

Service
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QM17.4E

EU



Service Manual

Chassis name	Platform	Model name
QM17.4E LA	MTK5593F	32PFS6402/12

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Product information

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Operating System

Android OS :

Android Lollipop 5.1

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Reception

- Aerial input : 75 ohm coaxial (IEC75)
- Tuner bands : Hyperband, S-Channel, UHF, VHF
- DVB : DVB-T2 (support HEVC), 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)
- 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 14/18V, Band selection 22kHz, Tone burst mode, LNB current 300mA max

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Display Type

Diagonal screen size

- 32PFS6402 : 80 cm / 32 inch

Display resolution

- 1920 x 1080p

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Display Input Resolution

Video formats

Resolution — Refresh rate

- 480i - 60 Hz
- 480p - 60 Hz
- 576i - 50 Hz
- 576p - 50 Hz
- 720p - 50 Hz, 60 Hz
- 1080i - 50 Hz, 60 Hz
- 1080p - 24 Hz, 25 Hz, 30 Hz

Computer formats

Resolutions (amongst others)

- 640 x 480p - 60 Hz
- 800 x 600p - 60 Hz
- 1024 x 768p - 60 Hz
- 1280 x 768p - 60 Hz

- 1360 x 765p - 60 Hz
- 1360 x 768p - 60 Hz
- 1280 x 1024p - 60 Hz
- 1920 x 1080p - 60 Hz

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Dimensions and Weights

32PFS6402

- without TV stand:

Width 726.5 mm - Height 438.7 mm - Depth 76.8 mm
- Weight ± 5.63 kg

- with TV stand:

Width 726.5 mm - Height 483.3 mm - Depth 168.7 mm - Weight ± 5.89 kg

43PUS64x2

- without TV stand:

Width 968.2 mm - Height 575.7 mm - Depth 76.8 mm
- Weight ± 9.38 kg

- with TV stand:

Width 968.2 mm - Height 623.3 mm - Depth 204.2 mm - Weight ± 9.69 kg

49PUS64x2

- without TV stand:

Width 1099.2 mm - Height 645.3 mm - Depth 78.6 mm - Weight ± 11.01 kg

- with TV stand:

Width 1099.2 mm - Height 699.7 mm - Depth 213.2 mm - Weight ± 11.31 kg

55PUS64x2

- without TV stand:

Width 1239.2 mm - Height 724.7 mm - Depth 84.8 mm
- Weight ± 16 kg

- with TV stand:

Width 1239.2 mm - Height 779.5 mm - Depth 231.7 mm - Weight ± 16.3 kg

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Connectivity

TV Side

- HDMI 3 in - ARC
- HDMI 4 in - MHL - ARC
- USB 2 - USB 3.0 (blue)
- USB 3 - USB 2.0
- 1x Common Interface slot: CI+/CAM
- Headphones - Stereo mini-jack 3.5mm

TV Rear

- Audio In (DVI to HDMI) - Stereo mini-jack 3.5mm
- SCART: Audio L/R, CVBS in, RGB
- YPbPr : Y Pb Pr, Audio L/R

TV Bottom

- HDMI 1 in
- HDMI 2 in
- USB 1 - USB 2.0

- Audio out – Optical Toslink
- Network LAN – RJ45
- Antenna (75 ohm)
- Satellite tuner

- 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.

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Sound

- wOOx
- HD Stereo
- Output power (RMS) : 16W
- Dolby Digital Plus®
- DTS 2.0 + Digital out™

23.10

Multimedia

Connections

- USB 2.0 / USB 3.0
- Ethernet LAN RJ-45
- Wi-Fi 802.11a/b/g/n (built-in)
- BT2.1 with EDR & BT4.0 with BLE

Supported USB file systems

- FAT 16, FAT 32, NTFS

Playback formats

- Containers : 3GP, AVCHD, AVI, MPEG-PS, MPEG-TS, MPEG-4, Matroska (MKV), Quicktime (MOV, M4V, M4A), Windows Media (ASF/WMV/WMA)
- Video Codecs : MPEG-1, MPEG-2, MPEG-4 Part 2, MPEG-4 Part 10 AVC (H264), H.265 (HEVC), VC-1, WMV9
- Audio Codecs : AAC, HE-AAC (v1/v2), AMR-NB, Dolby Digital, Dolby Digital Plus, DTS Premium Sound™, MPEG-1/2/2.5 Layer I/II/III (includes MP3), WMA (v2 to v9.2), WMA Pro (v9/v10)
- Subtitles :
 - Formats : SAMI, SubRip (SRT), SubViewer (SUB), MicroDVD (TXT), mplayer2 (TXT), TMPlayer (TXT)
 - Character encodings : UTF-8, Central Europe and Eastern Europe (Windows-1250), Cyrillic (Windows-1251), Greek (Windows-1253), Turkish (Windows-1254), Western Europe (Windows-1252)
- Image Codecs : JPEG, PNG, BMP
- Limitations :
 - Maximum supported total bit rate for a media file is 30Mbps.
 - Maximum supported video bit rate for a media file

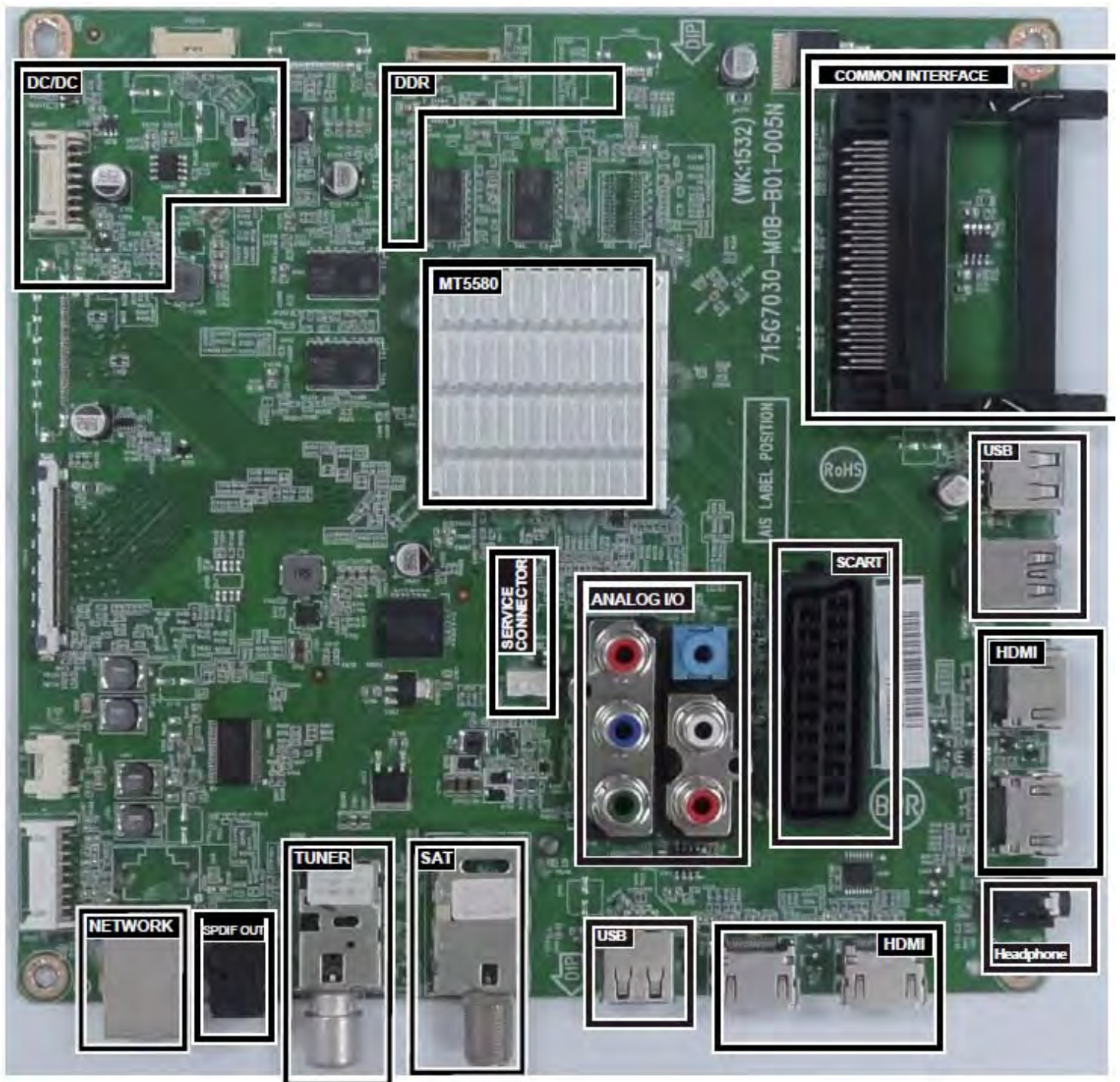
is 20Mbps.

- MPEG-4 AVC (H.264) is supported up to High Profile @ L5.1.
- H.265 (HEVC) is supported upto Main / Main 10 Profile up to Level 5.1
- VC-1 is supported up to Advanced Profile @ L3.

Supported media server software (DMS)

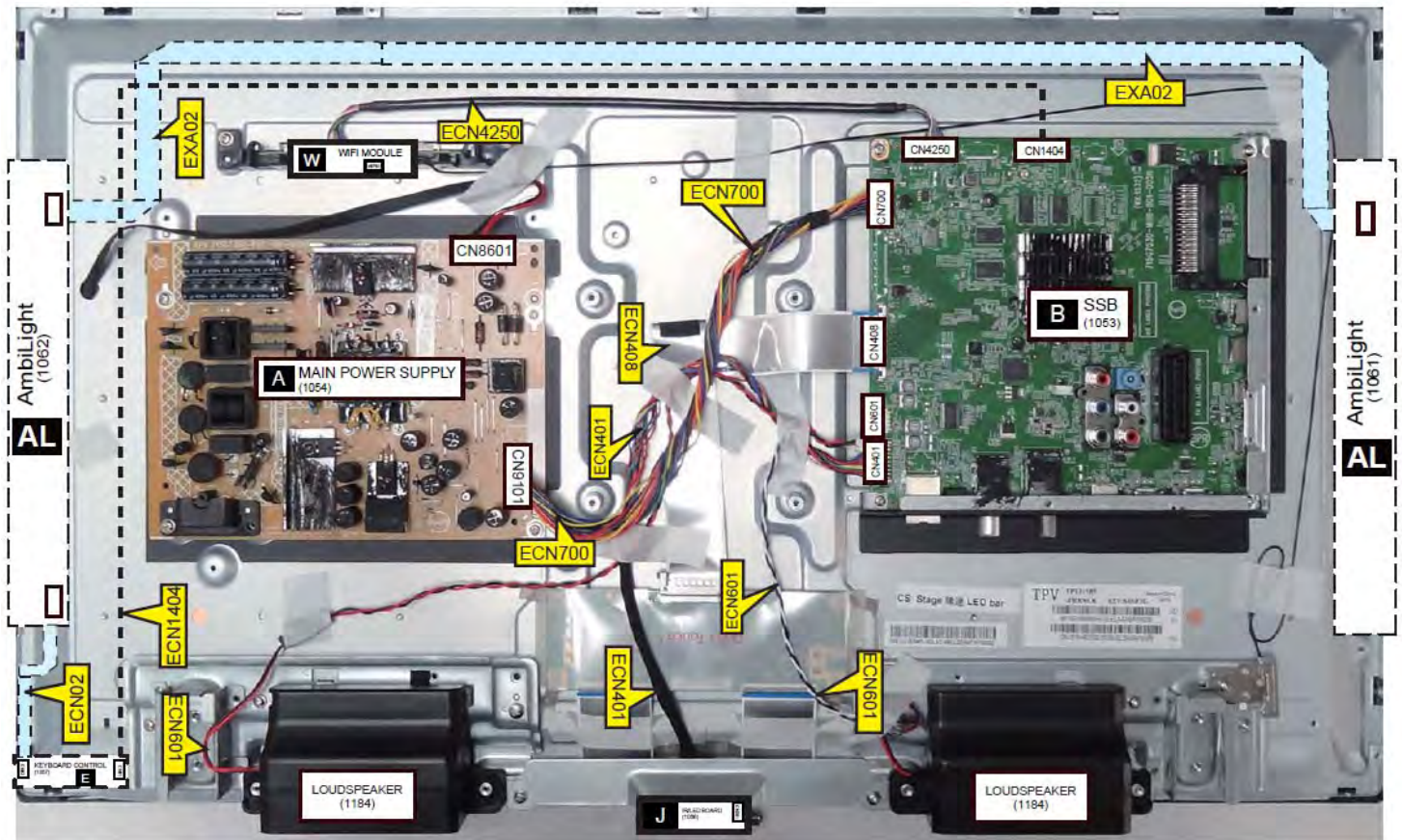
- You can use any DLNA V1.5 certified media server software (DMS class).

2. Connections Overview



3. Mechanical Instructions

3.1 Cable Dressing



Cable dressing (32" 6402 series)

3.2 Assembly/Panel Removal

3.2.1 Stand removal

Refer to 3-1 and 3-2 for details.

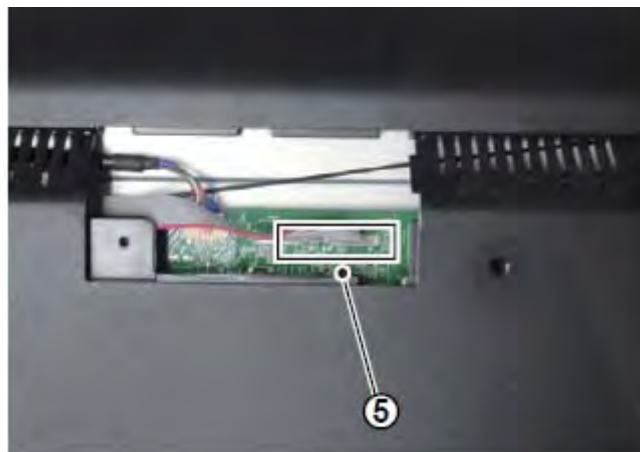
Warning: Disconnect the mains power cord before removing the rear cover.

1. Remove fixation screws [1] that secure the base assy, pull out the base assy from the set. Refer to 3-1 for details.
2. Remove the fixation screws [2], [3] and [4] that secure the rear cover. Refer to 3-1 for details.



3-1 Rear cover removal[1]

3. Unplug the connector [5] from SSB. Refer to 3-2 for details.
4. 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.

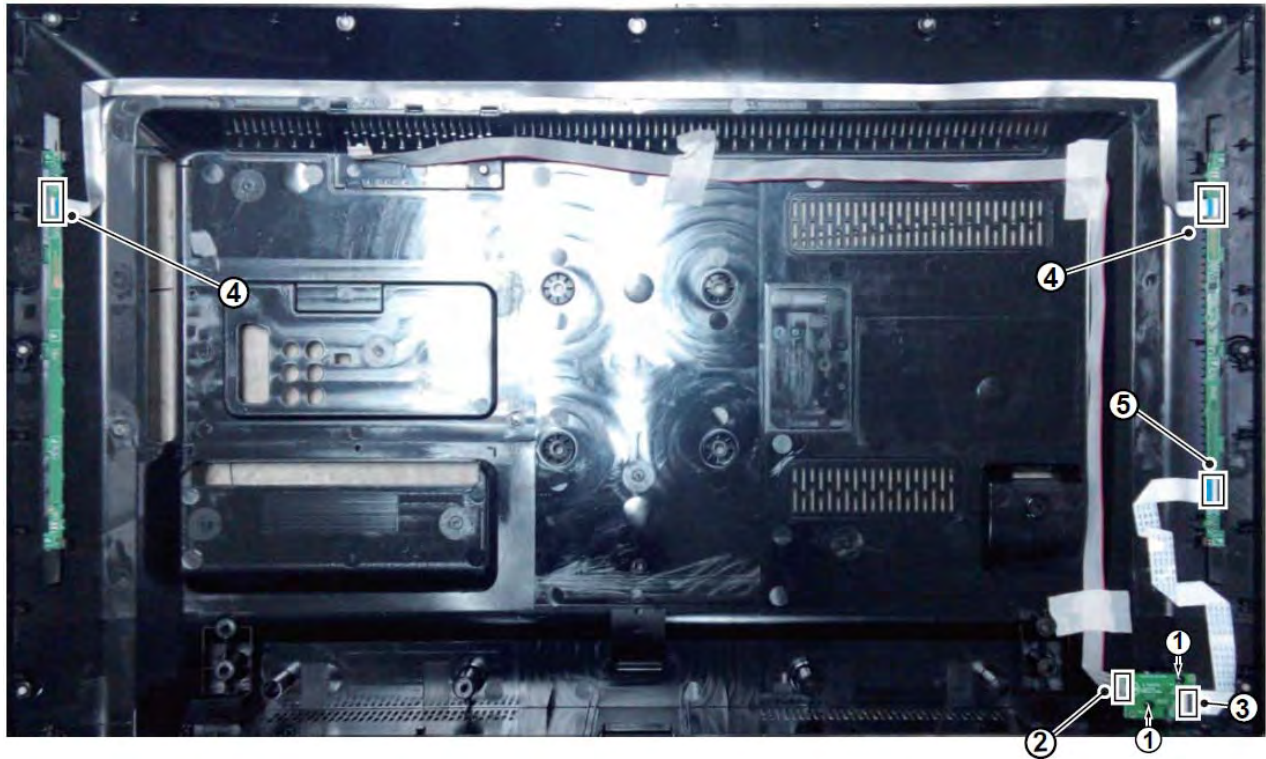


3-2 Rear cover removal[2]

3.2.2 AmbiLight Panel

Refer to 3-3 for details.

1. Gently release the clamps and unplug the connectors [4] that secure the ambilight panels. Release the clips from the FFC connector that connect with the keyboard [5].
2. Lift the AmbiLight panel from the rear cover. Make sure that wires and flat foils are not damaged while lifting the ambilight panel from the rear cover..



3-3 Ambilight and Keyboard removal

3.2.3 Keyboard Control Unit

Refer to 3-3 for details.

1. Release the connectors [2] and [3] from the keyboard control panel.

Caution: be careful, as these are very fragile connectors!

2. Remove all the fixation screws from the keyboard control panel [1] and take it out from the Back cover. When defective, replace the whole unit.

3.2.4 Small Signal Board (SSB)

Refer to 3-4 for details.

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

1. Release the clips from the LVDS connector that connect with the SSB[1].

Caution: be careful, as these are very fragile connectors!

2. Unplug all other connectors [2] .
3. Remove all the fixation screws from the SSB [3].
4. The SSB can now be shifted from side connector cover, then lifted and taken out of the I/O bracket. Refer to

1. 3-4 for details.



3-4 SSB removal

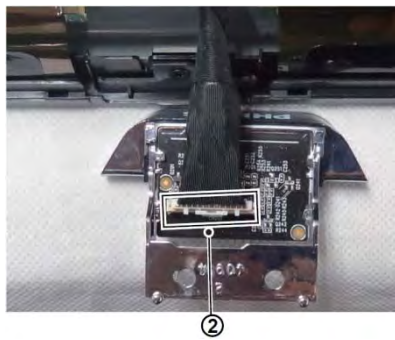
3.2.5 IR board Control Unit

Refer to **3-5** and **3-6** for details.

1. Remove the fixation screws [1] from the stand bracket, pull out the assy from the set. Refer to **3-5** for details.
2. Carefully Release the cover secured by clips, then unplug the connector [2] from the IR/LED board. The IR/LED Board can now be lifted and taken out from the cover. Refer to **3-6** for details.



3-5 IR/LED Board removal[1]



3-6 IR/LED Board removal[2]

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

Gently release the tapes that secure the speaker cables. Unplug the speaker connector from the SSB. Take the speakers out. When defective, replace the both units.

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

Remove the SSB as described earlier.

Remove the keyboard control panel as described earlier.

Remove the stand bracket as described earlier.

Remove the IR/LED as described earlier.

Remove the fixations screws that fix the metal clamps to the front bezel. Take out those clamps.

Remove all other metal parts not belonging to the panel.

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

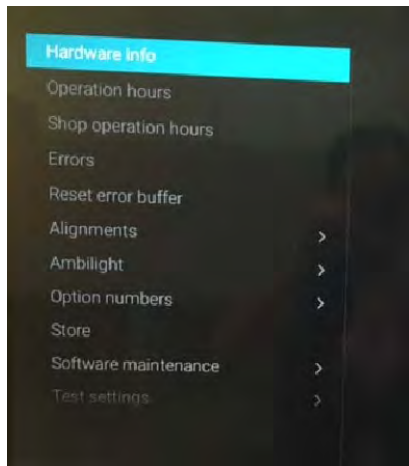
Use one of the following methods:

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



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

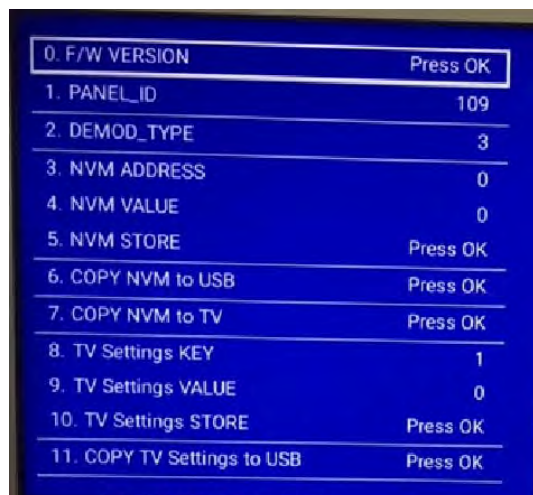
To activate the Factory mode, use the following method:

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



0. F/W VERSION	Press OK
1. PANEL_ID	109
2. DEMOD_TYPE	3
3. NVM ADDRESS	0
4. NVM VALUE	0
5. NVM STORE	Press OK
6. COPY NVM to USB	Press OK
7. COPY NVM to TV	Press OK
8. TV Settings KEY	1
9. TV Settings VALUE	0
10. TV Settings STORE	Press OK
11. COPY TV Settings to USB	Press OK

How to Exit the Factory mode

Use one of the following methods:

Select EXIT_FACTORY from the menu and press the “OK” button.

