SERVICE MANUAL

PC70DS / PC70DR / PC70DP

notebook

Notebook Computer

PC70DS / PC70DR / PC70DP

Service Manual

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HDMI™
HIGH-DEFINITION MULTIMEDIA INTERFACE

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 ***PC70DS / PC70DR / PC70DP*** 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

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.

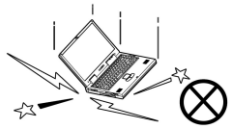
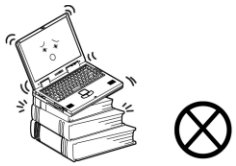
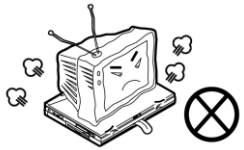
FCC Statement

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.

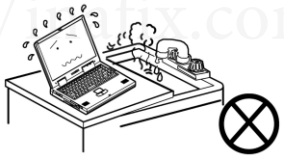
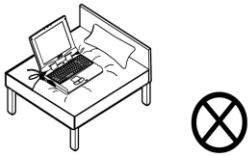
Instructions for Care and Operation

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

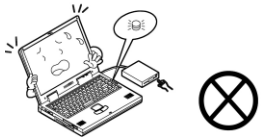
1. **Don't drop it, or expose it to shock.** If the computer falls, the case and the components could be damaged.

Do not expose the computer to any shock or vibration. 	*Do not place it on an unstable surface.* 	*Do not place anything heavy on the computer.* 

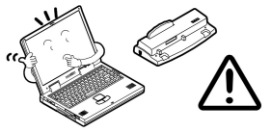
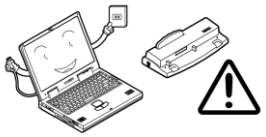
2. **Keep it dry, and don't overheat it.** Keep the computer and power supply away from any kind of heating element. This is an electrical appliance. If water or any other liquid gets into it, the computer could be badly damaged.

Do not expose it to excessive heat or direct sunlight. 	*Do not leave it in a place where foreign matter or moisture may affect the system.* 	*Don't use or store the computer in a humid environment.* 	*Do not place the computer on any surface which will block the vents.* 

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.

Do not turn off the power until you properly shut down all programs. 	*Do not turn off any peripheral devices when the computer is on.* 	*Do not disassemble the computer by yourself.* 	*Perform routine maintenance on your computer.* 

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**.

Use only approved brands of peripherals.	*Unplug the power cord before attaching peripheral devices.*
	

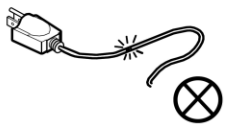
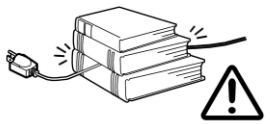
Power Safety

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.

Do not plug in the power cord if you are wet.	*Do not use the power cord if it is broken.*	*Do not place heavy objects on the power cord.*
		

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. 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".

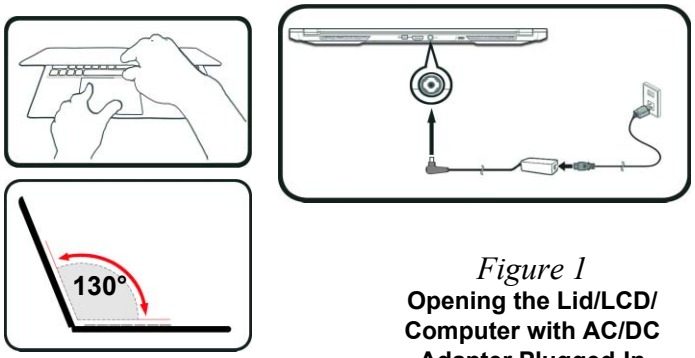
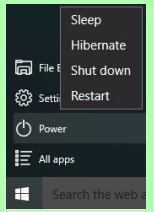


Figure 1
Opening the Lid/LCD/ Computer with AC/DC Adapter Plugged-In

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.



Contents

Chapter 1: Introduction

Overview

This manual covers the information you need to service or upgrade the ***PC70DS / PC70DR / PC70DP*** series notebook computer. Information about operating the computer (e.g. getting started, and the *Setup* utility) is in the *User's Manual*. Information about dri-vers (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 ***PC70DS / PC70DR / PC70DP*** 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.

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

i7-10870H (2.20GHz)

16MB Smart Cache, **14nm**, DDR4-2933MHz, TDP 45W

i7-10750H (2.60GHz)

12MB Smart Cache, **14nm**, DDR4-2933MHz, TDP 45W

Core Logic

Intel® HM470 Express Chipset

LCD Options

LCD, 17.3" (43.94cm), 16:9, FHD (1920x1080)/UHD (3840x2160)

BIOS

128Mb SPI Flash ROM

INSYDE BIOS

Memory

Dual Channel DDR4

Two 260 Pin SO-DIMM Sockets

Supporting up to **3200MHz DDR4** Memory

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

Compatible with 8GB, 16GB or 32GB Modules

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

Security

Security (Kensington® Type) Lock Slot

BIOS Password

Intel PTT for Systems Without TPM Hardware

Area Fingerprint Sensor

(**Factory Option**) TPM 2.0

Fingerprint Sensor

Video Adapter Options

Microsoft Hybrid Graphics Mode

Supports up to 4 Active Displays

Supports NVIDIA Surround View via HDMI x1, MiniDP x1 and TBT x1

Intel Integrated GPU

Intel® UHD Graphics 630

HDR Support

Rec. 2020

Microsoft DirectX®12 Compatible

NVIDIA® Discrete GPU

NVIDIA® GeForce GN20-E7 with Max-Q Design (PC70DS)

16GB GDDR6 Video RAM

Microsoft DirectX®12 Compatible

NVIDIA® GeForce GN20-E5 with Max-Q Design (PC70DR)

8GB GDDR6 Video RAM

Microsoft DirectX®12 Compatible

NVIDIA® GeForce GN20-E3 (PC70DP)

6GB GDDR6 Video RAM

Microsoft DirectX®12 Compatible

Pointing Device

Built-in Secure Pad (with Microsoft PTP Multi Gesture & Scrolling Functionality)

Keyboard

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

Or

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

Storage

(**Factory Option**) **One** M.2 2280 **SATA** Solid State Drive (SSD)

Or

(**Factory Option**) **Two** M.2 2280 **PCIe Gen3 x4** SSDs supporting RAID level 0/1

Audio

High Definition Audio Compliant Interface

S/PDIF Digital Output

Built-In Array Microphone

Two Speakers

Sound Blaster Atlas

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 9462 Wireless LAN (**802.11ac**) + Bluetooth

(**Factory Option**) Intel® Dual Band Wi-Fi 6 AX200 Wireless LAN (**802.11ax**) + Bluetooth

(**Factory Option**) Intel® Dual Band Wi-Fi 6 AX201 Wireless LAN (**802.11ax**) + Bluetooth

(**Factory Option**) Killer™ Dual Band Wi-Fi 6 AX1650i Wireless LAN (**802.11ax**) + Bluetooth

Card Reader

MicroSD Card Reader (up to UHS-II)

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 Thunderbolt 3 Port

Three USB 3.2 Gen 1 Type-A Ports (Including one AC/DC Powered USB Port)

One Mini DisplayPort 1.4

One HDMI-Out Port

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

One 2-In-1 Audio Jack (Headphones / Microphone)

One RJ-45 LAN Jack

One DC-In Jack

Features

Intel® Optane™ Technology

Virtual Reality Ready

Windows® Mixed Reality Compatible

Pantone Certificate*

NVIDIA G-SYNC Technology at Dynamic Display Switch mode*

**These features apply to some individual model designs within this series (check with your distributor/supplier for details).*

Windows® Mixed Reality Compatible

Environmental Spec

Temperature

Operating: 5°C - 35°C

Non-Operating: -20°C - 60°C

Relative Humidity

Operating: 20% - 80%

Non-Operating: 10% - 90%

Power

Embedded 3 Cell Polymer Battery Pack, 73WH

Full Range AC/DC Adapter

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

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

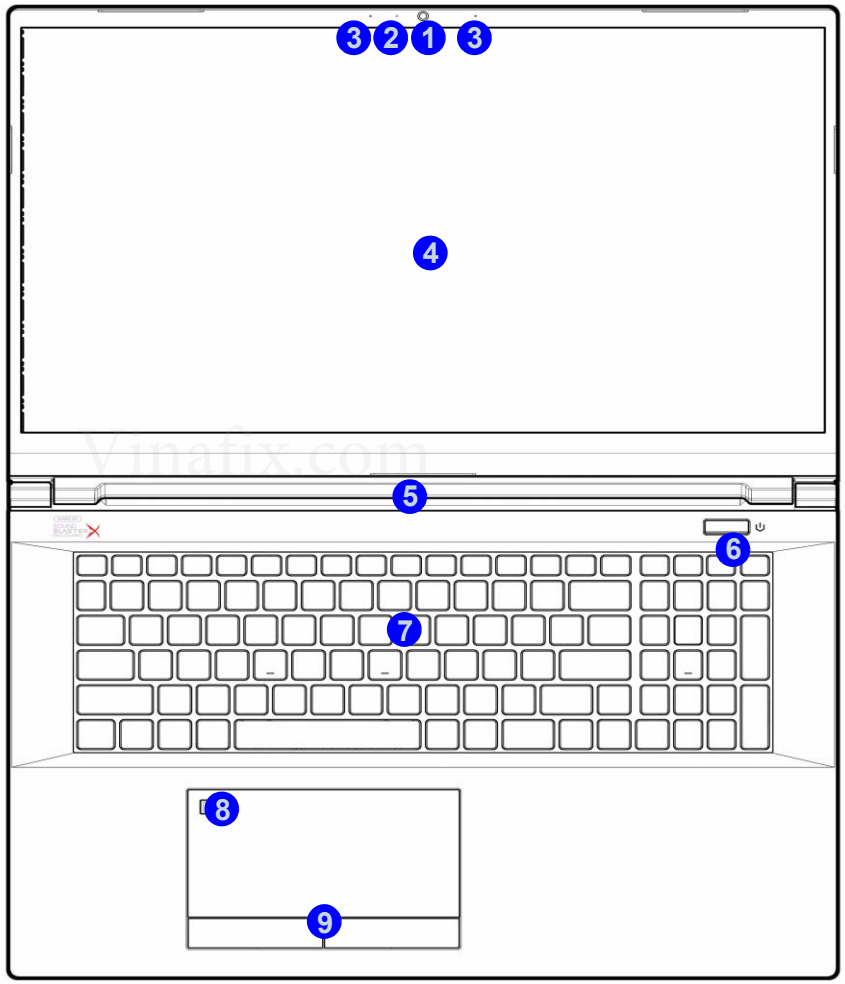
Dimensions & Weight

395.9mm (w) * 264.95mm (d) * 19.9mm (h)

2.3kg (Barebone with 73WH Battery)

External Locator - Top View with LCD Panel Open

Figure 1
Top View



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

External Locator - Front & Right Side Views

FRONT VIEW

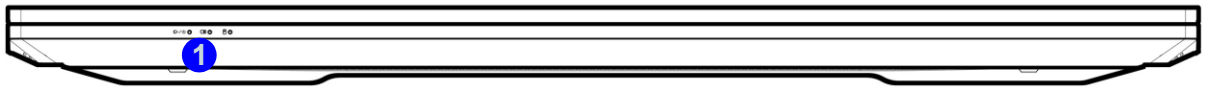


Figure 2
Front View

1. LED Indicators

RIGHT SIDE VIEW

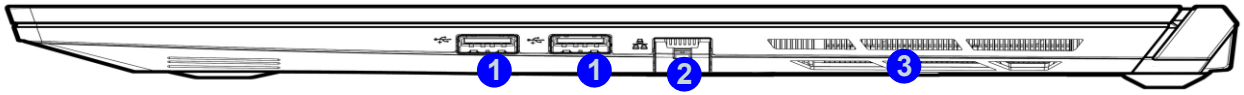


Figure 3
Right Side View

1. USB 3.2 Gen 1 Type-A Port
2. RJ-45 LAN Jack
3. Vent

External Locator - Left Side & Rear View

Figure 4
Left Side View

1. Security Lock Slot
2. Vent
3. MicroSD Card Reader
4. *Powered USB 3.2 Gen 1 Type-A Port
5. 2-In-1 Audio Jack (Headphone and Microphone)
6. 2-In-1 Audio Jack (Microphone and S/PDIF Optical)

LEFT SIDE VIEW

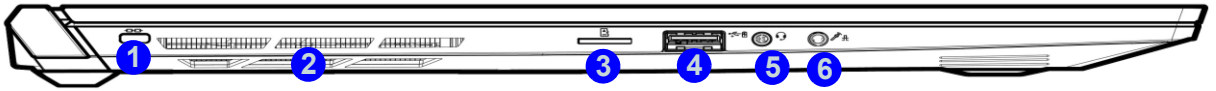
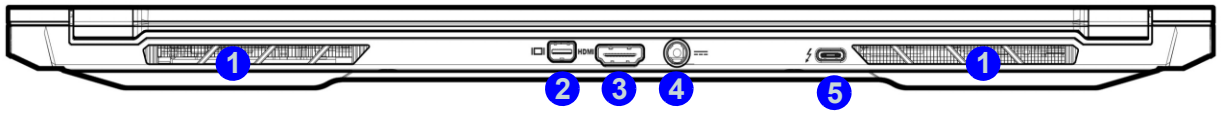


Figure 5
Rear View

1. Vent
2. Mini DisplayPort 1.4
3. HDMI-Out Port
4. DC-In Jack
5. Thunderbolt 3 Port

REAR VIEW



External Locator - Bottom View

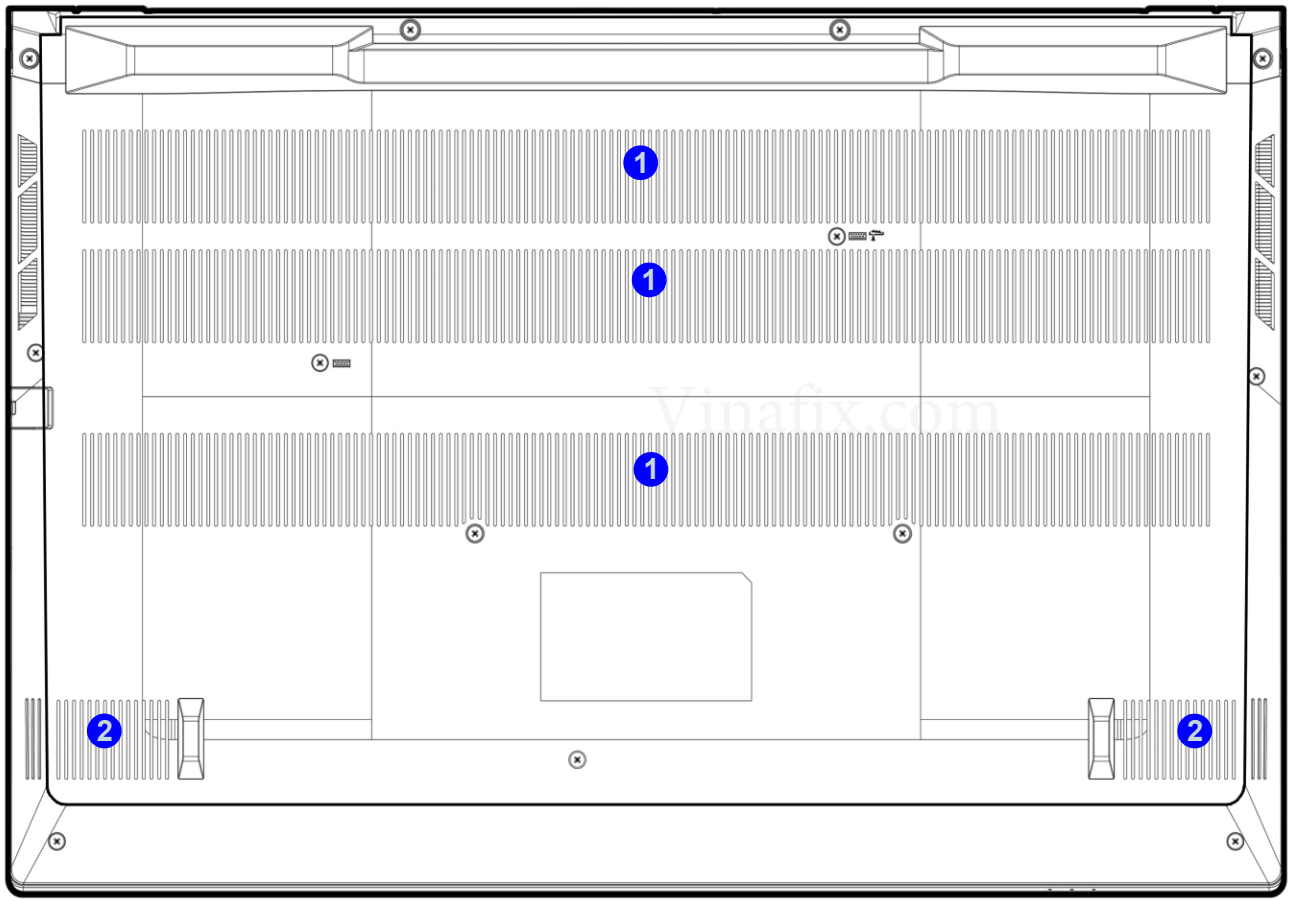


Figure 6
Bottom View

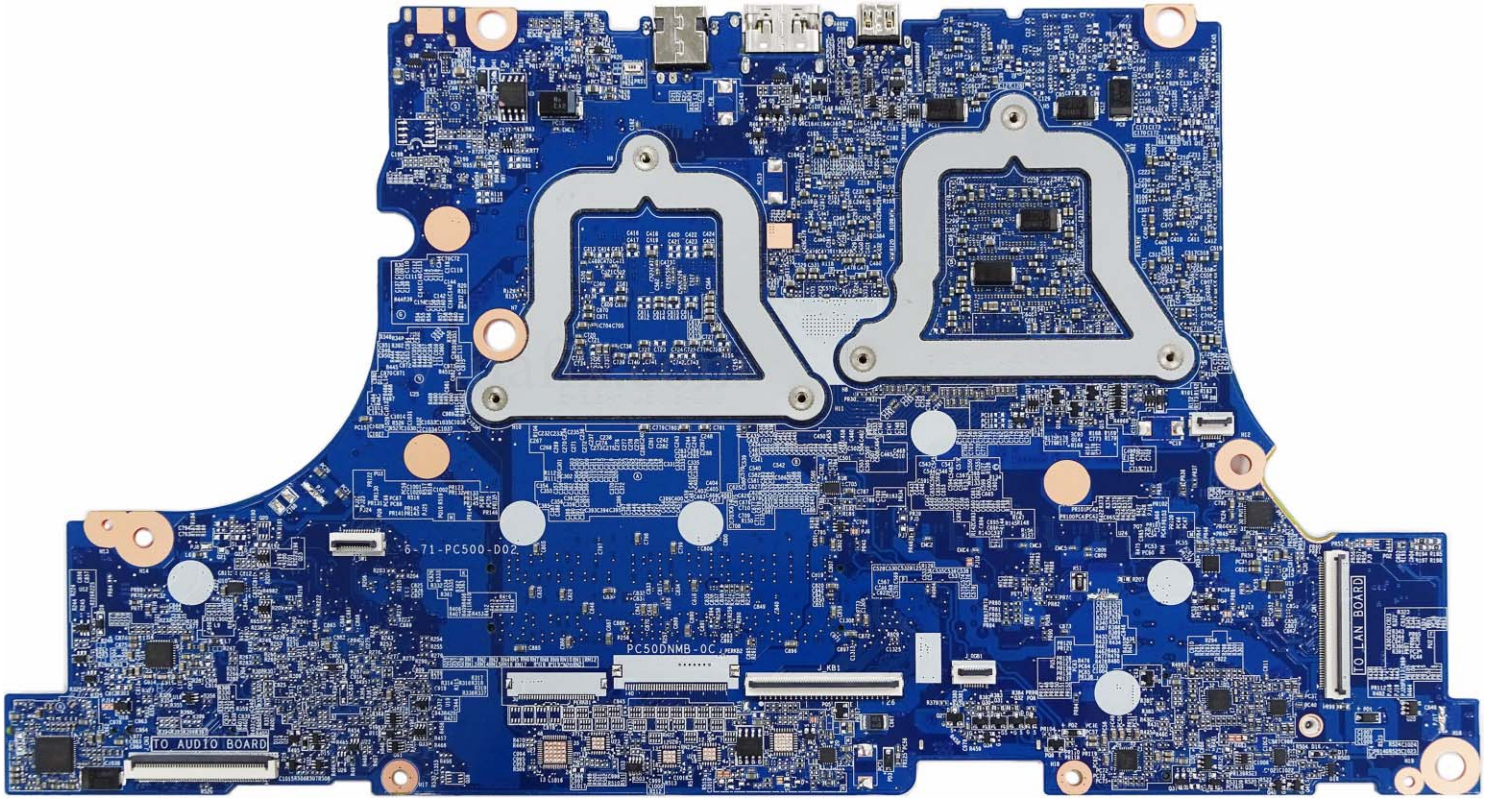
1. Vent
2. Speakers

Overheating

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

Mainboard Overview - Top (Key Parts)

Figure 7
Mainboard Top Key Parts



Mainboard Overview - Bottom (Key Parts)

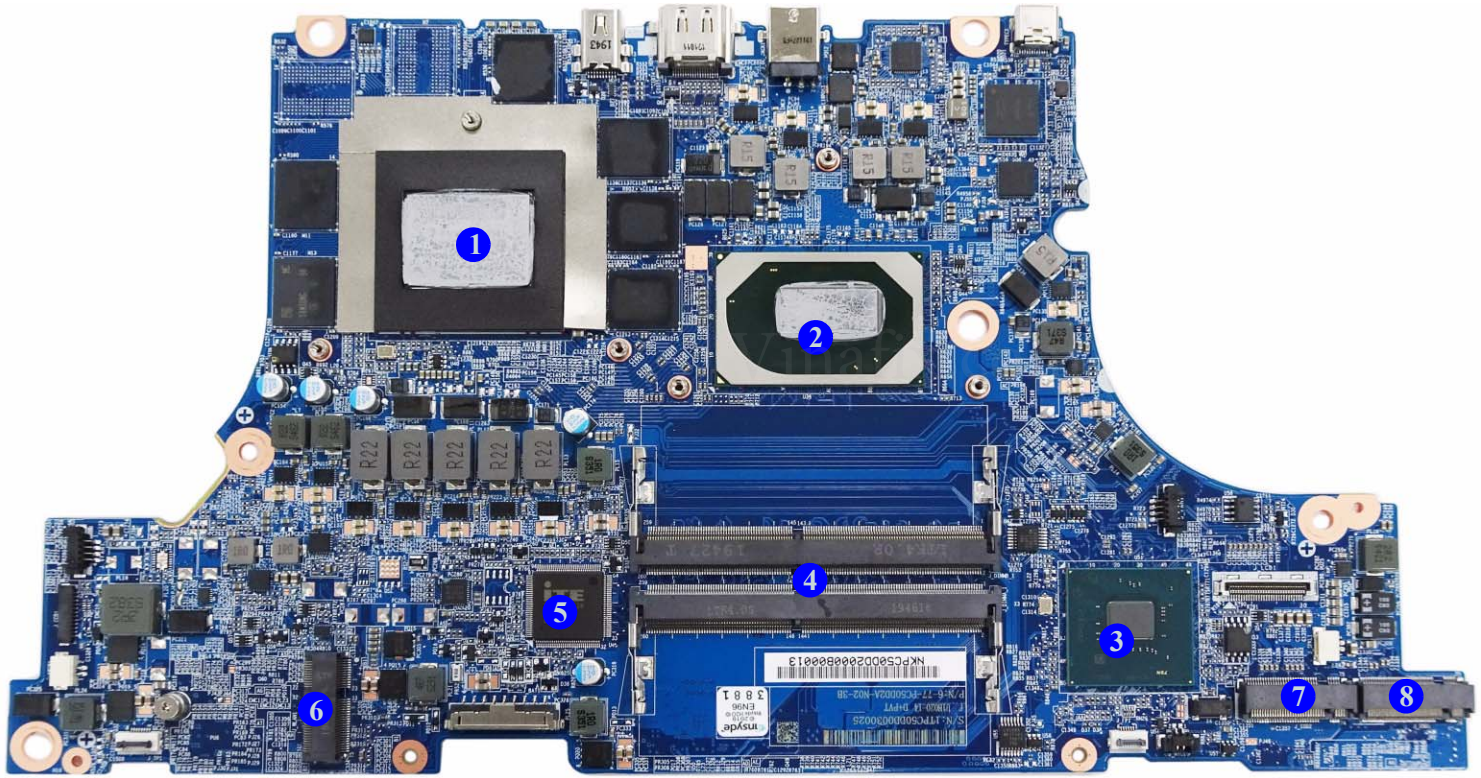


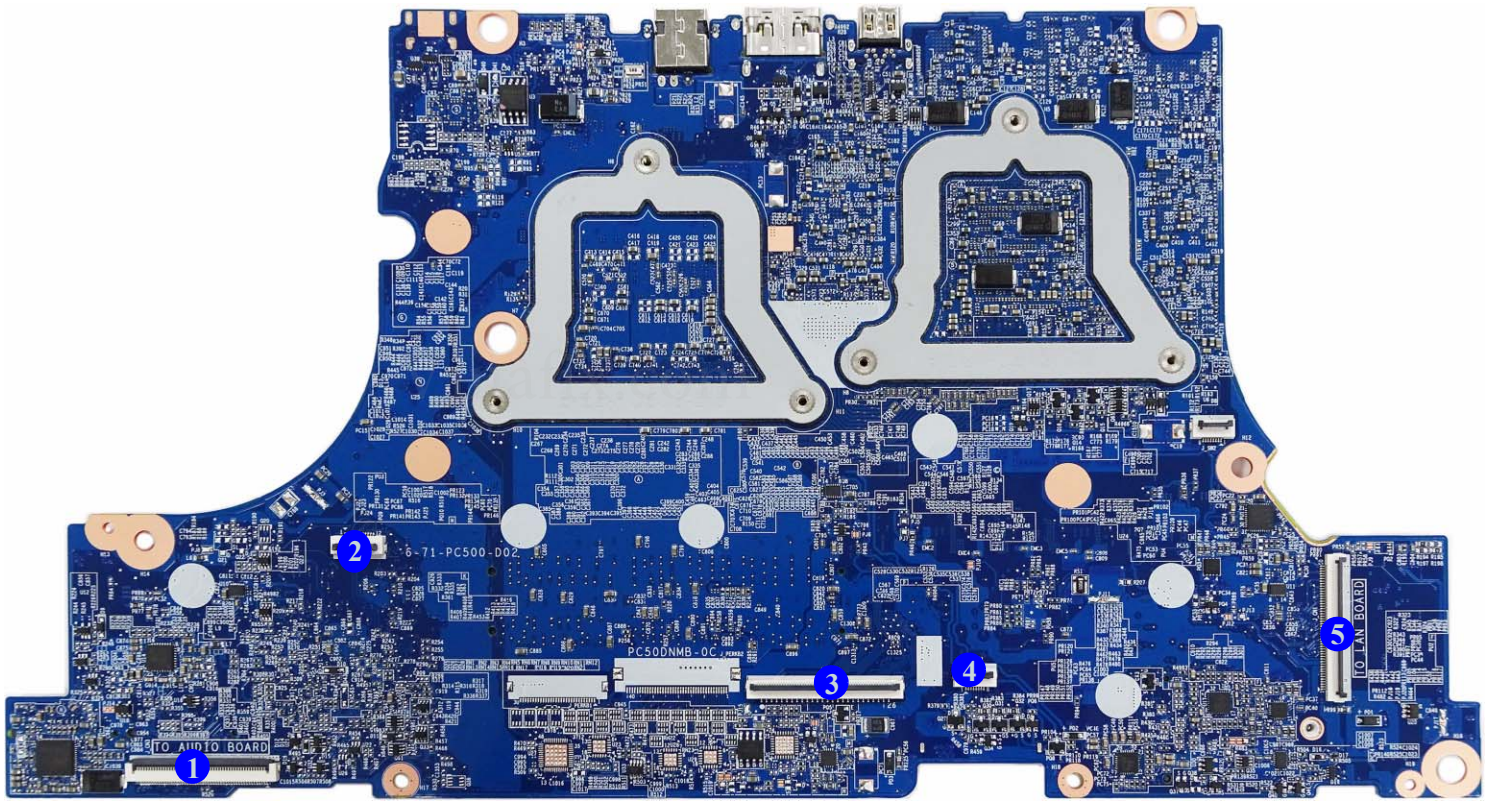
Figure 8
Mainboard Bottom Key Parts

1. GPU
2. CPU
3. PCH
4. Memory Slots DDR4 SO-DIMM
5. KBC-ITE IT5570
6. Mini-Card Connector (WLAN Module)
7. Mini-Card Connector (M.2 PCIE/Optane SSD Module)
8. Mini-Card Connector (M.2 PCIE/SATA SSD Module)

Mainboard Overview - Top (Connectors)

Figure 9
Mainboard Top Connectors

1. Audio Board Connector
2. LED Board Connector
3. Keyboard Cable Connector
4. Keyboard LED Connector
5. LAN Board Connector



Mainboard Overview - Bottom (Connectors)

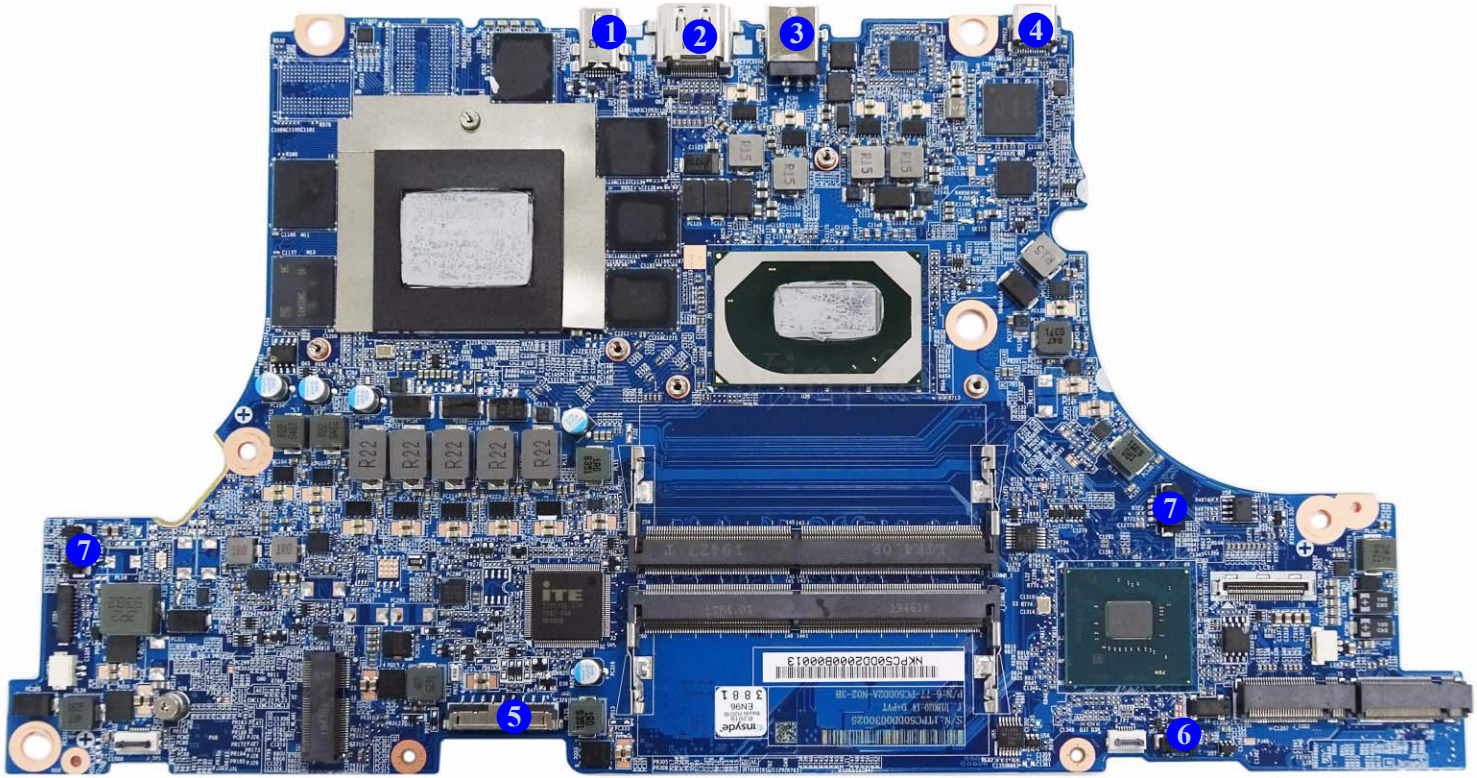


Figure 10
Mainboard Bottom Connectors

1. Mini DisplayPort 1.4
2. HDMI-Out Port
3. DC-In Jack
4. Thunderbolt 3 Port
5. Battery Cable Connector
6. RTC Battery Connector
7. Fan Connector

Chapter 2: Disassembly

Disassembly

Note that for the disassembly of any key parts, **the bottom case must be properly closed before opening the upper part of the LCD** to avoid any damage caused by the nature of the structure.

Overview

This chapter provides step-by-step instructions for disassembling the ***PC70DS / PC70DR / PC70DP*** 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.

Information

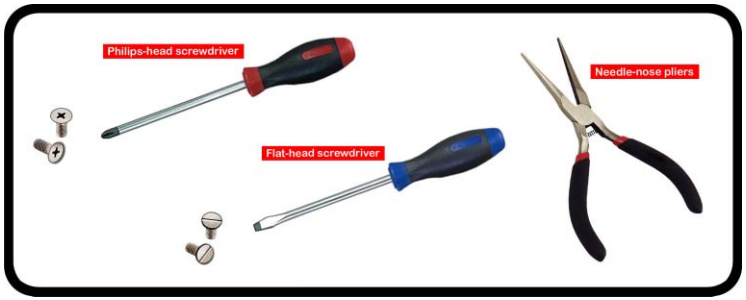
Warning

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.

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.

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.

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 Battery:

1. Remove the battery *page 2 - 5*

To remove the Keyboard:

1. Remove the battery *page 2 - 5*
2. Remove the keyboard *page 2 - 7*

To remove the System Memory:

1. Remove the battery *page 2 - 5*
2. Remove the keyboard *page 2 - 7*
3. Remove the system memory *page 2 - 8*

To remove and install the M.2 SSD:

1. Remove the battery *page 2 - 5*
2. Remove the keyboard *page 2 - 7*
3. Remove the M.2 SSD *page 2 - 9*

To remove the Wireless LAN Module:

1. Remove the battery *page 2 - 5*
2. Remove the keyboard *page 2 - 7*
3. Remove the WLAN *page 2 - 11*

To remove the Hinge Cover:

1. Remove the battery *page 2 - 5*
2. Remove the hinge cover *page 2 - 13*

To remove the CCD Module:

1. Remove the battery *page 2 - 5*
2. Remove the CCD module *page 2 - 14*

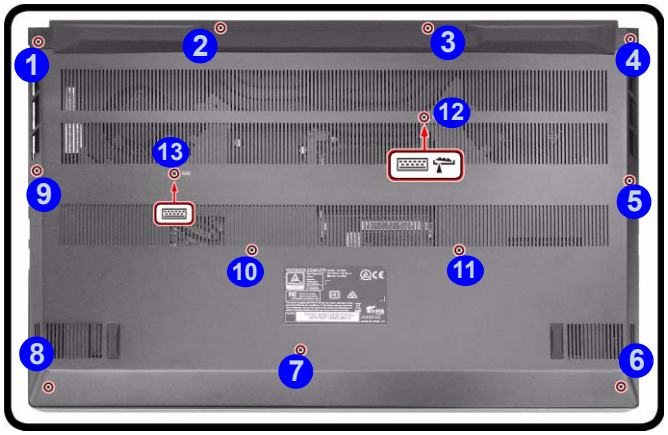
Removing the Battery

1. Turn **off** the computer, turn it over.
2. Remove screws 1 - 13 (*Figure 1a*).
3. Carefully lift the bottom case 14 up in the direction of the arrow at point 15 - 17 (*Figure 1b*). **Note: Do not press any of the hinge covers when or after removing the bottom case 14 .**
4. The battery will be visible at point 18 on the computer (*Figure 1c*).

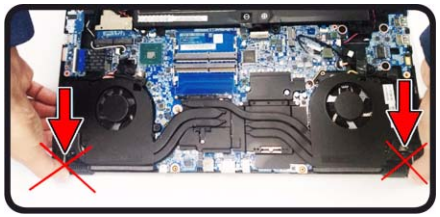
Figure 1
Battery Removal

a. Remove the screws.
b. Lift the bottom case.
c. Locate the battery.

a.



c.



b.

14. Bottom Case

- 13 Screws

Figure 2
Battery Removal

d. Disconnect the cable and remove the screws.
e. Lift the battery off the computer.

5. Carefully disconnect the cable 19, then remove screws 20 - 21 (***Figure 2d***). Note: make sure that SSD-2 (***page 2 - 10***) is not installed before removing screw 21.
6. Lift the battery 22 off the computer (***Figure 2e***).
7. Reverse the process to install a new battery (do not forget to replace all the screws and bottom cover).

d.

e.

22. Battery

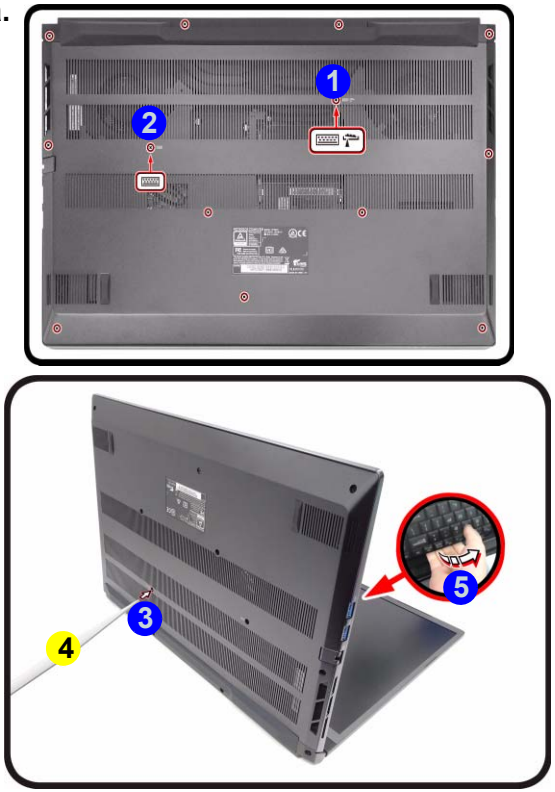
- 2 Screws

Removing the Keyboard

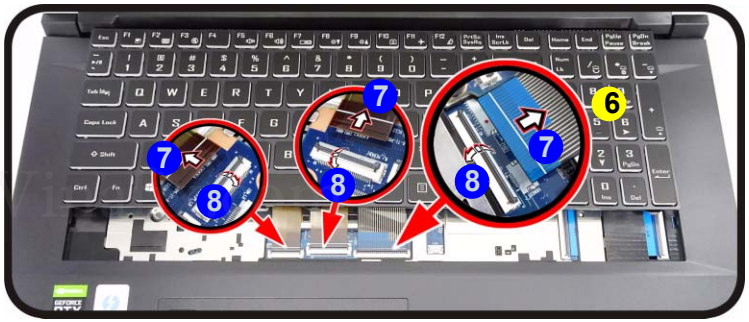
Keyboard Removal Procedure

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 3a***).
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 3b***).
5. Carefully lift the keyboard 6 off the computer (***Figure 3c***).

a.



b.



c.

Figure 3
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

Figure 4
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

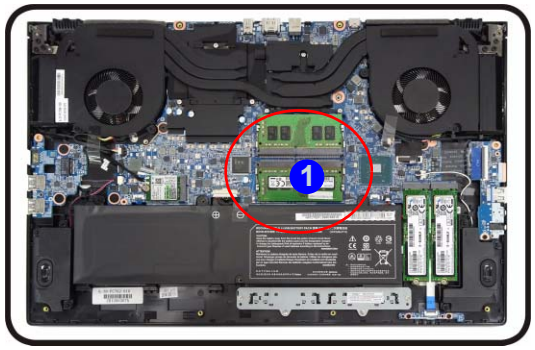
Removing the System Memory (RAM)

The computer has four memory sockets for 260 pin Small Outline Dual In-line Memory Modules (SO-DIMM) supporting DDR4 Up to 3200 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.

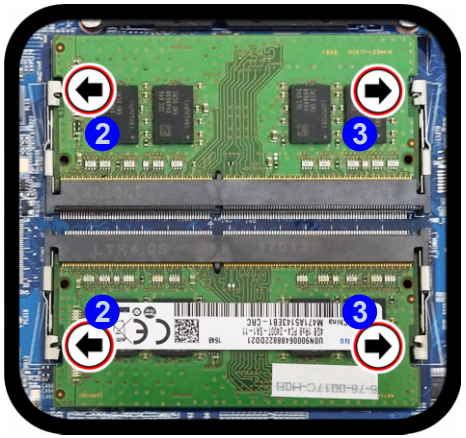
Memory Upgrade Process

1. Turn **off** the computer, remove the battery (***page 2 - 5***), and keyboard (***page 2 - 7***).
2. The RAM-2 modules will be visible at point 1 on the mainboard (***Figure 4a***).
3. Gently pull the two release latches (2 & 3) on the sides of the memory socket in the direction indicated by the arrows (***Figure 4b***). The RAM module 4 will pop-up (***Figure 4c***), 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.

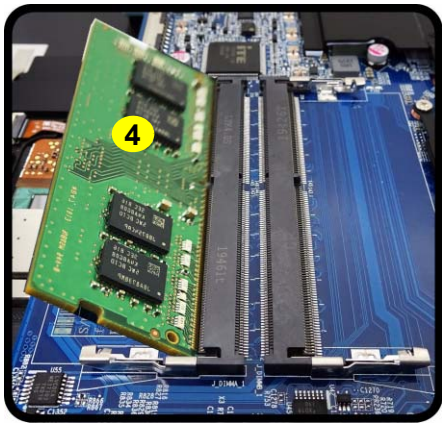
a.



b.



c.



Removing the M.2 SSD Module

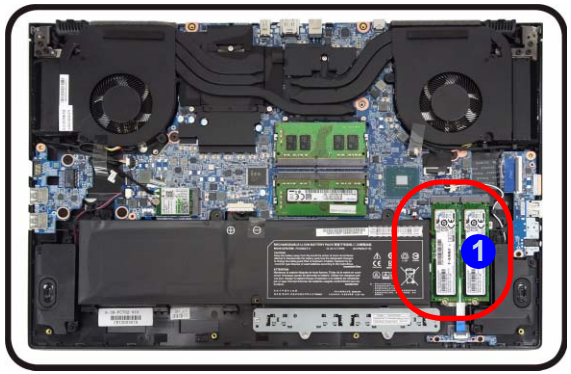
M.2 SSD-1 Removal Procedure

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

Figure 5
M.2 SSD-1 Module Removal

a. Locate the M.2 SSD.
b. Remove the screw.
c. The M.2 SSD module will pop up.

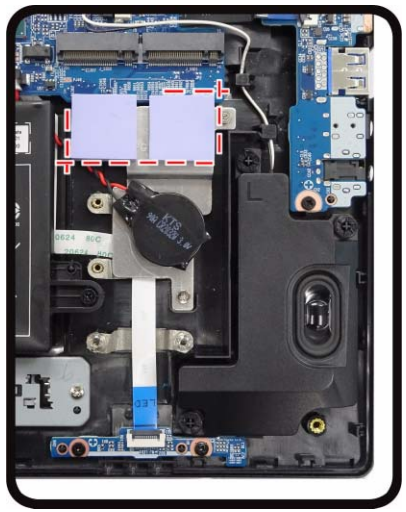
a.



b.

c.

SATA/PCIE SSD



3.M2 SSD Module

- 1 Screw

Figure 6
M.2 SSD-2 Module Removal

a. Locate the M.2 SSD.
b. Remove the screw.
c. The M.2 SSD module will pop up.

M.2 SSD-2 Removal Procedure

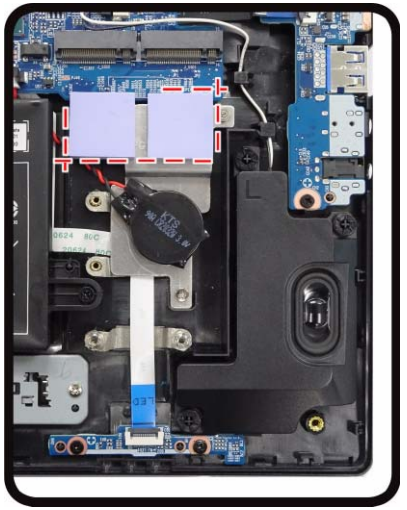
1. Turn **off** the computer, remove the battery (***page 2 - 5***), and keyboard (***page 2 - 7***).
2. The M.2 SSD module will be visible at point 1 on the mainboard (***Figure 6a***).
3. Remove the screw 2 (***Figure 6b***).
4. The M.2 SSD module 3 (***Figure 6c***) will pop-up, and you can remove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

a.

b.

c.

PCIE SSD



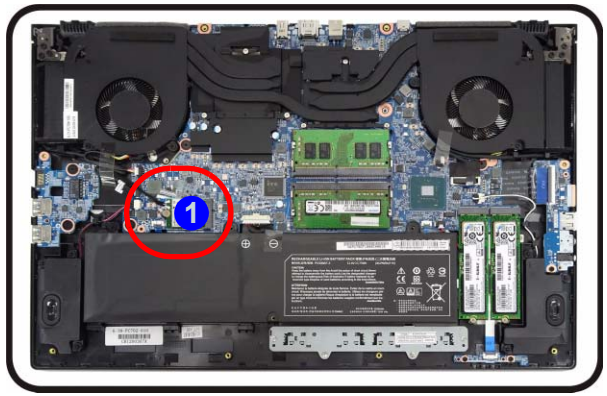
3.M2 SSD Module

- 1 Screw

Removing the Wireless LAN Module

1. Turn **off** the computer, remove the battery (*page 2 - 5*), and keyboard (*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.

a.



b.

c.

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 Hinge Cover

1. Turn **off** the computer, remove the battery (*page 2 - 5*).
2. The hinge cover will be visible at point 1.
3. Remove the screw 2 (*Figure 8a*).
4. Slide the hinge cover 3 out to a short distance 4 (*Figure 8b*).
5. Carefully lift the hinge cover upward 5 by 10-20 degrees as shown (*Figure 8c*) to remove it from the computer.

Figure 8
Hinge Cover Removal

a. Remove the screw.
b. Slide the hinge cover out.
c. Carefully lift the hinge cover upward as shown.

