

SERVICE MANUAL

notebook



NH70RAQ / NH70RHQ

Notebook Computer
NH70RAQ / NH70RHQ
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 **NH70RAQ / NH70RHQ** 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, 6.15A (**120** Watts) minimum AC/DC Adapter.

FCC Statement

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

This device may not cause harmful interference.

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

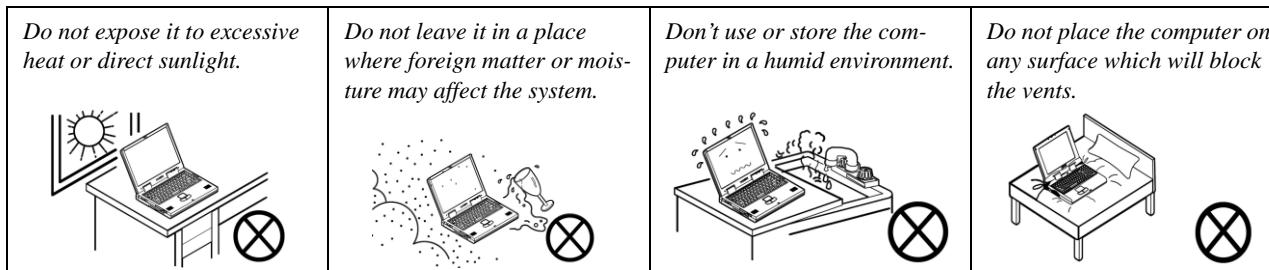
Instructions for Care and Operation

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

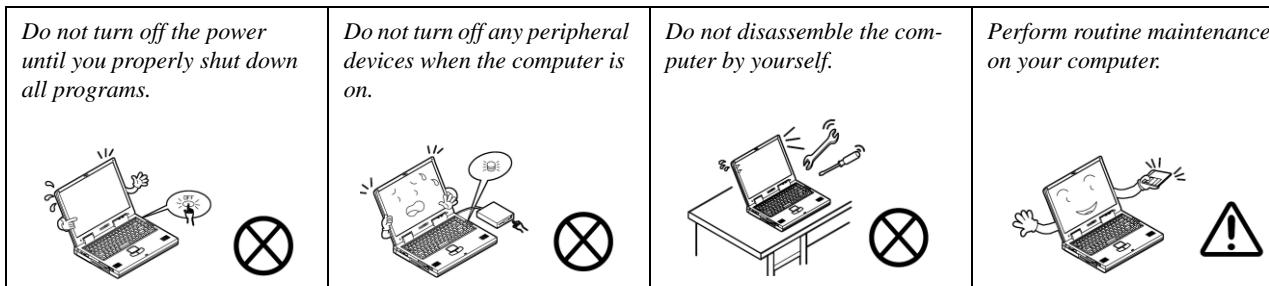
1. **Don't drop it, or expose it to shock.** If the computer falls, the case and the components could be damaged.



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

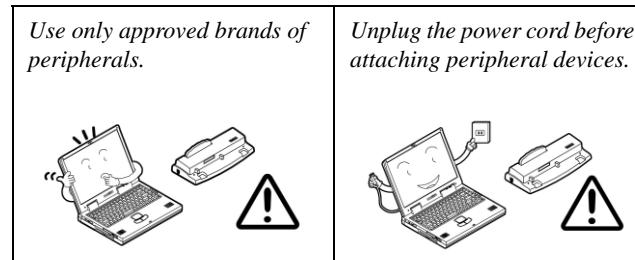


3. **Follow the proper working procedures for the computer.** Shut the computer down properly and don't forget to save your work. Remember to periodically save your data as data may be lost if the battery is depleted.



Preface

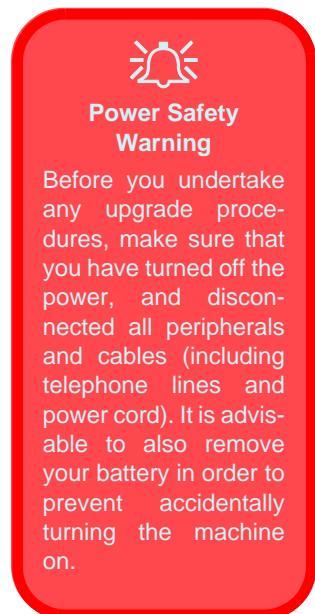
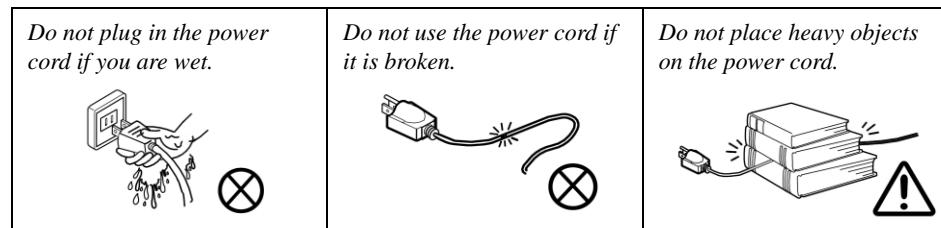
4. **Avoid interference.** Keep the computer away from high capacity transformers, electric motors, and other strong magnetic fields. These can hinder proper performance and damage your data.
5. **Take care when using peripheral devices.**



Power Safety

The computer has specific power requirements:

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



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 rear of the computer, then plug the AC power cord into an outlet, and connect the AC power cord to the AC/DC adapter and **leave it there for 6 seconds or longer**.
 - Remove the adapter cord from the computer's DC-In jack, and then plug it back in again; the battery will now be unlocked.
6. Use one hand to raise the lid/LCD to a comfortable viewing angle (do not exceed 130 degrees); use the other hand (as illustrated in Figure 1) to support the base of the computer (**Note: Never** lift the computer by the lid/LCD).
7. Press the power button to turn the computer "on".

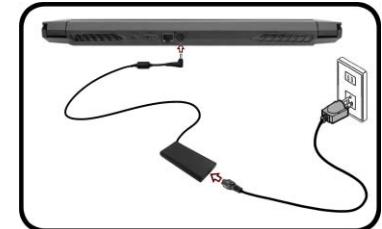
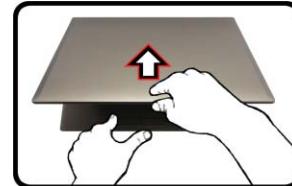


Figure 1
Opening the Lid/LCD/
Computer with AC/DC
Adapter Plugged-In



Shut Down

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

Click the icon  in the **Start Screen** and choose **Shut down** from the menu.



Or

Right-click the **Start button**  at the bottom of the **Start Screen** or the **Desktop** and choose **Shut down or sign out** > **Shut down** from the context menu.

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Chapter 1: Introduction

Overview

This manual covers the information you need to service or upgrade the **NH70RAQ / NH70RHQ** 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 **NH70RAQ / NH70RHQ** 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

The CPU is not a user serviceable part. Accessing the CPU in any way may violate your warranty.

Processor Options

Intel® Core™ i7 Processor

i7-9750H (2.60GHz)

12MB Smart Cache, **14nm**, DDR4-2666MHz, TDP 45W

Intel® Core™ i5 Processor

i5-9300H (2.40GHz)

8MB Smart Cache, **14nm**, DDR4-2666MHz, TDP 45W

Core Logic

Mobile Intel® HM370 Express Chipset

BIOS

128Mb SPI Flash ROM

INSYDE BIOS

Memory

Dual Channel DDR4

Two 260 Pin SO-DIMM Sockets

Supporting **DDR4 2666MHz** Memory Modules

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

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

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

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** Solid State Drive (SSD)

Or

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

Audio

High Definition Audio Compliant Interface

Sound Blaster™ Cinema 5

Built-In Array Microphone

Two Speakers

LCD Options

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

Video Adapter

Intel® Integrated GPU and NVIDIA® Discrete GPU

Supports Microsoft Hybrid Graphics

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 (for NH70RAQ)

4GB GDDR6 Video RAM on board

Microsoft DirectX® 12 Compatible

NVIDIA® GeForce GTX 1050 (for NH70RHQ)

3GB GDDR6 Video RAM on board

Microsoft DirectX® 12 Compatible

Security

Security (Kensington® Type) Lock Slot

BIOS Password

Intel® PTT for Systems Without TPM Hardware

(Factory Option) TPM 2.0

Keyboard

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

Pointing Device

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

Interface

One USB 3.1 Gen 2 Type-C Port*

**The maximum amount of current supplied by USB Type-C ports is 500mA (USB 2.0)/1500mA (USB 3.1).*

One USB 3.1 Gen 2 Type-A Port

One USB 3.0 (USB 3.1 Gen 1) Type-A Port

One USB 2.0 Port

One Mini DisplayPort

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

**USB 3.1 Gen 2**

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

Card Reader

Embedded Multi-In-1 Card Reader

MMC (MultiMedia Card) / RS MMC

SD (Secure Digital) / Mini SD / SDHC/ SDXC

M.2 Slots

Slot 1 for **Combo WLAN and Bluetooth Module**

Slot 2 for **SATA or PCIe Gen3 x4 SSD**

Slot 3 for **PCIe Gen3 x4 SSD**

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 9260 Wireless LAN (**802.11ac**) + Bluetooth

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

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

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

Environmental Spec**Temperature**

Operating: 5°C - 35°C

Non-Operating: -20°C - 60°C

Relative Humidity

Operating: 20% - 80%

Non-Operating: 10% - 90%

Power

Removable 4 Cell Smart Lithium-Ion Battery Pack, 48.96WH

Full Range AC/DC Adapter

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

DC Output: 19.5V, 6.15A (**120W**)

Dimensions & Weight

399.9mm (w) * 282.2mm (d) * 25.2mm (h)

2.5kg (Barebone with 48.96WH Battery)

Introduction

Figure 1
Top View

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



External Locator - Front & Right Side Views

Figure 2
Front View

1. LED Indicator

FRONT VIEW



RIGHT SIDE VIEW



Figure 3
Right Side View

1. USB 3.1 Gen 2 Type-A Port
2. USB 3.1 Gen 2 Type-C Port
3. Multi-in-1 Card Reader
4. Vent

Introduction

External Locator - Left Side & Rear View

Figure 4
Left Side View

1. Security Lock Slot
2. Vent
3. USB 3.0 (USB 3.1 Gen 1) Type-A Port
4. USB 2.0 Port
5. Microphone-In Jack
6. 2-In-1 Audio Jack (Headphone and Microphone)

LEFT SIDE VIEW



REAR VIEW

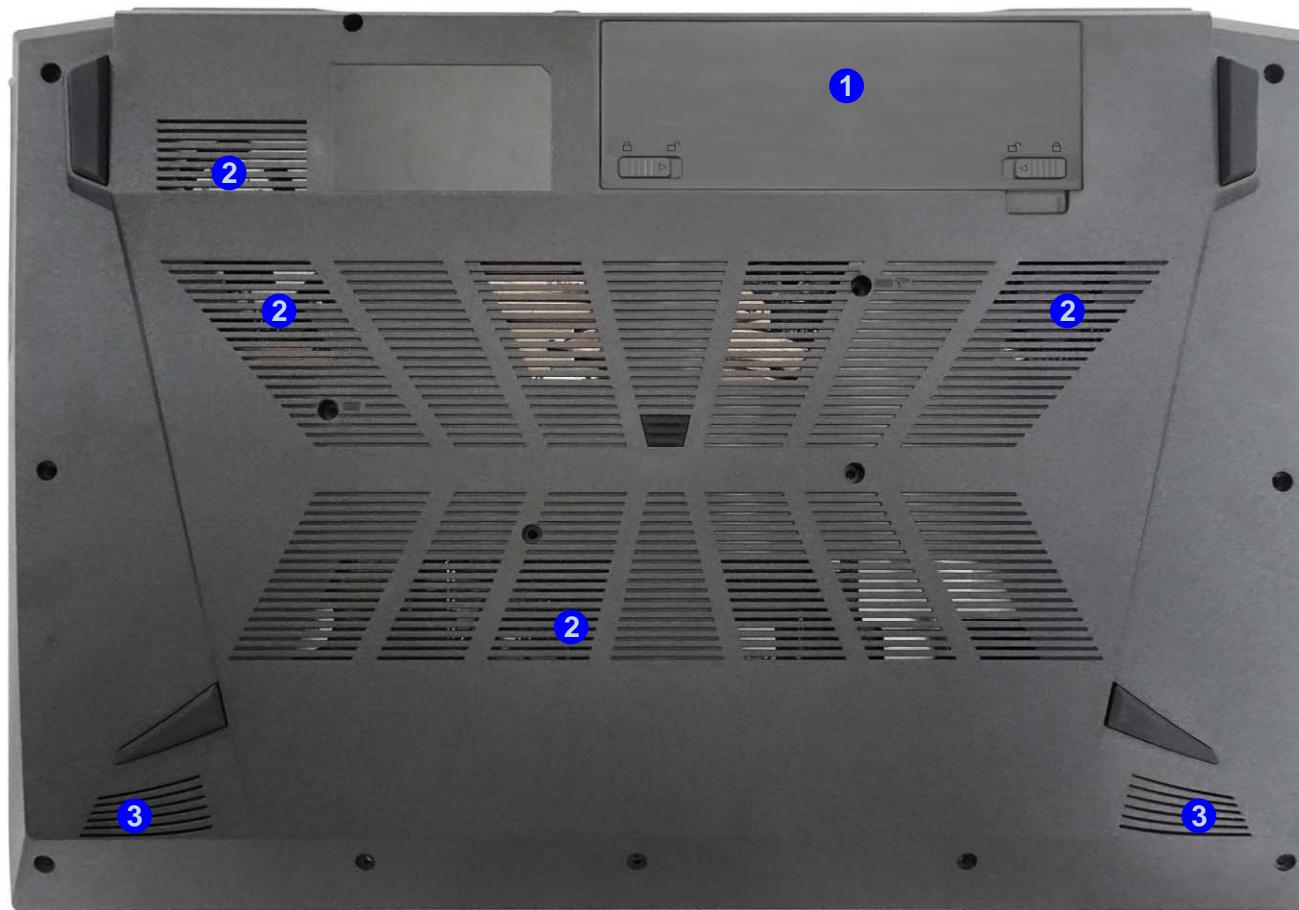


Figure 5
Rear View

1. Vent
2. Mini DisplayPort
3. HDMI-Out Port
4. RJ-45 LAN Jack
5. DC-In Jack

External Locator - Bottom View

Figure 6
Bottom View



1. Introduction



Overheating

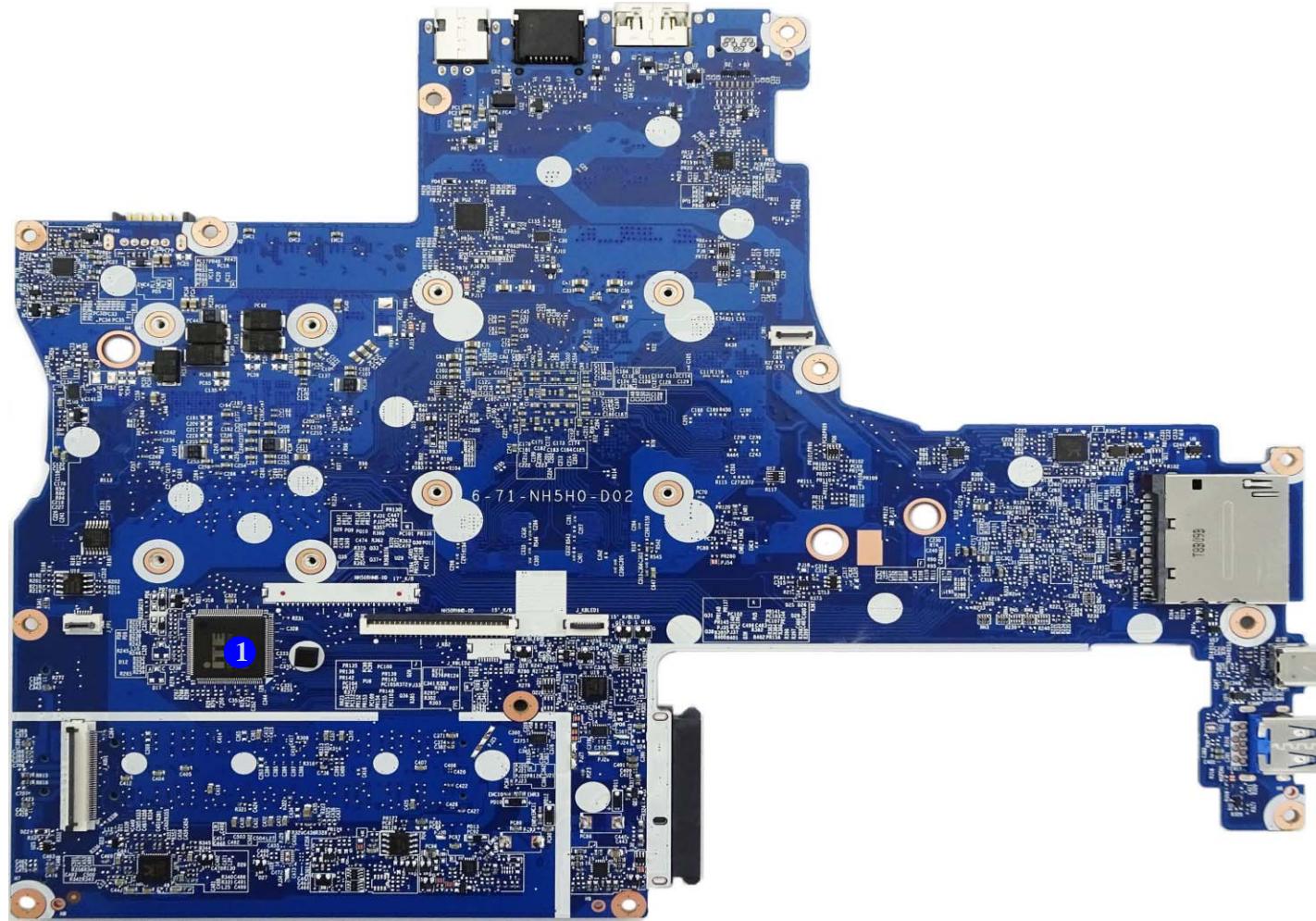
To prevent your computer from overheating, make sure nothing blocks any vent while the computer is in use.

Introduction

Figure 7
**Mainboard Top
Key Parts**

1. KBC-ITE IT5570

Mainboard Overview - Top (Key Parts)



Mainboard Overview - Bottom (Key Parts)

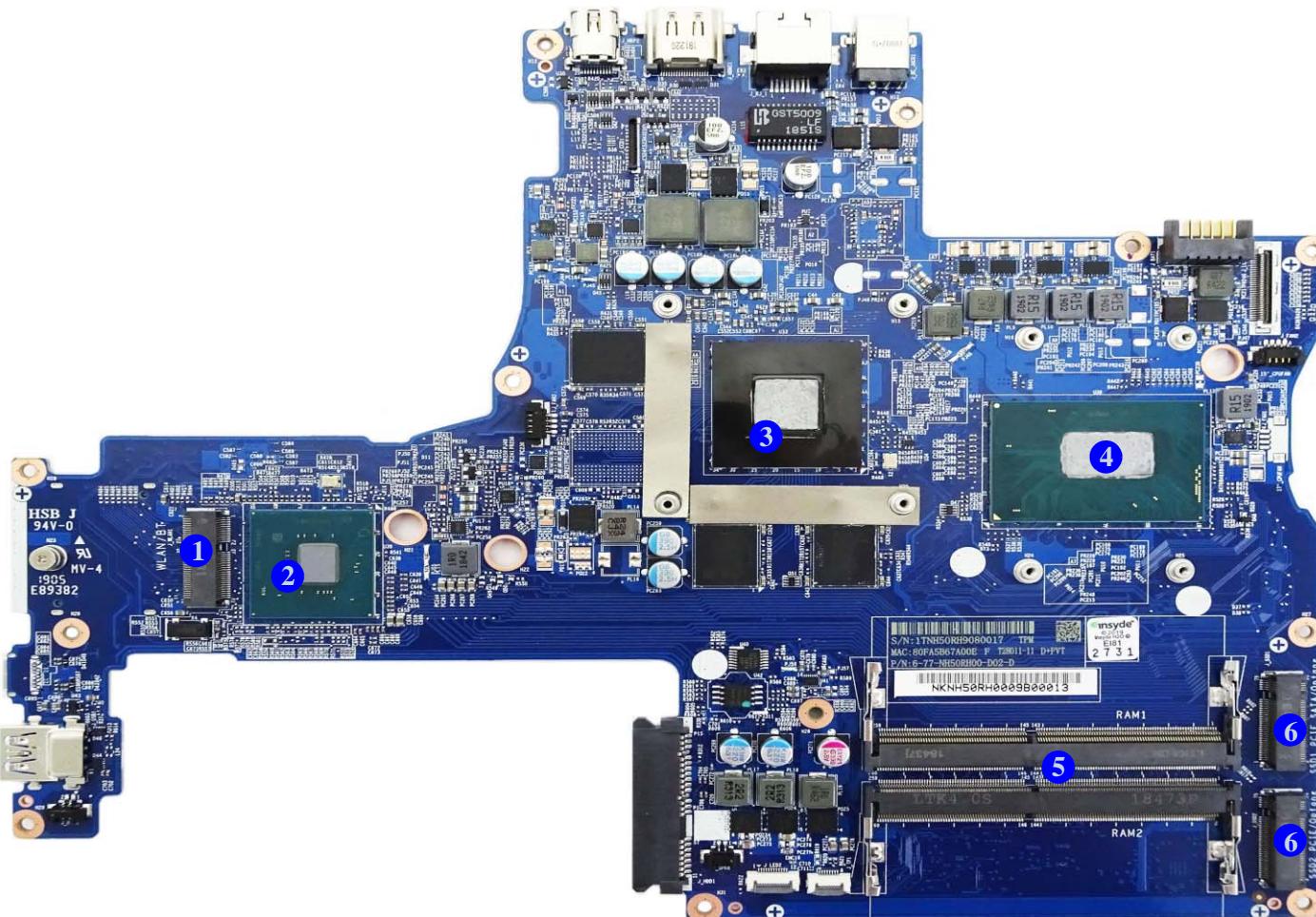


Figure 8
Mainboard Bottom
Key Parts

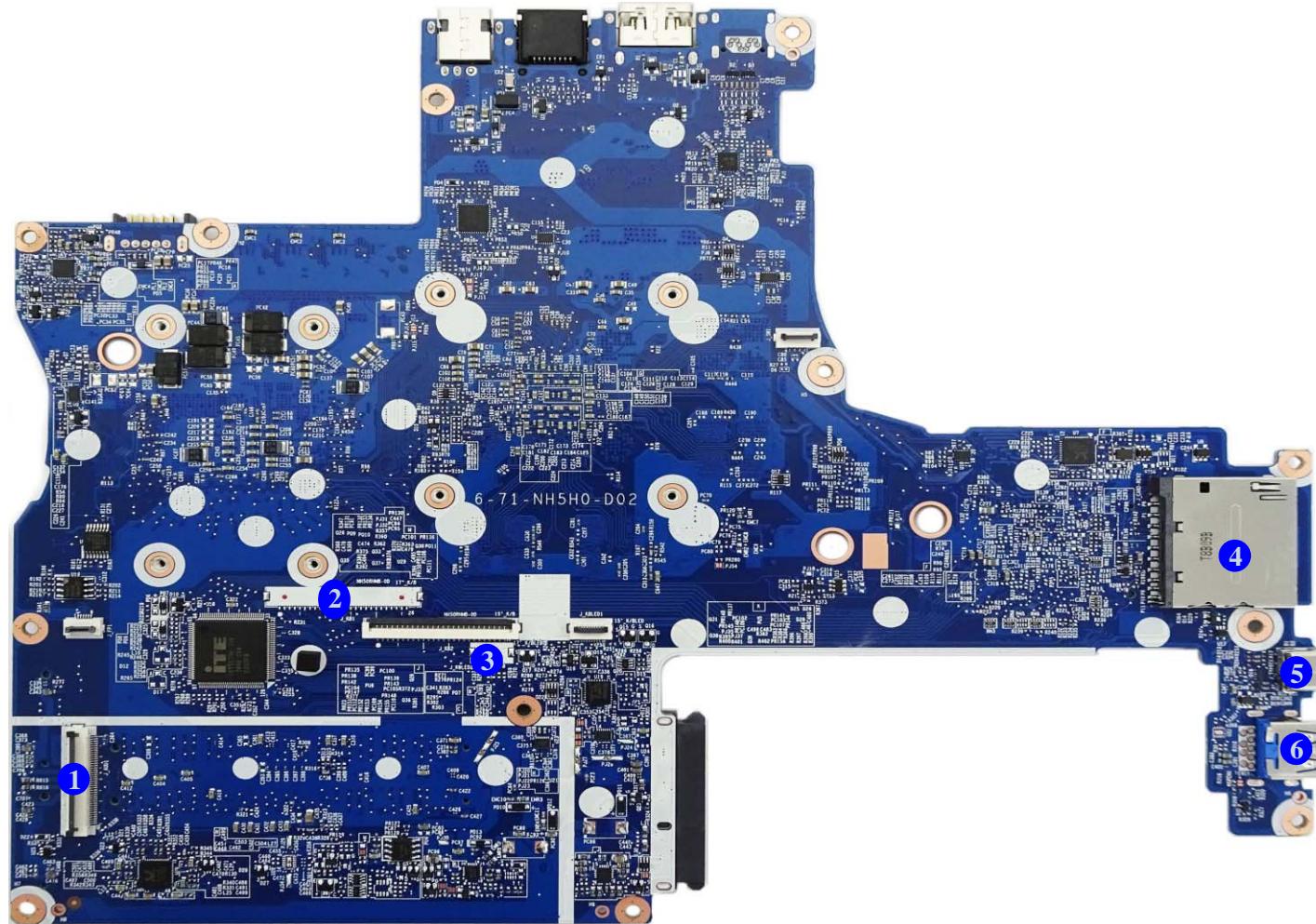
1. Mini-Card Connector (WLAN Module)
2. PCH
3. GPU
4. CPU
5. Memory Slots DDR4 SO-DIMM
6. M.2-Card Connector (SSD Module)

Introduction

Figure 9
**Mainboard Top
Connectors**

1. USB Connector
2. Keyboard Cable
Connector
3. KB LED
Connector
4. Multi-in-1 Card
Reader
5. USB 3.1 Gen 2
Type-C Port
6. USB 3.1 Gen 2
Type-A Port

Mainboard Overview - Top (Connectors)



Mainboard Overview - Bottom (Connectors)

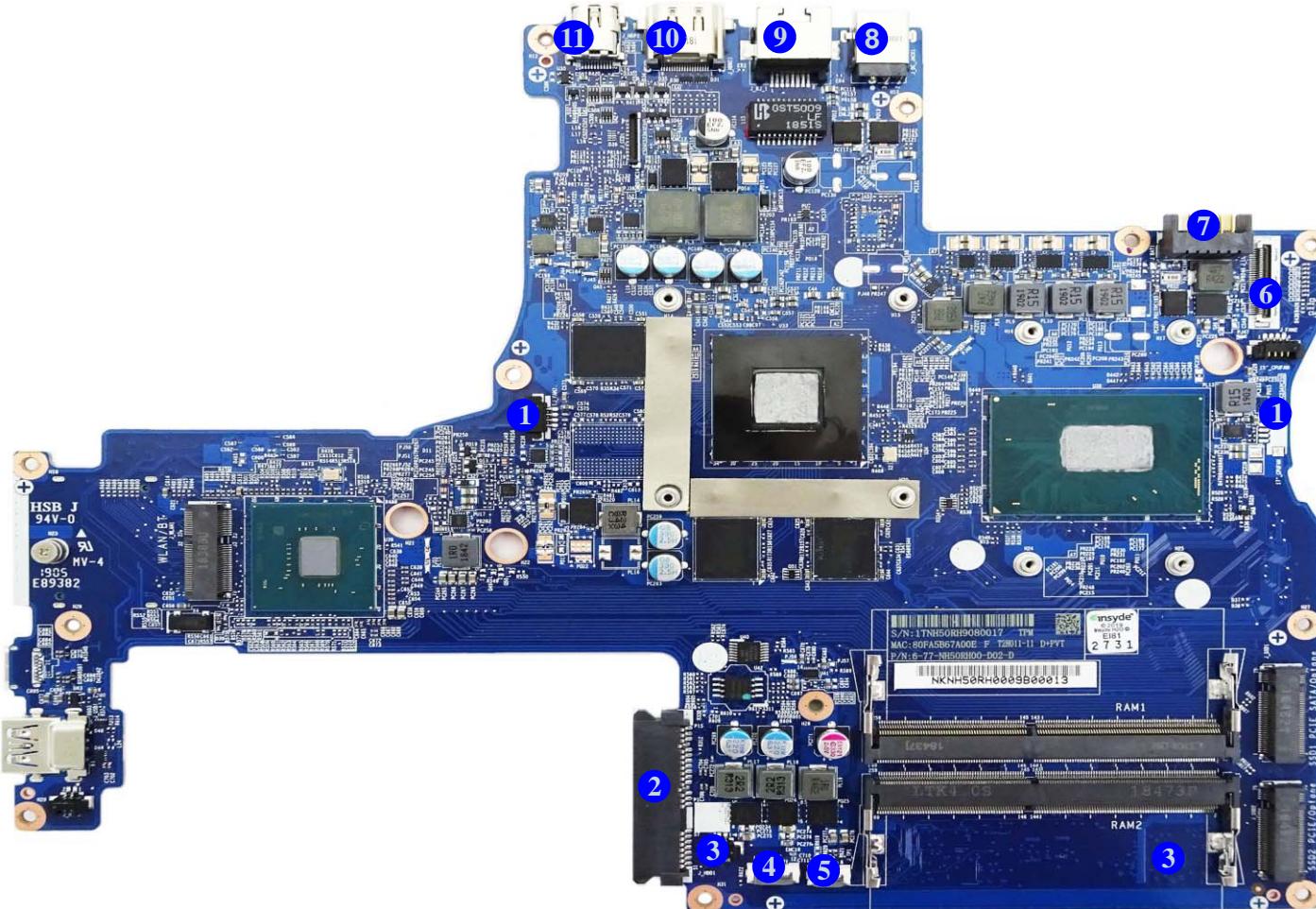


Figure 10
Mainboard Bottom
Connectors

1. Fan Connector
2. HDD Connector
3. Speaker Connector
4. LED Connector
5. Touchpad
Connector
6. LCD Connector
7. Battery Connector
8. DC-In Jack
9. RJ-45 LAN Jack
10. HDMI-Out Port
11. Mini Display Port

Introduction

Chapter 2: Disassembly

Overview

This chapter provides step-by-step instructions for disassembling the **NH70RAQ / NH70RHQ** series notebook's parts and subsystems. When it comes to reassembly, reverse the procedures (unless otherwise indicated).

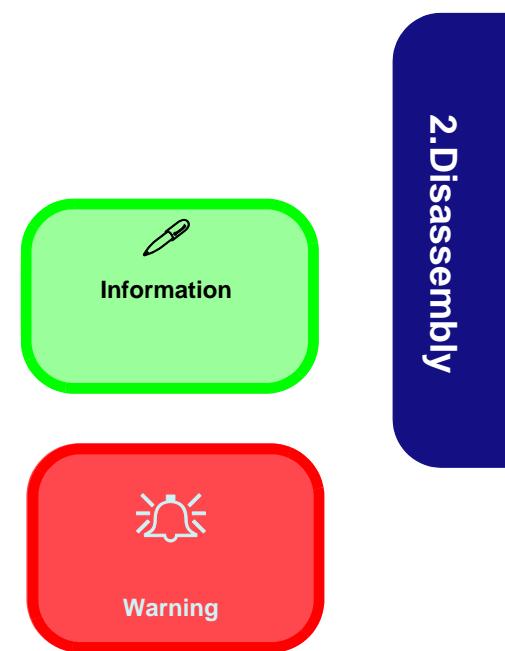
We suggest you completely review any procedure before you take the computer apart.

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 Battery:

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

To remove the Keyboard:

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

To remove the HDD:

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

To remove the System Memory:

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

To remove the M.2 SSD:

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

To remove the Wireless LAN Module:

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

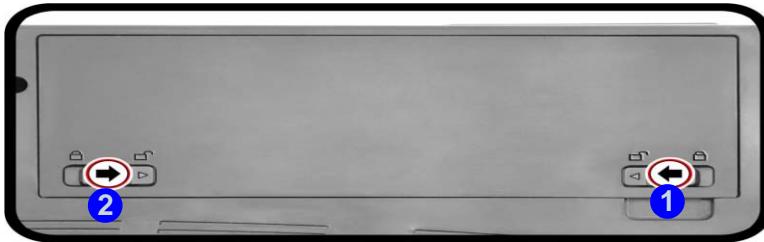
To remove the CCD Module:

1. Remove the battery [page 2 - 5](#)
2. Remove the HDD [page 2 - 7](#)
3. Remove the CCD module [page 2 - 13](#)

Removing the Battery

1. Turn the computer **off**, and turn it over.
2. Slide the latch **1** in the direction of the arrow (*Figure 1a*).
3. Slide the latch **2** in the direction of the arrow.
4. While holding the latch **2**, lift the battery **3** (*Figure 1b*) out of the compartment (*Figure 1c*).

a.



b.



c.

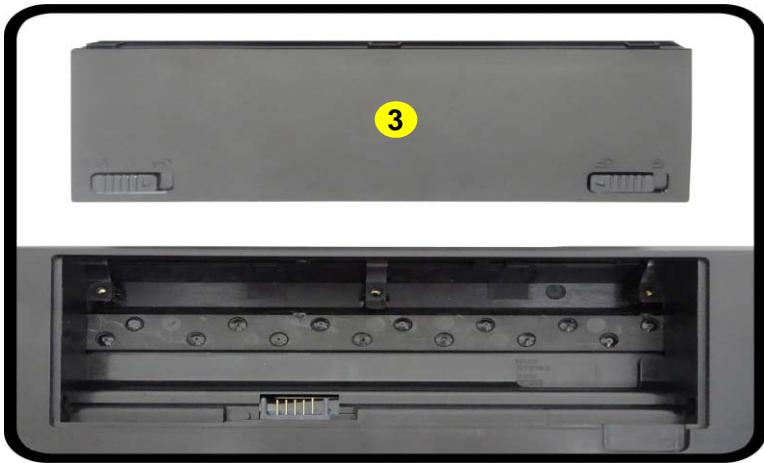
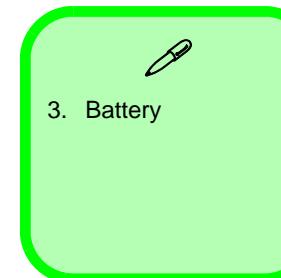


Figure 1
Battery Removal

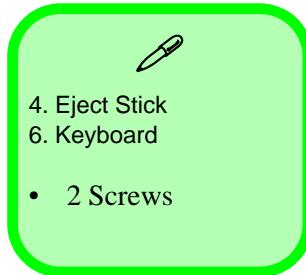
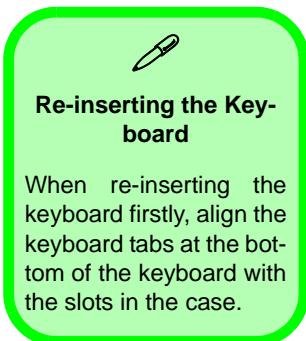
- a. Slide the latch **1** in the direction of the arrow, and slide the latch **2** in the direction of the arrow.
- b. Lift the battery.
- c. Remove the battery.



Disassembly

Figure 2
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.



Removing the Keyboard

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

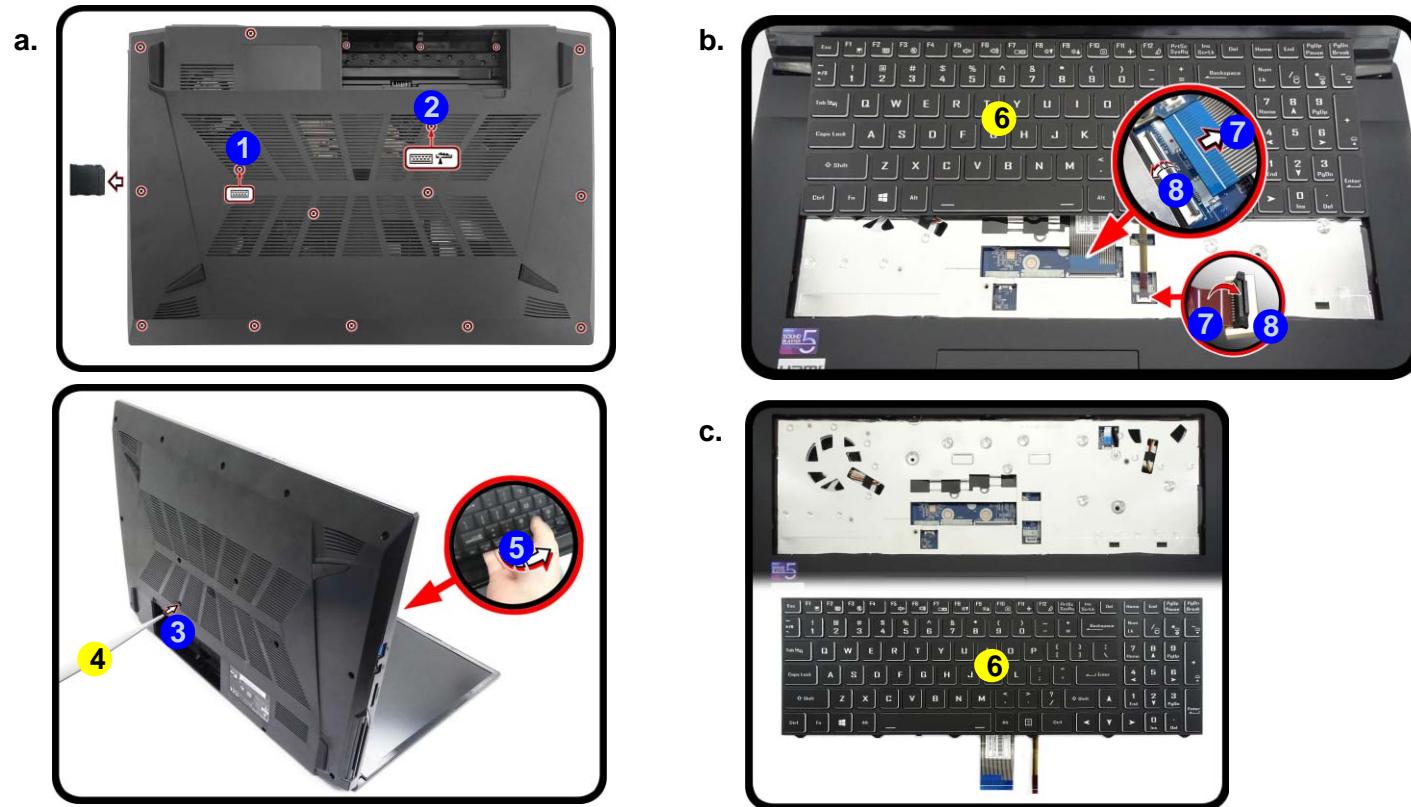


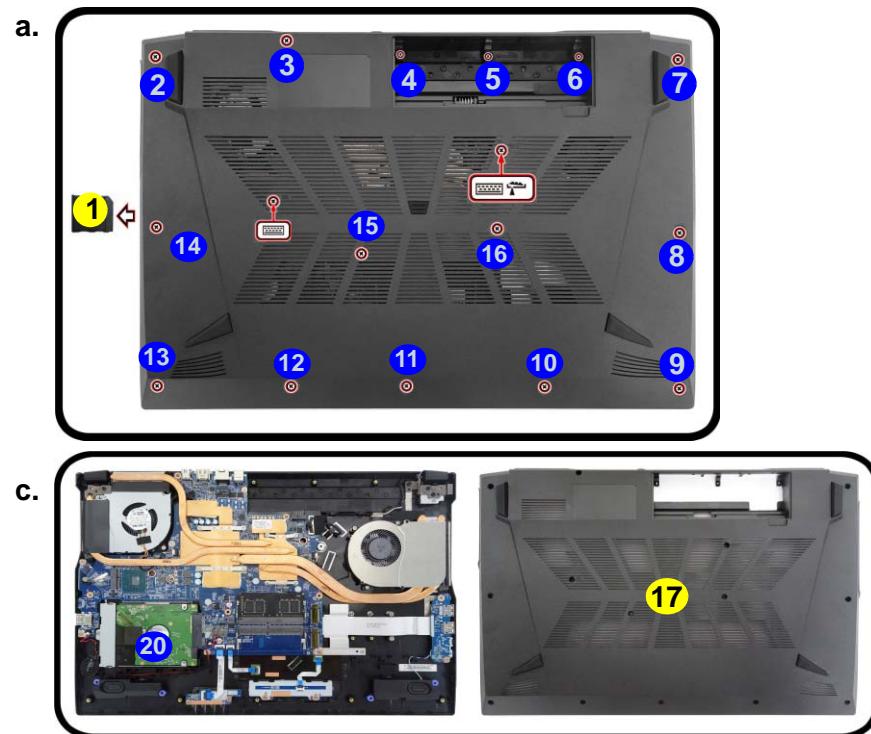
Figure 3
HDD Assembly
Removal

Removing the Hard Disk Drive

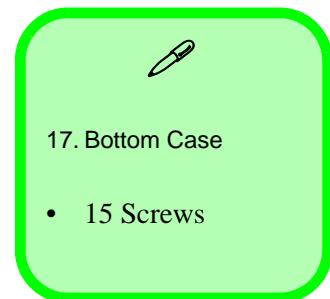
The hard disk drive can be taken out to accommodate other 2.5" serial (SATA) hard disk drives with a height of 7mm (h). Follow your operating system's installation instructions, and install all necessary drivers and utilities (as outlined in **Chapter 4 of the User's Manual**) when setting up a new hard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

Hard Disk Disassembly Process

1. Turn off the computer, and remove the battery ([page 2 - 5](#)).
2. Remove the SD card cover 1 and screws 2 - 16 ([Figure 3a](#)).
3. Open it up with the LCD on a flat surface, release the bottom case 17 at point 18 - 19 and remove it ([Figure 3b](#)).
4. The HDD will be visible at point 20 on the mainboard ([Figure 3c](#)).