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

4.4 Customer Service Mode (CSM)

Purpose

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

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

Specifications

Ignore “Service unfriendly modes”.

Line number for every

line (to make CSM language independent).

Set the screen mode to full

screen (all contents on screen is visible).

After leaving the Customer Service Mode, the original settings are restored.

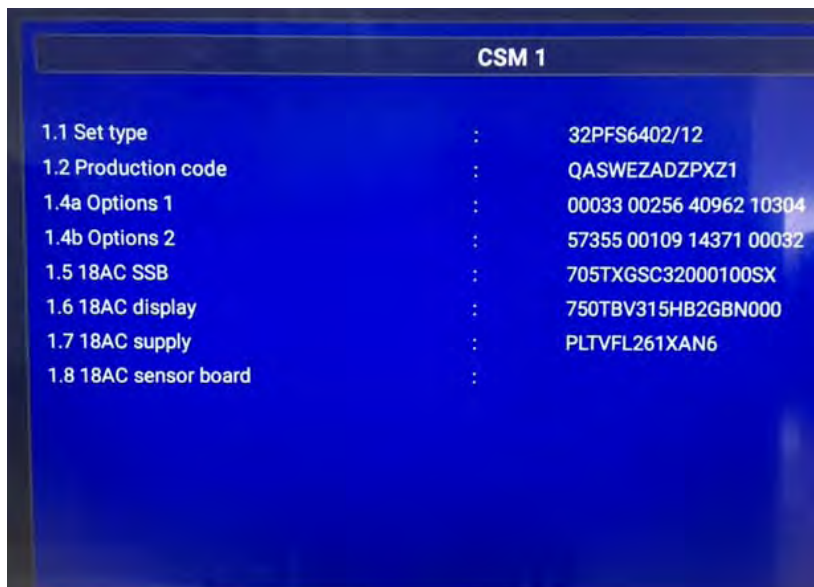
Possibility to use “CH+” or “CH-” for channel surfing, or enter the specific channel number on the RC.

How to Activate CSM

To activate CSM, press the following key sequence on a standard remote control transmitter: “**123654**” (do not allow the display to time out between entries while keying the sequence). After entering the Customer Service Mode, the following items are displayed. 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	:	32PFS6402/12
1.2 Production code	:	QASWEZADZPXZ1
1.4a Options 1	:	00033 00256 40962 10304
1.4b Options 2	:	57355 00109 14371 00032
1.5 18AC SSB	:	705TXGSC32000100SX
1.6 18AC display	:	750TBV315HB2GBN000
1.7 18AC supply	:	PLTVFL261XAN6
1.8 18AC sensor board	:	

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

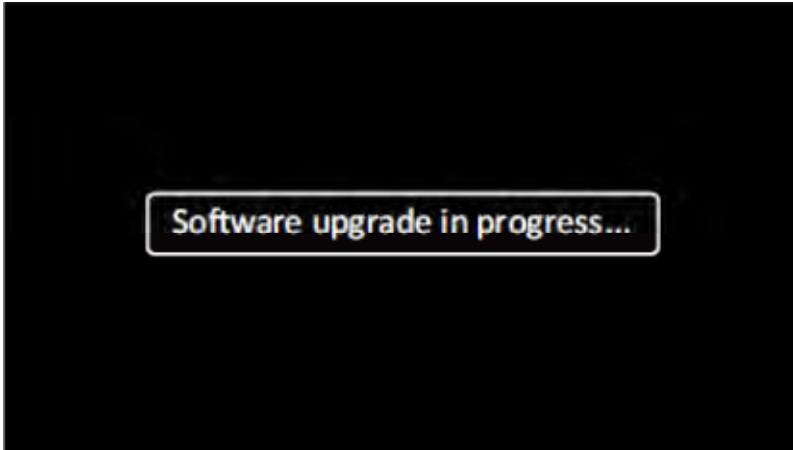
5.1 Software Upgrading

5.1.1. The following update is for .pkg file.

1. Rename the file to "upgrade_loader.pkg"
2. Prepare a USB memory.
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 ports.

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

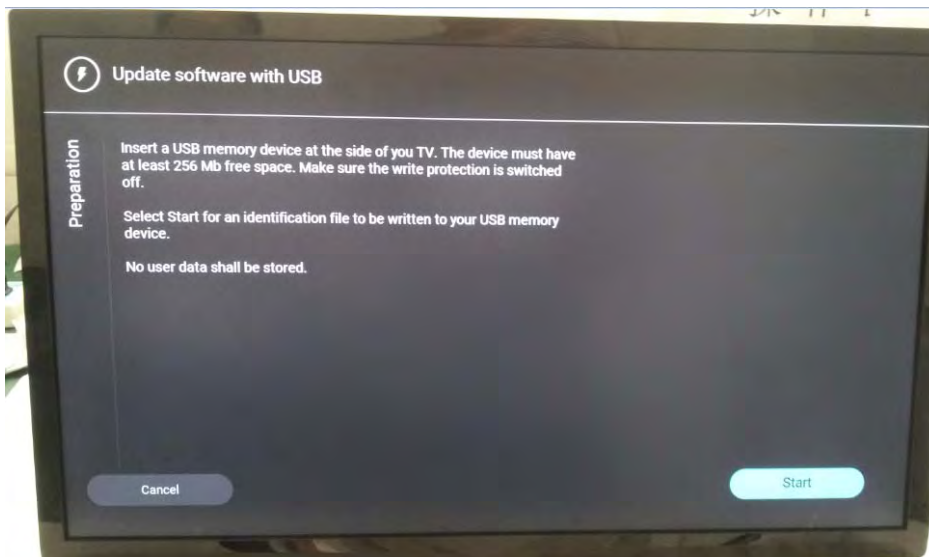
1. Prepare a USB memory.
2. Copy the software to USB flash disk(root directory).

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

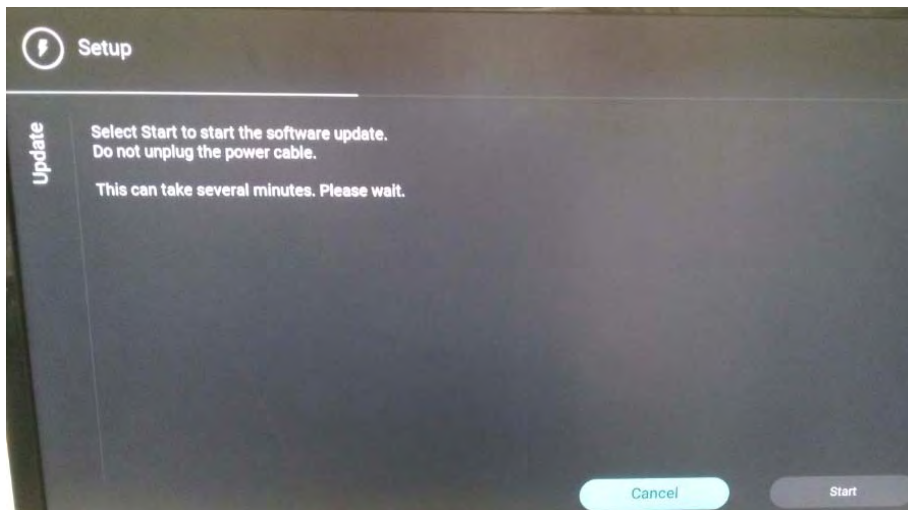


Step 2: F/W Upgrade

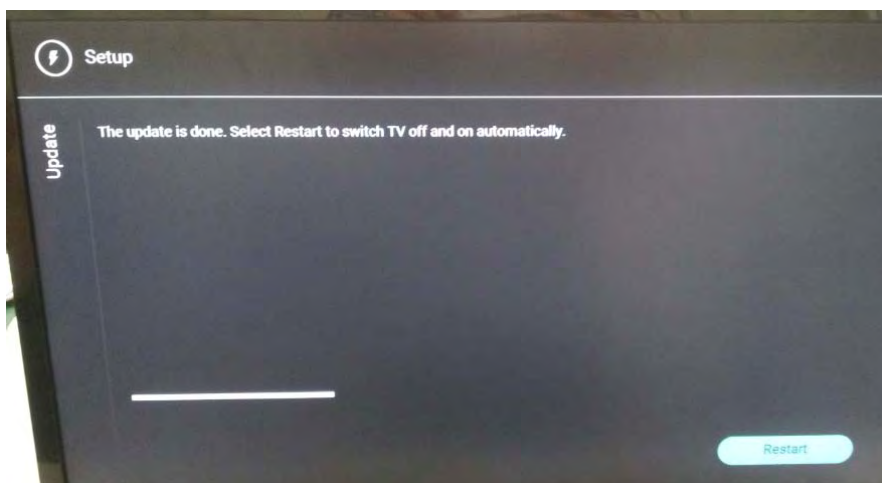
1. Plug the USB memory on the USB port on the side I/O port of TV (Please connect to USB 2.0 port, not recommend USB3.0 port)
2. AC on (Power plug)
3. TV will show message as below image, Press [Start] to detect the software automatically



1. Press [Start] to start software upgrade



2. Upgrade in progress
3. After software upgrade complete, select [Restart] to reboot TV.



Step 3: Check the SW version

1. After burning software, TV will restart
2. Press "Menu+1999+back", enter Factory 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!

5.2.1 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 three 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	Medium	Error/	I²C address	EB: in error buffer BL: Blinking LED	Device	Defective board
					Prot.				
I²C BUSES									
I²C 0 (SSB bus)	2	13	SOC	I²CM0	E		BL/EB	SSB	SSB
I²C MCU (BE bus)	2	14	SOC	I²CMCU	E		BL/EB	SSB	SSB
I²C 2 (FE bus)	2	15	SOC	I²CM2	E		BL/EB	SSB	SSB
I²C 1 (SFR bus)	2	18	SOC	I²CM1	E		BL/EB	SSB	SSB
SOC doesn't boot (HW cause)	2	15	St-by µP		P	D4	BL	MT5593	SSB
Supply related:									
12V	3	16	St-by µP	I/O	P		BL		Supply
Display supply (POK)	3	17	SOC	I/O	E		EB		Supply
SSB									
I2C switch	2	24	SOC	I²CMCU	E	E0	EB	PCA9540	SSB
Channel dec	2	27	SOC	I²CM2	E	D8-DC	EB	Silab Si216x	SSB
Boston (HDMI2.2)	2	29	SOC	I²CM0	E	64	EB	SIL 9777	SSB
Lnb controler	2	31	SOC	I²CM2	E	10	EB	LNBH 25	SSB
Kleernet (Wireless Audio)	2	32	SOC	I²CM1	E		EB		SSB
DTV Tuner	2	34	SOC	I²CM2	E	C0	EB	Silab Si2157 (H/T models) Sony Helene (K/S models)	SSB
Tuner DVB-S2	2	36	SOC	I²CM2	E	C6	EB	STV 6111	SSB
Class-D	2	37	SOC	I²CM3	E	36	EB	TAS 5731 PHP	SSB
FPGA PQ	2	38	SOC	I²CMCU	E	84?	EB	Durango	SSB
2nd Audio amplifier	2	39	SOC	I²CM3?	E	?	EB	?	SSB
T° sensor SSB/set	2	42	SOC	I²CM1	E	98	EB	LM 75	T°sensor
Light sensor	6	43	SOC	I²CM3	E	72	EB	TSL2571	SET
SOC doesn't boot (SW cause)	2	53	St-by µP		P	D4	BL	MT5593	SSB
NT72324	2	61	SOC	I²CM2	E	34	EB	NT72324	SSB
NT72323	2	62	SOC	I²CM2	E	A4	EB	NT72323	SSB

Splash error	2	65	SOC	-	E	-	EB	NT314, MT 5593,	SSB
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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.

Panel Code

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

CTN_ALT BOM#	Panel Type	Set Option Code
32PFS6402/12	TPT315B5-FHBN0.K S4DP2P	133

6. Circuit Descriptions

6.1 Introduction

The QM17.4E LA is a new chassis launched in Europe in 2017. The whole range is covered by MT5593F. The major deltas versus its predecessor support DVB-C; DVB-T/T2; DVB-S2 with also multi-media, USB 3.0, WIFI functionality.:

The QM17.4E LA chassis comes with the following stylings:

- series xxPHx6402/xx

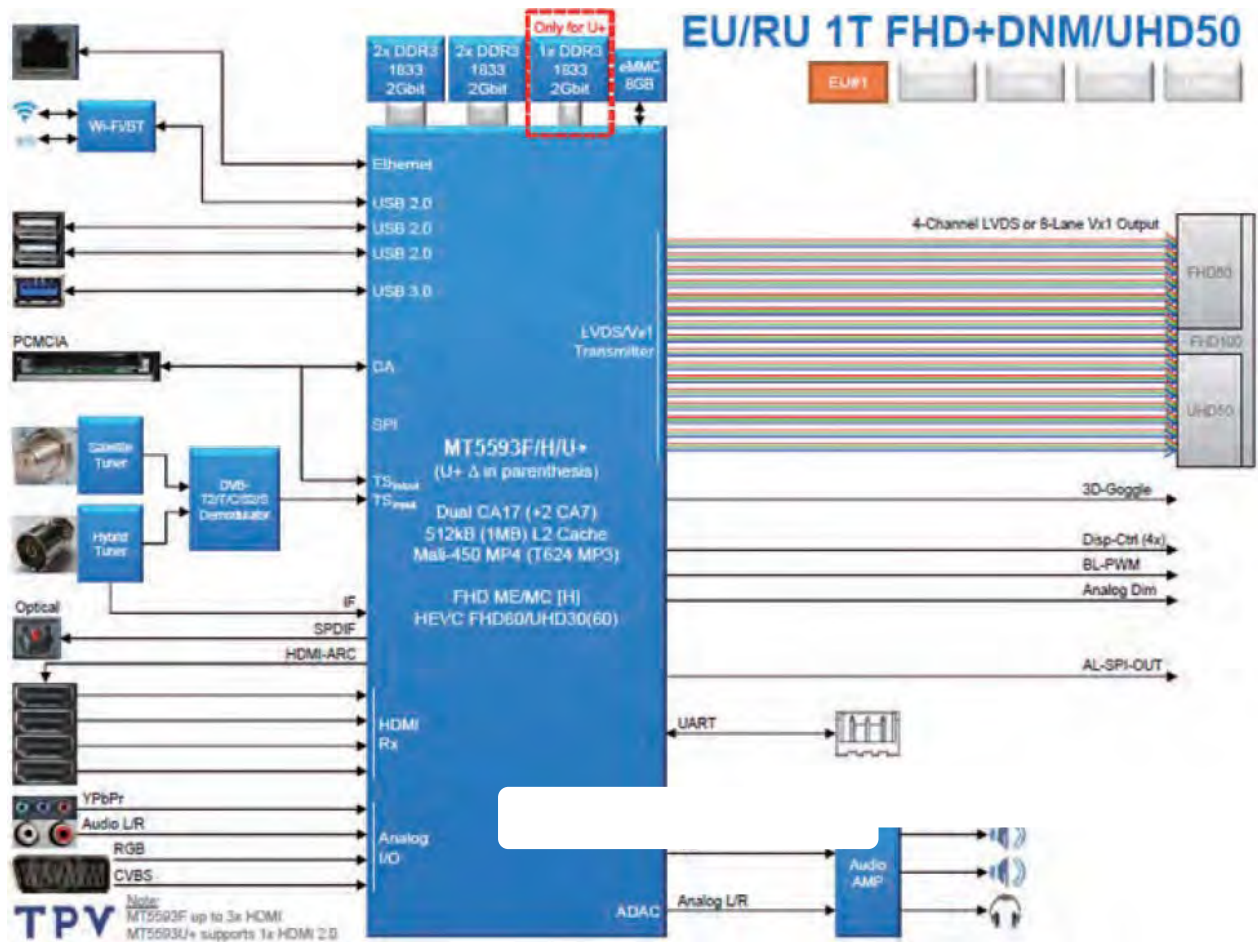
6.1.1 Implementation

Key components of this chassis are:

Key components of this chassis are:

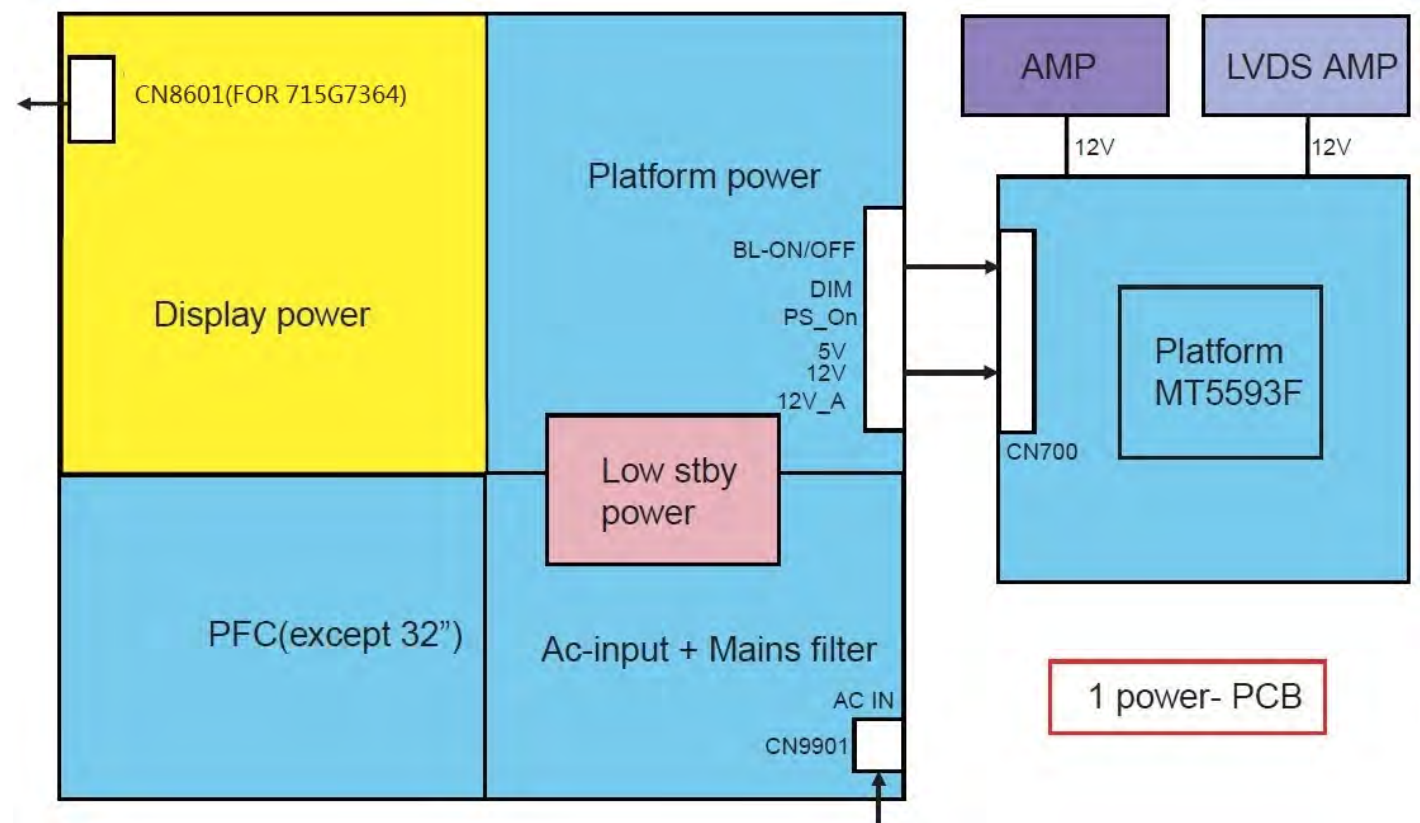
- SCALER MT5593FPIJ HSBGA-900
- TUNER EUROPE TDSY-G480D
- TUNER EUROPE TDQS-A701F
- DEMODULATOR Si2168-C50-GMR QFN-48
- AUDIO Amplifier TAS5760LDDCAR 20W TSSOP-48

6.1.2 Block diagram



6.2 Power Supply

Power architecture of this platform.



6.2.1 Power Supply Unit

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

Consult the Philips Service web portal for the order codes of the boards.

Important delta's with the platform are:

- New power architecture for LED backlight
- "Boost"-signal is now a PWM-signal + continuous variable

The control signals are:

- PS-ON
- Lamp "on/off"
- DIM (PWM) (not for PSDL)

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

- +8.5V output (standby mode)
- +12 output (on-mode)
- +12V_audio (audio AMP power)
- Output to the display; in case of
 - IPB: High voltage to the LCD panel
 - PSL and PSLS (LED-driver outputs)
 - PSDL (high frequent) AC-current.

6.2.2 Diversity

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

The following displays can be distinguished:

- CCFL/EEFL backlight: power panel is conventional IPB
- LED backlight:
 - side-view LED without scanning: PSL power panel

- side-view LED with scanning: PSLS power panel
- direct-view LED without 2D-dimming: PSL power panel
- direct-view LED with 2D-dimming: PSDL power panel.

PSL stands for **P**ower **S**upply with integrated LED-drivers.

PSLS stands for a **P**ower **S**upply with integrated LED-drivers with added **S**canning functionality (added microcontroller).

