

SERVICE MANUAL

PB70ED / PB71ED

notebook



Notebook Computer

PB70ED / PB71ED

Service Manual

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About this Manual

This manual is intended for service personnel who have completed sufficient training to undertake the maintenance and inspection of personal computers.

It is organized to allow you to look up basic information for servicing and/or upgrading components of the **PB70ED** / **PB71ED** series notebook PC.

The following information is included:

Chapter 1, Introduction, provides general information about the location of system elements and their specifications.
Chapter 2, Disassembly, provides step-by-step instructions for disassembling parts and subsystems and how to upgrade elements of the system.

Appendix A, Part Lists

Appendix B, Schematic Diagrams

Appendix C, Updating the FLASH ROM BIOS

Preface

IMPORTANT SAFETY INSTRUCTIONS

Follow basic safety precautions, including those listed below, to reduce the risk of fire, electric shock and injury to persons when using any electrical equipment:

1. Do not use this product near water, for example near a bath tub, wash bowl, kitchen sink or laundry tub, in a wet basement or near a swimming pool.
2. Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electrical shock from lightning.
3. Do not use the telephone to report a gas leak in the vicinity of the leak.
4. Use only the power cord and batteries indicated in this manual. Do not dispose of batteries in a fire. They may explode. Check with local codes for possible special disposal instructions.
5. This product is intended to be supplied by a Listed Power Unit as follows:
 - AC Input of 100 - 240V, 50 - 60Hz, DC Output of 19.5V, 9.23A (**180** Watts) minimum AC/DC Adapter.

FCC Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

This device may not cause harmful interference.

This device must accept any interference received, including interference that may cause undesired operation.

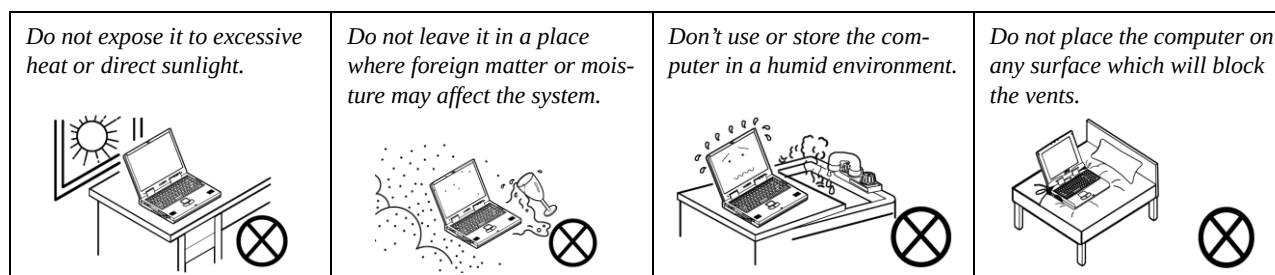
Instructions for Care and Operation

The notebook computer is quite rugged, but it can be damaged. To prevent this, follow these suggestions:

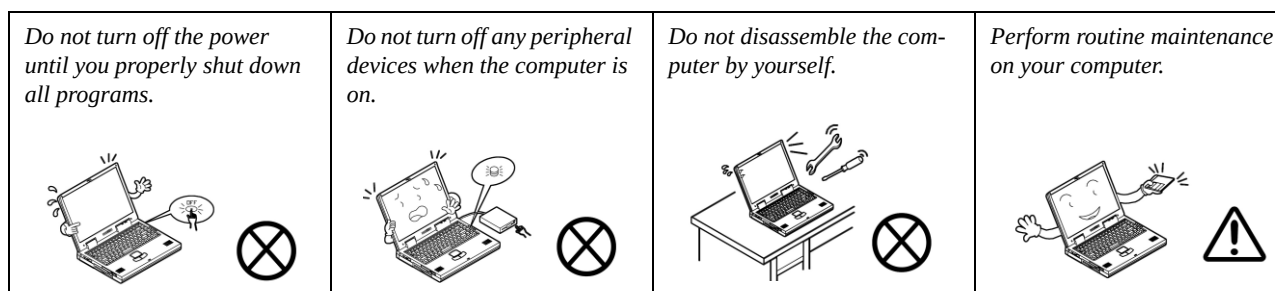
1. **Don't drop it, or expose it to shock.** If the computer falls, the case and the components could be damaged.



2. **Keep it dry, and don't overheat it.** Keep the computer and power supply away from any kind of heating element. This is an electrical appliance. If water or any other liquid gets into it, the computer could be badly damaged.

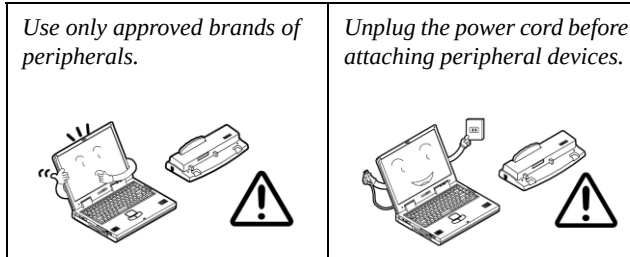


3. **Follow the proper working procedures for the computer.** Shut the computer down properly and don't forget to save your work. Remember to periodically save your data as data may be lost if the battery is depleted.



Preface

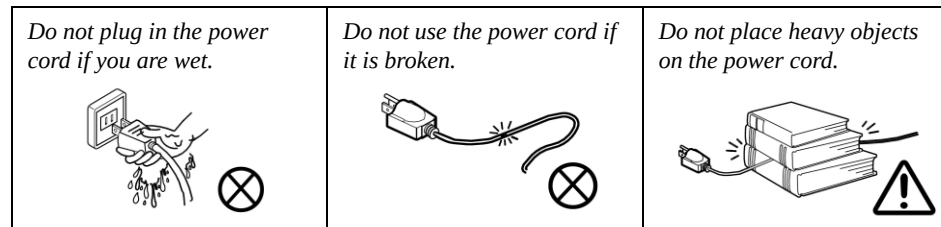
4. **Avoid interference.** Keep the computer away from high capacity transformers, electric motors, and other strong magnetic fields. These can hinder proper performance and damage your data.
5. **Take care when using peripheral devices.**



Power Safety

The computer has specific power requirements:

- Only use a power adapter approved for use with this computer.
- Your AC adapter may be designed for international travel but it still requires a steady, uninterrupted power supply. If you are unsure of your local power specifications, consult your service representative or local power company.
- The power adapter may have either a 2-prong or a 3-prong grounded plug. The third prong is an important safety feature; do not defeat its purpose. If you do not have access to a compatible outlet, have a qualified electrician install one.
- When you want to unplug the power cord, be sure to disconnect it by the plug head, not by its wire.
- Make sure the socket and any extension cord(s) you use can support the total current load of all the connected devices.
- Before cleaning the computer, make sure it is disconnected from any external power supplies.



Power Safety Warning

Before you undertake any upgrade procedures, make sure that you have turned off the power, and disconnected all peripherals and cables (including telephone lines and power cord). It is advisable to also remove your battery in order to prevent accidentally turning the machine on.

Battery Precautions

- Only use batteries designed for this computer. The wrong battery type may explode, leak or damage the computer.
- Do not continue to use a battery that has been dropped, or that appears damaged (e.g. bent or twisted) in any way. Even if the computer continues to work with a damaged battery in place, it may cause circuit damage, which may possibly result in fire.
- Recharge the batteries using the notebook's system. Incorrect recharging may make the battery explode.
- Do not try to repair a battery pack. Refer any battery pack repair or replacement to your service representative or qualified service personnel.
- Keep children away from, and promptly dispose of a damaged battery. Always dispose of batteries carefully. Batteries may explode or leak if exposed to fire, or improperly handled or discarded.
- Keep the battery away from metal appliances.
- Affix tape to the battery contacts before disposing of the battery.
- Do not touch the battery contacts with your hands or metal objects.

Battery Guidelines

The following can also apply to any backup batteries you may have.

- If you do not use the battery for an extended period, then remove the battery from the computer for storage.
- Before removing the battery for storage charge it to 60% - 70%.
- Check stored batteries at least every 3 months and charge them to 60% - 70%.



Battery Disposal

The product that you have purchased contains a rechargeable battery. The battery is recyclable. At the end of its useful life, under various state and local laws, it may be illegal to dispose of this battery into the municipal waste stream. Check with your local solid waste officials for details in your area for recycling options or proper disposal.

Caution

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used battery according to the manufacturer's instructions.

Battery Level

Click the battery icon  in the taskbar to see the current battery level and charge status. A battery that drops below a level of 10% will not allow the computer to boot up. Make sure that any battery that drops below 10% is recharged within one week.

Related Documents

You may also need to consult the following manual for additional information:

User's Manual on CD/DVD

This describes the notebook PC's features and the procedures for operating the computer and its ROM-based setup program. It also describes the installation and operation of the utility programs provided with the notebook PC.

System Startup

1. Remove all packing materials.
2. Place the computer on a stable surface.
3. Insert the battery and make sure it is locked in position.
4. Securely attach any peripherals you want to use with the computer (e.g. keyboard and mouse) to their ports.
5. **When first setting up the computer use the following procedure** (as to safeguard the computer during shipping, the battery will be locked to not power the system until first connected to the AC/DC adapter and initially set up as below):
 - Attach the AC/DC adapter cord to the DC-In jack on the left of the computer, then plug the AC power cord into an outlet, and connect the AC power cord to the AC/DC adapter and **leave it there for 6 seconds or longer**.
 - Remove the adapter cord from the computer's DC-In jack, and then plug it back in again; the battery will now be unlocked.
6. Use one hand to raise the lid/LCD to a comfortable viewing angle (do not exceed 130 degrees); use the other hand (as illustrated in Figure 1) to support the base of the computer (**Note: Never** lift the computer by the lid/LCD).
7. Press the power button to turn the computer "on".

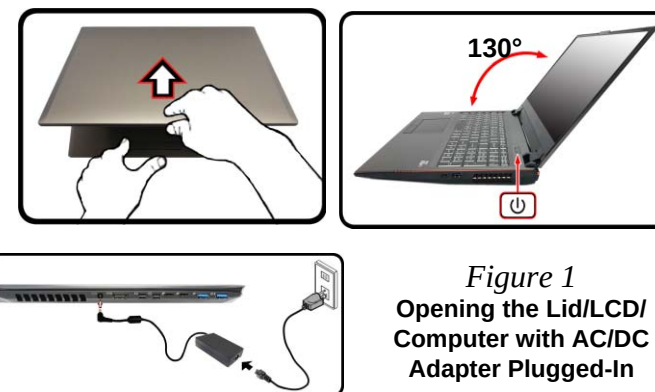


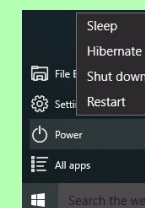
Figure 1
**Opening the Lid/LCD/
Computer with AC/DC
Adapter Plugged-In**



Shut Down

Note that you should always shut your computer down by choosing the **Shut down** command in **Windows** (see below). This will help prevent hard disk or system problems.

1. Click the Start Menu icon .
2. Click the **Power** item .
3. Choose **Shut Down** from the menu.



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Chapter 1: Introduction

Overview

This manual covers the information you need to service or upgrade the **PB70ED / PB71ED** series notebook computer. Information about operating the computer (e.g. getting started, and the *Setup* utility) is in the *User's Manual*. Information about drivers (e.g. VGA & audio) is also found in the *User's Manual*. The manual is shipped with the computer.

Operating systems (e.g. *Windows 10*, etc.) have their own manuals as do application softwares (e.g. word processing and database programs). If you have questions about those programs, you should consult those manuals.

The **PB70ED / PB71ED** series notebook is designed to be upgradeable. See [Disassembly on page 2 - 1](#) for a detailed description of the upgrade procedures for each specific component. Please take note of the warning and safety information indicated by the “” symbol.

The balance of this chapter reviews the computer's technical specifications and features.

Introduction

Specifications



Latest Specification Information

The specifications listed here are correct at the time of sending them to the press. Certain items (particularly processor types/speeds) may be changed, delayed or updated due to the manufacturer's release schedule. Check with your service center for more details.



CPU Speed & Computer in DC Mode

Note that when the computer is in DC mode (powered by the battery only) the CPU may not run at full speed. This is a design feature implemented in order to protect the battery.

Processor Options

i7-8750H (2.20GHz)

9MB Smart Cache, **14nm**, DDR4-2666MHz, TDP 45W

i5-8300H (2.30GHz)

9MB Smart Cache, **14nm**, DDR4-2666MHz, TDP 45W

Core Logic

Intel® HM370 Express Chipset

LCD Options

17.3" (43.94cm), 16:9, FHD (1920x1080)

BIOS

128Mb SPI Flash ROM

INSYDE BIOS

Memory

Dual Channel DDR4

Two 260 Pin SO-DIMM Sockets

Supporting **DDR4 2666MHz** Memory Modules

Memory Expandable from **8GB (minimum)** up to **64GB (maximum)**

Compatible with 4GB, 8GB, 16GB or 32GB Modules

(The real memory operating frequency depends on the FSB of the processor.)

Supports XMP 3000MHz (XMP is processor dependent)

Security

Security (Kensington® Type) Lock Slot

BIOS Password

Intel PTT for Systems Without TPM Hardware

(Factory Option) TPM 2.0

(Factory Option) Fingerprint Sensor

Video Adapter Options

Microsoft Hybrid Graphics Mode or Discrete Graphics Mode

Supports up to 4 Active Displays

Supports NVIDIA Surround View via HDMI x 1, MiniDP x1 and Display Port over Type-C

Intel Integrated GPU

Intel® UHD Graphics 630

Dynamic Frequency

Intel Dynamic Video Memory Technology

Microsoft DirectX®12 Compatible

NVIDIA® Discrete GPU

NVIDIA® GeForce RTX 2060

6GB GDDR6 Video RAM

Microsoft DirectX®12 Compatible

Pointing Device

(Factory Option) Built-in Touchpad/Secure Pad (with Microsoft PTP Multi Gesture & Scrolling Functionality)

Keyboard

Full Size **Multi Full Color** LED Keyboard (with numeric keypad)

Or

(Factory Option) Full Size **Full Color** "Per Key" LED Keyboard (with numeric keypad)

Storage

One changeable 2.5" (6cm) **7.0mm (h)** **SATA** (Serial) Hard Disk Drive/Solid State Drive (SSD)

(Factory Option) **One** M.2 **SATA/PCIe Gen3 x4** Solid State Drive (SSD)

Audio

High Definition Audio Compliant Interface
S/PDIF Digital Output
Built-In Array Microphone
Two Speakers
One Subwoofer
Sound BlasterX® Pro-Gaming 360°

Communication

1.0M HD PC Camera Module
Built-In 10/100/1000Mb Base-TX Ethernet LAN

WLAN/ Bluetooth M.2 Modules:

(**Factory Option**) Intel® Dual Band Wireless-AC 9260 Wireless LAN (**802.11ac**) + Bluetooth

(**Factory Option**) Intel® Dual Band Wireless-AC 9560 Wireless LAN (**802.11ac**) + Bluetooth

(**Factory Option**) Intel® Dual Band Wireless-AC 9462 Wireless LAN (**802.11ac**) + Bluetooth

(**Factory Option**) Qualcomm® Atheros Killer™ Wireless-AC 1550i Wireless LAN (**802.11ac**) + Bluetooth

Card Reader

Embedded Multi-In-1 Push-Push Card Reader
MMC (MultiMedia Card) / RS MMC
SD (Secure Digital) / Mini SD / SDHC/ SDXC

M.2 Slots

Slot 1 for **Combo WLAN and Bluetooth** Module
Slot 2 for **SATA or PCIe Gen3 x4 SSD**
Slot 3 for **PCIe Gen3 x4 SSD**

Interface

One USB 3.1 Gen 2 Type-C Port*

**The maximum amount of current supplied by USB Type-C ports is 500mA (USB 2.0)/900mA (USB 3.1).*

Or

(**Factory Option**) One Thunderbolt 3 Port**

***The maximum amount of current supplied by Thunderbolt 3 port is 3000mA.*

Three USB 3.0 (USB 3.1 Gen 1) Type-A Ports (Including one AC/DC Powered USB Port)

One DisplayPort 1.3 over USB 3.1 Gen 2 Type-C Port

One Mini DisplayPort 1.3

One HDMI-Out Port

One 2- In-1 Audio Jack (Microphone and S/PDIF Optical)

One 2- In-1 Audio Jack (Headphone and Microphone)

One RJ-45 LAN Jack

One DC-In Jack

**USB 3.1 Gen 2**

Note that when a single USB device is plugged in to a USB 3.1 Gen 2 port the data transfer speed will be 10Gbps, however when two devices are plugged in to both USB 3.1 Gen 2 ports, this bandwidth will be shared between the ports.

Features

Intel® Optane™ Technology

Supports NVIDIA® G-SYNC™ Technology

(NVIDIA® G-SYNC™ Technology is supported by some LCD panels and RTX series video adapters Only)

Virtual Reality Ready

Windows® Mixed Reality Compatible

(**Factory Option**) USB Drive

Environmental Spec**Temperature**

Operating: 5°C - 35°C

Non-Operating: -20°C - 60°C

Relative Humidity

Operating: 20% - 80%

Non-Operating: 10% - 90%

Power

Removable 6 Cell Smart Lithium-Ion Battery Pack, 62WH

(**Factory Option**) Removable 6-Cell Polymer Battery Pack, 47WH

Full Range AC/DC Adapter

AC Input: 100 - 240V, 50 - 60Hz

DC Output: 19.5V, 9.23A (**180W**)

Dimensions & Weight

399mm (w) * 275mm (d) * 29.9mm (h)

2.9kg (Barebone with 62WH Battery)

Introduction

Figure 1
Top View

1. PC Camera
2. *PC Camera LED
**When the PC camera is in use, the LED will be illuminated.*
3. Built-In Array Microphone
4. LCD
5. Power Button
6. Keyboard
7. Touchpad & Buttons
8. Fingerprint Sensor (Optional)

External Locator - Top View with LCD Panel Open



External Locator - Front & Right Side Views

FRONT VIEW



RIGHT SIDE VIEW



Figure 2
Front View

1. LED Indicator
2. Multi-in-1 Card Reader

Figure 3
Right Side View

1. USB 3.1 Gen 2 Type-C Port Or
(Factory Option) Thunderbolt 3 Port
2. USB 3.0 (USB 3.1 Gen 1) Type-A Port
3. Vent

Introduction

External Locator - Left Side & Rear View

Figure 4
Left Side View

1. Security Lock Slot
2. Vent
3. *Powered USB 3.0 (USB 3.1 Gen 1) Type-A Port
4. 2-In-1 Audio Jack (Microphone and S/PDIF Optical)
5. 2-In-1 Audio Jack (Headphone and Microphone)

LEFT SIDE VIEW



Figure 5
Rear View

1. Vent
2. RJ-45 LAN Jack
3. HDMI-Out Port
4. Mini DisplayPort 1.3
5. DisplayPort 1.3 over USB 3.1 Gen 2 Type-C Port
6. USB 3.0 (USB 3.1 Gen 1) Type-A Port
7. DC-In Jack

REAR VIEW



External Locator - Bottom View

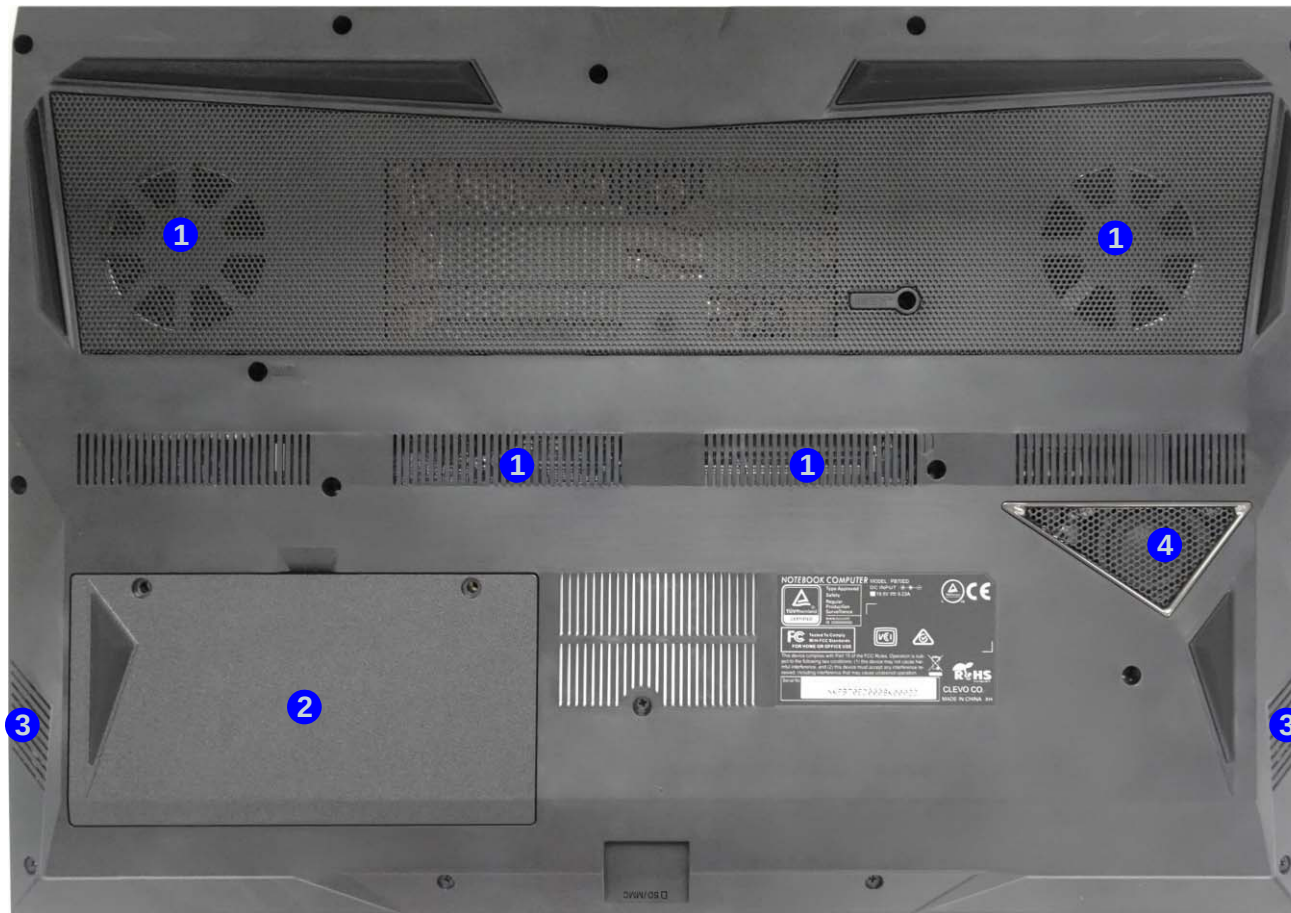


Figure 6
Bottom View

1. Vent
2. Battery
3. Speakers
4. Subwoofer



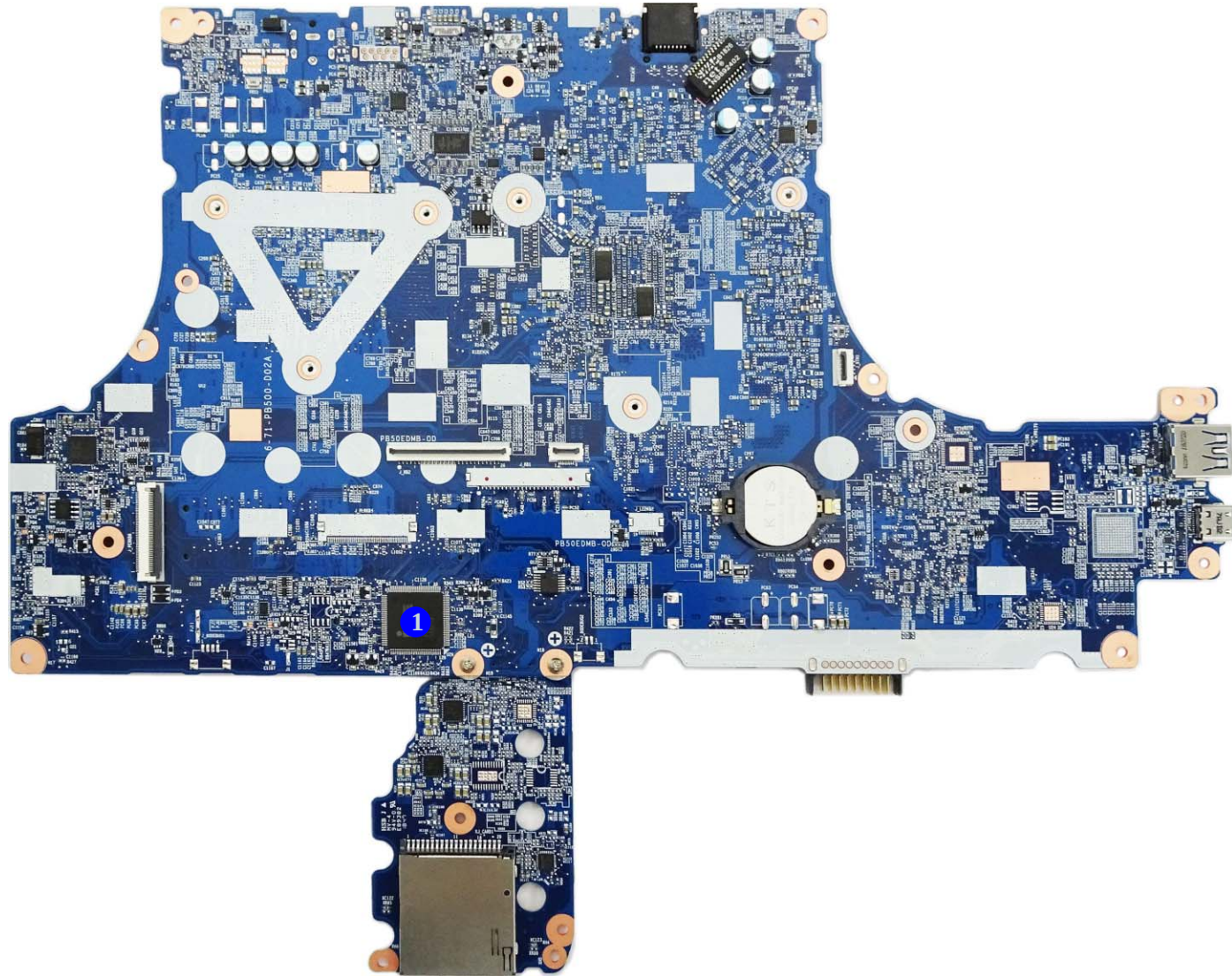
Overheating

To prevent your computer from overheating, make sure nothing blocks any vent while the computer is in use.

Figure 7
**Mainboard Top
Key Parts**

1. KBC-ITE IT8587

Mainboard Overview - Top (Key Parts)



Mainboard Overview - Bottom (Key Parts)

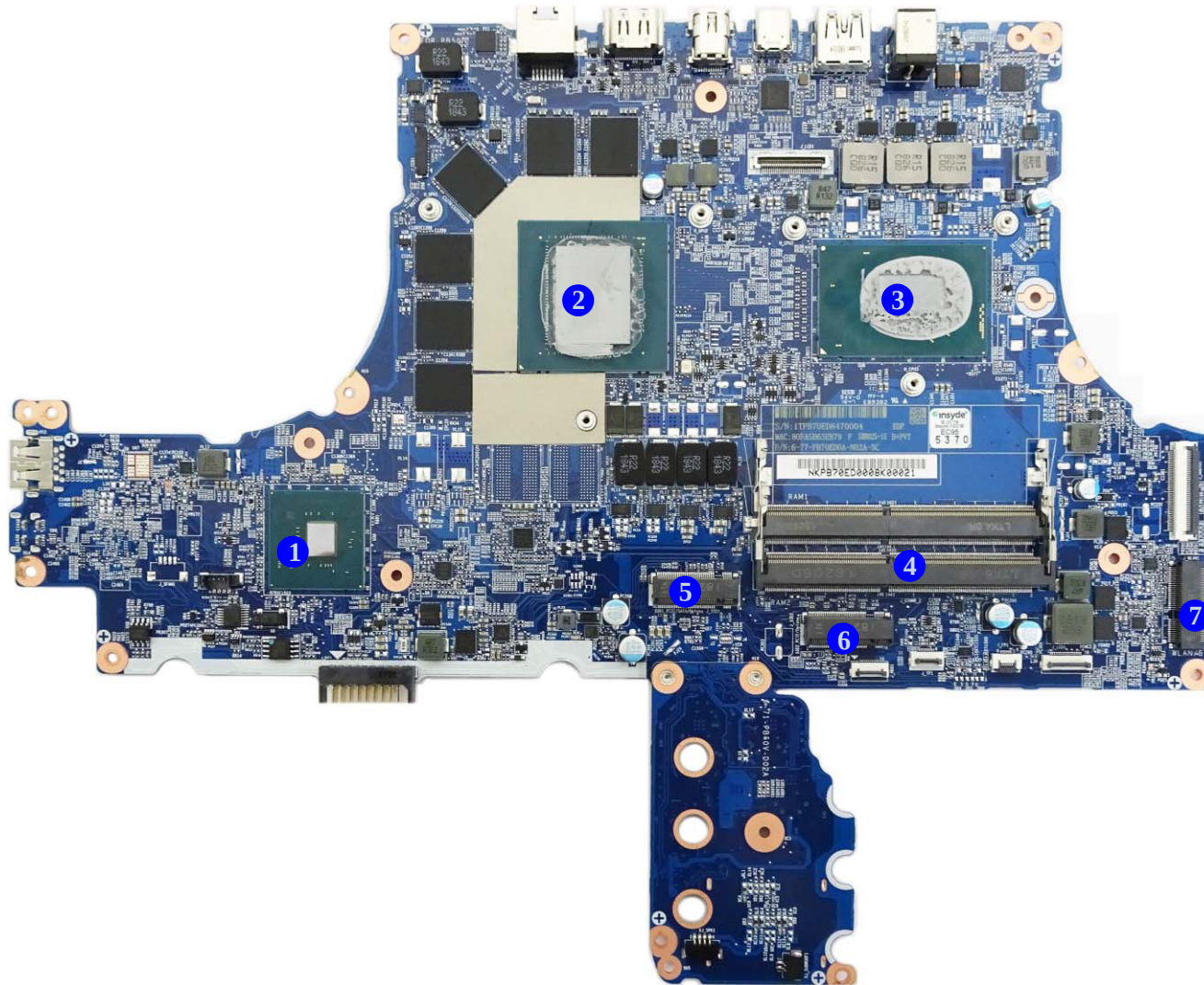


Figure 8
**Mainboard Bottom
Key Parts**

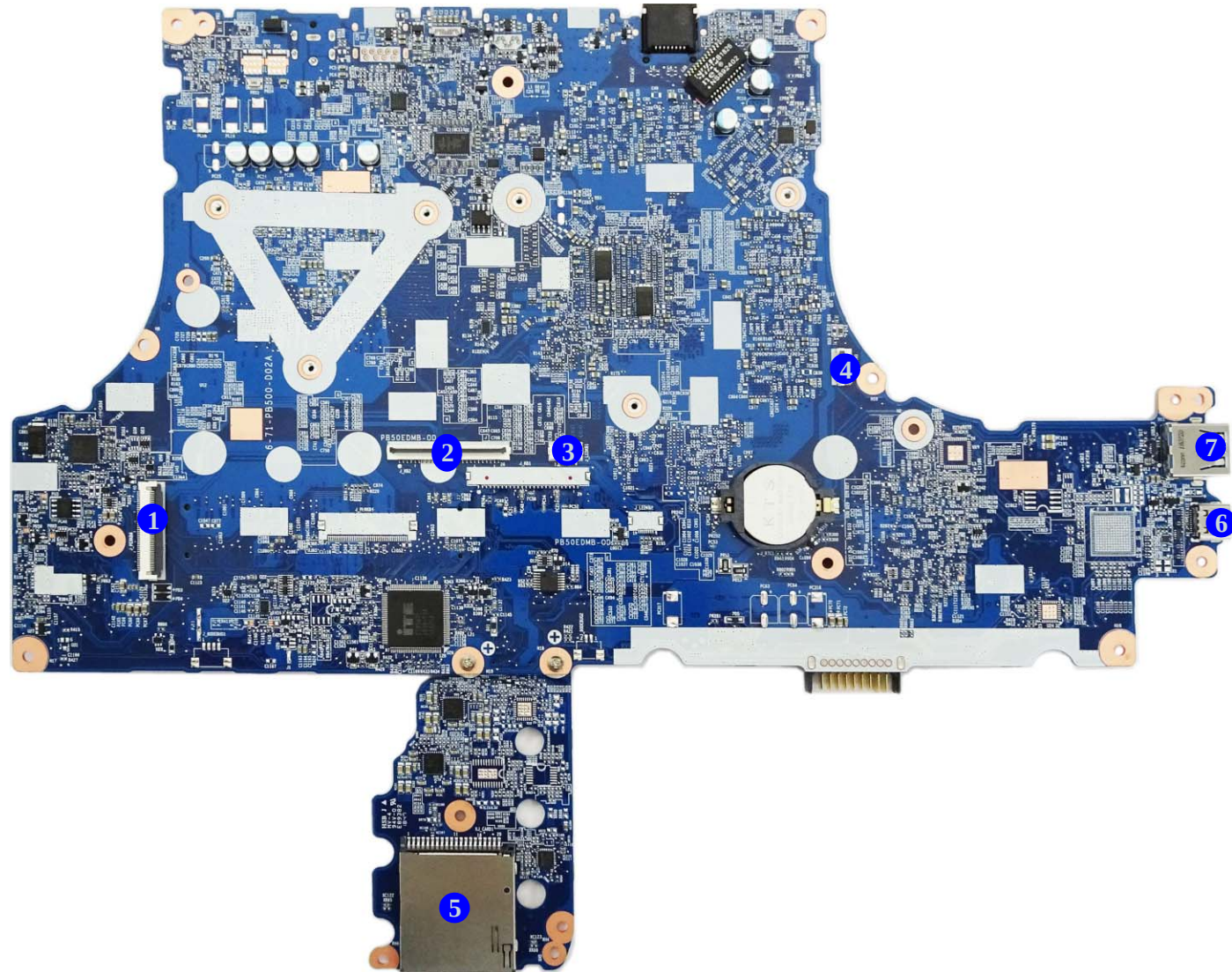
1. PCH
2. GPU
3. CPU
4. Memory Slots
DDR4 SO-DIMM
5. Mini-Card
Connector (M.2
PCIE/SATA SSD
Module)
6. Mini-Card
Connector (M.2
PCIE Module)
7. Mini-Card
Connector (WLAN
Module)

Introduction

Figure 9
**Mainboard Top
Connectors**

1. Per Key Cable Connector
2. Keyboard Cable Connector
3. RGB Keyboard Cable Connector
4. Power Switch Connector
5. Multi-in-1 Card Reader
6. USB 3.1 Gen 2 Type-C Port Or
(**Factory Option**)
Thunderbolt 3 Port
7. USB 3.0 (USB 3.1 Gen 1) Type-A Port

Mainboard Overview - Top (Connectors)



Mainboard Overview - Bottom (Connectors)

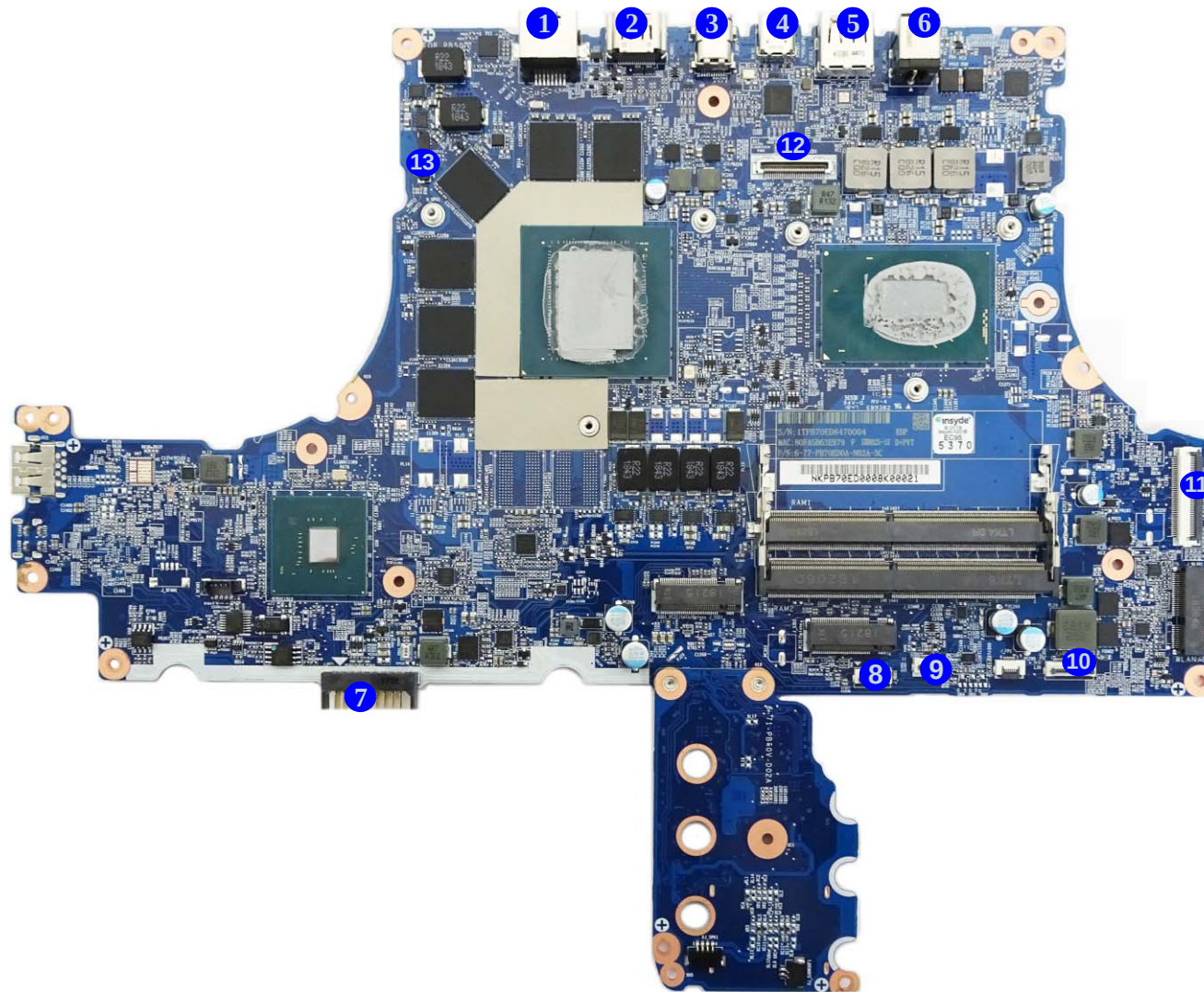


Figure 10
**Mainboard Bottom
Connectors**

1. RJ-45 LAN Jack
2. HDMI-Out Port
3. Mini DisplayPort 1.3
4. DisplayPort 1.3 over USB 3.1 Gen 2 Type-C Port
5. USB 3.0 (USB 3.1 Gen 1) Type-A Port
6. DC-In Jack
7. Battery Connector
8. HDD Cable Connector
9. Touchpad Cable Connector
10. LED Indicator Connector
11. Audio Board Connector
12. Panel Connector
13. CCD Connector

Chapter 2: Disassembly

Overview

This chapter provides step-by-step instructions for disassembling the **PB70ED / PB71ED** series notebook's parts and subsystems. When it comes to reassembly, reverse the procedures (unless otherwise indicated).

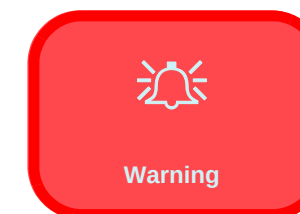
We suggest you completely review any procedure before you take the computer apart.

Procedures such as upgrading/replacing the RAM, optical device and hard disk are included in the User's Manual but are repeated here for your convenience.

To make the disassembly process easier each section may have a box in the page margin. Information contained under the figure # will give a synopsis of the sequence of procedures involved in the disassembly procedure. A box with a  lists the relevant parts you will have after the disassembly process is complete. **Note:** The parts listed will be for the disassembly procedure listed ONLY, and not any previous disassembly step(s) required. Refer to the part list for the previous disassembly procedure. The amount of screws you should be left with will be listed here also.

A box with a  will also provide any possible helpful information. A box with a  contains warnings.

An example of these types of boxes are shown in the sidebar.



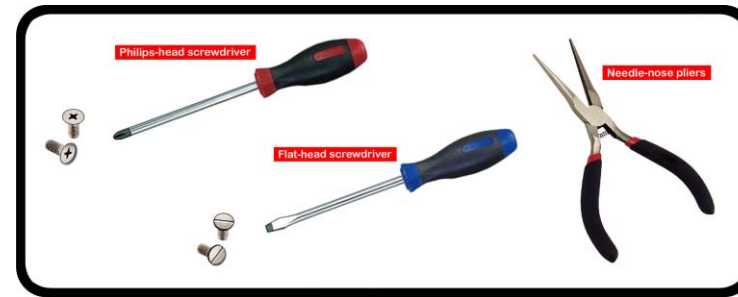
Disassembly

NOTE: All disassembly procedures assume that the system is turned **OFF**, and disconnected from any power supply (the battery is removed too).

Maintenance Tools

The following tools are recommended when working on the notebook PC:

- M3 Philips-head screwdriver
- M2.5 Philips-head screwdriver (magnetized)
- M2 Philips-head screwdriver
- Small flat-head screwdriver
- Pair of needle-nose pliers
- Anti-static wrist-strap



Connections

Connections within the computer are one of four types:

Locking collar sockets for ribbon connectors

To release these connectors, use a small flat-head screwdriver to gently pry the locking collar away from its base. When replacing the connection, make sure the connector is oriented in the same way. The pin1 side is usually not indicated.

Pressure sockets for multi-wire connectors

To release this connector type, grasp it at its head and gently rock it from side to side as you pull it out. Do not pull on the wires themselves. When replacing the connection, do not try to force it. The socket only fits one way.

Pressure sockets for ribbon connectors

To release these connectors, use a small pair of needle-nose pliers to gently lift the connector away from its socket. When replacing the connection, make sure the connector is oriented in the same way. The pin1 side is usually not indicated.

Board-to-board or multi-pin sockets

To separate the boards, gently rock them from side to side as you pull them apart. If the connection is very tight, use a small flat-head screwdriver - use just enough force to start.

Maintenance Precautions

The following precautions are a reminder. To avoid personal injury or damage to the computer while performing a removal and/or replacement job, take the following precautions:

1. **Don't drop it.** Perform your repairs and/or upgrades on a stable surface. If the computer falls, the case and other components could be damaged.
2. **Don't overheat it.** Note the proximity of any heating elements. Keep the computer out of direct sunlight.
3. **Avoid interference.** Note the proximity of any high capacity transformers, electric motors, and other strong magnetic fields. These can hinder proper performance and damage components and/or data. You should also monitor the position of magnetized tools (i.e. screwdrivers).
4. **Keep it dry.** This is an electrical appliance. If water or any other liquid gets into it, the computer could be badly damaged.
5. **Be careful with power.** Avoid accidental shocks, discharges or explosions.
 - Before removing or servicing any part from the computer, turn the computer off and detach any power supplies.
 - When you want to unplug the power cord or any cable/wire, be sure to disconnect it by the plug head. Do not pull on the wire.
6. **Peripherals** – Turn off and detach any peripherals.
7. **Beware of static discharge.** ICs, such as the CPU and main support chips, are vulnerable to static electricity. Before handling any part in the computer, discharge any static electricity inside the computer. When handling a printed circuit board, do not use gloves or other materials which allow static electricity buildup. We suggest that you use an anti-static wrist strap instead.
8. **Beware of corrosion.** As you perform your job, avoid touching any connector leads. Even the cleanest hands produce oils which can attract corrosive elements.
9. **Keep your work environment clean.** Tobacco smoke, dust or other air-born particulate matter is often attracted to charged surfaces, reducing performance.
10. **Keep track of the components.** When removing or replacing any part, be careful not to leave small parts, such as screws, loose inside the computer.

Cleaning

Do not apply cleaner directly to the computer, use a soft clean cloth.

Do not use volatile (petroleum distillates) or abrasive cleaners on any part of the computer.

(For Computer Models Supplied with Light Blue Cleaning Cloth) Some computer models in this series come supplied with a light blue cleaning cloth. To clean the computer case with this cloth follow the instructions below.

- Power off the computer and peripherals.
- Disconnect the AC/DC adapter from the computer.
- Use a little water to dampen the cloth slightly.
- Clean the computer case with the cloth.
- Dry the computer with a dry cloth, or allow it time to dry before turning on.
- Reconnect the AC/DC adapter and turn the computer on.



Power Safety Warning

Before you undertake any upgrade procedures, make sure that you have turned off the power, and disconnected all peripherals and cables (including telephone lines and power cord). It is advisable to also remove your battery in order to prevent accidentally turning the machine on.