- a. Remove the SD card cover and screws.
- b. Remove the bottom case.
- c. Locate the HDD.



2. Disassembly

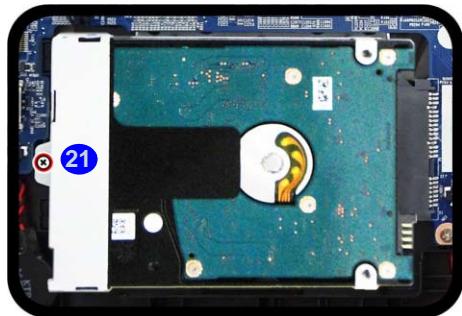
Disassembly

Figure 4
HDD Assembly
Removal (cont'd.)

- d. Remove the screws.
- e. Slightly lift and pull the HDD in the direction of the arrow.
- f. Lift the HDD assembly out of the bay.
- g. Remove the screws and bracket from the HDD.

5. Remove the screw **21** from the HDD assembly (**Figure 4d**).
6. Slightly lift and pull up the tab **22** out to release the hard disk assembly (**Figure 4e**).
7. Lift the hard disk assembly **23** out of the bay **24** (**Figure 4f**).
8. Remove screws **25** - **26** and bracket **27** from the hard disk **28** (**Figure 4g**).
9. Reverse the process to install a new hard disk (**make sure to properly press to seal all sides of the bottom case especially near the vent area** and do not forget to replace the screws).

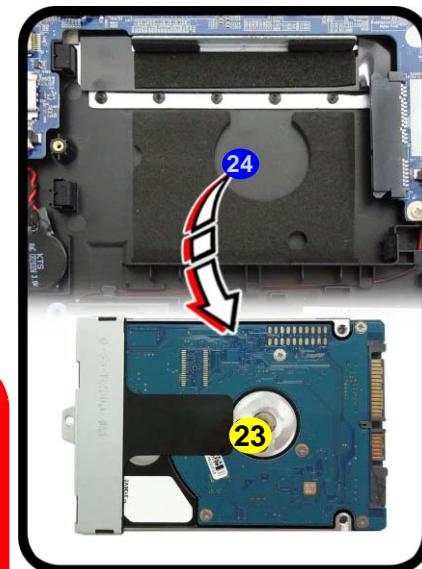
d.



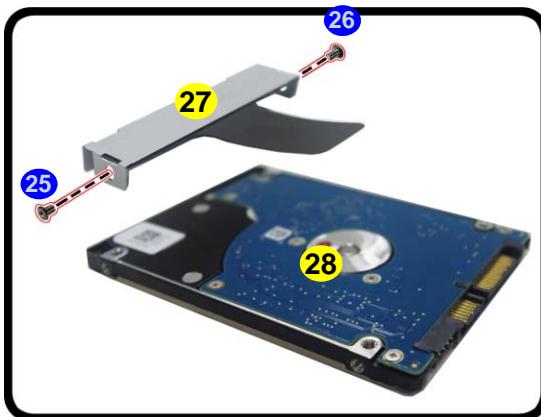
e.



f.



g.



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.

- 23. HDD Assembly
- 27. Bracket
- 28. HDD
- 3 Screws

*Figure 5
RAM Module
Removal*

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

2. Disassembly



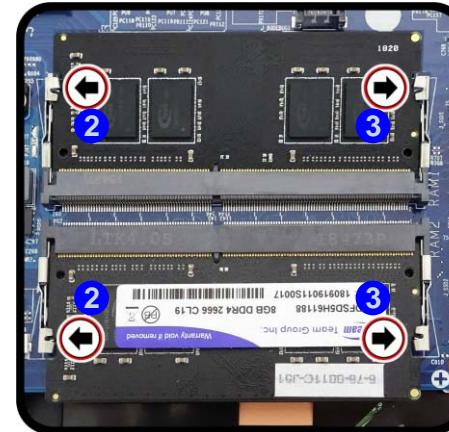
Contact Warning

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.

a.



b.



c.



4. RAM Module

Disassembly

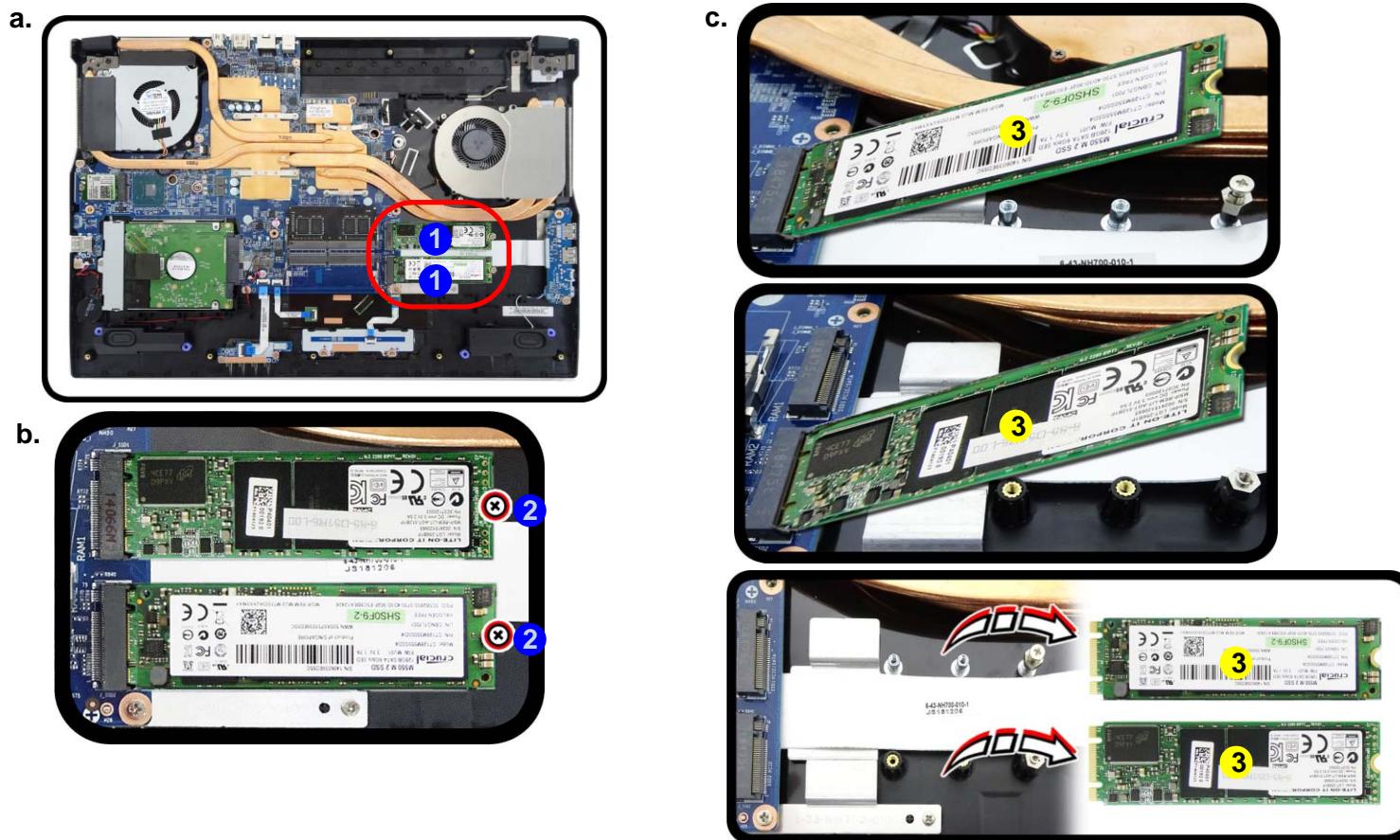
Figure 6
M.2 SSD Module Removal

- 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 Module Removal Procedure

1. Turn off the computer, turn it over, remove the battery ([page 2 - 5](#)).
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.



Removing the Wireless LAN Module

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

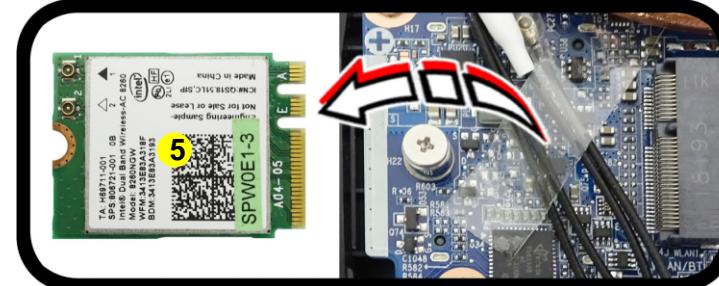


Figure 7
Wireless LAN
Module Removal

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

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

5. Wireless LAN Module

- 1 Screw

Disassembly

Wireless LAN, Combo Module Cables

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

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

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

Removing the CCD

1. Turn **off** the computer, turn it over to remove the battery ([page 2 - 5](#)).
2. Lay the computer down on a flat surface with the top case up forming a 90 degree angle.
3. Carefully run your fingers around the inner frame of the LCD panel to lift at points **1** - **4** as indicated by the arrows ([Figure 8a](#)).
4. Remove the LCD front cover **5** ([Figure 8b](#)).

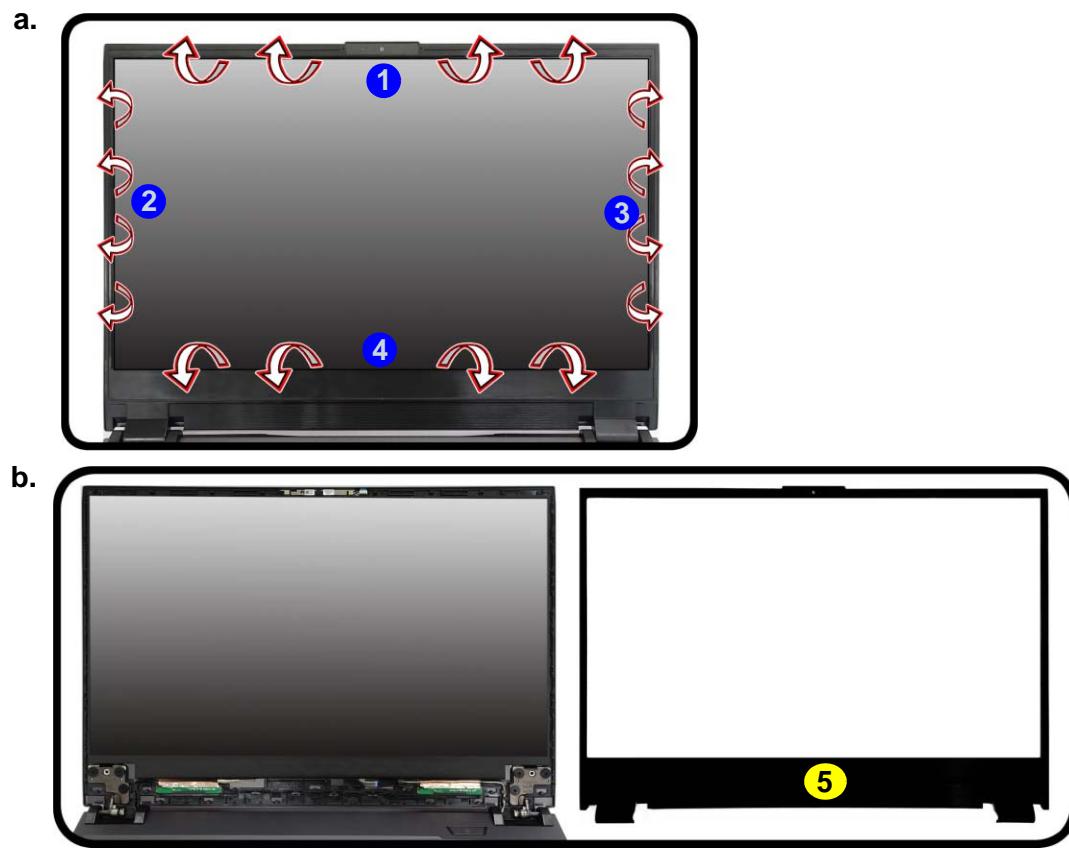


Figure 8
CCD Removal

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

Disassembly

Figure 9 CCD Removal (cont'd)

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

c.



d.



8. CCD Module

Appendix A:Part Lists

This appendix breaks down the *NH70RAQ / NH70RHQ* 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.

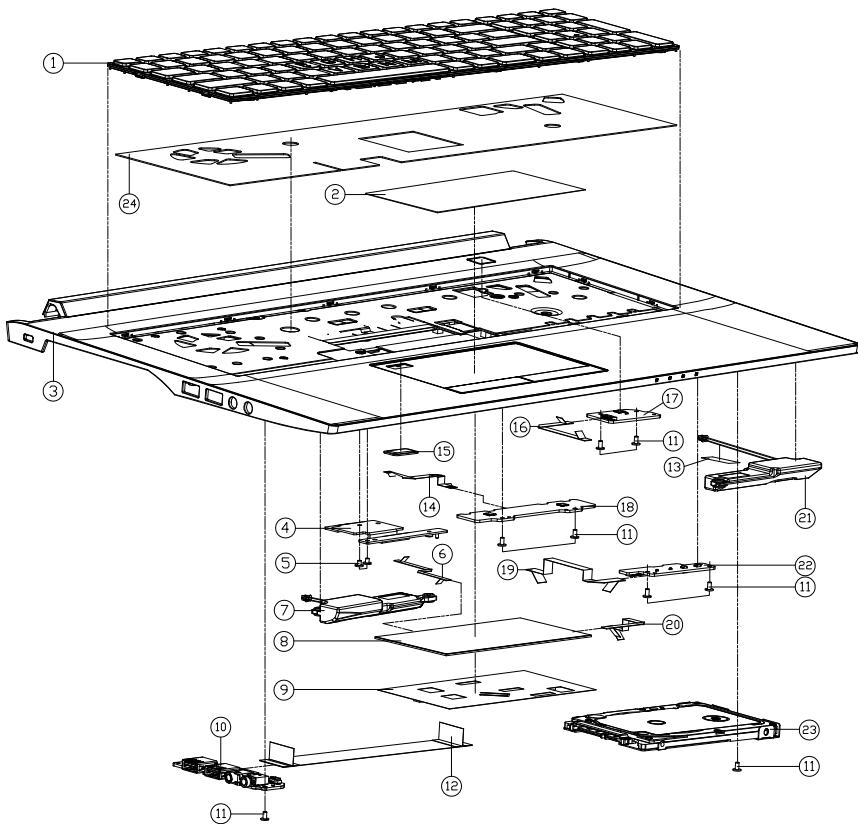
Table A - 1
**Part List Illustration
Location**

Part List Illustration Location

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

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

Top

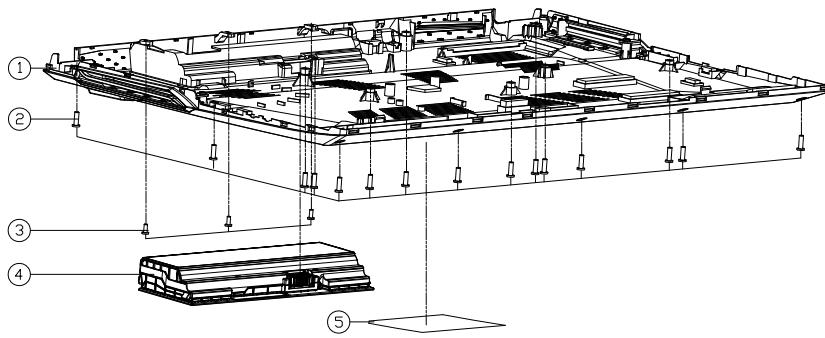


ITEM	PART NAME	PART NO	REMARK
1	KB FOR MULTI 15C BL KB US SERIES NH70EDQ	6-NH70EDQ-KB-MCL-US	
2	W/D FP TP MYLAR AG32 NH55EDQ	6-40-NH552-052	
2	W/FP TP MYLAR AG32 NH55EDQ	6-40-NH552-041	
3	TOP CASE MODULE NH70RAQ	6-39-NH7E2-012	
4	MB SUPPORT BKT AL1050 NH70DQ	6-33-NH702-010	
5	SCREW M2x3L K1 NI ICT NY (D=0.07,DT=0.8)	6-35-B1120-3RD	
6	FFC FINGER TO MB L=65.5MM 3.3V 6P (0XNH70EDQ)	6-43-NH700-051	
7	SPK L-CABLE L=544 2W 4P 1.50 MM DS-254-HL-B2-HF NB01J	6-23-5NB70-0L1	
8	TOUCH PAD SIMPLICS TH-P348 1C (0845MM) (WHD) NH50Q	6-49-N15Z3-011	
8	TOUCH PAD SIMPLICS TH-P348 1C (0845MM) (WHD) NH50Q	6-49-N15Z3-021	
9	TP MYLAR PET NH70EDQ	6-40-NH702-011	
10	AUDIO BOARD W/REDIVER V2.0 NH50RH	6-77-NH5H6-D02	
10	AUDIO BOARD V2.0 NH50RA	6-77-NH5E8-D02	
11	SCREW M2x4L K1 NI ICT NY (D=0.045,DT=0.8)	6-35-B1120-4RC	
12	FFC AUDIO TO MB L=140.5MM 5V 4P (0XNH70EDQ)	6-43-NH700-011	
13	TAPE MYLAR (C) MYLAR M550J	6-40-M55J2-030	
14	FFC CABLE CLICK TO TP L=6MM 3V 4PIN (0X) NH50Q	6-43-NH500-051	
15	TP WD FP RUBBER (17.9x11.2x1.2T) SILICONE	6-47-N15Z2-090	FOR W/D FP(TOUCH PAD)
16	FFC POWER TO MB L=67MM 3.3V 4P (0XNH70EDQ)	6-43-NH700-020	
17	POWER SW BOARD V1.0 NH70RHQ	6-77-NH7HS-D01	
17	POWER SWITCH BOARD V1.0 NH70RAQ	6-77-NH7ES-D01	
18	CLICK BOARD V1.0 NH50RH	6-77-NH5H2-D01	
18	CLICK BOARD V1.0 NH50RA	6-77-NH5E2-D01	
19	FFC LED TO MB L=87MM 3.3V 12P (0XNH70EDQ)	6-43-NH700-031	
20	FFC TP TO MB L=73MM 3.3V 8P (0XNH70EDQ)	6-43-NH700-040	
21	SPK R-CABLE L=544 2W 4P L=200MM DS-254-HL-B2-HF NB01J	6-23-5NB70-0R1	
22	LED BOARD V2.0 NH70RHQ	6-77-NH5H4-D02-A	
22	LED BOARD V1.0A NH70RAQ	6-77-NH5E4-D01A-A	
23	W/D HDD ASS'Y NH70EDQ	6-79-NH70EDQJ-010	
23	W/HDD ASS'Y NH70EDQ	6-79-NH70EDQJ-020	
24	MYLAR (326.55x100.3x0.55T)FOR KB NH70EDQ	6-40-NH702-080	FOR NON BL KB SERIES

Figure A - 1
Top

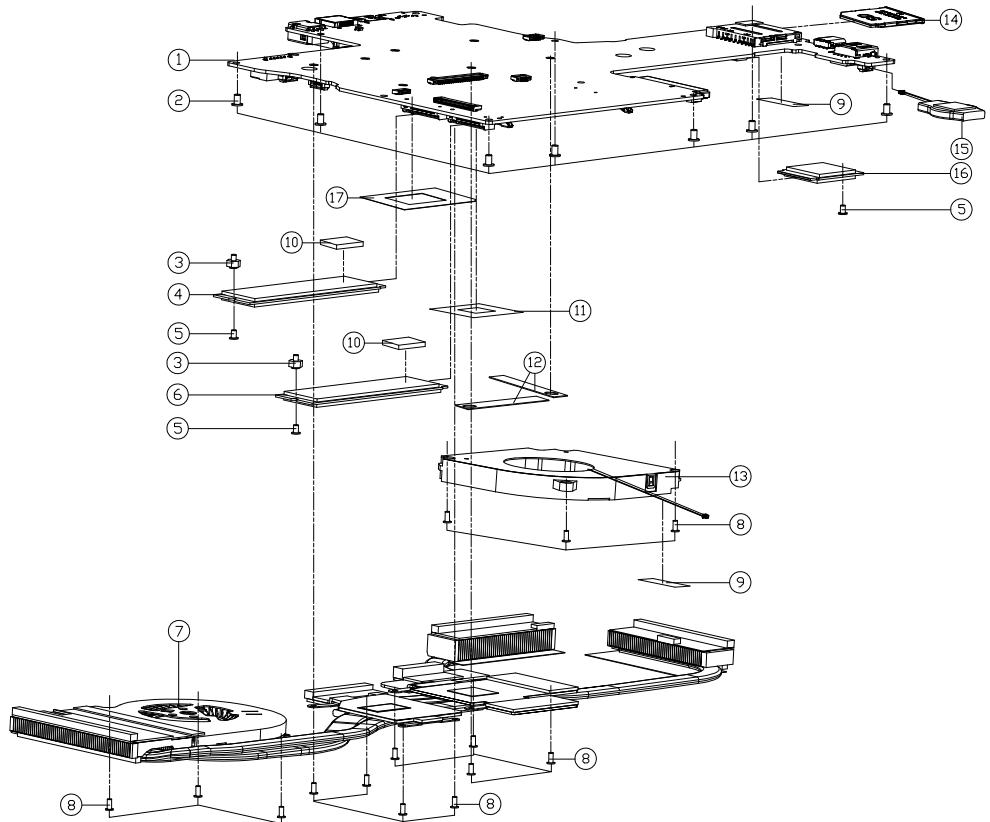
Bottom

Figure A - 2
Bottom



ITEM	PART NAME	PART NO	REMARK
1	BOTTOM CASE MODULE NH70RAQ	6-39-NH7E3-012	
2	SCREW M2.5*8L KI BK/Z NY ICT	6-35-B6125-8R0	
3	SCREW M2*5L KICT=0.8 D=4.0 BK/Z ICT NY	6-35-B6120-5R0	
4	BATP S LI 14AV/24HV/48SWH KSP SW/SD ORANGE 900224H AD NSCD	6-87-NH50S-41C01	
4	BATP S LI 14AV/24HV/48SWH KSP GETAC/LG ORANGE 54159021000 NSCD	6-87-NH50S-42D01	
4	BATP S LI 14SV/28HV/41WH KSP GENICAS ORANGE 5415902002 C75WNSHNSB	6-87-NH5ES-42D00	
4	BATP S LI 14SV/28HV/41WH KSP OR/GRN/BLU ORANGE 900224H AD C75WNSHNSB	6-87-NH5ES-41F00	
4	BATP S LI 14SV/28HV/41WH KSP SW/LG ORANGE 900224H AD C75WNSHNSB	6-87-NH5ES-41D00	
5	PRODUCT LABEL FOR NH70RHQ	6-45-NH70RHQ3-010	
5	PRODUCT LABEL FOR NH70RAQ	6-45-NH70RAQ3-010	

Main Board

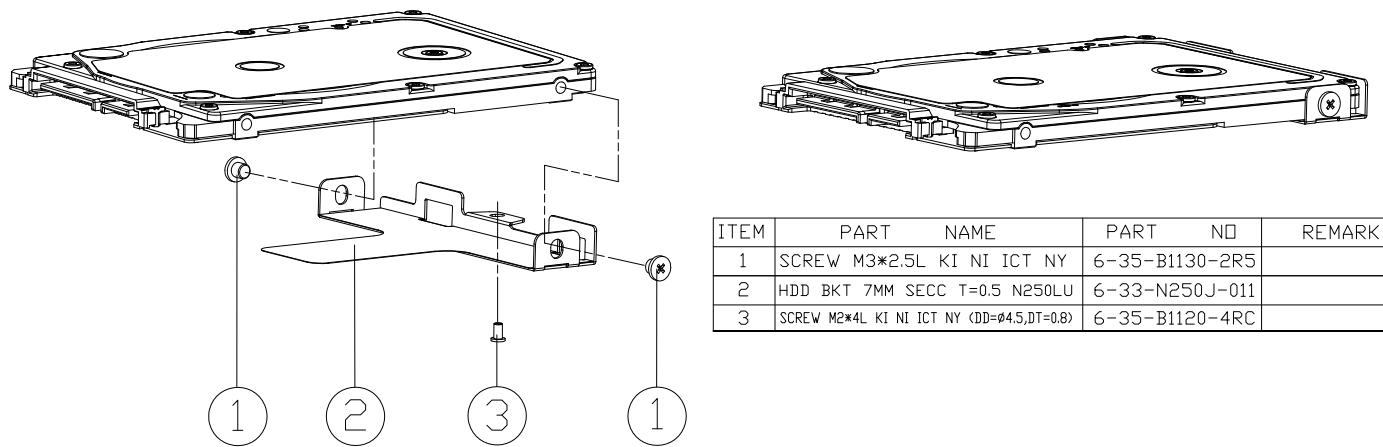


ITEM	PART NAME	PART NO	REMARK
1	MAIN BOARD CPU/17-975W/260 V20 CIPXV/TPO NH70RHQ	6-77-NH70RHQ-D02-E	
1	MAIN BOARD CPU/15-930W/240 V20 CIPXV/TPO NH70RHQ	6-77-NH70RHQ-D02-1F	
1	MAIN BOARD CPU/15-930W/240 V20 CIPXV/TPO NH70RHQ	6-77-NH70RHQ-D02-F	
1	MAIN BOARD CPU/17-975W/260 V20 CIPXV/TPO NH70RHQ	6-77-NH70RHQ-D02-1E	
1	MAIN BOARD CPU/15-930W/260 V20 CIPXV/TPO NH70RHQ	6-77-NH70RHQ-D02-E	
1	MAIN BOARD CPU/15-930W/260 V20 CIPXV/TPO NH70RHQ	6-77-NH70RHQ-D02-1F	
1	MAIN BOARD CPU/15-930W/260 V20 CIPXV/TPO NH70RHQ	6-77-NH70RHQ-D02-F	
1	MAIN BOARD CPU/17-975W/260 V20 CIPXV/TPO NH70RHQ	6-77-NH70RHQ-D02-1E	
1	MAIN BOARD CPU/15-930W/260 V20 CIPXV/TPO NH70RHQ	6-77-NH70RHQ-D02-E	
1	MAIN BOARD CPU/15-930W/260 V20 CIPXV/TPO NH70RHQ	6-77-NH70RHQ-D02-1F	
1	MAIN BOARD CPU/15-930W/260 V20 CIPXV/TPO NH70RHQ	6-77-NH70RHQ-D02-F	
1	MAIN BOARD CPU/17-975W/260 V20 CIPXV/TPO NH70RHQ	6-77-NH70RHQ-D02-1E	
1	MAIN BOARD CPU/15-930W/260 V20 CIPXV/TPO NH70RHQ	6-77-NH70RHQ-D02-E	
2	SCREW M2.5x4L (D=4.6,T=0.8) K1 NI ICT NY	6-35-B1125-4RA	
3	SCREW M2x1L 0.25 D5 STEEL ICI NY FOR MFT CARDED	6-35-ZA120-2R5-1	
4	SU R2 200 5000 OHM RESISTOR 10% 0.1W 1206	6-85-D51R6-101	OPTION
4	SU R2 200 5000 OHM RESISTOR 10% 0.1W 1206	6-85-D51R6-104	OPTION
4	SU R2 200 5000 OHM RESISTOR 10% 0.1W 1206	6-85-D51R6-K00	OPTION
4	SU R2 200 5000 OHM RESISTOR 10% 0.1W 1206	6-85-D51R6-200	OPTION
4	SU R2 200 5000 OHM RESISTOR 10% 0.1W 1206	6-85-D515B-S08	OPTION
4	SU R2 200 5000 OHM RESISTOR 10% 0.1W 1206	6-85-D51R6-H05	OPTION
4	SU R2 200 5000 OHM RESISTOR 10% 0.1W 1206	6-85-D5116-Z02	OPTION
4	SU R2 200 5000 OHM RESISTOR 10% 0.1W 1206	6-85-D5164-Z00	OPTION
5	SCREW M2x2L K1 NI ICT NY (D=0.95, T=0.8)	6-35-B1120-2RA	
6	SU R2 200 5000 OHM RESISTOR 10% 0.1W 1206	6-85-D51R6-K00	OPTION
6	SU R2 200 5000 OHM RESISTOR 10% 0.1W 1206	6-85-D51R6-H05	OPTION
6	SU R2 200 5000 OHM RESISTOR 10% 0.1W 1206	6-85-D515B-S08	OPTION
6	SU R2 200 5000 OHM RESISTOR 10% 0.1W 1206	6-85-D5116-Z02	OPTION
6	SU R2 200 5000 OHM RESISTOR 10% 0.1W 1206	6-85-D5164-Z00	OPTION
7	HEATSINK MODULE NH70RAQ	6-31-NH7EN-102	
8	SCREW M2x4L K1 NI ICT NY (D=4.5,D=0.8)	6-35-B1120-4RC	
9	TAPE MYLAR (C),MYLAR M550J	6-40-M55J2-030	
10	THERMAL PAD RS300 2041x3.0MM NH70ED0	6-48-NH702-011	
11	N17P GPU MYLAR PET (29x29x0.15) NH70RHQ	6-40-NH7H2-010	FDR NH70RHQ
11	VGA N18P MYLAR NH50RA	6-40-NH5ES-010	FDR NH70RAQ
12	EMI ABSORBER (45x90x3) FOR N850HP6	6-47-N85P2-021	
13	VGA FAN MODULE (WINMAX PWM NH70RA)	6-31-NH5E2-202	
14	JUMPER J101 (NON PUSH TYPE) (22x18mm) NH70EN	6-42-W9708-011	
15	BAR 20MM BY 22MM W/CLIPS 5MM 10202035500100 SHROUD	6-23-22015-T00	
16	WAVY CORD 1000 MM LENGTH FOR 12V POWER 24 PIN 12.0MM X 12.0MM	6-88-P75FF-4210	OPTION
16	WAVY CORD 1000 MM LENGTH FOR 12V POWER 24 PIN 12.0MM X 12.0MM	6-88-N24GF-4200	OPTION
16	WAVY CORD 1000 MM LENGTH FOR 12V POWER 24 PIN 12.0MM X 12.0MM	6-88-N24GF-4220	OPTION
16	WAVY CORD 1000 MM LENGTH FOR 12V POWER 24 PIN 12.0MM X 12.0MM	6-88-P75FF-4230	OPTION
16	WAVY CORD 1000 MM LENGTH FOR 12V POWER 24 PIN 12.0MM X 12.0MM	6-88-P95EF-4200	OPTION
17	CFL 6-2 MYLAR PB50RF	6-40-PB50S-F11	

Figure A - 3
Main Board

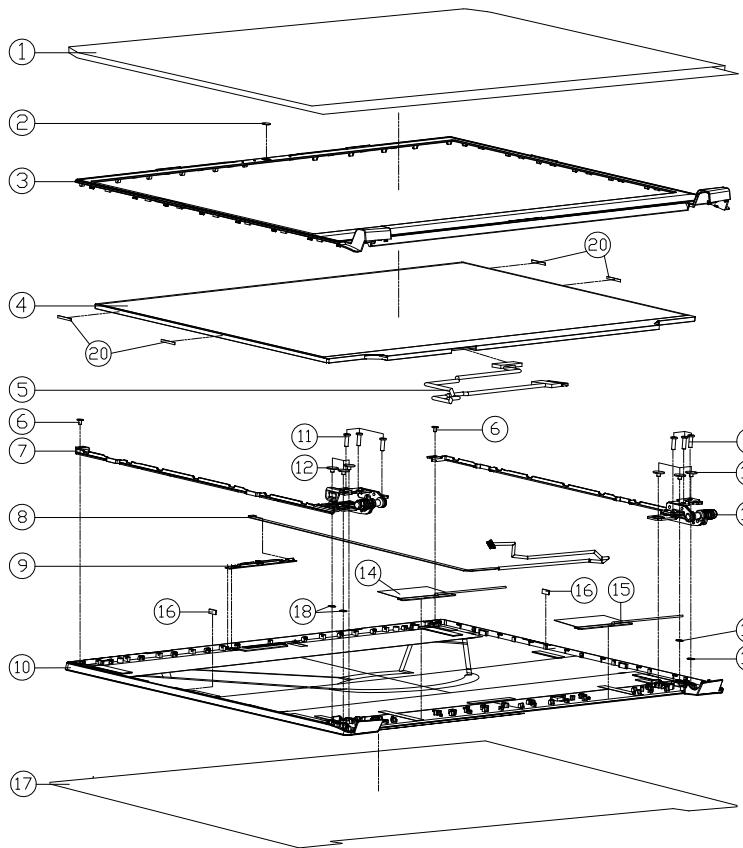
HDD

Figure A - 4
HDD



ITEM	PART NAME	PART NO	REMARK
1	SCREW M3*2.5L KI NI ICT NY	6-35-B1130-2R5	
2	HDD BKT 7MM SECC T=0.5 N250LU	6-33-N250J-011	
3	SCREW M2*4L KI NI ICT NY (DD=Φ4.5,DT=0.8)	6-35-B1120-4RC	

LCD



ITEM	PART NAME	PART NO	REMARK
1	LCD PROTECT MYLAR BOPP NB70TJ1	6-40-NB708-010	
2	CCD LENS PMMA (DIAMETER 3.6MM) (MP1) P970EN	6-42-P97N1-011	
3	LCD FRONT COVER MODULE NH70EDQ	6-39-NH701-012	
4	LCD NH73P FHD/VVA/144Hz/7IN/ND G7/EIP INNOLUX N73HCE-G3 LED 35W	6-50-NBB35-V130	
4	LCD NH73P FHD/VVA/144Hz/SV G-SYNC/7IN/ND G7/EIP INNOLUX N73HCE-G3 LED 35W	6-50-NBB35-Z120	
4	LCD NH73P FHD/VVA/144Hz/SV G-SYNC/7IN/ND G7/EIP INNOLUX N73HCE-G3 LED 35W	6-50-NBB35-L120	
4	LCD NH73P FHD/VVA/7IN/ND G7/EIP AU B173HAWA2 0.1940 LED 35W	6-50-NBB35-G020	
5	WIRE CABLE FOR EIP FHD 144Hz 5PIN 0.194 4PIN GND/V COM/VIDEO-22-HD (NHD)	6-43-NH701-021-N	
5	WIRE CABLE FOR EIP FHD 5PIN 0.194 3PIN GND/V COM/VIDEO-22-HD (NHD)	6-43-NH701-011-N	
6	SCREW M2*3L KI NI ICT NY (D=0.4, T=0.8)	6-35-B1120-3RD	
7	LCD HINGE L (SK7+SECC) NH70EDQ	6-33-NH701-0L1	
8	CCD CABLE L=550MM 8PIN 30V (HL) NH70EDQ	6-43-NH70T-012	
9	LCD CABLE FOR EIP FHD 144Hz 5PIN 0.194 4PIN GND/V COM/VIDEO-22-HD (NHD) (OPTION)	6-88-N15ZC-5100	OPTION
9	LCD CABLE FOR EIP FHD 144Hz 5PIN 0.194 3PIN GND/V COM/VIDEO-22-HD (NHD) (OPTION)	6-88-N15ZC-4900	OPTION
10	LCD BACK COVER MODULE NH70EDQ	6-39-NH701-022	
11	SCREW M2.5*6L K BZ ICT NY	6-35-82125-6RA	
12	SCREW M2.5*2.5L KI BK/Z ICT NY (D=0.8, T=0.6)	6-35-B6125-2R5	
13	LCD HINGE R (SK7+SECC) NH70EDQ	6-33-NH701-0R1	
14	ANTENNA IPLEX WLAN VFL1 PCB DRK A : PLASTIC 245/56 L= 15MM NH70EDQ	6-23-7NH70-010	
15	ANTENNA IPLEX WLAN VFL2 PCB DRK A : PLASTIC 245/56 L= 20MM NH70EDQ	6-23-7NH70-020	
16	LCD PANEL FIXED RUBBER SILICONE 55x341LT NH70EDQ	6-47-NH701-041	
17	LCD PROTECT MYLAR 8B35 NH70EDQ	6-40-NH701-040	
18	WASHER(Φ6*Φ3*0.4T MM)(MYLAR)	6-37-02000-612	
19	WASHER Φ6*Φ3*0.6T (MYLAR) FOR 3XB/C LCDGHYU/HI14X12	6-37-02000-603	
20	PANEL BLACK MYLAR 20*3*0.3T NH70EDQ	6-40-NH701-030	

Figure A - 5
LCD

Appendix B: Schematic Diagrams

This appendix has circuit diagrams of the *NH70RAQ / NH70RHQ* notebook's PCB's. The following table indicates where to find the appropriate schematic diagram.

