

SERVICE MANUAL

NP50DB / NP50DE

notebook

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Notebook Computer

NP50DB / NP50DE

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 *NP50DB* / *NP50DE* 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

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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, 6.15A (**120** Watts) minimum AC/DC Adapter.

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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.

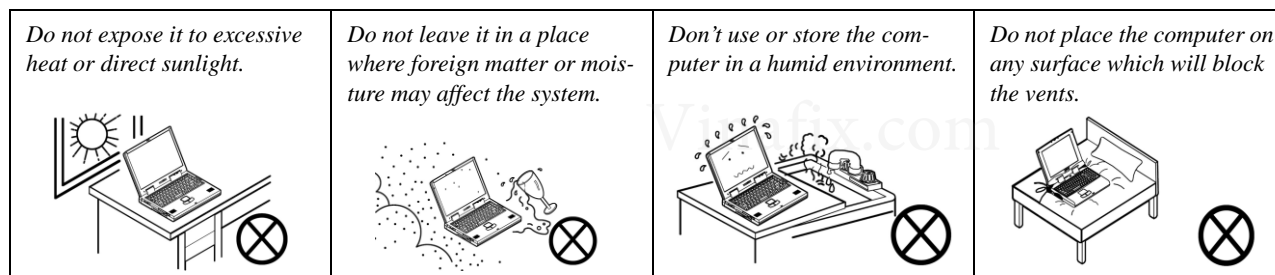
Instructions for Care and Operation

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

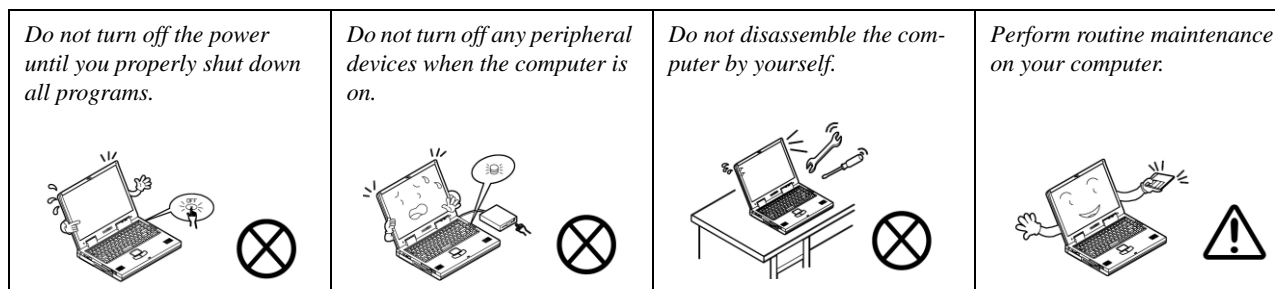
1. **Don't drop it, or expose it to shock.** If the computer falls, the case and the components could be damaged.



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.

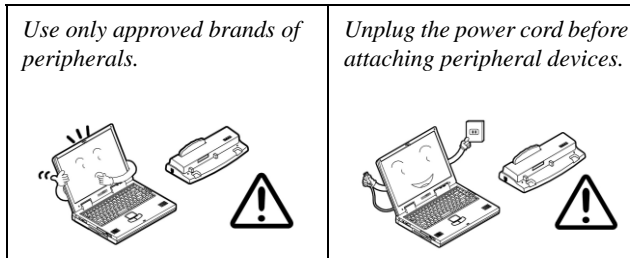


3. **Follow the proper working procedures for the computer.** Shut the computer down properly and don't forget to save your work. Remember to periodically save your data as data may be lost if the battery is depleted.



Preface

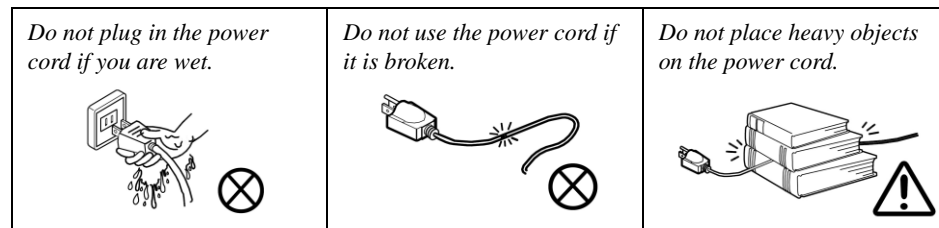
4. **Avoid interference.** Keep the computer away from high capacity transformers, electric motors, and other strong magnetic fields. These can hinder proper performance and damage your data.
5. **Take care when using peripheral devices.**



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. 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".

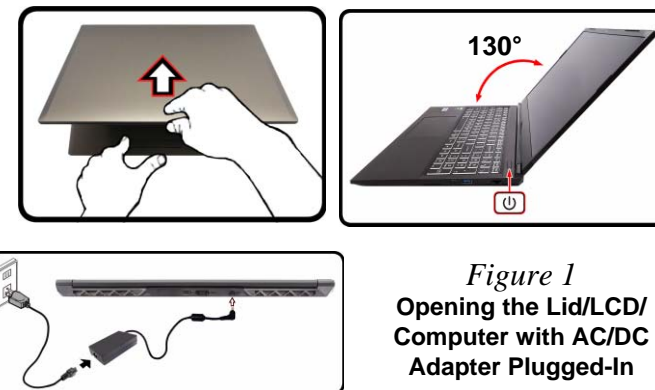




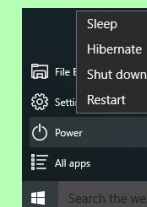
Figure 1
**Opening the Lid/LCD/
Computer with AC/DC
Adapter Plugged-In**



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 **NP50DB / NP50DE** 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 **NP50DB / NP50DE** 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

i7-10750H (2.60GHz)

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

i5-10300H (2.50GHz)

8MB Smart Cache, 14nm, DDR4-2933MHz, TDP 45W

Core Logic

Intel® HM470 Express Chipset

LCD Options

15.6" (39.62cm), 16:9, FHD (1920x1080)

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 up to **32GB**

Compatible with 4GB, 8GB or 16GB Modules

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

Storage

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

(Factory Option) One M.2 2280 **SATA/PCIe Gen3 x4 SSD** Solid State Drive (SSD)

Security

Security (Kensington® Type) Lock Slot

Intel PTT for Systems Without TPM Hardware

(Factory Option) TPM 2.0

Video Adapter Options

Microsoft Hybrid Graphics Mode or Discrete Graphics Mode

Supports up to 3 Active Displays

Intel Integrated GPU

Intel® UHD Graphics 630

Dynamic Frequency

Intel Dynamic Video Memory Technology

Microsoft DirectX®12 Compatible

NVIDIA® Discrete GPU

NVIDIA® GeForce GTX 1650 (NP50DB)

4GB GDDR6 Video RAM

Microsoft DirectX®12 Compatible

Supports PCIe x8

NVIDIA® GeForce GTX 1650Ti (NP50DE)

4GB GDDR6 Video RAM

Microsoft DirectX®12 Compatible

Supports PCIe x8

Pointing Device

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

Keyboard

Full-size **Multi-Color** LED Keyboard (with Numeric Keypad)

Audio

High Definition Audio Compliant Interface

Sound Blaster Cinema 6

Built-In Array Microphone

Two Speakers

Communication

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

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

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**

Interface

One USB 2.0 Port
Two USB 3.2 Gen 1 Type-A Ports
One USB 3.2 Gen 2 Type-C Port*
**The maximum amount of current supplied by USB Type-C ports is 500mA (USB 2.0)/900mA (USB 3.2).*

One Mini DisplayPort 1.4
One HDMI-Out Port
One Microphone-In Jack
One 2- In-1 Audio Jack (Headphone and Microphone)
One RJ-45 LAN Jack
One DC-In Jack

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 4 Cell Polymer Battery Pack, 49Wh

Full Range AC/DC Adapter
AC Input: 100 - 240V, 50 - 60Hz
DC Output: 19.5V, 6.15A (**120W**)

Dimensions & Weight

359.5mm (w) * 238mm (d) * 21.9mm (h)
1.85kg (Barebone with 49Wh 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. Vent
7. Keyboard
8. Touchpad & Buttons

External Locator - Top View with LCD Panel Open



External Locator - Front & Right Side Views

Figure 2
Front View

1. LED Indicators

FRONT VIEW



Figure 3
Right Side View

1. Speaker
2. Multi-in-1 Card Reader
3. USB 3.2 Gen 2 Type-C Port
4. USB 3.2 Gen 1 Type-A Port
5. RJ-45 LAN Jack

RIGHT SIDE VIEW



Introduction

External Locator - Left Side & Rear View

Figure 4
Left Side View

1. Security Lock Slot
2. Vent
3. USB 3.2 Gen 1 Type-A Ports
4. USB 2.0 Port
5. Microphone-In Jack
6. 2-In-1 Audio Jack (Headphone and Microphone)
7. Speaker

LEFT SIDE VIEW



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Figure 5
Rear View

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

REAR VIEW



External Locator - Bottom View

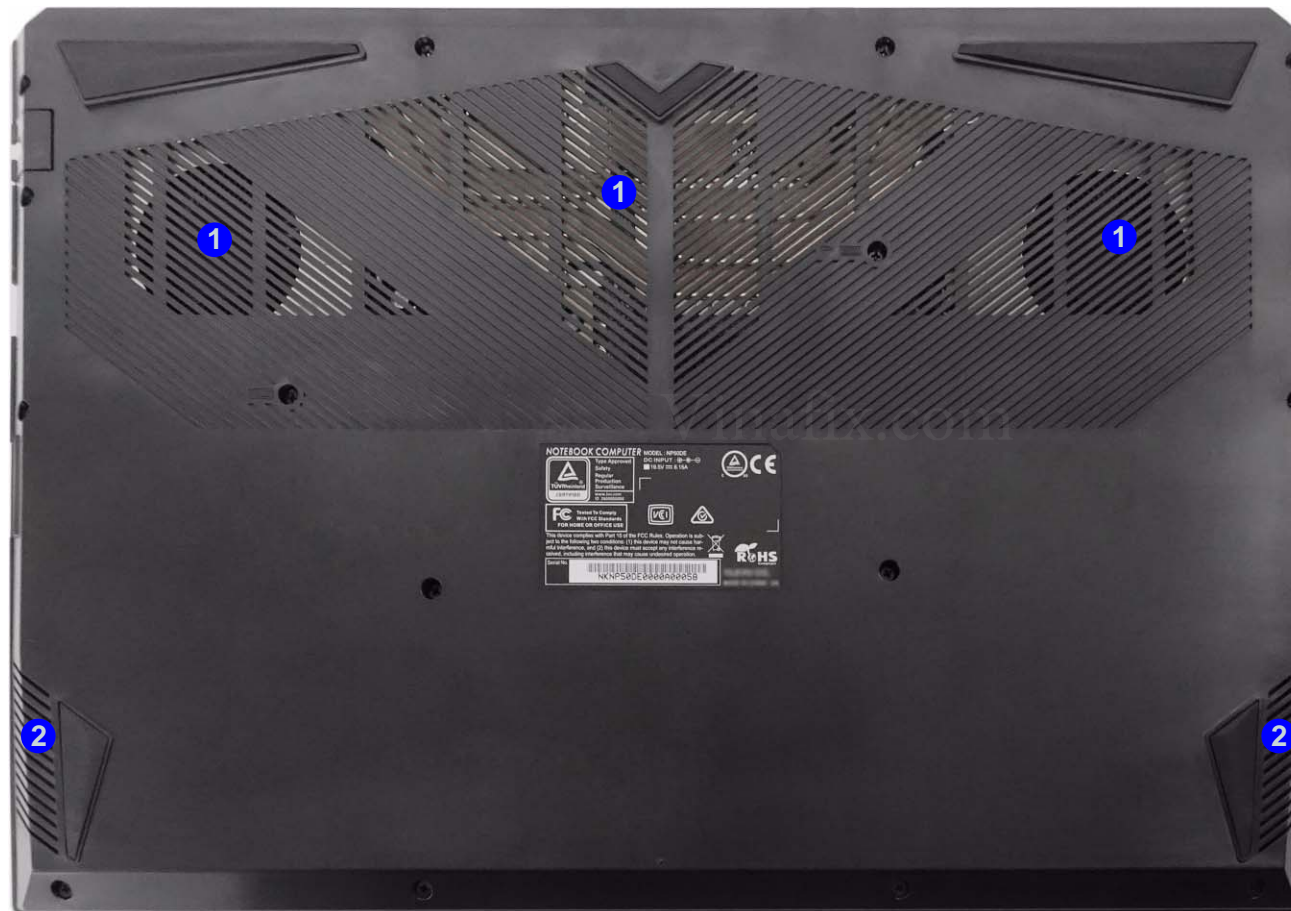


Figure 6
Bottom View

1. Vent
2. Speakers

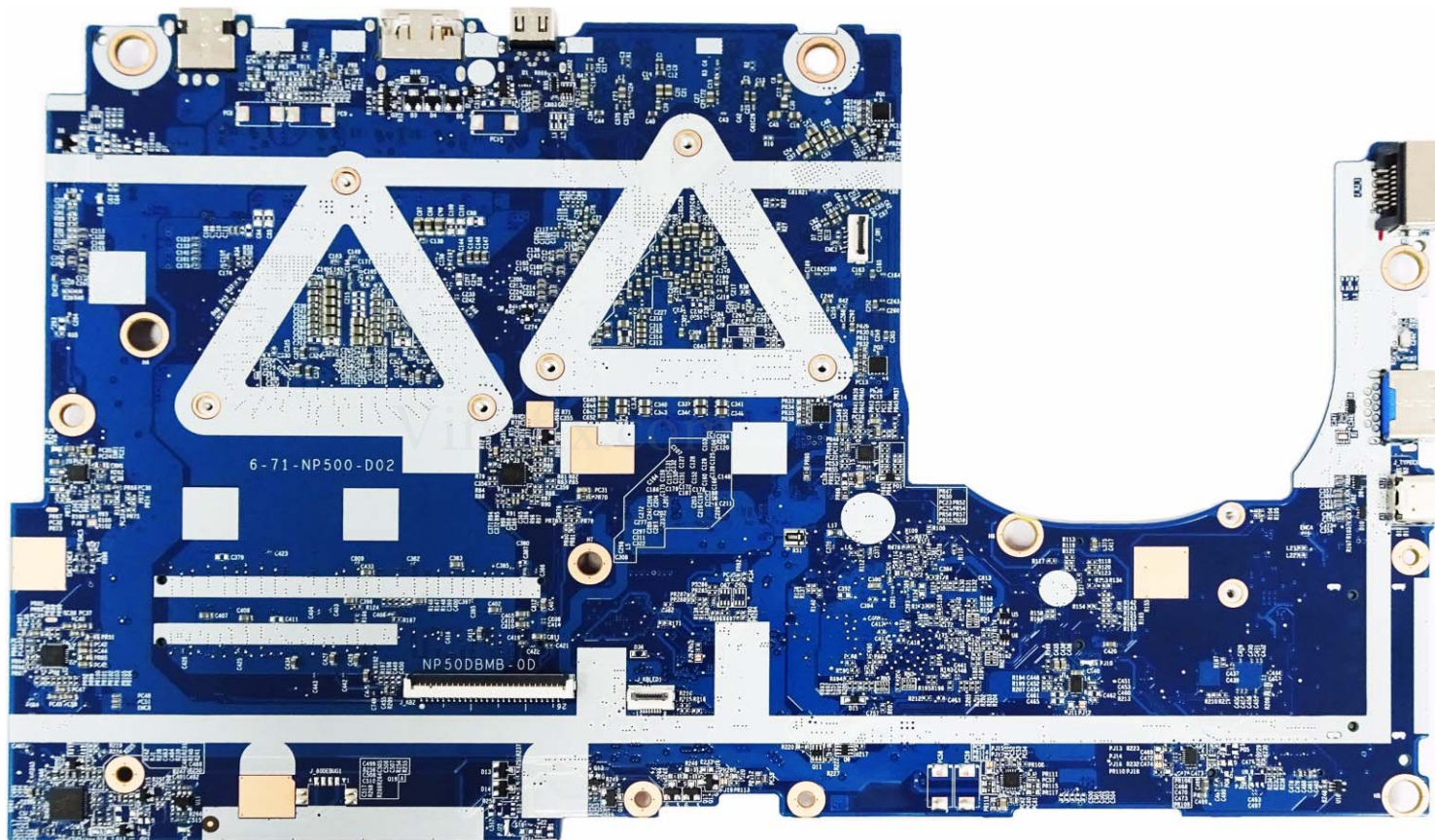


Overheating

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

Figure 7
Mainboard Top
Key Parts

Mainboard Overview - Top (Key Parts)



Mainboard Overview - Bottom (Key Parts)

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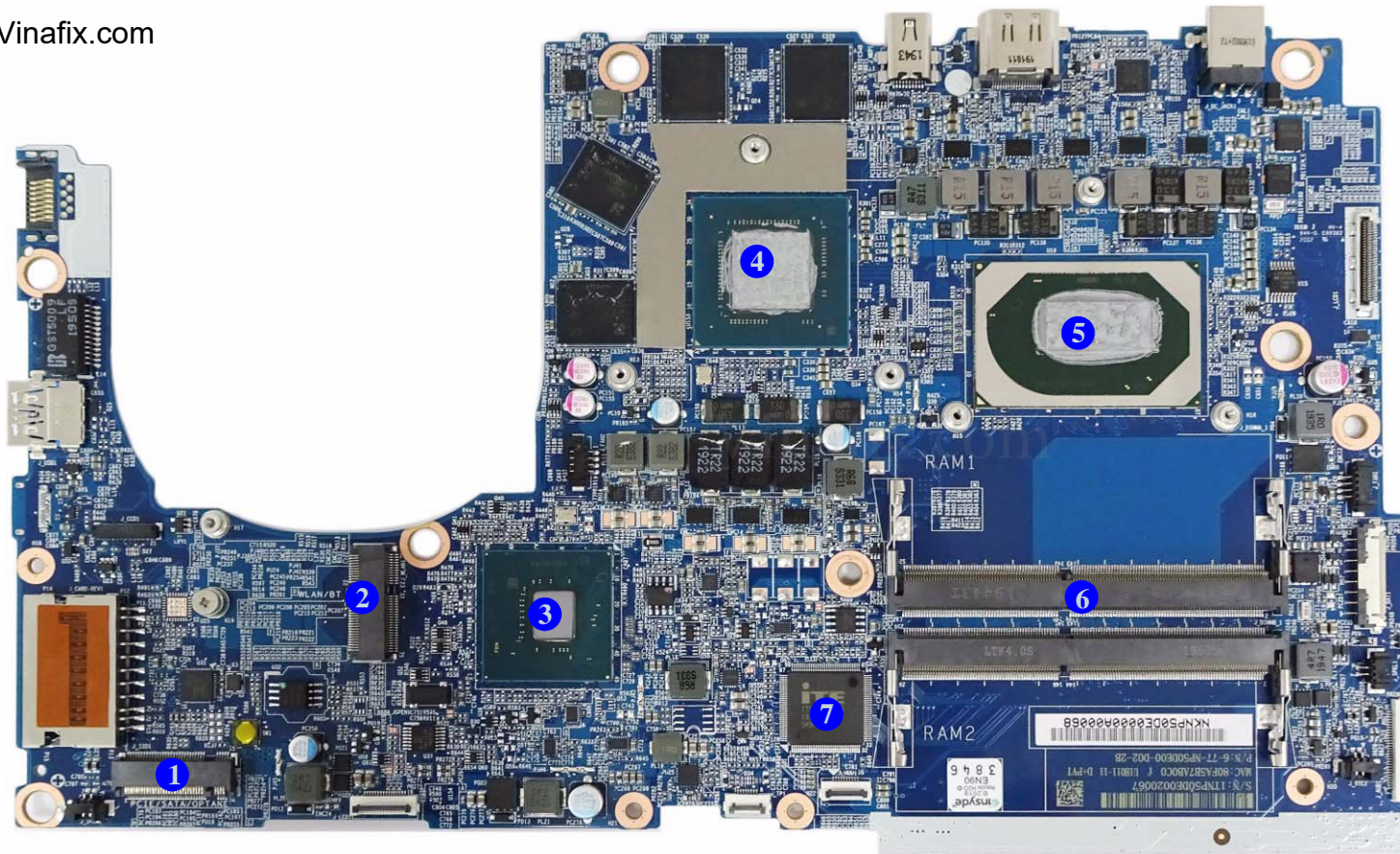


Figure 8
**Mainboard Bottom
Key Parts**

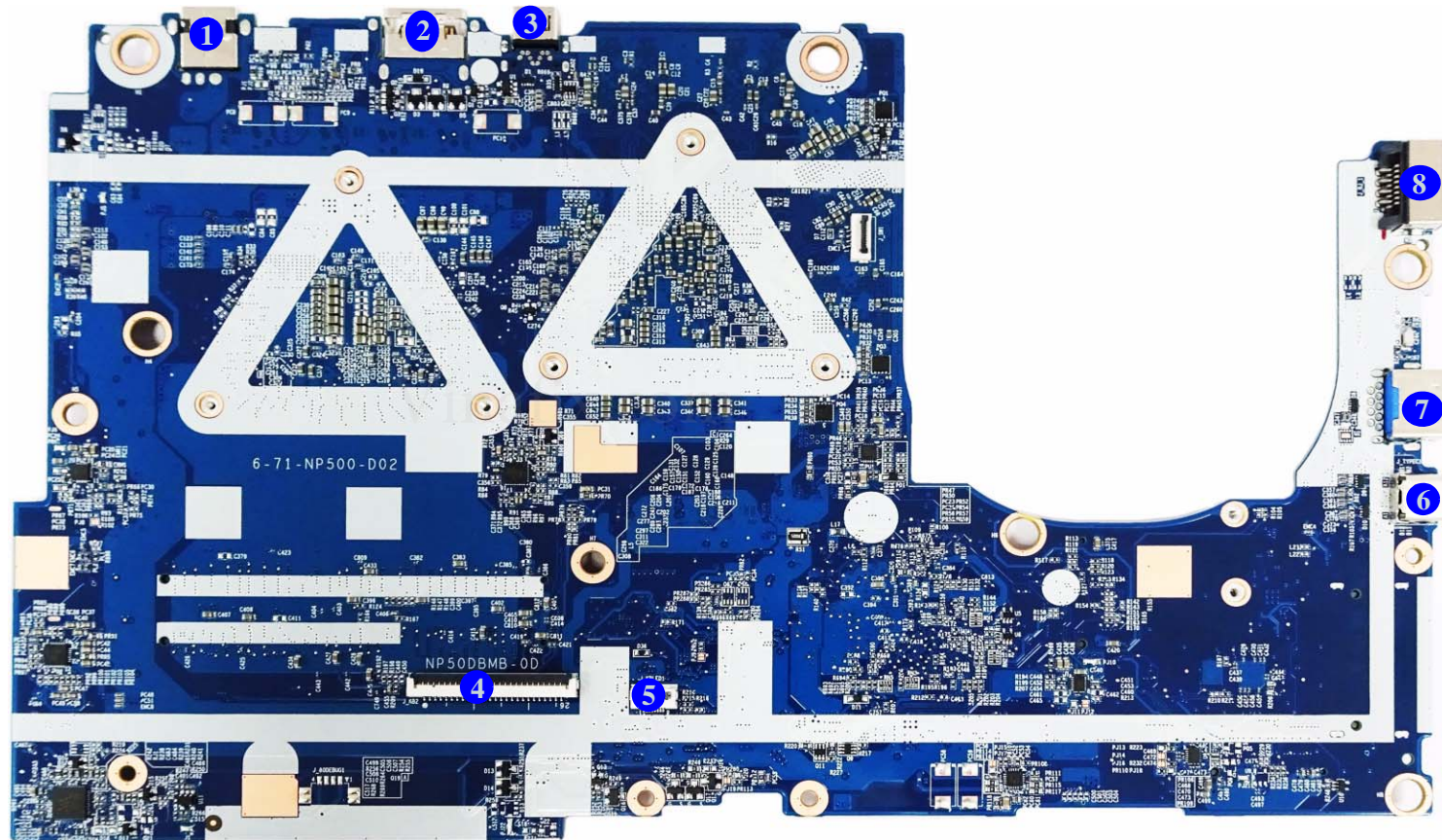
1. Mini-Card Connector (M.2 SSD Module)
2. Mini-Card Connector (WLAN Module)
3. PCH
4. GPU
5. CPU
6. Memory Slots DDR4 SO-DIMM
7. KBC-ITE IT5570

Introduction

Figure 9
**Mainboard Top
Connectors**

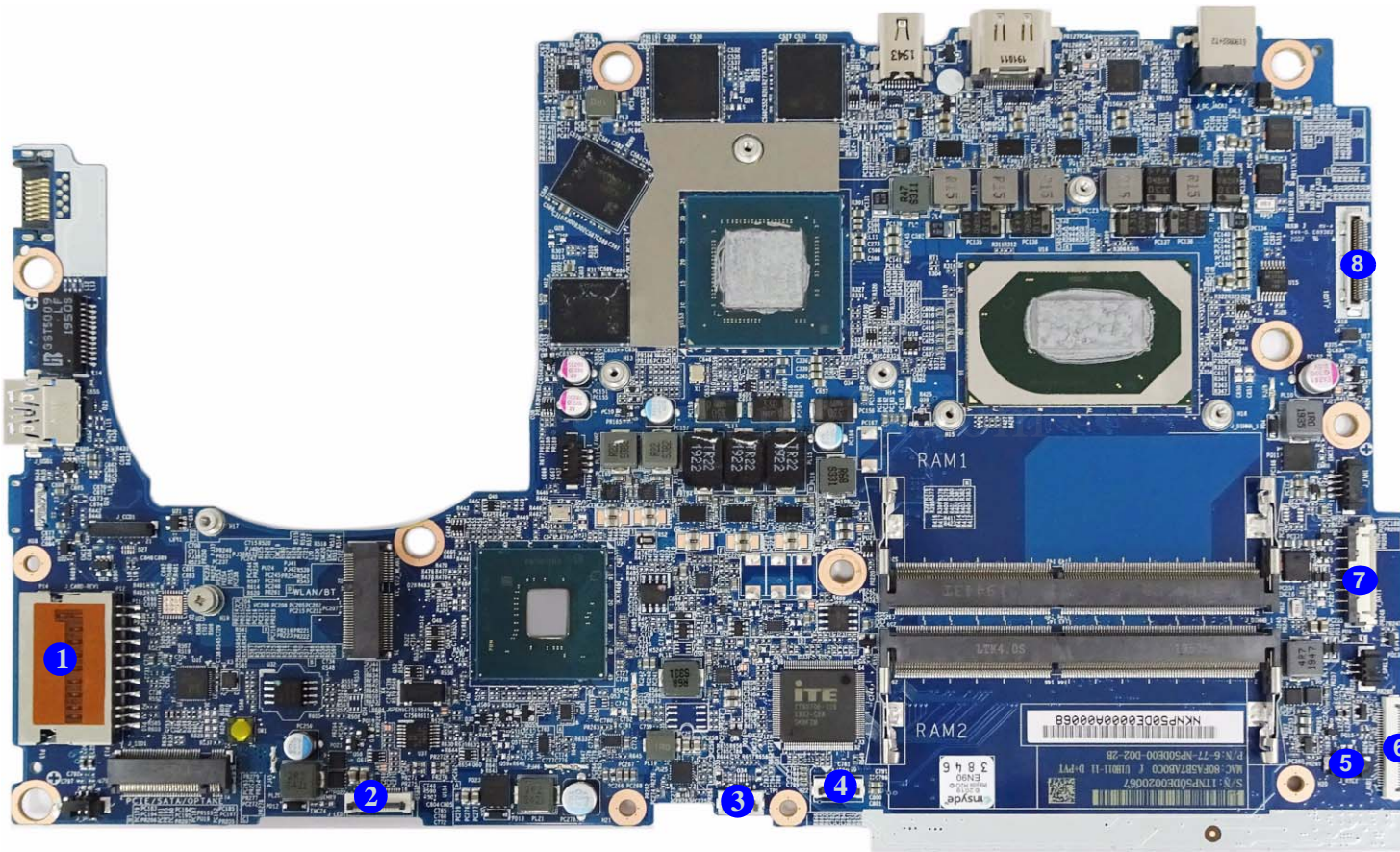
Mainboard Overview - Top (Connectors)

1. DC-In Jack
2. HDMI Port
3. Mini Display Port
4. Keyboard Cable Connector
5. LED KB Connector
6. USB 3.2 Gen 2 Type-C Port
7. USB 3.2 Gen 1 Type-A Port
8. RJ-45 LAN Jack



Mainboard Overview - Bottom (Connectors)

Figure 10
**Mainboard Bottom
Connectors**



1. Multi-in-1 Card Reader
2. LED Connector
3. Clickpad Cable Connector
4. HDD Cable Connector
5. CMOS Battery Connector
6. Audio Connector
7. Battery Connector
8. LCD Connector

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Chapter 2: Disassembly



Overview

This chapter provides step-by-step instructions for disassembling the *NP50DB / NP50DE* series notebook's parts and subsystems. When it comes to reassembly, reverse the procedures (unless otherwise indicated).

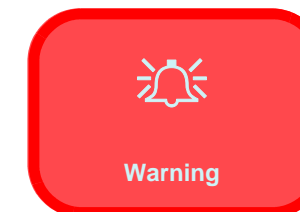
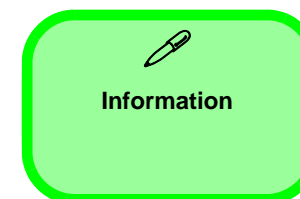
We suggest you completely review any procedure before you take the computer apart.

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.



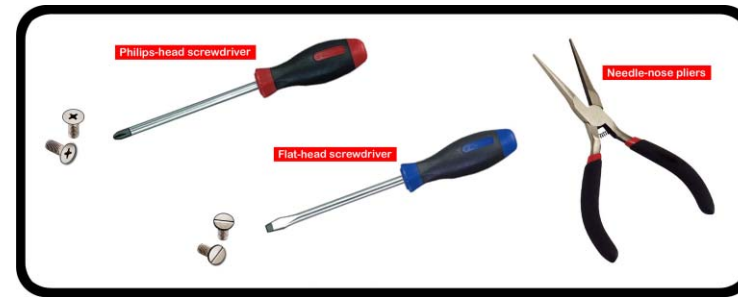
Disassembly

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 keyboard *page 2 - 5*

To remove the Battery:

1. Remove the keyboard *page 2 - 5*
2. Remove the battery *page 2 - 6*

To remove the M.2 SSD:

1. Remove the keyboard *page 2 - 5*
2. Remove the battery *page 2 - 6*
3. Remove the M.2 SSD *page 2 - 8*

To remove the HDD:

1. Remove the keyboard *page 2 - 5*
2. Remove the battery *page 2 - 6*
3. Remove the HDD *page 2 - 9*

To remove the System Memory:

1. Remove the keyboard *page 2 - 5*
2. Remove the battery *page 2 - 6*
3. Remove the system memory *page 2 - 11*

To remove the Wireless LAN Module:

1. Remove the keyboard *page 2 - 5*
2. Remove the battery *page 2 - 6*
3. Remove the WLAN *page 2 - 12*

To install the Touchpad:

1. Install the touchpad *page 2 - 14*

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 1a**).
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 1b**).
5. Carefully lift the keyboard **6** off the computer (**Figure 1c**).

