SERVICE MANUAL

P650HS(-G) / P651HS(-G)

notebook

Notebook Computer

P650HS(-G) / P651HS(-G)

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 ***P650HS(-G) / P651HS(-G)*** series notebook PC.

The following information is included:

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

Appendix A, Part Lists
Appendix B, Schematic Diagrams
Appendix C, Updating the FLASH ROM BIOS

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, 11.8A (**230** Watts) minimum AC/DC Adapter.

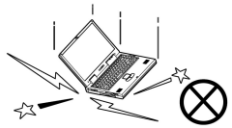
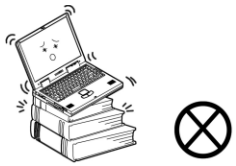
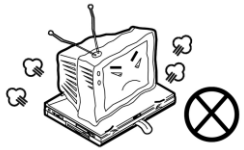
FCC Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
This device may not cause harmful interference.
This device must accept any interference received, including interference that may cause undesired operation.

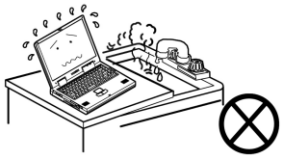
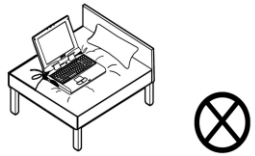
Instructions for Care and Operation

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

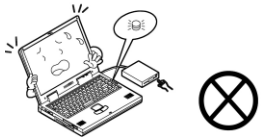
1. **Don't drop it, or expose it to shock.** If the computer falls, the case and the components could be damaged.

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

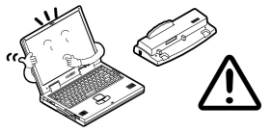
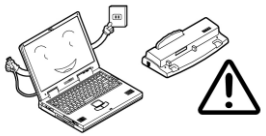
2. **Keep it dry, and don't overheat it.** Keep the computer and power supply away from any kind of heating element. This is an electrical appliance. If water or any other liquid gets into it, the computer could be badly damaged.

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

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

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

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

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

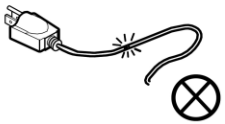
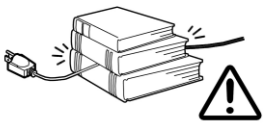
Power Safety

The computer has specific power requirements:

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

Power Safety Warning

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

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

Battery Precautions

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

Battery Guidelines

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

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

Battery Disposal

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

Caution

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

Battery Level

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

Related Documents

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

User's Manual on CD/DVD

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

System Startup

1. Remove all packing materials.
2. Place the computer on a stable surface.
3. Insert the battery and make sure it is locked in position.
4. Securely attach any peripherals you want to use with the computer (e.g. keyboard and mouse) to their ports.
5. Attach the AC/DC adapter to the DC-In jack at 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.
6. Use one hand to raise the lid/LCD to a comfortable viewing angle (do not exceed 135 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".

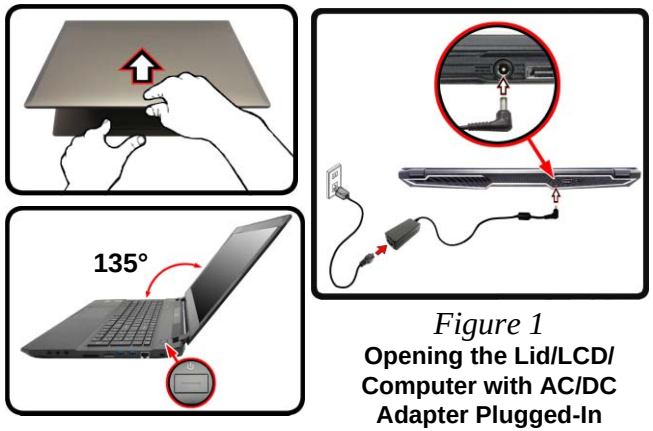
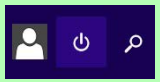


Figure 1
Opening the Lid/LCD/ Computer with AC/DC Adapter Plugged-In

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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Updating the FLASH ROM BIOS..... C-1

Chapter 1: Introduction

Overview

This manual covers the information you need to service or upgrade the ***P650HS(-G) / P651HS(-G)*** series notebook computer. Information about operating the computer (e.g. getting started, and the *Setup* utility) is in the *User's Manual*. Information about dri-vers (e.g. VGA & audio) is also found in the *User's Manual*. The manual is shipped with the computer.

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

The ***P650HS(-G) / P651HS(-G)*** series notebook is designed to be upgradeable. See ***Disassembly on page 2 - 1*** for a detailed description of the upgrade procedures for each specific component. Please take note of the warning and safety information indicated by the "  " symbol.

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

Specifications

Latest Specification Information

The specifications listed in this section are correct at the time of going to 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 details.

G-SYNC Support

G-SYNC is only supported if you have a G-SYNC capable display and a GTX series video adapter (contact your distributor or supplier for 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

i7-7820HK (2.90GHz)

8MB Smart Cache, **14nm**, DDR4-2400MHz, TDP 45W

i7-7700HQ (2.80GHz)

6MB Smart Cache, **14nm**, DDR4-2400MHz, TDP 45W

Supports Intel® CPU over-clocking technology on i7-7820HK

Core Logic

Intel® HM175 Express Chipset

LCD Options

15.6" (39.62cm), 16:9, UHD (3840x2160)/FHD (1920x1080)

BIOS

AMI BIOS (64Mb SPI Flash-ROM)

Memory

Four 260 Pin SO-DIMM Sockets Supporting **DDR4 2400MHz** Memory

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

Compatible with 4GB, 8GB or 16GB Modules

Supports XMP 2666MHz (XMP support depends on processor)

SO-DIMM Memory Types

All SO-DIMM memory modules installed in the system should be identical (the same size and brand) in order to prevent unexpected system behavior.

Do not mix SO-DIMM memory module sizes and brands otherwise unexpected system problems may occur.

Security

Security (Kensington® Type) Lock Slot

BIOS Password

Intel PTT for Systems Without TPM Hardware

(**Factory Option**) TPM 2.0

(**Factory Option**) Fingerprint Reader Module

Video Adapter Options

Microsoft Hybrid Graphics Mode or Discrete Graphics Mode

Supports up to 4 Active Displays

Supports NVIDIA Surround View via HDMI x 1 and MiniDP x2

Intel Integrated GPU

Intel® HD Graphics 630

Dynamic Frequency

Intel Dynamic Video Memory Technology

Microsoft DirectX®12 Compatible

NVIDIA® Discrete GPU

NVIDIA® GeForce GTX 1070

8GB GDDR5 Video RAM

Microsoft DirectX®12 Compatible

Supports GPU Overclocking

Pointing Device

Built-in Touchpad (scrolling key functionality integrated)

Keyboard

(**Factory Option**) **Full Color Illuminated** Full-size Winkey Keyboard (with numeric keypad)

Or

(**Factory Option**) Full-size **Illuminated White LED** Winkey Keyboard (with numeric keypad)

Storage

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

Or

(**Factory Option**) One **PCIe Gen3 x4** M.2 2280 SSD

Two Changeable 2.5" (6cm) **SATA** (Serial) Hard Disk Drives (HDDs)/SSDs (**1st: 7.0mm (h) & 2nd: 7.0mm/9.5mm (h)**) supporting RAID Level 0/1

Or

One changeable 2.5" (6cm) **7.0mm/9.5mm (h) SATA** (Serial) Hard Disk Drive/Solid State Drive (SSD)

Audio

High Definition Audio Compliant Interface

S/PDIF Digital Output

Two Speakers

Sound Blaster Audio

ESS™ SABRE HIFI DAC for High Resolution Headphone Audio

Built-In Array Microphone

Note: External 5.1CH Audio Output Supported by Line-Out, Microphone-In and Headphone & S/PDIF Out Combo Jacks

Interface

Two USB 3.1 Gen 2 Type C Ports

Three USB 3.0 (USB 3.1 Gen 1) Ports (Including one AC/DC Powered USB port)

Two Mini DisplayPorts (1.3)

One HDMI-Out Port

One 2-In-1 Audio Jack (Headphone & S/PDIF (Optical) Out Combo Jack)

One Microphone-In Jack

One Line-Out Jack

One RJ-45 LAN Jack

One DC-In Jack

Communication

Built-In 10/100/1000Mb Base-TX Ethernet LAN

2.0M FHD PC Camera Module

(**Factory Option**) M.2 3G/4G Module

WLAN/ Bluetooth M.2 Modules:

(**Factory Option**) Intel® Wireless-AC 8265 Wireless LAN (**802.11ac**) + Bluetooth **4.1**

(**Factory Option**) Intel® Wireless-AC 3168 Wireless LAN (**802.11ac**) + Bluetooth **4.0**

(**Factory Option**) Qualcomm® Atheros Killer™ Wireless-AC 1535 Wireless LAN (**802.11ac**) + Bluetooth **4.1**

(**Factory Option**) Qualcomm® Wireless LAN (**802.11ac/ad**) + Bluetooth **4.1**

Card Reader

Embedded Multi-In-1 Push-Push Card Reader

MMC (MultiMedia Card) / RS MMC

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

M.2 Slots

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

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

Slot 3 for **SATA SSD**

(**Factory Option**) Slot 4 for **3G/4G** Module

Note: (**Factory Option**) **LTE** or **802.11ad** Antenna

M.2 SSD Limitation

When slot 3 has an M.2 SATA SSD installed, then slot 2 will not be available for M.2 PCIe SSDs.

Features

Supports NVIDIA G-SYNC Technolgy in dGPU Mode

(G-SYNC is only supported if you have a G-SYNC capable display and a GTX series video adapter)

Virtual Reality Ready

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, 60WH

Full Range AC/DC Adapter

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

DC Output: 19.5V, 11.8A (**230W**)

Dimensions & Weight

385mm (w) * 271mm (d) * 28.8mm (h)

2.65kg (Barebone with 60WH Battery)

External Locator - Top View with LCD Panel Open

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. Speakers
6. Power Button
7. Keyboard
8. Touchpad & Buttons
9. Fingerprint Reader (**Optional**)

External Locator - Front & Right Side Views

FRONT VIEW

Figure 2
Front View

1. LED Indicator

RIGHT SIDE VIEW

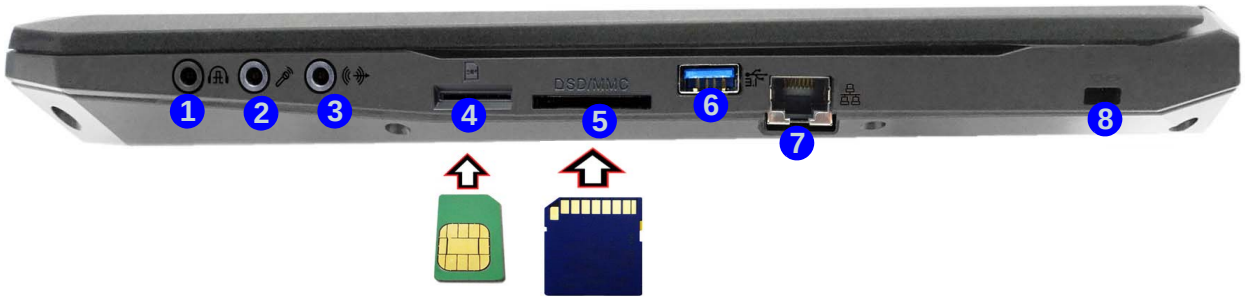


Figure 3
Right Side View

1. Headphone & S/PDIF Combo Jack
2. Microphone-In Jack
3. Line-Out Jack
4. USIM Card Reader (for 3G/4G USIM Cards)
5. Multi-in-1 Card Reader
6. USB 3.0/3.1 Port
7. RJ-45 LAN Jack
8. Security Lock Slot

External Locator - Left Side & Rear View

Figure 4
Left Side View

1. Vent
2. Mini Display Port
3. USB 3.1 Gen 2 Type C Ports
4. USB 3.0/3.1 Port
5. Powered USB 3.0/ 3.1 Port

LEFT SIDE VIEW

Figure 5
Rear View

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

REAR VIEW

External Locator - Bottom View

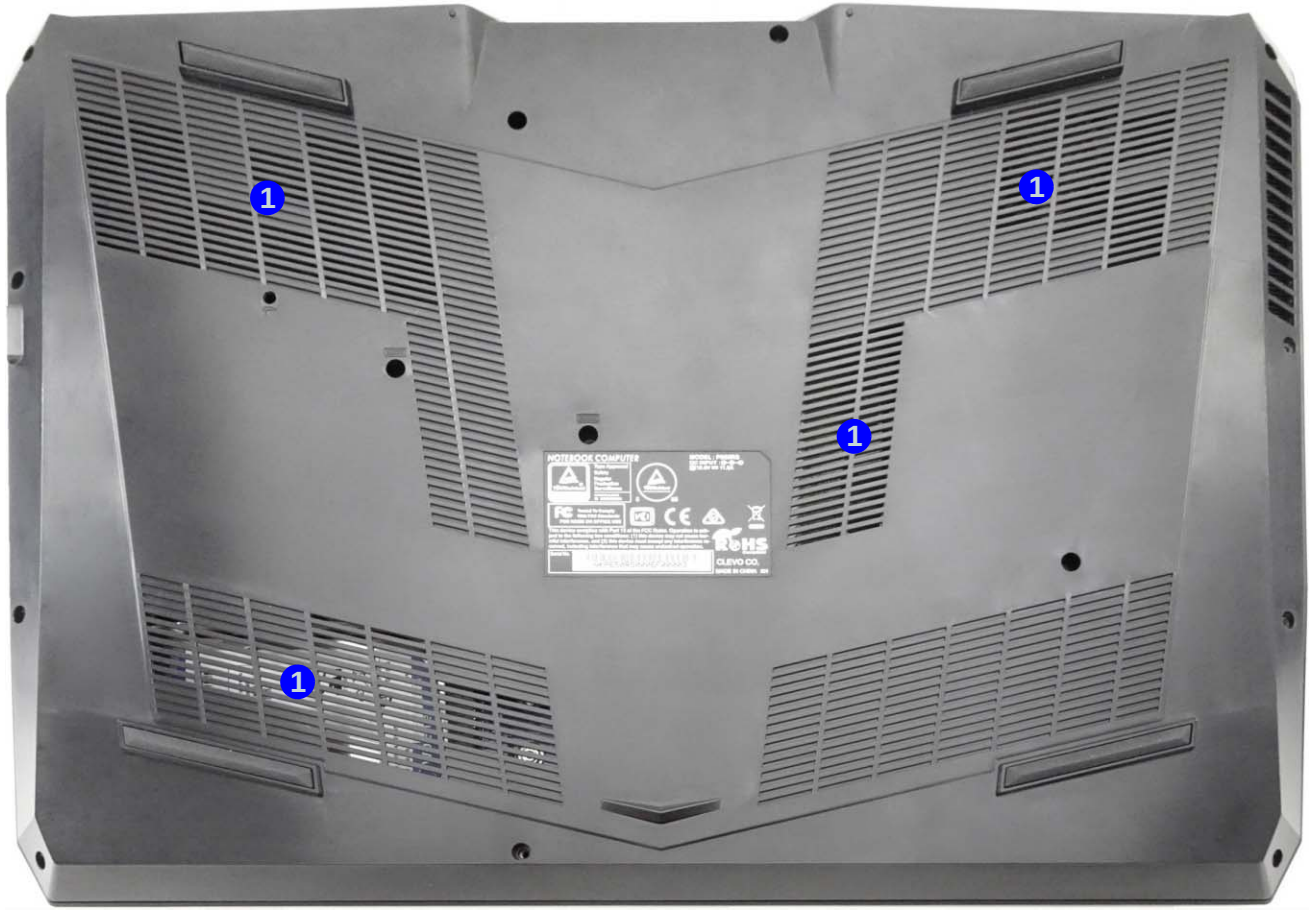


Figure 6
Bottom View

1. Vent

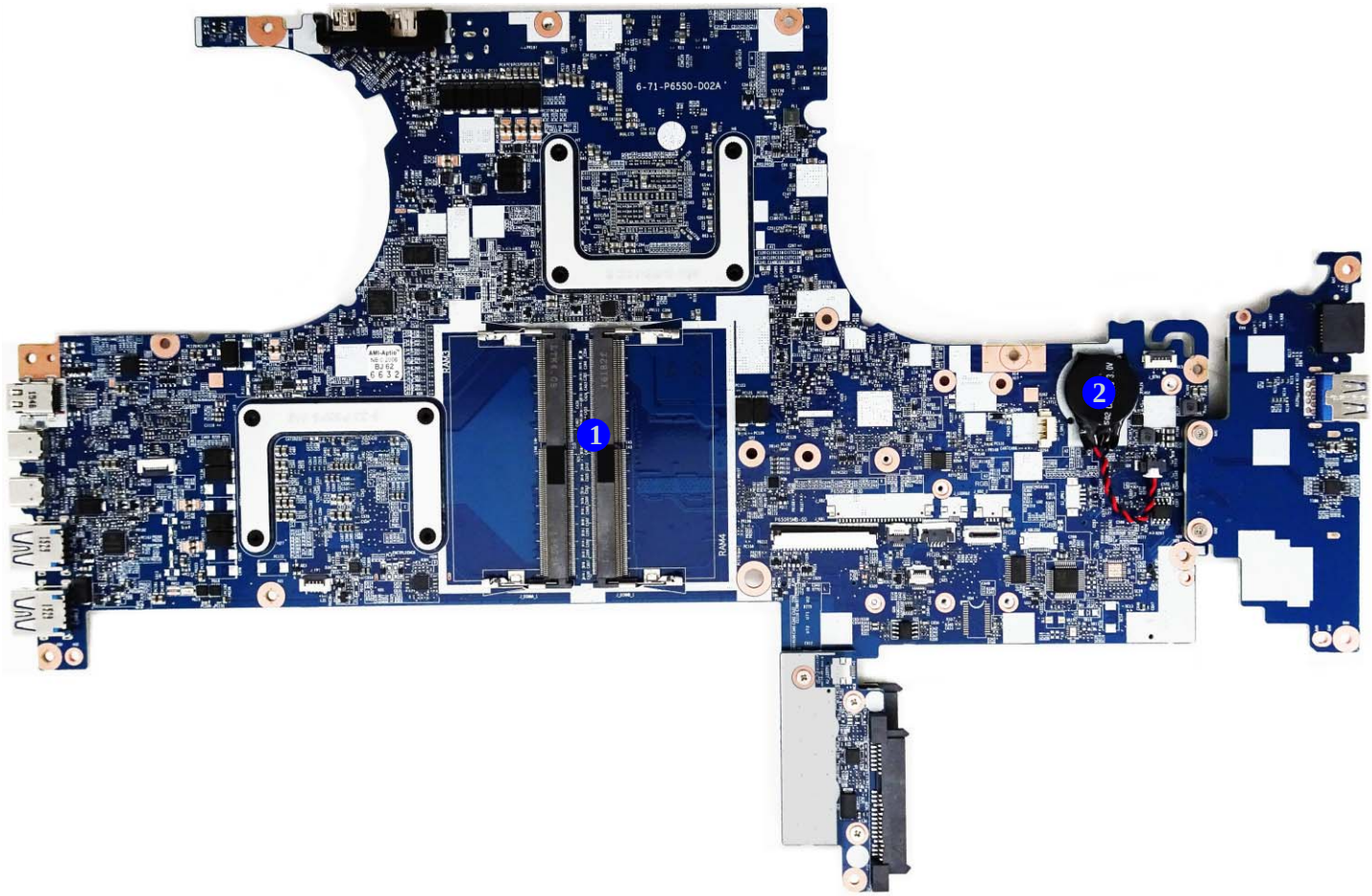
Overheating

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

Mainboard Overview - Top (Key Parts)

Figure 7
Mainboard Top Key Parts

1. Memory Slots DDR4 SO-DIMM
2. CMOS Battery



Mainboard Overview - Bottom (Key Parts)