Diagram - Page	Diagram - Page	Diagram - Page
<i>System Block Diagram - Page B - 2</i>	<i>PCH 1/9 - Page B - 25</i>	<i>1.05DX_VCCSTG/VCCSFR_OC - Page B - 48</i>
<i>Processor 1/6 - Page B - 3</i>	<i>PCH 2/9 - Page B - 26</i>	<i>VCCGT & VCCSA Output Stage - Page B - 49</i>
<i>Processor 2/6 - Page B - 4</i>	<i>PCH 3/9 - Page B - 27</i>	<i>AC_In, Charger - Page B - 50</i>
<i>Processor 3/6 - Page B - 5</i>	<i>PCH 4/9 - Page B - 28</i>	<i>NVVDD1 - Page B - 51</i>
<i>Processor 4/6 - Page B - 6</i>	<i>PCH 5/9 - Page B - 29</i>	<i>NVVDD2 - Page B - 52</i>
<i>Processor 5/6 - Page B - 7</i>	<i>PCH 6/9 - Page B - 30</i>	<i>PEX_VDD - Page B - 53</i>
<i>Processor 6/6 - Page B - 8</i>	<i>PCH 7/9 - Page B - 31</i>	<i>FBVDDQ - Page B - 54</i>
<i>DDR4 CHA SO-DIMM - Page B - 9</i>	<i>PCH 8/9 - Page B - 32</i>	<i>IV8_RUN/AON - Page B - 55</i>
<i>DDR4 CHB SO-DIMM - Page B - 10</i>	<i>PCH 9/9 - Page B - 33</i>	<i>Audio Board - Page B - 56</i>
<i>VGA PCI Express - Page B - 11</i>	<i>M.2 Card - Page B - 34</i>	<i>NH50 PW Board - Page B - 57</i>
<i>VGA Frame Buffer Interface - Page B - 12</i>	<i>M.2 WLAN+BT - Page B - 35</i>	<i>Hall Sensor Board - Page B - 58</i>
<i>Frame Buffer A - Page B - 13</i>	<i>USB Charger - Page B - 36</i>	<i>Click Board - Page B - 59</i>
<i>Frame Buffer A - Page B - 14</i>	<i>Card Reader / LAN RTL8411B - Page B - 37</i>	<i>LED Board - Page B - 60</i>
<i>Frame Buffer B - Page B - 15</i>	<i>HDD, Click TP, Audio, Hall Con. - Page B - 38</i>	<i>NH70 PW Board - Page B - 61</i>
<i>Frame Buffer B - Page B - 16</i>	<i>LED, CCD, TPM, Power SW Con. - Page B - 39</i>	<i>Audio Codec - Page B - 62</i>
<i>VGA I/O - Page B - 17</i>	<i>KBC-ITE IT5570 - Page B - 40</i>	<i>Power Measurement - Page B - 63</i>
<i>NVIDIA Power Sequence - Page B - 18</i>	<i>RGB KB Only - Page B - 41</i>	<i>Power Sequence - Page B - 64</i>
<i>NVIDIA GPIO Level Shift - Page B - 19</i>	<i>5V, 5VS, 3.3V, 3.3VS - Page B - 42</i>	<i>Audio Board - Page B - 65</i>
<i>VGA PWR / GND - Page B - 20</i>	<i>VDD1.05V, VCCIO - Page B - 43</i>	
<i>VGA NVVDD Coupling - Page B - 21</i>	<i>VDD3, VDD5 - Page B - 44</i>	
<i>MDP - Page B - 22</i>	<i>DDR 1.2V / 0.6VS, 2.5V - Page B - 45</i>	
<i>Panel, Inverter - Page B - 23</i>	<i>VCore Output Stage - Page B - 46</i>	
<i>HDMI - Page B - 24</i>	<i>VCC_Core & VCCGT - Page B - 47</i>	

Table B - 1
SCHEMATIC
DIAGRAMS

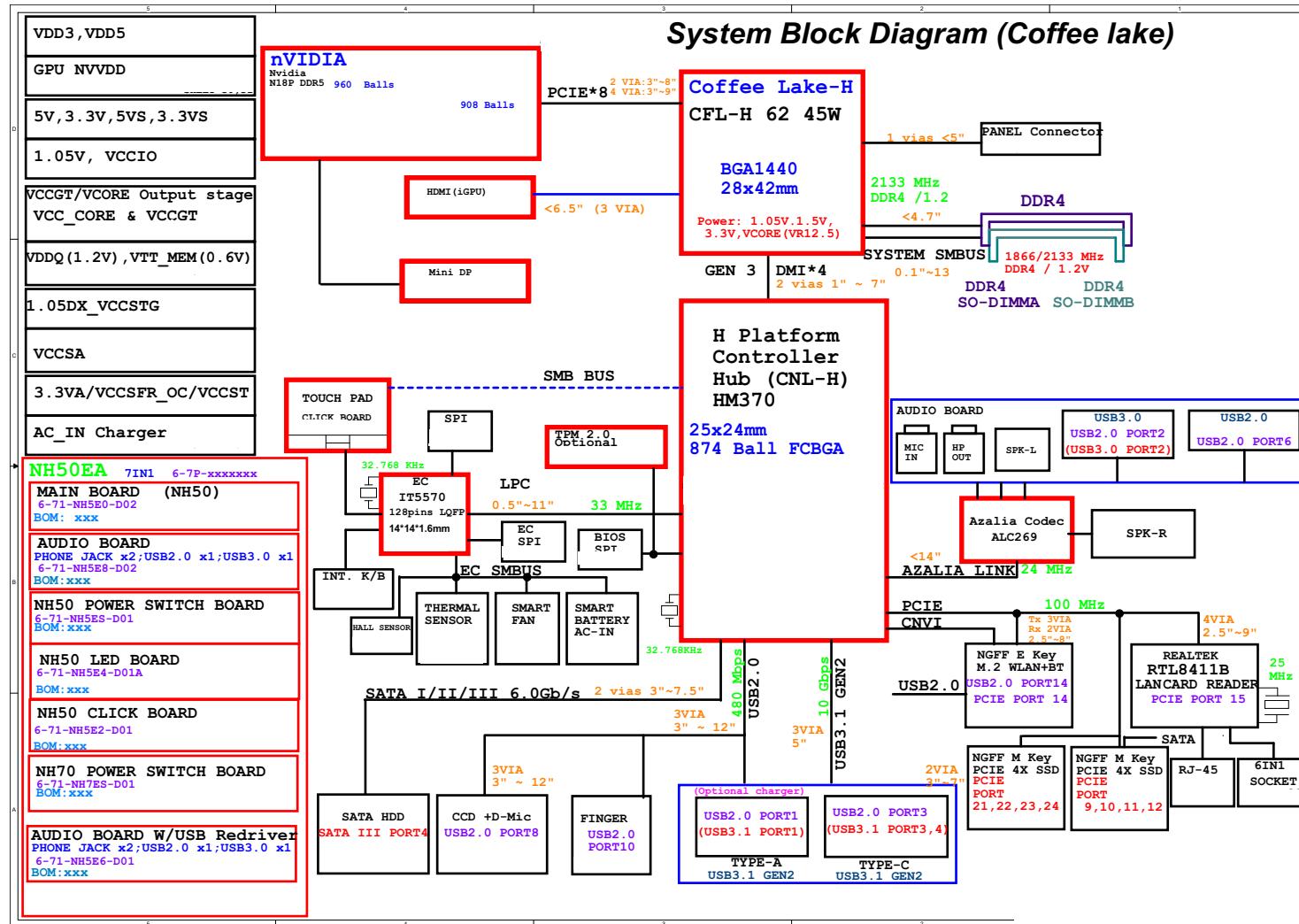


Version Note

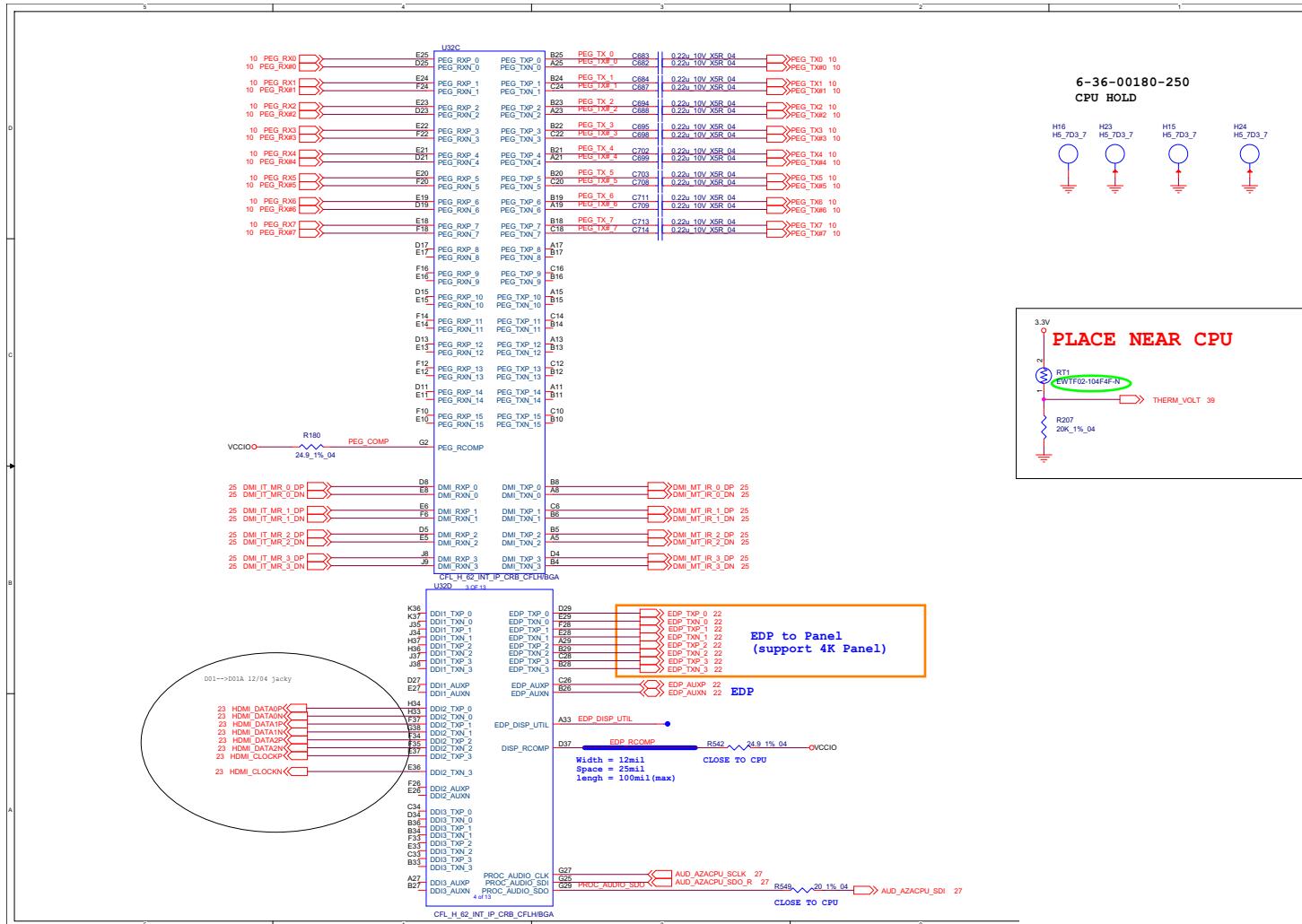
The schematic diagrams in this chapter are based upon version 6-7P-NH5E6-002. If your mainboard (or other boards) are a later version, please check with the Service Center for updated diagrams (if required).