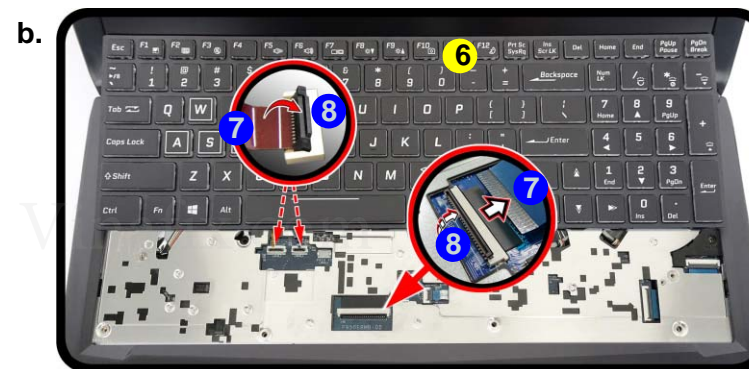
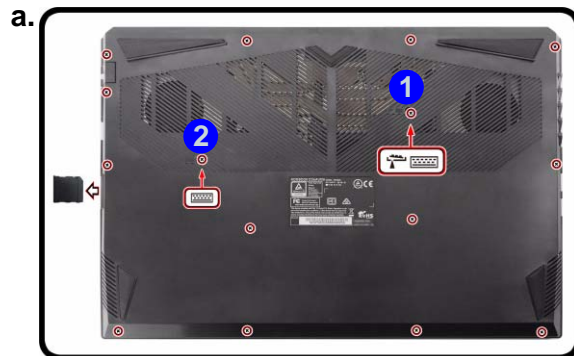


Figure 1
Keyboard Removal

- 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.
- Lift the keyboard up and disconnect the keyboard ribbon cable from the locking collar socket.
- 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.



- Eject Stick
- Keyboard

- 2 Screws

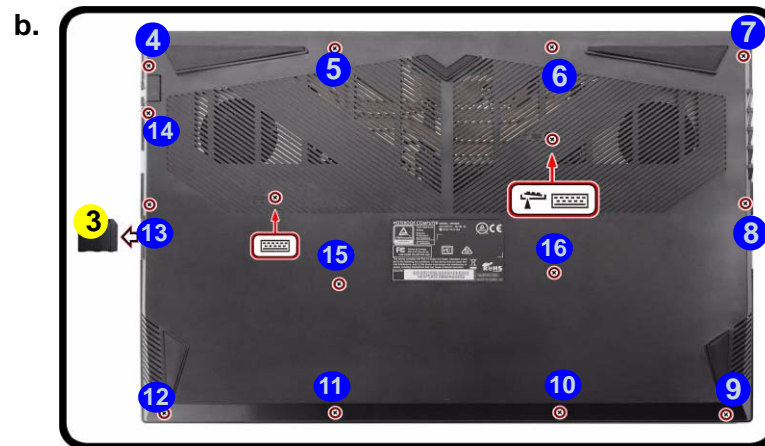
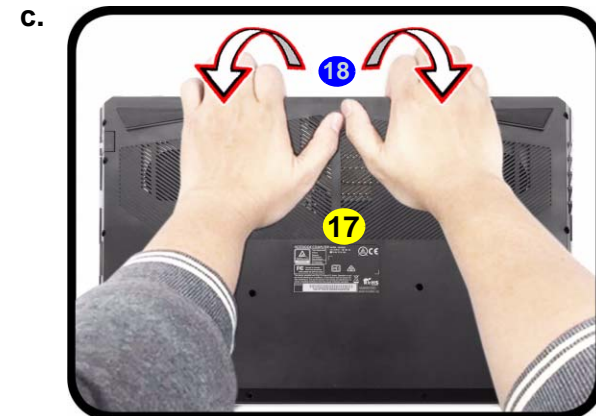
Disassembly

Figure 2
Battery Removal

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

Removing the Battery

- Turn the computer **off**, and remove the keyboard ([page 2 - 5](#)).
- Remove screws **1** - **2** ([Figure 2a](#)).
- Remove the SD card cover **3** and screws **4** - **16** ([Figure 2b](#)).
- Carefully lift the bottom case **17** up in the direction of the arrow at point **18** - **19** and remove it ([Figure 2c](#)).



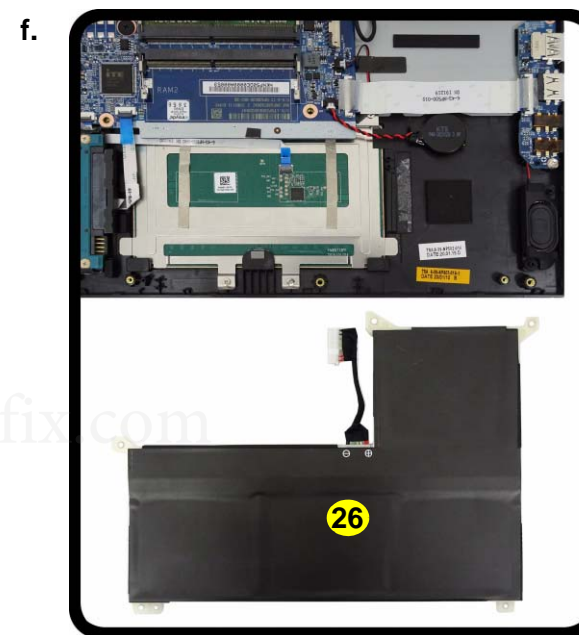
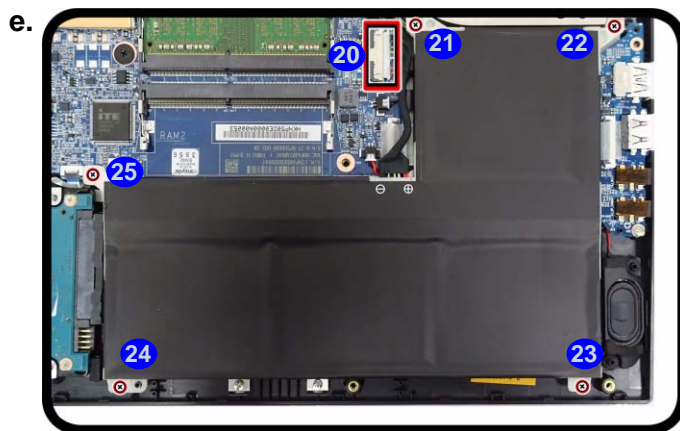
3. SD Card Cover
17. Bottom Case

- 15 Screws

5. The battery will be visible at point **19** on the computer (**Figure 3d**).
6. Carefully disconnect the cable **20**, then remove screws **21** - **25** (**Figure 3e**).
7. Lift the battery **26** off the computer (**Figure 3f**).
8. Reverse the process to install a new battery (do not forget to replace all the screws and bottom cover).

Figure 3
Battery Removal
(cont'd.)

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



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26. Battery

- 5 Screws

Disassembly

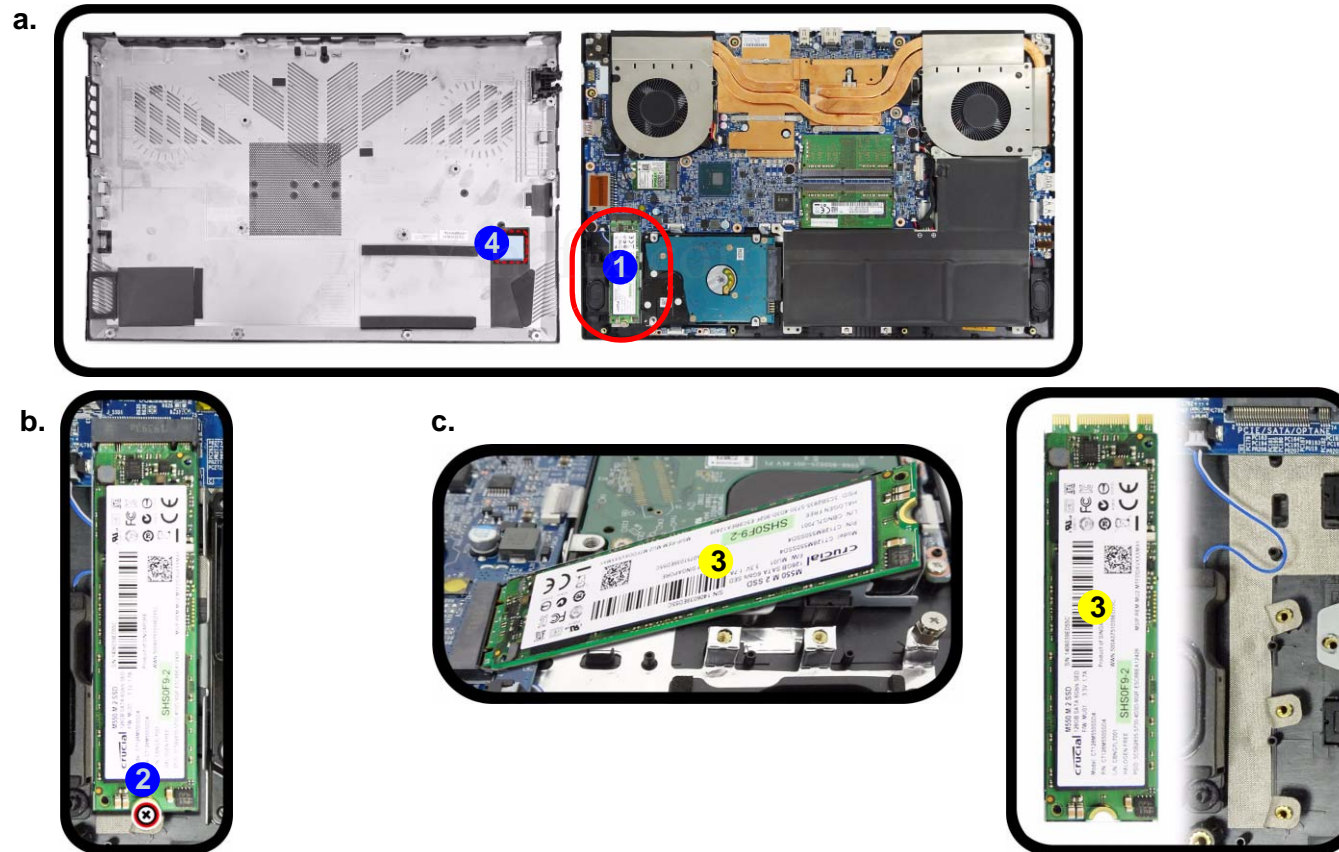
Figure 4
M.2 SSD Module Removal

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

Removing the M.2 SSD Module

M.2 SSD Removal Procedure

1. Turn **off** the computer, turn it over, remove the battery ([page 2 - 6](#)).
2. The M.2 SSD module will be visible at point **1** on the mainboard ([Figure 4a](#)).
3. Remove the screw **2** ([Figure 4b](#)).
4. The M.2 SSD module **3** ([Figure 4c](#)) 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 make sure that the thermal pad **4** is attached).



3.M2 SSD Module

- 1 Screw

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, and remove the battery ([page 2 - 6](#)) and SSD ([page 2 - 8](#)).
2. The HDD will be visible at point **1** on the mainboard ([Figure 5a](#)).
3. Remove screws **2** from the HDD assembly ([Figure 5b](#)).

a.



b.



Figure 5
HDD Assembly Removal

- a. Locate the HDD.
- b. Remove the screw.



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.



6. Hard Disk

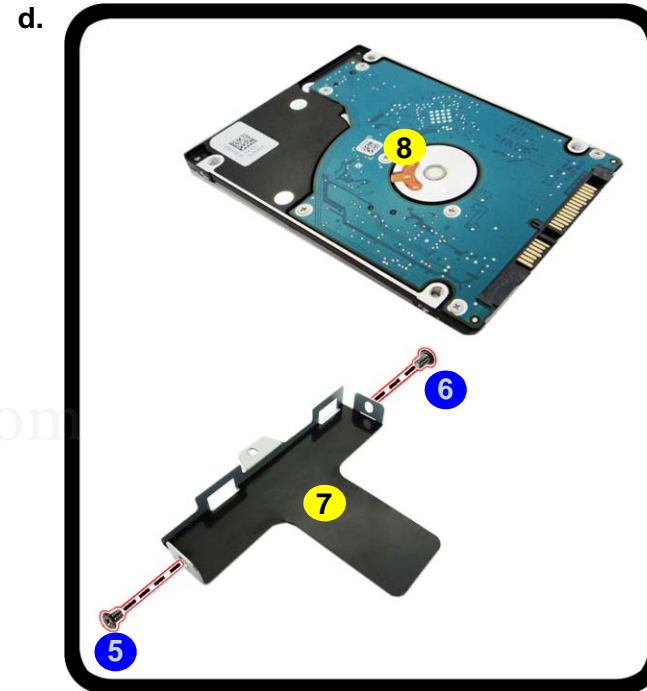
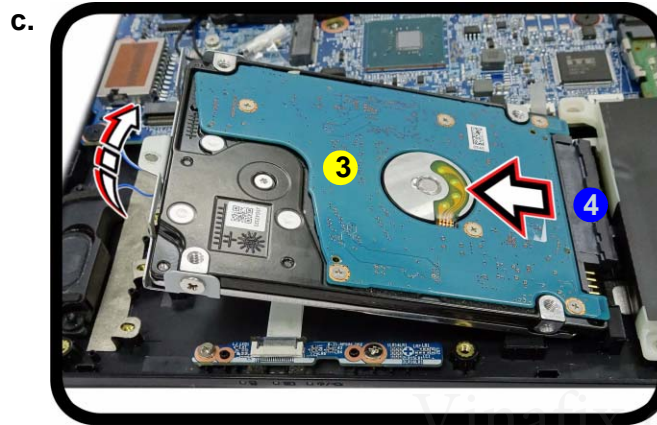
- 1 Screw

Disassembly

Figure 6
**HDD Assembly
Removal (cont'd.)**

- c. Slide and lift the HDD assembly to disconnect from the connector.
d. Remove the screws and bracket from the HDD.

4. Carefully lift and slightly slide the hard disk up.
5. Disconnect the hard disk assembly **3** from the connector **4** (*Figure 6c*).
6. Remove screws **5** - **6** and bracket **7** from the hard disk **8** (*Figure 6d*).
7. Reverse the process to install a new hard disk (do not forget to replace the screws).



- 3. HDD Assembly
- 7. HDD Bracket
- 8. HDD

- 2 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 3200 MHz. The main memory can be expanded up to 32GB. 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, turn it over, remove the battery ([page 2 - 6](#)).
2. The RAM-2 modules will be visible at point **1** on the mainboard ([Figure 7a](#)).
3. Gently pull the two release latches (**2** & **3**) on the sides of the memory socket in the direction indicated by the arrows ([Figure 7b](#)). The RAM module **4** will pop-up ([Figure 7c](#)), 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 - 6](#)).
9. Restart the computer to allow the BIOS to register the new memory configuration as it starts up.

Figure 7
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.

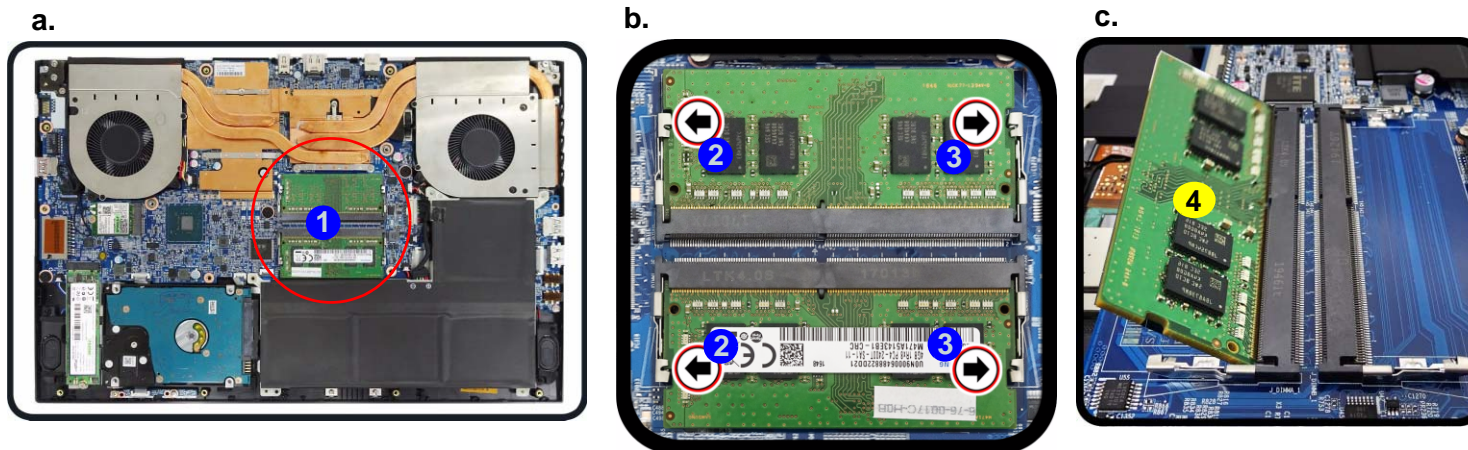


Contact Warning

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 8
**Wireless LAN
Module Removal**

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

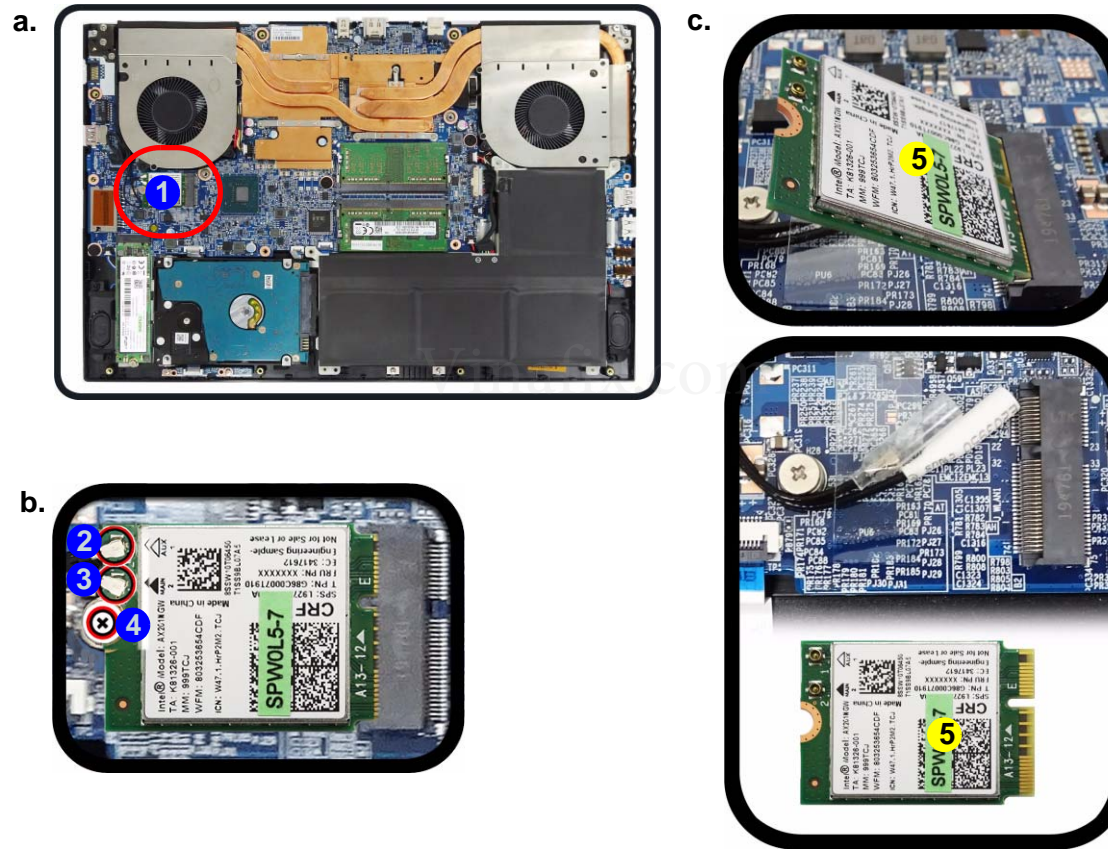
Note: Make sure you reconnect the antenna cable to the “1 + 2” socket (*Figure 8b*).

5. Wireless LAN Module

- 1 Screw

Removing the Wireless LAN Module

- Turn **off** the computer, turn it over, remove the battery (*page 2 - 6*).
- The Wireless LAN module will be visible at point **1** on the mainboard (*Figure 8a*).
- Carefully disconnect the cables **2** & **3**, and then remove the screw **4** (*Figure 8b*).
- The Wireless LAN module **5** (*Figure 8c*) will pop-up, and you can remove it from the computer.



Wireless LAN, Combo Module Cables

Note that the cables for connecting to the antennae on WLAN, WLAN & Bluetooth Combo, and LTE 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.

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Disassembly

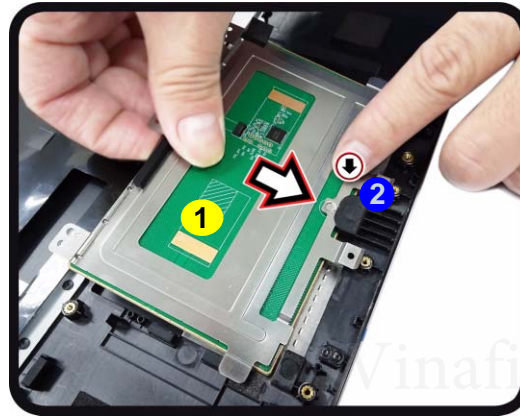
Figure 9
**Touchpad
Installation**

- a. Insert the touchpad assembly as shown.
- b. Tighten the screws and connect the cable connector.

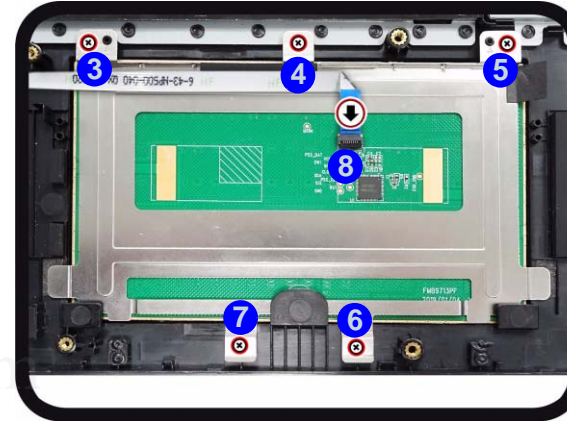
Installing the Touchpad

1. Insert the touchpad assembly **1** by carefully sliding the board attention while pushing it down **2** as shown (*Figure 9a*).
2. Tighten the screws **3** - **7** (*Figure 9b*).
3. Connect and lock the cable connector **8** in place (*Figure 9b*).

a.



b.



1. Touchpad Assembly

- 5 Screws

Appendix A:Part Lists

This appendix breaks down the *NP50DB / NP50DE* 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.

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Part List Illustration Location

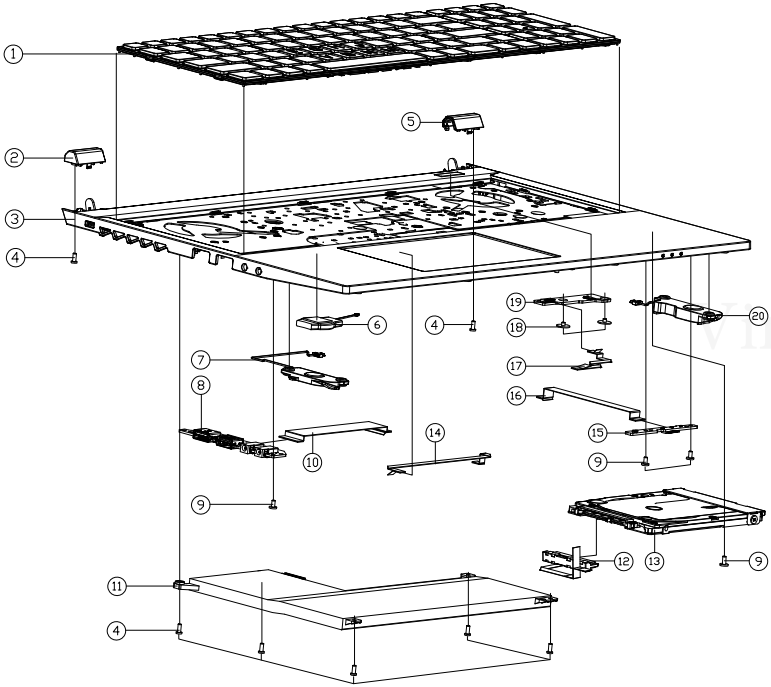
The following table indicates where to find the appropriate part list illustration.

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>

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Top

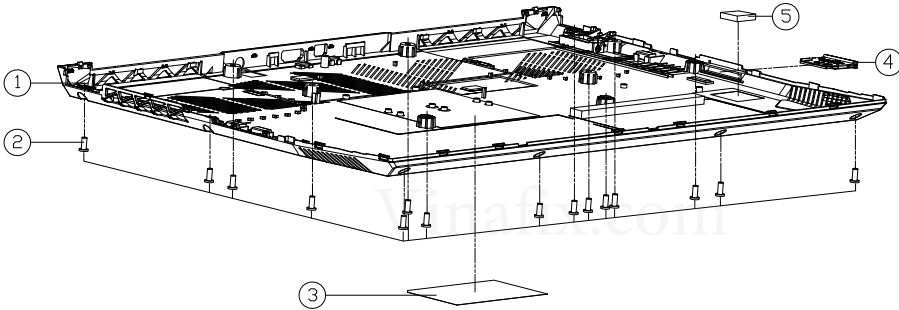


ITEM	PART NAME	PART NO	REMARK
1	KB FOR MULTI 15C BL KB SERIES NL50CU	6-NL50CU-KB-MCL	KB FOR MULTI 15C BL KB SERIES
1	B TO JPNICE COVER/PCB NL50 BLK W/TE SLIDE LONG PINING TAIL/END KEY COVER FOR MCJ	6-80-N1S20-21D-1M	FOR MULTI 15C BL KB JP SERIES KB FOR MCJ
2	HINGE COVER L FOR TOP (COVER/STRD FR3008+) NP50DB	6-42-NP502-052	
3	(PRE-PROCESS) TOP CASE MODULE NP50DB	6-78-NP50DB02-010	
4	SCREW M2*5L KI(T=0.8 D=3.5) BK/Z ICT NY	6-35-B6120-5RC	
5	HINGE COVER R FOR TOP (COVER/STRD FR3008+) NP50DB	6-42-NP502-042	
6	BAT. 20MM 3V 220MAH W/CABLE 55MM BCR2032H5.5VX0UB (SHI/HND)	6-23-22015-TE0	
7	SPK+CABLE L L44*23 2W 4? L150MM VTS251410-03 NL50CU	6-23-5NL5C-0L0	
8	AUDIO BOARD V2.0 (PCB R=1.4) NP50DB	6-77-NP508-D02-1	
9	SCREW M2*4L KI NI ICT NY (DD=04.5,DT=0.8)	6-35-B1120-4RC	
10	FFC CABLE AUDIO TO MB L=91MM 60V 30PIN (QX) NP50DB	6-43-NP500-011	
11	W/TP S L1 152V322W/4PM RSP SCOUT/ENTER ORANGE/20 REAR/39MM C073MM NP50DB	6-87-NP50S-43G01	
12	HDD CONNCR-006260000+PCB+W/CABLE+DATE CODE 0FC CABLE 66.0MM NP50DB	6-23-FNP50-011	
13	W/O HDD ASS'Y NP50DB	6-79-NP50DB0J-010	
13	W/HDD ASS'Y NP50DB	6-79-NP50DB0J-020	
14	FFC CABLE TP TO MB L=122MM 60V 8PIN (QX) NP50DB	6-43-NP500-041	
15	LED BOARD V2.0 NP50DB	6-77-NP504-D02	
16	FFC CABLE HALL TO MB L=92MM 60V 16PIN (QX) NP50DB	6-43-NP500-031	
17	FFC CABLE POWER TO MB L=71MM 60V 4PIN (QX) NP50DB	6-43-NP500-021	
18	SCREW M2*2L KI BK/Z ICT NY(08,T=0.6)	6-35-B6120-2RE	
19	POWER SW BOARD V2.0 NP50DB	6-77-NP50S-D02	
20	SPK+CABLE R L44*23 2W 4? L50MM VTS251410-04 NL50CU	6-23-5NL5C-0R0	

Figure A - 1
Top

Bottom

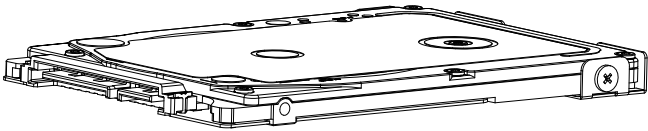
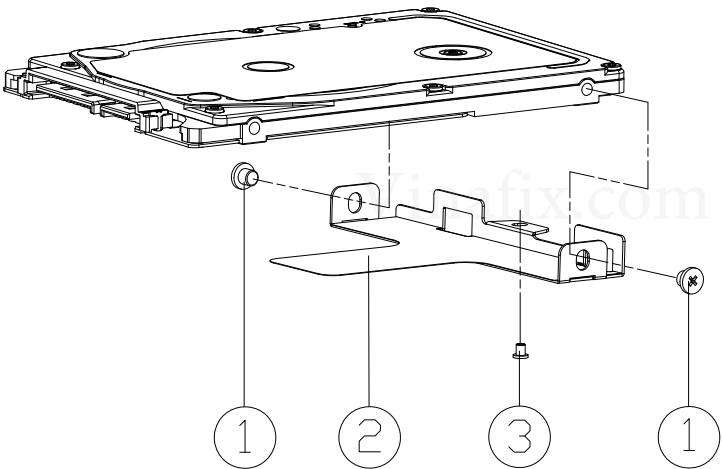
Figure A - 2
Bottom



ITEM	PART NAME	PART NO	REMARK
1	BOTTOM CASE MODULE NP50DB	6-39-NP503-012	
2	SCREW M2.5*6L K BZ ICT NY	6-35-82125-6RA	
3	PRODUCT LABEL FOR NP50DB	6-45-NP50DB03-010	
3	PRODUCT LABEL FOR NP50DE	6-45-NP50DE03-010	
3	PRODUCT LABEL FOR NP50DB-M	6-45-NP50DBM3-010	
3	PRODUCT LABEL FOR NP50DE-M	6-45-NP50DEM3-010	
3	PRODUCT LABEL FOR NP55DE-H	6-45-NP55DEH3-010	
4	DUMMY 3IN1 NON PUSH TYPE PC+ABS (C7230P-700DE) V9703IW	6-42-W9708-030	
5	THERMAL PAD MA500 (17.3*17.3*2.5MM) NP50DB	6-48-NP508-010	

