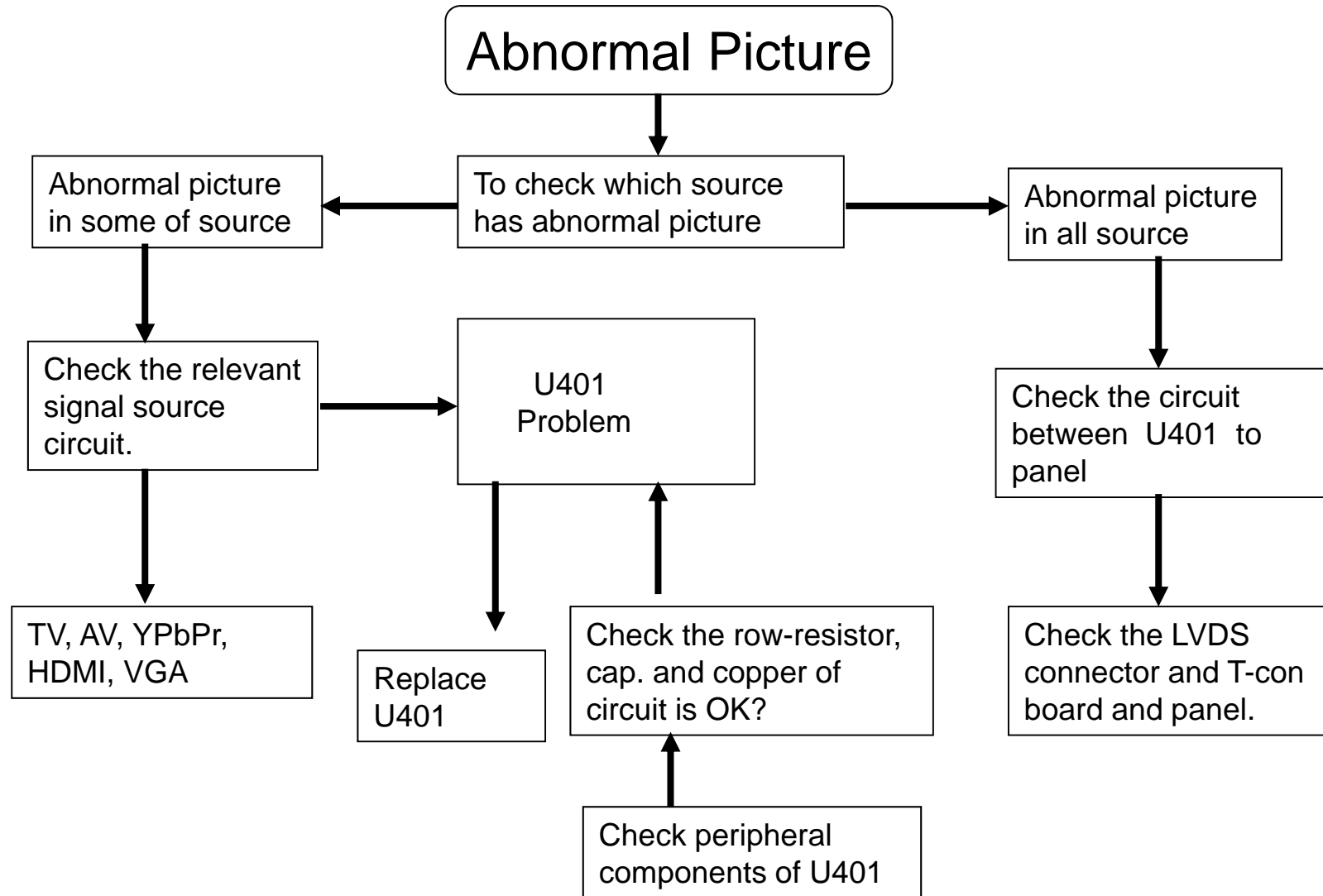


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# Trouble Shooting



# Trouble Shooting



# Trouble Shooting