Schematic Diagrams**System Block Diagram**

Sheet 1 of 64
System Block Diagram

**B - 2 System Block Diagram**

Processor 1/6

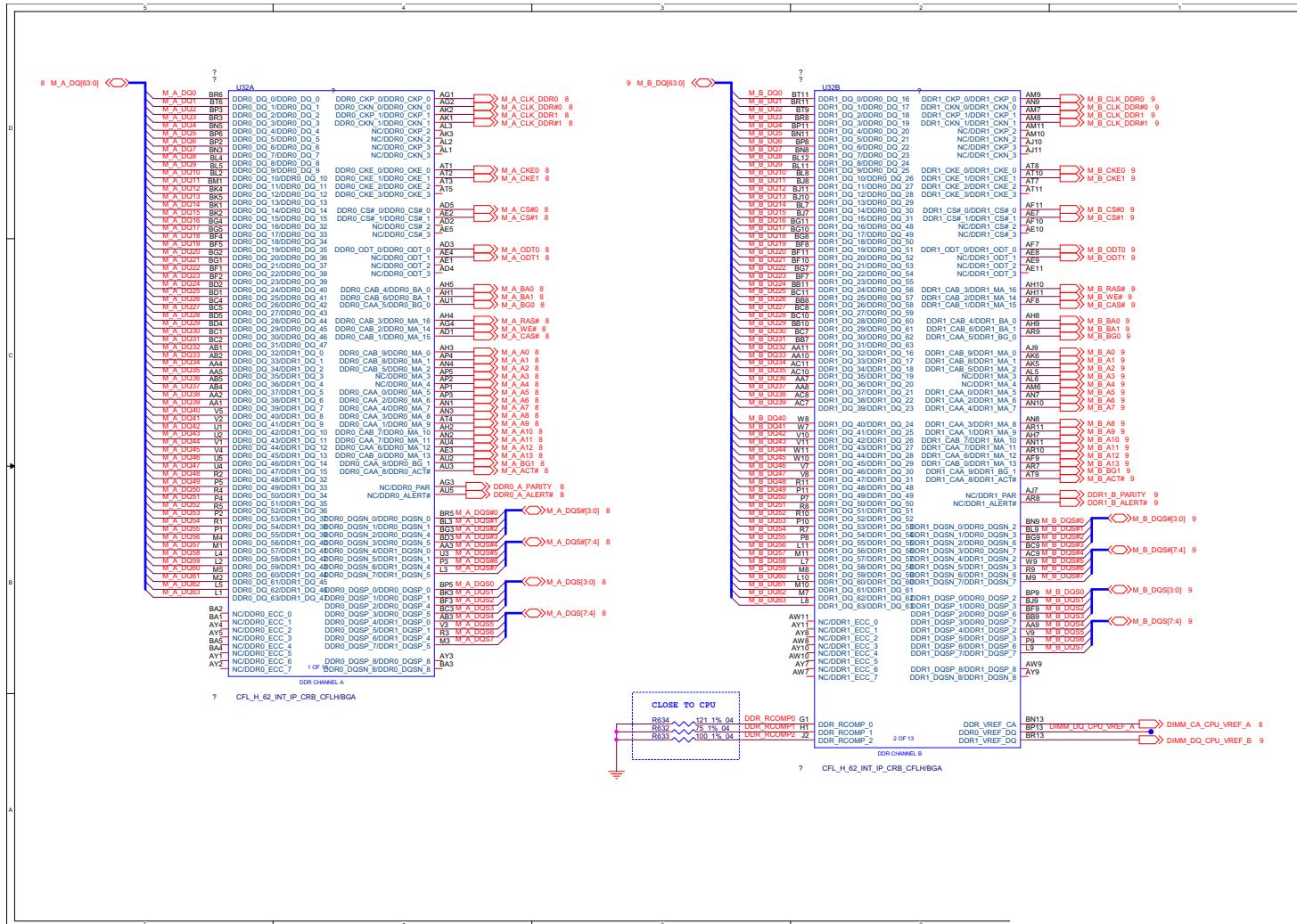


Sheet 2 of 64
Processor 1/6

B. Schematic Diagrams

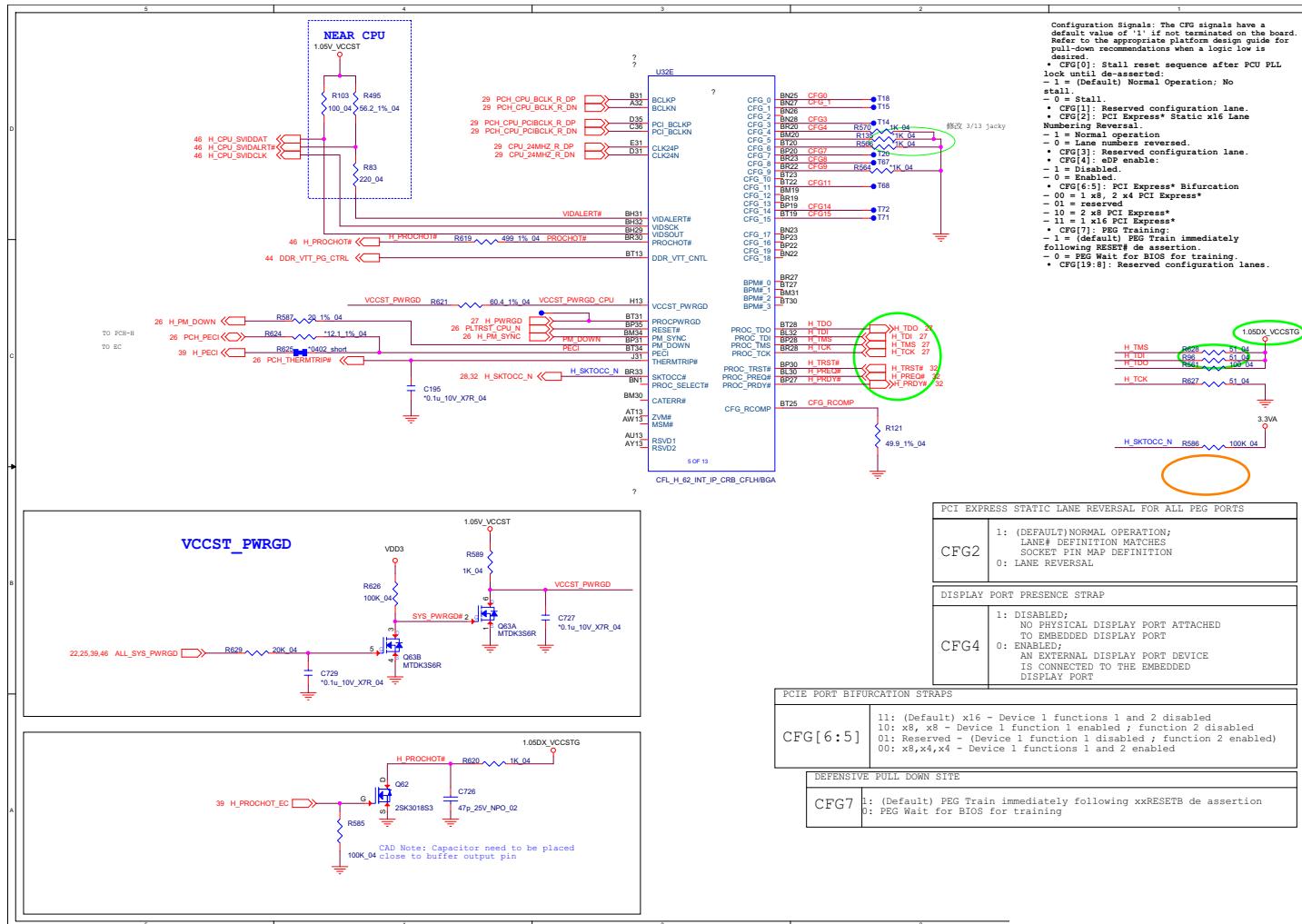
Schematic Diagrams

Processor 2/6



B - 4 Processor 2/6

Processor 3/6

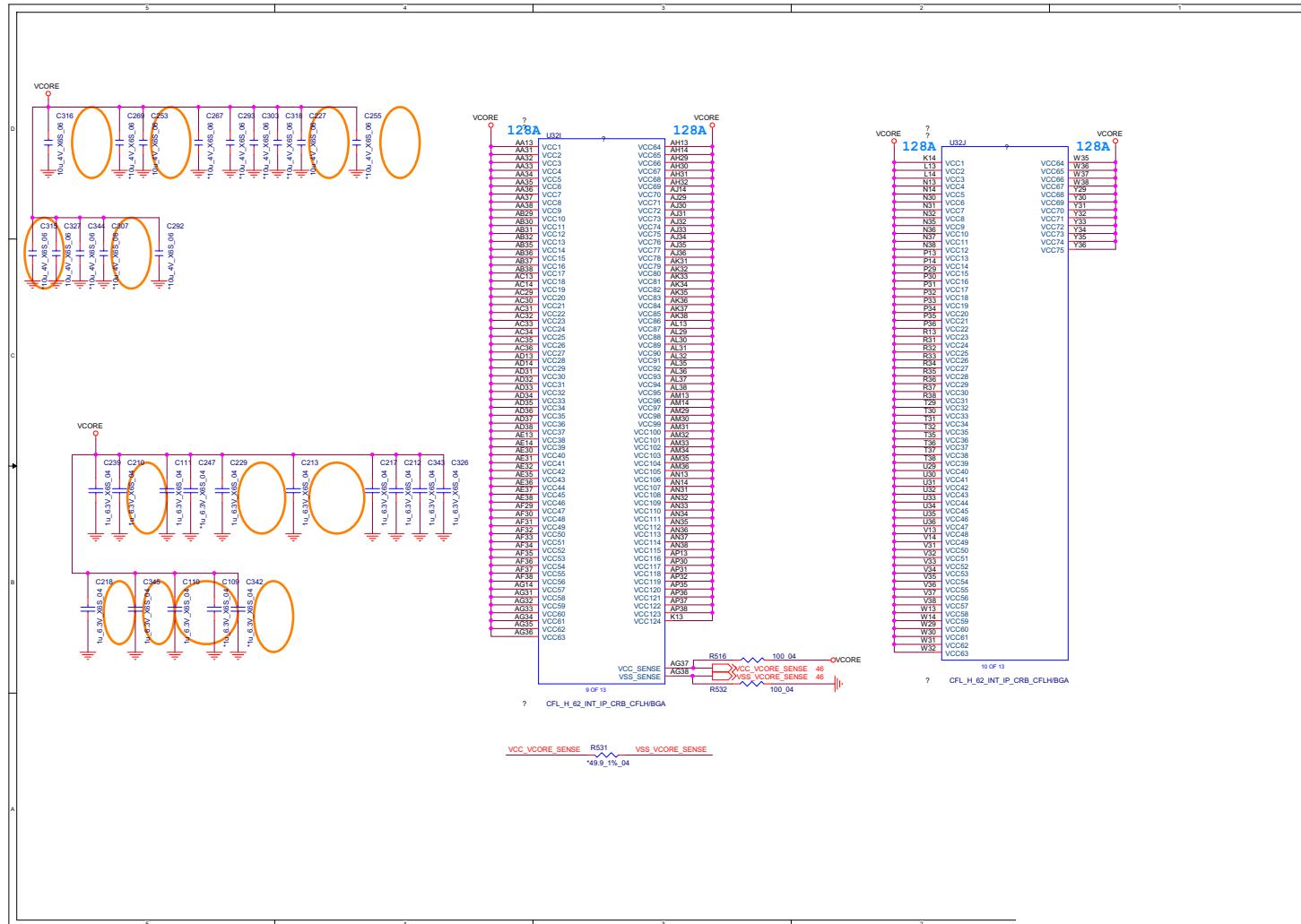


Sheet 4 of 64
Processor 3/6

B.Schematic Diagrams

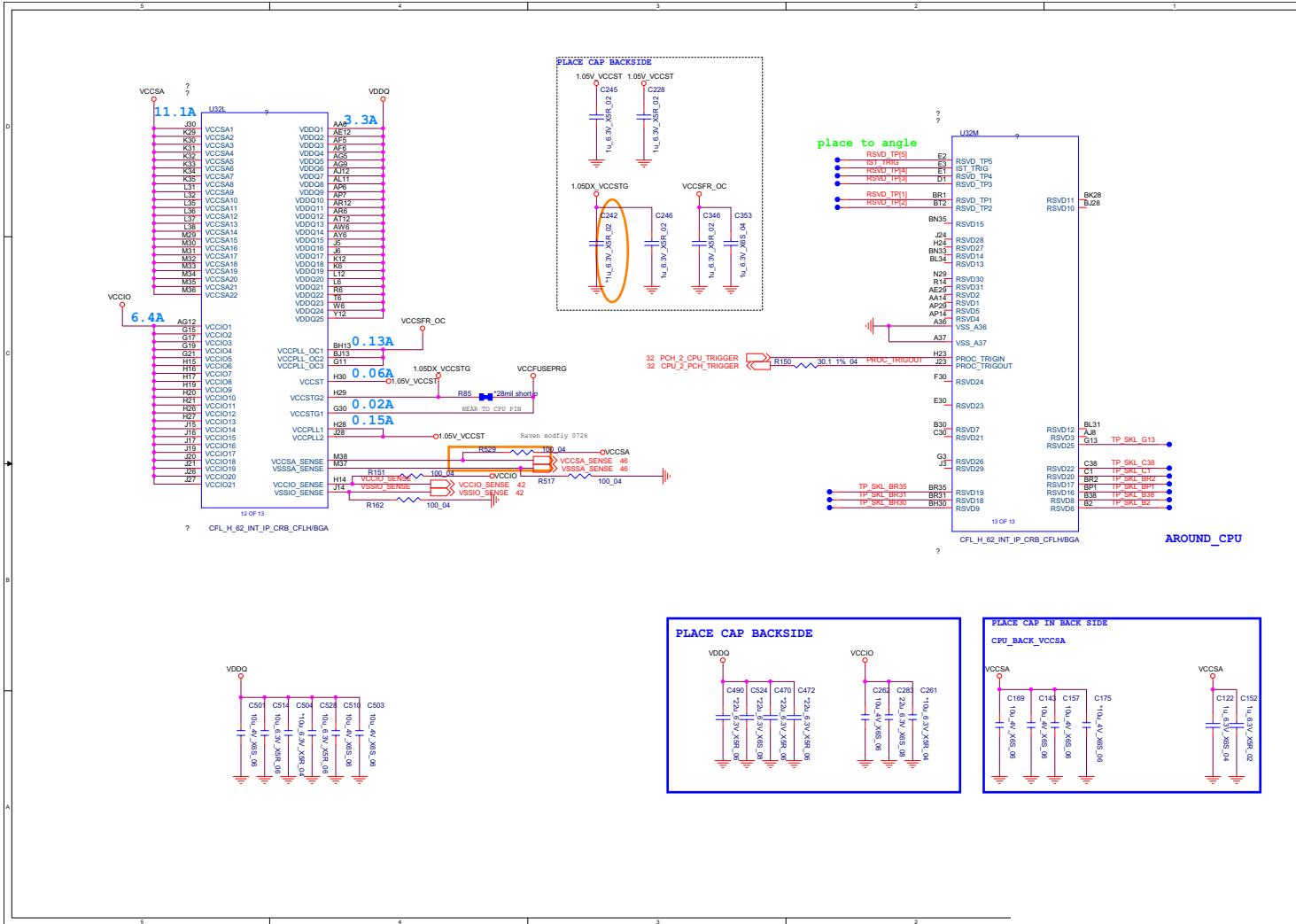
Schematic Diagrams

Processor 4/6



Sheet 5 of 64
Processor 4/6

Processor 5/6

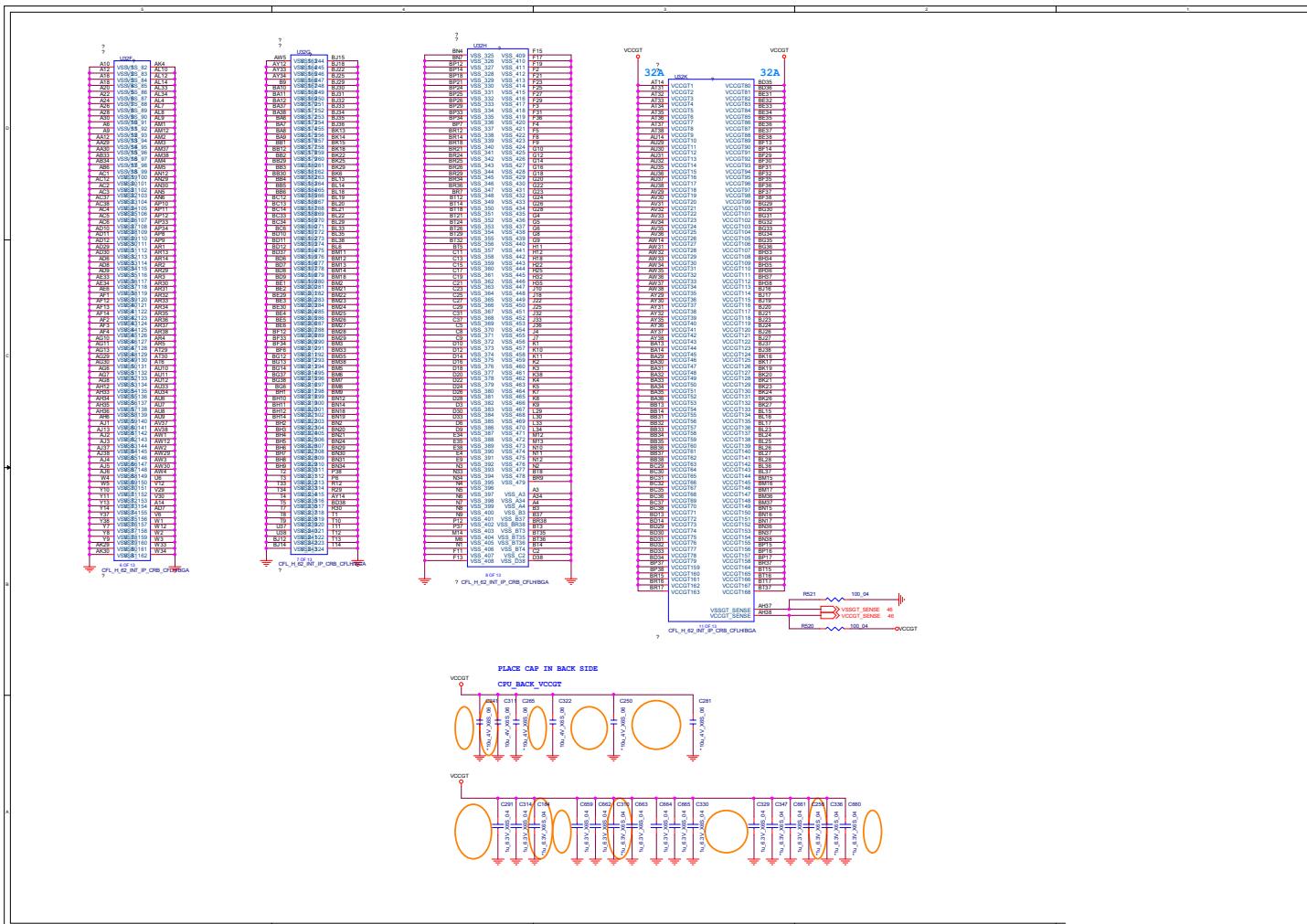


Sheet 6 of 64
Processor 5/6

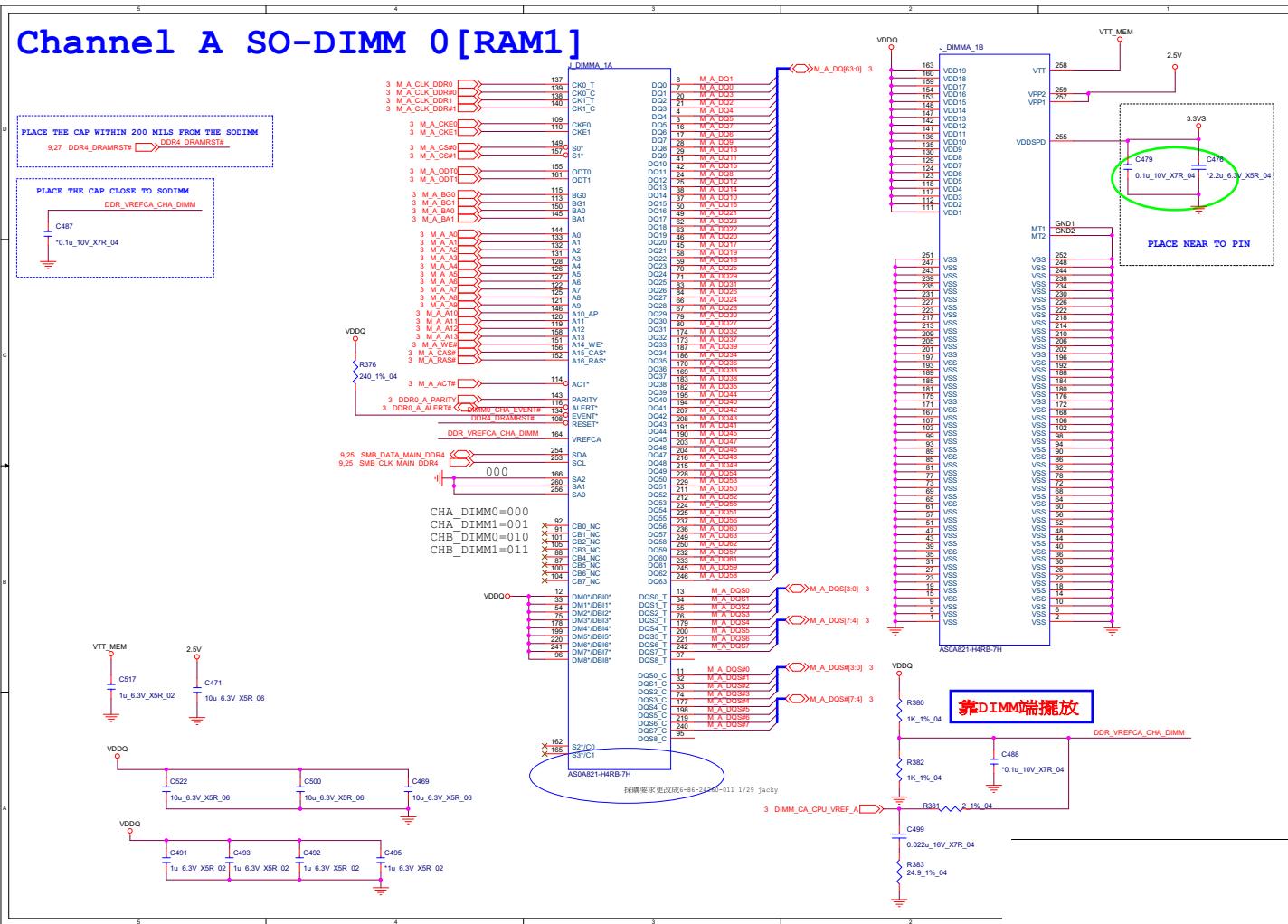
Schematic Diagrams

Processor 6/6

Sheet 7 of 64
Processor 6/6



DDR4 CHA SO-DIMM



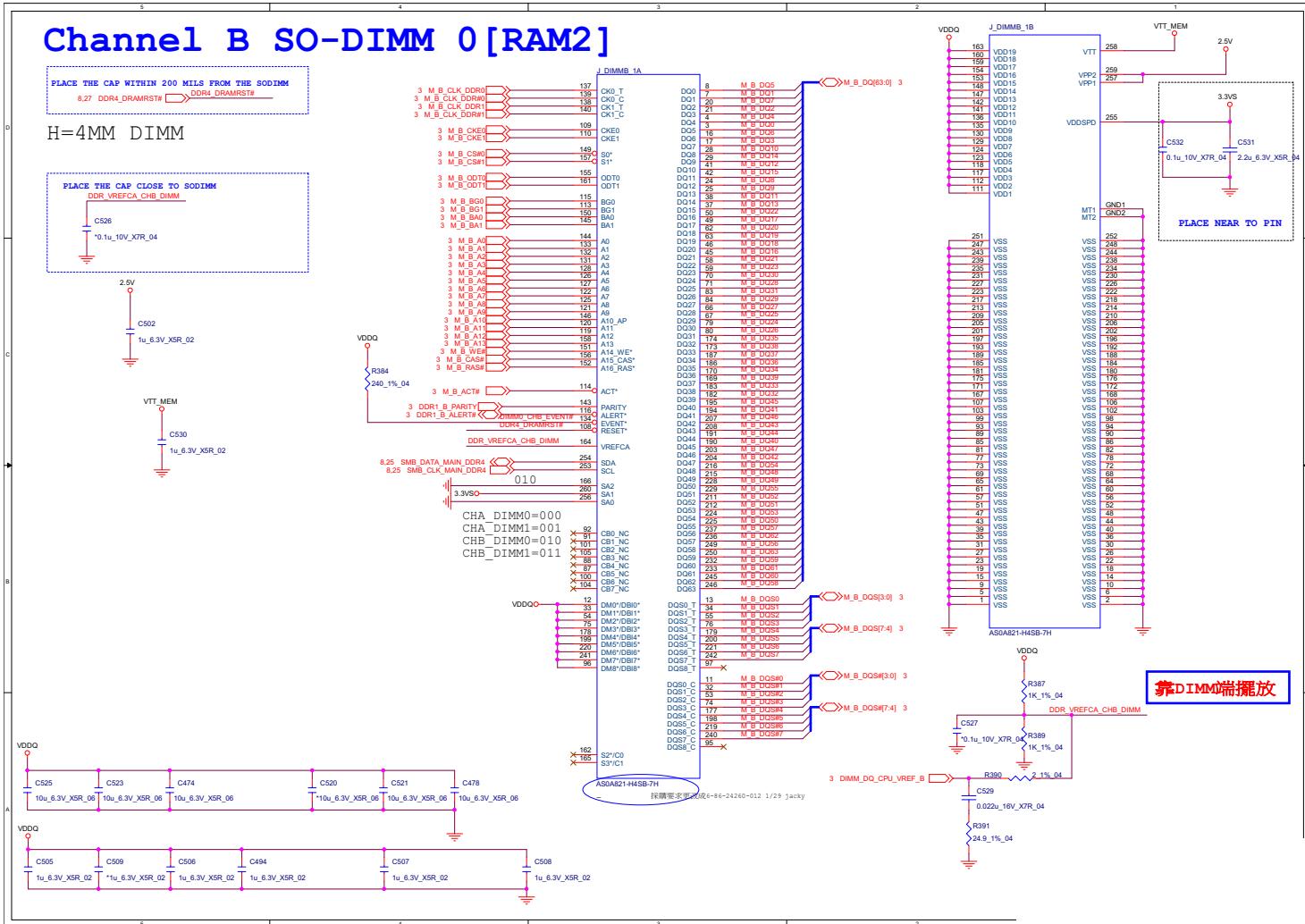
Sheet 8 of 64
DDR4 CHA SO-DIMM

B.Schematic Diagrams

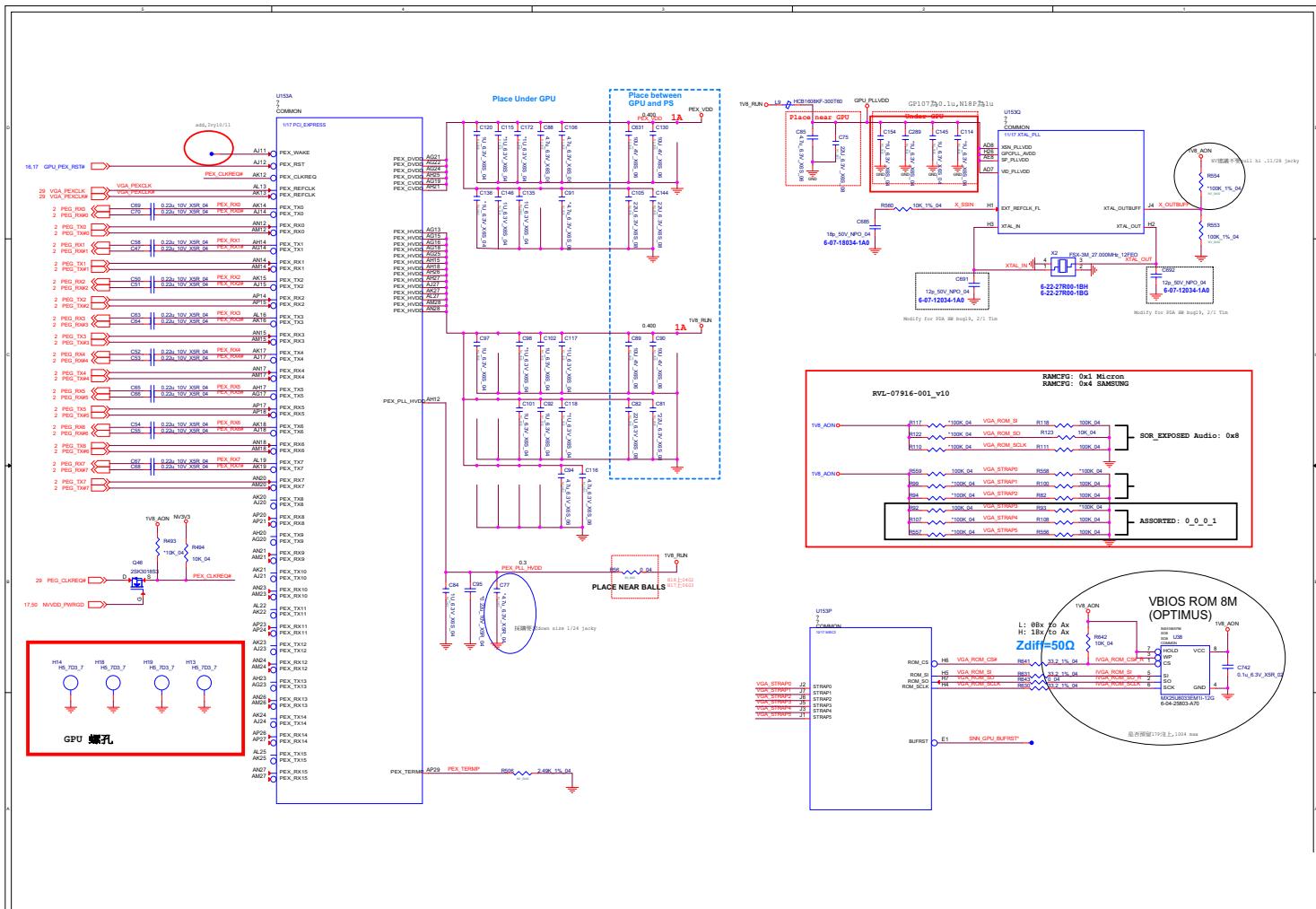
Schematic Diagrams

DDR4 CHB SO-DIMM

Sheet 9 of 64
DDR4 CHB SO-DIMM



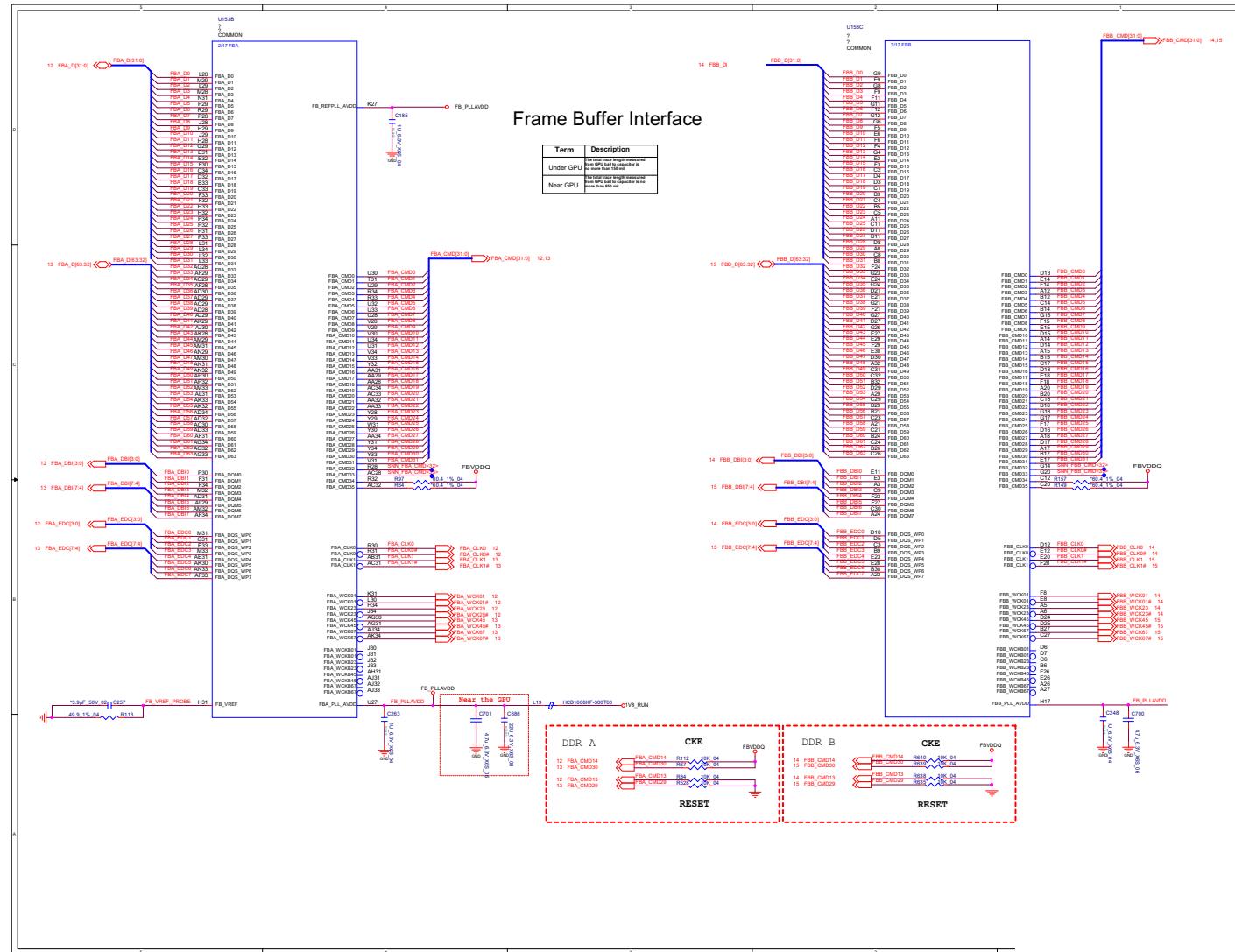
VGA PCI Express



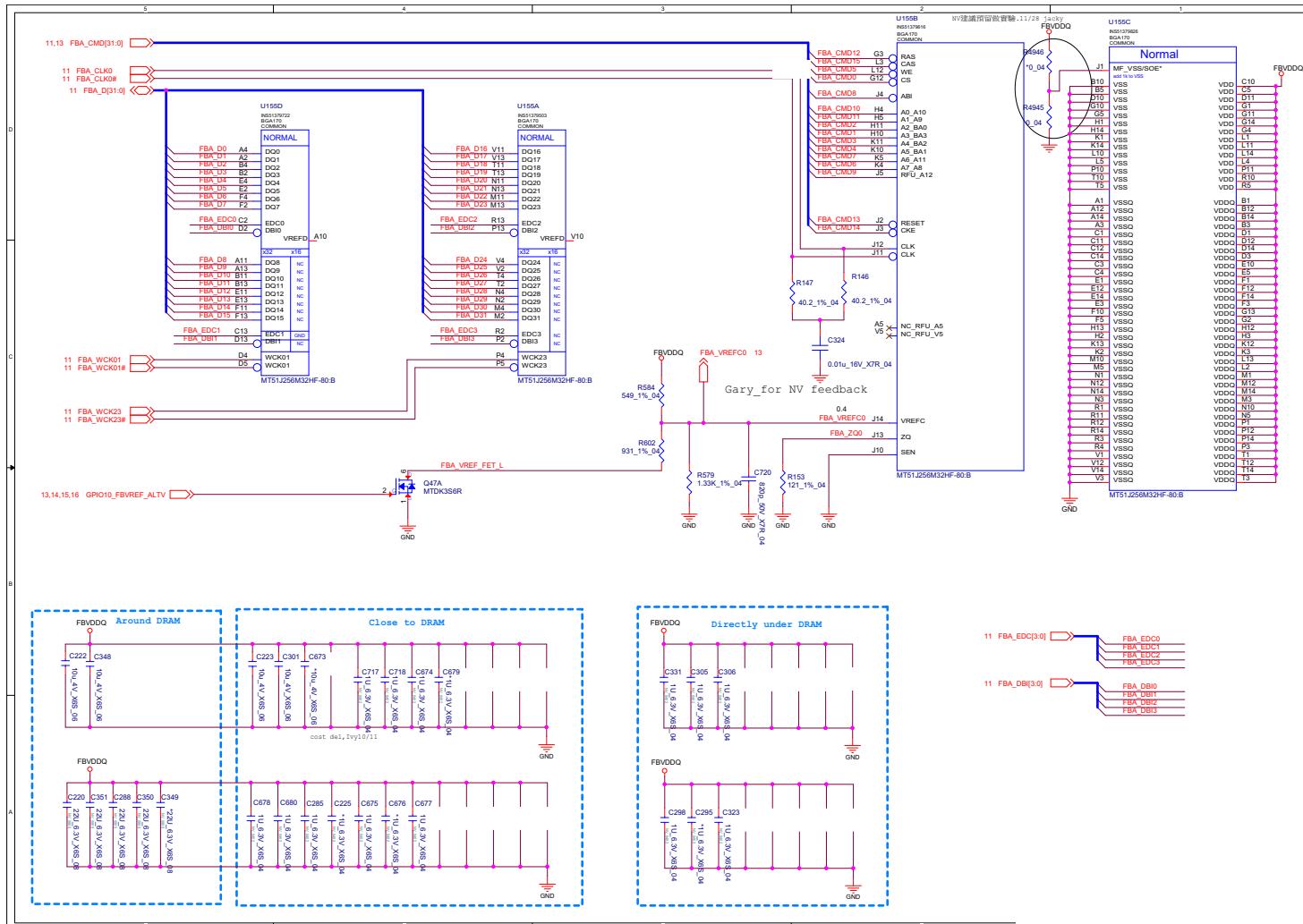
Sheet 10 of 64
VGA PCI Express

Schematic Diagrams

VGA Frame Buffer Interface



Frame Buffer A



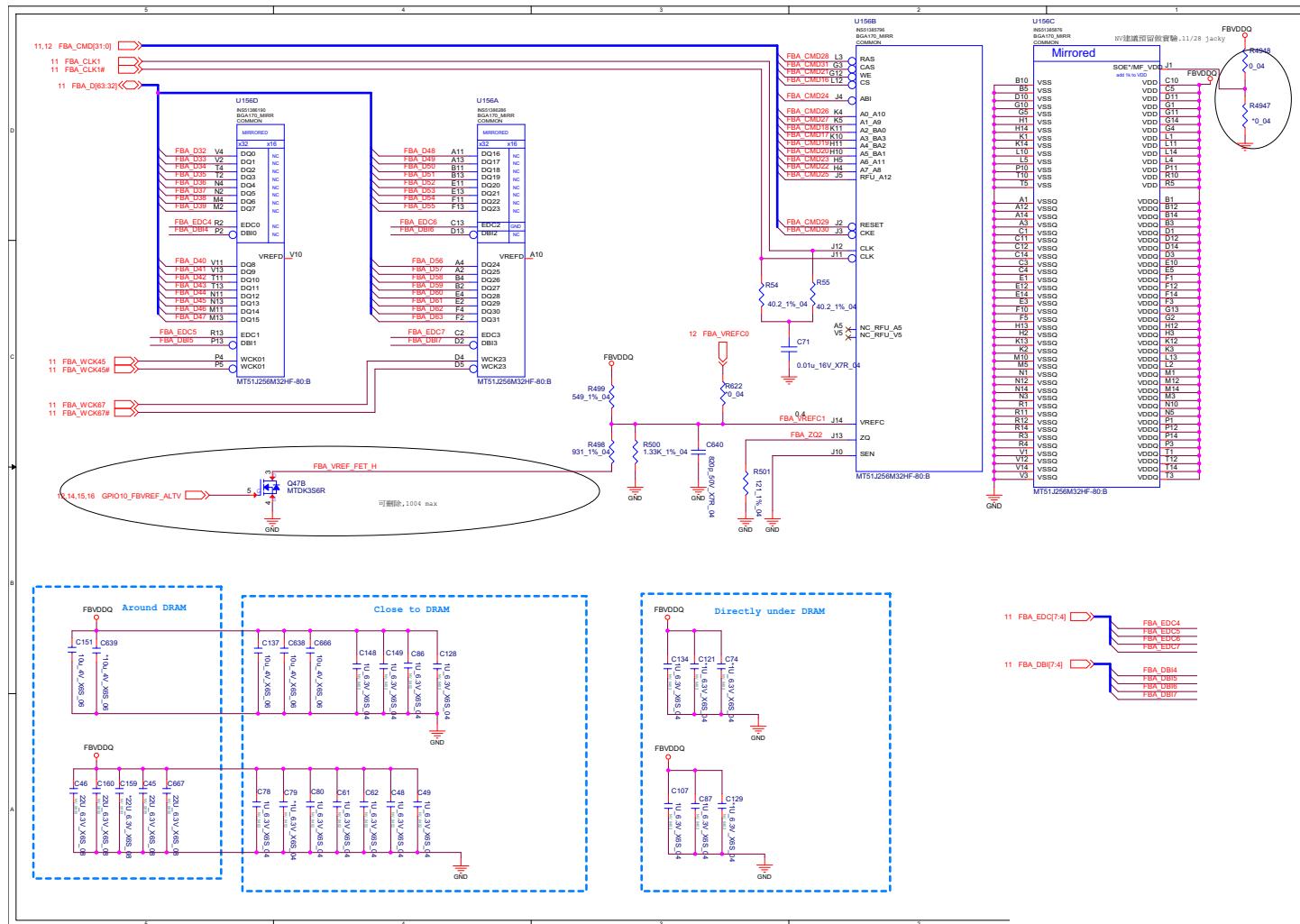
Sheet 12 of 64
Frame Buffer A

B.Schematic Diagrams

Schematic Diagrams

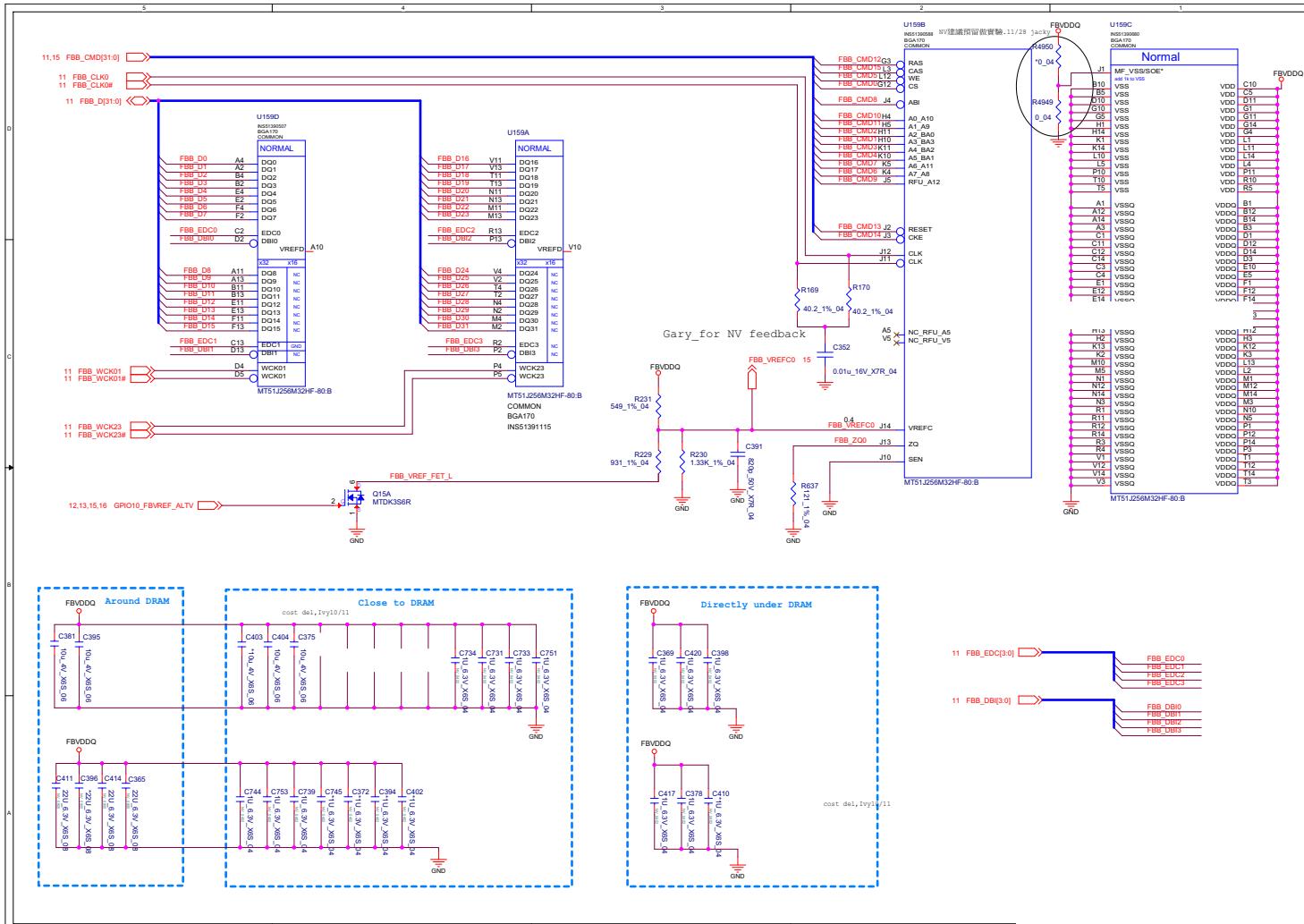
Frame Buffer A

Sheet 13 of 64