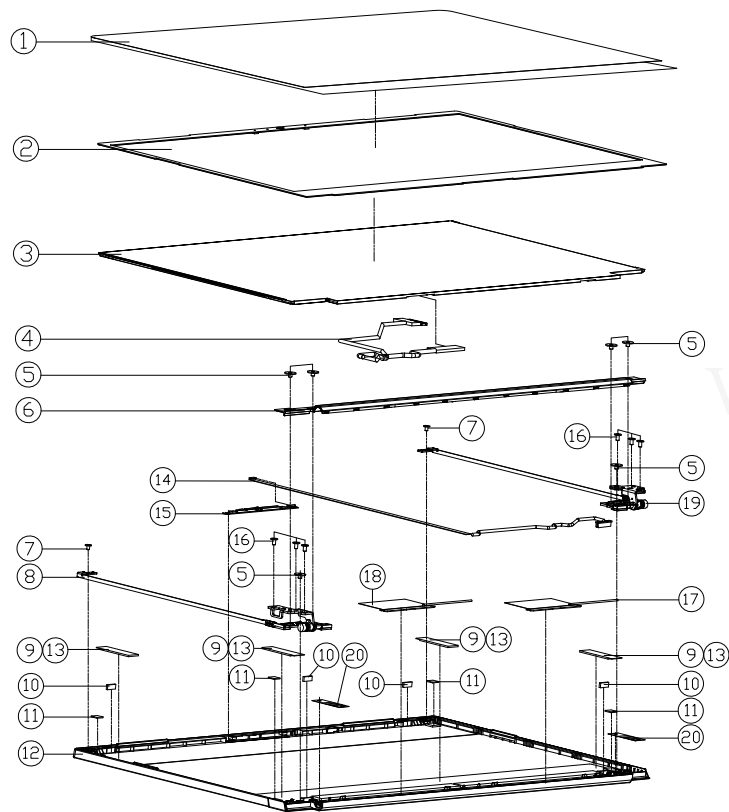
HDD

Figure A - 4
HDD



ITEM	PART NAME	PART NO	REMARK
1	SCREW M3*3.0L KI NI ICT NY	6-35-B1130-3R5	
2	HDD BKT 7MM SECC T=0.5 N250LU	6-33-N250J-011	
3	SCREW M2*4L KI NI ICT NY (DD=04.5,DT=0.8)	6-35-B1120-4RC	

LCD



ITEM	PART NAME	PART NO	REMARK
1	LCD PROTECT MYLAR BOPP N150ZU	6-40-N15Z8-010	
2	FRONT COVER MYLAR NP50DB	6-40-NP501-031	
3	LCD 15.6" FHD (EDP) INNOLUX N156HGE-EAB (LED) 3.2 MM	6-50-LBB26-L124	
3	LCD N156" FHD/VVA/120HZ/NA/NDN GT/EDP PANDA LMS6LFG-L LED 3.2MM	6-50-LBB32-Y150	
3	LCD N156" FHD/VVA/NDN GT/EDP BEE N156HFM-N1 F6 8030/8033 LED 26 MM	6-50-LBB26-Z020	
3	LCD N156" FHD/IPS/NA/NDN GT/EDP LG LP156WFC-SPD3 LED 3.2MM	6-50-LBB32-L015	
4	WIRE CABLE FOR EDP 250MM 30V I 40PIN (4H/L/W CON/LV0140-212) NP50DB	6-43-NP501-011-N	
4	WIRE CABLE FOR EDP 250MM 1 30V 30PIN (4H/L/W CON/LV0140-212) NP50DB	6-43-NL5C1-012-N	
5	SCREW M2.5*2.5L KI BK/Z ICT NY (Ø8,T=0.6)	6-35-B6125-2R5	
6	FRONT BEZEL MODULE NP50DB	6-42-NP501-102	
7	SCREW M2*3L KI NI ICT NY (DD=Ø4.0,DT=0.8)	6-35-B1120-3RD	
8	HINGE L (SK7) NP50DB	6-33-NP501-0L1	
9	BACK SPONGE REMOVE ADHESIVE OP95T NP50DB	6-47-NP501-030	FOR 6-50-LBB26-L124 6-50-LBB26-Z020
10	LCD RUBBER (8*3.4*1.3) NP50DB	6-47-NP501-010	
11	LCD GASKET (6*6*0.6) NP50DB	6-47-00190-660-1	FOR 6-50-LBB26-L124 6-50-LBB26-Z020
12	BACK COVER MODULE NP50DB	6-39-NP501-022	
13	BACK SPONGE REMOVE ADHESIVE OP35T NP50DB	6-47-NP501-050	FOR 6-50-LBB32-Y150 6-50-LBB32-L015
14	WIRE+FFC CABLE FOR CCD 500MM 3.3V 12P (4H/L) NP50DB	6-43-NP50T-011	
15	WIRE CABLE FOR CCD 500MM 3.3V 12P (4H/L) NP50DB	6-88-N15ZC-5100	OPTION
15	WIRE CABLE FOR CCD 500MM 3.3V 12P (4H/L) NP50DB	6-88-N15ZC-4900	OPTION
16	SCREW M2.5*4L KI BK/D ICT NY	6-35-B4125-4RA	
17	ANTENNA (PEXA) WLAN WGT W1.1 PCB (OLAPLASTIC) 2.4G/5G/60HZ W1.1-200MM NP50DB	6-23-7NP50-011	
18	ANTENNA (PEXA) WLAN WGT W1.2 PCB (OLAPLASTIC) 2.4G/5G/60HZ W1.2-250MM NP50DB	6-23-7NP50-020	
19	HINGE R (SK7) NP50DB	6-33-NP501-0R1	
20	LCD CABLE MYLAR NP50DB	6-40-NP501-010	

Figure A - 5
LCD

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Appendix B: Schematic Diagrams

This appendix has circuit diagrams of the *NP50DB / NP50DE* notebook's PCB's. The following table indicates where to find the appropriate schematic diagram.

Diagram - Page	Diagram - Page	Diagram - Page
System Block Diagram - Page B - 2	Panel, Inverter - Page B - 23	VDD3, VDD5 - Page B - 44
Processor 1/6 - Page B - 3	HDMI - Page B - 24	DDR 1.2V, 0.6VS, 2.5V - Page B - 45
Processor 2/6 - Page B - 4	PCH 1/9 - Page B - 25	VCore Output Stage - Page B - 46
Processor 3/6 - Page B - 5	PCH 2/9 - Page B - 26	VVC_Core, VCCGT, VCCSA - Page B - 47
Processor 4/6 - Page B - 6	PCH 3/9 - Page B - 27	1.05DX_VCCSTG, VCCSFR_OC, 1.8VA - Page B - 48
Processor 5/6 - Page B - 7	PCH 4/9 - Page B - 28	VCCGT, VCCSA Output Stage - Page B - 49
Processor 6/6 - Page B - 8	PCH 5/9 - Page B - 29	AC_In, Charger - Page B - 50
DDR4 CHA SO-DIMM_0 - Page B - 9	PCH 6/9 - Page B - 30	NVVDD 1 - Page B - 51
DDR4 CHB SO-DIMM_0 - Page B - 10	PCH 7/9 - Page B - 31	NVVDD 2 - Page B - 52
Straps and XTAL - Page B - 11	PCH 8/9 - Page B - 32	PEX_VDD - Page B - 53
VGA Frame Buffer Interface - Page B - 12	PCH 9/9 - Page B - 33	FBVDDQ - Page B - 54
VGA Frame Buffer A - Page B - 13	ALC293D - Page B - 34	DGPU Power Measurement - Page B - 55
VGA Frame Buffer A - Page B - 14	M.2 WLAN+BT, PCIE4X SSD - Page B - 35	IV8_RUN/AON, NV3V3 - Page B - 56
VGA Frame Buffer B - Page B - 15	USB, Charger - Page B - 36	Audio Board - Page B - 57
VGA Frame Buffer B - Page B - 16	Card Reader / LAN RTL8411B - Page B - 37	LED Board - Page B - 58
VGA I/O - Page B - 17	HDD, TP, Audio, Hall Conn - Page B - 38	Power Board - Page B - 59
NVIDIA Power Sequence - Page B - 18	LED, CCD, TPM, Power SW Conn - Page B - 39	Power Sequence - Page B - 60
NVIDIA GPIO Level Shift - Page B - 19	KBC-ITE IT5570 - Page B - 40	
VGA PWR/GND/NCs - Page B - 20	RGB KB - Page B - 41	
VGA NVVDD Coupling - Page B - 21	5V, 5VS, 3.3V, 3.3VS - Page B - 42	
MDP - Page B - 22	VDD 1.05V, VCCIO, 3.3VA, VCCST - Page B - 43	

Table B - 1
**SCHEMATIC
DIAGRAMS**

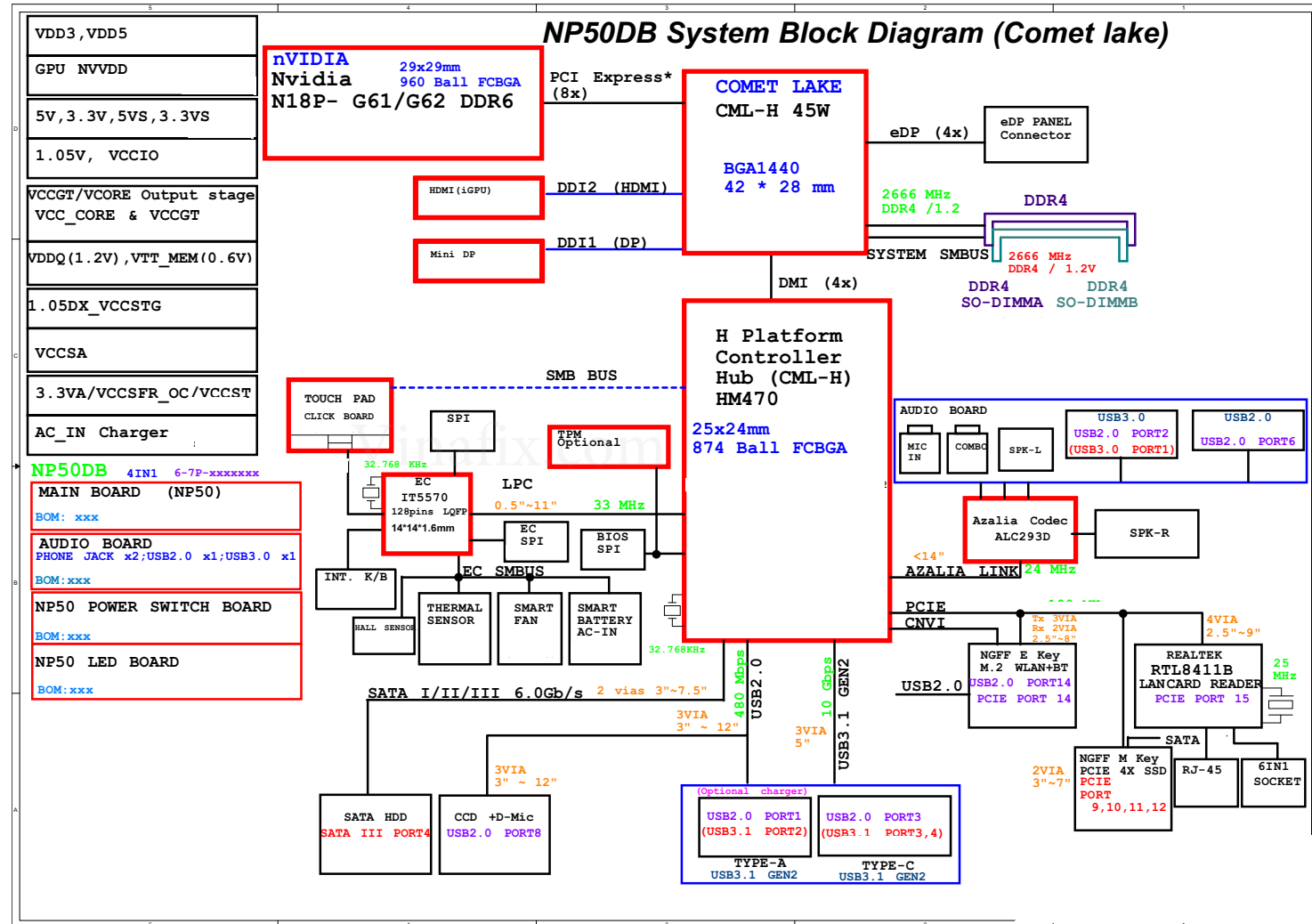


Version Note

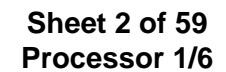
The schematic diagrams in this chapter are based upon version 6-7P-NP504-002. If your mainboard (or other boards) are a later version, please check with the Service Center for updated diagrams (if required).