Disassembly Steps

The following table lists the disassembly steps, and on which page to find the related information. **PLEASE PERFORM THE DISASSEMBLY STEPS IN THE ORDER INDICATED.**

To remove the Keyboard:

- 1. Remove the battery [page 2 - 5](#)

To remove the Battery:

- 1. Remove the battery [page 2 - 5](#)
- 2. Remove the keyboard [page 2 - 6](#)

To remove the HDD:

- 1. Remove the battery [page 2 - 5](#)
- 2. Remove the keyboard [page 2 - 6](#)
- 3. Remove the HDD [page 2 - 7](#)

To remove the System Memory:

- 1. Remove the battery [page 2 - 5](#)
- 2. Remove the keyboard [page 2 - 6](#)
- 3. Remove the HDD [page 2 - 7](#)
- 4. Remove the system memory [page 2 - 9](#)

To remove and install the M.2 SSD:

- 1. Remove the battery [page 2 - 5](#)
- 2. Remove the keyboard [page 2 - 6](#)
- 3. Remove the HDD [page 2 - 7](#)
- 4. Remove the M.2 SSD [page 2 - 10](#)

To remove the Wireless LAN Module:

- 1. Remove the battery [page 2 - 5](#)
- 2. Remove the keyboard [page 2 - 6](#)
- 3. Remove the HDD [page 2 - 7](#)
- 4. Remove the WLAN [page 2 - 11](#)

To remove the CCD Module:

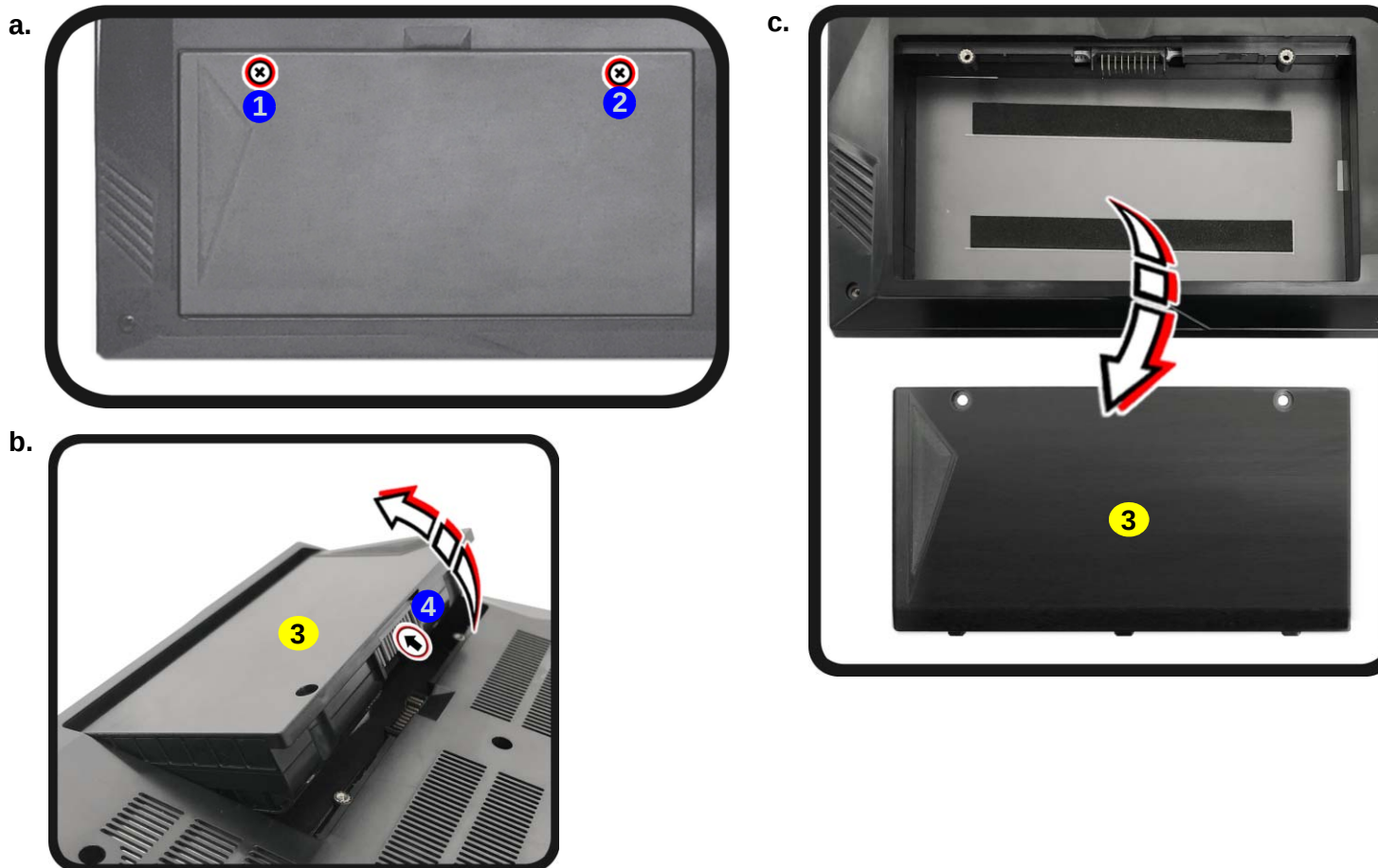
- 1. Remove the battery [page 2 - 5](#)
- 2. Remove the CCD module [page 2 - 13](#)

Removing the Battery

1. Turn **off** the computer, turn it over.
2. Remove screws **1** - **2** (*Figure 1a*).
3. Carefully lift the battery **3** up in the direction of the arrow at point **4** (*Figure 1b*).
4. Remove the battery **3** off the computer (*Figure 1c*).
5. Reverse the process to install a new battery (do not forget to replace all the screws and bottom cover).

Figure 1
Battery Removal

- a. Remove the screws.
- b. Lift the battery up.
- c. Remove the battery.



- 3. Battery
- 2 Screws

Disassembly

Figure 2

Keyboard Removal

- a. Remove the screws from the bottom of the computer and then eject the keyboard using a special eject stick to push the keyboard out while releasing the keyboard as shown.
- b. Lift the keyboard up and disconnect the keyboard ribbon cable from the locking collar socket.
- c. Remove the keyboard.



Re-inserting the Keyboard

When re-inserting the keyboard firstly, align the keyboard tabs at the bottom of the keyboard with the slots in the case.



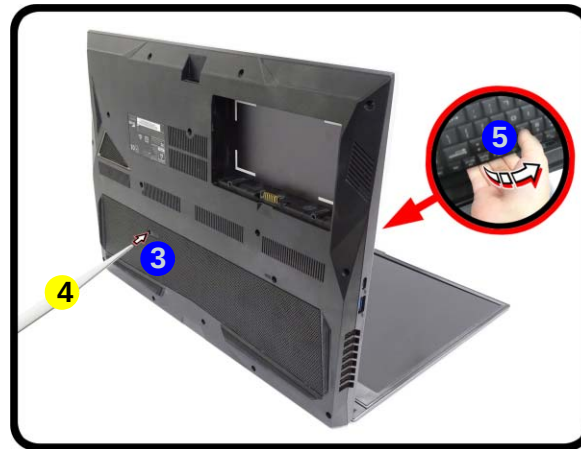
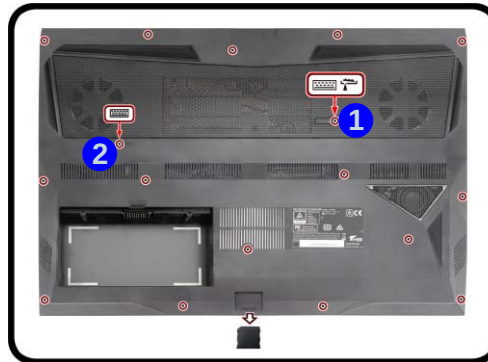
4. Eject Stick
6. Keyboard

- 2 Screws

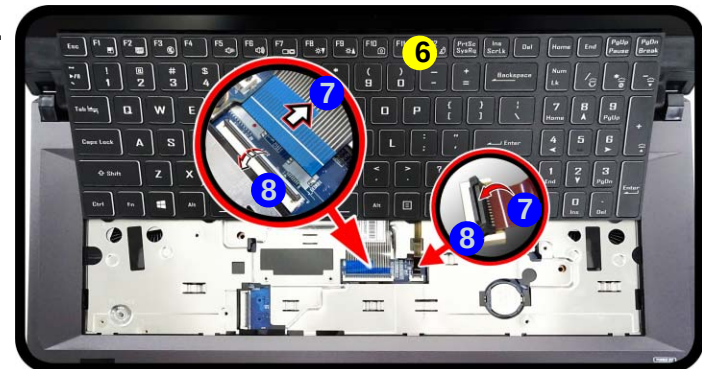
Removing the Keyboard

1. Turn **off** the computer, turn it over.
2. Remove screws **1** - **2** from the bottom of the computer.
3. Open it up with the LCD on a flat surface before pressing at point **3** to release the keyboard module (use the special eject stick **4** to do this) while releasing the keyboard in the direction of the arrow **5** as shown (**Figure 2a**).
4. Carefully lift the keyboard **6** up, being careful not to bend the keyboard ribbon cable **7**. Disconnect the keyboard ribbon cable **7** from the locking collar socket by using a flat-head screwdriver to pry the locking collar pins **8** away from the base (**Figure 2b**).
5. Carefully lift the keyboard **6** off the computer (**Figure 2c**).

a.



b.



c.



Removing the Hard Disk Drive

The hard disk drive can be taken out to accommodate other 2.5" serial (SATA) hard disk drives with a height of 7mm (h). Follow your operating system's installation instructions, and install all necessary drivers and utilities (as outlined in **Chapter 4 of the User's Manual**) when setting up a new hard disk.

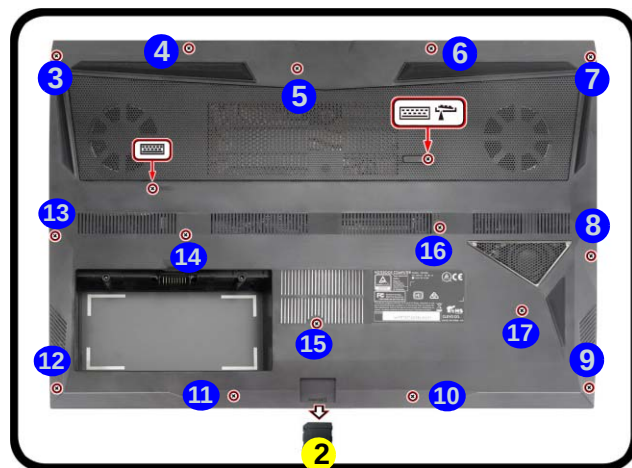
Hard Disk Disassembly Process

1. Turn **off** the computer, turn it over and remove the battery ([page 2 - 5](#)) and keyboard ([page 2 - 5](#)).
2. Remove the screw **1** ([Figure 3a](#)).
3. Remove the SD card cover **2** and screws **3** - **17** ([Figure 3b](#)).
4. Carefully lift the bottom case **18** up in the direction of the arrow at point **19** - **24** and remove it ([Figure 3c](#)).

a.



b.



c.

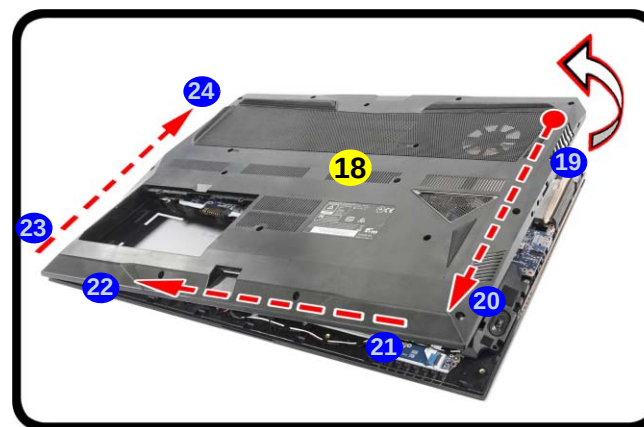


Figure 3
**HDD Assembly
Removal**

- Remove the screws.
- Remove the SD cover and screws.
- Remove the bottom case.



HDD System Warning

New HDD's are blank. Before you begin make sure:

You have backed up any data you want to keep from your old HDD.

You have all the CD-ROMs and FDDs required to install your operating system and programs.

If you have access to the internet, download the latest application and hardware driver updates for the operating system you plan to install. Copy these to a removable medium.



2. SD Card Cover
18. Bottom Case

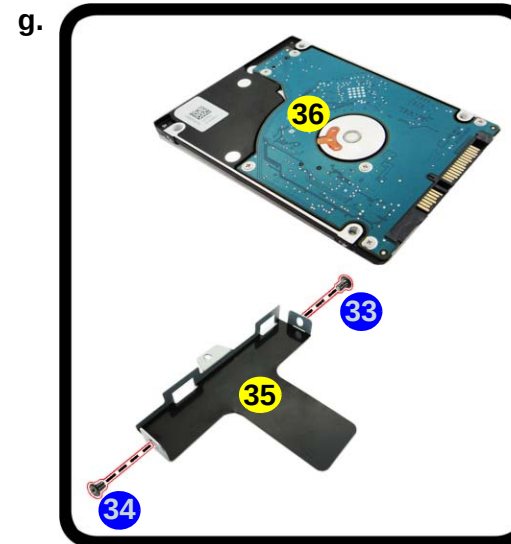
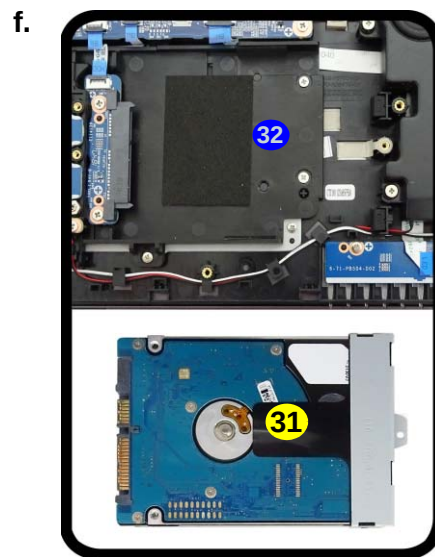
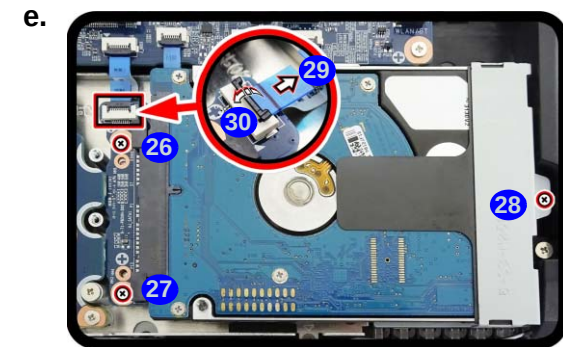
- 15 Screws

Disassembly

Figure 4
**HDD Assembly
Removal (cont'd.)**

- d. Locate the HDD.
- e. Remove the screw.
- f. Slide and pull the HDD assembly out of the bay.
- g. Remove the screws and bracket from the HDD.

- 5. The HDD will be visible at point **25** on the mainboard (*Figure 4d*).
- 6. Remove screws **26** - **28** from the HDD assembly and disconnect the ribbon cable **29** from the locking collar socket by using a flat-head screwdriver to pry the locking collar pins **30** away from the base (*Figure 4e*).
- 7. Lift the hard disk assembly **31** out of the bay **32** (*Figure 4f*).
- 8. Remove screws **33** - **34** and bracket **35** from the hard disk **36** (*Figure 4g*).
- 9. Reverse the process to install a new hard disk (do not forget to carefully reinsert the bottom case in reverse order (see *Figure 3c*) and to replace the screws).



31. HDD Assembly
35. HDD Bracket
36. HDD

- 5 Screws

Removing the System Memory (RAM)

The computer has four memory sockets for 260 pin Small Outline Dual In-line Memory Modules (SO-DIMM) supporting DDR4 Up to 2400 MHz. The main memory can be expanded up to 64GB. The total memory size is automatically detected by the POST routine once you turn on your computer.

Memory Upgrade Process

1. Turn **off** the computer, remove the battery ([page 2 - 5](#)), keyboard ([page 2 - 6](#)) and bottom case ([page 2 - 7](#)).
2. The RAM-2 modules will be visible at point **1** on the mainboard ([Figure 5a](#)).
3. Gently pull the two release latches (**2** & **3**) on the sides of the memory socket in the direction indicated by the arrows ([Figure 5b](#)). The RAM module **4** will pop-up ([Figure 5c](#)), and you can then remove it.
4. Pull the latches to release the second module if necessary.
5. Insert a new module holding it at about a 30° angle and fit the connectors firmly into the memory slot.
6. The module will only fit one way as defined by its pin alignment. Make sure the module is seated as far into the slot as it will go. **DO NOT FORCE IT**; it should fit without much pressure.
7. Press the module in and down towards the mainboard until the slot levers click into place to secure the module.
8. Replace the bottom cover and the screws (see [page 2 - 5](#)).
9. Restart the computer to allow the BIOS to register the new memory configuration as it starts up.

Figure 5
RAM Module Removal

- a. The RAM modules will be visible at point **1** on the mainboard.
- b. Pull the release latches.
- c. Remove the module.

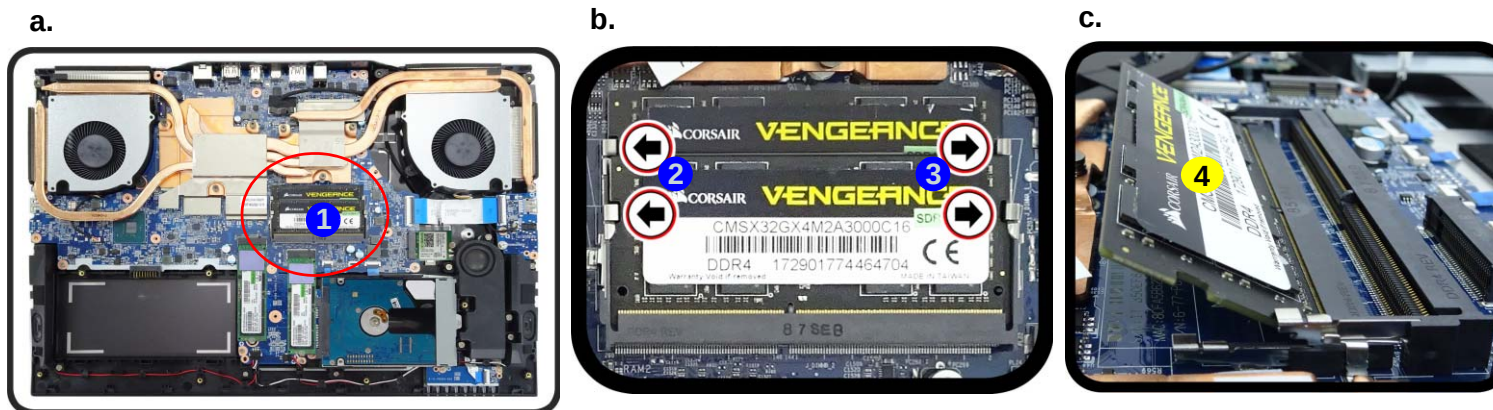


Contact Warning

Be careful not to touch the metal pins on the module's connecting edge. Even the cleanest hands have oils which can attract particles, and degrade the module's performance.



4. RAM Module



Disassembly

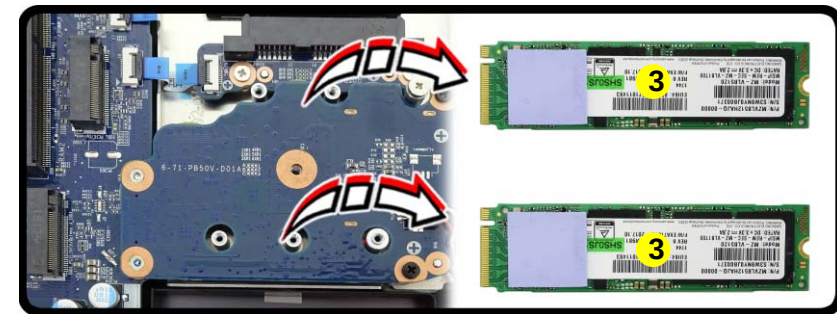
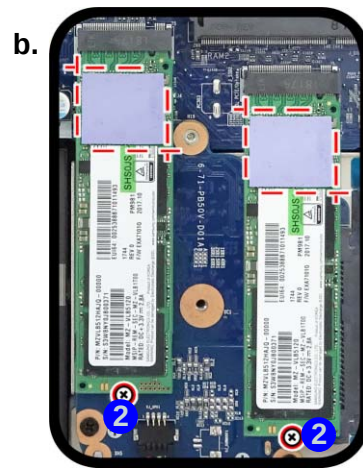
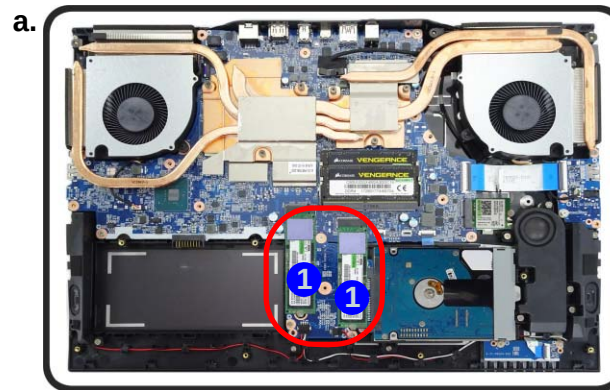
Figure 6
M.2 SSD-1 Module Removal

- Locate the M.2 SSD.
- Remove the screw.
- The M.2 SSD module will pop up.

Removing the M.2 SSD Module

M.2 SSD-1 Removal Procedure

- Turn **off** the computer, remove the battery ([page 2 - 5](#)), keyboard ([page 2 - 6](#)) and bottom case ([page 2 - 7](#)).
- The M.2 SSD module will be visible at point **1** on the mainboard ([Figure 6a](#)).
- Remove the screw **2** ([Figure 6b](#)).
- The M.2 SSD module **3** ([Figure 6c](#)) will pop-up, and you can remove it from the computer.
- Reverse the process to install a new module (do not forget to replace the screws and thermal pad).



3.M2 SSD Module

- 1 Screw

Removing the Wireless LAN Module

1. Turn **off** the computer, remove the battery ([page 2 - 5](#)), keyboard ([page 2 - 6](#)) and bottom case ([page 2 - 7](#)).
2. The Wireless LAN module will be visible at point **1** on the mainboard ([Figure 7a](#)).
3. Carefully disconnect the cables **2** & **3**, and then remove the screw **4** ([Figure 7b](#))
4. The Wireless LAN module **5** ([Figure 7c](#)) will pop-up, and you can remove it from the computer.

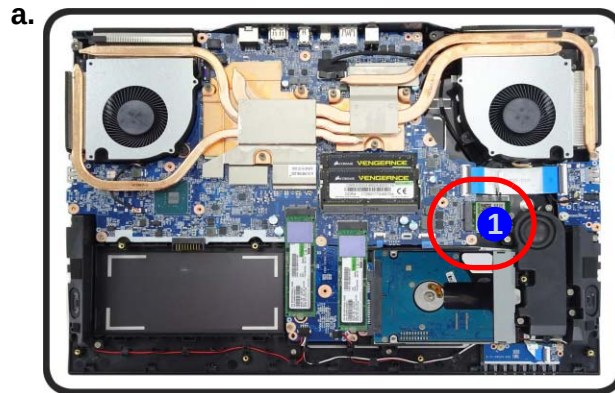


Figure 7
**Wireless LAN
Module Removal**

- a. Locate the WLAN.
- b. Disconnect the cables and remove the screw.
- c. The WLAN module will pop up.

Note: Make sure you reconnect the antenna cable to the “1 + 2” socket ([Figure 7b](#)).



5. Wireless LAN Module

- 1 Screw

Wireless LAN, Combo Module Cables

Note that the cables for connecting to the antennae on WLAN, WLAN & Bluetooth Combo modules are not labelled. The cables/covers (each cable will have either a black or transparent cable cover) are color coded for identification as outlined in the table below.

Module Type	Antenna Type	Cable Color	Cable Cover Type
WLAN/WLAN & Bluetooth Combo	WM 1	Black	Transparent
	WM 2	Black	White

Cable 1 is usually connected to antenna 1 on the module, and cable 2 to antenna 2.

Removing the CCD

1. Turn **off** the computer, turn it over to remove the battery ([page 2 - 5](#)).
2. Lay the computer down on a flat surface with the top case up forming a 130 degree angle.
3. Carefully run your fingers around the inner frame of the LCD panel to lift at points **1** - **4** as indicated by the arrows ([Figure 8a](#)).
4. Remove the LCD front cover **5** ([Figure 8b](#)).

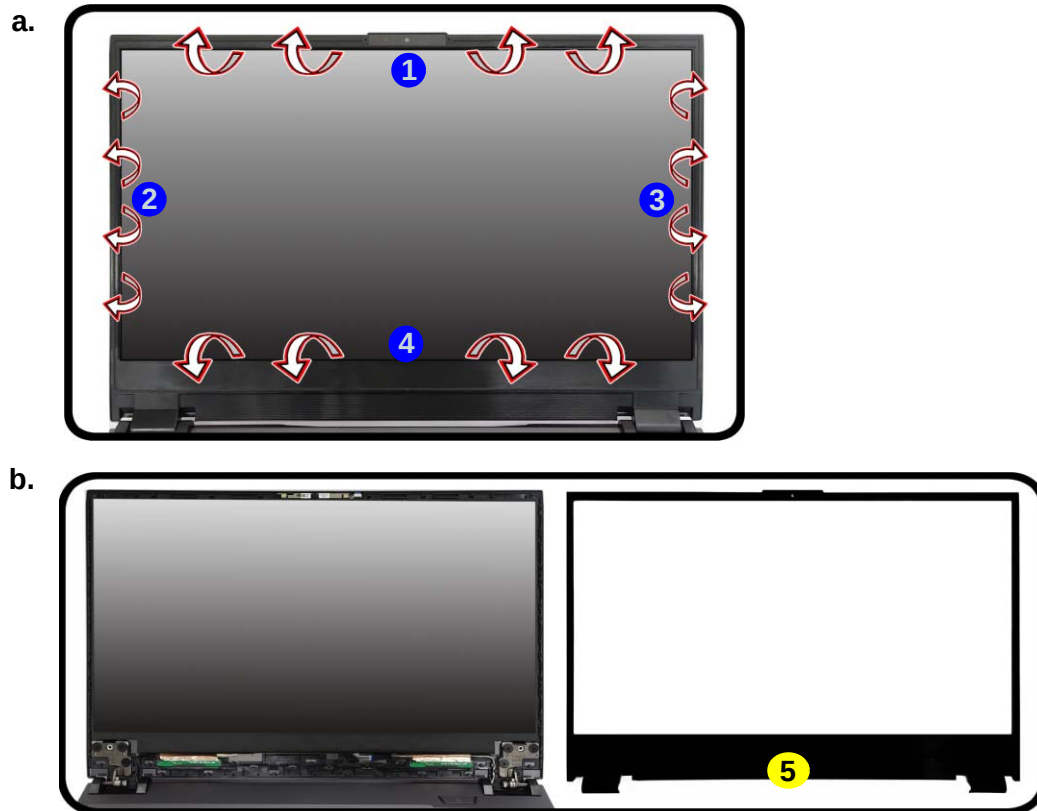


Figure 8
CCD Removal

- a. Carefully release the inner frame of the LCD panel at the points indicated by the arrows.
- b. Remove the LCD front cover.



5. LCD Front Cover

Disassembly

Figure 9
CCD Removal
(cont'd)

- c. Disconnect the cable from the locking collar socket.
- d. Remove the CCD module.

- 5. Disconnect the cable ⑥ from the locking collar socket by using a flat-head screwdriver to pry the locking collar pins ⑦ away from the base (*Figure 9c*).
- 6. Remove the CCD module ⑧ (*Figure 9d*).
- 7. Reverse the process to install a new CCD module.



8. CCD Module

Appendix A:Part Lists

This appendix breaks down the **PB70ED / PB71ED** series notebook's construction into a series of illustrations. The component part numbers are indicated in the tables opposite the drawings.

Note: This section indicates the *manufacturer's* part numbers. Your organization may use a different system, so be sure to cross-check any relevant documentation.

Note: Some assemblies may have parts in common (especially screws). However, the part lists DO NOT indicate the total number of duplicated parts used.

Note: Be sure to check any update notices. The parts shown in these illustrations are appropriate for the system at the time of publication. Over the product life, some parts may be improved or re-configured, resulting in *new* part numbers.

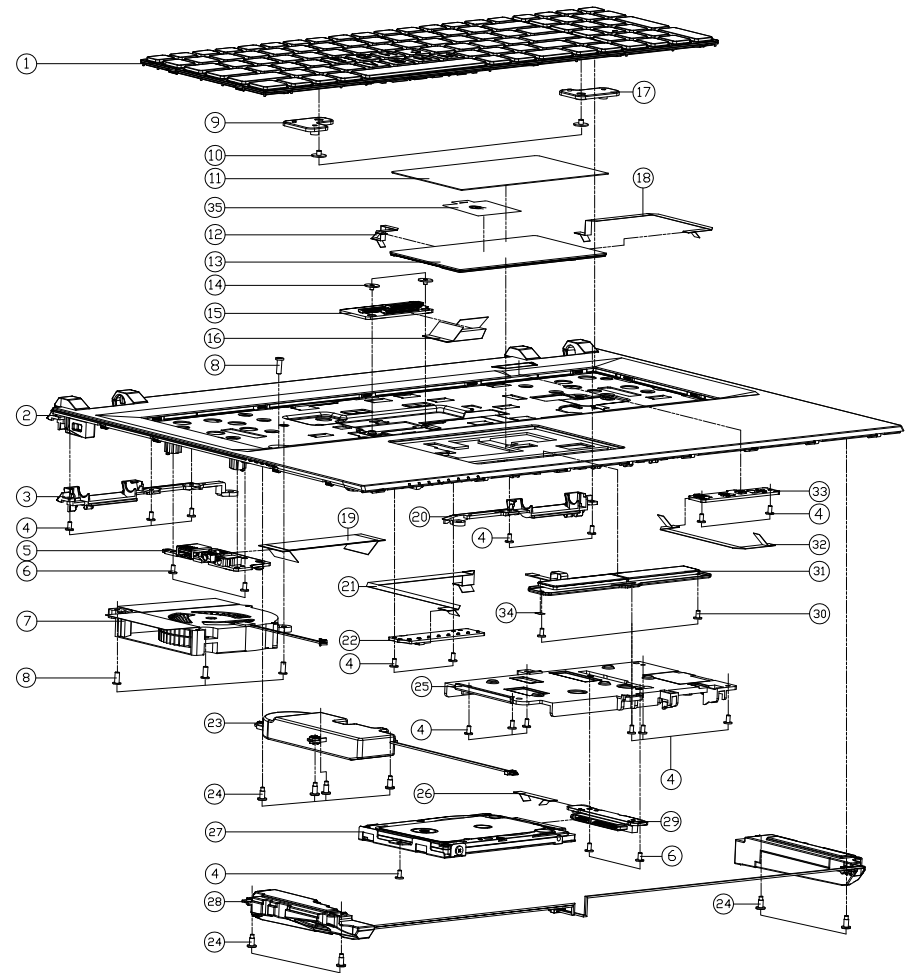
Part List Illustration Location

The following table indicates where to find the appropriate part list illustration.

Table A - 1
**Part List Illustration
Location**

Part	
Top	<i>page A - 3</i>
Bottom	<i>page A - 4</i>
Main Board	<i>page A - 5</i>
HDD	<i>page A - 6</i>
LCD	<i>page A - 7</i>

Top

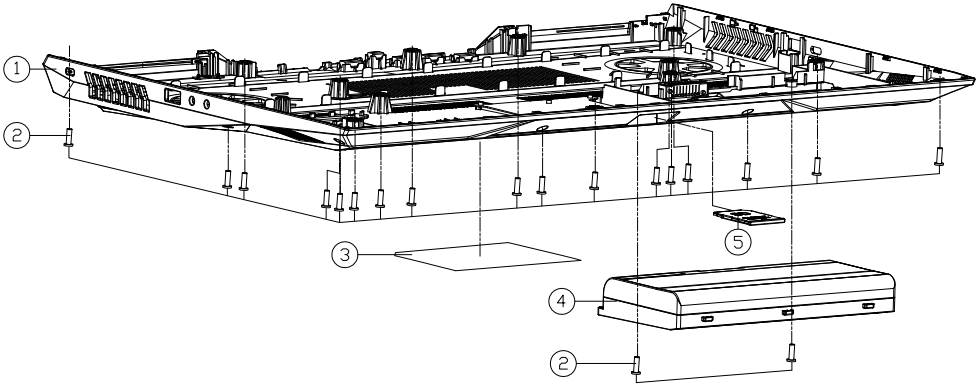


ITEM	PART NAME	PART NO.	REMARK
1	KEYBOARD BLK W/ LED BACKLIGHT (KAPDK)	6-80-N1520-01D-1	FOR LED PER KEY KB SERIES
1	KB FOR MULTI ISC BL KB US SERIES PB70EF	6-PB70EF-KB-MCL-US	FOR MULTI ISC BL KB SERIES
2	TOP CASE MODULE (BLASTER) PB70EF (KAPDK)	6-39-PB702-012-B	
2	TOP CASE MODULE (BLASTER) PB70EF (KAPDK)	6-39-PB712-011-B	
3	HINGE COVER L PC+ABS (CIVESTRO FR3008) PB70EF	6-42-PB702-011	
4	SCREW M2*4L KT NI ICT NY (CD=04.5,DT=0.8)	6-35-B1120-4RC	
5	AUDIO JACK BOARD V3.0A (V/REDRIVER) PB70EF	6-77-PB508-D03A-A	
6	SCREW M2.5*4L (D=4.6,T=0.8) KT NI ICT NY	6-35-B1125-4RA	
7	CPU FAN MODULE PWM (FCN) PB70EF	6-31-PB70S-102	
8	SCREW M2.5*8L KT BK/Z NY ICT	6-35-B6125-8R0	
9	KB TRANSFER BKT-2 PB70EF	6-33-PB702-021	
10	SCREW M2.5*2.5L KT BK/Z ICT NY(0.8,T=0.6)	6-35-B6125-2R5	
11	TP MYLAR AG32 FOR P970EN	6-40-P97N2-020	FOR V/D FPGAMMA TOUCH PAD
12	FFC FP TO MB L=52MM 5V 6PIN PB70EF	6-43-PB700-021	FOR V/FP (GAMMA SECURE PAD)
13	GAMMA SECURE PAD SYMPTICS IN-PAD-02 20*20 0.15MM 0.15MM 0.15MM 0.15MM	6-49-P95N3-022	FOR V/FP (GAMMA SECURE PAD)
13	GAMMA TOUCH PAD SYMPTICS IN-PAD-02 20*20 0.15MM 0.15MM 0.15MM 0.15MM	6-49-P95N3-011	FOR V/D FPGAMMA TOUCH PAD
14	SCREW M2*2L KT BK/Z ICT NY(0.8,T=0.6)	6-35-B6120-2RE	
15	PER KEY BOARD V3.0 PB50EF	6-77-PB507-D03	
16	FFC P-KEY TO MB L=59MM 5V 40PIN PB70EF	6-43-PB700-051	
17	KB TRANSFER BKT-1 PB70EF	6-33-PB702-011	
18	FFC TP TO MB L=135MM 5V 8PIN PB70EF	6-43-PB700-031	
19	FFC AUDIO TO MB L=75MM 5V 40PIN PB70EF	6-43-PB700-011	
20	HINGE COVER R PC+ABS (CIVESTRO FR3008) PB70EF	6-42-PB702-051	
21	FFC LED TO MB L=189MM 5V 16PIN PB70EF	6-43-PB700-041	
22	LED BOARD V3.0 PB50EF	6-77-PB504-D03	
23	SUBWOOFER+CABLE 170MM 4W 400 2P (TUSTER) PB70EF	6-23-5PB70-0W0	
24	SCREW M2*6.2L NI ICT NY FOR SPEAKER	6-35-Z1120-6R2	
25	TP HOLDER MODULE PB70EF	6-42-PB702-102	
26	FFC CABLE HDD TO MB (P=45) L=263MM 60V 10PIN (C00) PB70EF	6-43-PB500-062	
27	W/D HDD ASS'Y PB70EF	6-79-PB70EF0J-010	
27	W/HDD ASS'Y PB70EF	6-79-PB70EF0J-020	
28	SPEAKER+CABLE R 200MM L 230MM 2W 400 4P (TUSTER) PB70EF	6-23-5PB70-0S1	
29	HDD BOARD V3.0 PB50EF	6-77-PB50N-D03	
30	SCREW M2*3L KT NI ICT NY (CD=04.0,DT=0.8)	6-35-B1120-3RD	
31	FUNCTION KEY FOR CLICK BUTTON MODULE W/D FINER AND PAINT PS086S	6-23-KP65R-023	
32	FFC POWER TO MB L=103MM 5V 4PIN PB70EF	6-43-PB700-061	
33	PWR BTN BOARD V3.0 PB70EF	6-77-PB50C-D03-A	
34	CLICK MODULE FPC MYLAR BK5*10.4T P970EN	6-40-P97N2-060	
35	GAMMA SECURE PAD FINGER PRINT STICKER FOR P95/P6/P7	6-45-P95N8-D10	FOR V/FP (GAMMA TOUCH PAD)

Figure A - 1
Top

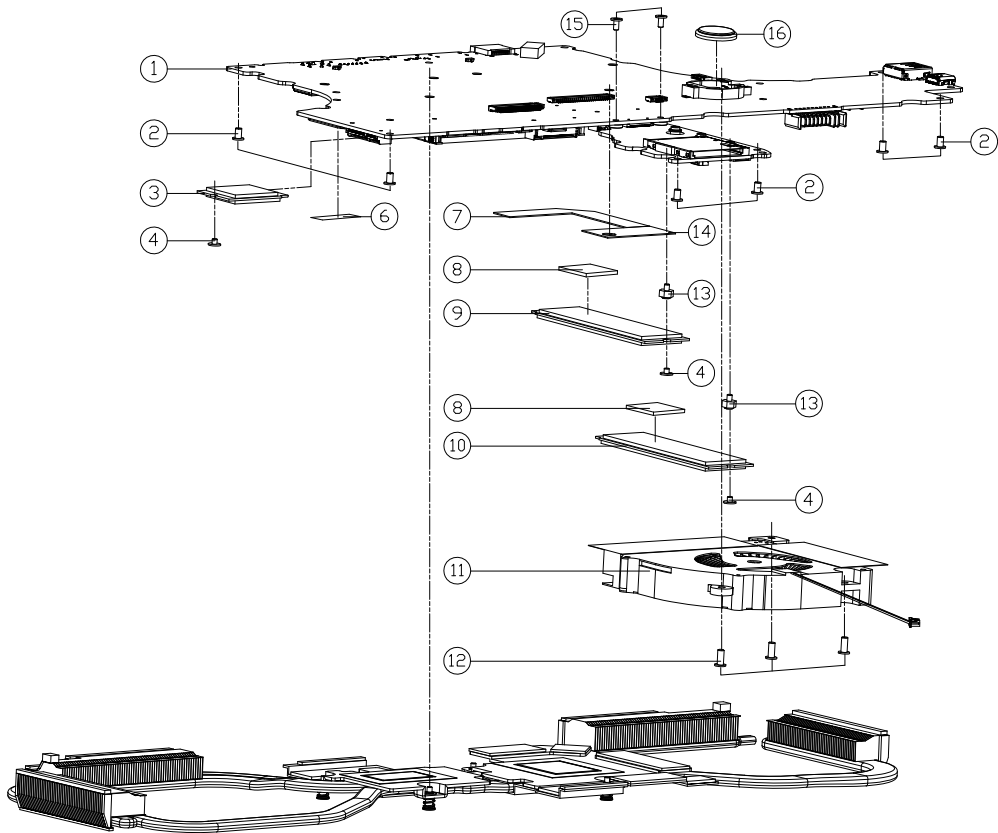
Bottom

Figure A - 2
Bottom



ITEM	PART NAME	PART NO	REMARK
1	BOTTOM COVER MODULE PB70EF	6-39-PB703-012	
1	BOTTOM COVER MODULE PB71EF	6-39-PB713-011	
2	.SCREW M2.5x8L KI BK/Z NY ICT	6-35-B6125-8R0	
3	PRODUCT LABEL FOR PB70ED	6-45-PB70ED03-010	
3	PRODUCT LABEL FOR PB70ED-G	6-45-PB70EDG3-010	
3	PRODUCT LABEL FOR PB70EF	6-45-PB70EF03-010	
3	PRODUCT LABEL FOR PB70EF-G	6-45-PB70EFG3-010	
3	PRODUCT LABEL FOR PB71ED	6-45-PB71ED03-010	
3	PRODUCT LABEL FOR PB71ED-G	6-45-PB71EDG3-010	
3	PRODUCT LABEL FOR PB71EF	6-45-PB71EF03-010	
3	PRODUCT LABEL FOR PB71EF-G	6-45-PB71EFG3-010	
4	WŁĄCZNIK WYKŁADKOWY ZEP ZŁĄCZAS ODMOCNIA SZCZEBNIAŁ (TEXTURED PEGS)	6-87-PB50S-62D02	
4	WŁĄCZNIK WYKŁADKOWY ZEP ZŁĄCZAS ODMOCNIA WŁĄCZNIK IŁO (TEXTURED PEGS)	6-87-PB50S-61D02	
5	WŁĄCZNIK ZŁĄCZNIK TYTUŁU PEŁNIAŁ (CZĘŚĆ WŁĄCZNIK WŁĄCZNIK)	6-42-W9708-011	

Main Board

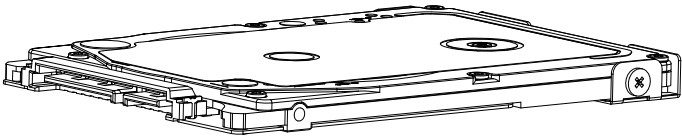
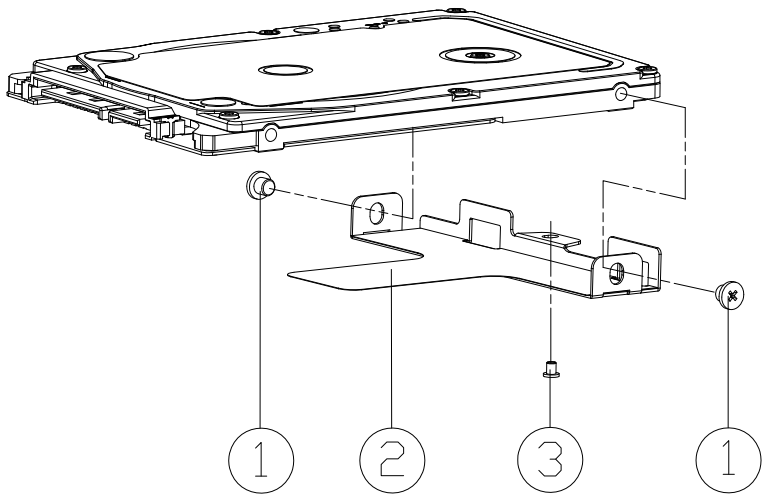


ITEM	PART	NAME	PART NO	REMARK
1	MB	ABSORBER-1	6-77-PB70EFGA-N03-A	
1	MB	ABSORBER-2	6-77-PB70EFGA-N03-B	
1	MB	ABSORBER-3	6-77-PB70EFGA-N03-1B	
1	MB	ABSORBER-4	6-77-PB70EFGA-N03-3B	
2	SCREW	M2.5x4L (D=4.6,T=0.8) KI NI ICT NY	6-35-B1125-4RA	
3	WAFER	CONDUCTIVE THERMAL PASTE (T=0.8) KI NI ICT NY	6-88-P95EF-4200	OPTION
3	WAFER	CONDUCTIVE THERMAL PASTE (T=0.8) KI NI ICT NY	6-88-P75FF-4210	OPTION
3	WAFER	CONDUCTIVE THERMAL PASTE (T=0.8) KI NI ICT NY	6-88-N24GF-4220	OPTION
3	WAFER	CONDUCTIVE THERMAL PASTE (T=0.8) KI NI ICT NY	6-88-N24GF-4200	OPTION
4	SCREW	M2x2L KI NI ICT NY (DD=0.5, T=0.8)	6-35-B1120-2RA	
5	CPU & VGA	RTX G2 HEATSINK MODULE PB70EF	6-31-PB70N-102	
6	TAPE	MYLAR TRANSPARENT (20x10x0.05) P180HM	6-40-P1803-020	
7	MB	ABSORBER-1	6-47-PB50S-010	
8	THERMAL	PAD FOR M2 SSD M4500 18x18mm PB50EF	6-48-PB503-011	
9	SSD	M2 2280 TOSHIBA SHIMADA NVMe SSD 1TB 48 LAYERS	6-85-D511T-S00	OPTION
9	SSD	M2 2280 SHIMADA SHIMADA NVMe SSD 1TB 48 LAYERS	6-85-D515B-S08	OPTION
9	SSD	M2 2280 SHIMADA SHIMADA NVMe SSD 1TB 48 LAYERS	6-85-D515B-S05	OPTION
9	SSD	M2 2280 SHIMADA SHIMADA NVMe SSD 1TB 48 LAYERS	6-85-D515B-Z00	OPTION
9	SSD	M2 2280 SHIMADA SHIMADA NVMe SSD 1TB 48 LAYERS	6-85-D516-K00	OPTION
9	SSD	M2 2280 SHIMADA SHIMADA NVMe SSD 1TB 48 LAYERS	6-85-D516-Z02	OPTION
9	SSD	M2 2280 SHIMADA SHIMADA NVMe SSD 1TB 48 LAYERS	6-85-D515B-H02	OPTION
9	SSD	M2 2280 SHIMADA SHIMADA NVMe SSD 1TB 48 LAYERS	6-85-D5164-Z00	OPTION
10	SSD	M2 2280 TOSHIBA SHIMADA NVMe SSD 1TB 48 LAYERS	6-85-D511T-Z00	OPTION
10	SSD	M2 2280 SHIMADA SHIMADA NVMe SSD 1TB 48 LAYERS	6-85-D516-K101	OPTION
10	SSD	M2 2280 SHIMADA SHIMADA NVMe SSD 1TB 48 LAYERS	6-85-D511T-S00	OPTION
10	SSD	M2 2280 SHIMADA SHIMADA NVMe SSD 1TB 48 LAYERS	6-85-D515B-S08	OPTION
10	SSD	M2 2280 SHIMADA SHIMADA NVMe SSD 1TB 48 LAYERS	6-85-D515B-S05	OPTION
10	SSD	M2 2280 SHIMADA SHIMADA NVMe SSD 1TB 48 LAYERS	6-85-D515B-Z00	OPTION
10	SSD	M2 2280 SHIMADA SHIMADA NVMe SSD 1TB 48 LAYERS	6-85-D516-K00	OPTION
10	SSD	M2 2280 SHIMADA SHIMADA NVMe SSD 1TB 48 LAYERS	6-85-D516-Z02	OPTION
10	SSD	M2 2280 SHIMADA SHIMADA NVMe SSD 1TB 48 LAYERS	6-85-D515B-H02	OPTION
10	SSD	M2 2280 SHIMADA SHIMADA NVMe SSD 1TB 48 LAYERS	6-85-D5164-Z00	OPTION
11	GPU	FAN MODULE PWM (FCN) PB70EF	6-31-PB70S-202	
12	SCREW	M2.5x8L KI BK/Z NY ICT	6-35-B6125-8R0	
13	SCREW	M2x5L W=25 D=5 STEEL ICT NY FOR HEAT CONDUCTIVE	6-35-ZA120-2R5-1	
14	MB	ABSORBER-2	6-47-PB50S-020	
15	SCREW	M2x4L KI NI ICT NY (DD=0.5,T=0.8)	6-35-B1120-4RC	
16	BATTERY	3V 220MA BBBCR2032B (KTS)	6-23-6A2B2-030	

Figure A - 3
Main Board

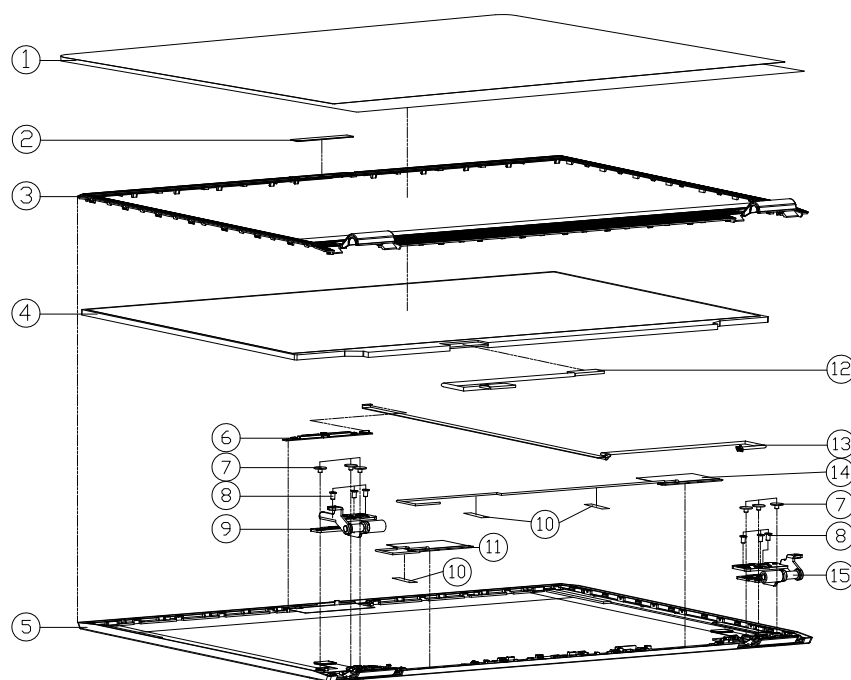
HDD

Figure A - 4
HDD



ITEM	PART NAME	PART NO	REMARK
1	SCREW M3*2.5L KI NI ICT NY	6-35-B1130-2R5	
2	HDD BKT 7MM SECC T=0.5 N250LU	6-33-N250J-011	
3	SCREW M2*4L KI NI ICT NY (DD=Ø4.5,DT=0.8)	6-35-B1120-4RC	

LCD



ITEM	PART NAME	PART NO	REMARK
1	LCD PROTECT MYLAR BOPP NB70TJ1	6-40-NB708-010	
2	CCD LENS PMMA N150ZU	6-42-N15Z1-020	
3	FRONT COVER MODULE PB70EF	6-39-PB701-012	
4	LCD N073" FHD/VVA/744HZ/5V G-SYNC/NT/NDN G7/ EDP 10E N1073TH-AAA LED 33MM	6-50-NBB35-Z120	
4	LCD N073" FHD/VVA/744HZ/5V G-SYNC/NT/NDN G7/ EDP AU B738H040 0U/V040 33MM	6-50-NBB35-G120	
4	LCD N073" FHD/IPS/144HZ/5V G-SYNC/NT/NDN G7/ EDP LG LPT35WFG-SP01 33MM	6-50-NBB35-L120	
5	BACK COVER MODULE PB70EF	6-39-PB701-022	
5	BACK COVER MODULE PB71EF	6-39-PB711-021	
6	AVC CAMERA PDSN TUBED 0.8MM/0.8MM 10 IN 10 DTYPE MICRO PDSN WHITE LED VIO-RED/RED 0.8MM VIO-RED	6-88-N15ZC-4900	OPTION
6	AVC CAMERA PDSN TUBED 0.8MM/0.8MM 10 IN 10 DTYPE MICRO PDSN WHITE LED VIO-RED/RED 0.8MM VIO-RED	6-88-N15ZC-5100	OPTION
7	SCREW M2.5*2.5L KI BK/Z ICT NY(Ø8,T=0.6)	6-35-B6125-2R5	
8	SCREW M2.5*4L (D=4.6,T=0.8) KI NI ICT NY	6-35-B1125-4RA	
9	HINGE L (SK7) LD PB70EF	6-33-PB701-0L1	
10	TDP CASE MYLAR FR83 25*7*0.05 P180HM	6-40-P1802-030	
11	ANTENNA SLOT 28MM IPDCA W/LAN VGT W/L PCB DR 24G/56 L= 300MM P80EF	6-23-7PB70-010	
12	CABLE FIBER EDP 300MM 30V 1 40 PIN GEL/LW CONN V06130-224-HF) PB70EF	6-43-PB701-011-N	
13	CCD CABLE L=500MM 30V 8PIN (HT) PB50EF	6-43-PB50T-012-1	
14	ANTENNA SLOT 28MM IPDCA W/LAN VGT W/L PCB DR 24G/56 L= 300MM P80EF	6-23-7PB70-020	
15	HINGE R (SK7) LD PB70EF	6-33-PB701-0R1	

Figure A - 5
LCD

Appendix B: Schematic Diagrams

This appendix has circuit diagrams of the **PB70ED / PB71ED** notebook's PCB's. The following table indicates where to find the appropriate schematic diagram.