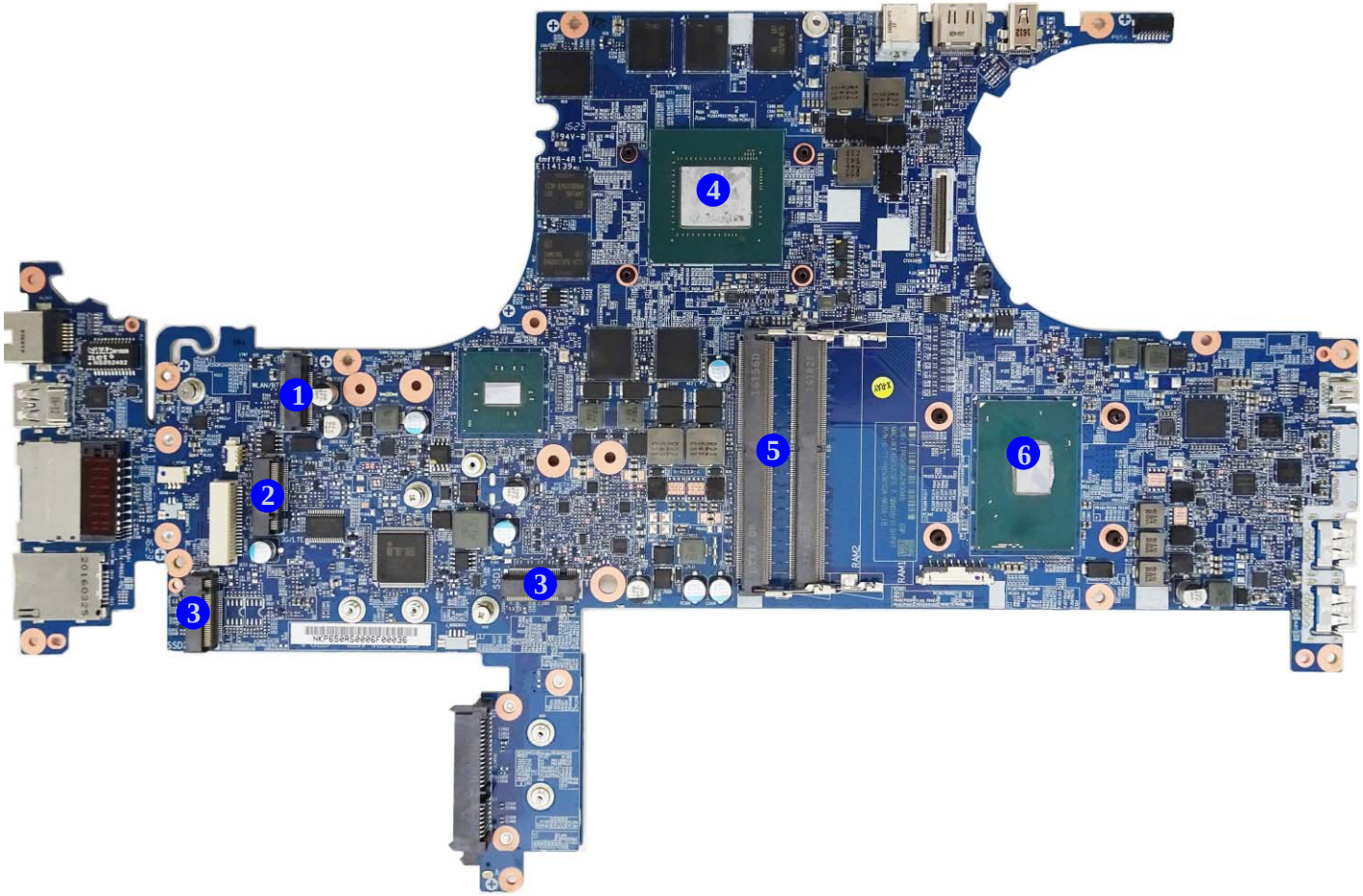


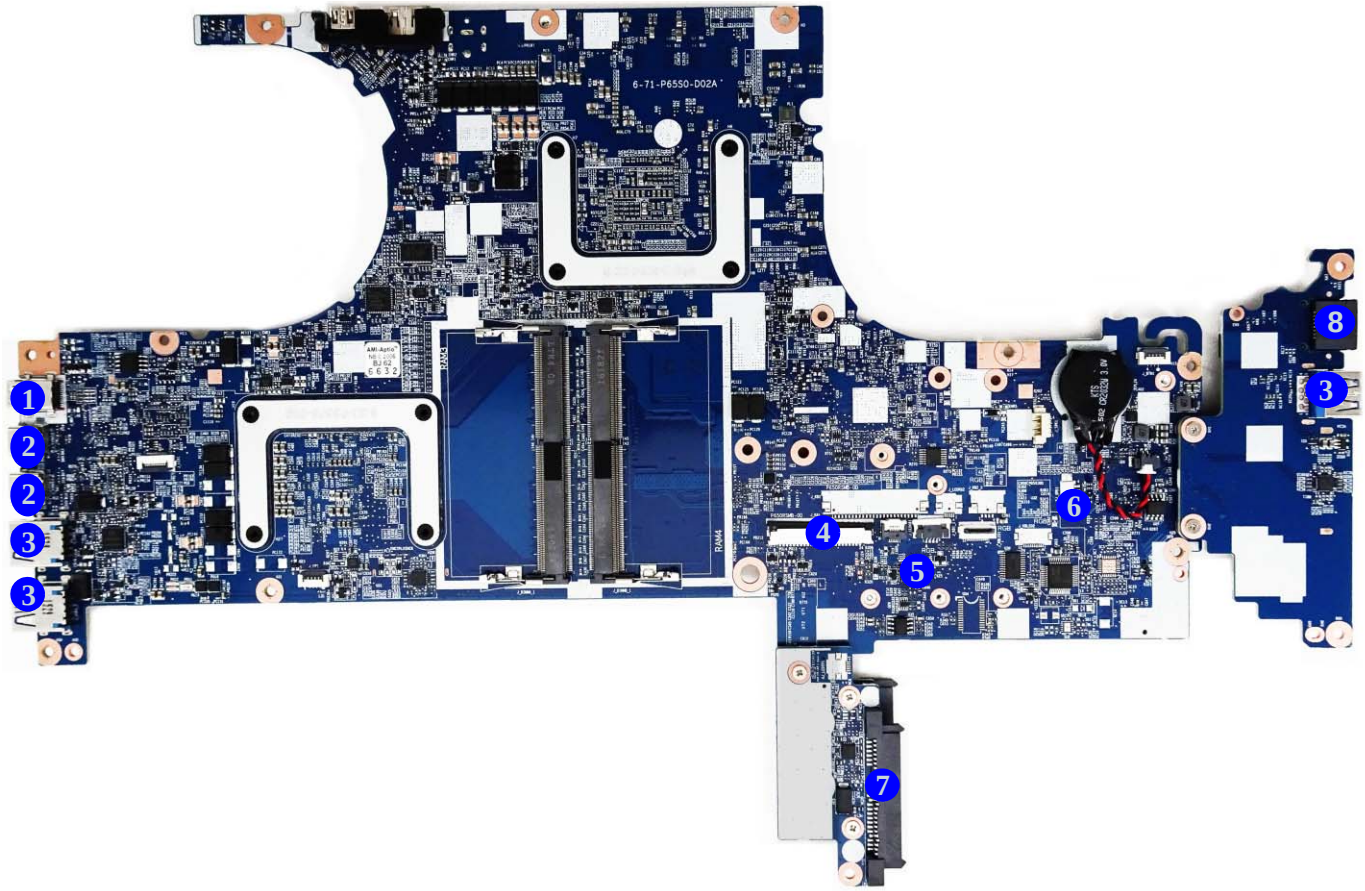
Figure 8
Mainboard Bottom Key Parts

1. Mini-Card Connector (WLAN Module)
2. Mini-Card Connector (M.2 3G/4G Module)
3. Mini-Card Connector (M.2 PCIE/SATA SSD Module)
4. GPU-GTX1070M
5. Memory Slots DDR4 SO-DIMM
6. CPU

Mainboard Overview - Top (Connectors)

Figure 9
Mainboard Top Connectors

1. Mini Display Port
2. USB Ports 3.1 Gen 2 Type C Connector
3. USB Ports 3.0/3.1 Connector
4. Keyboard Cable Connector
5. TP Connector
6. Speaker Connector
7. HDD Connector
8. RJ-45 LAN Jack



Mainboard Overview - Bottom (Connectors)

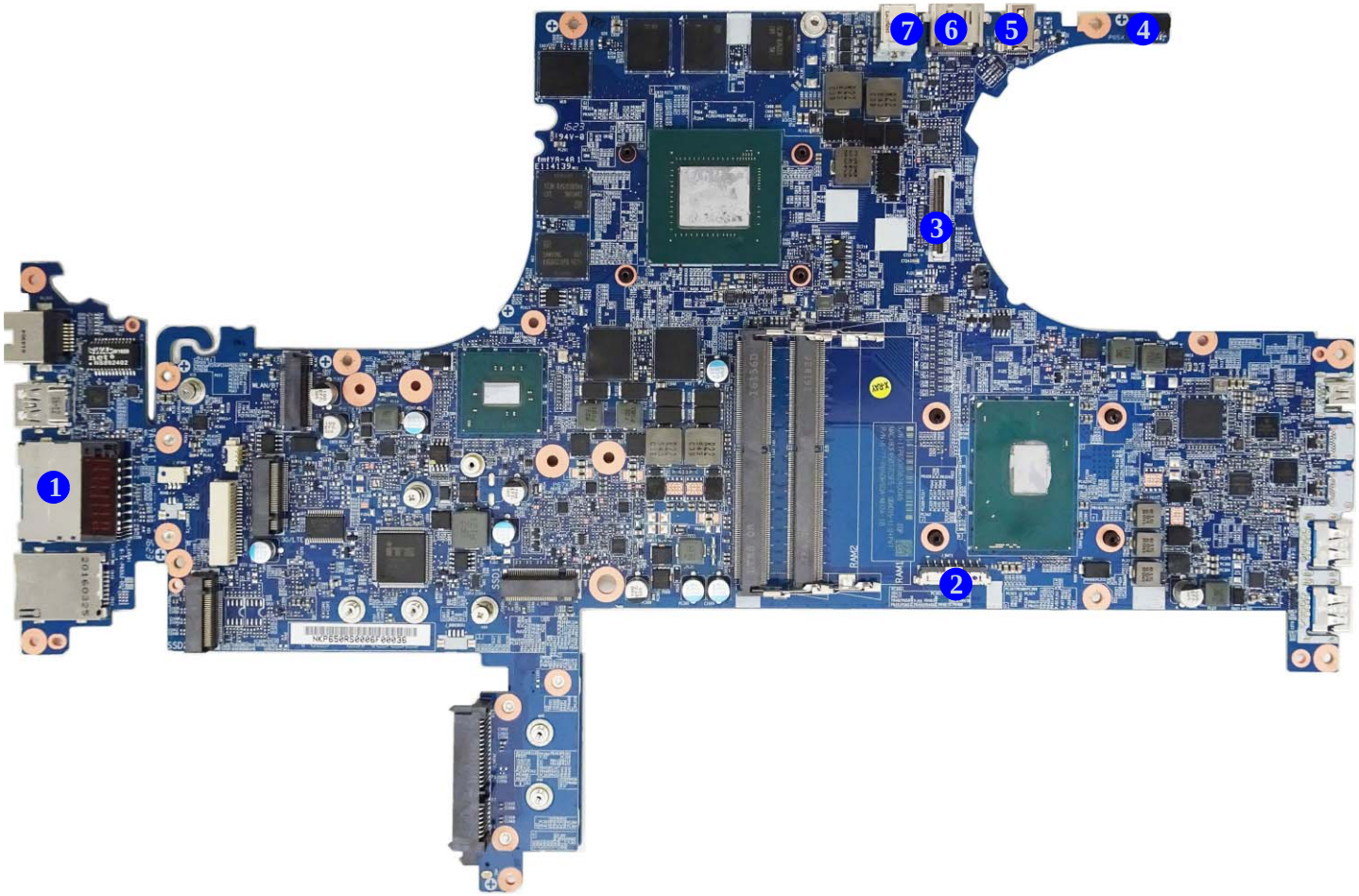


Figure 10
Mainboard Bottom Connectors

1. Multi-in-1 Card Reader
2. Battery Connector
3. LCD Cable Connector
4. CCD Connector
5. Mini Display Port
6. HDMI-Out Port
7. DC-In Jack

Chapter 2: Disassembly

Overview

This chapter provides step-by-step instructions for disassembling the ***P650HS(-G) / P651HS(-G)*** series notebook's parts and subsystems. When it comes to reassembly, reverse the procedures (unless otherwise indicated).

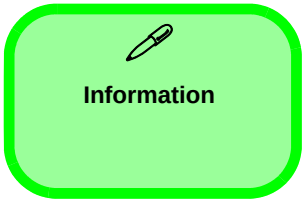
We suggest you completely review any procedure before you take the computer apart.

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.



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

Maintenance Tools

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

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

Connections

Connections within the computer are one of four types:

Locking collar sockets for ribbon connectors	To release these connectors, use a small flat-head screwdriver to gently pry the locking collar away from its base. When replacing the connection, make sure the connector is oriented in the same way. The pin1 side is usually not indicated.
Pressure sockets for multi-wire connectors	To release this connector type, grasp it at its head and gently rock it from side to side as you pull it out. Do not pull on the wires themselves. When replacing the connection, do not try to force it. The socket only fits one way.
Pressure sockets for ribbon connectors	To release these connectors, use a small pair of needle-nose pliers to gently lift the connector away from its socket. When replacing the connection, make sure the connector is oriented in the same way. The pin1 side is usually not indicated.
Board-to-board or multi-pin sockets	To separate the boards, gently rock them from side to side as you pull them apart. If the connection is very tight, use a small flat-head screwdriver - use just enough force to start.

Maintenance Precautions

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

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

Power Safety Warning

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

Cleaning

Do not apply cleaner directly to the computer, use a soft clean cloth.
Do not use volatile (petroleum distillates) or abrasive cleaners on any part of the computer.

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 battery *page 2 - 6*

To remove the HDD:

1. Remove the battery *page 2 - 6*
2. Remove the HDD *page 2 - 8*

To remove the System Memory:

1. Remove the battery *page 2 - 6*
2. Remove the system memory *page 2 - 10*

To remove and install the M.2 SSD:

1. Remove the battery *page 2 - 6*
2. Remove the M.2 SSD *page 2 - 13*
3. Install the M.2 SSD *page 2 - 15*

To remove the Wireless LAN Module:

1. Remove the battery *page 2 - 6*
2. Remove the WLAN *page 2 - 16*

To remove the 3G/4G Module:

1. Remove the battery *page 2 - 6*
2. Remove the 3G/4G *page 2 - 18*

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***).

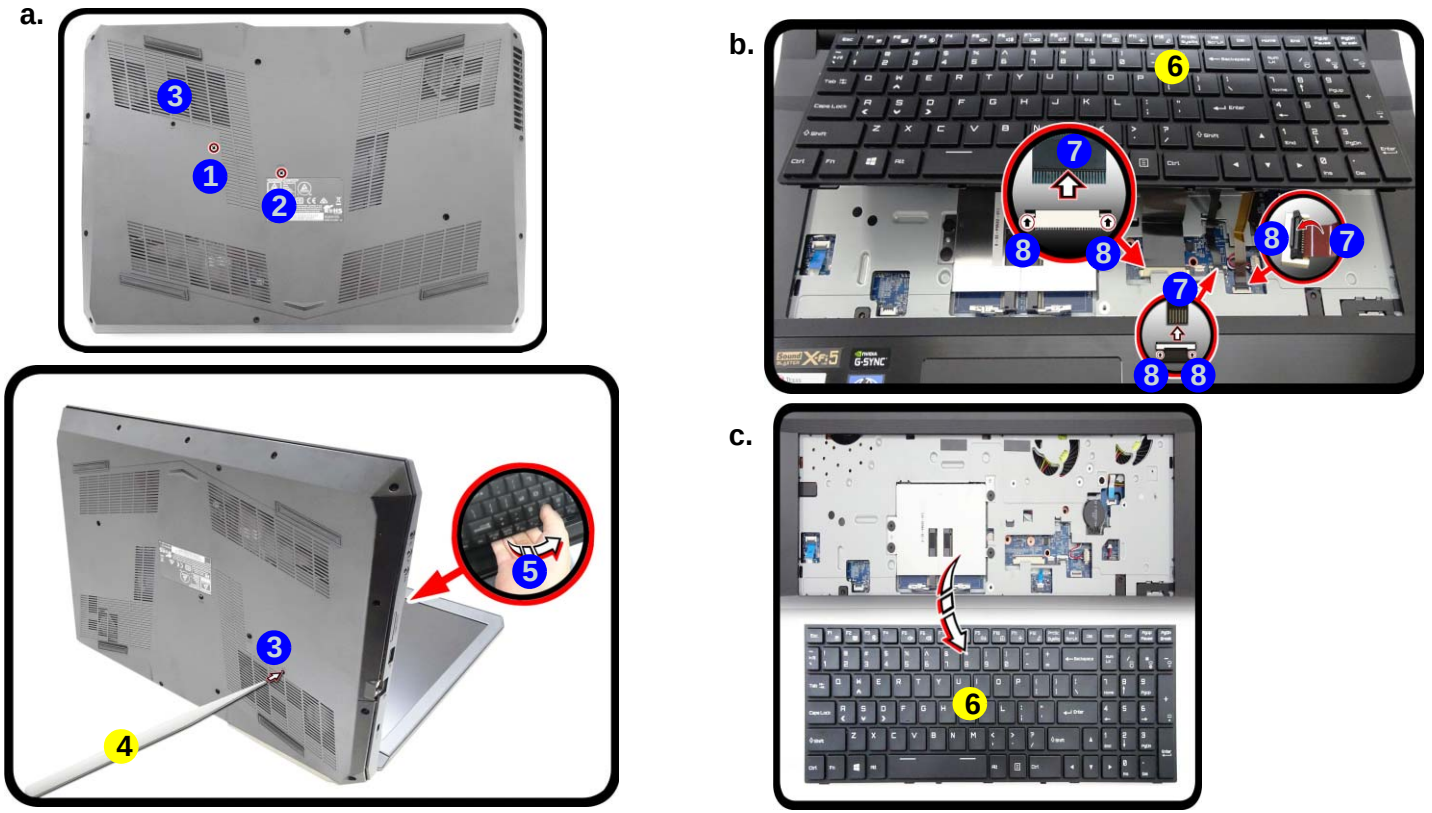


Figure 1
Keyboard Removal

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

Re-inserting the Keyboard

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

4. Eject Stick
6. Keyboard

- 2 Screws

Figure 2
Battery Removal

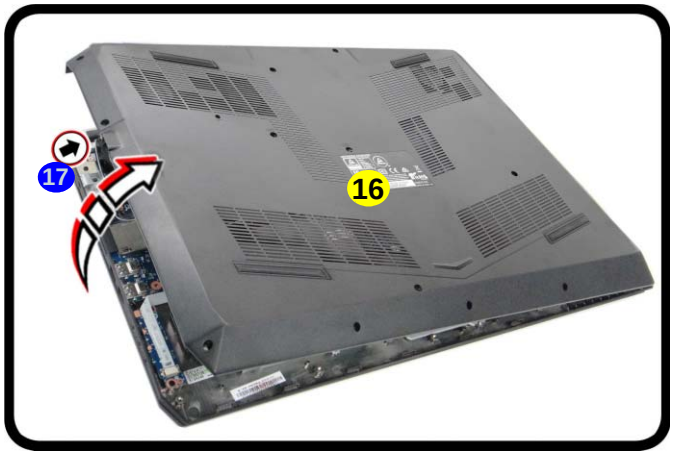
a. Remove the SD cover and screws.
b. Remove the bottom case.
c. Locate the battery.

Removing the Battery

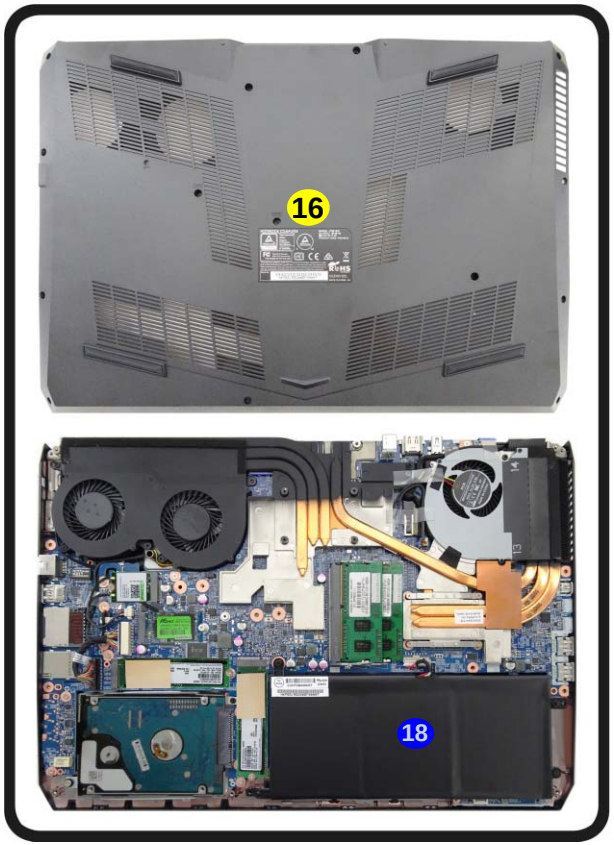
1. Turn the computer **off**, and turn it over.
2. Remove the SD card cover 1 and screws 2 - 15 (***Figure 2a***).
3. Carefully lift the bottom case 16 up in the direction of the arrow 17 and remove it (***Figure 2b***).
4. The battery will be visible at point 18 on the computer (***Figure 2c***).

a.

b.



c.



1. SD Card Cover
16. Bottom Case

- 14 Screws

5. Carefully disconnect the cable 19, then remove screws 20 - 22 (*Figure 3b*).
6. Lift the battery 23 off the computer (*Figure 3e*).
7. Reinsert the bottom case starting from point 24 as shown (*Figure 3f*) to avoid damaging the rear eSATA/USB 3.0 port. Tighten the screws to secure the bottom case in place.

Figure 3
Battery Removal (cont'd.)

d. Disconnect the cable and remove the screws.
e. Lift the battery off the computer.
f. Reinsert the bottom case and tighten the screws.

d.

e.

f.

24. Battery

- 3 Screws

Figure 4
HDD Assembly Removal

a. Locate the HDD.
b. Remove the screws.