System Block Diagram

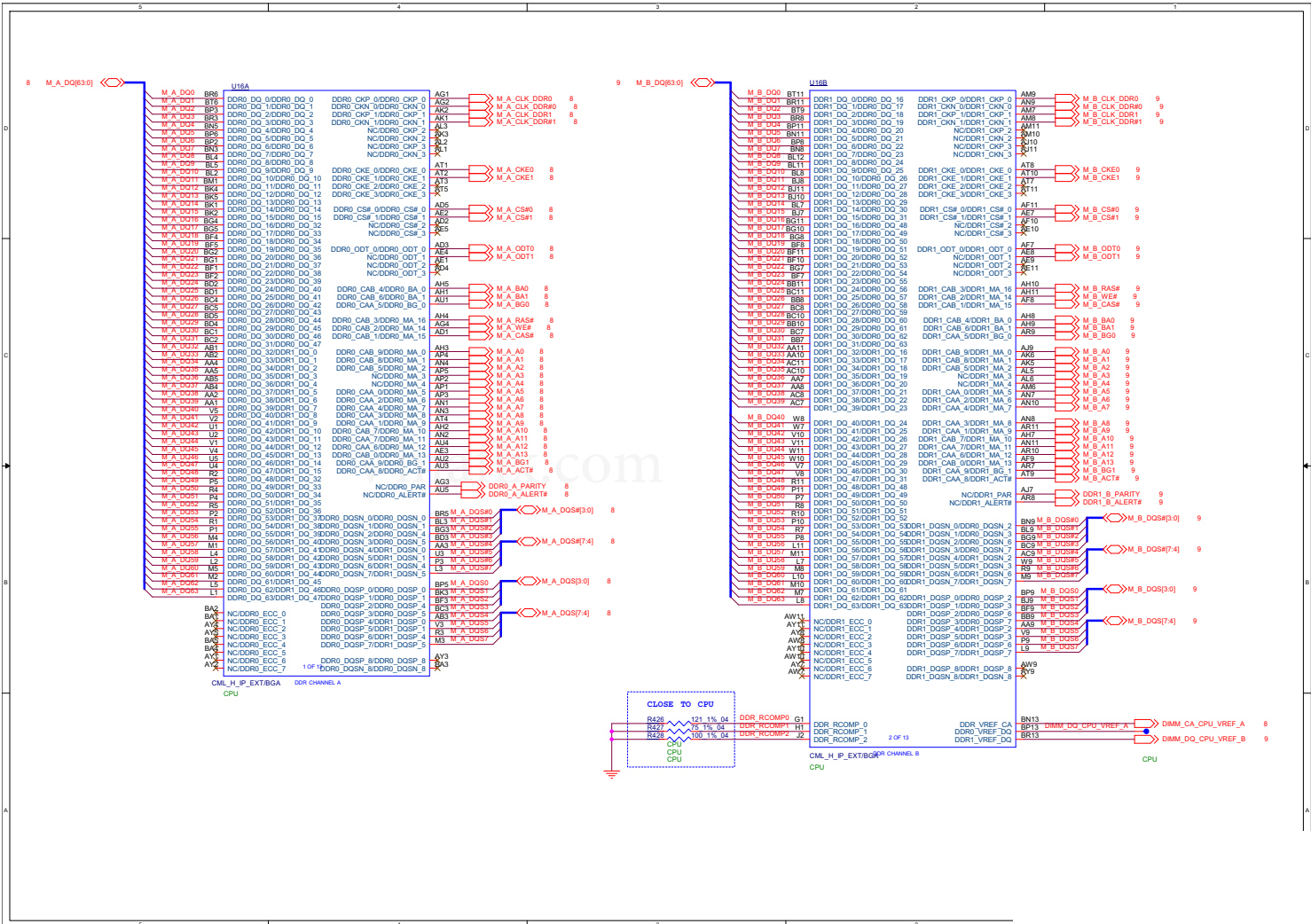
Sheet 1 of 59
System Block
Diagram



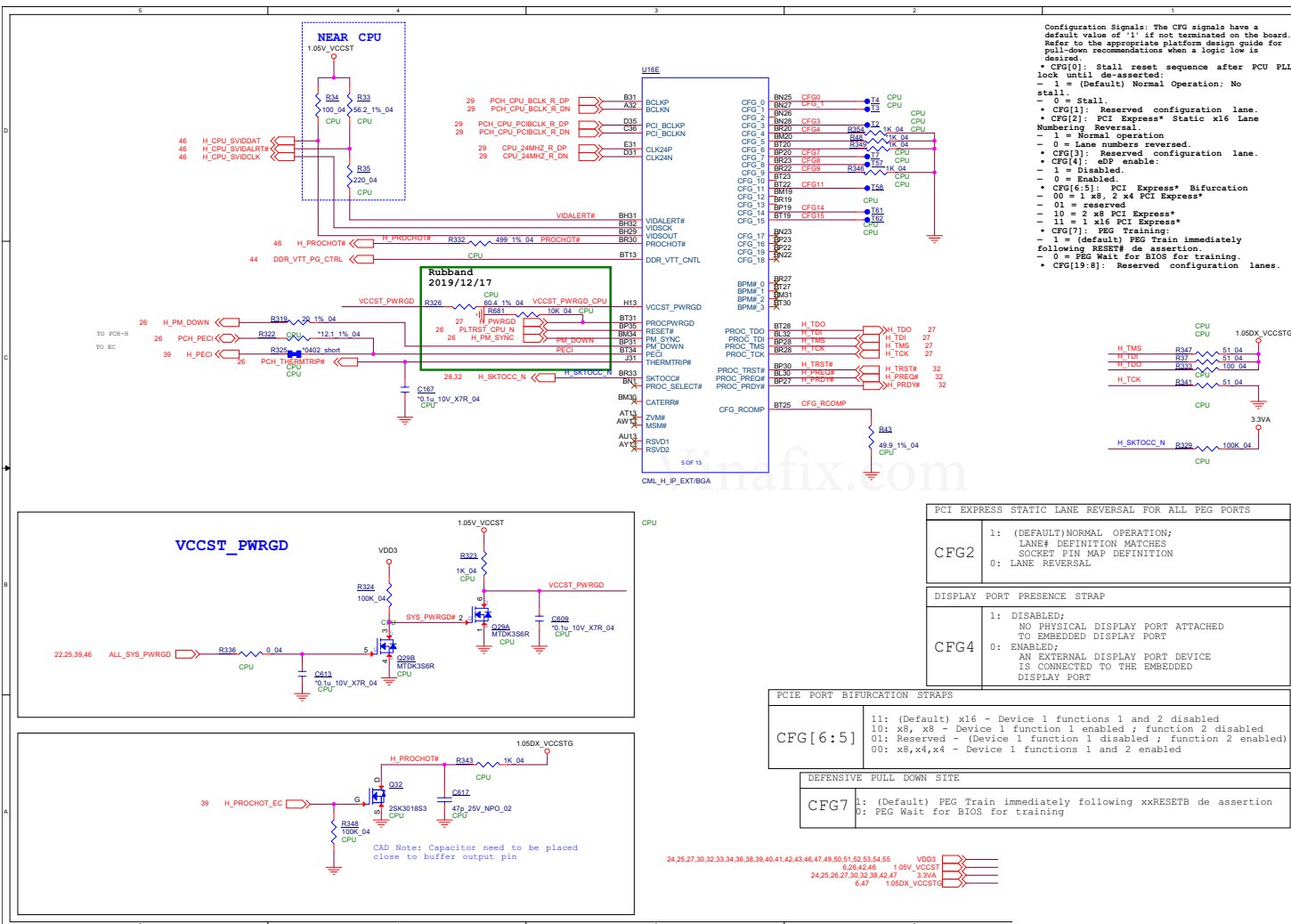
Processor 1/6 B - 3



Processor 2/6



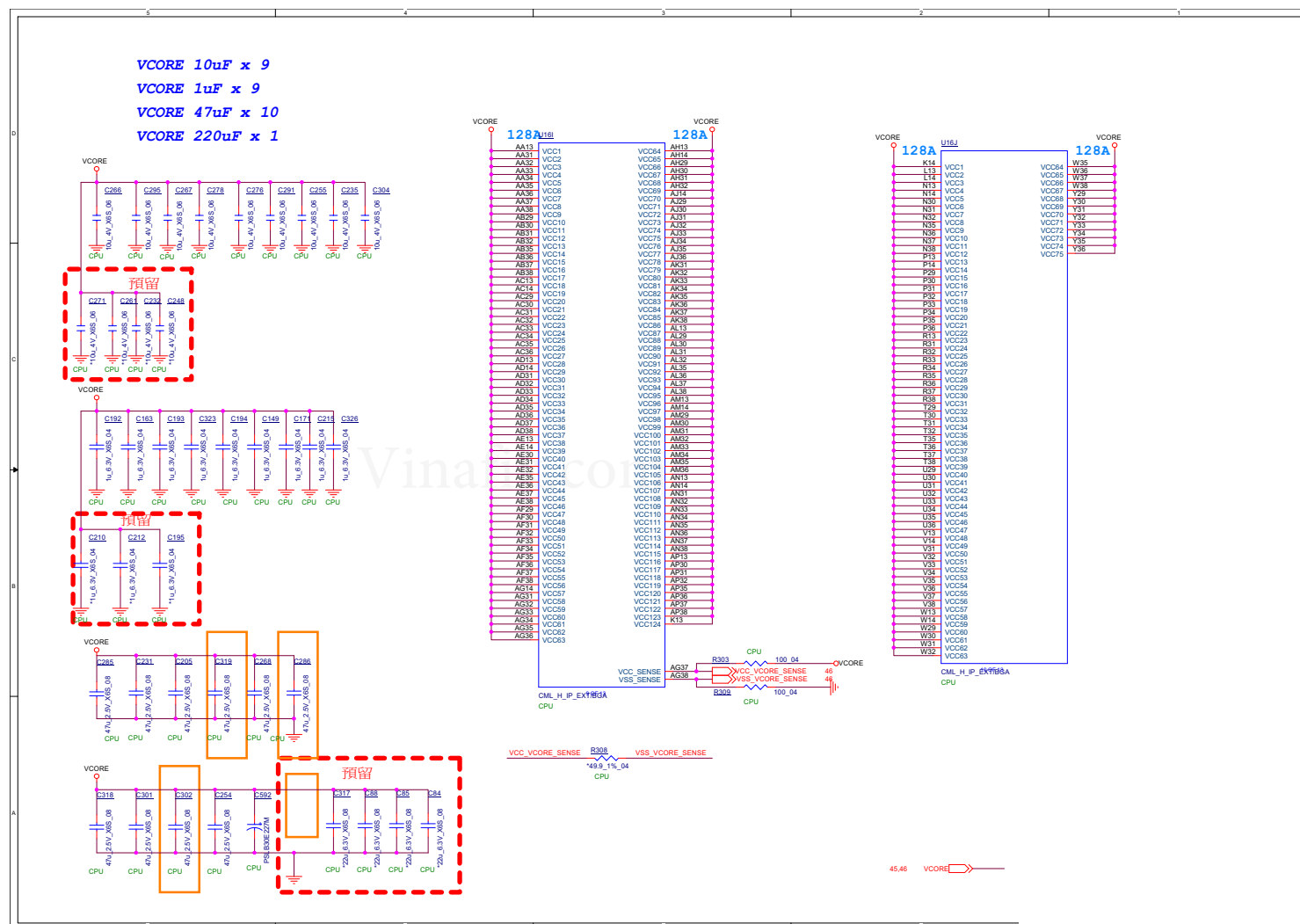
Processor 3/6



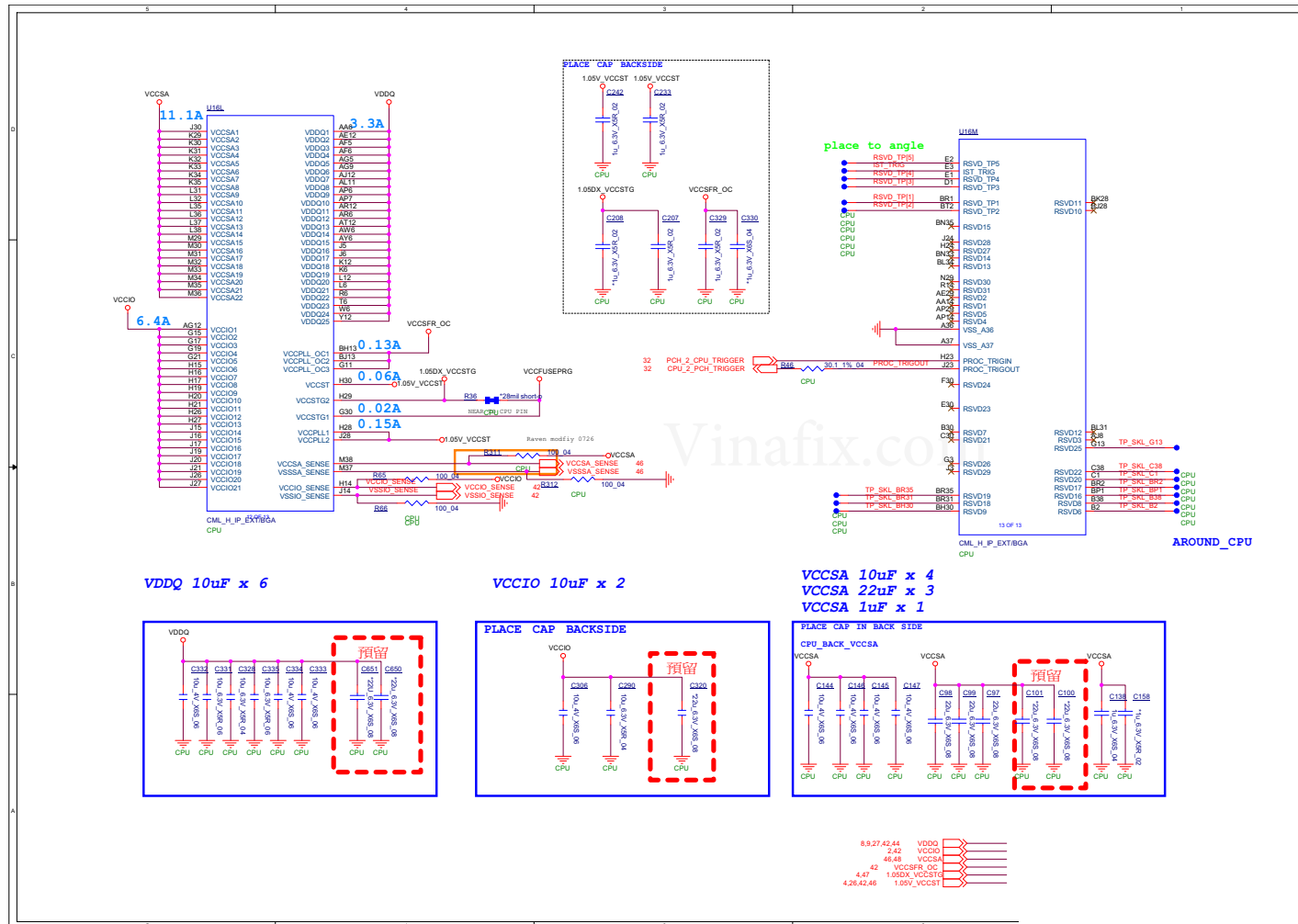
Processor 4/6

B. Schematic Diagrams

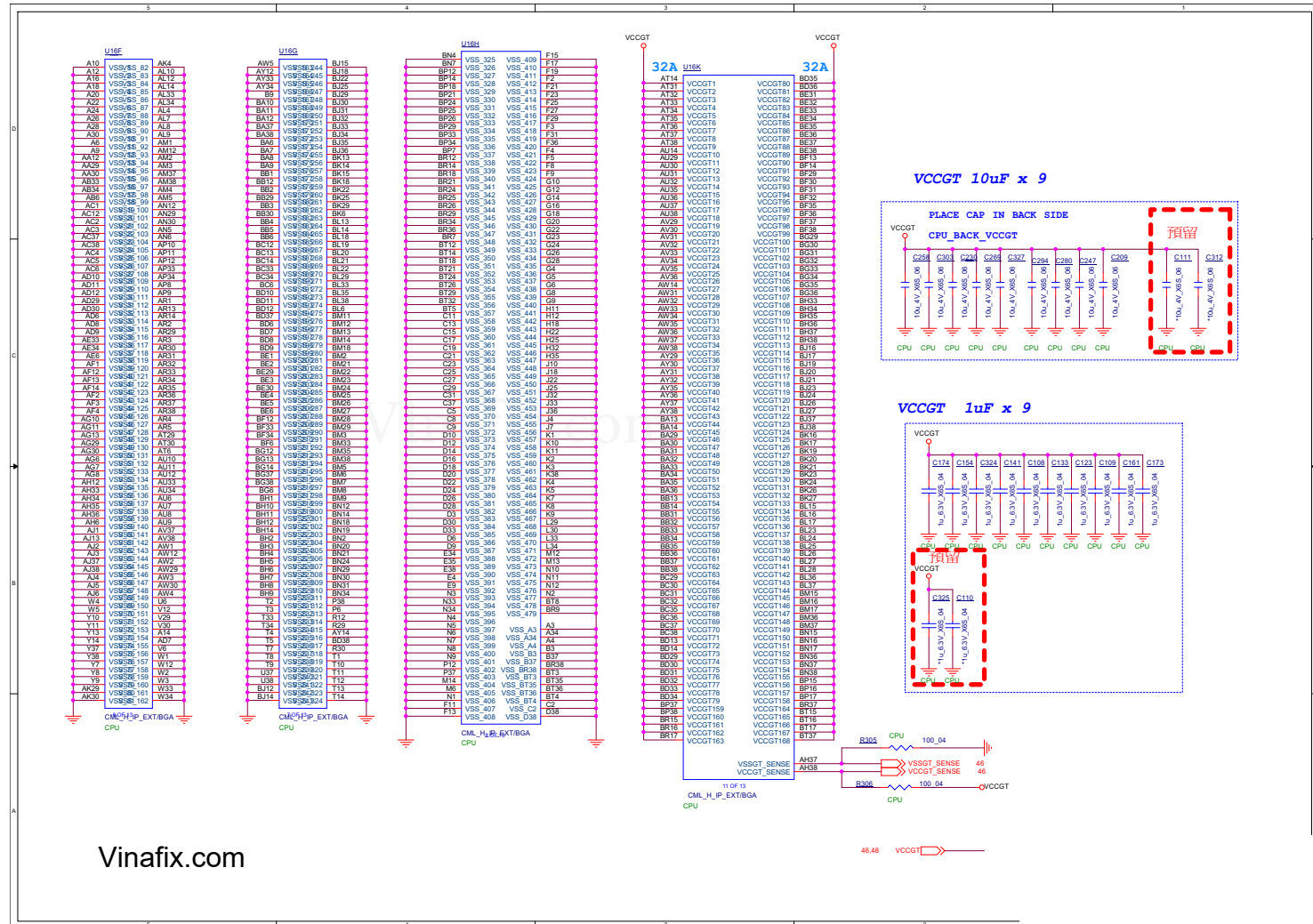
Sheet 5 of 59
Processor 4/6



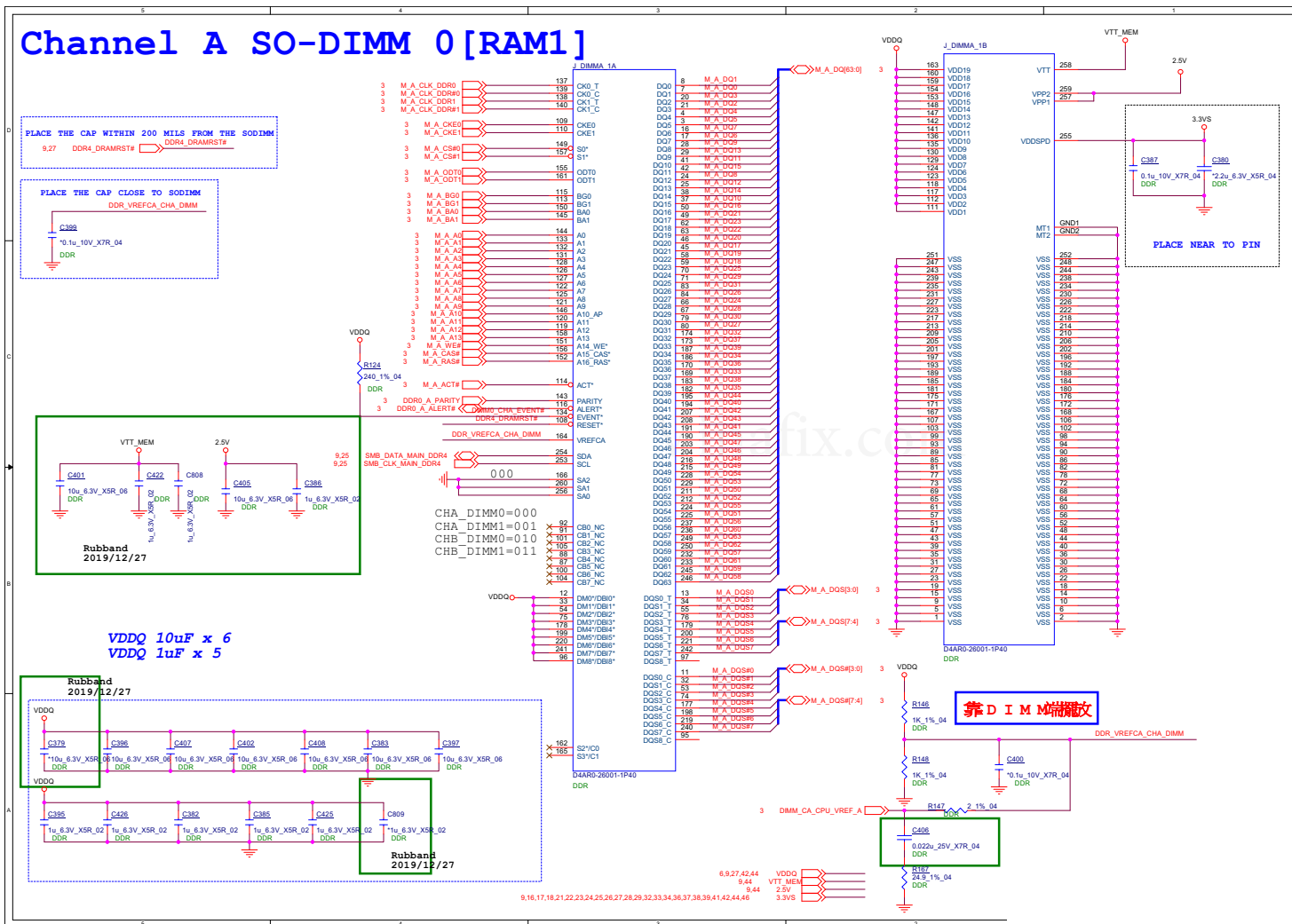
Processor 5/6 B - 7



Processor 6/6

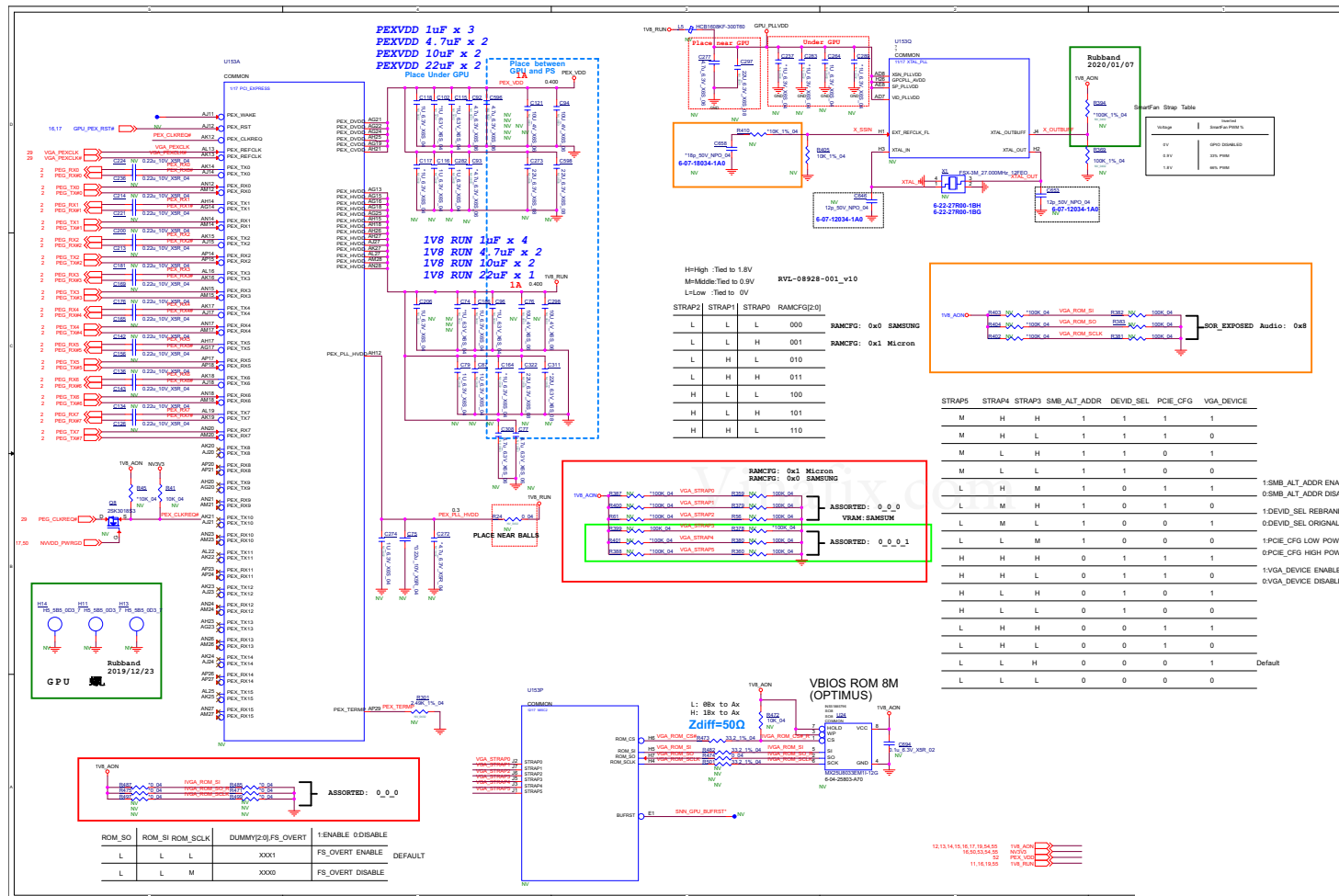
Sheet 7 of 59
Processor 6/6

DDR4 CHA SO-DIMM_0



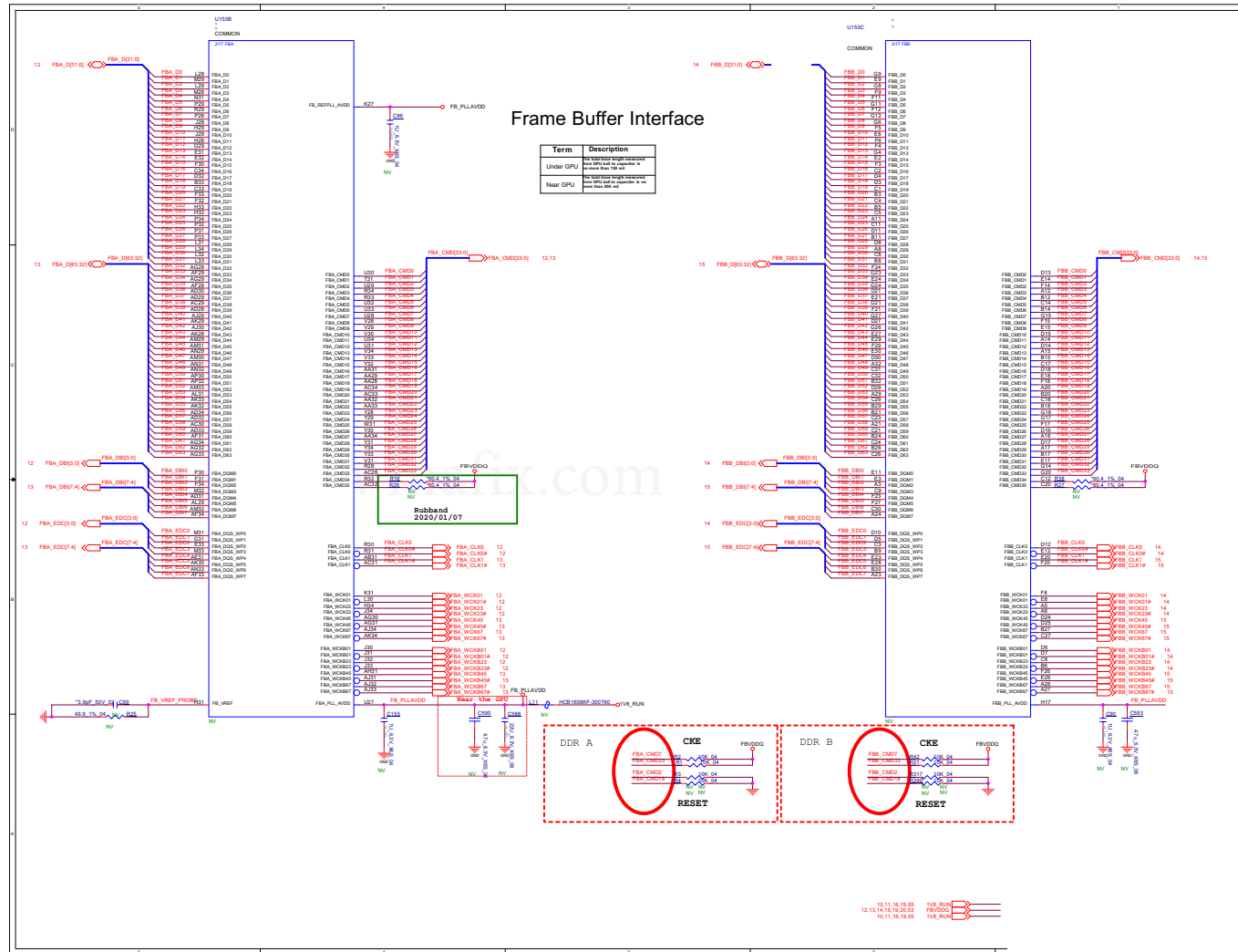
Sheet 8 of 59
DDR4 CHA SO-
DIMM_0

Straps and XTAL



VGA Frame Buffer Interface

Sheet 11 of 59
VGA Frame Buffer Interface



B.Schematic Diagrams

FBVDDQ 1uF x 18
FBVDDQ 10uF x 6
FBVDDQ 22uF x 5

1V8 AON 1uF x 4

OPTION: Under DRAM

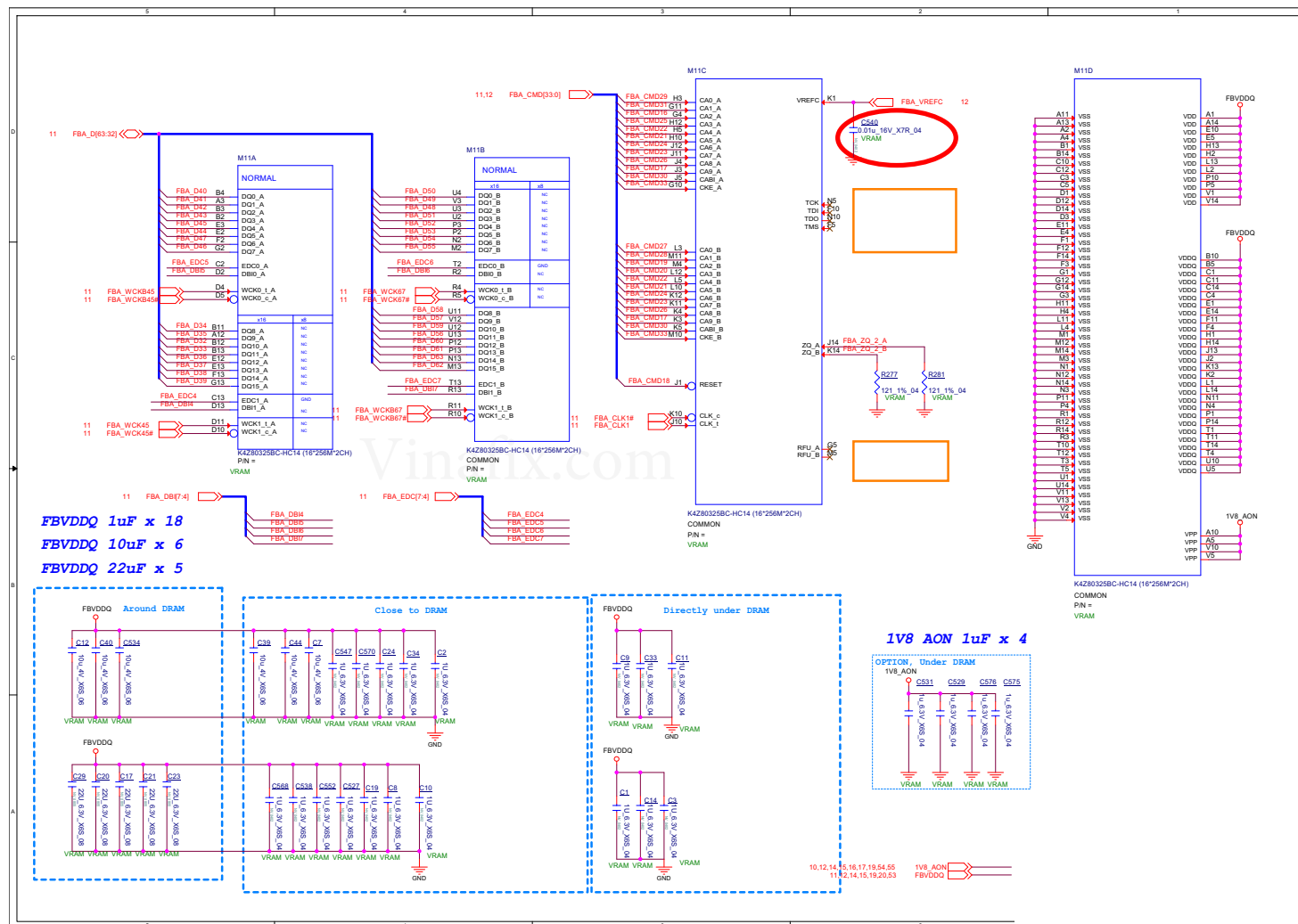
10.13, 14, 15, 16, 17, 18, 54, 55
11.13, 14, 15, 19, 20, 53