Diagram - Page	Diagram - Page	Diagram - Page	Diagram - Page
System Block Diagram - Page B - 2	Frame Buffer Partition D - Page B - 26	USB Redriver - Page B - 50	VCCGT, VCCSA - Page B - 74
Processor 1/6 - Page B - 3	GPU 4/6 - Page B - 27	ANX7440 - Page B - 51	NVVD 1 & 2 - Page B - 75
Processor 2/6 - Page B - 4	GPU 5/6 - Page B - 28	USB+DP Type-C - Page B - 52	NVVD 3 - Page B - 76
Processor 3/6 - Page B - 5	IFP I/O Interface - Page B - 29	TPM - Page B - 53	PEX_VDD - Page B - 77
Processor 4/6 - Page B - 6	GPU 6/6 - Page B - 30	LAN RTL8111H - Page B - 54	FBVDDQ - Page B - 78
Processor 5/6 - Page B - 7	GPU NVVD, FBVDDQ - Page B - 31	ALC1220 - Page B - 55	AC-In, Charger - Page B - 79
Processor 6/6 - Page B - 8	GPU GND - Page B - 32	EC ITE8587 - Page B - 56	LED Board - Page B - 80
DDR4 CHA SO-DIMM_0 - Page B - 9	GPU Decoupling - Page B - 33	Fan, TP, Smart AMP PWR - Page B - 57	Power Board - Page B - 81
DDR4 CHB SO-DIMM_0 - Page B - 10	GPU Decoupling 2 - Page B - 34	LED Keyboard Ctrl - Page B - 58	HDD Board - Page B - 82
Panel - Page B - 11	GPU Pwr Ctrl, Level Shift - Page B - 35	LID - Page B - 59	Audio Board, Fan - Page B - 83
HDMI - Page B - 12	PCH 1/9 - Page B - 36	TR-TBT - Page B - 60	Audio Board_USB - Page B - 84
Mini DP Port - Page B - 13	PCH 2/9 - Page B - 37	AR_TBT_SP PWR - Page B - 61	Audio Board_AMP, Jack - Page B - 85
PS8330B - Page B - 14	PCH 3/9 - Page B - 38	TPS65987 - Page B - 62	Per Keyboard - Page B - 86
PS8331 - Page B - 15	PCH 4/9 - Page B - 39	TBT/Type C - Page B - 63	RTS5250 - Page B - 87
GPU 1/6 - Page B - 16	PCH 5/9 - Page B - 40	Conn_to Extend Board - Page B - 64	AMP TPA2008D2 - Page B - 88
GPU 2/6 - Page B - 17	PCH 6/9 - Page B - 41	3.3VA, 3.3V, 3.3VS, 5VS - Page B - 65	Subwoofer - Page B - 89
Frame Buffer Partition A - Page B - 18	PCH 7/9 - Page B - 42	PWR_SW VCCST, STG, SFR_OC - Page B - 66	Smart AMP - Page B - 90
Frame Buffer Partition A - Page B - 19	PCH 8/9 - Page B - 43	PWR_SW 1V8_AON, RUN - Page B - 67	Smart AMP for Subwoofer - Page B - 91
Frame Buffer Partition B - Page B - 20	PCH 9/9 - Page B - 44	VDD3, VDD5 - Page B - 68	Speaker Con - Page B - 92
Frame Buffer Partition B - Page B - 21	HDD Port - Page B - 45	DDR 1.2V, 0.6VS, 2.5V - Page B - 69	
GPU 3/6 - Page B - 22	M.2 WLAN+BT - Page B - 46	1.8VA, 1.05VA - Page B - 70	
Frame Buffer Partition C - Page B - 23	M.2 PCIEX4 SATA - Page B - 47	VCCIO - Page B - 71	
Frame Buffer Partition C - Page B - 24	CCD, FP - Page B - 48	VCore, VCCGT, VCCSA - Page B - 72	
Frame Buffer Partition D - Page B - 25	USB - Page B - 49	VCore Output Stage - Page B - 73	

Table B - 1
**SCHEMATIC
DIAGRAMS**

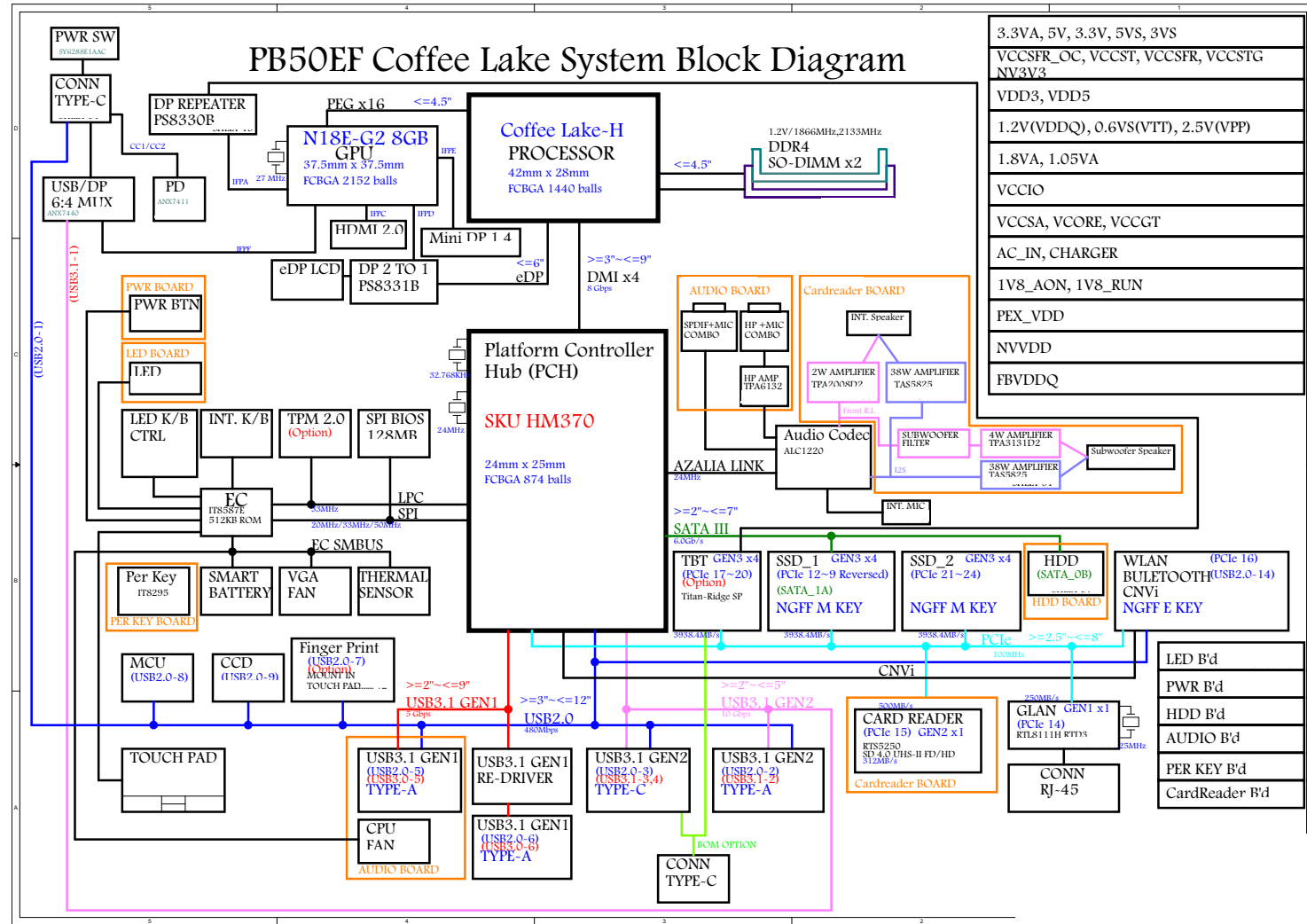


Version Note

The schematic diagrams in this chapter are based upon version 6-7P-PB5E7-001. If your mainboard (or other boards) are a later version, please check with the Service Center for updated diagrams (if required).