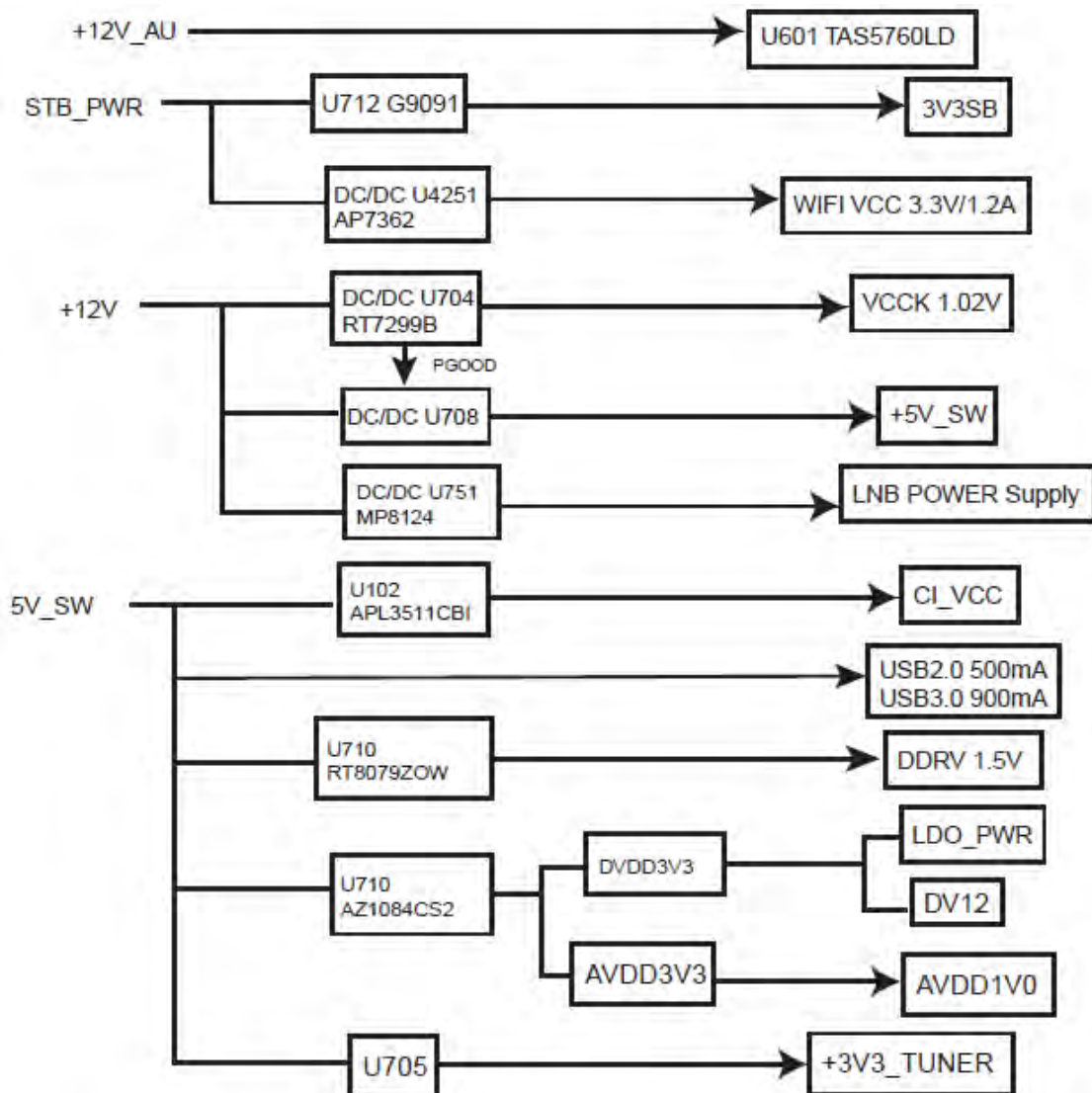
PSDL stands for a **P**ower **S**upply for **D**irect-view **L**ED backlight with 2D-dimming.

6.3 DC/DC Converters

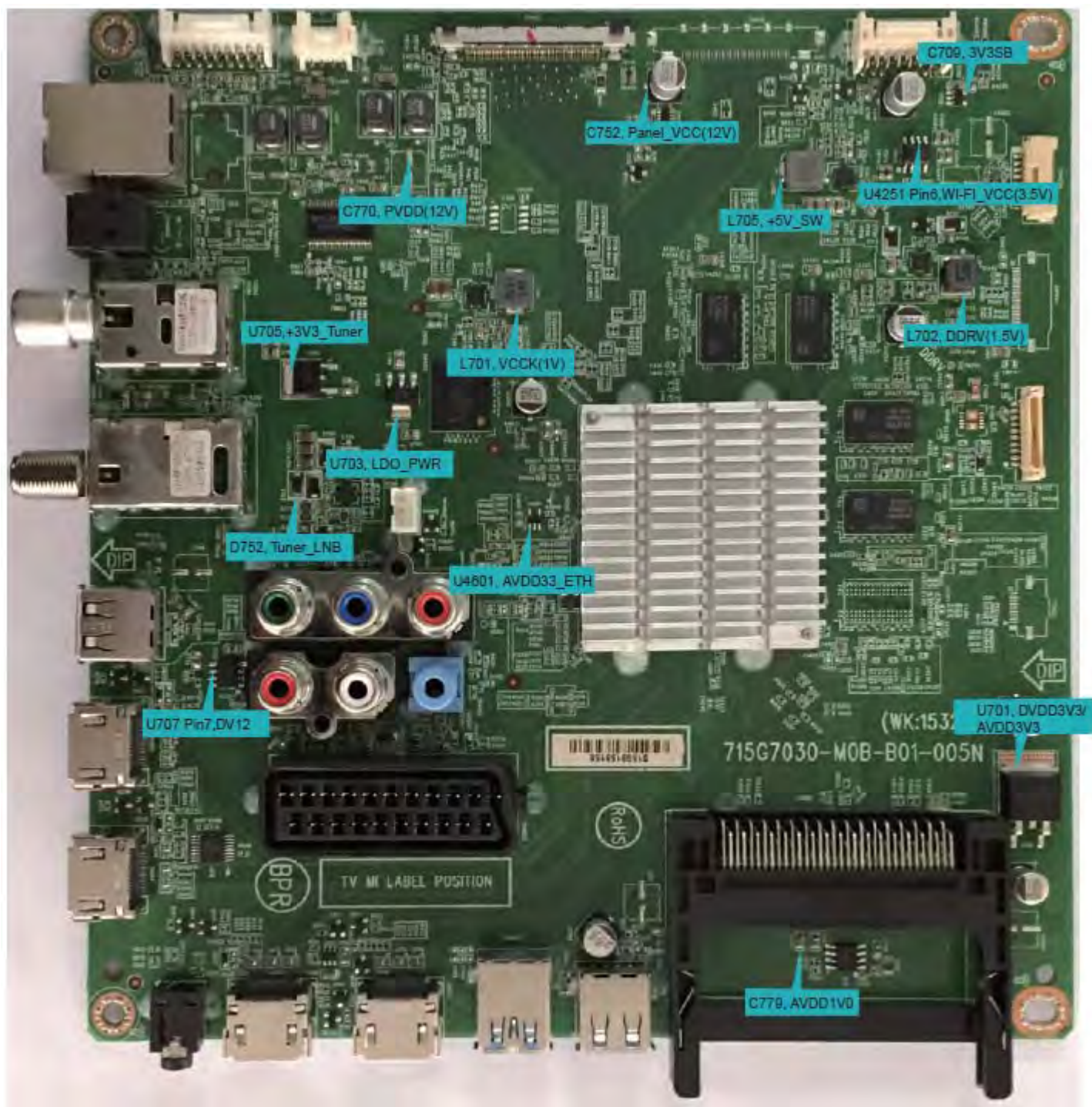
The on-board DC/DC converters deliver the following voltages(depending on set execution):

- +3V3-SB, permanent voltage for the Stand-by Power system
- +3V3-STANDBY, voltage for IR/Key board
- +12V, input from the power supply for the panel common(active mode)
- 12V, input from the power supply for LNB supply
- +3V3-EMMC, voltage for EMMC when TV on
- TUNER_3V3, supply voltage for tuner
- +5V-SW, input intermediate supply voltage for USB Power
- +12V-AUDIO1 for the AUDIO AMP
- +3.3VA_T2, voltage for Demodulator IC channel decoder

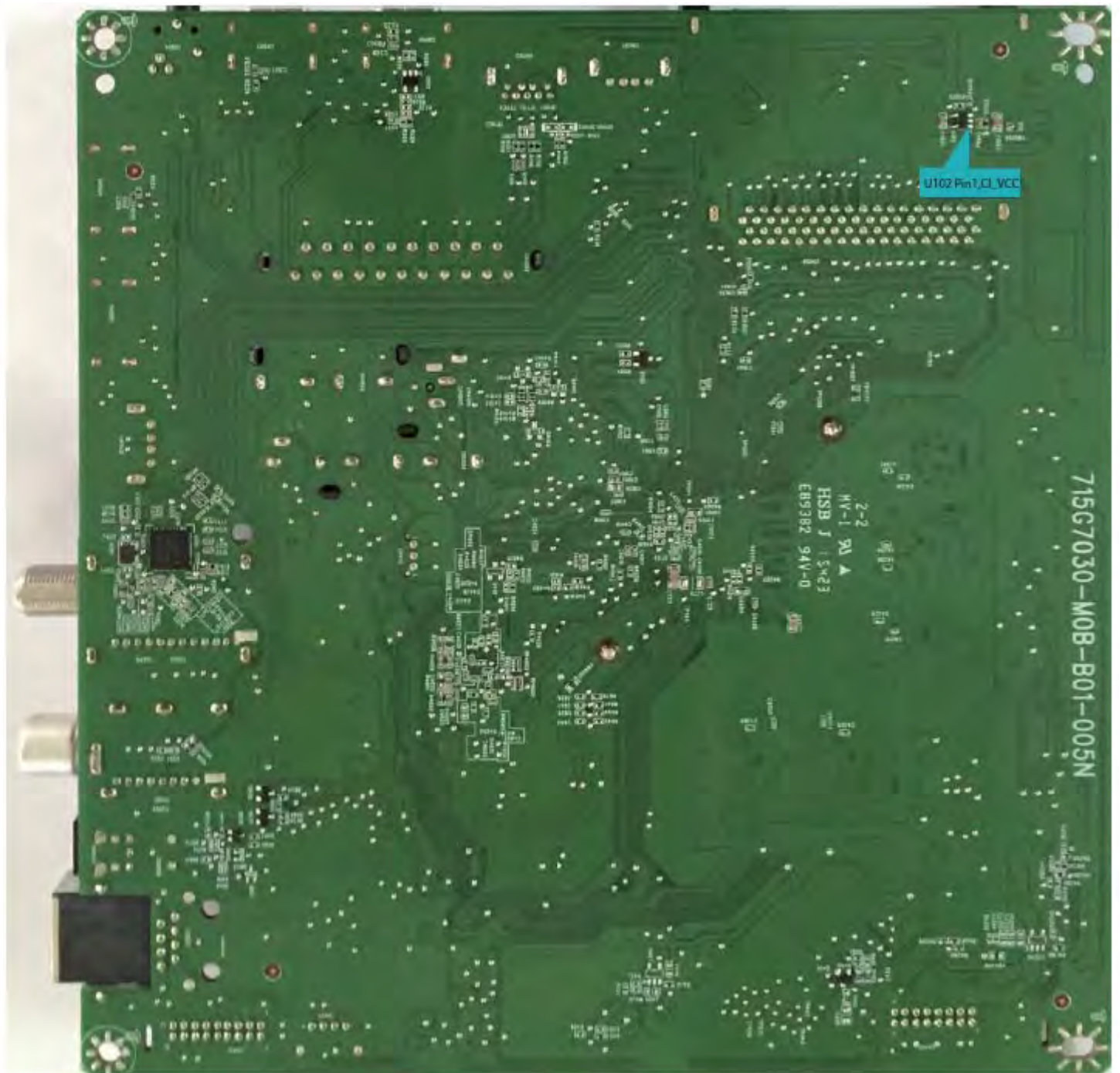
6.3.1 Power tree



6.3.2 Power layout SSB



Power SSB Top View



Power SSB Bottom View

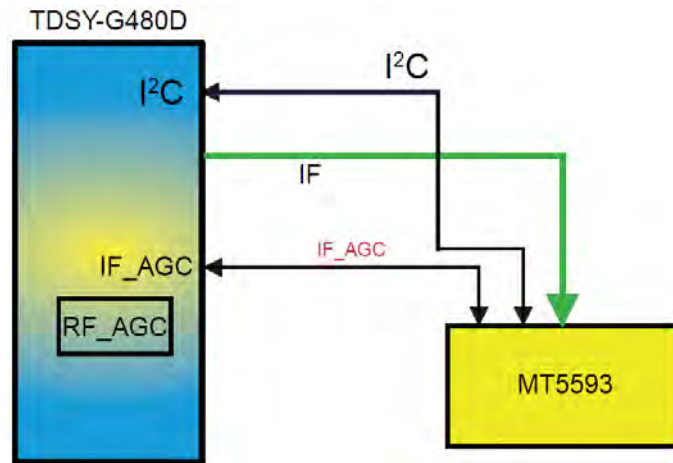
6.4 Front-End Analogue and DVB-T/T2, DVB-C; DVB S/S2, ISDB-T reception

6.4.1 DTB-T/T2 part

Front-End for analogue tuner consist of the following key components:

- TUNER EUROPE TDSY-G480D
- SCALER MT5593FPIJ HSBGA-900 Processor

Below find a block diagram of the front-end application for analogue part..



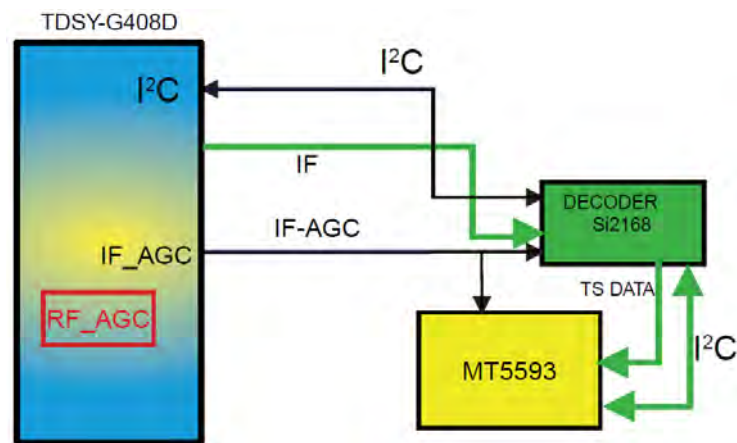
Front-End Analogue block diagram

6.4.1 DTV T2 reception

The Front-End for DVT part consist of the following key components:

- TUNER EUROPE TDSY-G480D
- SCALER MT5593FPIJ HSBGA-900 Processor
- DEMODULATOR Si2168-C50-GMR QFN-48

Below find a block diagram of the front-end application for DTV part.



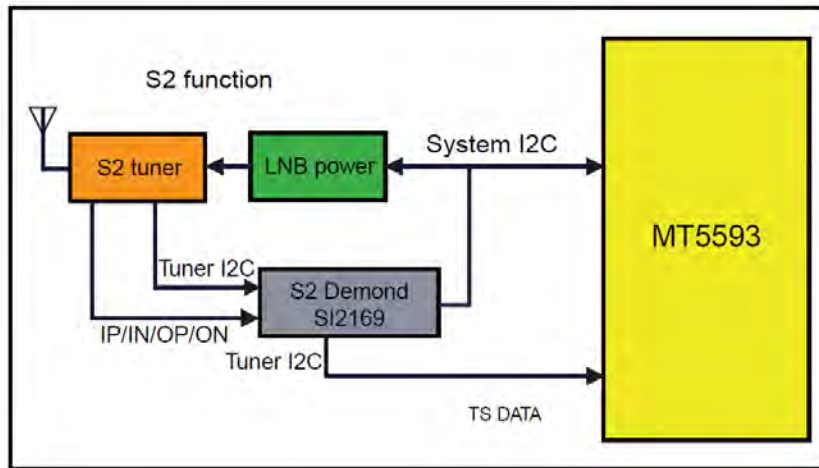
Front-End DVB-T2 DTV block diagram

6.4.2 Front-End DTV-S2 reception

The Front-End for ISTB part consist of the following key components:

- TUNER EUROPE TDQS-A701F
- SCALER MT5593FPIJ HSBGA-900 Processor
- DEMODULATOR Si2166-C50-GMR QFN48

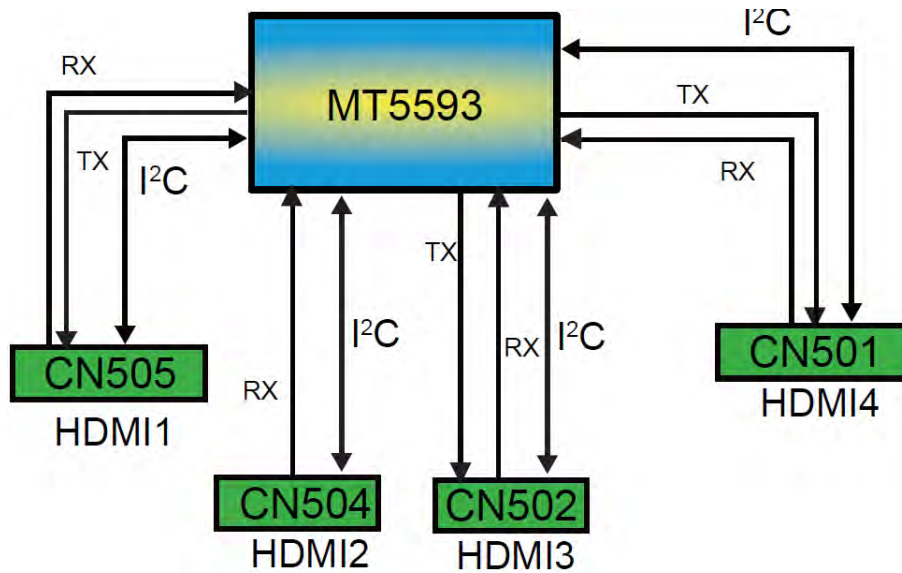
Below find a block diagram of the front-end application for DTV part.



Front-End DVB-S2 DTV block diagram

6.5 HDMI

Refer to below for the application.



HDMI input configuration

The following HDMI connector can be used:

- HDMI 1: HDMI input (TV digital interface support HDMI1.4/HDCP1.3) with digital audio/PC DVI input/ARC
- HDMI 2: HDMI input (TV digital interface support HDCP) with digital audio/PC DVI input/ARC
- HDMI 3: HDMI input (TV digital interface support HDMI1.4/HDCP1.3) with digital audio/PC DVI input/ARC
- HDMI 4: HDMI input (TV digital interface support HDMI1.4/HDCP1.3) with digital audio/PC DVI input/ARC
- +5V detection mechanism
- Stable clock detection mechanism
- HPD control
- CEC control

6.6 Video and Audio Processing - MT5593FPIJ

The MT5593FPIJ is the main audio and video processor (or System-on-Chip) for this platform. It has the following features:

- ATSC /DVB-T /DVB-C/DTMB demodulators
- True 120HZ Full HD MJC
- Power CPU core
- 3D graphic support OpenGL ES 1.1/2.0
- A multi-standard video decoder
- A transport de-multiplexer
- One HDMI 2.0 receiver with 3D support
- MHL2.0& Standby charging
- 2D/3D converter
- Rich format audio codec
- Local dimming (LED backlight)
- Ethernet MAC+PHY
- TCON
- Panel overdrive control
- Four-link LVDS, mini-LVDS, V-by-one, EPI

The MT5593FPIJ family consists of a DTV front-end demodulator, a backend decoder and a TV controller and offers high integration for advanced applications. It integrates a transport de-multiplexer, a high definition video decoder, an audio decoder, a four-link LVDS transmitter, a mini-LVDS transmitter, a V-by-one transmitter, an EPI transmitter, and an NTSC/PAL/SECAM TV decoder with 3D comb filter(NTSC/PAL).