1V8 AON
FBVDDQ

VGA Frame Buffer A

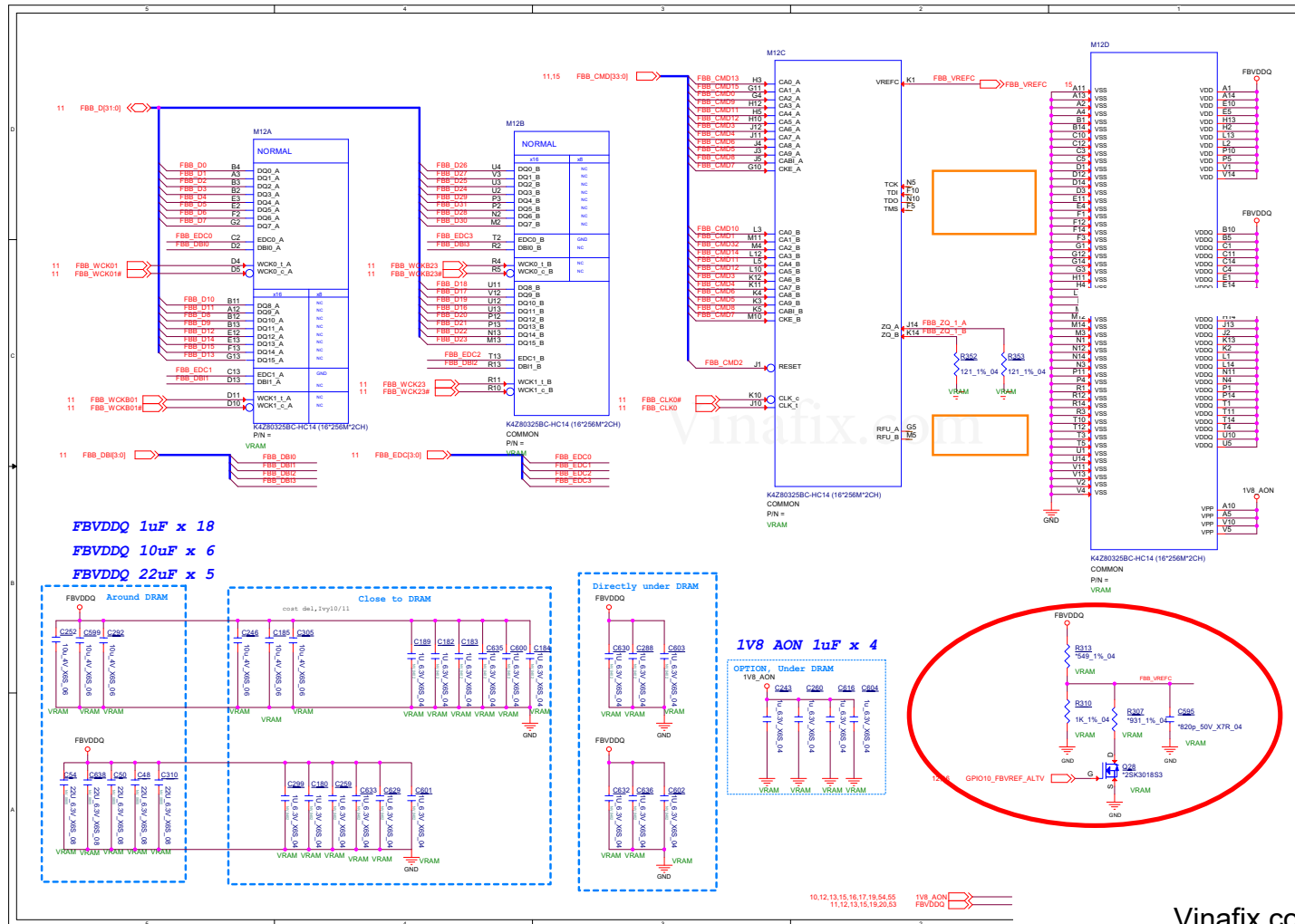
B. Schematic Diagrams

Sheet 13 of 59
VGA Frame Buffer
A



VGA Frame Buffer B

Sheet 14 of 59
VGA Frame Buffer
B



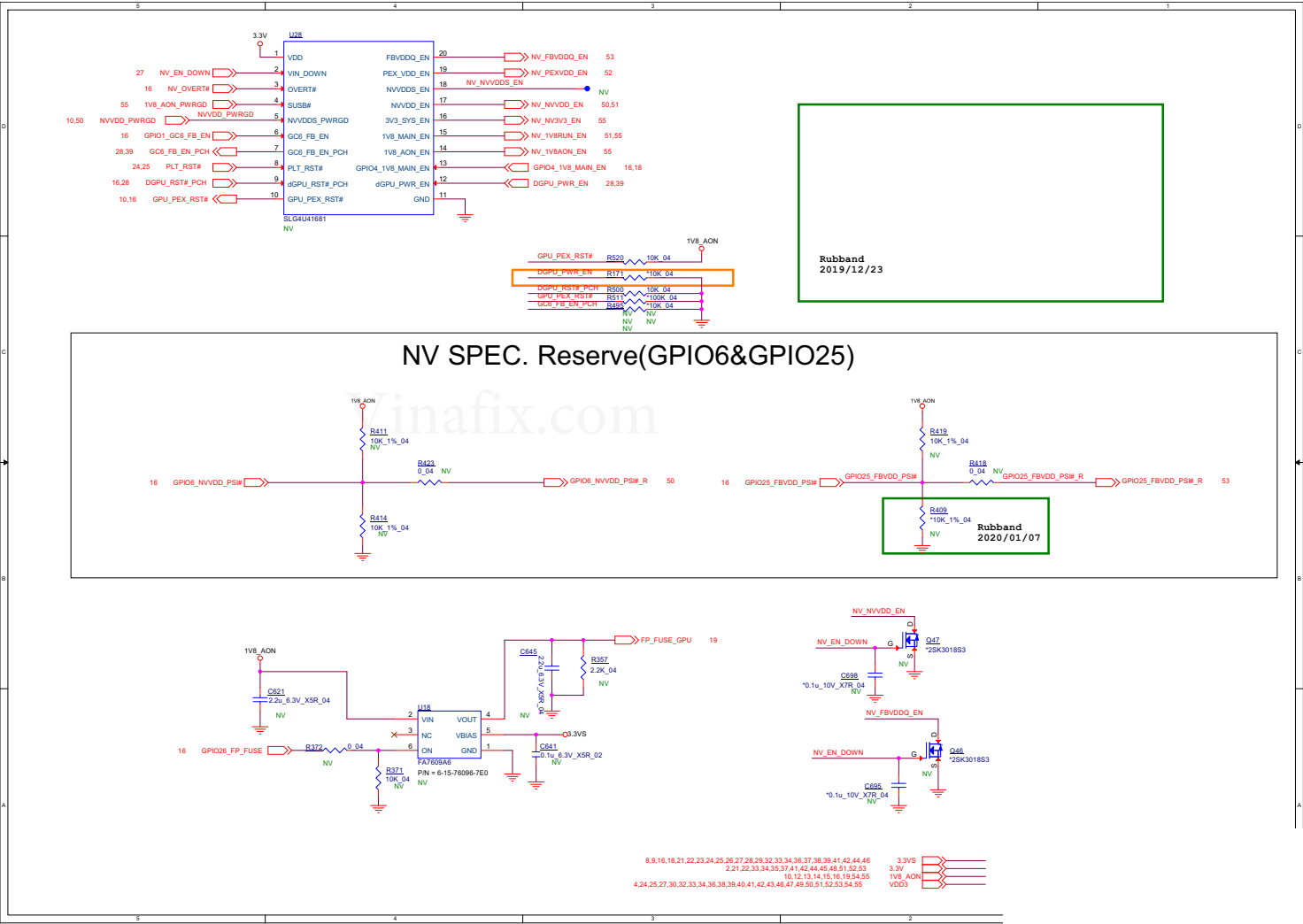
原图 I 2 改成 S Mbus就不上件

2019/12/27

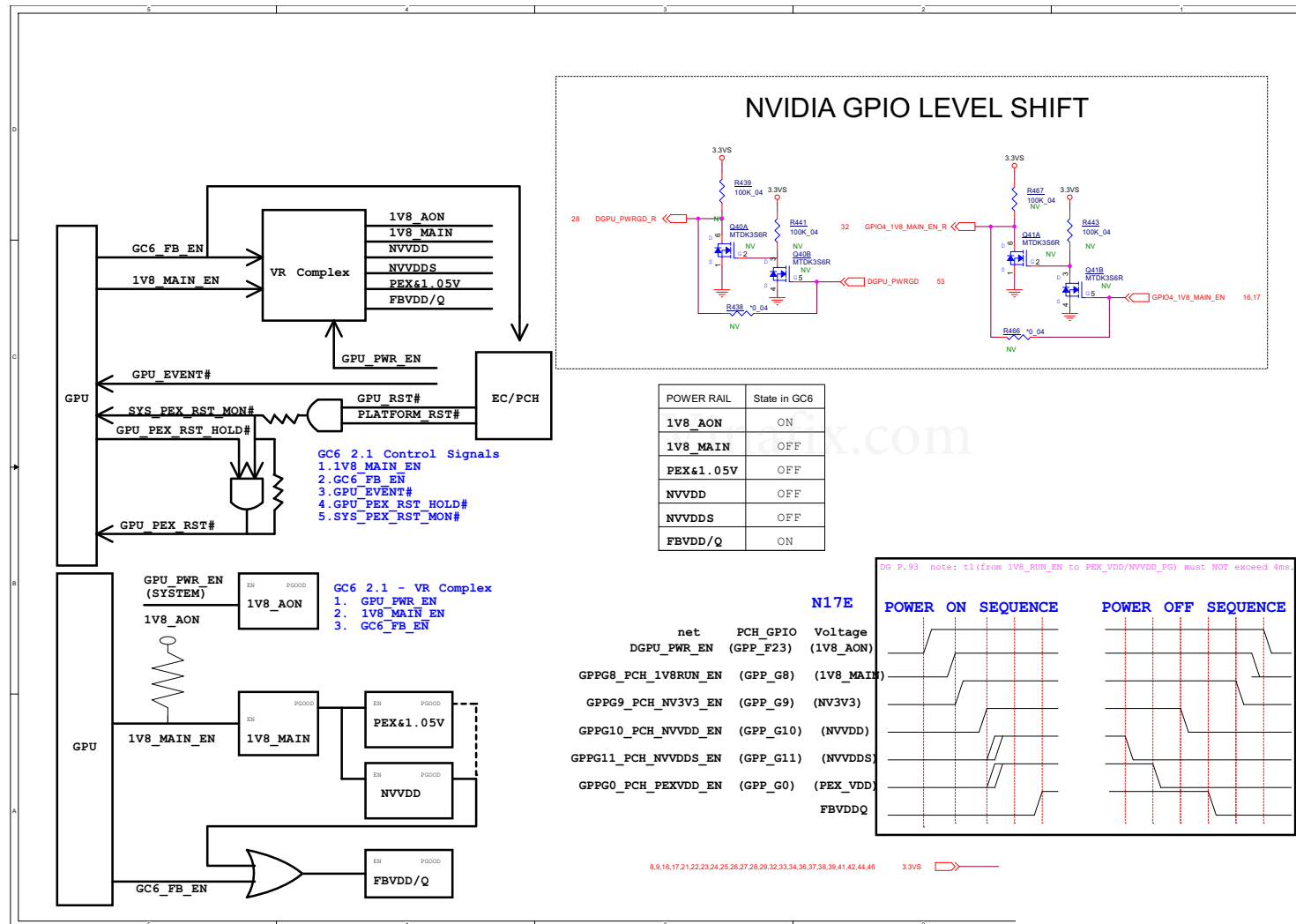
B.Schematic Diagrams

NVIDIA Power Sequence

Sheet 17 of 59
NVIDIA Power
Sequence



NVIDIA GPIO Level Shift

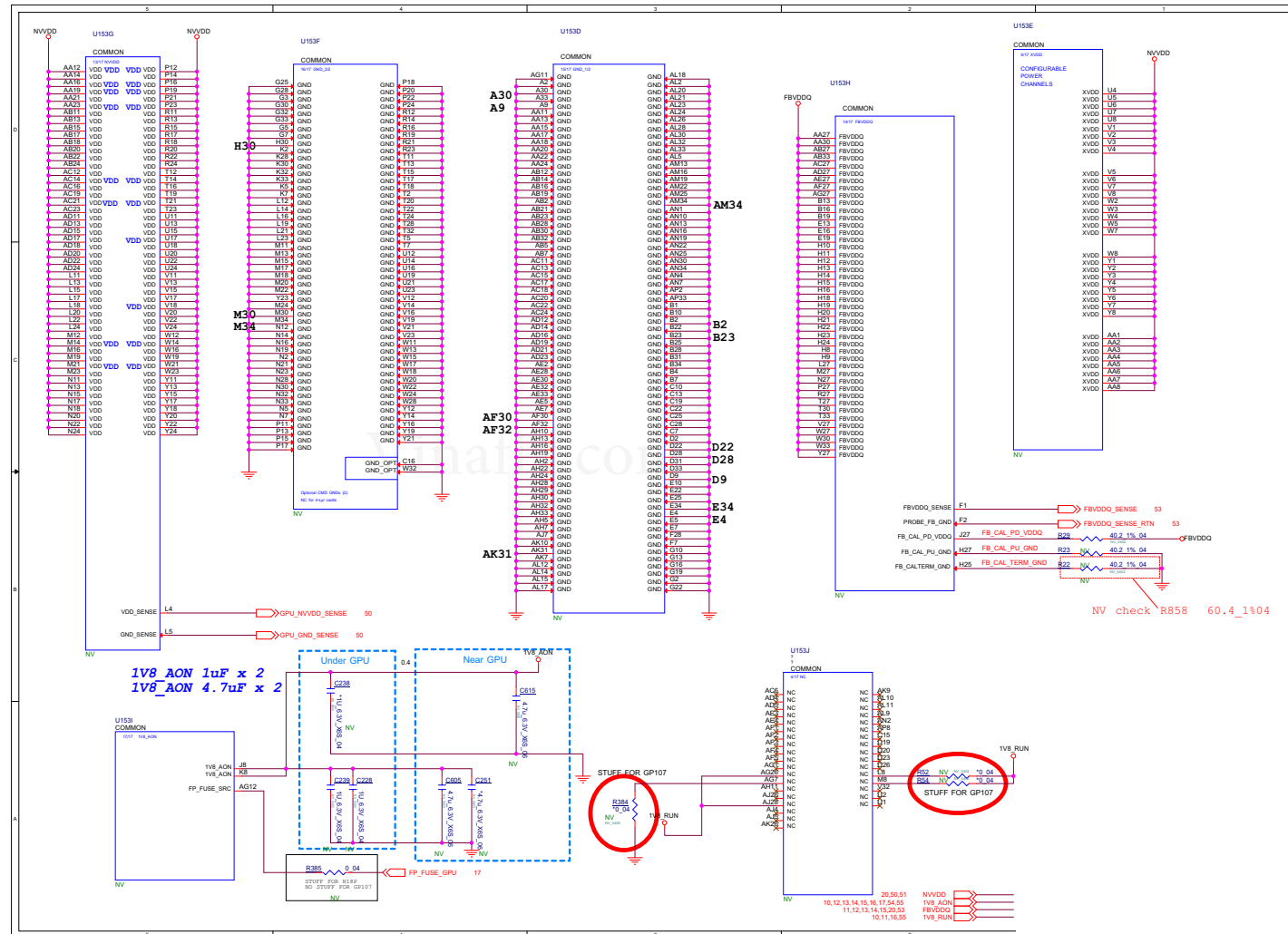


Sheet 18 of 59
NVIDIA GPIO Level
Shift

Schematic Diagrams

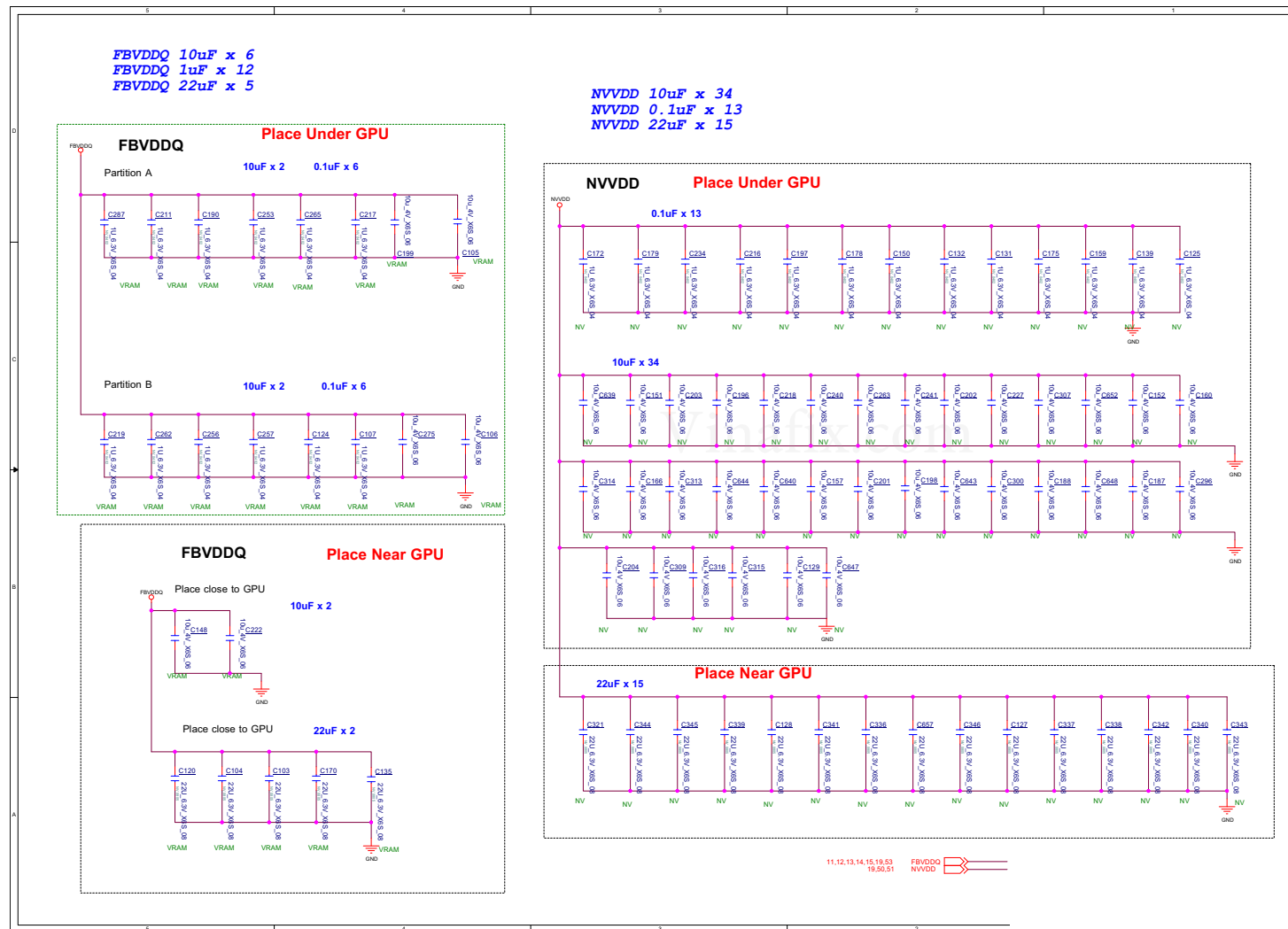
VGA PWR/GND/NCs

Sheet 19 of 59
VGA PWR/GND/
NCs



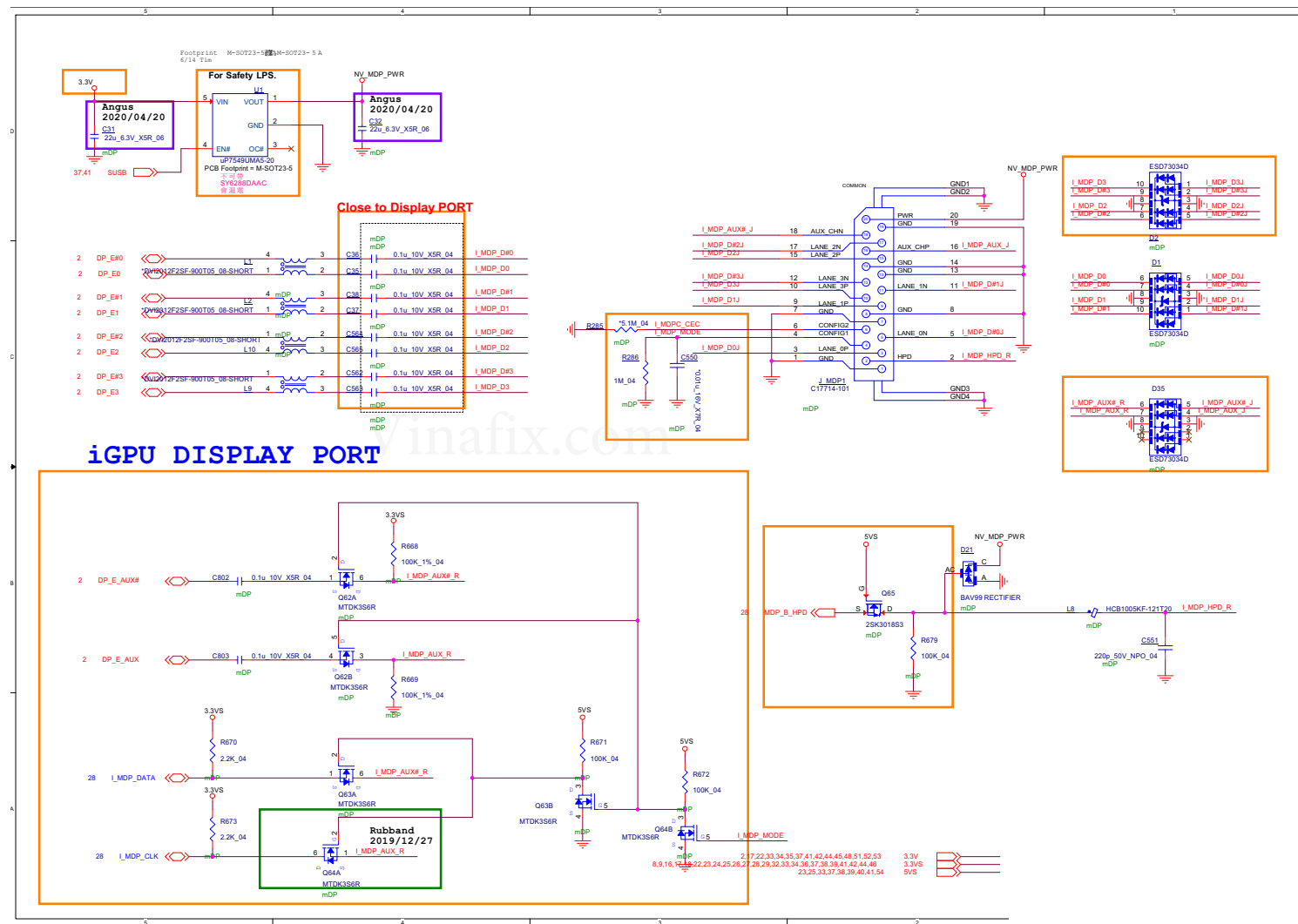
VGA NVVDD Coupling

Sheet 20 of 59
VGA NVVDD
Coupling

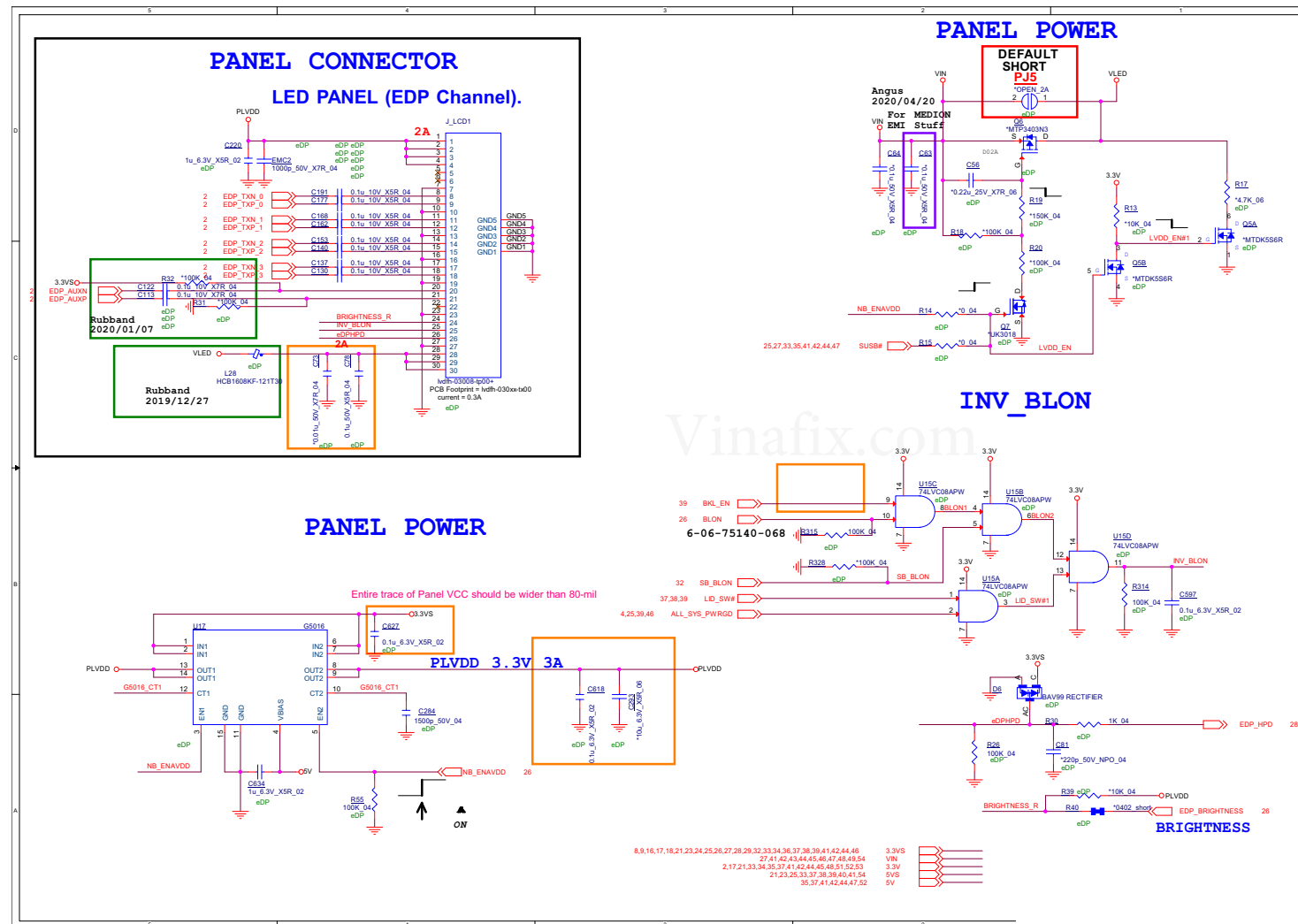


MDP

B.Schematic Diagrams



Panel, Inverter

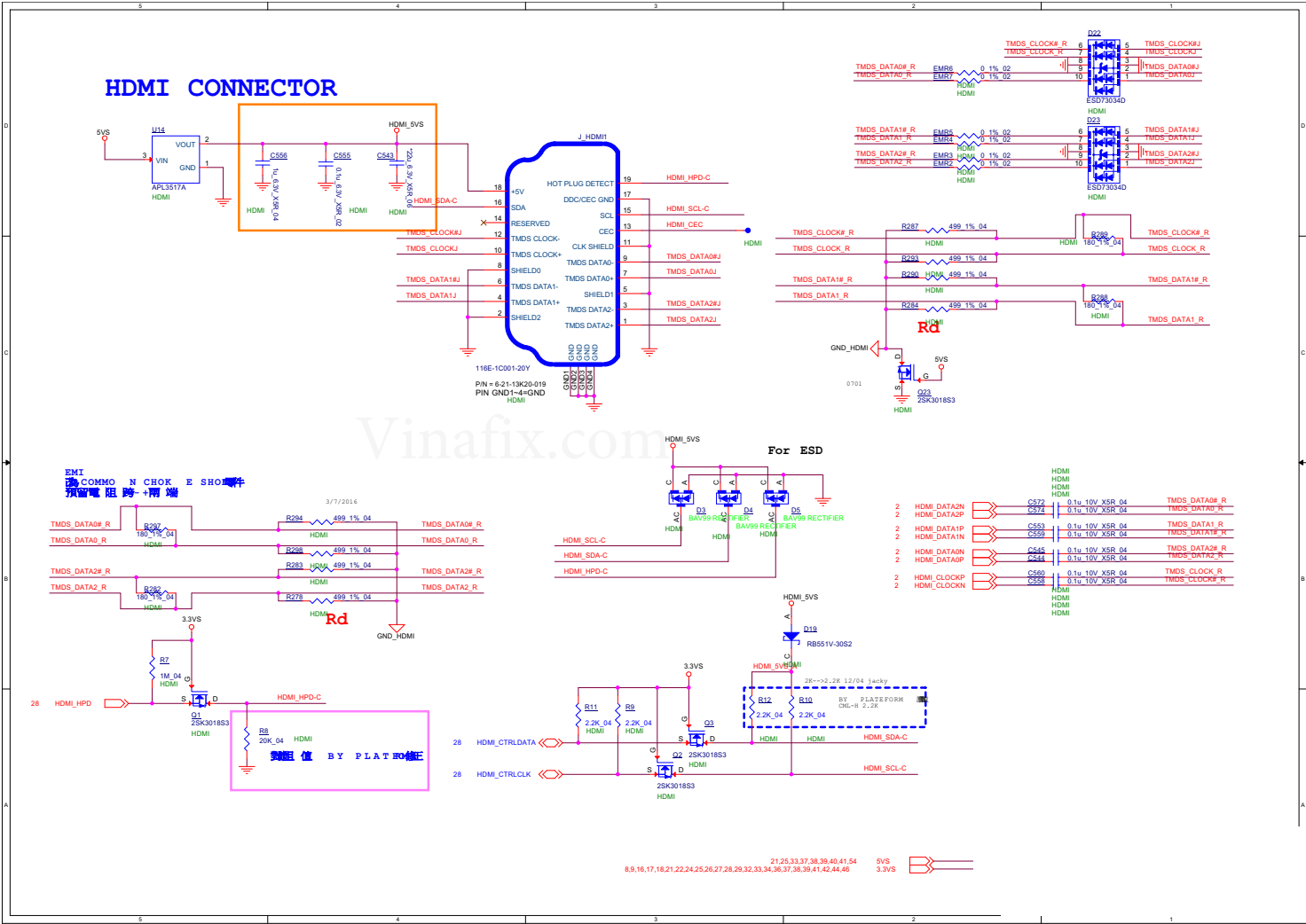


Sheet 22 of 59
Panel, Inverter

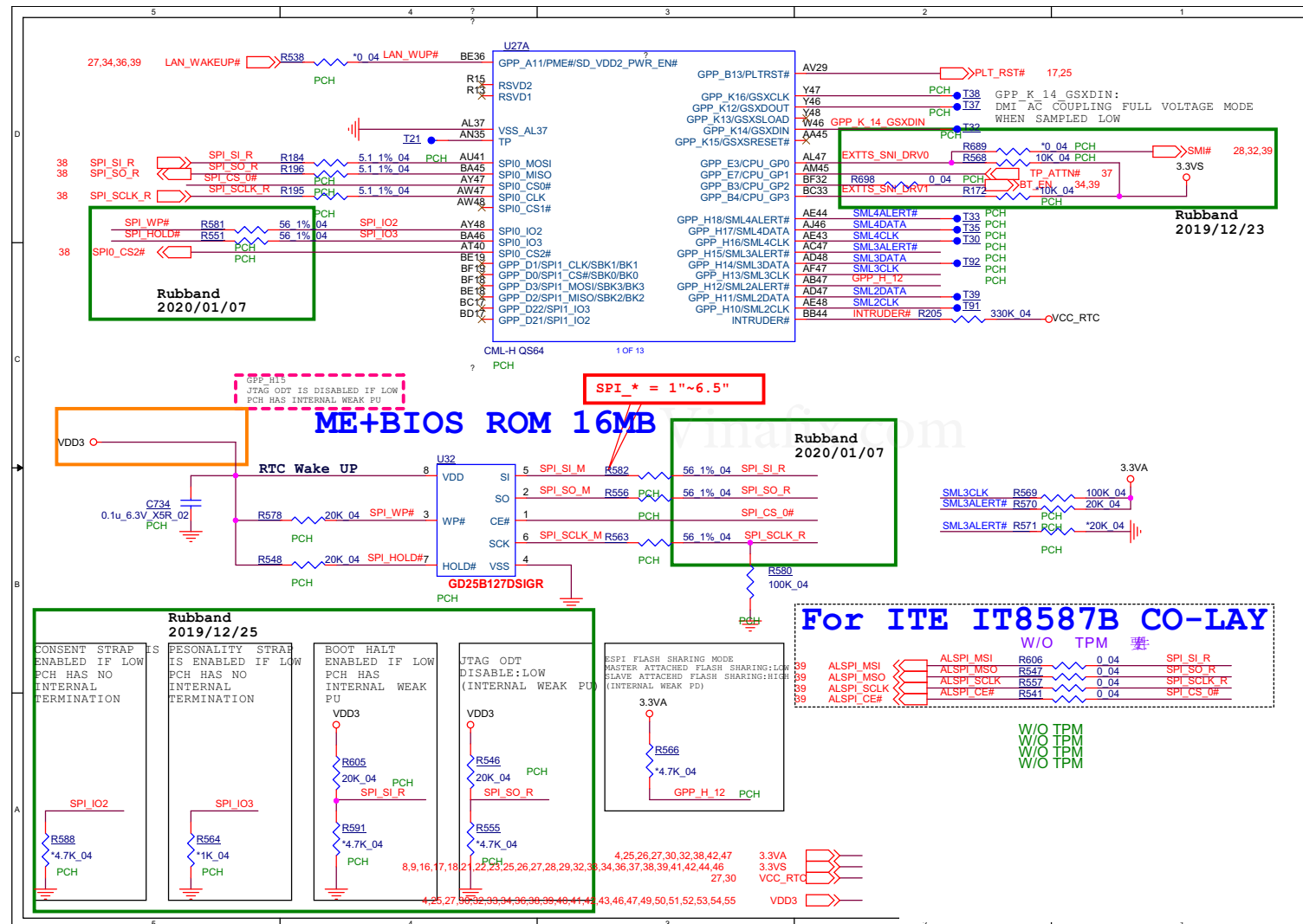
Schematic Diagrams

HDMI

Sheet 23 of 59
HDMI



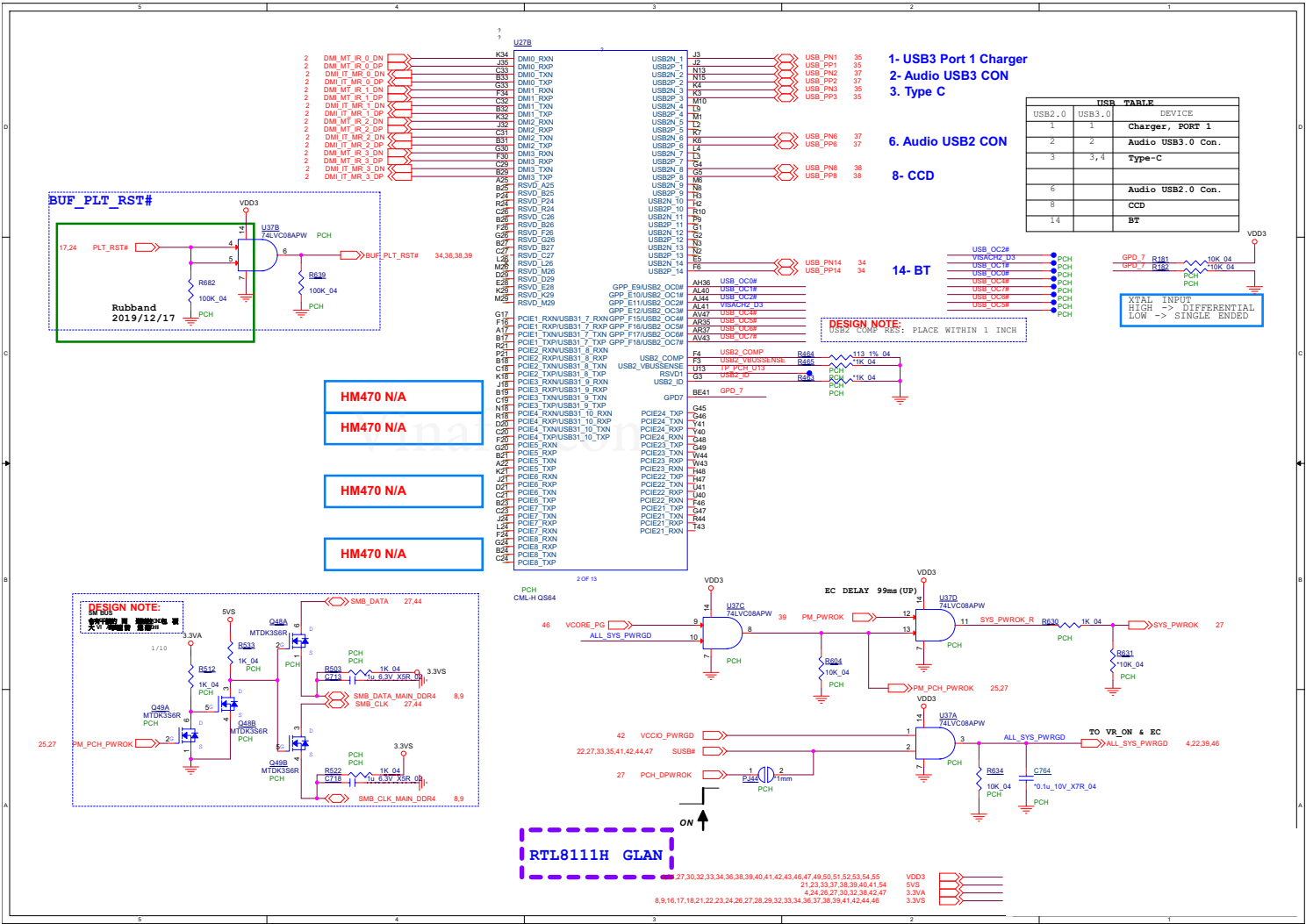
PCH 1/9

Sheet 24 of 59
PCH 1/9

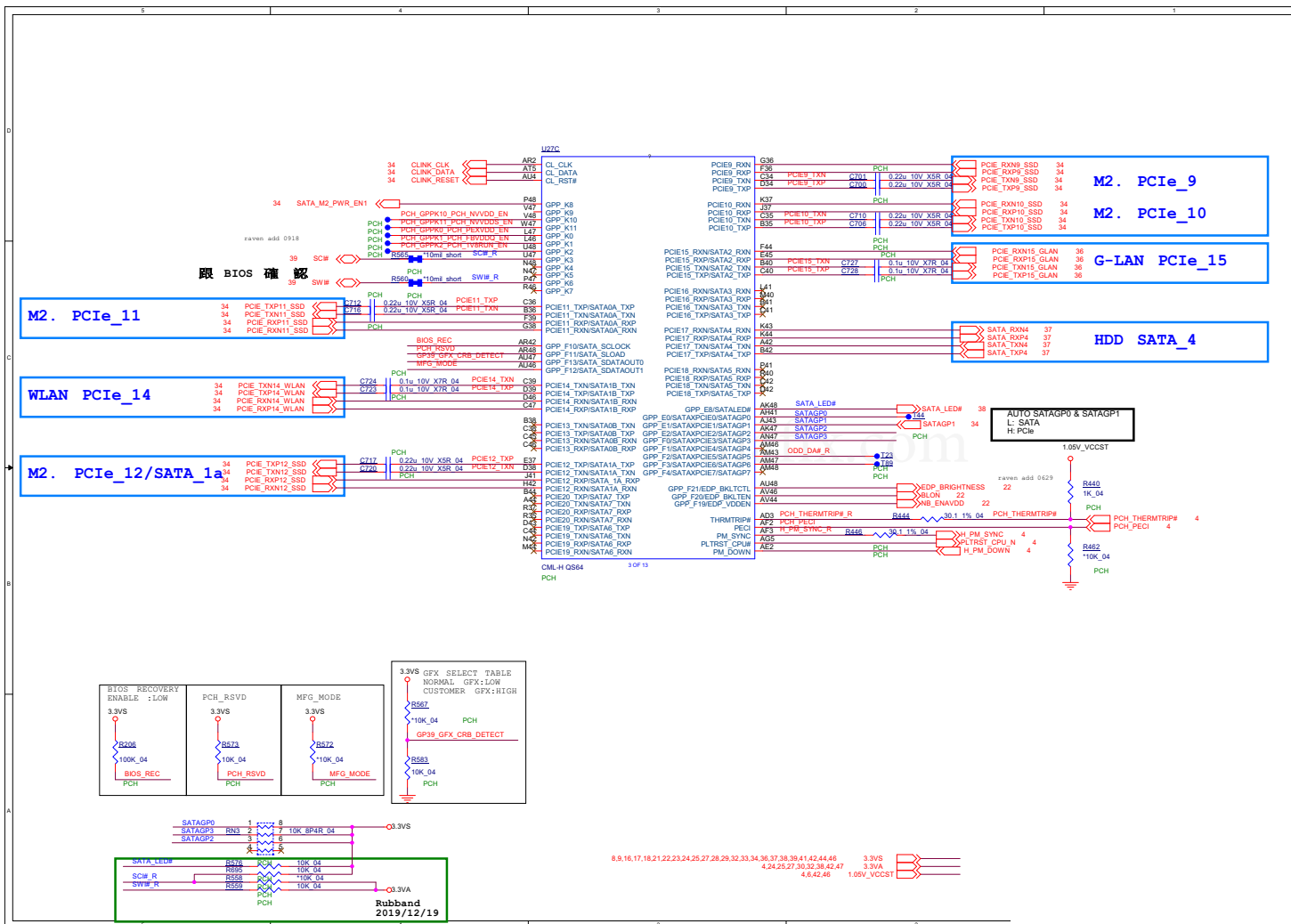
Schematic Diagrams

PCH 2/9

Sheet 25 of 59
PCH 2/9



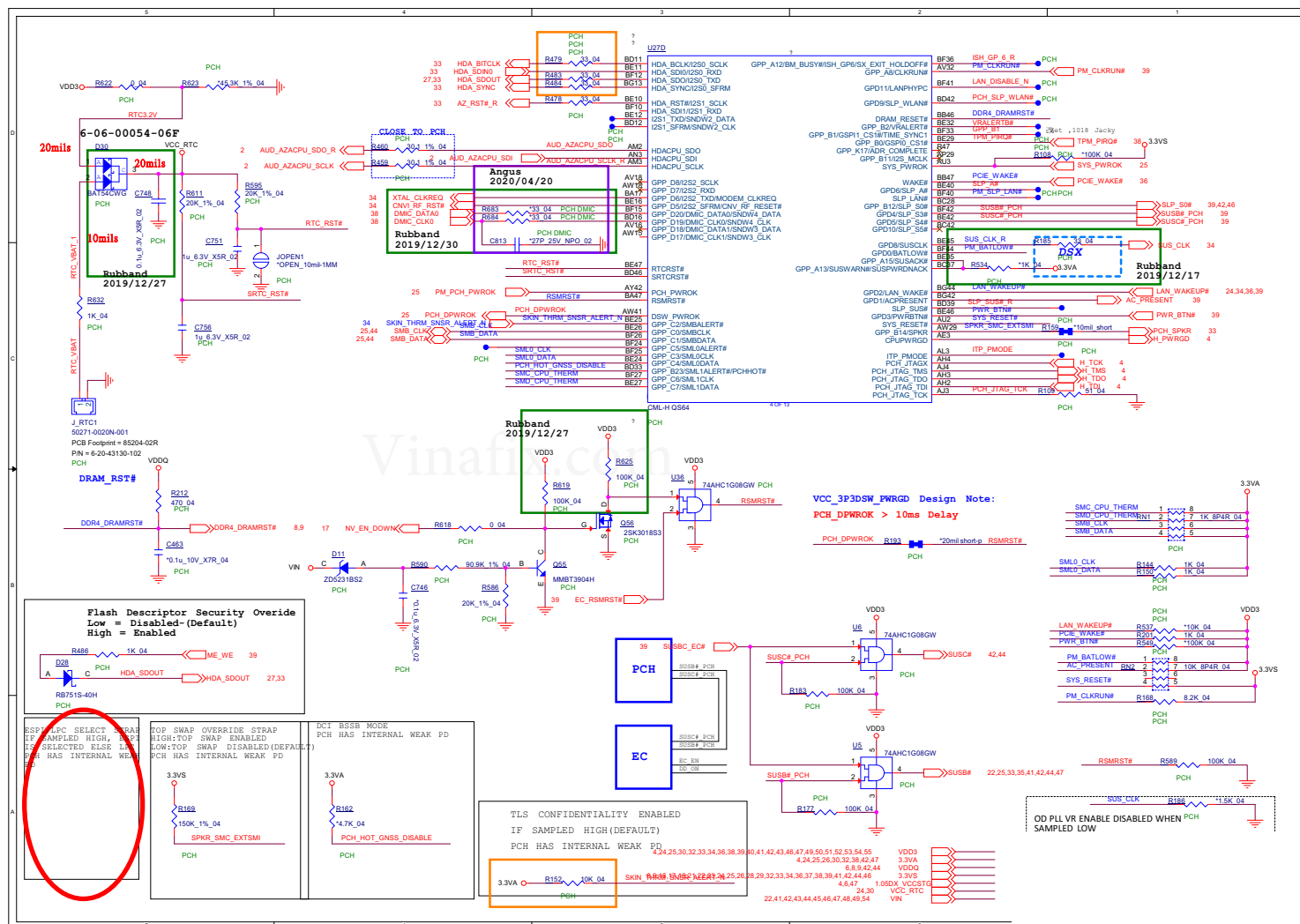
PCH 3/9

Sheet 26 of 59
PCH 3/9

PCH 4/9

B. Schematic Diagrams

Sheet 27 of 59
PCH 4/9



MDP OUT (B) (GPU)

HDMI OUT(C)

1-USB3.1_Gen2 Port 1 Charger

2-USB3.1_Gen1 Port 2 (Audio B'd)