3.Hinge Cover

- 1 Screw

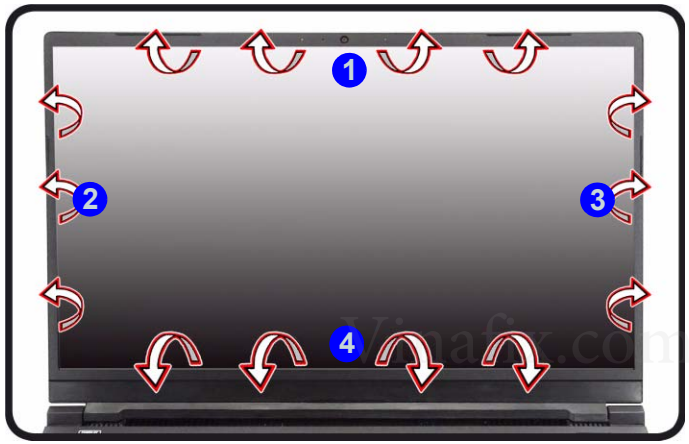
Figure 9
CCD Removal

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

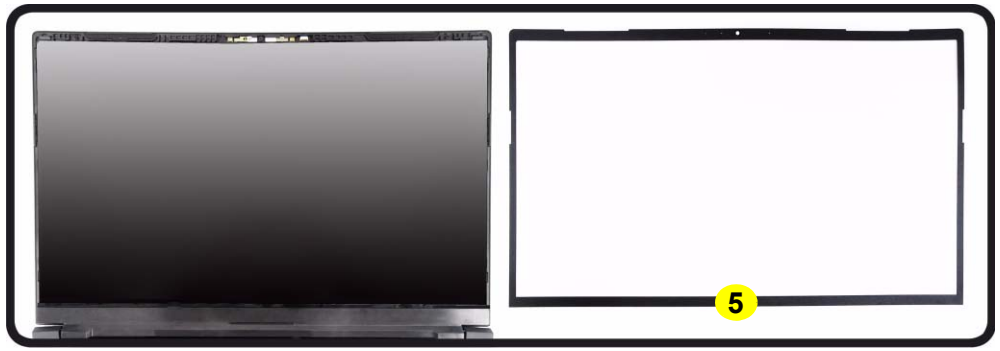
Removing the CCD

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 mylar to lift at points 1 - 4 as indicated by the arrows (*Figure 9a*).
4. Remove the LCD front cover 5 (*Figure 9b*).

a.



b.



5. LCD Mylar Cover

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 10c***).
6. Remove the CCD module 8 (***Figure 10d***).
7. Reverse the process to install a new CCD module.

c.

d.

Figure 10
CCD Removal (cont'd)

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

8. CCD Module

Appendix A: Part Lists

This appendix breaks down the ***PC70DS / PC70DR / PC70DP*** 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.

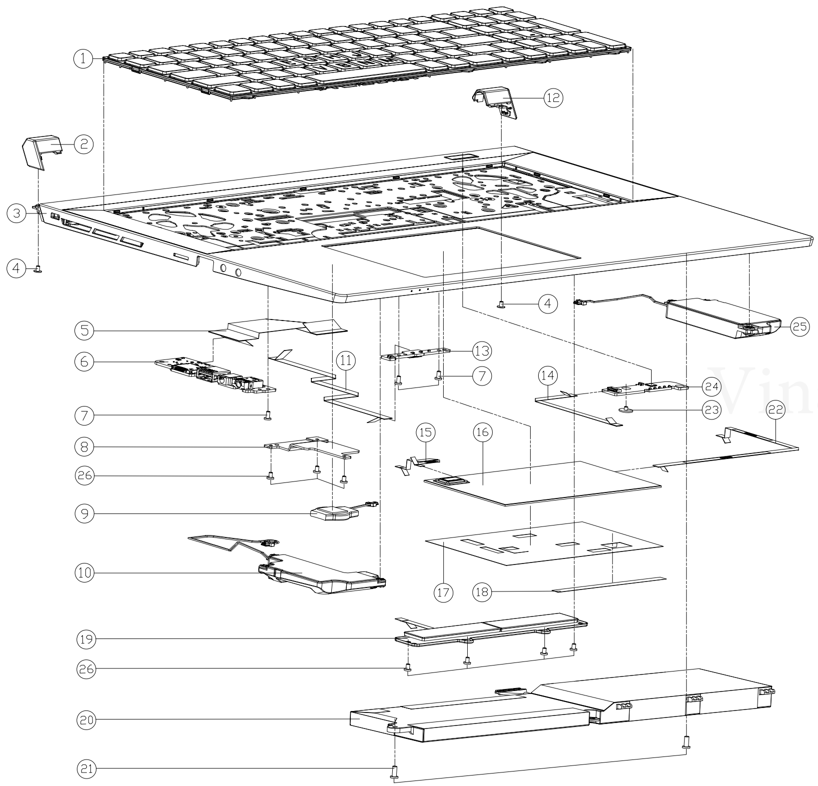
Part List Illustration Location

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

Table A - 1
Part List Illustration Location

Part	
Top	*page A - 3*
Bottom	*page A - 4*
Main Board	*page A - 5*
LCD	*page A - 6*

Top

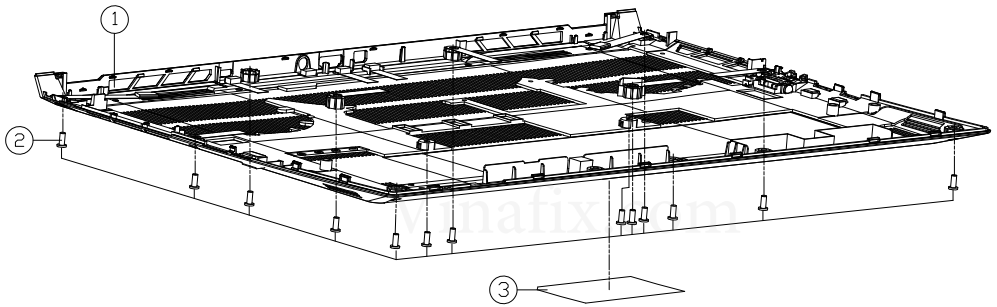


ITEM	PART NAME	PART NO	REMARK
1	KB FOR LED PER KEY KB US SERIES PC50DN2	6-PC50DN2-KB-LPK-US	
1	KB FOR MULTI 15C BL KB US SERIES PC50DN2	6-PC50DN2-KB-MCL-US	
1	MCJ (OPTION) BOM PC70DS	6-PC70DS-CUSTOM-MCJ	
2	TOP CASE HINGE CAP L MODULE PC70DN2 (MP)	6-42-PC702-202	
3	TOP CASE MODULE(BLASTERX) (KAPOK) PC70DN2	6-39-PC702-013-B	
4	SCREW M2*3L KI NI ICT NY (OD=Ø4.0,DT=0.8)	6-35-B1120-3RD	
5	FFC CABLE AUDIO TO MB L=92MM 50V 50PIN (QX) PC70DN2	6-43-PC700-042-1	
6	AUDIO BOARD V2.0 PC50DS	6-77-PC5D8-D02	
7	.SCREW M2*4L KI BZ ICT NY	6-35-B6120-4RA	
8	M2 THERMAL BKT AL5052 PC70DN2	6-33-PC702-052	
9	BAT. 20MM 3V 220MAH W/CABLE 55MM BCR2032H5.5VM1UB (SHIHNO)	6-23-22015-TE0	
10	SPEAKER+CABLE L 95MM 2W 4? 2P 640301 (FOSTER) (ADD NUMBER LABE) PC70DN2	6-23-5PC70-0L2	
11	FFC CABLE LED TO MB L=192MM 50V 12PIN (QX) PC70DN2	6-43-PC700-052-1	
12	TOP CASE HINGE CAP R MODULE PC70DN2 (MP)	6-42-PC702-102	
13	LED BOARD V1.0 PC70DS	6-77-PC7D4-D01	
14	FFC CABLE POWER TO MB L=102MM 50V 8PIN (QX) PC70DN2	6-43-PC700-062-1	
15	FFC CABLE FINGER TO MB L=58MM 50V 6PIN (QX) PC70DN2	6-43-PC700-032-1	
16	SECURE PAD SYNAPTICS TM-P3621-001 I2C+PS2 (130*67MM) (FW:3174198)	6-49-X17S3-011-G	
17	TP MYLAR PET FOR PC70DN2	6-40-PC702-022	
18	CONDUCTIVE CLOTH 90*5*0.1 PC70DN2	6-47-PC702-030	
19	FUNCTION KEY FOR CLICK BUTTON MODULE W/O FINGER ADD PAINT PC70DN2	6-23-KPC70-010	
20	BAT.P S LI 11.4V/6.405AH/73WH PSE 3S1P GETAC/HIGH POWER (POLYMER)541391410001(6220MAH)	6-87-PC50S-72A03	
21	.SCREW M2.5*6L K BZ ICT NY	6-35-82125-6RA	
22	FFC CABLE CLICK TO MB L=190MM 50V 8PIN (QX) PC70DN2	6-43-PC700-012-1	
23	SCREW M2*2L KI BK/Z ICT NY(Ø8,T=0.6)	6-35-B6120-2RE	
24	POWER BOARD V1.0 PC70DS	6-77-PC7DC-D01	
25	SPEAKER+CABLE R 67MM 2W 4? 2P 640509 (FOSTER)(ADD NUMBER LABE) PC70DN2	6-23-5PC70-0R2	
26	.SCREW M2*2.5L KI NI ICT NY (Ø4 T=0.5 1#)	6-35-B1120-2R6	

Figure A - 1
Top

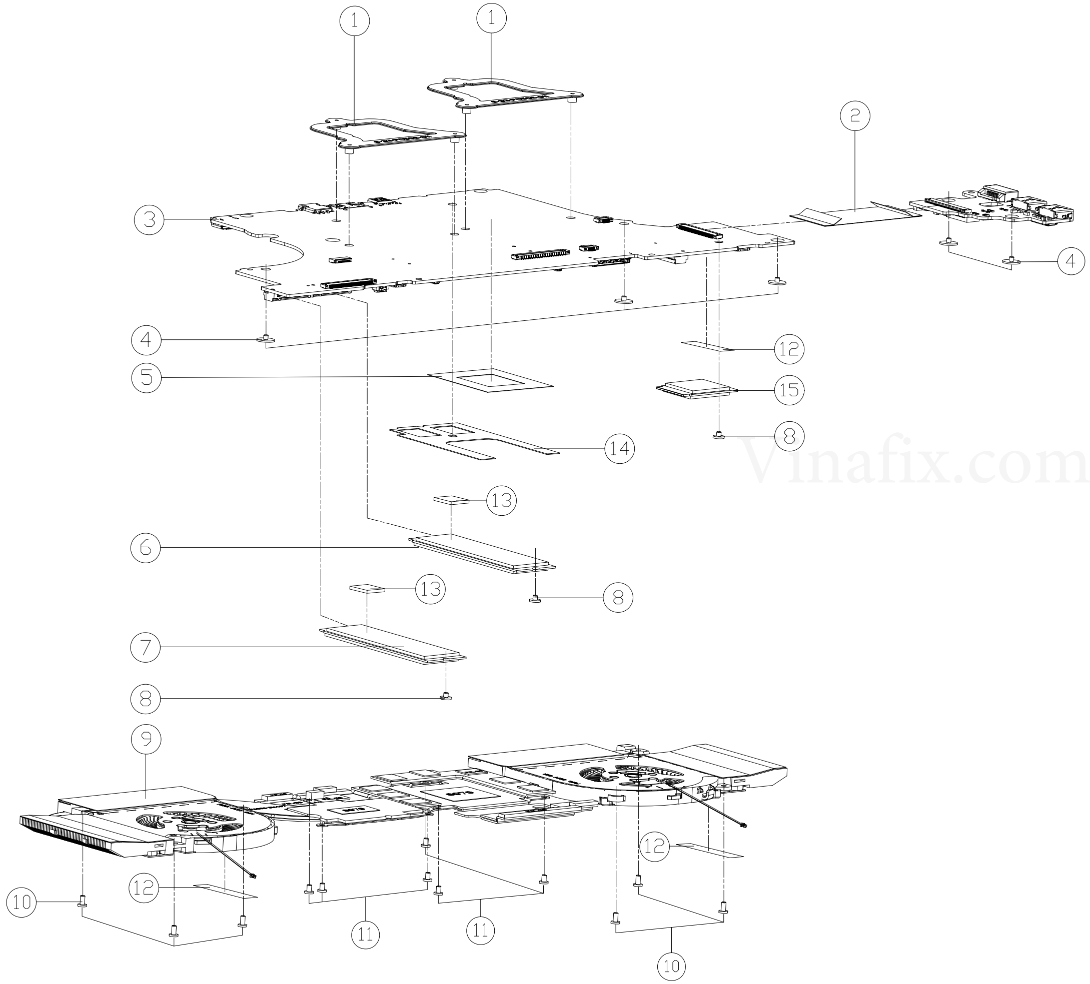
Bottom

Figure A - 2
Bottom



ITEM	PART NAME	PART NO	REMARK
1	BOTTOM CASE MODULE PC70DN2	6-39-PC703-012	
2	SCREW M2.5*6L K BZ ICT NY	6-35-82125-6RA	
3	PRODUCT LABEL FOR PC70DN2	6-45-PC70DN23-010	
3	PRODUCT LABEL FOR PC70DD2	6-45-PC70DD23-010	
3	PRODUCT LABEL FOR PC70DF1	6-45-PC70DF13-010	
3	PRODUCT LABEL FOR PC70DN2	6-45-PC70DC03-010	
3	PRODUCT LABEL FOR PC70DS	6-45-PC70DS03-010	
3	PRODUCT LABEL FOR PC70DP	6-45-PC70DP03-010	
3	PRODUCT LABEL FOR PC70DR	6-45-PC70DR03-010	
3	PRODUCT LABEL FOR PC70DP-D	6-45-PC70DPD3-010	
3	PRODUCT LABEL FOR PC70DS-D	6-45-PC70DSD3-010	
3	PRODUCT LABEL FOR PC70DR-D	6-45-PC70DRD3-010	

Main Board



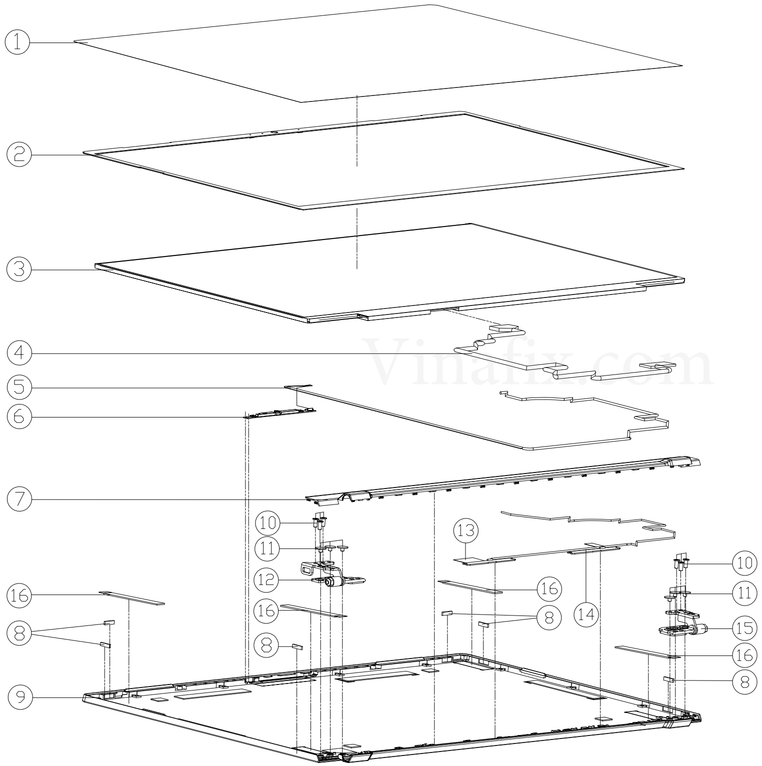
ITEM	PART NAME	PART NO	REMARK
1	CPU SUPPORT PC50DN2	6-33-PC50S-011	
2	FFC CABLE USB TO MB L=55MM 50V 50PIN (QX) PC70DN2	6-43-PC700-022-1	
3	MAIN BOARD(CPU/I7-10750H/2.6G) V2.0 (EDP)(MULTI 15C BL KB ? LED PER KEY KB)(W/TPM) +LAN BOARD V1.0 PC70DS	6-77-PC70DS0A-N02-4C	
3	MAIN BOARD(CPU/I7-10870H/2.2G) V2.0 (EDP)(LED PER KEY KB)(W/TPM) +LAN BOARD V1.0 PC70DS	6-77-PC70DS0A-N02-B	
3	MAIN BOARD(CPU/I7-10870H/2.2G) V2.0 (EDP)(LED PER KEY KB)(W/TPM) +LAN BOARD V1.0 PC70DR	6-77-PC70DR0A-N02-B	
3	MAIN BOARD(CPU/I7-10870H/2.2G) V2.0 (EDP)(MULTI 15C BL KB)(W/O TPM) +LAN BOARD V1.0 PC70DP	6-77-PC70DP0A-N02-3B	
3	MAIN BOARD(CPU/I7-10750H/2.6G) V2.0 (EDP)(MULTI 15C BL KB)(W/O TPM) +LAN BOARD V1.0 PC70DP	6-77-PC70DP0A-N02-3C	
4	SCREW M2*2L KI BK/Z ICT NY(Ø8,T=0.6)	6-35-B6120-2RE	
5	GN20 MYLAR E5-E7 PC50DS	6-40-X17K0-010	FOR PC70DS/DR/-D
5	GN20 MYLAR E3 PC50DS	6-40-X17K0-020	FOR PC70DP/DP-D
6	SSD M2 2280 1TB SAMSUNG MZVLB1T0HBLR-00000 (PM981A) PCIE G3*4 3D TLC 96 LAYERS	6-85-D511T-S04	OPTION
6	SSD M2 2280 1TB SAMSUNG MZVLQ1T0HALB-00000 (PM991) PCIE G3*4 3D TLC 96 LAYERS	6-85-D511T-S05	OPTION
6	SSD M2 2280 1TB WD SDBPNTY-1T00 (SN730) PCIE G3*4 3D TLC 96 LAYERS	6-85-D511T-W01	OPTION
6	SSD M2 2280 512GB SAMSUNG MZVLB512HBJQ-00000 (PM981A) PCIE G3*4 3D TLC 96 LAYERS	6-85-D515B-S0A	OPTION
6	SSD M2 2280 512GB WD SDBPNTY-512G (SN730) PCIE G3*4 3D TLC 96 LAYERS	6-85-D515B-W02	OPTION
6	SSD M2 2280 512GB SAMSUNG MZVLQ512HALU-00000 (PM991) PCIE G3*4 3D TLC 96 LAYERS	6-85-D515B-S0B	OPTION
6	SSD M2 2280 256GB WD SDBPNTY-256G (SN730) PCIE G3*4 3D TLC 96 LAYERS	6-85-D51R6-W02	OPTION
6	SSD M2 2280 16GB(256GB INTEL HBRPEKNX0101A (TETON GLACIER) PCIE G3*4 3DXPOINT QLC 64 LAYERS	6-85-D51R6-Z04	OPTION
6	SSD M2 2280 16GB INTEL MEMPEK1J016GAES (OPTANE MEMORY STONY BEACH 2) PCIE G3*2 3D XPOINT	6-85-D5116-Z02	OPTION
6	OPTANE MEMORY M2 2280 64GB INTEL MEMPEK1J064GAES (STONY BEACH 2) PCIE G3*2 3D XPOINT	6-85-D5164-Z00	OPTION
6	SSD M2 2280 1TB PHISON MGEACSOM4-1TB (E12S) PCIE G3*4 3D TLC 96 LAYERS	6-85-D511T-H04	OPTION
6	SSD M2 2280 512GB PHISON ESMP512GKB4C2-E13T (E13T) PCIE G3*4 DRAMLESS 3D TLC 96 LAYERS	6-85-D515B-H05	OPTION
6	SSD M2 2280 1TB PHISON ESMP001TKB4C2-E16S (E16) PCIE G4*4 3D TLC 96 LAYERS	6-85-D511T-H01	OPTION
7	SSD M2 2280 512GB KINGSTON RBU-SNS8180S3/512GJ (RBU-SNS8180S3) SATA3 3D TLC 64 LAYERS	6-85-D515B-K00	OPTION
7	SSD M2 2280 512GB TEAMGROUP TE512GS510SMB0 (S510) SATA3 3D TLC 96 LAYERS	6-85-D515B-T00	OPTION
7	SSD M2 2280 512GB MICRON MTFDDAV512TDL(1300) SATA3 3D TLC 96 LAYERS	6-85-D515B-102	OPTION
7	SSD M2 2280 256GB MICRON MTFDDAV256TBN (1100) SATA3 (MICRON 3D TLC 64 LAYERS)	6-85-D51R6-101	OPTION
7	SSD M2 2280 1TB SAMSUNG MZVLB1T0HBLR-00000 (PM981A) PCIE G3*4 3D TLC 96 LAYERS	6-85-D511T-S04	OPTION
7	SSD M2 2280 1TB SAMSUNG MZVLQ1T0HALB-00000 (PM991) PCIE G3*4 3D TLC 96 LAYERS	6-85-D511T-S05	OPTION
7	SSD M2 2280 1TB WD SDBPNTY-1T00 (SN730) PCIE G3*4 3D TLC 96 LAYERS	6-85-D511T-W01	OPTION
7	SSD M2 2280 512GB SAMSUNG MZVLB512HBJQ-00000 (PM981A) PCIE G3*4 3D TLC 96 LAYERS	6-85-D515B-S0A	OPTION
7	SSD M2 2280 512GB WD SDBPNTY-512G (SN730) PCIE G3*4 3D TLC 96 LAYERS	6-85-D515B-W02	OPTION
7	SSD M2 2280 512GB SAMSUNG MZVLQ512HALU-00000 (PM991) PCIE G3*4 3D TLC 96 LAYERS	6-85-D515B-S0B	OPTION
7	SSD M2 2280 256GB WD SDBPNTY-256G (SN730) PCIE G3*4 3D TLC 96 LAYERS	6-85-D51R6-W02	OPTION
7	SSD M2 2280 16GB(256GB INTEL HBRPEKNX0101A (TETON GLACIER) PCIE G3*4 3DXPOINT QLC 64 LAYERS	6-85-D51R6-Z04	OPTION
7	SSD M2 2280 16GB INTEL MEMPEK1J016GAES (OPTANE MEMORY STONY BEACH 2) PCIE G3*2 3D XPOINT	6-85-D5116-Z02	OPTION
7	OPTANE MEMORY M2 2280 64GB INTEL MEMPEK1J064GAES (STONY BEACH 2) PCIE G3*2 3D XPOINT	6-85-D5164-Z00	OPTION
7	SSD M2 2280 512GB KINGSTON DM8P0S3512B-A0 (DM8P0S3) SATA3 3D TLC 96 LAYERS	6-85-D515B-K01	OPTION
7	SSD M2 2280 512GB BIWIN CNF82NS1F00-512 (NP202) SATA3 3D TLC 96 LAYERS	6-85-D515B-B02	OPTION
7	SSD M2 2280 1TB PHISON MGEACSOM4-1TB (E12S) PCIE G3*4 3D TLC 96 LAYERS	6-85-D511T-H04	OPTION
7	SSD M2 2280 512GB PHISON ESMP512GKB4C2-E13T (E13T) PCIE G3*4 DRAMLESS 3D TLC 96 LAYERS	6-85-D515B-H05	OPTION
7	SSD M2 2280 1TB PHISON ESMP001TKB4C2-E16S (E16) PCIE G4*4 3D TLC 96 LAYERS	6-85-D511T-H01	OPTION
8	SCREW M2*2L KI NI ICT NY (DD=Ø5 ,T=0.8)	6-35-B1120-2RA	
9	HEATSINK MODULE PC70DN2	6-31-PC70N-104	
10	.SCREW M2*4L KI BZ ICT NY	6-35-B6120-4RA	
11	.SCREW M2*3L KI NI ICT NY (DD=Ø4.0,DT=0.8)	6-35-B1120-3RD	
12	TAPE MYLAR (C),MYLAR M550J	6-40-M55J2-030	
13	THERMAL PAD MA500 (17.3*17.3*2.75T)MM N750BU	6-48-N7503-010	
14	VGA EMI ABSORBER 3 PC50DS	6-47-PC5DS-010	
15	WLAN+BT COMBO DUAL BAND INTEL HARRISON PEAK 2 NEW OTP AX201NGW(NMV) NON-VPRO 2X2 AX+BT BT5.0 CNVI M2 2230	6-88-NV40F-4210	
15	WLAN+BT COMBO DUAL BAND INTEL JEFFERSON PEAK 1 9462NGW(NMW95856) NON-VPRO 1X1 DIVERSITY ANTENNA AC+BT BT5.0 CNVI M2 2230	6-88-N24GF-4200	
15	WLAN+BT COMBO DUAL BAND INTEL CYCLONE PEAK 2 AX200NGW(NMV) NON-VPRO 2X2 AX+BT BT5.0 M2 2230	6-88-N15CF-4210	
15	WLAN+BT COMBO DUAL BAND RIVET KILLER 1650I NEW OTP (INTEL AX201NGW(NMV) NEW OTP) 2X2 AC+BT BT5.0 CNVI M2 2230	6-88-NV40F-4220	
15	WLAN+BT COMBO DUAL BAND INTEL KILLER 1675X(AX210NGW(NMV)) (NMW999M86) 2X2 AX+BT BT5.2 M2 2230	6-88-X17KF-4220	
15	WLAN+BT COMBO DUAL BAND INTEL WIFI 6E TYPHOON PEAK 2 AX210NGW(NMV) (NMW999M85) NON-VPRO 2X2 AX+BT BT5.2 M2 2230	6-88-X17KF-4210	

Figure A - 3
Main Board

A.Part Lists

LCD

Figure A - 4
LCD



ITEM	PART NAME	PART NO	REMARK
1	LCD PROTECT MYLAR BOPP NB70TJ1	6-40-NB708-010	
2	FRONT CASE MYLAR (MP1) PC70DN2	6-40-PC701-012	
3	LCD N17.3" FHD/WVA/300HZ/SW G-SYNC/N7/NON GT/EDP AU B173HAN05.1 3.5MM	6-50-NBB35-G190	
3	LCD N17.3" FHD/WVA/144HZ/SW G-SYNC/N7/NON GT/EDP LG LP173WFG-SPB1 (EDID:C4) 3.5MM	6-50-NBB35-L123	
3	LCD N17.3" UHD/WVA/SW G-SYNC/ADOBE 100%/NON GT/EDP AU B173ZAN03.0 (H/W:2A) 3.5MM	6-50-N1B35-G100	
3	LCD N17.3" FHD/WVA/144HZ/SW G-SYNC/N7/NON GT/EDP AU B173HAN05.0 (H/W:4A) 3.5MM	6-50-NBB35-G123	
3	LCD N17.3" FHD/WVA/240HZ/SW G-SYNC/N7/NON GT/EDP AU B173HAN05.0 (H/W:4A) 3.5MM	6-50-NBB35-G162	
4	WIRE EDP CABLE FHD 400MM 19V 40PIN (HT/LW CON:LV03140-212-HF) PC70DN2	6-43-PC701-011-1N	
4	COAXIAL CABLE EDP 400MM 30V 40PIN (240HZ) (HT/LW CON: LV06130-224) PC70DN2	6-43-PC701-021-1N	
5	WIRE+FFC CABLE FOR CCD D-MIC 650MM 3.3V 8P TO 12P(HT) PC70DN2	6-43-PC70T-012-1	
6	UVC CAMERA CHICONY FIX(RGB) CNFIH3821003920LH 1M HD OV9734 N150ZU FW5404 W/WHITE-LED W/2D-MIC(NARROW BORDER WITH FFC)	6-88-N15ZC-5100	OPTION
6	UVC CAMERA BISON FIX(RGB) BNH419VXB-000 1M HD OV9734 N150ZU FWXXXX W/WHITE-LED W/2D-MIC(NARROW BORDER WITH FFC)	6-88-N15ZC-4900	OPTION
6	UVC CAMERA CHICONY FIX(RGB) C7FKH7221003920LH 1M HD W/2D-MIC 4.0*71.2 OV9734 N150ZU FW2739 W/WHITE-LED	6-88-N15ZC-5102	OPTION
7	LCD FRONT COVER (MP2) MODULE PC70DN2	6-39-PC701-013	
8	LCD RUBBER (9.5*2.5*1.2T) GARY P970EN	6-47-P97N1-030	
9	LCD BACK COVER (MP1) MODULE PC70DN2	6-39-PC701-022	
10	.SCREW M2.5*6L K BZ ICT NY	6-35-82125-6RA	
11	SCREW M2.5*2.5L KI BK/Z ICT NY(ø8,T=0.6)	6-35-B6125-2R5	
12	LCD HINGE L (MP1) (SK7+1144) PC70DN2	6-33-PC701-0L2	
13	ANTENNA IPEX4 WLAN WGT WL1 PCB DL 2.4G/5G/6GHZ WL1=450MM PC70DN2	6-23-7PC70-011	
14	ANTENNA IPEX4 WLAN WGT WL2 PCB DL 2.4G/5G/6GHZ WL2=300MM PC70DN2	6-23-7PC70-021	
15	LCD HINGE R (MP1) (SK7+1144) PC70DN2	6-33-PC701-0R2	
16	LALATAPE (75*10*0.3T)	6-47-0019A-K04	

Appendix B: Schematic Diagrams

This appendix has circuit diagrams of the ***PC70DS / PC70DR / PC70DP*** notebook's PCB's. The following table indicates where to find the appropriate schematic diagram.

Table B - 1
SCHEMATIC DIAGRAMS

Version Note

The schematic diagrams in this chapter are based upon version 6-7P-PC5D7-002. If your mainboard (or other boards) are a later version, please check with the Service Center for updated diagrams (if required).

System Block Diagram

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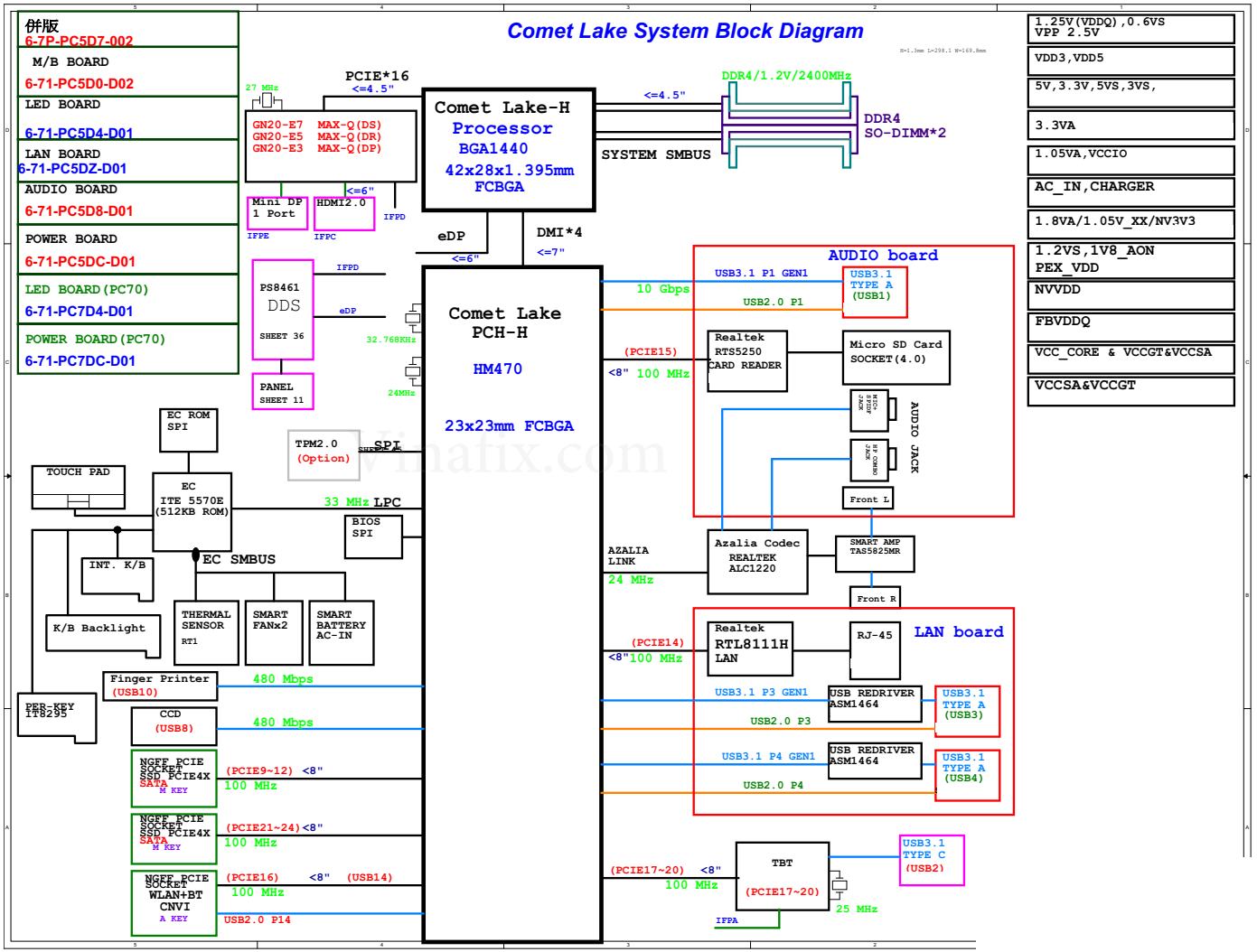
System Block Diagram



Processor 1/7

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Processor 1/7

Processor 2/7

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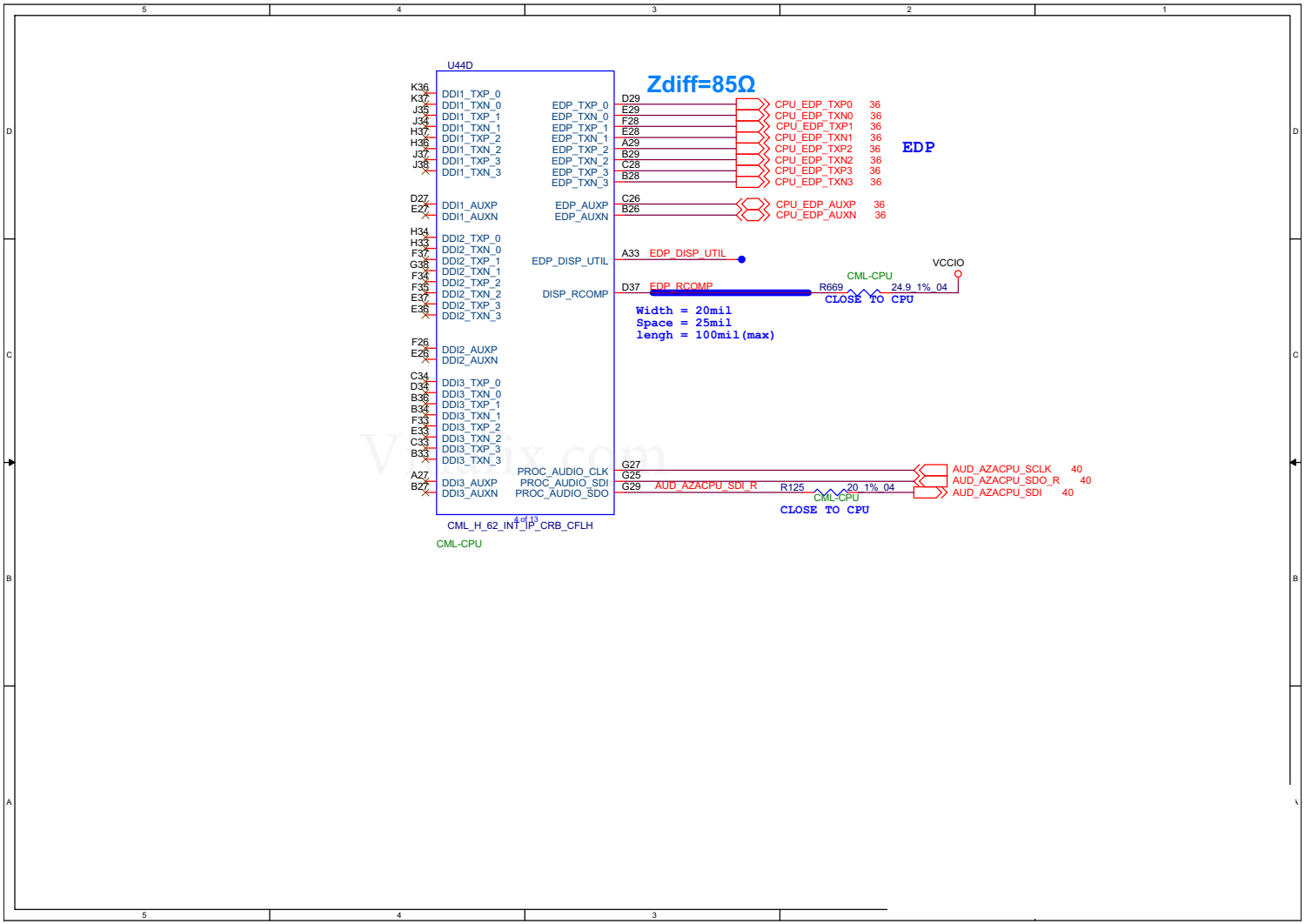
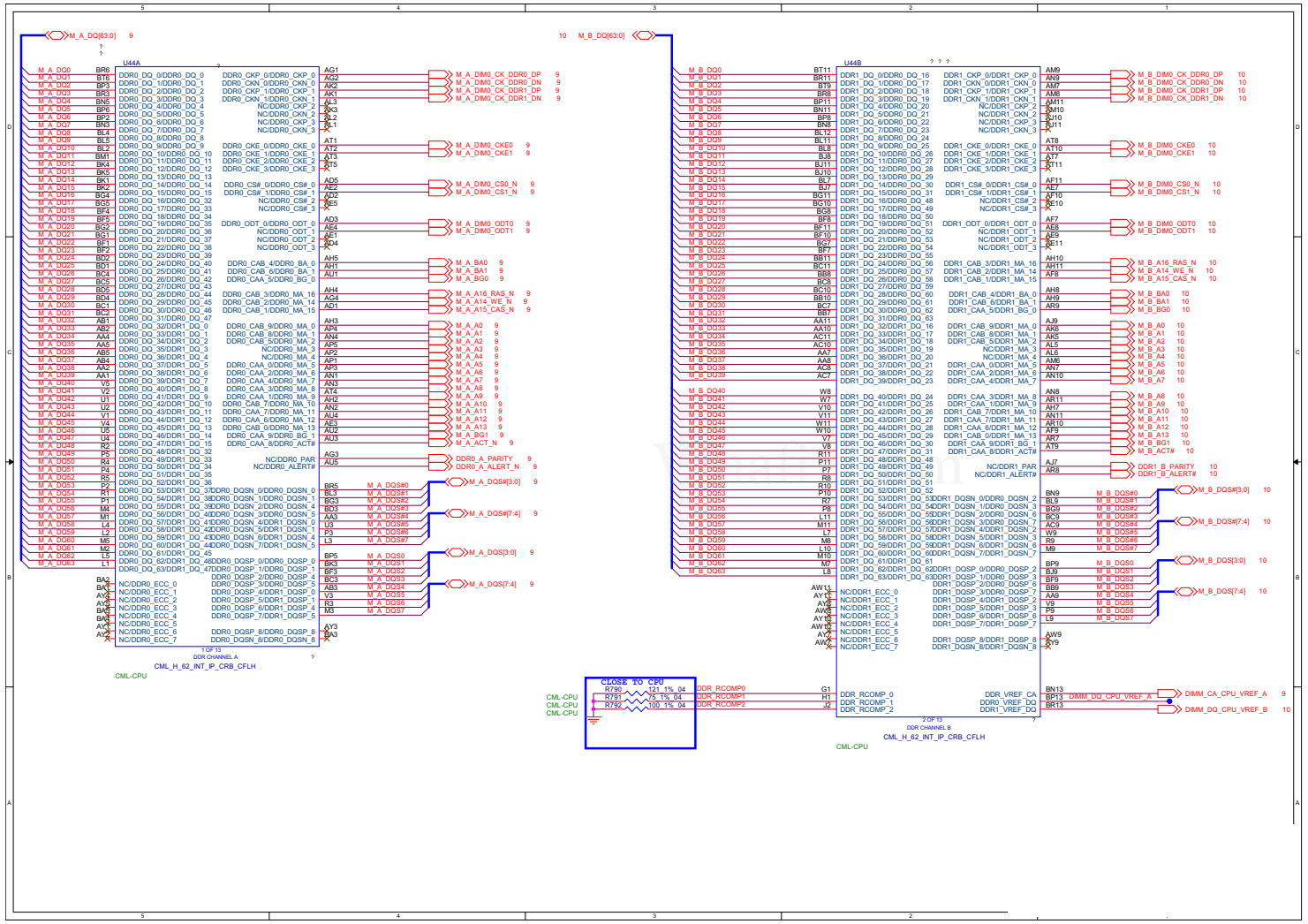
Processor 2/7



Processor 3/7



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Processor 3/7

Processor 4/7

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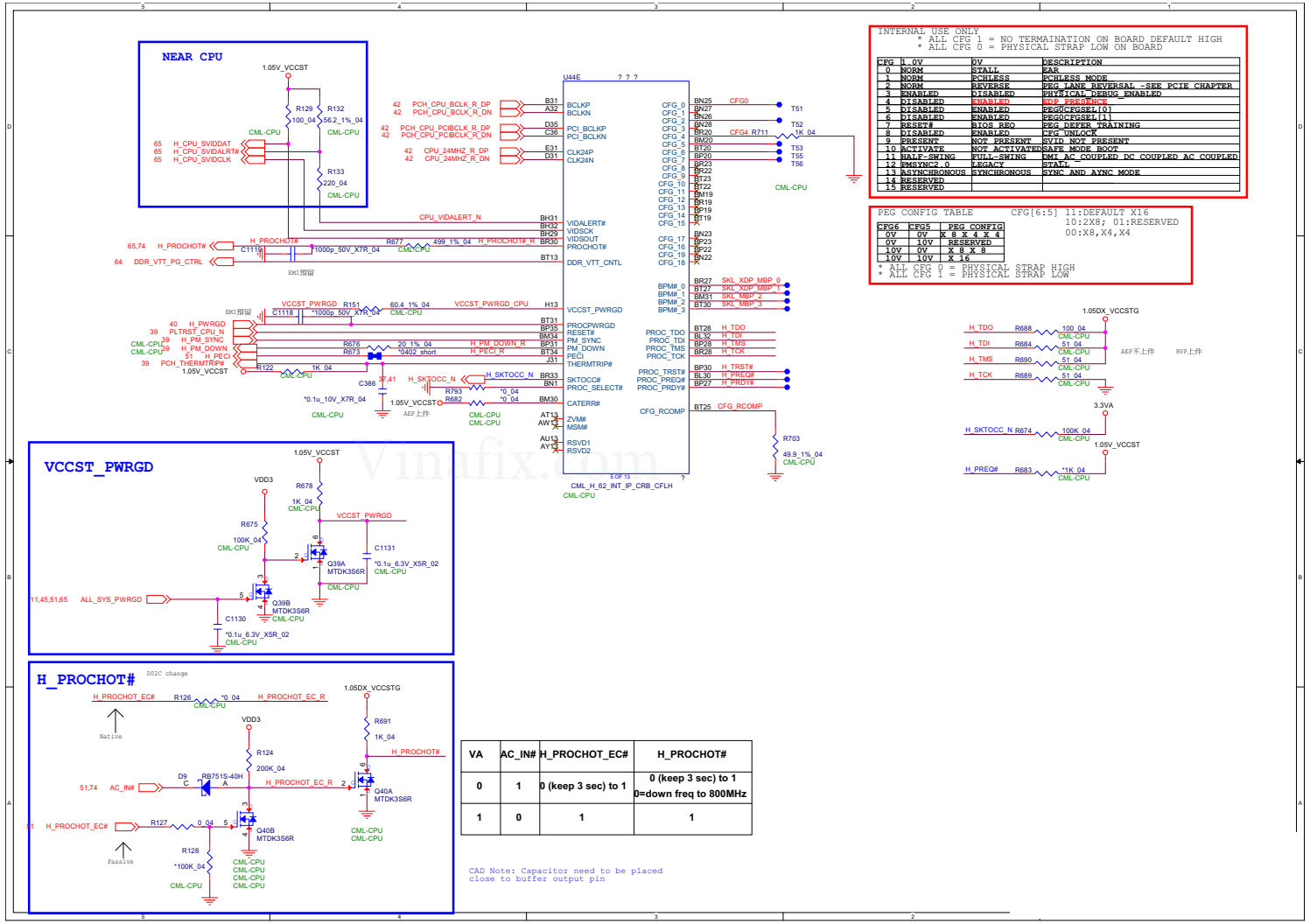
Processor 4/7

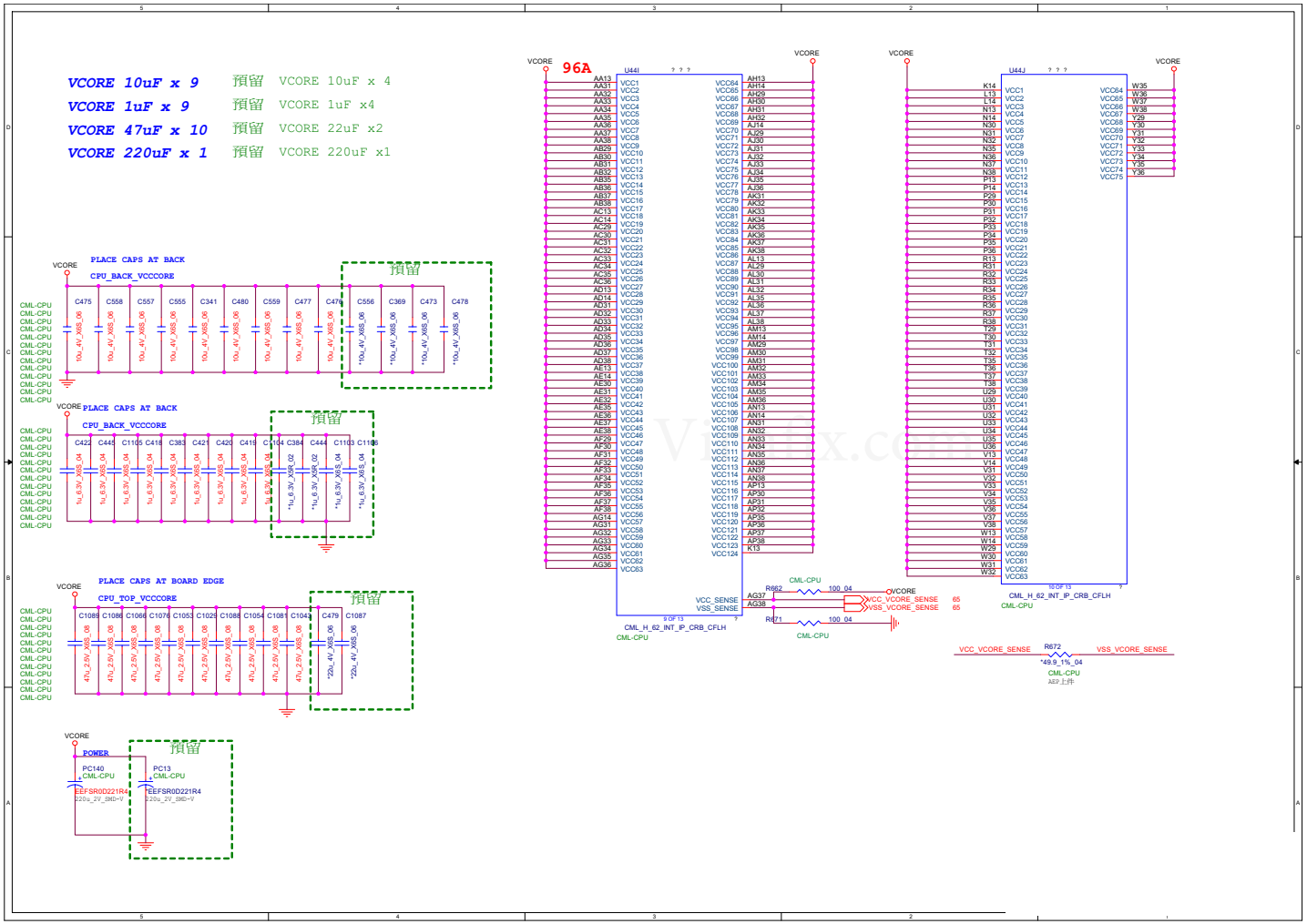


CFG[1:0]	0V	DESCRIPTION
0	NORM	STALL
1	NORM	PCHLESS
2	NORM	REVERSE
3	ENABLED	DISABLED
4	DISABLED	ENABLED
5	DISABLED	ENABLED
6	DISABLED	ENABLED
7	RESET#	BIOS REQ
8	DISABLED	ENABLED
9	PRESENT	NOT PRESENT
10	ACTIVATE	NOT ACTIVATED
11	HALF-SWING	FULL-SWING
12	PMSYNC2_0	LEGACY
13	ASYNCHRONOUS	SYNCHRONOUS
14	RESERVED	
15	RESERVED	