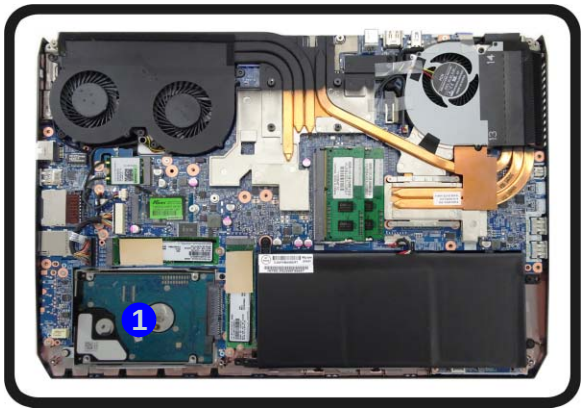
Removing the Hard Disk Drive

The hard disk drive can be taken out to accommodate other 2.5" serial (SATA) hard disk drives with a height of 9.5mm or 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.

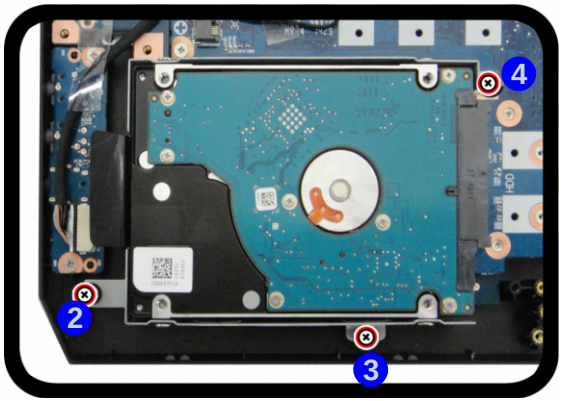
Hard Disk Disassembly Process

1. Turn **off** the computer, and remove the battery (*page 2 - 6*).
2. The HDD will be visible at point 1 on the mainboard (*Figure 4a*).
3. Remove screws 2 - 4 from the HDD assembly (*Figure 4b*).

a.



b.



6. Hard Disk

- 3 Screws

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.

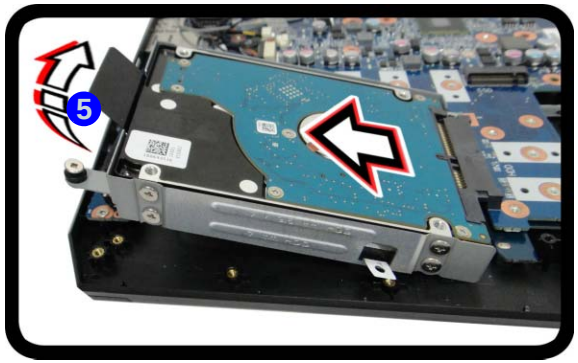
If you have access to the internet, download the latest application and hardware driver updates for the operating system you plan to install. Copy these to a removable medium.

4. Slightly lift and pull the hard disk in the direction of arrow 5 (*Figure 5c*).
5. Lift the hard disk assembly 6 out of the bay 7 (*Figure 5d*).
6. Remove screws 8 - 15 and bracket 16 from the hard disk 17 (*Figure 5e*).
7. Reverse the process to install a new hard disk (do not forget to replace the screws).

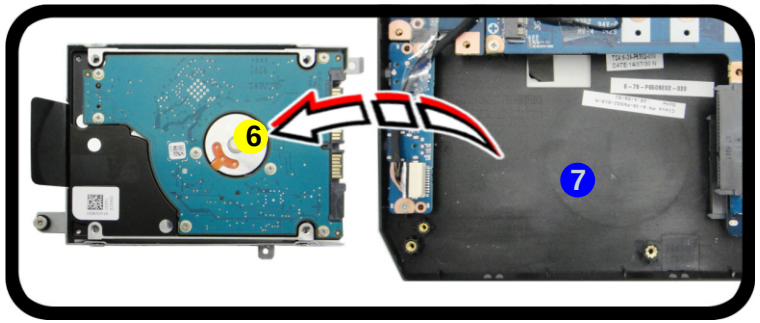
Figure 5
HDD Assembly Removal (cont'd.)

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

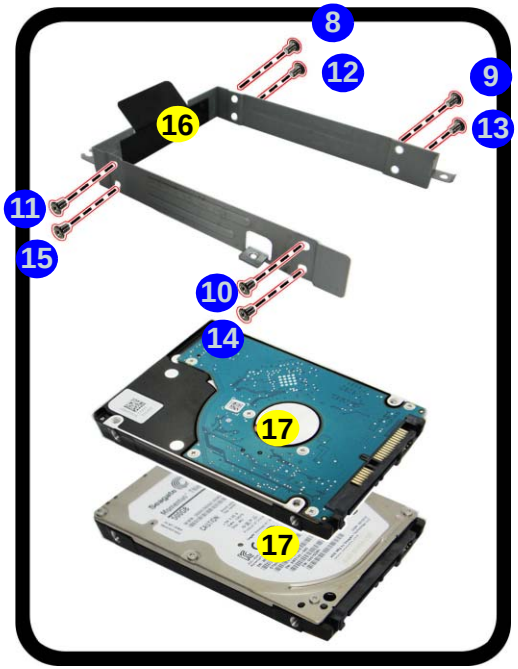
c.



d.



e.



Installing 9.5mm or 7mm HDD

Note that the hard disks pictured on the following pages are all 7mm(h) hard disk drive.

In some cases 9.5mm(h) hard disk drives will be installed. It can only be installed on the upper slot.

There are two hard disk drive options:

Two changeable 2.5" (6cm) **7.0mm** (h) **SATA** (Serial) Hard Disk Drives/Solid State Drives (SSD) supporting RAID level 0/1
Or
One changeable 2.5" (6cm) **9.5mm** (h) **SATA** (Serial) Hard Disk Drive/Solid State Drive (SSD)

For more information, contact your distributor/supplier, and bear in mind your warranty terms.

6. HDD Assembly
16. HDD Bracket
17. HDD

- 8 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 2133/2400 MHz. The main memory can be expanded up to 64GB. The total memory size is automatically detected by the POST routine once you turn on your computer.

Memory-1 Upgrade Process

1. Turn **off** the computer, turn it over, remove the keyboard (***page 2 - 5***).
2. The RAM modules will be visible at point 1 after removing the shielding plate (***Figure 6a***).
3. Remove screws 2 - 5 and lift the shielding plate 6 off the computer (***Figure 6b***).

Figure 6
RAM-1 Module Removal

a. The RAM modules will be visible at point 1.
b. Remove the screws and lift the shielding plate out.

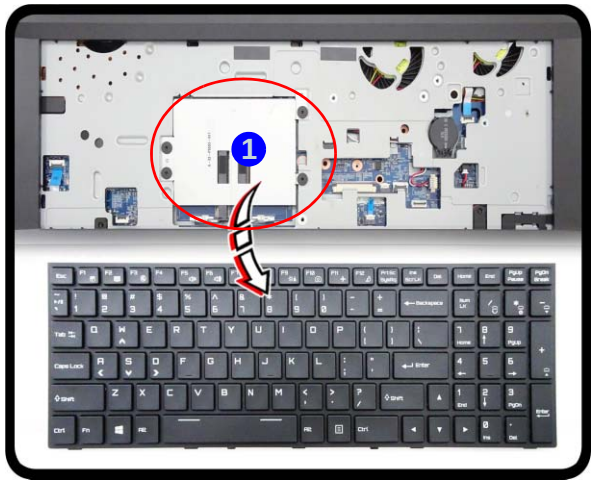
Contact Warning

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.

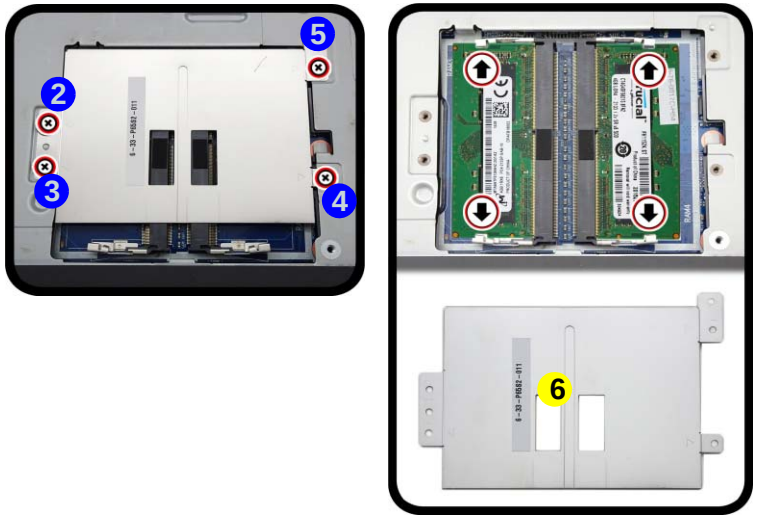
6. RAM Shielding Plate

- 4 Screws

a.



b.

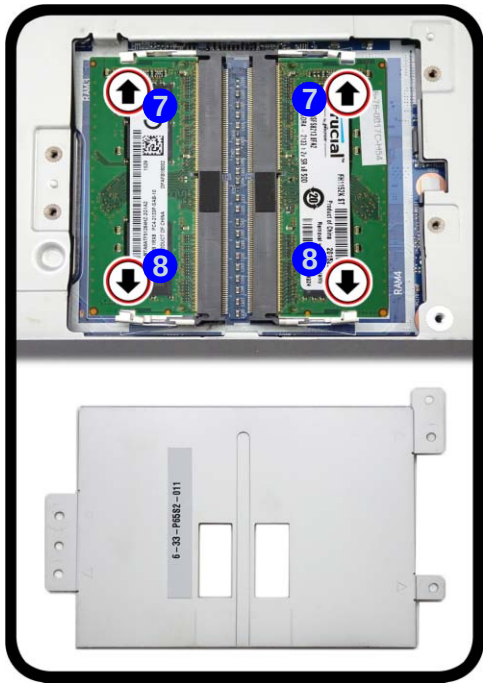


4. Gently pull the two release latches (7 & 8) on the sides of the memory socket in the direction indicated by the arrows (***Figure 7c***). The RAM module 9 will pop-up (***Figure 7d***), and you can then remove it.
5. Pull the latches to release the second module if necessary.
6. Insert a new module holding it at about a 30° angle and fit the connectors firmly into the memory slot.
7. 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.
8. Press the module in and down towards the mainboard until the slot levers click into place to secure the module.

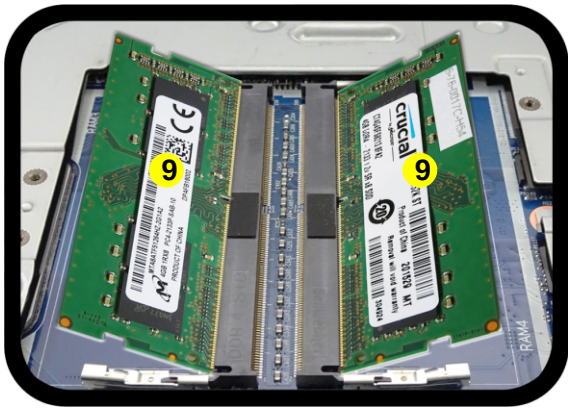
Figure 7
RAM-1 Module Removal (cont'd)

c. Pull the release latches.
d. Remove the module.

c.



d.



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.

9. RAM Module

Figure 8
RAM-2 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

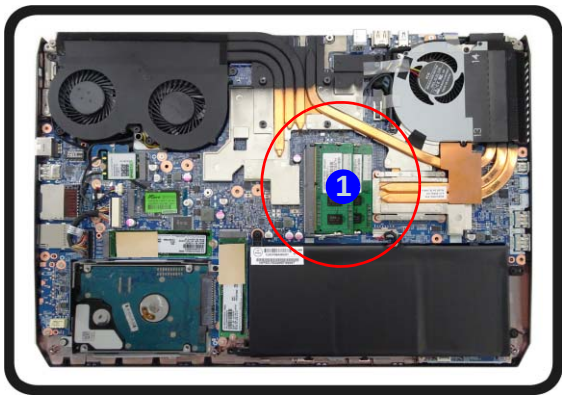
Be careful not to touch the metal pins on the module's connecting edge. Even the cleanest hands have oils which can attract particles, and degrade the module's performance.

4. RAM Module

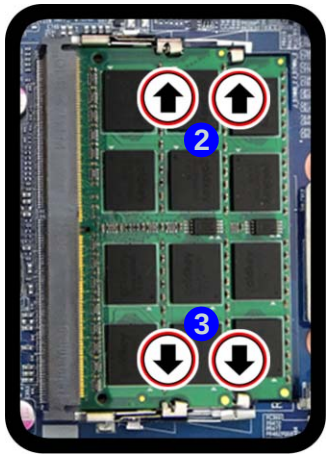
Memory-2 Upgrade Process

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 8a***).
3. Gently pull the two release latches (2 & 3) on the sides of the memory socket in the direction indicated by the arrows (***Figure 8b***). The RAM module 4 will pop-up (***Figure 8c***), 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.

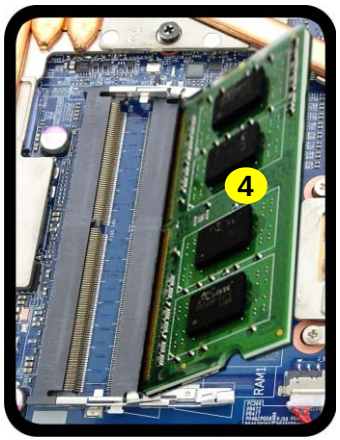
a.



b.



c.



Removing and Installing the M.2 SSD Module

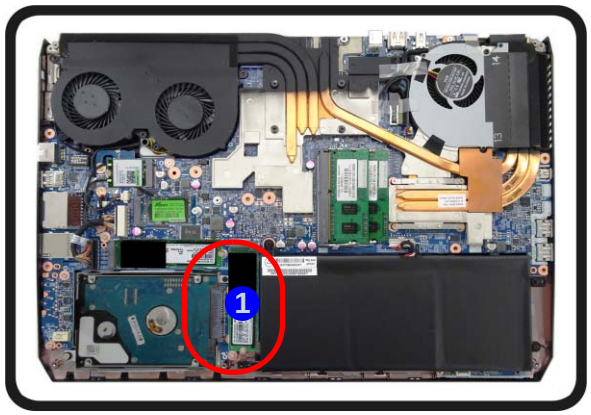
M.2 SSD-1 Removal Procedure

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 9a*).
3. Remove the screw 2 (*Figure 9b*)
4. The M.2 SSD module 3 (*Figure 9c*) will pop-up, and you can remove it from the computer.
5. Reverse the process to install a new module (do not forget to replace the screws and thermal pad).

Figure 9
M.2 SSD-1 Module Removal

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

a.



b.

c.

3.M2 SSD Module

- 1 Screw

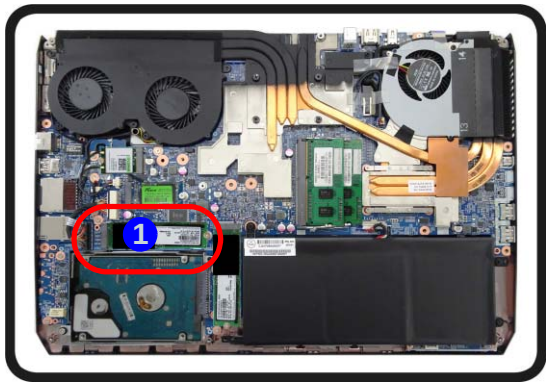
Figure 10
M.2 SSD-2 Module Removal

a. Locate the module.
b. Disconnect the cables and remove the screw.
c. The module will pop-up.
d. Lift the module up off the socket.

M.2 SSD-2 Removal Procedure

1. Turn **off** the computer, remove the battery (***page 2 - 6***).
2. Locate the module, it is visible at point 1 (***Figure 10a***).
3. Remove the screw 2 from the module (***Figure 10b***).
4. The module 3 will pop-up (***Figure 10c***).
5. Lift the module 3 up and off the computer (***Figure 10d***).

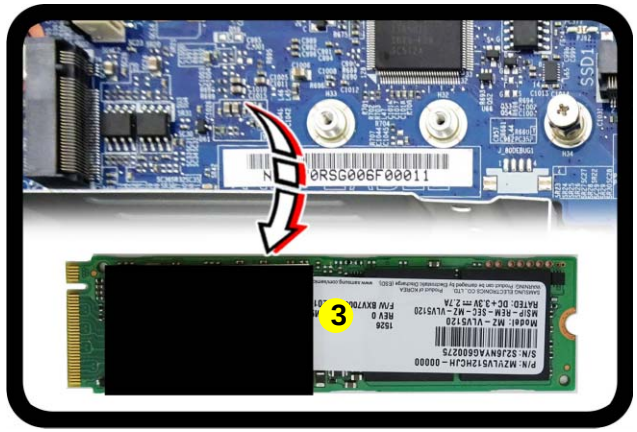
a.



b.

c.

d.



3. M.2 SSD Module

- 1 Screw

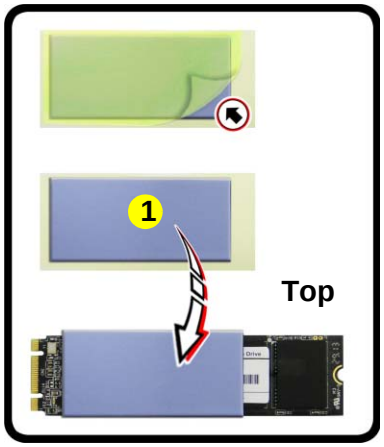
M.2 SSD Installation Procedure

1. Place the thermal pad 1 on the module as shown (***Figure 11a***).
2. Insert the module 2 in the computer (***Figure 11b***).
3. Tighten the screw 3 to secure it in place (***Figure 11c***).

Figure 11
M.2 SSD Module Installation

a. Place the thermal pad.
b. Insert the module.
c. Tighten the screw.

a.



b.

c.

Thermal Pad

Be sure to place the thermal pad's adhesive side down onto the module surface as shown.

1. Thermal Pad
2. M2 SSD Module

- 1 Screw

Figure 12
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 12b***).

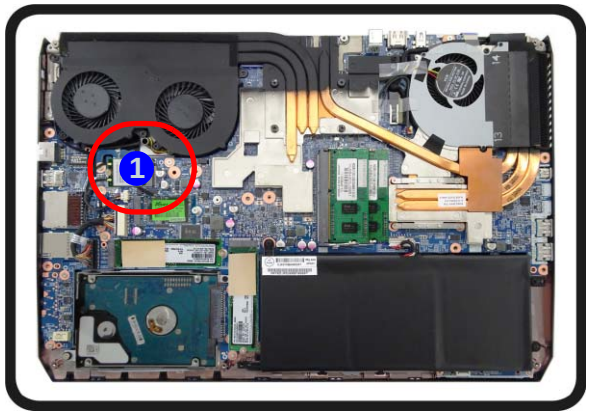
5.Wireless LAN Module

- 1 Screw

Removing the Wireless LAN Module

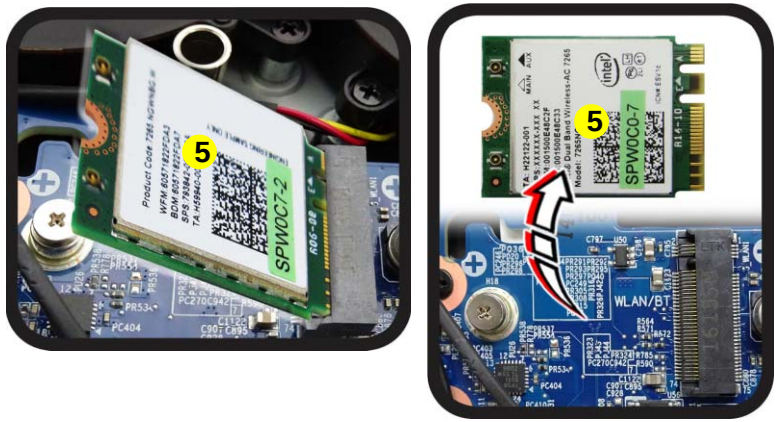
1. Turn **off** the computer, turn it over, remove the battery (***page 2 - 6***).
2. The Wireless LAN module will be visible at point 1 on the mainboard (***Figure 12a***).
3. Carefully disconnect the cables 2 & 3, and then remove the screw 4 (***Figure 12b***)
4. The Wireless LAN module 5 (***Figure 12c***) will pop-up, and you can remove it from the computer.

a.



b.

c.



Wireless LAN, Combo, 3G & LTE Module Cables

Note that the cables for connecting to the antennae on WLAN, WLAN & Bluetooth Combo, 3G 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	Gray	
	WM 3	White	
LTE Broadband	LTE 1	Black	Black
	LTE 2	Gray	
3G Broadband	3G 1	Black	Black
	3G 2	Gray	

Cable 1 is usually connected to antenna 1 (Main) on the module, and cable 2 to antenna 2 (Aux).

Removing the 3G/4G Module

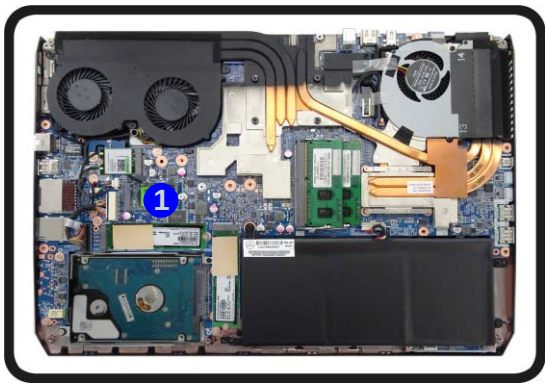
3G/4G Removal Procedure

1. Turn **off** the computer, remove the battery (***page 2 - 6***).
2. Locate the module, it is visible at point 1 (***Figure 13a***).
3. Carefully disconnect the cables 2 & 3, and then remove the screw 4 from the module (***Figure 13b***).
4. The module 3 will pop-up (***Figure 13c***).
5. Lift the module 5 up and off the computer (***Figure 13d***).