3-USB3.1_Gen2 Port 3 TYPE-C_1

4-USB3.1_Gen2 Port 4 TYPE-C_2

CLOSE TO PCH

Rubband
2019/12/19

Rubband
2020/01/07

Rubband
2019/12/26

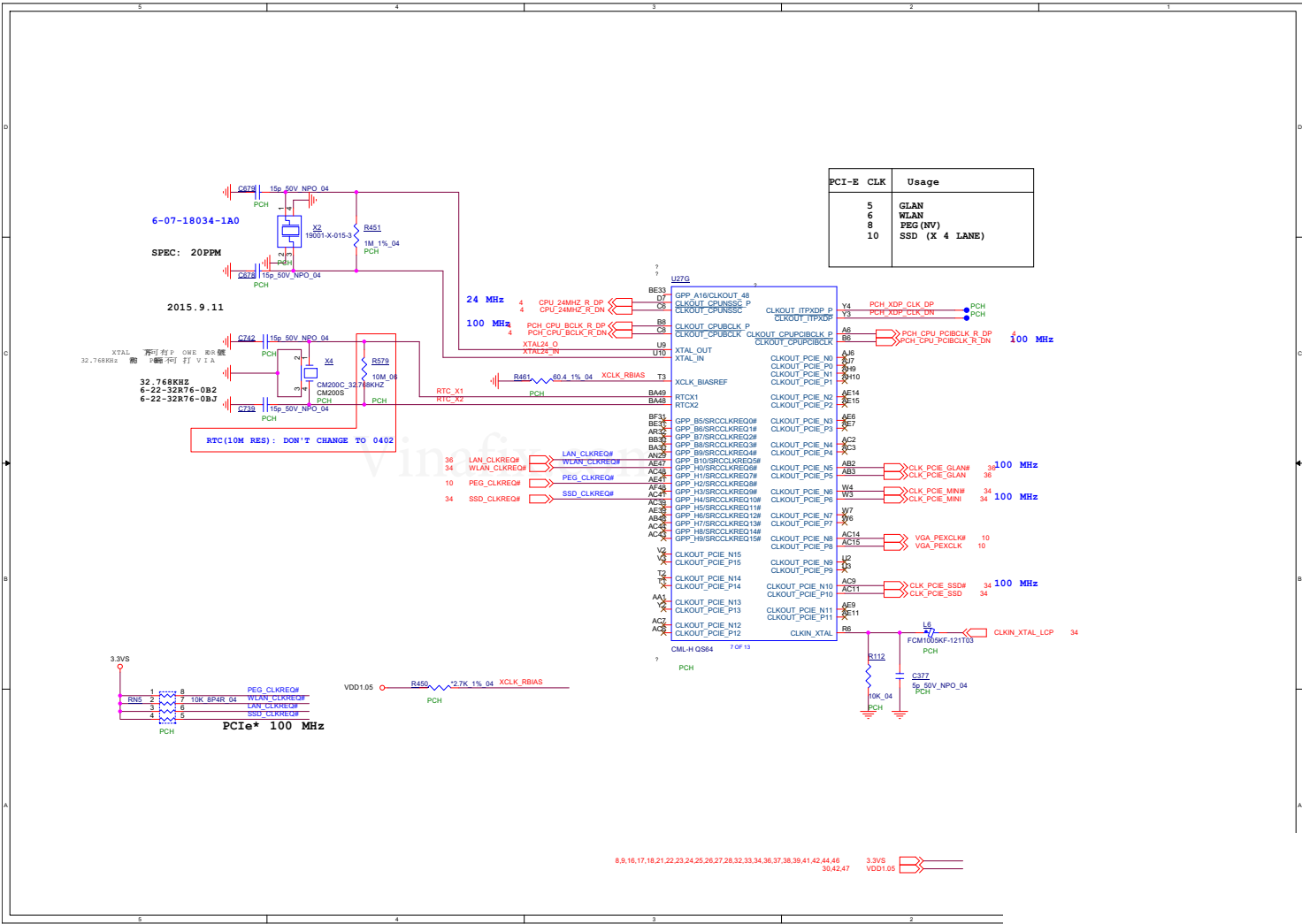
USB TABLE		
USB2.0	USB3.0	DEVICE
1	1	Charger, PORT 1
2	2	Audio USB3.0 Con.
3	3,4	Type-C
6		Audio USB2.0 Con.
8		CCD
14		BT

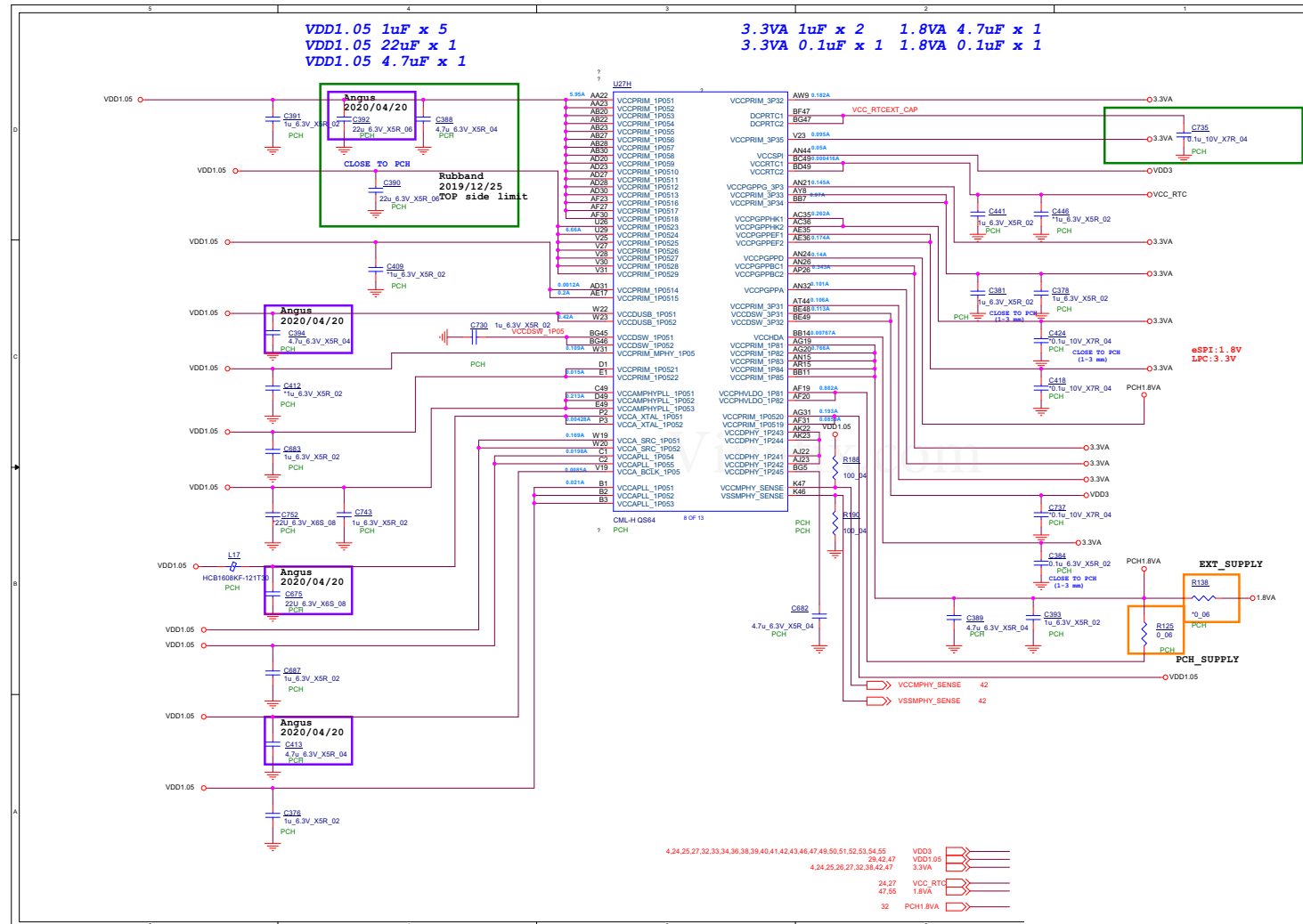
(ANX3411) PD Controller supports DP Alt & 4+3 Modes with full firmware stack)