CFG6	CFG5	PEG_CONFIG
0V	0V	X 8 X 4 X 4
0V	10V	RESERVED
10V	0V	X 8 X 8
10V	10V	X 16

VA	AC_IN#	H_PROCHOT_EC#	H_PROCHOT#
0	1	0 (keep 3 sec) to 1	0 (keep 3 sec) to 1 0=down freq to 800MHz
1	0	1	1

Processor 5/7



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Processor 5/7

Processor 6/7

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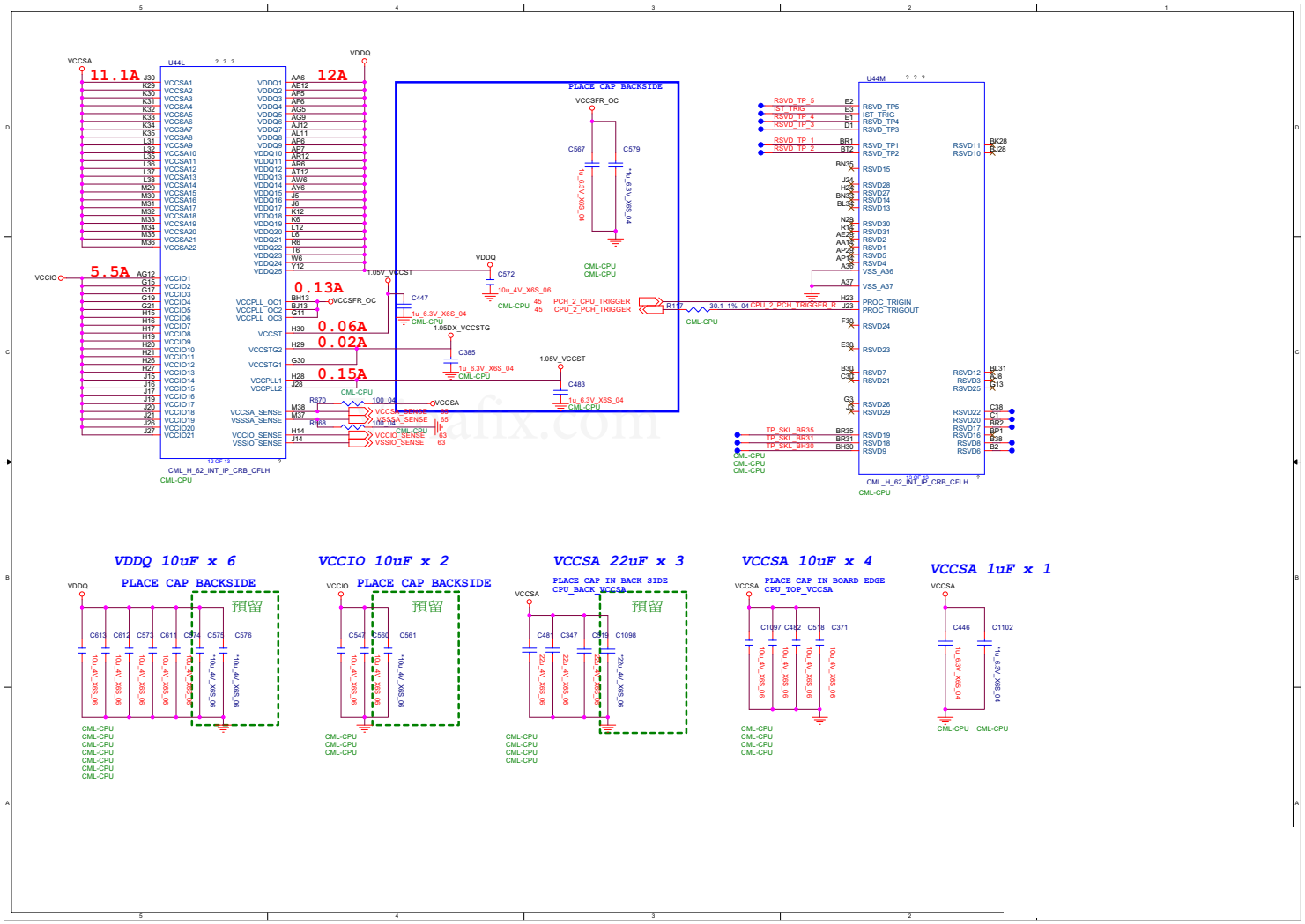
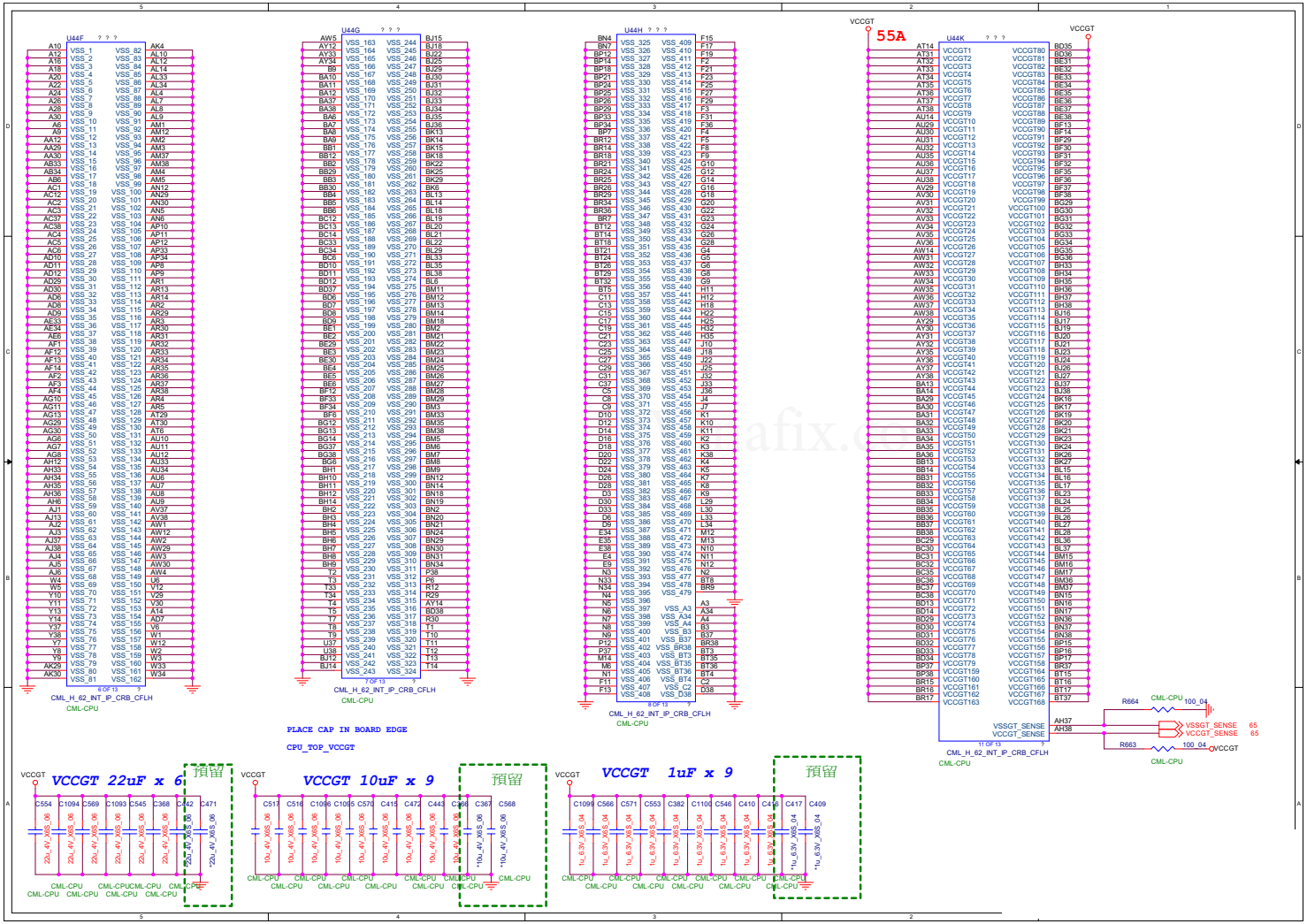
Processor 6/7



Processor 7/7



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Processor 7/7

DDR4 CHA SO-DIMM_0

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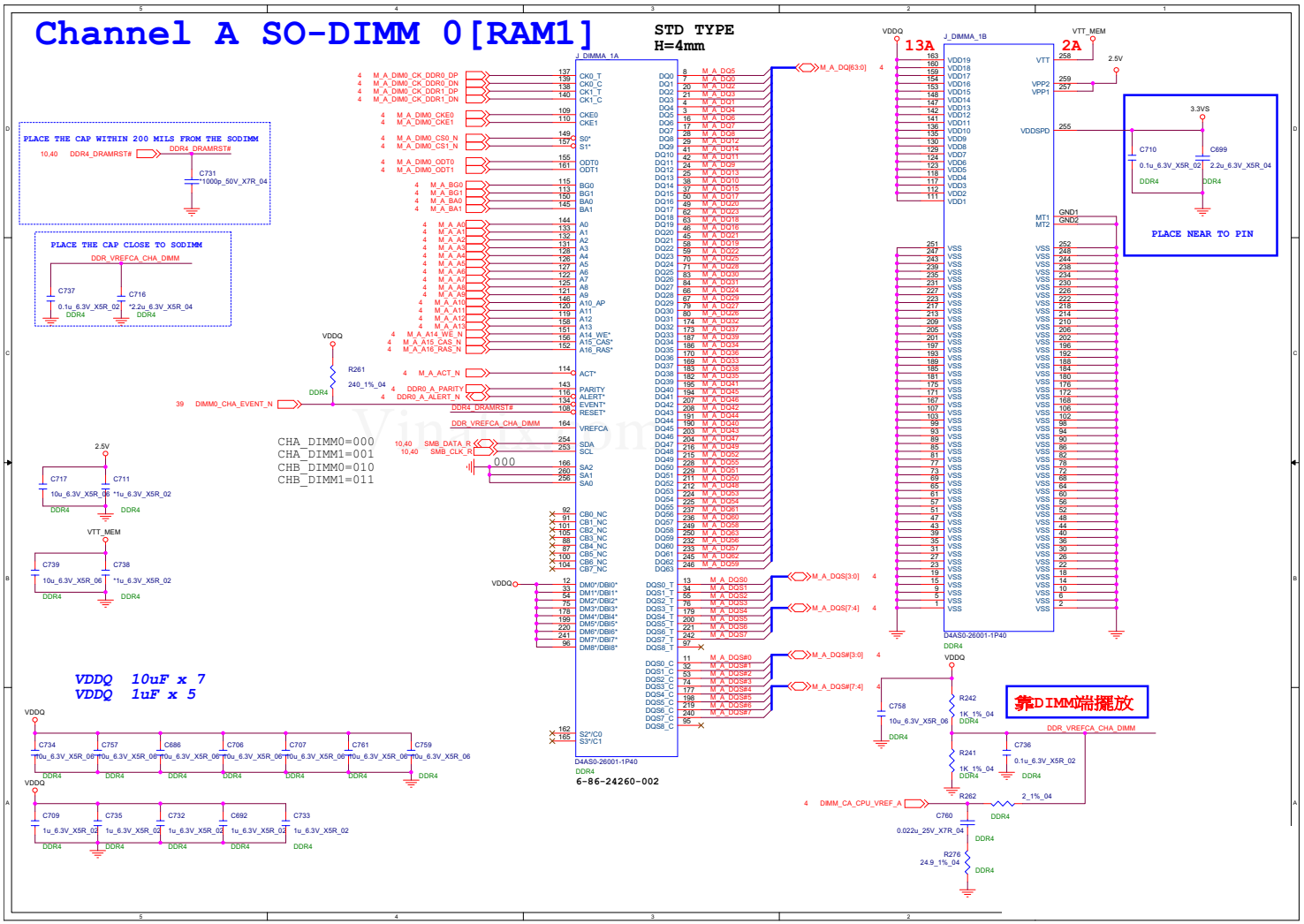
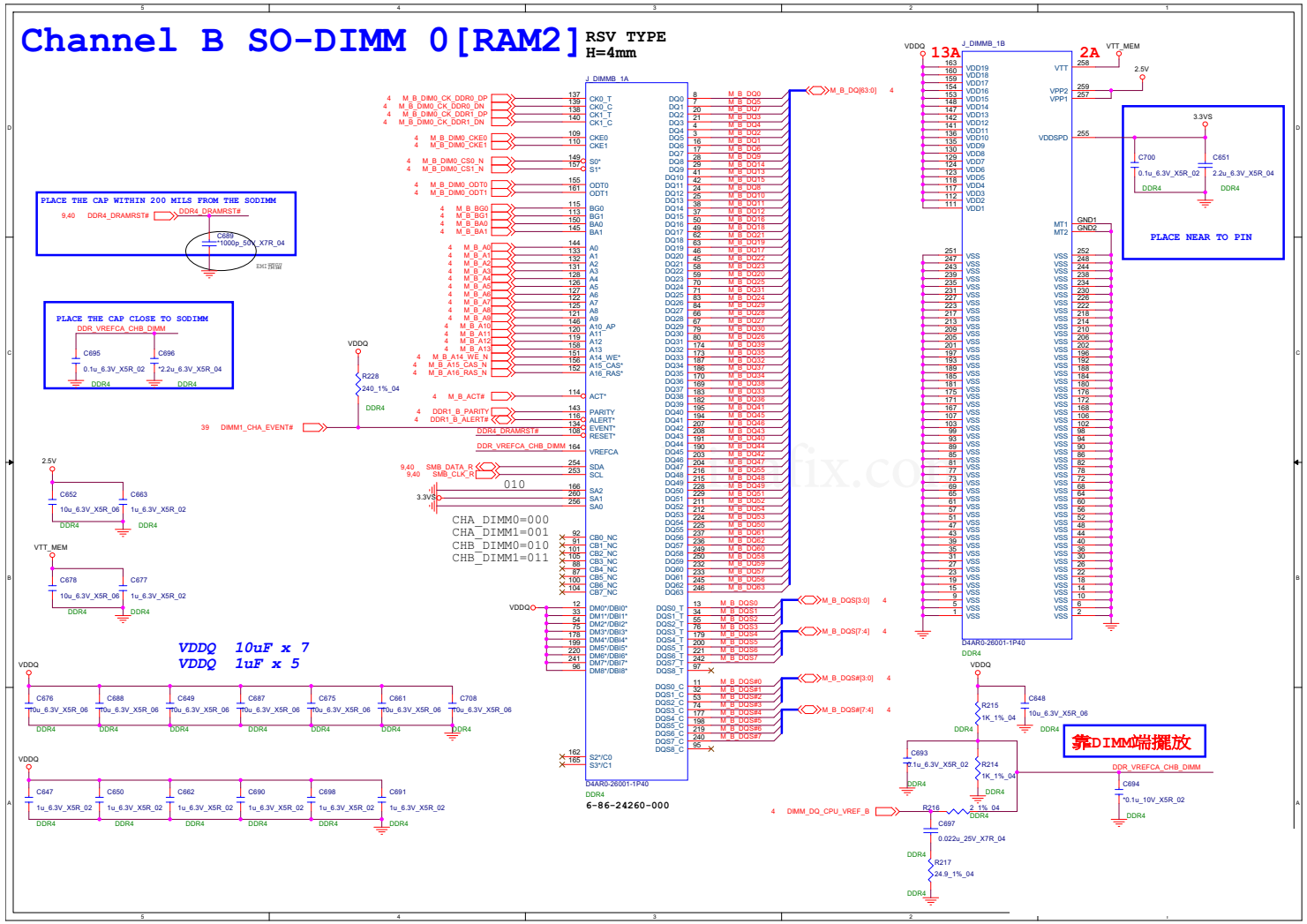
DDR4 CHA SO-DIMM_0



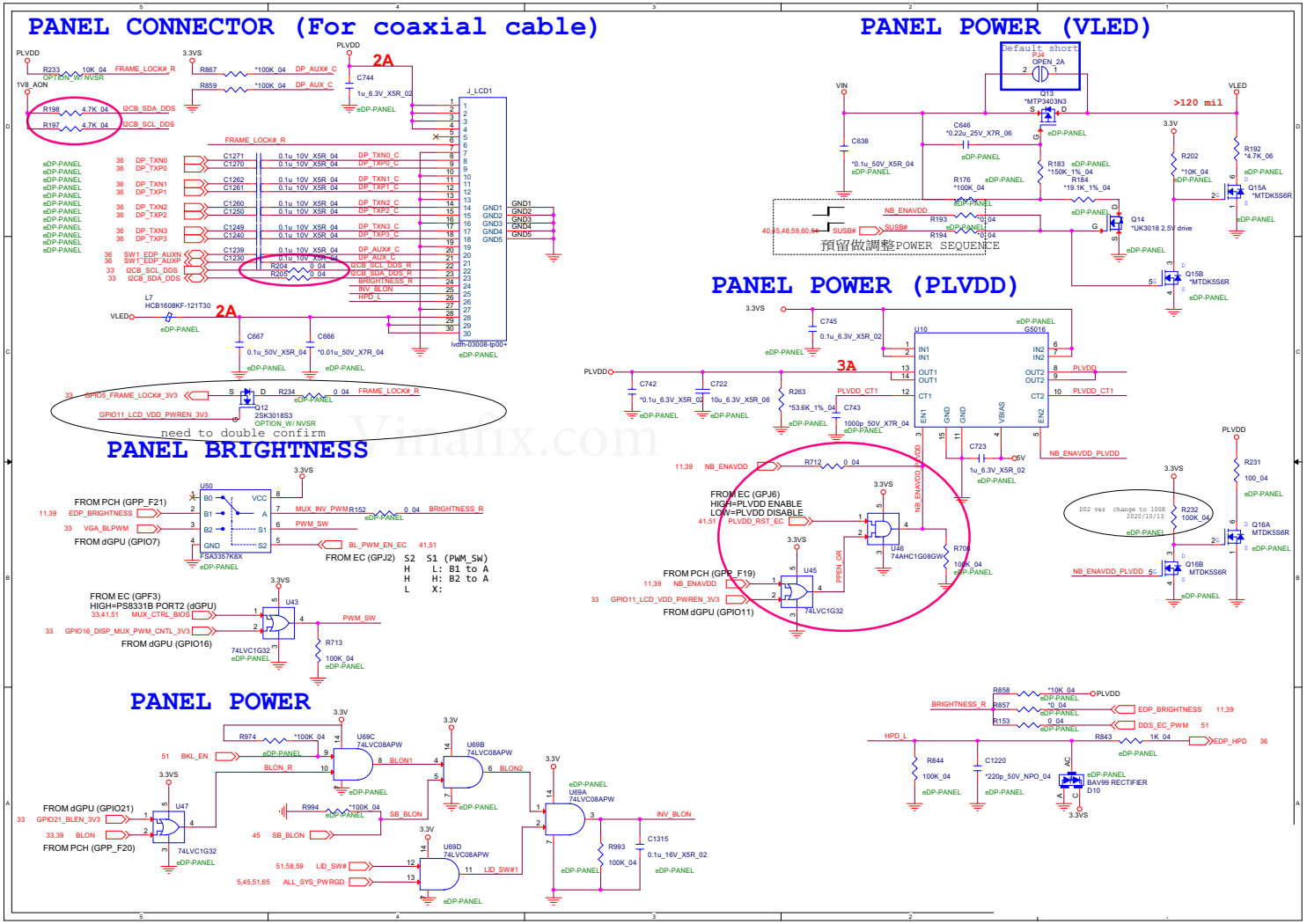
DDR4 CHB SO-DIMM_0



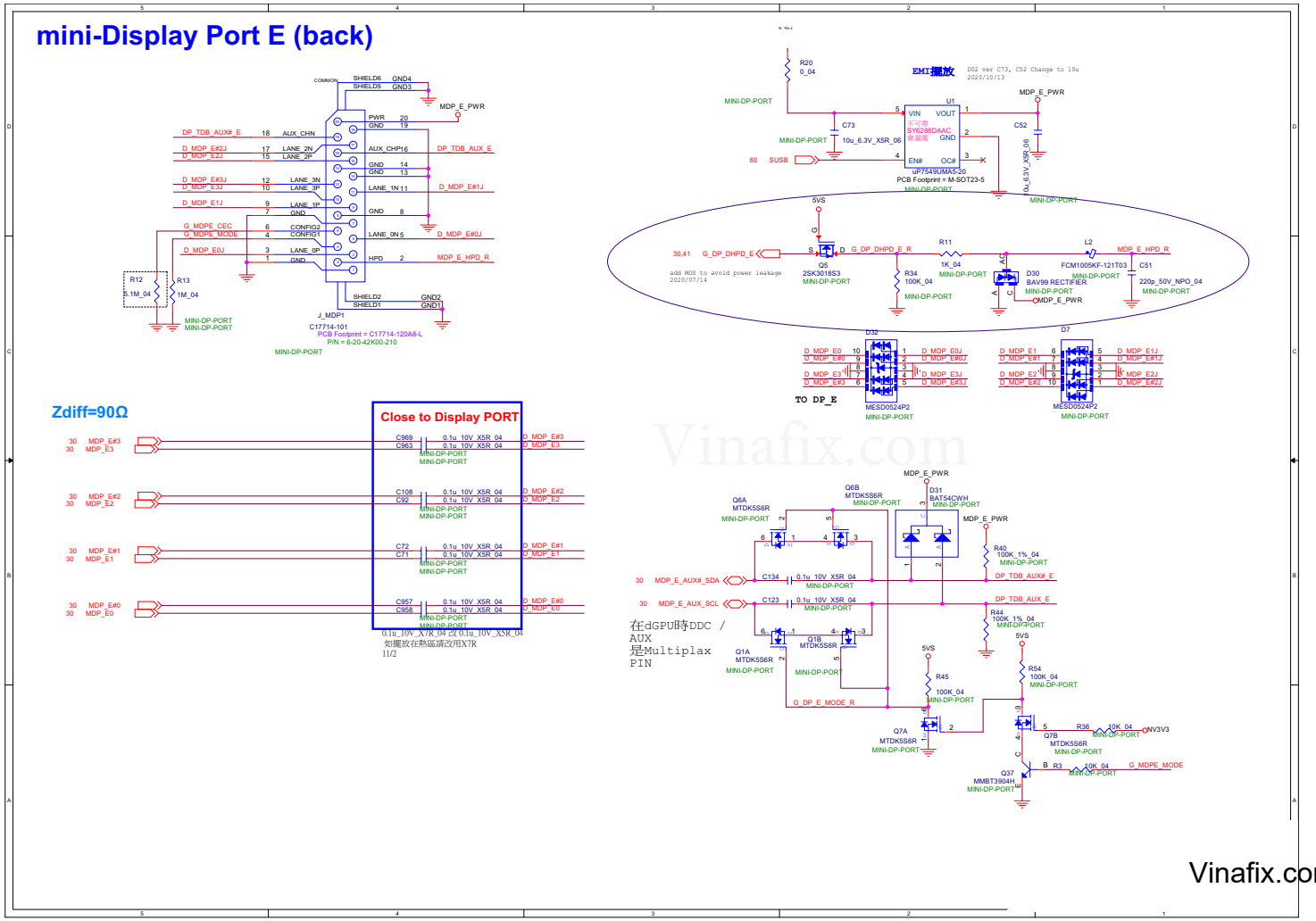
Sheet 10 of 81
DDR4 CHB SO-DIMM_0

Panel, Inverter

Sheet 11 of 81
Panel, Inverter



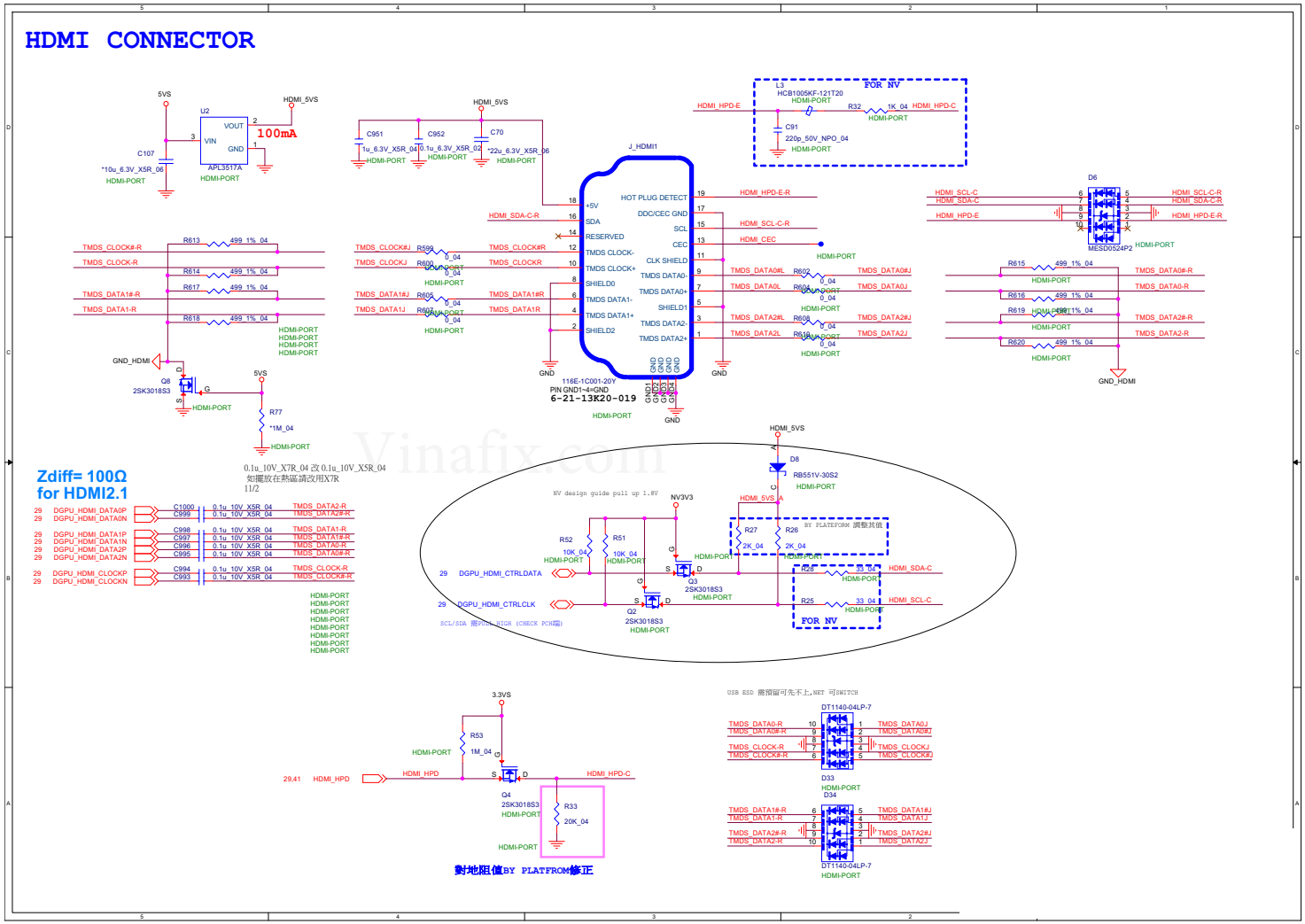
Mini DP Port



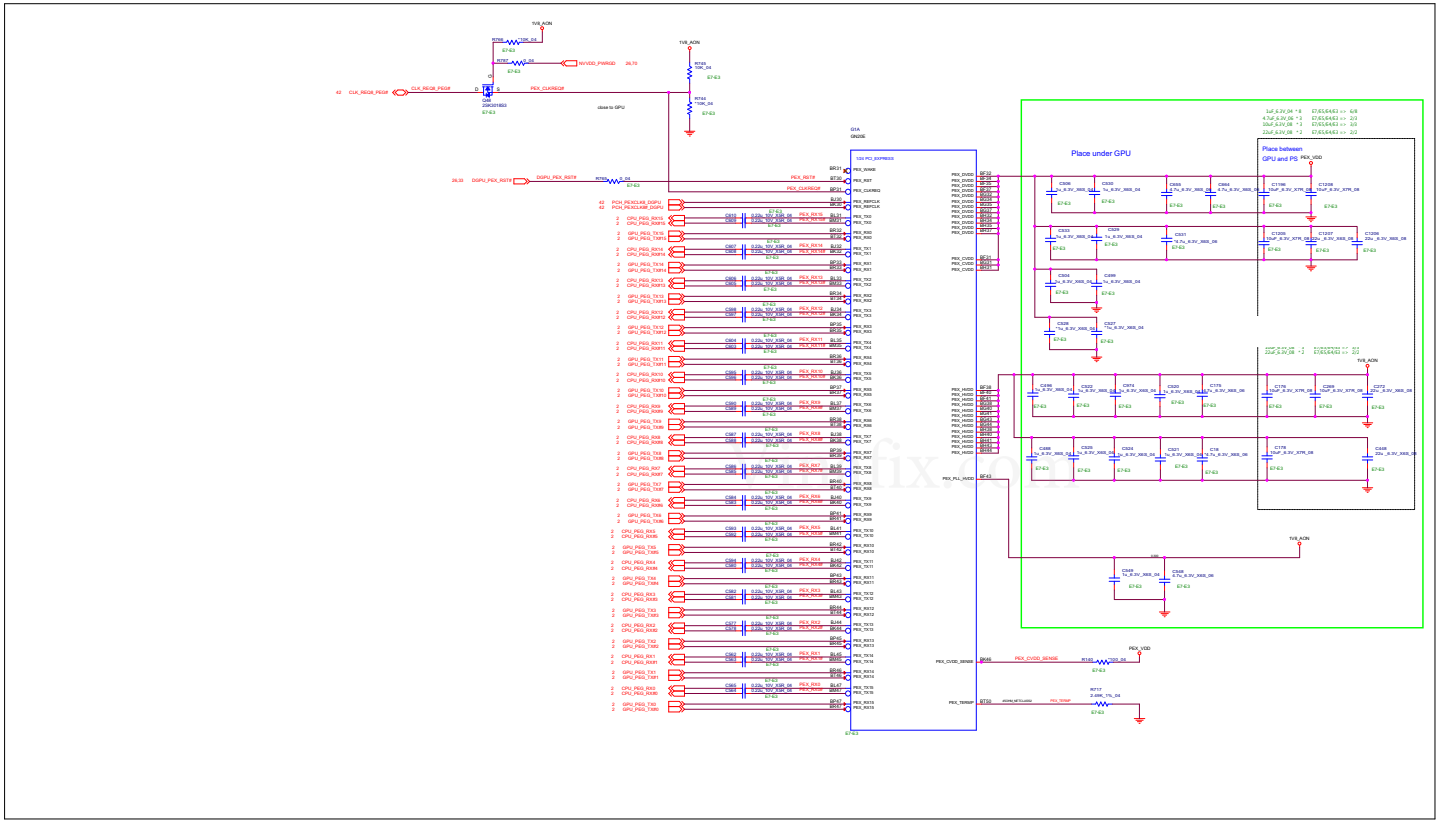
Sheet 12 of 81
Mini DP Port

HDMI

Sheet 13 of 81
HDMI



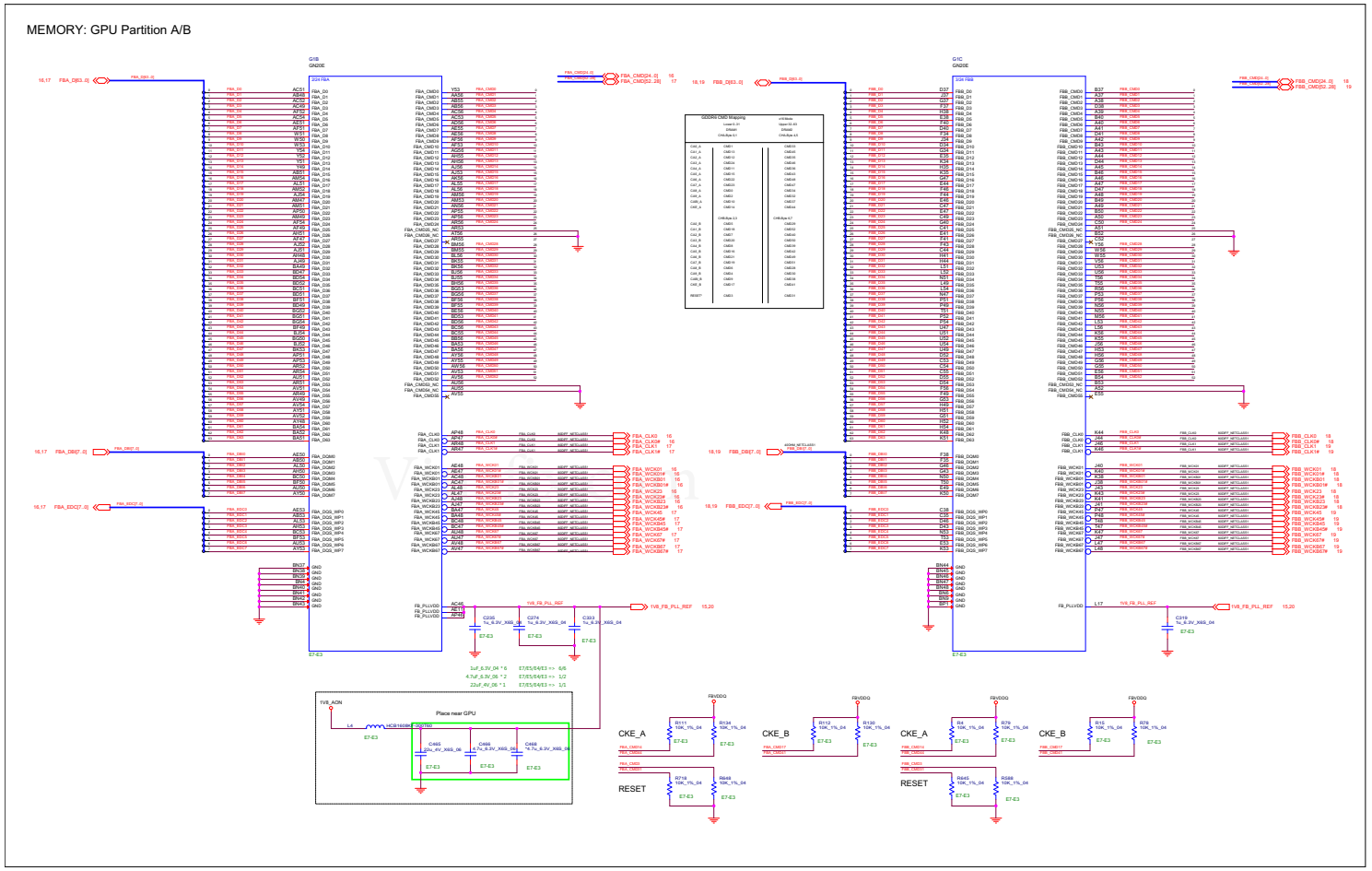
VGA PCI Express



Sheet 14 of 81
VGA PCI Express

GPU Frame Buffer Partition A_B

Sheet 15 of 81
GPU Frame Buffer Partition A_B



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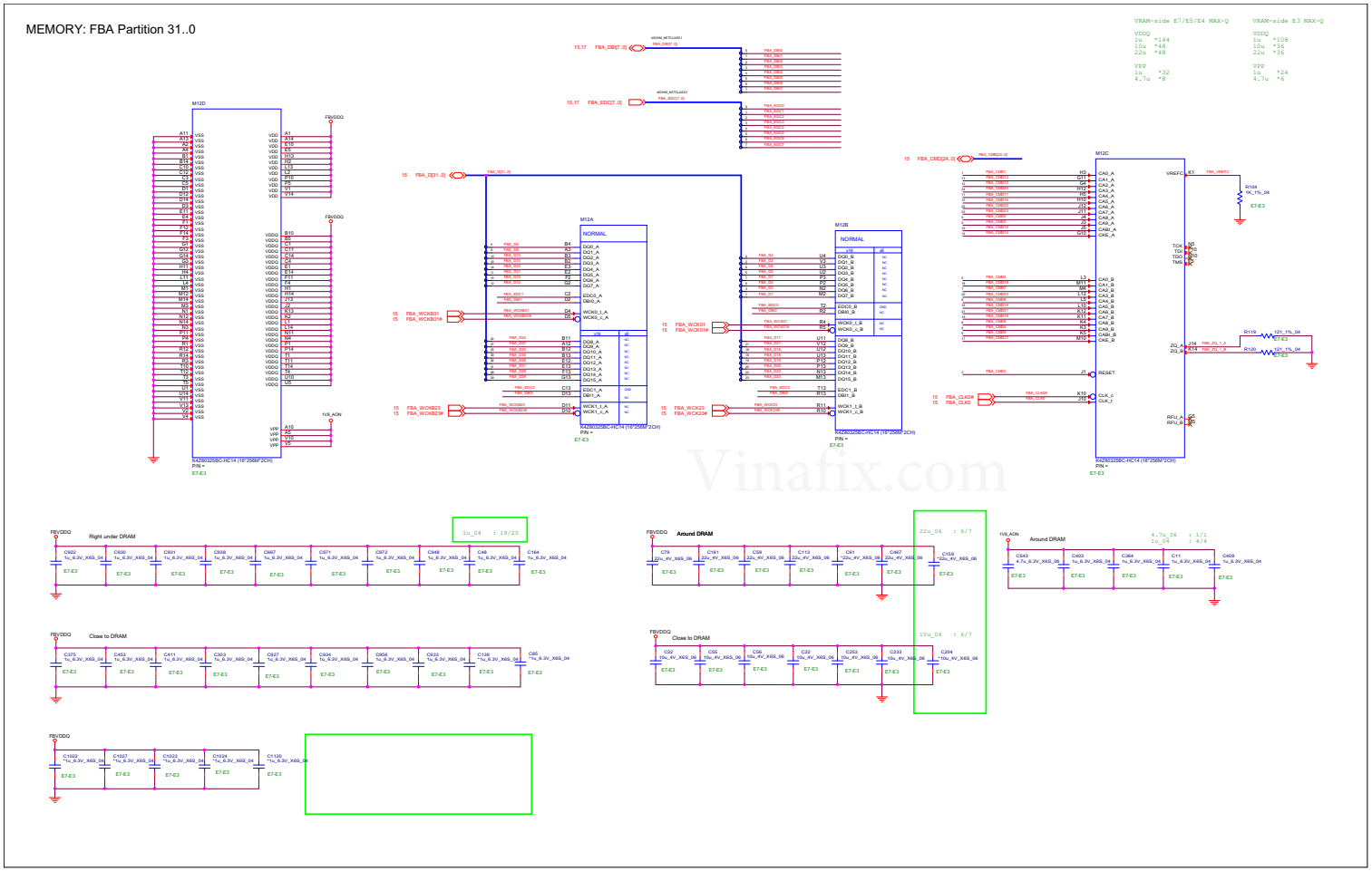

Sheet 16 of 81
Frame Buffer
Partition A

B.Schematic Diagrams

Frame Buffer Partition A

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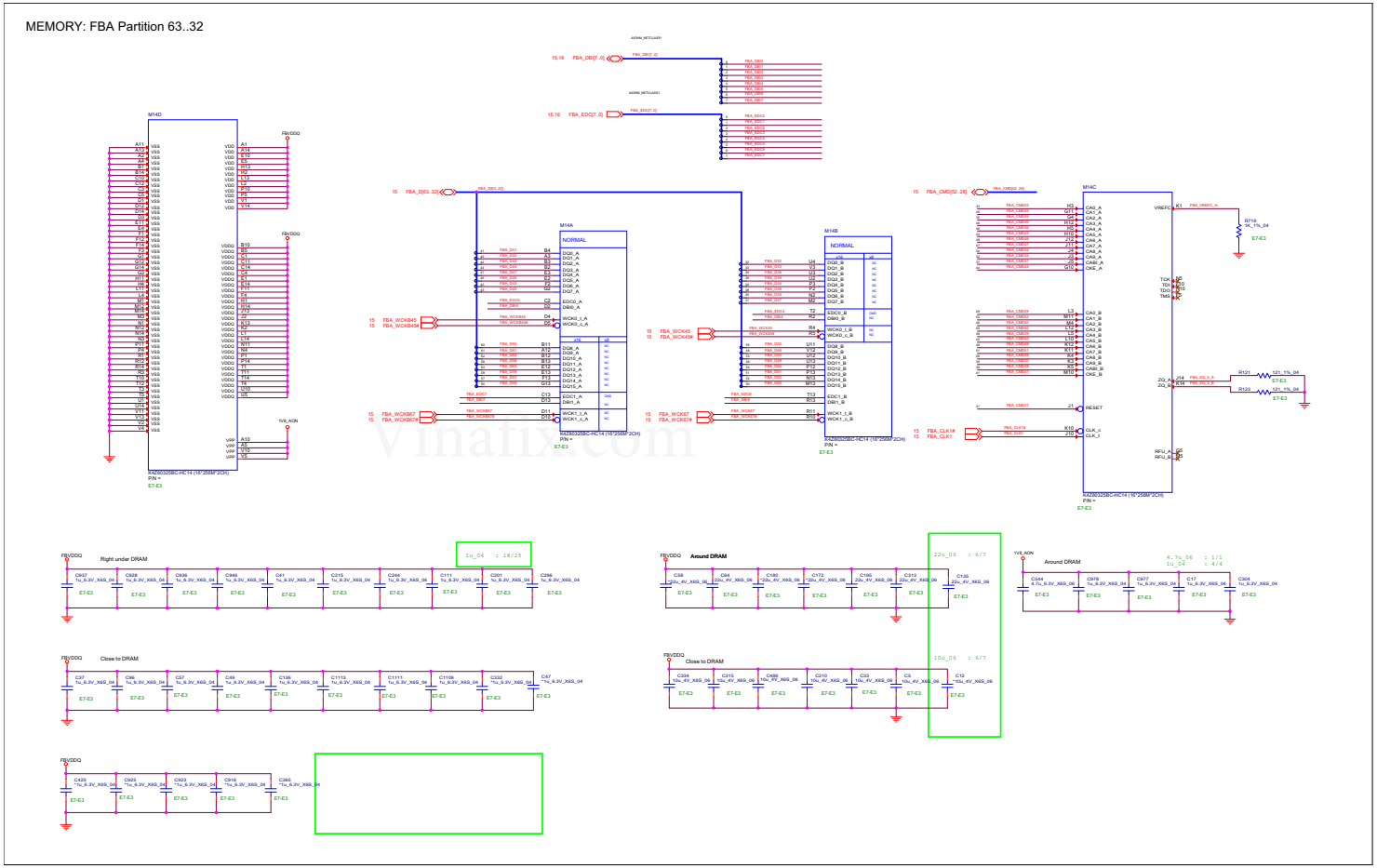
Frame Buffer
Partition A



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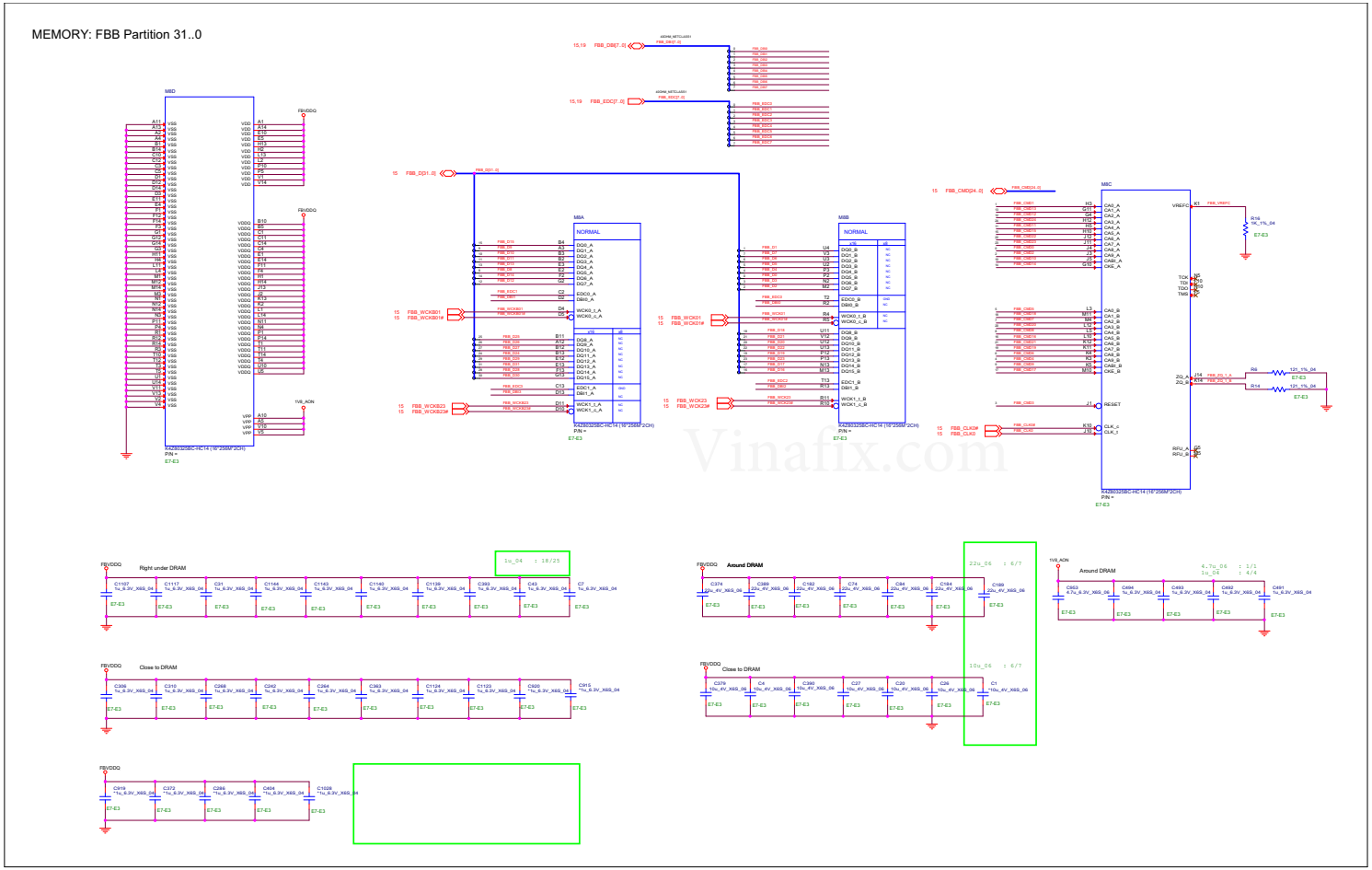