Schematic Diagrams

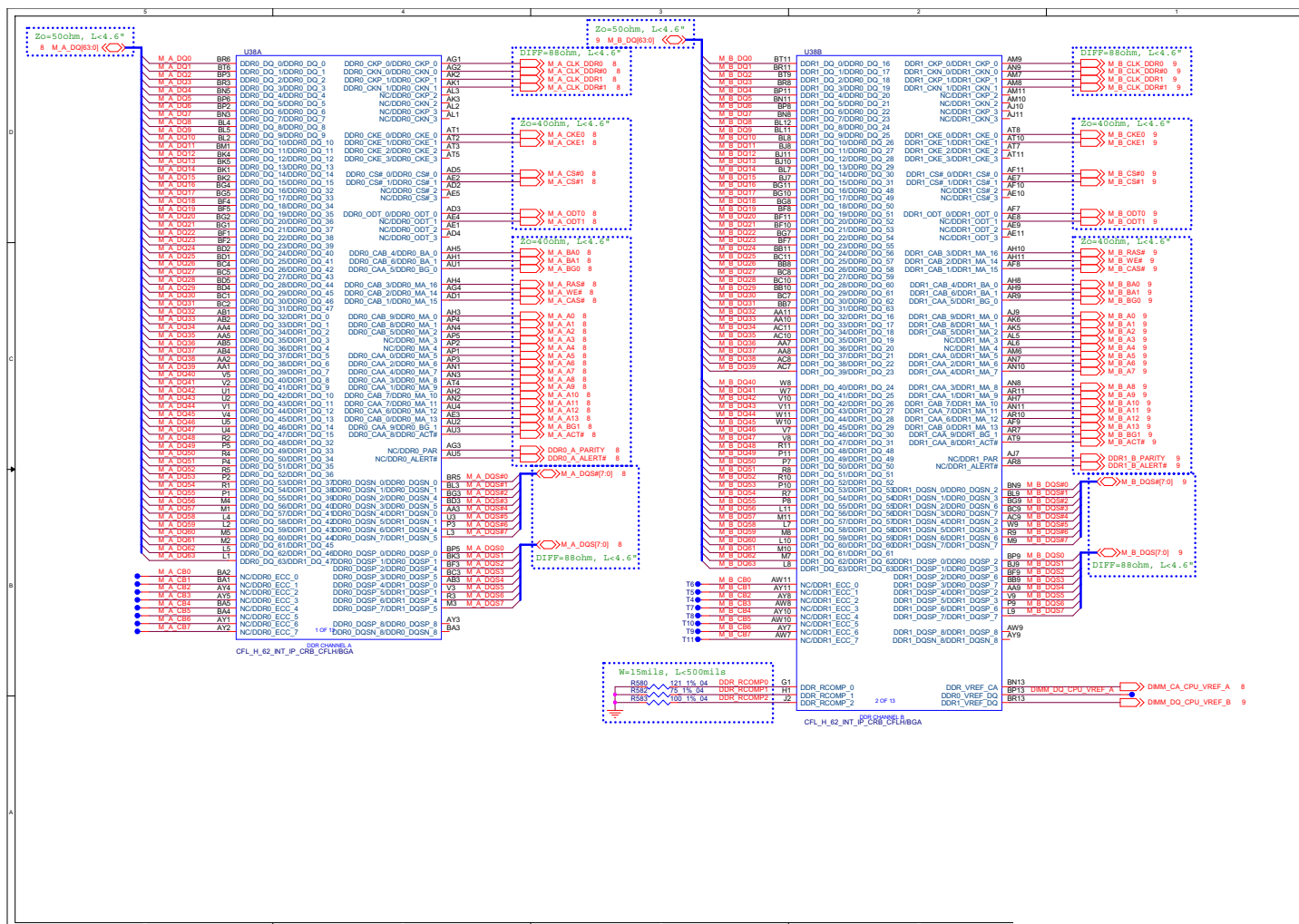
System Block Diagram



Sheet 1 of 91
System Block
Diagram

B.Schematic Diagrams

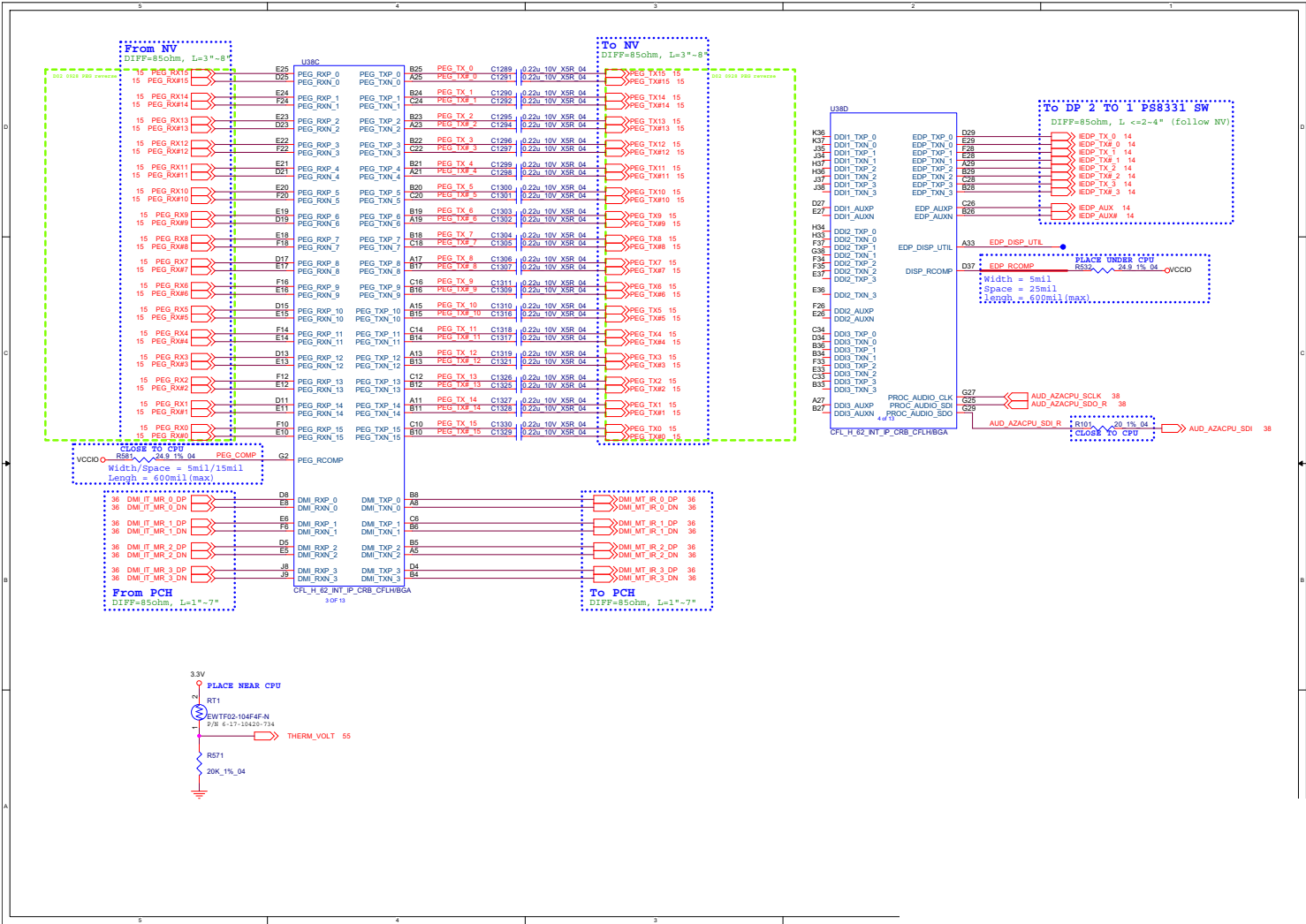
Processor 1/6 B - 3



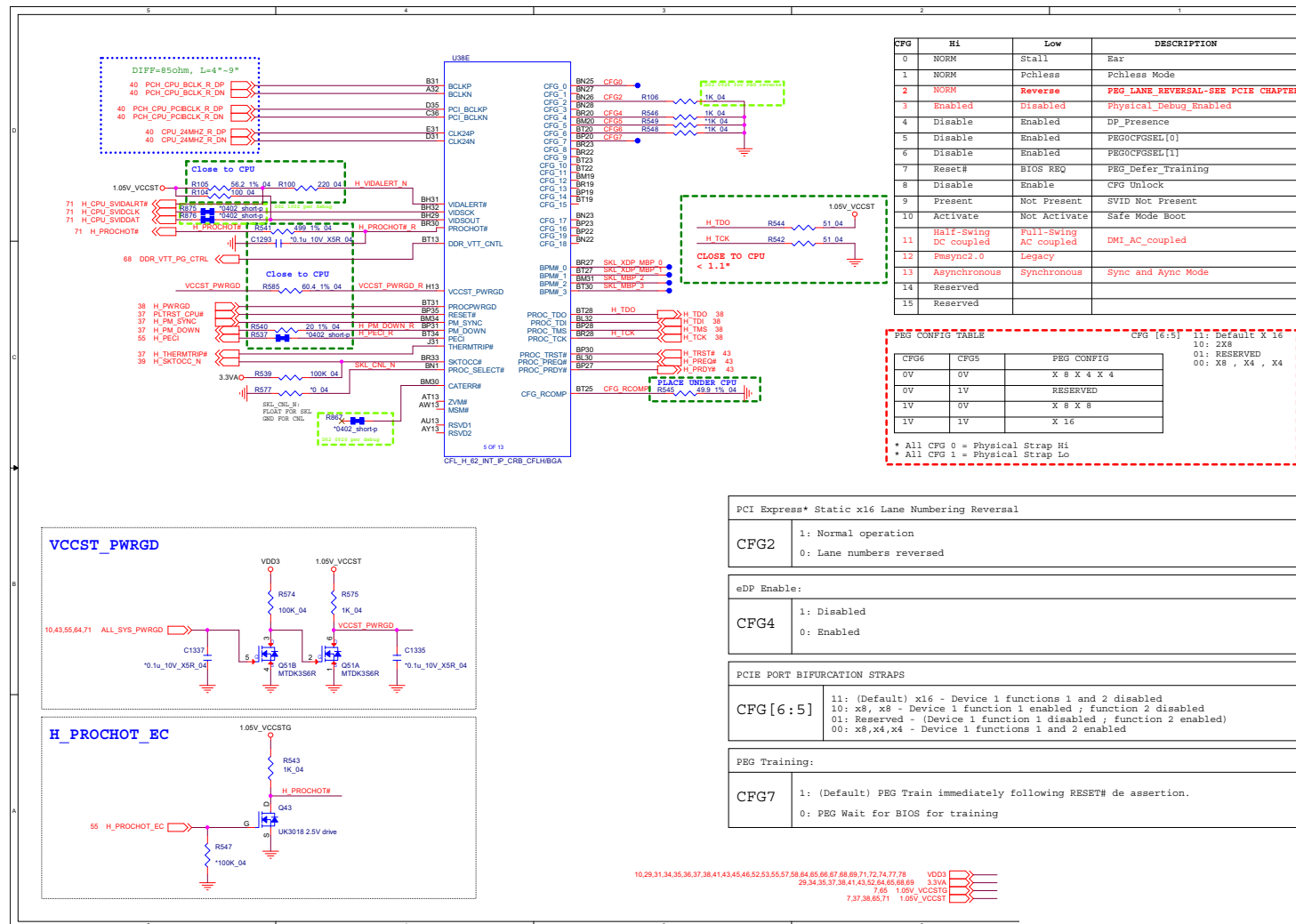
Schematic Diagrams

Processor 2/6

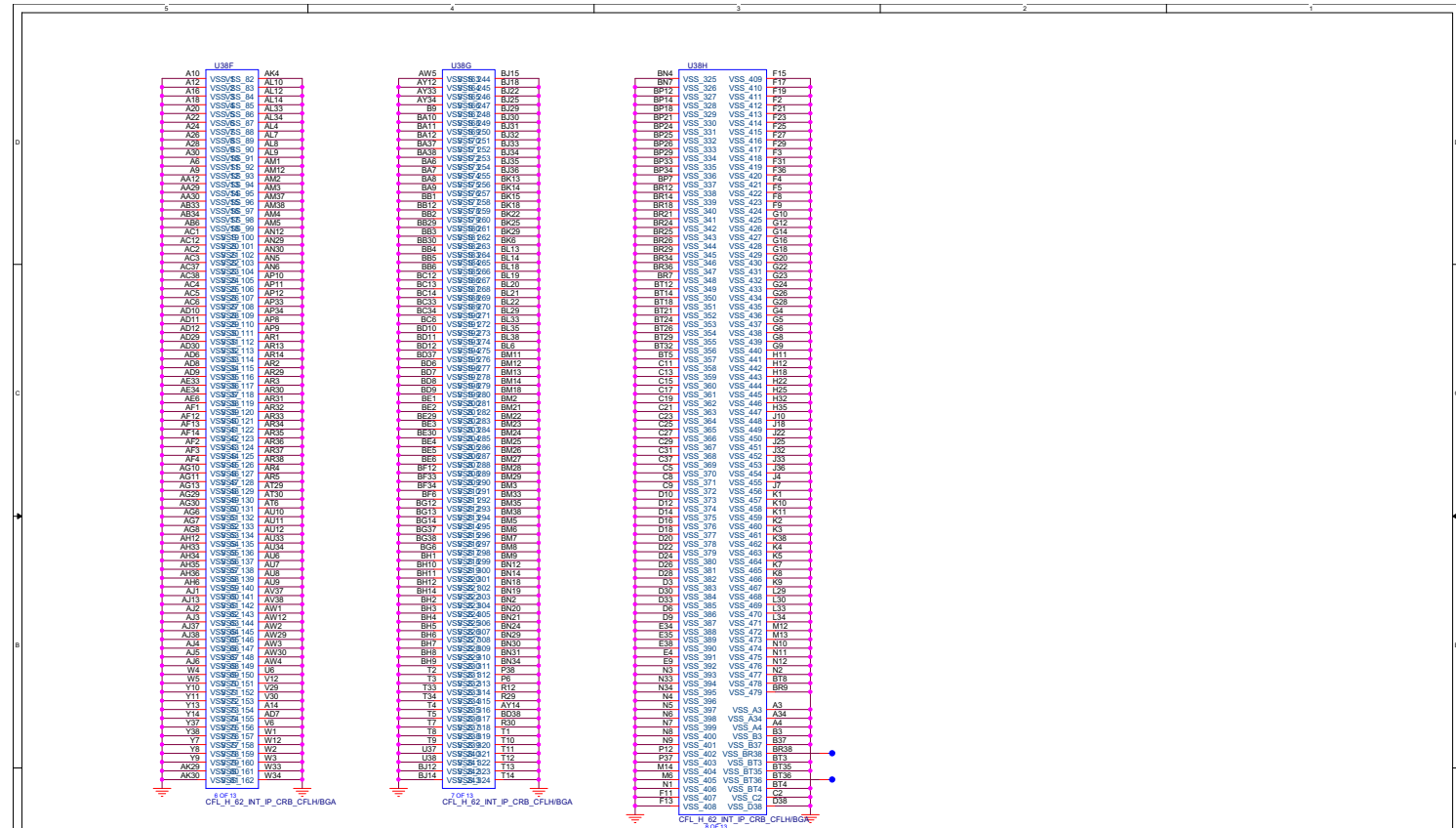
Sheet 3 of 91
Processor 2/6



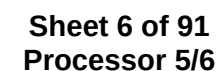
Processor 3/6

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Processor 3/6

Processor 4/6

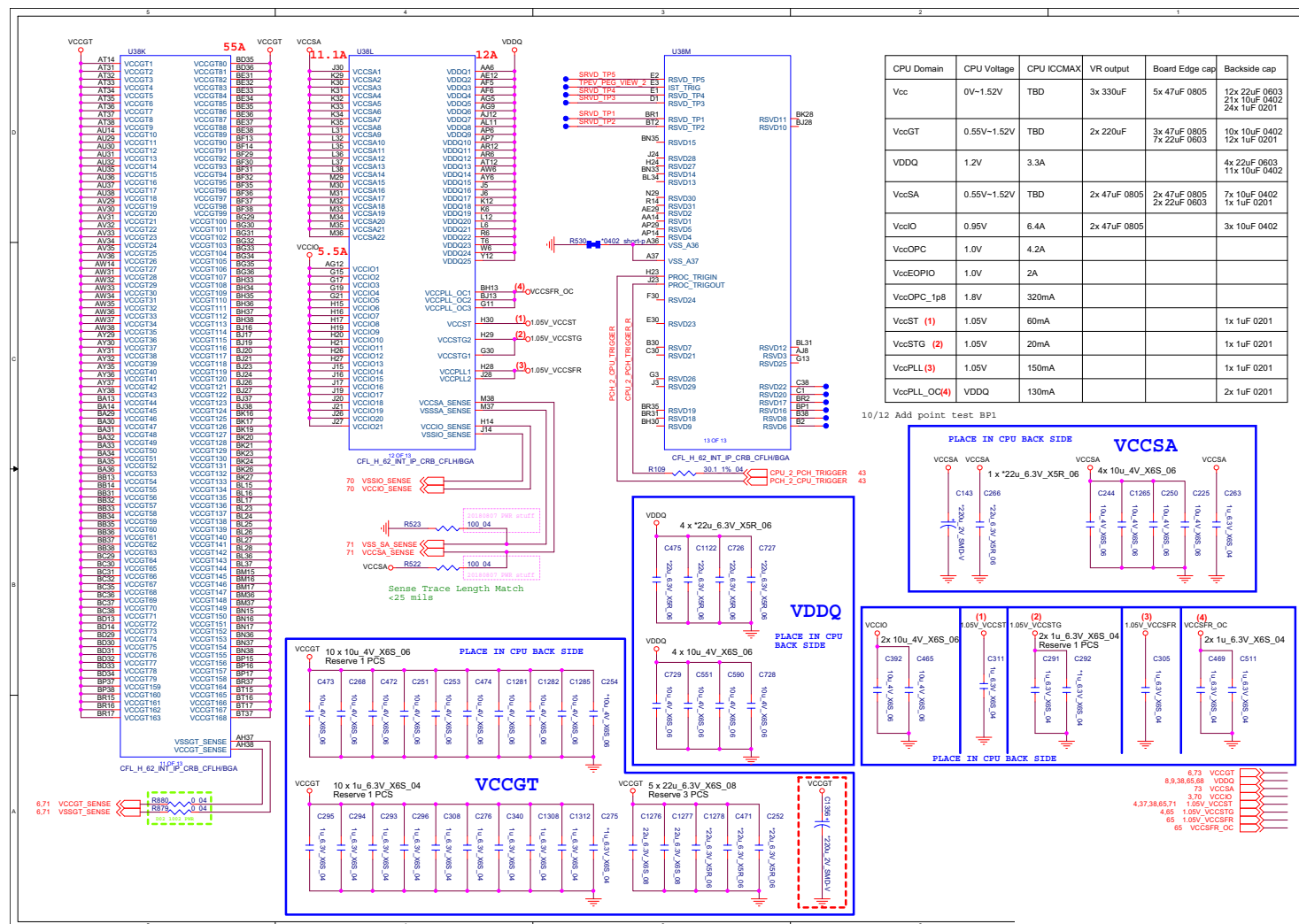


Processor 5/6 B - 7



Processor 6/6

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Processor 6/6

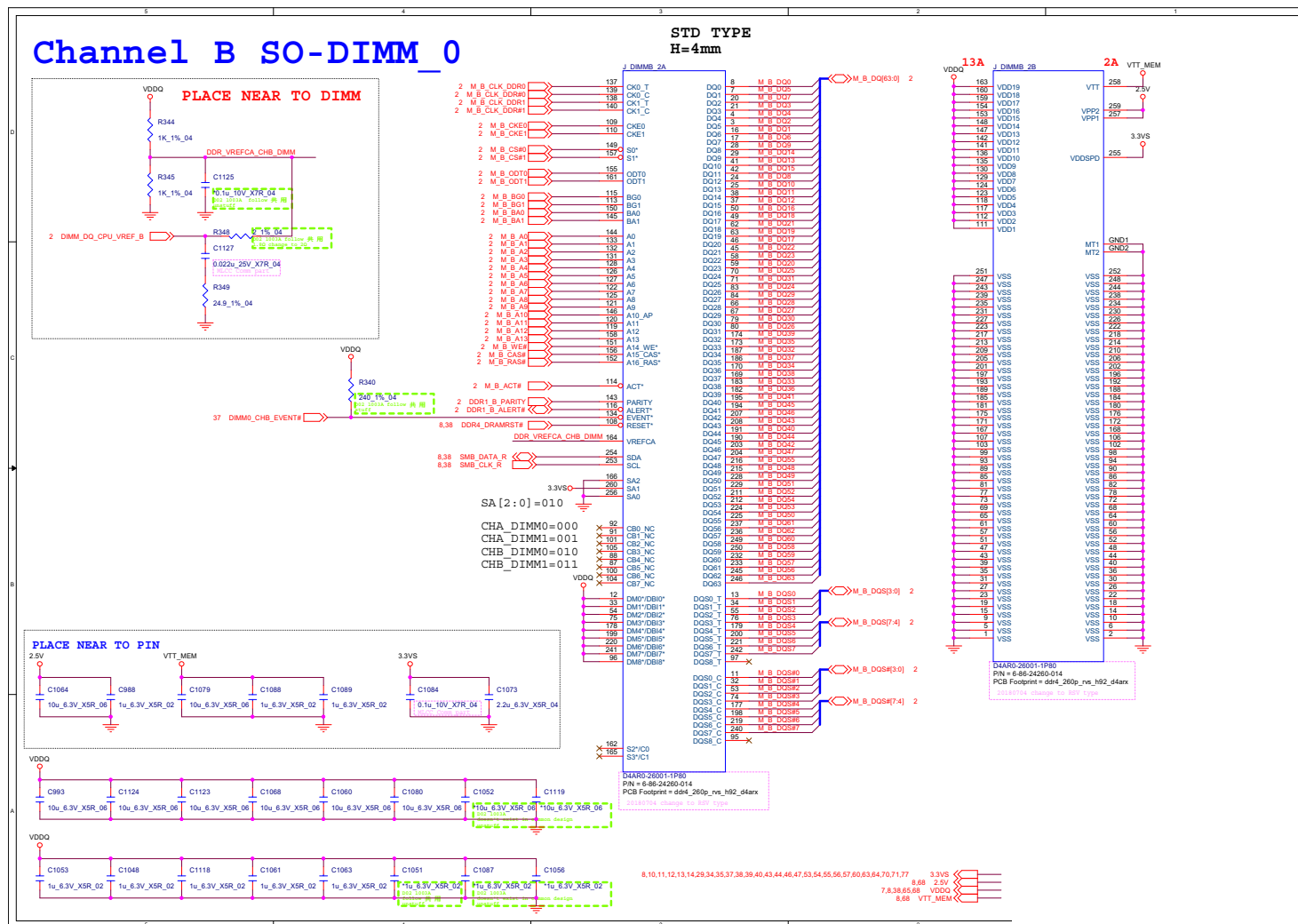


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DDR4 CHA SO-
DIMM_0

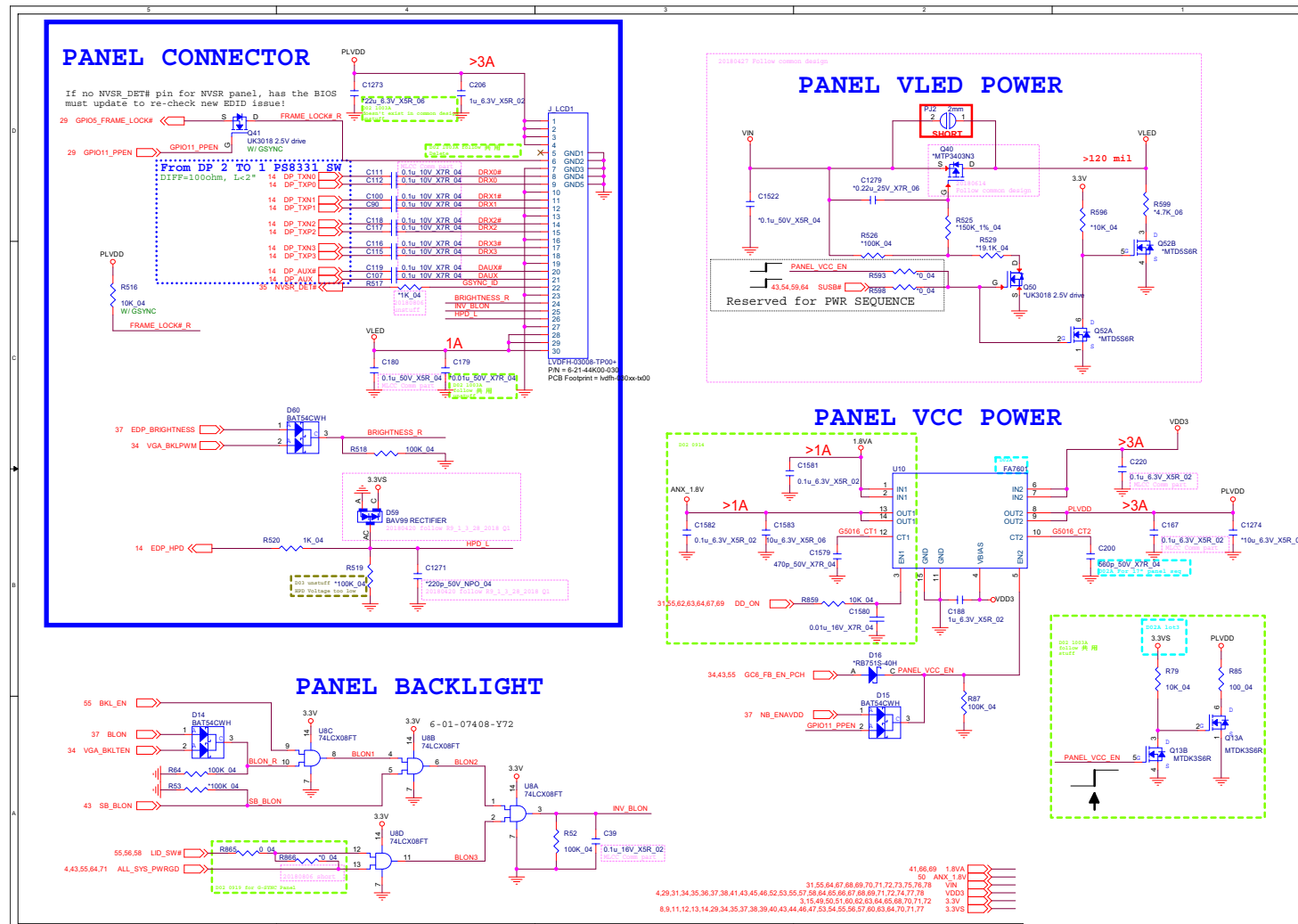


DDR4 CHB SO-DIMM_0

Channel B SO-DIMM 0

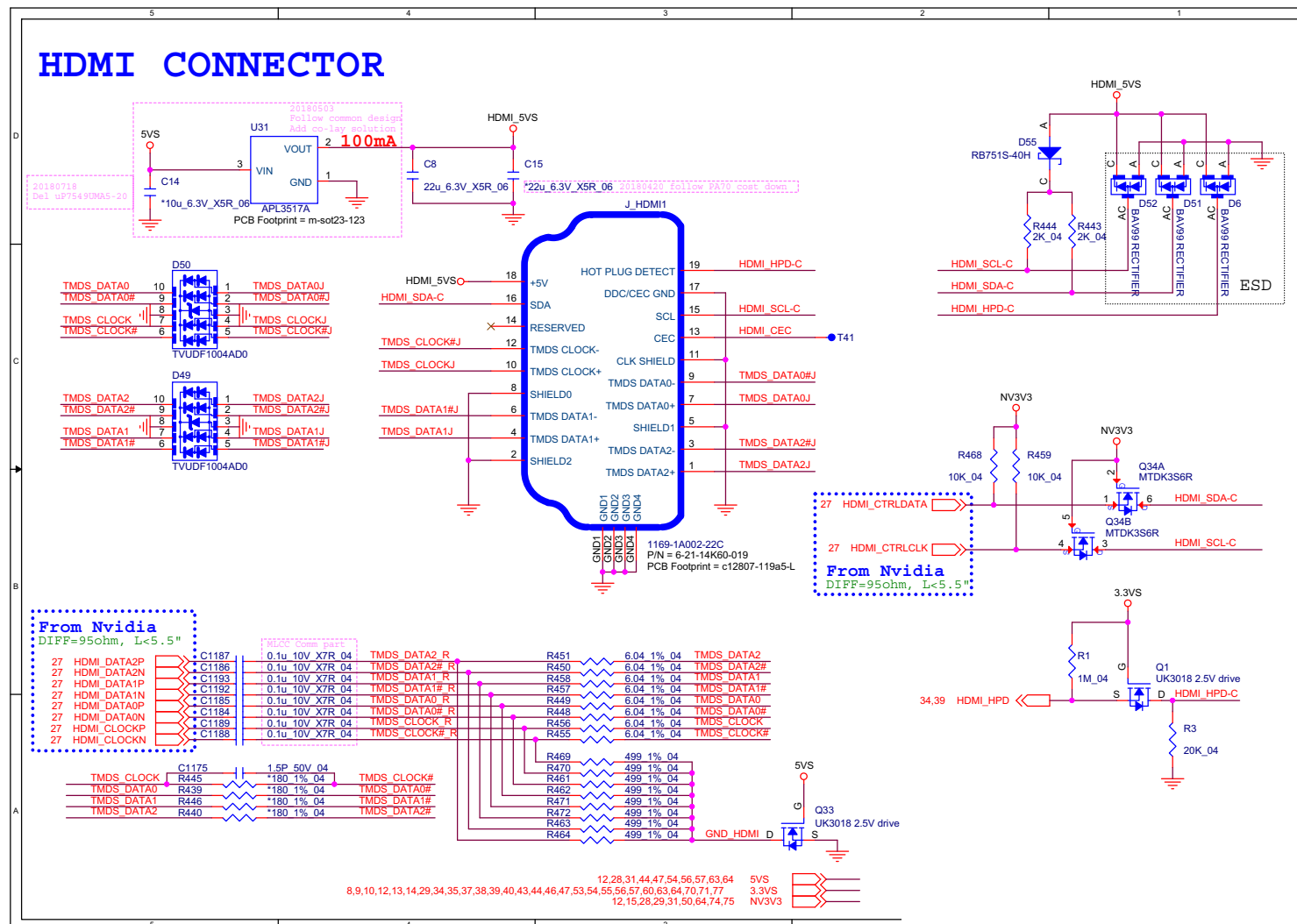


Panel B - 11

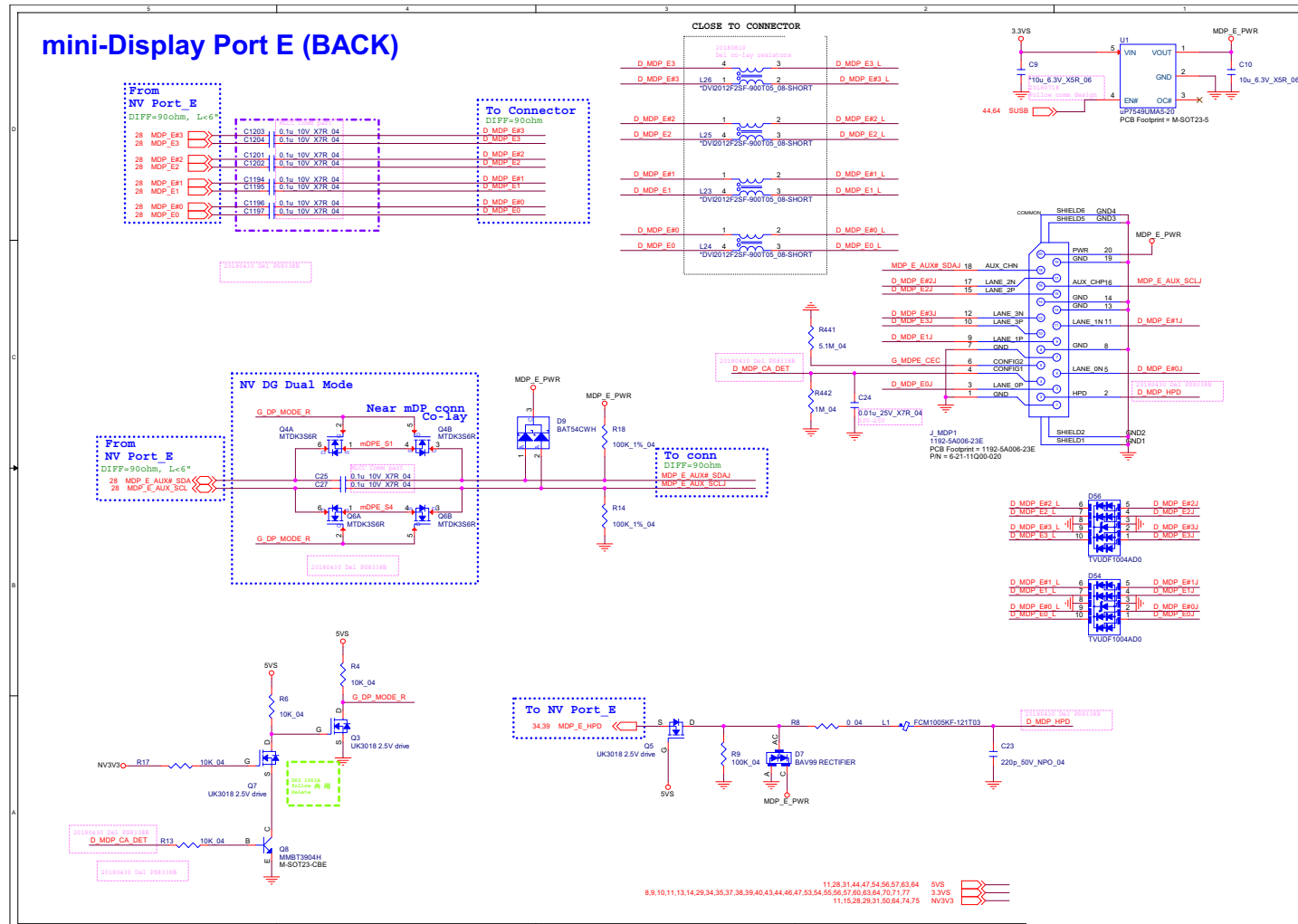


HDMI

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HDMI



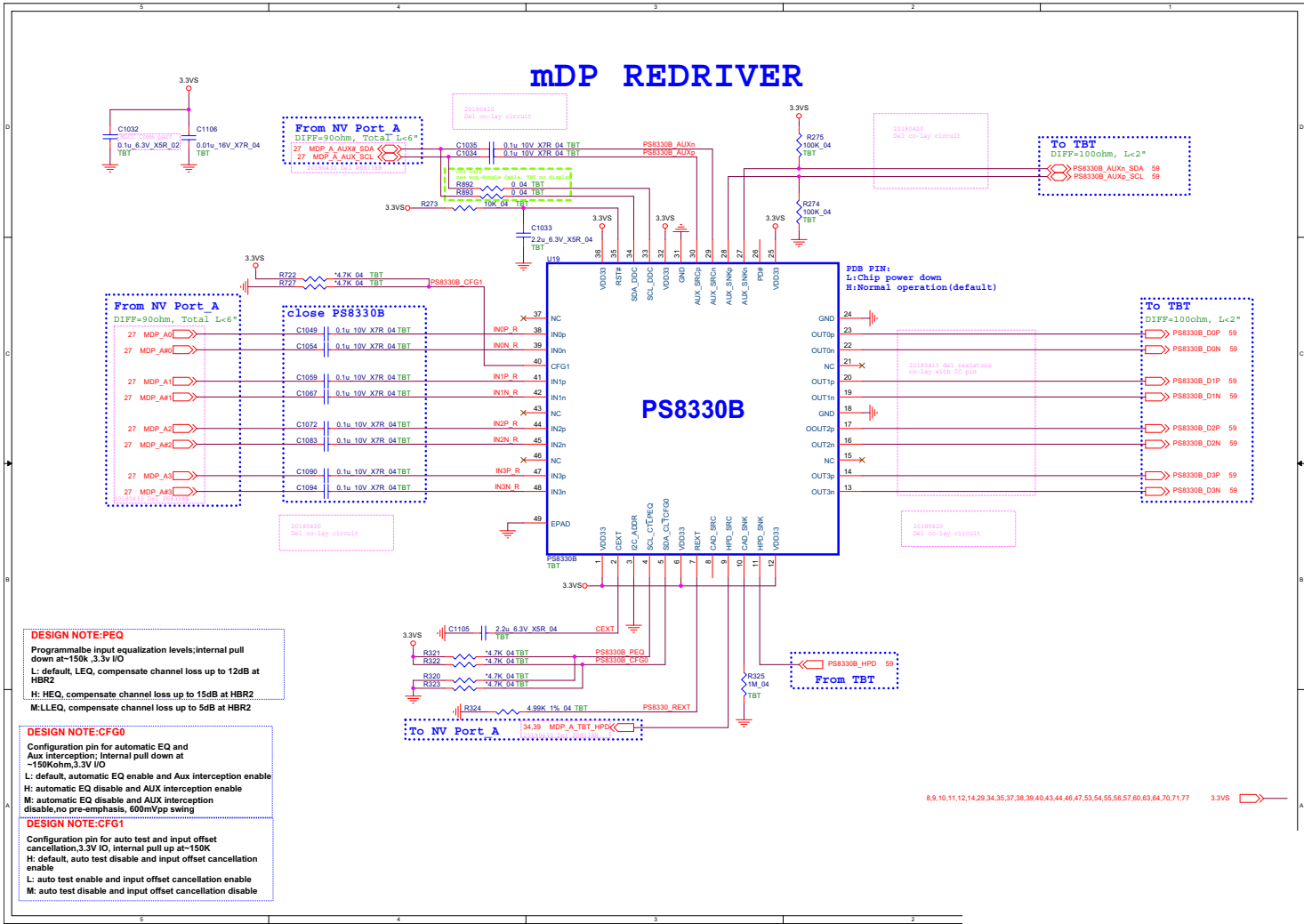
Mini DP Port B - 13



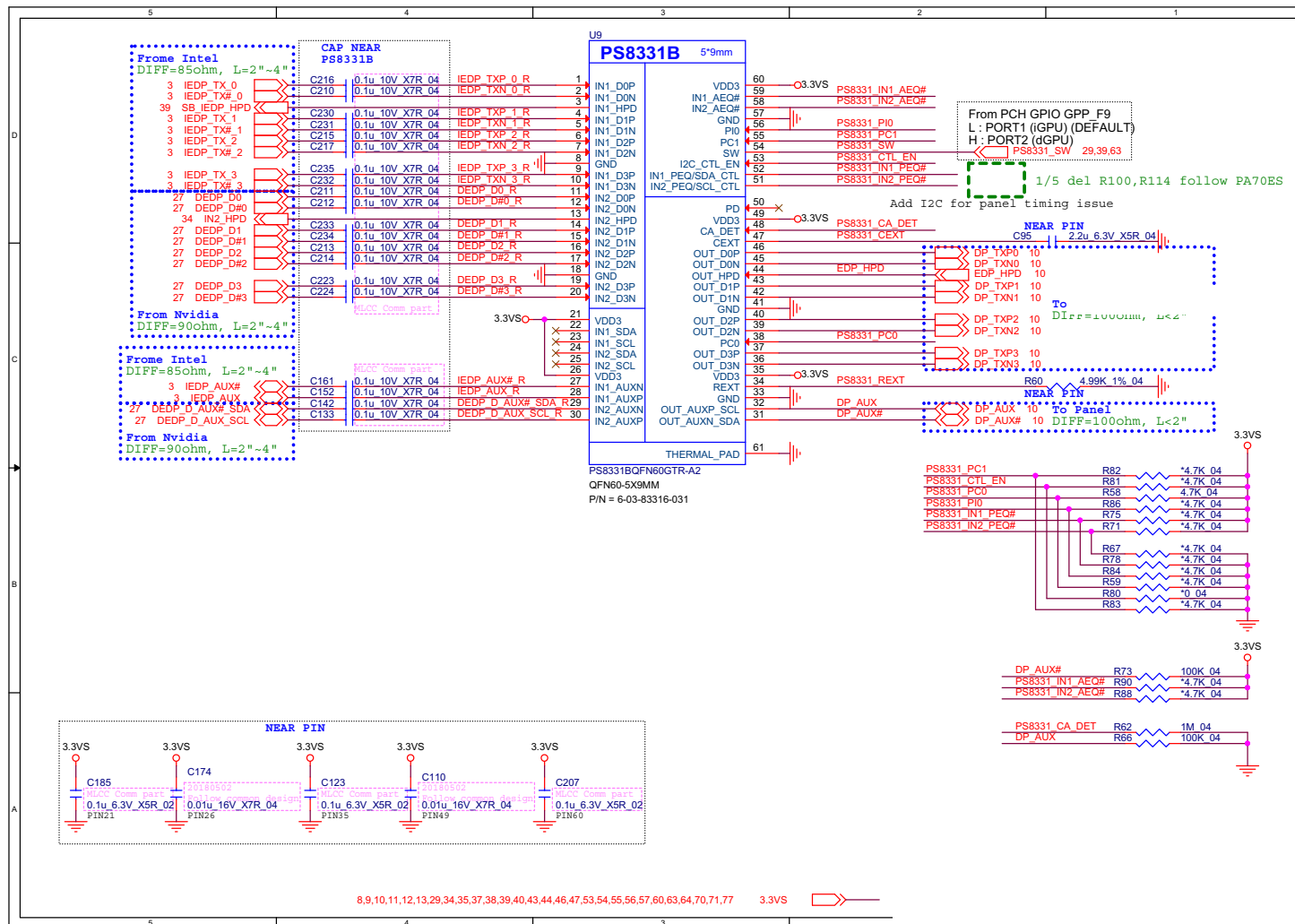
PS8330B

B.Schematic Diagrams

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PS8330B



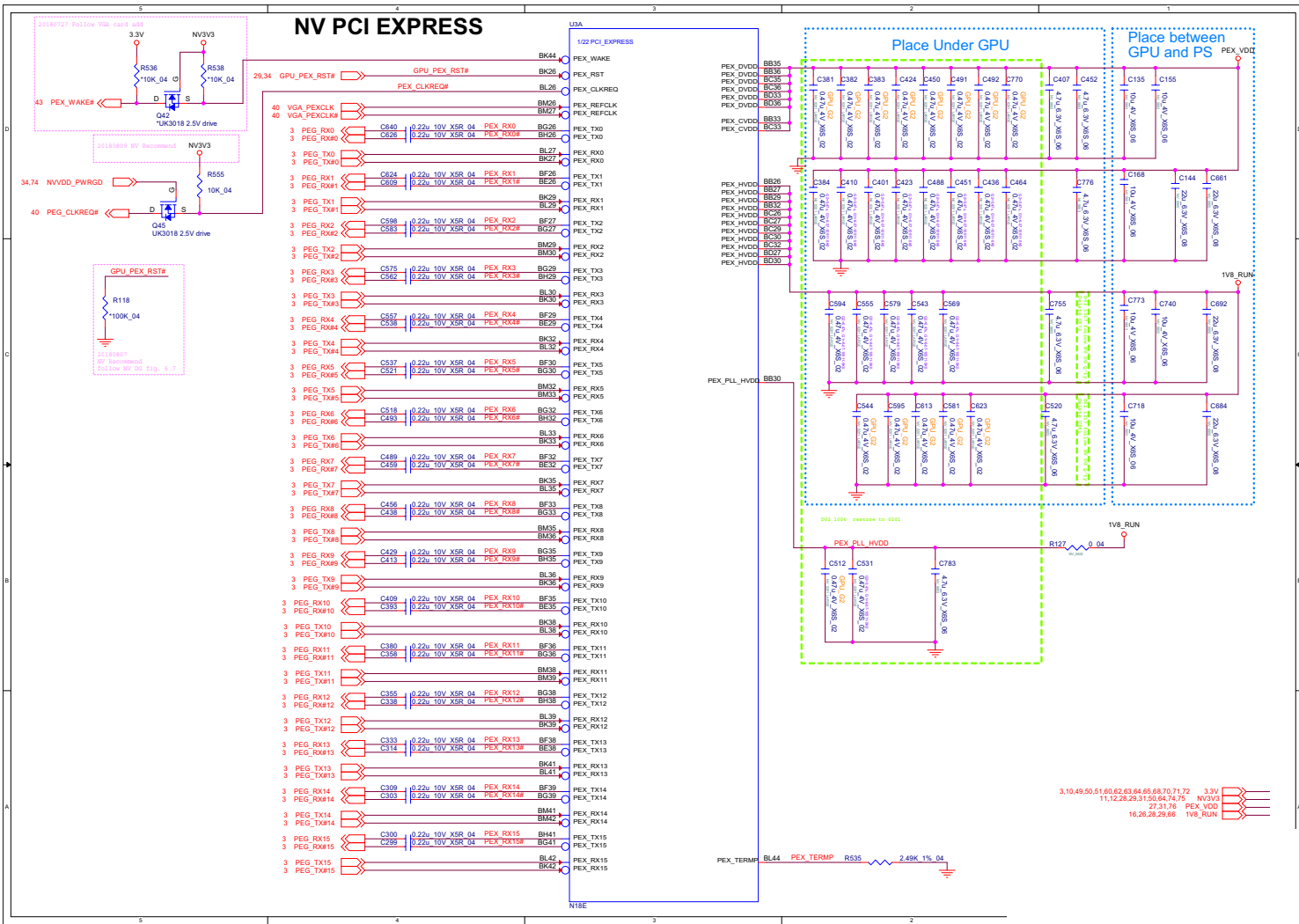
PS8331

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PS8331

GPU 1/6

B. Schematic Diagrams

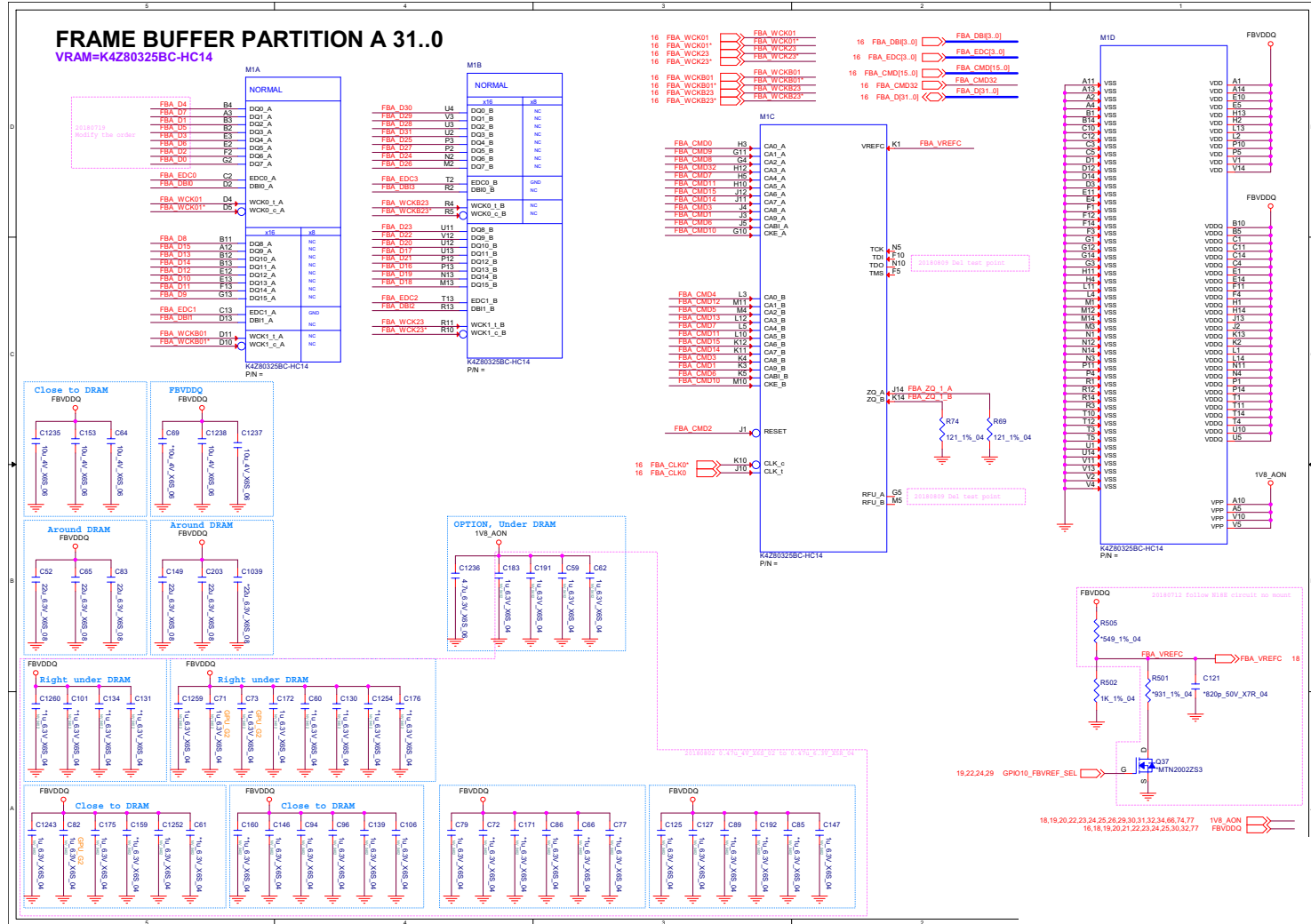
Sheet 15 of 91
GPU 1/6



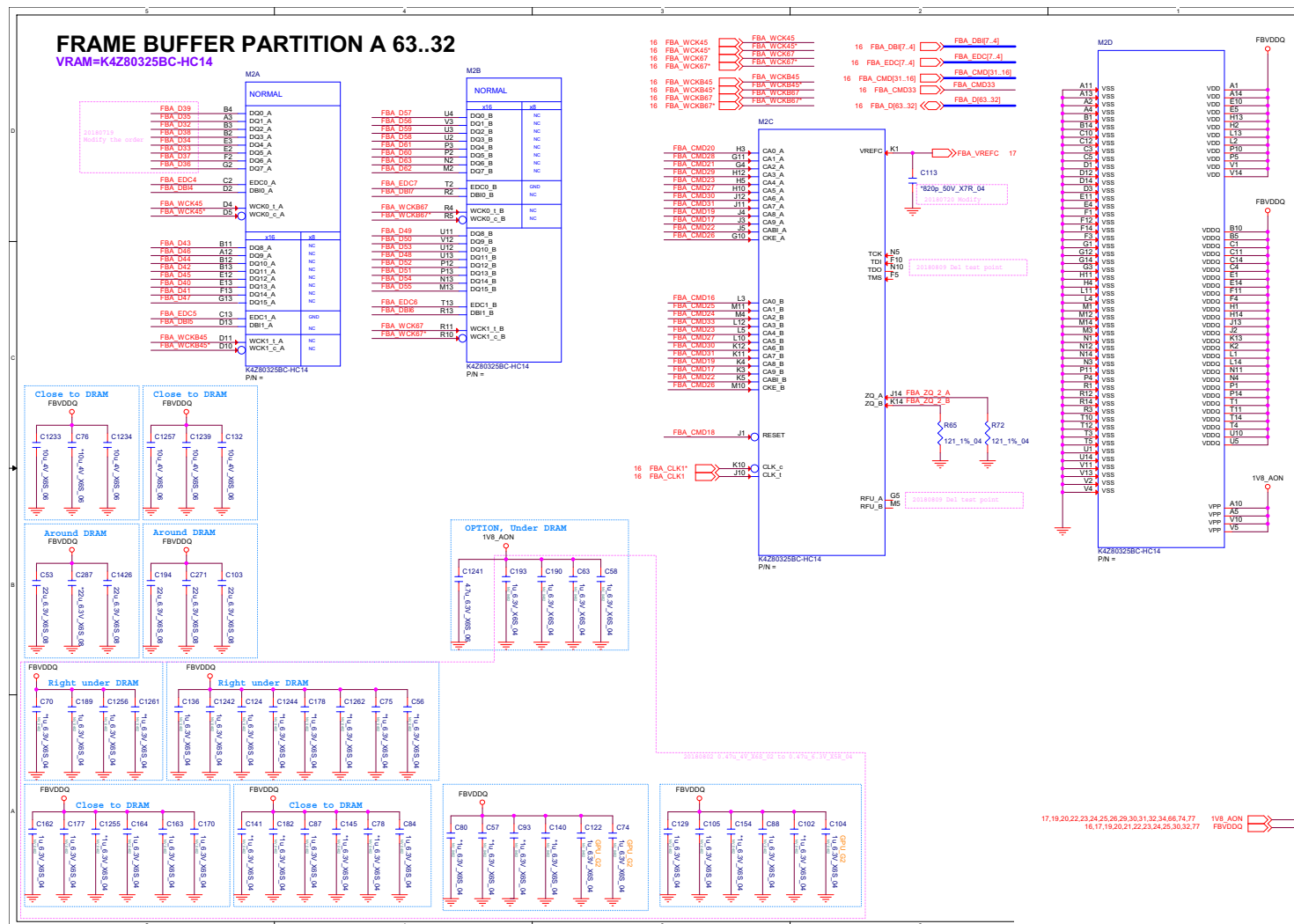
Source	Target	Score
FBB_DB[7..0]	FBB_DB[7..0]	19.20
FBB_EDC[7..0]	FBB_EDC[7..0]	19.20
FBB_CMD[15..0]	FBB_CMD[15..0]	19
FBB_CMD[31..16]	FBB_CMD[31..16]	20
FBB_CMD32	FBB_CMD32	19
FBB_CMD33	FBB_CMD33	20
FBB_D[63..0]	FBB_D[63..0]	19.20

Frame Buffer Partition A

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Frame Buffer
Partition A

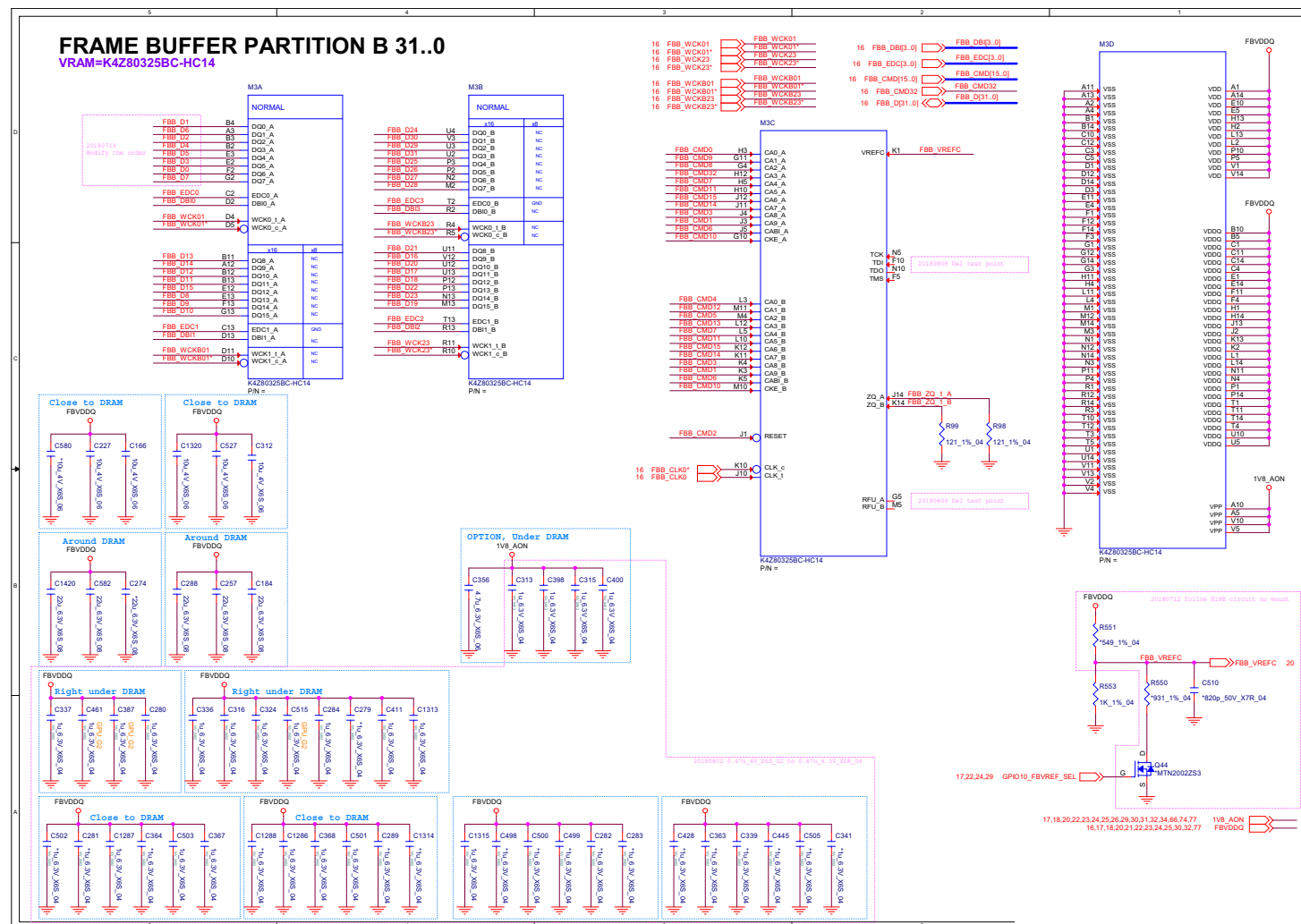


Frame Buffer Partition A

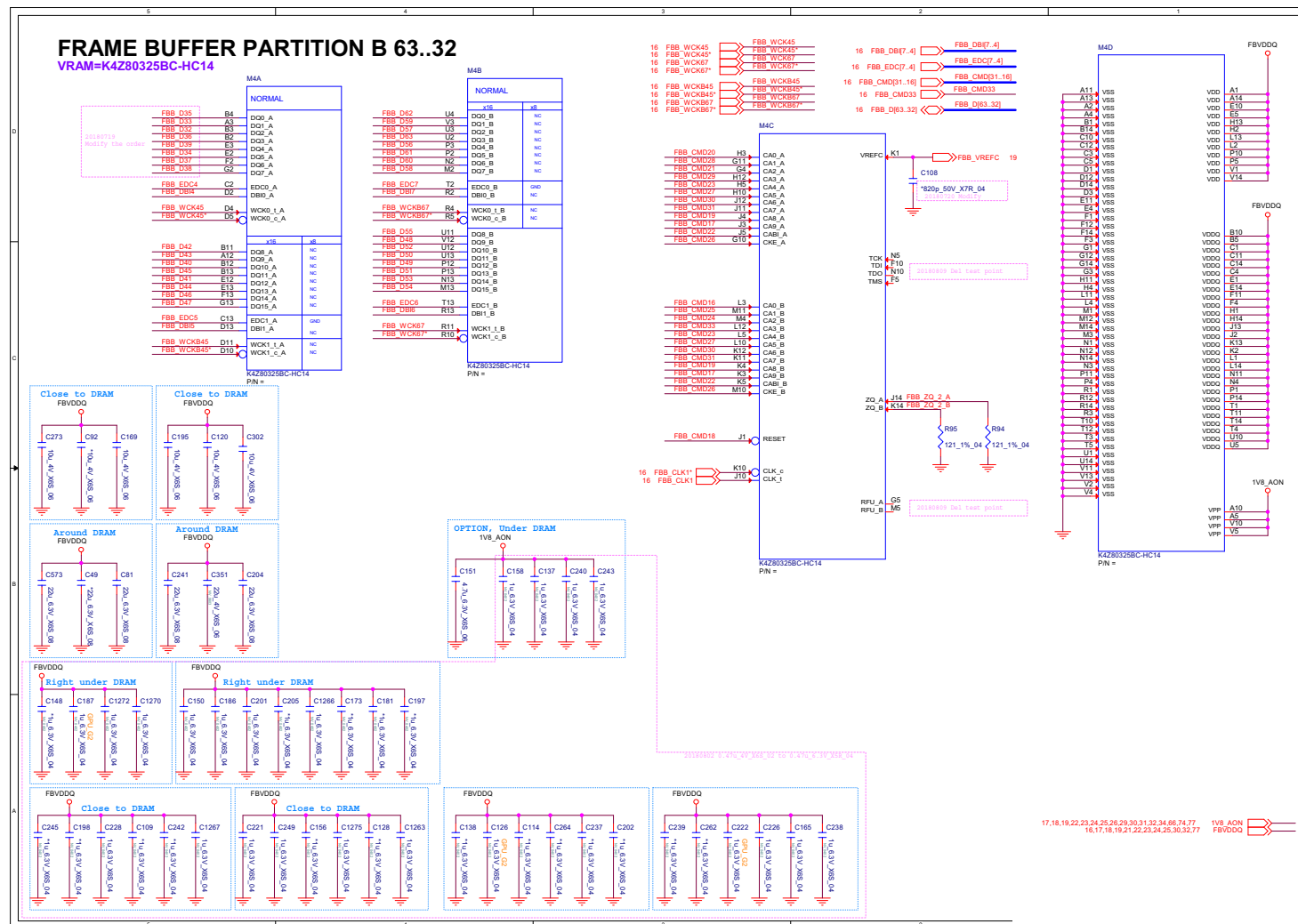


Frame Buffer Partition B

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Frame Buffer
Partition B



Frame Buffer Partition B



GPU 3/6

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GPU 3/6

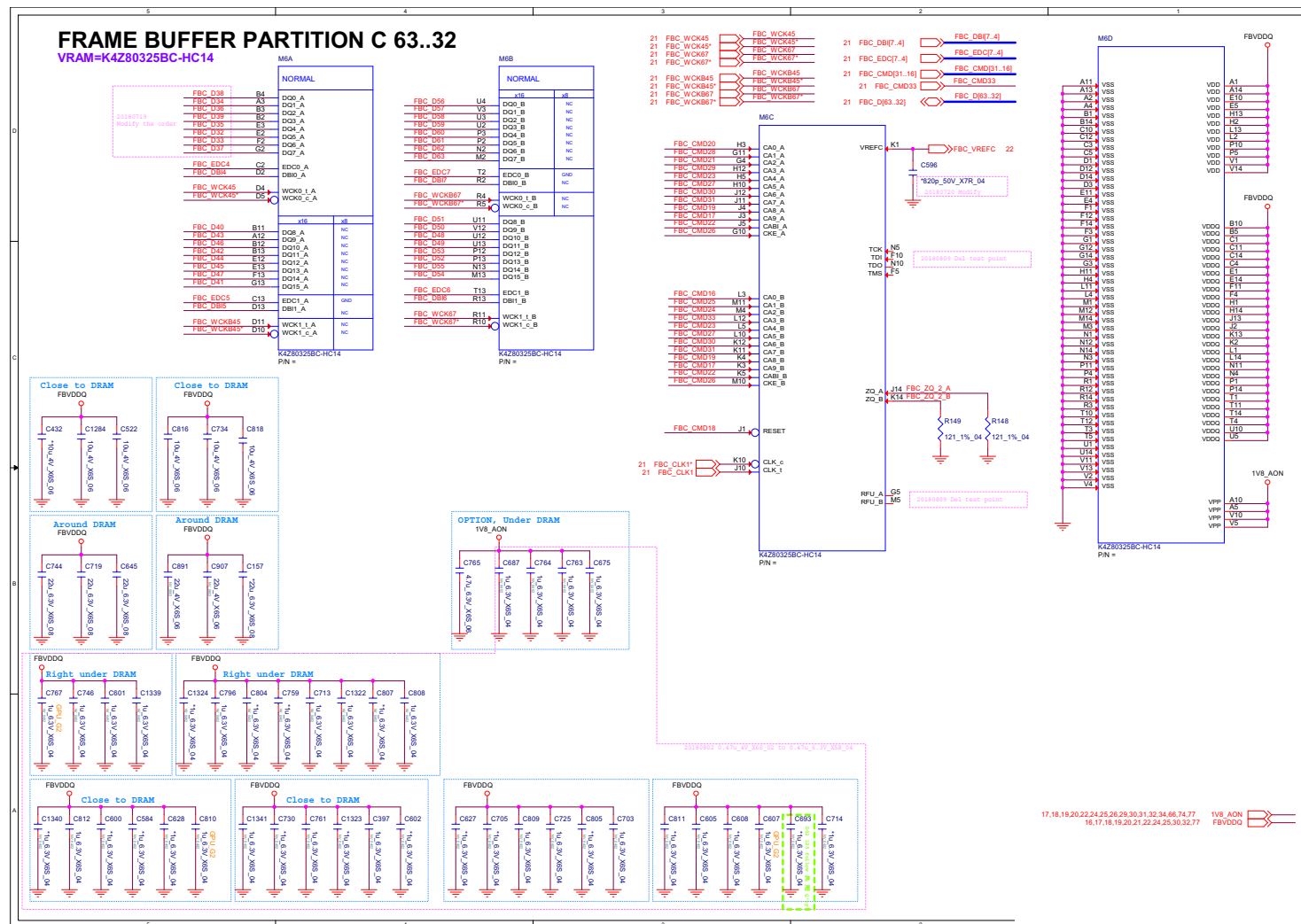


Sheet 22 of 91
Frame Buffer
Partition C



B.Schematic Diagrams

Sheet 23 of 91
Frame Buffer
Partition C

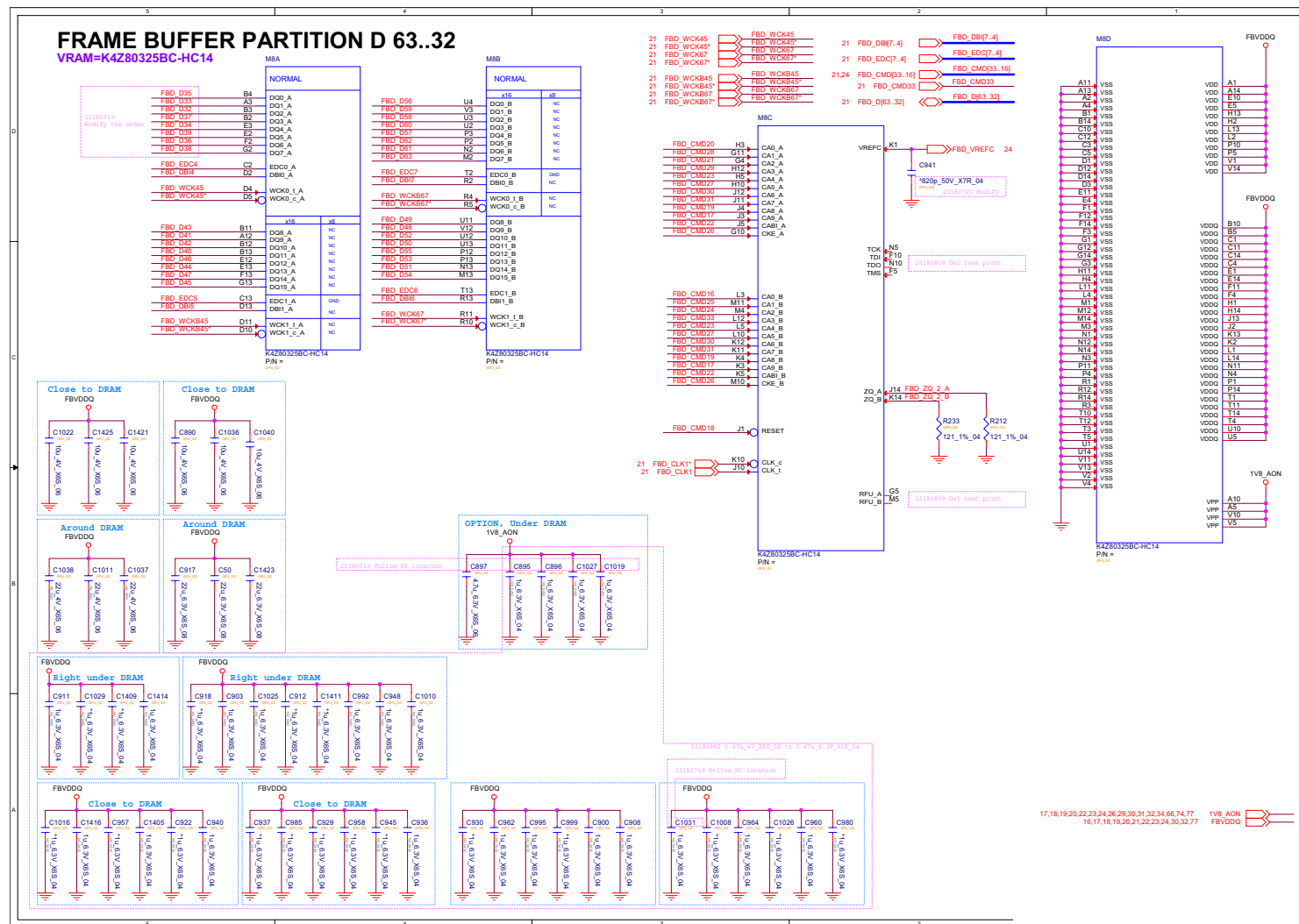


The image displays a detailed PCB layout for the K4280325BC-HC14, specifically for the frame buffer partition D 31.0. The layout is organized into several functional areas:

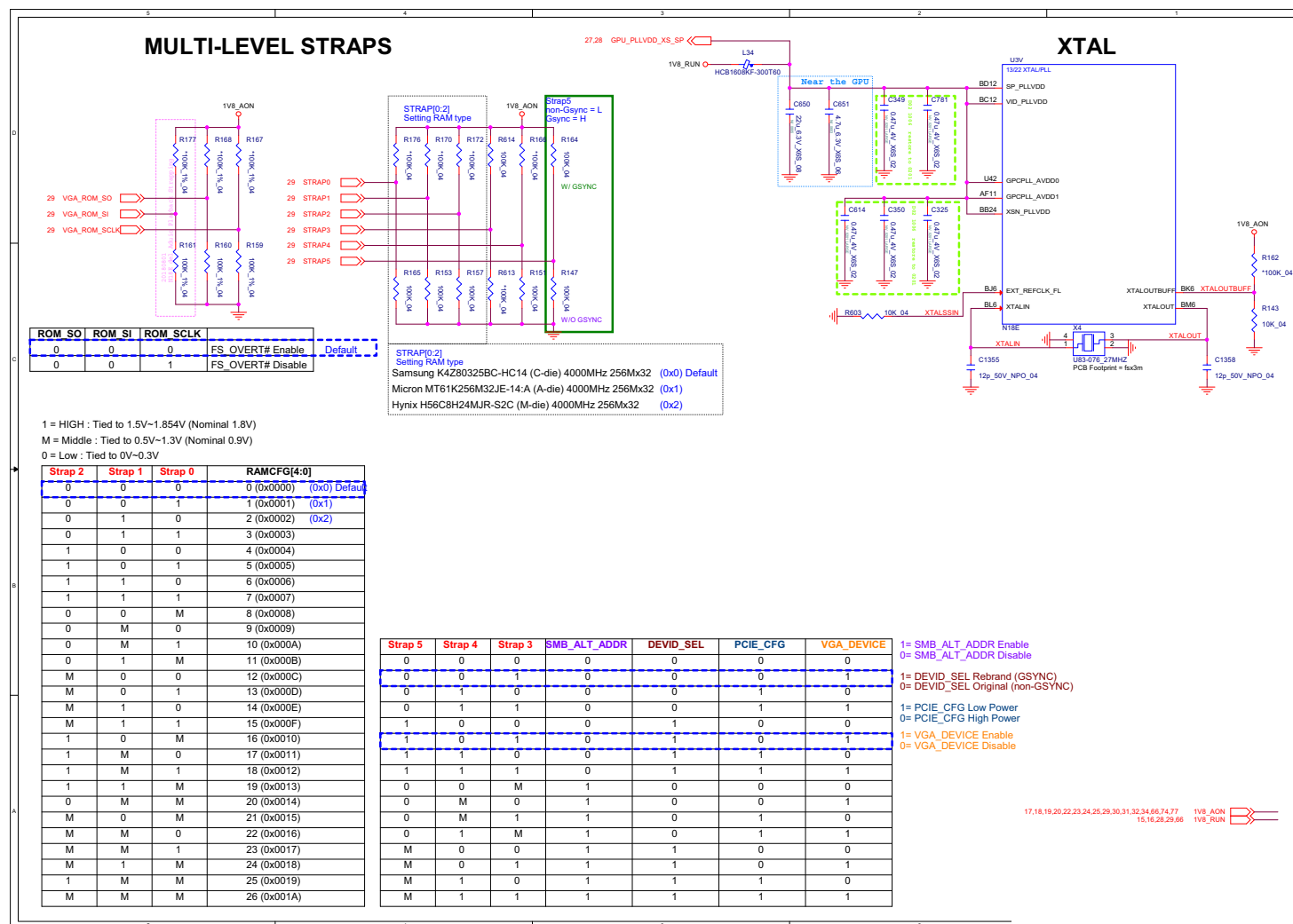
- Top Section:** Contains the main component placement and pin connections. The K4280325BC-HC14 is shown with its pins connected to various power and signal lines. Key components include:
 - Capacitors:** C893, C1422, C1428, C1030, C892, C1002, C51, C1043, C1369, C1342, C1251, C855, C324, C859, C914, C881, C346, C935, C926, C854, C1028, C347, C1018, C909, C338, C831, C305, C866, C1415, C863, C1417, C820, C918, C842, C1412, C827, C832, C1004, C910, C1017, C1006, C955, C1410, C894, C1021, C978, C891, C1407.
 - Resistors:** R216, R218, R219, R220, R221, R222, R223, R224, R225, R226, R227, R228, R229, R230, R231, R232, R233, R234, R235, R236, R237, R238, R239, R240, R241, R242, R243, R244, R245, R246, R247, R248, R249, R250, R251, R252, R253, R254, R255, R256, R257, R258, R259, R260, R261, R262, R263, R264, R265, R266, R267, R268, R269, R270, R271, R272, R273, R274, R275, R276, R277, R278, R279, R280, R281, R282, R283, R284, R285, R286, R287, R288, R289, R290, R291, R292, R293, R294, R295, R296, R297, R298, R299, R300, R301, R302, R303, R304, R305, R306, R307, R308, R309, R310, R311, R312, R313, R314, R315, R316, R317, R318, R319, R320, R321, R322, R323, R324, R325, R326, R327, R328, R329, R330, R331, R332, R333, R334, R335, R336, R337, R338, R339, R340, R341, R342, R343, R344, R345, R346, R347, R348, R349, R350, R351, R352, R353, R354, R355, R356, R357, R358, R359, R360, R361, R362, R363, R364, R365, R366, R367, R368, R369, R370, R371, R372, R373, R374, R375, R376, R377, R378, R379, R380, R381, R382, R383, R384, R385, R386, R387, R388, R389, R390, R391, R392, R393, R394, R395, R396, R397, R398, R399, R400, R401, R402, R403, R404, R405, R406, R407, R408, R409, R410, R411, R412, R413, R414, R415, R416, R417, R418, R419, R420, R421, R422, R423, R424, R425, R426, R427, R428, R429, R430, R431, R432, R433, R434, R435, R436, R437, R438, R439, R440, R441, R442, R443, R444, R445, R446, R447, R448, R449, R450, R451, R452, R453, R454, R455, R456, R457, R458, R459, R460, R461, R462, R463, R464, R465, R466, R467, R468, R469, R470, R471, R472, R473, R474, R475, R476, R477, R478, R479, R480, R481, R482, R483, R484, R485, R486, R487, R488, R489, R490, R491, R492, R493, R494, R495, R496, R497, R498, R499, R500, R501, R502, R503, R504, R505, R506, R507, R508, R509, R510, R511, R512, R513, R514, R515, R516, R517, R518, R519, R520, R521, R522, R523, R524, R525, R526, R527, R528, R529, R530, R531, R532, R533, R534, R535, R536, R537, R538, R539, R540, R541, R542, R543, R544, R545, R546, R547, R548, R549, R550, R551, R552, R553, R554, R555, R556, R557, R558, R559, R560, R561, R562, R563, R564, R565, R566, R567, R568, R569, R570, R571, R572, R573, R574, R575, R576, R577, R578, R579, R580, R581, R582, R583, R584, R585, R586, R587, R588, R589, R590, R591, R592, R593, R594, R595, R596, R597, R598, R599, R600, R601, R602, R603, R604, R605, R606, R607, R608, R609, R610, R611, R612, R613, R614, R615, R616, R617, R618, R619, R620, R621, R622, R623, R624, R625, R626, R627, R628, R629, R630, R631, R632, R633, R634, R635, R636, R637, R638, R639, R640, R641, R642, R643, R644, R645, R646, R647, R648, R649, R650, R651, R652, R653, R654, R655, R656, R657, R658, R659, R660, R661, R662, R663, R664, R665, R666, R667, R668, R669, R670, R671, R672, R673, R674, R675, R676, R677, R678, R679, R680, R681, R682, R683, R684, R685, R686, R687, R688, R689, R690, R691, R692, R693, R694, R695, R696, R697, R698, R699, R700, R701, R702, R703, R704, R705, R706, R707, R708, R709, R710, R711, R712, R713, R714, R715, R716, R717, R718, R719, R720, R721, R722, R723, R724, R725, R726, R727, R728, R729, R730, R731, R732, R733, R734, R735, R736, R737, R738, R739, R740, R741, R742, R743, R744, R745, R746, R747, R748, R749, R750, R751, R752, R753, R754, R755, R756, R757, R758, R759, R760, R761, R762, R763, R764, R765, R766, R767, R768, R769, R770, R771, R772, R773, R774, R775, R776, R777, R778, R779, R780, R781, R782, R783, R784, R785, R786, R787, R788, R789, R790, R791, R792, R793, R794, R795, R796, R797, R798, R799, R800, R801, R802, R803, R804, R805, R806, R807, R808, R809, R810, R811, R812, R813, R814, R815, R816, R817, R818, R819, R820, R821, R822, R823, R824, R825, R826, R827, R828, R829, R830, R831, R832, R833, R834, R835, R836, R837, R838, R839, R840, R841, R842, R843, R844, R845, R846, R847, R848, R849, R850, R851, R852, R853, R854, R855, R856, R857, R858, R859, R860, R861, R862, R863, R864, R865, R866, R867, R868, R869, R870, R871, R872, R873, R874, R875, R876, R877, R878, R879, R880, R881, R882, R883, R884, R885, R886, R887, R888, R889, R890, R891, R892, R893, R894, R895, R896, R897, R898, R899, R900, R901, R902, R903, R904, R905, R906, R907, R908, R909, R910, R911, R912, R913, R914, R915, R916, R917, R918, R919, R920, R921, R922, R923, R924, R925, R926, R927, R928, R929, R930, R931, R932, R933, R934, R935, R9