Schematic Diagrams

PCH 6/9

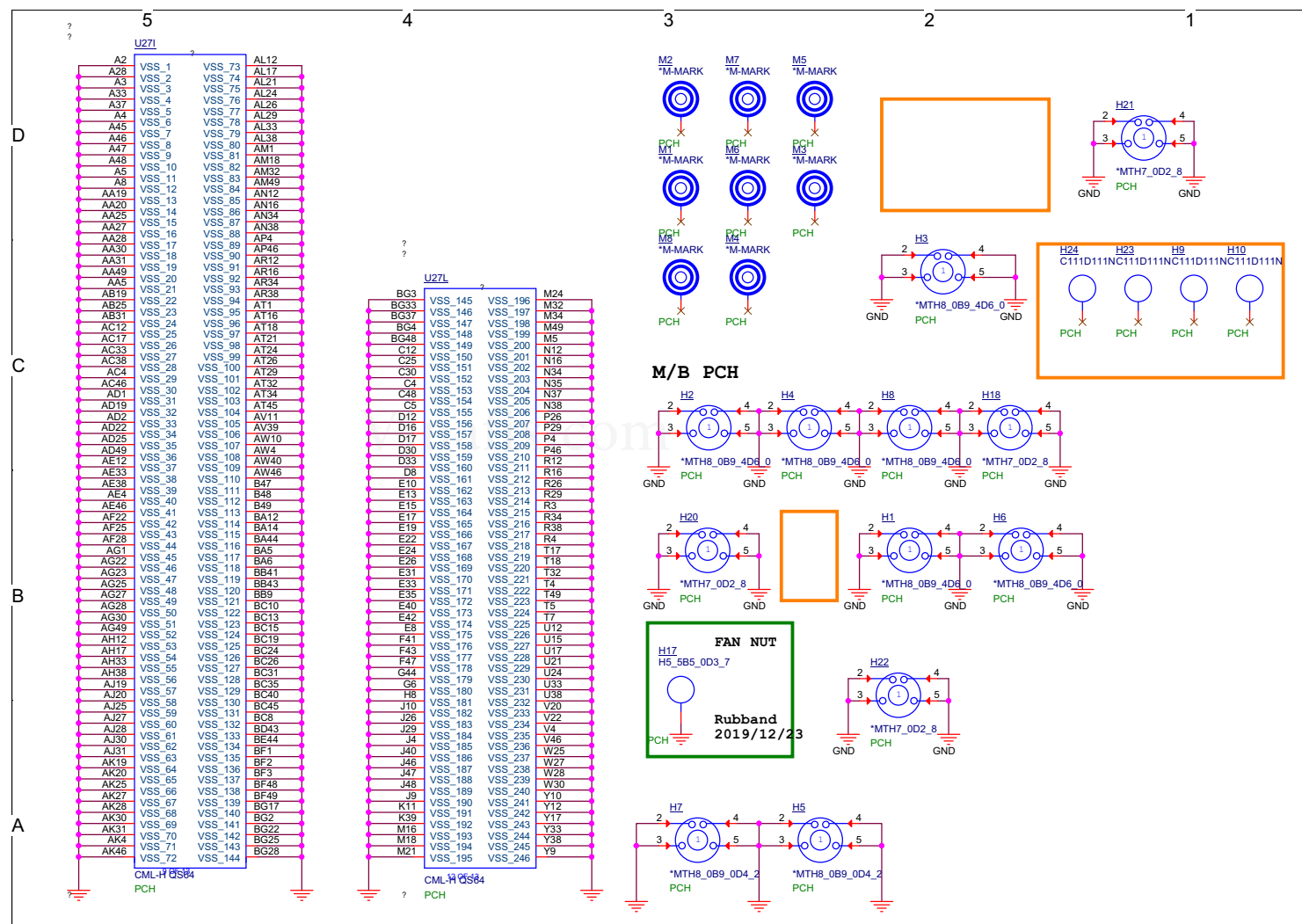
Sheet 29 of 59
PCH 6/9



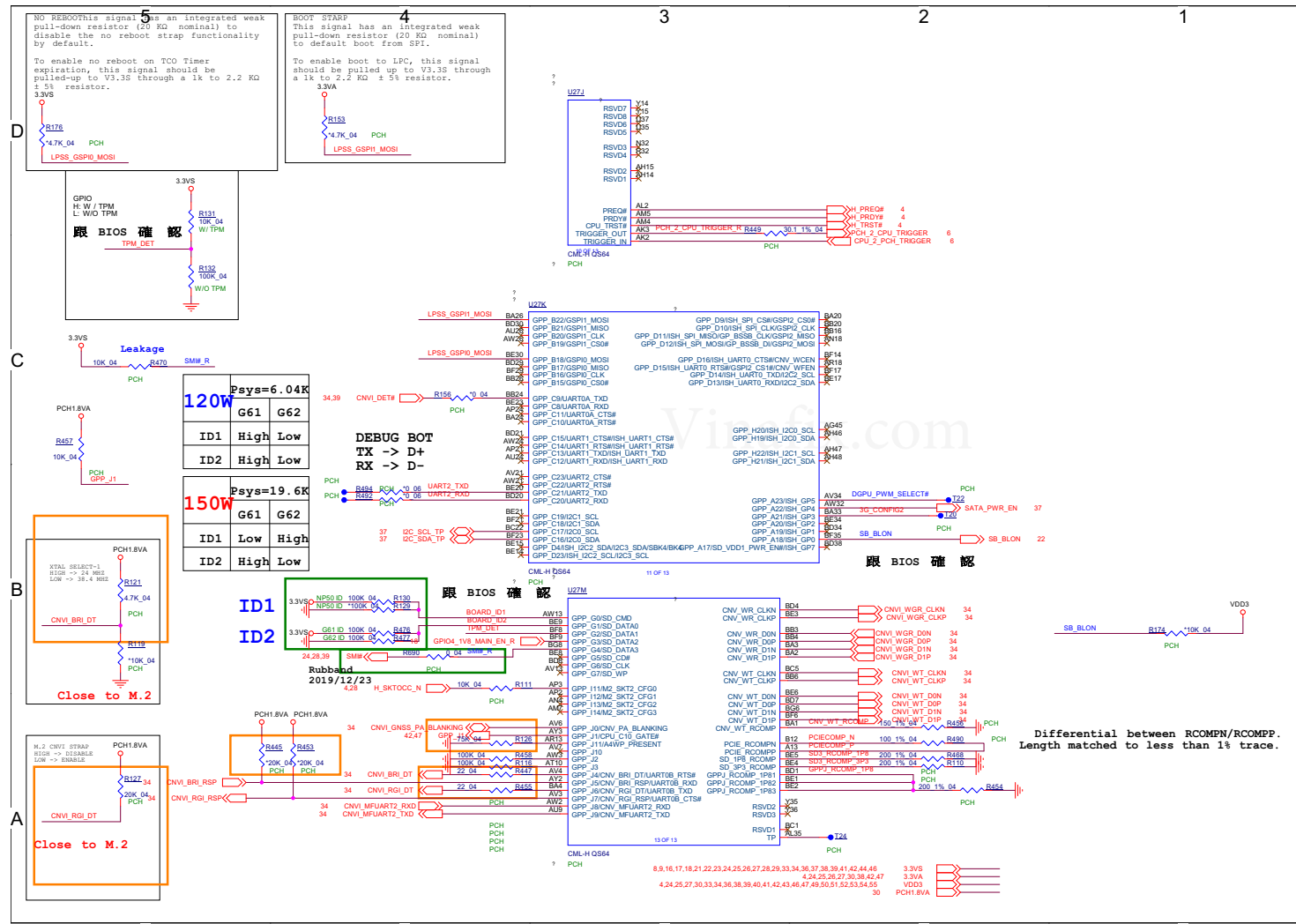


B.Schematic Diagrams

Sheet 31 of 59
PCH 8/9

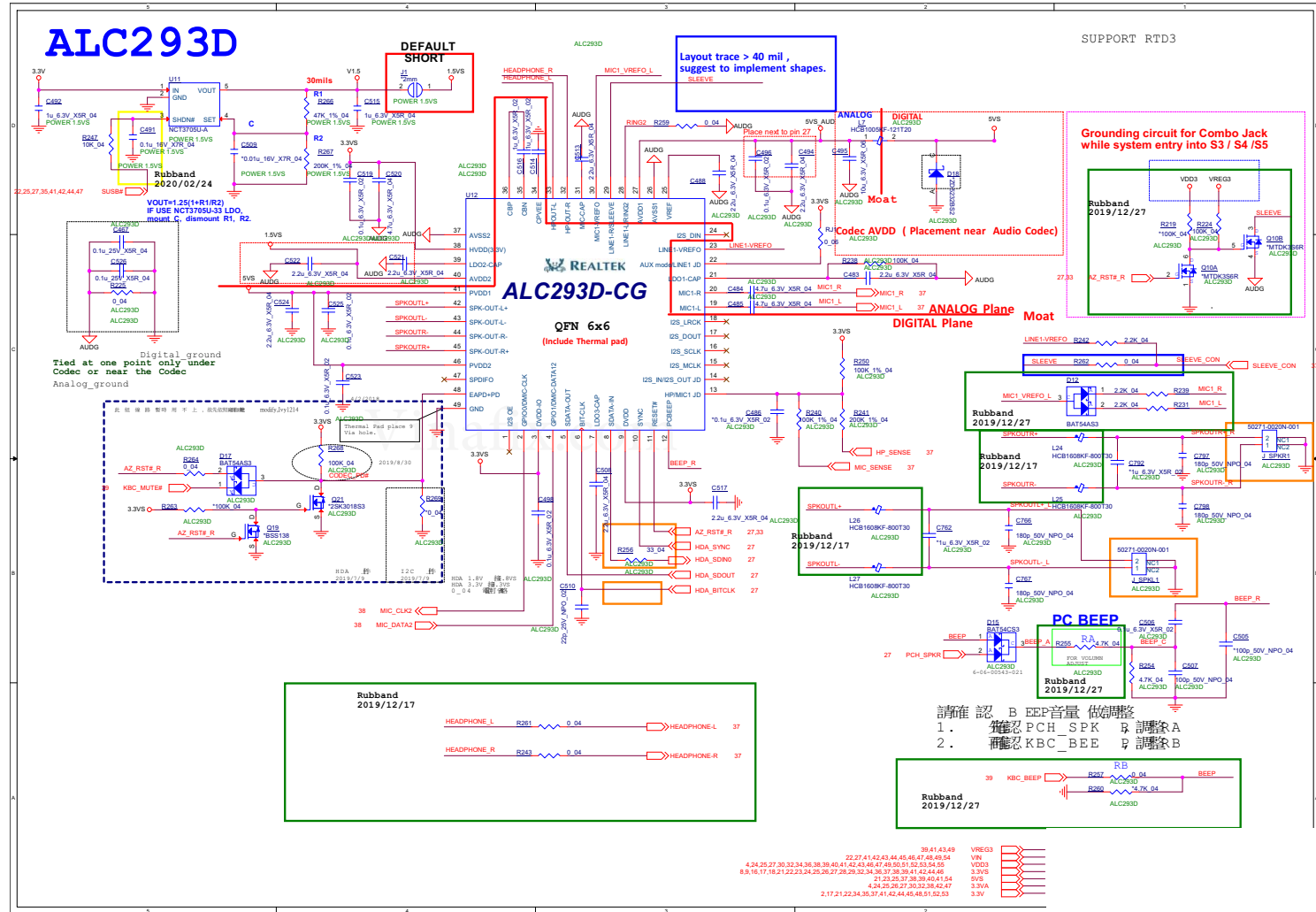


PCH 9/9 B - 33

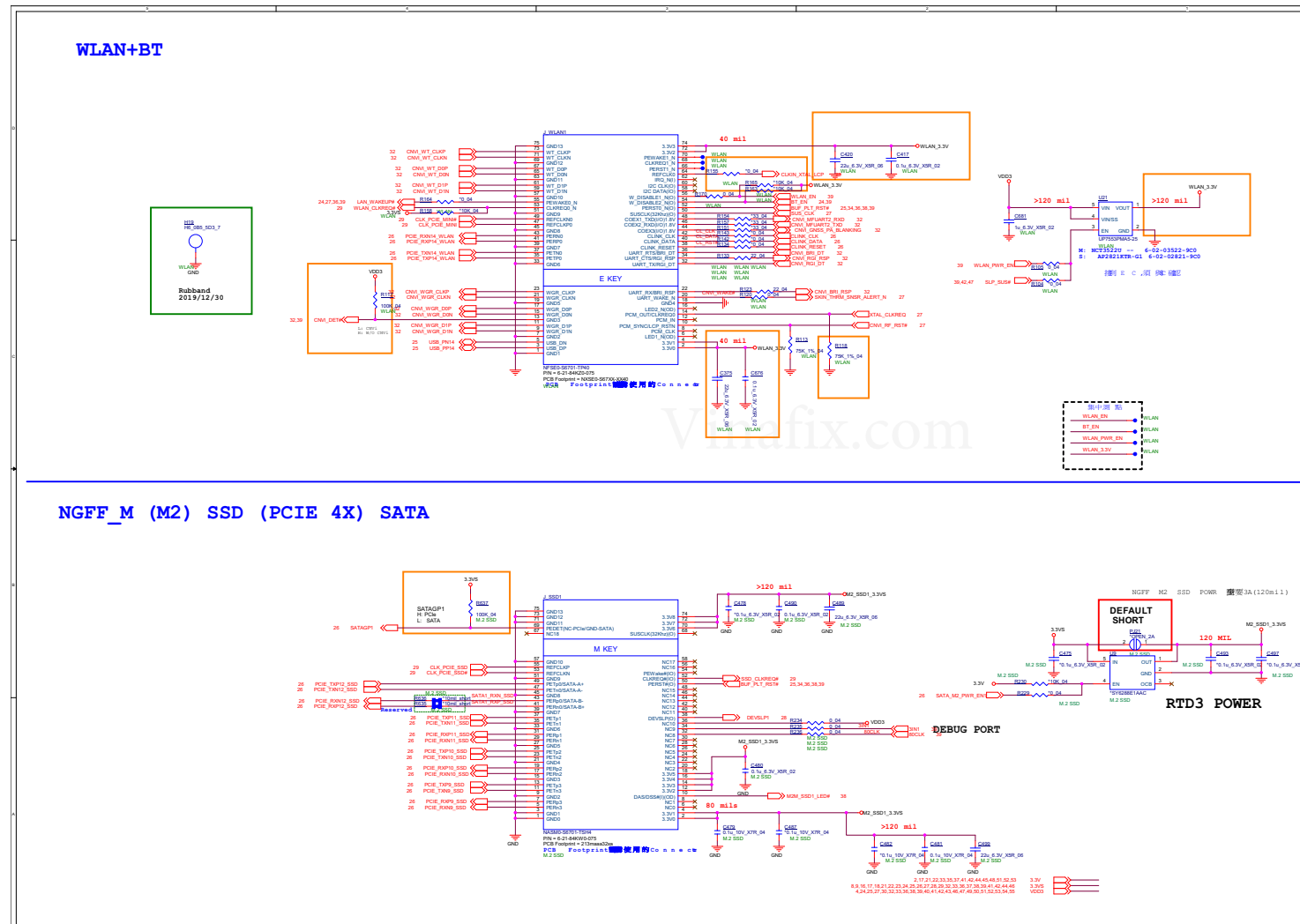


ALC293D

Sheet 33 of 59
ALC293D



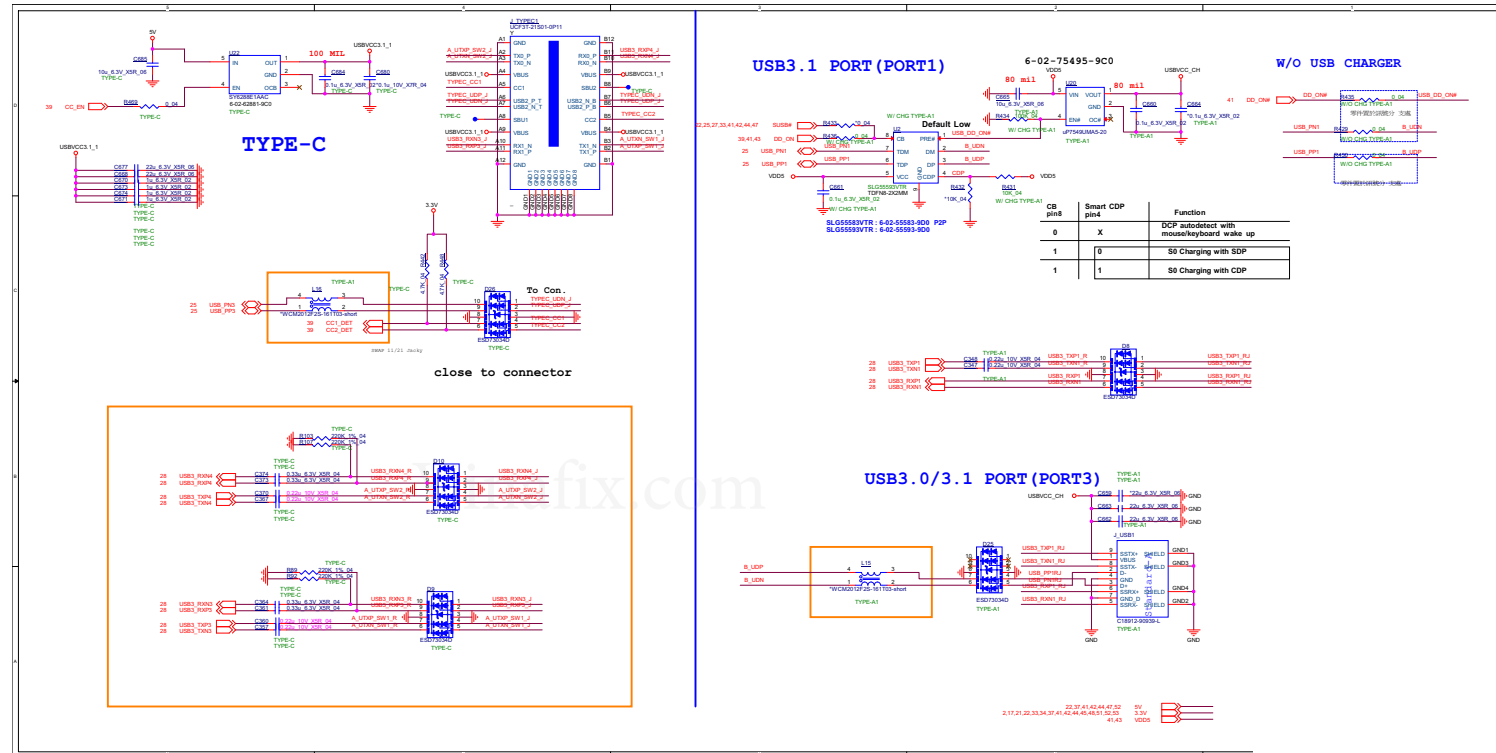
M.2 WLAN+BT, PCIE4X SSD



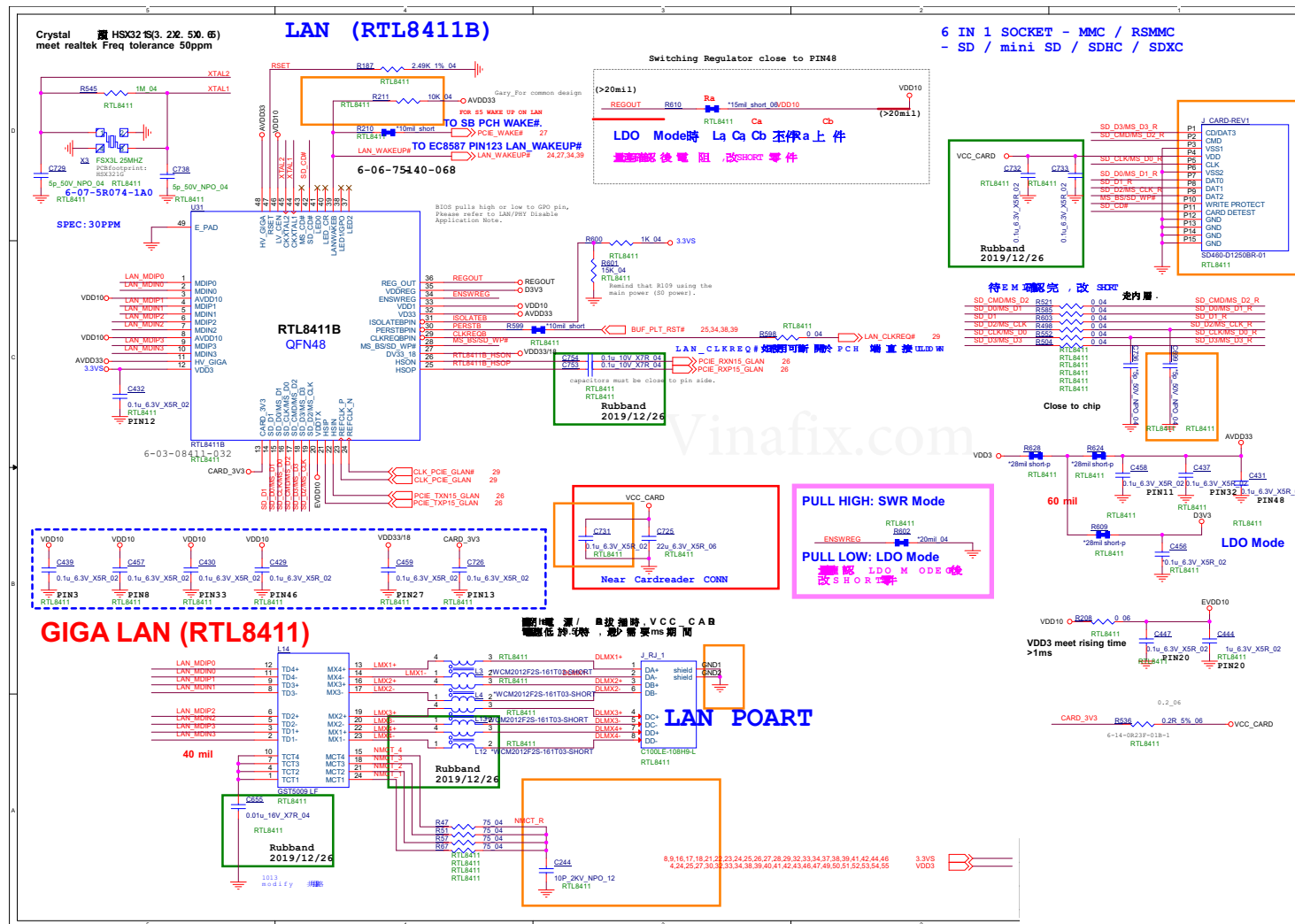
Sheet 34 of 59
M.2 WLAN+BT,
PCIE4X SSD

USB, Charger

Sheet 35 of 59
USB, Charger



Card Reader / LAN RTL8411B

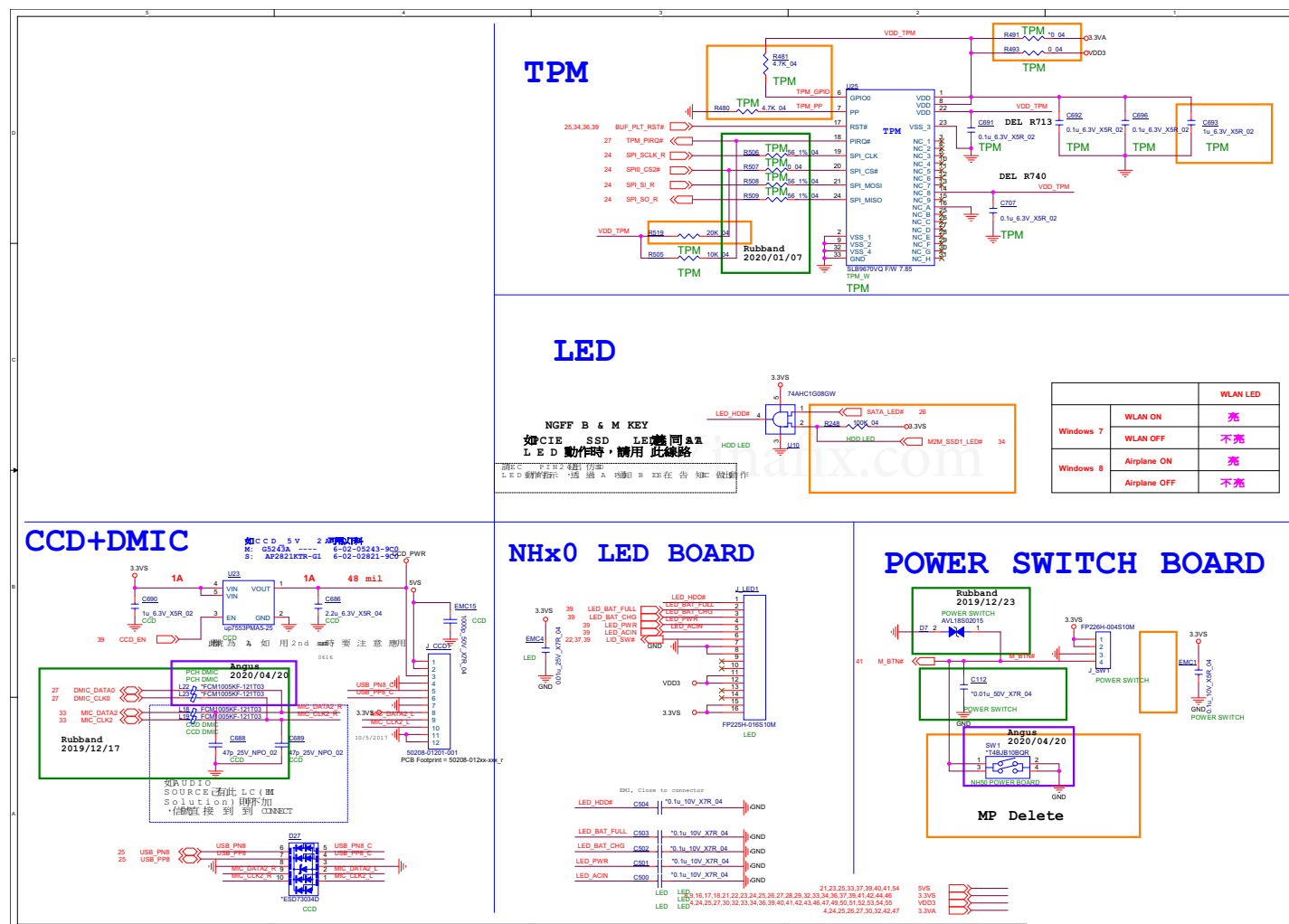


B. Schematic Diagrams

Sheet 37 of 59
HDD, TP, Audio,
Hall Conn



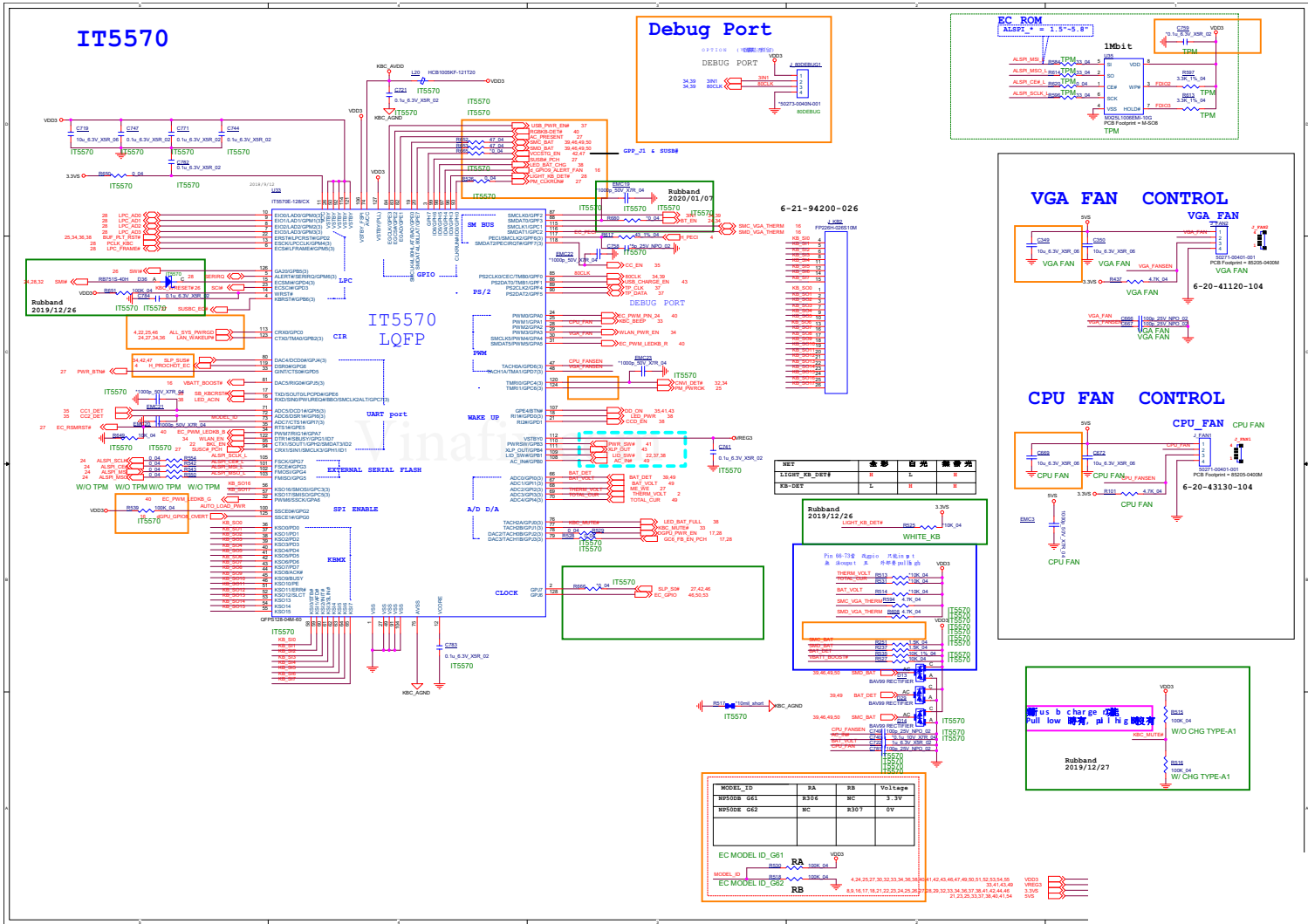
LED, CCD, TPM, Power SW Conn



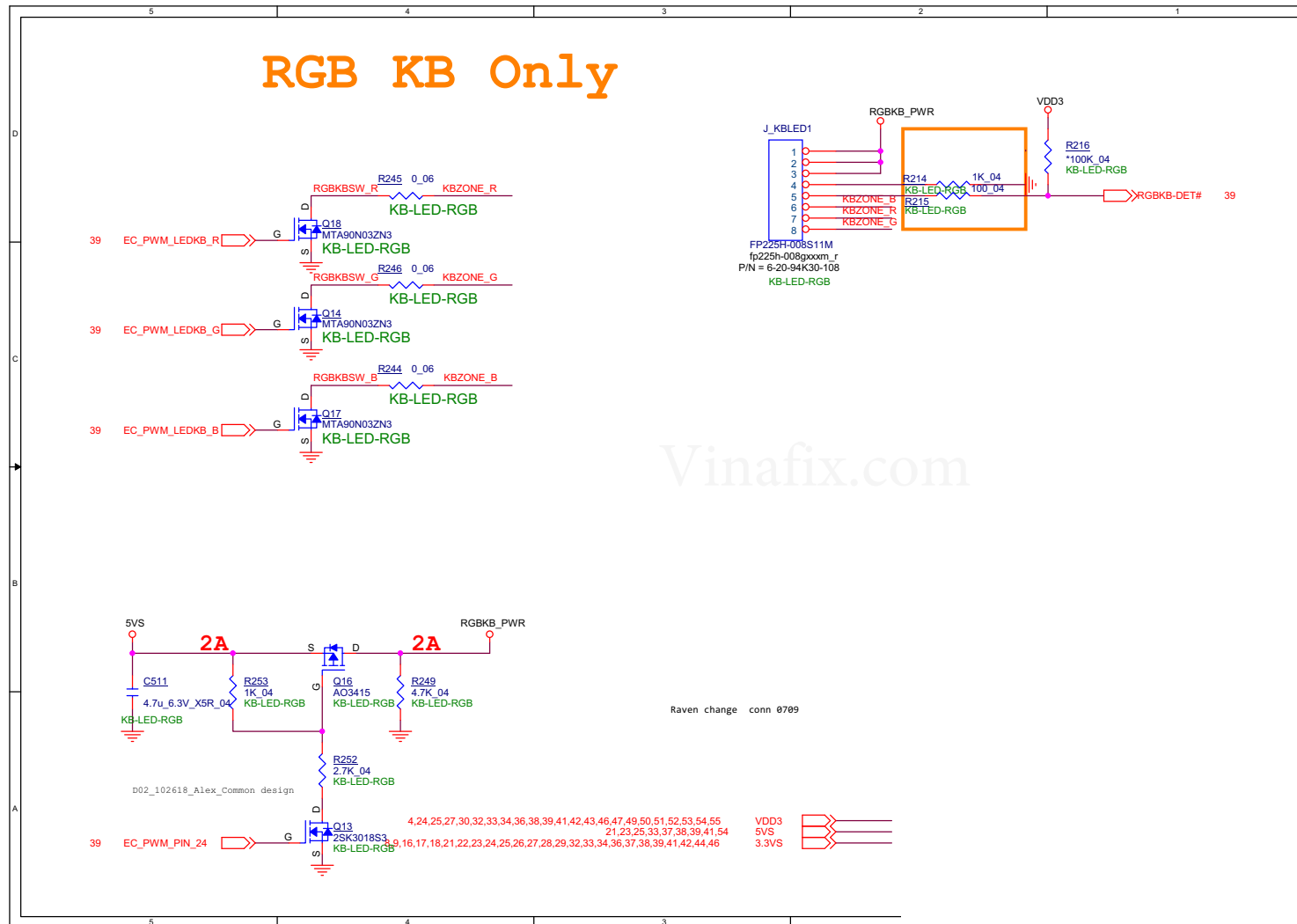
KBC-ITE IT5570

3. Schematic Diagrams

Sheet 39 of 59
KBC-ITE IT5570



RGB KB

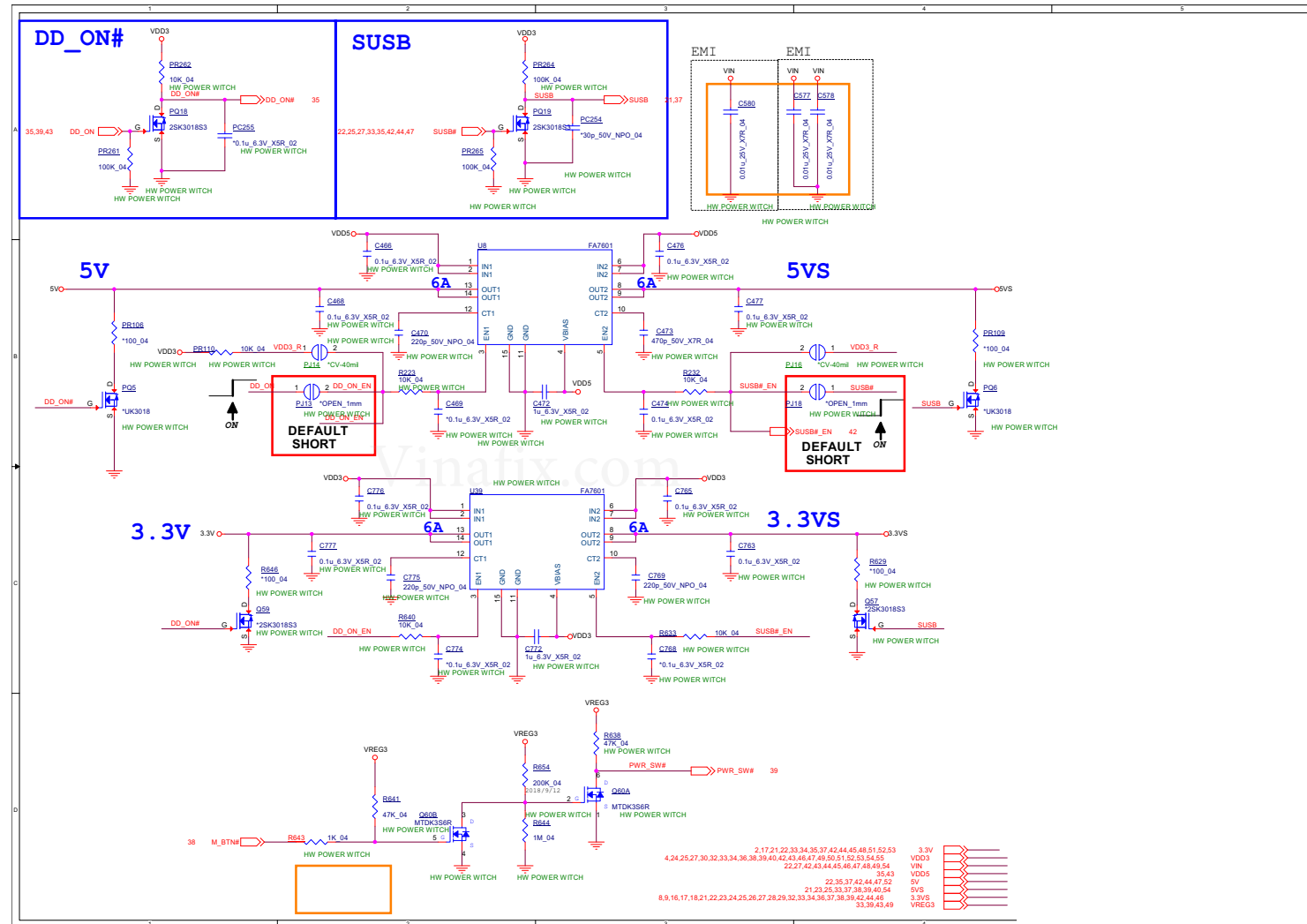


Sheet 40 of 59
RGB KB

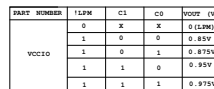
Schematic Diagrams

5V, 5VS, 3.3V, 3.3VS

Sheet 41 of 59
5V, 5VS, 3.3V,
3.3VS



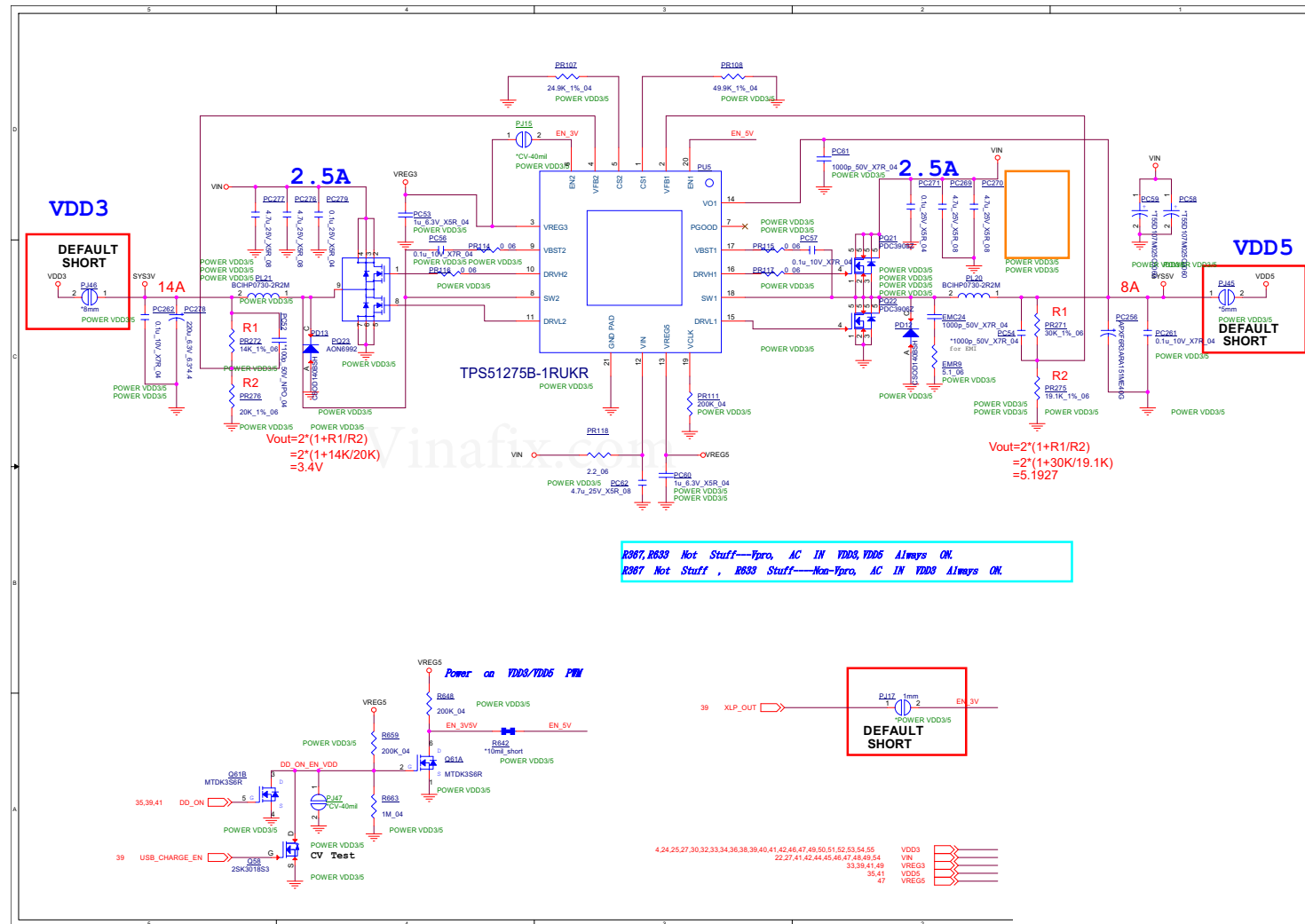
Sheet 42 of 59
VDD 1.05V, VCCIO,
3.3VA, VCCST