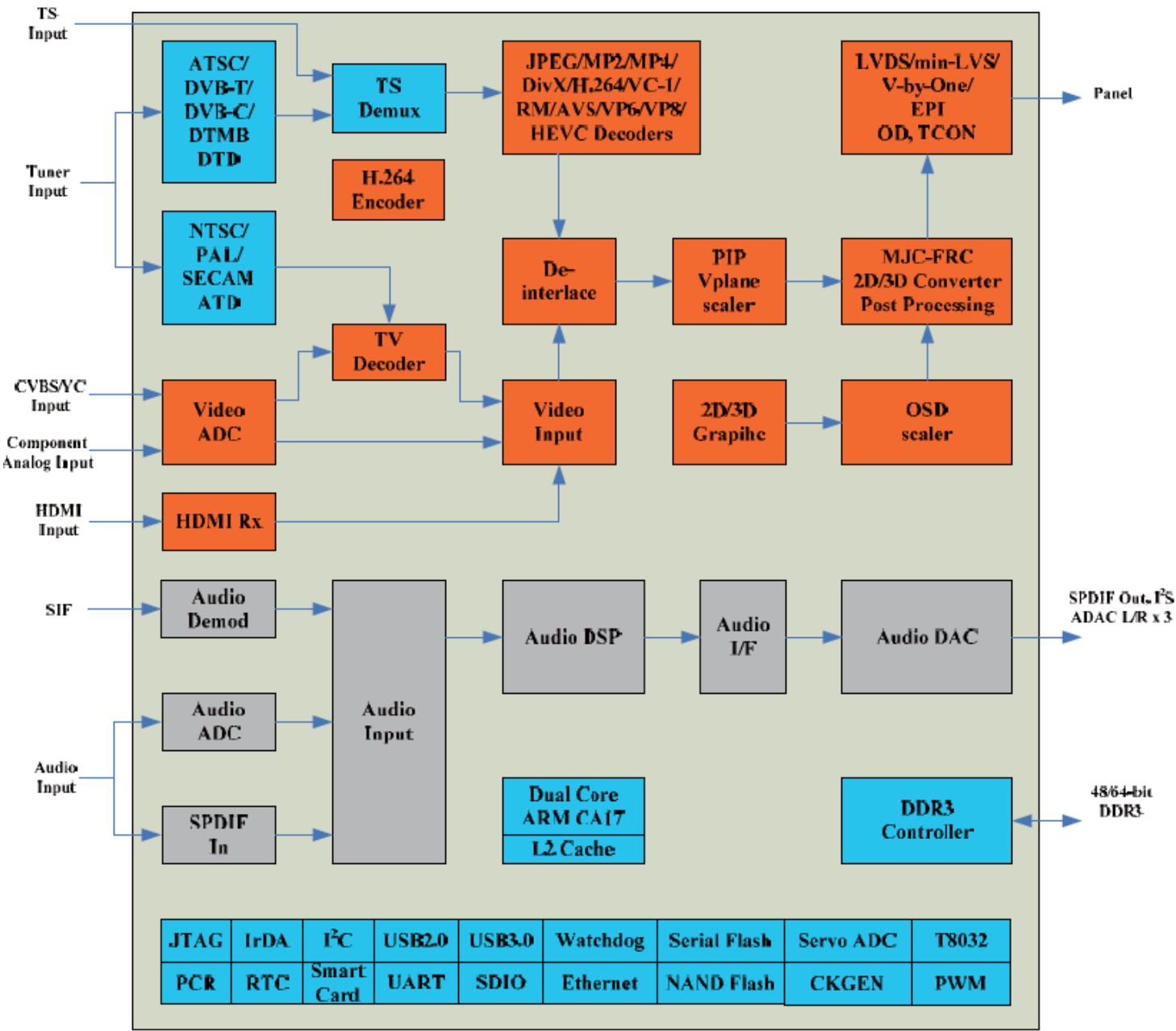
The MT5593FPIJ enables consumer electronics manufacturers to build high quality, low cost and feature-rich DTV. The MT5593FPIJ family supports Full-HD MPEG1/2/4/H.264/VC1/RM/AVS/ and H.264/HEVC video decoder standards, and JPEG. The MT5593FPIJ also supports edia Tek MDDi de-interlace solution which can reach very smooth picture quality for motions. A 3D comb filter added to the TV decoder recovers great details for still pictures.

The special color processing technology provides a natural, deep colors and true studio quality video. Moreover, the MT5593 family has built-in high resolution and high-quality audio codec. The MT5593FPIJ family provides consumers with and Full-HD 120Hz experience. It integrates high-quality Full-HD ME/MC technology. The MT5593FPIJ family supports ATSC, DVB-T and DVB-C, DTMB demodulation functions. It reserves transport stream inputs for external demodulators for other countries or areas. TV maker can easily port the same UI to worldwide TV models. First-class adjacent and co-channel rejection capability grants excellent reception. Professional error-concealment provides stable, smooth and mosaic-free video quality.

7. IC Data Sheets

7.1 MT5593FPIJ (IC U401)

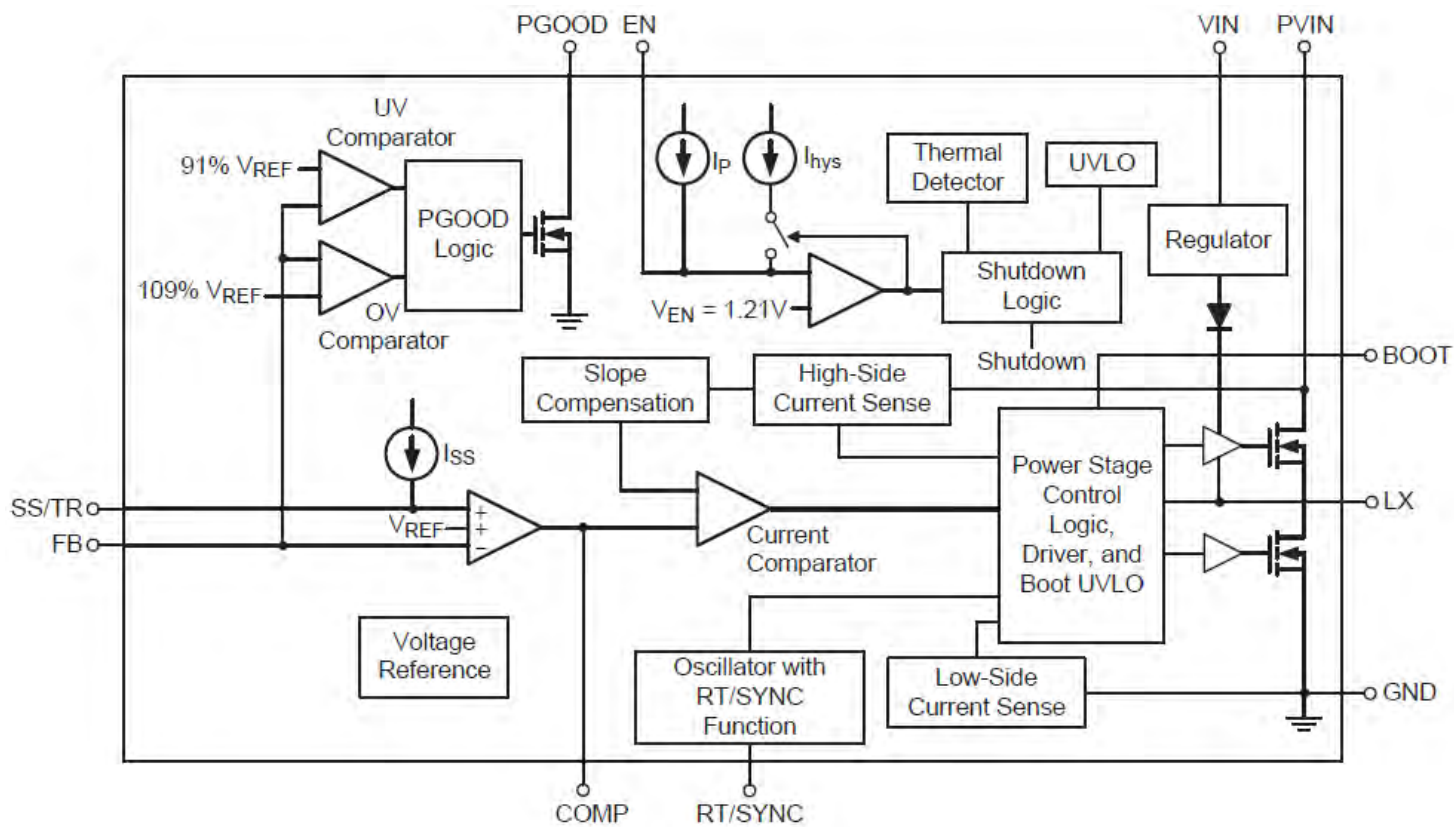
Block diagram



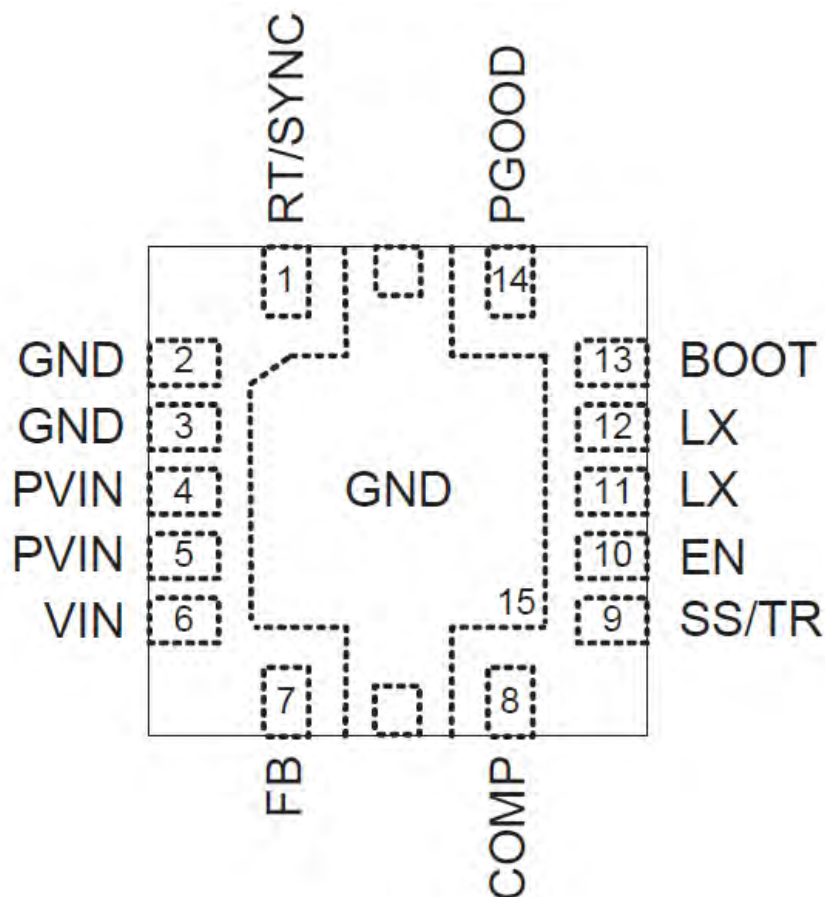
[illegible]

7.2 RT7299BHGQW (IC U704)

Block diagram

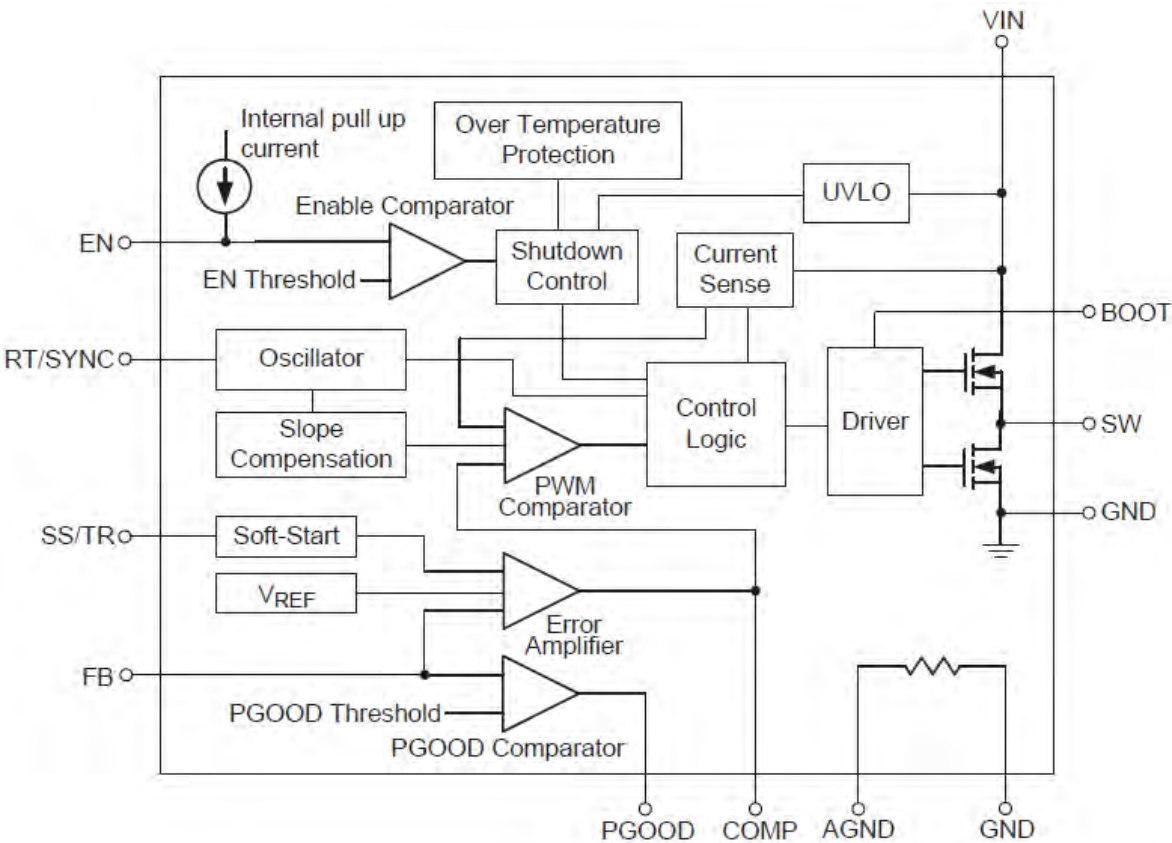


Pinning information

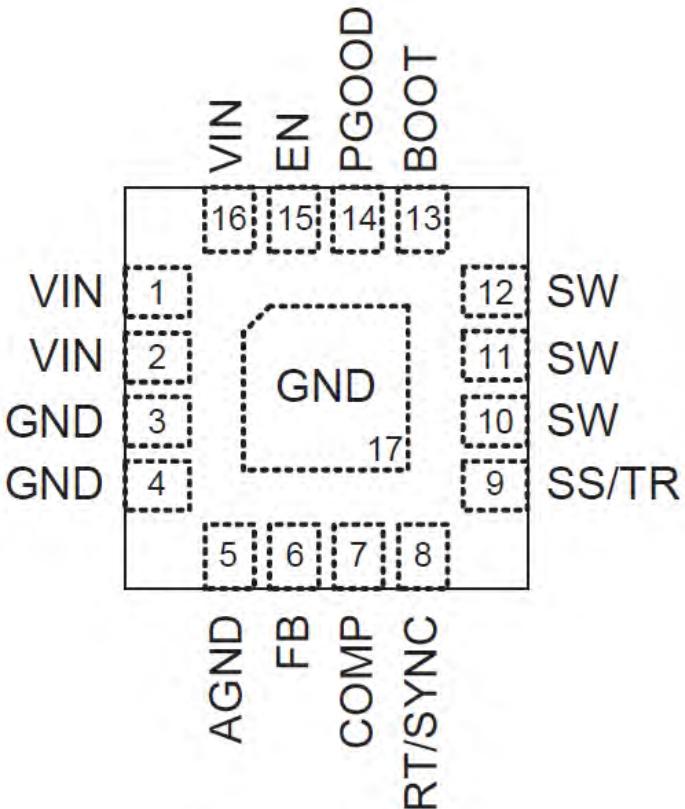


7.3 RT8079GQW (IC U710)

Block diagram

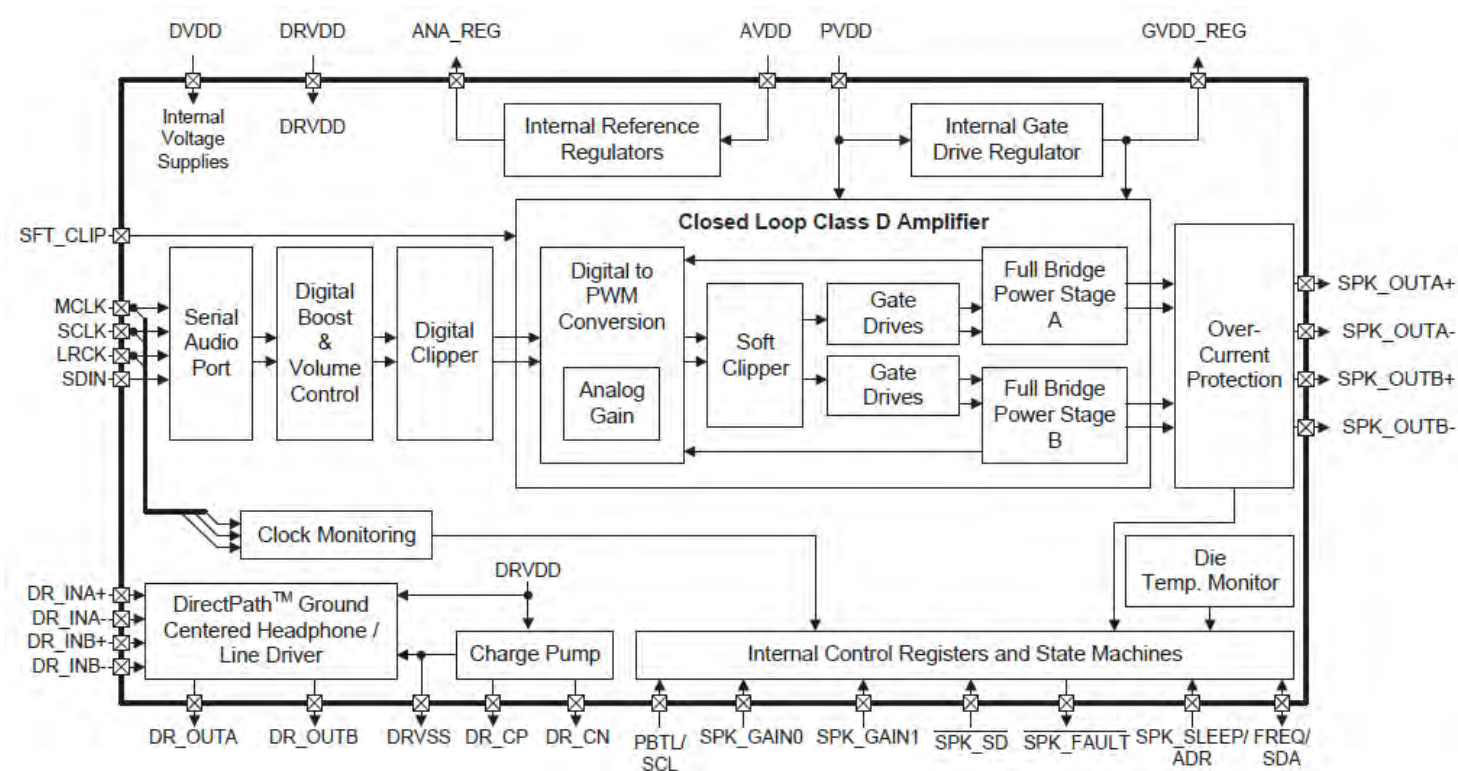


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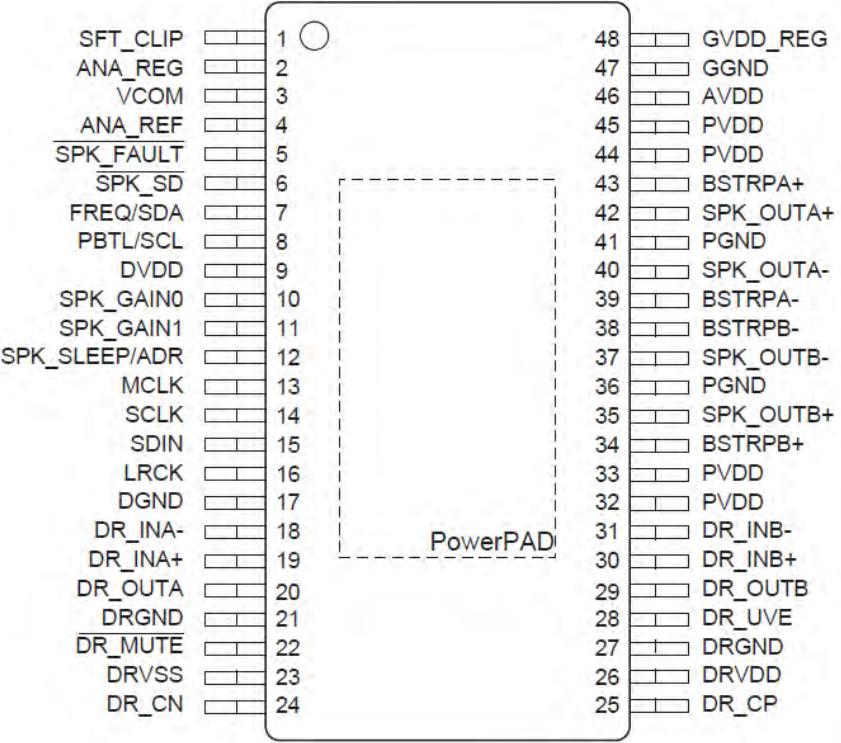