Sheet 24 of 91
Frame Buffer
Partition D

Sheet 25 of 91
Frame Buffer
Partition D

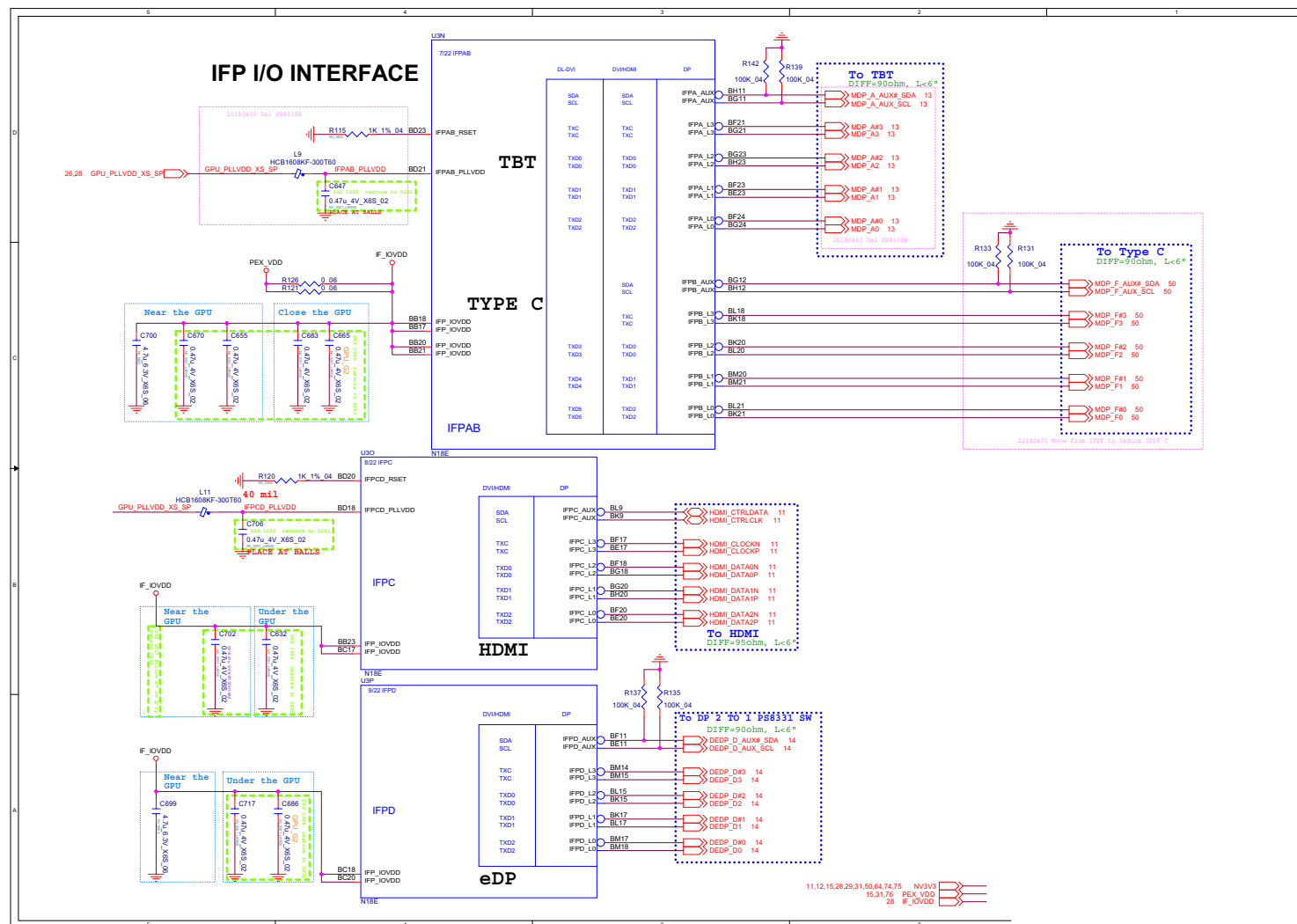


GPU 4/6 B - 27

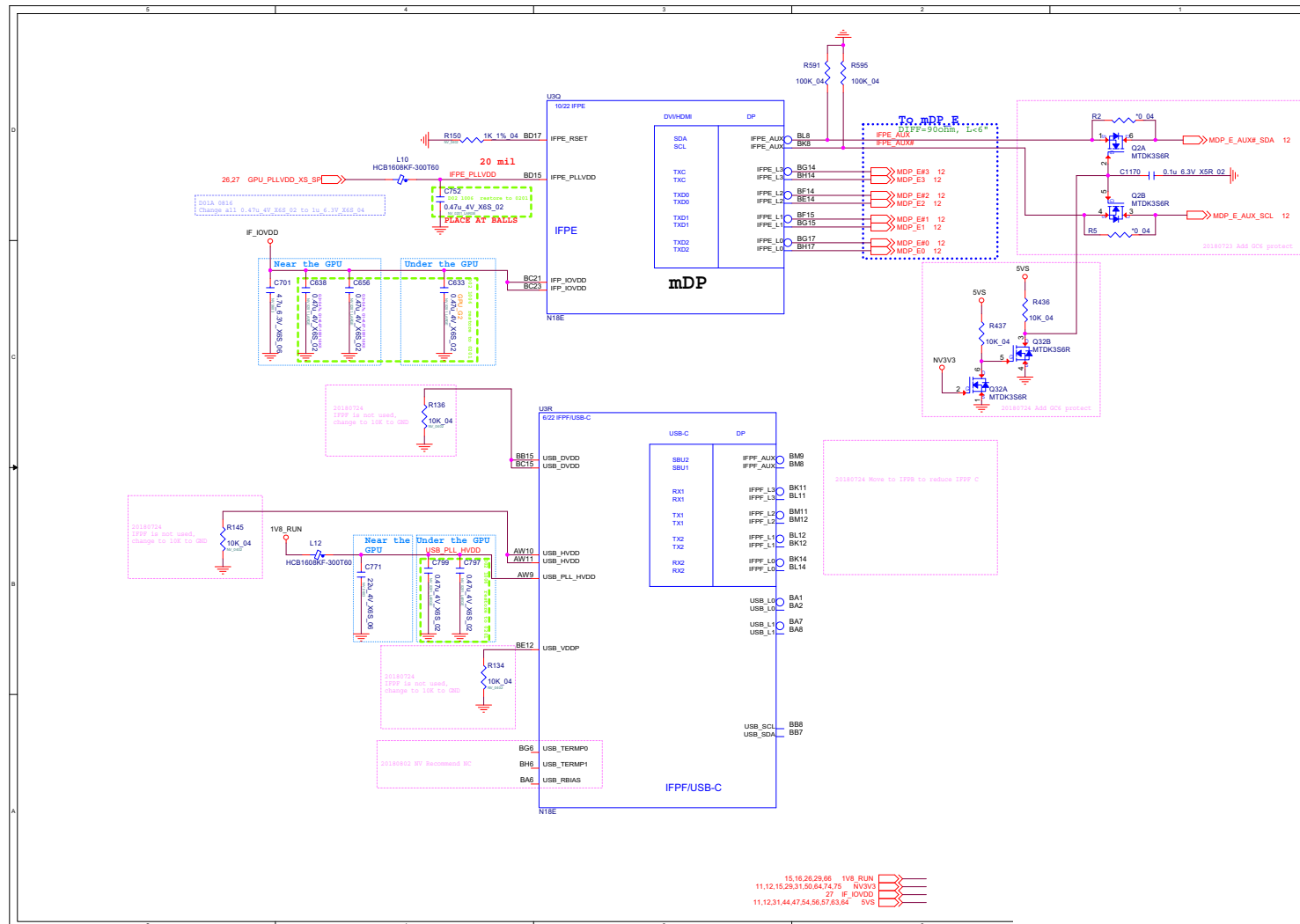


GPU 5/6

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GPU 5/6



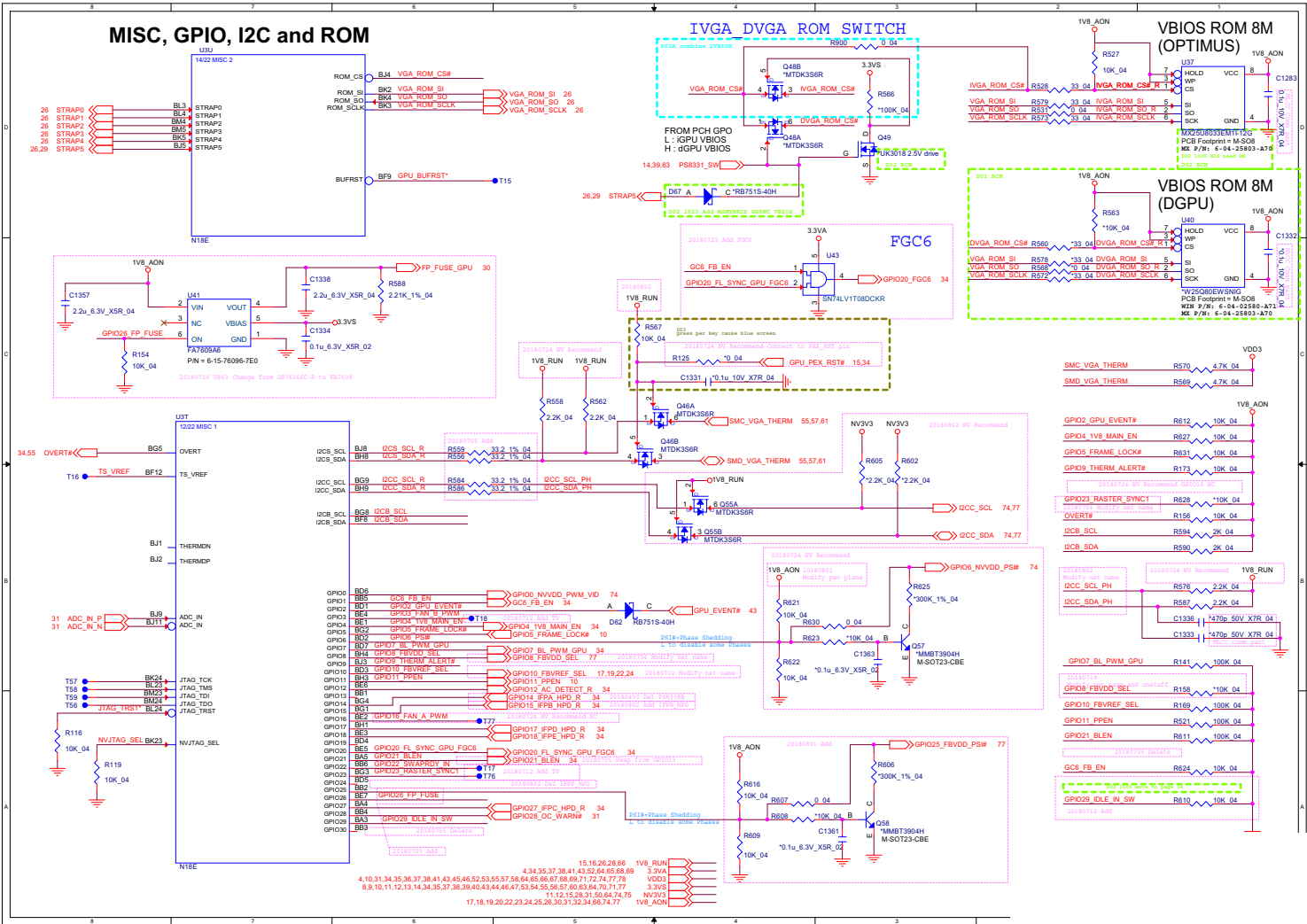
IFP I/O Interface B - 29



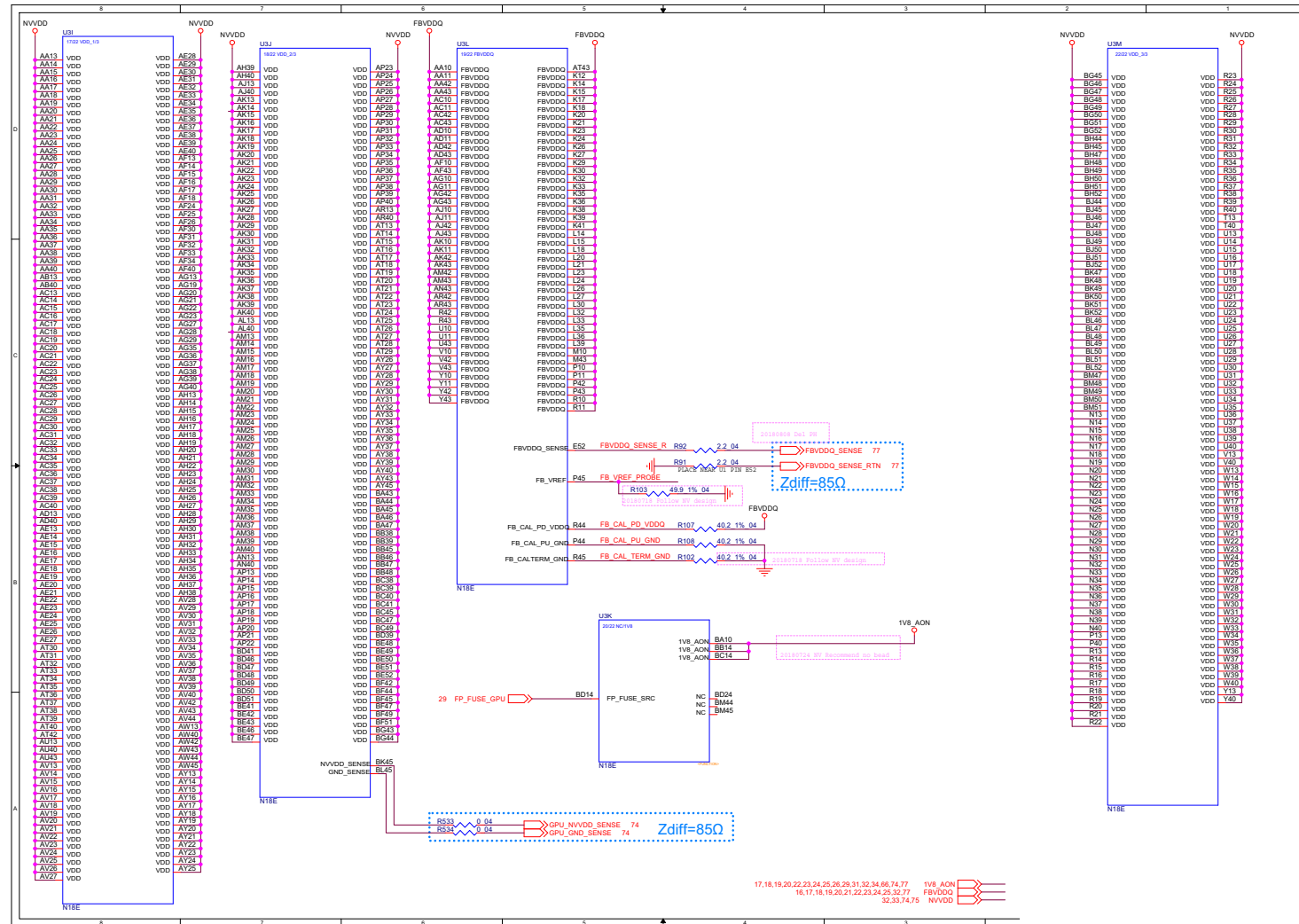
Schematic Diagrams

GPU 6/6

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GPU 6/6



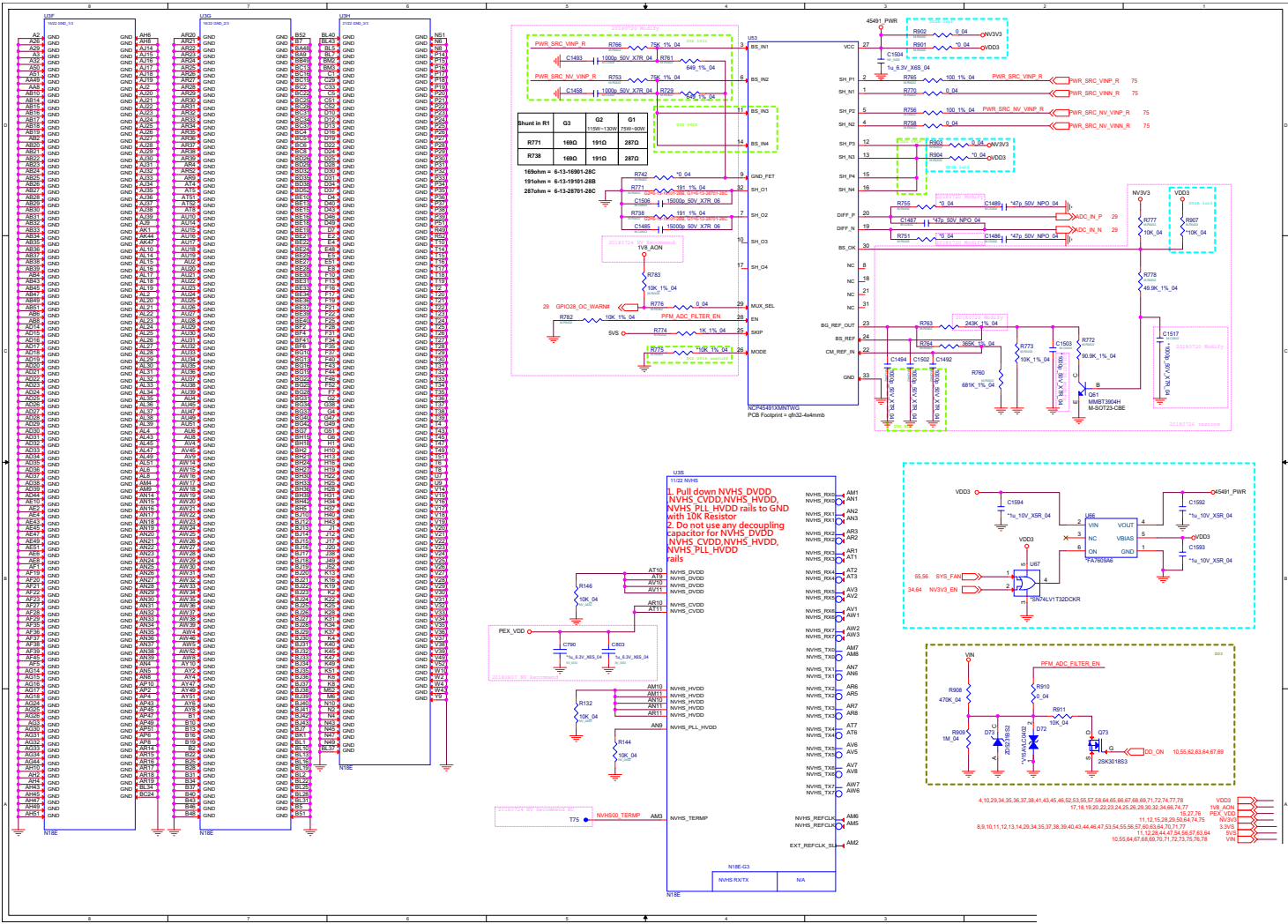
GPU NVVDD, FBVDDQ



Schematic Diagrams

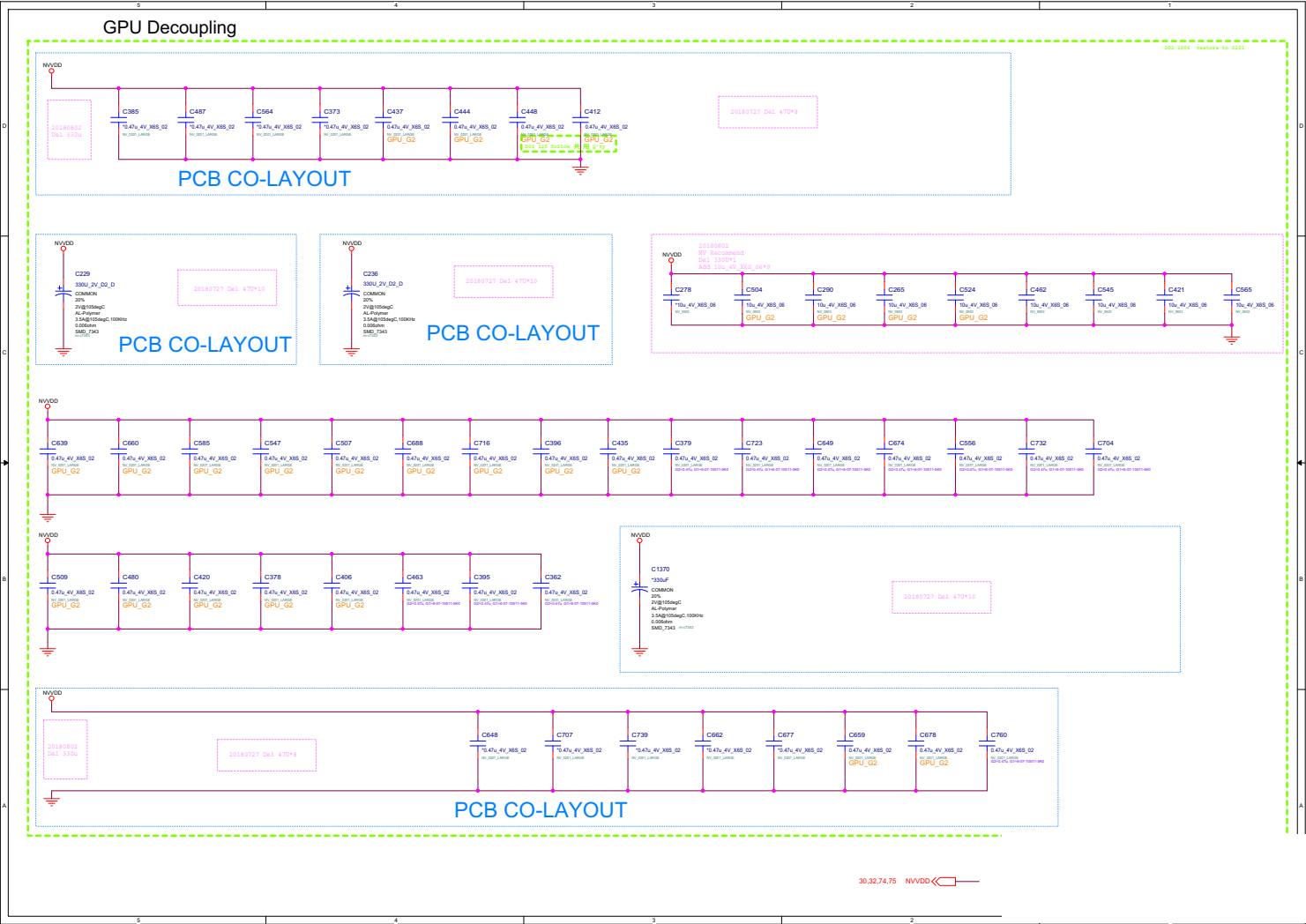
GPU GND

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GPU GND



GPU Decoupling B - 33

GPU Decoupling 2



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GPU Decoupling 2

B.Schematic Diagrams

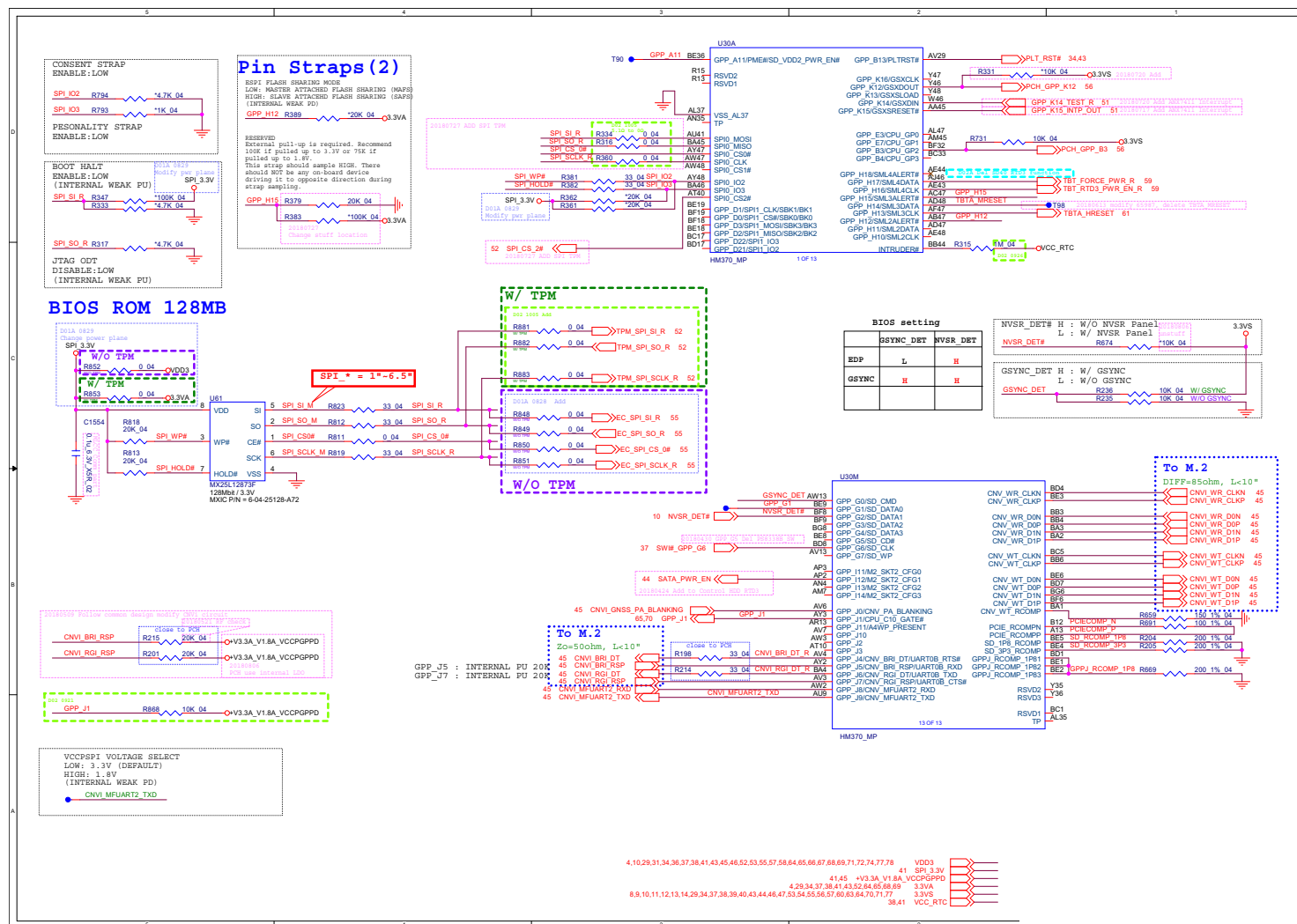
Schematic Diagrams



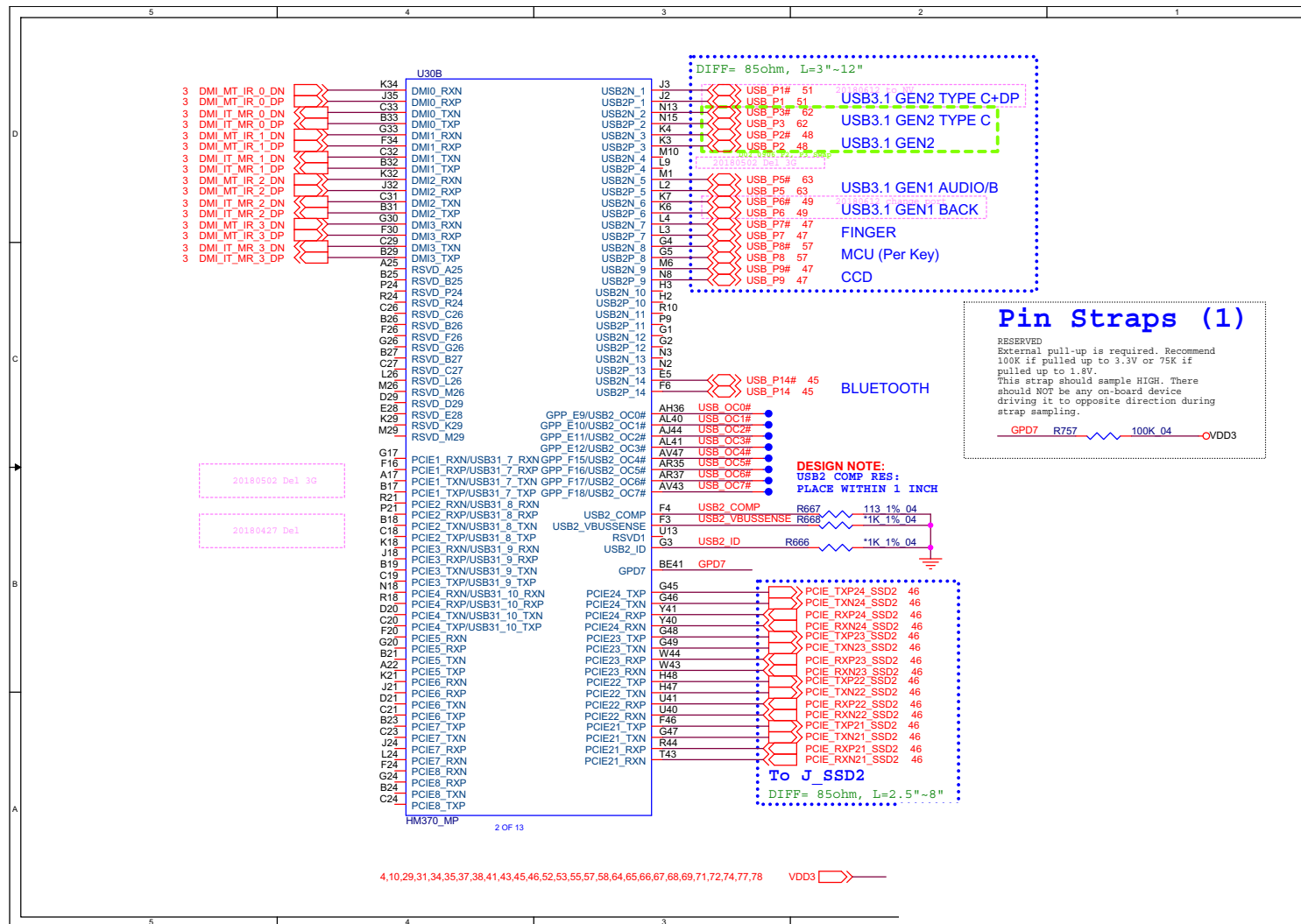
Schematic Diagrams

PCH 1/9

B.Schematic Diagrams



PCH 2/9

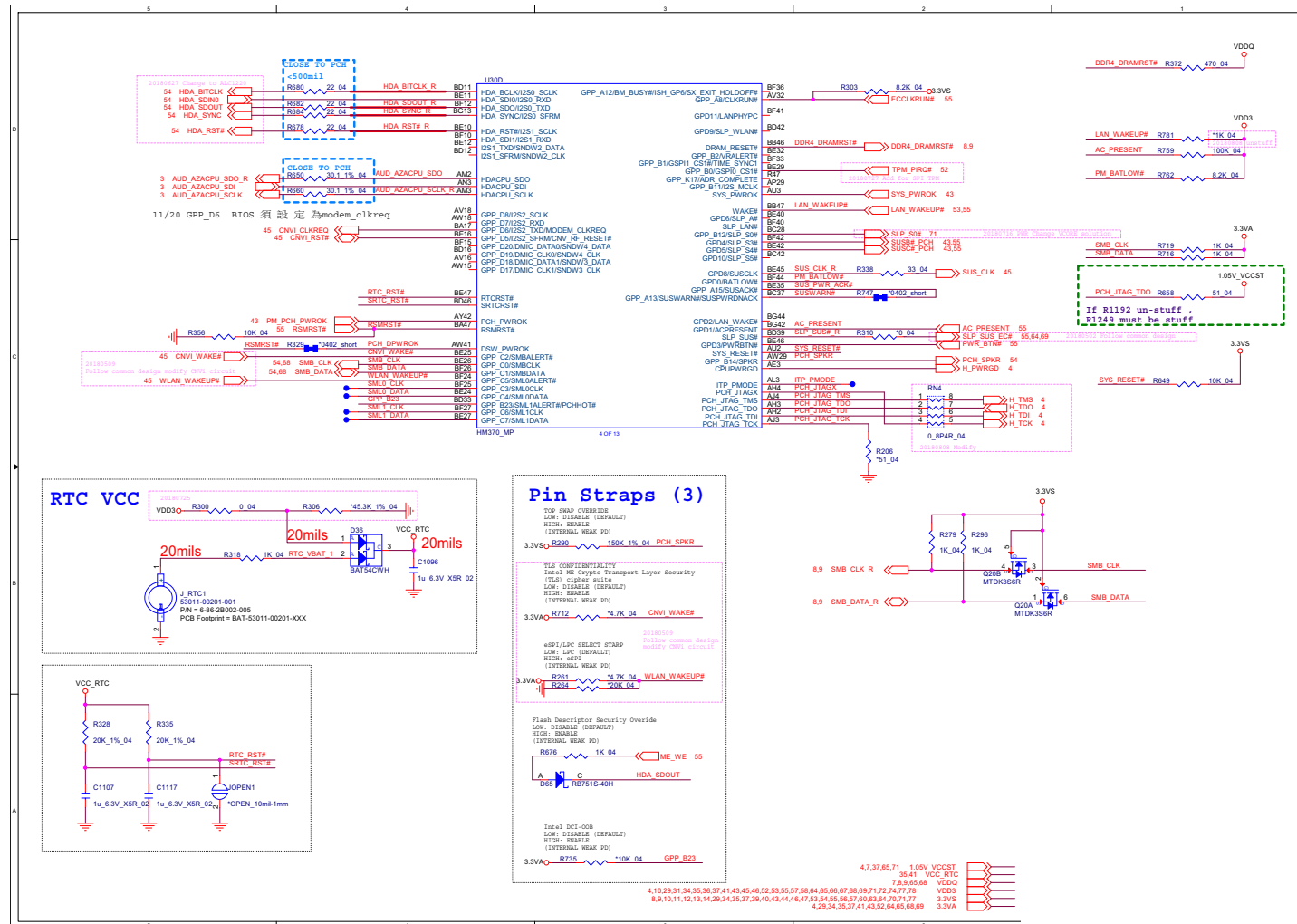
Sheet 36 of 91
PCH 2/9

PCH 3/9

B. Schematic Diagrams

Schematic Diagrams

PCH 4/9



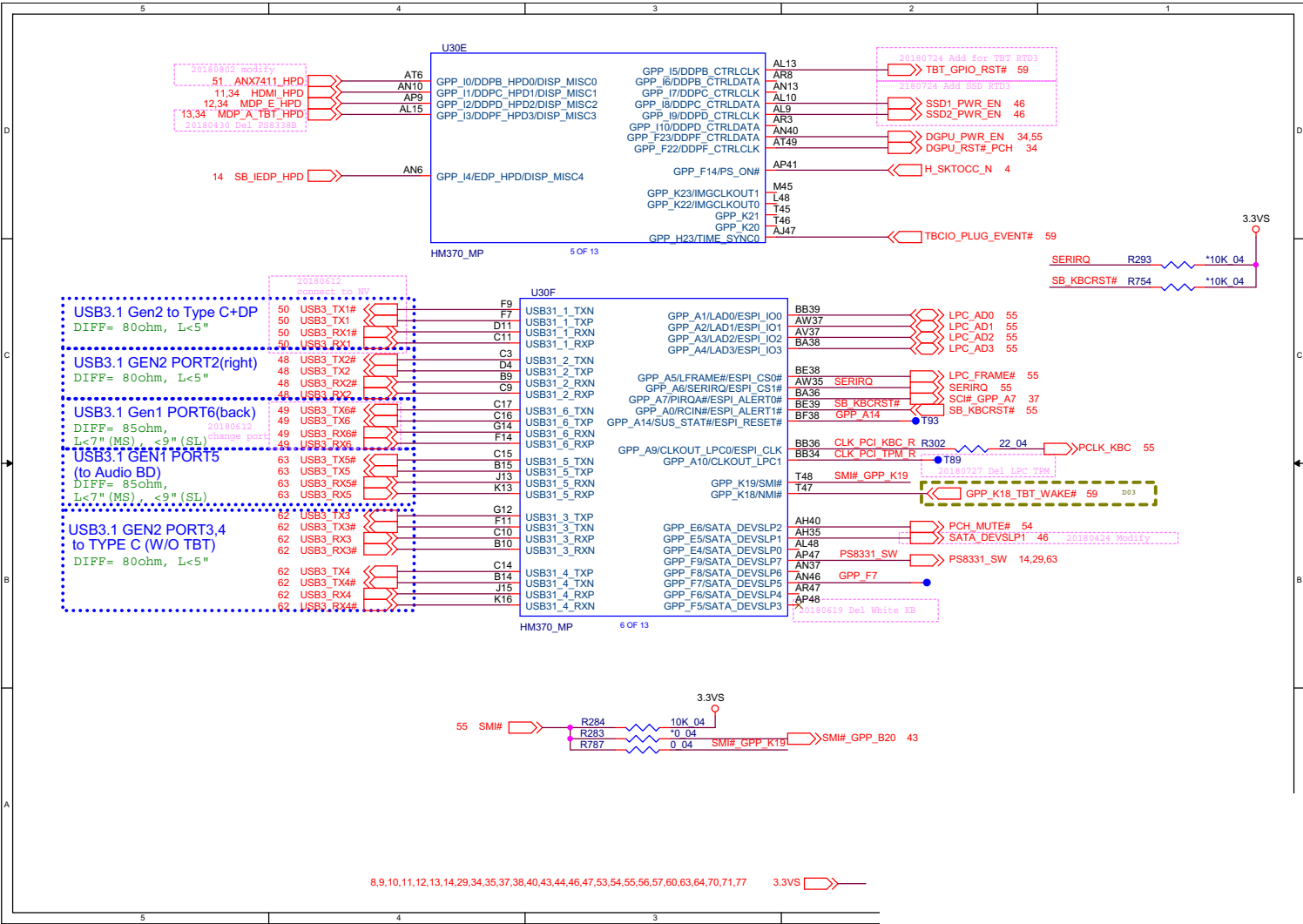
Sheet 38 of 91
PCH 4/9

B.Schematic Diagrams

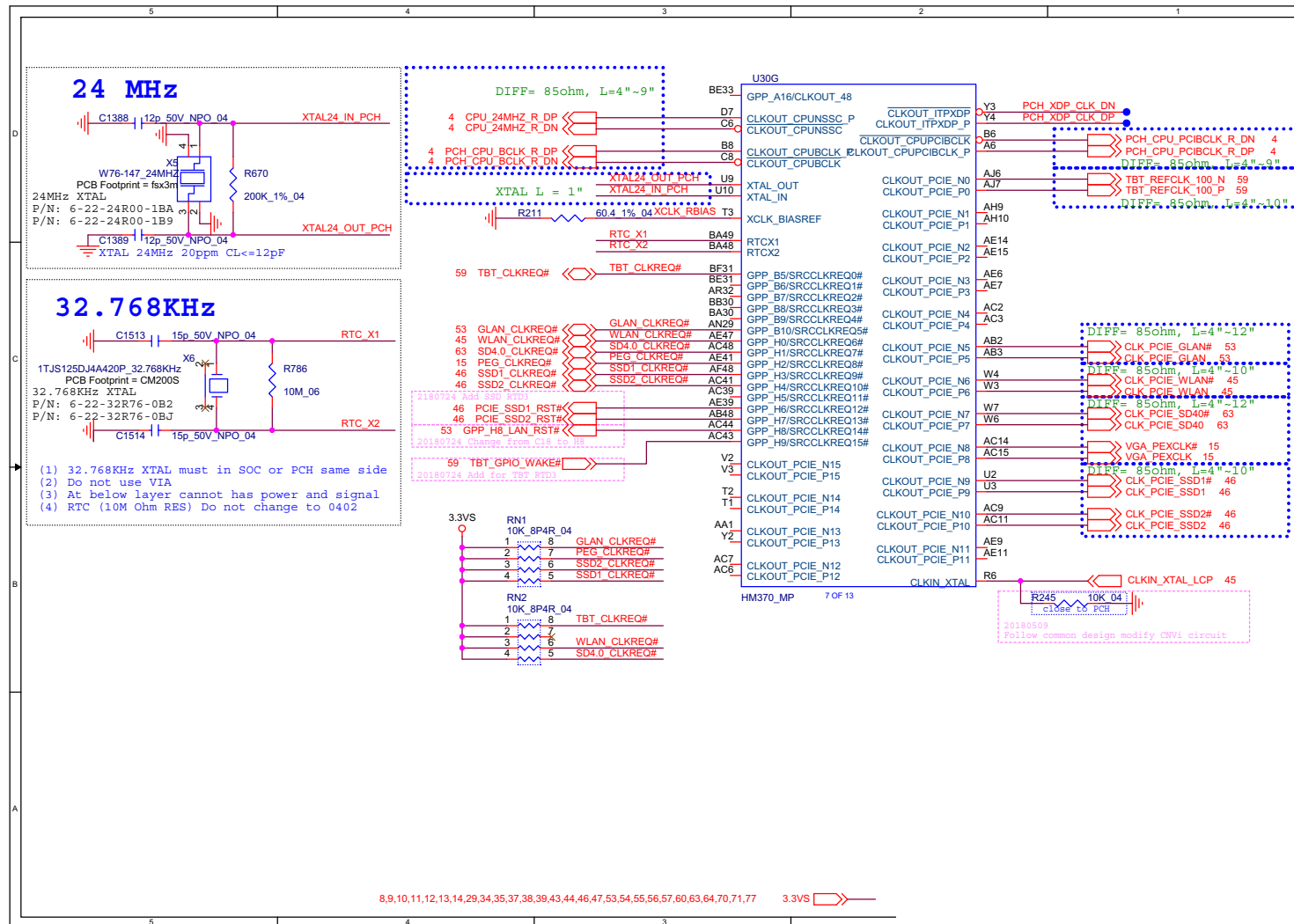
Schematic Diagrams

PCH 5/9

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PCH 5/9



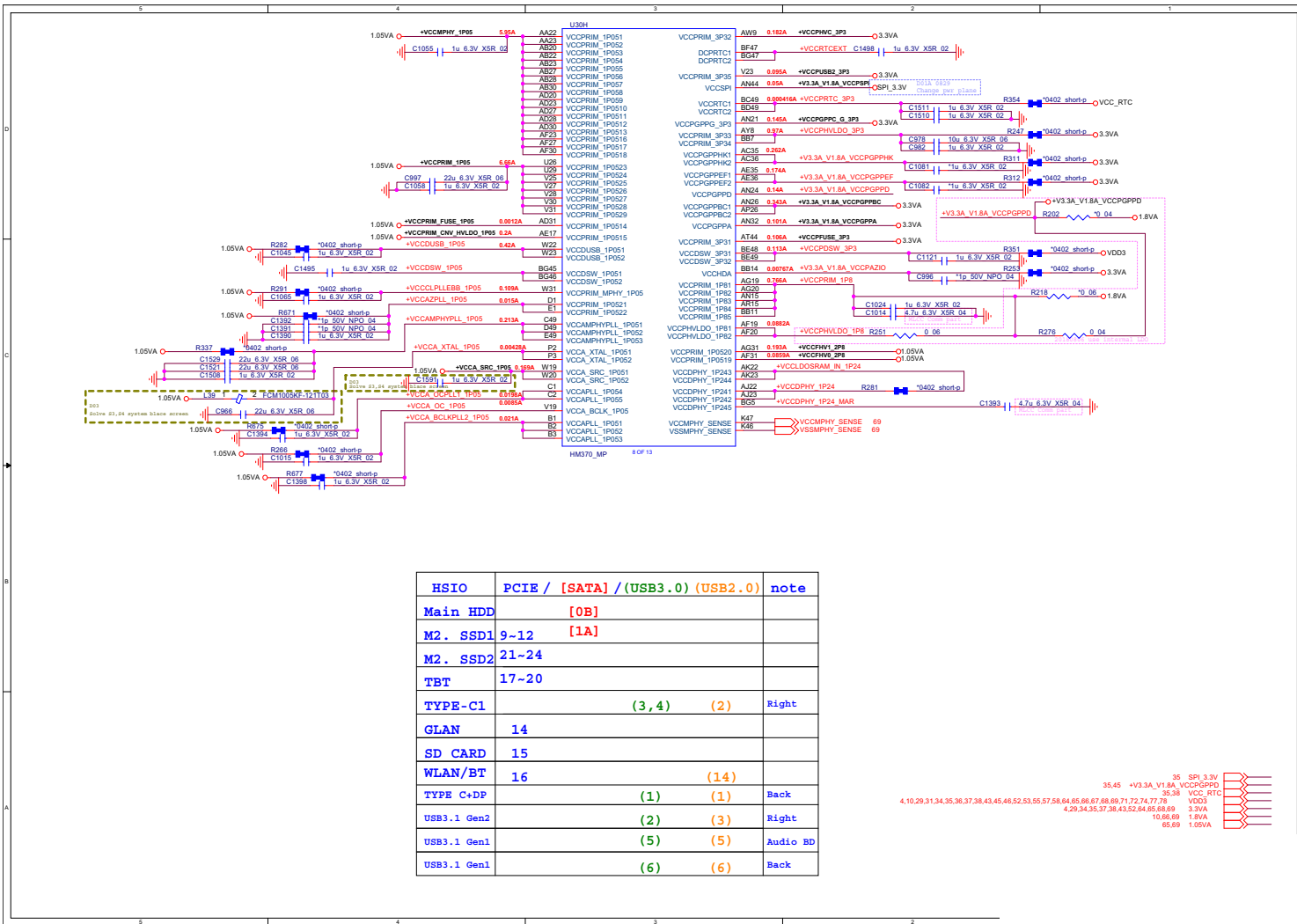
PCH 6/9

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PCH 6/9

PCH 7/9

B.Schematic Diagrams

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PCH 7/9



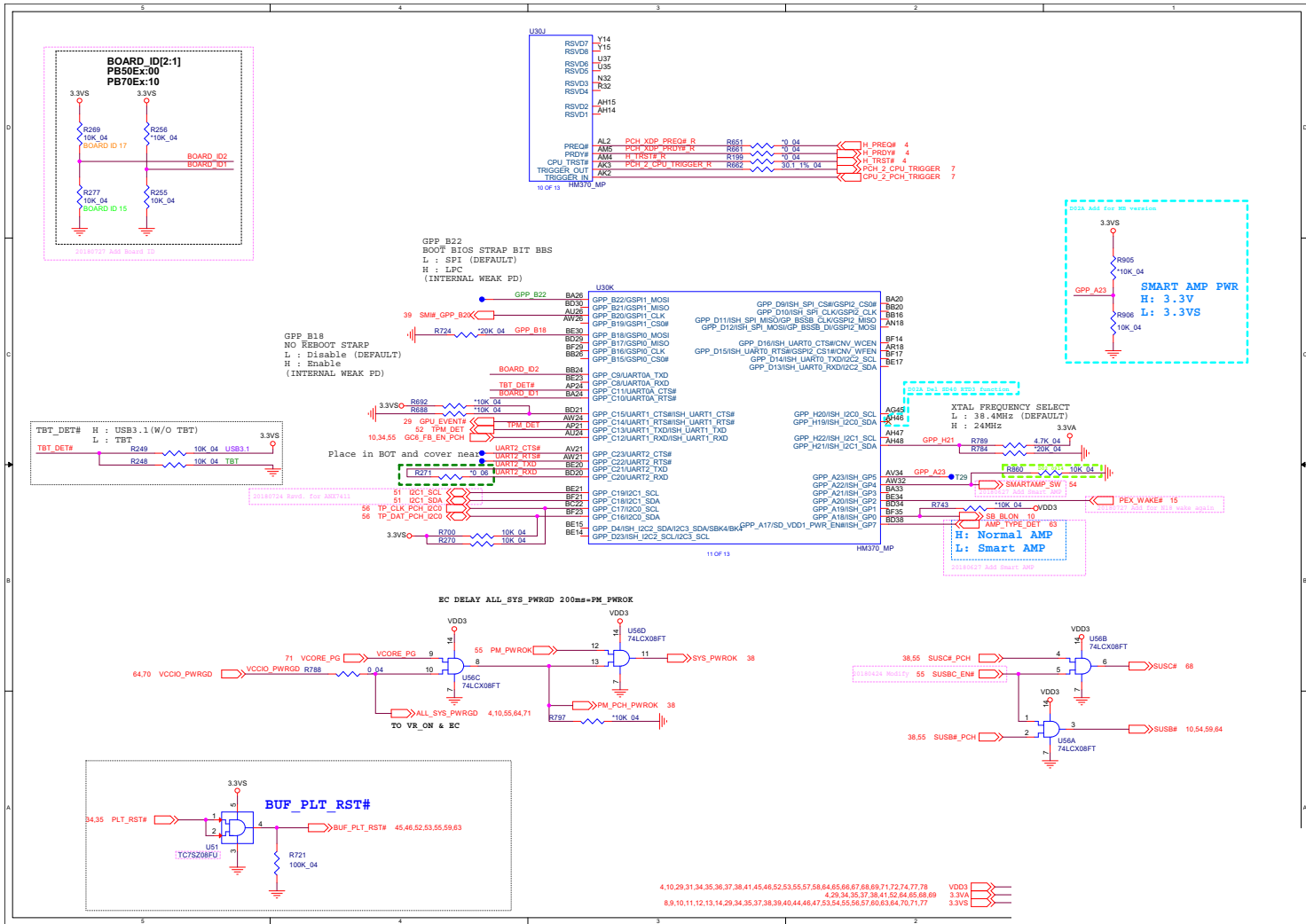
PCH 8/9

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PCH 8/9

B.Schematic Diagrams

PCH 9/9

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PCH 9/9



HDD Port B - 45

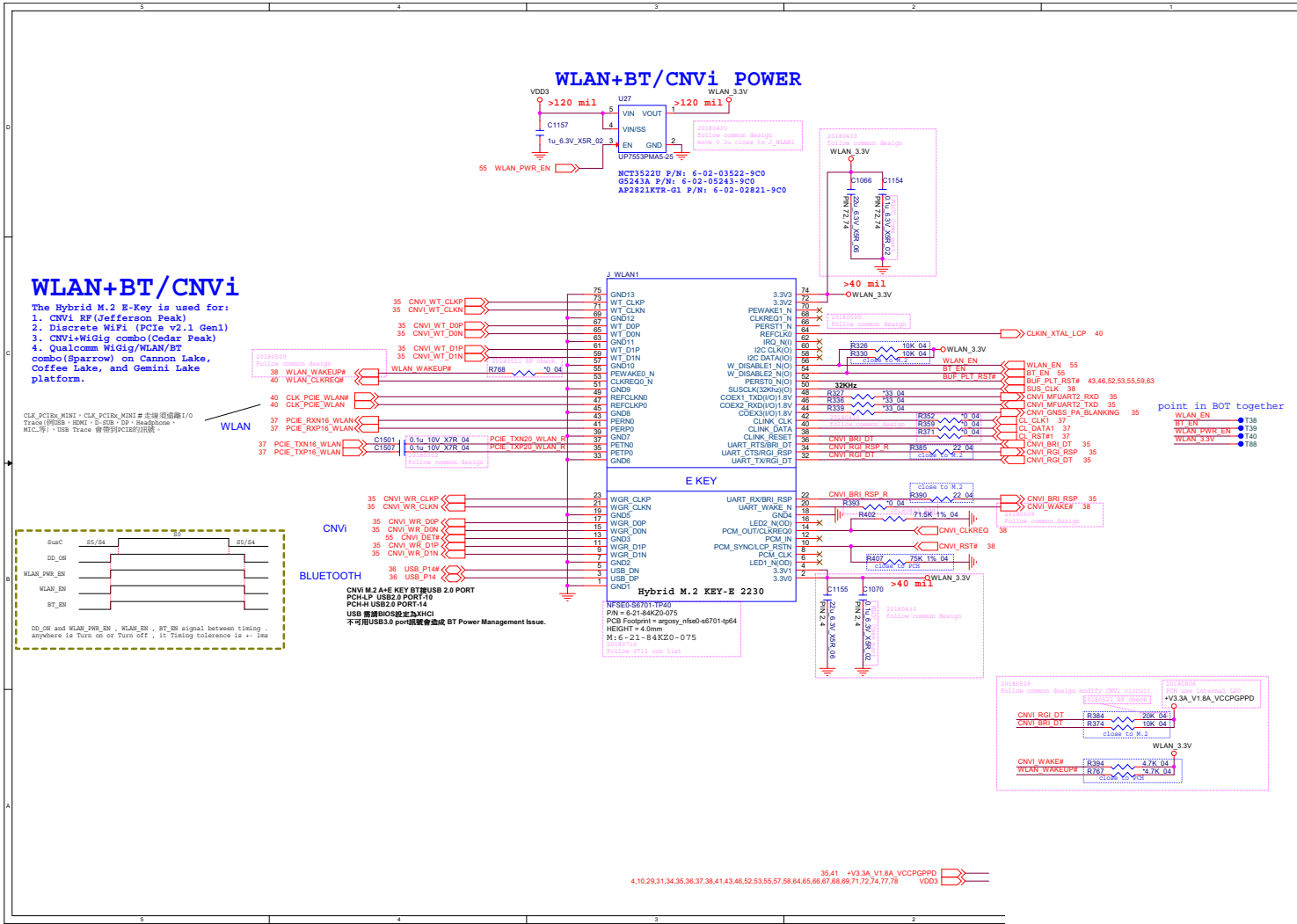


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M.2 WLAN+BT

B.Schematic Diagrams

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M.2 WLAN+BT



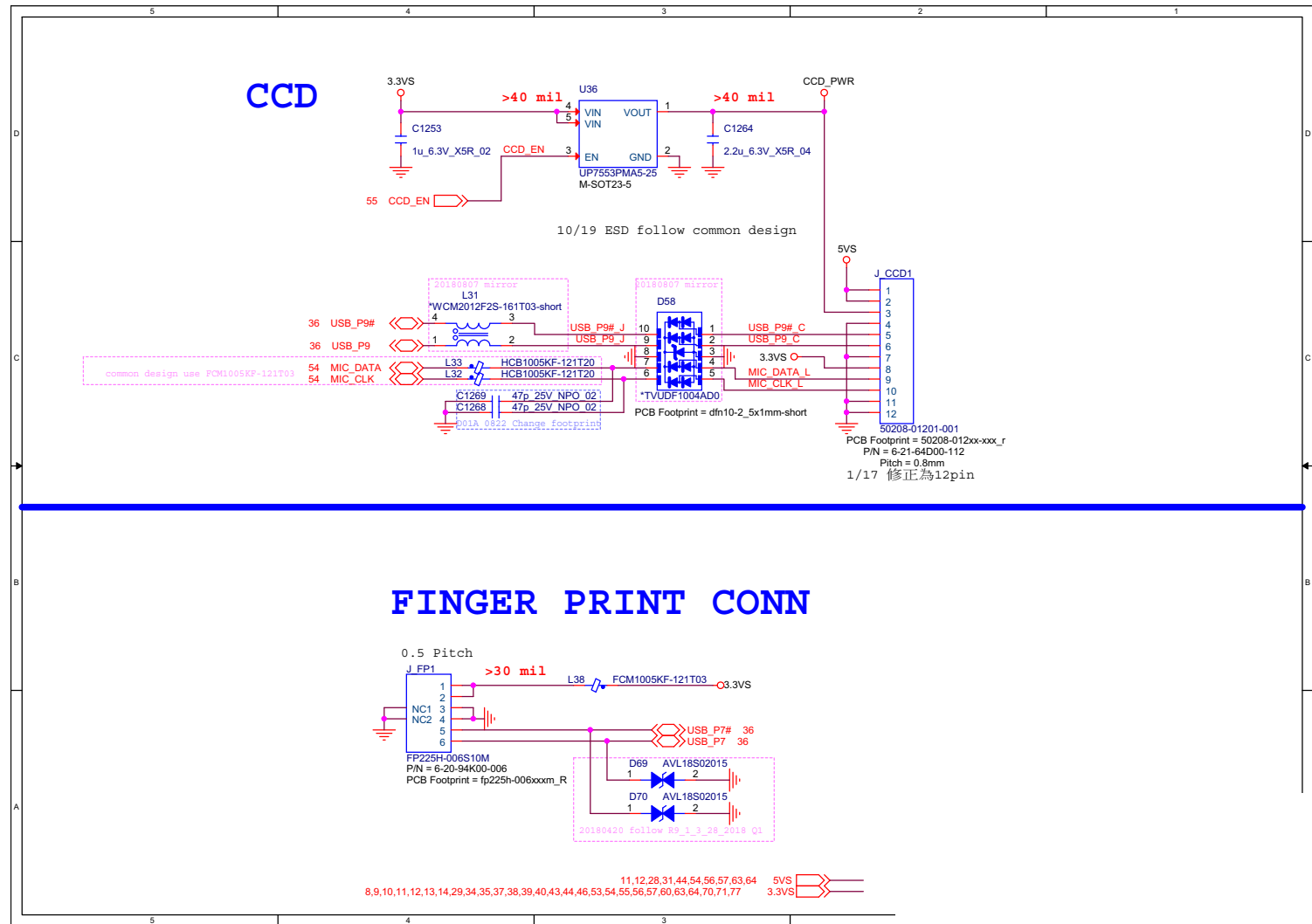