Figure 13
3G/4G Module Removal

a. Locate the module.
b. Disconnect the cables and remove the screw.
c. The module will pop-up.
d. Lift the module up off the socket.

a.



c.

b.

d.

5. 3G/4G Module

- 1 Screw

Appendix A:Part Lists

This appendix breaks down the ***P650HS(-G) / P651HS(-G)*** series notebook's construction into a series of illustrations. The component part numbers are indicated in the tables opposite the drawings.

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

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

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

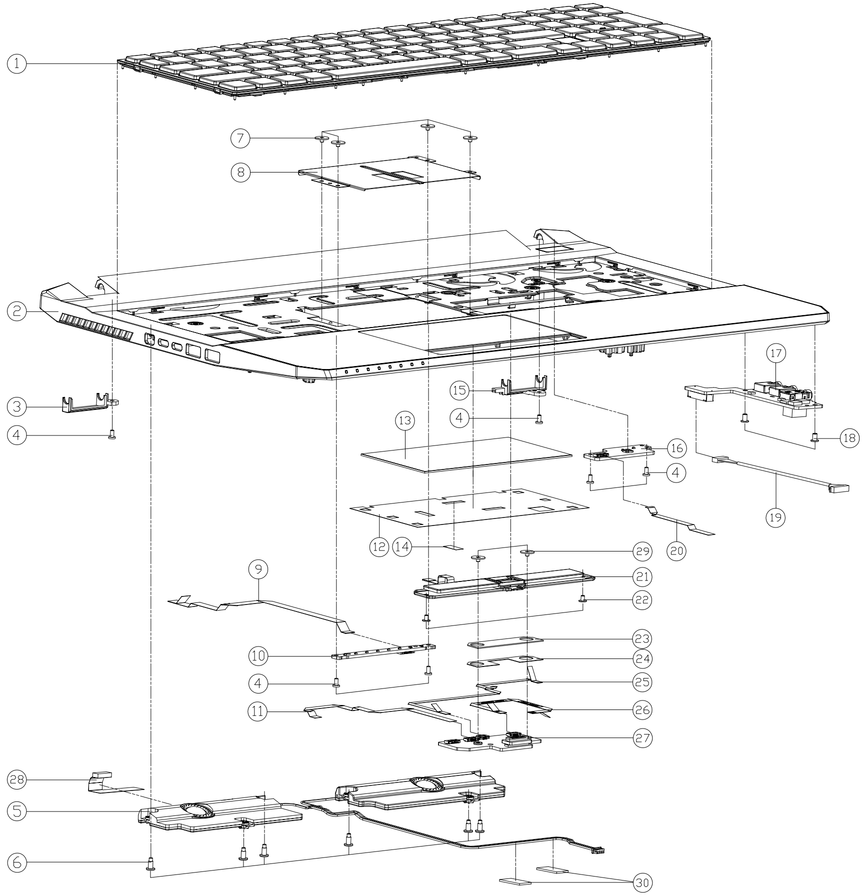
Part List Illustration Location

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

Table A - 1
Part List Illustration Location

Part	
Top	*page A - 3*
Bottom	*page A - 4*
Main Board	*page A - 5*
HDD	*page A - 6*
LCD	*page A - 7*
LCD (Sharp)	*page A - 8*

Top



ITEM	PART NAME	PART NO	REMARK
1	MULTI BL KB USA MP-13H83USJ430C P650RS BLACK GAMING SILVER LINING PRINTING ISOLATION WITH WIN10 KEY + K/B FRAME	6-80-P65S0-012-1	
1	WHITE BL KB USA MP-13H83USJ430B P650SE BLACK ISOLATION WITH WIN8 KEY + K/B FRAME	6-80-P6500-013-1	
2	TOP CASE MODULE (ONKYO) P650RS (KAPOK)	6-39-P65S2-012-N	
2	TOP CASE MODULE (ONKYO) P651RS (KAPOK)	6-39-P65S2-112-N	
3	HINGE COVER L (C7230P-BK1C340) P650RS	6-42-P65S2-021	
4	.SCREW M2*4L KI NI ICT NY (DD=ø4.5,DT=0.4)	6-35-B1120-4RE	
5	SPK+CABLE FRONT R&L 51*20 T5_2 2W 4? EE09223A L=236.5MM R=230.0MM P650SE	6-23-5P650-0S1	
6	SCREW M2*6.2L NI ICT NY FOR SPEAKER	6-35-Z1120-6R2	
7	SCREW M2*2L KI NI ICT NY (DD=ø5 ,T=0.5)	6-35-B1120-2R0	
8	DDR BRACKET(SUS304) P650RS	6-33-P65S2-012	
9	FFC CABLE LED TO MB (P=0.5) 170.5MM 60V 12PIN P650RS	6-43-P65S0-012-1	
10	LED BOARD V2.0 P650RS	6-77-P65S4-D02	
11	FFC CABLE FINGER TO MB (P=1.0) 142.6MM 60V 4PIN P650RS	6-43-P65S0-021-1	ONLY FOR W/FINGER
12	TOUCH PAD MYLAR (PET 125.8*65) P650RS	6-40-P65S2-030	
13	TOUCH PAD SYNAPTICS TM-03163-002 P650RS (108*61MM)	6-49-P65S3-010	
14	TP CONDUCTIVE TYPE 23*10 P650RS	6-47-P65S2-020	
15	HINGE COVER R (C7230P-BK1C340) P650RS	6-42-P65S2-011	
16	POWER BOARD V2.0 P650RS	6-77-P65SC-D02	
17	ESS AUDIO BOARD V2.0B P650RS	6-77-P65S8-D02B	
18	.SCREW M2.5*4L KI NI ICT NY	6-35-21125-4R0	
19	WIRE CABLE FOR ESS AUDIO 57MM 50V 40PIN P650RS	6-43-P65S0-051-1	
20	FFC CABLE POWER TO MB (P=1.0) 69.5MM 60V 4PIN P650RS	6-43-P65S0-031	
21	FUNCTION KEY FOR CLICK BUTTON MODULE W/O FINGER P650RE6	6-23-KP65R-022	
21	FUNCTION KEY FOR CLICK BUTTON MODULE W/FINGER P650RE6	6-23-KP65R-012	
22	.SCREW M2*3L KI NI ICT NY (DD=ø4.5,DT=0.4)	6-35-B1120-3RE	
23	CLICK W/O FP MYLAR PET (48*14*0.5T) P650SE	6-40-P6502-080	ONLY FOR W/O FINGER
24	CLICK W/FINGER MYLAR2 PET (48*14*0.3T) P650SE	6-40-P6502-040	ONLY FOR W/FINGER
25	FFC CABLE TP TO MB (P=1.0) 195.0MM 60V 4PIN P650RS	6-43-P65S0-041-1	
26	FFC CABLE TP TO CLICK (P=0.5) 101.8MM 60V 8PIN P650RE6	6-43-P65R0-021	
27	CLICK TRANSFER BOARD (W/FP) V2.0+FINGER SENOR BOARD V1.0A P650RS	6-77-P65SA-N02	
27	CLICK TRANSFER BOARD (W/OFP) V2.0 P650RS	6-77-P65S2-D02-1	
28	GASKET SPK (32.5*2.5H*26) P650RS	6-47-00190-320	
29	SCREW M2*2L KI BK/Z ICT NY(ø8,T=0.6)	6-35-B6120-2RE	
30	TAPE MYLAR TRANSPARENT (20*10*0.05) P180HM	6-40-P1803-020	

Figure A - 1
Top

Bottom

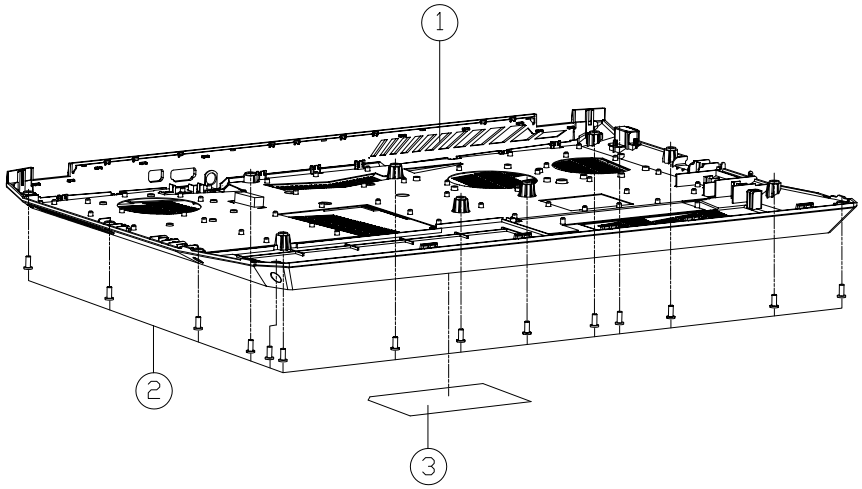
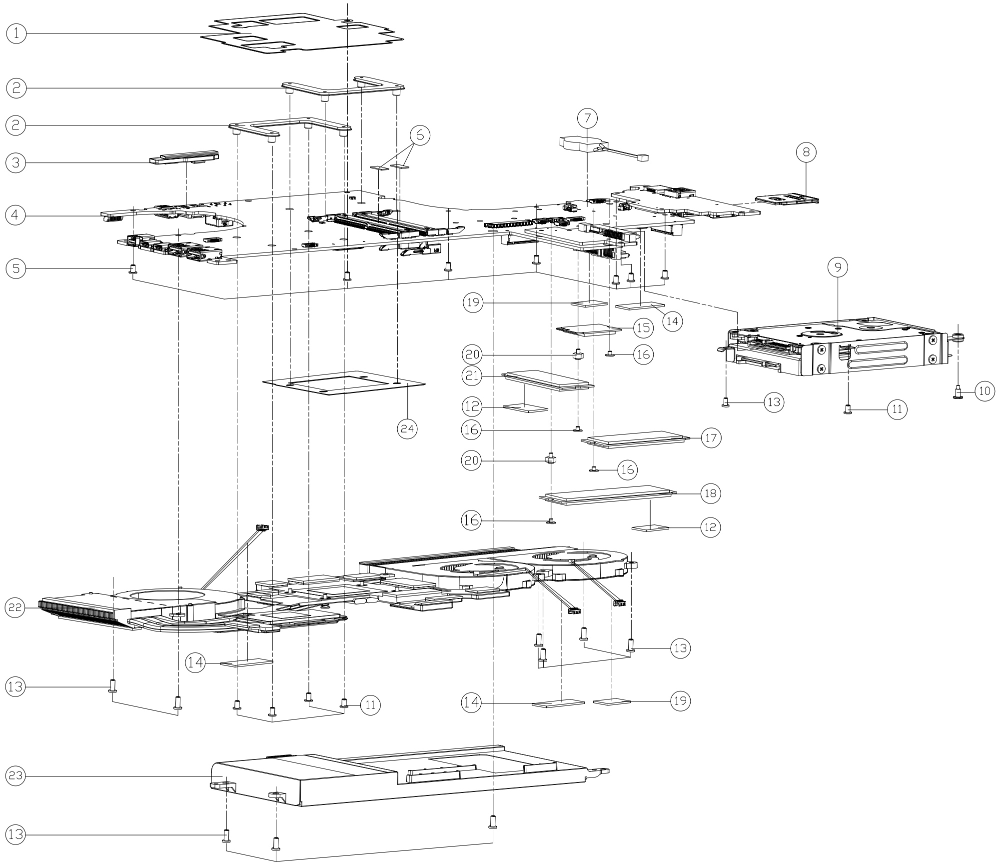


Figure A - 2
Bottom

ITEM	PART NAME	PART NO	REMARK
1	BOTTOM CASE MODULE P650RS	6-39-P65S3-012	
1	BOTTOM CSAE MODULE P651RS	6-39-P65S3-112	
2	SCREW M2.5*6L K BZ ICT NY	6-35-82125-6RA	
3	PRODUCT LABEL FOR P650RS (FOLLOW NEW CE SAFETY)	6-45-P650RS03-011	
3	PRODUCT LABEL FOR P651RS(FOLLOW NEW CE SAFETY)	6-45-P651RS03-011	
3	PRODUCT LABEL FOR P650RS-G (FOLLOW NEW CE SAFETY)	6-45-P650RSG3-011	
3	PRODUCT LABEL FOR P651RS-G (FOLLOW NEW CE SAFETY)	6-45-P651RSG3-011	
3	PRODUCT LABEL FOR P650HS (CHANGE LOGO)	6-45-P650HS03-011	
3	PRODUCT LABEL FOR P651HS (CHANGE LOGO)	6-45-P651HS03-011	
3	PRODUCT LABEL FOR P650HS-G (CHANGE LOGO)	6-45-P650HSG3-011	
3	PRODUCT LABEL FOR P651HS-G (CHANGE LOGO)	6-45-P651HSG3-011	

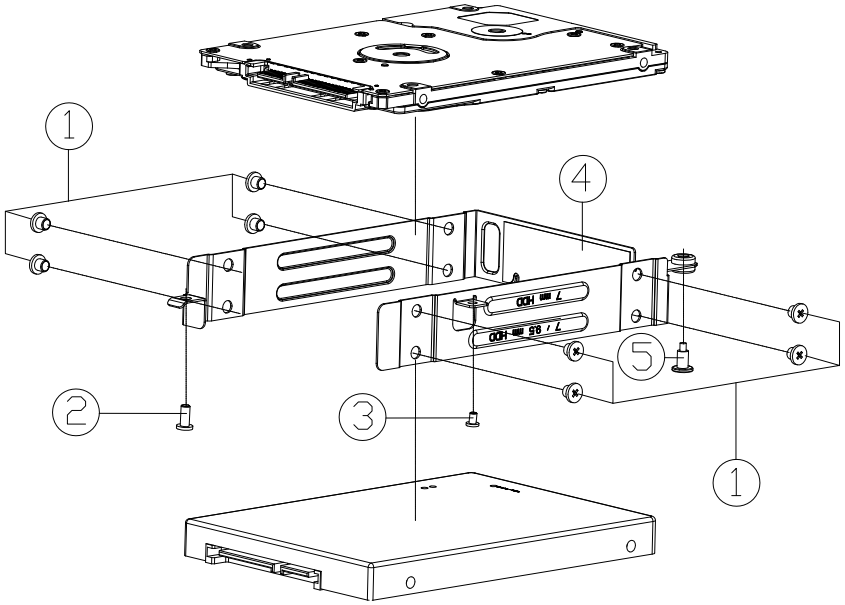
Main Board



ITEM	PART NAME	PART NO	REMARK
1	CONDUCTIVE CLOTH FOR GPU P670RS-GM	6-47-P67SS-010-M	
2	CPU SUPPORT BRACKET SECC T=1.2 NUT ADD 0.4MM P650RP6	6-33-P65PS-011	
3	HDMI SAFETY RUBBER (SILICON RUBBER) P670RS-GM	6-47-P67SS-021-M	
4	MAIN BOARD(CPU/I7-6820HK/2.7G) V2.0A (EDPX/V/TPM+HDD BOARD V2.0+USB LAN CARDREADER BOARD V2.0 P650RS	6-77-P650RS0A-N02A-A	
4	MAIN BOARD(CPU/I7-6700HQ/2.6G) V2.0A (EDPX/V/O TPM+HDD BOARD V2.0+USB LAN CARDREADER BOARD V2.0 P650RS	6-77-P650RS0A-N02A-1B	
4	MAIN BOARD(CPU/I7-6700HQ/2.6G) V2.0A (EDPX/V/O TPM+HDD BOARD V2.0+USB LAN CARDREADER BOARD V2.0 P650RS-G	6-77-P650RSGA-N02A-1B	
4	MAIN BOARD(CPU/I7-6820HK/2.7G) V2.0A (EDPX/V/TPM+HDD BOARD V2.0+USB LAN CARDREADER BOARD V2.0 P650RS-G	6-77-P650RSGA-N02A-A	
4	MAIN BOARD(CPU/I7-7820HK/2.9G) V2.0C (EDPX/V/TPM+HDD BOARD V2.0A+USB LAN CARDREADER BOARD V2.0A P650HS	6-77-P650HS0A-N02C-A	
4	MAIN BOARD(CPU/I7-7700HQ/2.8G) V2.0C (EDPX/V/TPM+HDD BOARD V2.0A+USB LAN CARDREADER BOARD V2.0A P650HS	6-77-P650HS0A-N02C-B	
4	MAIN BOARD(CPU/I7-7700HQ/2.8G) V2.0C (EDPX/V/O TPM+HDD BOARD V2.0A+USB LAN CARDREADER BOARD V2.0A P650HS	6-77-P650HS0A-N02C-1B	
4	MAIN BOARD(CPU/I7-7820HK/2.9G) V2.0C (EDPX/V/TPM+HDD BOARD V2.0A+USB LAN CARDREADER BOARD V2.0A P650HS-G	6-77-P650HSGA-N02C-A	
4	MAIN BOARD(CPU/I7-7700HQ/2.8G) V2.0C (EDPX/V/O TPM+HDD BOARD V2.0A+USB LAN CARDREADER BOARD V2.0A P650HS-G	6-77-P650HSGA-N02C-1B	
5	.SCREW M2.5*4L KI NI ICT NY	6-35-21125-4R0	
6	DDR4 SOCKET RUBBER(10.8*5) SILICONE P650RE6	6-47-P65RS-011	
7	BAT. 20MM 3V 220MAH W/CABLE 55MM BCR2032H5.5VM1UB (SHIHND)	6-23-22015-TE0	
8	DUMMY 3IN1 NON PUSH TYPE PC+ABS (C7230P-701DE)(CHANGE) W970SUW	6-42-W9708-011	
9	W/O HDD ASS'Y P650RS	6-79-P650RS0J-010	
9	W/HDD ASS'Y P650RS	6-79-P650RS0J-020	
9	W/O 2ND HDD ASS'Y P650RS	6-79-P650RS0J-030	
9	W/ 2ND HDD ASS'Y P650RS	6-79-P650RS0J-040	
10	SCREW M2*6.2L NI ICT NY FOR SPEAKER	6-35-Z1120-6R2	
11	.SCREW M2*4L KI NI ICT NY (DD=ø4.5,DT=0.4)	6-35-B1120-4RE	
12	THERMAL PAD RS300 (30*20*1.7T)MM FOR M.2 SSD P650RS	6-48-P65SS-020	
13	SCREW M2.5*6L K BZ ICT NY	6-35-82125-6RA	
14	TAPE MYLAR (C),MYLAR M550J	6-40-M55J2-030	
15	WLAN+BT COMBO DUAL BAND INTEL SNOWFIELD PEAK 8260NGW NON-VPRO MP8260 2X2 AC+BT 4.1 LE C1 STEPPING M2 2230 GENERIC P67RG	6-88-P67RF-4200	OPTION
15	WLAN+BT COMBO INTEL STONE PEAK 7265NGW.NGW D0 STEPPING PCI-E M2 2230 2X2 BGN+BT GENERIC W95LU	6-88-W95LF-4240	OPTION
15	WLAN+BT COMBO INTEL WIRELESS-AC 3165 (STONE PEAK D, 1X1 AC + BT 3165NGW.GQ) PCI-E M2 2230 N240LU	6-88-N240F-4200	OPTION
15	WLAN+ BT COMBO ATHEROS QCNFA364A(KILLER 1535 DUAL BAND 2X2 AC+BT 4.1 LE M2 2230 P750DM	6-88-P75DF-9601	OPTION
15	WLAN+BT+8021AD COMBO USI SPARROW-M2-2230 QCA9008-TBD1 8501-6M773-H5 8021AC+8021AD+BT4.1 LE (USB) M2 2230 P870DM2	6-88-P872F-8100	OPTION
15	WLAN+BT COMBO DUAL BAND INTEL WINDSTORM PEAK 8265NGW NON-VPRO 2X2 AC+BT BT4.2 M2 2230 P650RS	6-88-P65SF-4200	OPTION
15	WLAN+BT COMBO DUAL BAND INTEL SANDY PEAK 3168NGW 1X1 AC+BT BT4.2 M2 2230 P650RS	6-88-P65SF-4210	OPTION
16	SCREW M2*2L KI NI ICT NY (DD=ø5 ,T=0.5)	6-35-B1120-2R0	
17	.WCDMA HUAWEI MU736 HSPA+ NGFF CARD USB INTERFACE WITHOUT GPS S210TU	6-88-S210W-8810	OPTION
17	LTE 4G NO GPS MODULE HUAWEI ME936 FIRMWARE VER 11.350.20.00.00 FOR EUROPE NGFF M2 CARD USB INTERFACE W330SU2	6-88-W3306-8841	OPTION
18	SSD M.2 2280 512GB CRUCIAL MTFDDAV512MBF (M600) SATA3 MLC	6-85-D515B-101	OPTION
18	SSD M2 2280 512GB SAMSUNG MZNLN512HCJH00000 (PM871) SATA3 V2 EVO	6-85-D515B-S01	OPTION
18	SSD M.2 2280 500GB CRUCIAL CT500MX200SSD4 (MX200) SATA3 MLC	6-85-D515A-100	OPTION
18	SSD M.2 2280 250GB CRUCIAL CT250MX200SSD4 (MX200) SATA3 MLC	6-85-D51R0-100	OPTION
19	TAPE MYLAR TRANSPARENT (20*10*0.05) P180HM	6-40-P1803-020	
20	.SCREW M2*2.5L (H=2.5 D=5) STEEL ICT NY FOR NGFF CARD(CHANGE)	6-35-ZA120-2R5-1	
21	SSD M.2 2280 512GB CRUCIAL MTFDDAV512MBF (M600) SATA3 MLC	6-85-D515B-101	OPTION
21	SSD M2 2280 512GB SAMSUNG MZNLN512HCJH00000 (PM871) SATA3 V2 EVO	6-85-D515B-S01	OPTION
21	SSD M.2 2280 500GB CRUCIAL CT500MX200SSD4 (MX200) SATA3 MLC	6-85-D515A-100	OPTION
21	SSD M.2 2280 250GB CRUCIAL CT250MX200SSD4 (MX200) SATA3 MLC	6-85-D51R0-100	OPTION
21	SSD M2 2280 512GB SAMSUNG MZVPV512HDGL-00000 (SM951_NVME) PCIE G3X4 MLC	6-85-D515B-S02	OPTION
21	SSD M2 2280 512GB SAMSUNG MZVLV512HCJH-00000 (PM951) PCIE G3X4 TLC	6-85-D515B-S03	OPTION
21	* SSD M2 2280 256GB SAMSUNG MZVPV256HDGL-00000 (SM951_NVME) PCIE G3X4 MLC	6-85-D51R6-S04	OPTION
22	CPU & VGA HEATSINK MODULE WITH FAN P650RS	6-31-P65S2-102	
23	BAT.P S LI 14.8V/4.068AH/60WH PSE 4S1P SMP/COSLIGHT (POLYMER) 980T/0A123F EU DESIGN CHANGE(0830255) ADD CQC P650SE	6-87-P650S-4253	
23	BAT.P S LI 14.8V/4.1AH/60WH 4S1P GETAC/LUWIN (POLYMER) 541387X6003 W/O TCO LABEL CHANGE(0830255) ADD CQC P650SE	6-87-P650S-4U32	
24	ABSORBER 69*63.7*0.45T P670RS-GM	6-47-P67SS-030-M	ONLY FOR P650HS/-G