7.4 TAS5760LDDCAR (IC U601)

Block diagram

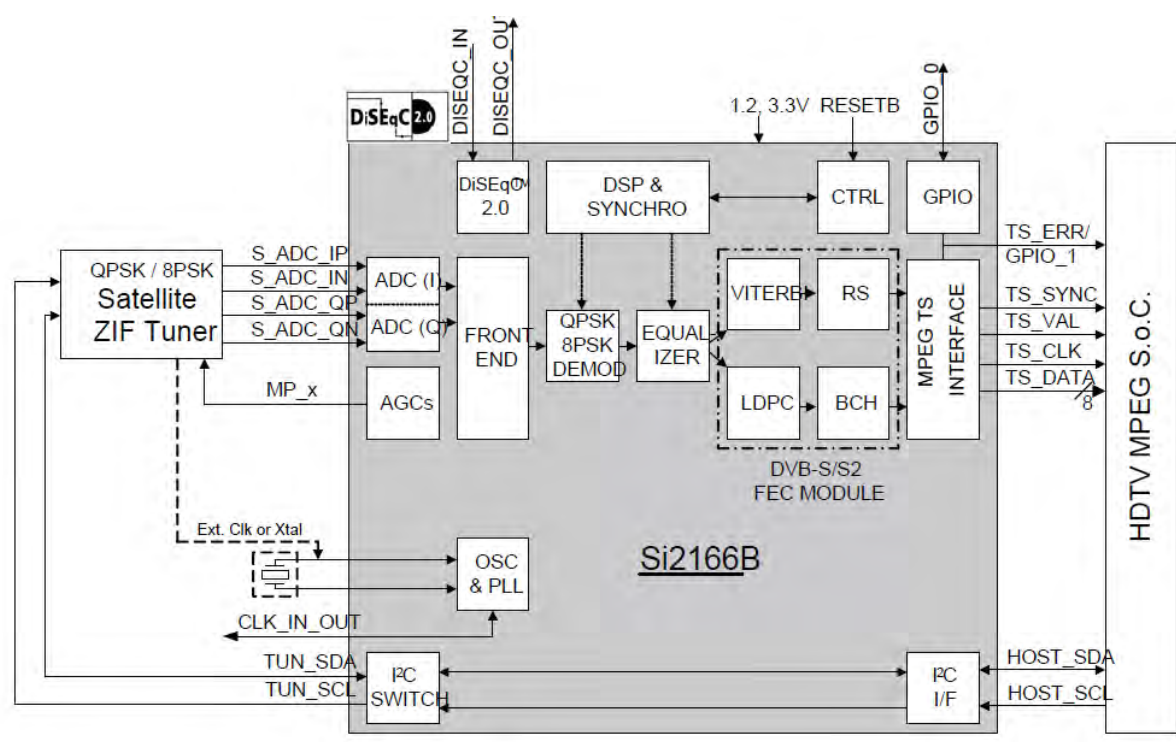


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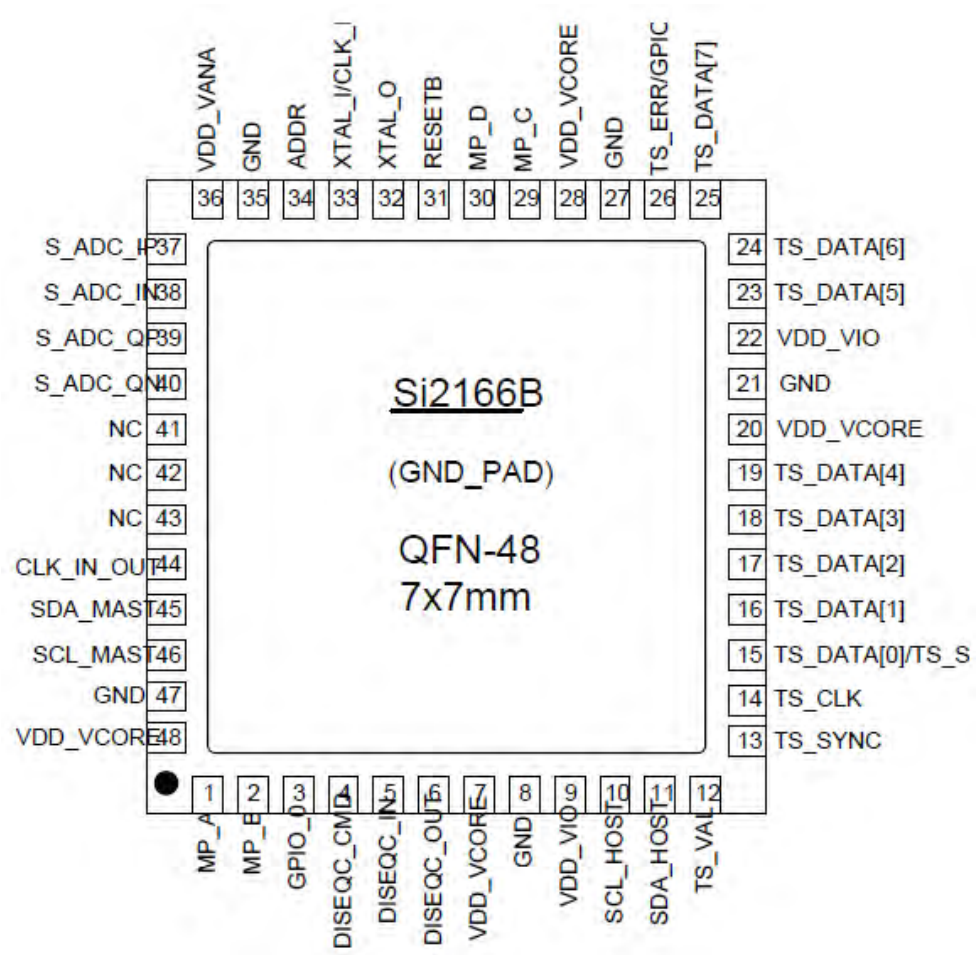


7.5 Si2168-C50-GMR (IC U201)

Block diagram



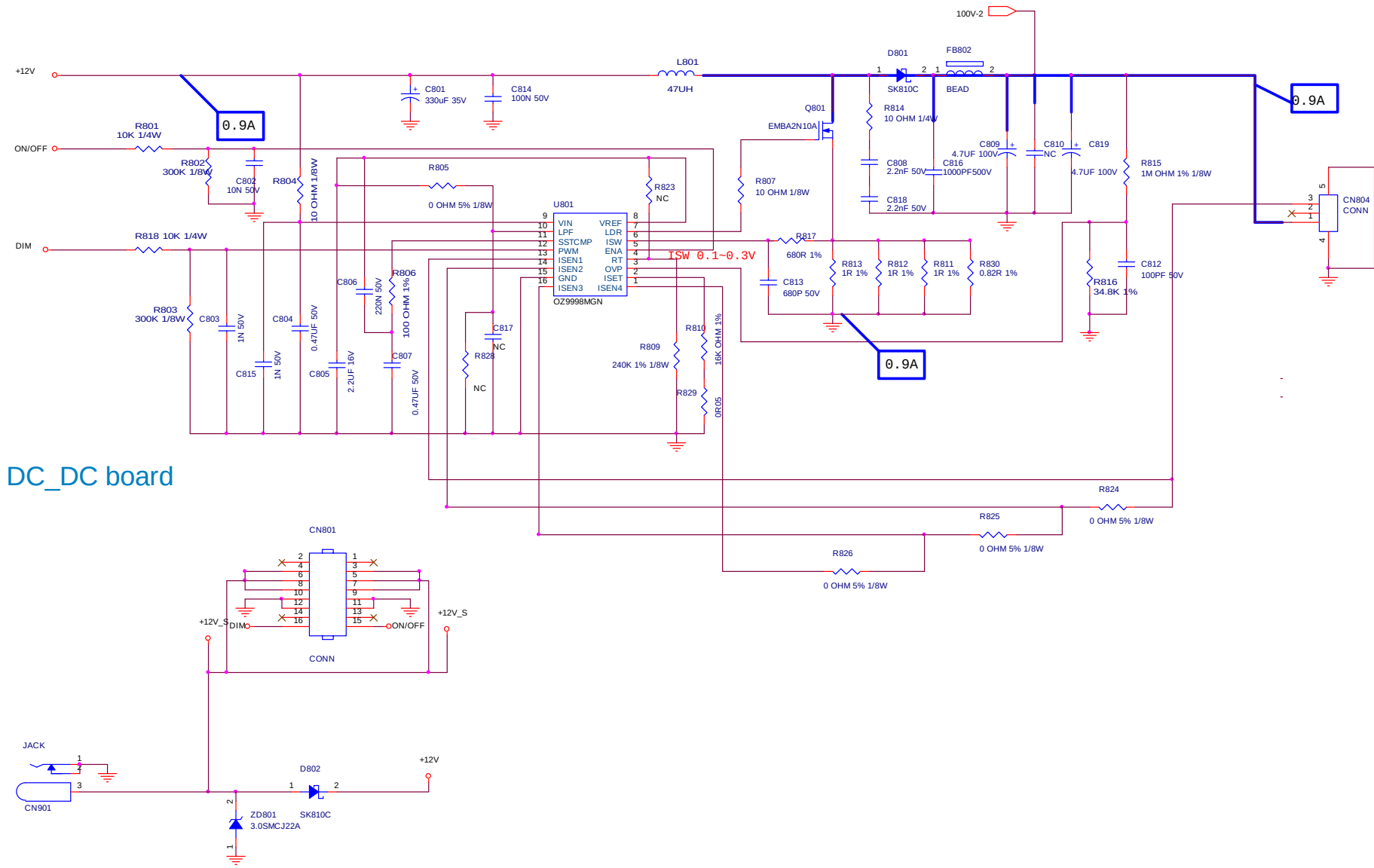
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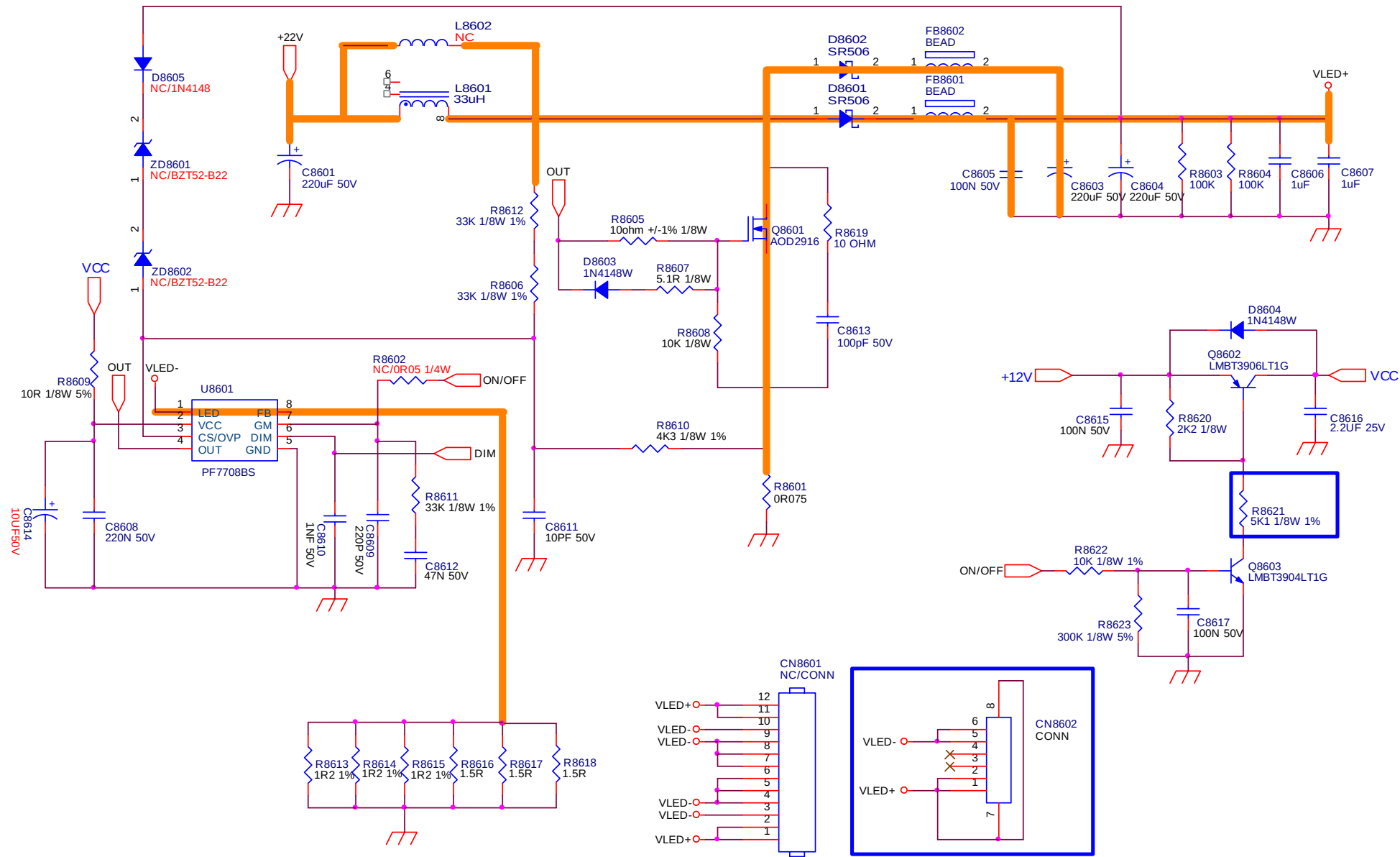
8.Circuit Diagrams

8.1 715G7364 PSU (For 32"6402 Series)

8-1-1 POWER



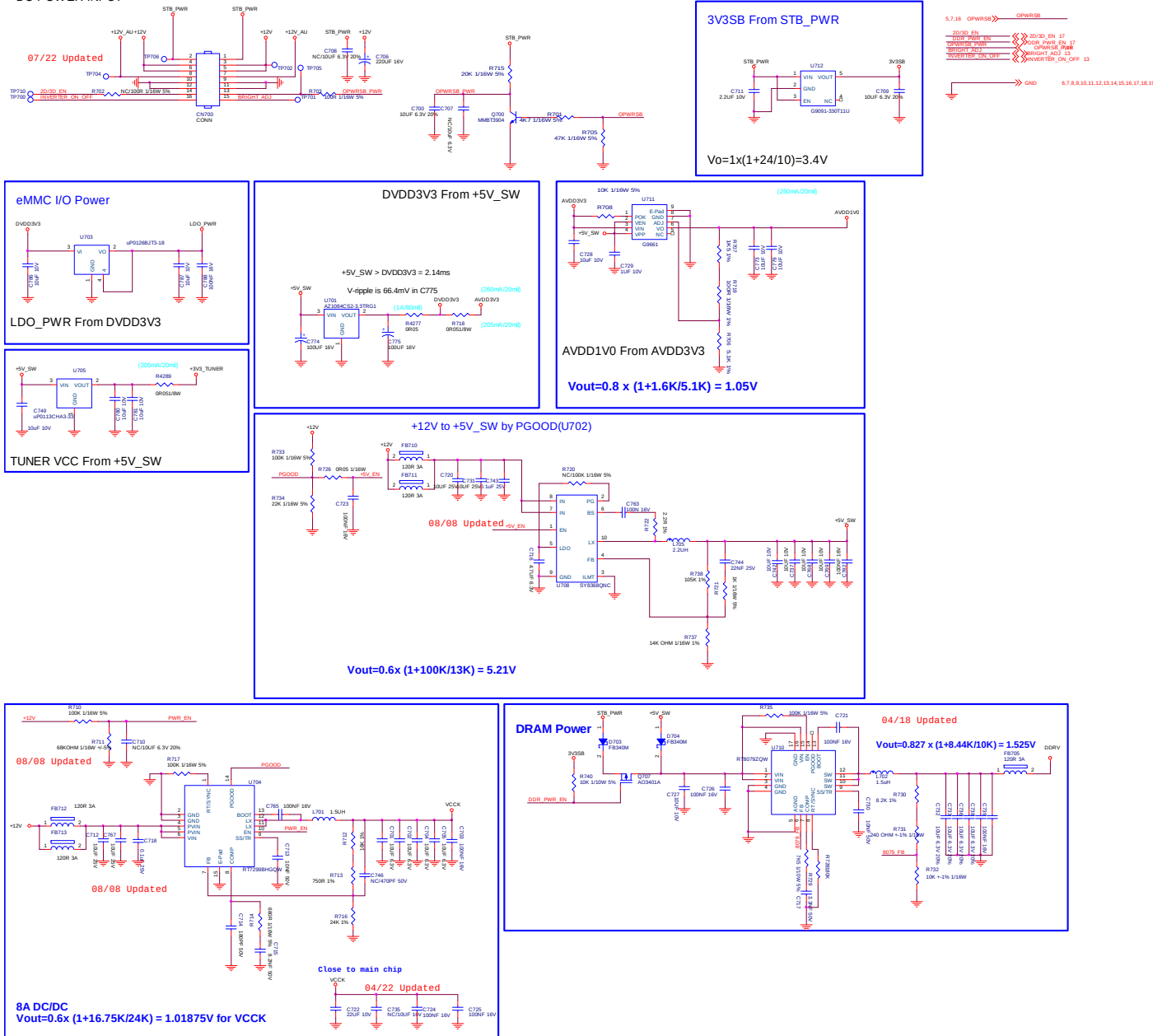
8-1-2 LED DRIVER



8.2 715G7030 MAIN

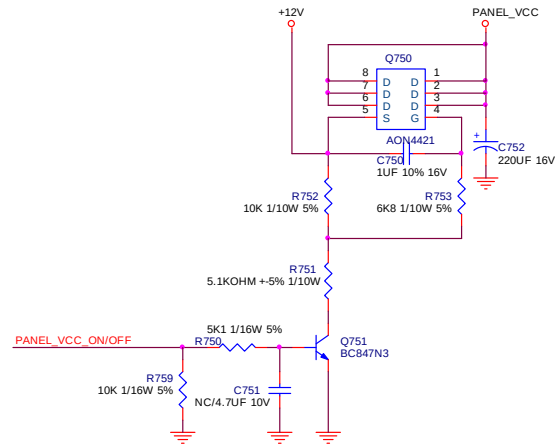
8-2-1 System Power 1

DC POWER INPUT

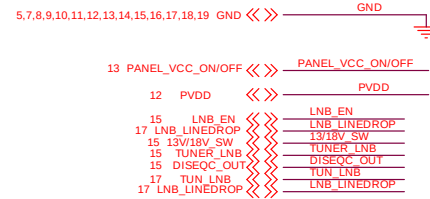
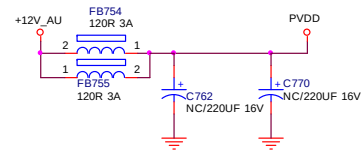