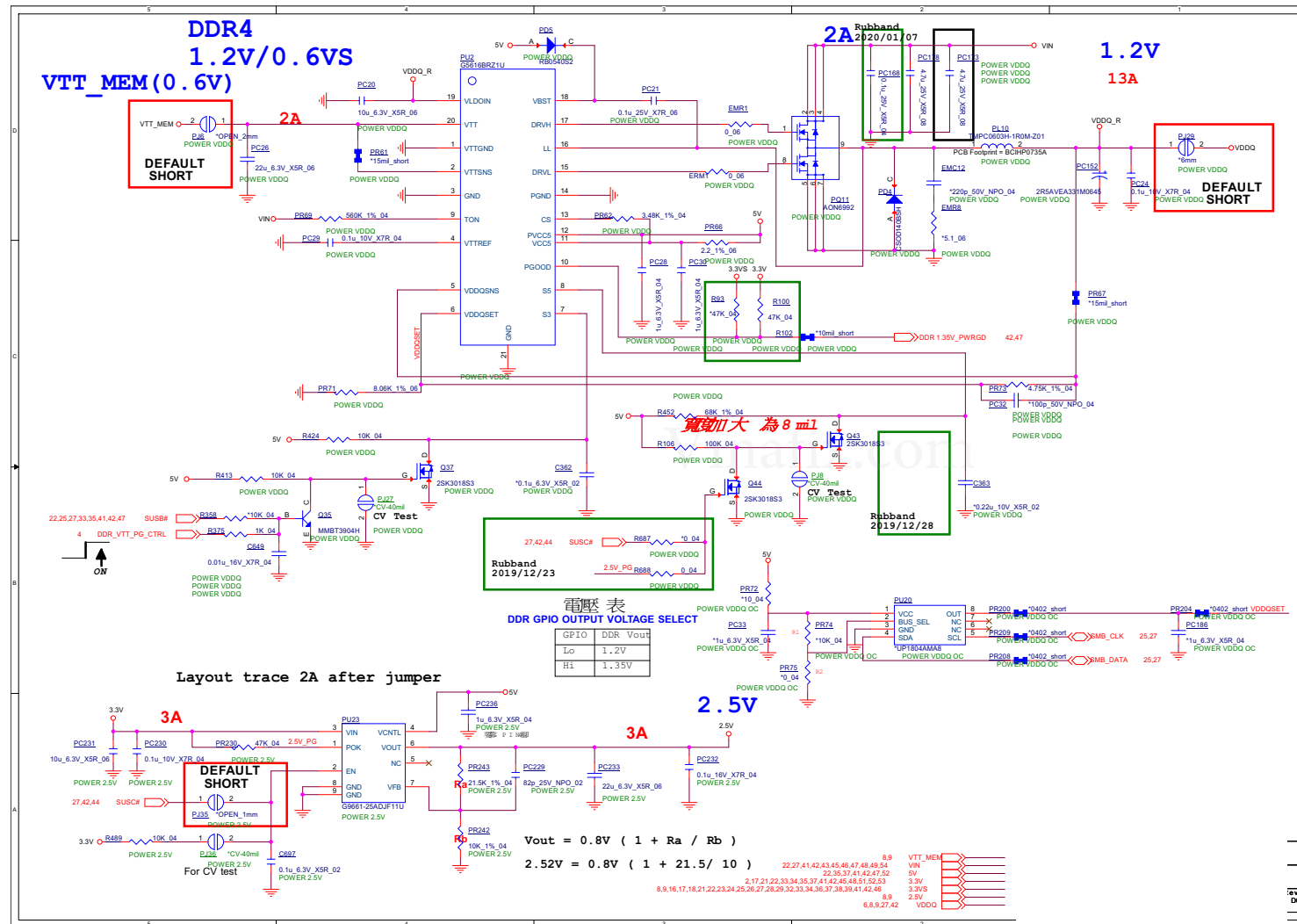
Schematic Diagrams

VDD3, VDD5

Sheet 43 of 59
VDD3, VDD5



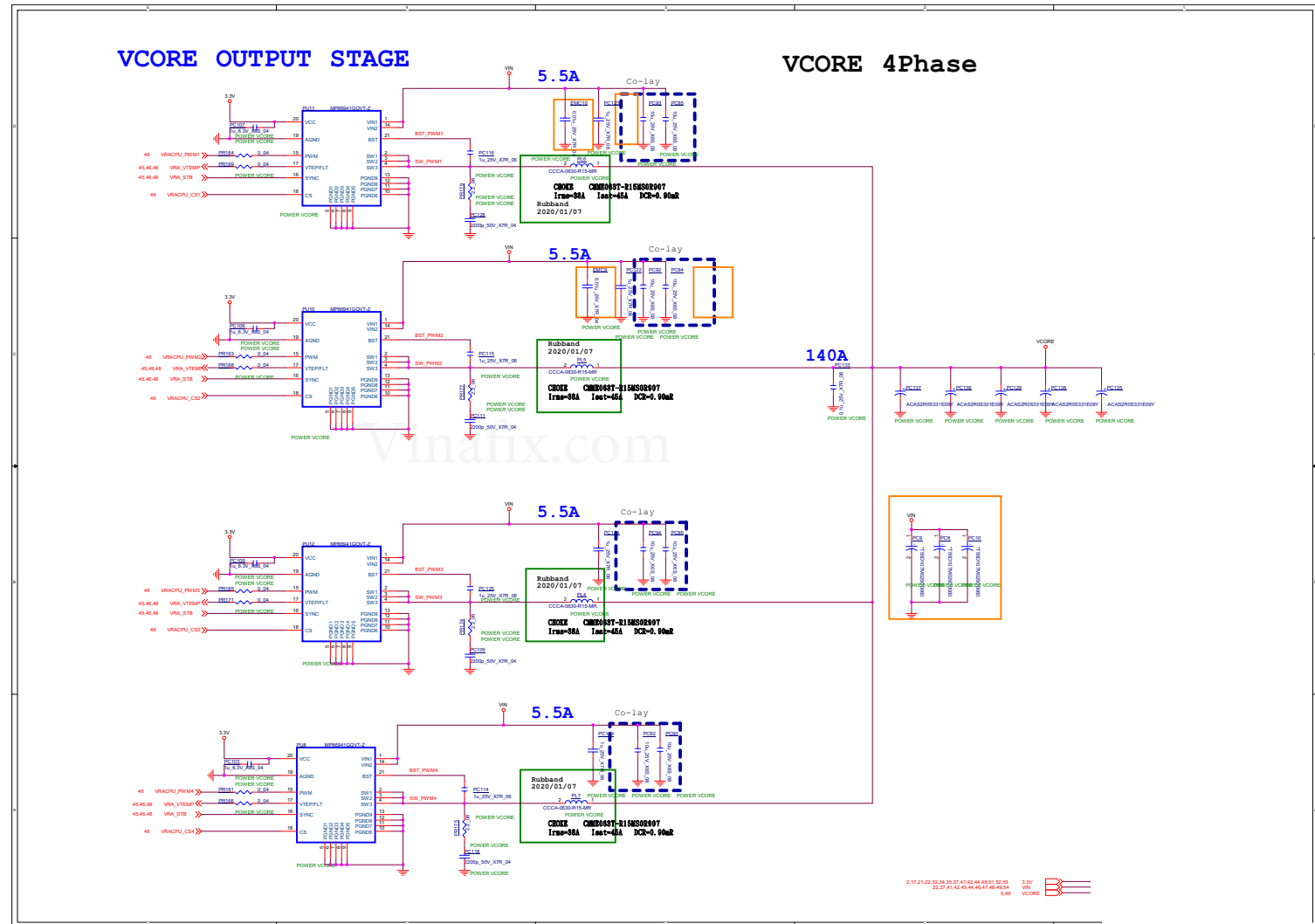
DDR 1.2V, 0.6VS, 2.5V



Sheet 44 of 59
DDR 1.2V, 0.6VS,
2.5V

VCore Output Stage

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VCore Output
Stage



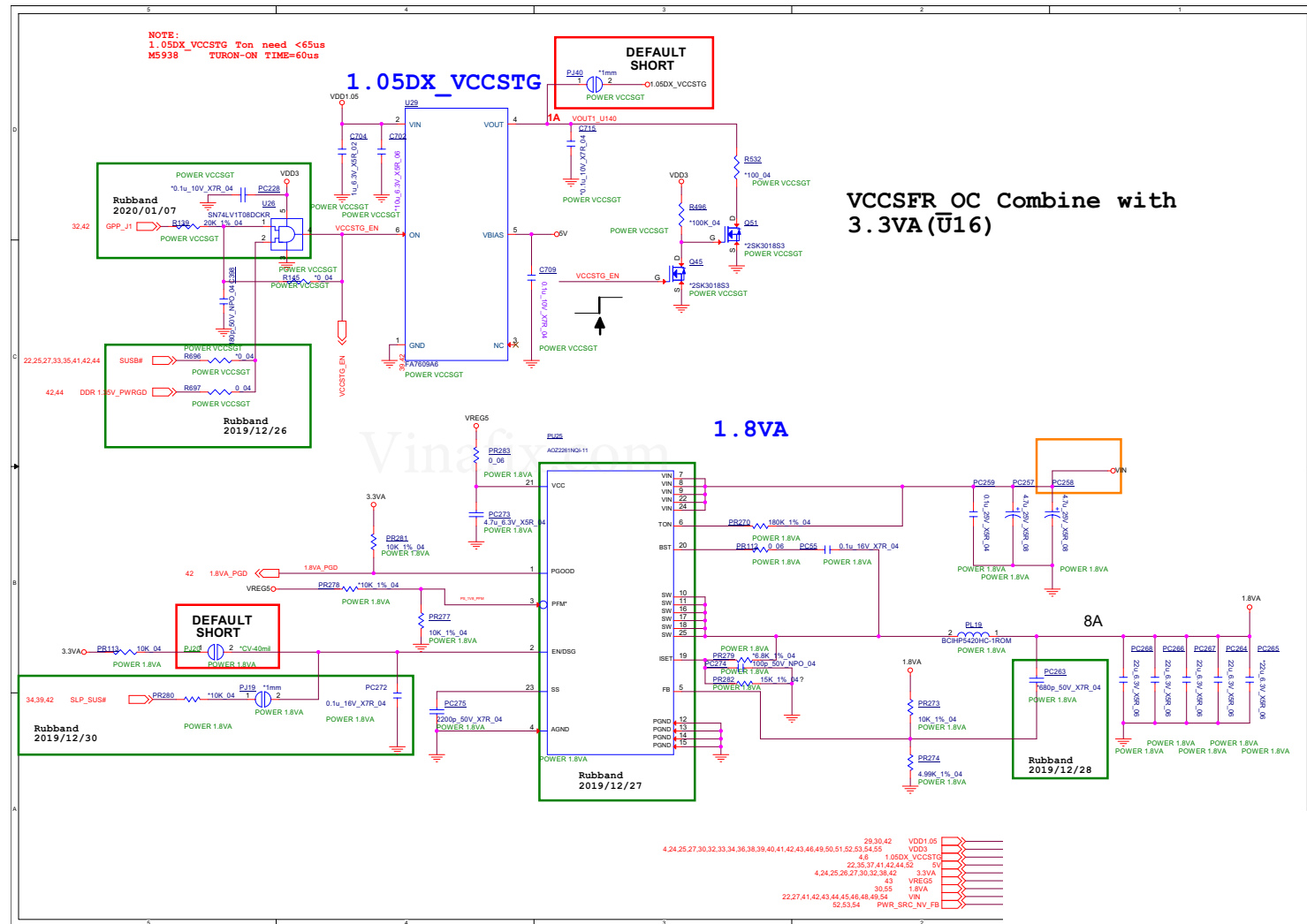
Sheet 46 of 59
VCC_Core, VCCGT,
VCCSA



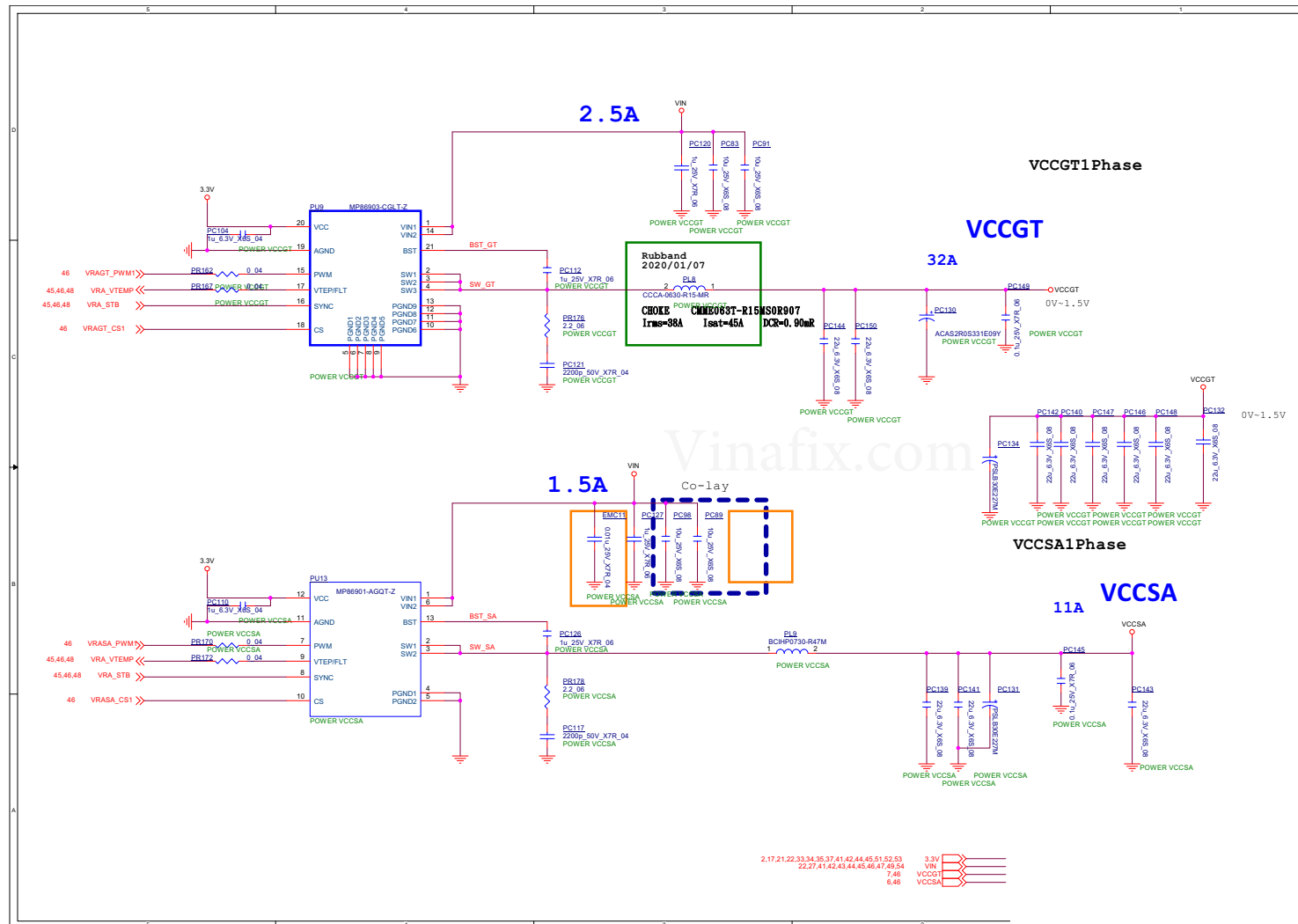
Schematic Diagrams

1.05DX_VCCSTG, VCCSFR_OC, 1.8VA

Sheet 47 of 59
1.05DX_VCCSTG,
VCCSFR_OC,
1.8VA

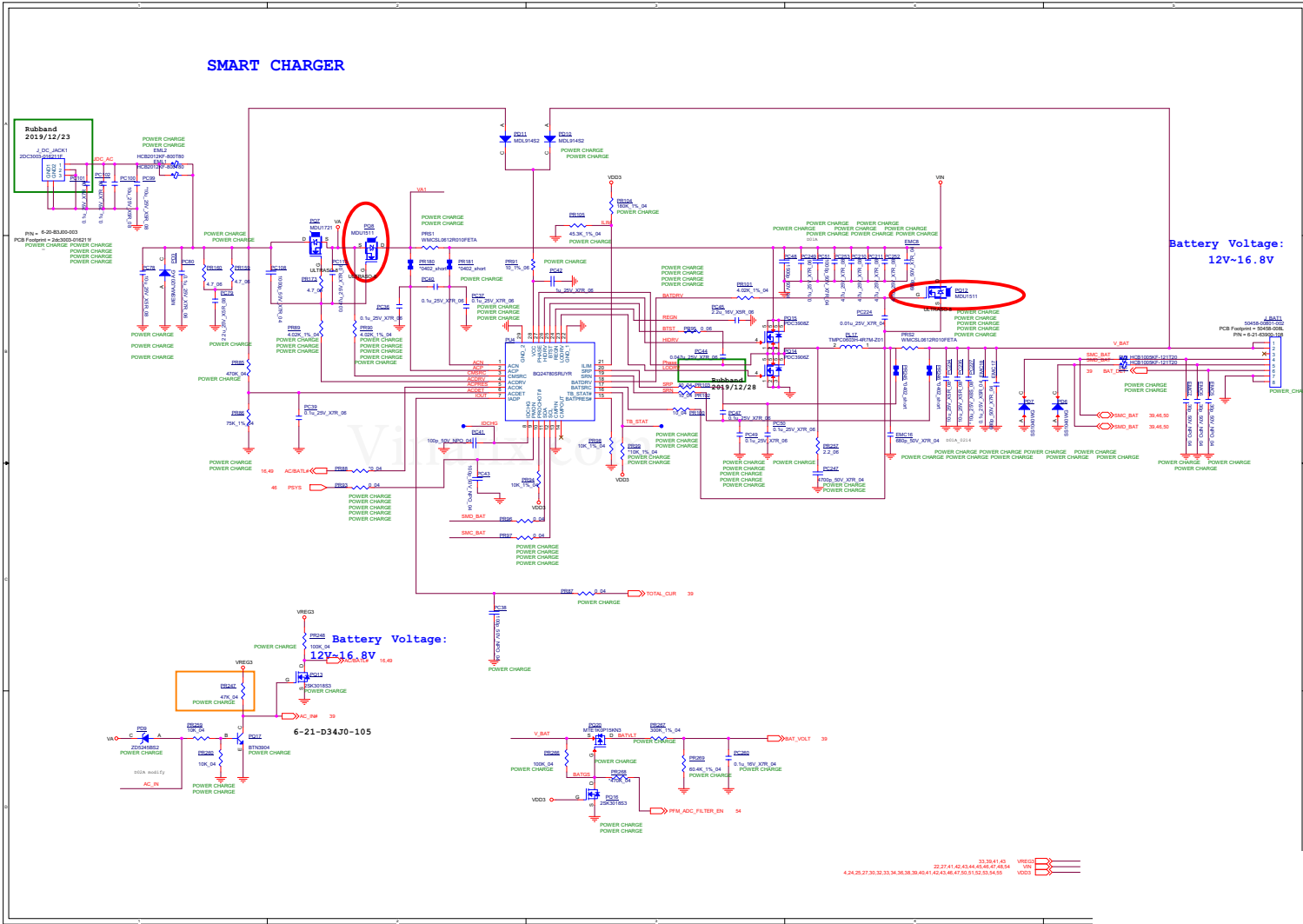


VCCGT, VCCSA Output Stage



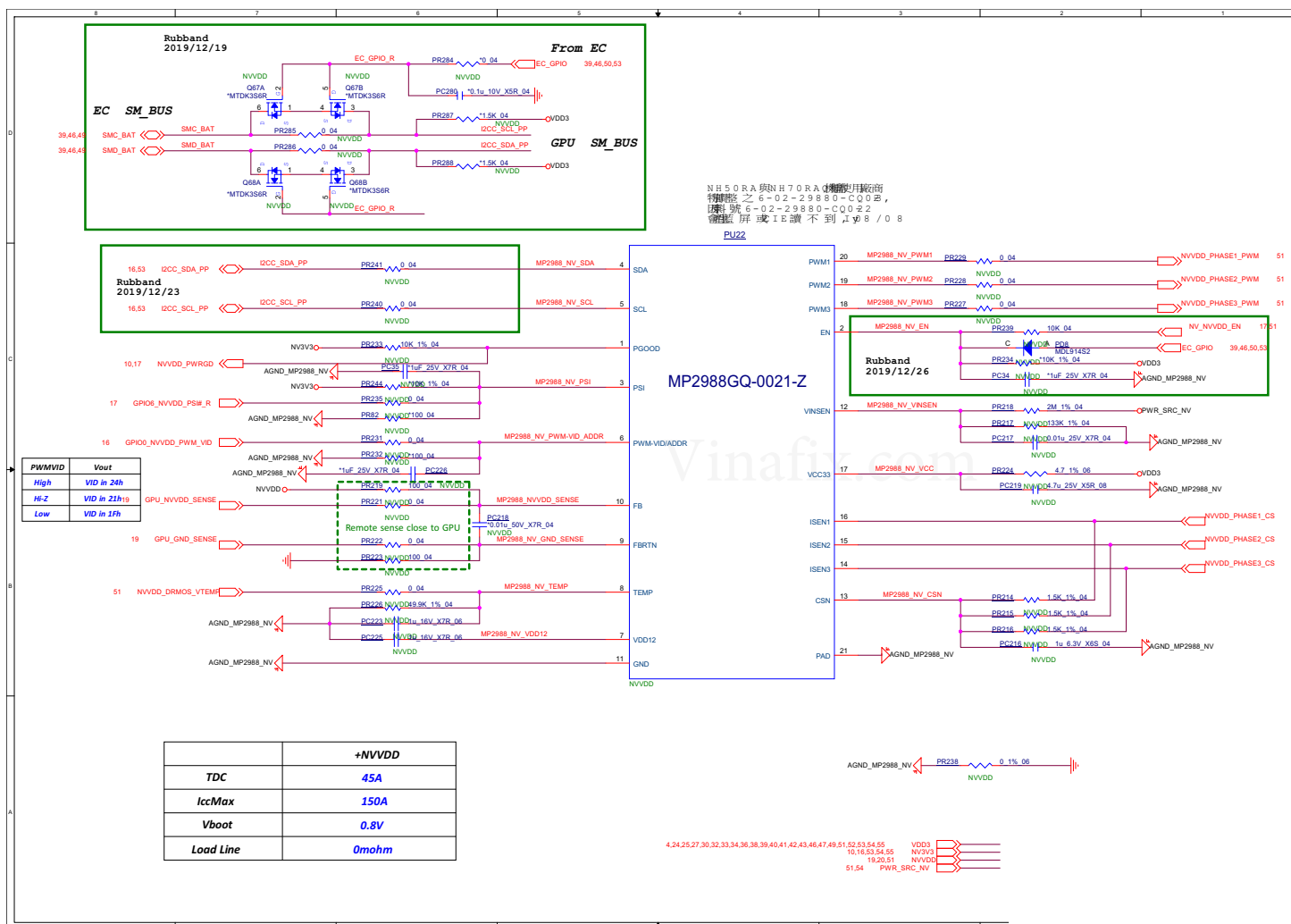
Sheet 48 of 59
VCCGT, VCCSA
Output Stage

AC_In, Charger

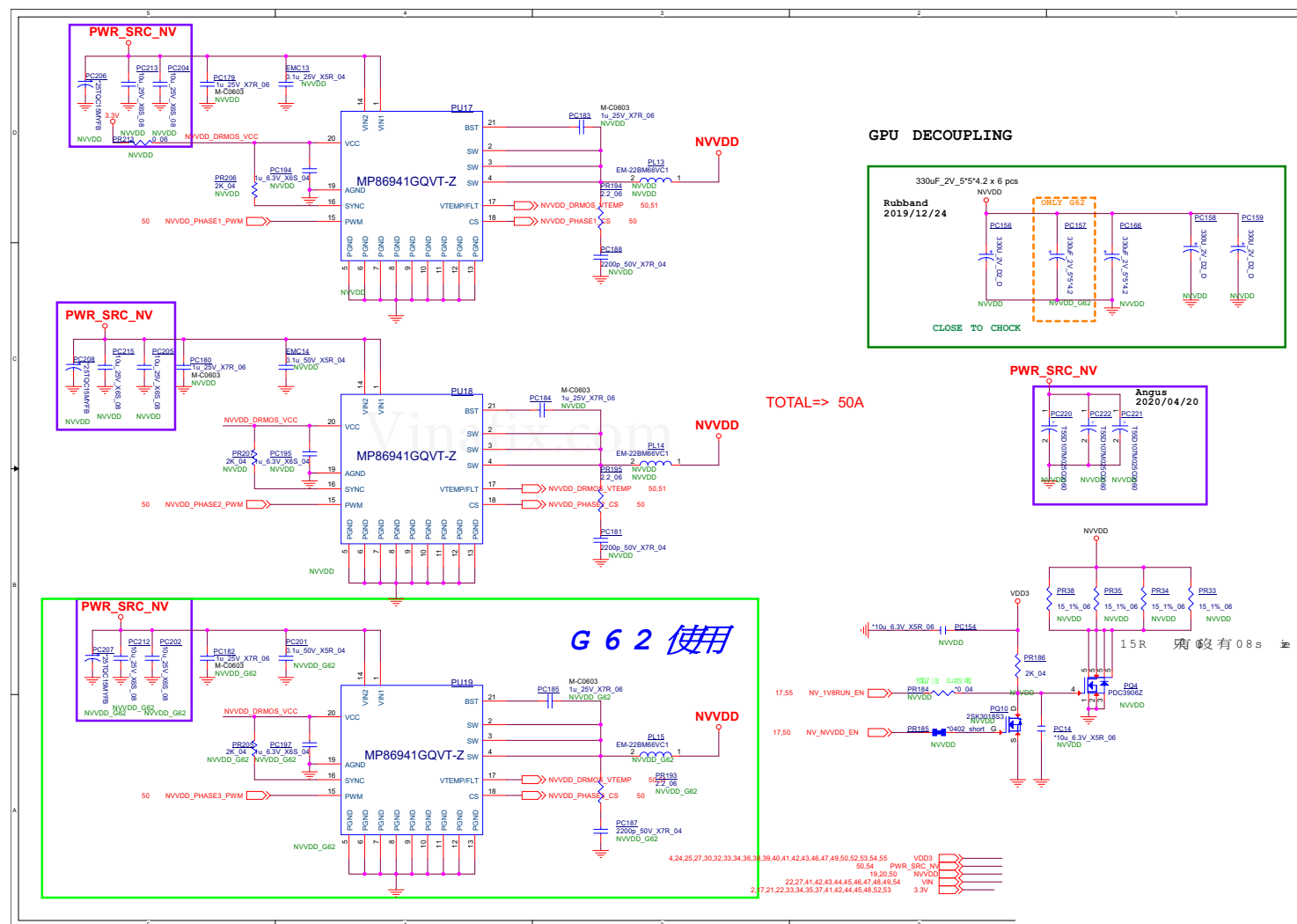


Sheet 49 of 59
AC_In, Charger

NVVDD 1

Sheet 50 of 59
NVVDD 1

Sheet 51 of 59
NVVDD 2



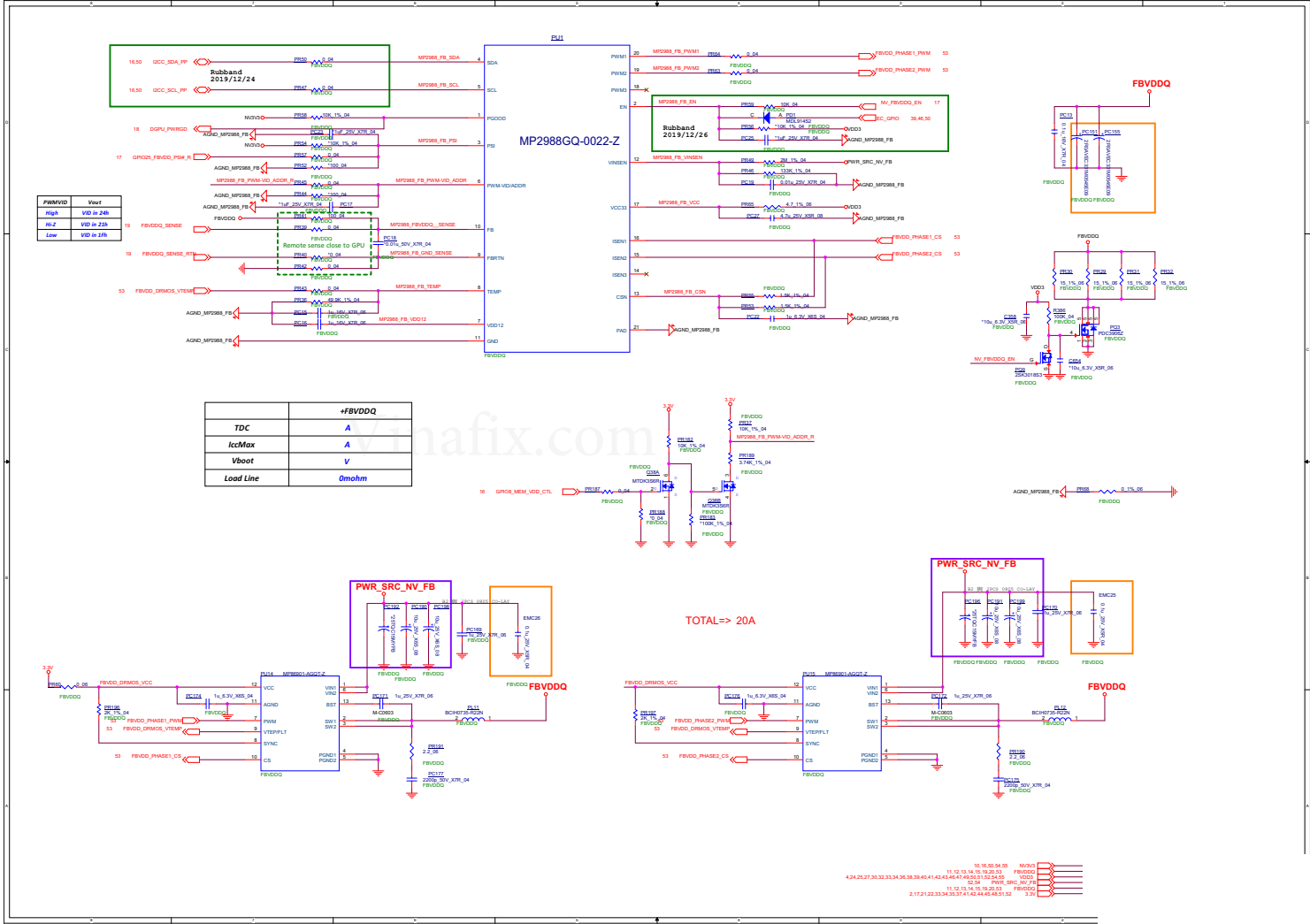
PEX_VDD B - 53



FBVDDQ

B. Schematic Diagrams

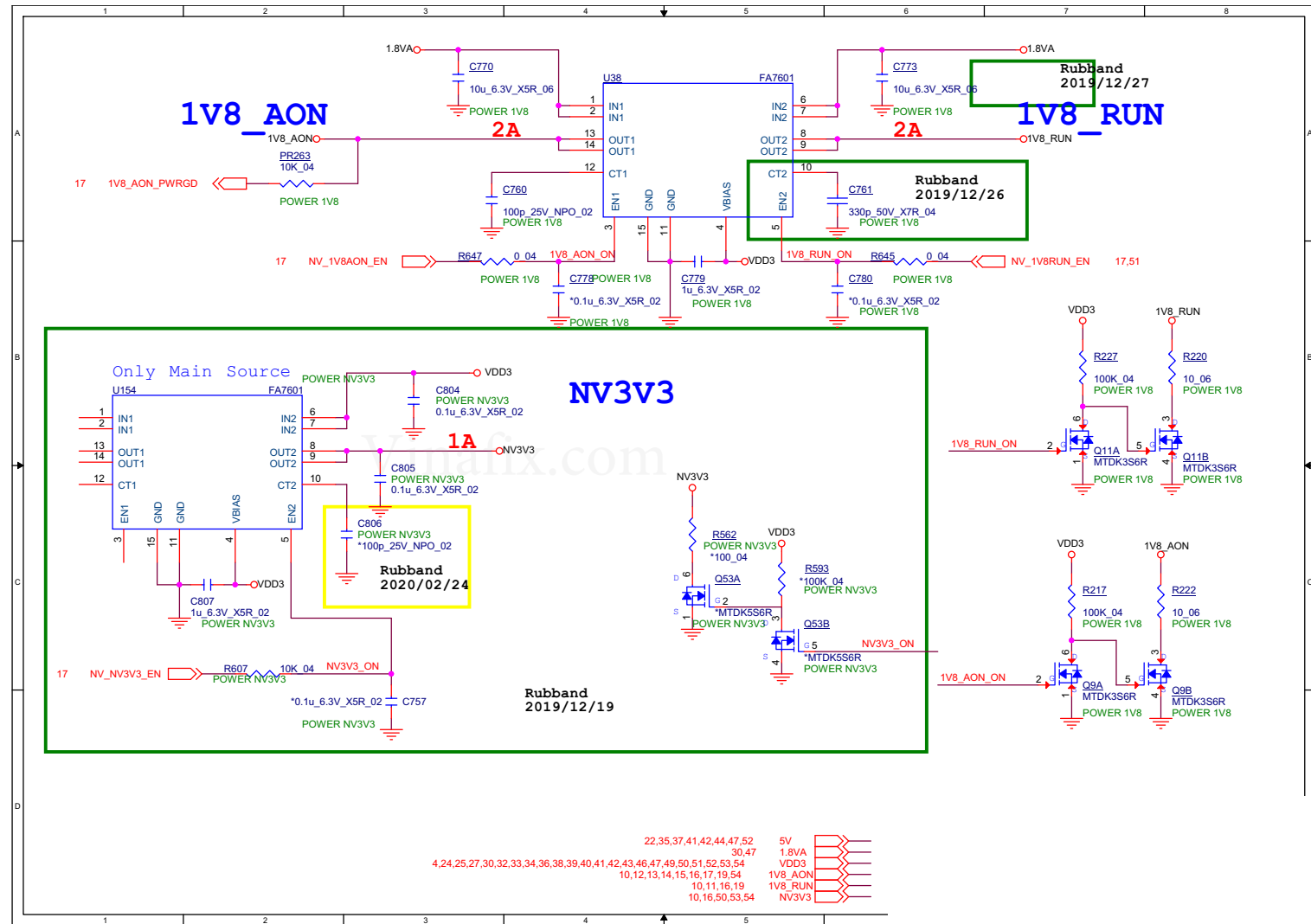
Sheet 53 of 59
FBVDDQ





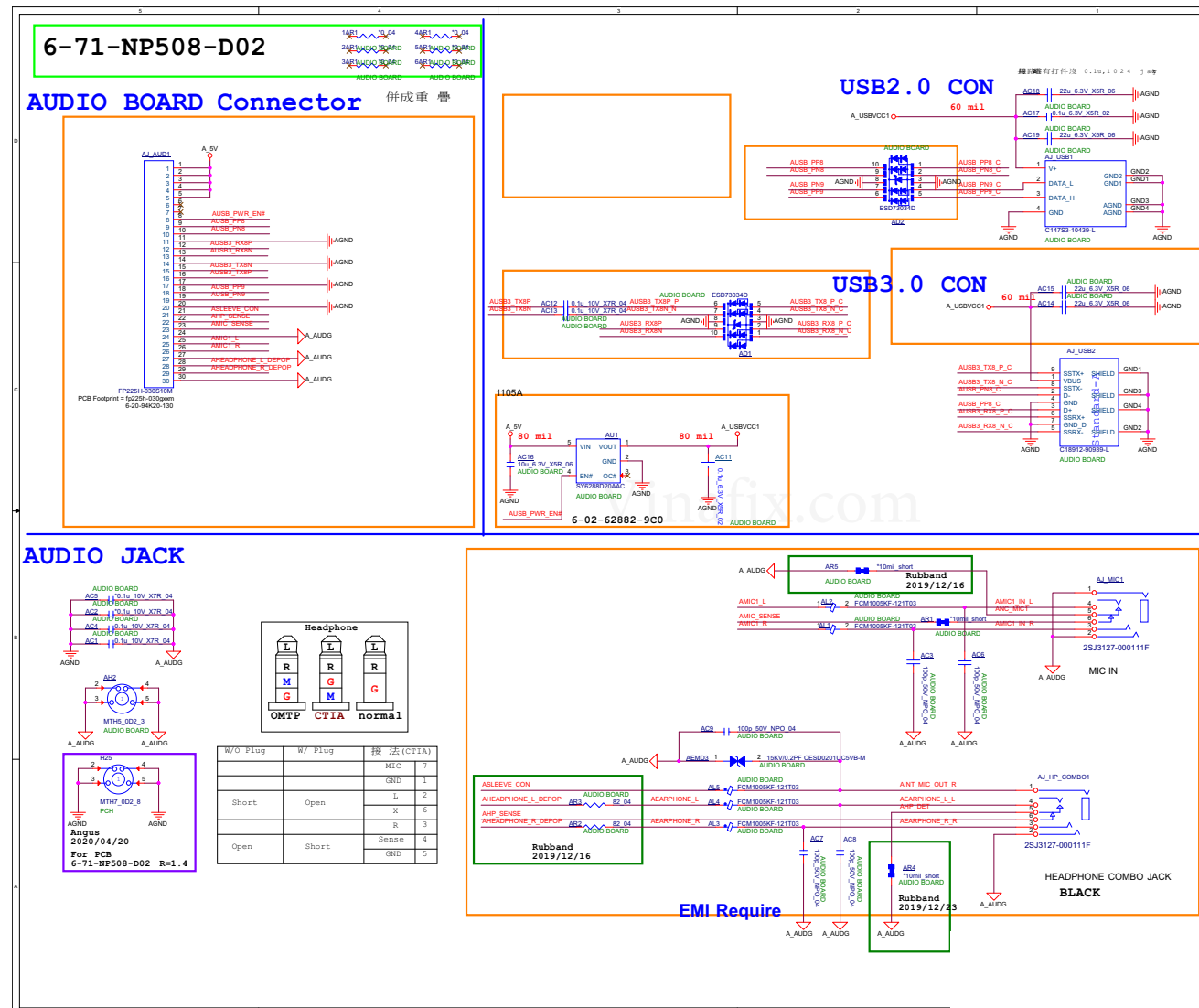
Schematic Diagrams

1V8_RUN/AON, NV3V3

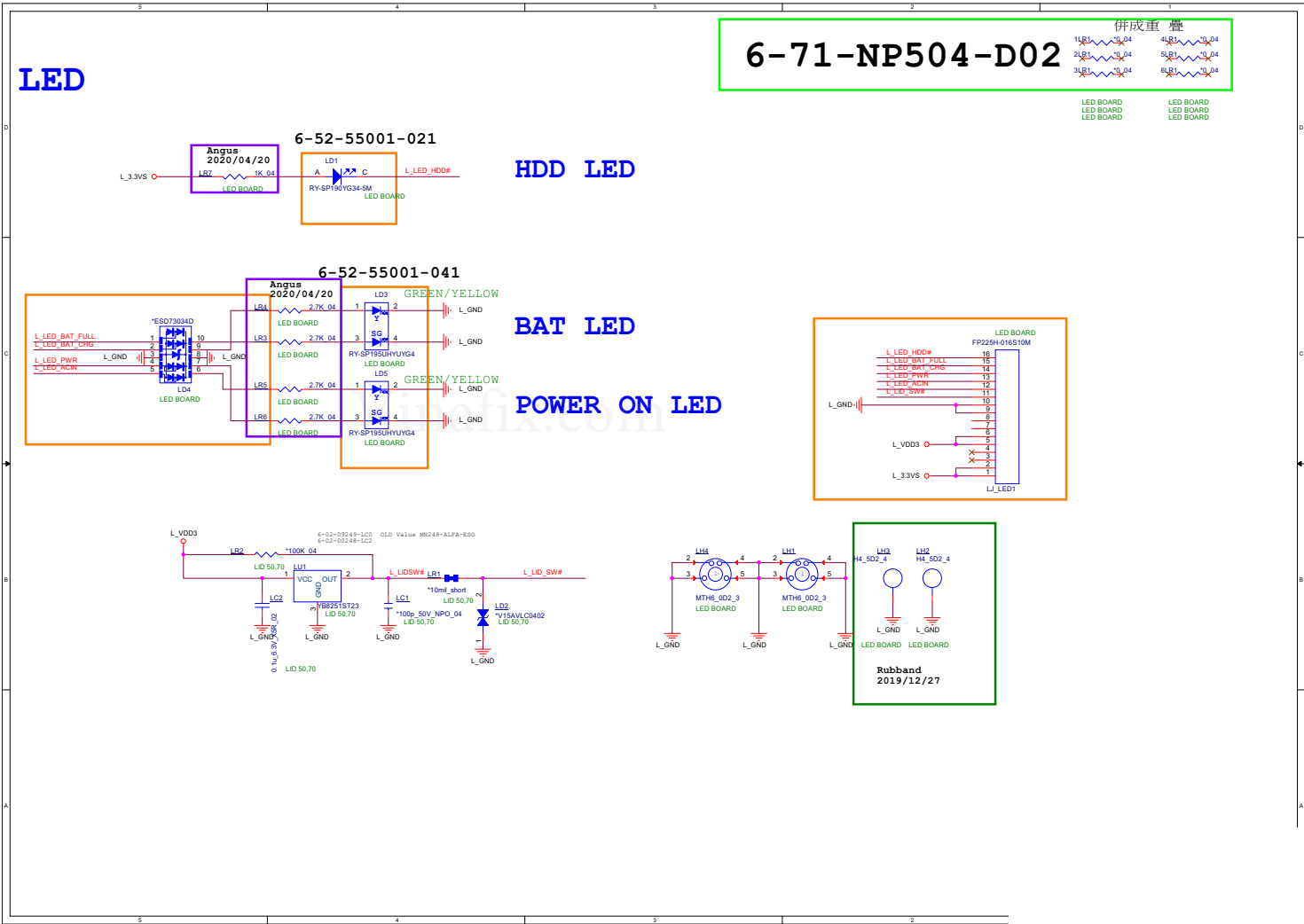


Sheet 55 of 59
1V8_RUN/AON,
NV3V3

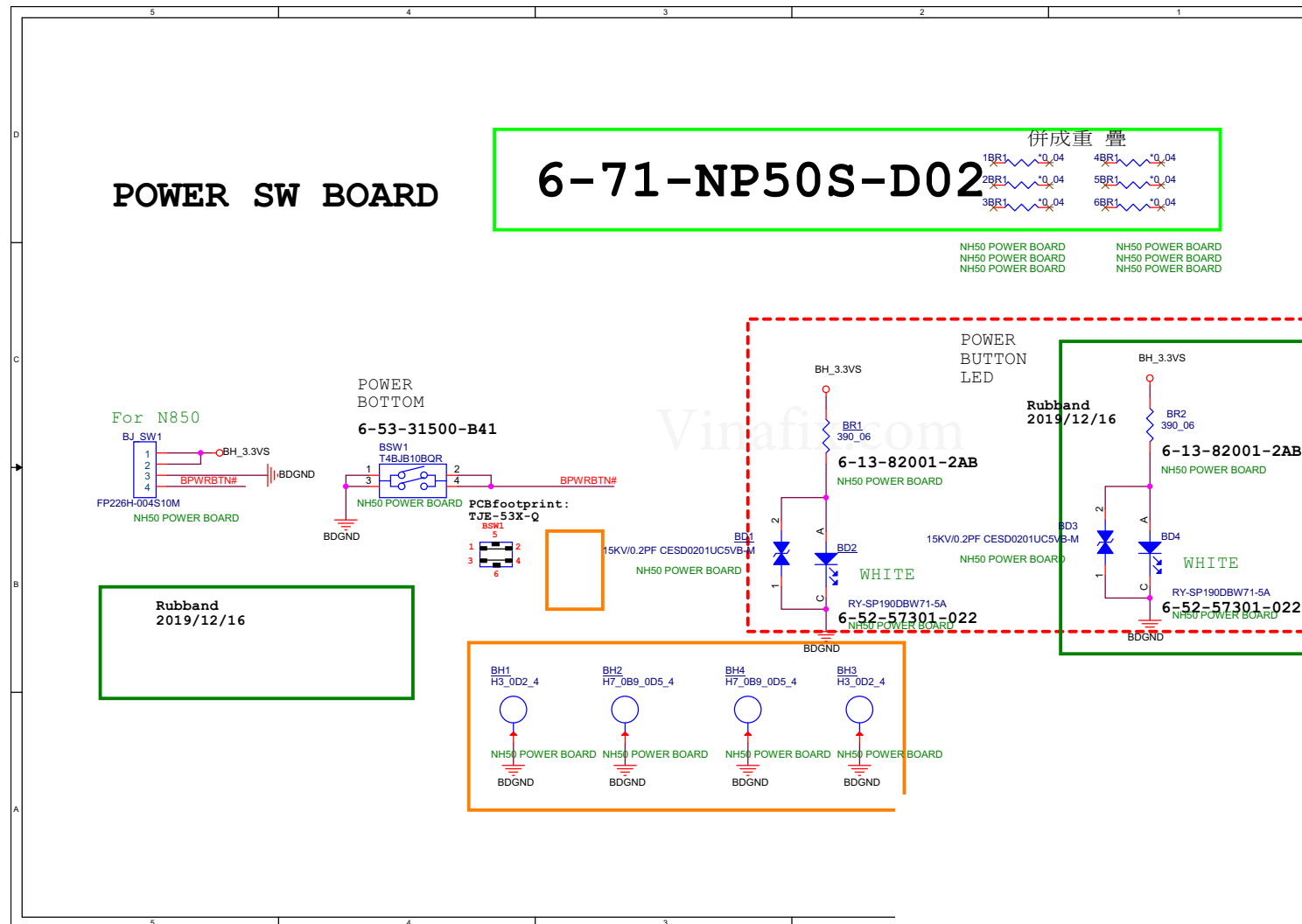
Audio Board B - 57



LED Board



Power Board

Sheet 58 of 59
Power Board