Figure A - 3
Main Board

HDD



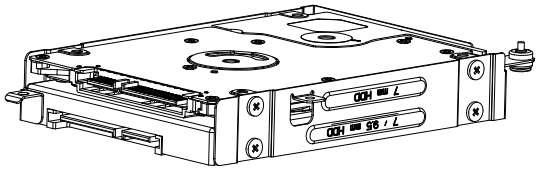


Figure A - 4
HDD

ITEM	PART NAME	PART NO	REMARK
1	SCREW M3*2.5L KI NI ICT NY	6-35-B1130-2R5	
2	SCREW M2.5*6L K BZ ICT NY	6-35-82125-6RA	
3	.SCREW M2*4L KI NI ICT NY (DD=Ø4.5,DT=0.4)	6-35-B1120-4RE	
4	HDD BKT SECC P670SG	6-33-P6702-061	
5	.SCREW M2*6.2L NI ICT NY FOR SPEAKER	6-35-Z1120-6R2	

LCD

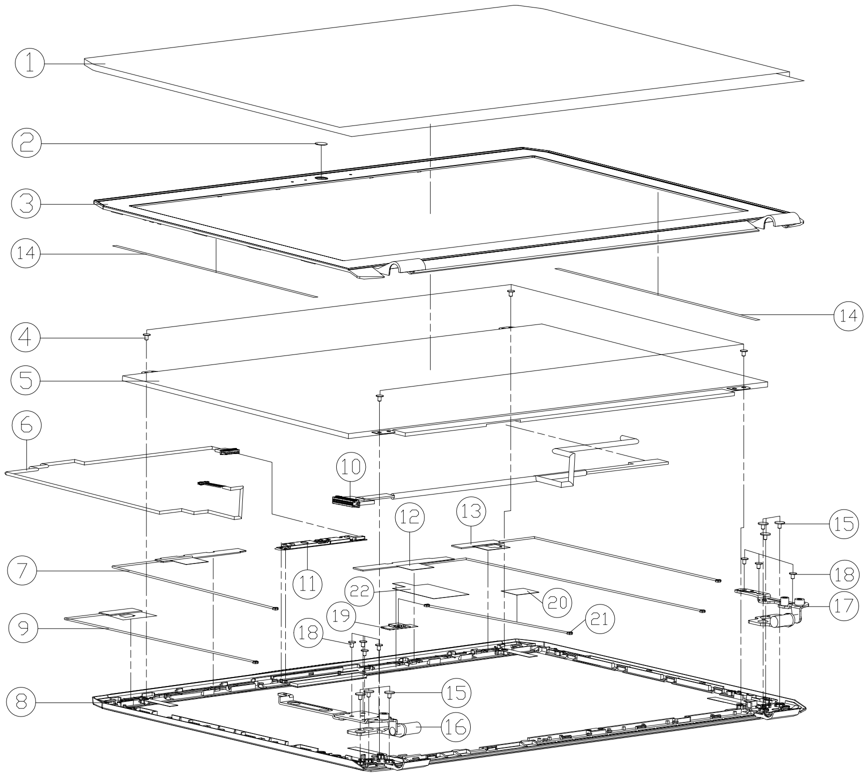
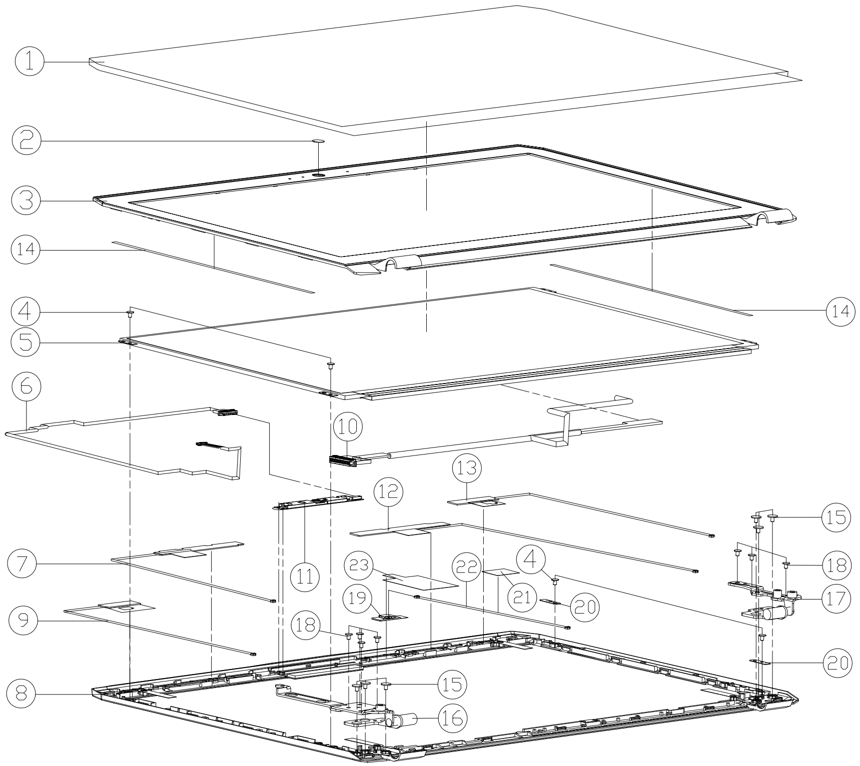


Figure A - 5
LCD

ITEM	PART NAME	PART NO	REMARK
1	LCD PROTECT MYLAR BOPP N650DU	6-40-N6508-040	
2	CCD LENS PMMA P650SE	6-42-P6501-010	
3	LCD FRONT COVER MODULE P650SE	6-39-P6501-015	
4	.SCREW M2*2.5L KI BK/Z ICT NY 1# Ø3.5 T=0.5	6-35-B6120-2RD	
5	LCD 15.6" UHD (PLS)(EDP) SAMSUNG LTN156FL02-101 " SUPPORT S/W G-SYNC "(LED) 2.6MM	6-50-L1226-M03	
5	LCD 15.6" FHD/IPS/EDP LG LP156WF6-SPB1 (N7) (LED)" SUPPORT S/W G-SYNC " 3.2MM	6-50-LB232-L04	
5	LCD 15.6" FHD/IPS/EDP LG LP156WF6-SPK1 (N4) (LED) 3.2MM	6-50-LB232-L06	
5	LCD 15.6" FHD/IPS/EDP LG LP156WF6-SPK3 (N4) (LED) 3.2MM	6-50-LB232-L08	
5	LCD 15.6" UHD (IPS)(EDP) LG LP156UD1-SPB1 (LED) 2.6MM	6-50-L1226-L00	
5	LCD 15.6" FHD/120HZ/NVSR G-SYNC/N7/EDP AU B156HTN05.2 (LED)3.2MM	6-50-LB232-G17	
6	WIRE CALBE FOR CCD 535MM 30V 8PIN (CMI) P650SE	6-43-P650T-011-1	
7	ANTENNA IPEX4 3G+LTE JEM LTE-2 PCB 0.7G/0.8G/0.9G/1.8G/1.9G/2.1G/2.6GHZ CABLE BLACK L=900MM P650SE	6-23-7P650-072	必須先選3G1/LTE-1/天線 才可以選 LTE -2天線
8	LCD BACK COVER MODULE P650SE	6-39-P6501-027	
8	LCD BACK COVER MODULE P651SE	6-39-P6511-026	
9	ANTENNA IPEX4 WLAN JEM WL2 PCB 2.4G/5G CABLE BLACK L=800MM P650SE	6-23-7P650-052	
10	WIRE+COAXIAL CABLE FOR EDP(SAMSUNG) 270MM 30V 30P (I) (CMI/THL CON:HLX09002) P650SE	6-43-P6501-032-1C	
10	WIRE CABLE FOR EDP(AUO/BOE) 270MM 30V 30P (I) (CMI/THL CON:HLX09008) P650SE	6-43-P6501-042-1C	
10	WIRE CABLE FOR EDP(AUO) 300MM (I) 30V 30P (CMI/HLS CON:HLX09008) P650RS	6-43-P65S1-010-1S	
11	UVC CAMERA CHICONY FIX CKFGF1021003920LH 2M FHD OV2740 W650DC FW3601 W/WHITE-LED W/2D-MIC	6-88-W65DC-5100	OPTION
11	UVC CAMERA BISON FIX BN8VU6VTH-200 2M FHD OV2740 P775KM FW0609 W/WHITE-LED W/2D-MIC	6-88-P775C-4901	OPTION
12	ANTENNA IPEX4 3G+LTE JEM LTE-1 PCB 0.7G/0.8G/0.9G/1.8G/1.9G/2.1G/2.6GHZ L=600MM P650SE	6-23-7P650-060	需要出3G/LTE 模組 必選此3G1/LTE-1天線
13	ANTENNA IPEX4 WLAN JEM WL1 PCB 2.4G/5G L=500MM P650SE	6-23-7P650-041	OPTION
14	FRONT COVER GLUE U&D (NITTO 5000 180*3*0.15) FOR W655SZ	6-40-W6551-020	
15	SCREW M2*2L KI BK/Z ICT NY(Ø8,T=0.6)	6-35-B6120-2RE	
16	LCD HINGE L (SK7) P650RS	6-33-P65S1-0L1	
17	LCD HINGE R (SK7) P650RS	6-33-P65S1-0R2	
18	.SCREW M2.5*4L KI NI ICT NY	6-35-21125-4R0	
19	ANTENNA IPEX4 WLAN JEM WL2 PCB 2.4G/5G CABLE BLACK L=800MM P650SE	6-88-P8722-8100	FOR 6-88-P872F-8100
20	802.11AD TAPE MYLAR(BLACK)(20*15*0.12T)P655RP6	6-40-P655S-P10	FOR 6-88-P872F-8100
21	802.11AD CABLE 640MM MXJA02JA6400TE MURATA CONNECTER P870DM2	6-23-7P872-010	FOR 6-88-P872F-8100
22	802.11AD COPPER FOIL P775DM2	6-47-P7751-211	FOR 6-88-P872F-8100

LCD (Sharp)

Figure A - 6
LCD (Sharp)



ITEM	PART NAME	PART NO	REMARK
1	LCD PROTECT MYLAR BOPP N650DU	6-40-N6508-040	
2	CCD LENS PMMA P650SE	6-42-P6501-010	
3	LCD FRONT COVER MODULE P650SE	6-39-P6501-015	
4	.SCREW M2*2.5L KI BK/Z ICT NY 1# ø3.5 T=0.5	6-35-B6120-2RD	
5	LCD 15.6" QFHD (EDP) IPS MODE SHARP LQ156D1JW04 LED 3.14MM F/W UPDATE	6-50-L1231-A01	
6	WIRE CALBE FOR CCD 535MM 30V 8PIN (CMI) P650SE	6-43-P650T-011-1	
7	ANTENNA IPEX4 3G+LTE JEM LTE-2 PCB 0.7G/0.8G/0.9G/1.8G/1.9G/2.1G/2.6GHZ CABLE BLACK L=900MM P650SE	6-23-7P650-072	必須先選3G1/LTE-1/天線 才可以選 LTE -2天線
8	LCD BACK COVER MODULE P650SE	6-39-P6501-027	
8	LCD BACK COVER MODULE P651SE	6-39-P6511-026	
9	ANTENNA IPEX4 WLAN JEM WL2 PCB 2.4G/5G CABLE BLACK L=800MM P650SE	6-23-7P650-052	
10	WIRE+COAXIAL CABLE FOR EDP(SHARP) 270MM 30V 40P (I) (CMI/THL CON#LX09267) P650SE	6-43-P6501-052-1C	
11	UVC CAMERA CHICONY FIX CKFGF1021003920LH 2M FHD OV2740 W650DC FW3601 W/WHITE-LED W/2D-MIC	6-88-W65DC-5100	OPTION
11	UVC CAMERA BISON FIX BN8VU6VTH-200 2M FHD OV2740 P775KM FWXXXX W/WHITE-LED W/2D-MIC	6-88-P775C-4900	OPTION
12	ANTENNA IPEX4 3G+LTE JEM LTE-1 PCB 0.7G/0.8G/0.9G/1.8G/1.9G/2.1G/2.6GHZ L=600MM P650SE	6-23-7P650-060	需要出3G/LTE 模組 必選此3G1/LTE-1天線
13	ANTENNA IPEX4 WLAN JEM WL1 PCB 2.4G/5G L=500MM P650SE	6-23-7P650-041	OPTION
14	FRONT COVER GLUE U&D (NITTO 5000 180*3*0.15) FOR W655SZ	6-40-W6551-020	
15	SCREW M2*2L KI BK/Z ICT NY(ø8,T=0.6)	6-35-B6120-2RE	
16	LCD HINGE L (SK7) P650RS	6-33-P65S1-0L1	
17	LCD HINGE R (SK7) P650RS	6-33-P65S1-0R2	
18	.SCREW M2.5*4L KI NI ICT NY	6-35-21125-4R0	
19	ANTENNA IPEX4 WLAN JEM WL2 PCB 2.4G/5G CABLE BLACK L=800MM P650SE	6-88-P8722-8100	FOR 6-88-P872F-8100
20	LCD PANEL BRACKET (SECC) P650SE	6-33-P6501-010	
21	802.11AD TAPE MYLAR(BLACK)(20*15*0.12T)P655RP6	6-40-P655S-P10	FOR 6-88-P872F-8100
22	802.11AD CABLE 640MM MXJA02JA6400TE MURATA CONNECTER P870DM2	6-23-7P872-010	FOR 6-88-P872F-8100
23	802.11AD COPPER FOIL P775DM2	6-47-P7751-211	FOR 6-88-P872F-8100

Appendix B: Schematic Diagrams

This appendix has circuit diagrams of the ***P650HS(-G) / P651HS(-G)*** notebook's PCB's. The following table indicates where to find the appropriate schematic diagram.

Diagram - Page	Diagram - Page	Diagram - Page	Diagram - Page
System Block Diagram - Page B - 2	*Frame Buffer Partition C_D - Page B - 26*	*M.2 3G/LTE - Page B - 50*	*VCC_Core & VCCSA - Page B - 74*
Processor 1/7 - Page B - 3	*GPU Decoupling 1 - Page B - 27*	*Realtek ALC898 - Page B - 51*	*VCore Output Stage - Page B - 75*
Processor 2/7 - Page B - 4	*GPU Decoupling 2 - Page B - 28*	*TPA2008D2 - Page B - 52*	*VCCGT - Page B - 76*
Processor 3/7 - Page B - 5	*Straps & XTAL - Page B - 29*	*Subwoofer - Page B - 53*	*VCCGT Output Stage - Page B - 77*
Processor 4/7 - Page B - 6	*IFP I/O Interface - Page B - 30*	*AR_TBT - Page B - 54*	*Audio Board P65_ESS_A 1/3 - Page B - 78*
Processor 5/7 - Page B - 7	*Misc - GPIO, I2C and ROM - Page B - 31*	*AR_Power - Page B - 55*	*Audio Board P65_ESS_A 2/3 - Page B - 79*
Processor 6/7 - Page B - 8	*NVIDIA Power Sequence - Page B - 32*	*TPS65982 - Page B - 56*	*Audio Board P65_ESS_A 3/3 - Page B - 80*
Processor 7/7 - Page B - 9	*GPIO Level Shift - Page B - 33*	*TPS65982-1 - Page B - 57*	*Audio Board P67_3DAMP_E - Page B - 81*
DDR CHA SO-DIMM_0 - Page B - 10	*GPU NVVDD, FBVDDQ - Page B - 34*	*AR_Conn Type A/C - Page B - 58*	*P650RS Power Board - Page B - 82*
DDR CHA SO-DIMM_1 - Page B - 11	*GPU GND - Page B - 35*	*TPM, CCD, TP - Page B - 59*	*P650RS HDD Board - Page B - 83*
DDR CHB SO-DIMM_0 - Page B - 12	*PCH 1/9 - Page B - 36*	*Fan, LID, KB LED - Page B - 60*	*P650RS LED Board - Page B - 84*
DDR CHB SO-DIMM_1 - Page B - 13	*PCH 2/9 - Page B - 37*	*Connector - Page B - 61*	*P650RS FP Board - Page B - 85*
Panel, Inverter - Page B - 14	*PCH 3/9 - Page B - 38*	*DDR 1.2V / 0.6VS - Page B - 62*	*P650RS Click Board - Page B - 86*
Mini DP Port E - Page B - 15	*PCH 4/9 - Page B - 39*	*VDD3, VDD5 - Page B - 63*	*P650RS USB Board 1/3 - Page B - 87*
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HDMI - Page B - 17	*PCH 6/9 - Page B - 41*	*Power 1.0V, VCCIO - Page B - 65*	*P650RS USB Board 3/3 - Page B - 89*
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VGA Frame Buffer Partition - Page B - 19	*PCH 8/9 - Page B - 43*	*1.0DX_VCCSTG/VCCSFR_OC/2.5V - Page B - 67*	*P670RS USB Board 1/2 - Page B - 91*
Frame Buffer Partition A - Page B - 20	*PCH 9/9 - Page B - 44*	*1V8_RUN/AON, NV3V3 - Page B - 68*	*P670RS USB Board 2/2 - Page B - 92*
Frame Buffer Partition B - Page B - 21	*KBC IT8587 - Page B - 45*	*NVVDD Phase 1 & 2 - Page B - 69*	
Frame Buffer Partition A_B - Page B - 22	*RGB KB Only - Page B - 46*	*NVVDD Phase 3~4 - Page B - 70*	
GPU Frame Buffer Partition - Page B - 23	*USB Charger - Page B - 47*	*NVVDDS - Page B - 71*	
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Table B - 1
SCHEMATIC DIAGRAMS

Version Note

The schematic diagrams in this chapter are based upon version 6-7P-P65SB-008. If your mainboard (or other boards) are a later version, please check with the Service Center for updated diagrams (if required).