8-2-2 System Power 2

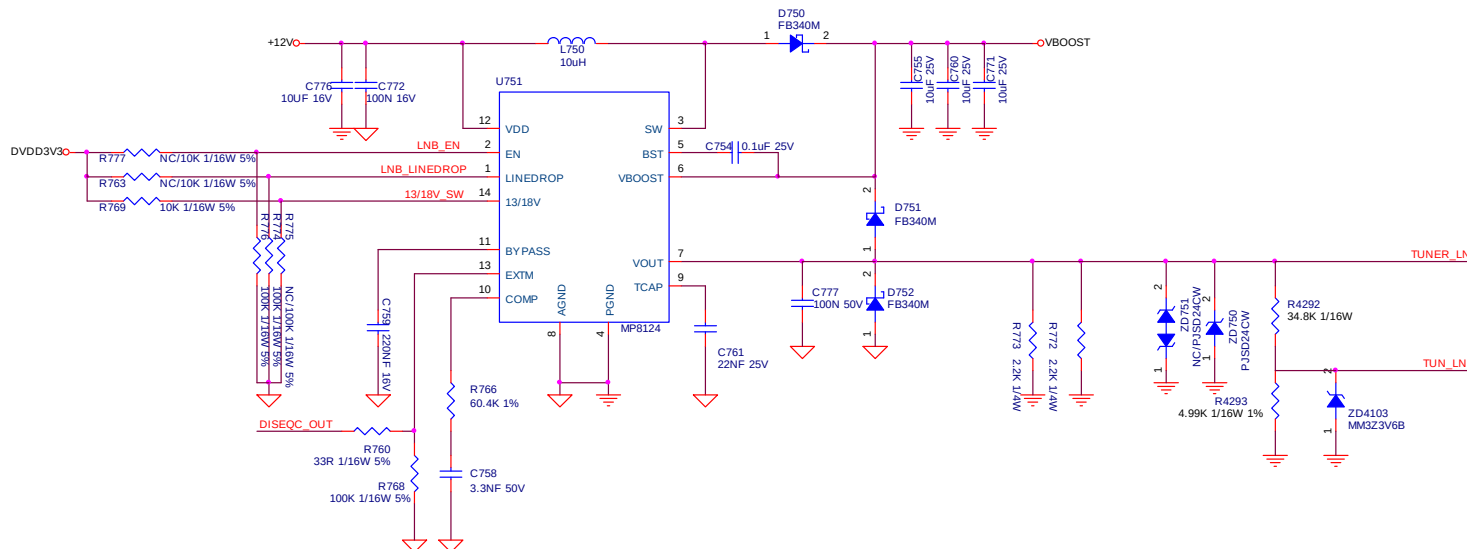
Panel VCC=12V



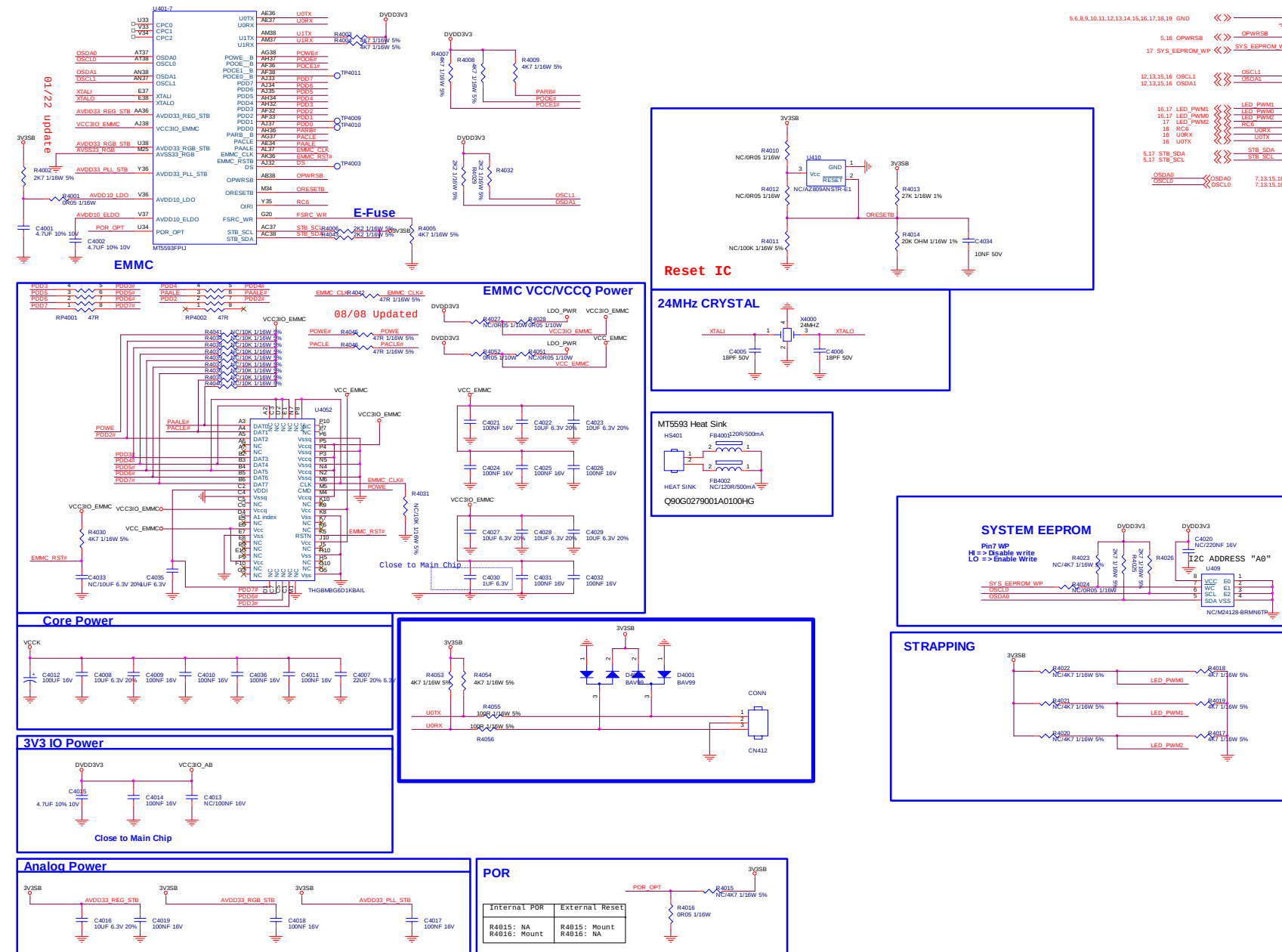
Audio VCC= +12V



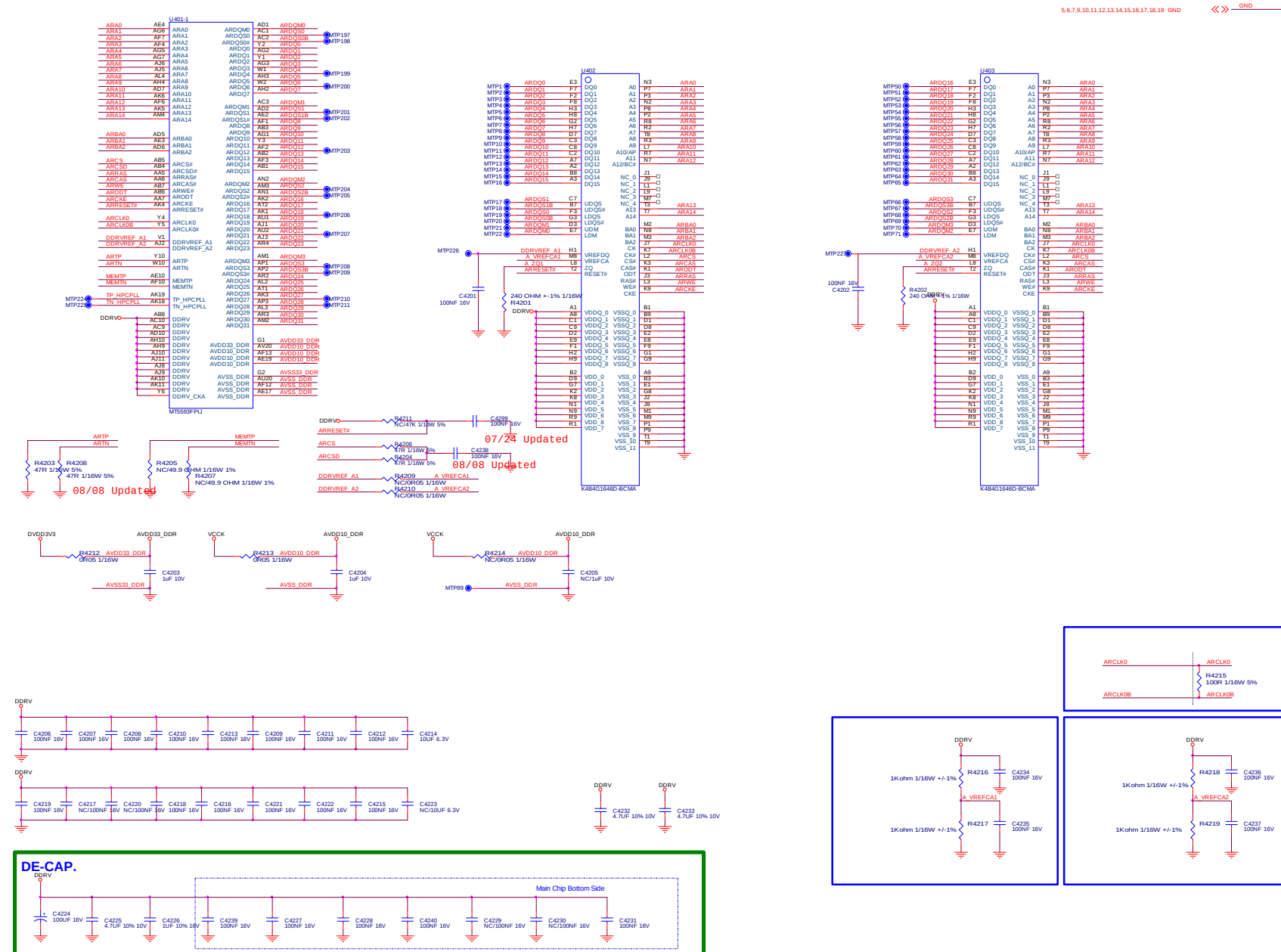
LNB POWER SUPPLY



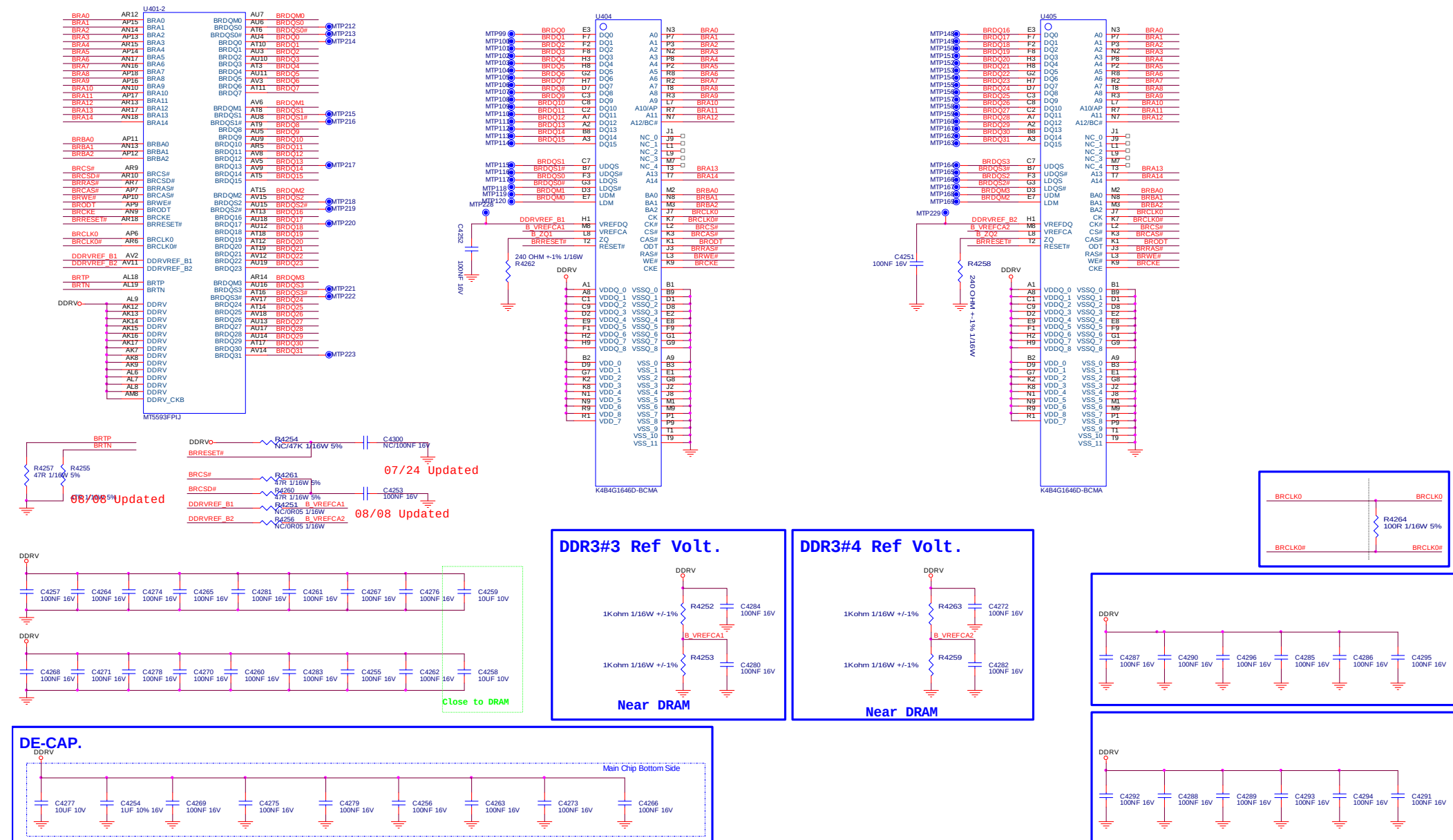
8-2-3 Peripheral



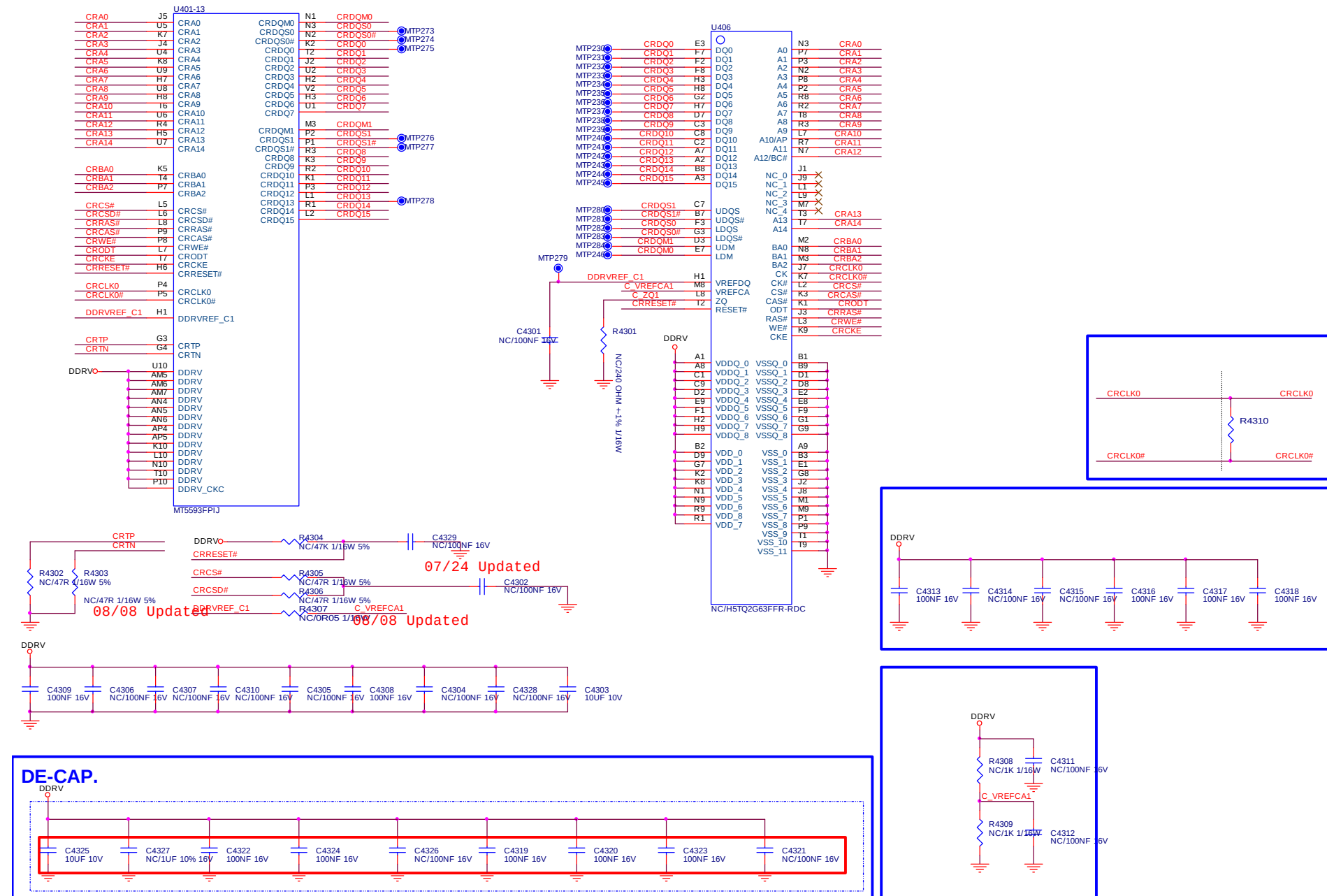
8-2-4 DDR3x2



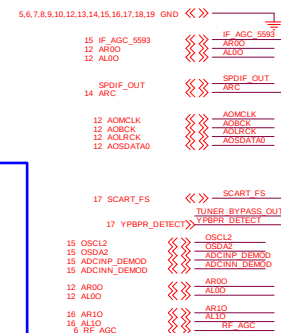
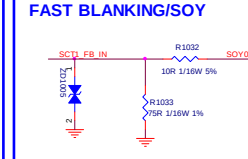
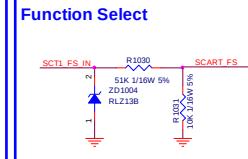
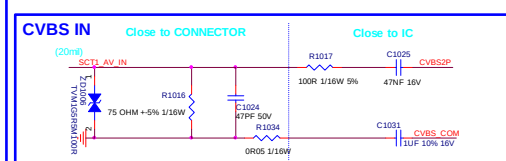
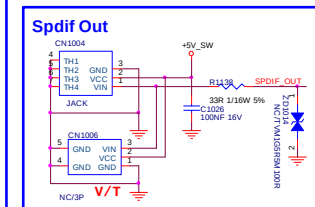
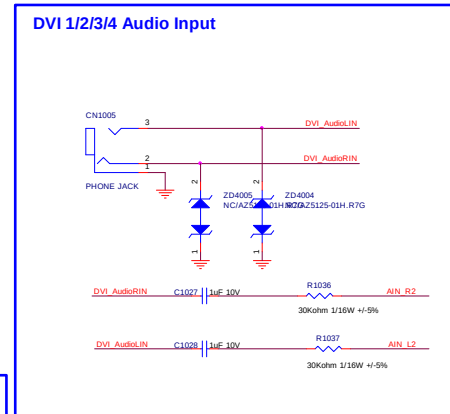
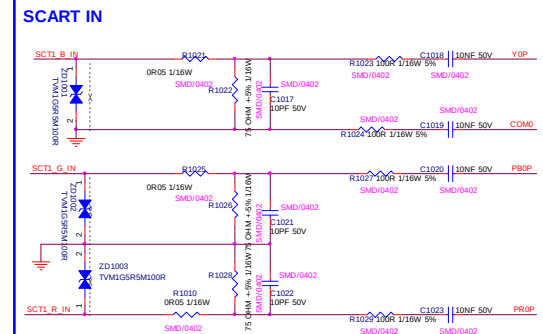
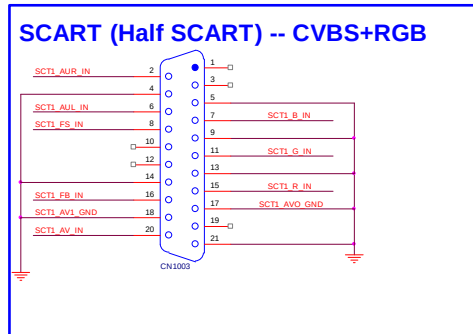
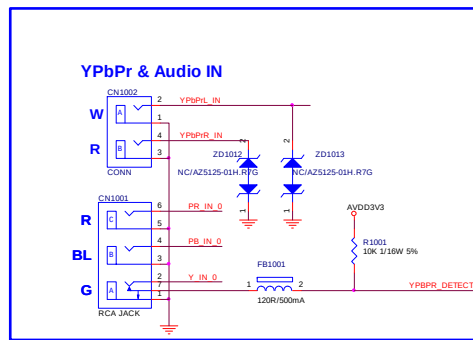
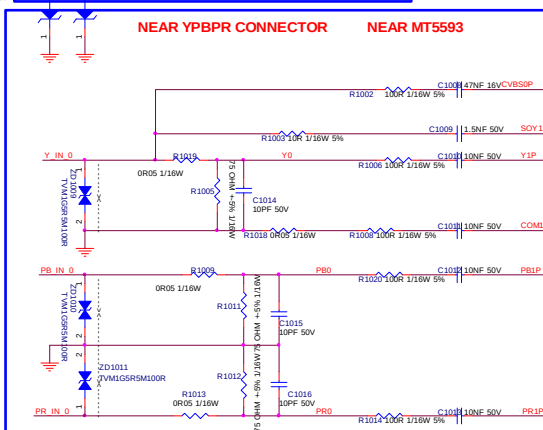
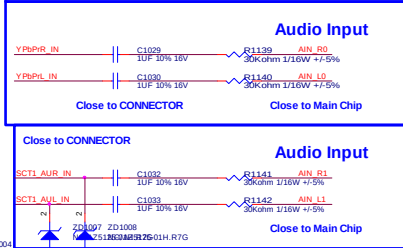
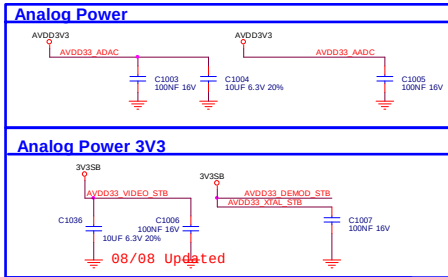
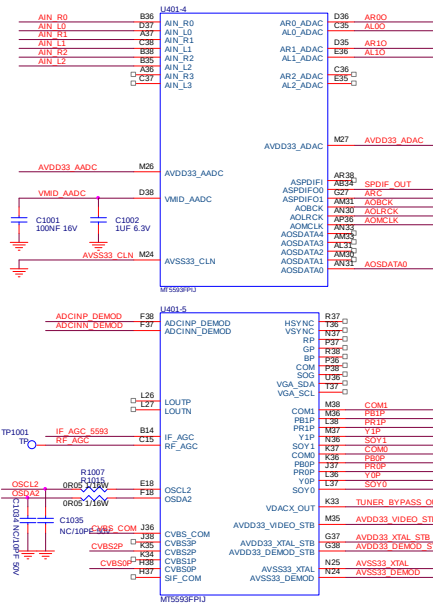
8-2-5 DDR3x2



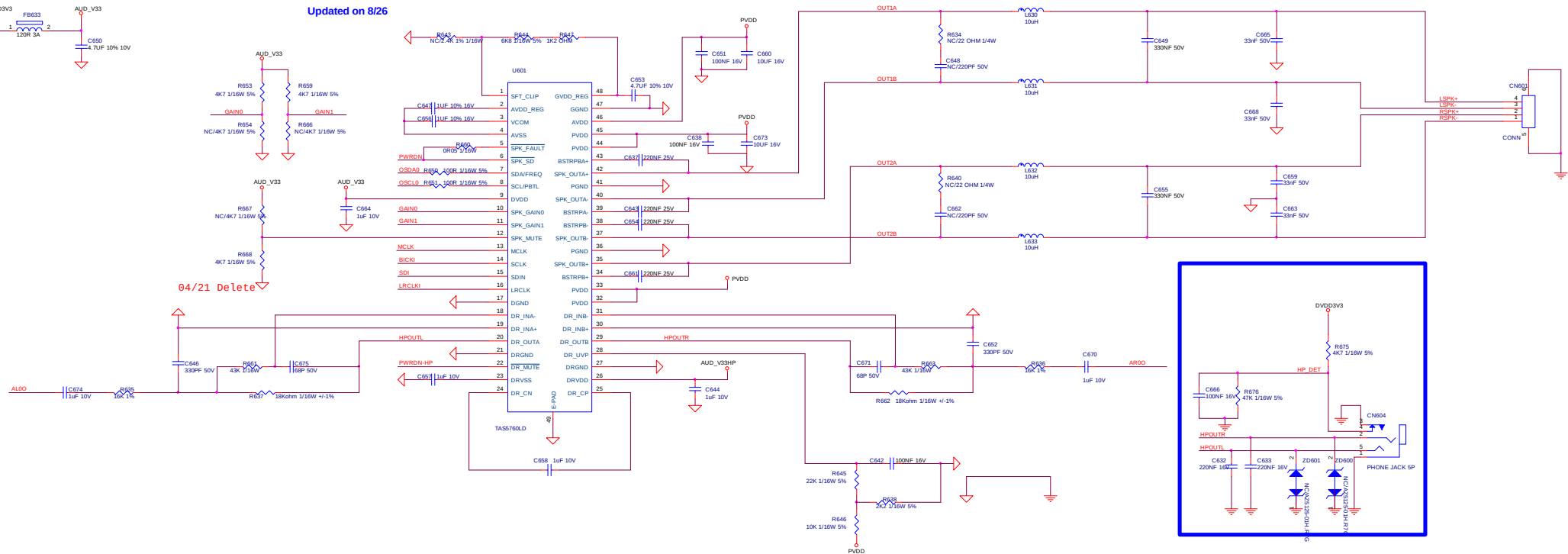
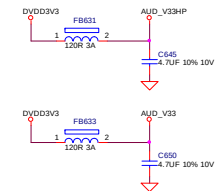
8-2-6 DDR3x1