Frame Buffer A



B - 14 Frame Buffer A

Frame Buffer B

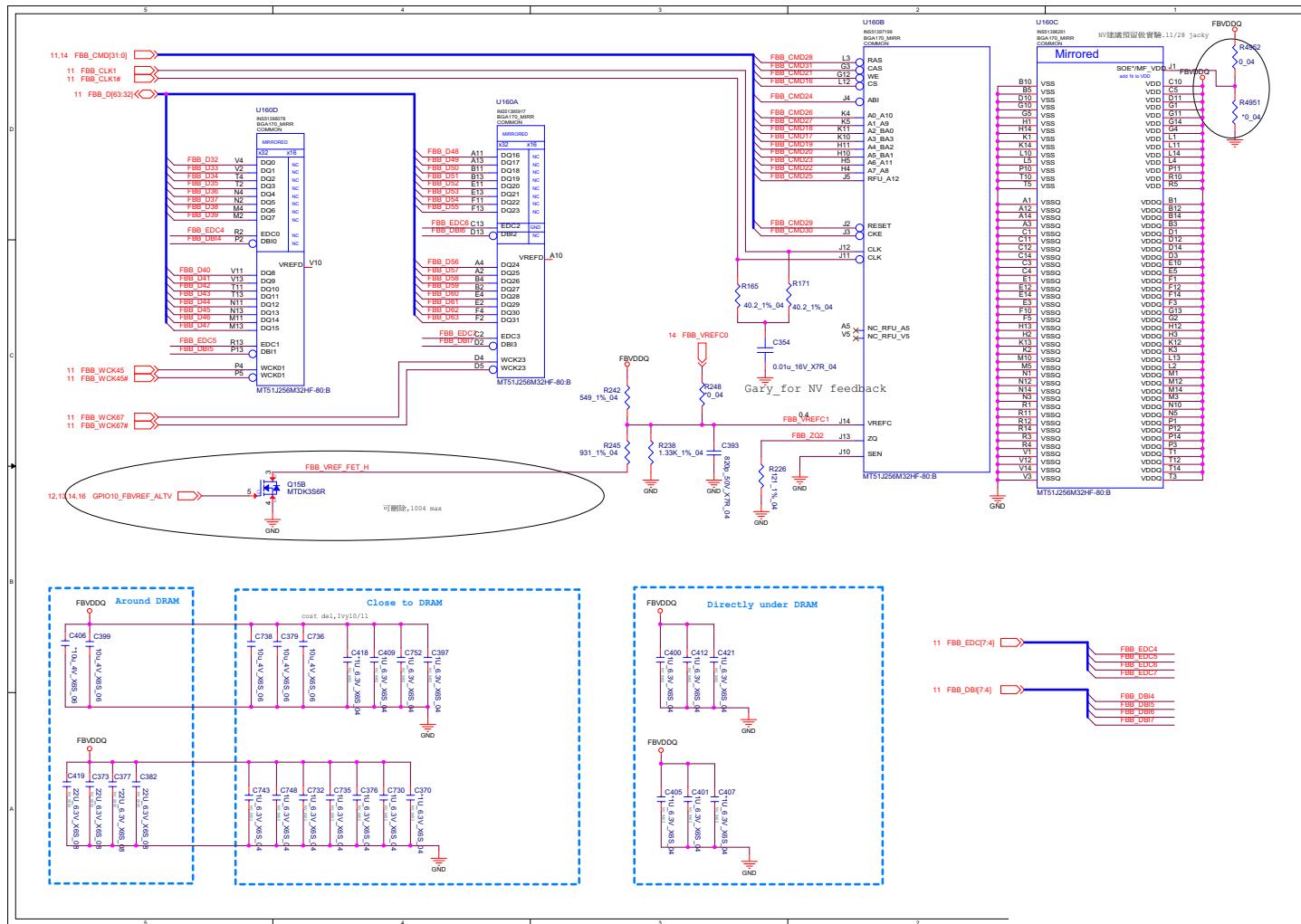


Sheet 14 of 64
Frame Buffer B

Schematic Diagrams

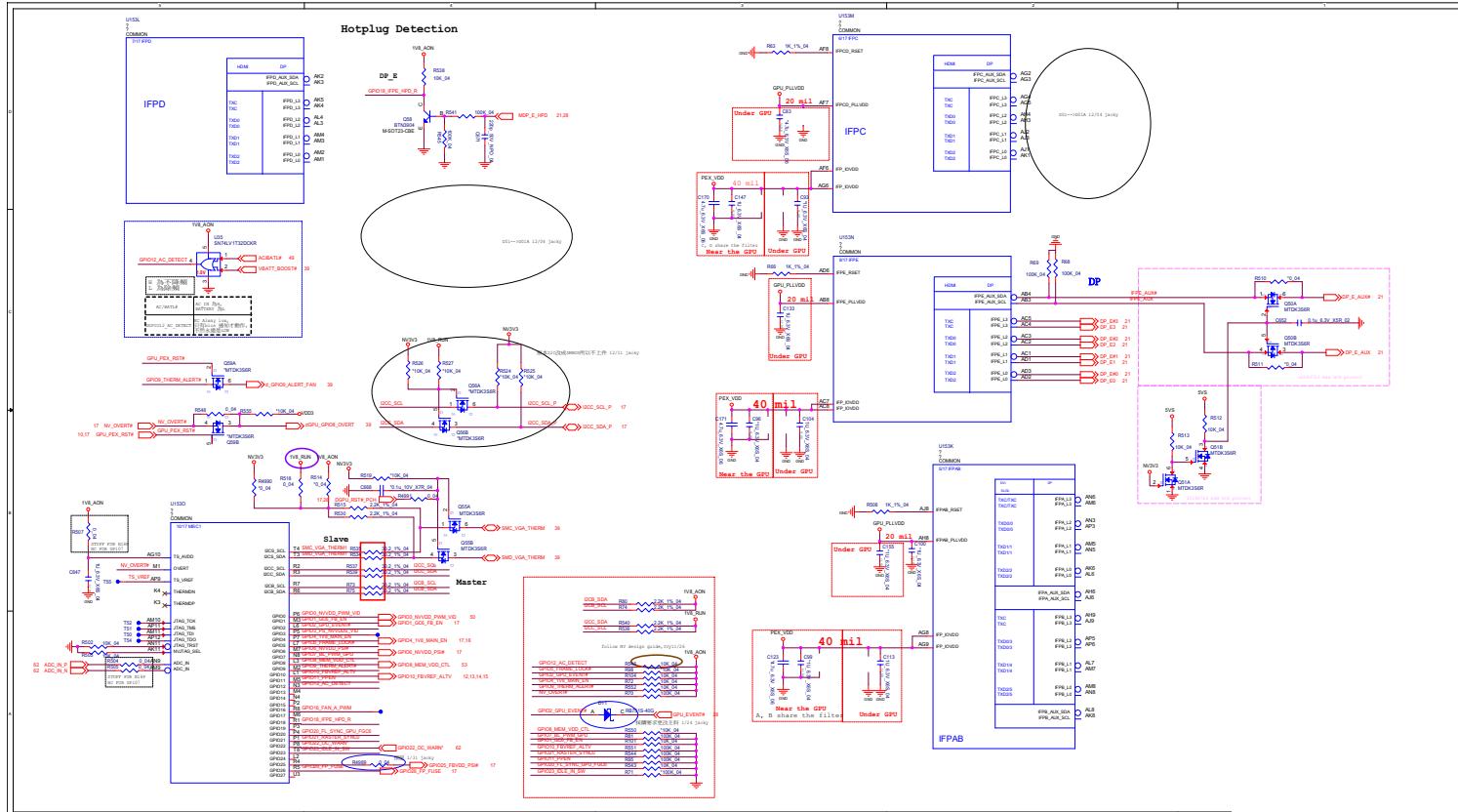
Frame Buffer B

Sheet 15 of 64
Frame Buffer B



Schematic Diagrams

VGA I/O



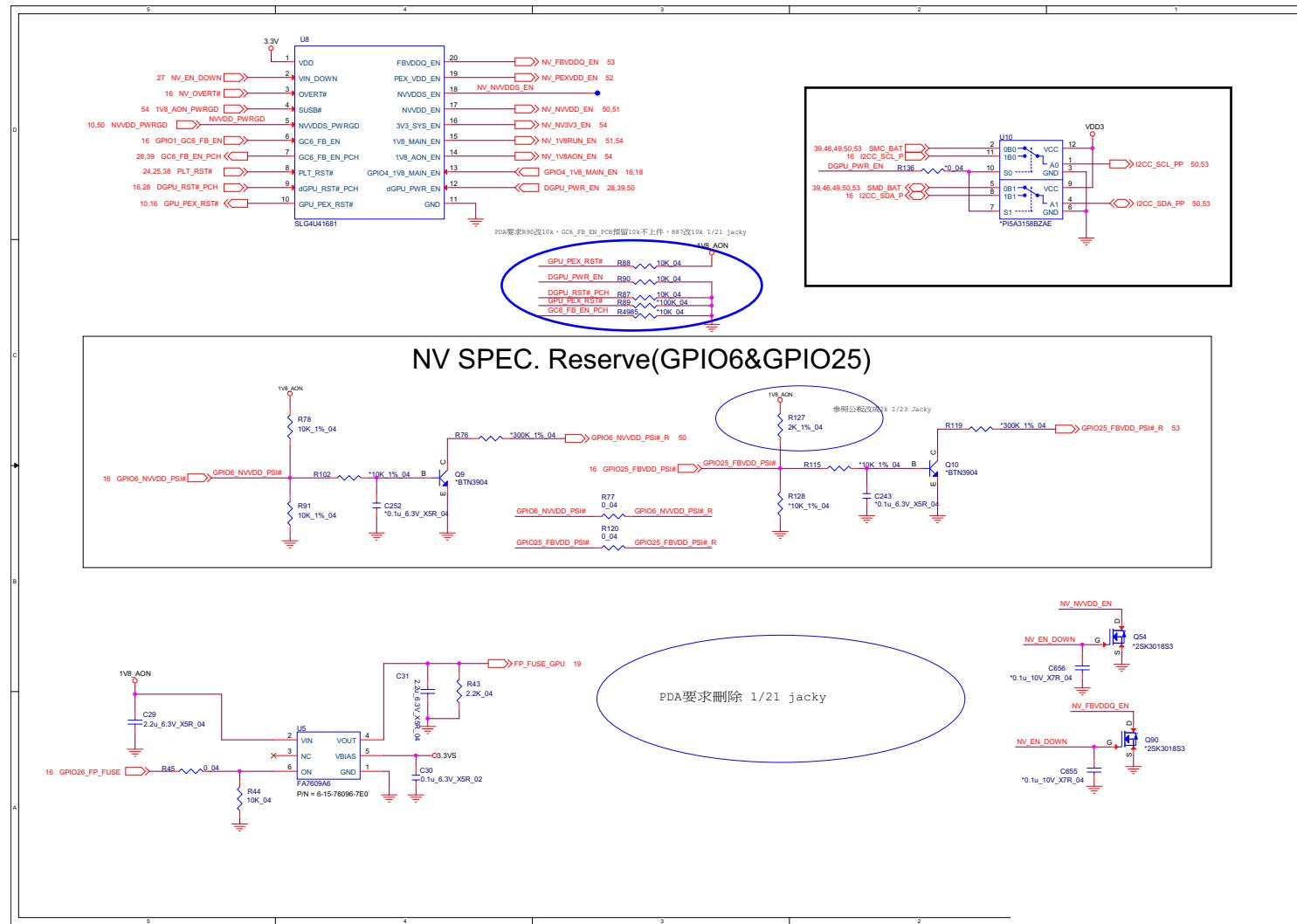
Sheet 16 of 64
VGA I/O

B.Schematic Diagrams

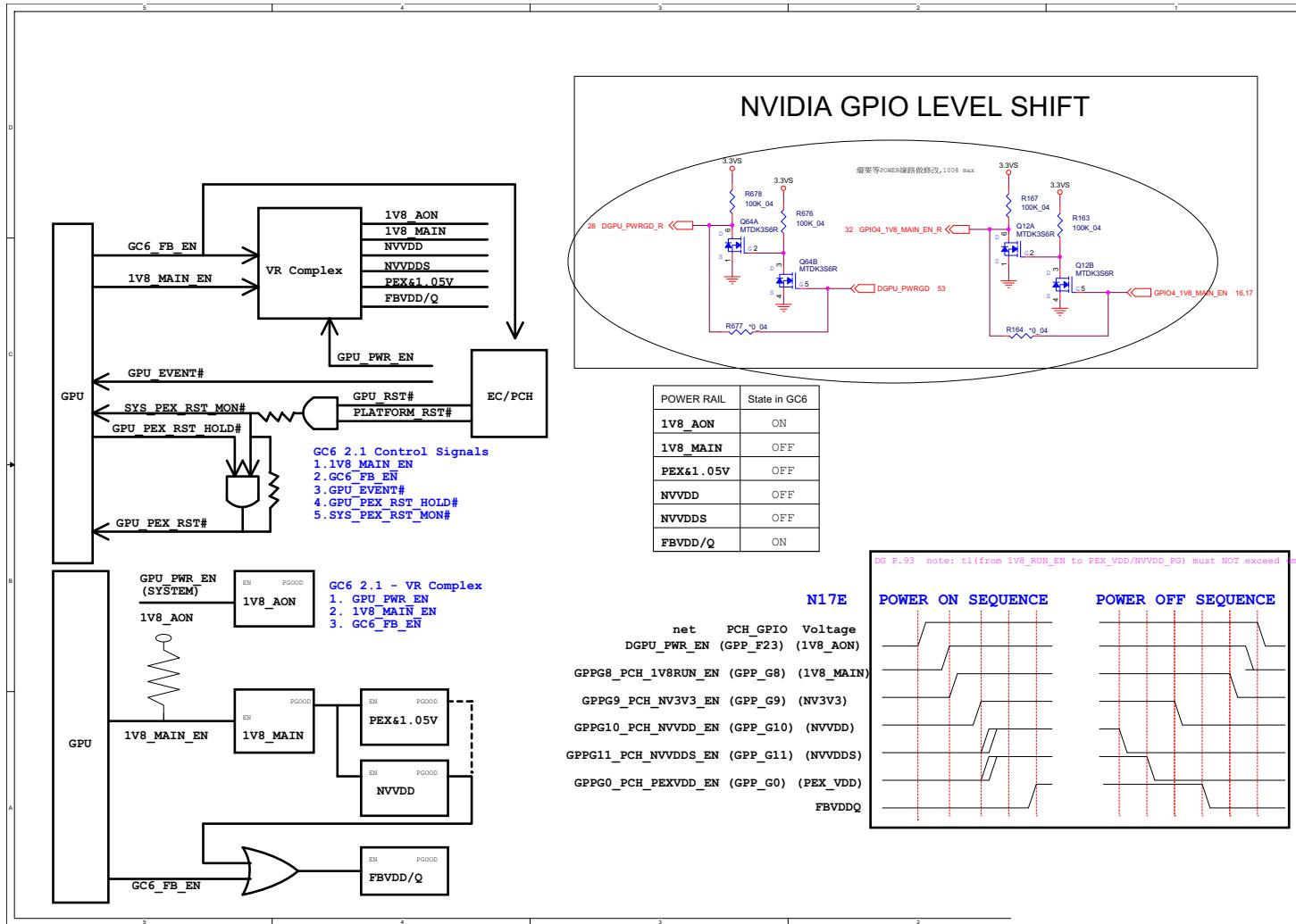
Schematic Diagrams

NVIDIA Power Sequence

Sheet 17 of 64
NVIDIA Power
Sequence



NVIDIA GPIO Level Shift

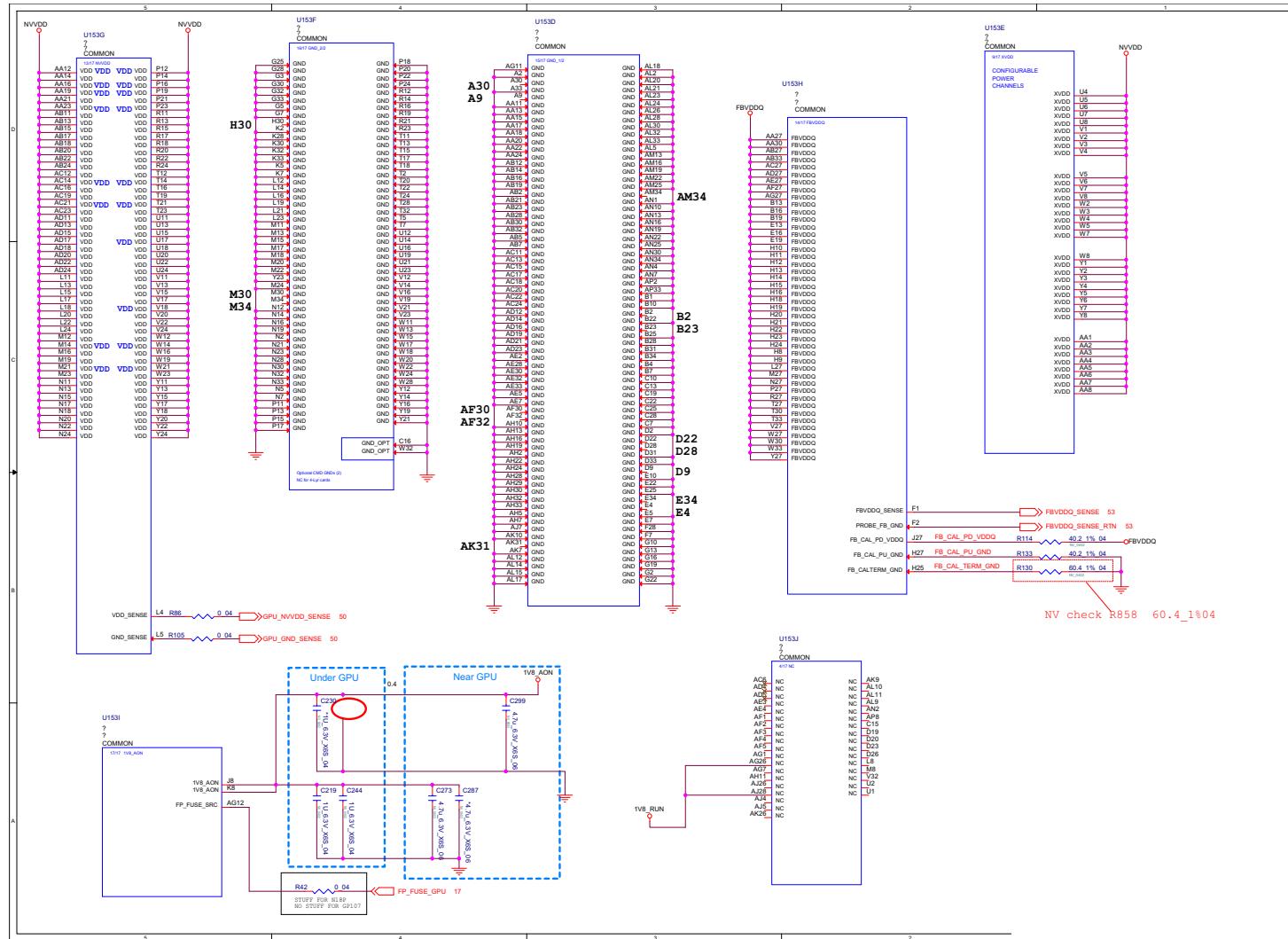


Sheet 18 of 64
NVIDIA GPIO Level Shift

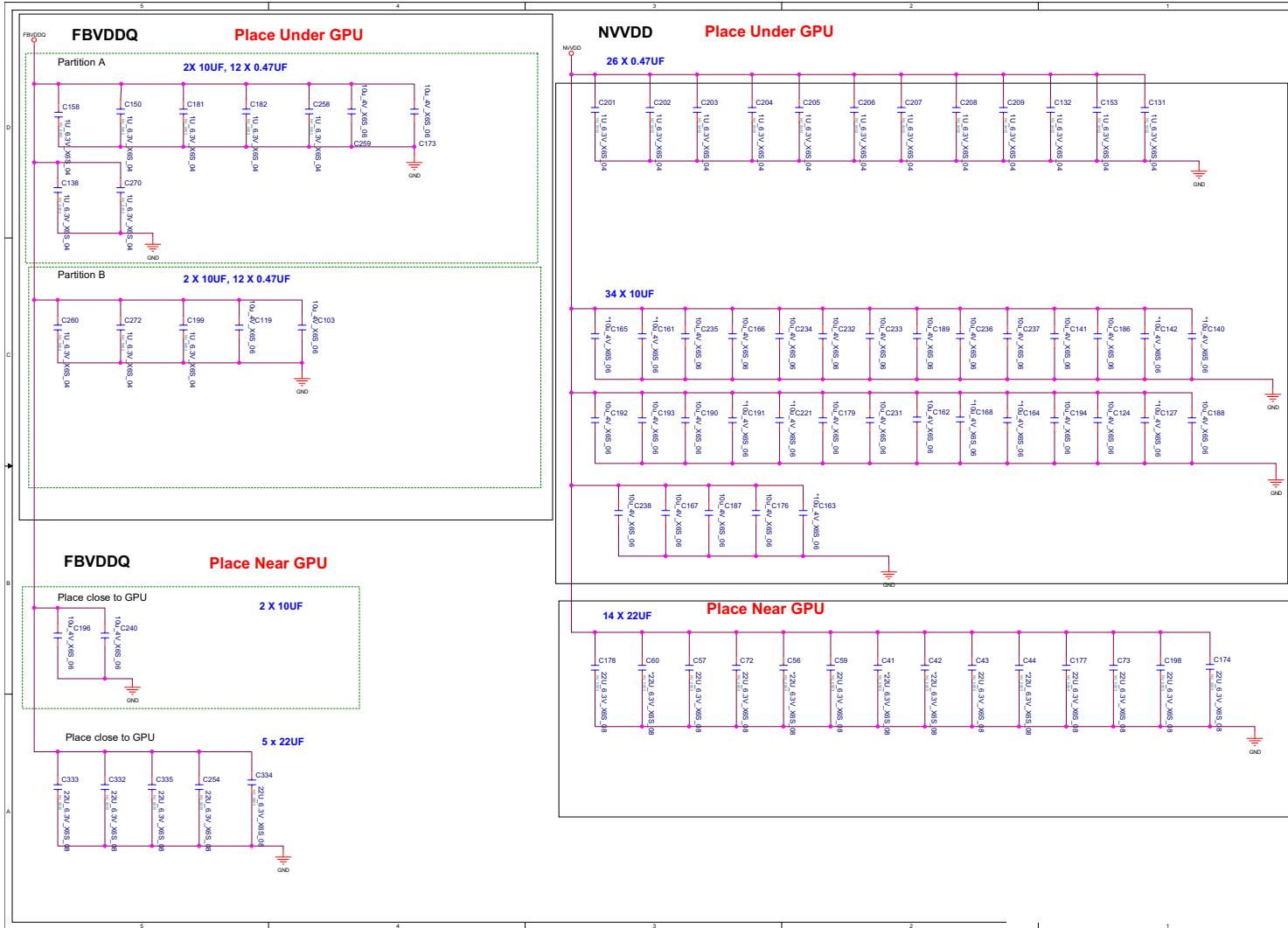
Schematic Diagrams

VGA PWR / GND

Sheet 19 of 64
VGA PWR / GND



VGA NVVDD Coupling

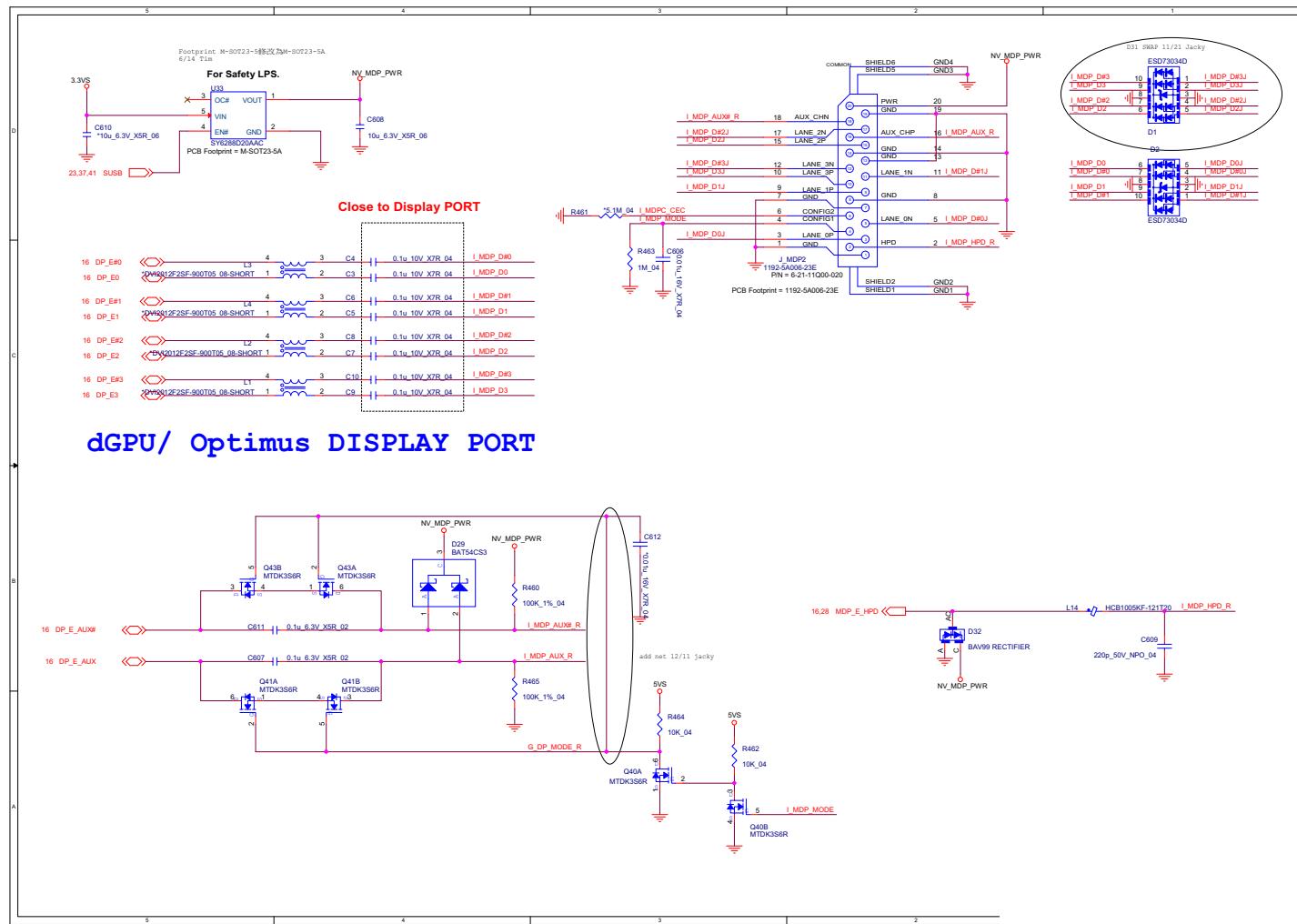


Sheet 20 of 64
VGA NVVDD
Coupling

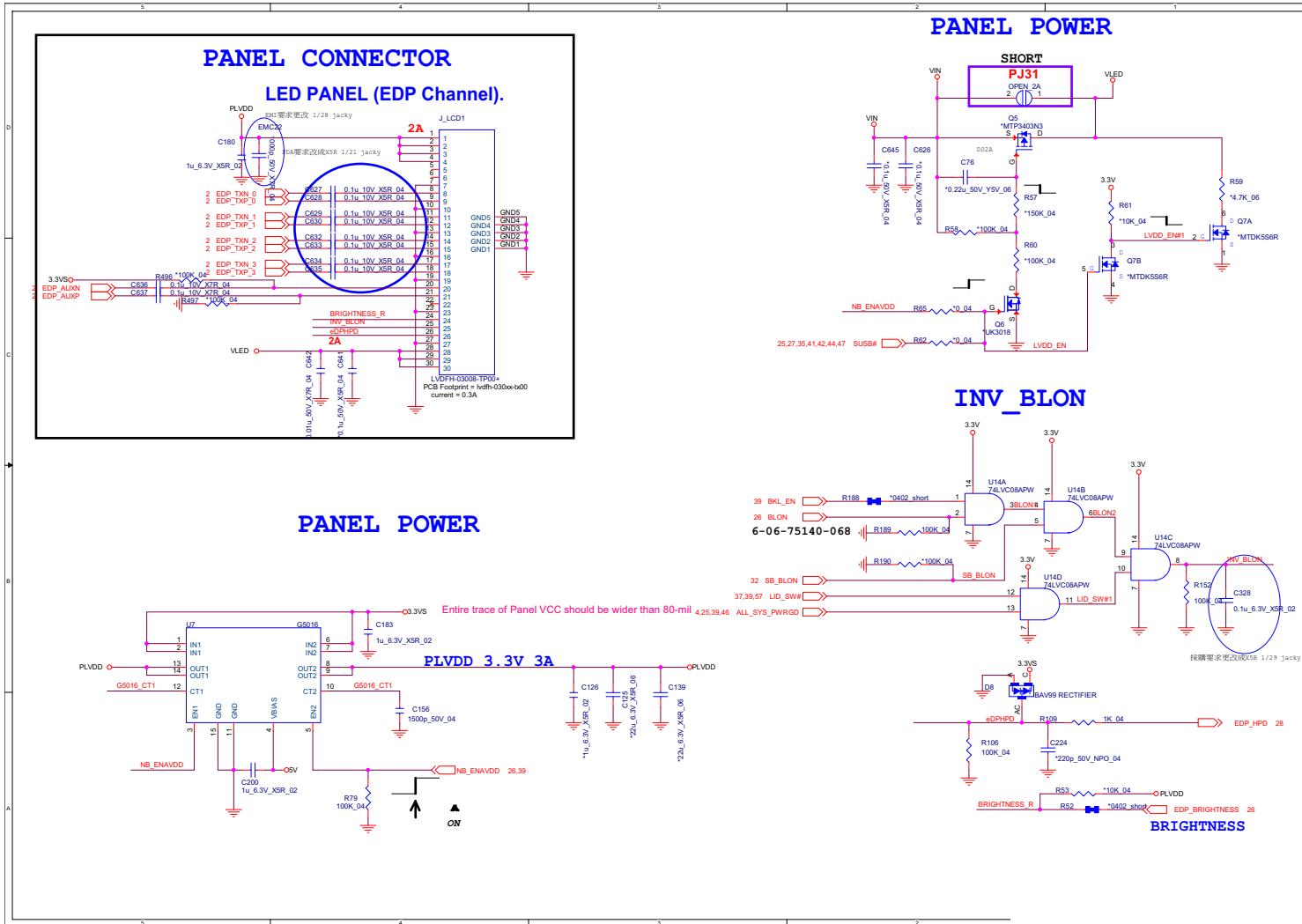
Schematic Diagrams

MDP

Sheet 21 of 64
MDP



Panel, Inverter

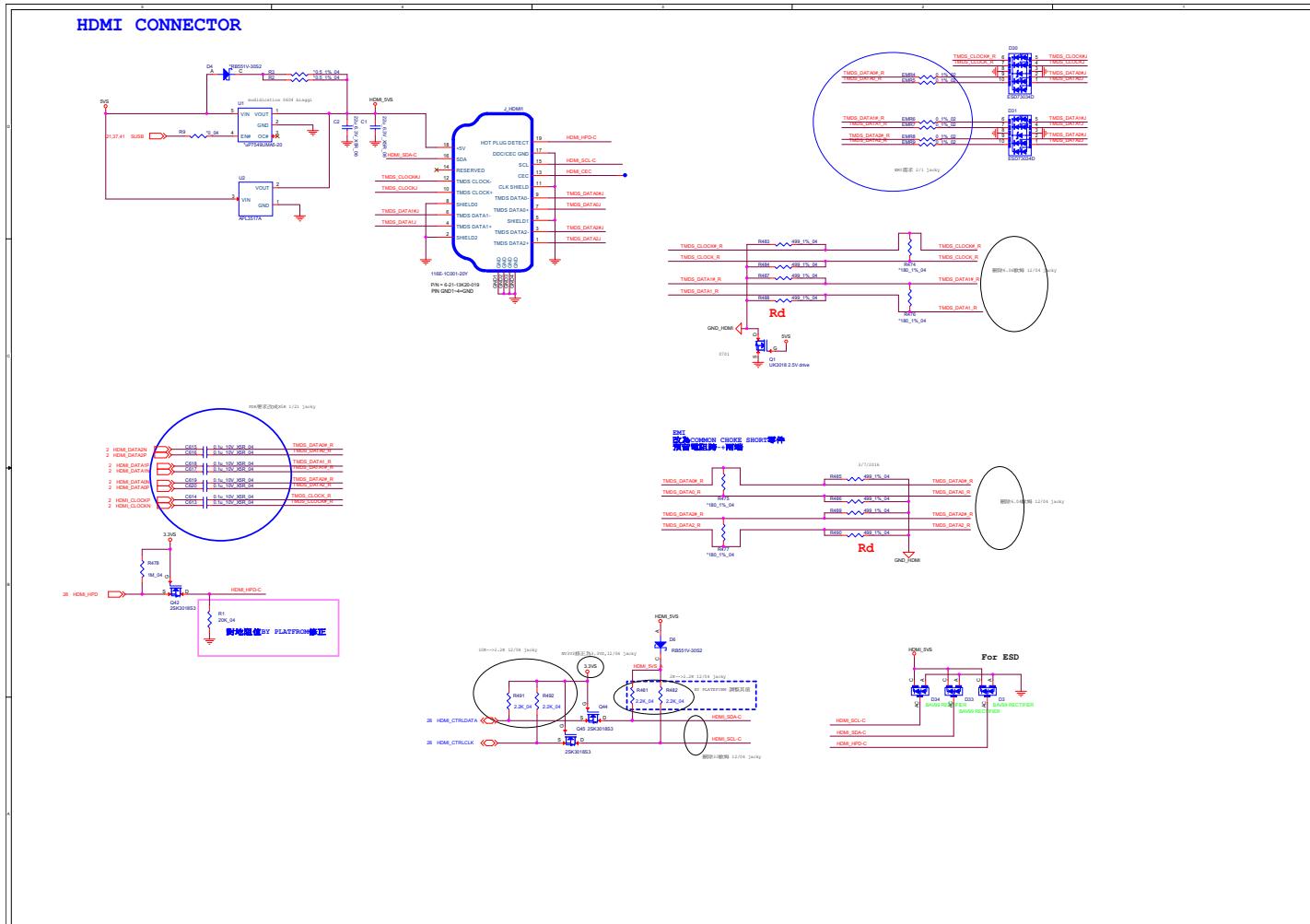


Sheet 22 of 64
Panel, Inverter

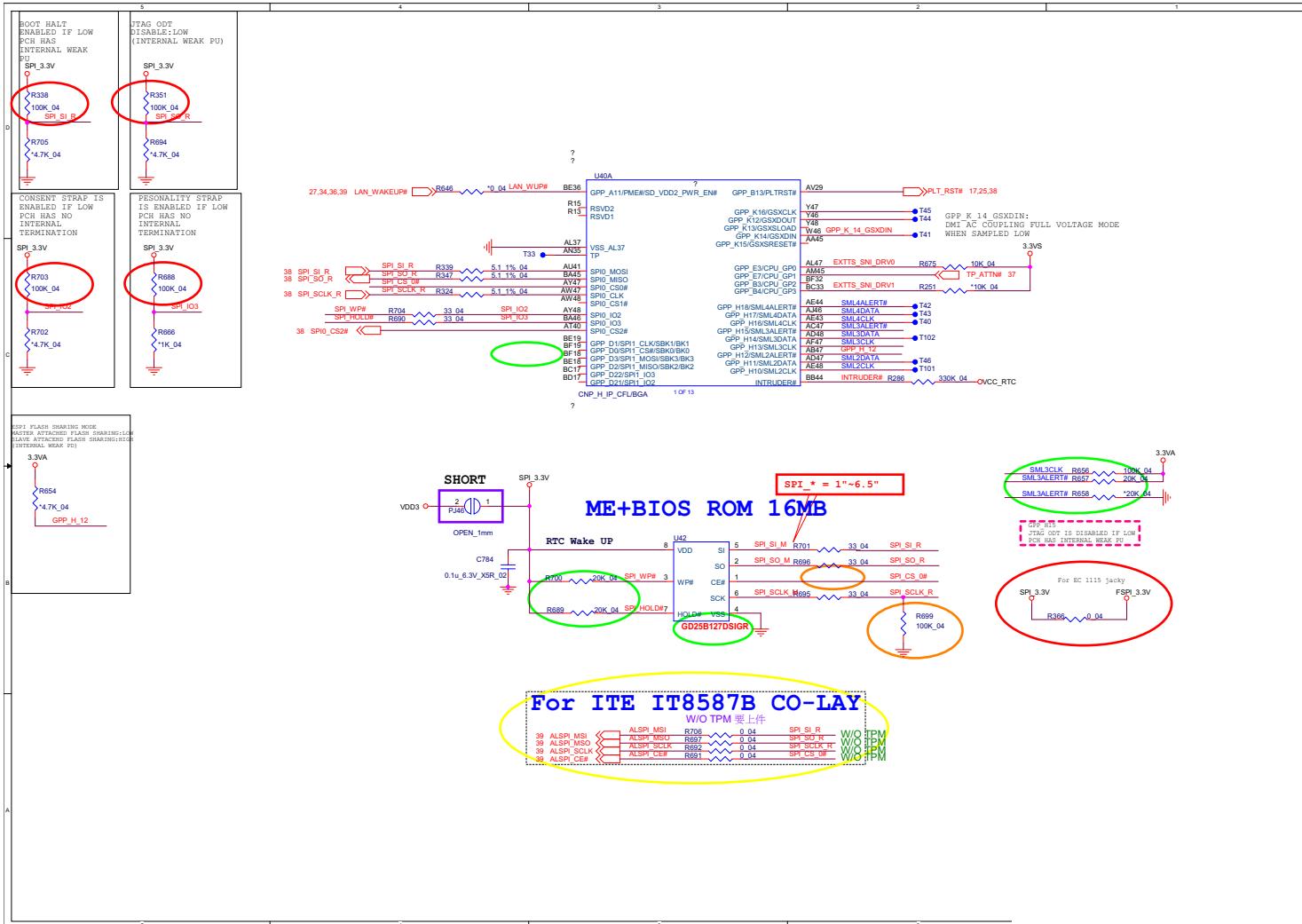
Schematic Diagrams

HDMI

Sheet 23 of 64
HDMI



PCH 1/9



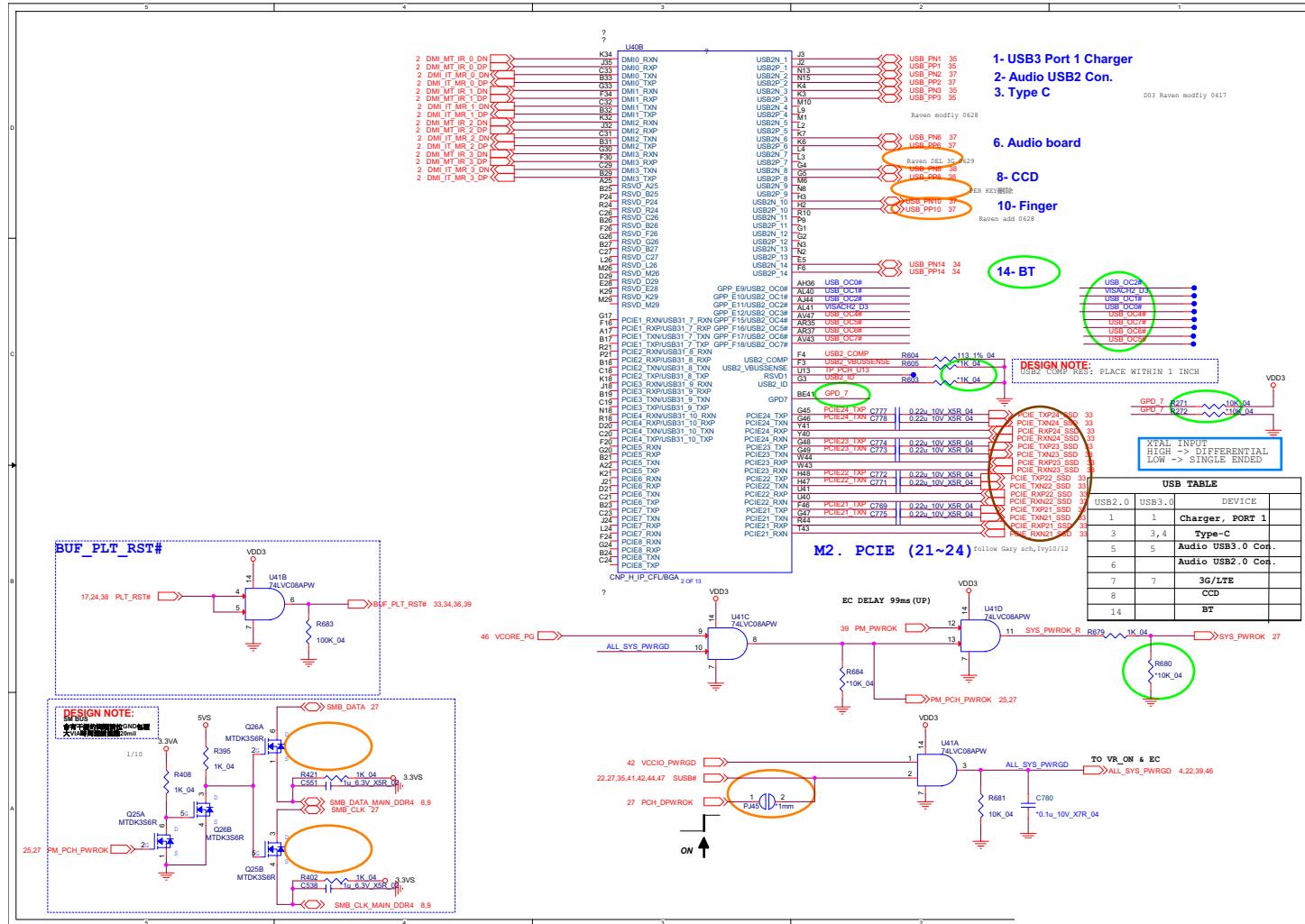
Sheet 24 of 64
PCH 1/9

B.Schematic Diagrams

Schematic Diagrams

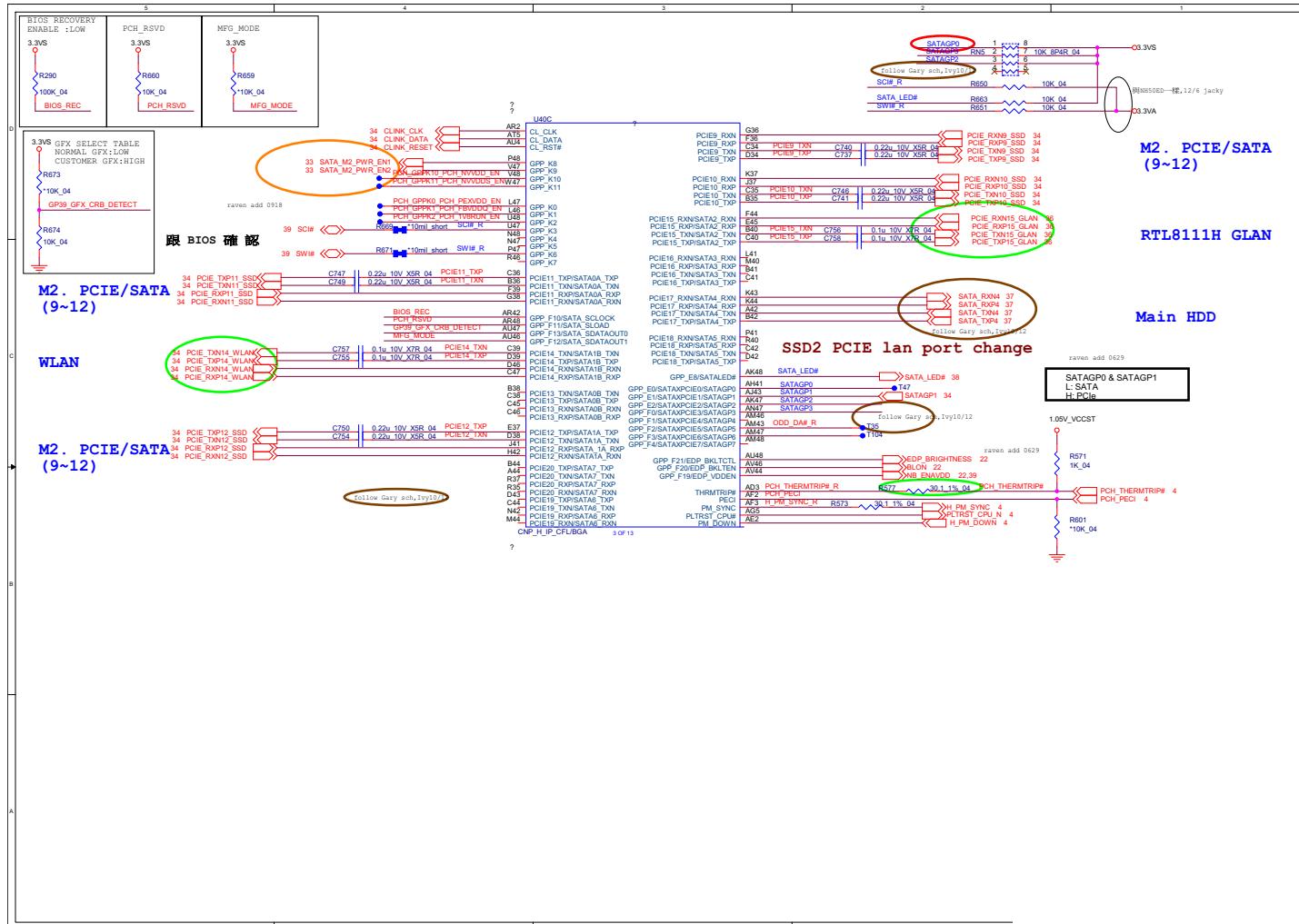
PCH 2/9

Sheet 25 of 64
PCH 2/9



B - 26 PCH 2/9

PCH 3/9

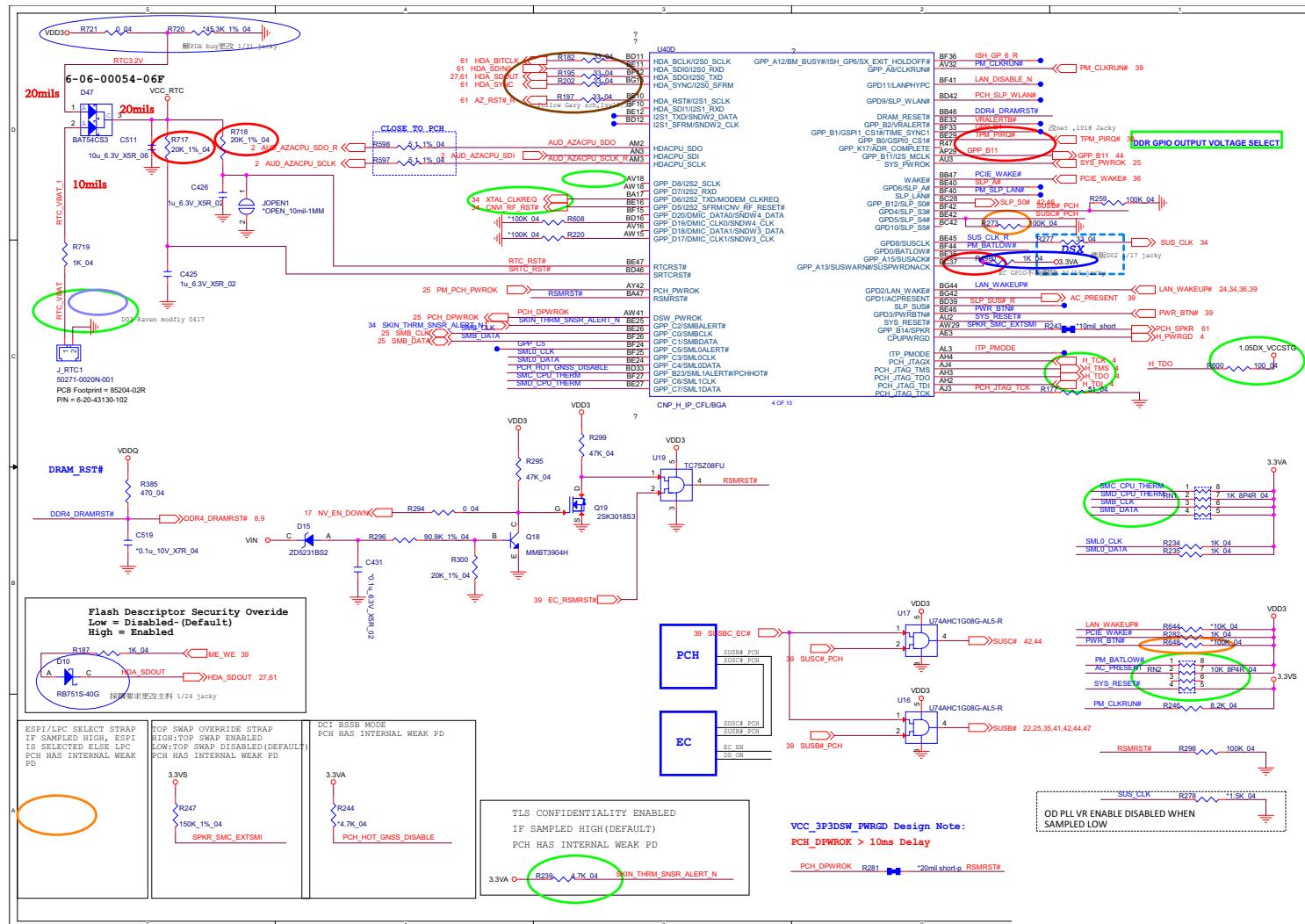