System Block Diagram

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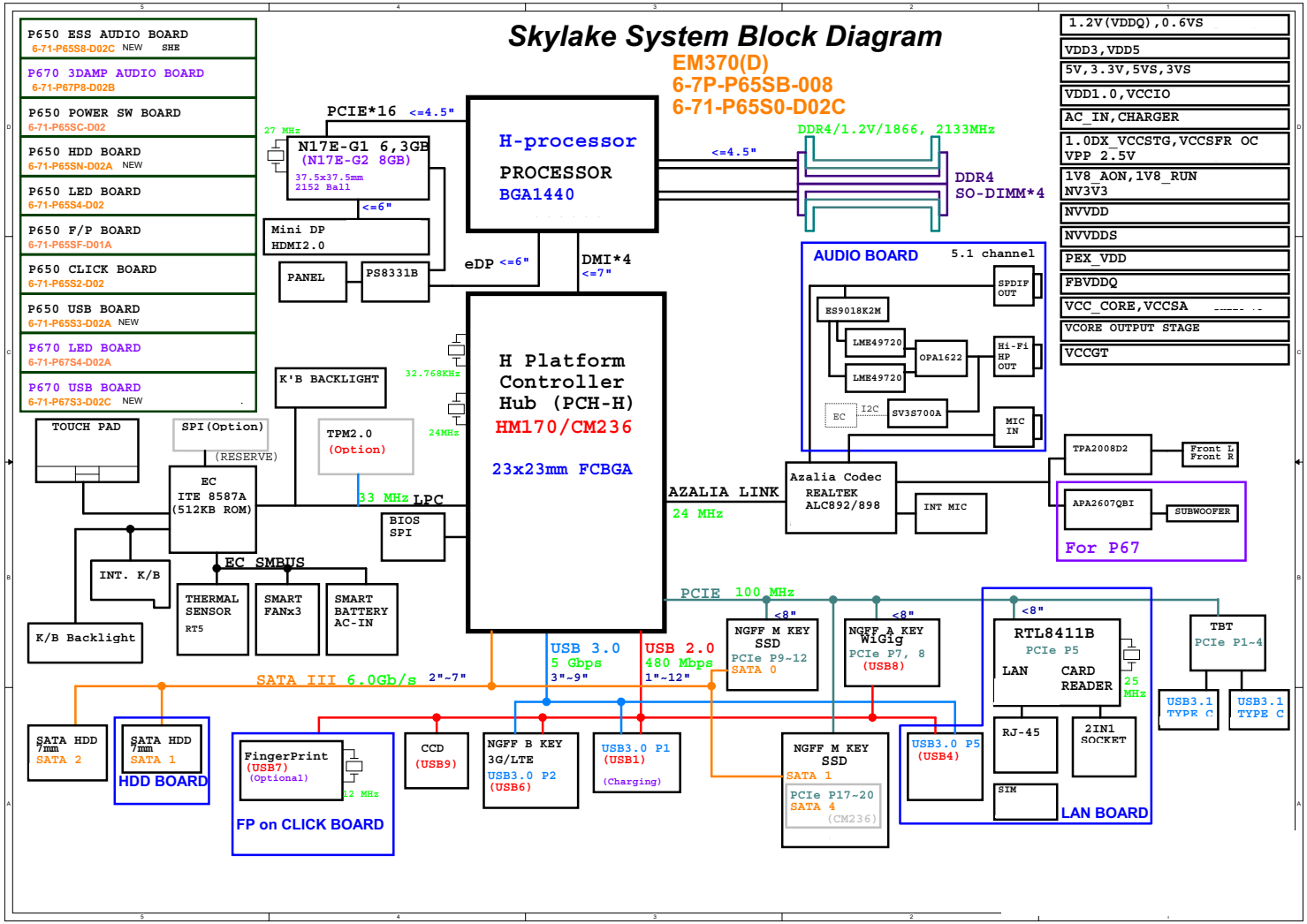
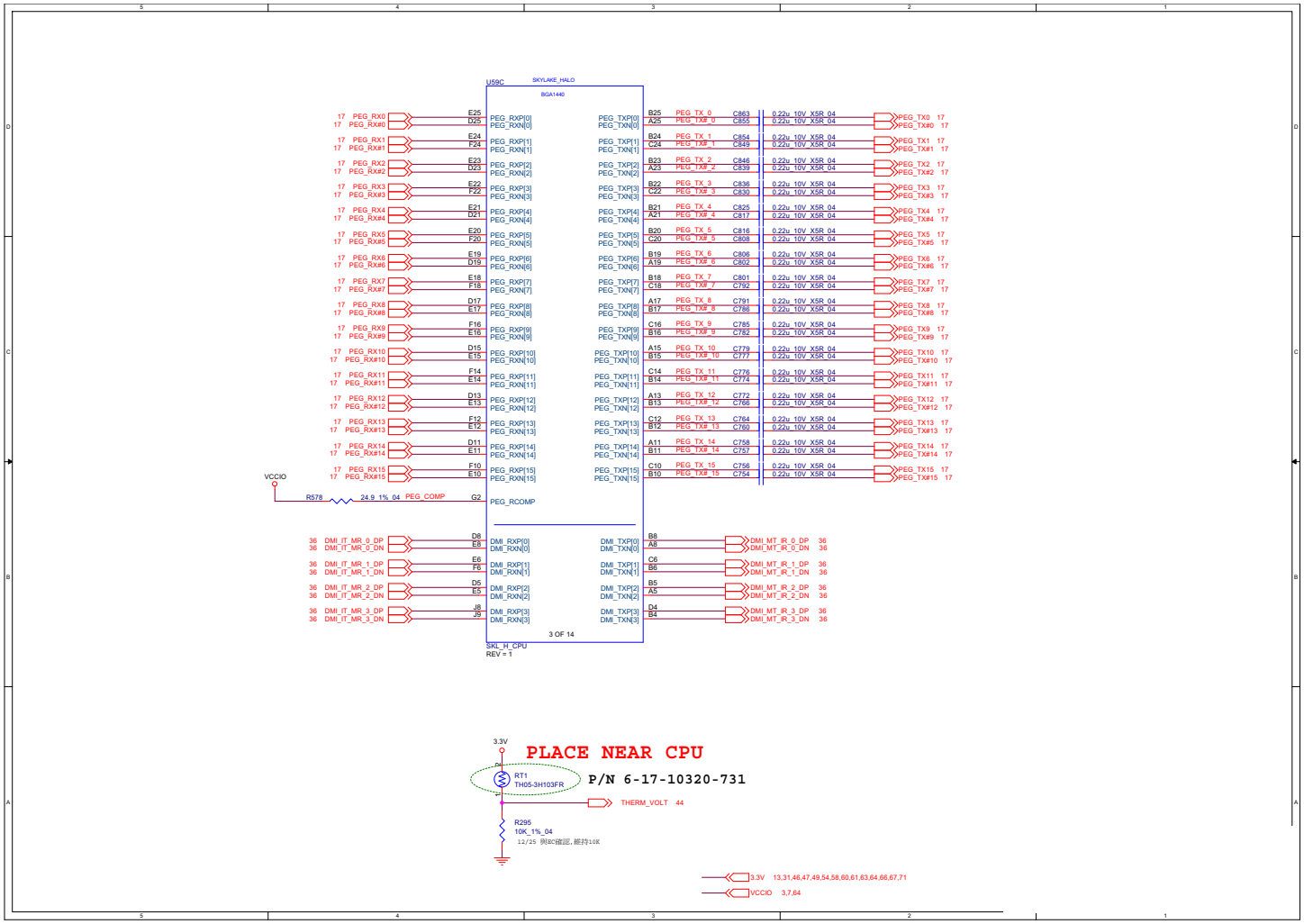
System Block Diagram



Processor 1/7



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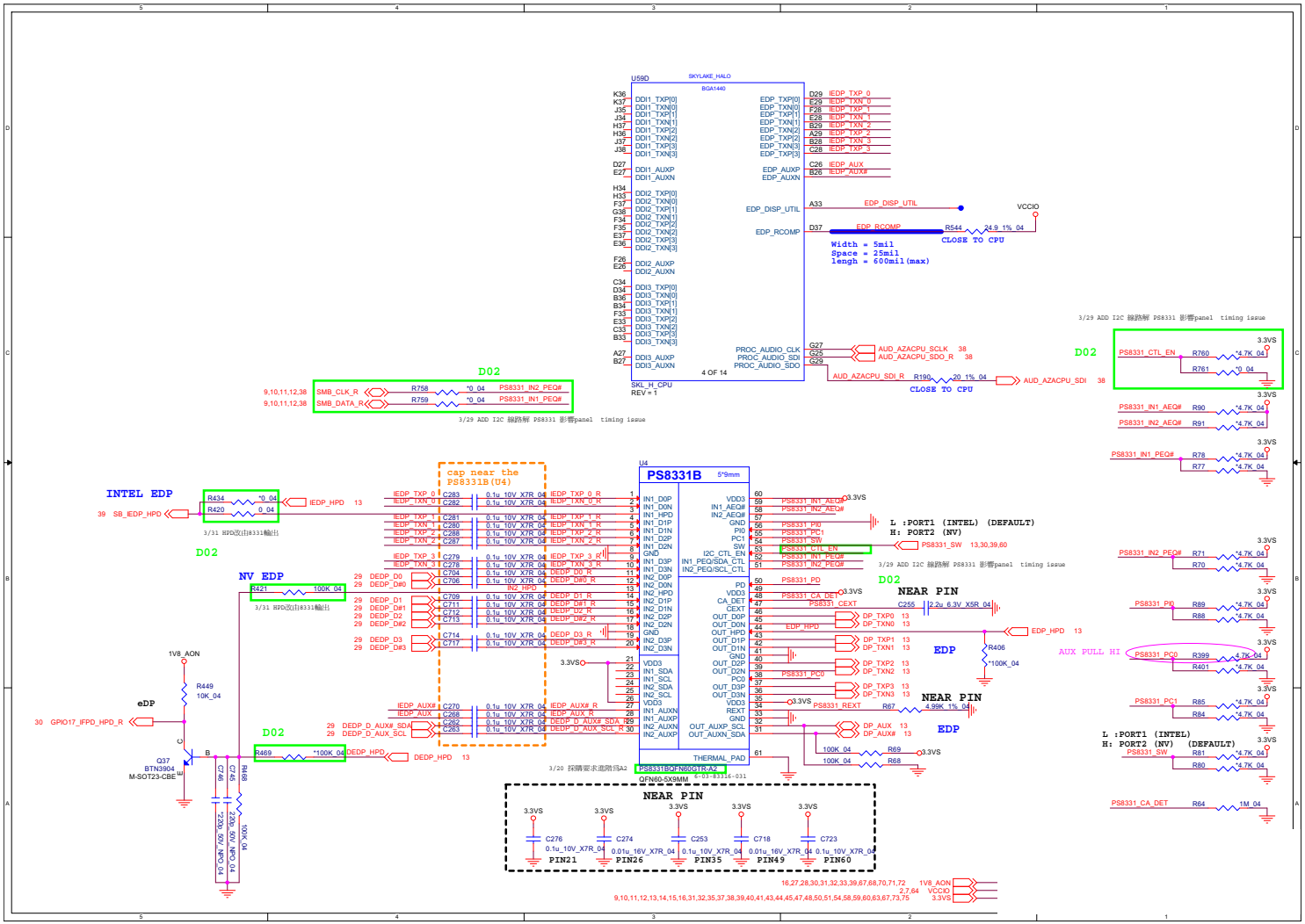
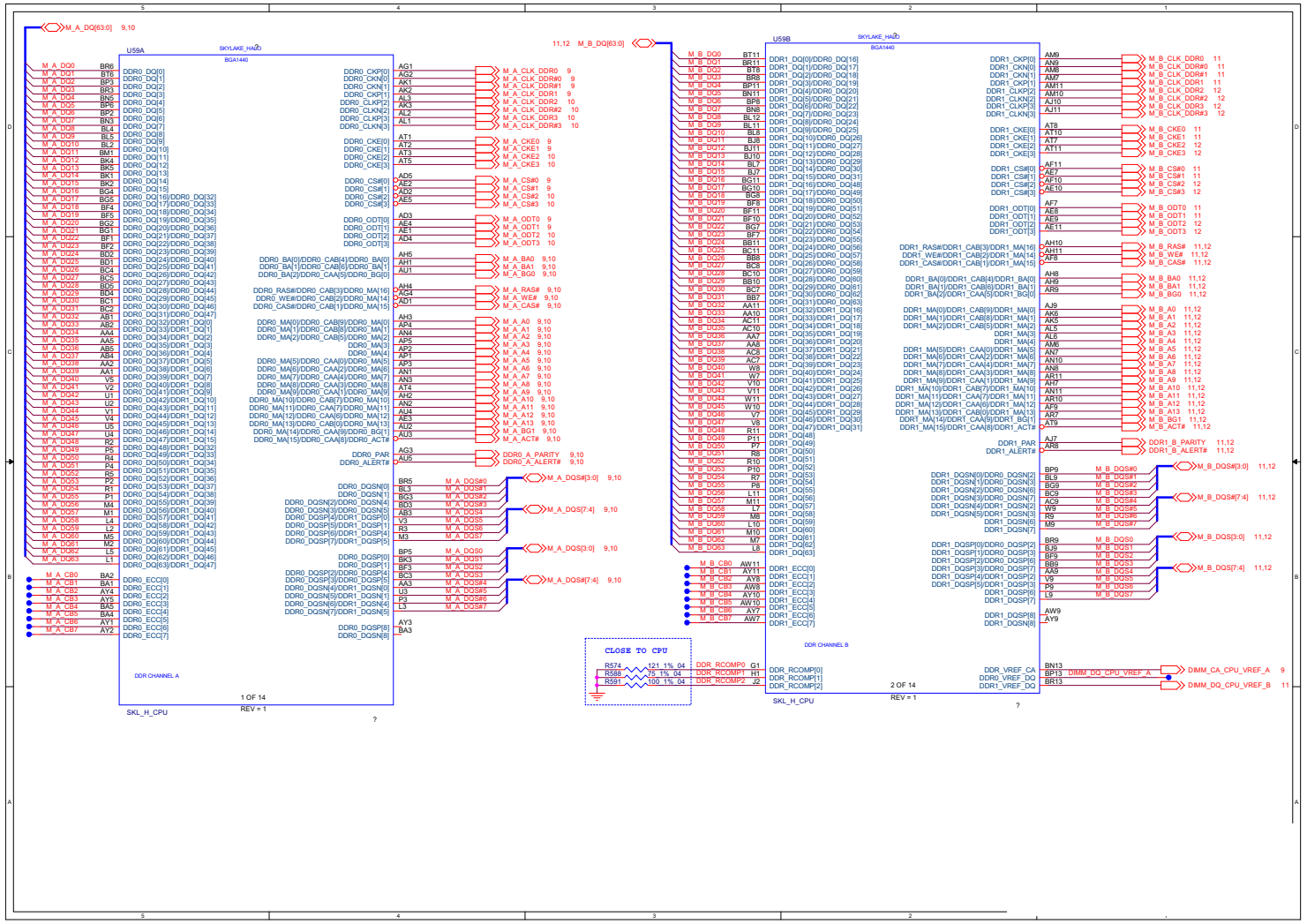
Processor 1/7

Processor 2/7

Sheet 3 of 91
Processor 2/7



Processor 3/7



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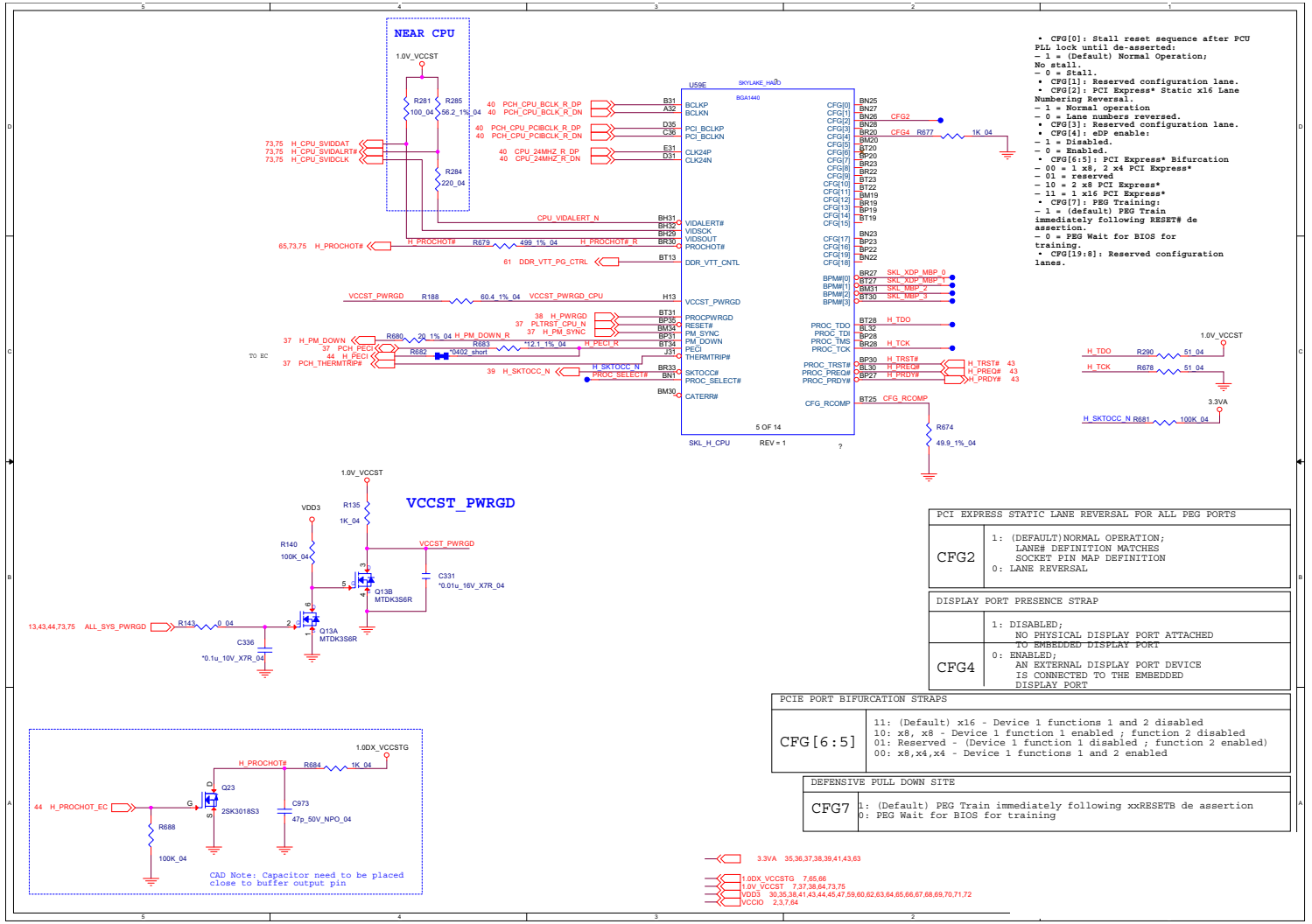
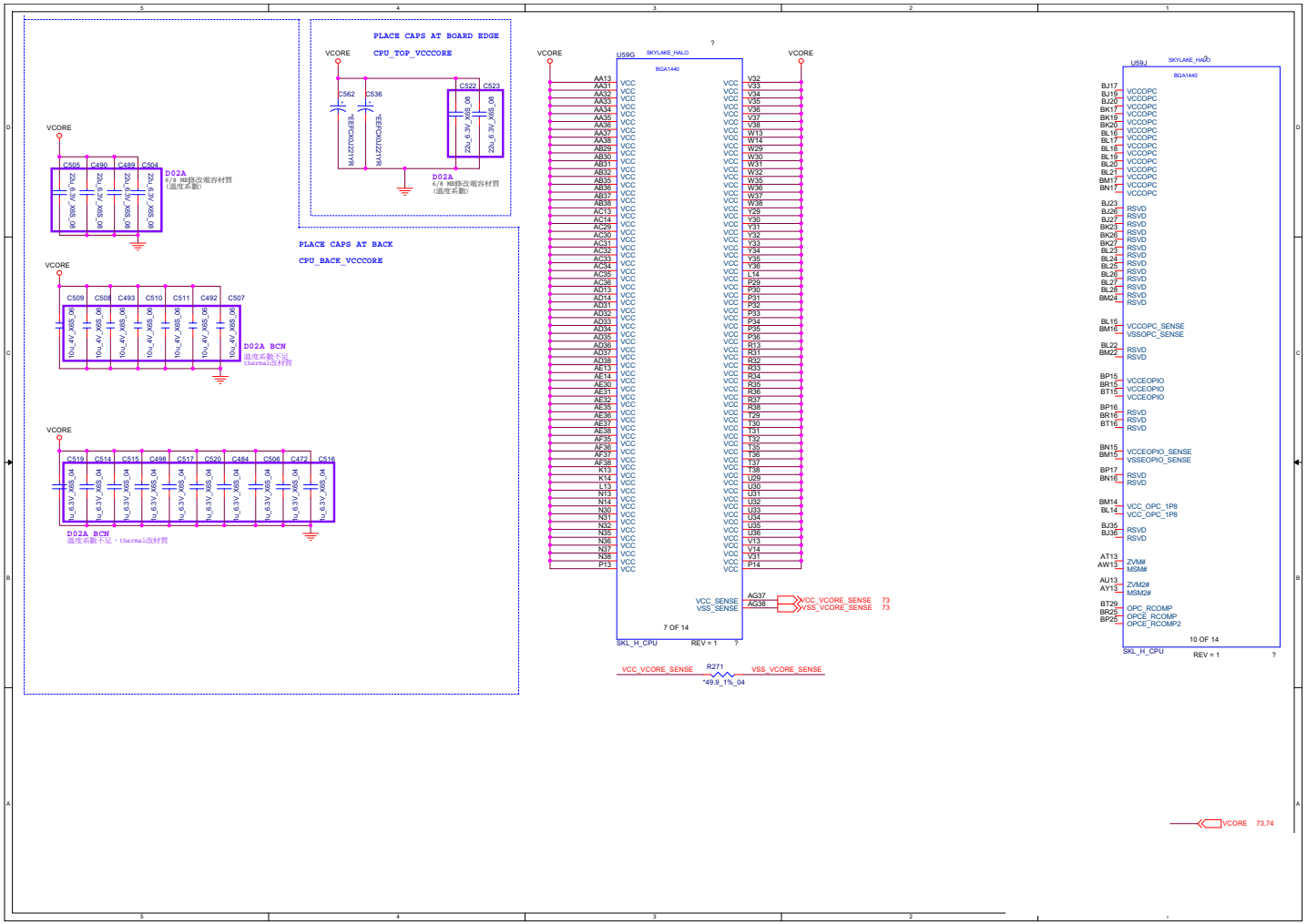
Processor 3/7