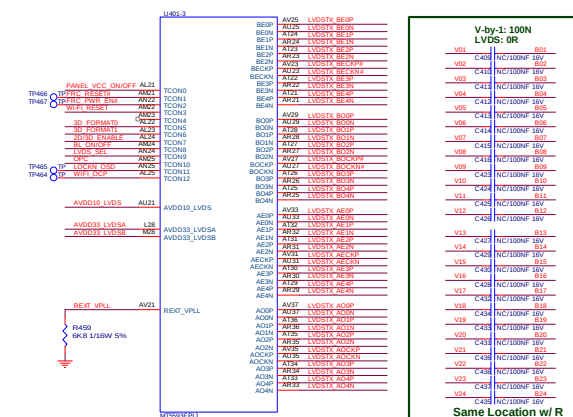
8-2-7 SCART/YPbPr



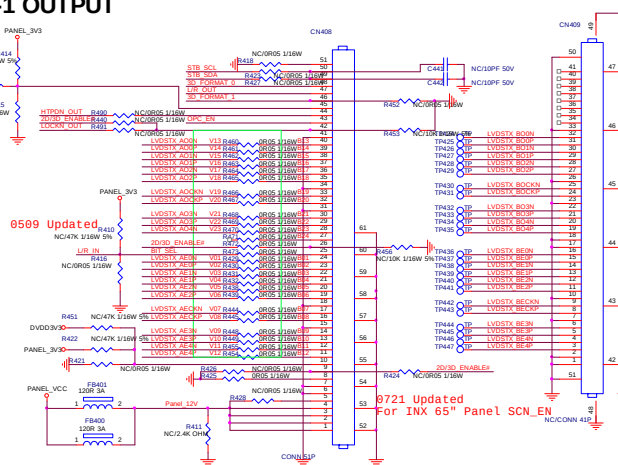
Main Speak CKT



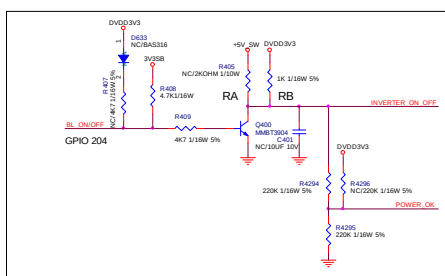
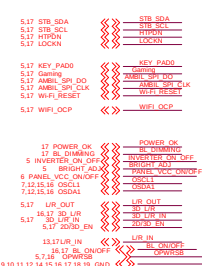
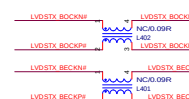
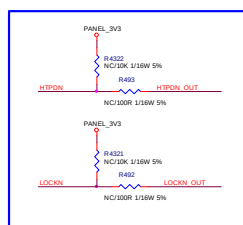
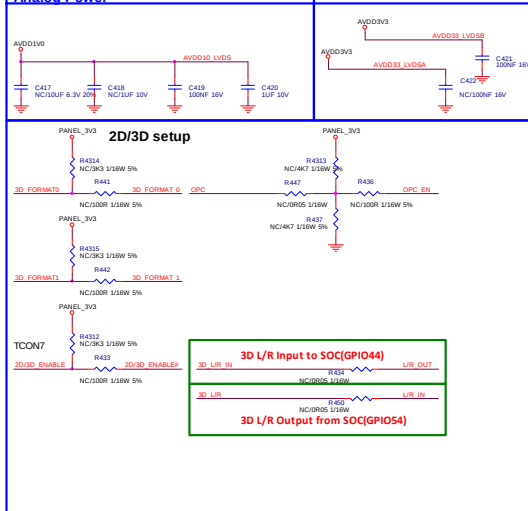
8-2-9 LVDS



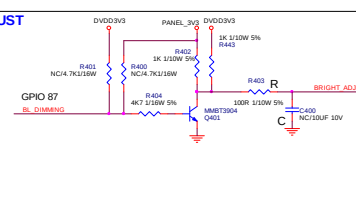
LVDS/V-BY-1 OUTPUT



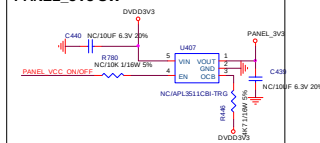
Analog Power



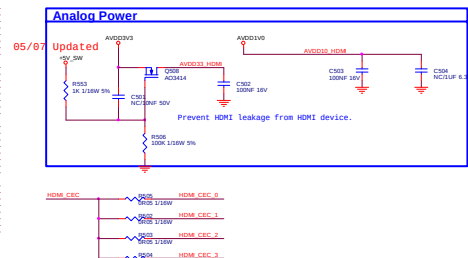
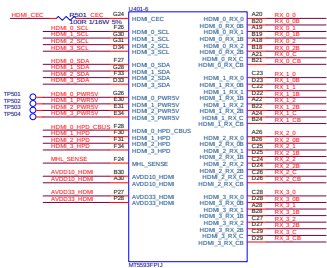
BRIGHT ADJUST



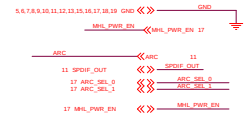
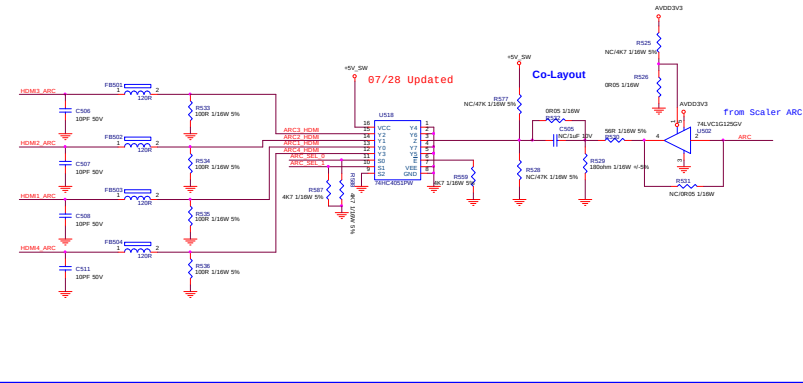
PANEL 3V3 SW



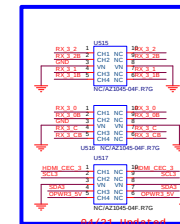
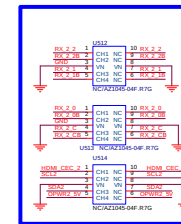
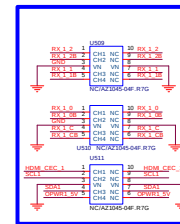
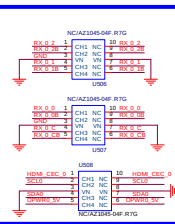
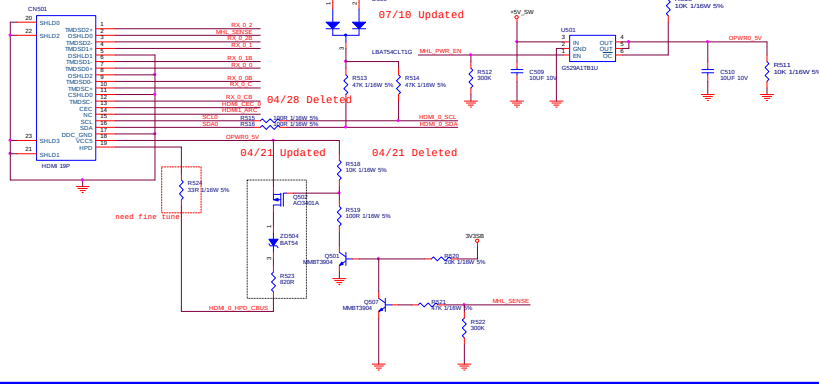
8-2-10 MHL/HDMI Input



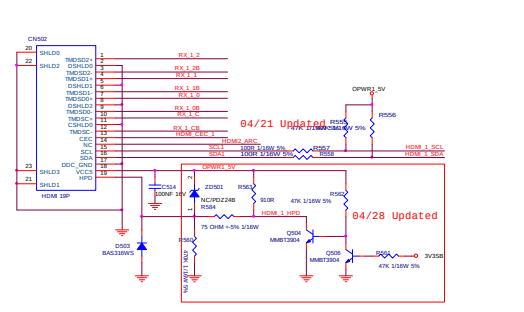
Audio Return Channel (ARC)



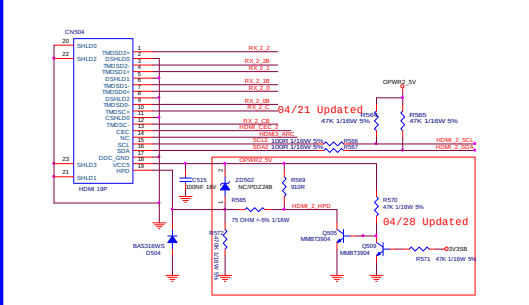
HDMI Port4 (MHL)



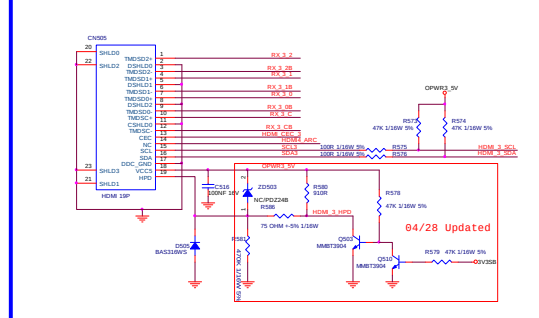
HDMI port 3 (Embedded EDID)



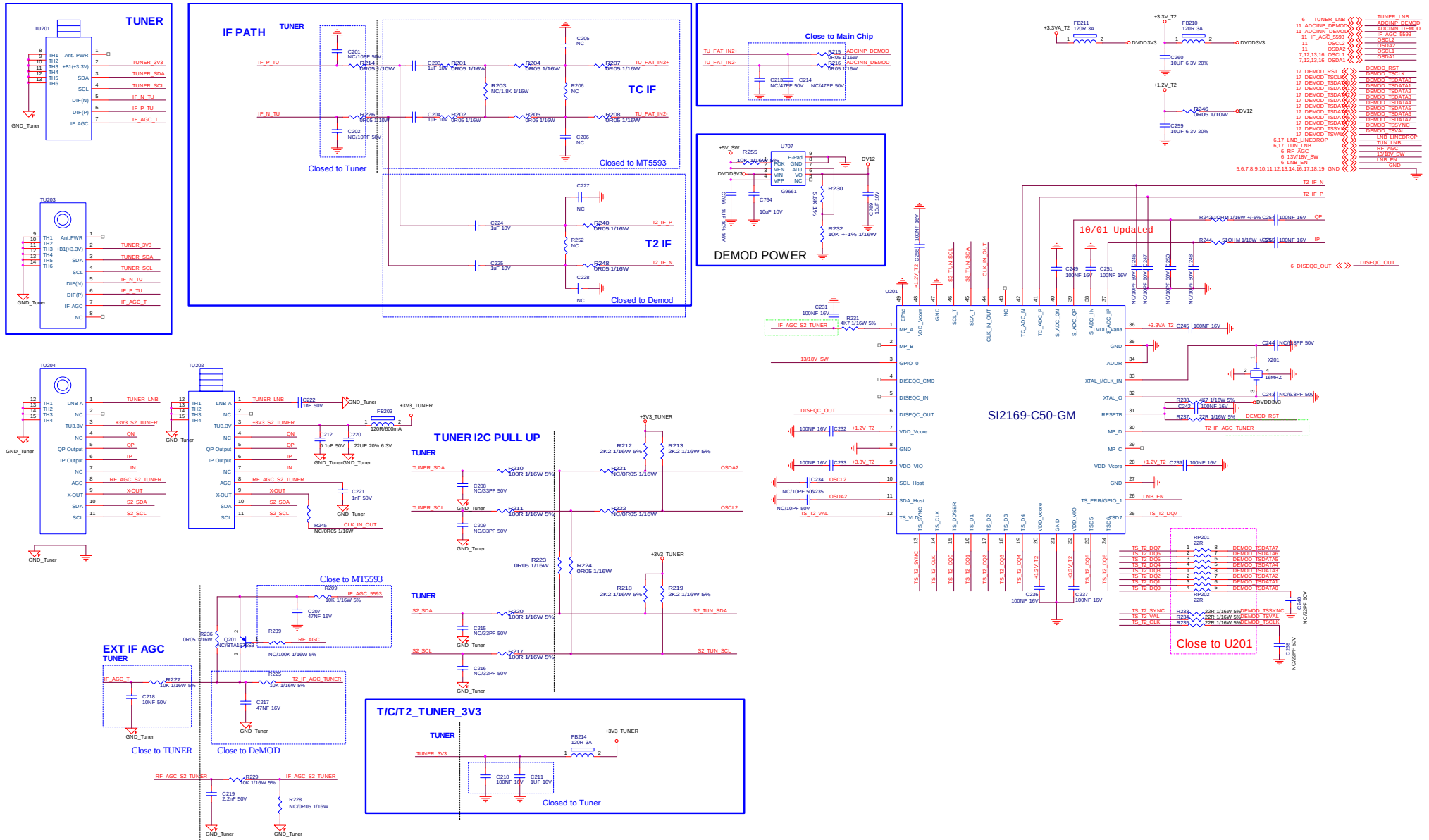
HDMI port 2 (Embedded EDID)



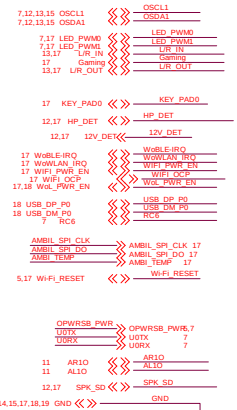
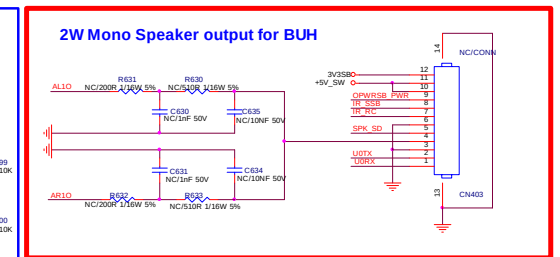
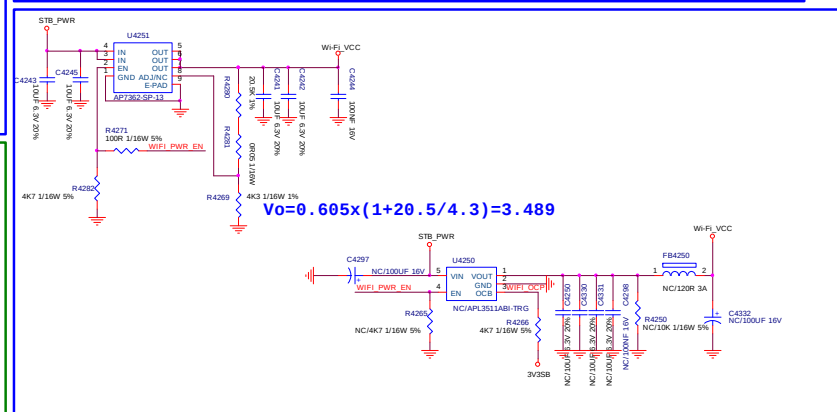
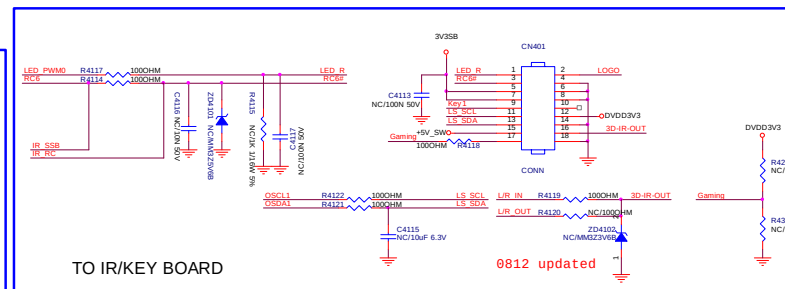
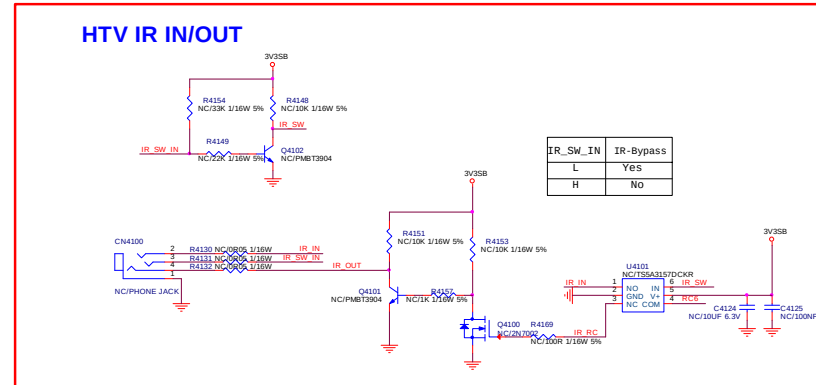
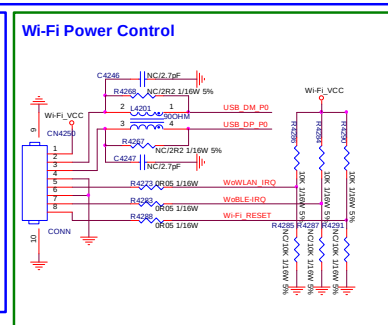
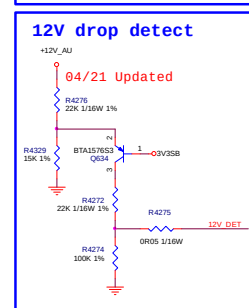
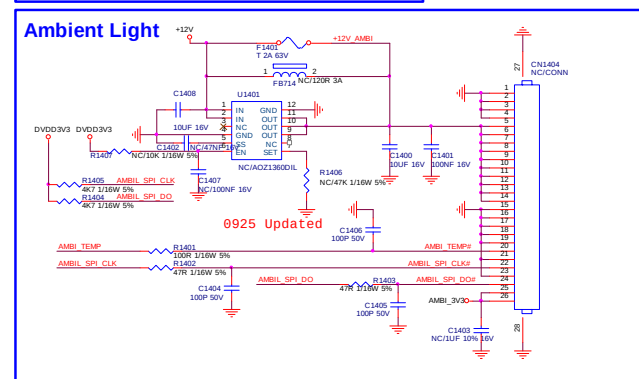
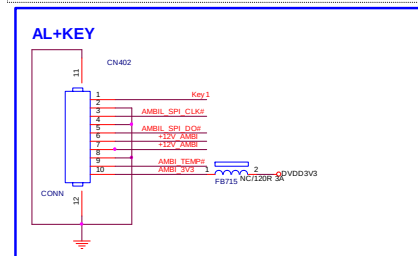
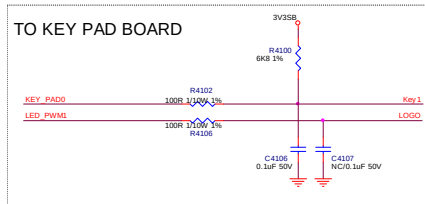
HDMI port 1 (Embedded EDID)