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PCH 3/9

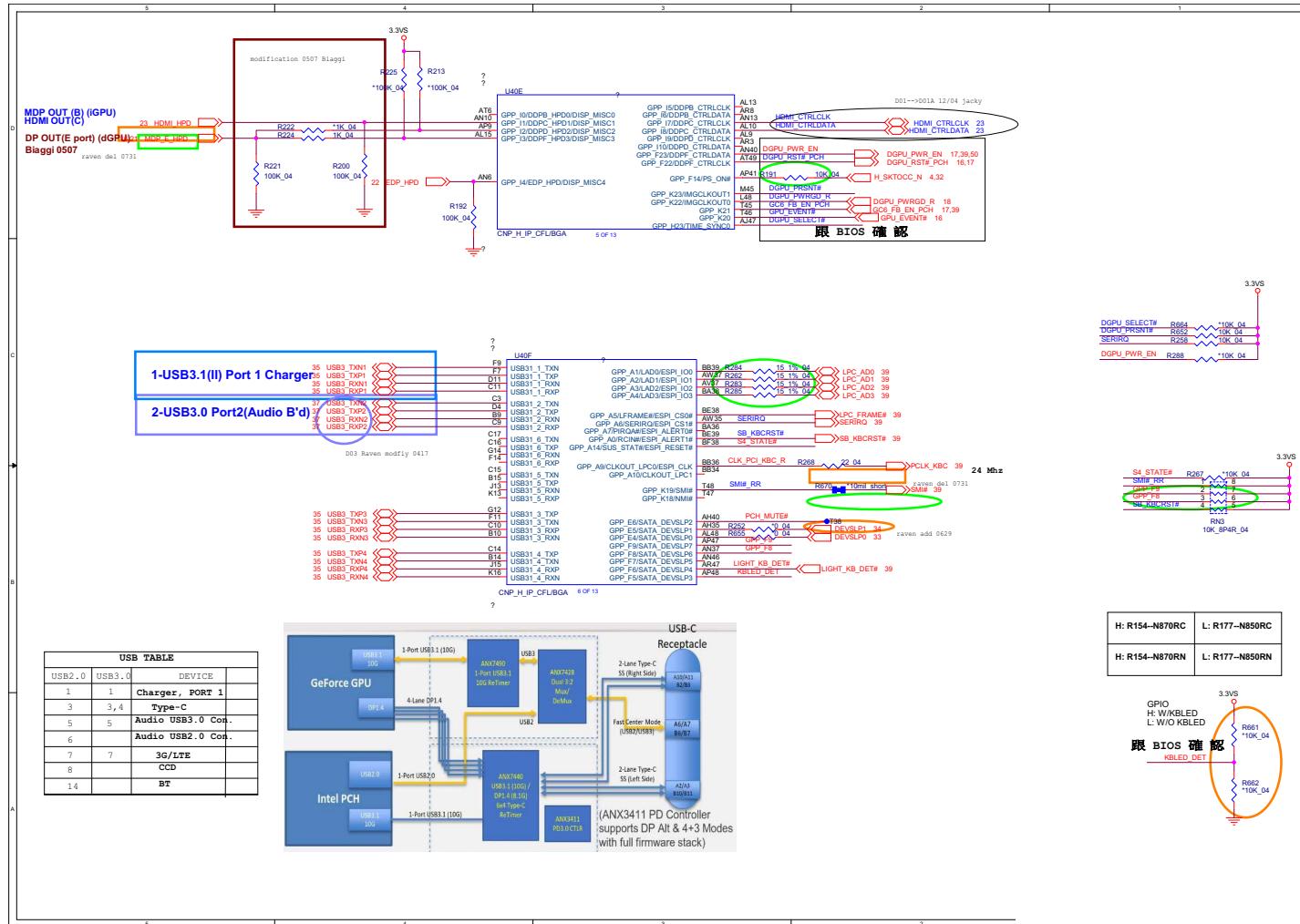
Schematic Diagrams

PCH 4/9

Sheet 27 of 64
PCH 4/9



PCH 5/9



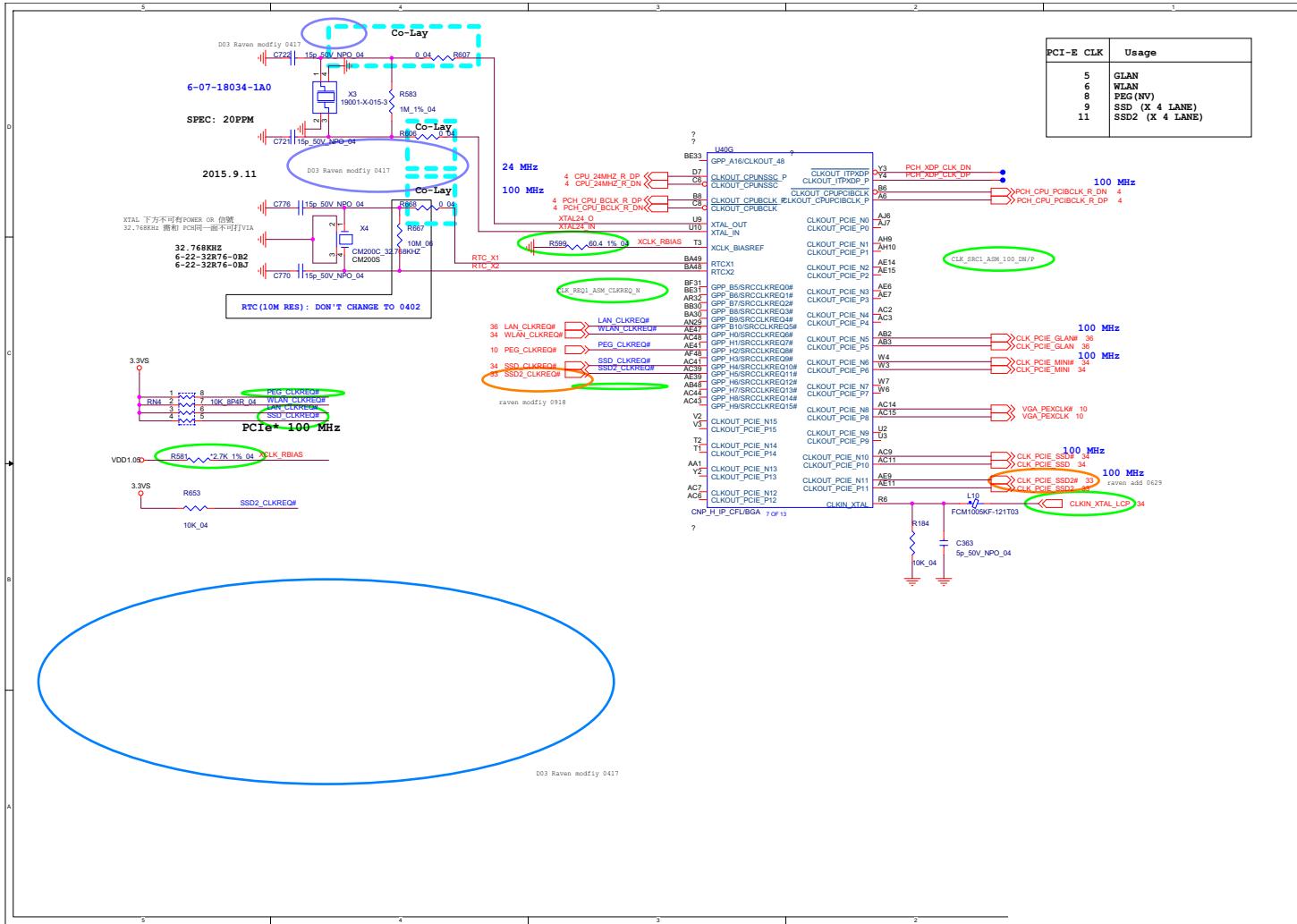
Sheet 28 of 64
PCH 5/9

B.Schematic Diagrams

Schematic Diagrams

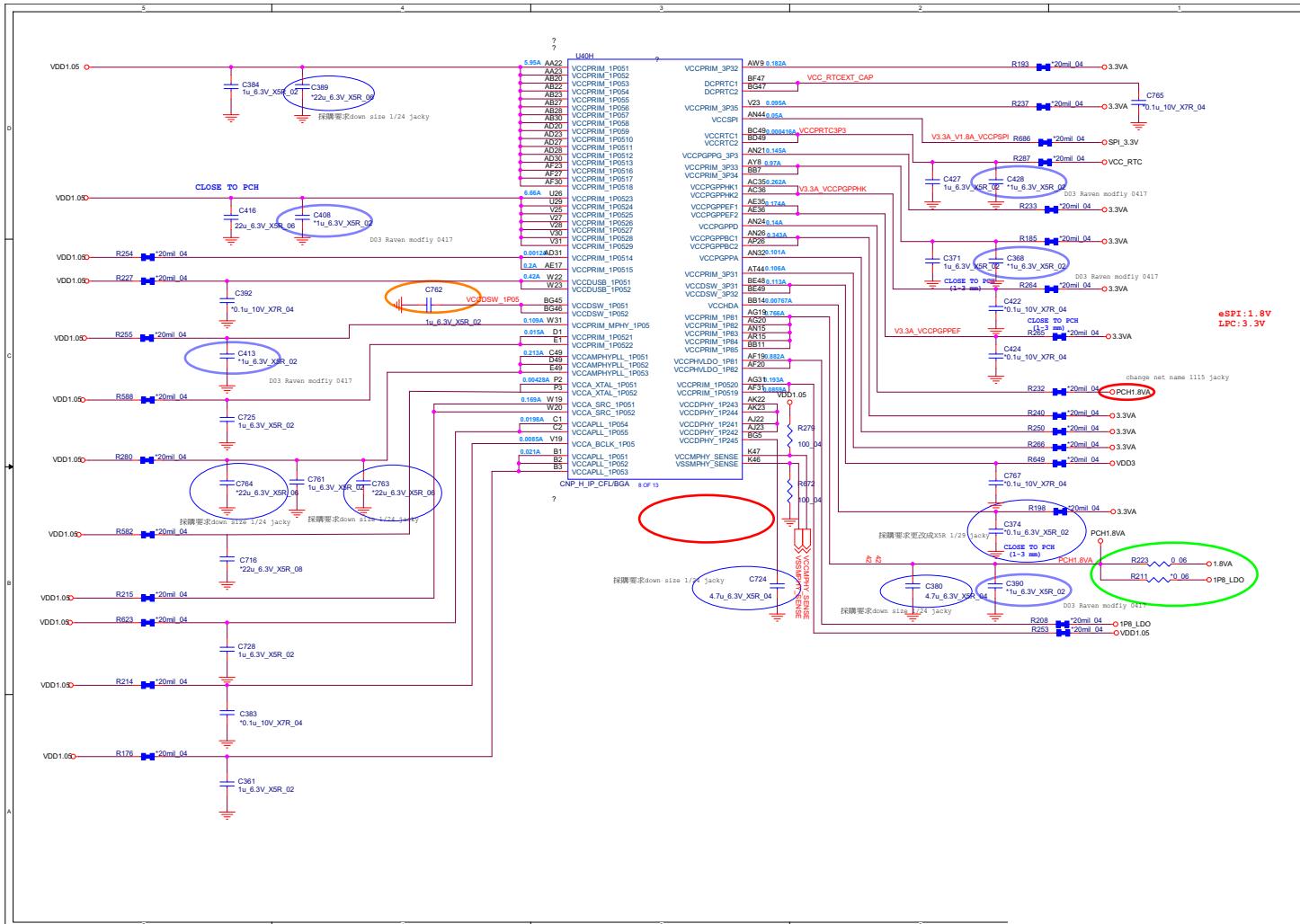
PCH 6/9

Sheet 29 of 64
PCH 6/9



Schematic Diagrams

PCH 7/9



Sheet 30 of 64
PCH 7/9

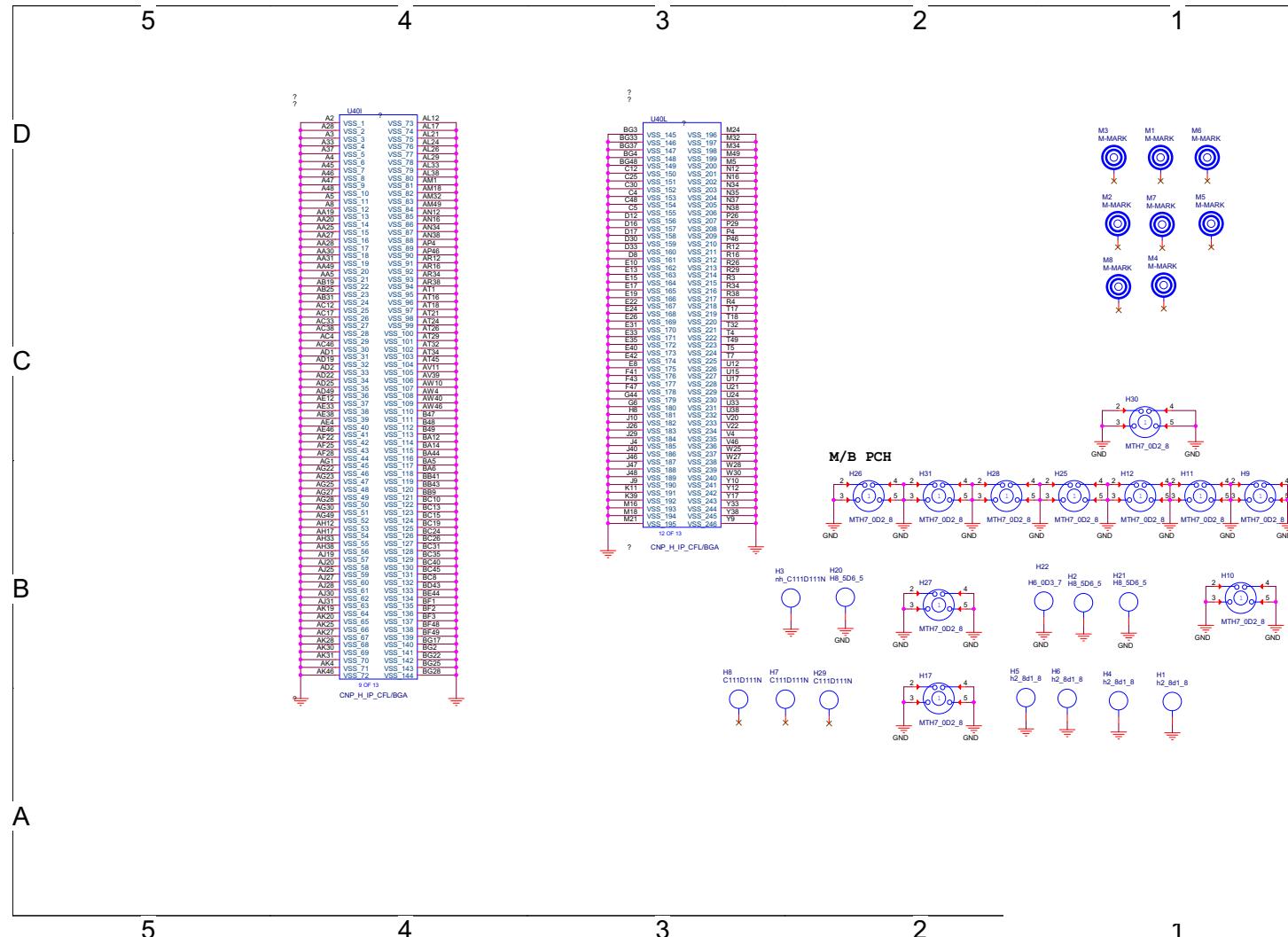
B.Schematic Diagrams

B.Schematic Diagrams

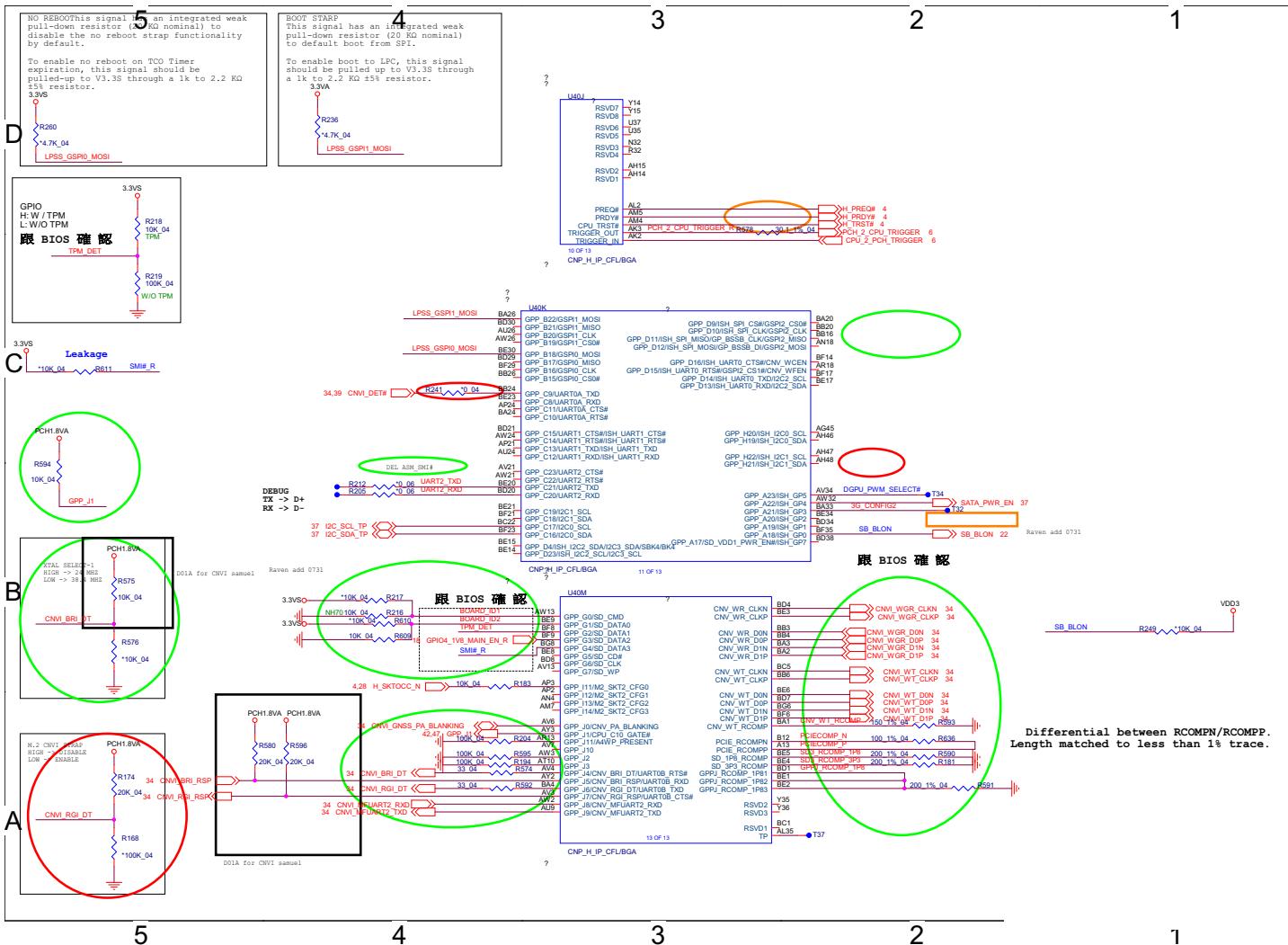
Schematic Diagrams

PCH 8/9

Sheet 31 of 64
PCH 8/9



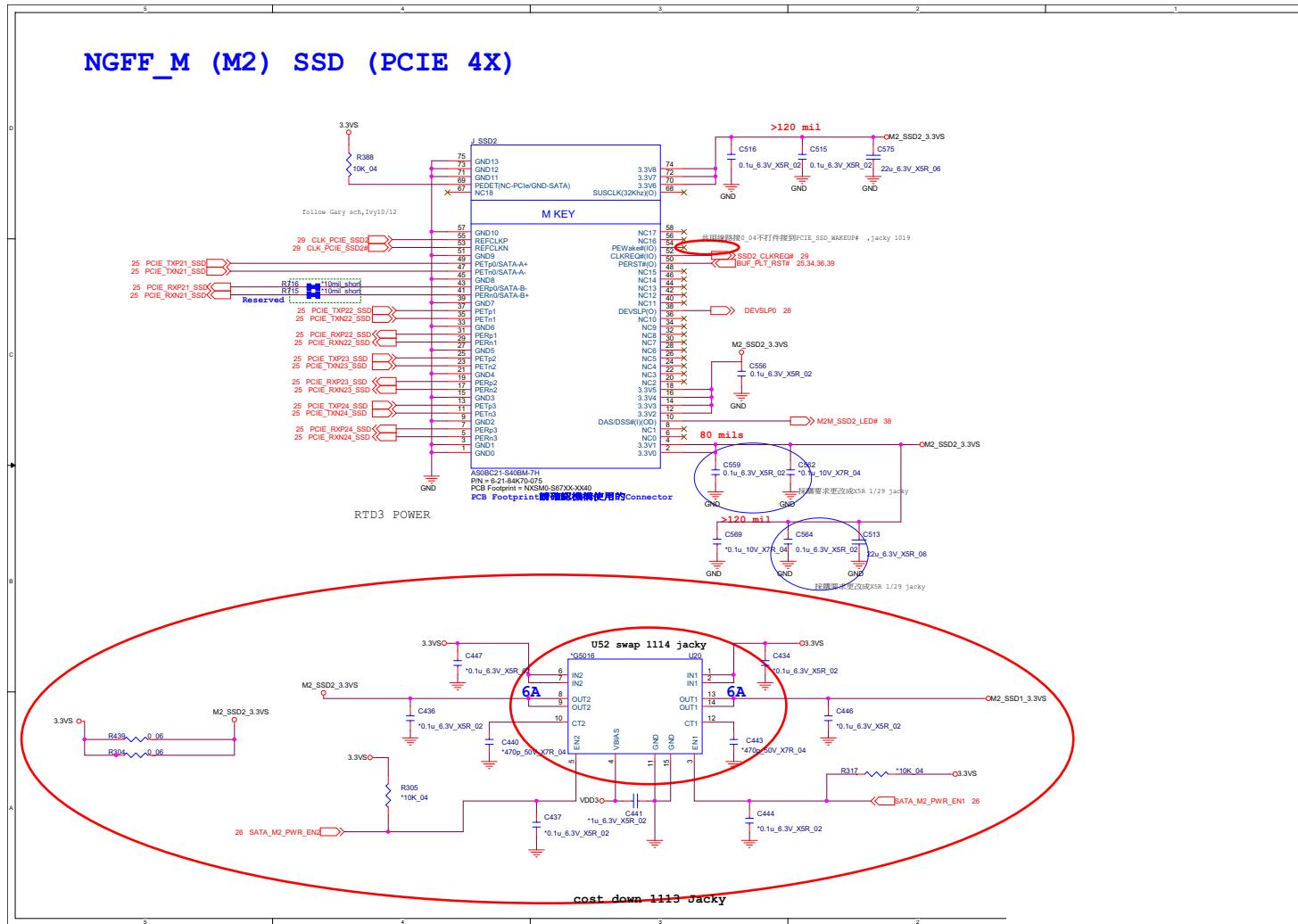
PCH 9/9



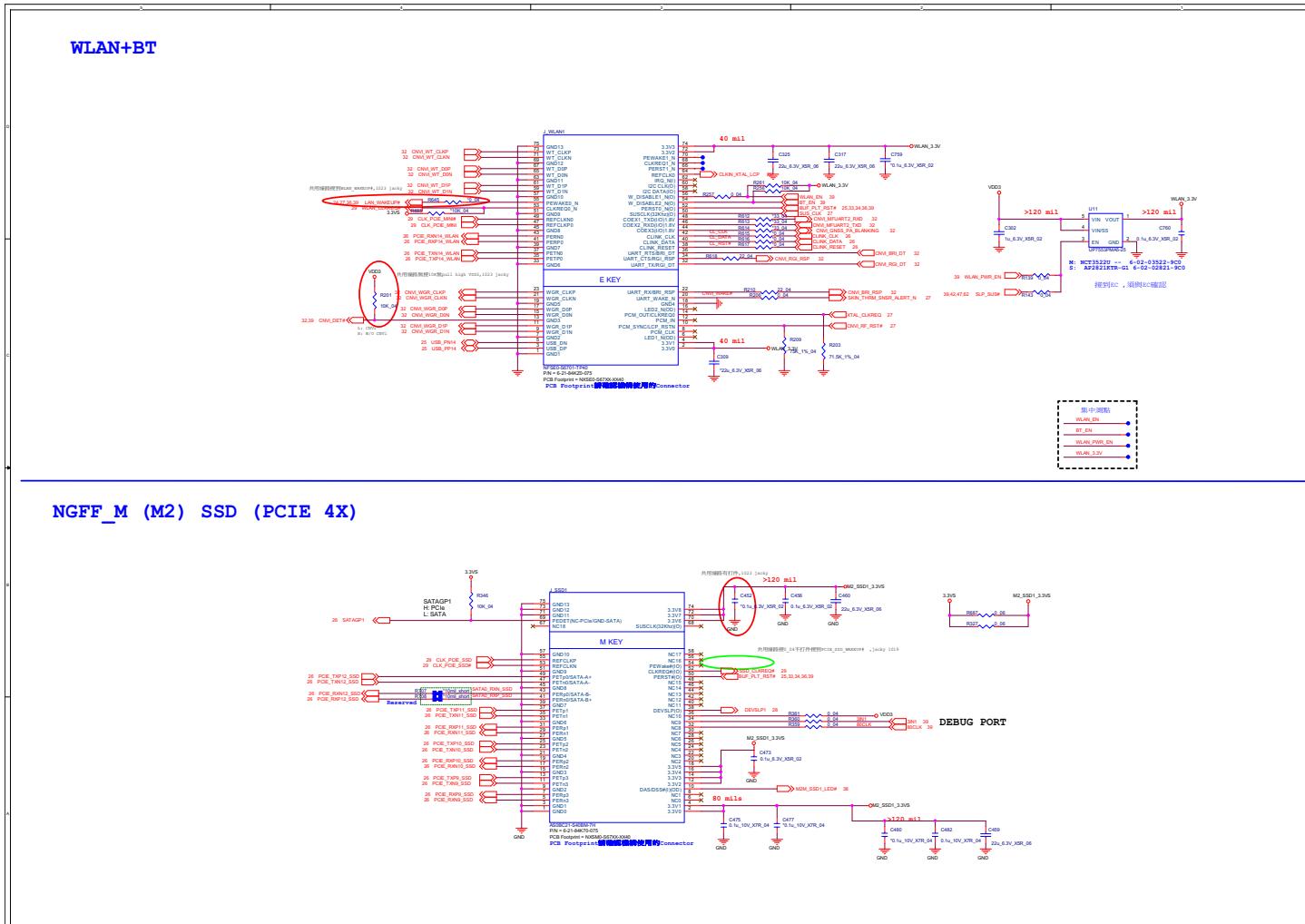
Schematic Diagrams

M.2 Card

Sheet 33 of 64
M.2 Card



M.2 WLAN+BT

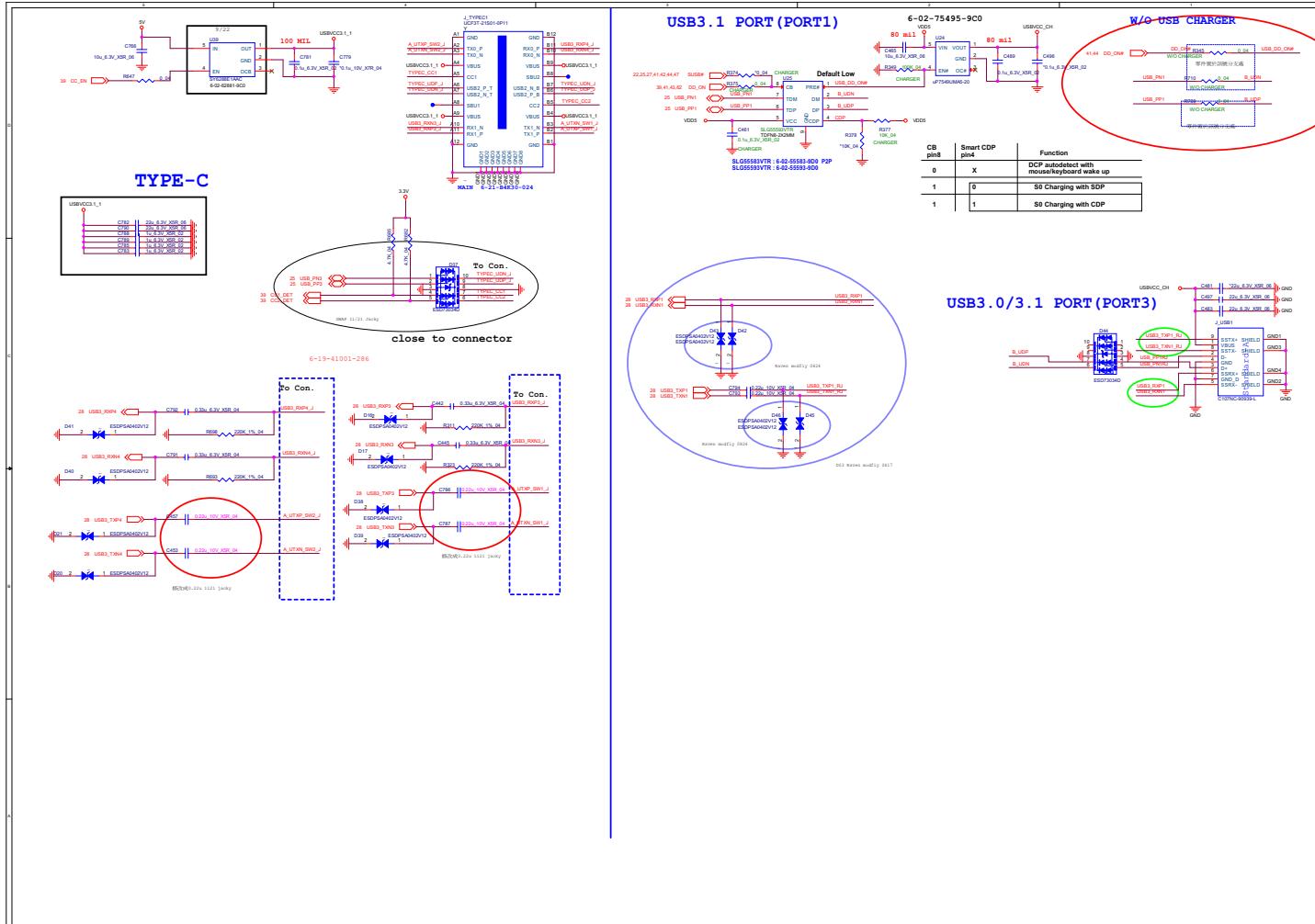


Sheet 34 of 64
M.2 WLAN+BT

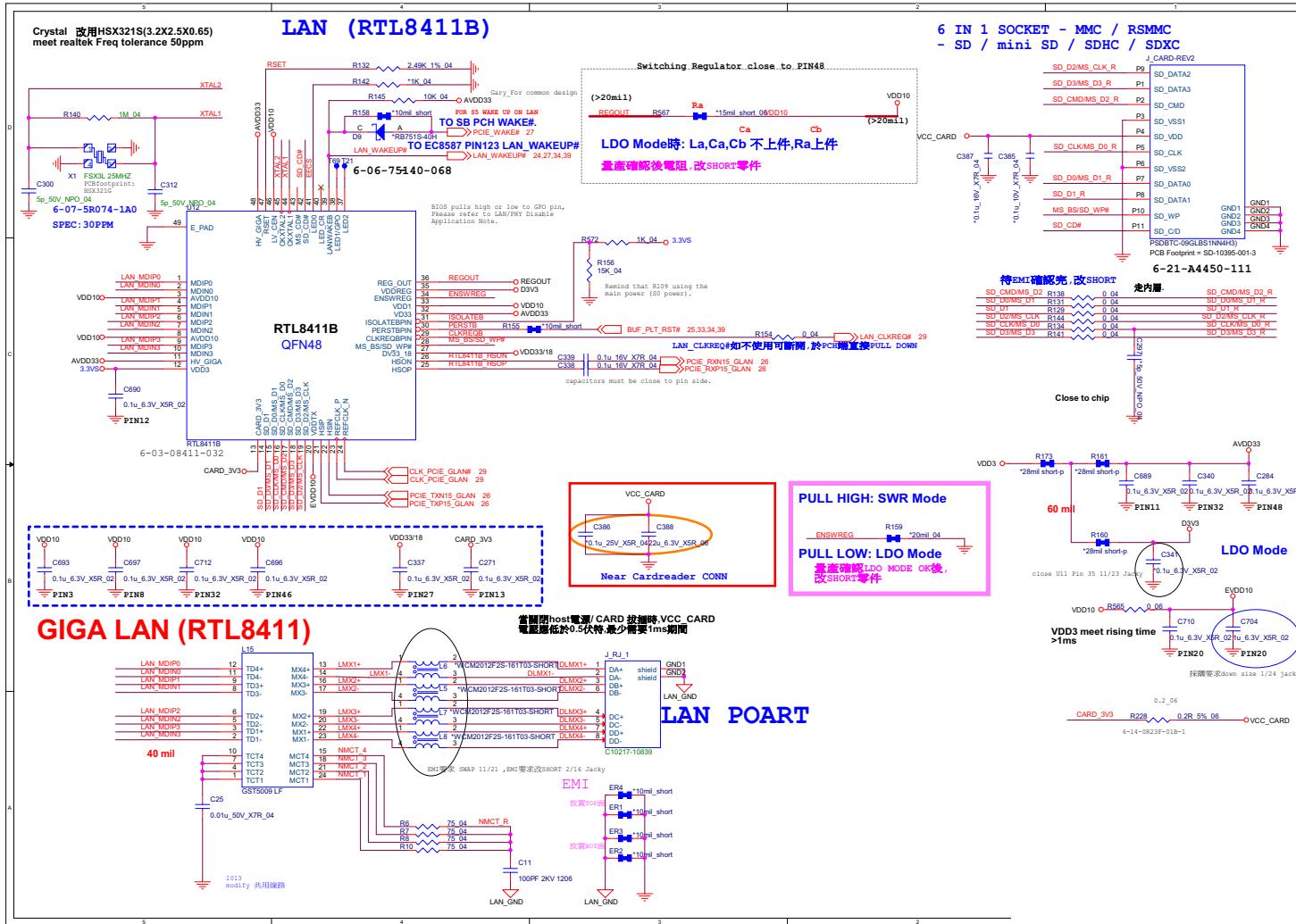
Schematic Diagrams

USB Charger

Sheet 35 of 64
USB Charger



Card Reader / LAN RTL8411B



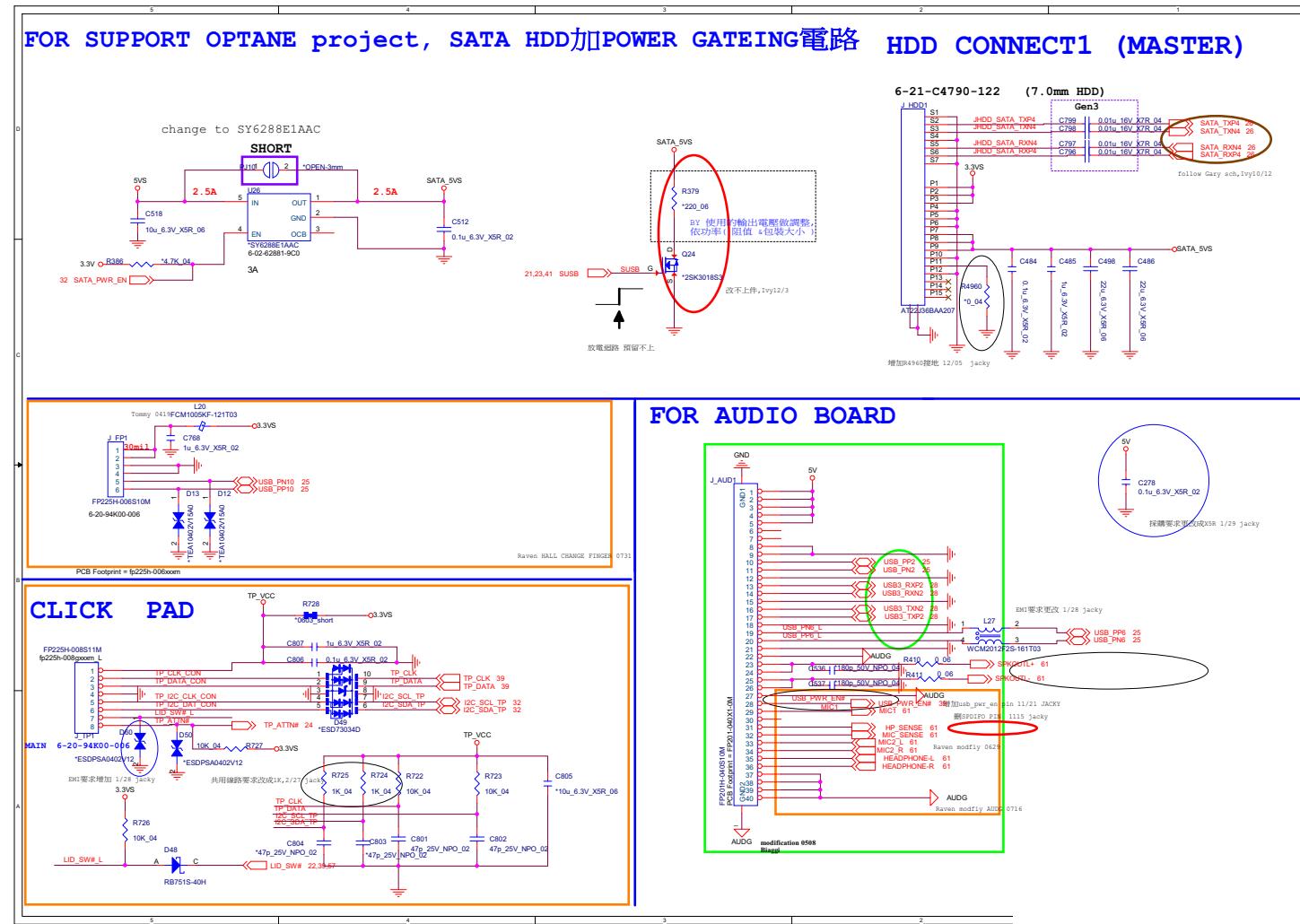
Sheet 36 of 64
Card Reader /
LAN RTL8411B

B.Schematic Diagrams

Schematic Diagrams

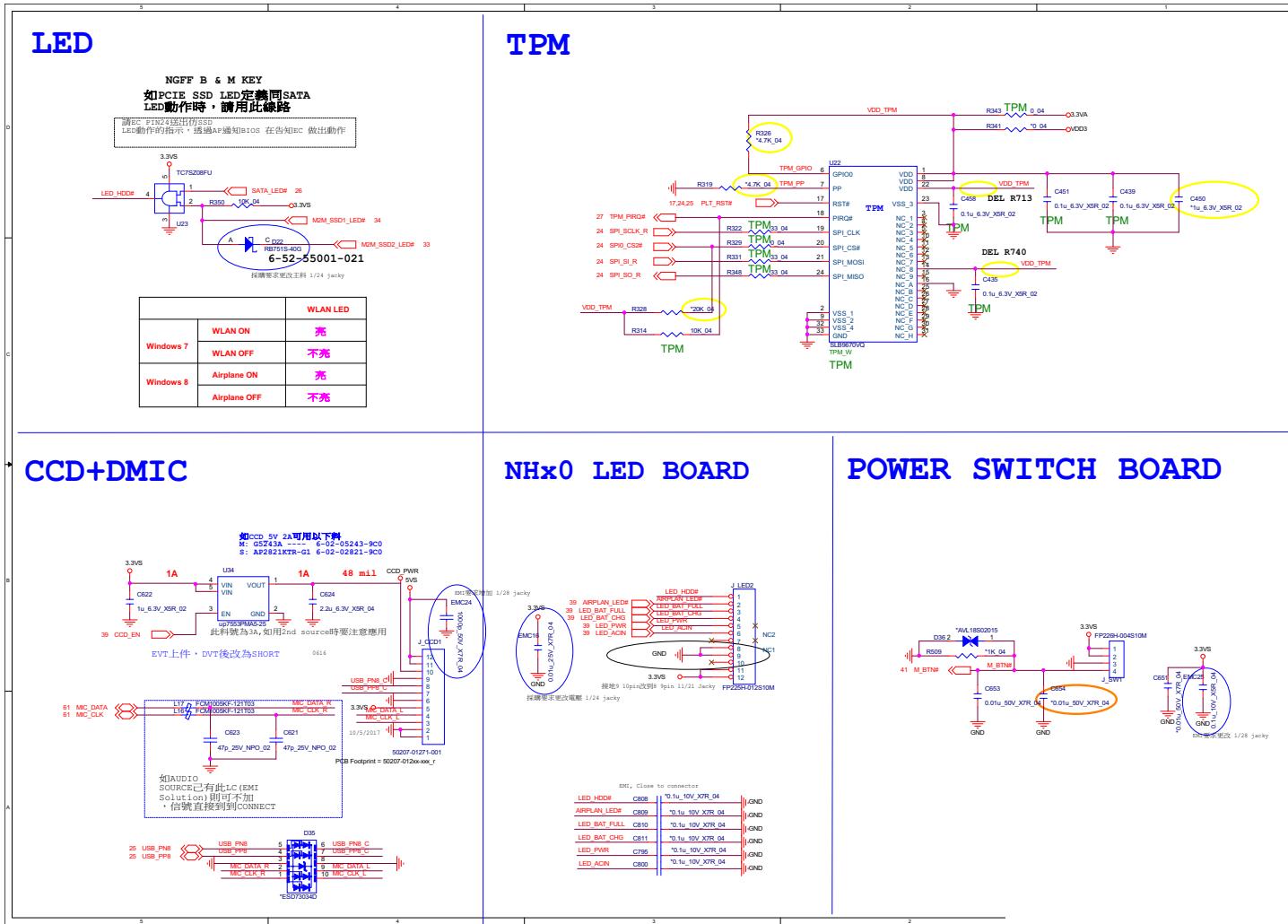
HDD, Click TP, Audio, Hall Con.

Sheet 37 of 64
HDD, Click TP,
Audio, Hall Con.



B - 38 HDD, Click TP, Audio, Hall Con.

LED, CCD, TPM, Power SW Con.

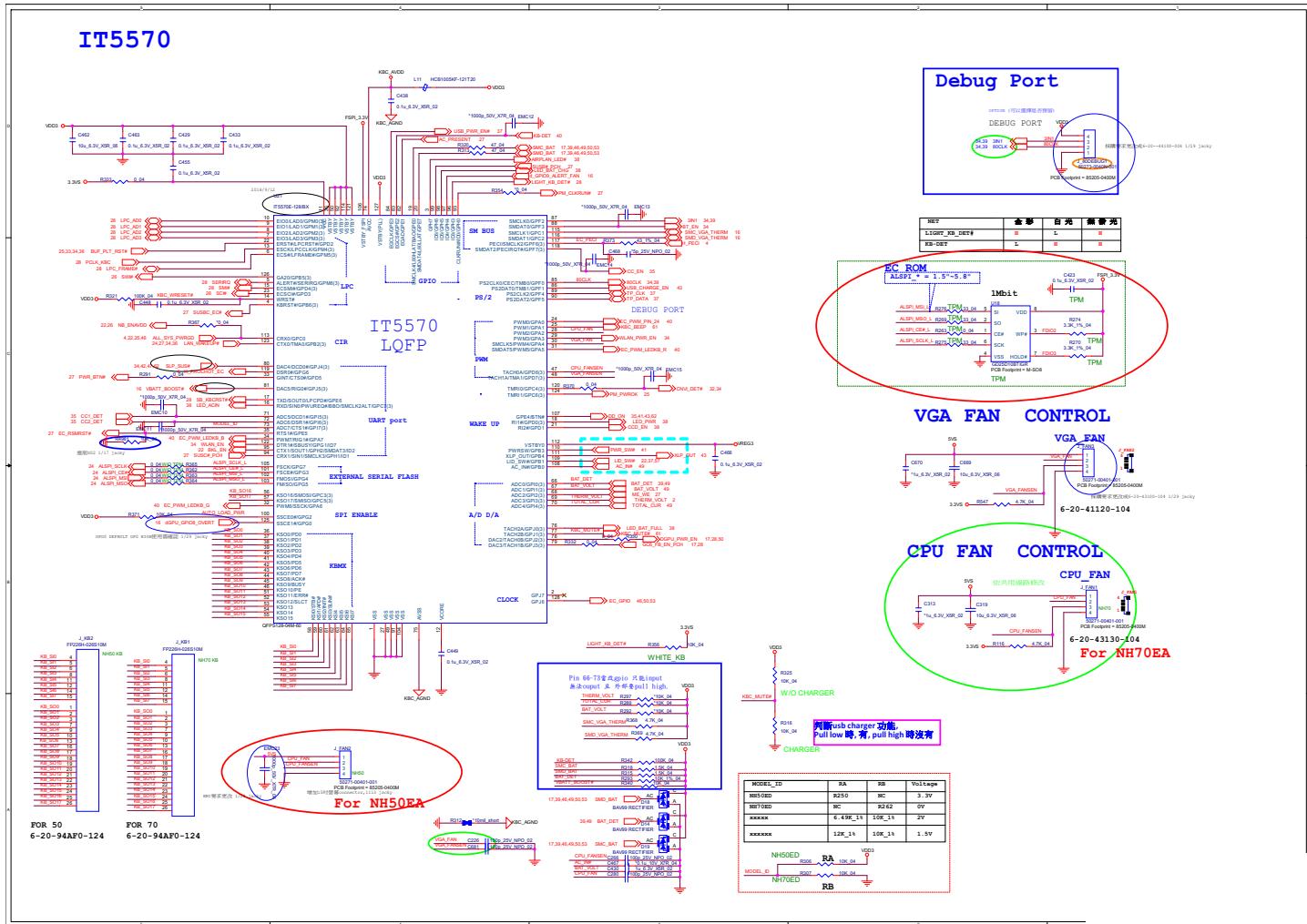


Sheet 38 of 64
LED, CCD, TPM,
Power SW Con.