Sheet 18 of 81
Frame Buffer
Partition B

Frame Buffer Partition B

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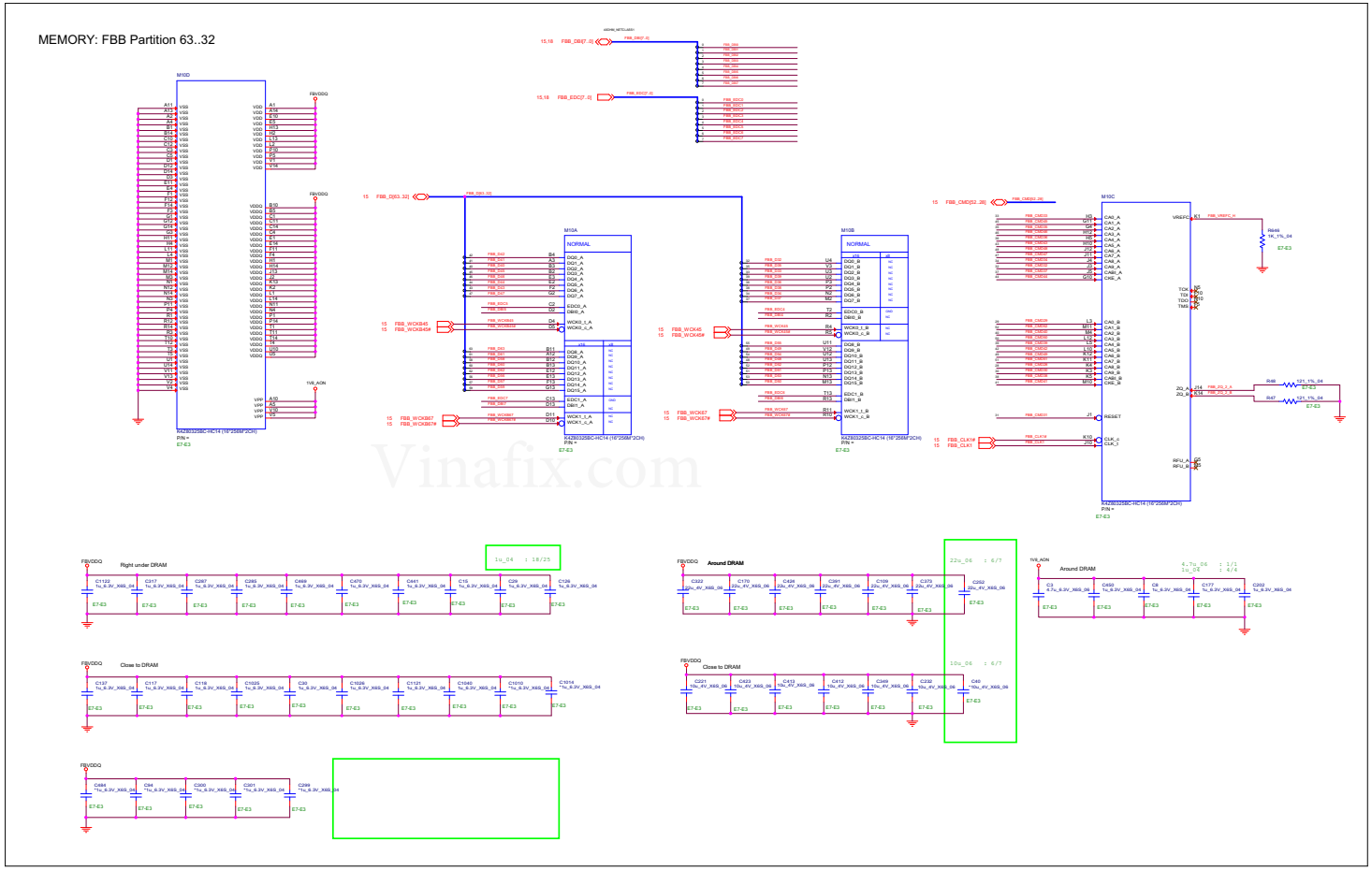
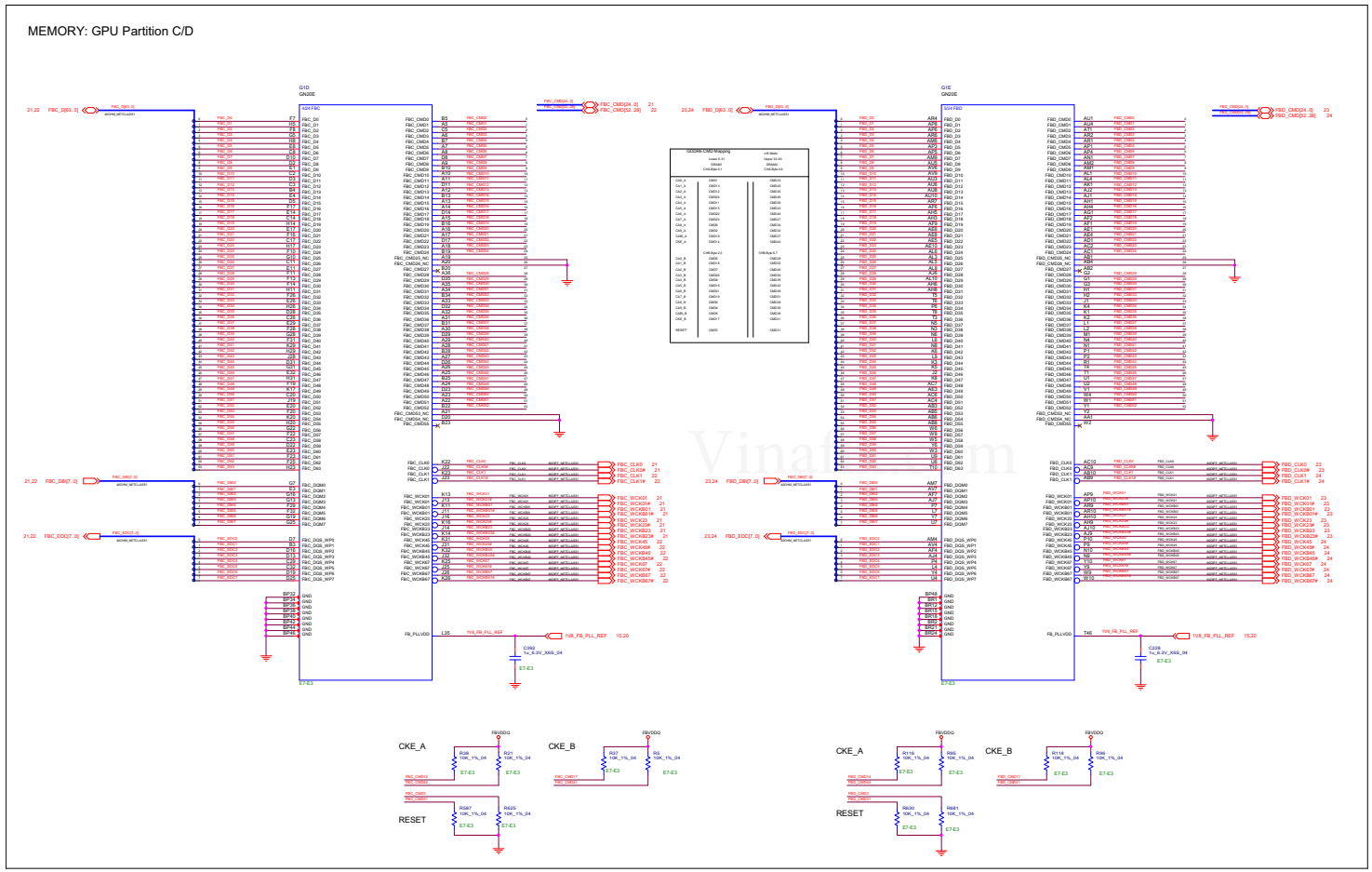
Frame Buffer
Partition B



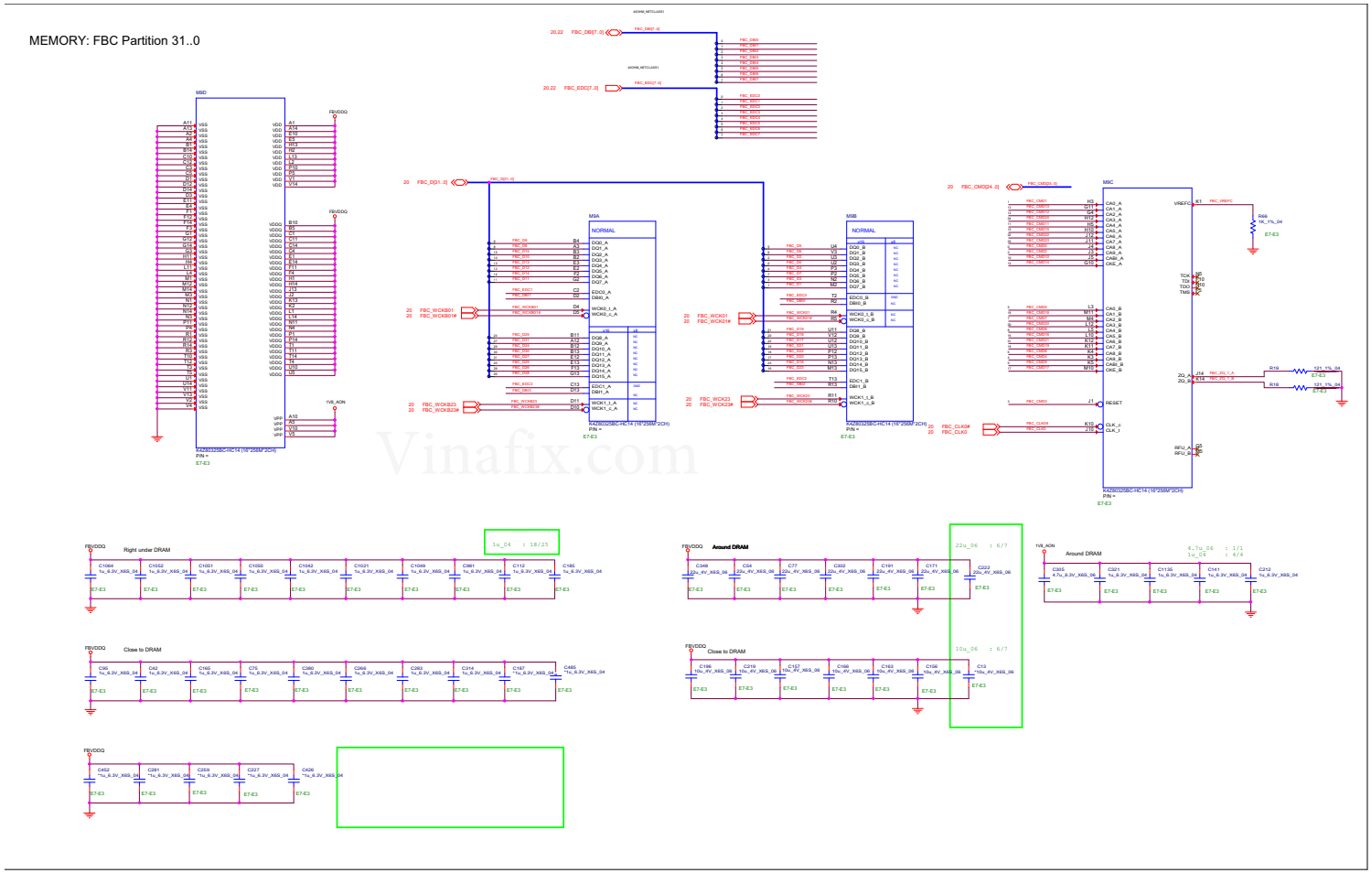
GPU Frame Buffer Partition C_D



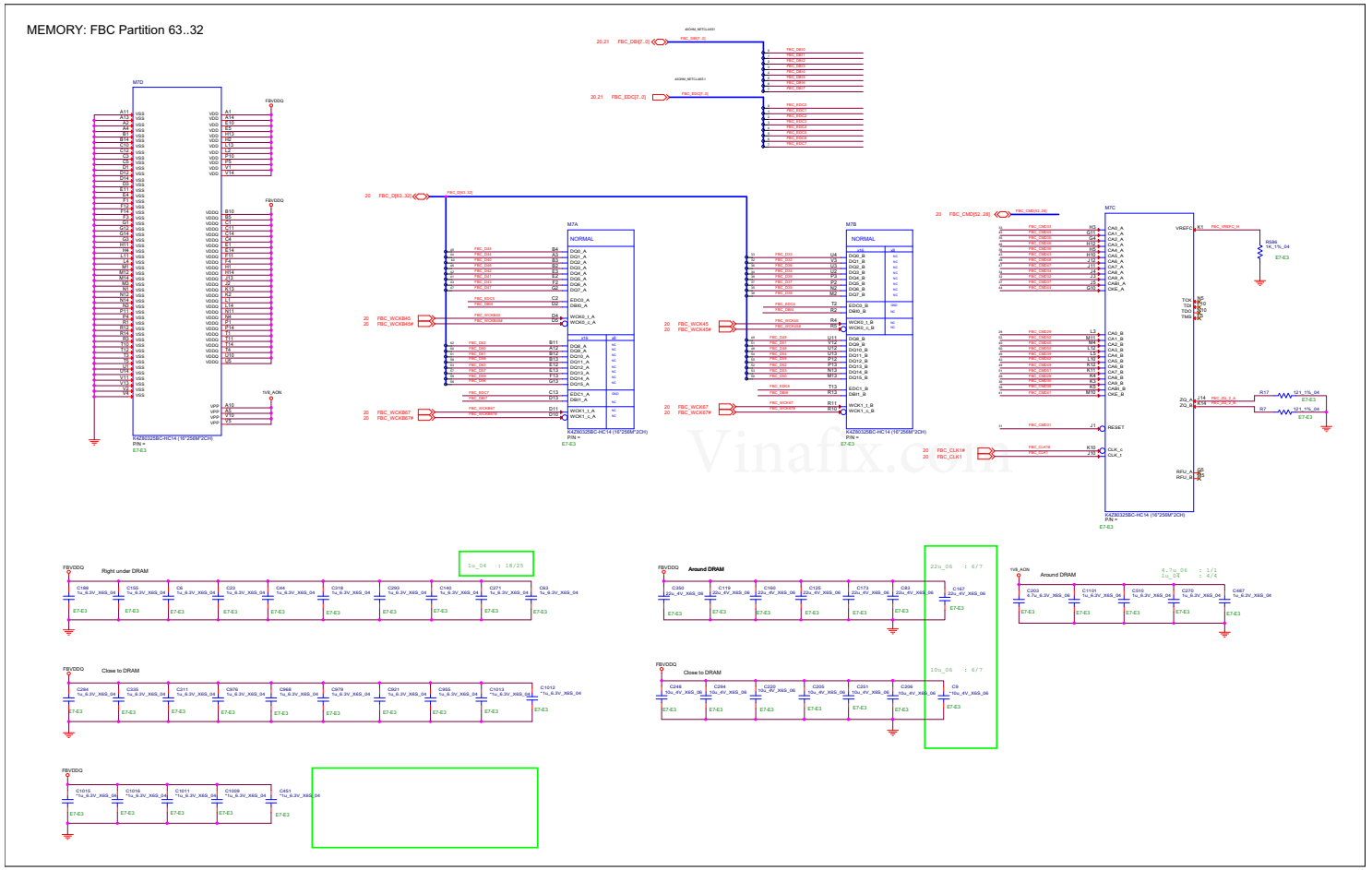
Sheet 20 of 81
GPU Frame Buffer
Partition C_D

Frame Buffer Partition C

Sheet 21 of 81
Frame Buffer Partition C



Frame Buffer Partition C



Sheet 22 of 81
Frame Buffer
Partition C

B.Schematic Diagrams

Frame Buffer Partition D

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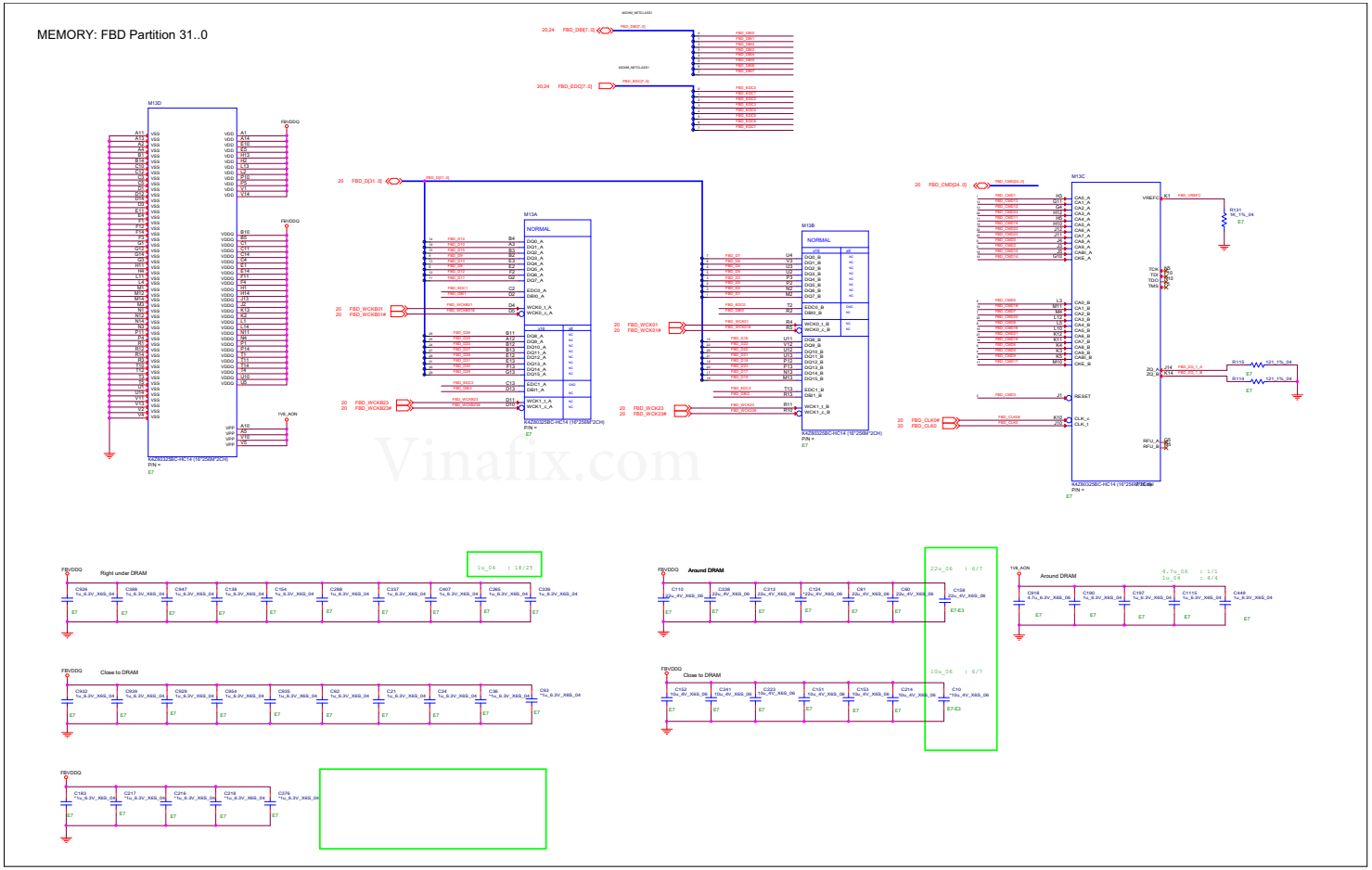
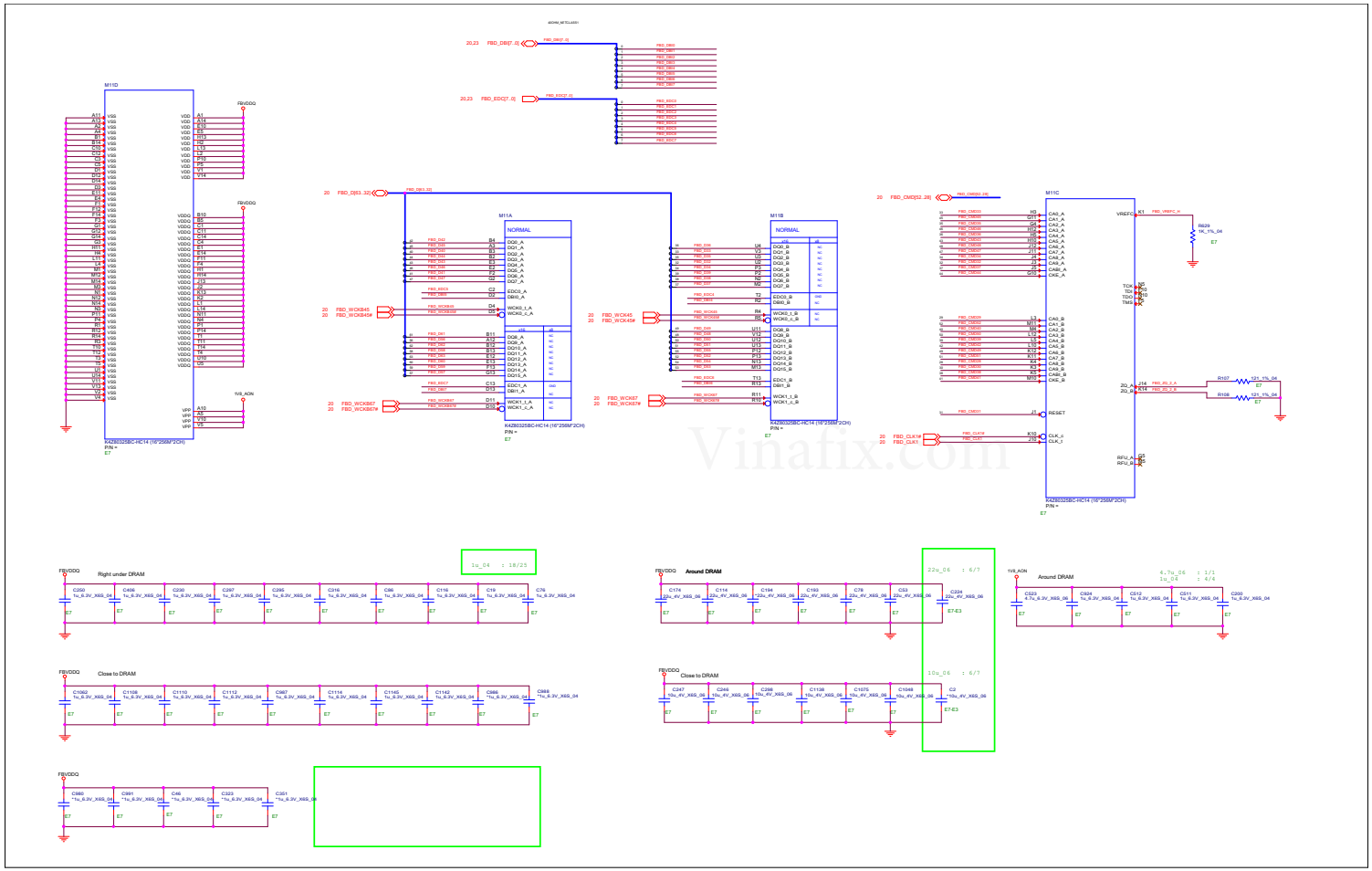
Frame Buffer
Partition D



Frame Buffer Partition D



Sheet 24 of 81
Frame Buffer
Partition D

GPU PWR & GND

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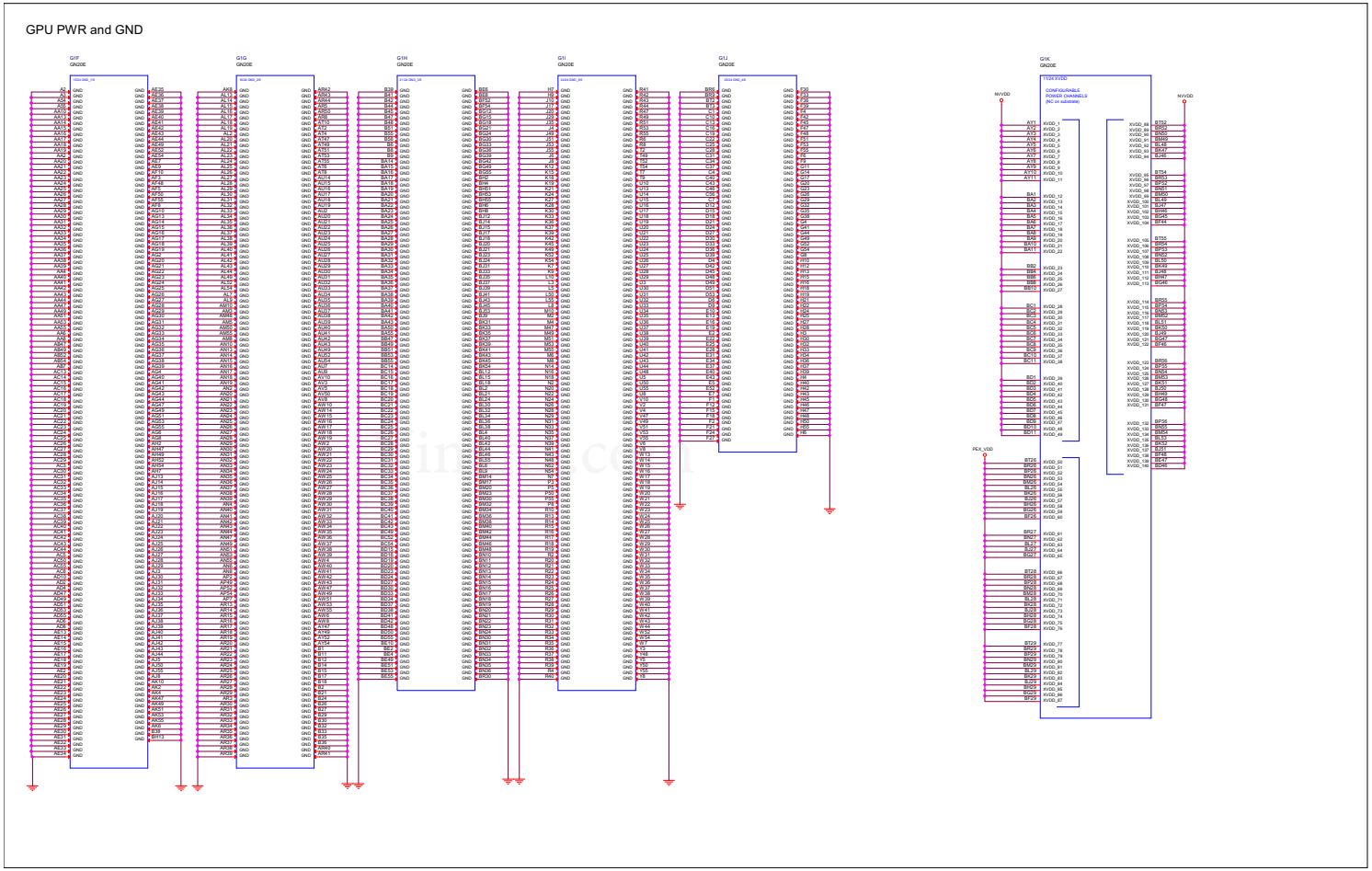
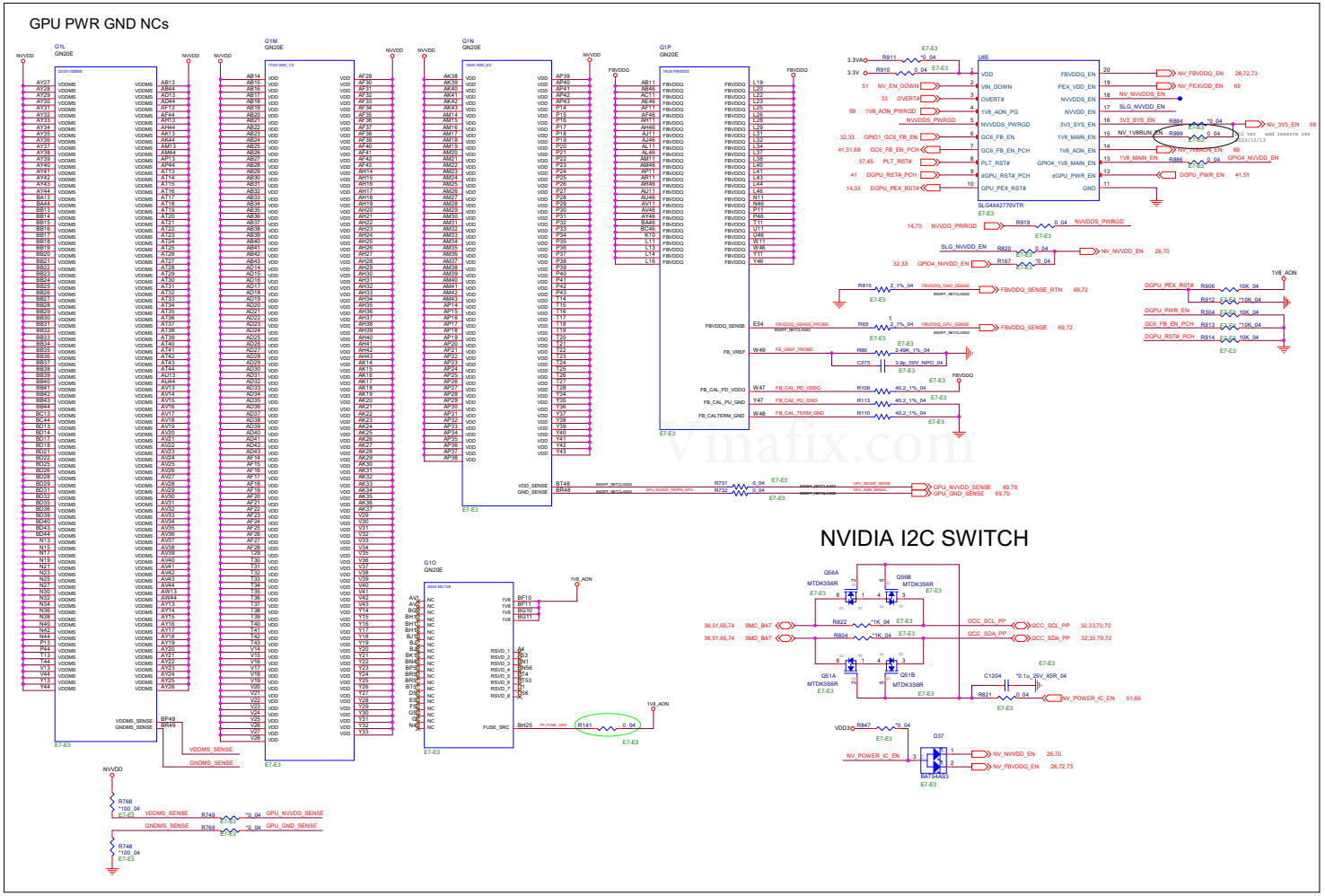
GPU PWR & GND



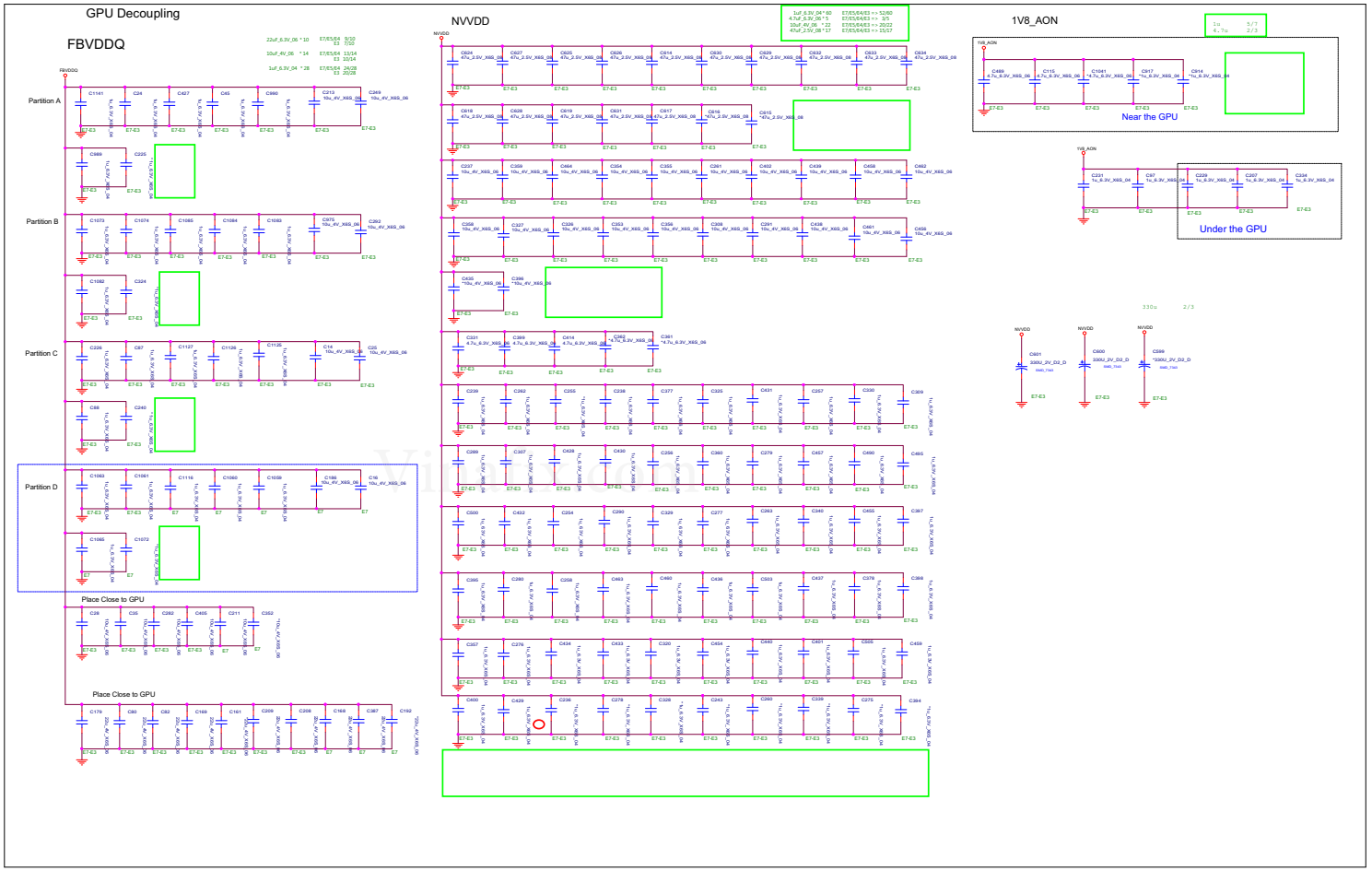
GPU PWR & GND



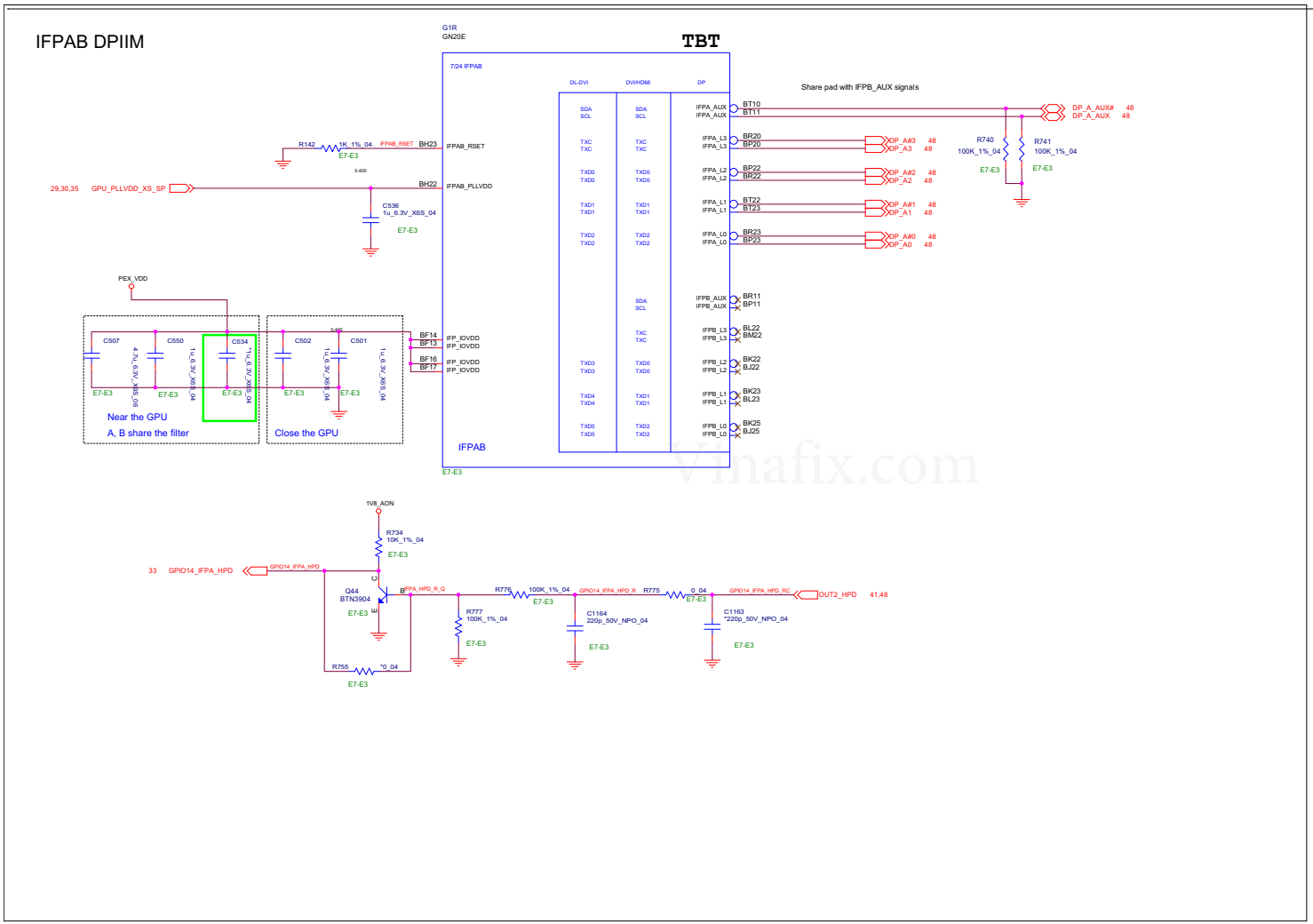
Sheet 26 of 81
GPU PWR & GND

GPU Decoupling

Sheet 27 of 81
GPU Decoupling



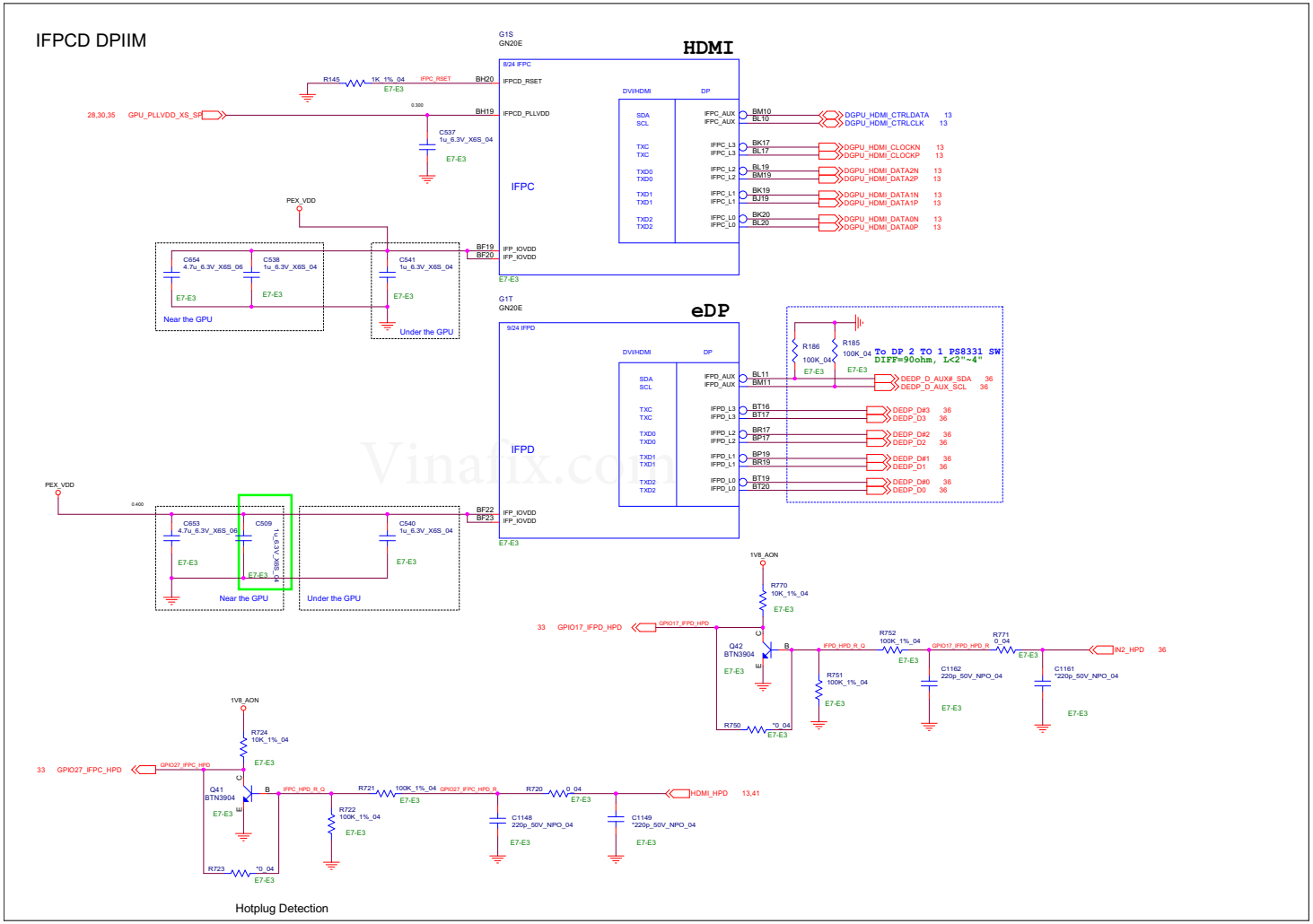
GPU IFPAB DPIIM



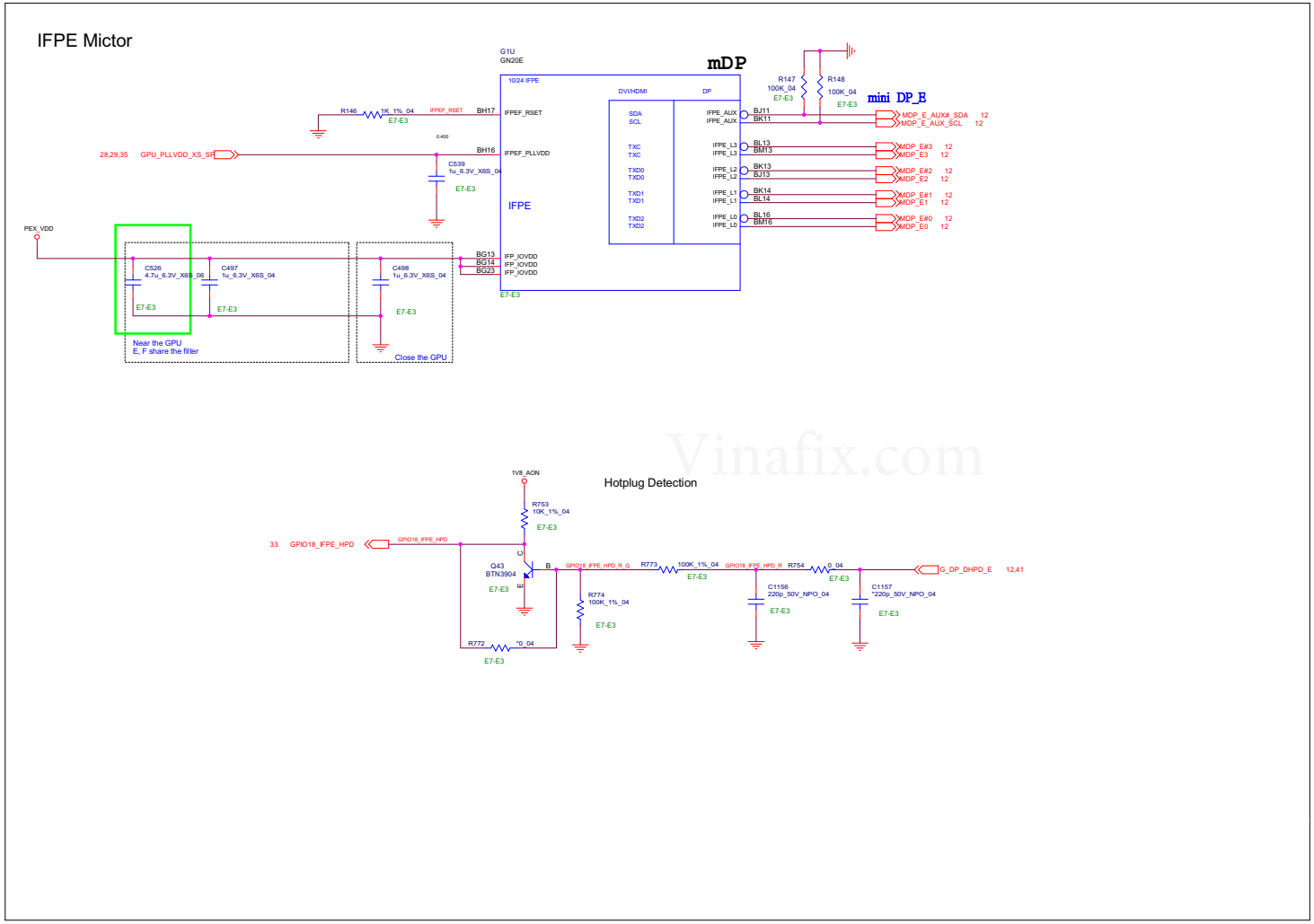
Sheet 28 of 81
GPU IFPAB DPIIM

GPU IFPCD DPIIM

Sheet 29 of 81
GPU IFPCD DPIIM



GPU IFPE Mictor



Sheet 30 of 81
GPU IFPE Mictor

GPU IFPF DP

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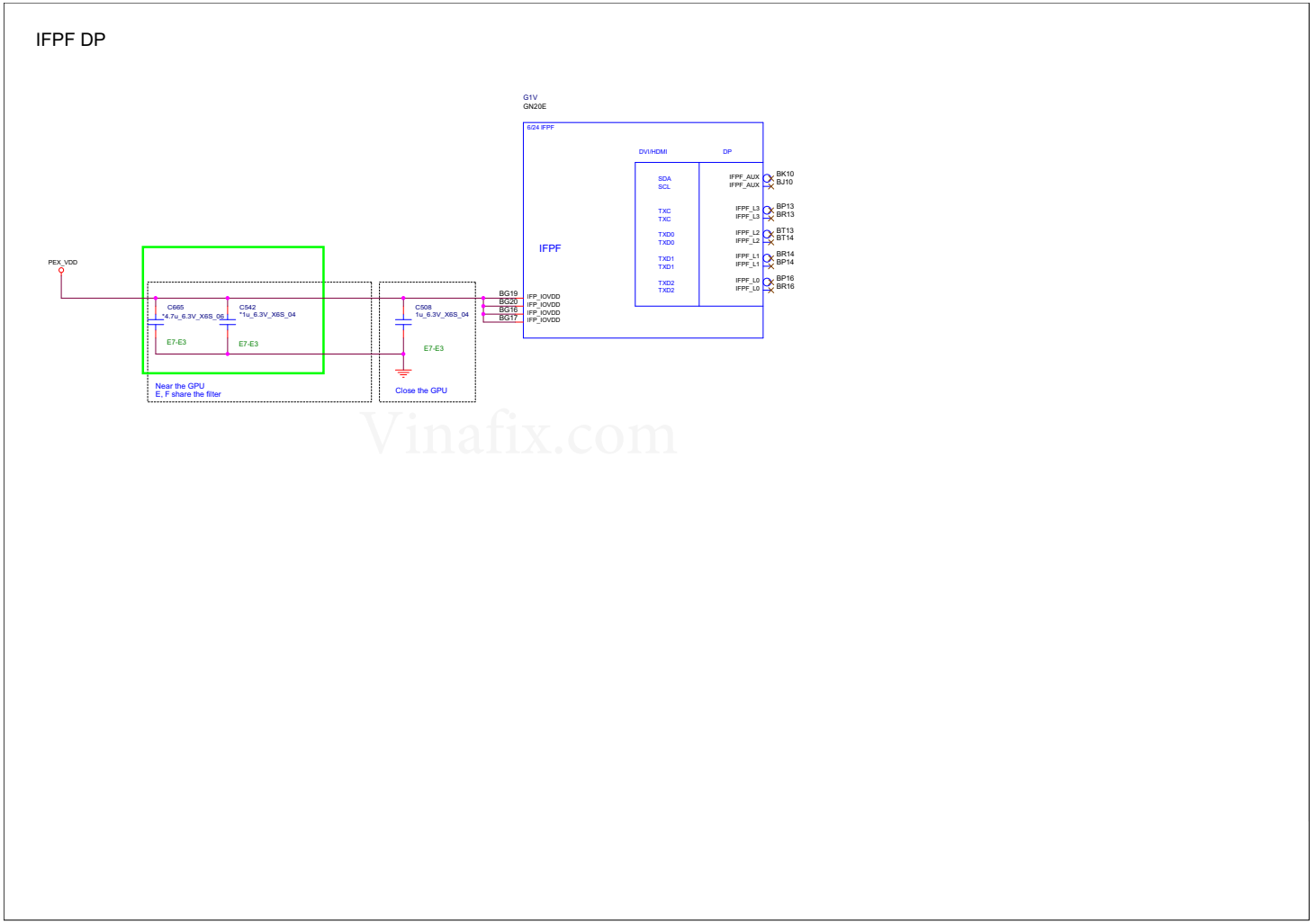
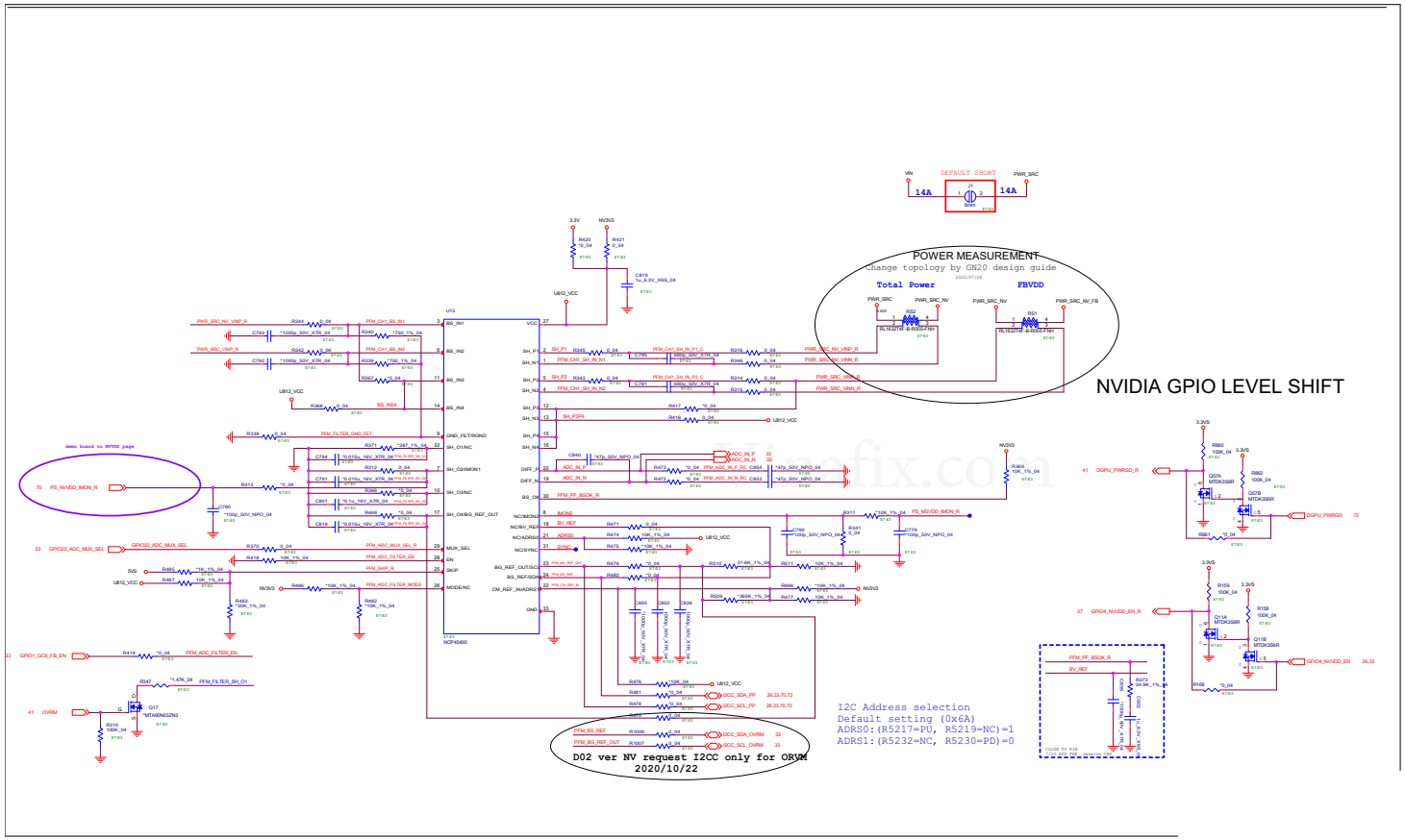
GPU IFPF DP