M.2 PCIEX4 SATA B - 47



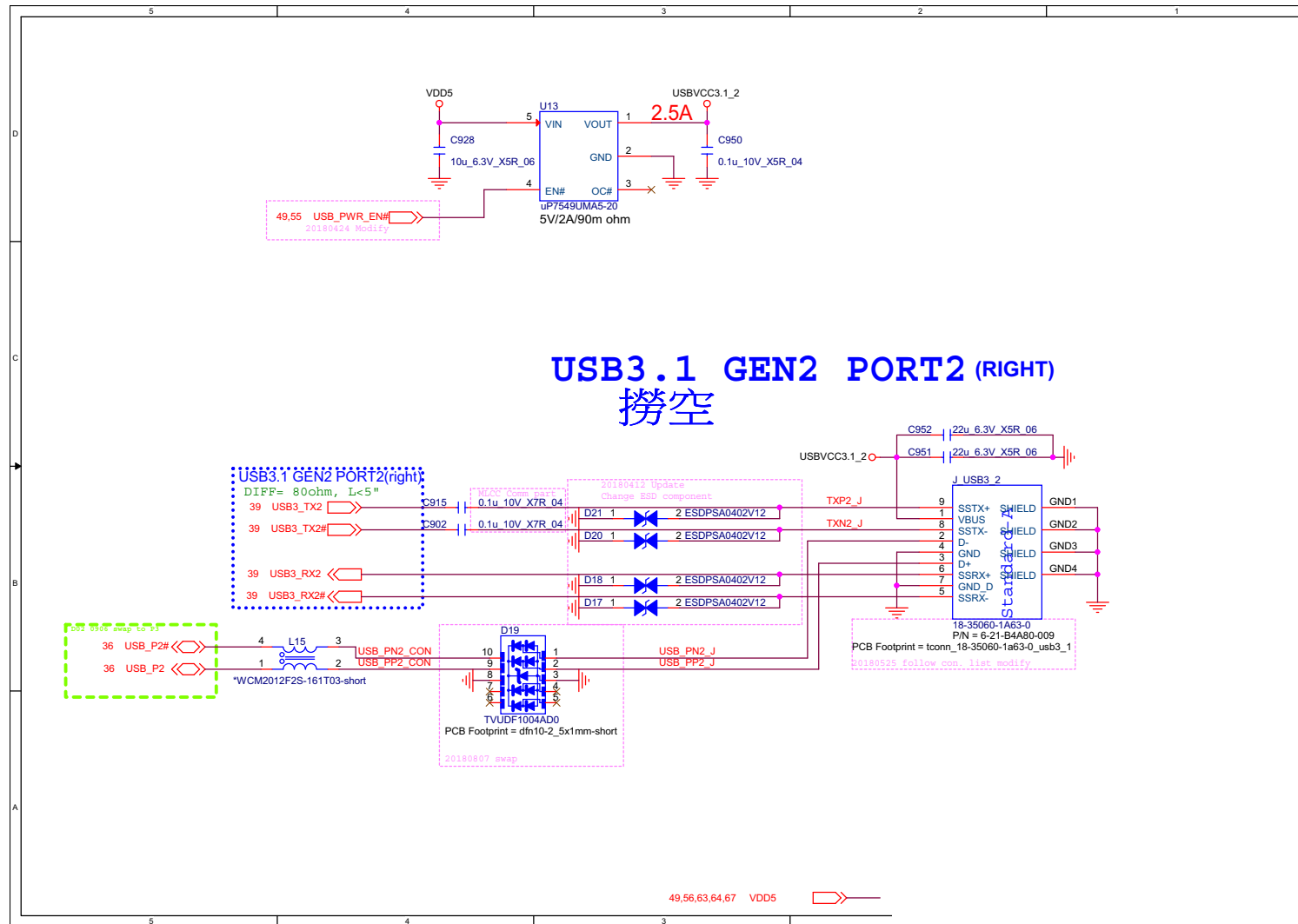
Schematic Diagrams

CCD, FP

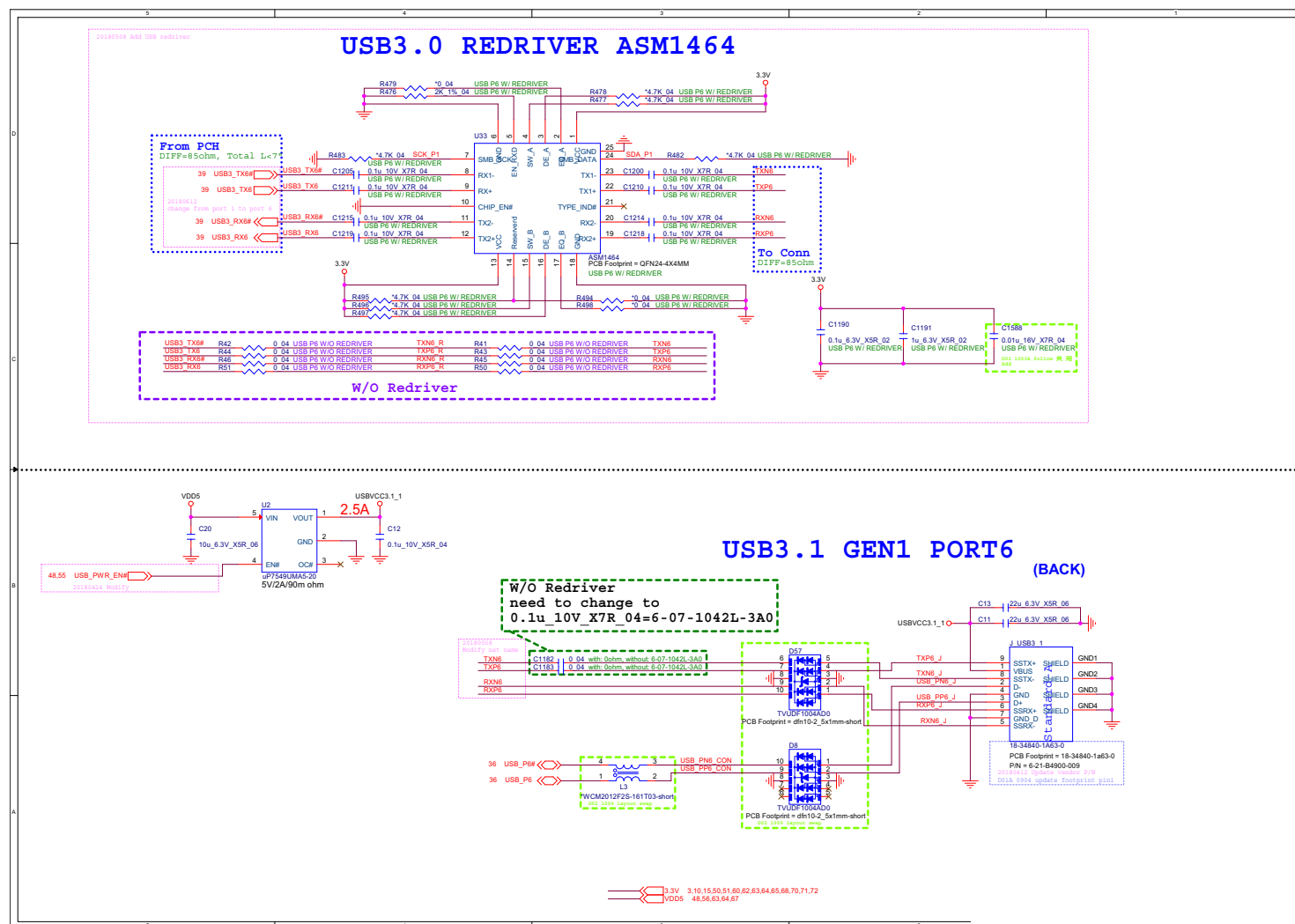
Sheet 47 of 91
CCD, FP



USB

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USB

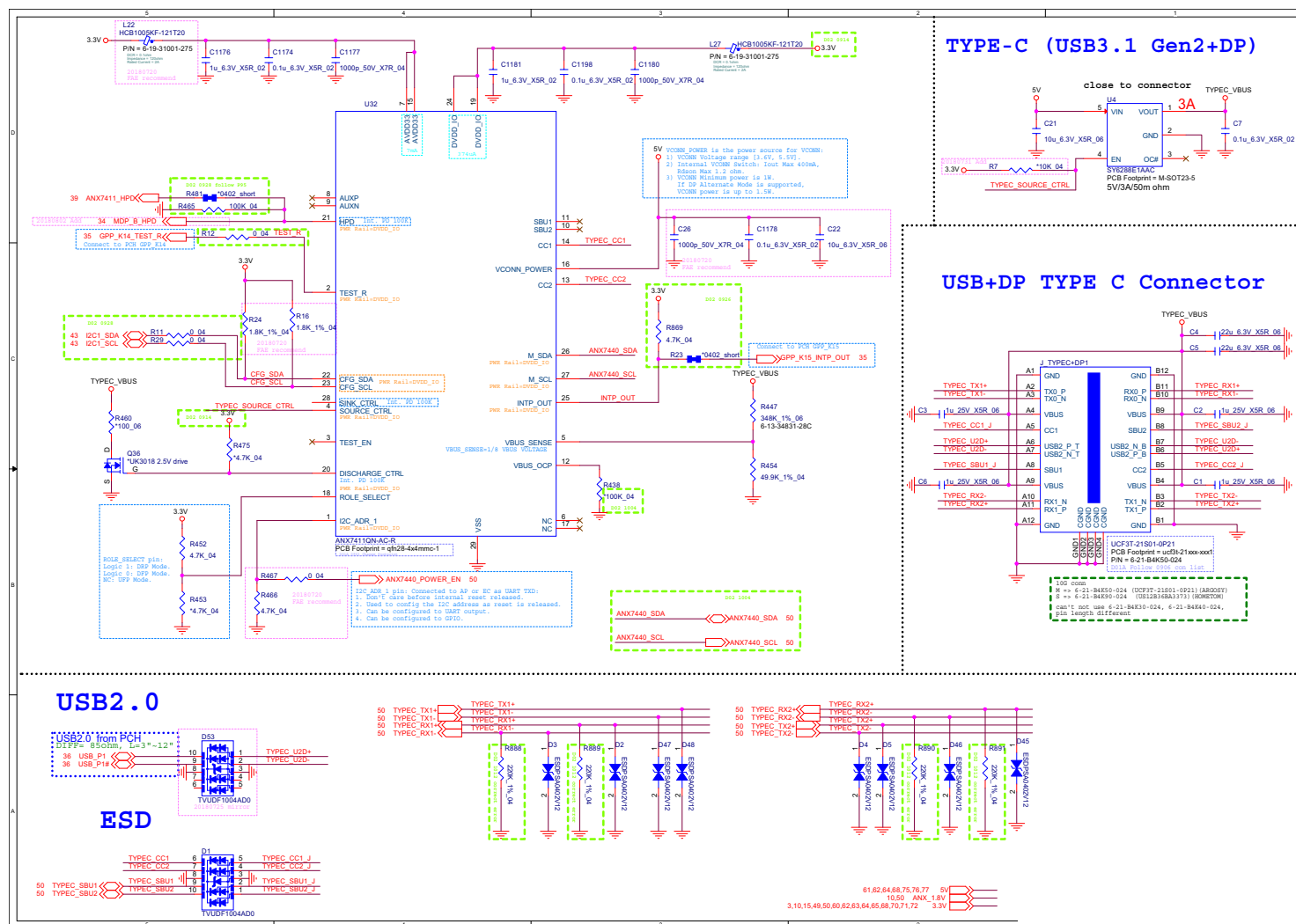
Sheet 49 of 91
USB Redriver



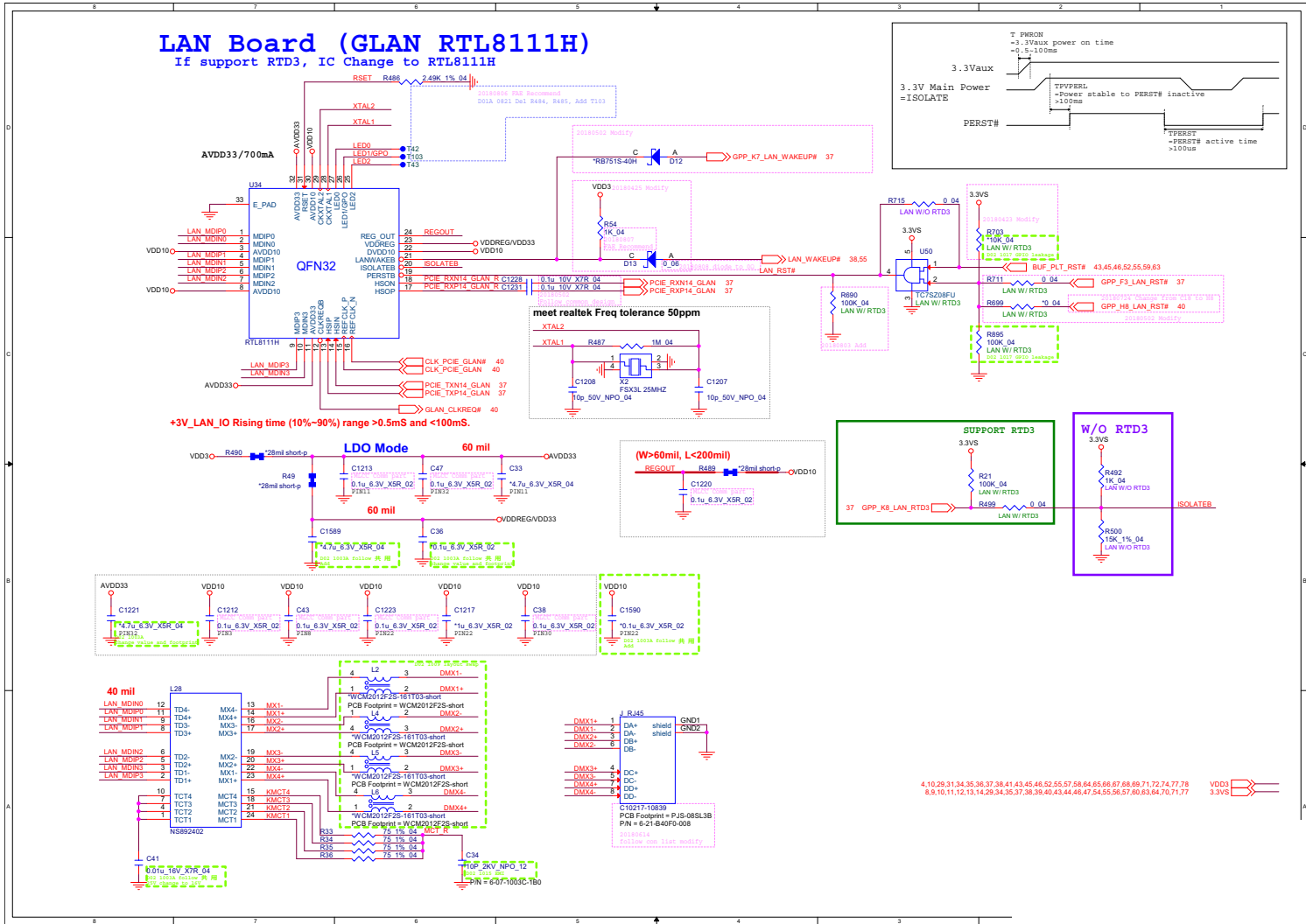
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USB+DP Type-C

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USB+DP Type-C



LAN RTL8111H

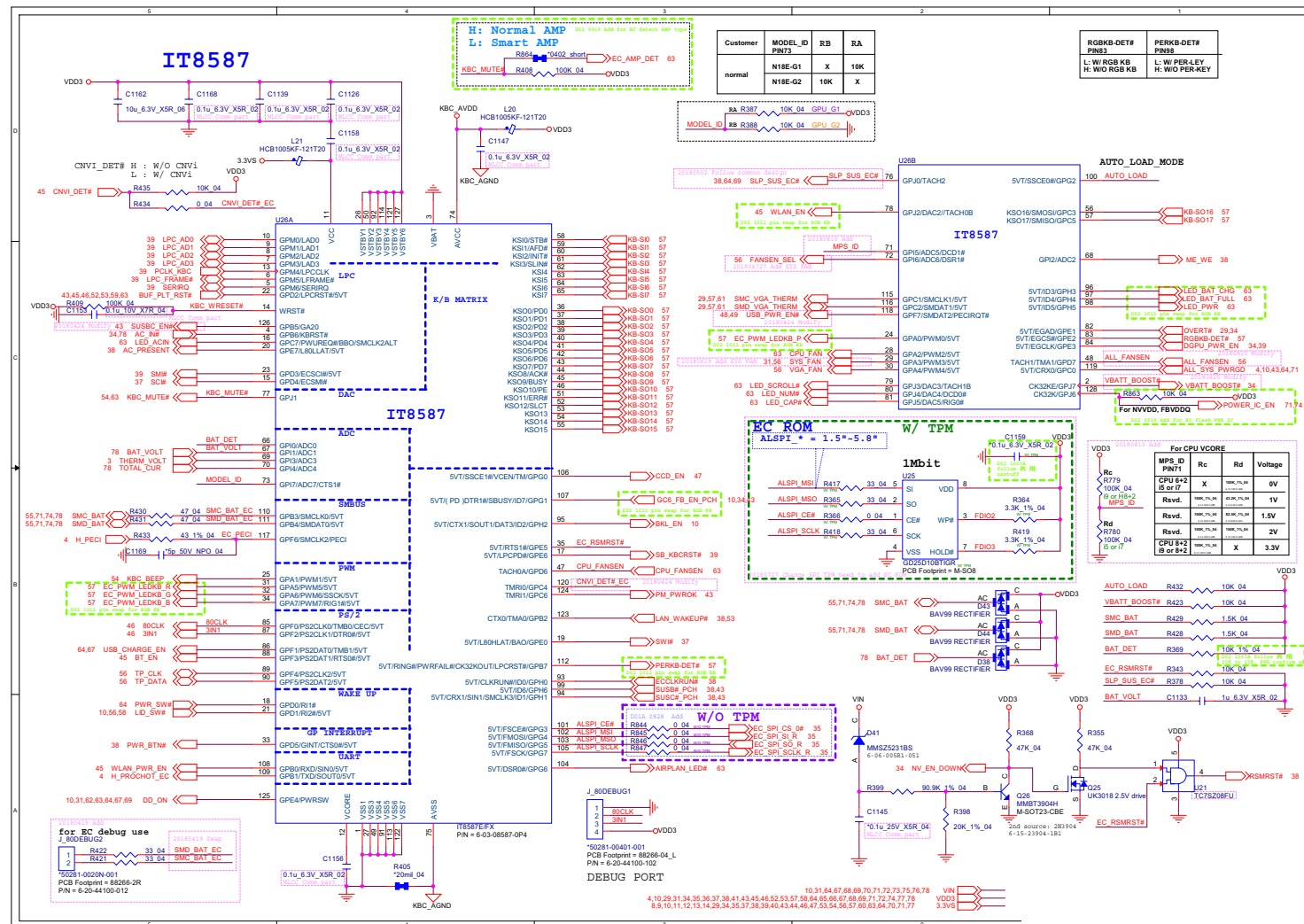


B.Schematic Diagrams

[illegible]

EC ITE8587

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EC ITE8587



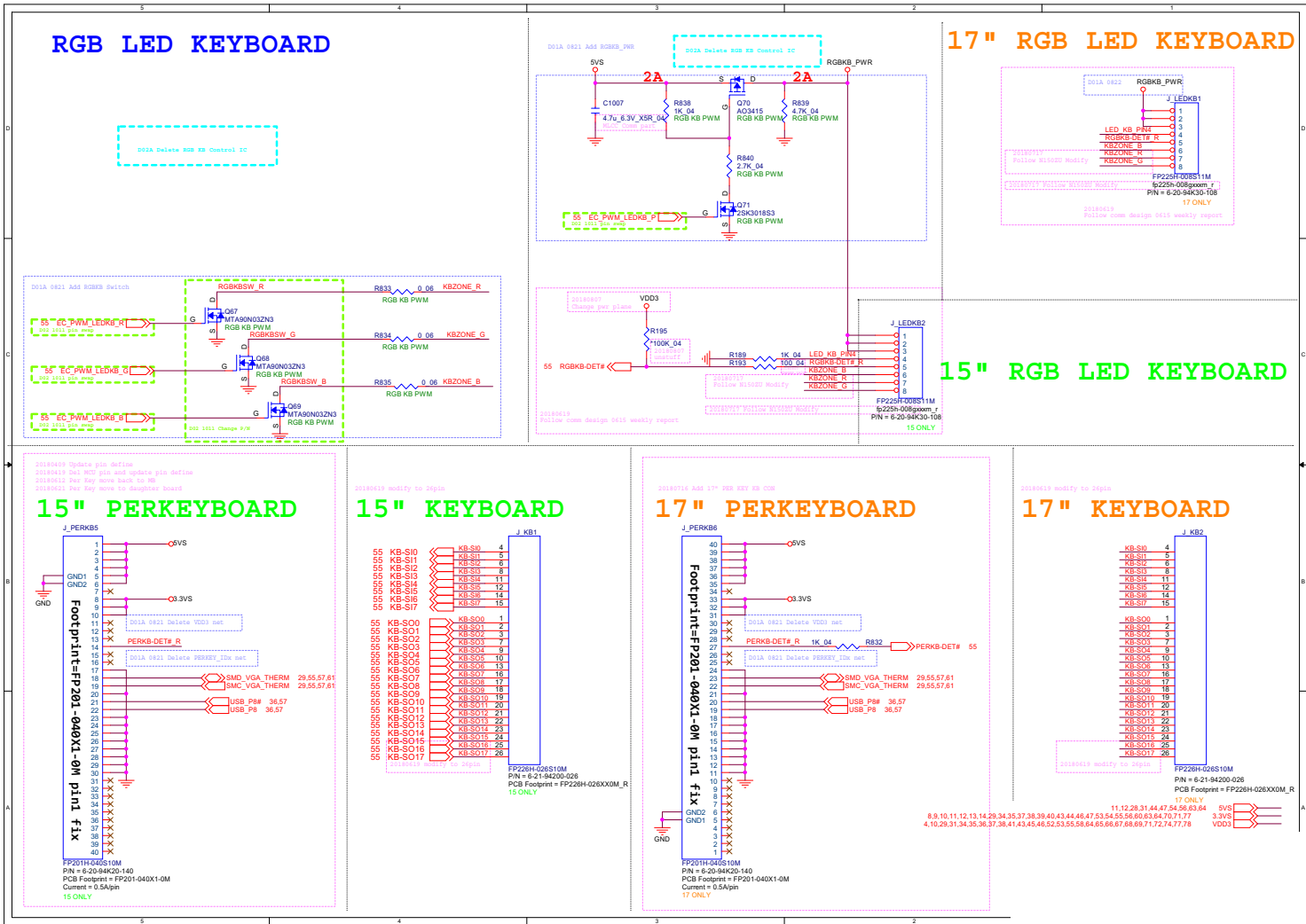
The image displays four distinct PCB layout sections:

- VGA FAN For G1:** A schematic for a fan control circuit. It includes a 5V supply, a 100k resistor (R1446), a 100pF capacitor (C1447), and a 100pF capacitor (C1448). The fan is connected to a 5V supply through a 100pF capacitor (C1449). The fan is labeled "VGA FAN" and "FANSEN_SEL 55".
- SYSTEM FAN for G2:** A schematic for a fan control circuit. It includes a 5V supply, a 100k resistor (R1446), a 100pF capacitor (C1447), and a 100pF capacitor (C1448). The fan is connected to a 5V supply through a 100pF capacitor (C1449). The fan is labeled "SYSTEM FAN" and "FANSEN_SEL 55".
- TOUCH PAD:** A schematic for a touch pad interface. It includes a 5V supply, a 100k resistor (R1446), a 100pF capacitor (C1447), and a 100pF capacitor (C1448). The touch pad is connected to a 5V supply through a 100pF capacitor (C1449). The touch pad is labeled "TOUCH PAD" and "FANSEN_SEL 55".
- SMART AMP POWER 10V:** A schematic for a 10V power amplifier. It includes a 10V supply, a 100k resistor (R1446), a 100pF capacitor (C1447), and a 100pF capacitor (C1448). The amplifier is connected to a 10V supply through a 100pF capacitor (C1449). The amplifier is labeled "SMART AMP POWER 10V" and "FANSEN_SEL 55".