Processor 4/7

Sheet 5 of 91
Processor 4/7



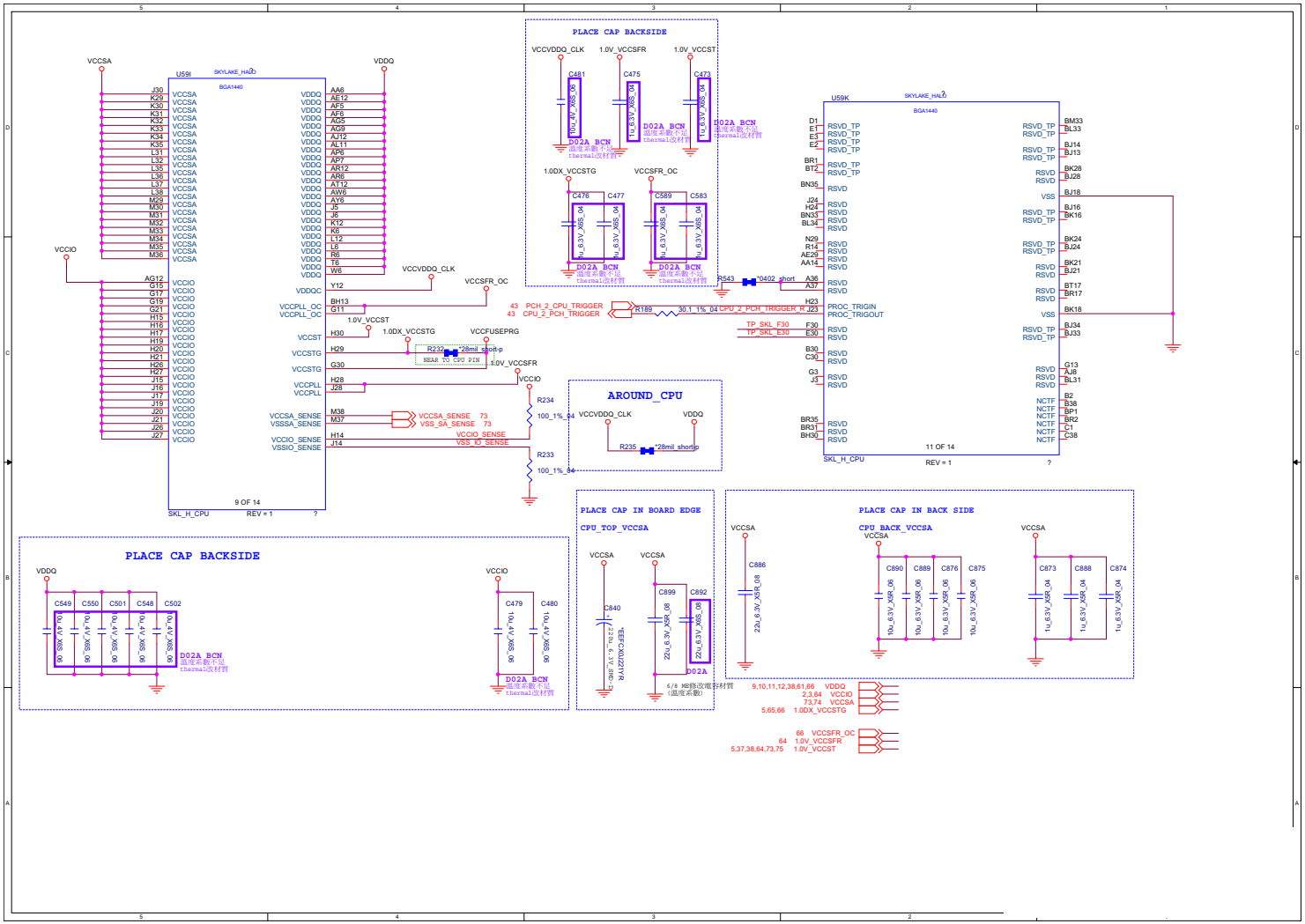
Processor 5/7



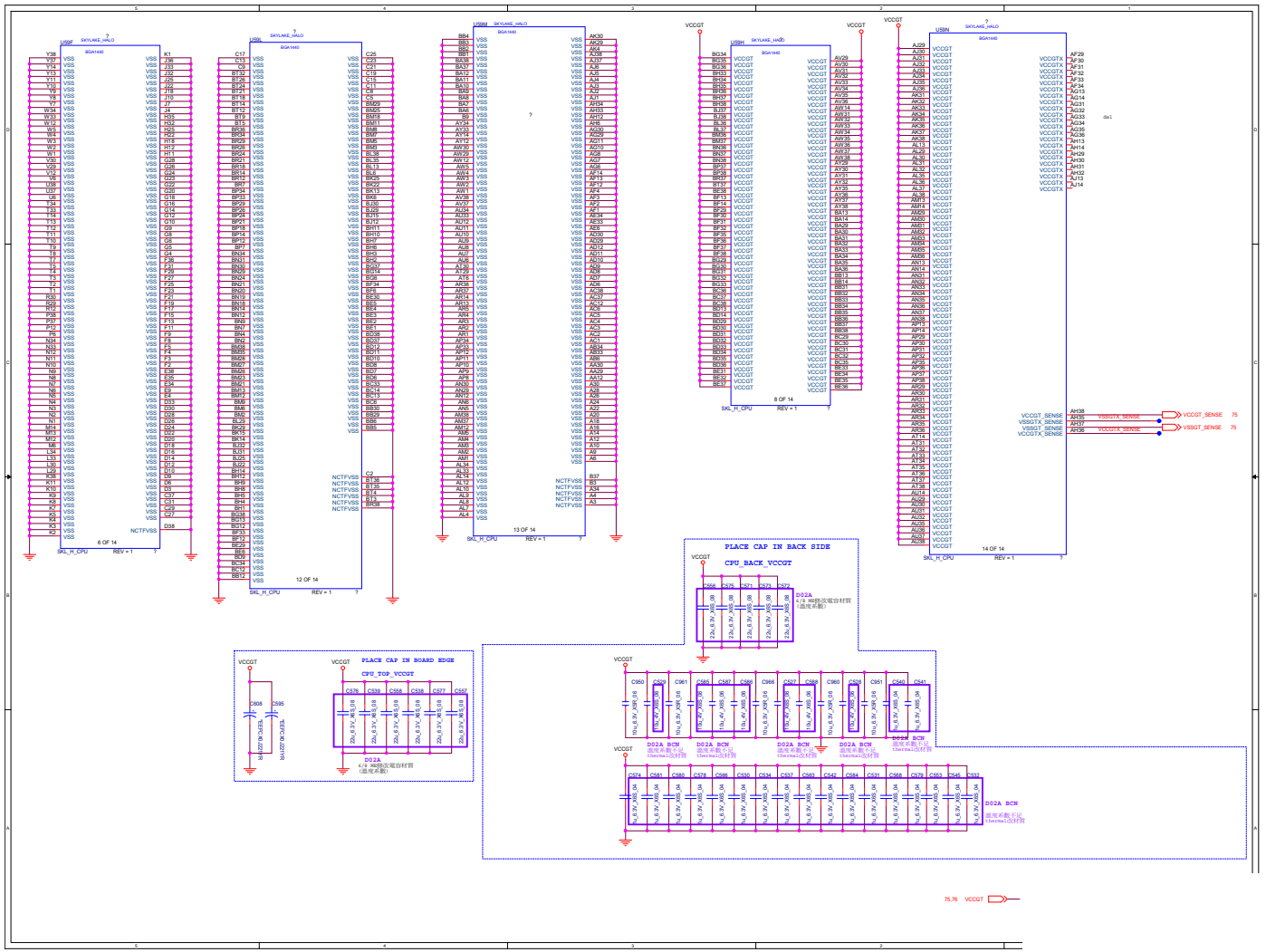
Sheet 6 of 91
Processor 5/7

Processor 6/7

Sheet 7 of 91
Processor 6/7



Processor 7/7



Sheet 8 of 91
Processor 7/7

DDR CHA SO-DIMM_0

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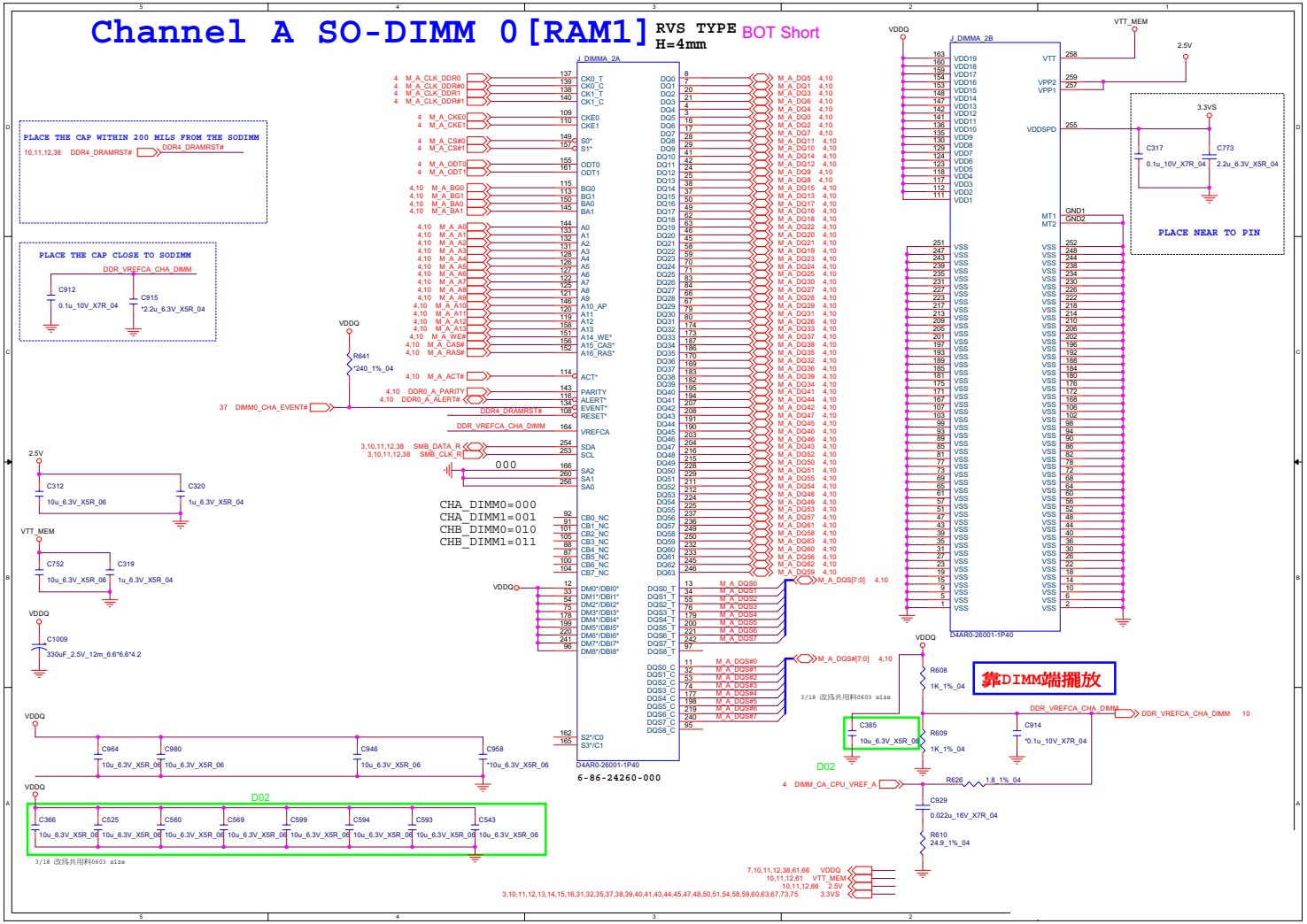
DDR CHA SO-DIMM_0



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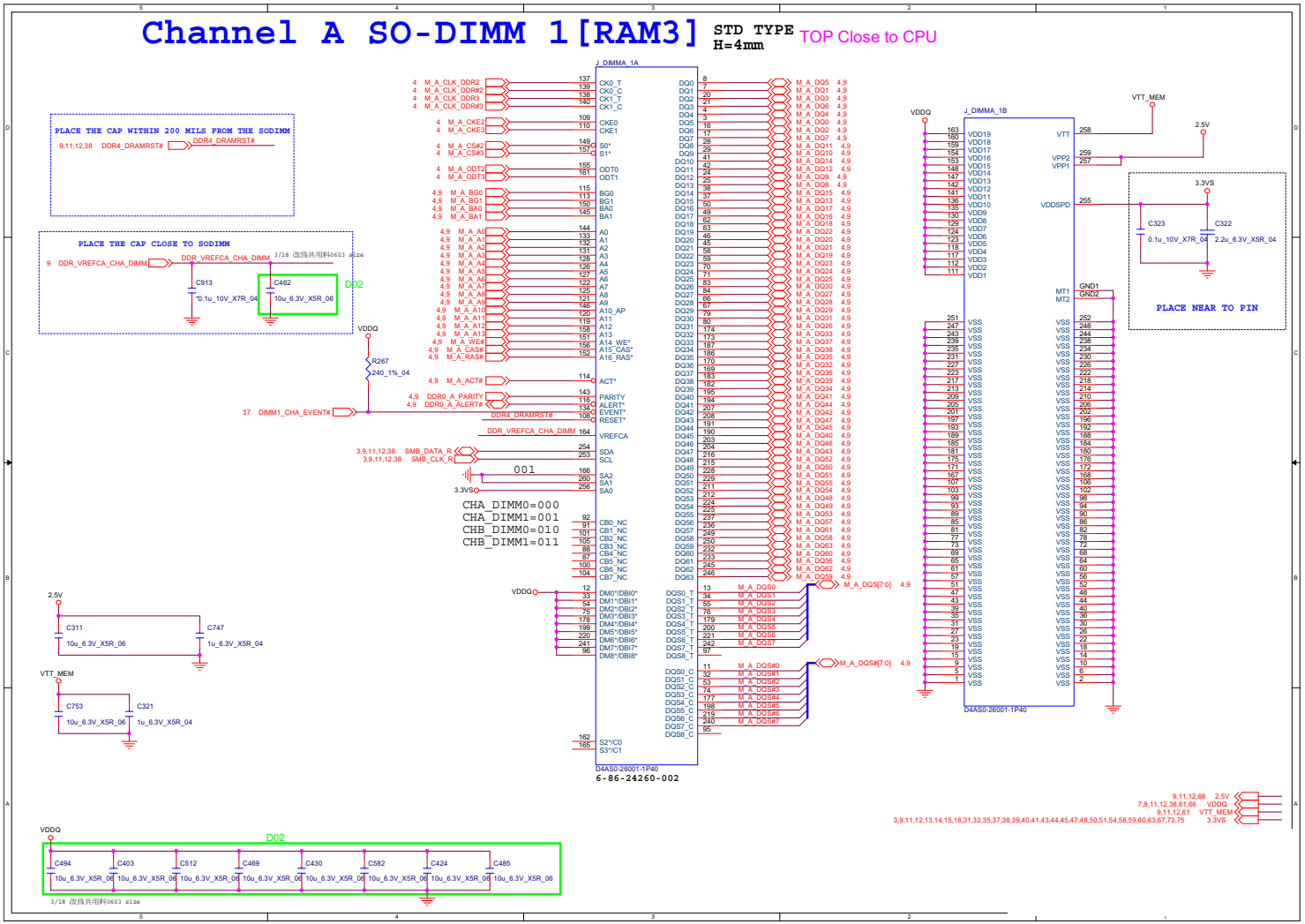

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DDR CHA SO-DIMM_1

B.Schematic Diagrams

DDR CHB SO-DIMM_0

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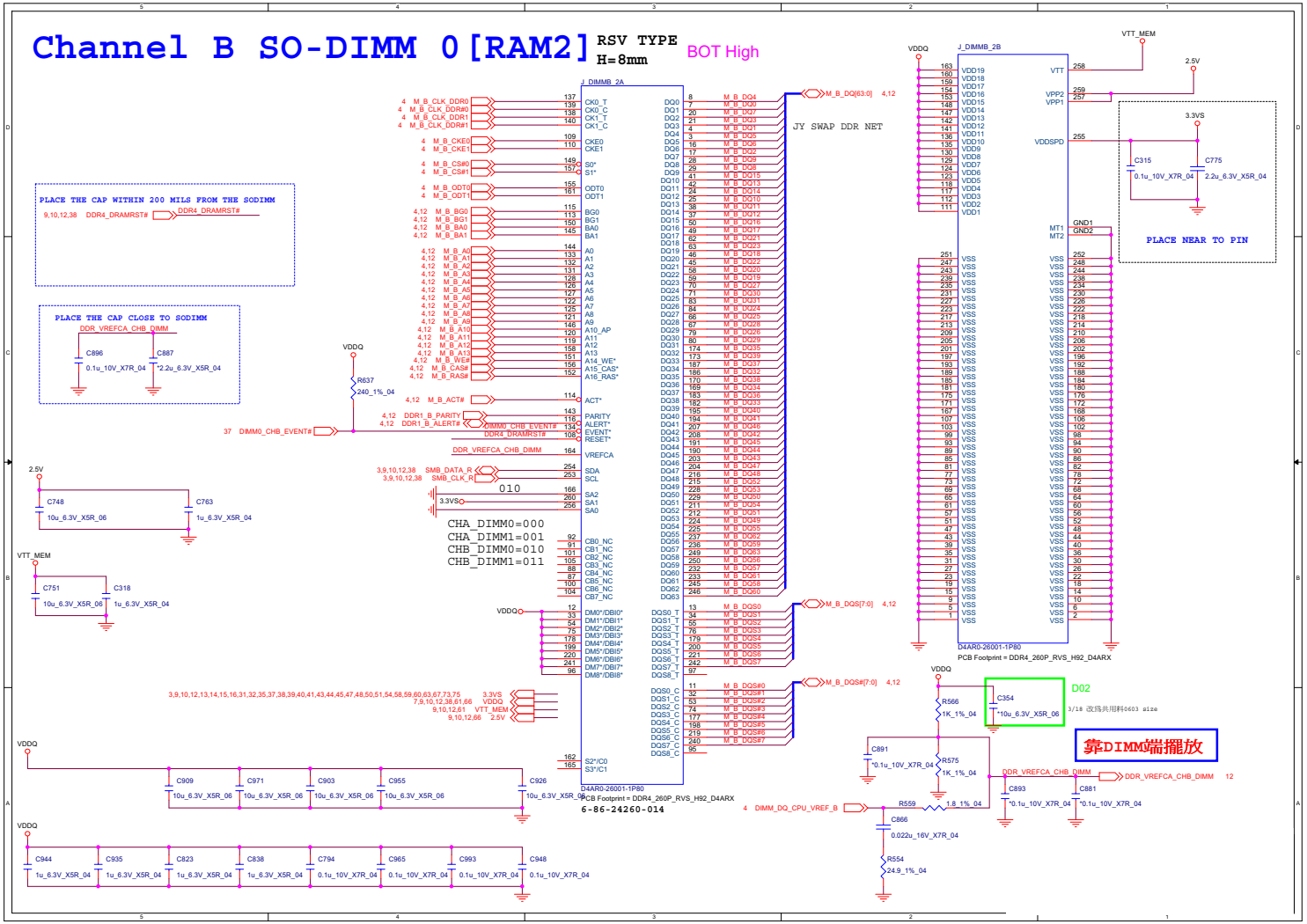
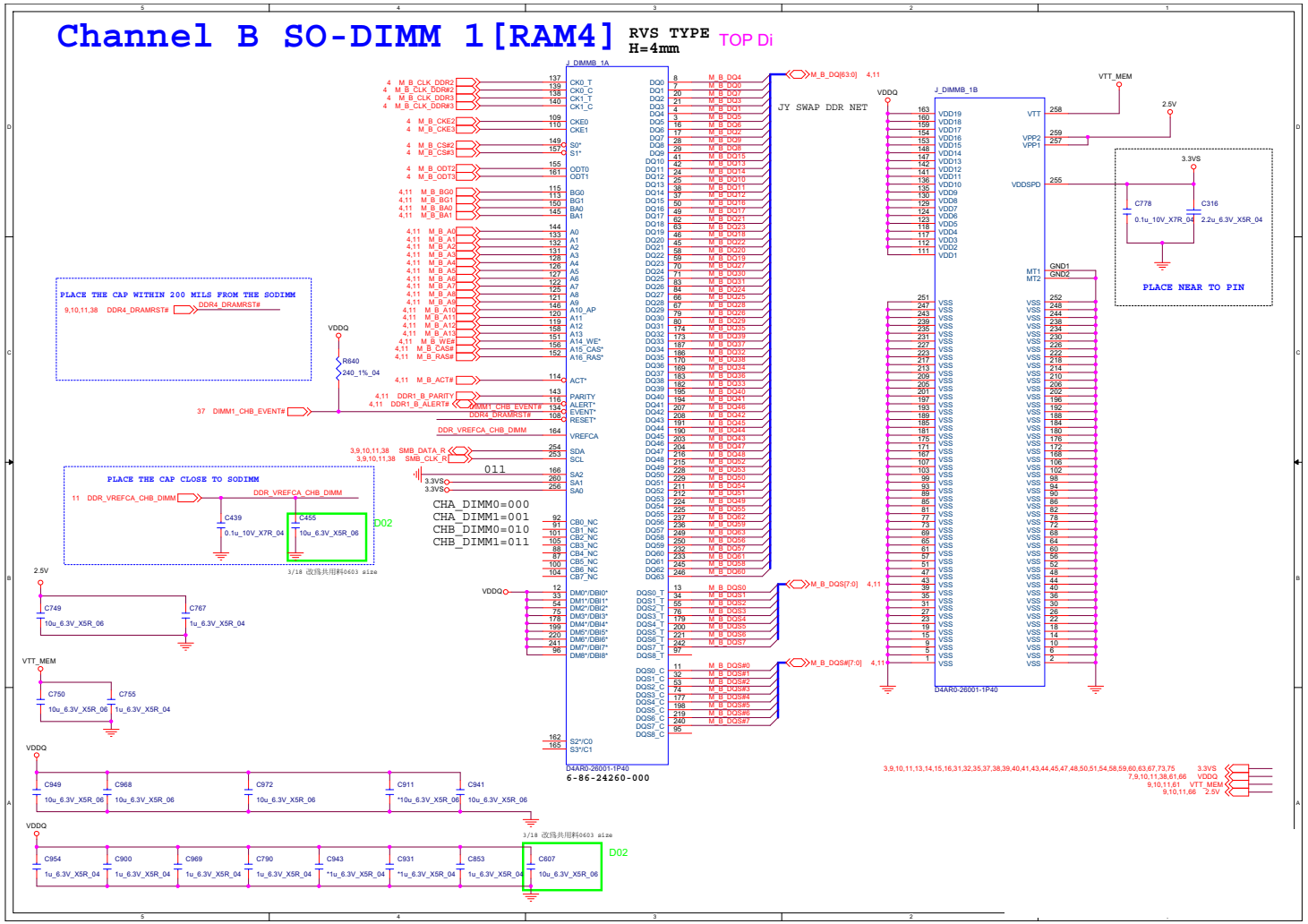
DDR CHB SO-DIMM_0