Output Power Measurement



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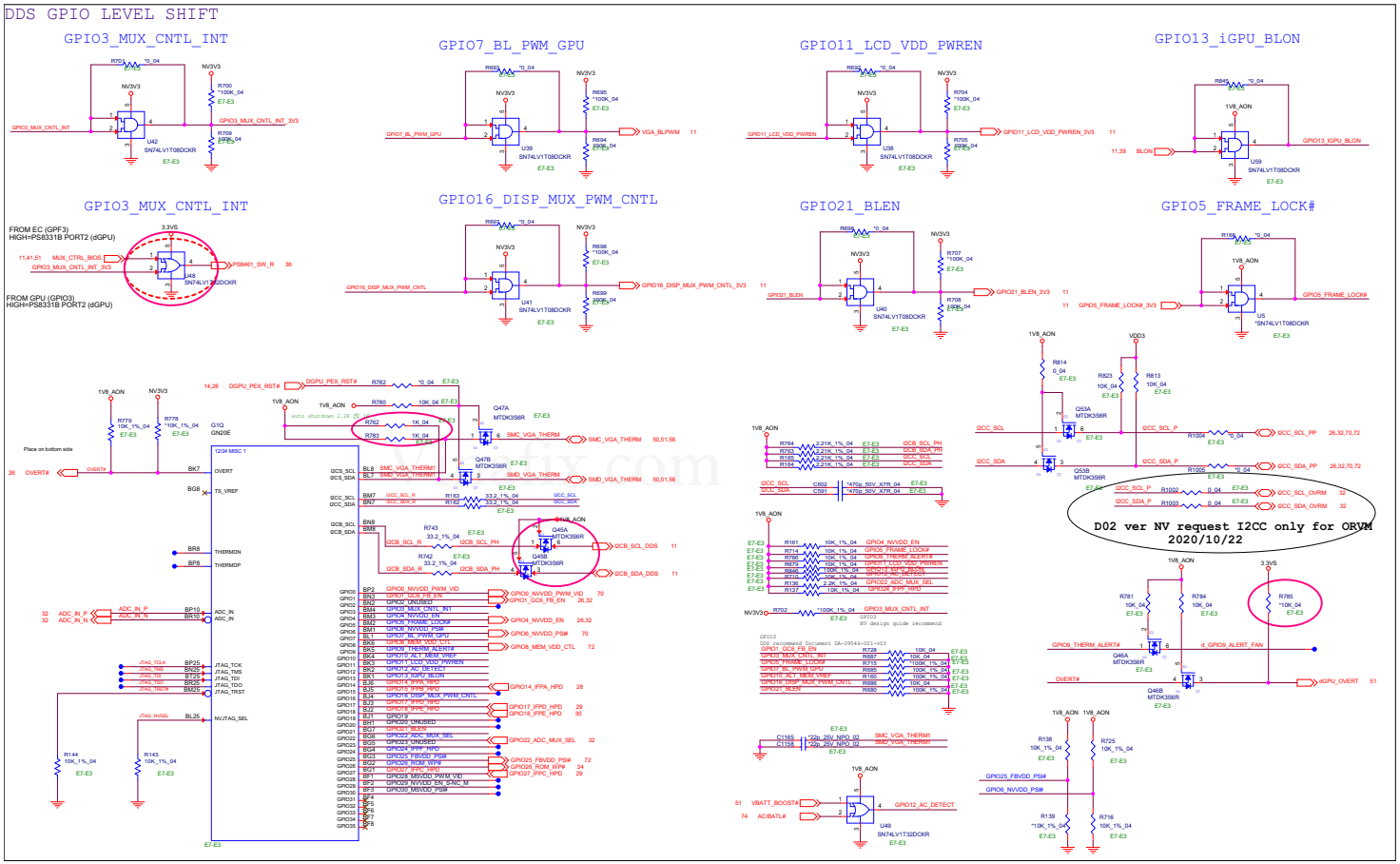
Output Power Measurement

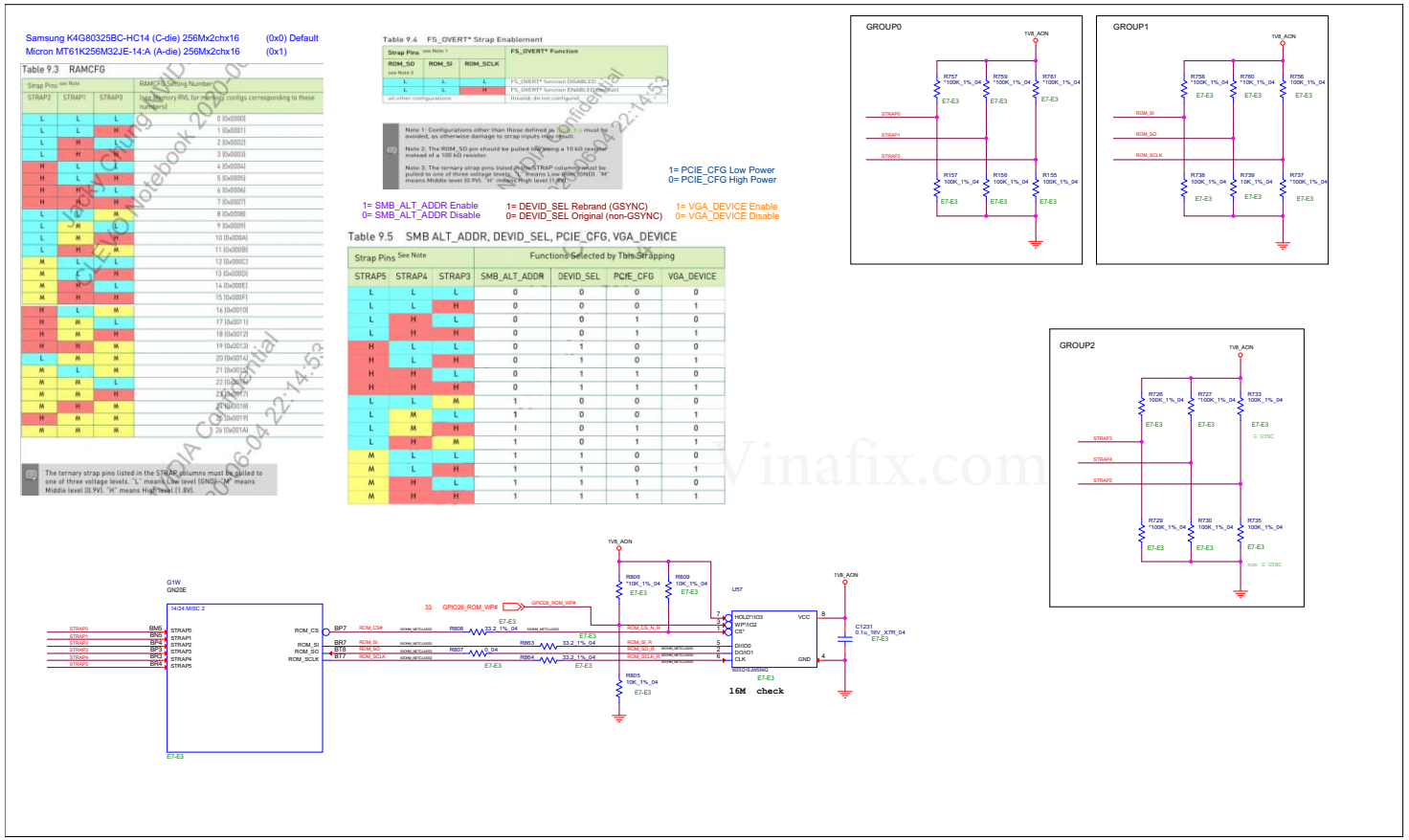
B.Schematic Diagrams

GPU GPIO, Fan, JTAG

Sheet 33 of 81
GPU GPIO, Fan, JTAG



GPU ROM, Straps



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GPU ROM, Straps

GPU XTAL

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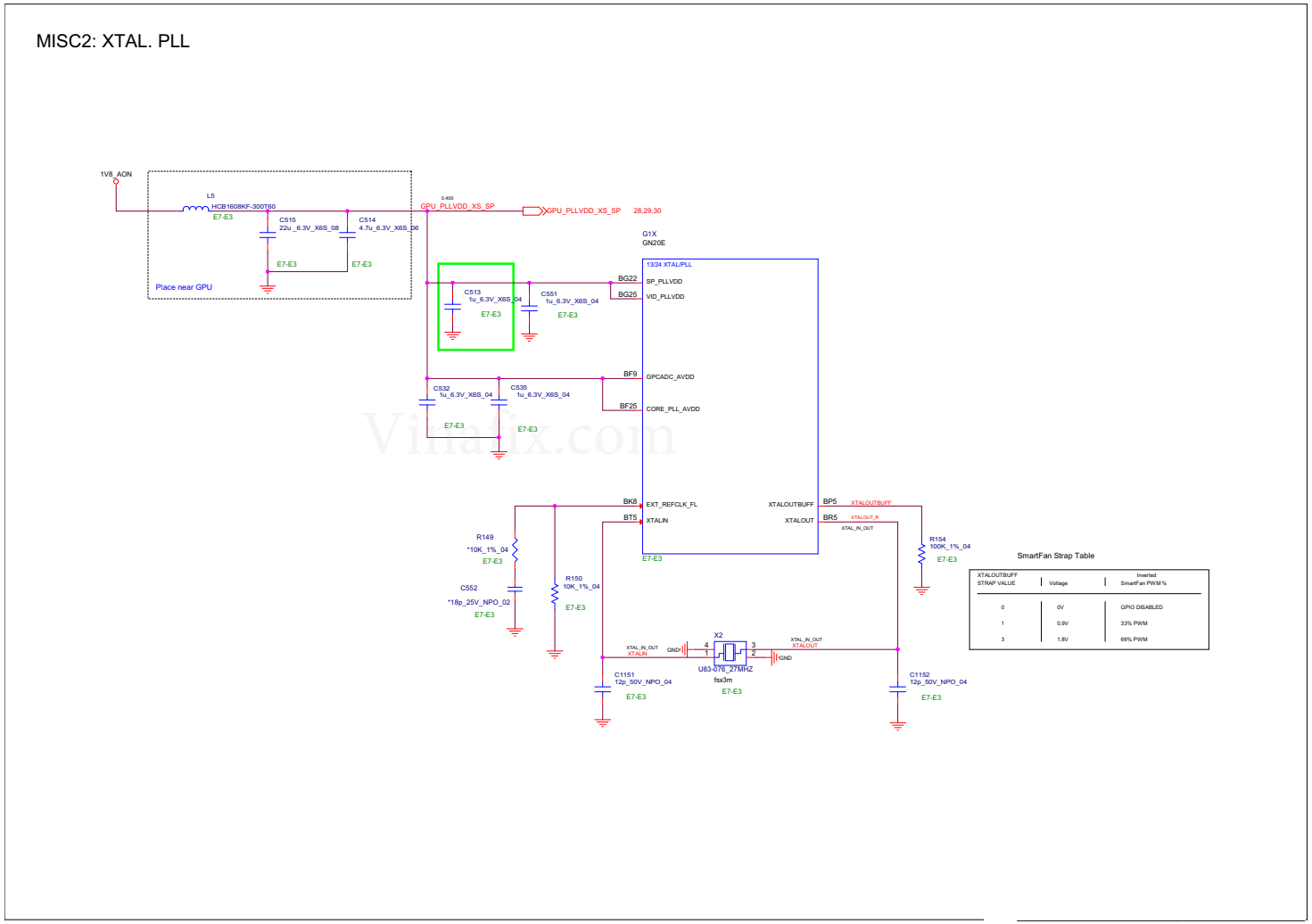
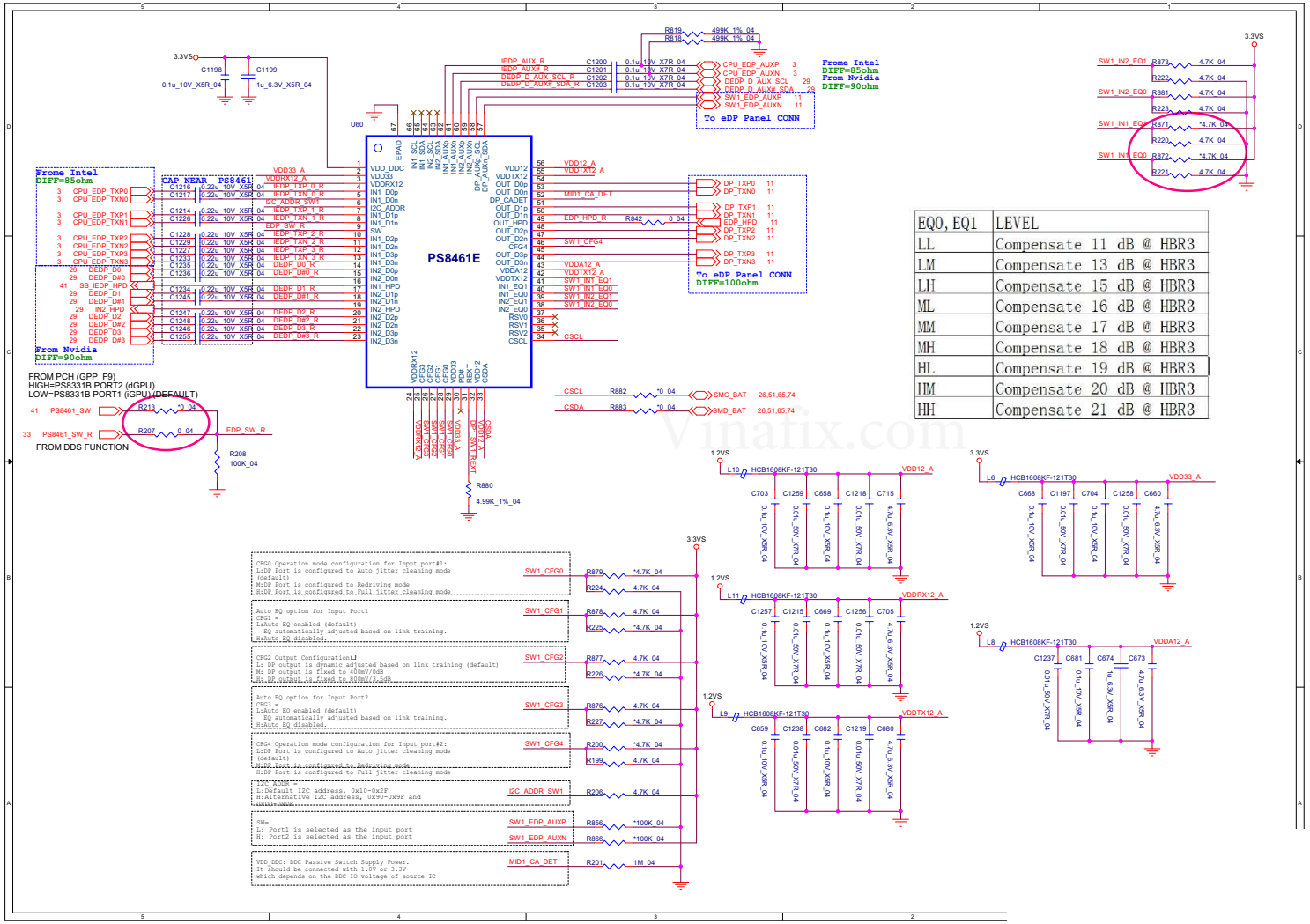
GPU XTAL



eDP 2-to-1 PS8461 SW



EQ0, EQ1	LEVEL
LL	Compensate 11 dB @ HBR3
LM	Compensate 13 dB @ HBR3
LH	Compensate 15 dB @ HBR3
ML	Compensate 16 dB @ HBR3
MM	Compensate 17 dB @ HBR3
MH	Compensate 18 dB @ HBR3
HL	Compensate 19 dB @ HBR3
HM	Compensate 20 dB @ HBR3
HH	Compensate 21 dB @ HBR3

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eDP 2-to-1 PS8461
SW

PCH 1/9

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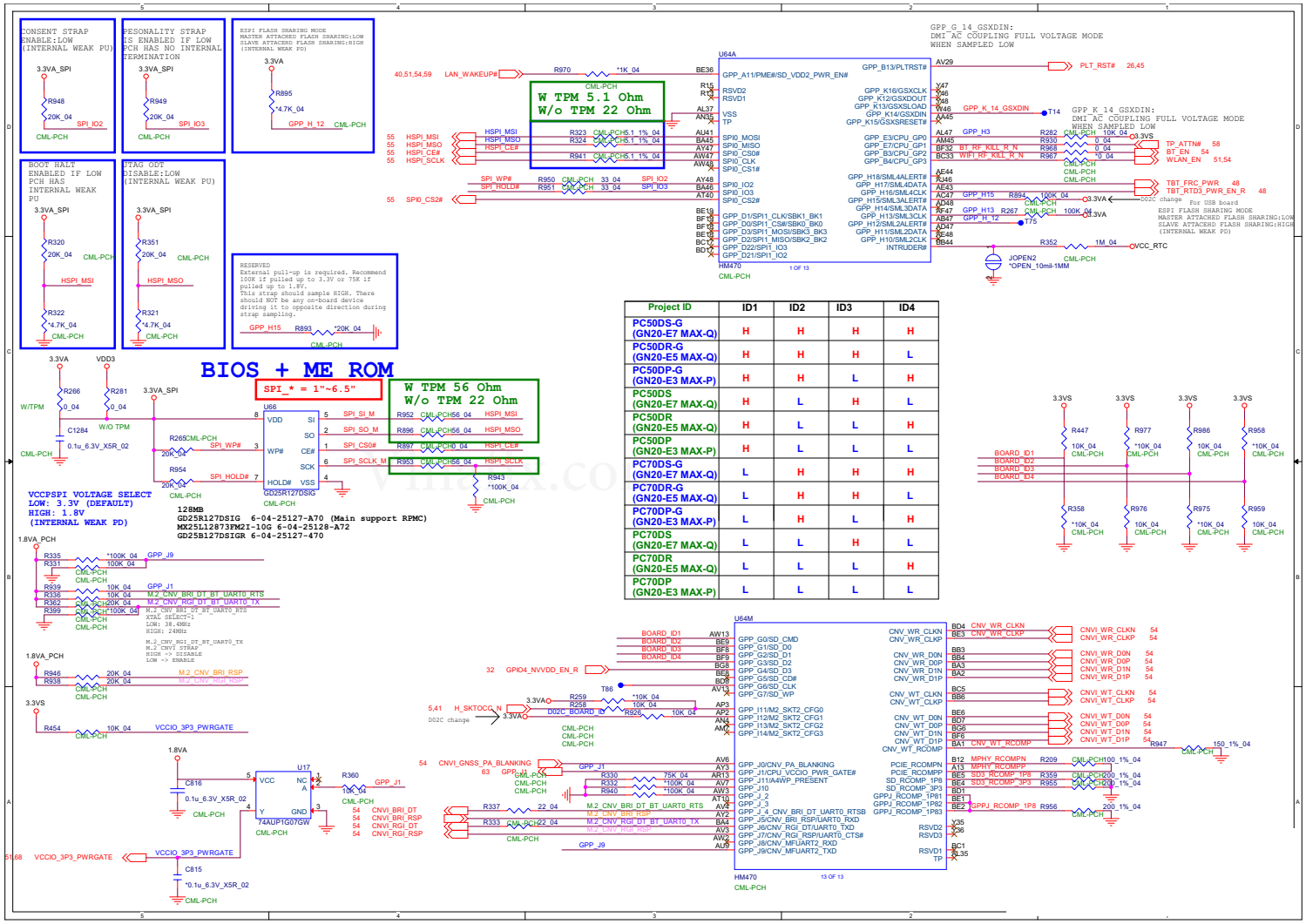
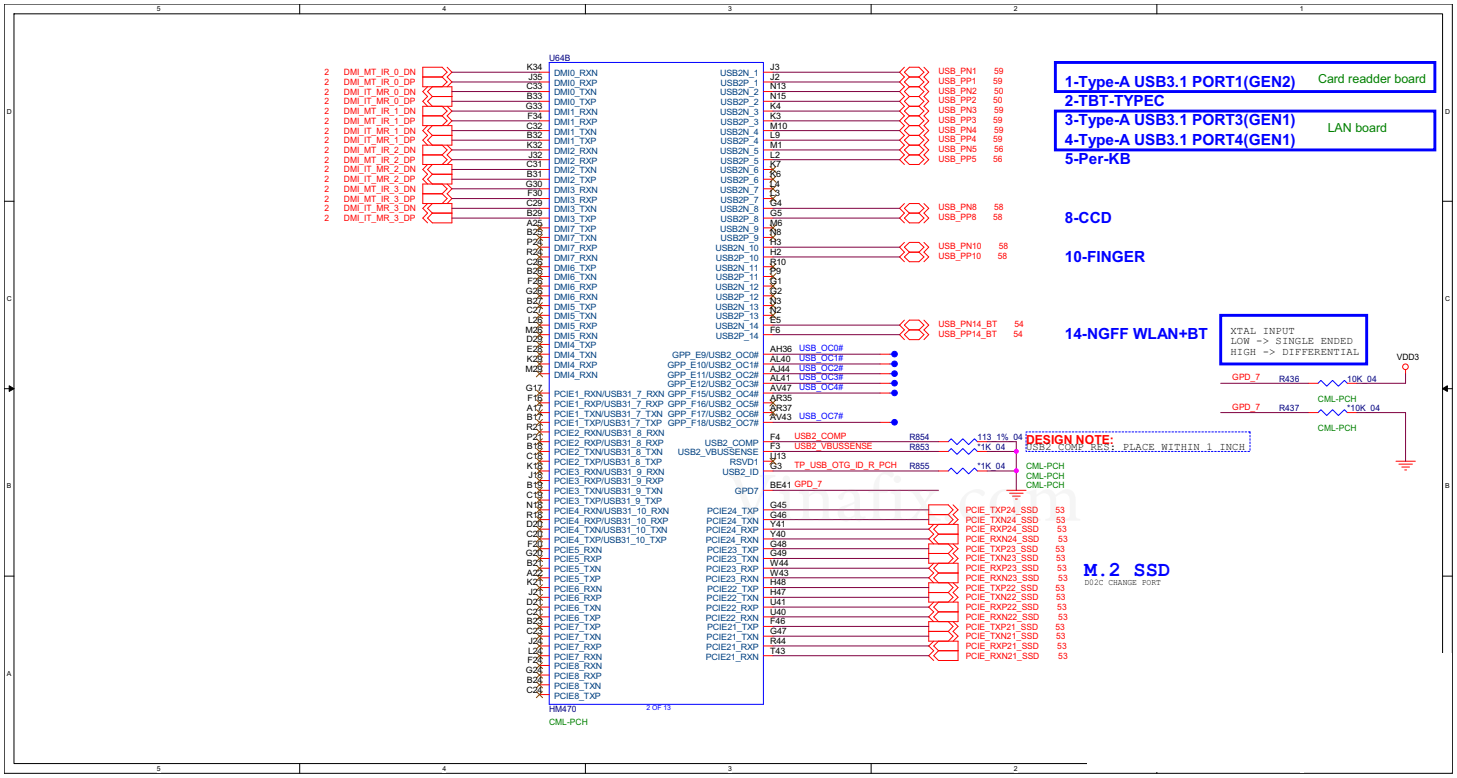
PCH 1/9



Project ID	ID1	ID2	ID3	ID4
PC50DS-G (GN20-E7 MAX-Q)	H	H	H	H
PC50DR-G (GN20-E5 MAX-Q)	H	H	H	L
PC50DP-G (GN20-E3 MAX-P)	H	H	L	H
PC50DS (GN20-E7 MAX-Q)	H	L	H	L
PC50DR (GN20-E5 MAX-Q)	H	L	L	H
PC50DP (GN20-E3 MAX-P)	H	L	L	L
PC70DS-G (GN20-E7 MAX-Q)	L	H	H	H
PC70DR-G (GN20-E5 MAX-Q)	L	H	H	L
PC70DP-G (GN20-E3 MAX-P)	L	H	L	H
PC70DS (GN20-E7 MAX-Q)	L	L	H	L
PC70DR (GN20-E5 MAX-Q)	L	L	L	H
PC70DP (GN20-E3 MAX-P)	L	L	L	L

PCH 2/9



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PCH 2/9

PCH 3/9

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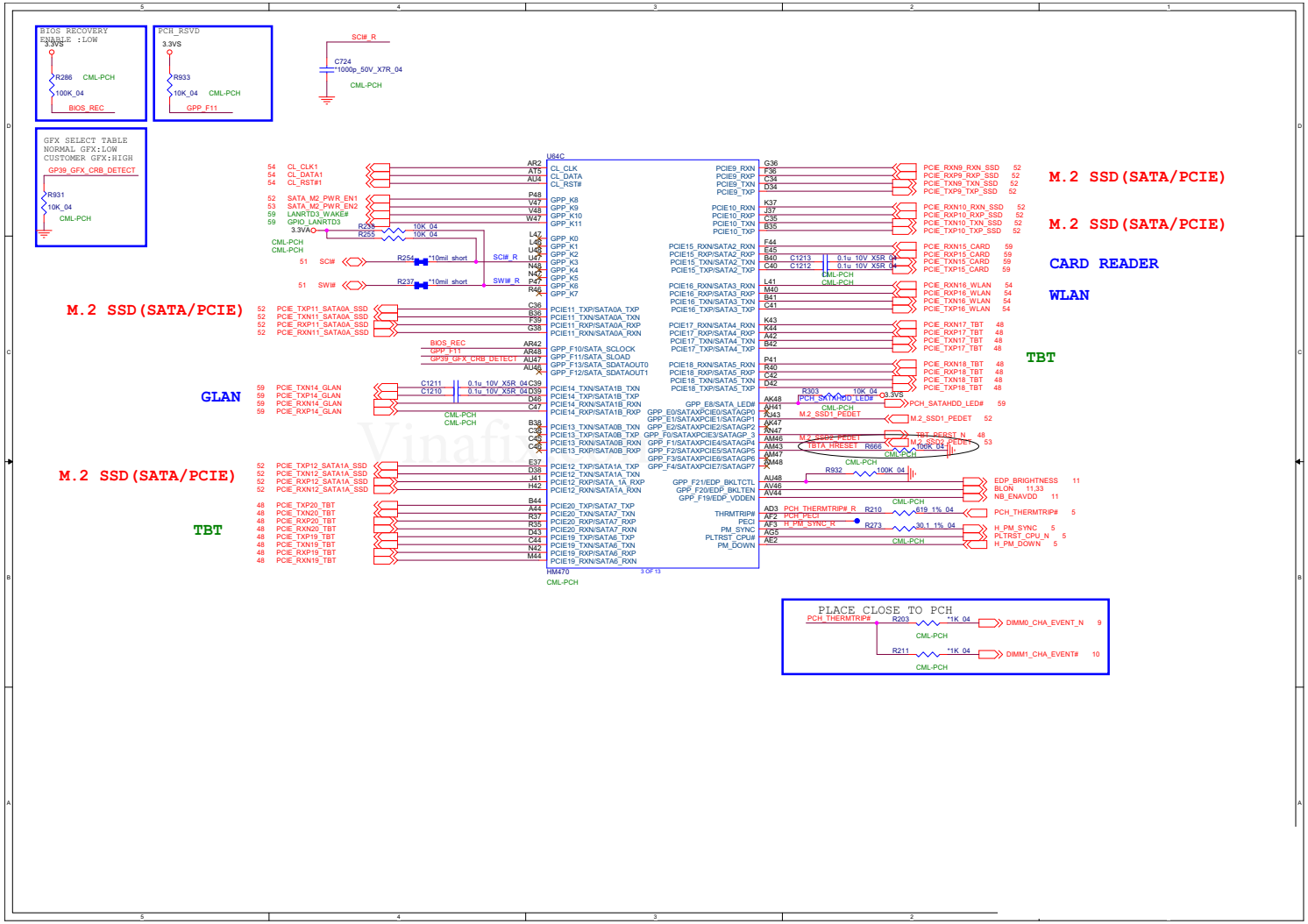
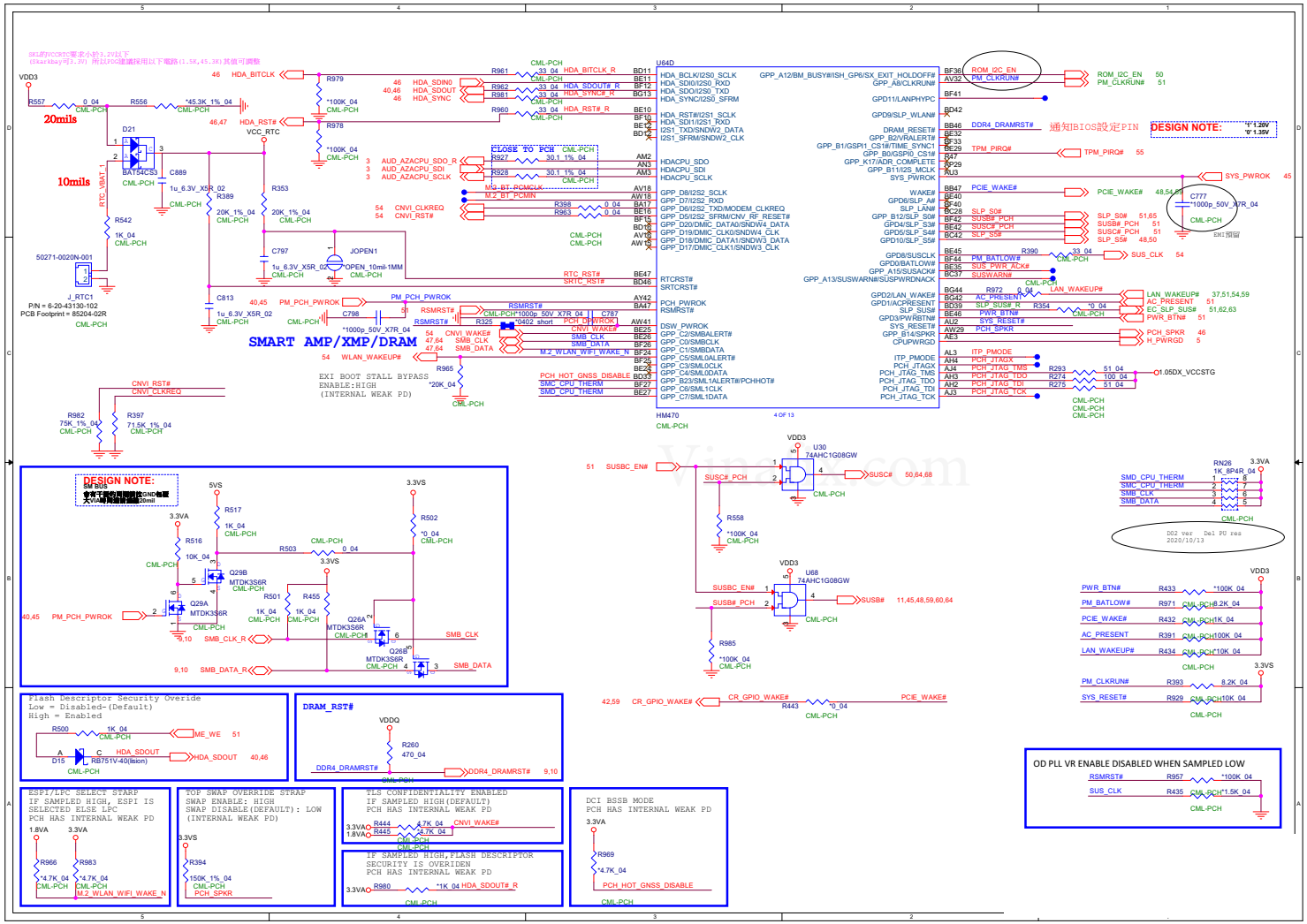
PCH 3/9



PCH 4/9



Sheet 40 of 81
PCH 4/9

PCH 5/9

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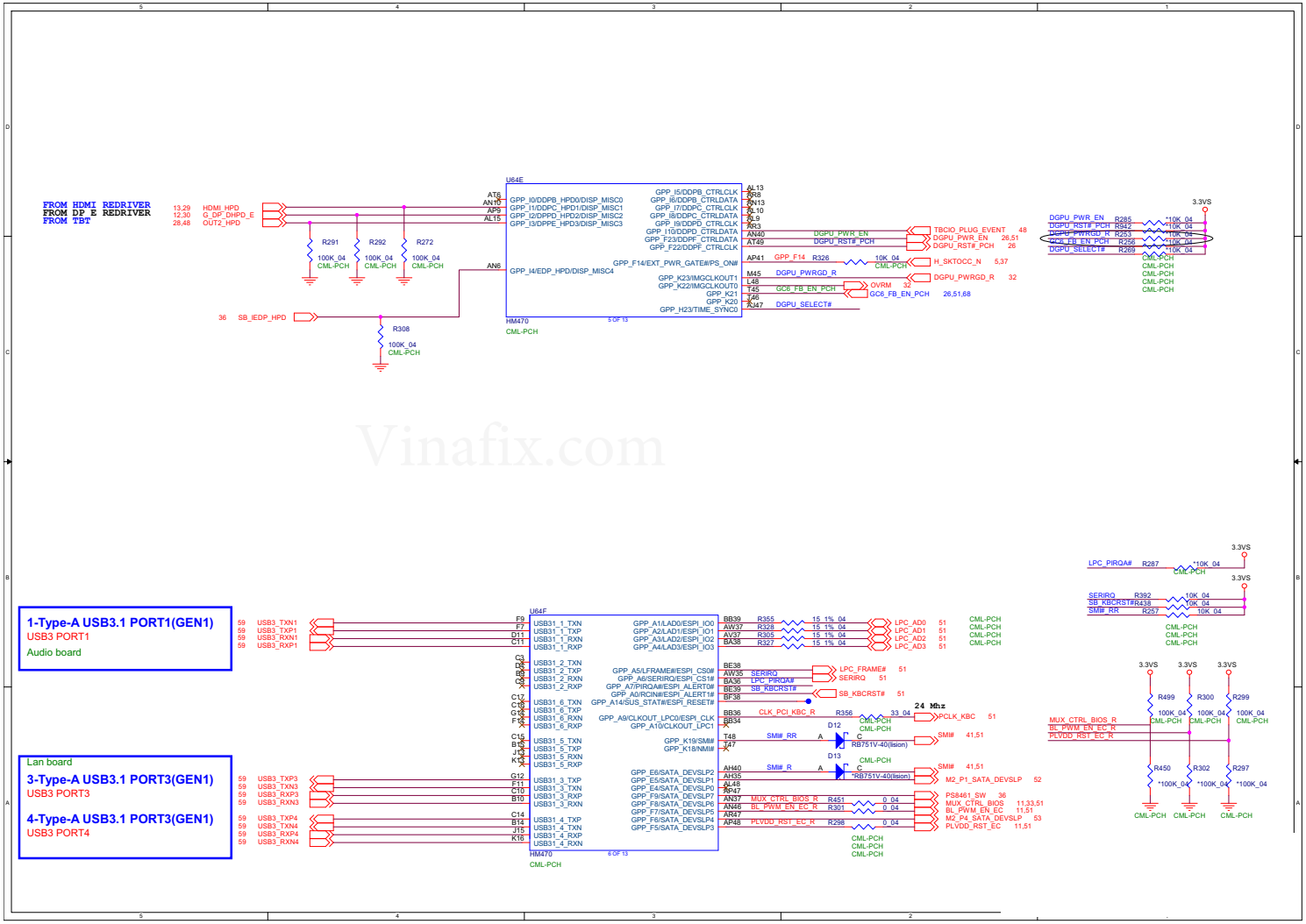
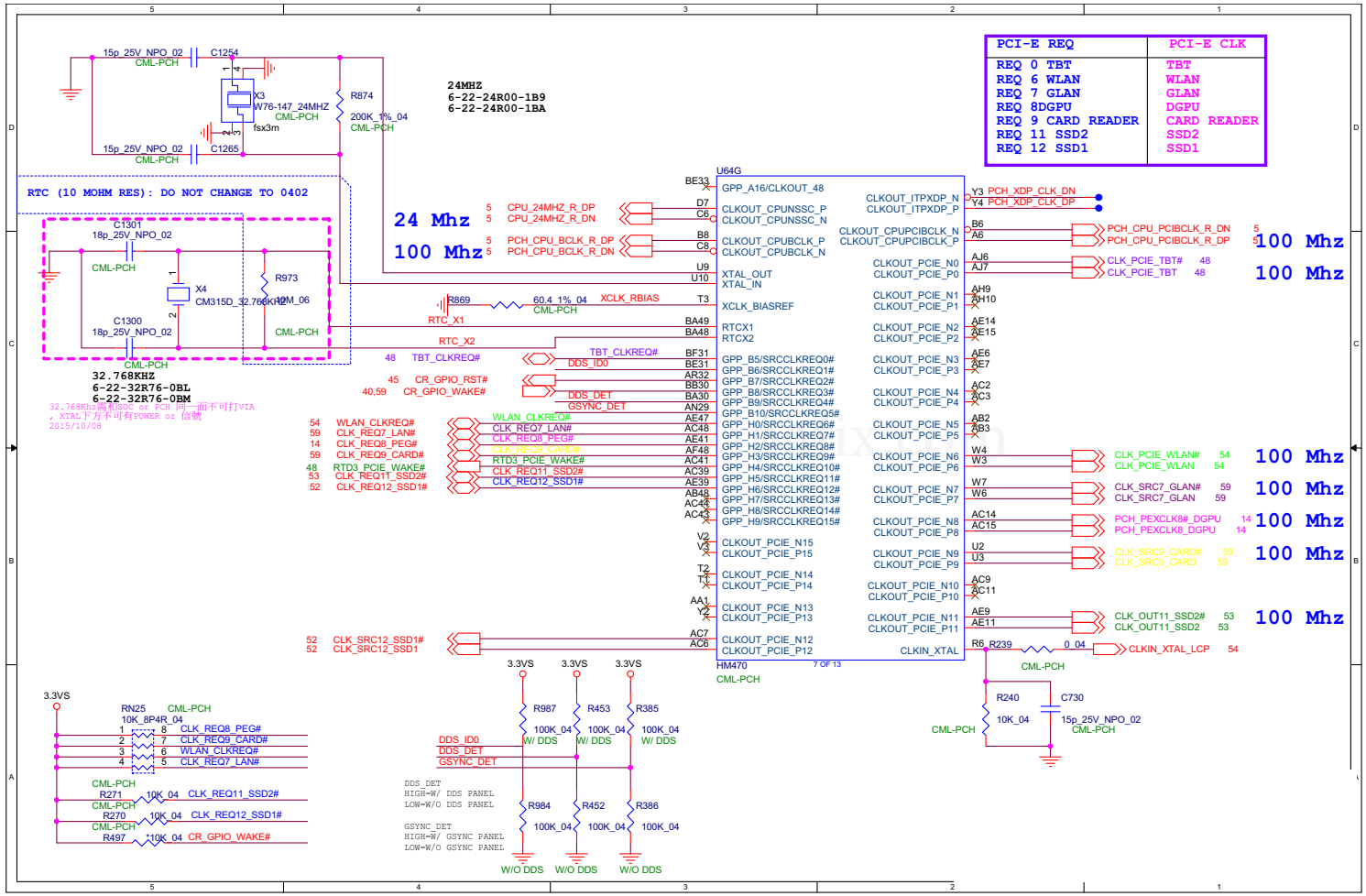
PCH 5/9