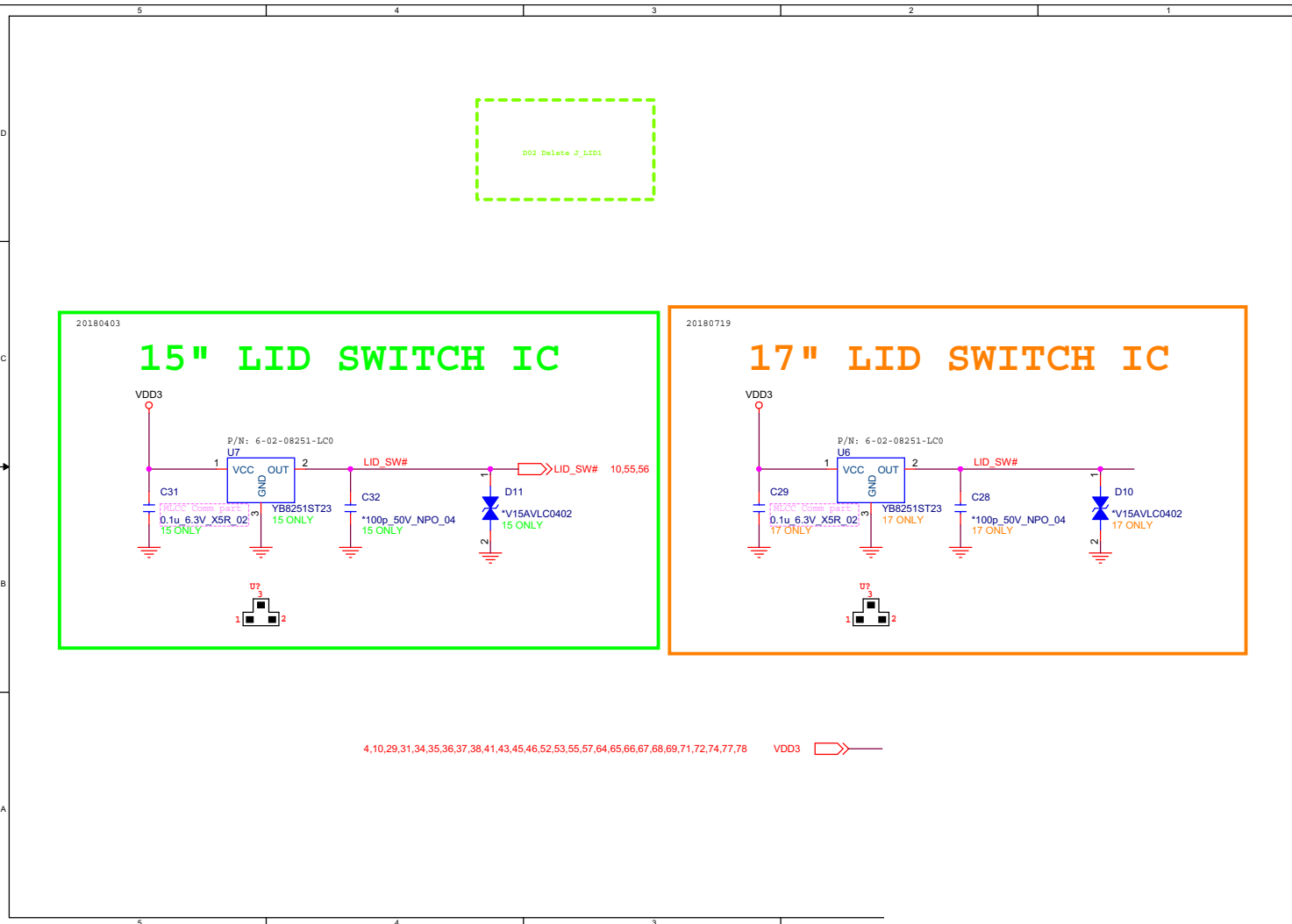
LED Keyboard Ctrl

B.Schematic Diagrams

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LED Keyboard Ctrl



LID



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LID

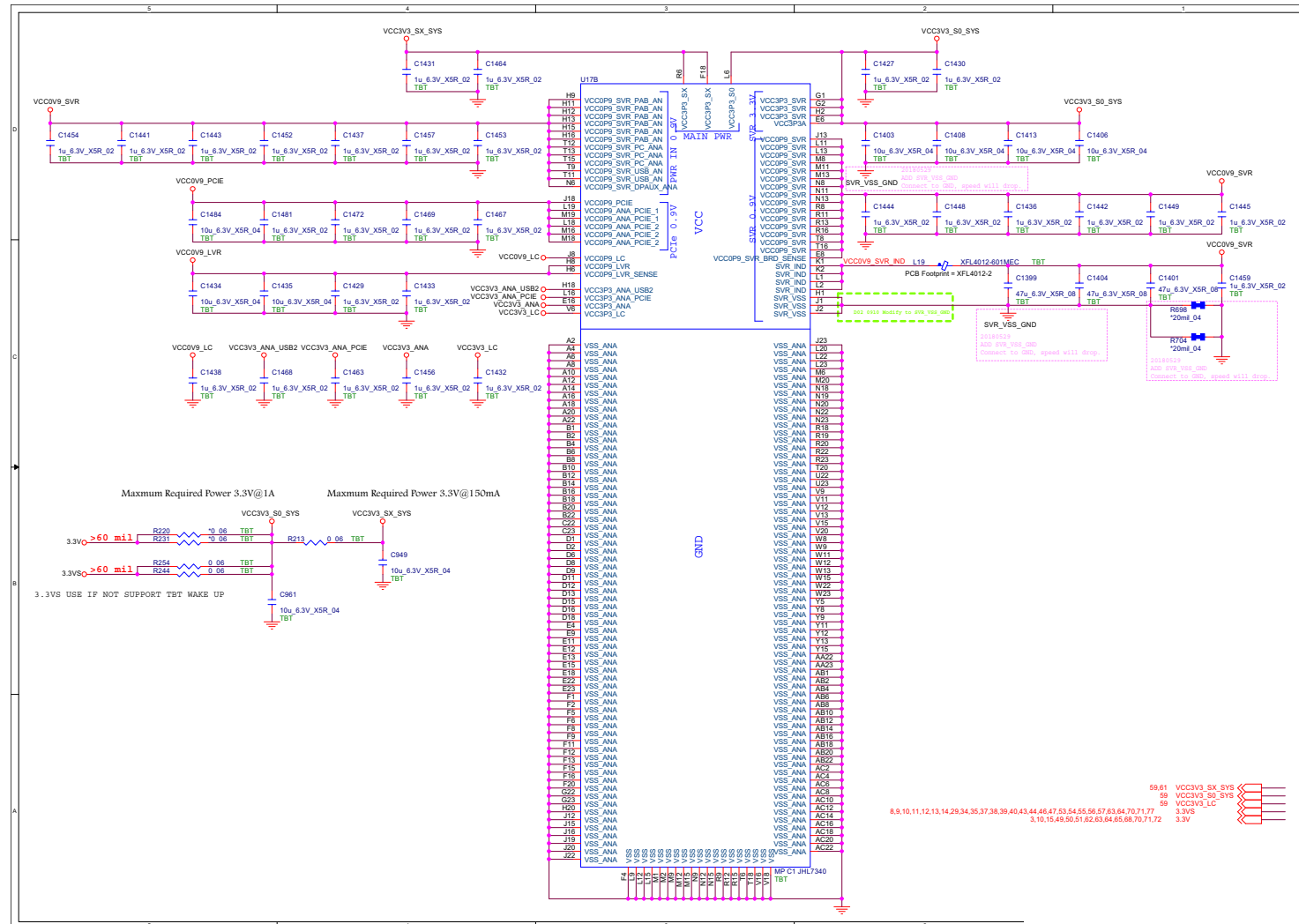
TR-TBT

B. Schematic Diagrams



Schematic Diagrams

AR_TBT_SP PWR

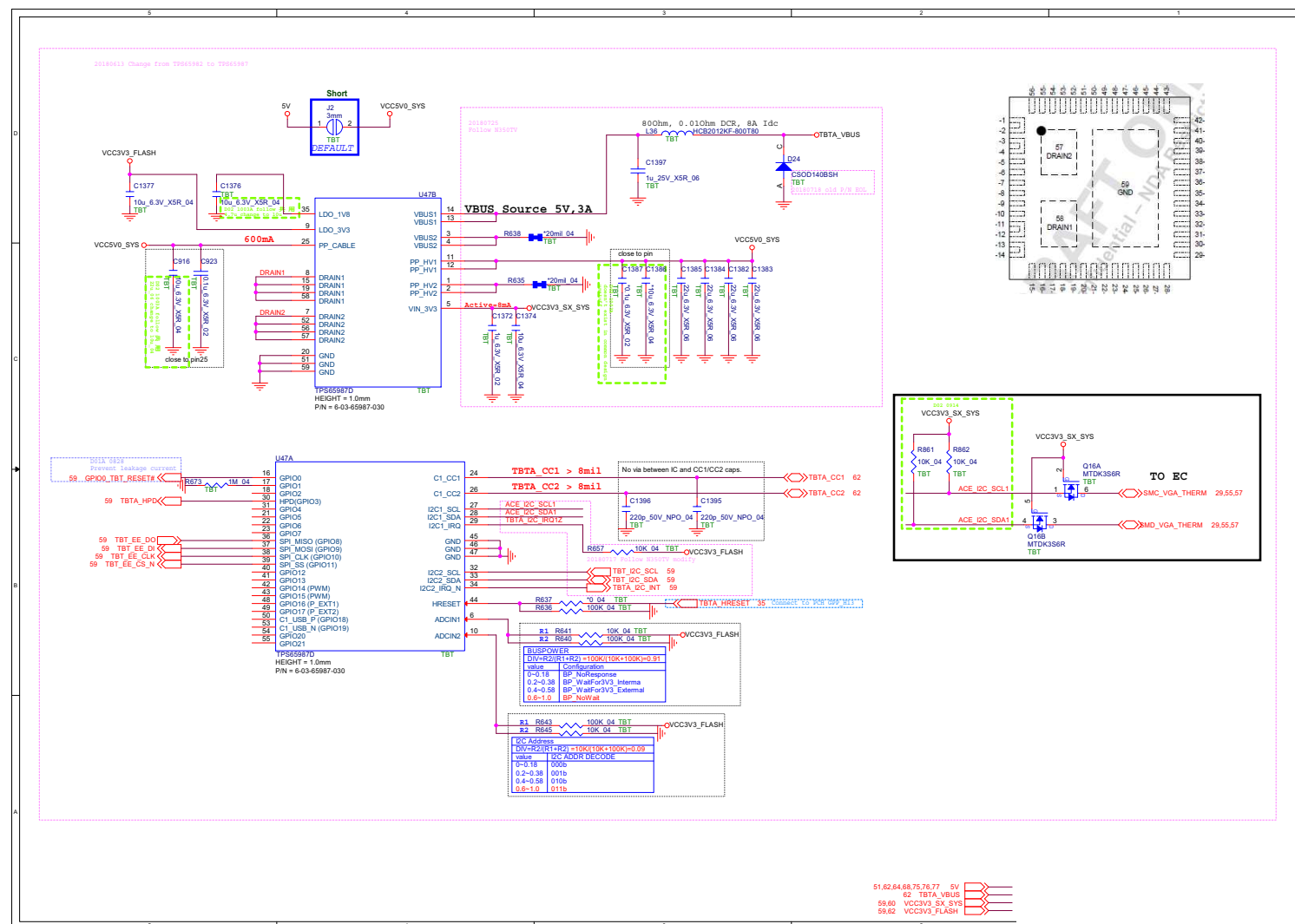


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AR_TBT_SP PWR

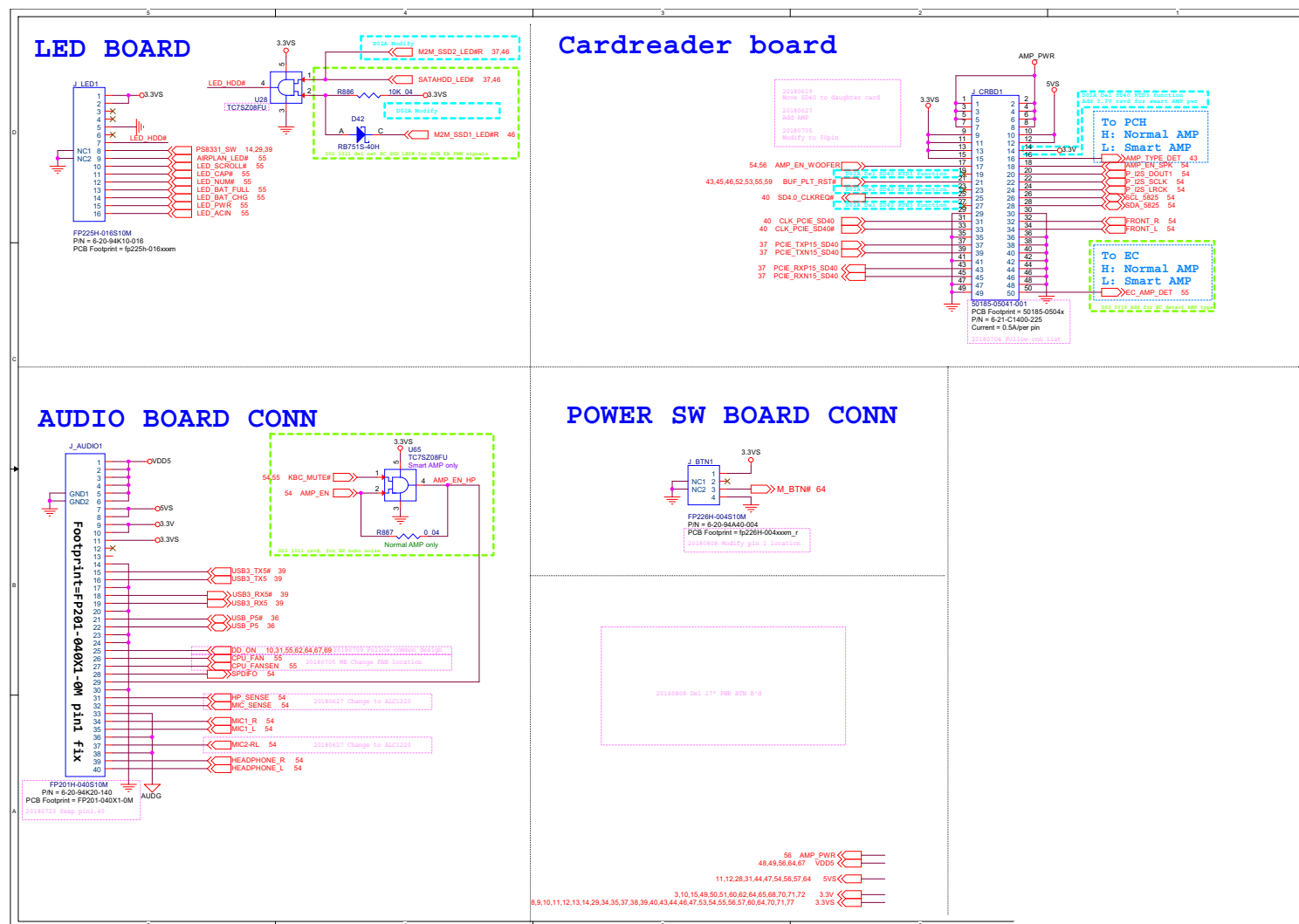
B.Schematic Diagrams

TPS65987

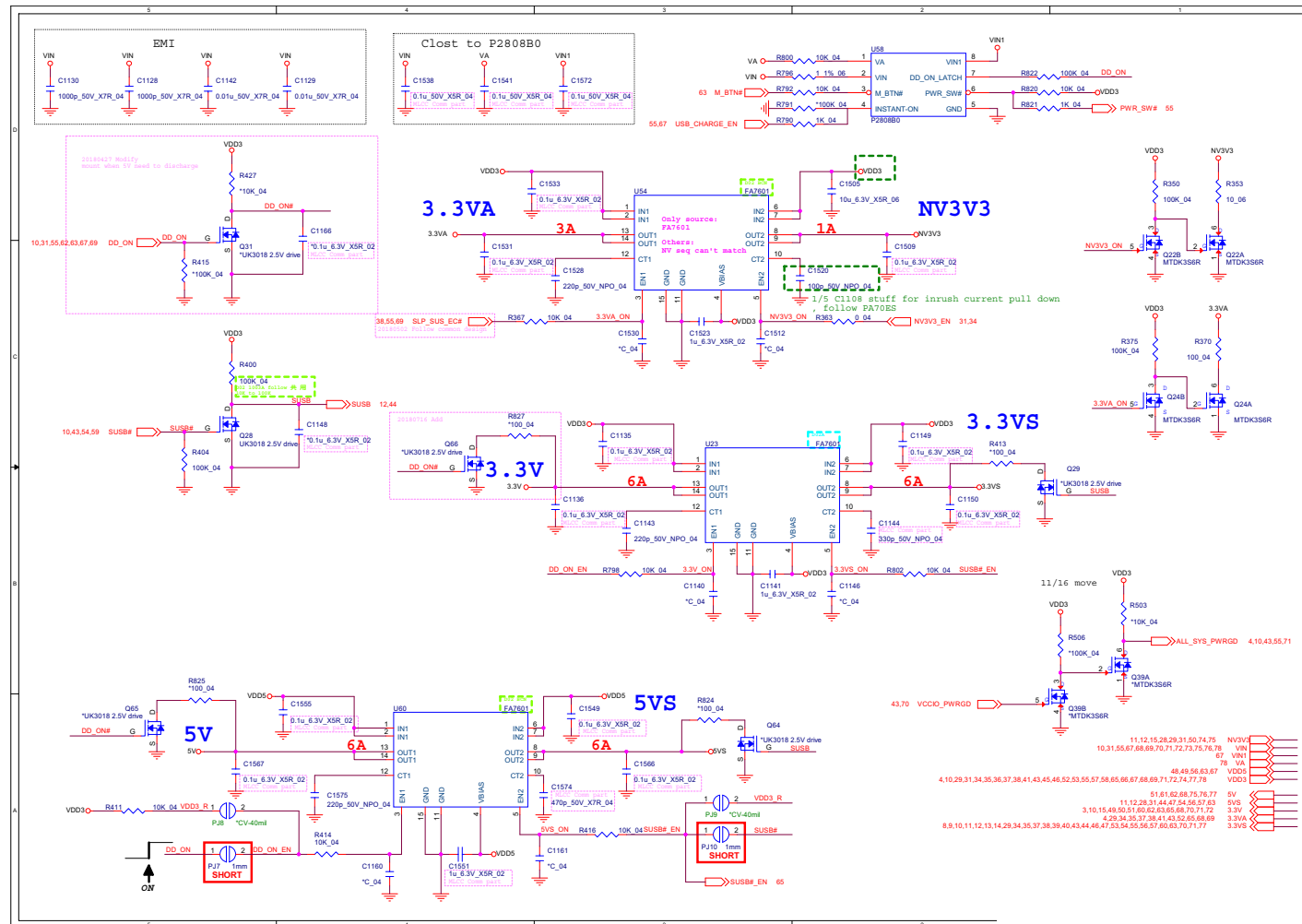
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TPS65987



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Conn_to Extend
Board



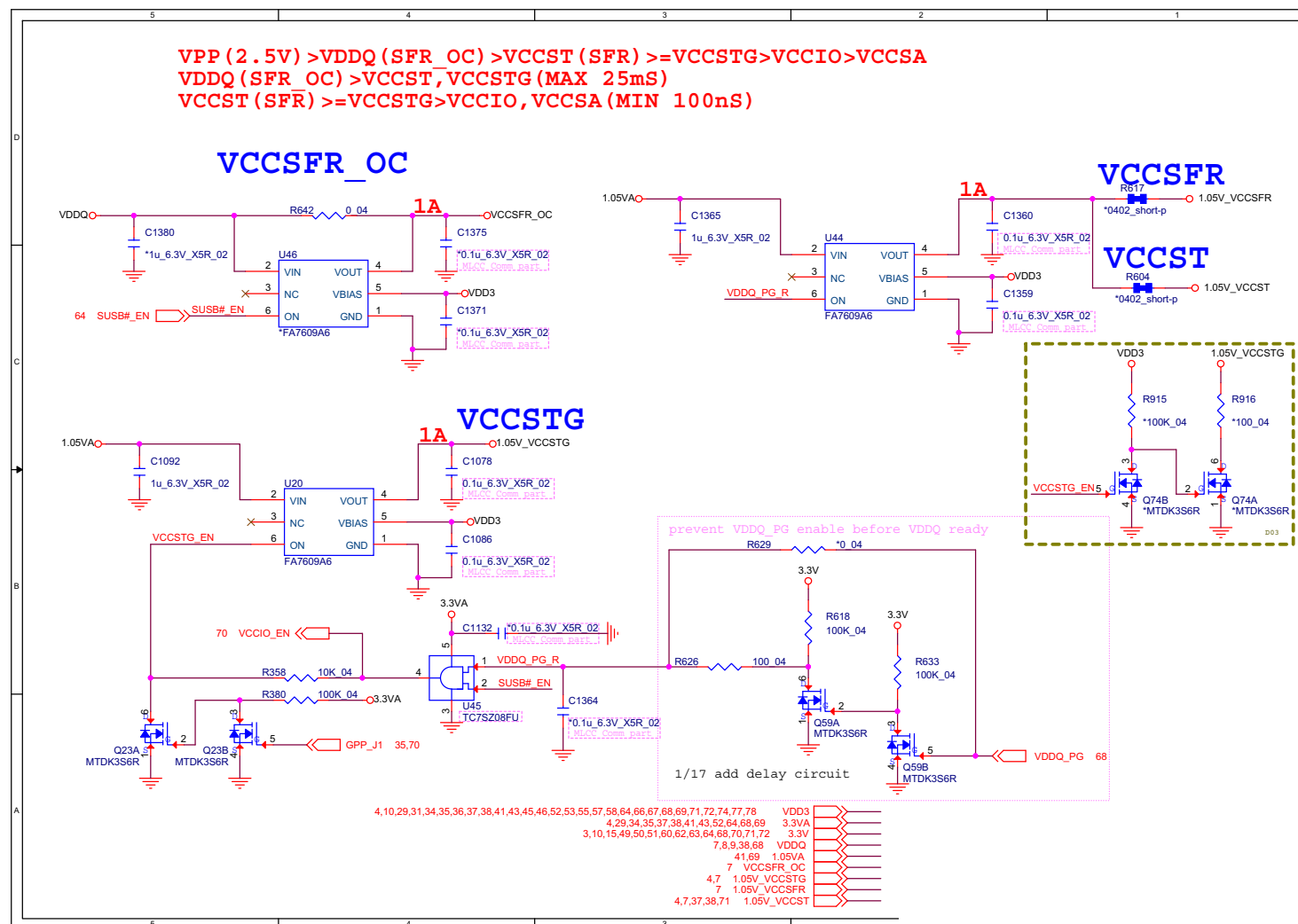
3.3VA, 3.3V, 3.3VS, 5VS



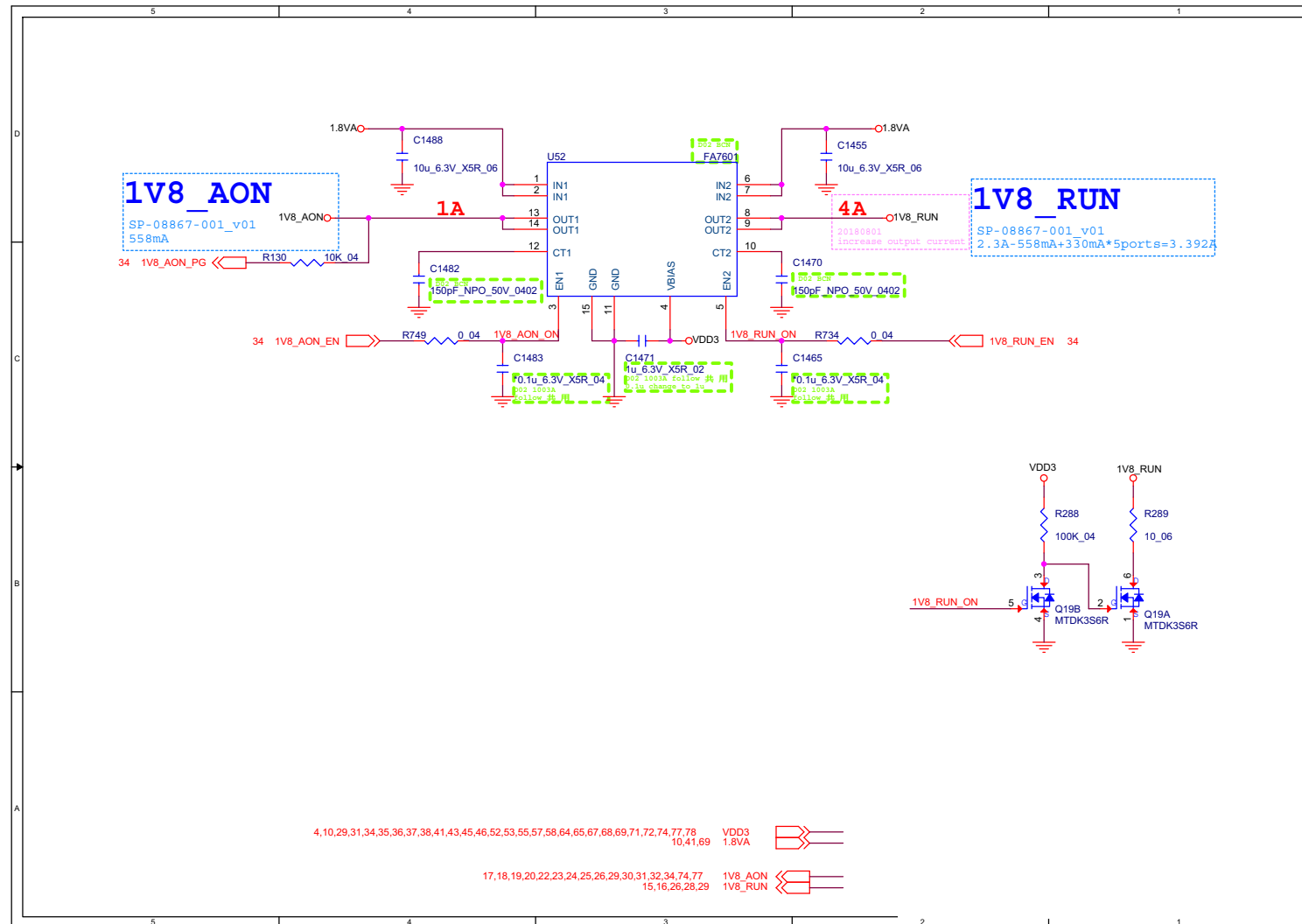
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3.3VA, 3.3V, 3.3VS,
5VS

PWR_SW VCCST, STG, SFR_OC

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PWR_SW VCCST,
STG, SFR_OC



PWR_SW 1V8_AON, RUN

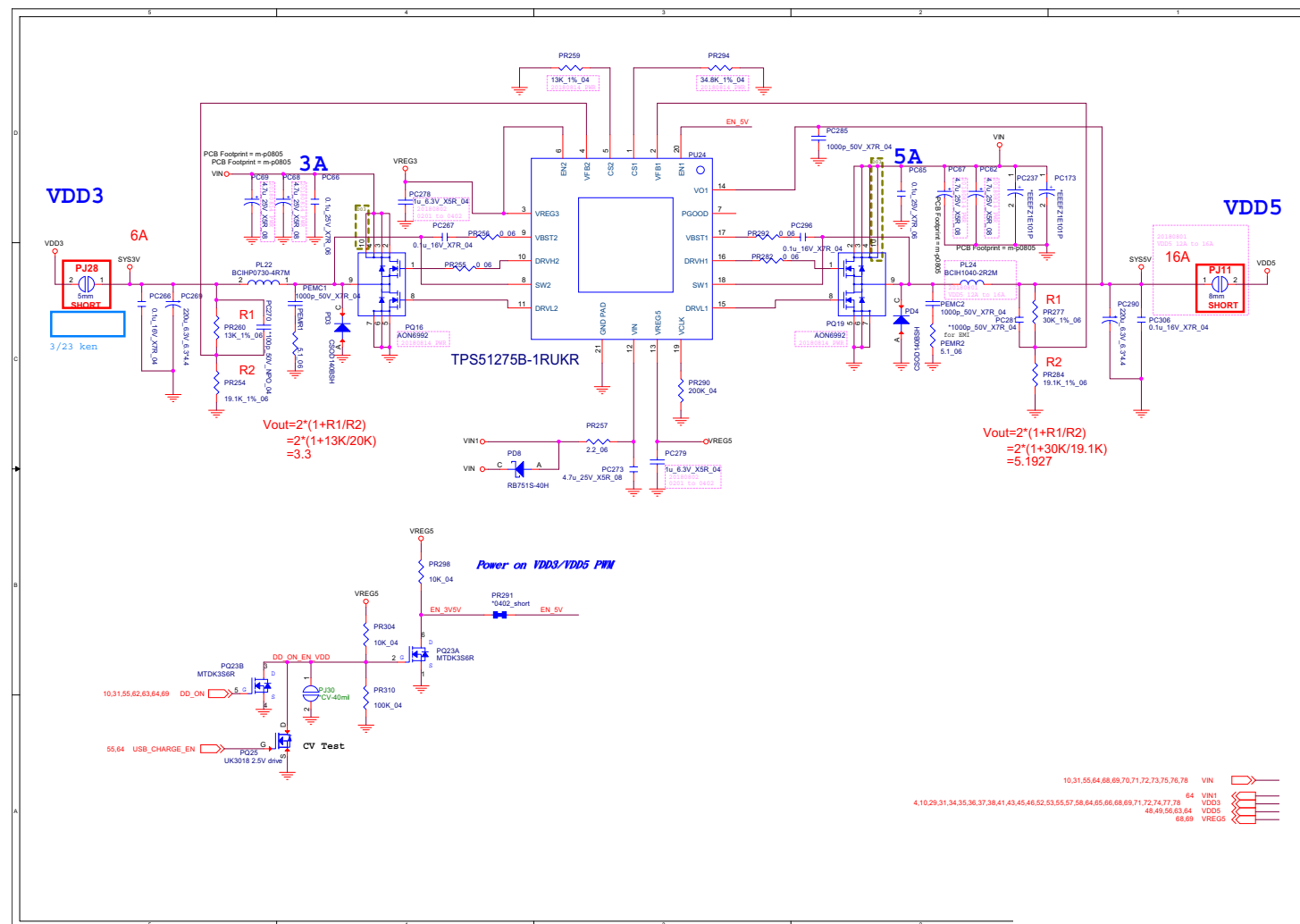


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PWR_SW
1V8_AON, RUN

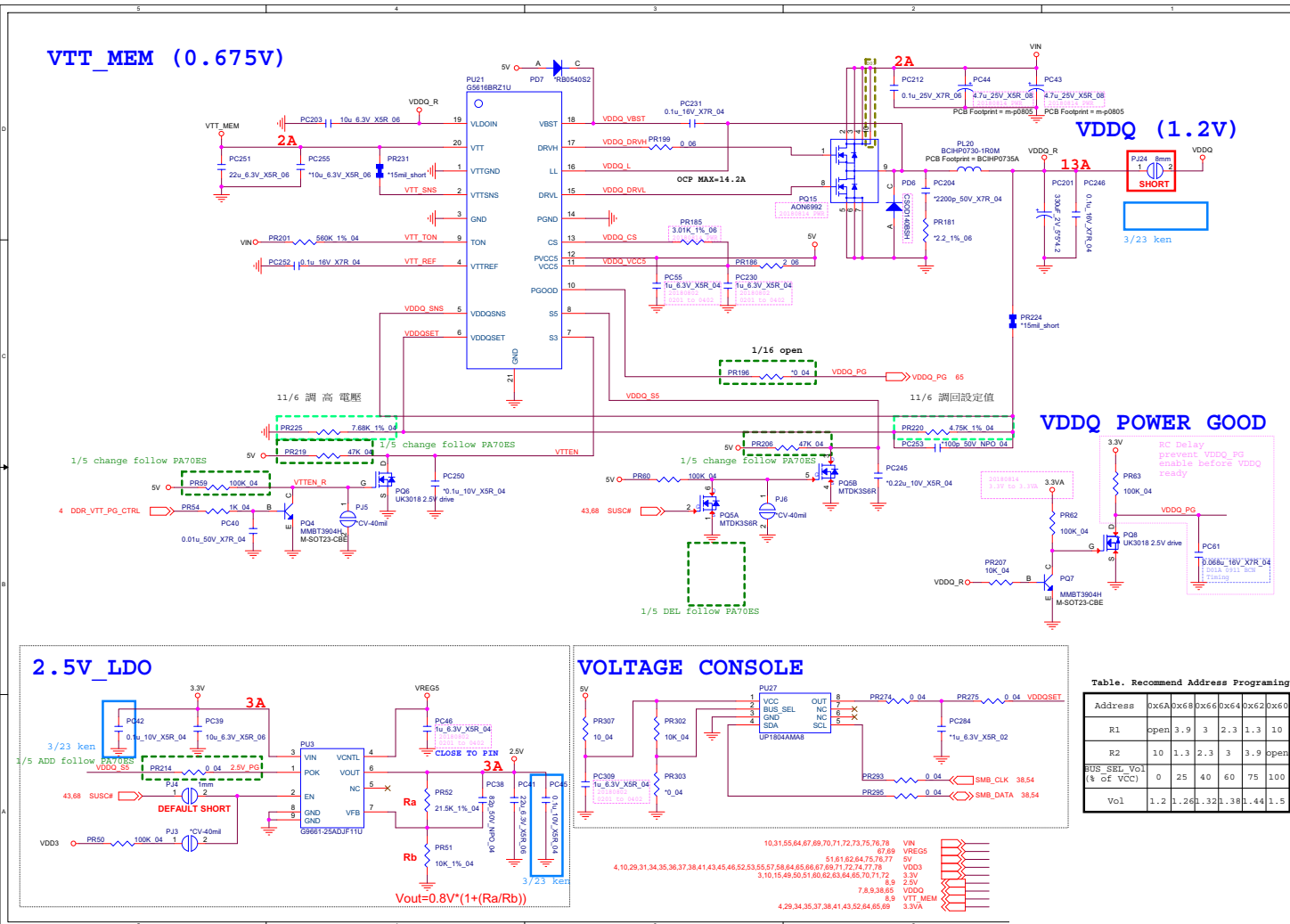
VDD3, VDD5

B.Schematic Diagrams

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VDD3, VDD5



DDR 1.2V, 0.6VS, 2.5V

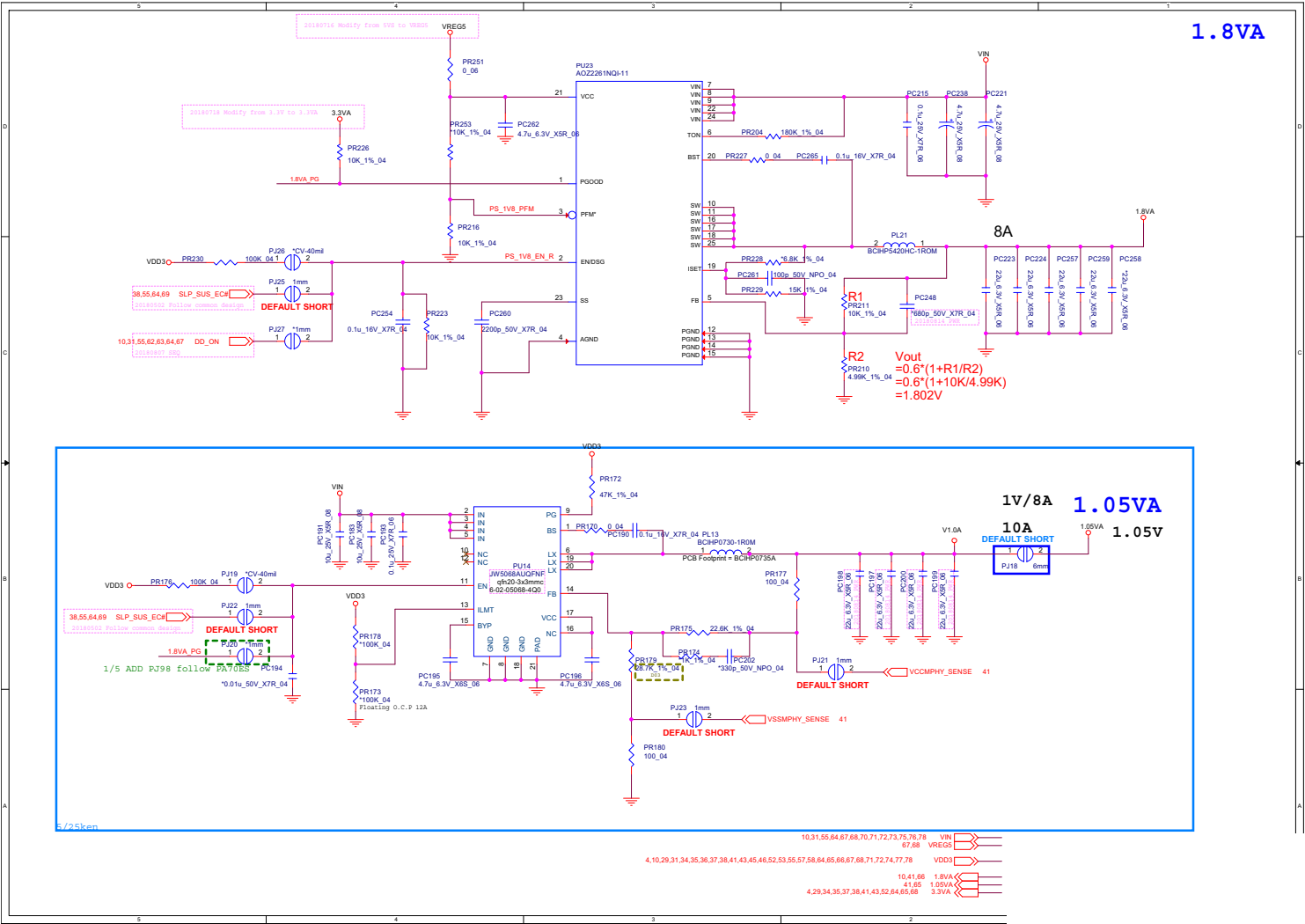


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DDR 1.2V, 0.6VS,
2.5V

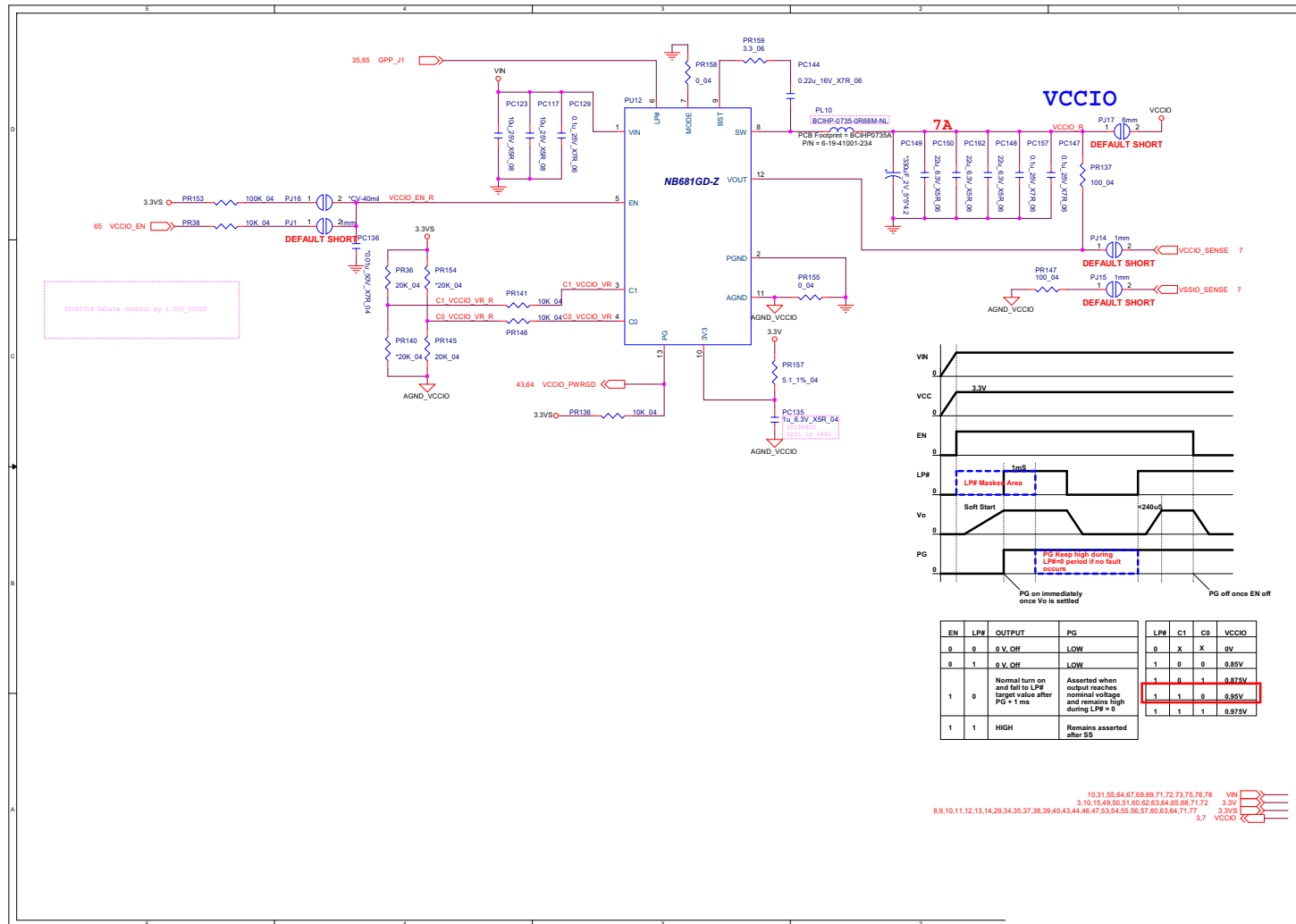
Schematic Diagrams

1.8VA, 1.05VA

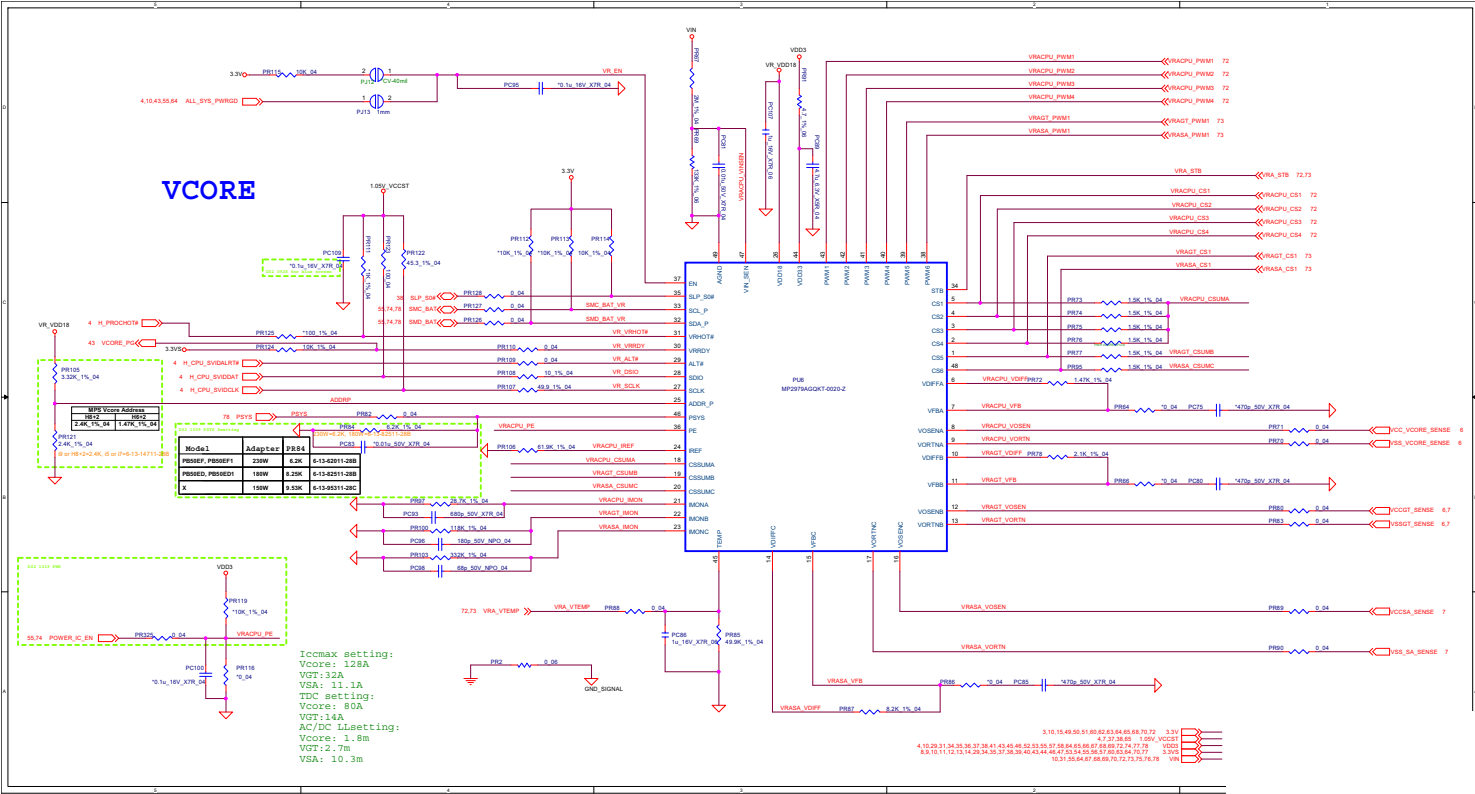
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1.8VA, 1.05VA