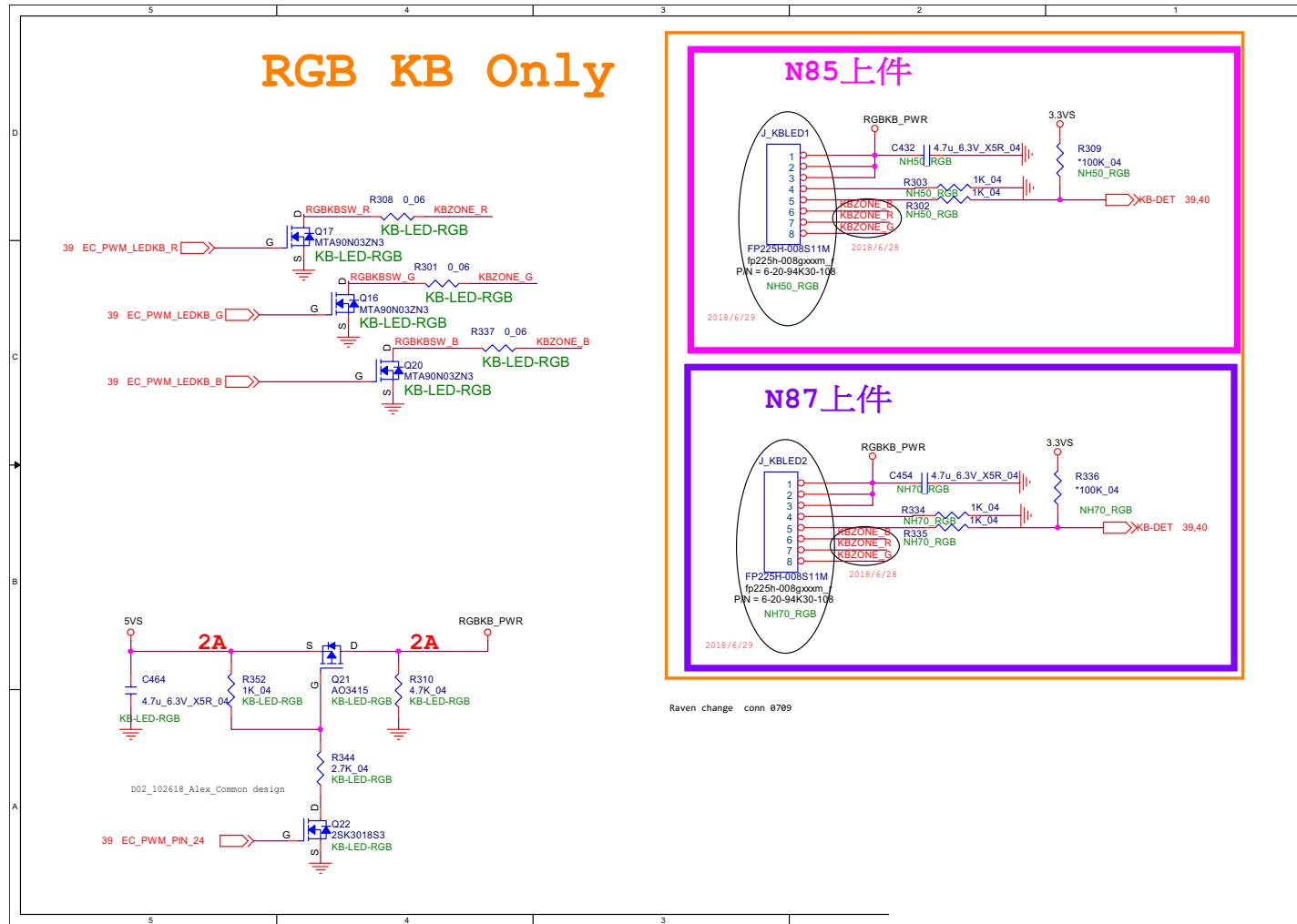
Schematic Diagrams

KBC-ITE IT5570

Sheet 39 of 64
KBC-ITE IT5570



RGB KB Only



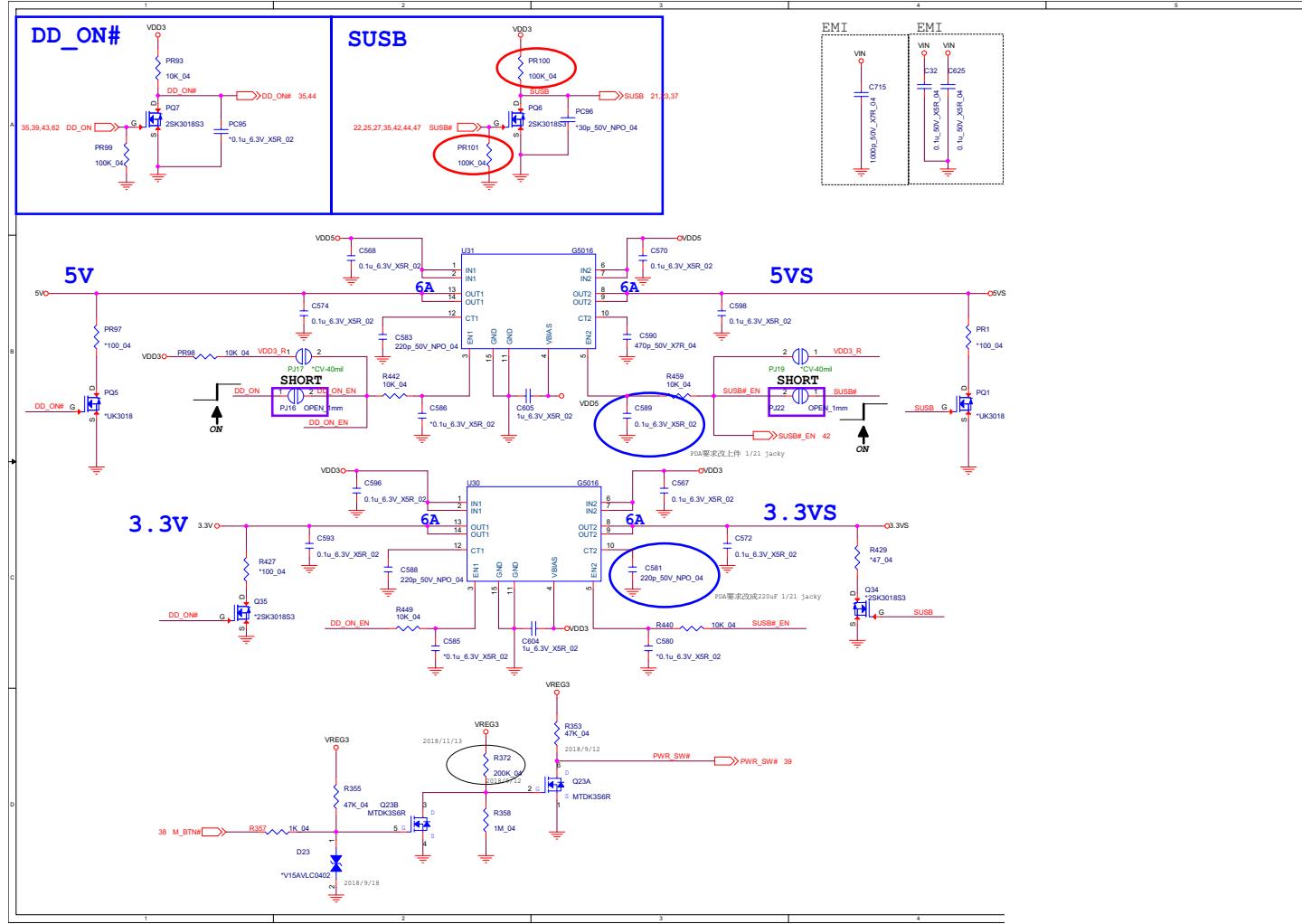
Sheet 40 of 64
RGB KB Only

B.Schematic Diagrams

Schematic Diagrams

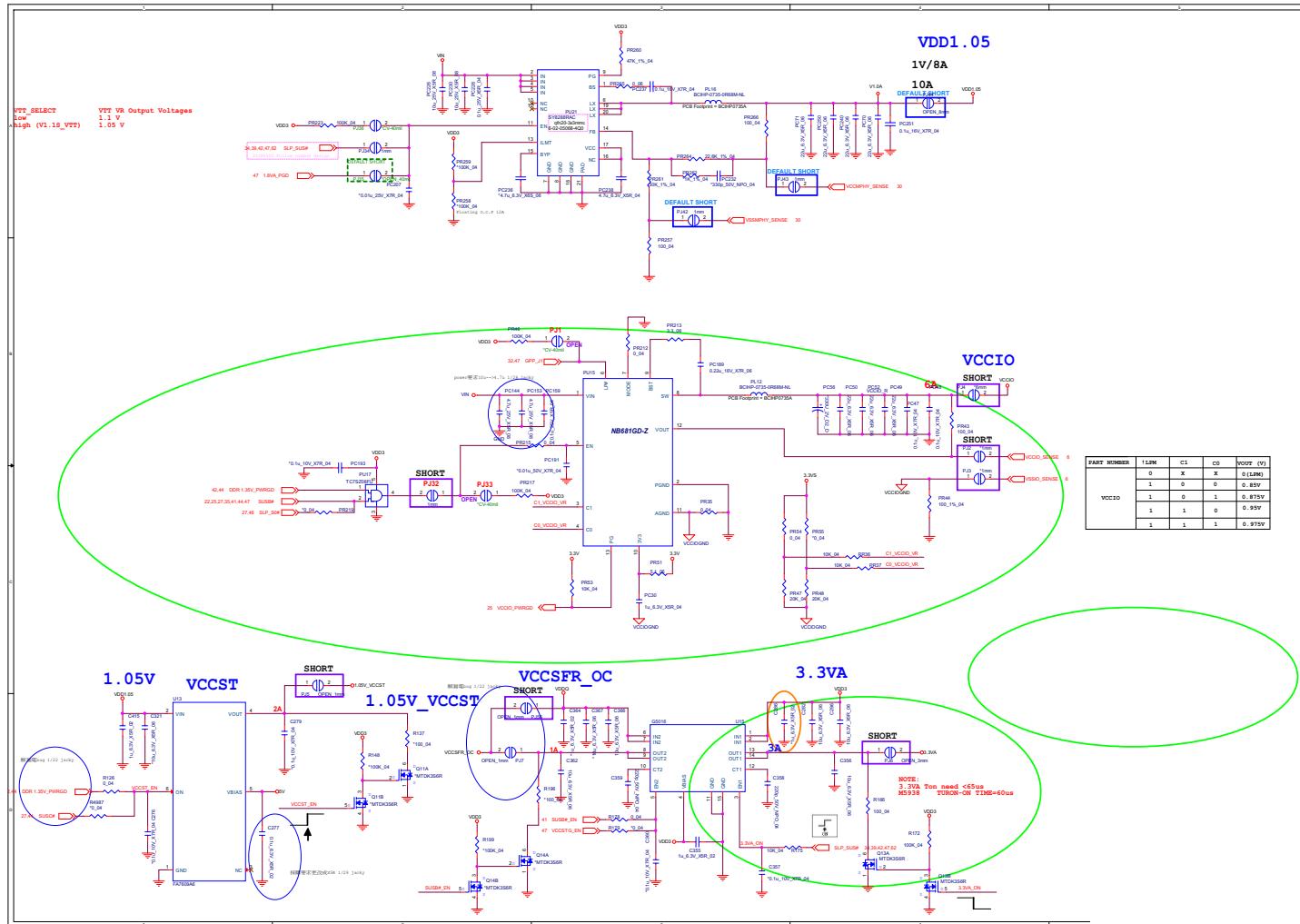
5V, 5VS, 3.3V, 3.3VS

Sheet 41 of 64
5V, 5VS, 3.3V,
3.3VS



B - 42 5V, 5VS, 3.3V, 3.3VS

VDD1.05V, VCCIO



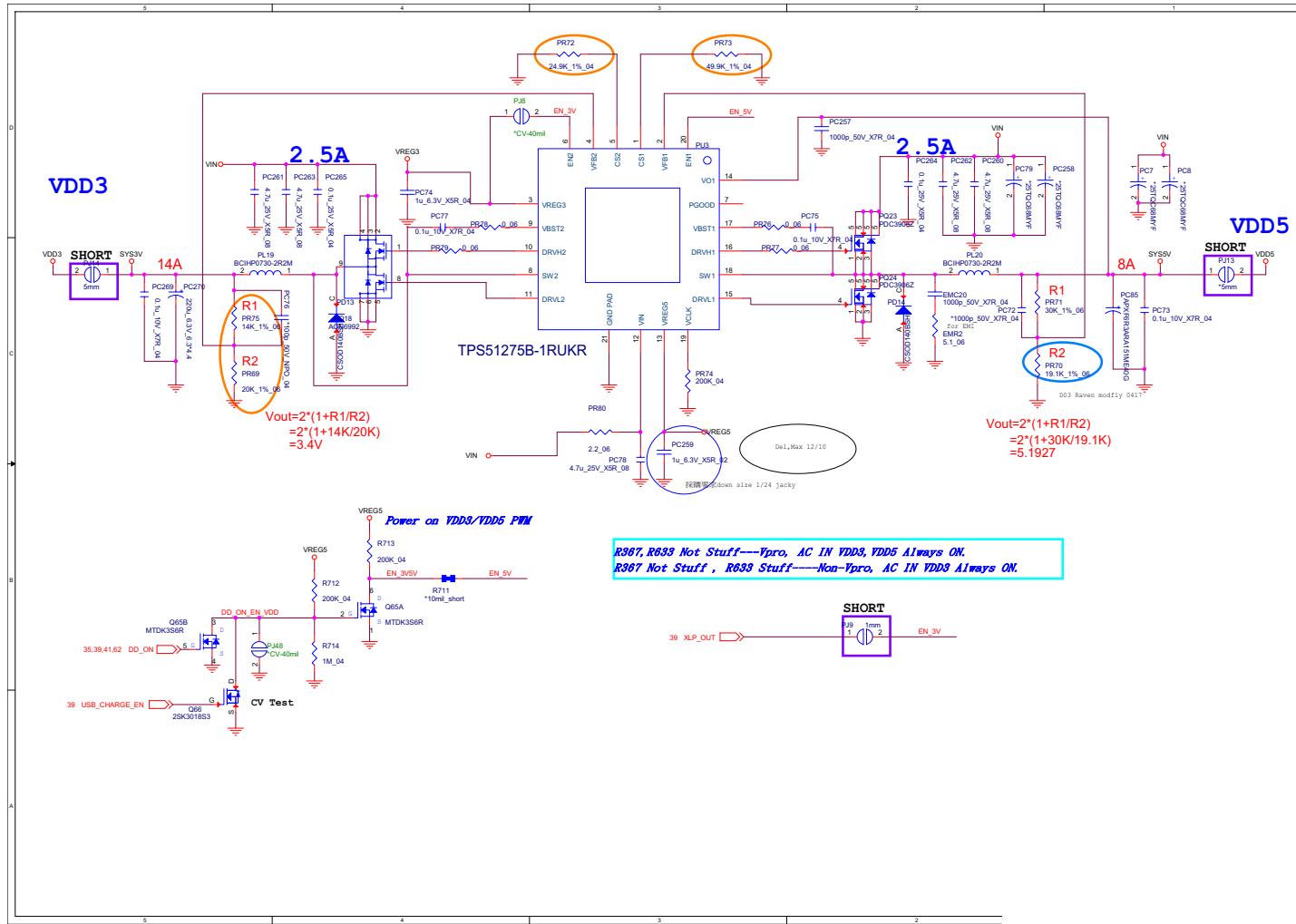
Sheet 42 of 64
VDD1.05V, VCCIO

B.Schematic Diagrams

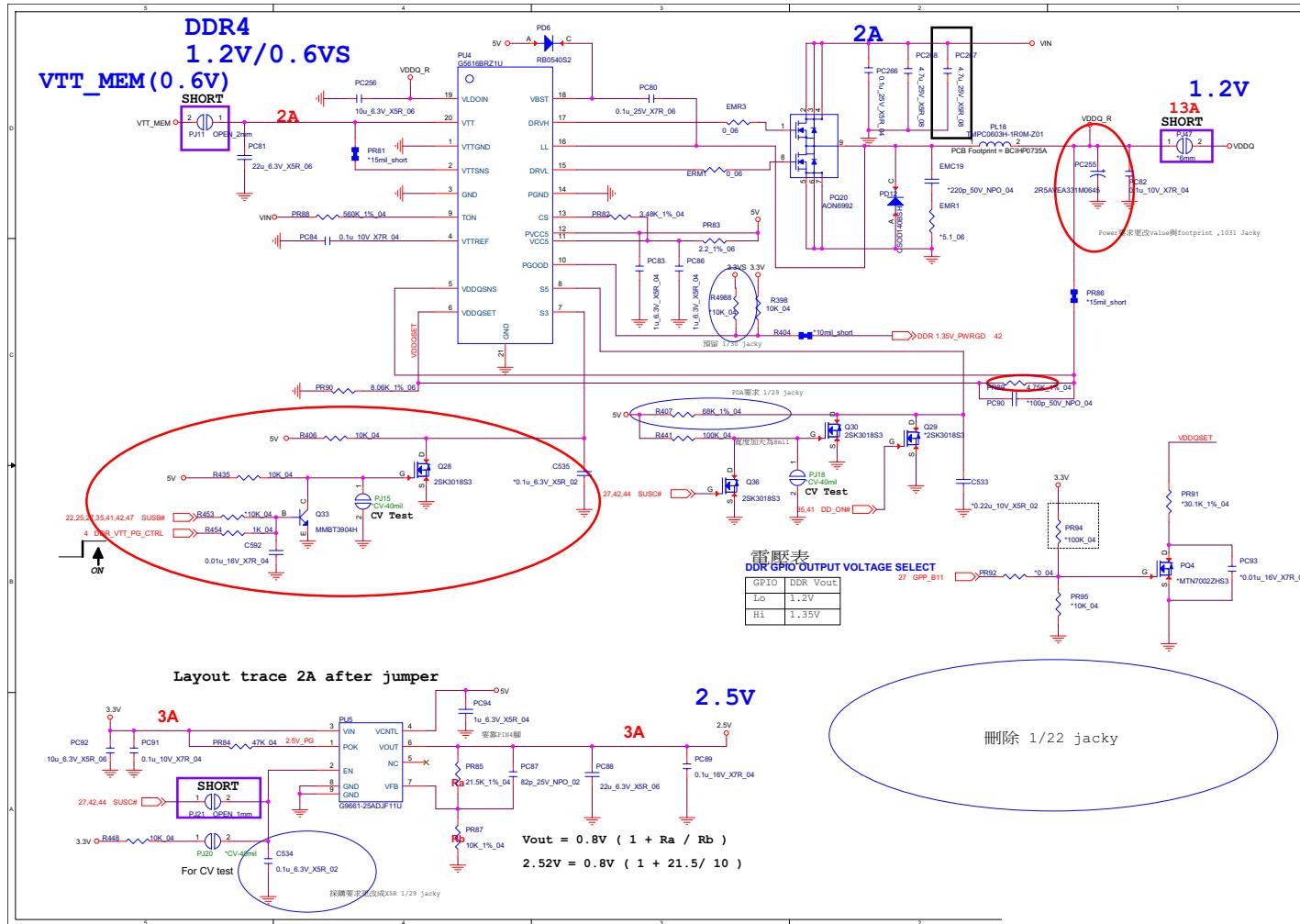
Schematic Diagrams

VDD3, VDD5

Sheet 43 of 64
VDD3, VDD5



DDR 1.2V / 0.6VS, 2.5V

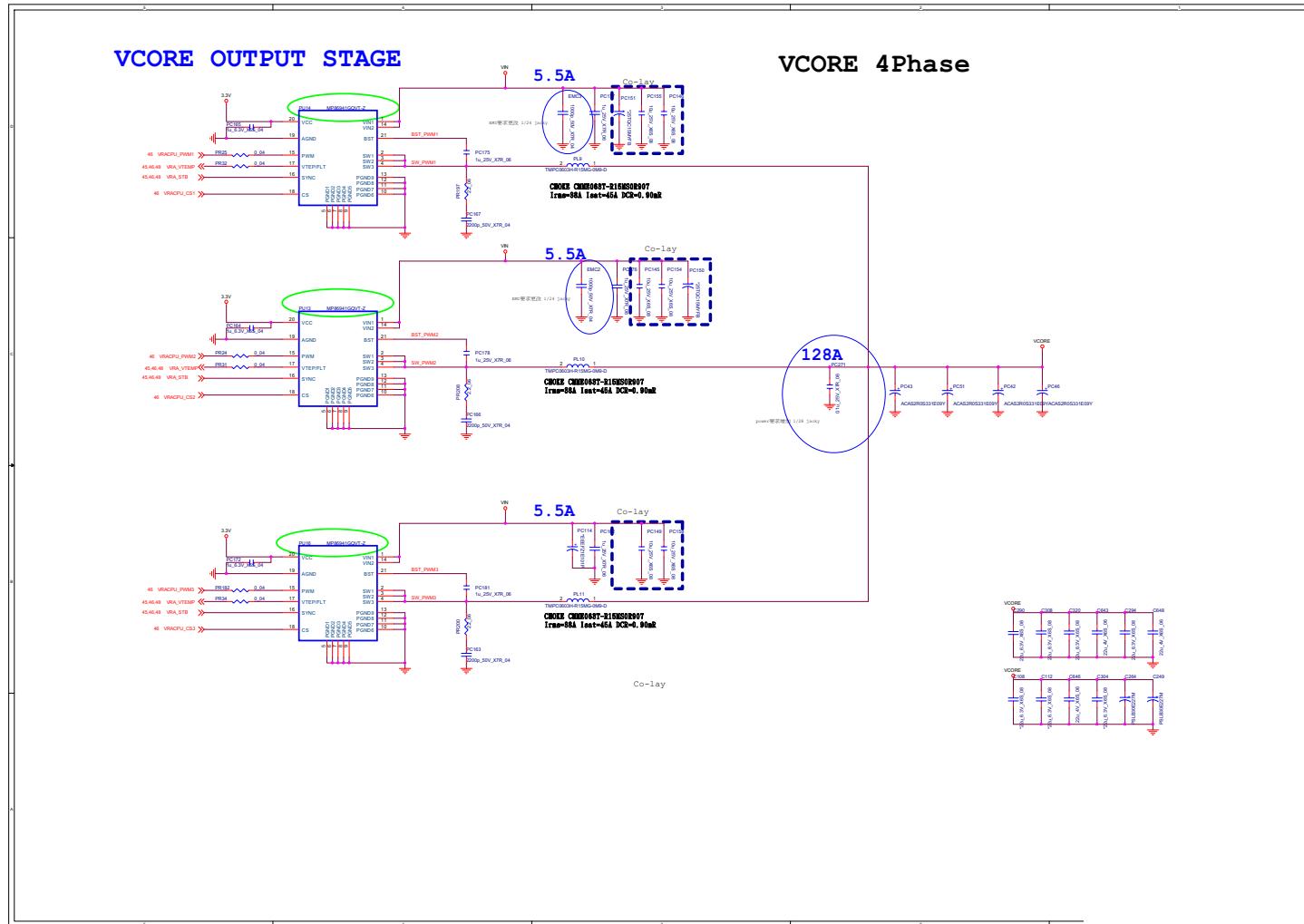


Sheet 44 of 64
DDR 1.2V / 0.6VS,
2.5V

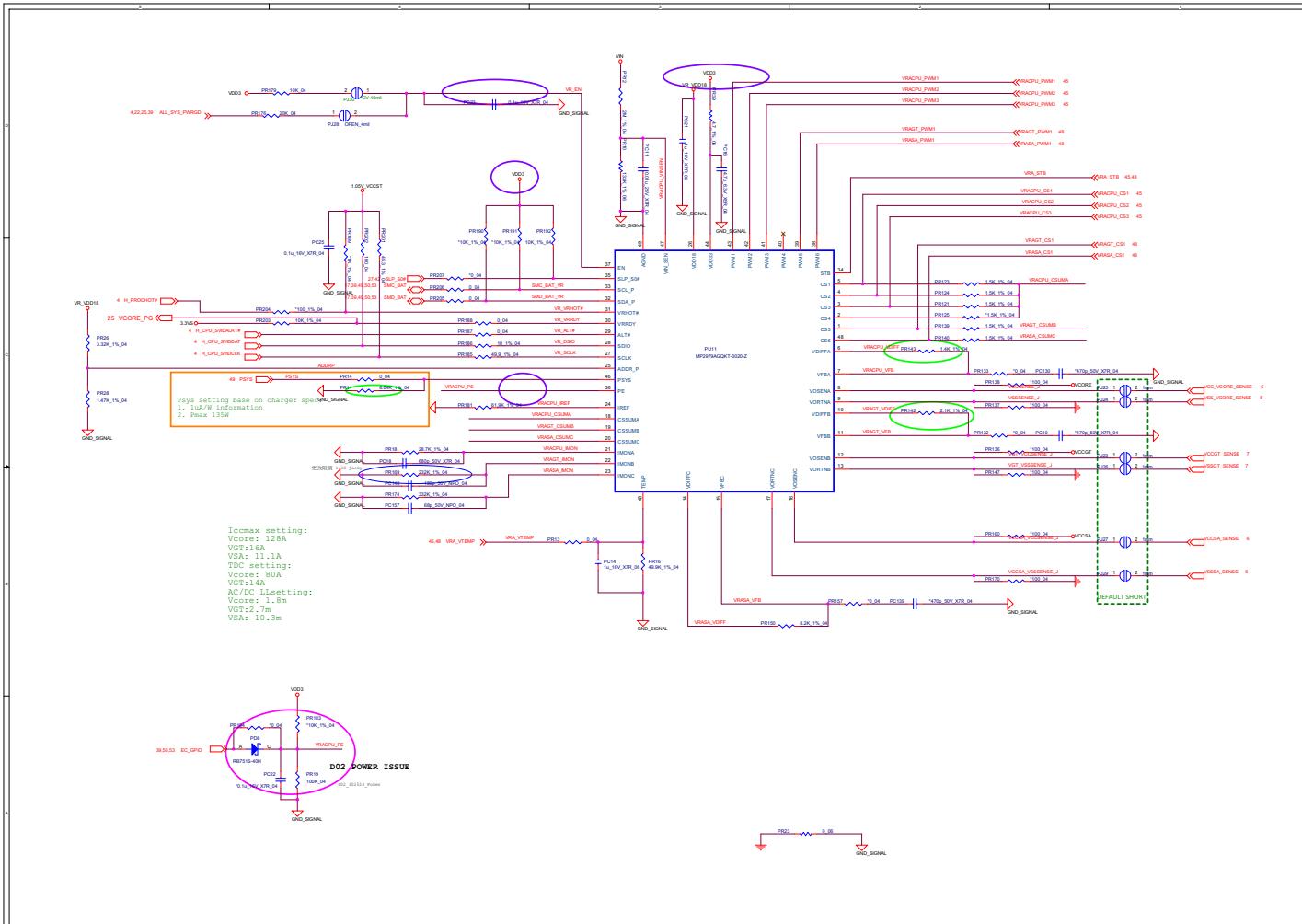
Schematic Diagrams

VCore Output Stage

Sheet 45 of 64
VCore Output
Stage



VCC_Core & VCCGT

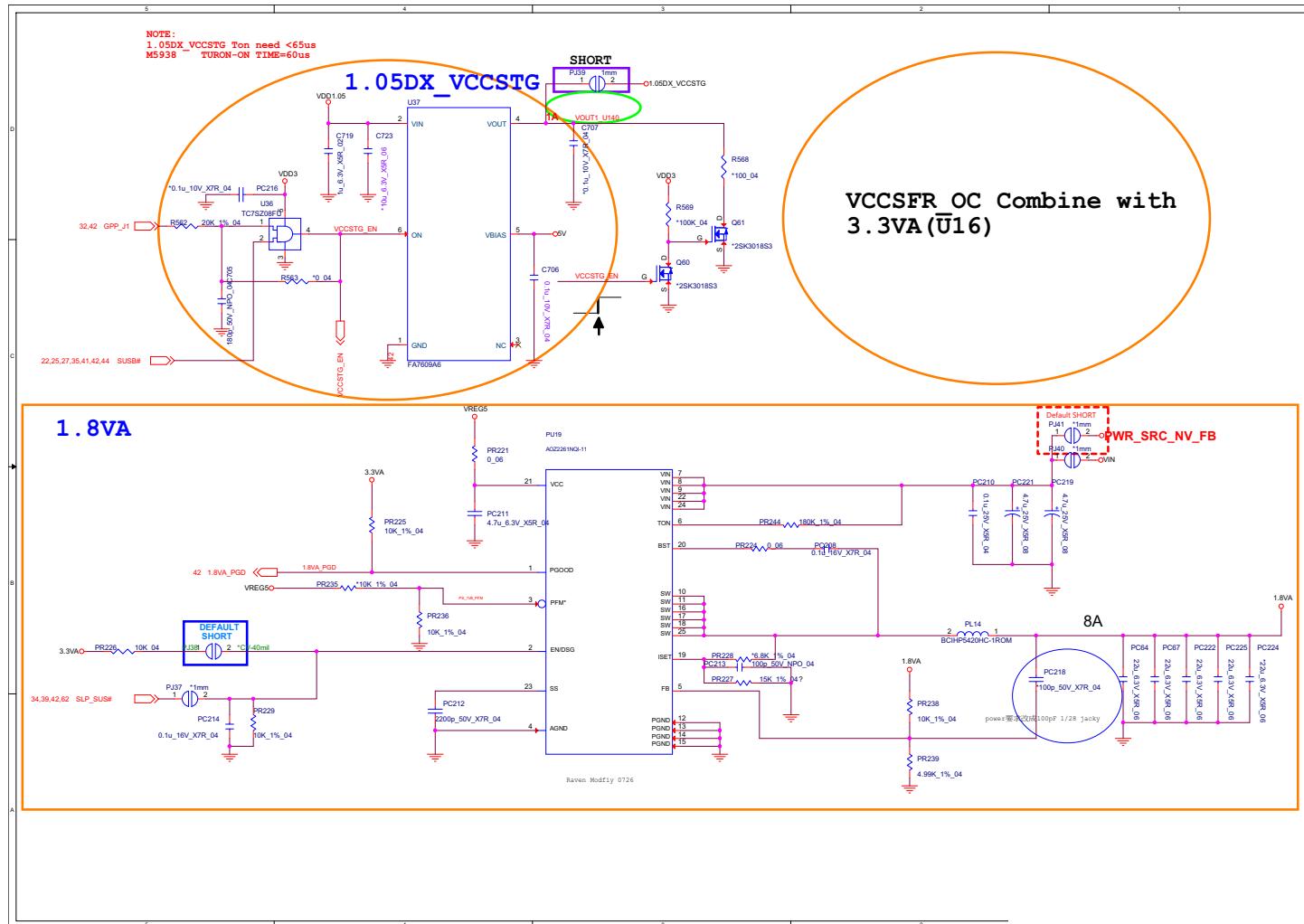


Sheet 46 of 64
VCC_Core &
VCCGT

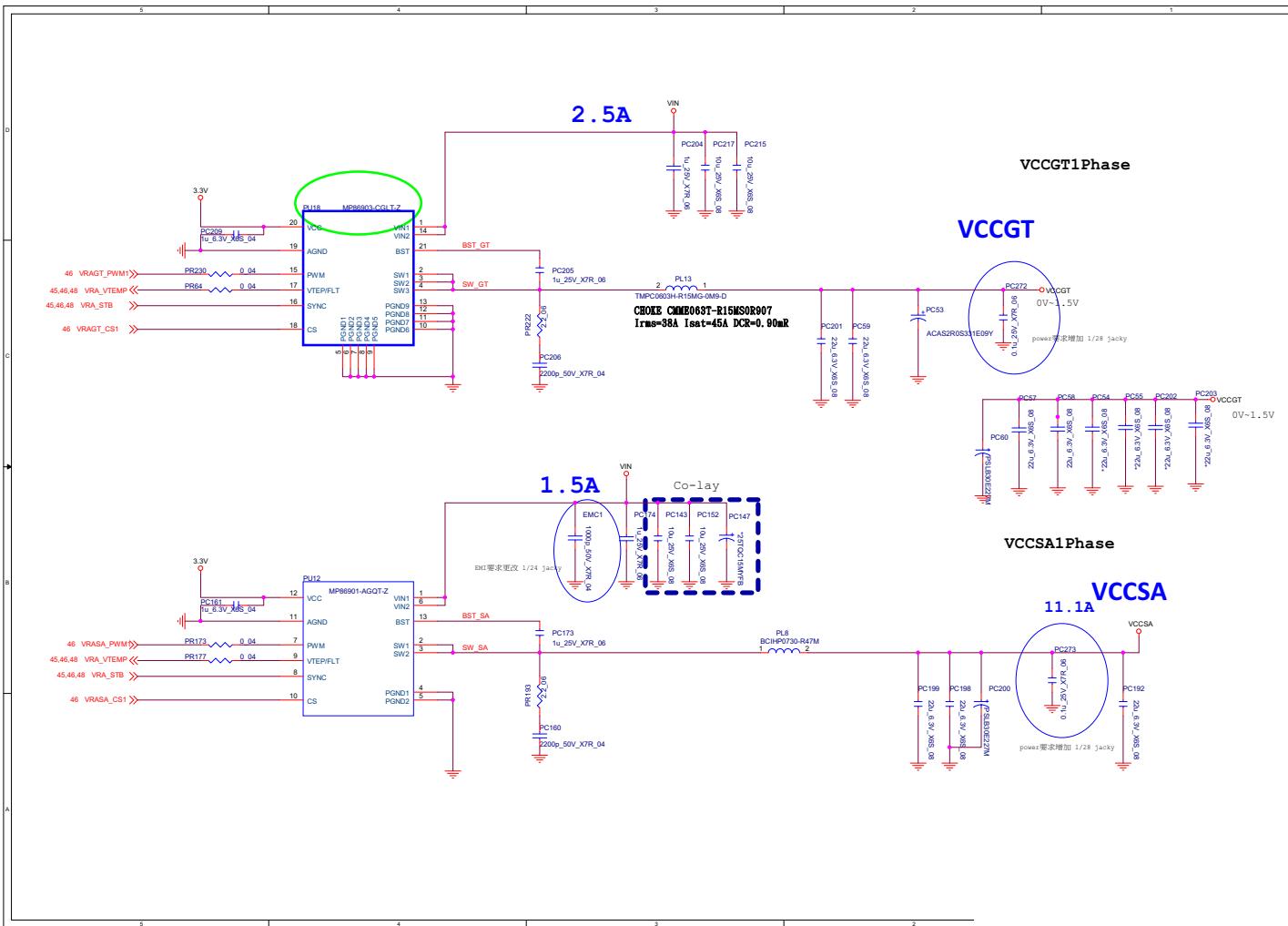
Schematic Diagrams

1.05DX_VCCSTG/VCCSFR_OC

Sheet 47 of 64
1.05DX_VCCSTG/
VCCSFR_OC



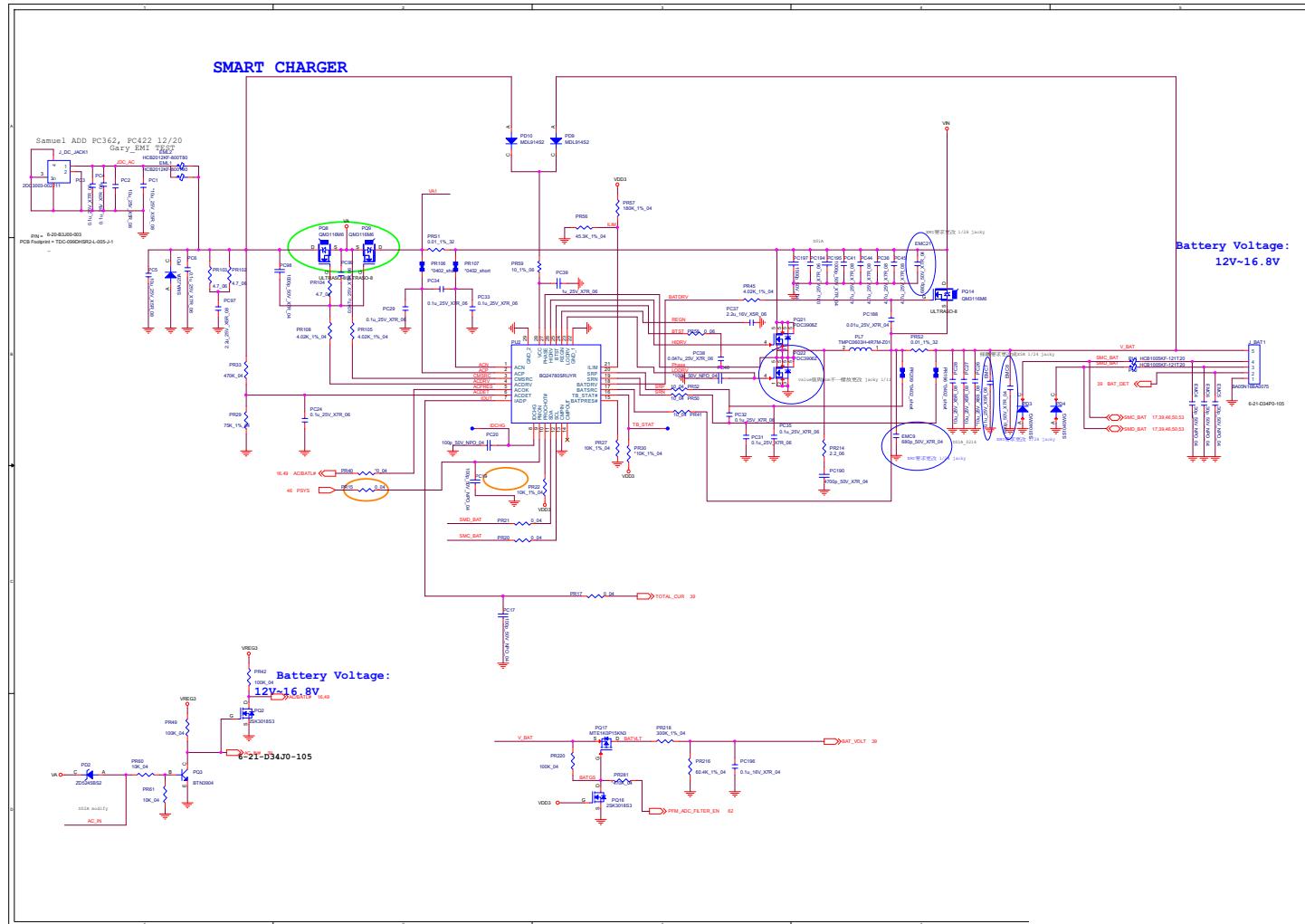
VCCGT & VCCSA Output Stage



Sheet 48 of 64
VCCGT & VCCSA
Output Stage

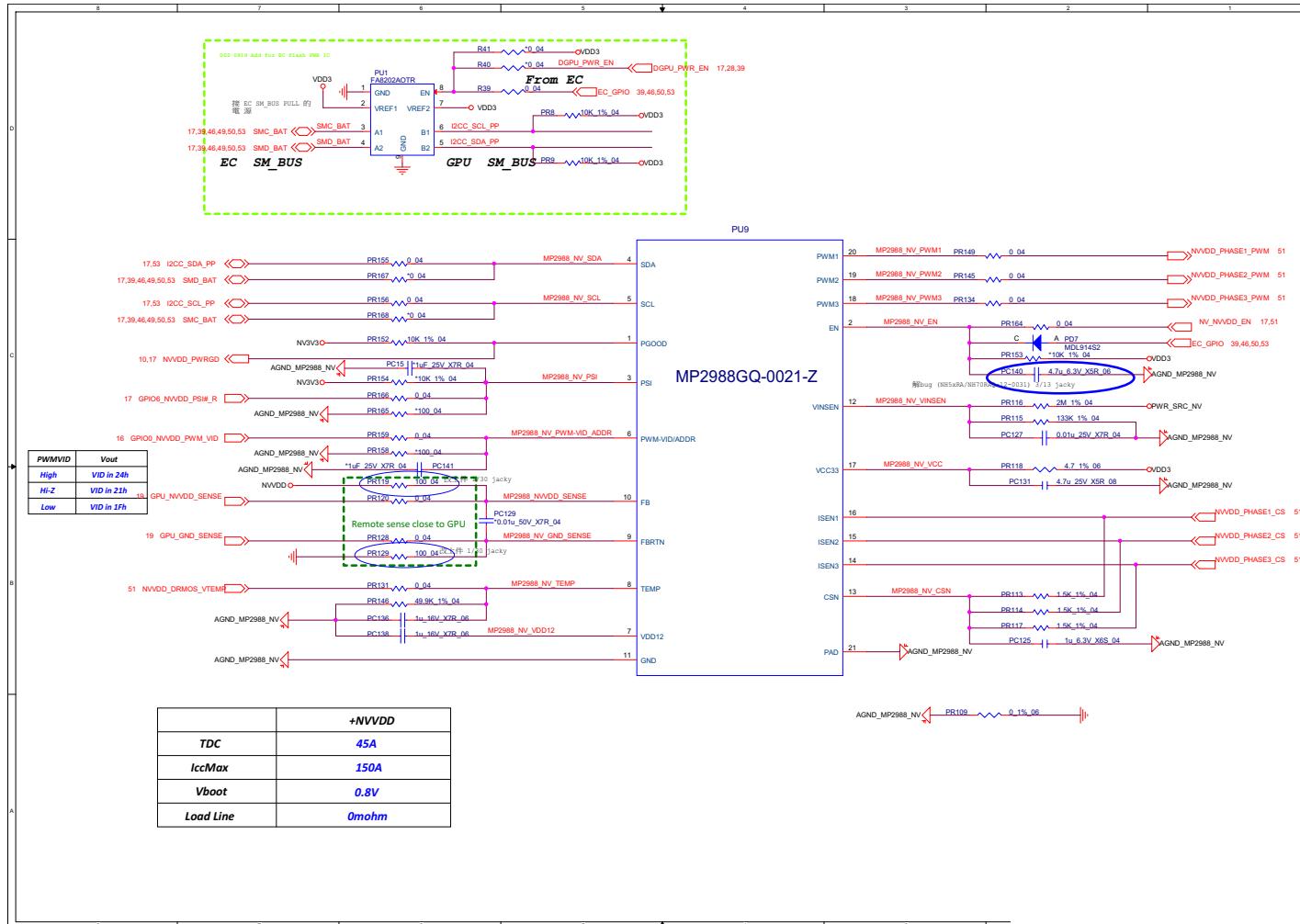
Schematic Diagrams**AC_In, Charger**

Sheet 49 of 64
AC_In, Charger



B - 50 AC_In, Charger

NVVDD1



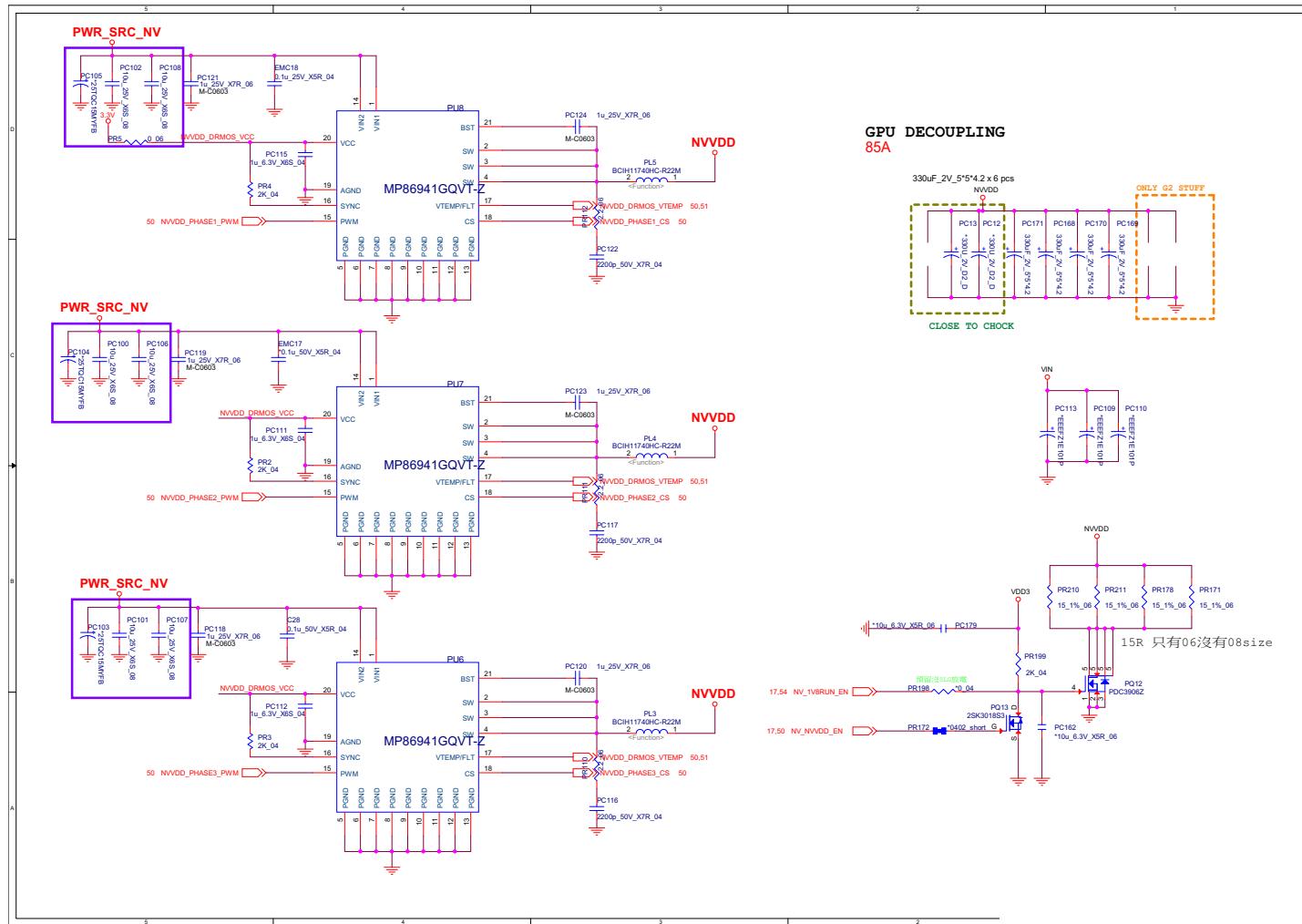
Sheet 50 of 64
NVVDD1

B.Schematic Diagrams

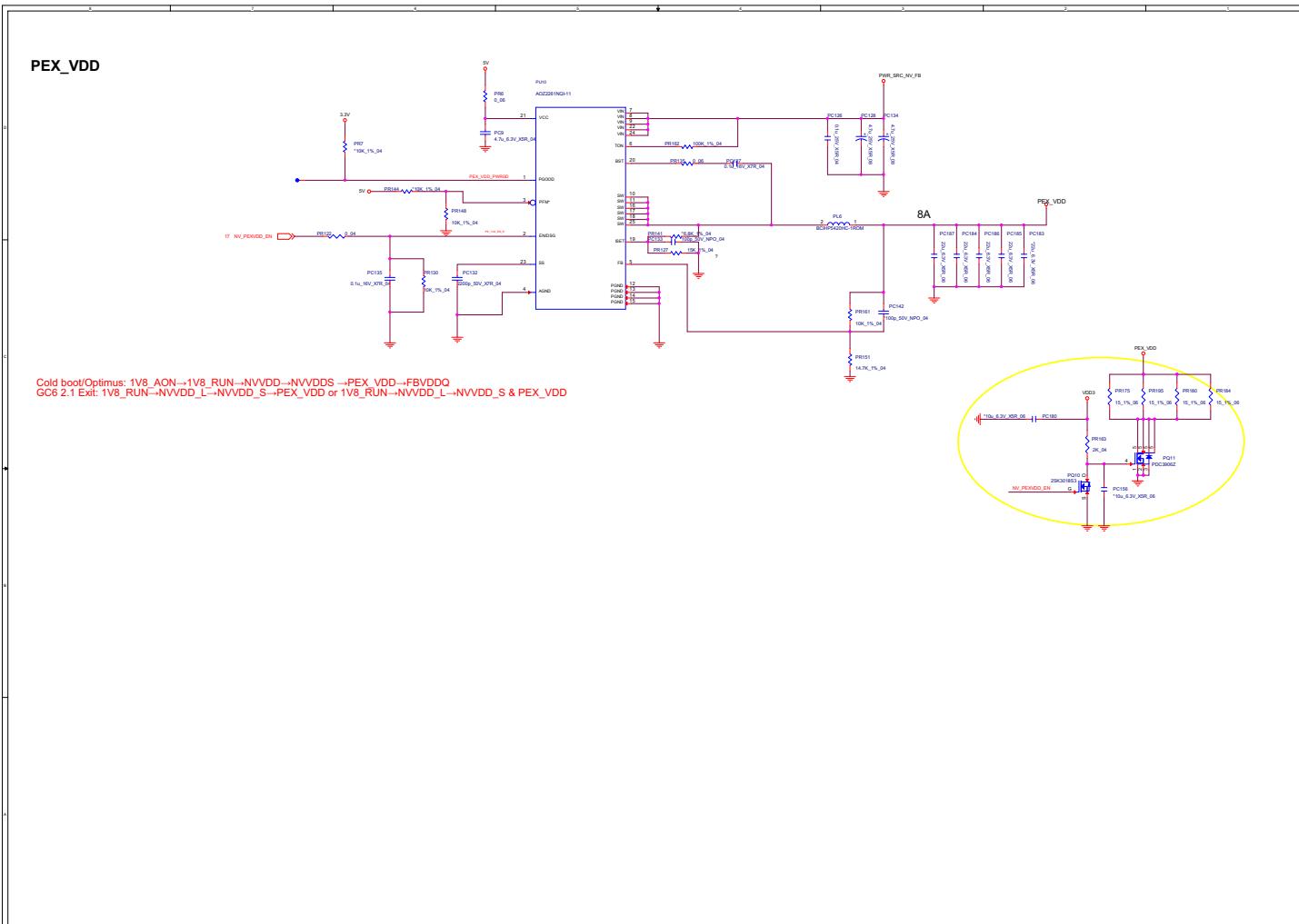
Schematic Diagrams

NVVDD2

Sheet 51 of 64
NVVDD2



PEX_VDD

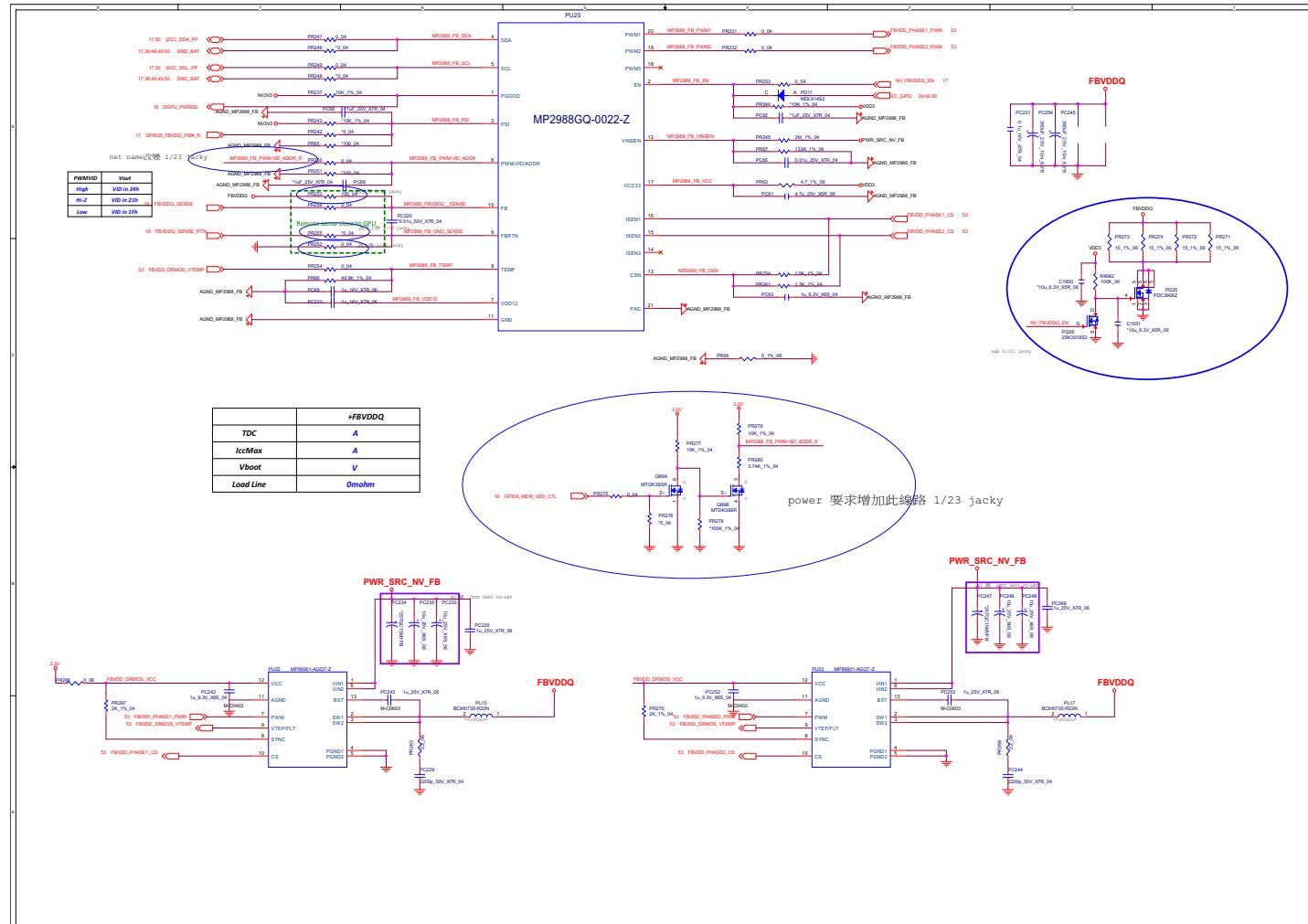