PCH 6/9



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PCH 6/9

PCH 7/9

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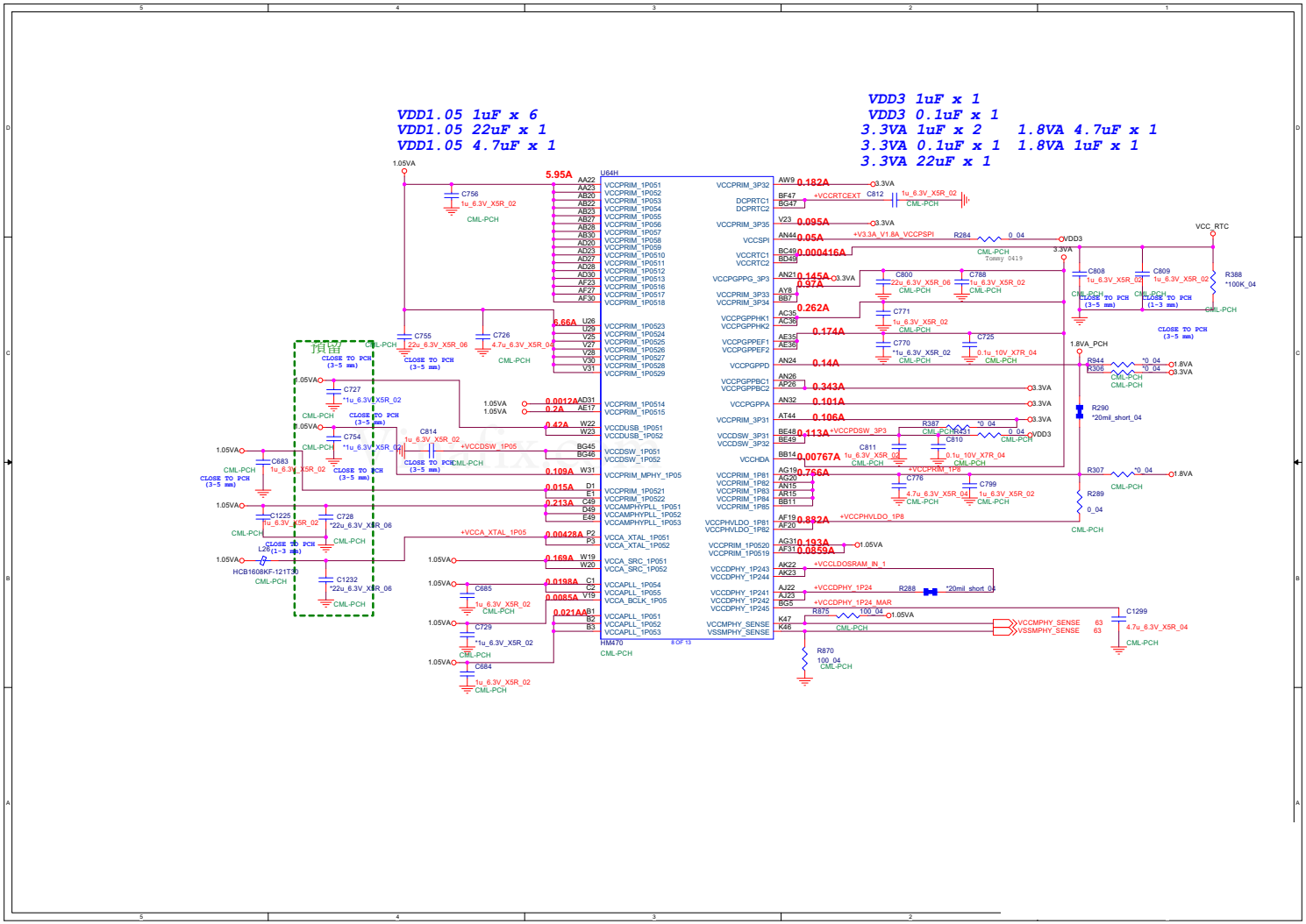
PCH 7/9



PCH 8/9

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PCH 8/9

PCH 9/9

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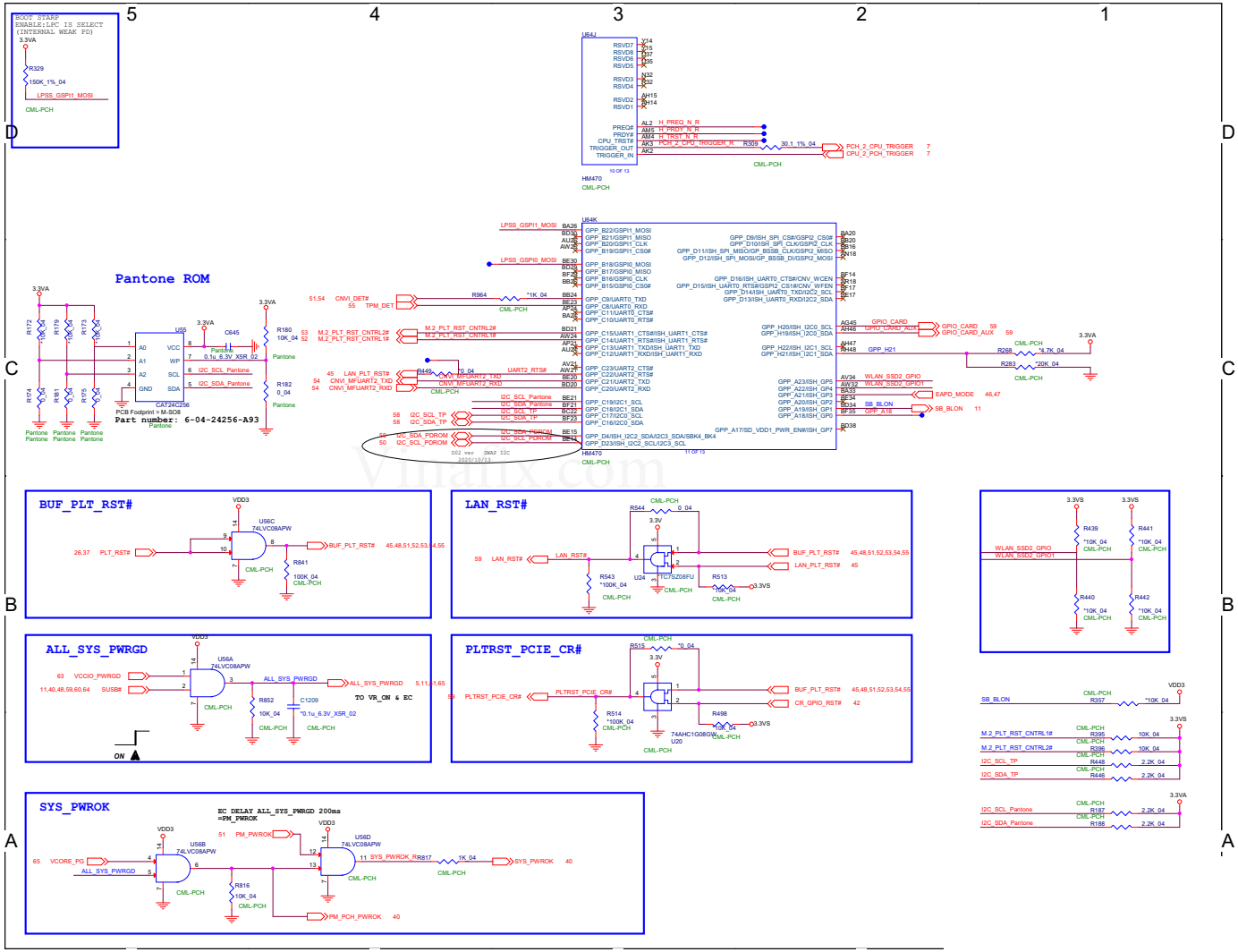
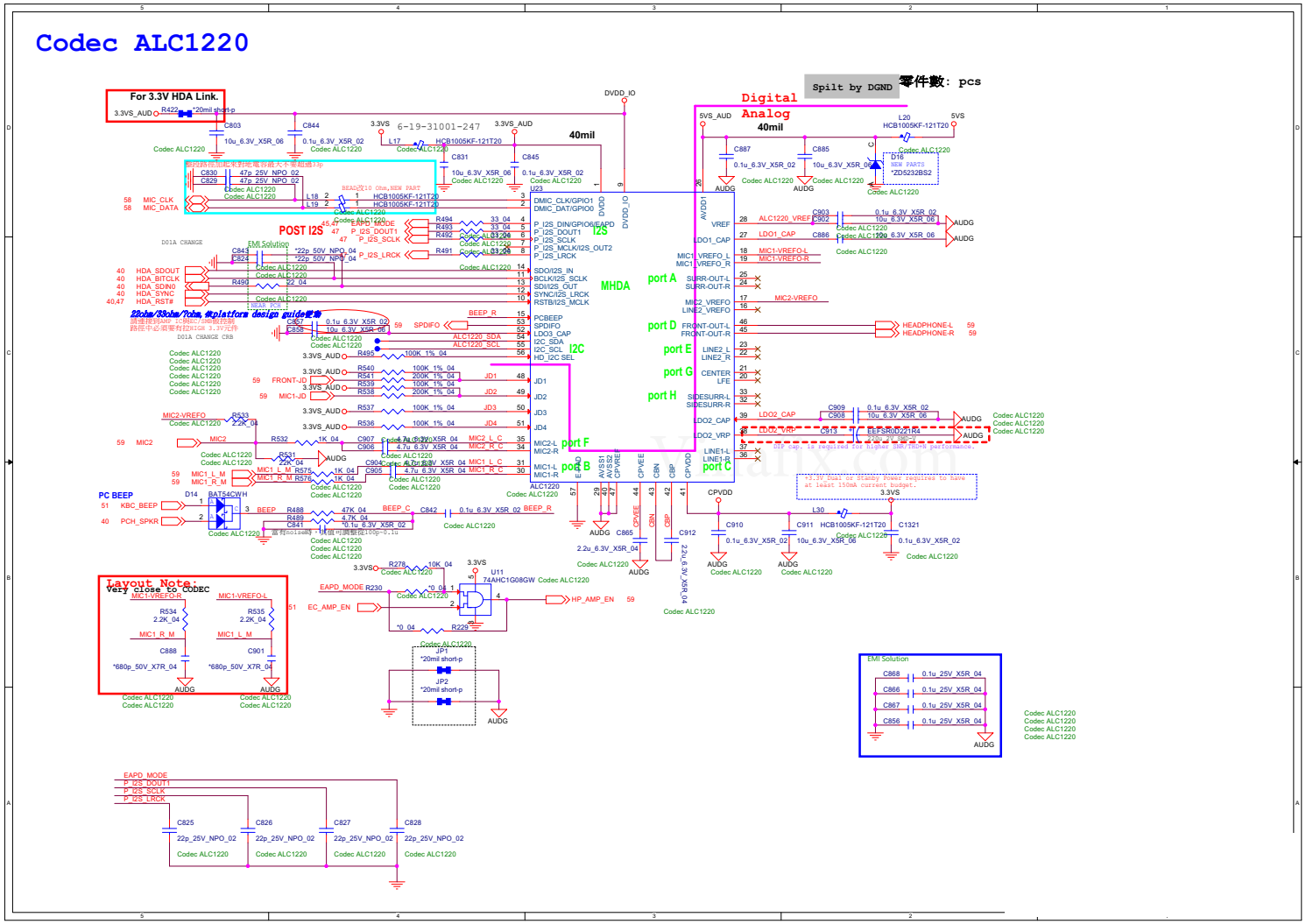
PCH 9/9



Audio Codec



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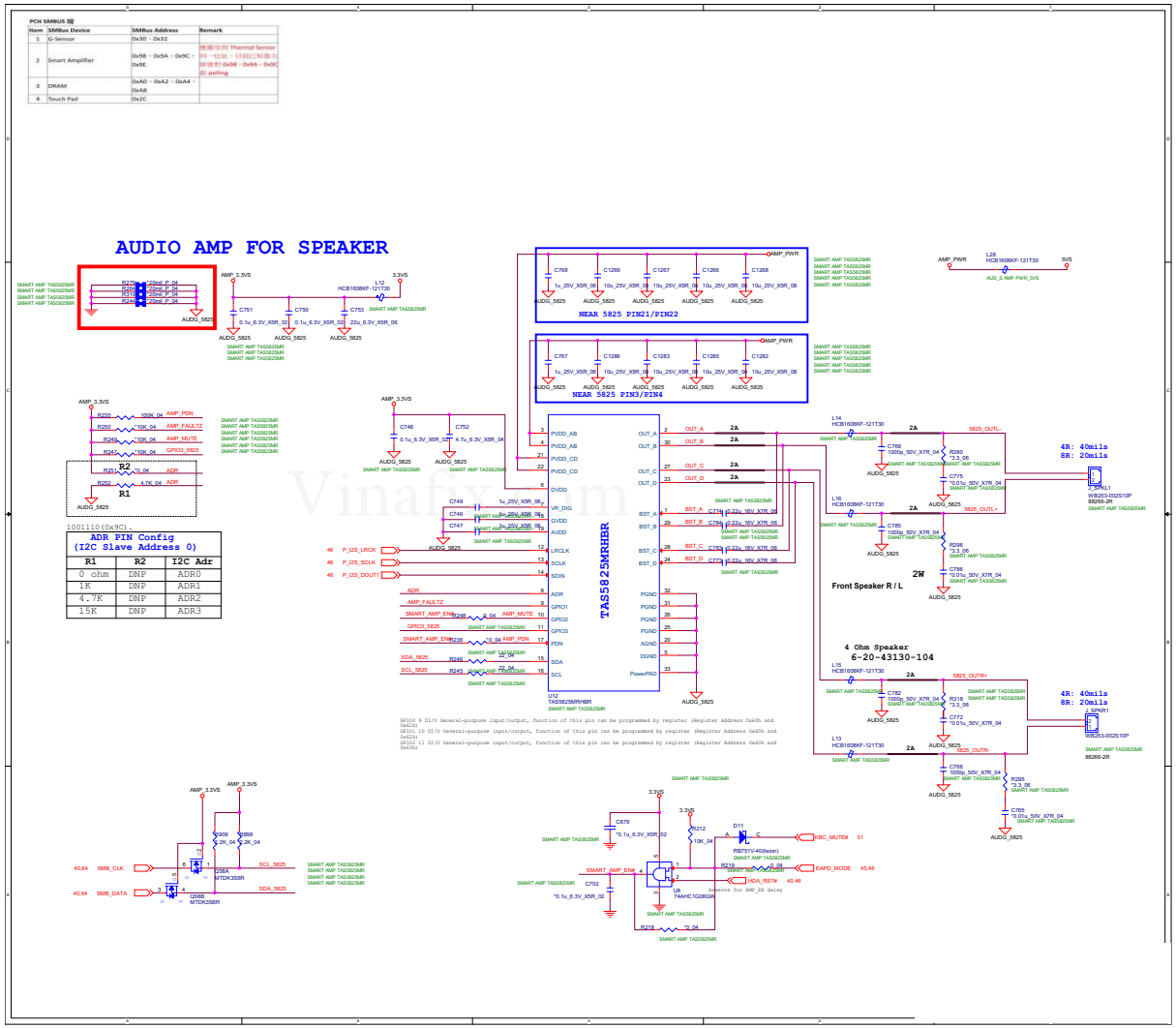
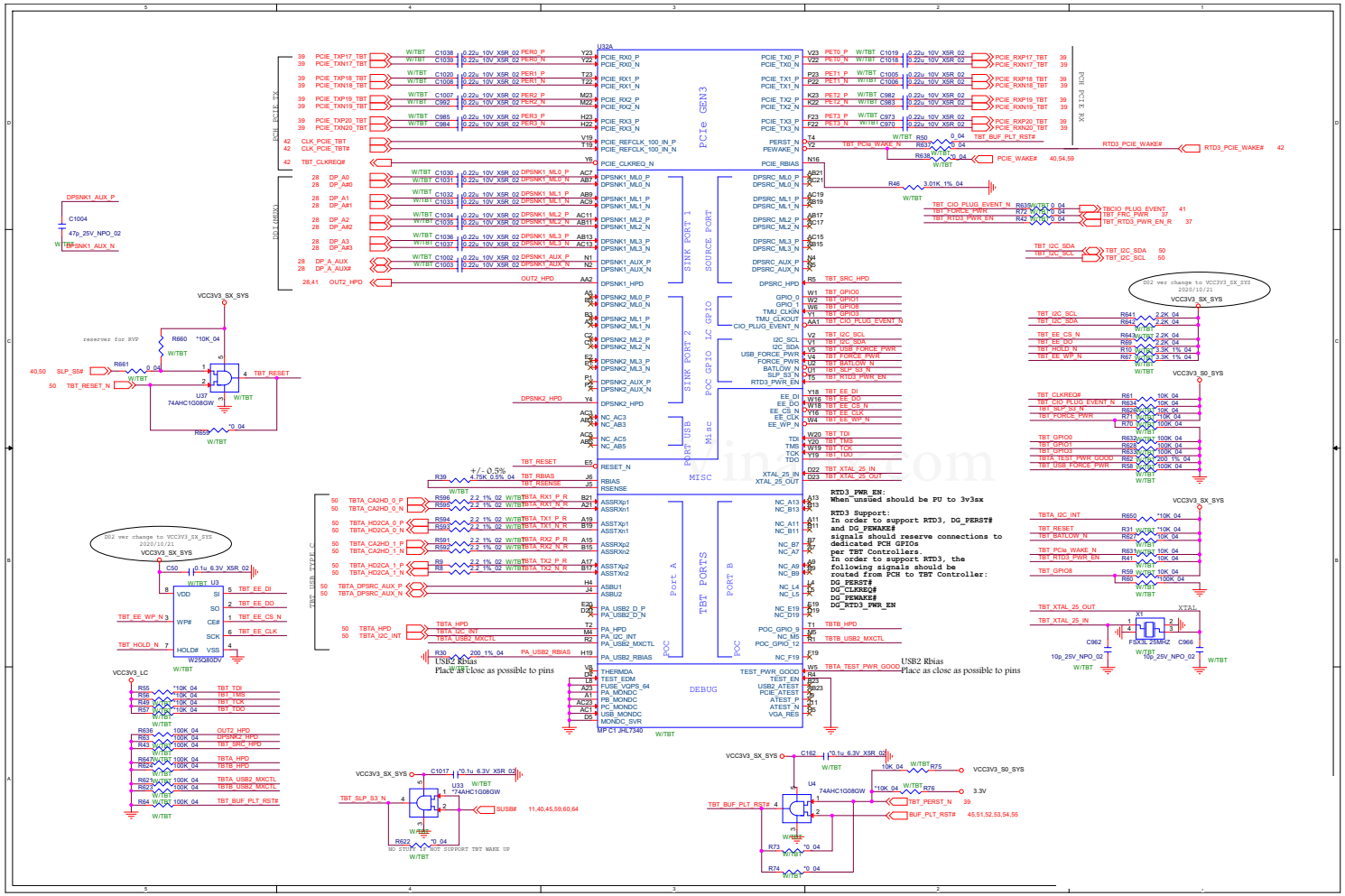
Audio Codec

Smart AMP

Sheet 47 of 81
Smart AMP



TBT TR



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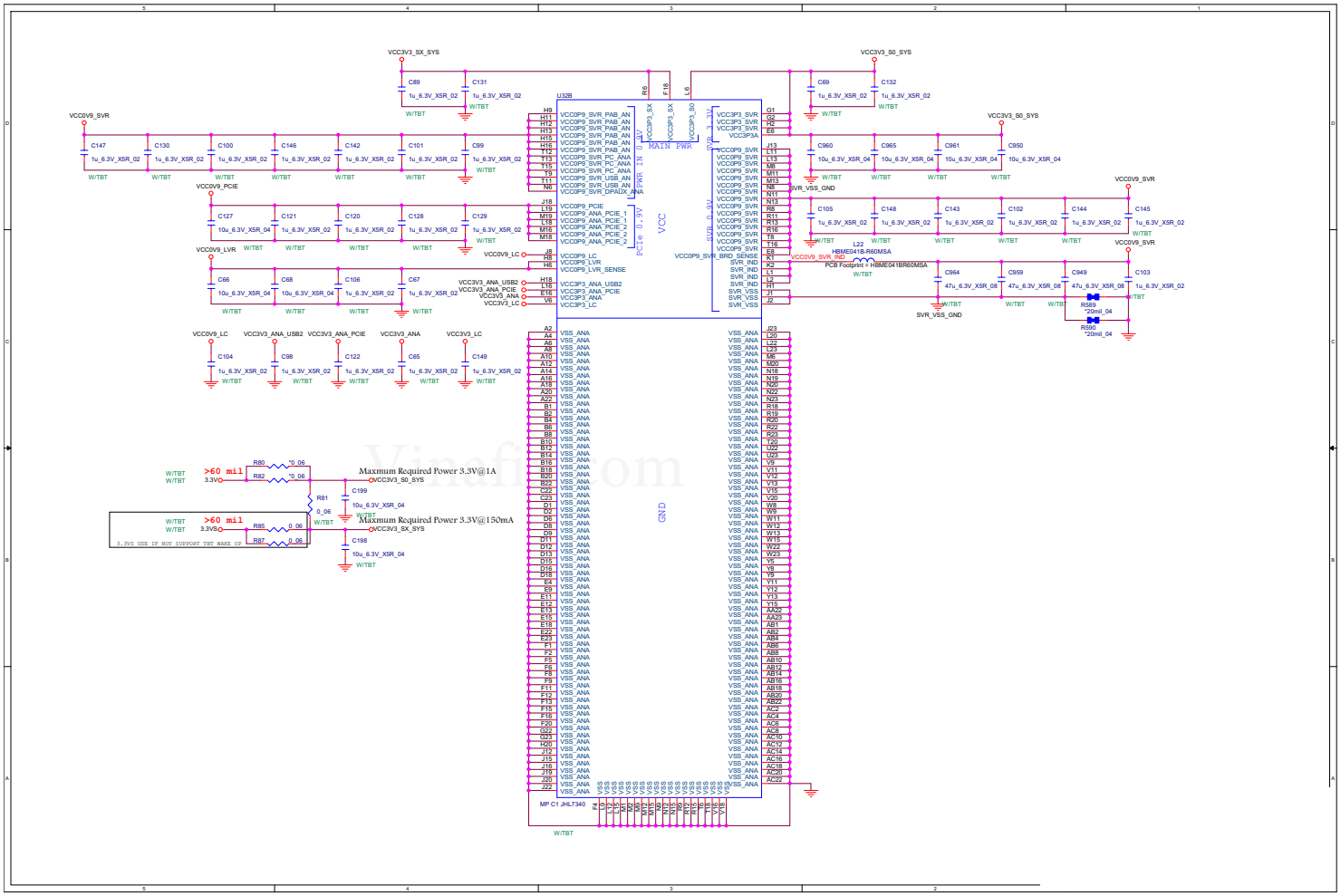
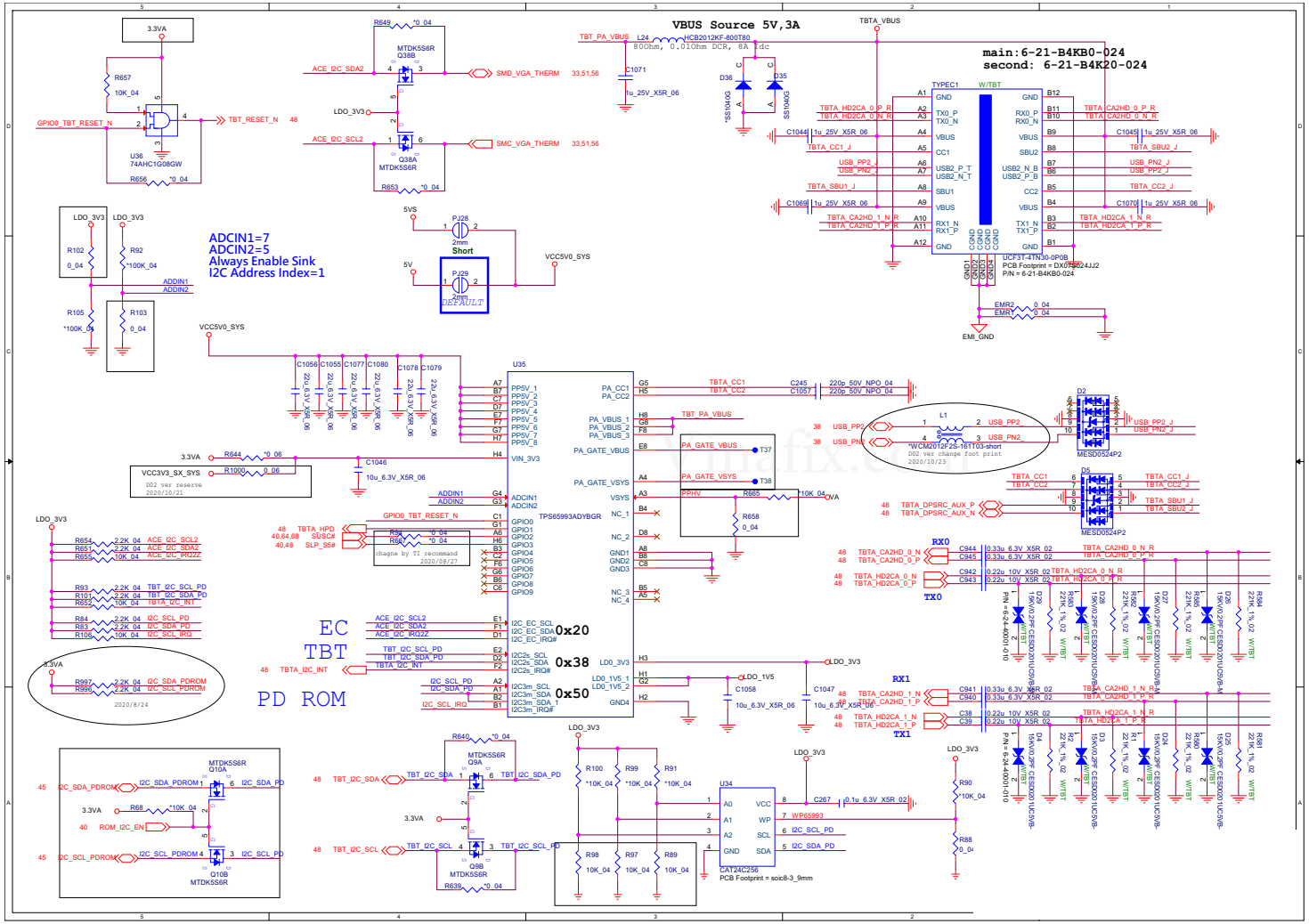
TBT TR

TBT TR Power

Sheet 49 of 81
TBT TR Power



TPS65987D


VBUS Source 5V,3A
main:6-21-B4KB0-024
second: 6-21-B4K20-024
ADCIN1=7
ADCIN2=5
Always Enable Sink
I2C Address Index=1
TPS65993ADYBGR
EC
TBT
PD ROM
0x20
0x38
0x50
TYPEC1
W/TBT
RX0
TX0
RX1
TX1

EC ITE5570

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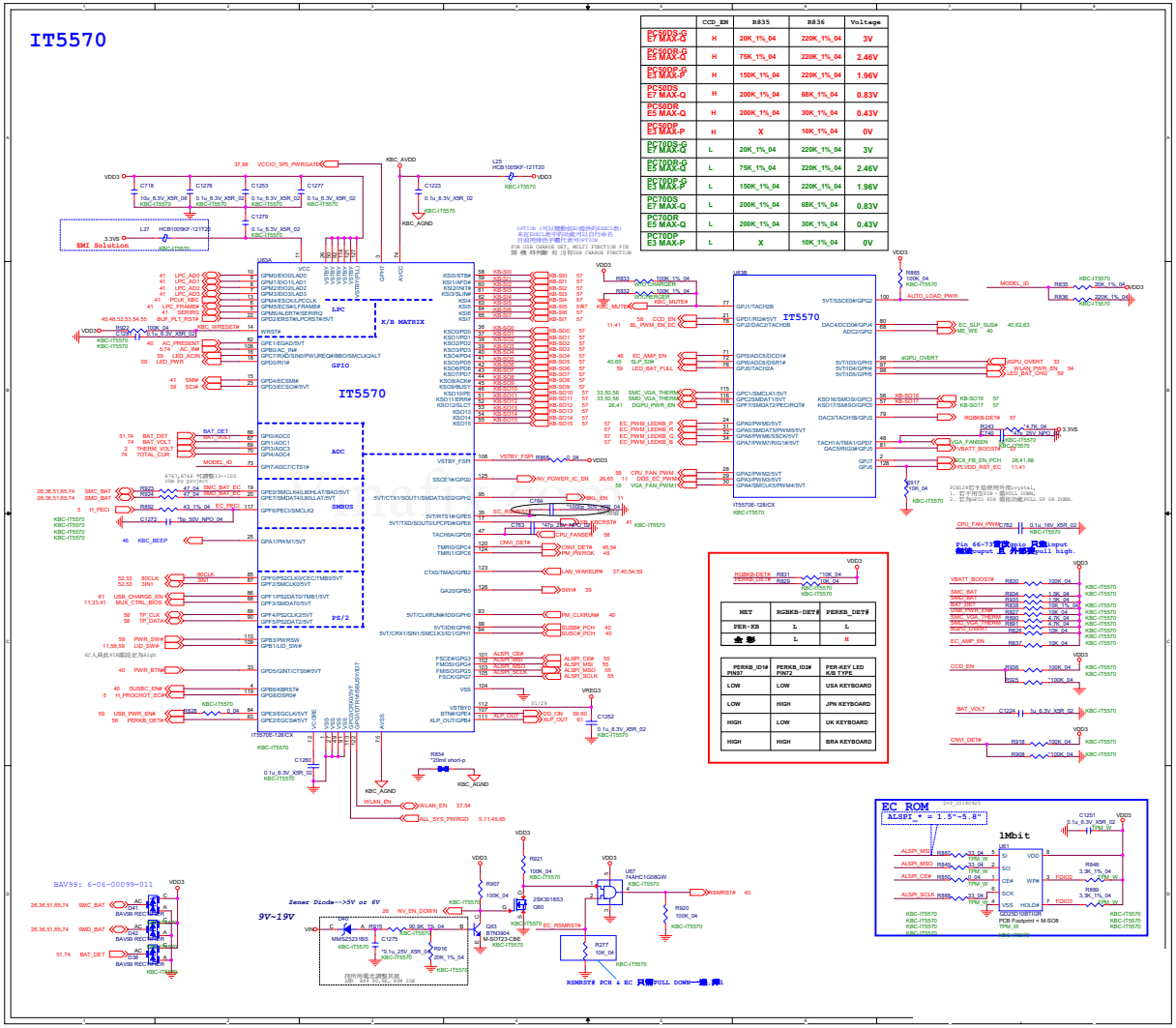
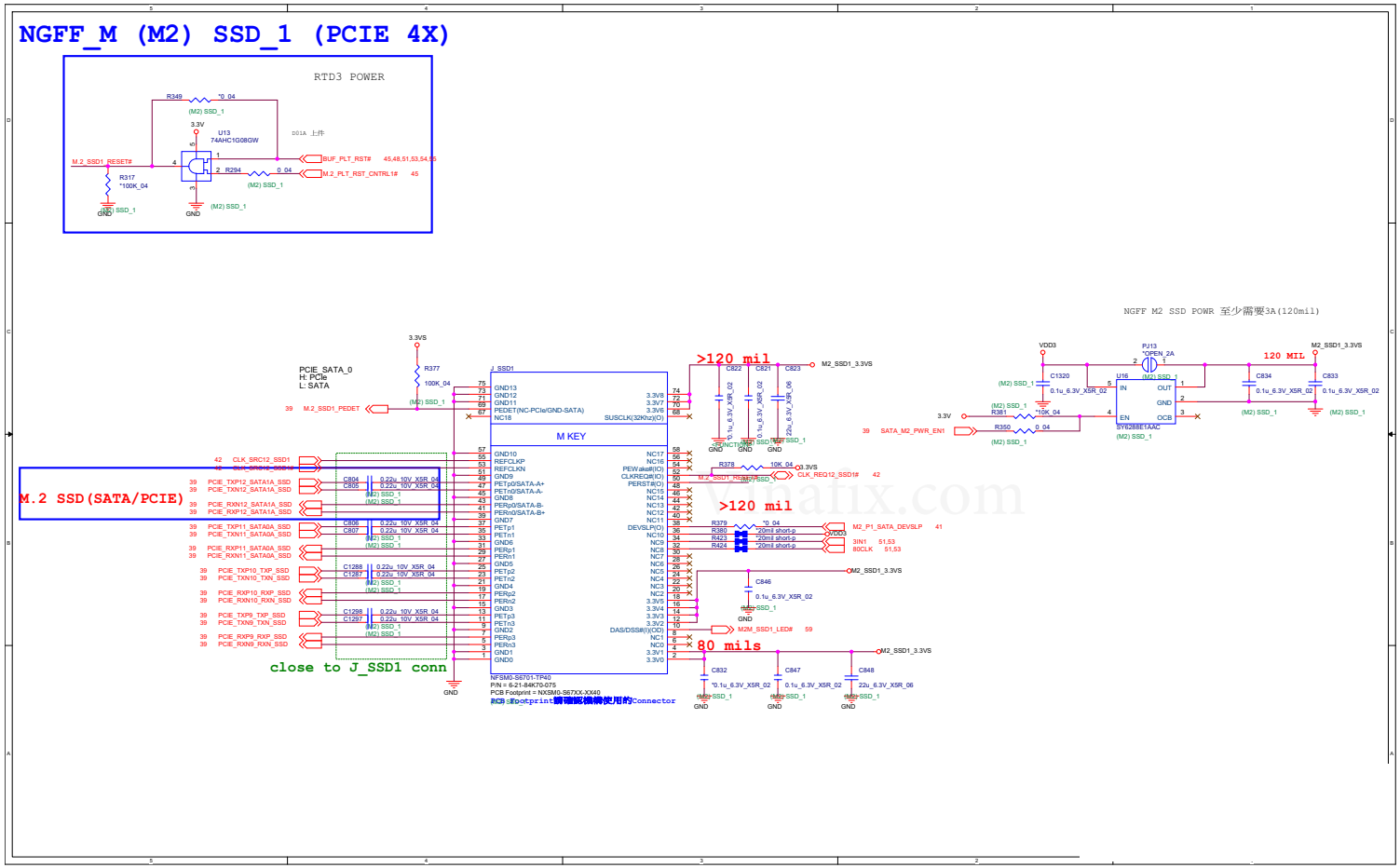
EC ITE5570



M.2 PCIE4X SSD1



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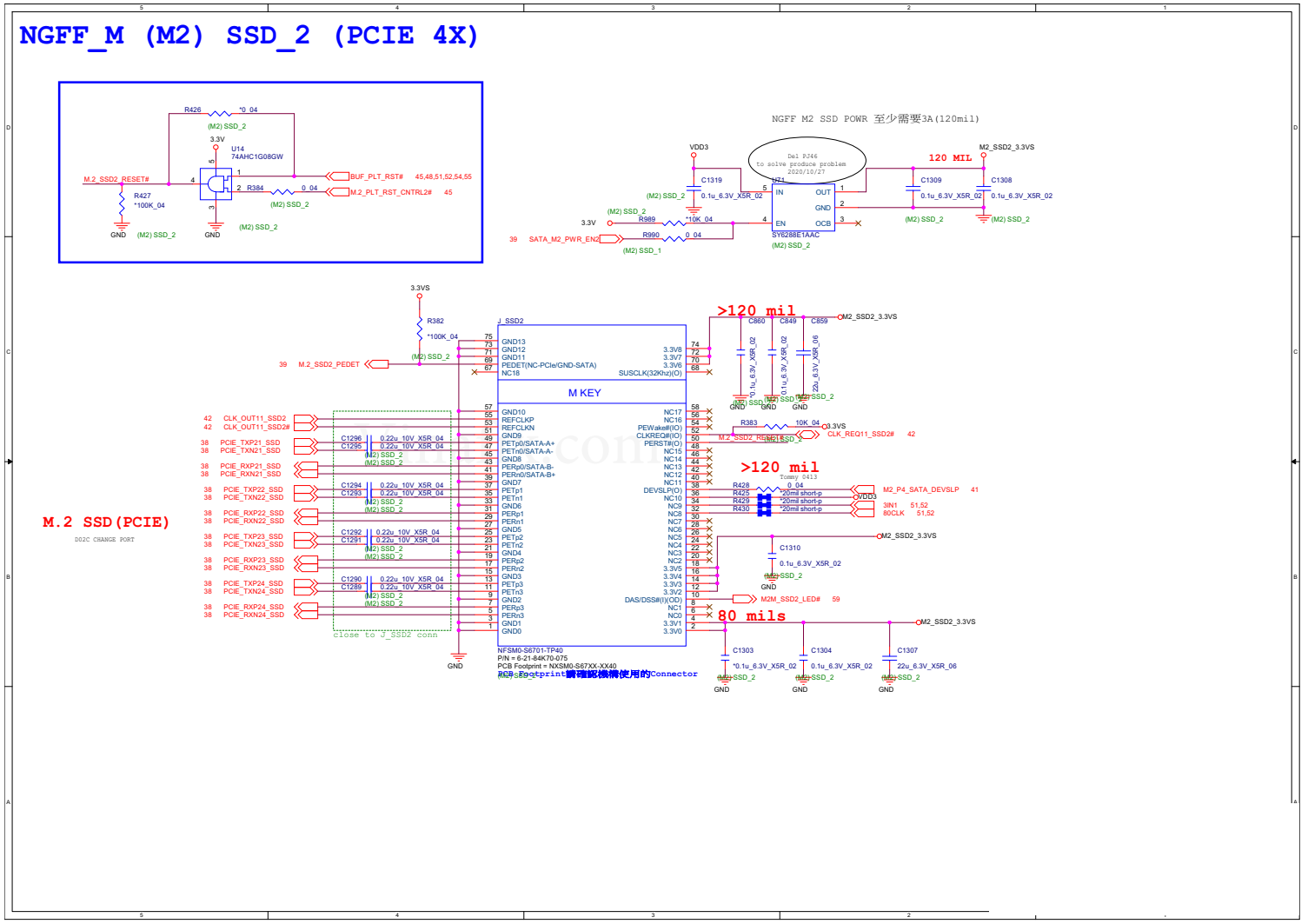
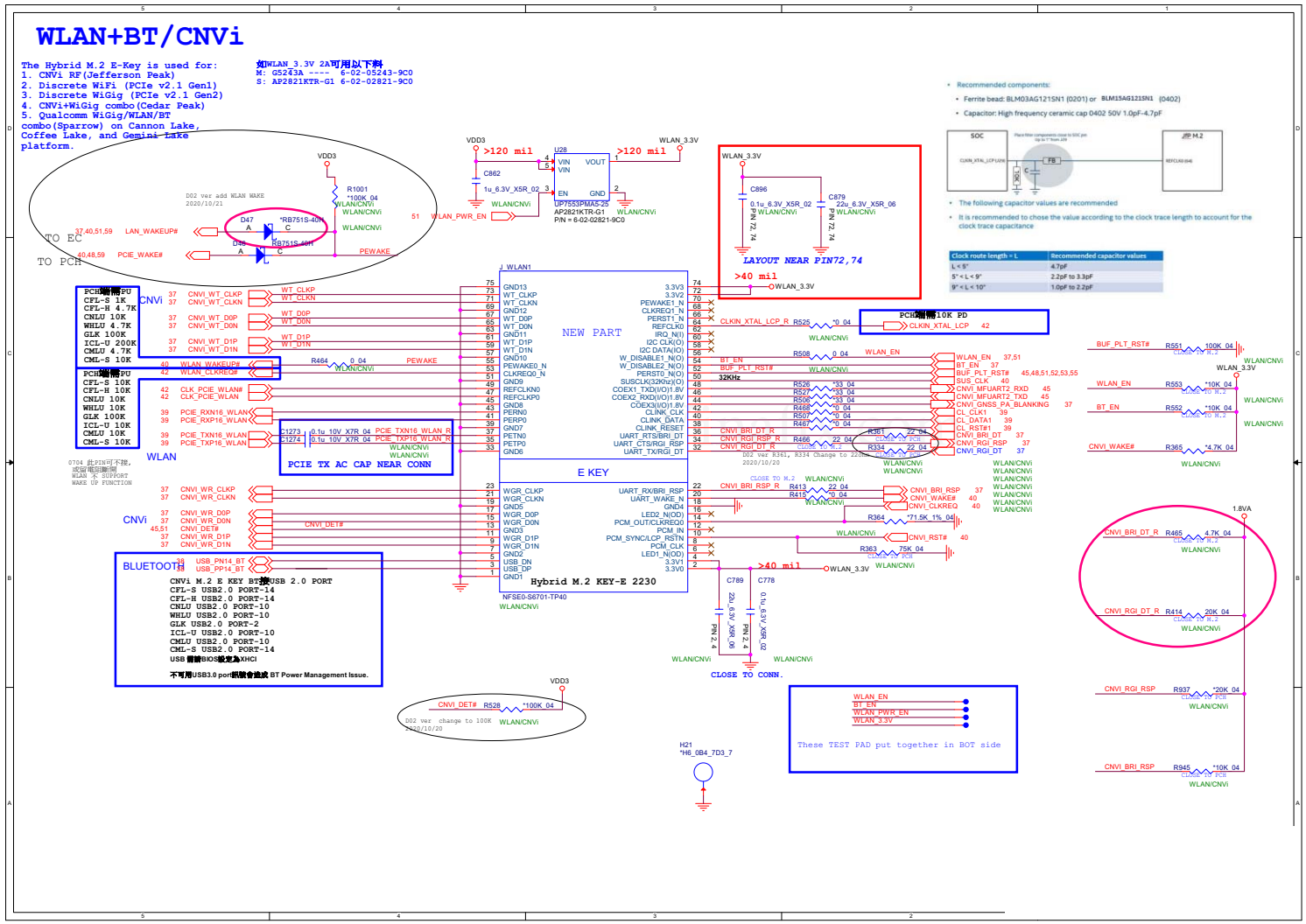
M.2 PCIE4X SSD1

M.2 PCIE4X SSD2

Sheet 53 of 81
M.2 PCIE4X SSD2



M.2 WLAN+BT



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M.2 WLAN+BT

TPM, Screw

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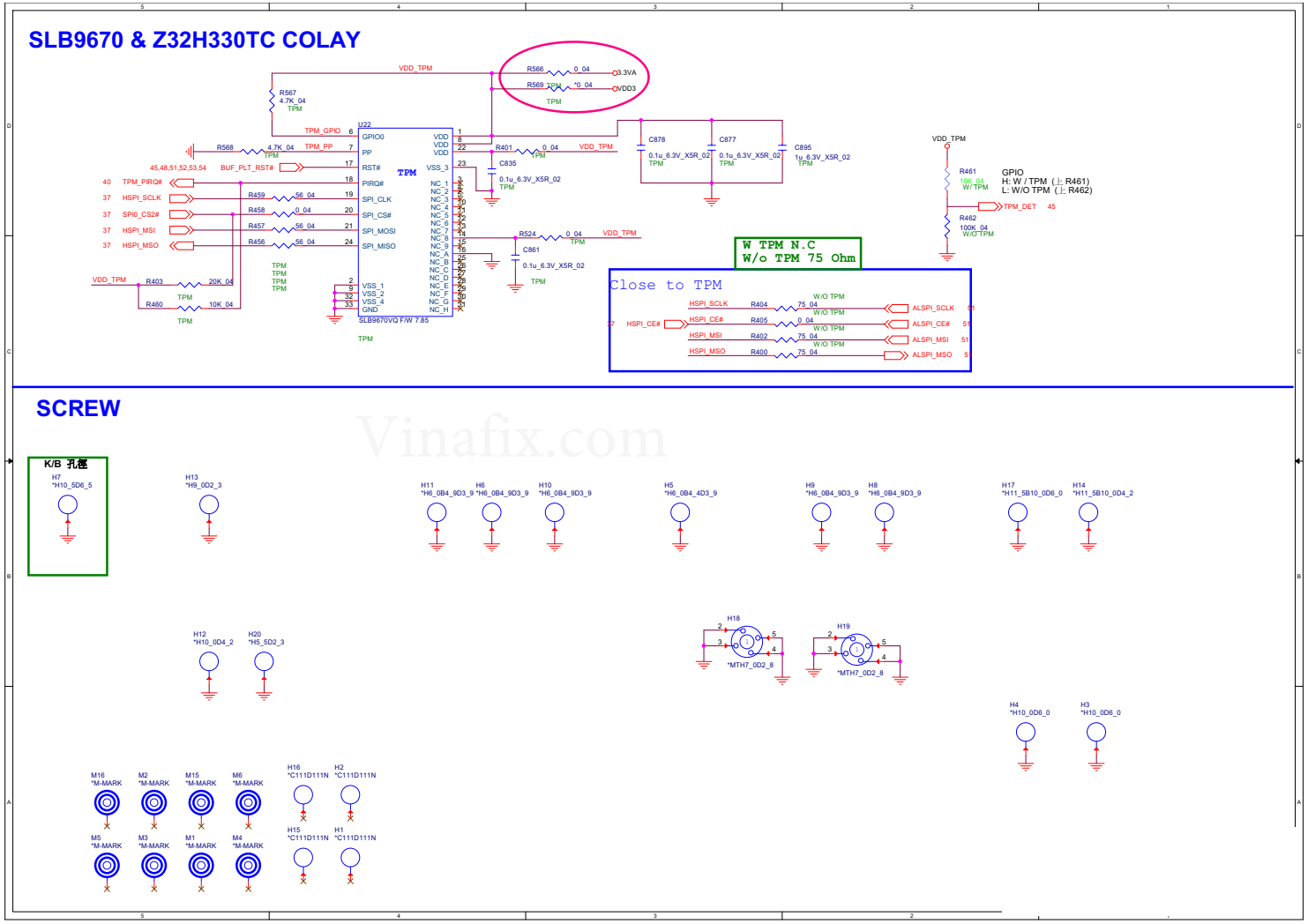
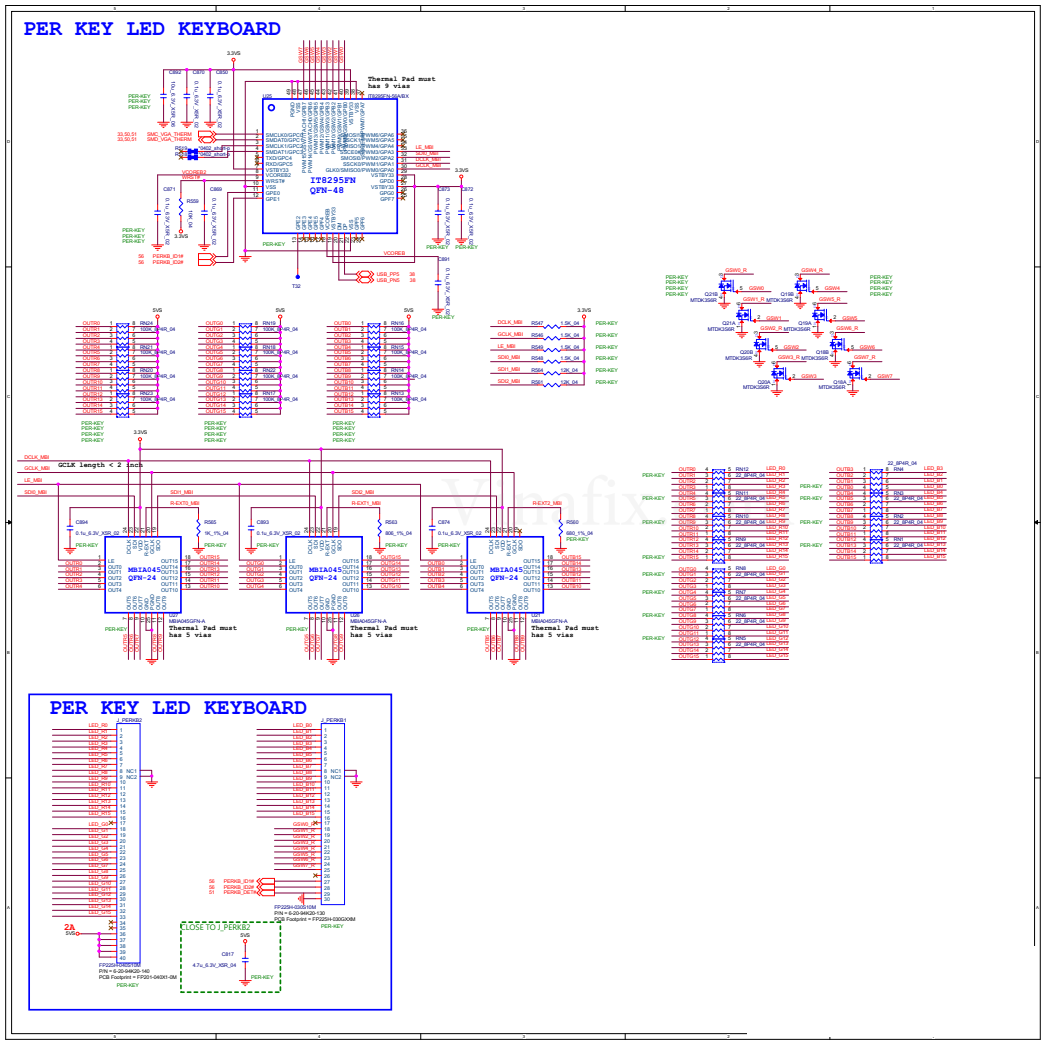
TPM, Screw