VCCIO



VCore, VCCGT, VCCSA



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VCore

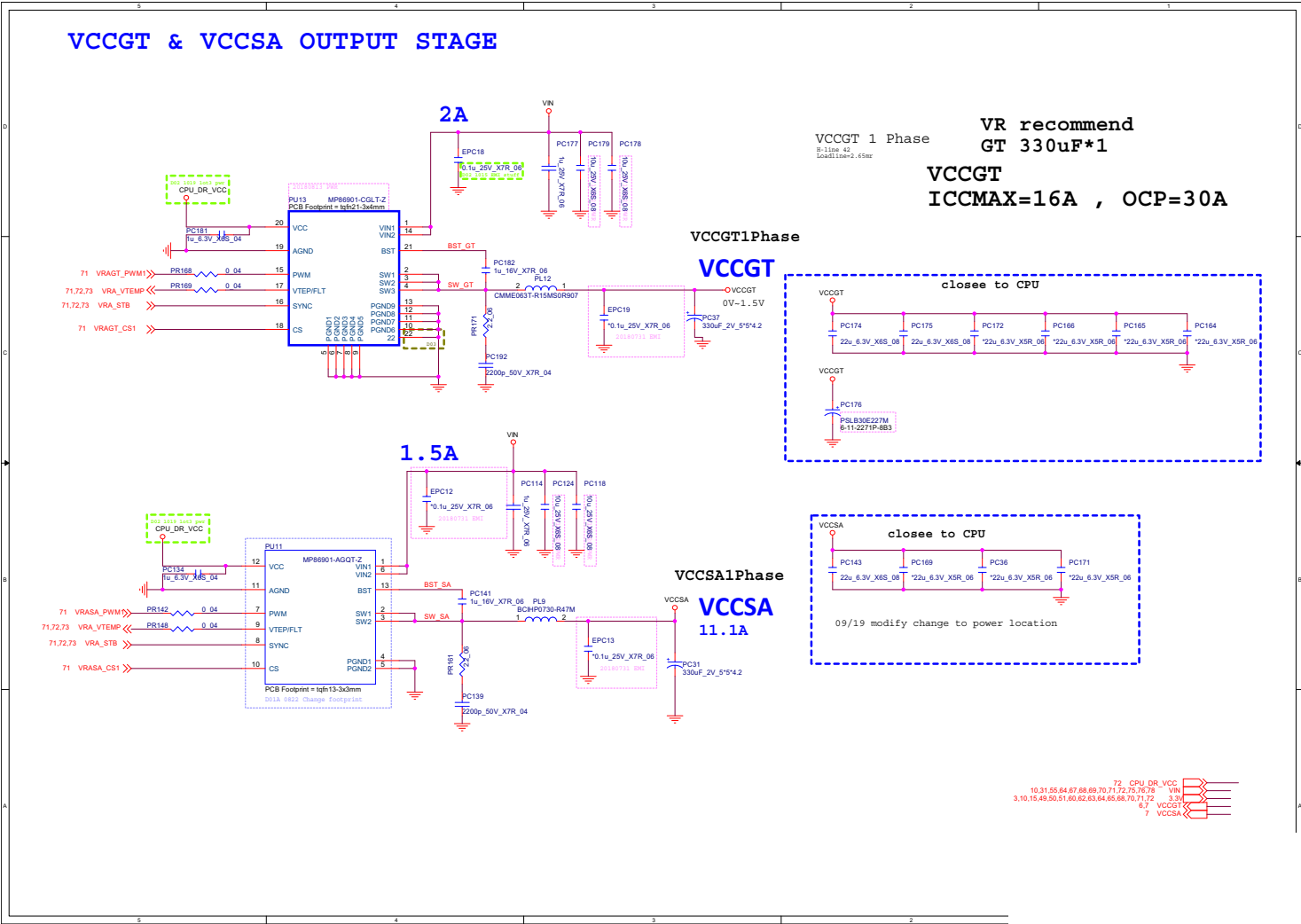
B.Schematic Diagrams



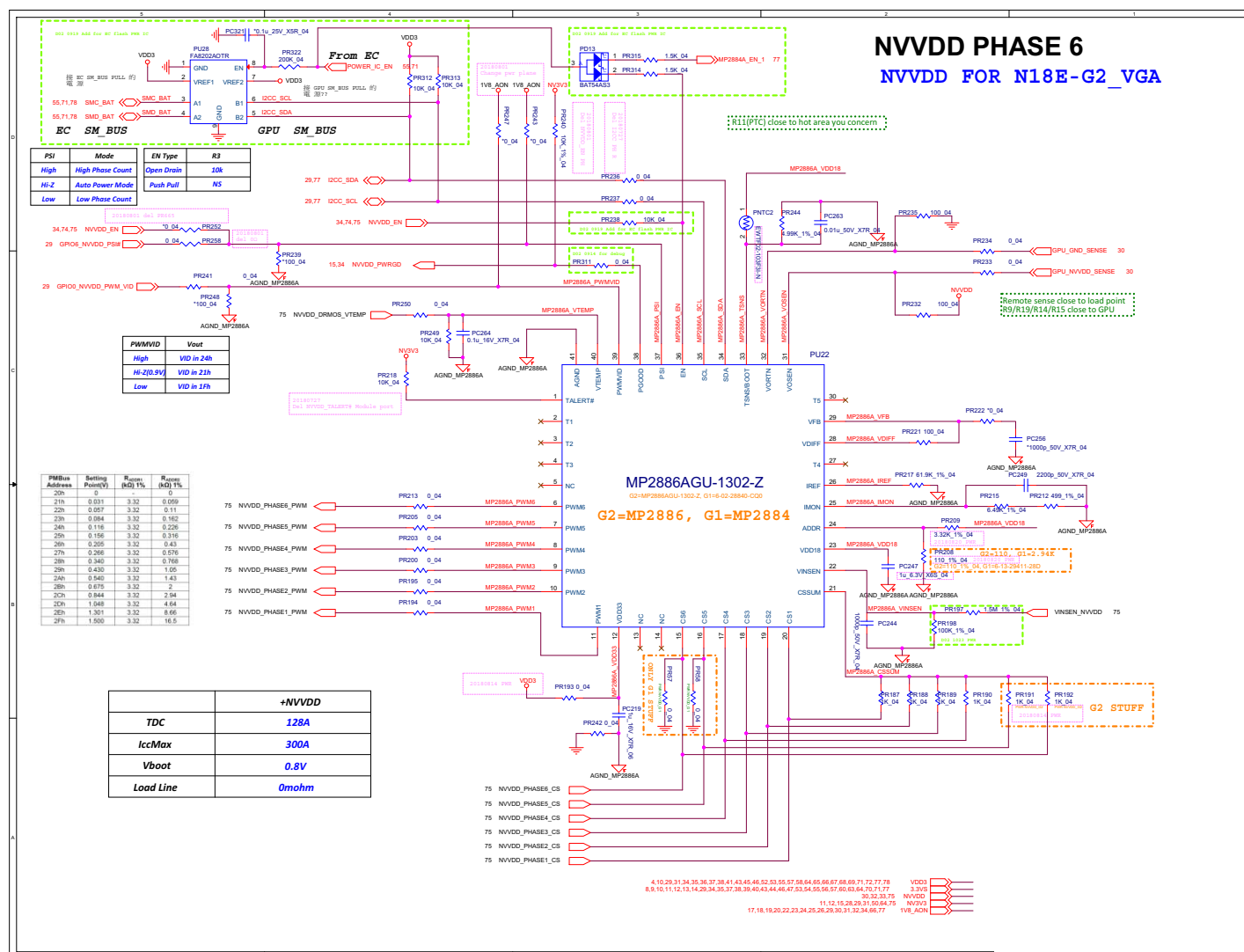
Schematic Diagrams

VCCGT, VCCSA

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VCCGT, VCCSA

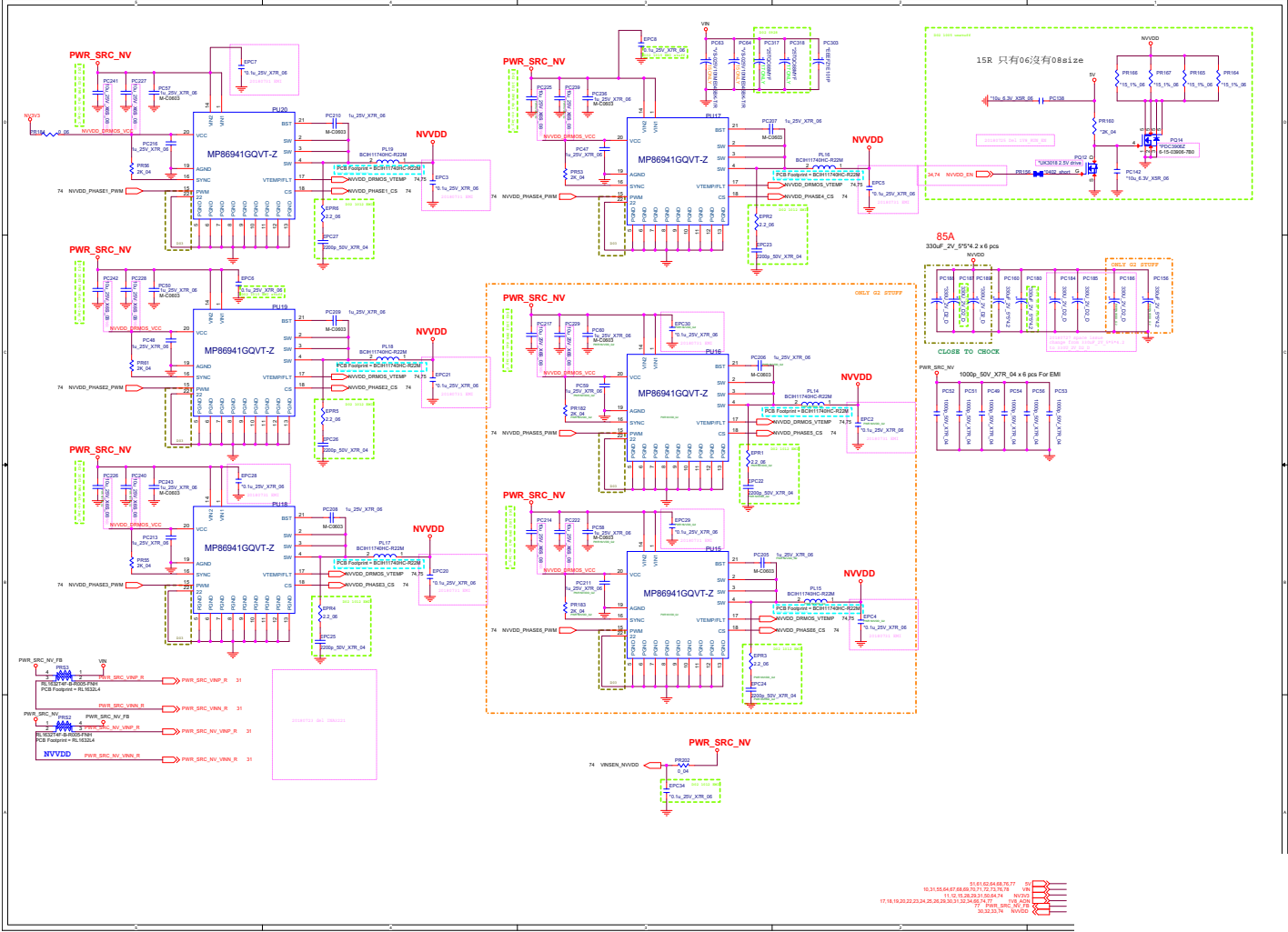


NVVDD 1 & 2

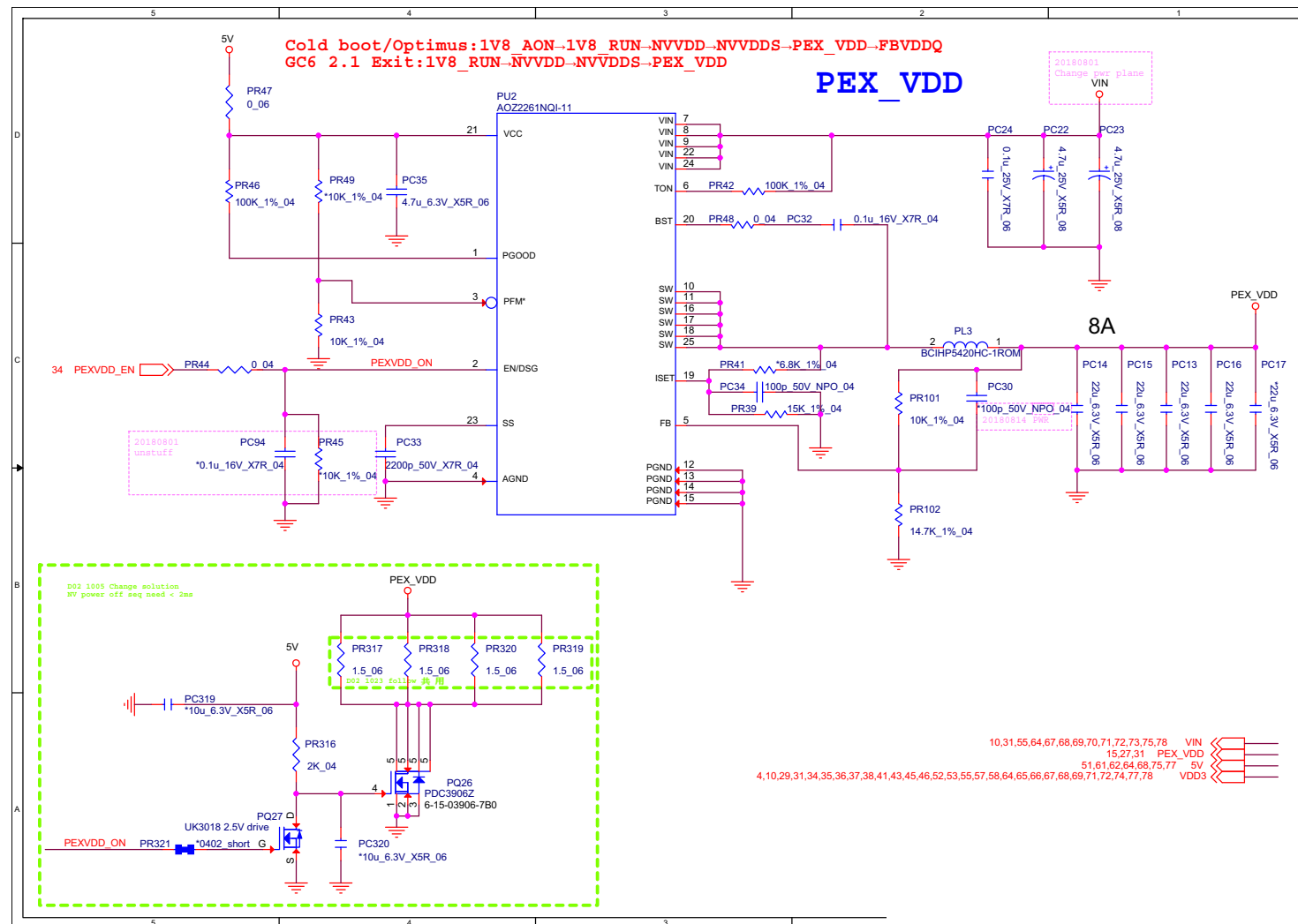


NVVDD 3

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NVVDD 3

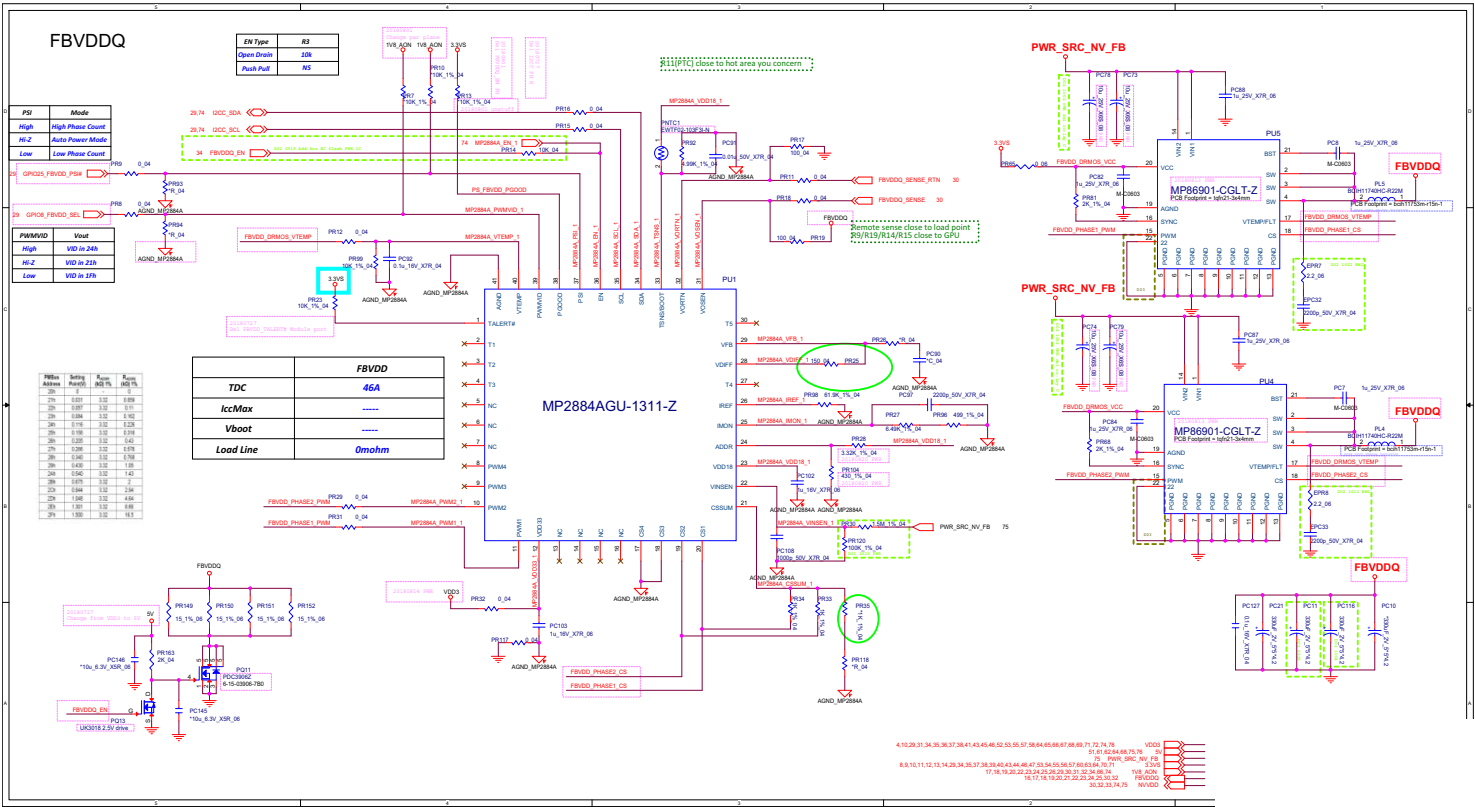


PEX_VDD

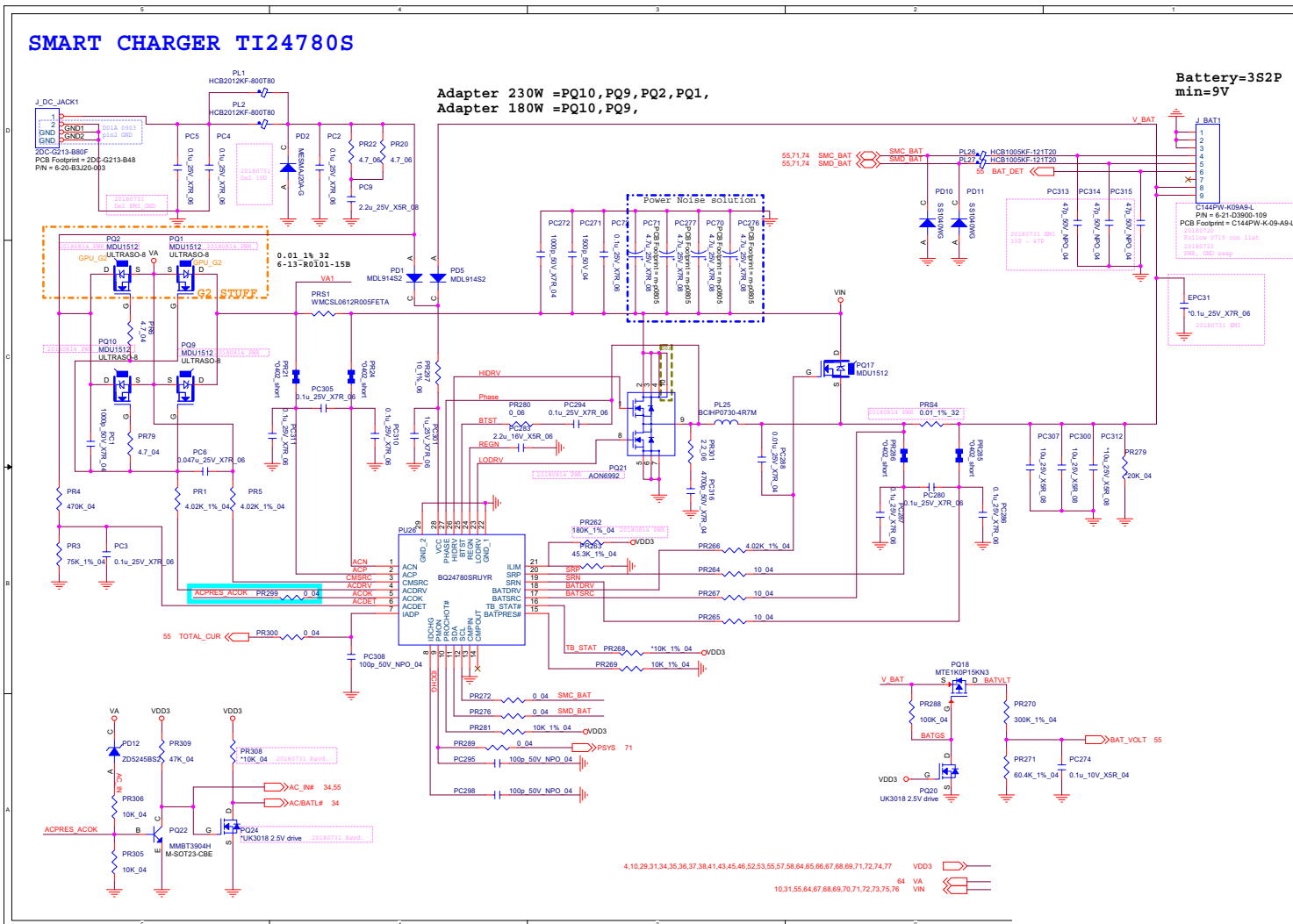
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PEX_VDD

FBVDDQ

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FBVDDQ



AC-In, Charger

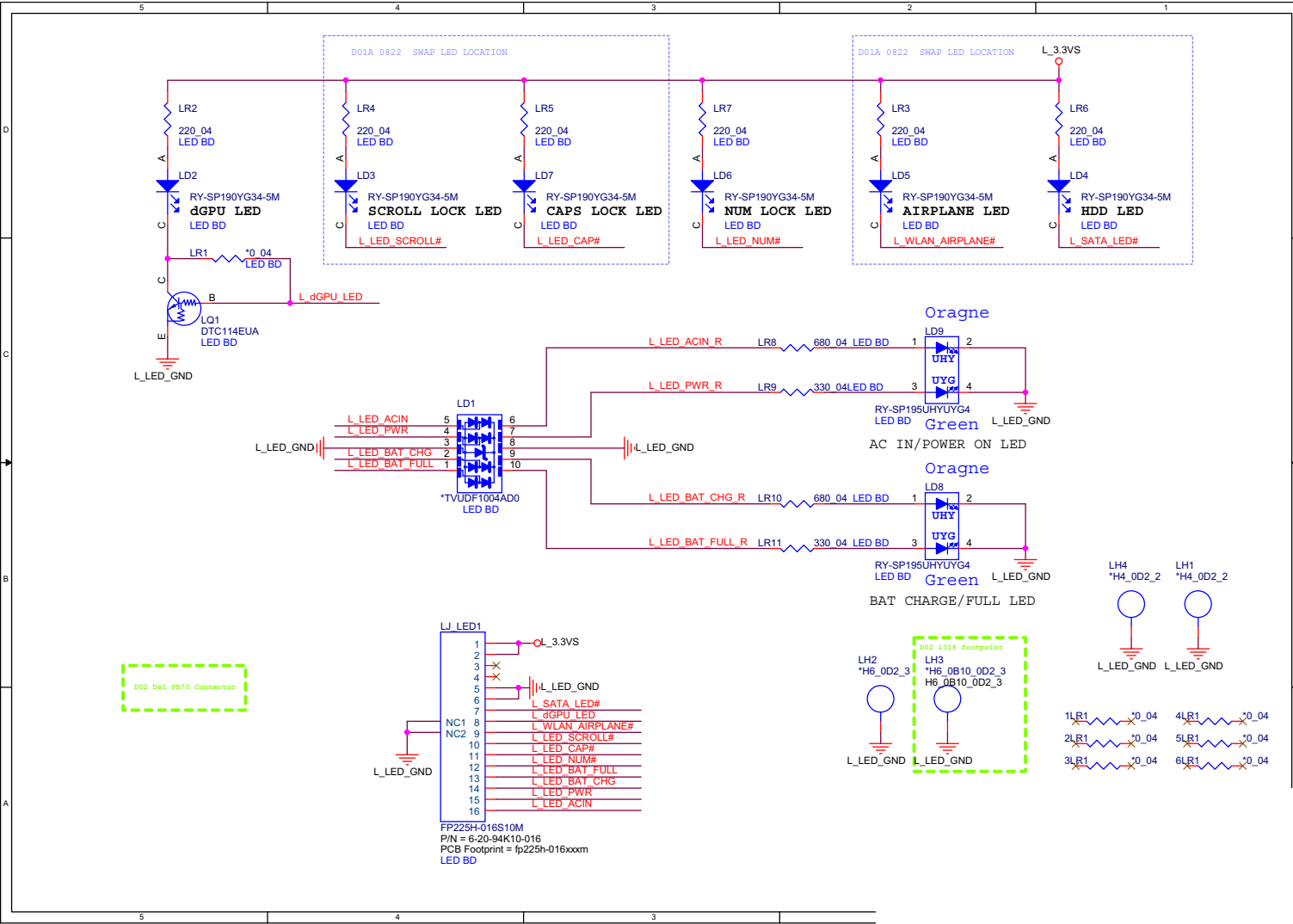


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AC-In, Charger

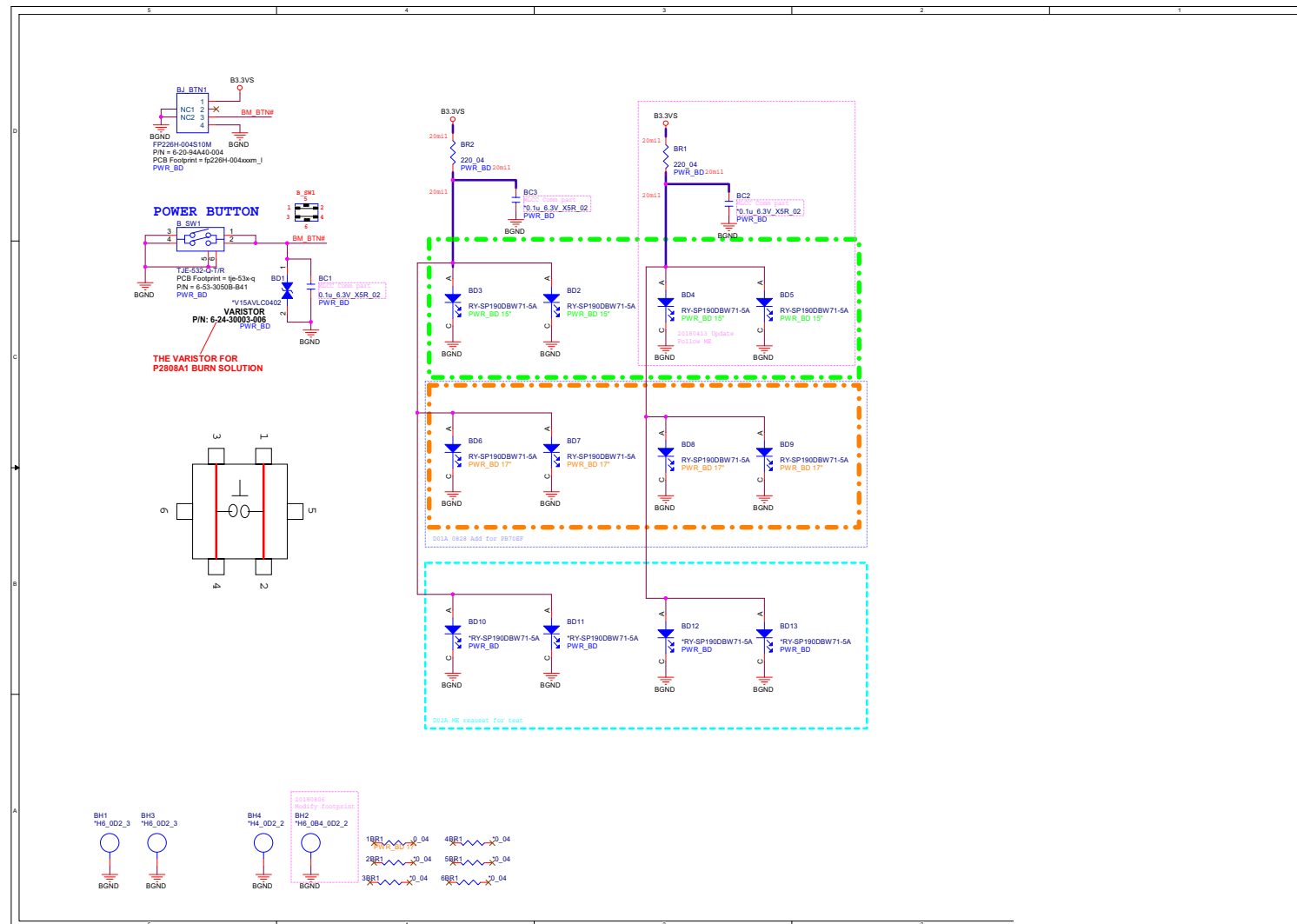
Schematic Diagrams

LED Board

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LED Board



Power Board

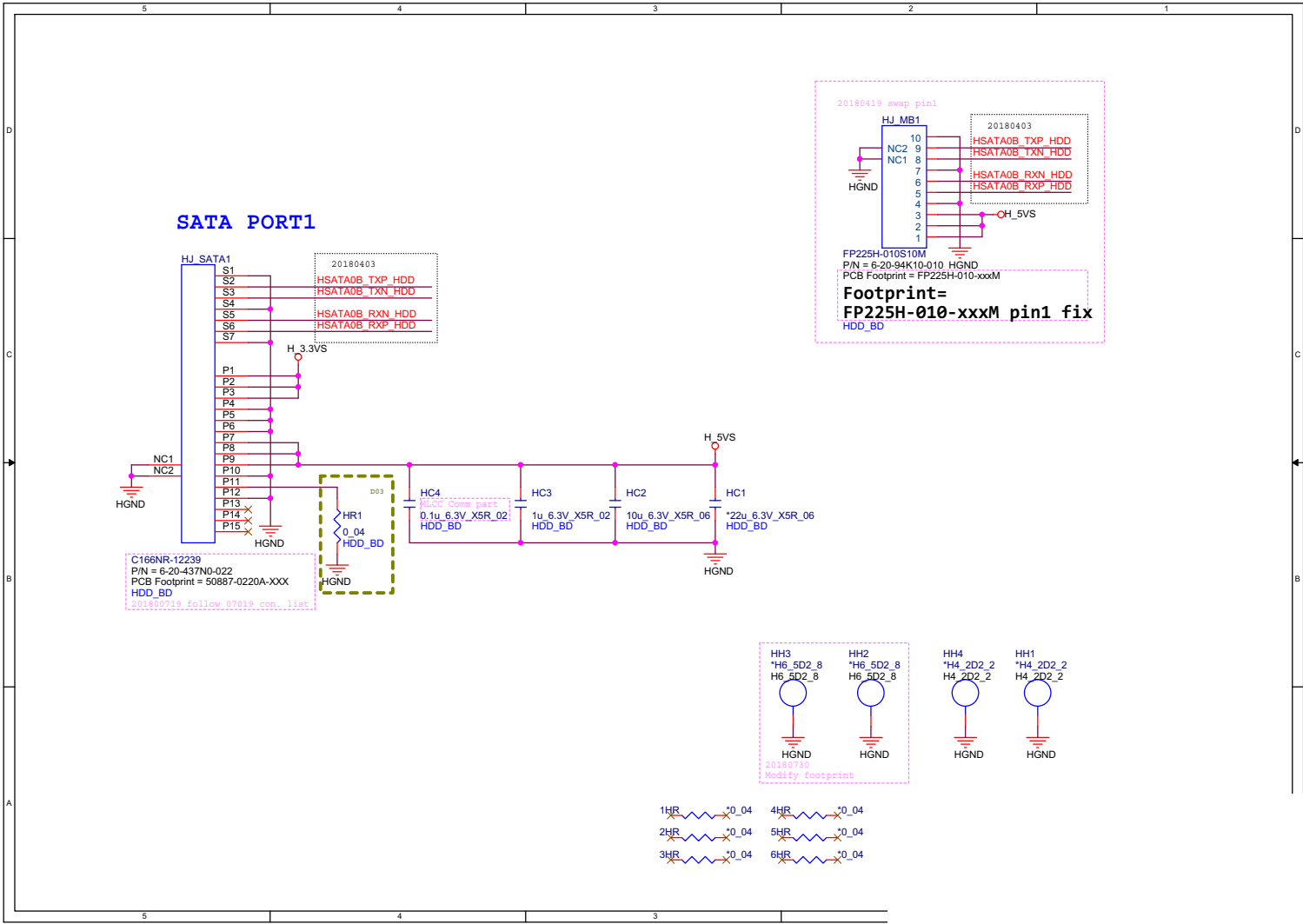


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Power Board

Schematic Diagrams

HDD Board

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HDD Board

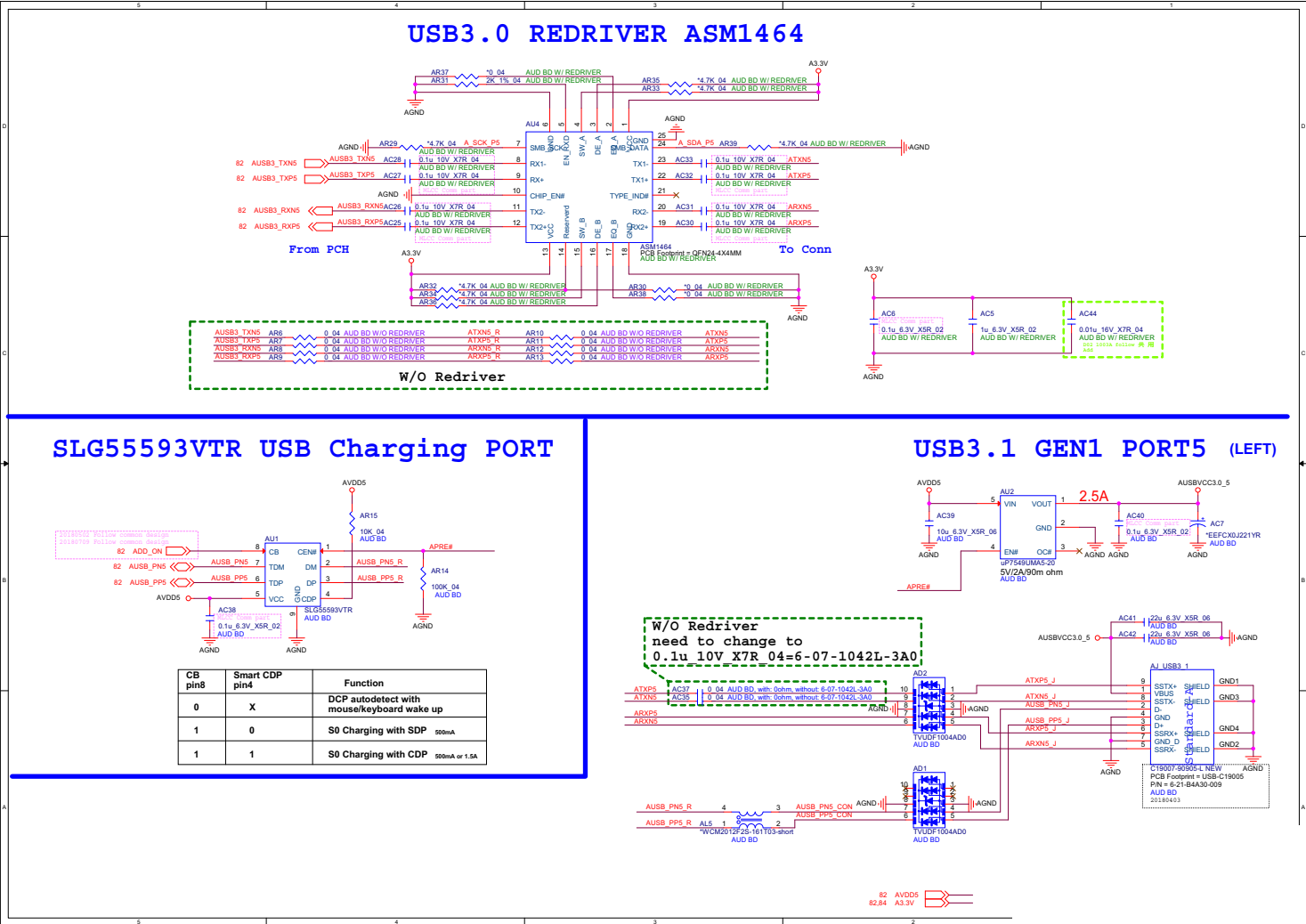


Audio Board, Fan B - 83

Schematic Diagrams

Audio Board_USB

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Audio Board_USB

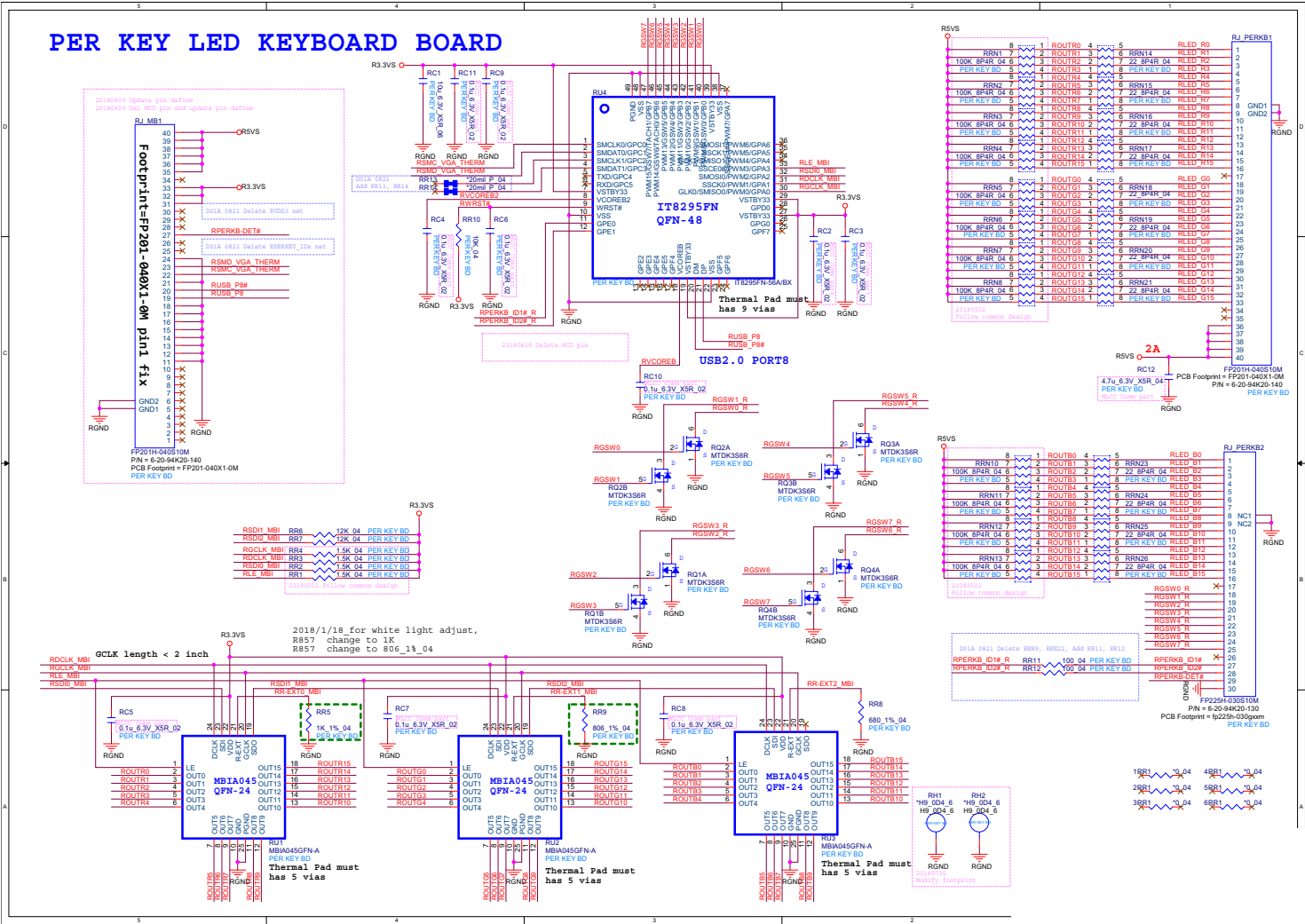


Audio Board_AMP, Jack B - 85

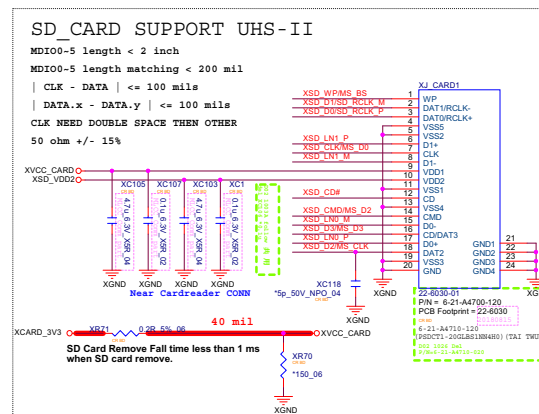
Schematic Diagrams

Per Keyboard

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Per Keyboard

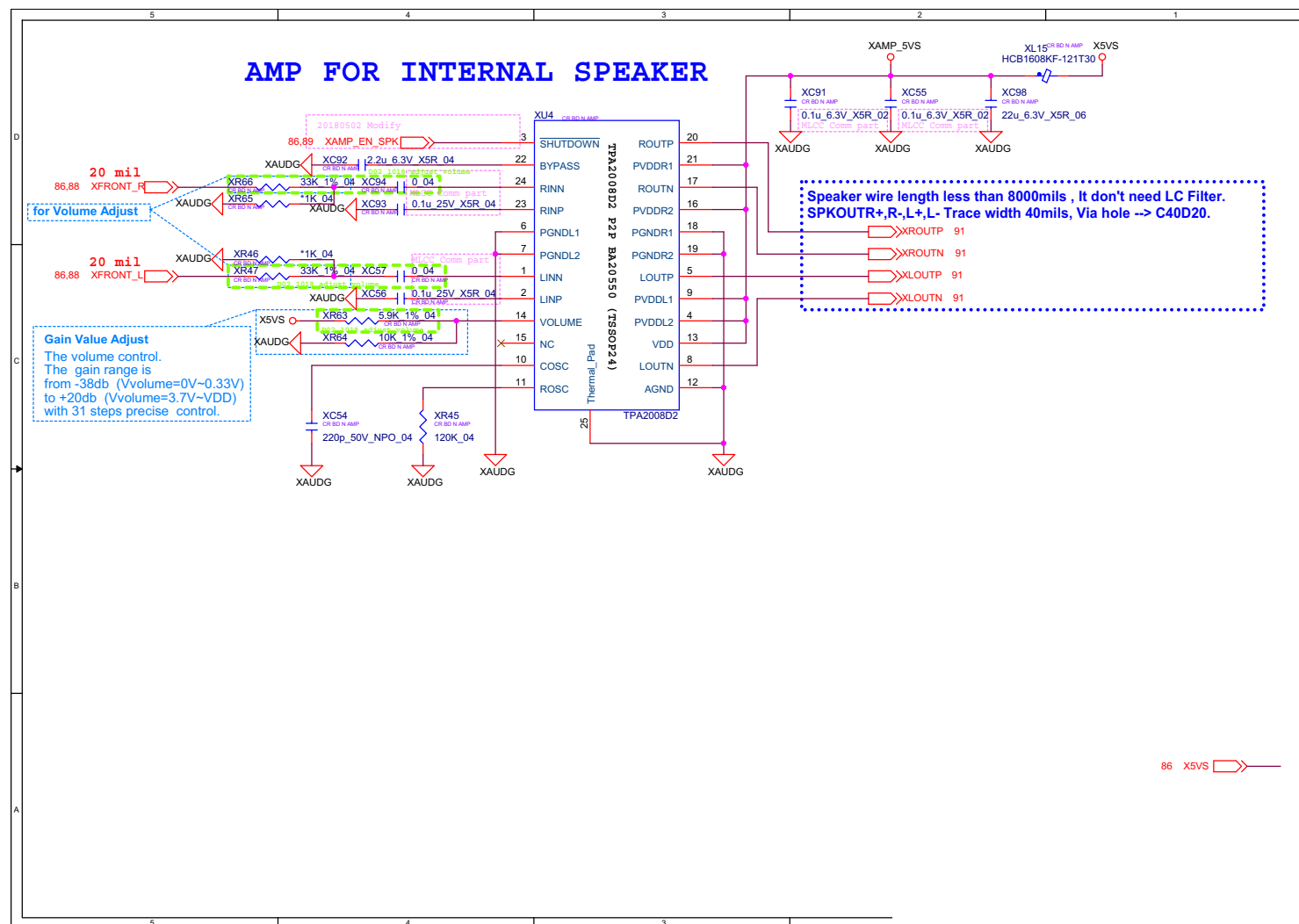


RTS5250 B - 87

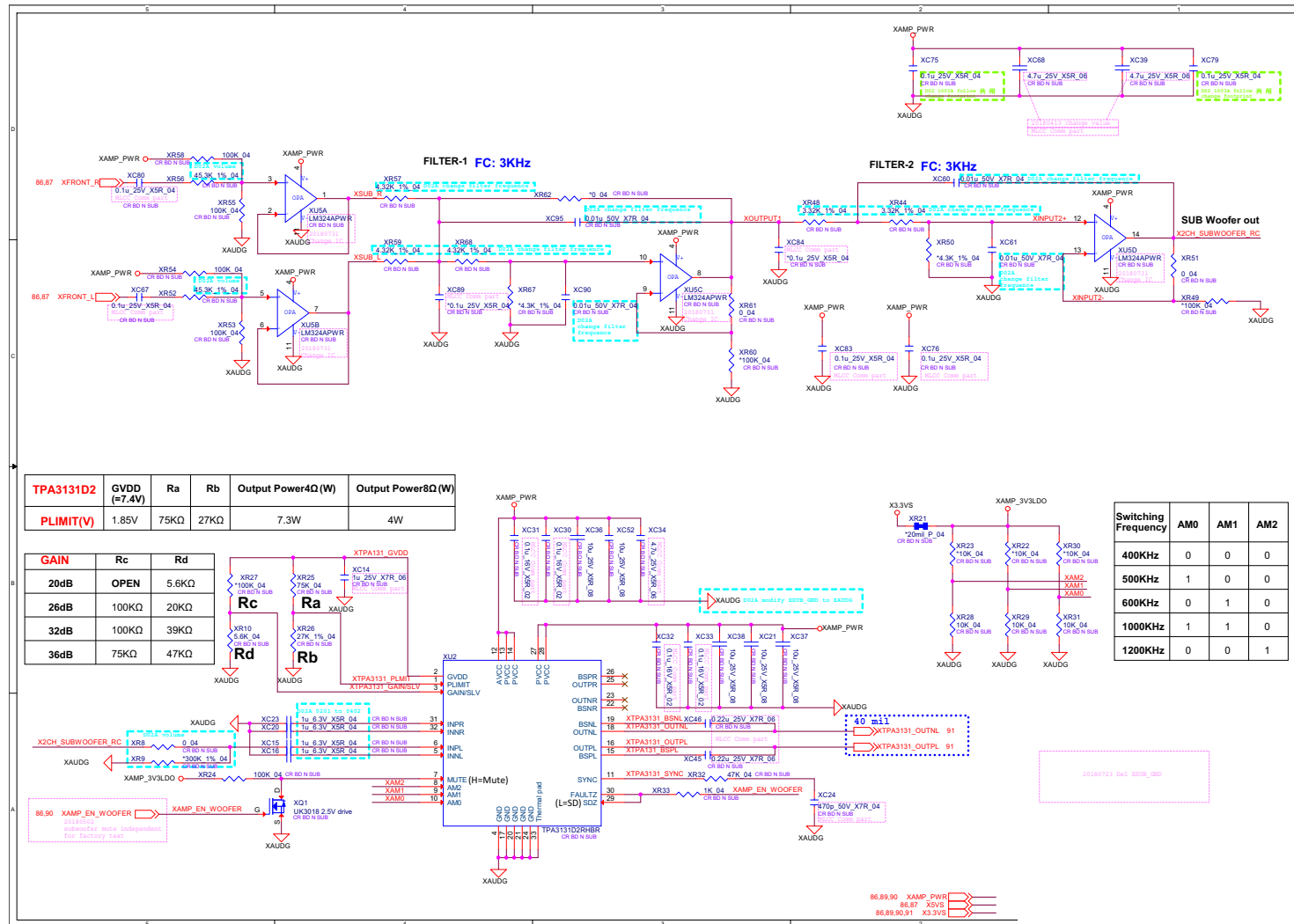


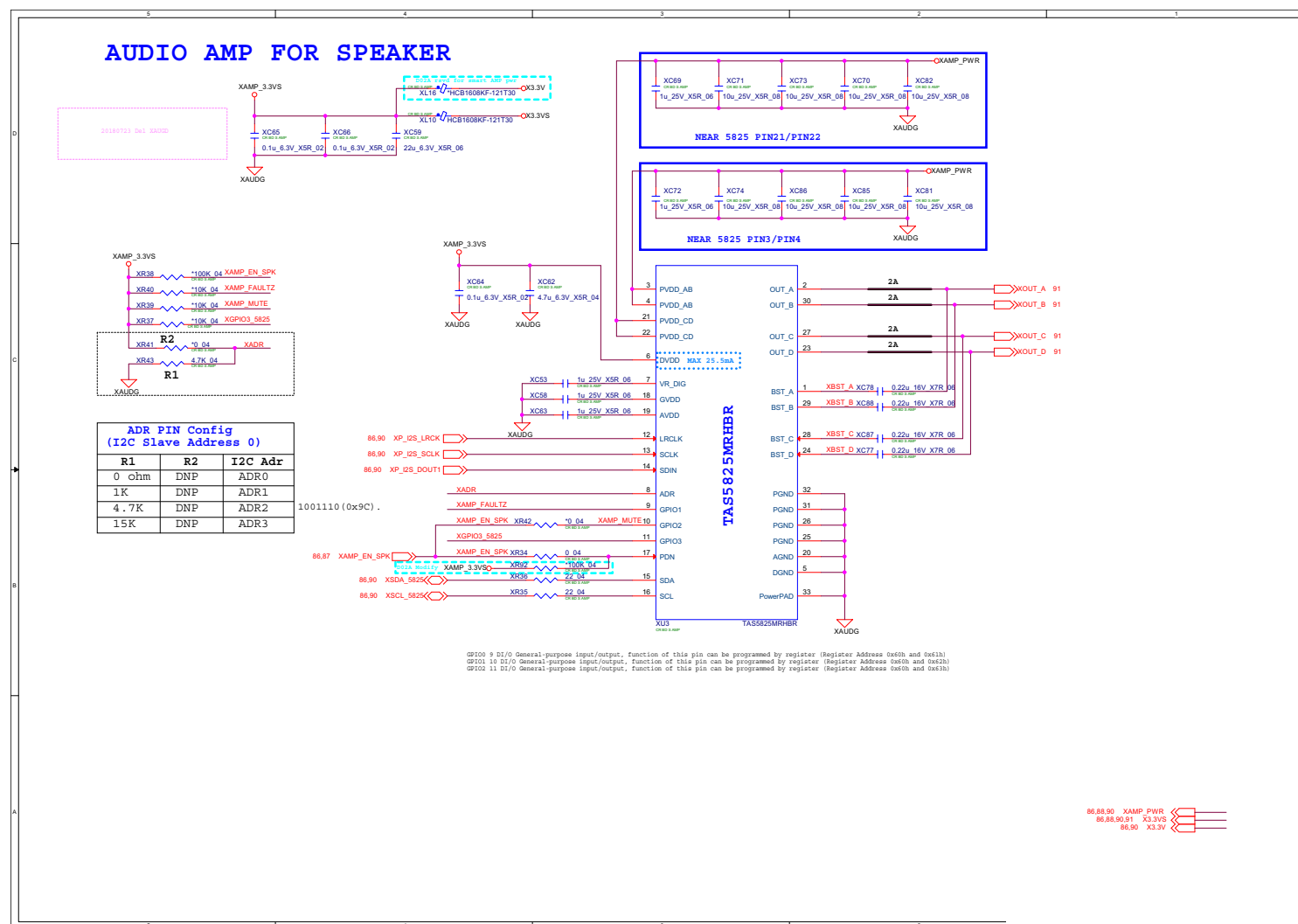
AMP TPA2008D2

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AMP TPA2008D2

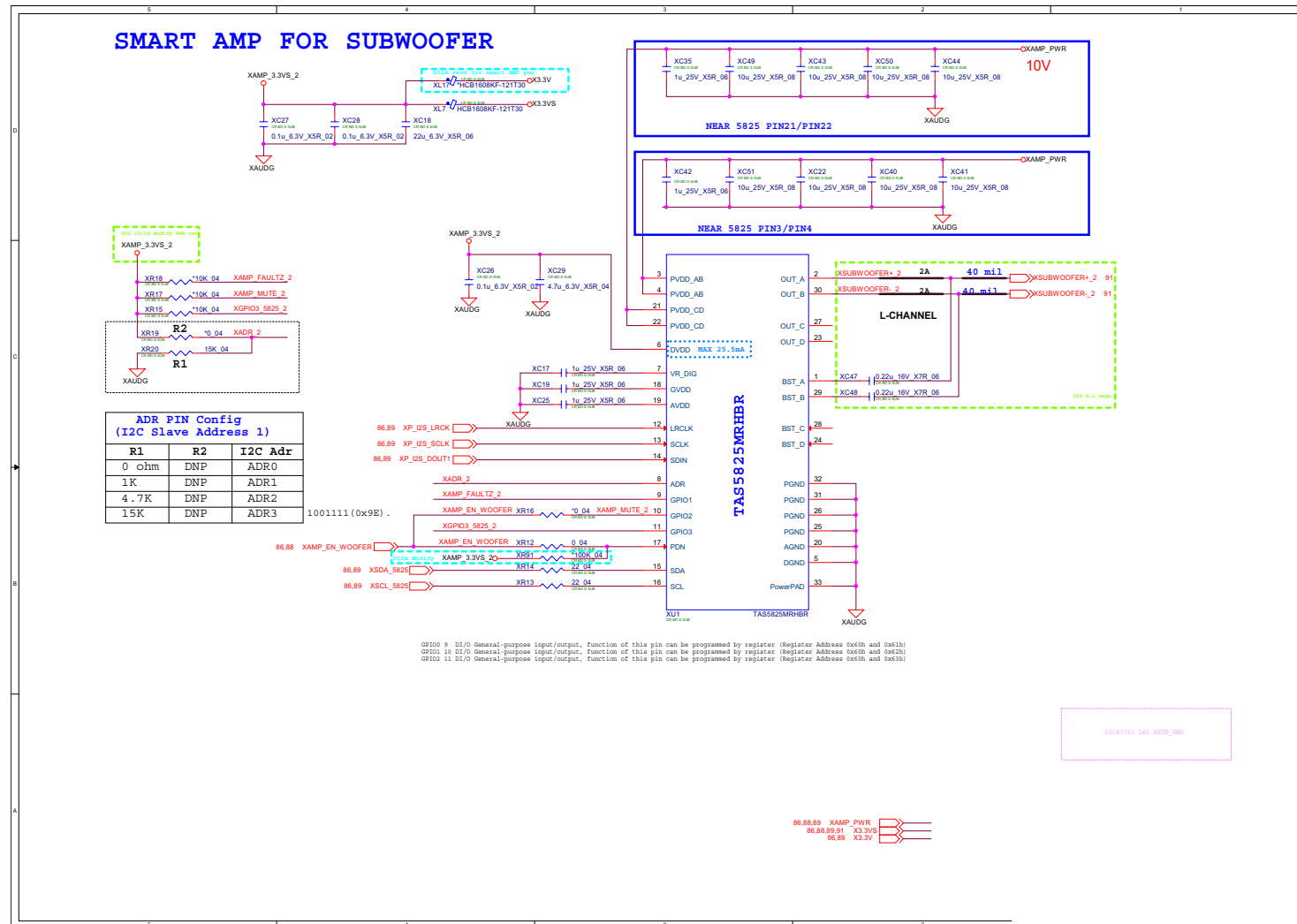


Subwoofer

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Subwoofer



Smart AMP for Subwoofer



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 Samrt AMP for
 Subwoofer

Speaker Con

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Speaker Con