Sheet 52 of 64
PEX_VDD

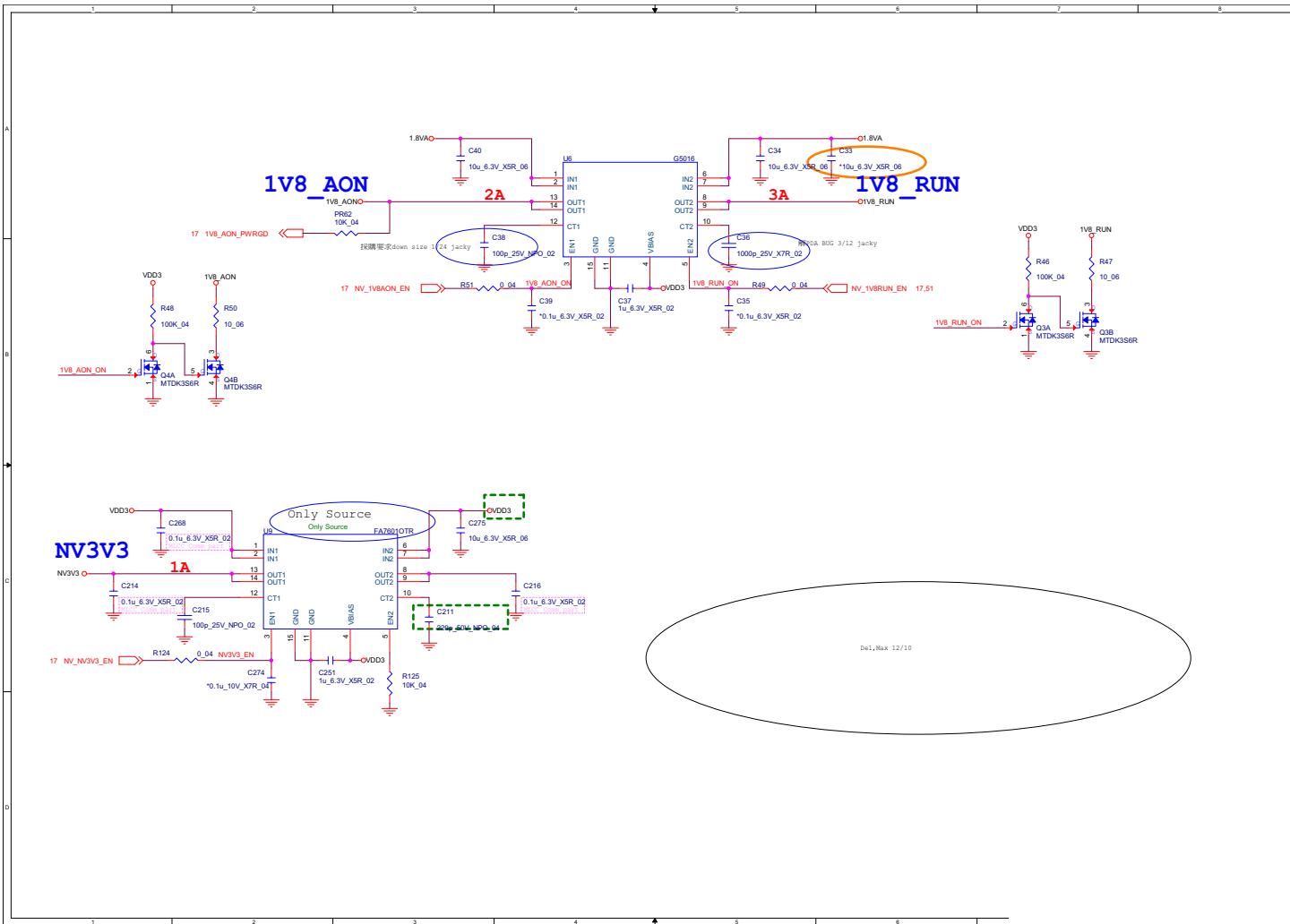
Schematic Diagrams

FBVDDQ

Sheet 53 of 64
FBVDDQ



1V8_RUN/AON

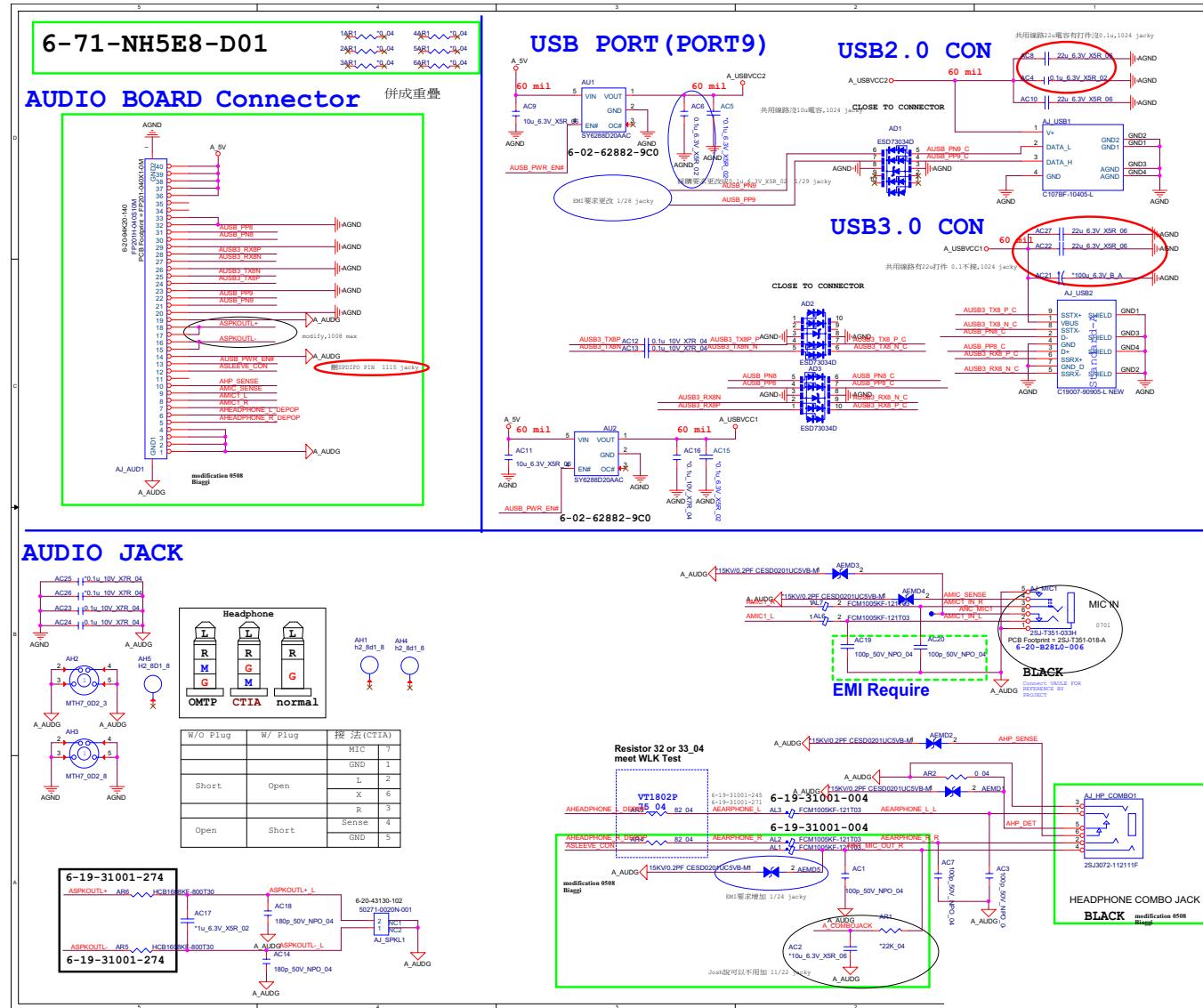


Sheet 54 of 64
1V8_RUN/AON

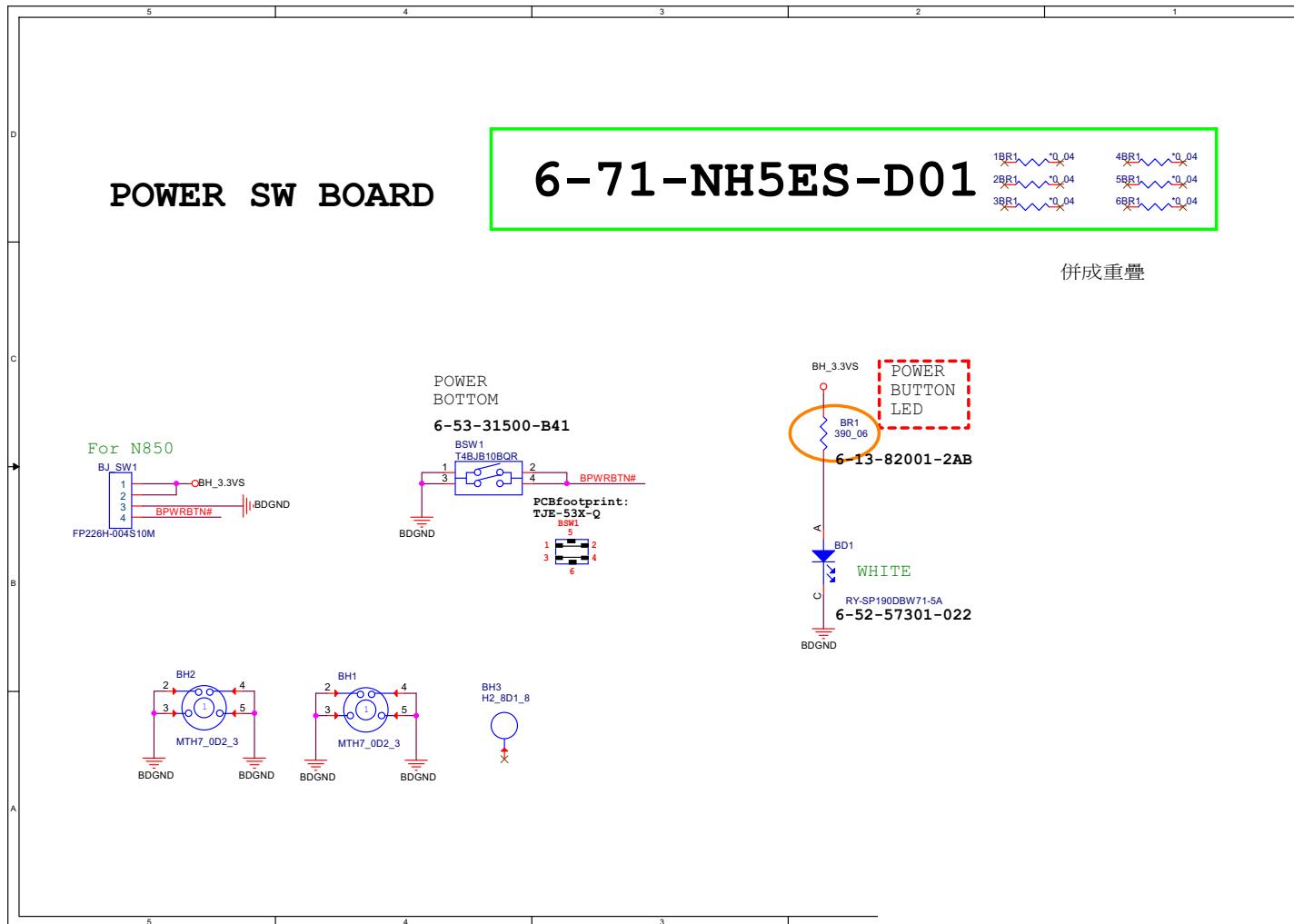
Schematic Diagrams

Audio Board

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Audio Board



NH50 PW Board

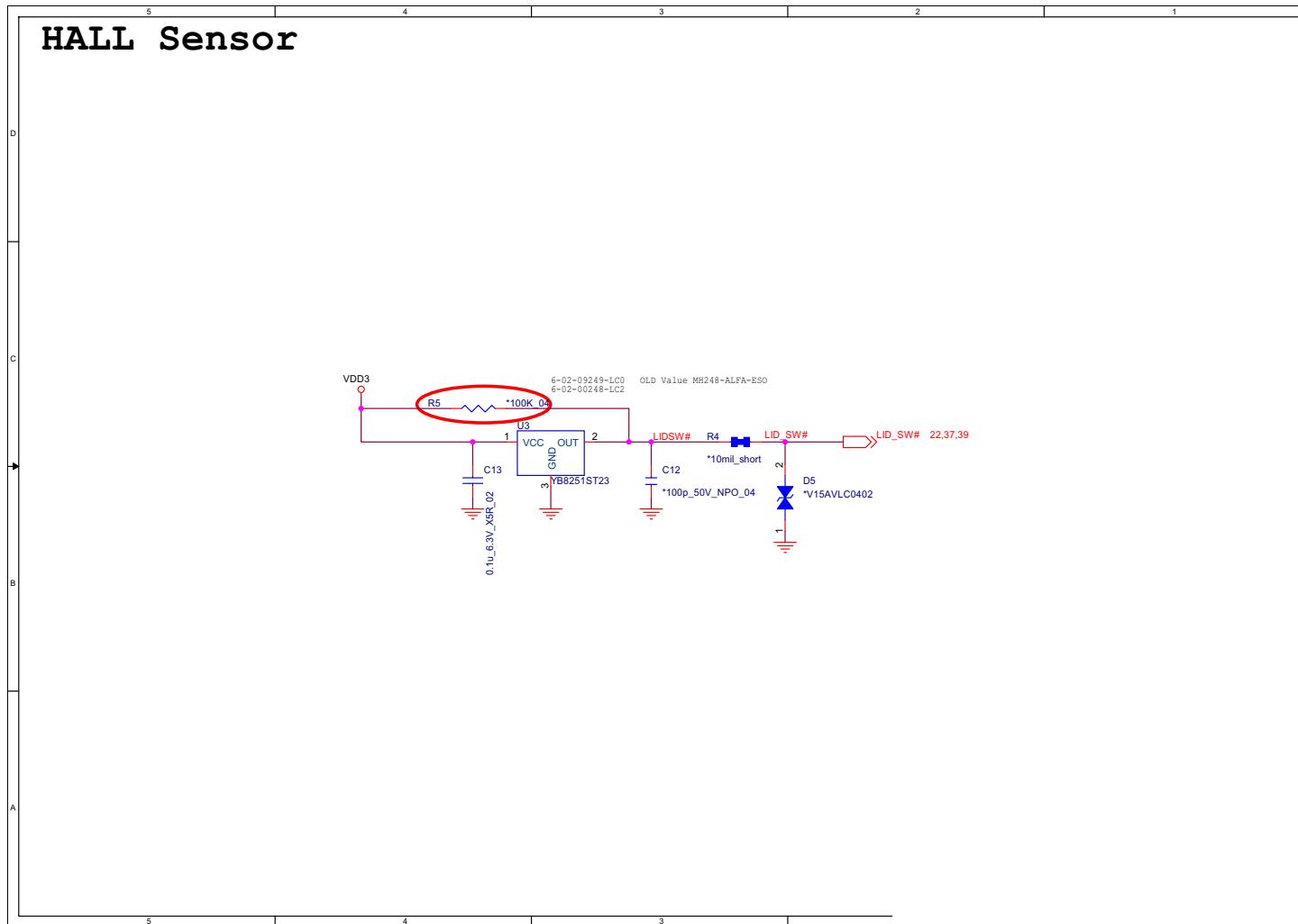


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NH50 PW Board

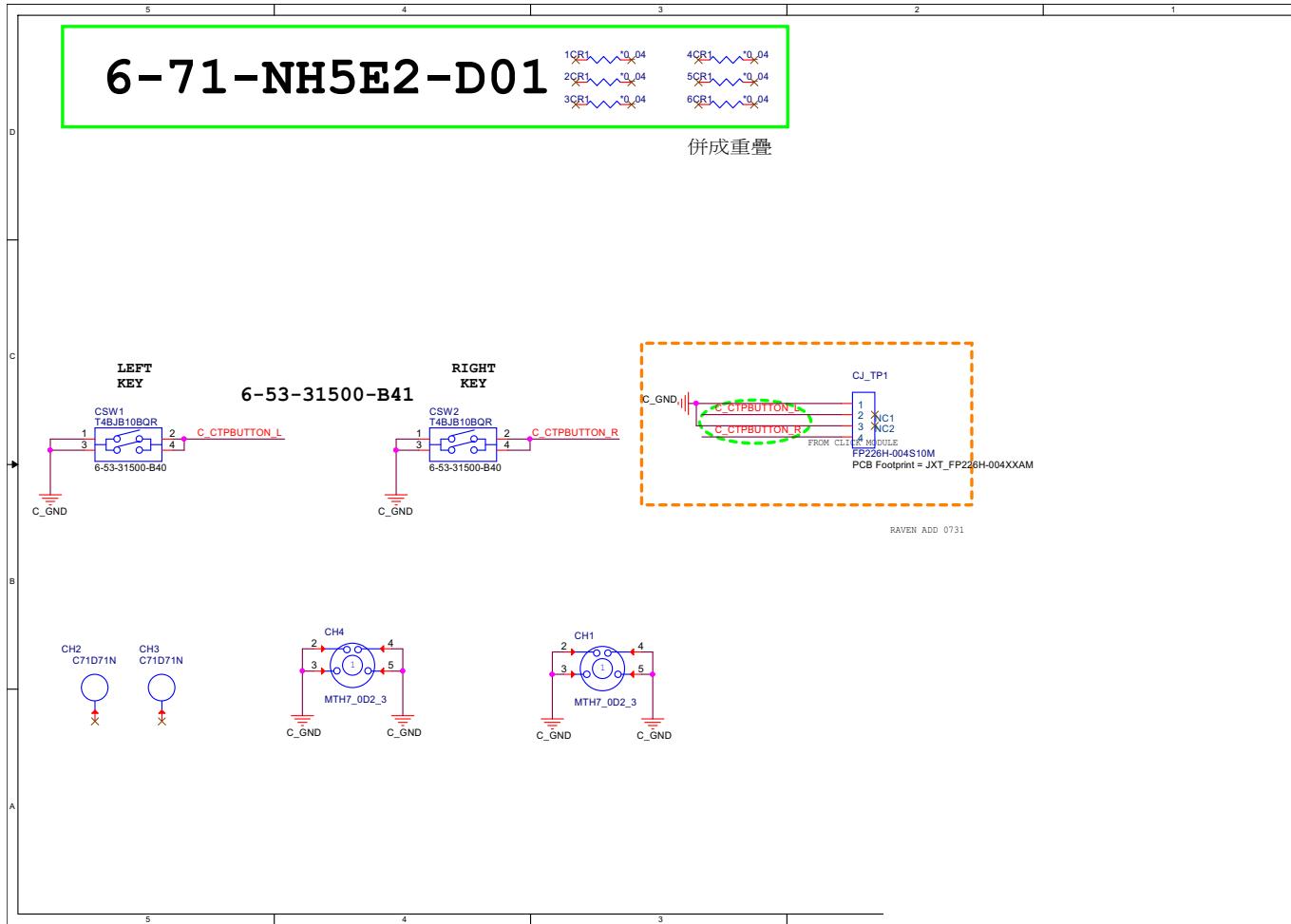
Schematic Diagrams

Hall Sensor Board

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Hall Sensor Board



Click Board

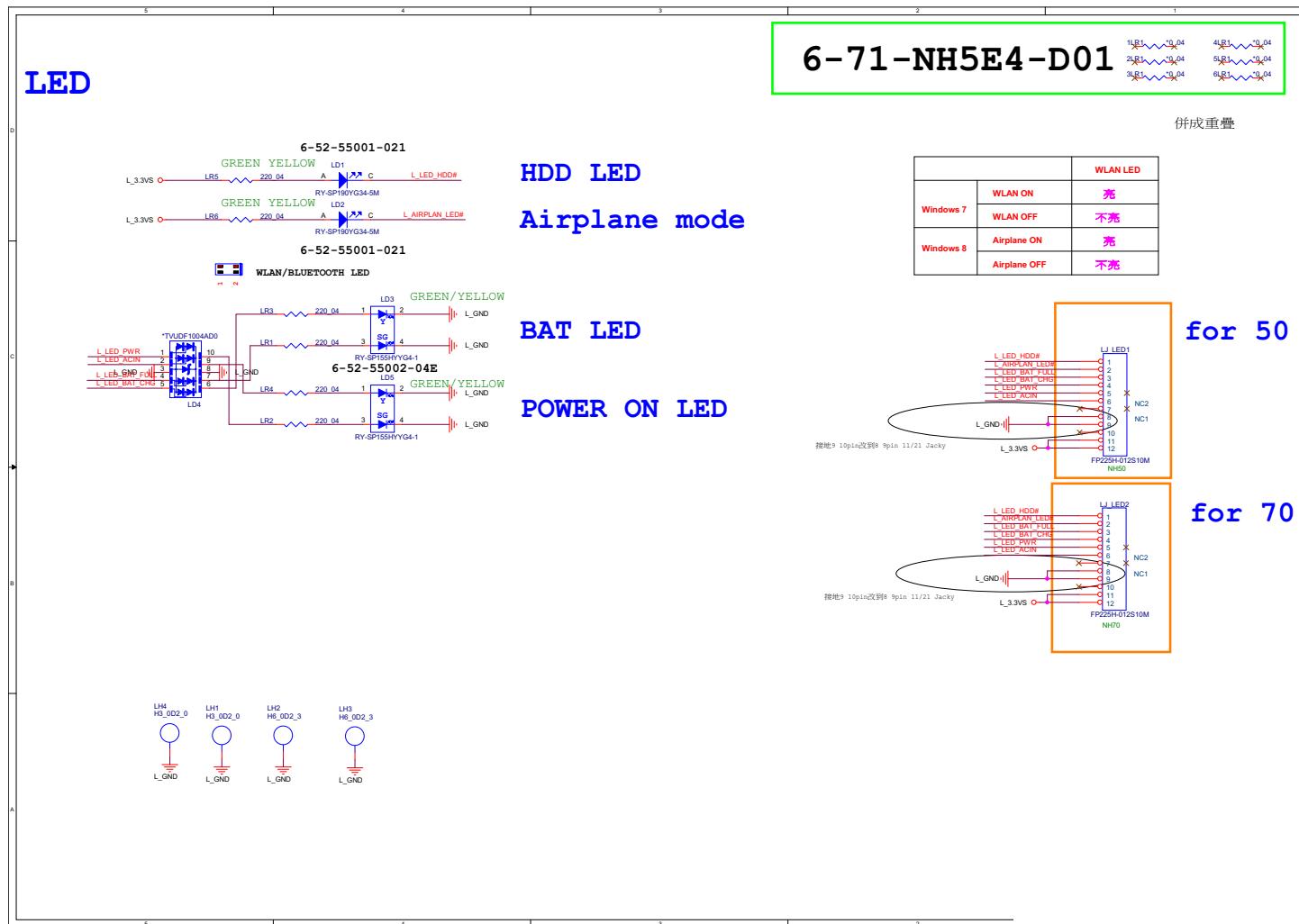


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Click Board

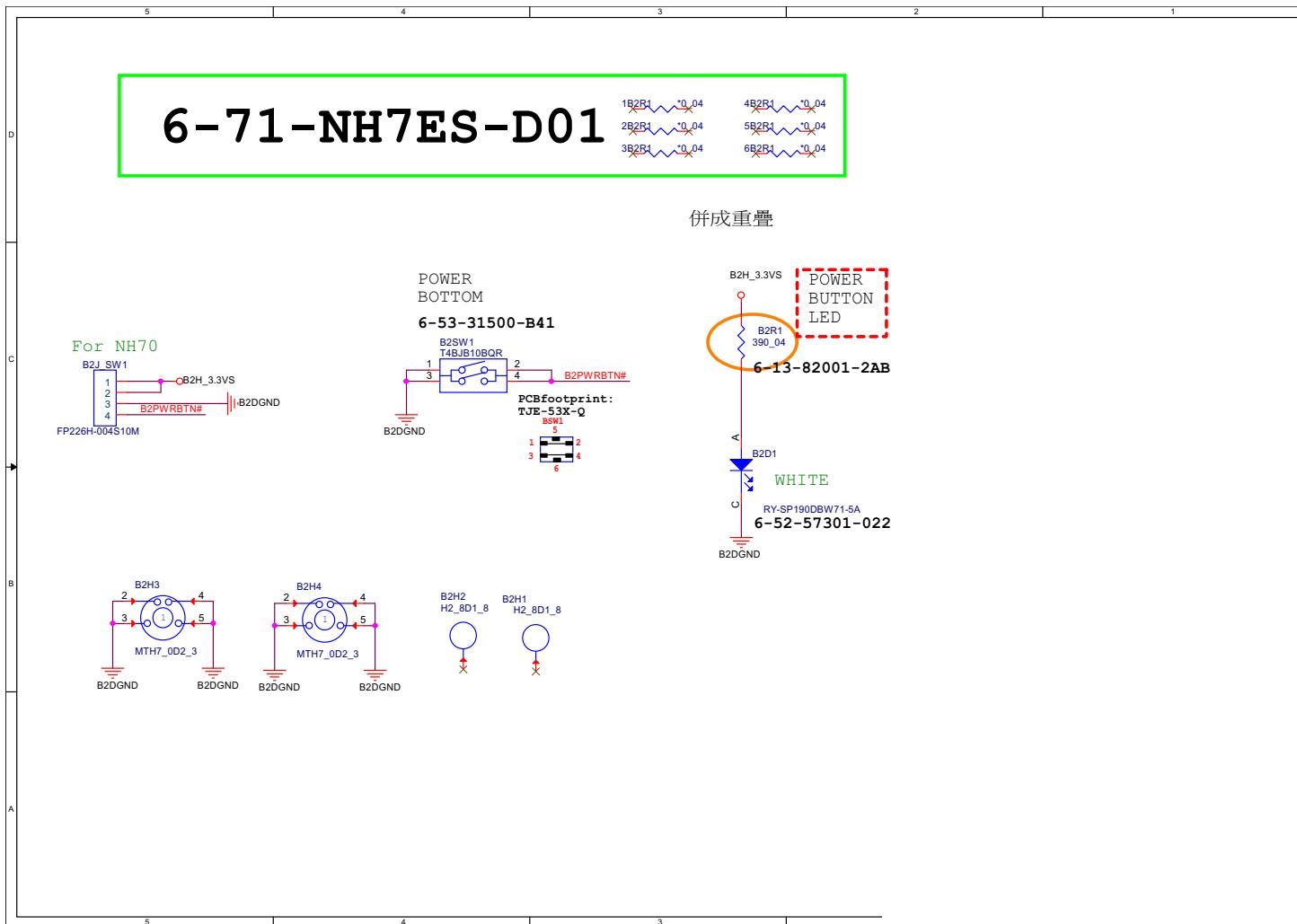
Schematic Diagrams

LED Board

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LED Board



NH70 PW Board

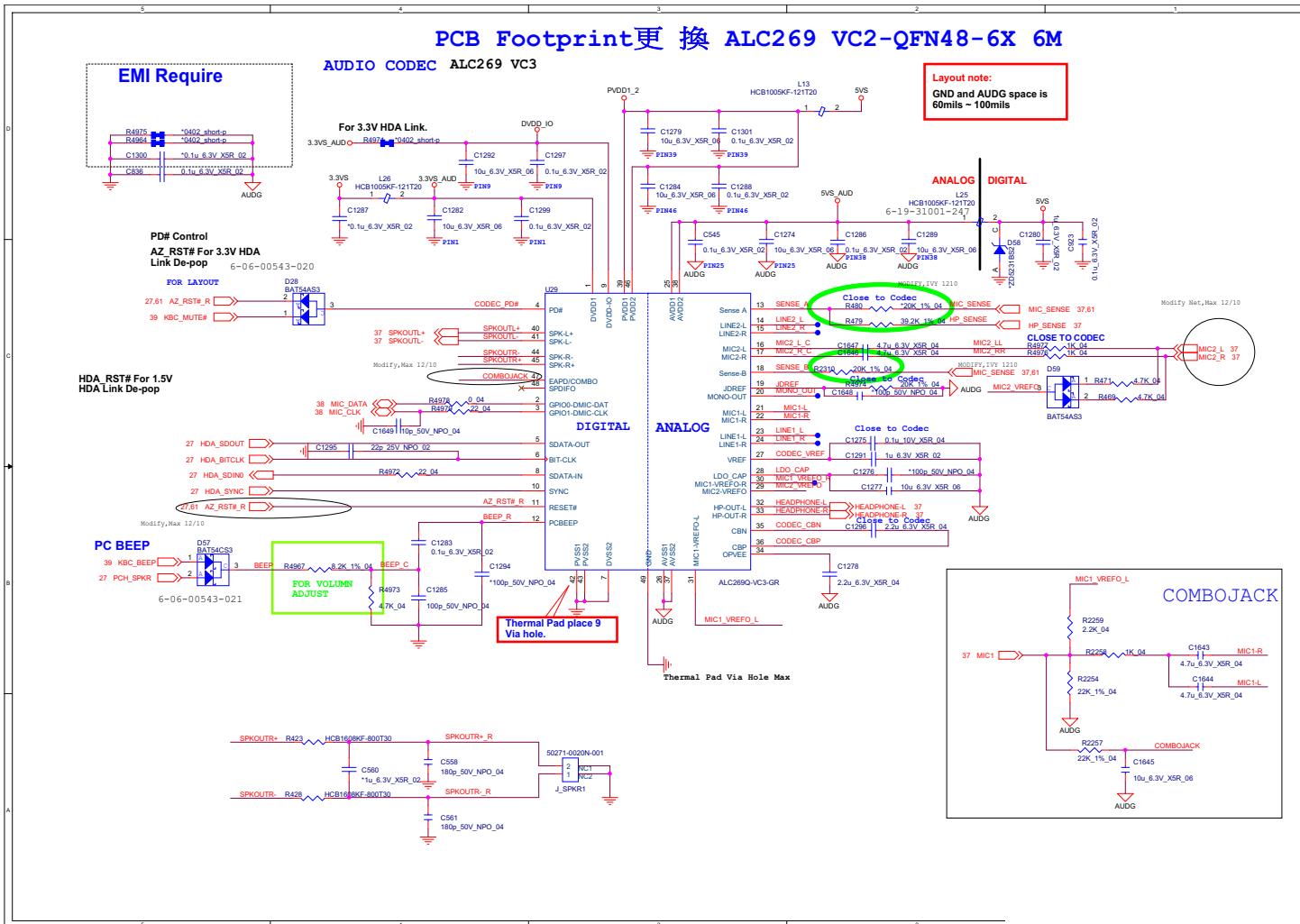


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NH70 PW Board

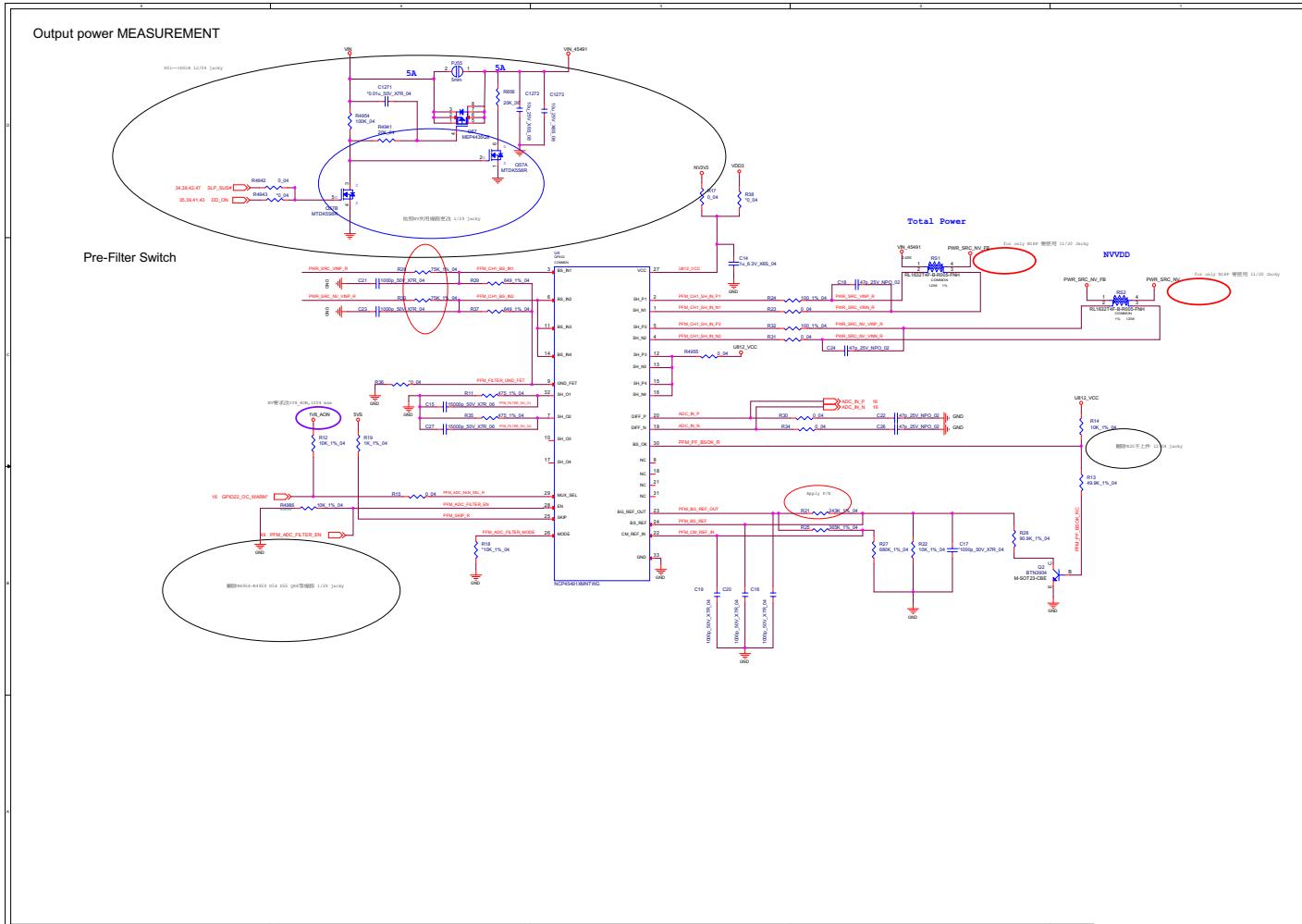
Schematic Diagrams

Audio Codec

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Audio Codec



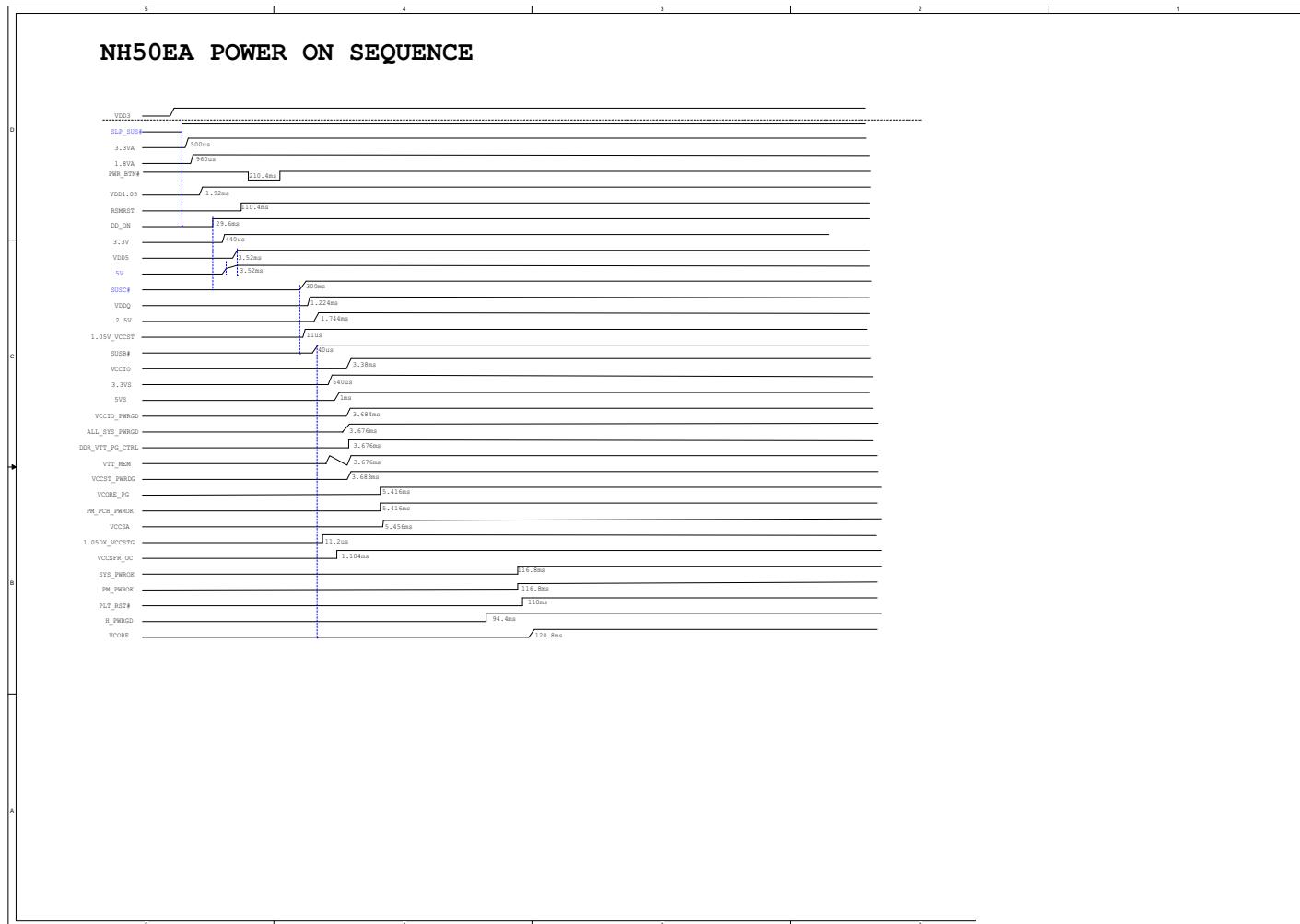
Power Measurement



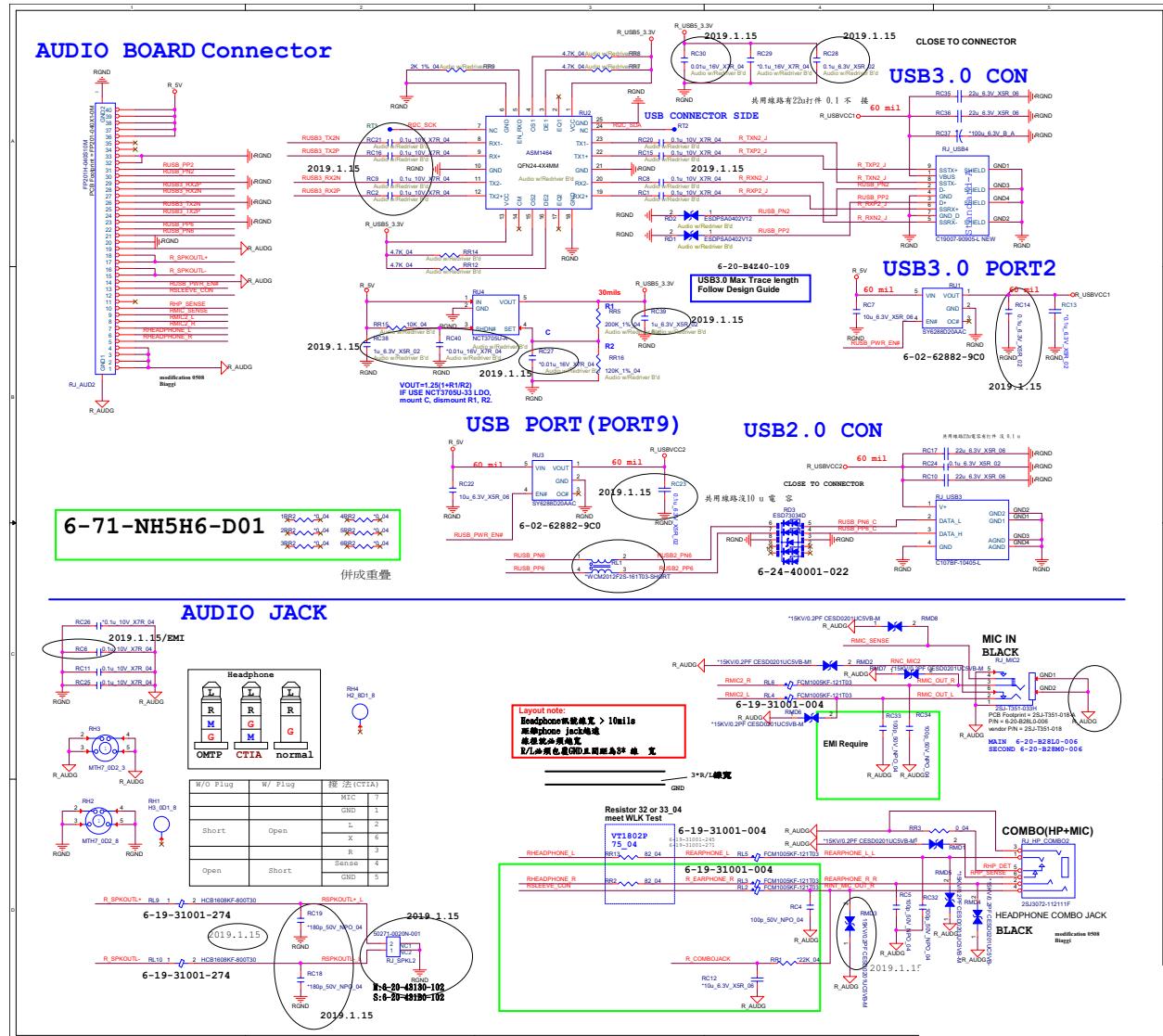
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Power
Measurement

Schematic Diagrams**Power Sequence**

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Power Sequence



Audio Board



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Audio Board

Schematic Diagrams