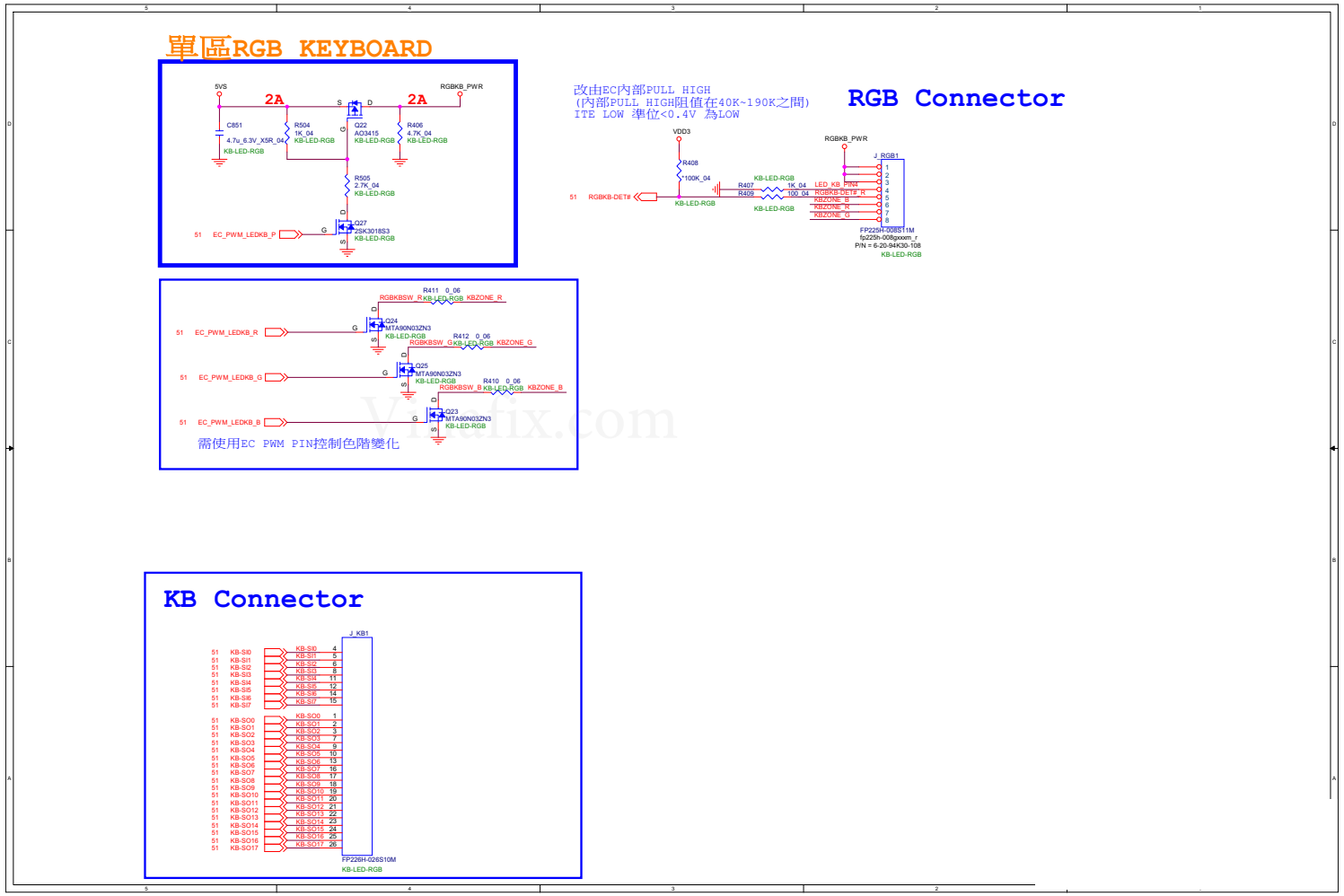
Per Key LED KB



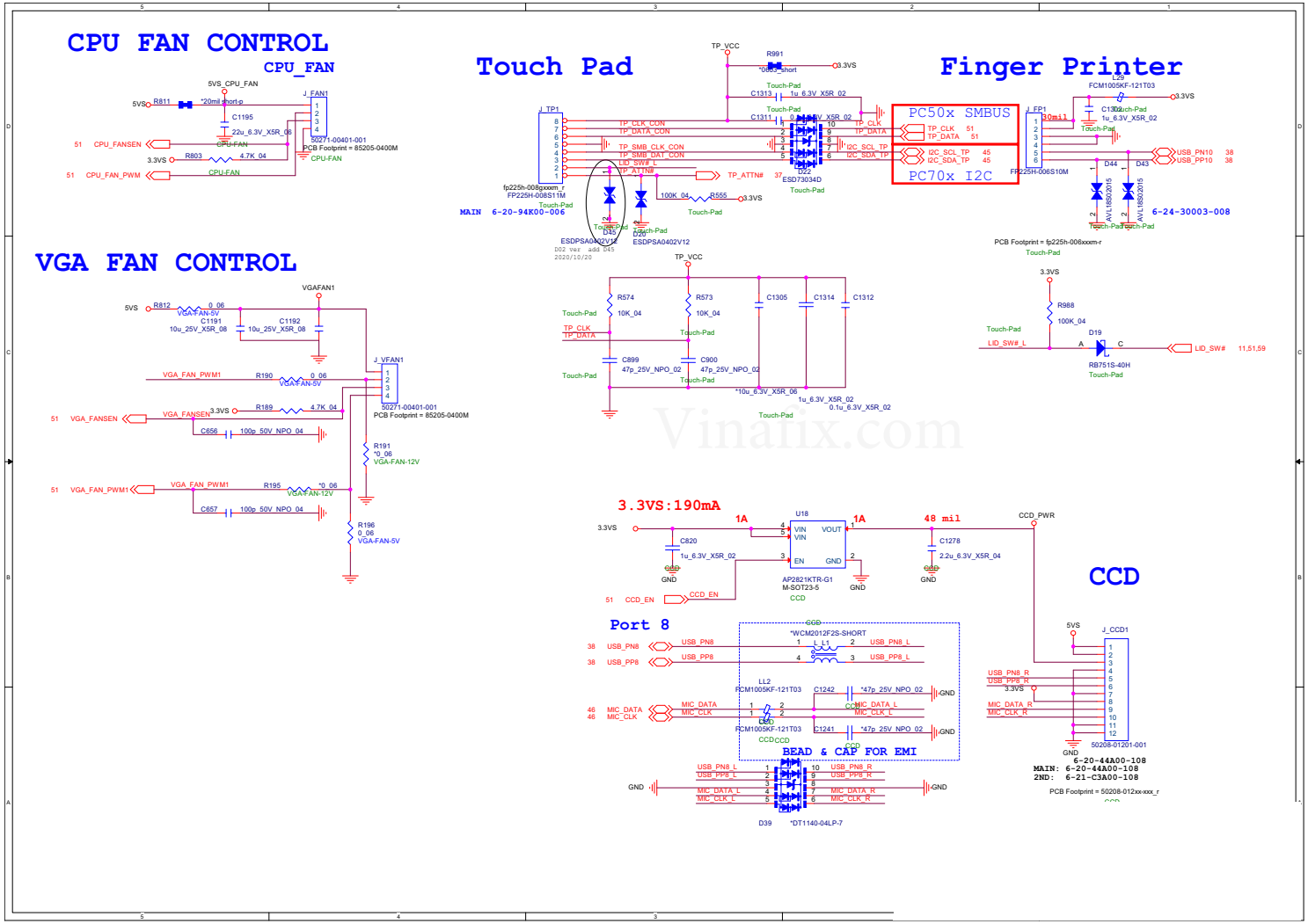
Sheet 56 of 81
Per Key LED KB

Backlight KB

Sheet 57 of 81
Backlight KB



NB Connector



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NB Connector

Card Connector

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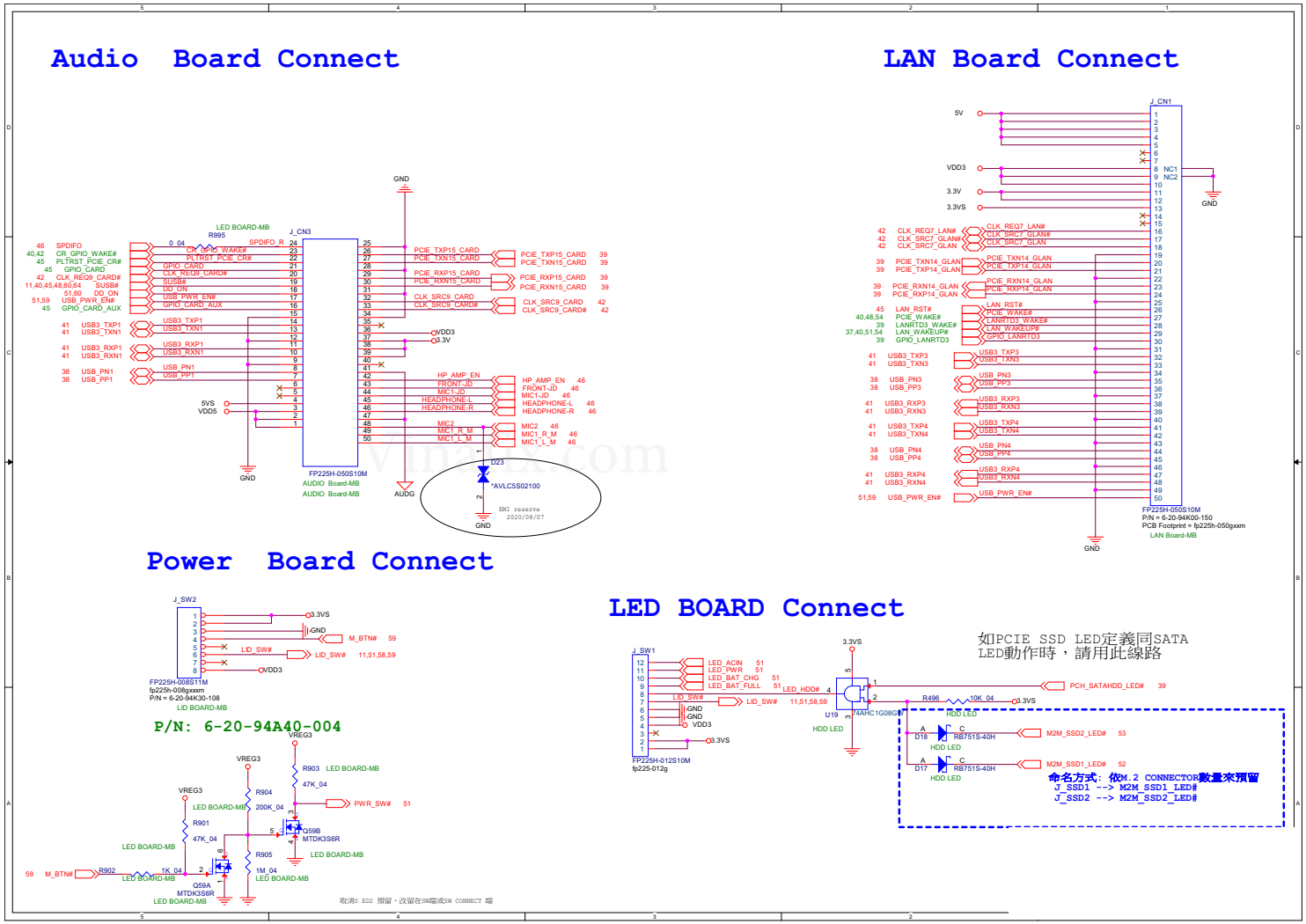
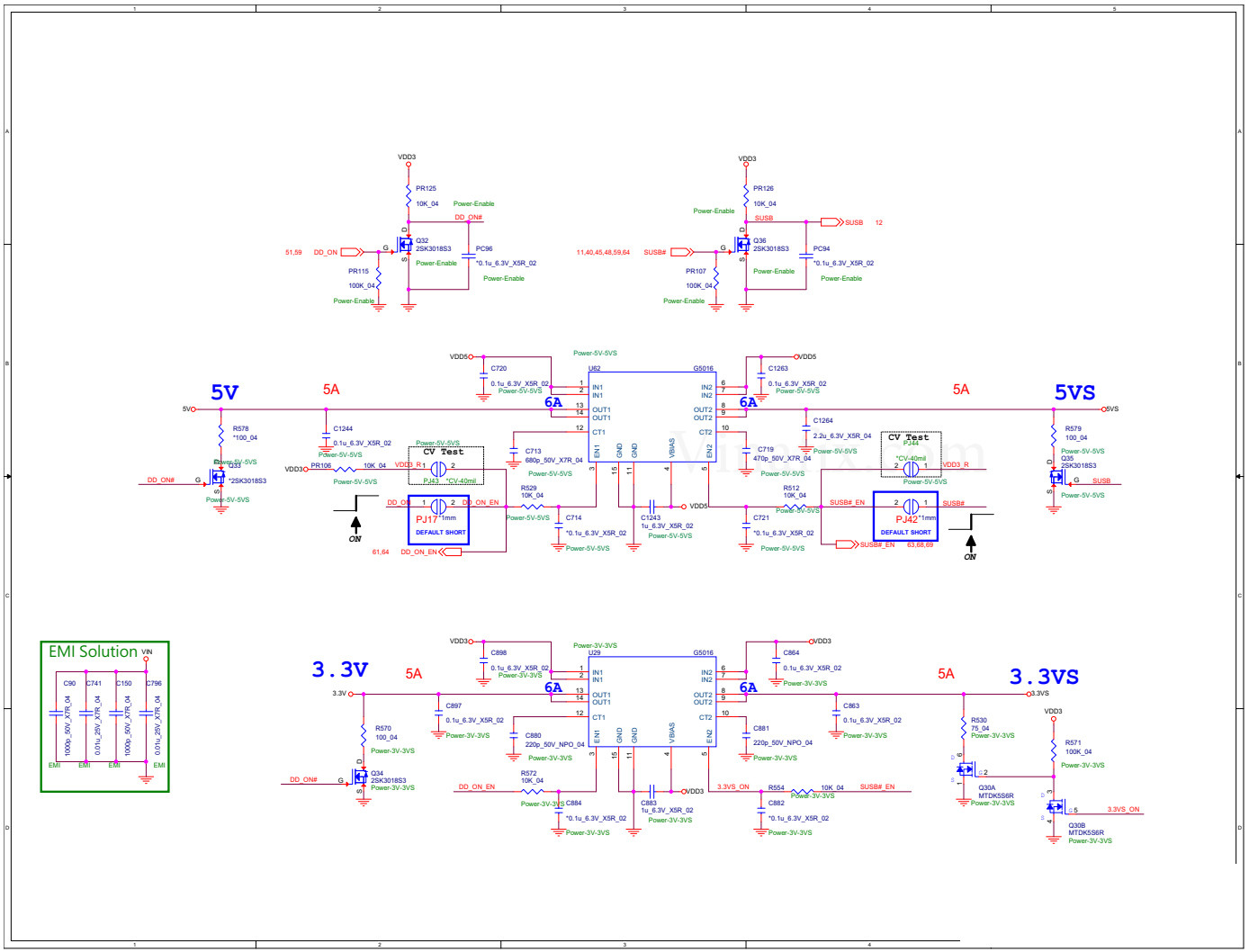
Card Connector



5V, 5VS, 3.3V, 3.3VS



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5V, 5VS, 3.3V, 3.3VS

VDD3, VDD5

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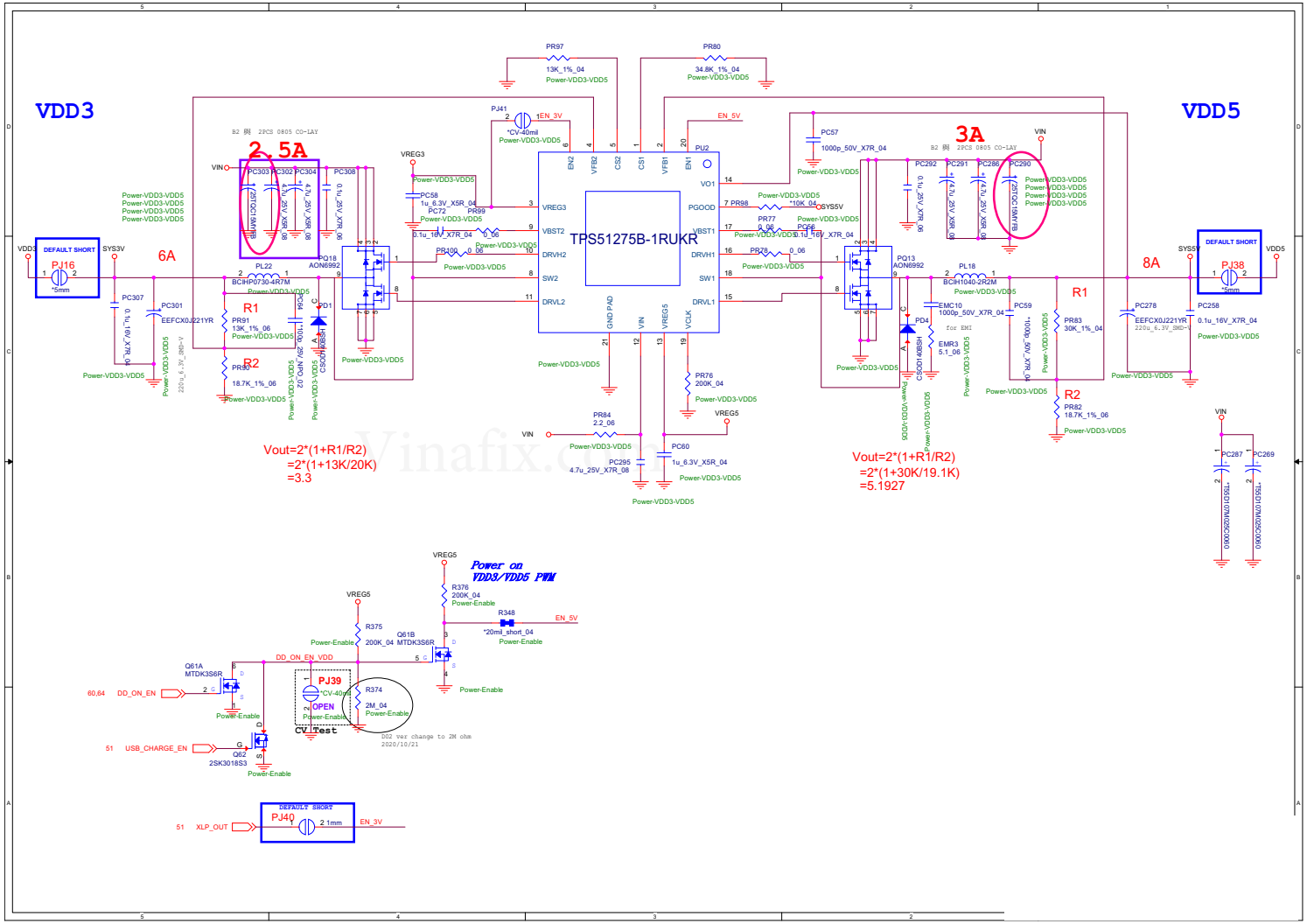
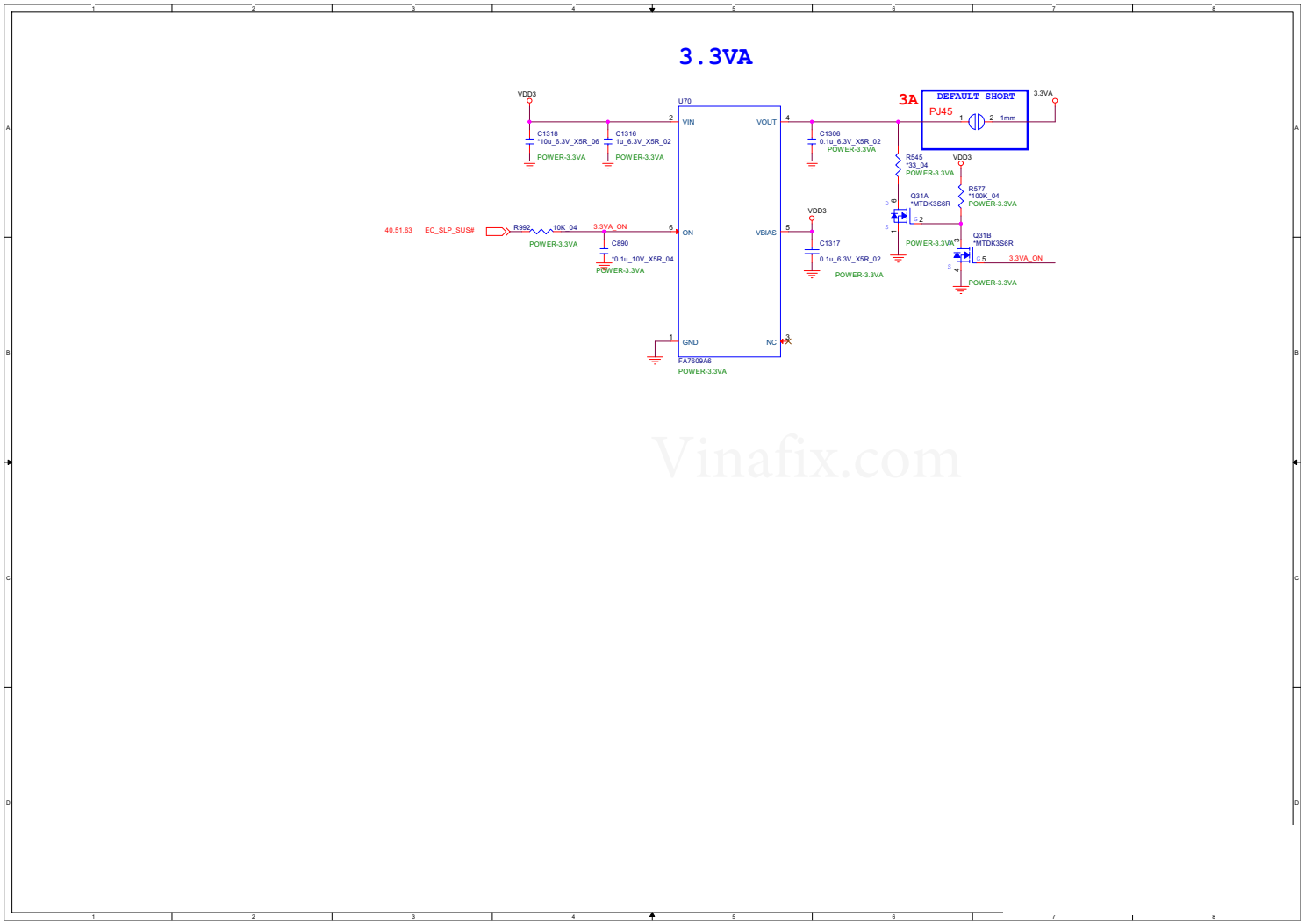
VDD3, VDD5



3.3VA



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3.3VA

1.05VA, VCCIO

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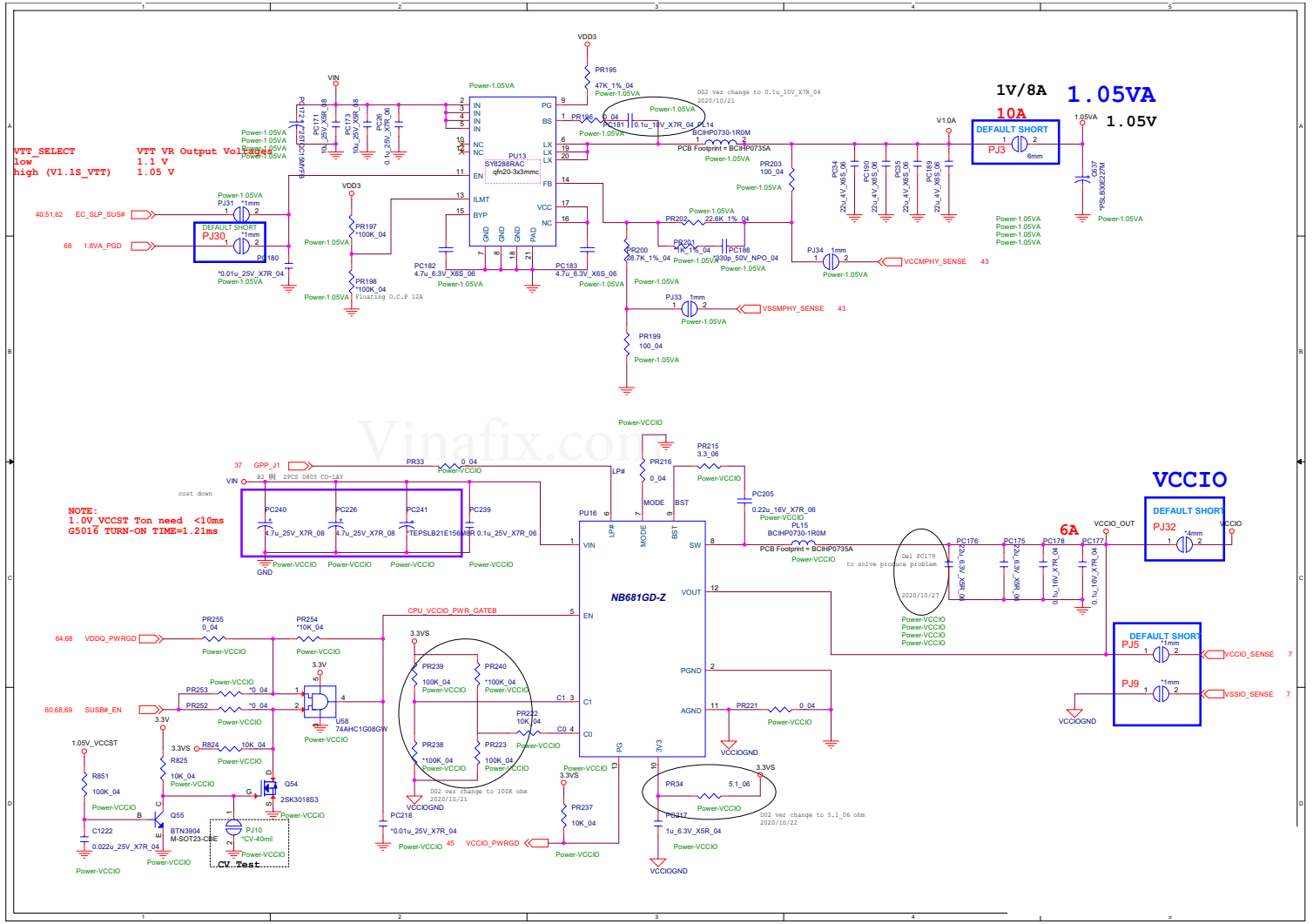
1.05VA, VCCIO



DDR 1.2V, 0.6VS

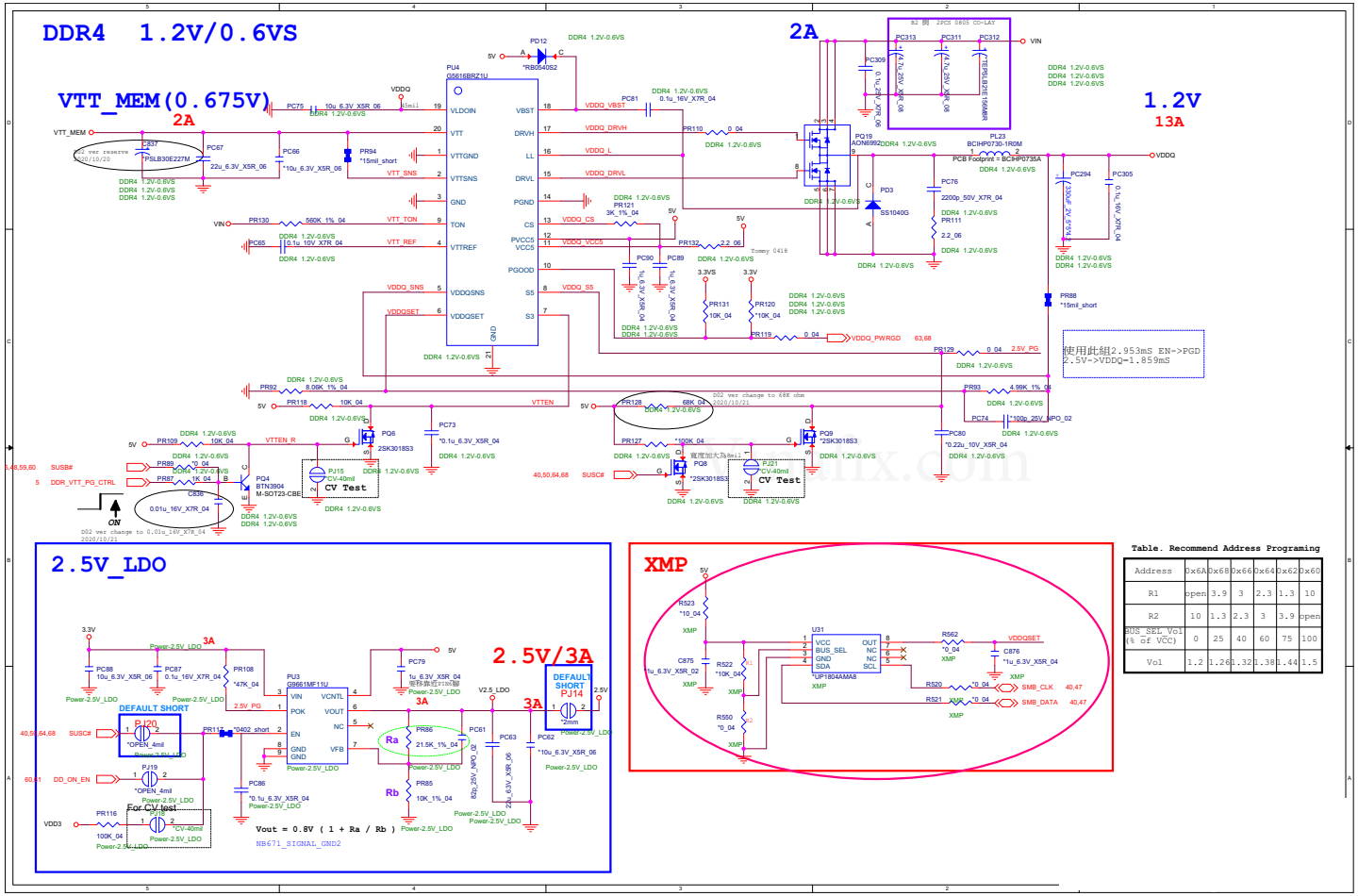


Table. Recommend Address Programing

Address	0x6A	0x68	0x66	0x64	0x62	0x60
R1	open	3.9	3	2.3	1.3	10
R2	10	1.3	2.3	3	3.9	open
BUS_SEL Vol (% of VCC)	0	25	40	60	75	100
Vol	1.2	1.26	1.32	1.38	1.44	1.5

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DDR 1.2V, 0.6VS

VCore, VCCGT, VCCSA

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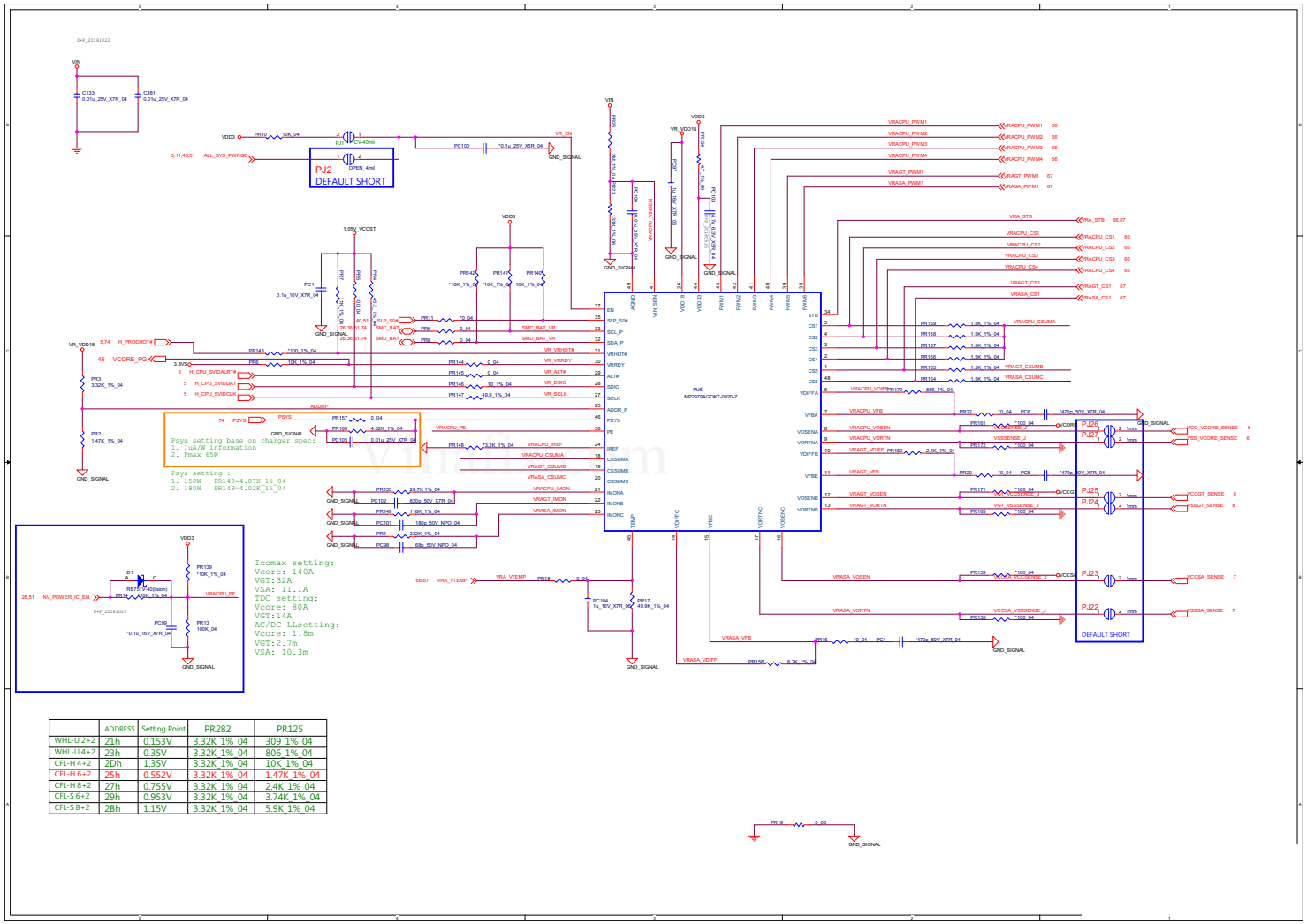
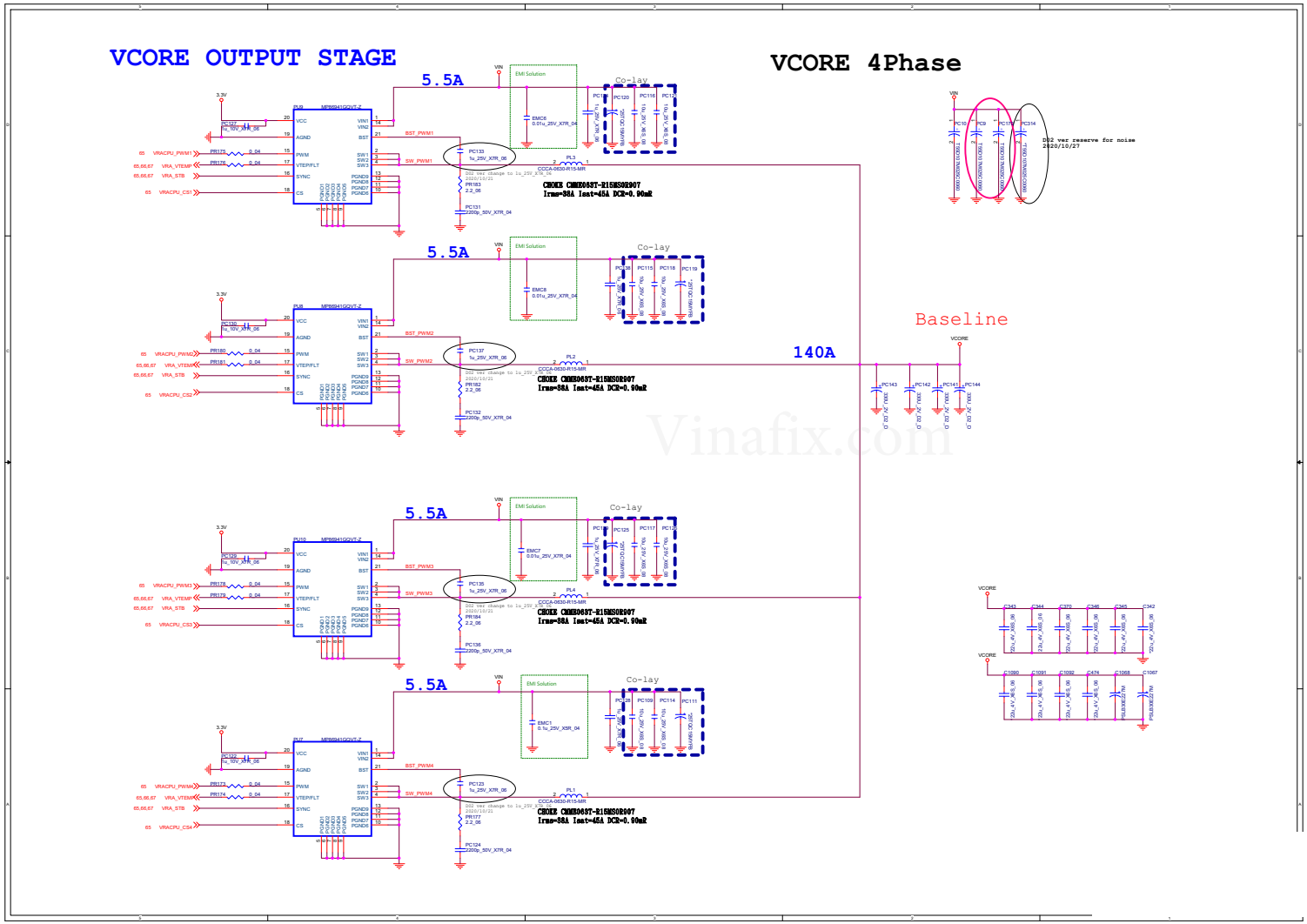
VCore, VCCGT, VCCSA



	ADDRESS	Setting Point	PR282	PR125
WHL-U 2+2	21h	0.153V	3.32K_1%_04	309_1%_04
WHL-U 4+2	23h	0.35V	3.32K_1%_04	806_1%_04
CFL-H 4+2	2Dh	1.35V	3.32K_1%_04	10K_1%_04
CFL-H 6+2	25h	0.552V	3.32K_1%_04	1.47K_1%_04
CFL-H 8+2	27h	0.755V	3.32K_1%_04	2.4K_1%_04
CFL-S 6+2	29h	0.953V	3.32K_1%_04	3.74K_1%_04
CFL-S 8+2	2Bh	1.15V	3.32K_1%_04	5.9K_1%_04

VCore Output Stage



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VCore Output Stage

VCCGT, VCCSA Output Stage

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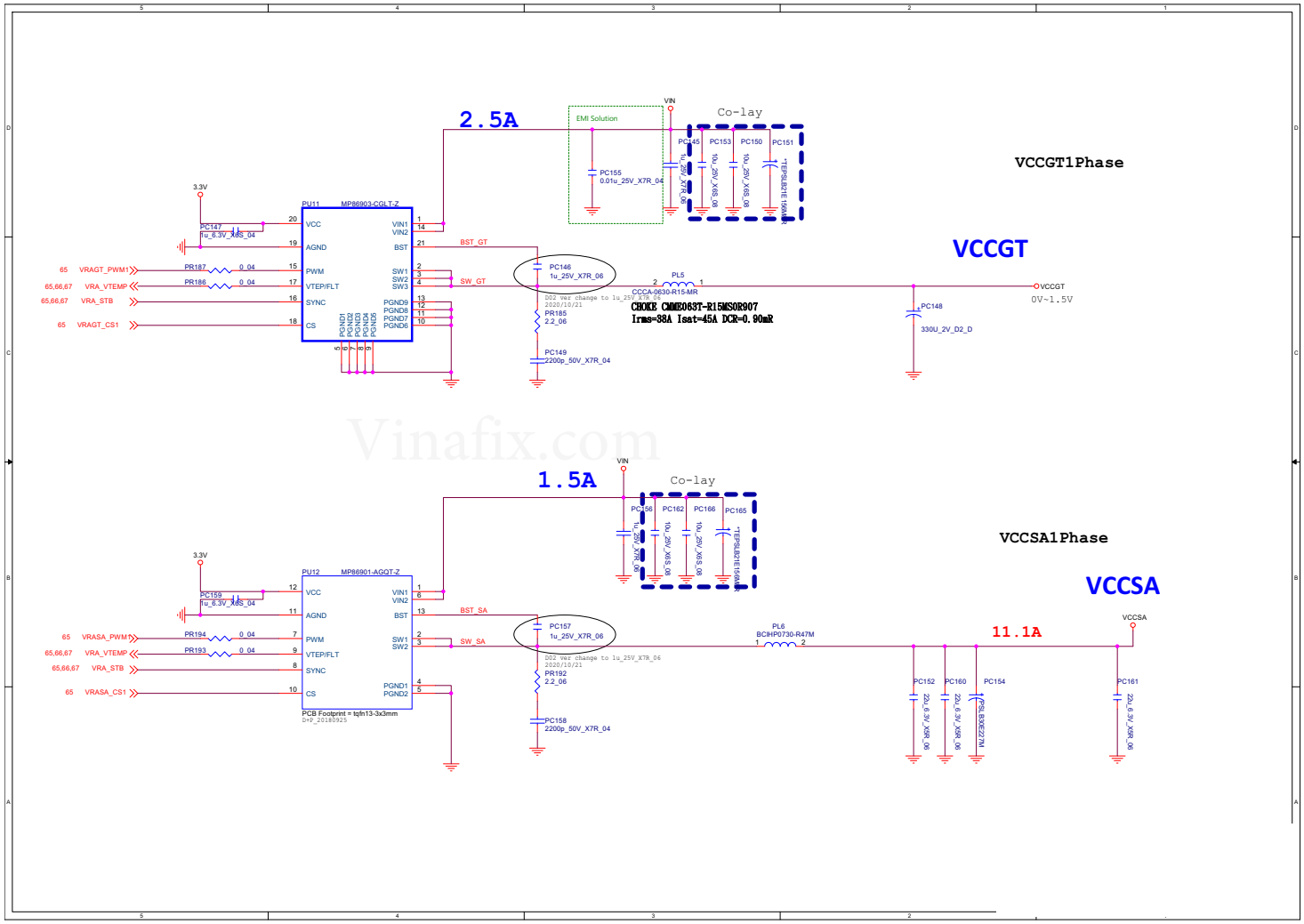
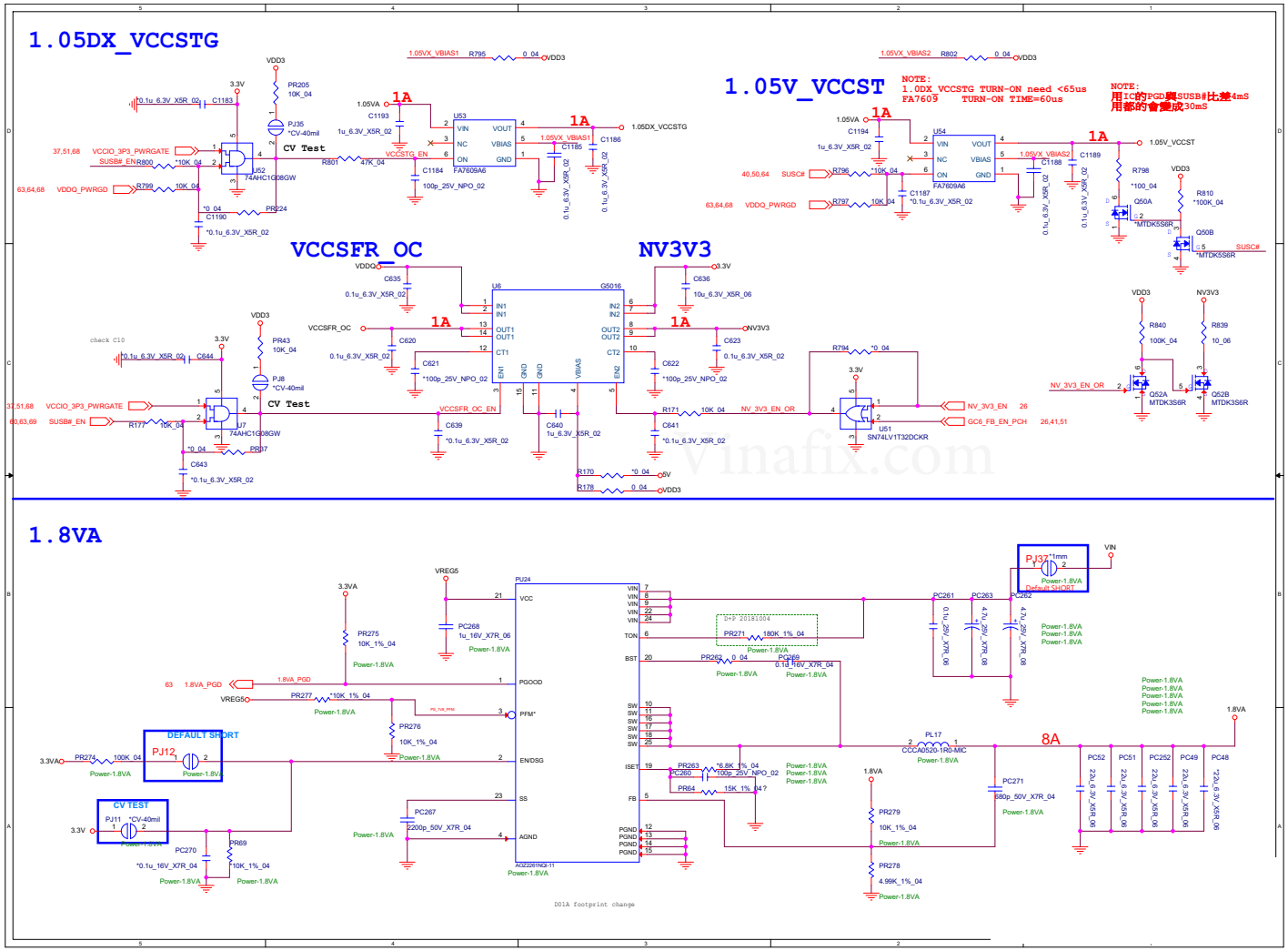
VCCGT, VCCSA
Output Stage