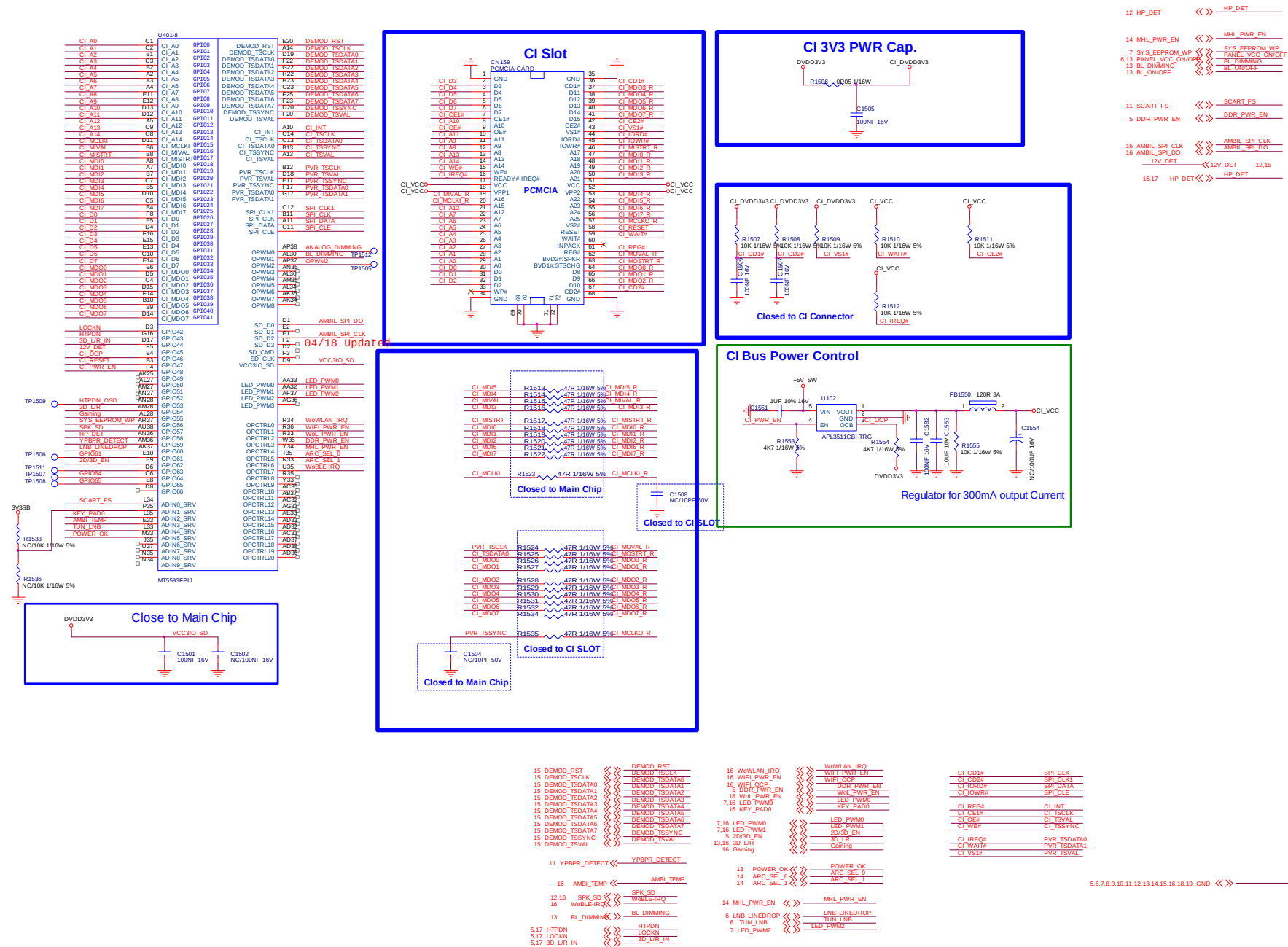
8-2-11 Tuner/Demodulator



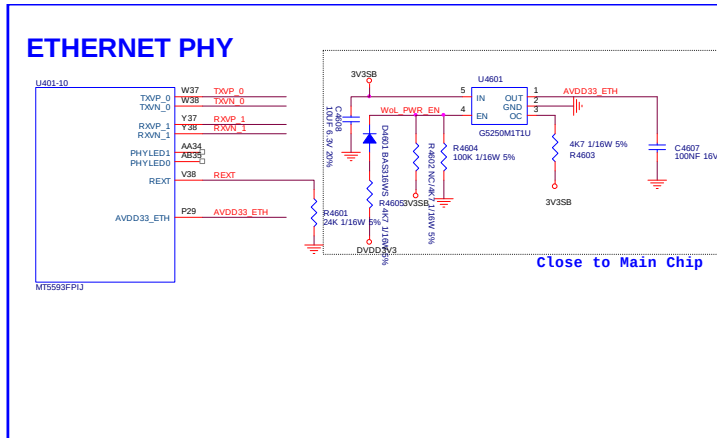
8-2-12 Connector



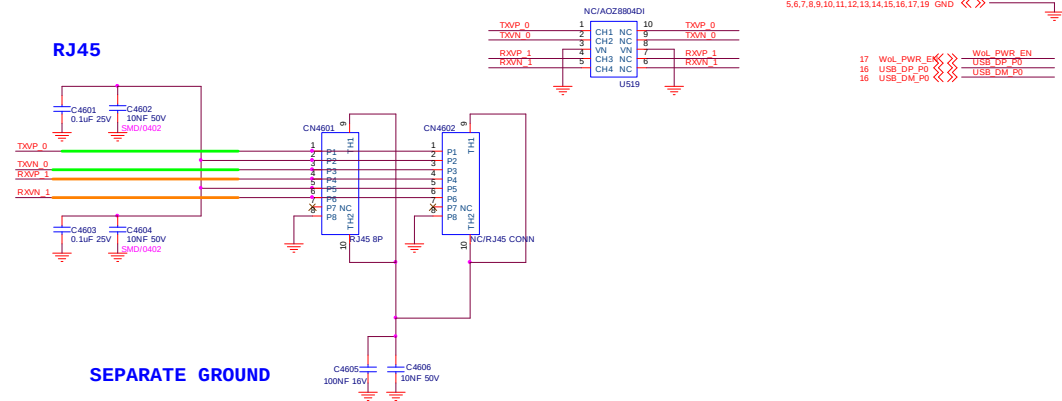
8-2-13 Internal CI



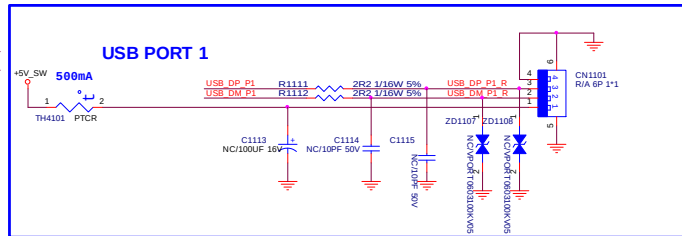
8-2-14 USB/ETHERNET PHY



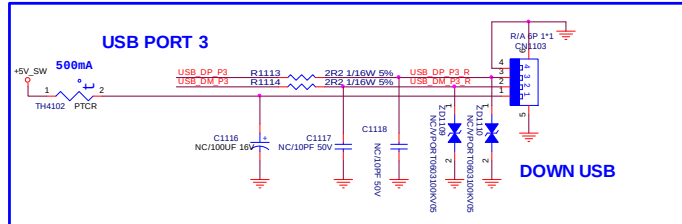
RJ45



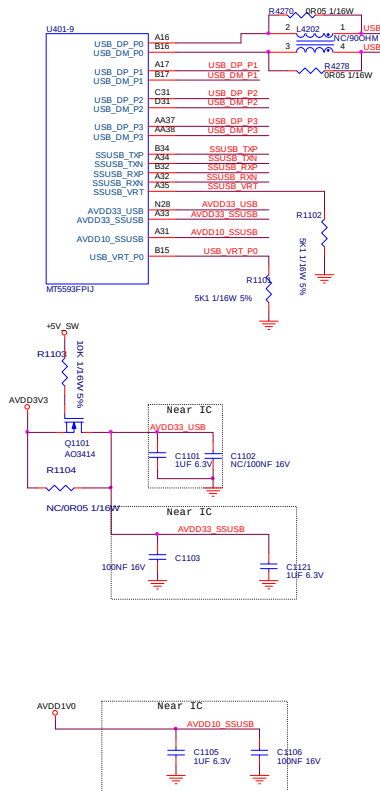
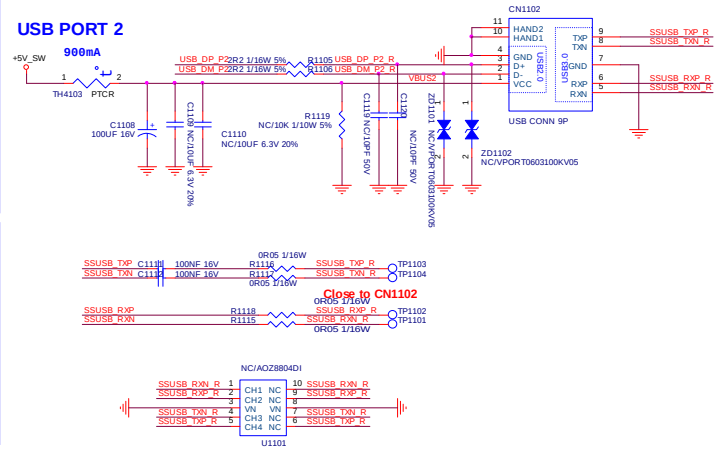
USB PORT 1



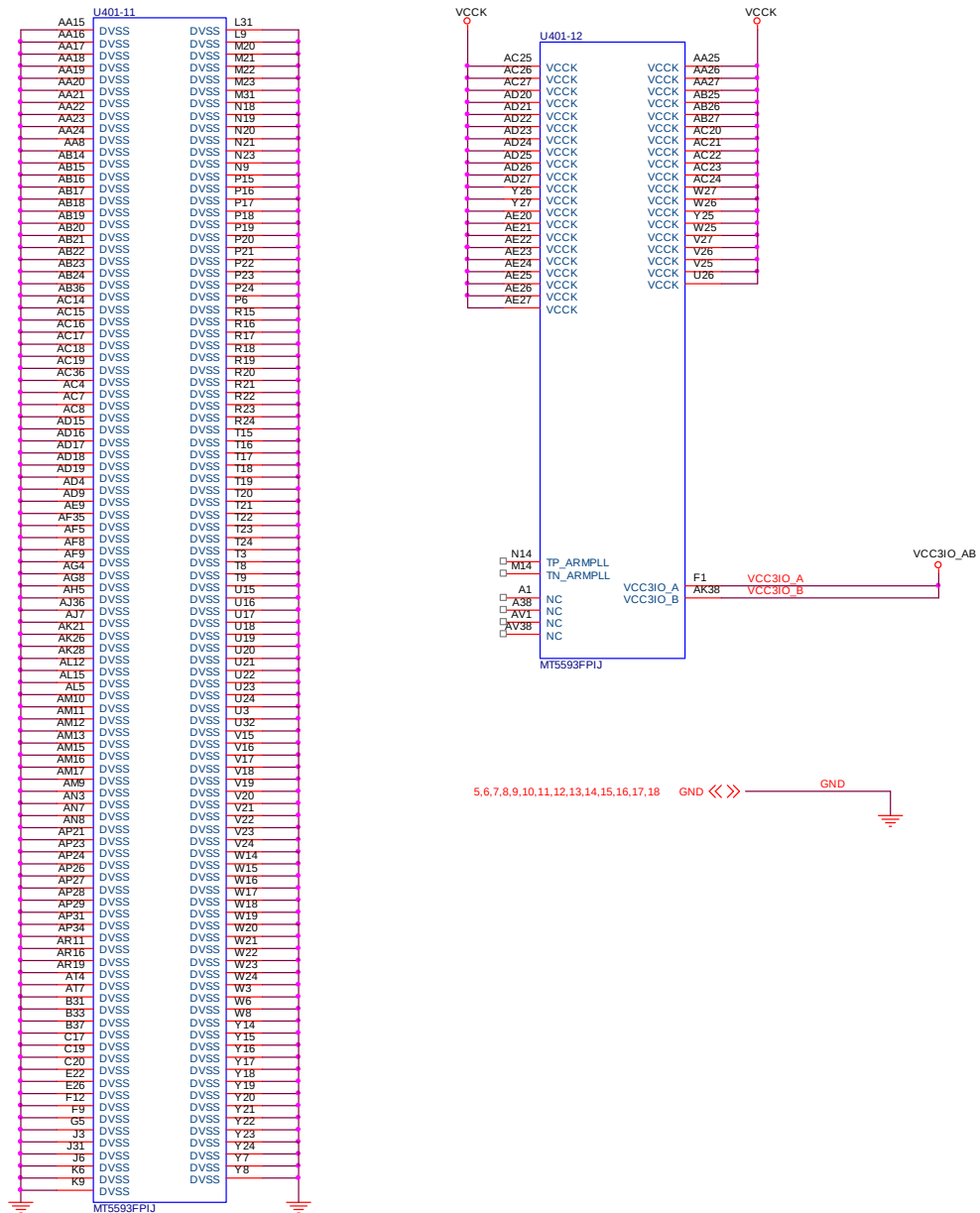
USB PORT 3



USB PORT 2

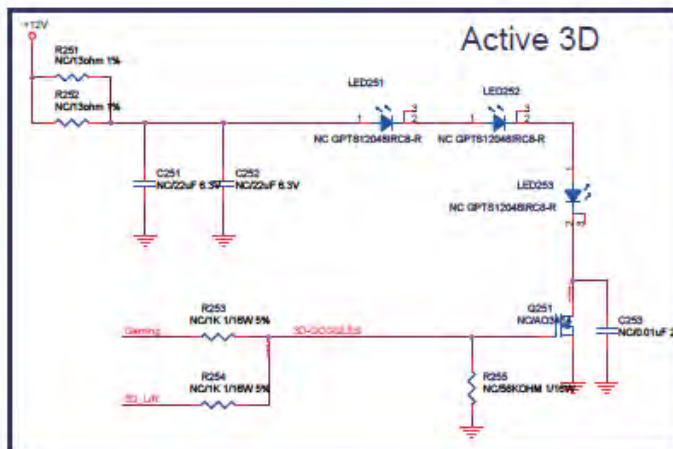
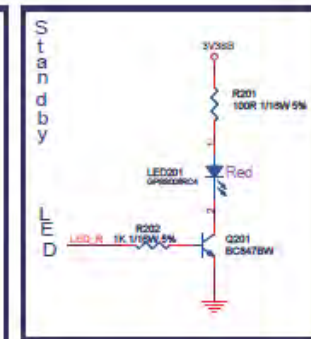
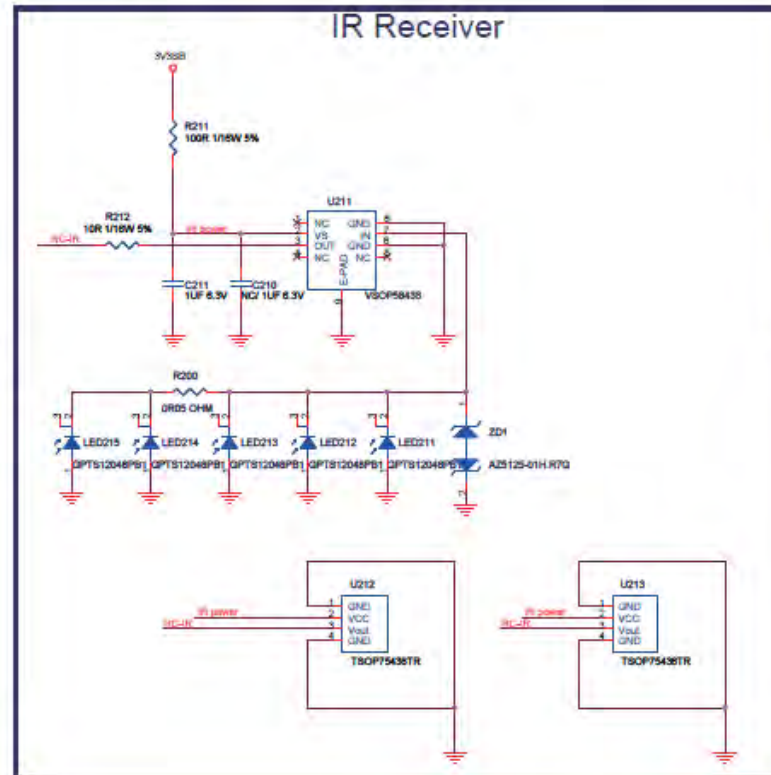
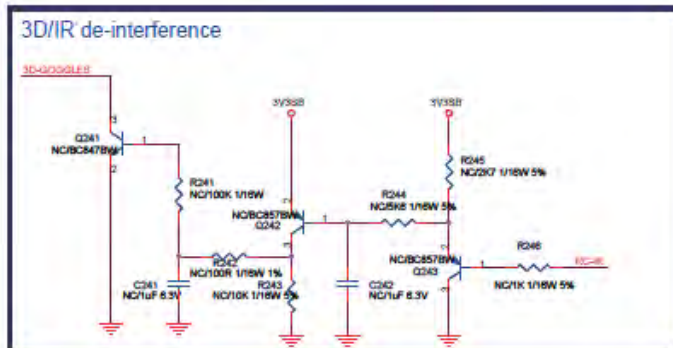
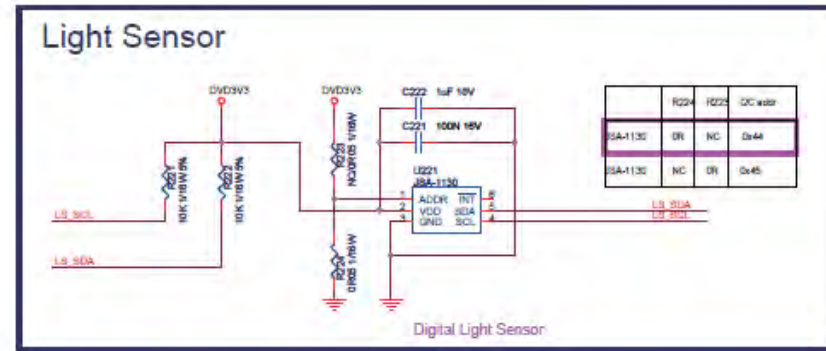
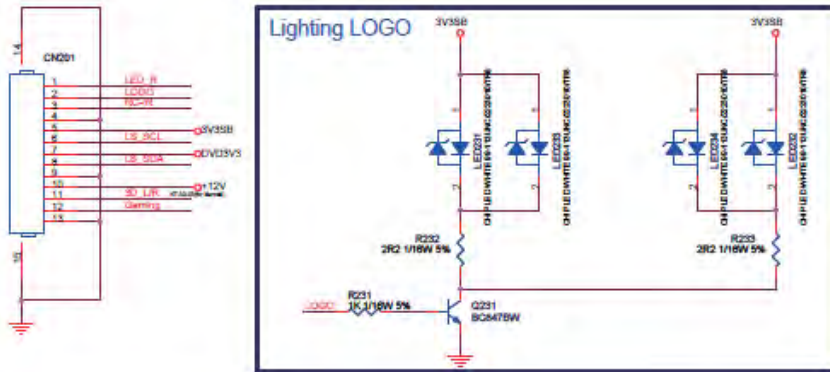


8-2-15 VCCK & DVSS



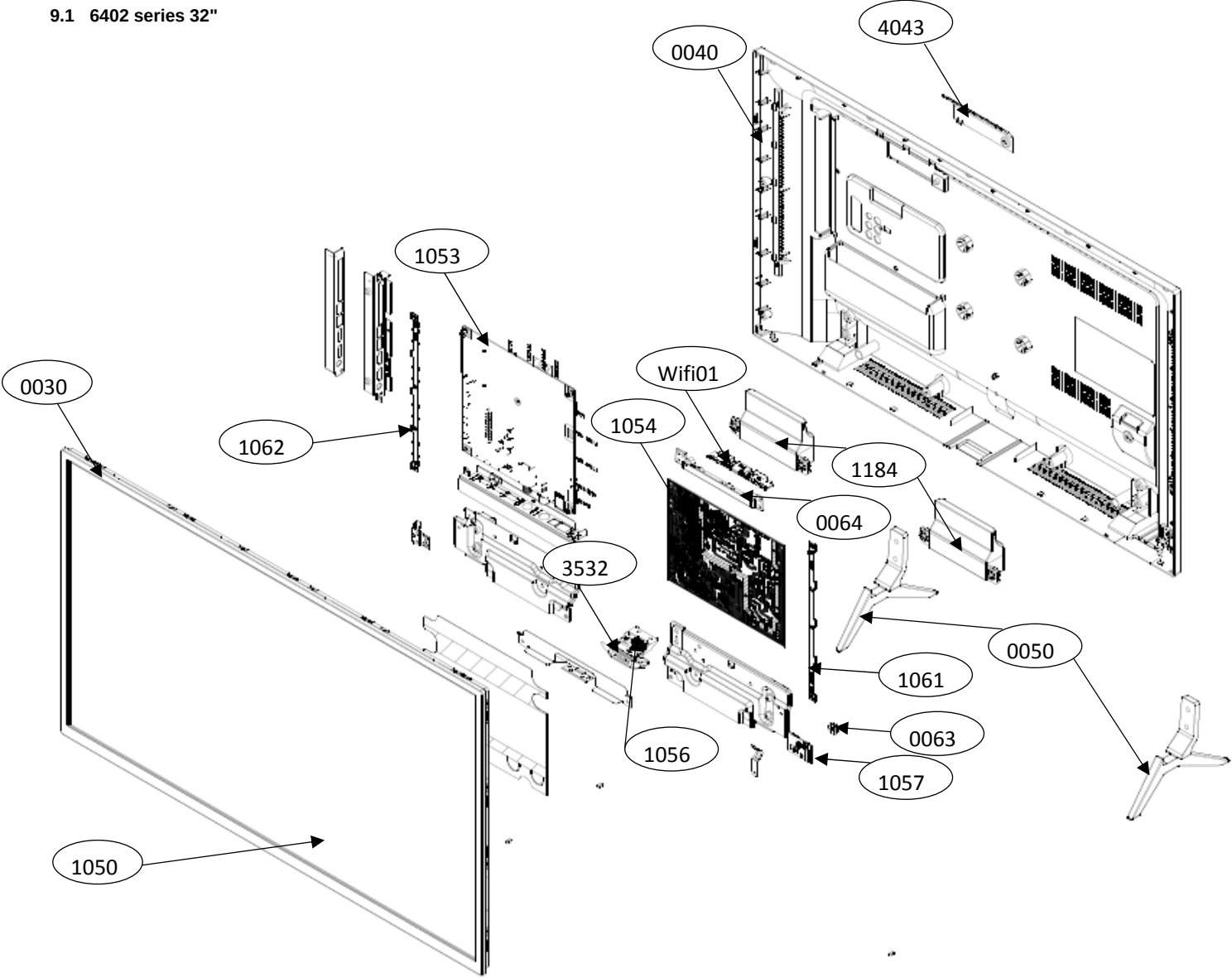
8.3 715G7785 IR/LED Panel

8-3-1 LED&IR&3D



9. Styling Sheets

9.1 6402 series 32"



Pos No.	Description	Remarks
0030	Bezel	
0040	Rear cover	
0050	Stand	
0063	KEY_FUNCTION	
0064	PCB_FRAME	
1050	Display panel	
1053	Panel SSB	
1054	Power Supply Unit	
1056	IR/LED panel	
1057	KEY BOARD ASSY	
1061	AMBILIGHT ASSY	
1062	AMBILIGHT ASSY	
1176	Remote control	Not displayed
1184	Speakers	
3532	DECO_LOGO	
4043	COVER_SERVICE	