1.8VA, 1.05V_XX/NV3V3



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1.8VA, 1.05V_XX/
NV3V3

PEX_VDD, 1.2VS, 1V8_AON

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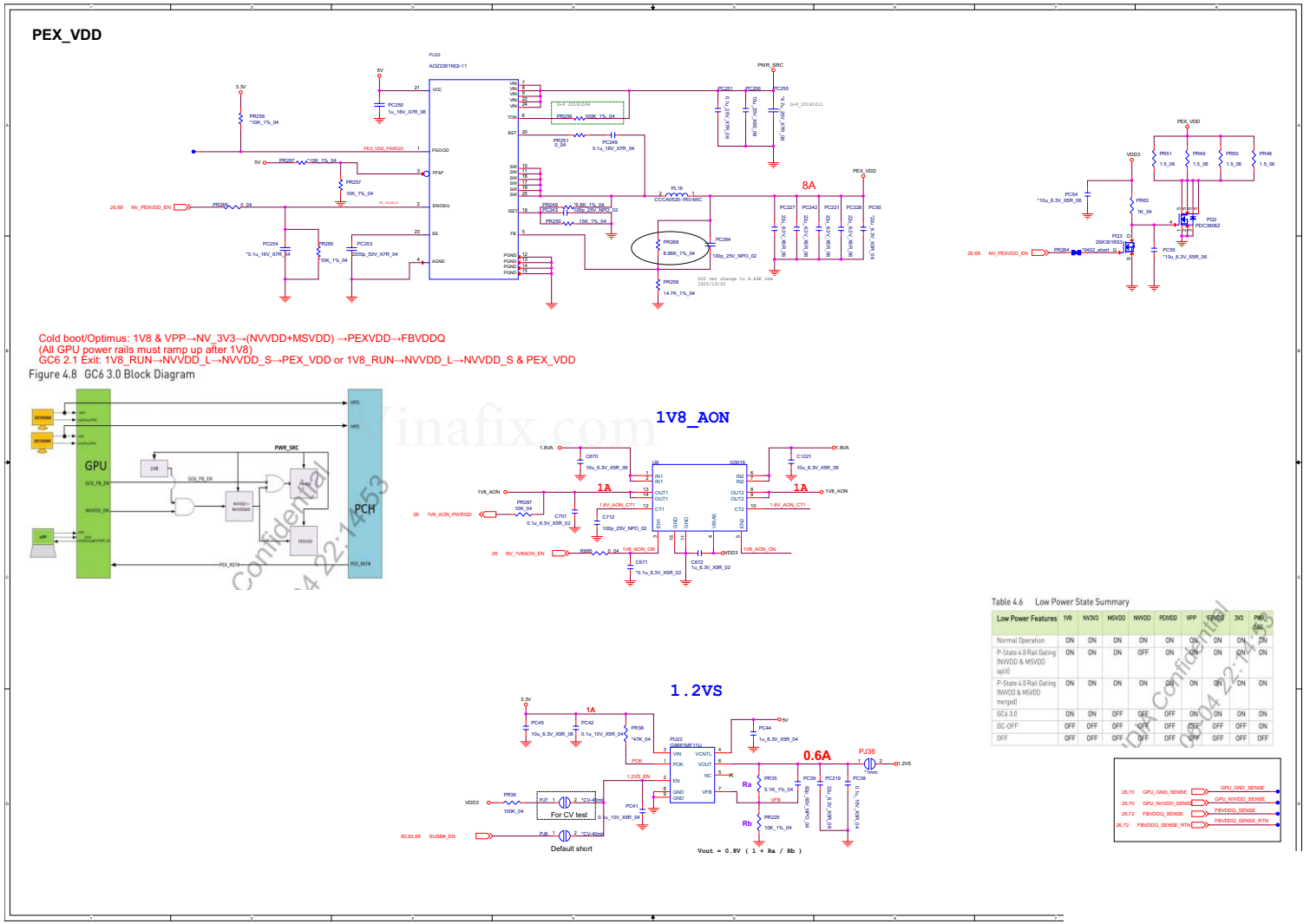
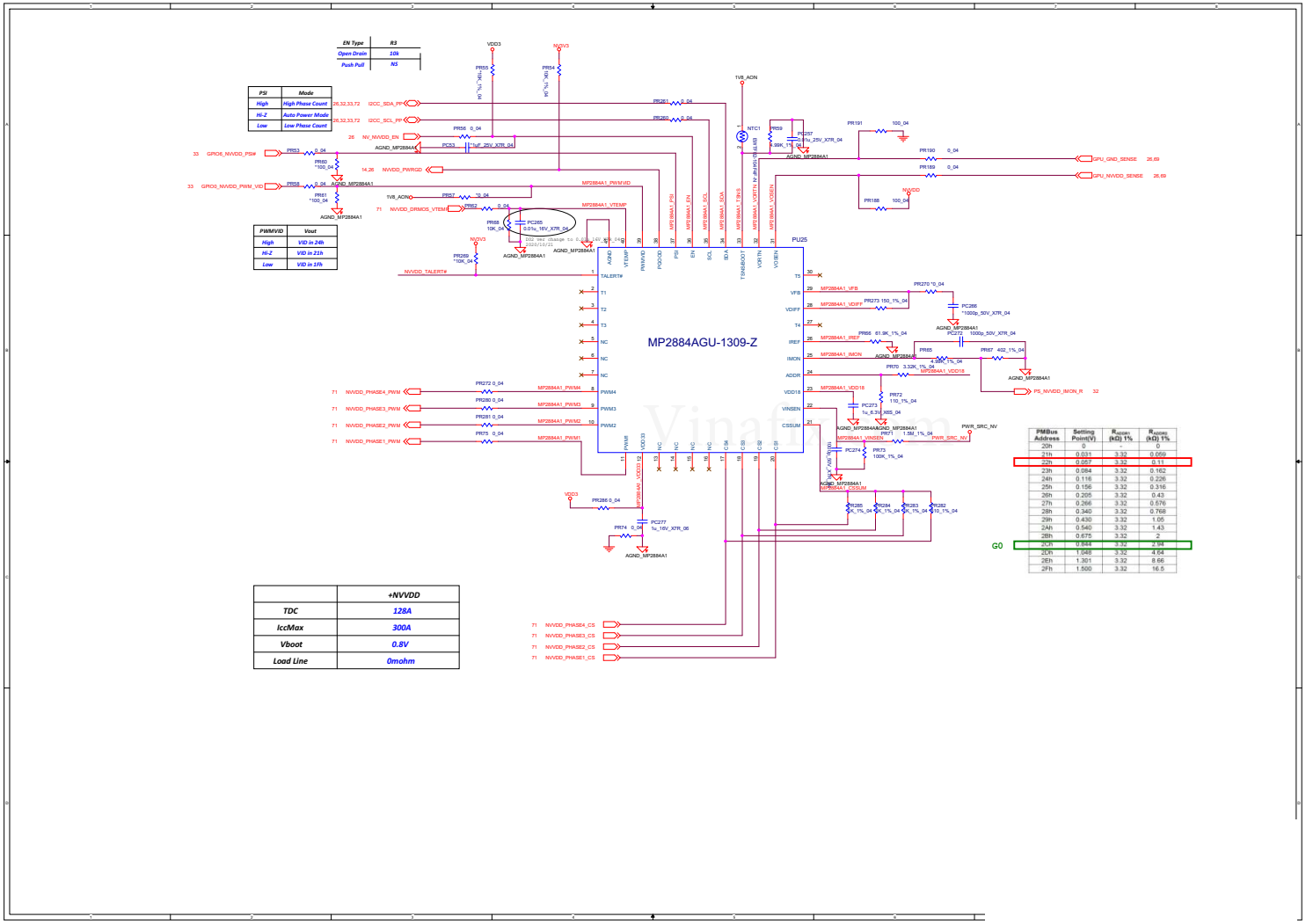
PEX_VDD,1.2VS,
1V8_AON



NVVDD 1



	+NVVDD
TDC	128A
IccMax	300A
Vboot	0.8V
Load Line	0mohm

PMBus Address	Setting Point(V)	R_{ADDR0} (kΩ) 1%	R_{ADDR1} (kΩ) 1%
20h	0	-	0
21h	0.031	3.32	0.059
22h	0.057	3.32	0.11
23h	0.084	3.32	0.162
24h	0.116	3.32	0.226
25h	0.156	3.32	0.316
26h	0.205	3.32	0.43
27h	0.266	3.32	0.576
28h	0.340	3.32	0.768
29h	0.430	3.32	1.05
2Ah	0.540	3.32	1.43
2Bh	0.675	3.32	2
2Ch	0.844	3.32	2.94
2Dh	1.048	3.32	4.64
2Eh	1.301	3.32	8.66
2Fh	1.500	3.32	16.5

G0

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NVVDD 1

NVVDD 2

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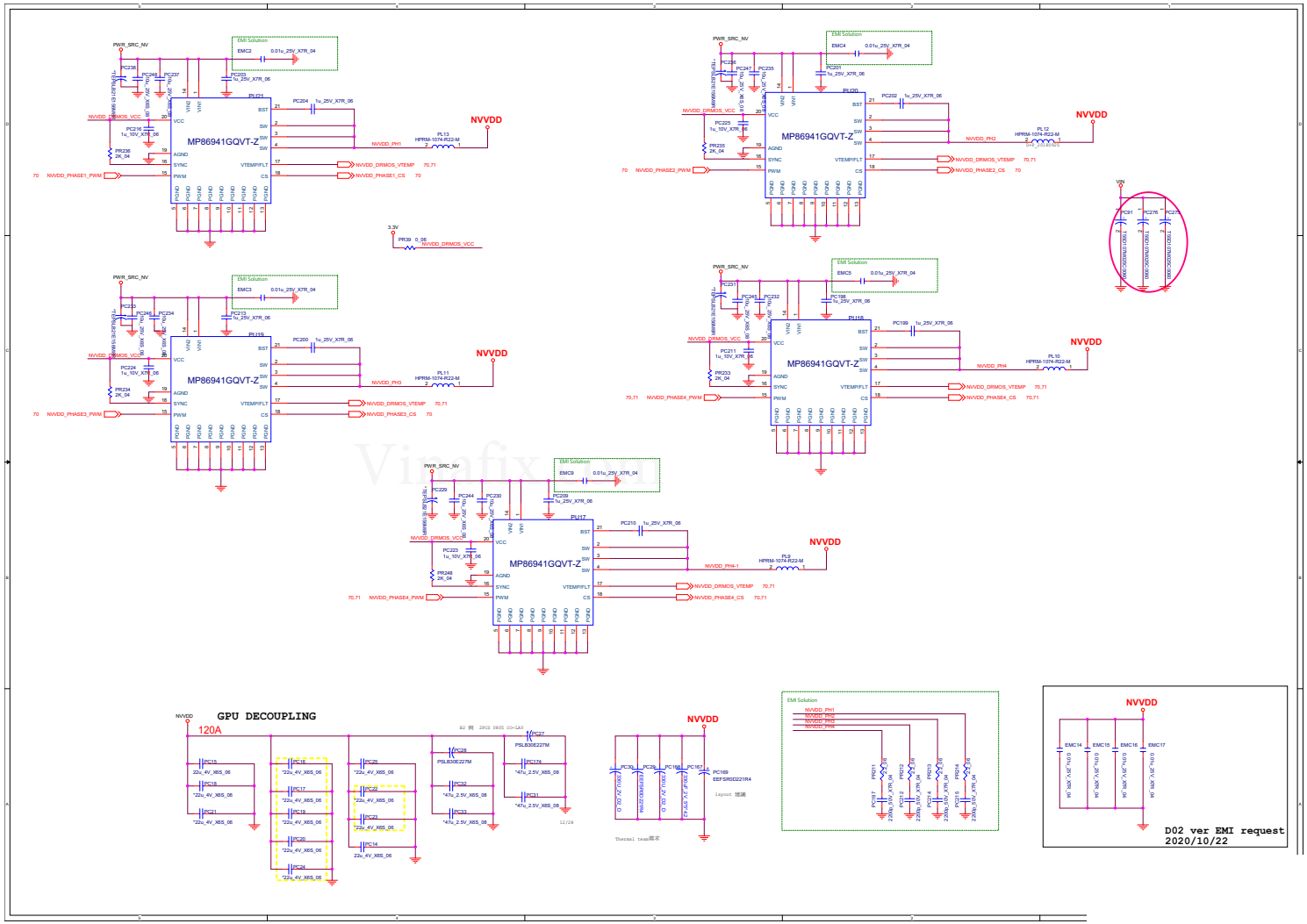
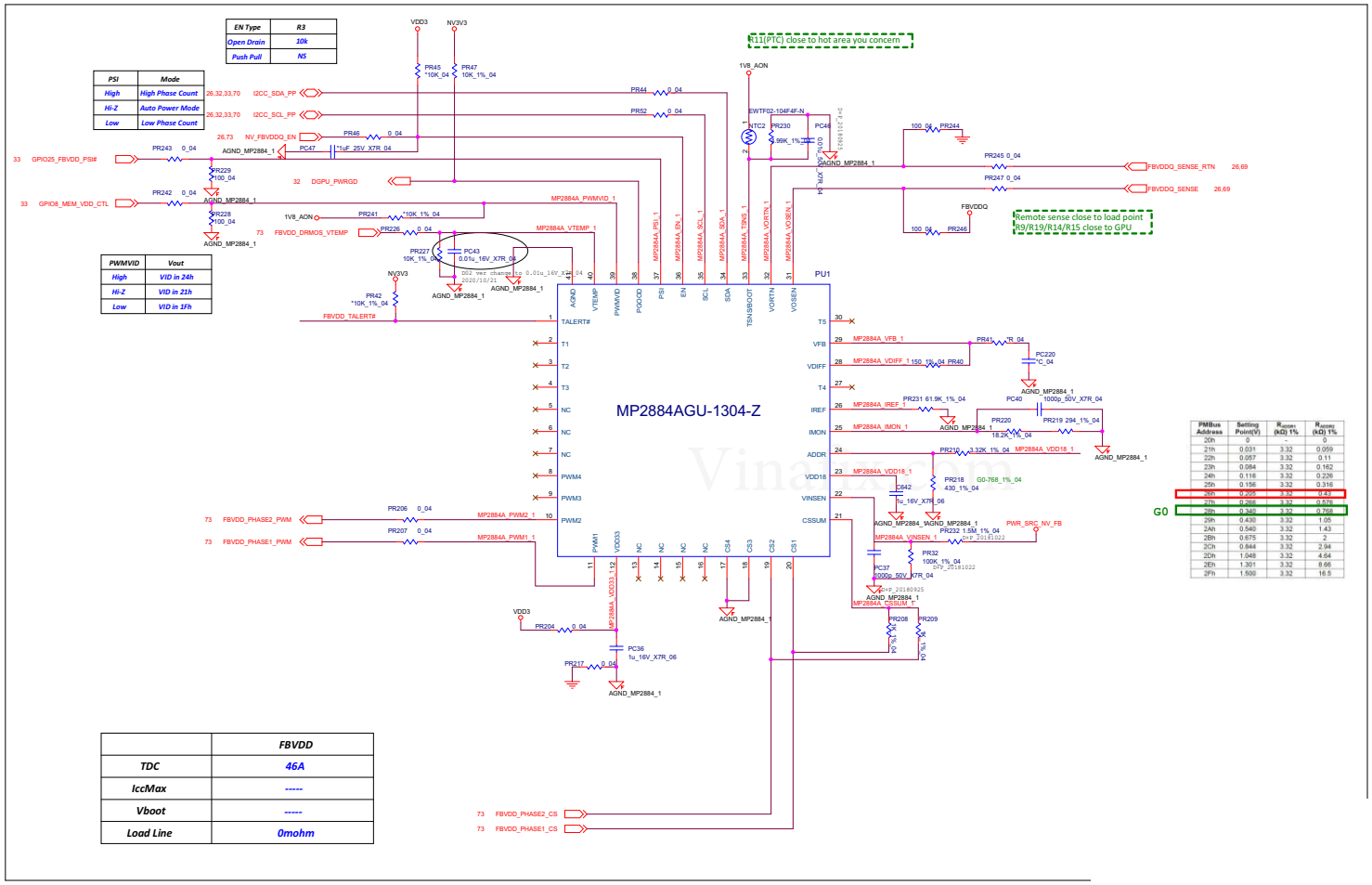
NVVDD 2



FBVDD



EN Type	R3
Open Drain	10k
Push Pull	NS

PSI	Mode
High	High Phase Count
Hi-Z	Auto Power Mode
Low	Low Phase Count

PWMVID	Vout
High	VID in 24h
Hi-Z	VID in 21h
Low	VID in 1Fh

	FBVDD
TDC	46A
IccMax	-----
Vboot	-----
Load Line	0mohm

PMBus Address	Setting Point(V)	R_{comp} (kΩ) 1%	R_{comp} (kΩ) 1%
20h	0	-	0
21h	0.031	3.32	0.059
22h	0.057	3.32	0.11
23h	0.084	3.32	0.162
24h	0.116	3.32	0.226
25h	0.156	3.32	0.316
26h	0.295	3.32	0.43
27h	0.364	3.32	0.576
28h	0.340	3.32	0.768
29h	0.430	3.32	1.05
2Ah	0.540	3.32	1.43
2Bh	0.675	3.32	2
2Ch	0.844	3.32	2.94
2Dh	1.048	3.32	4.64
2Eh	1.301	3.32	8.66
2Fh	1.500	3.32	16.5

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FBVDD

FBVDD

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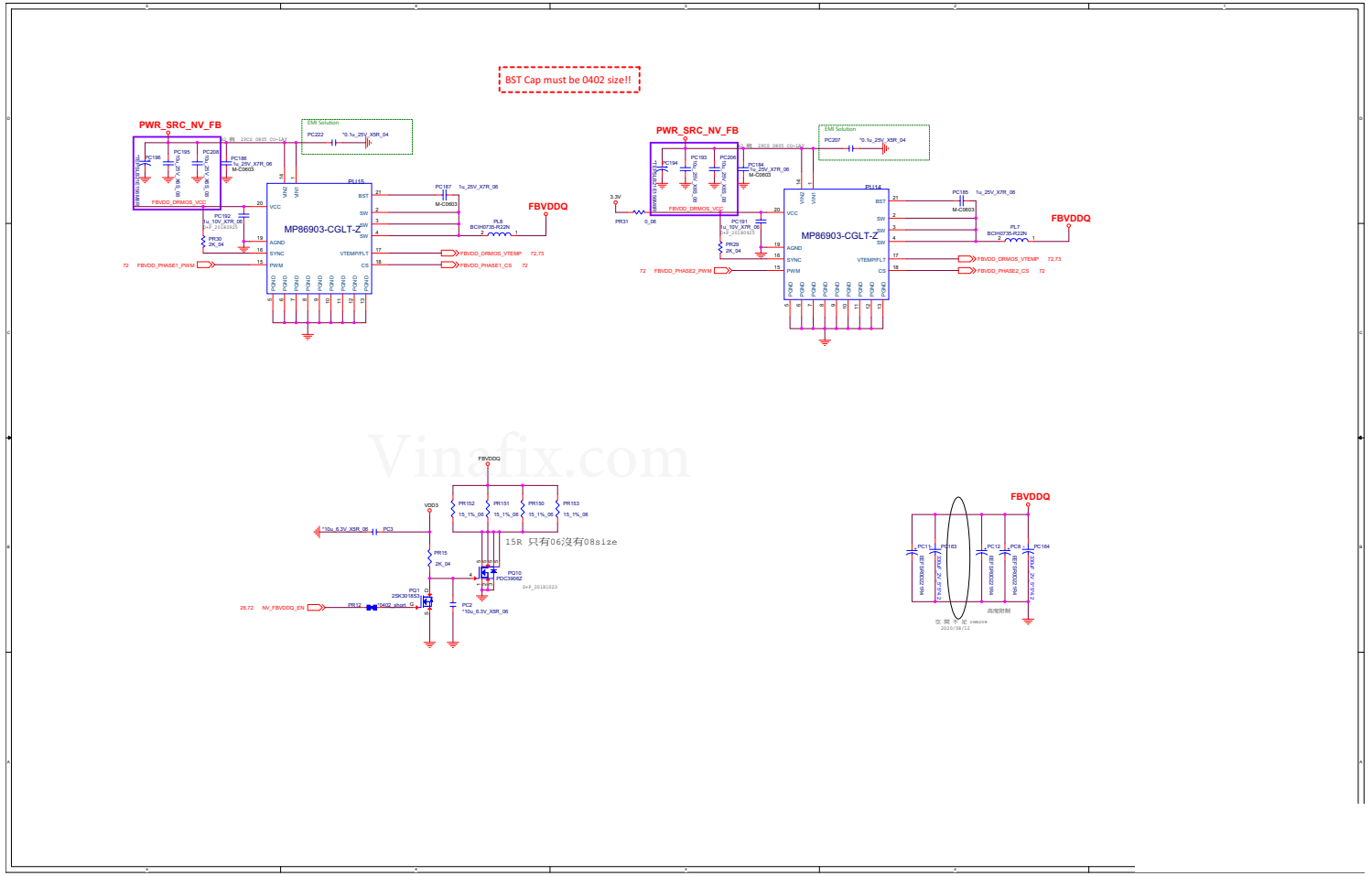
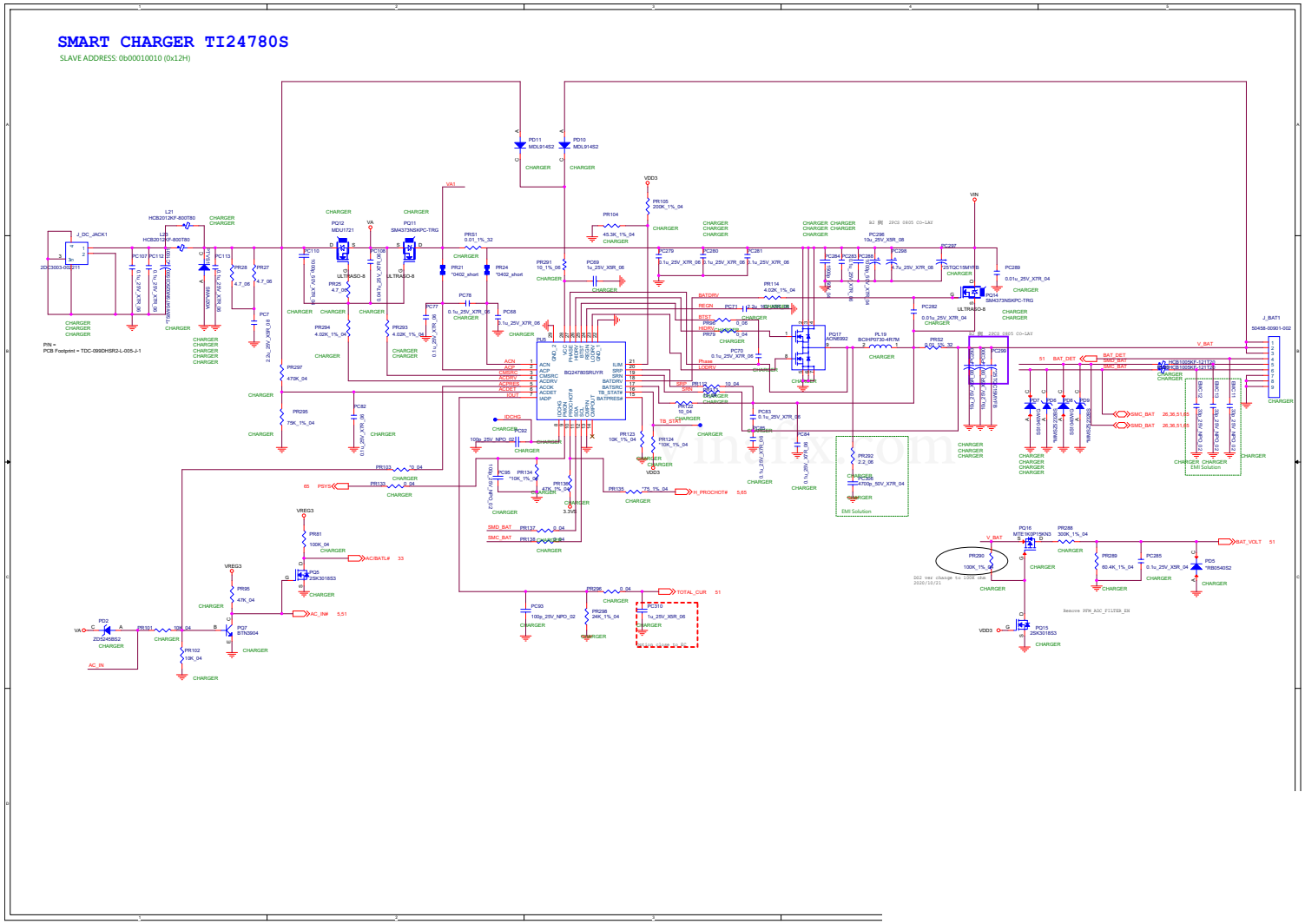
FBVDD



AC_In, Charger



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AC_In, Charger

Audio Board

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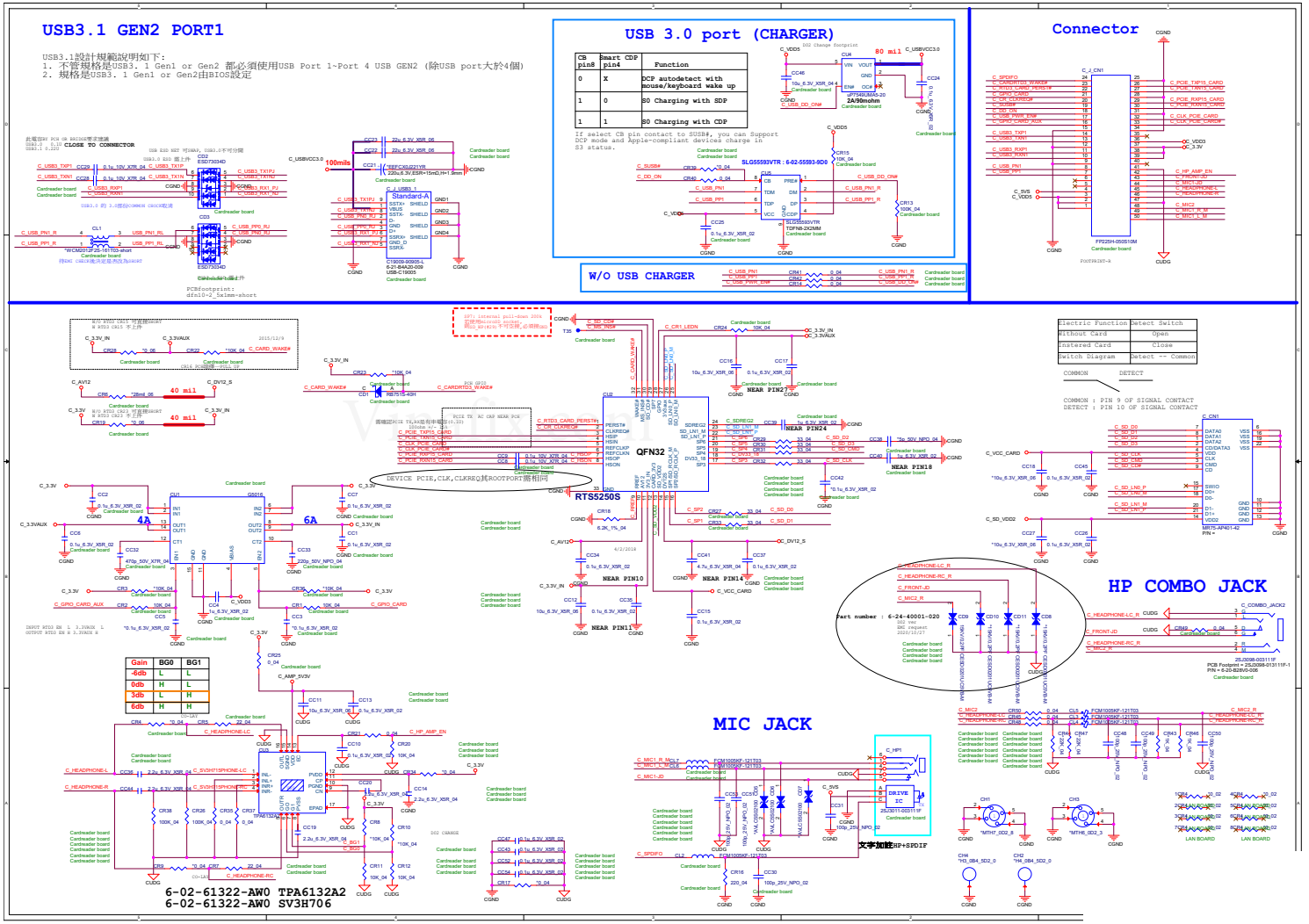
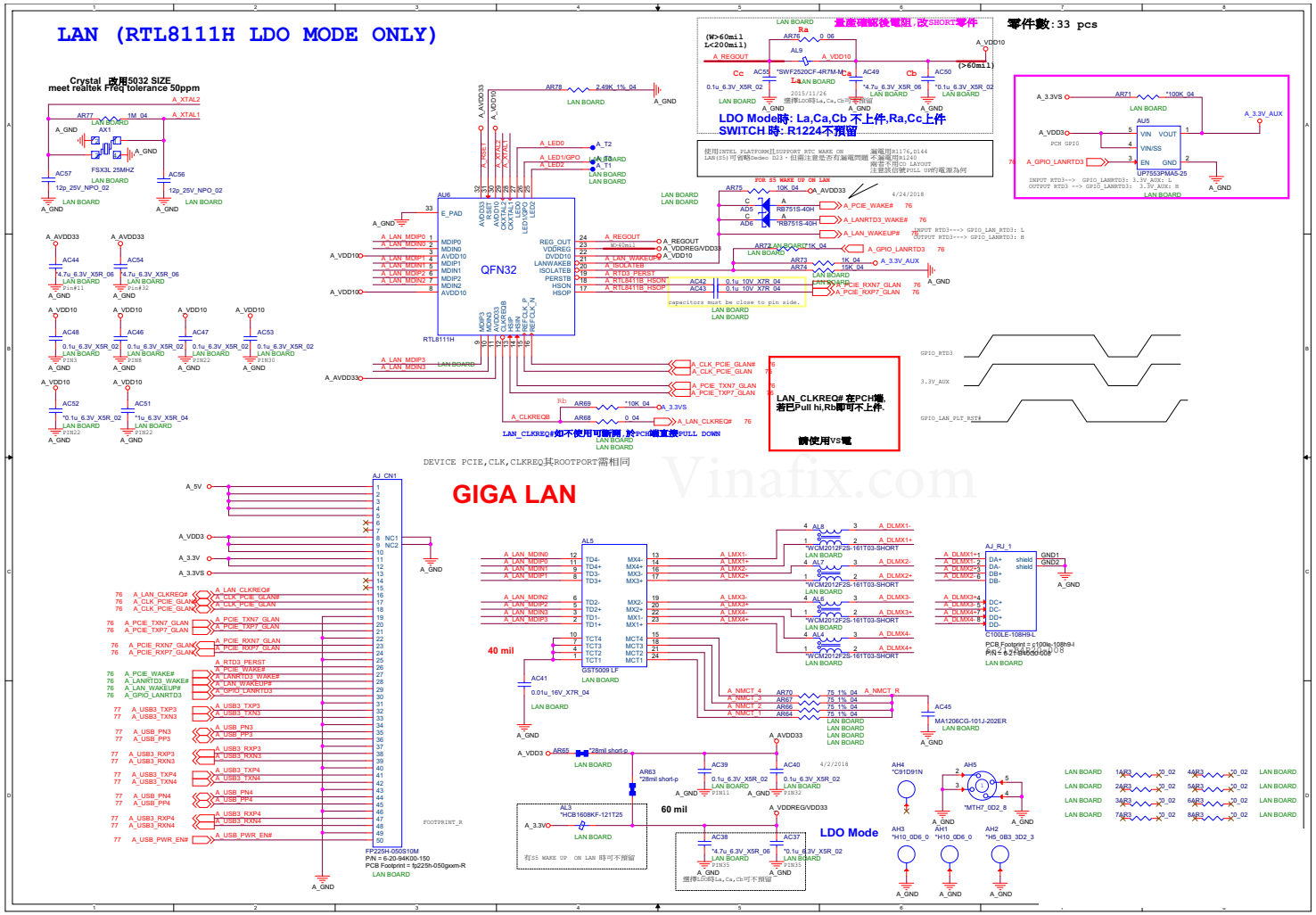
Audio Board



LAN Board



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LAN Board

B.Schematic Diagrams

LAN Board

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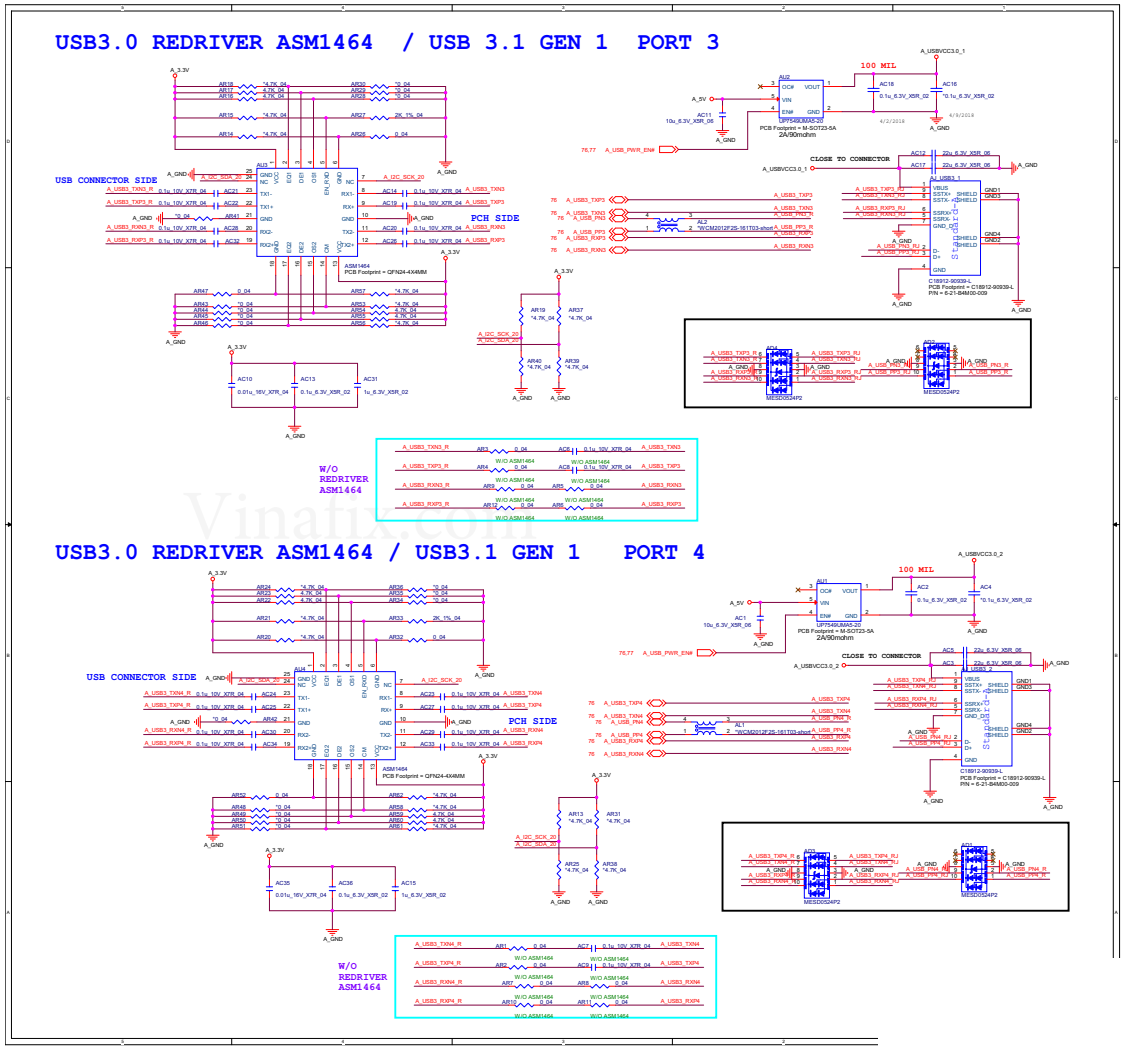
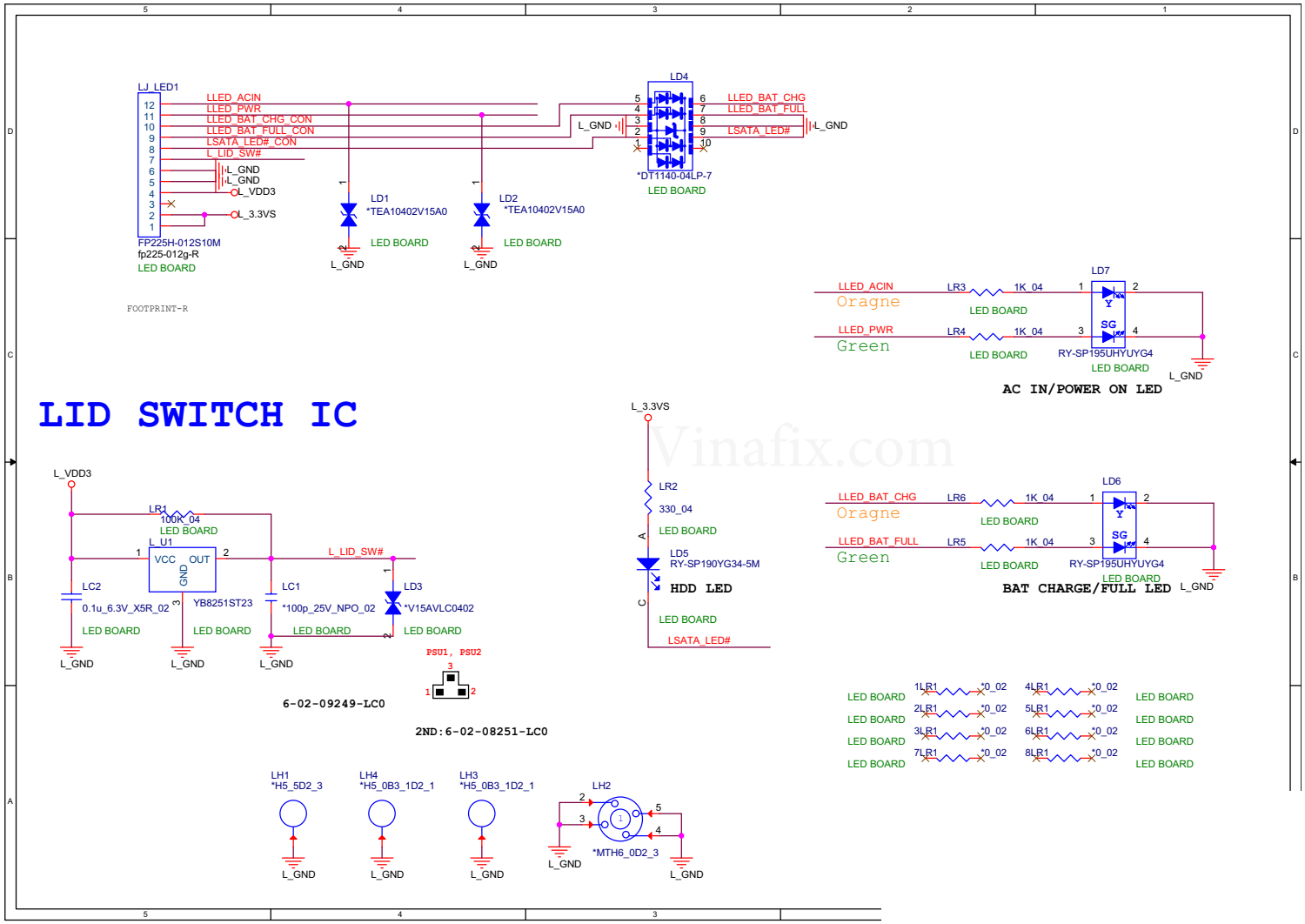
LAN Board



LED Board



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LED Board

Power Board PC50

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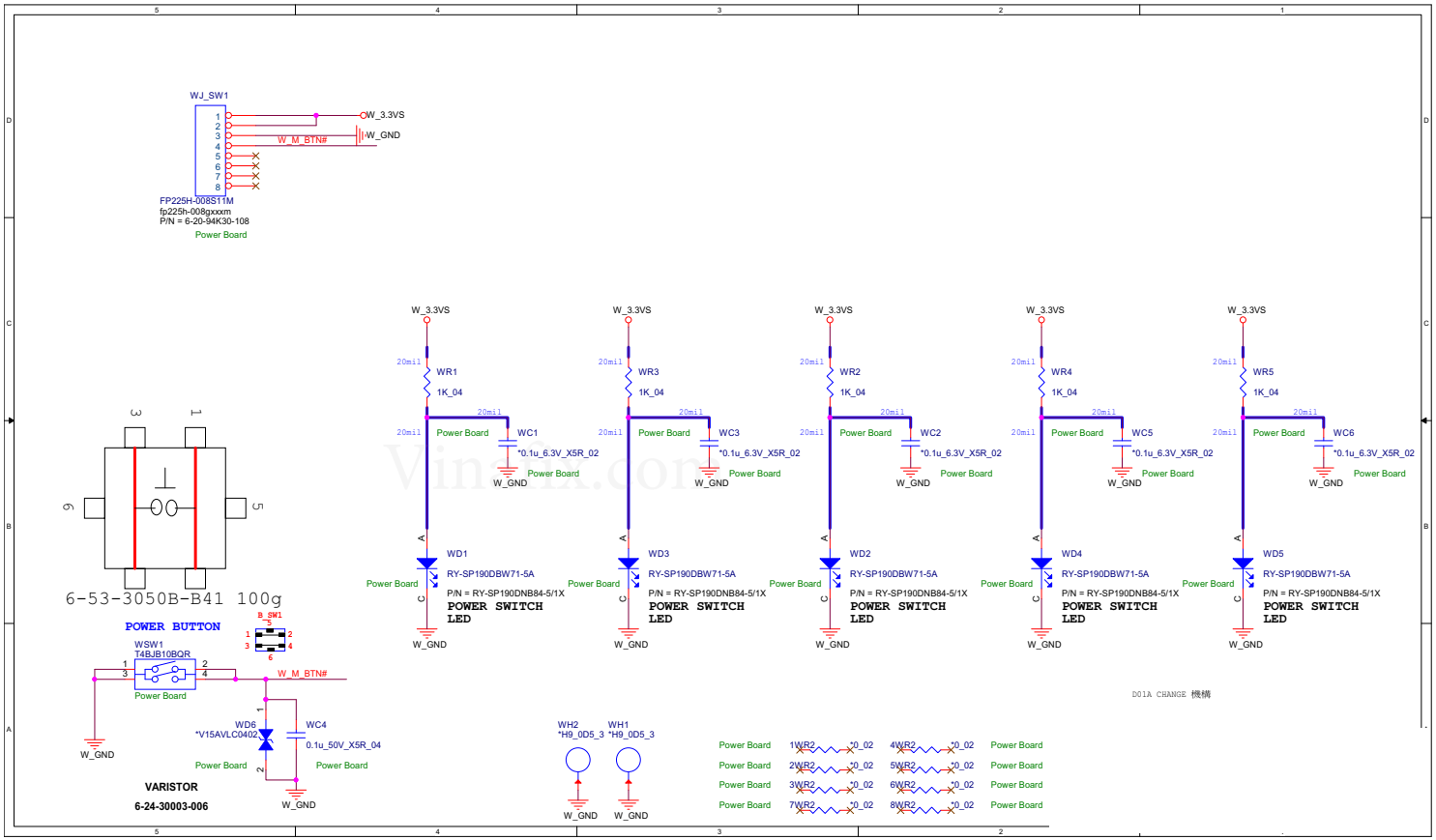
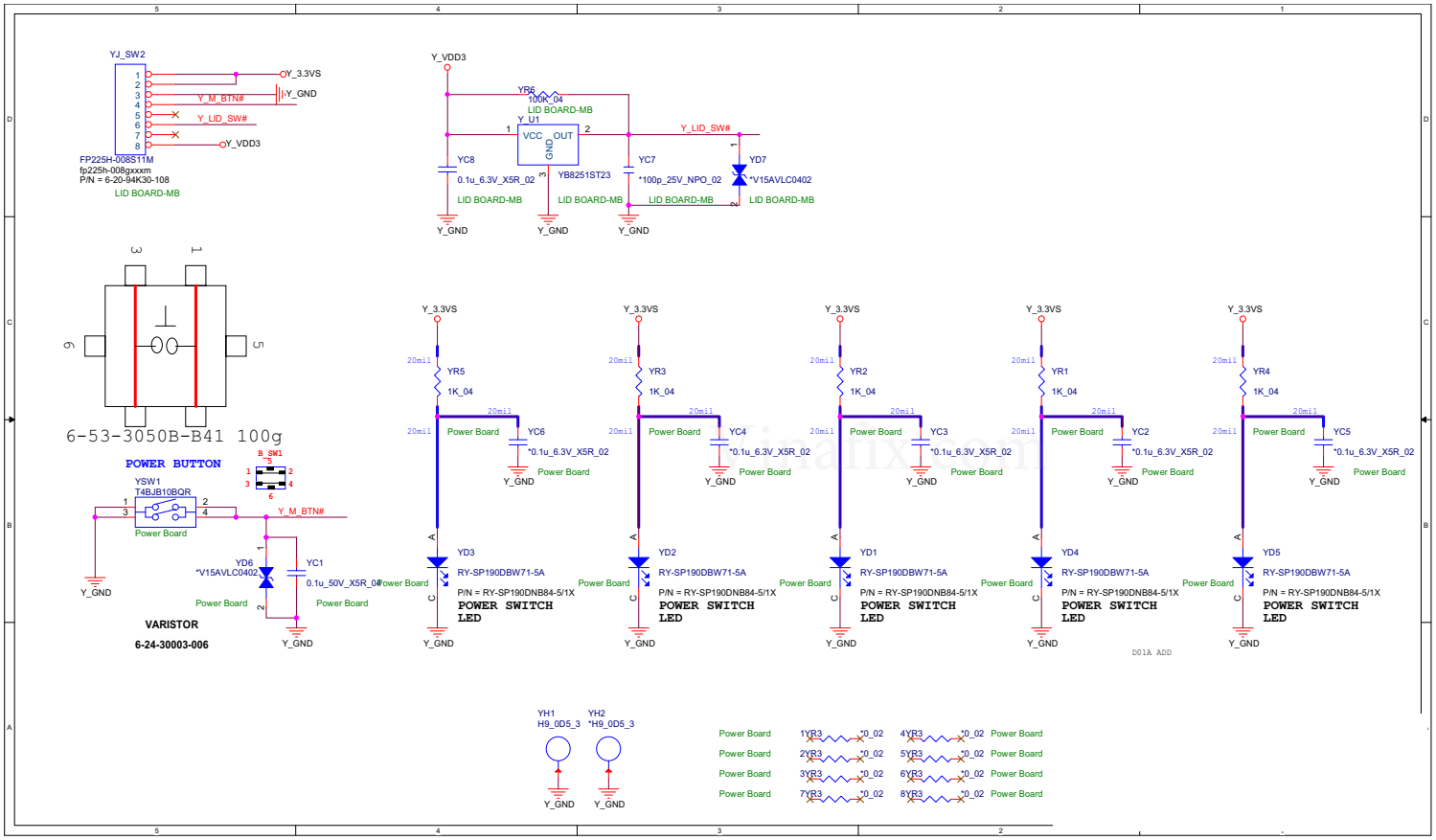
Power Board PC50



Power Board PC70



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Power Board PC70

LED Board PC70

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LED Board PC70