DDR CHB SO-DIMM_1



Sheet 12 of 91
DDR CHB SO-DIMM_1

B.Schematic Diagrams

Panel, Inverter

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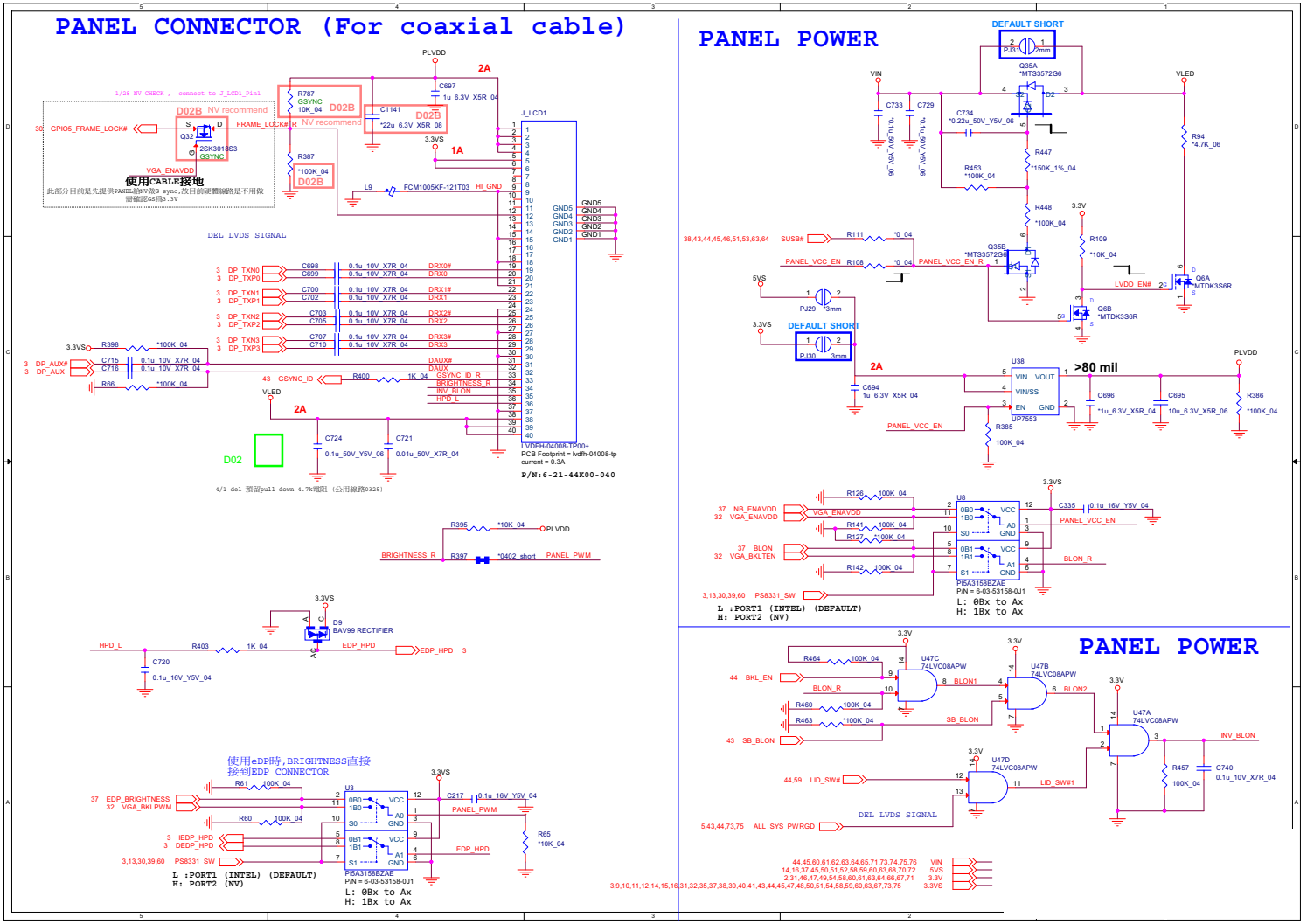
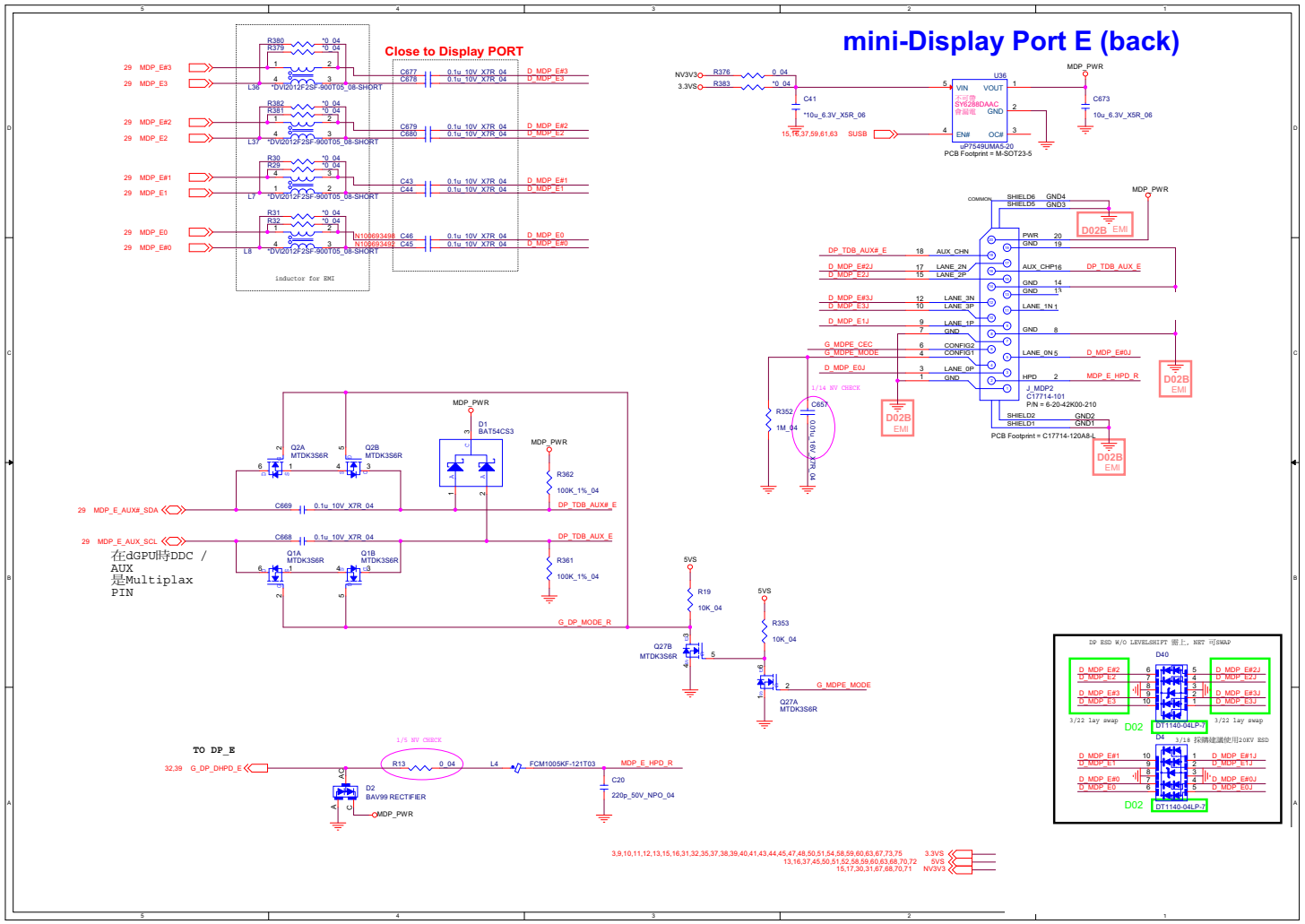
Panel, Inverter



Mini DP Port E



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Mini DP Port E

Mini DP Port F + PS8330B

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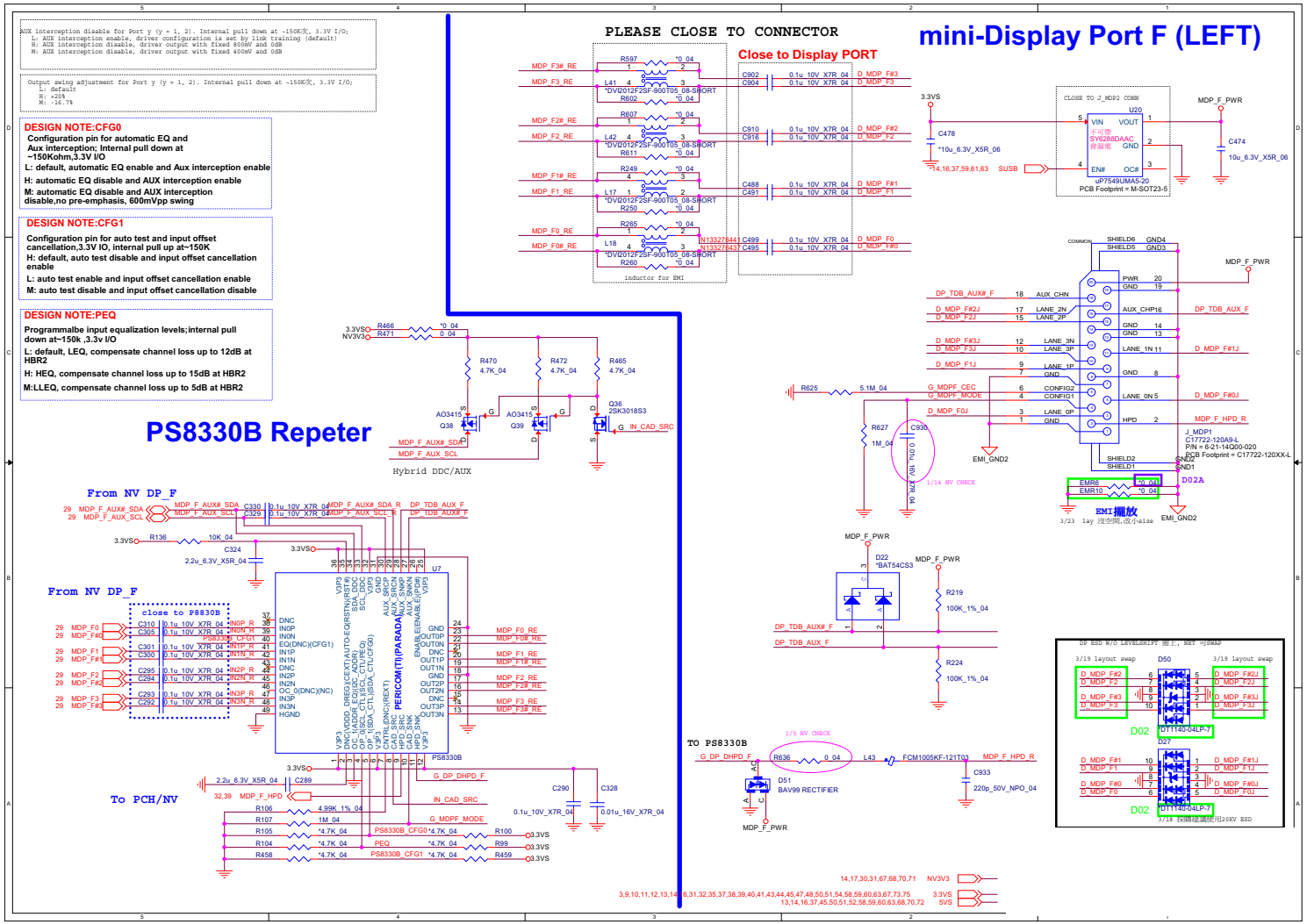
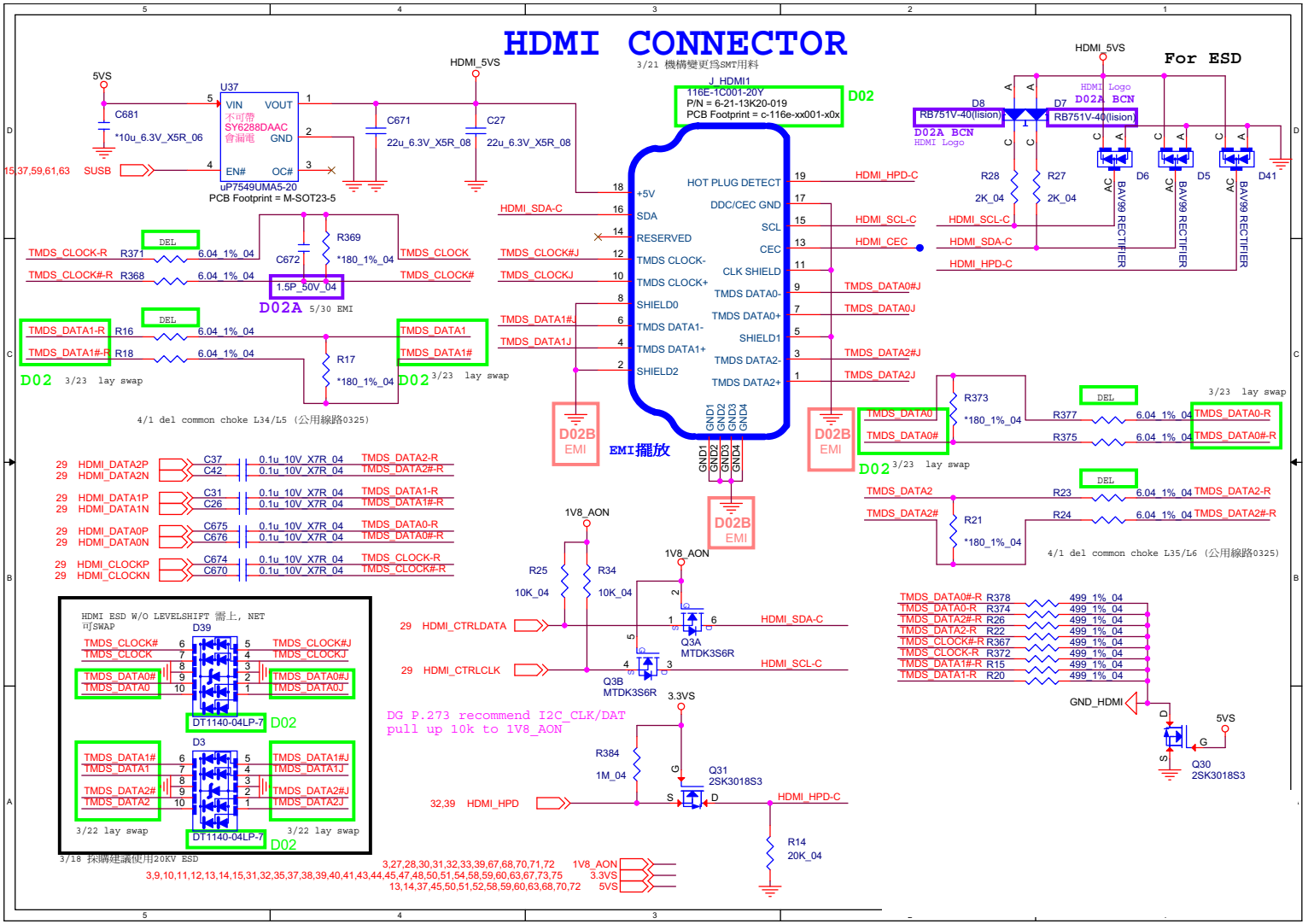
Mini DP Port F + PS8330B



HDMI



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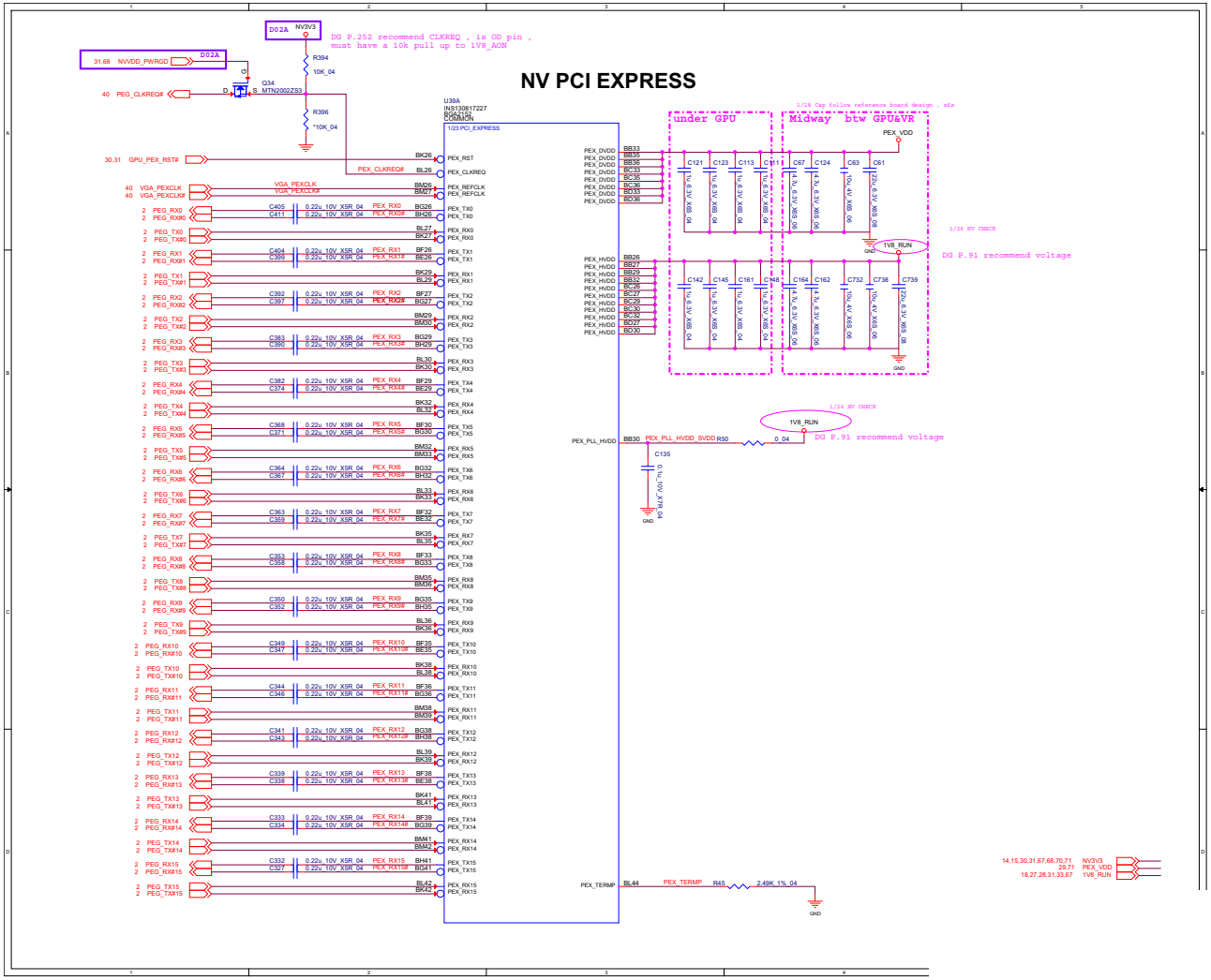
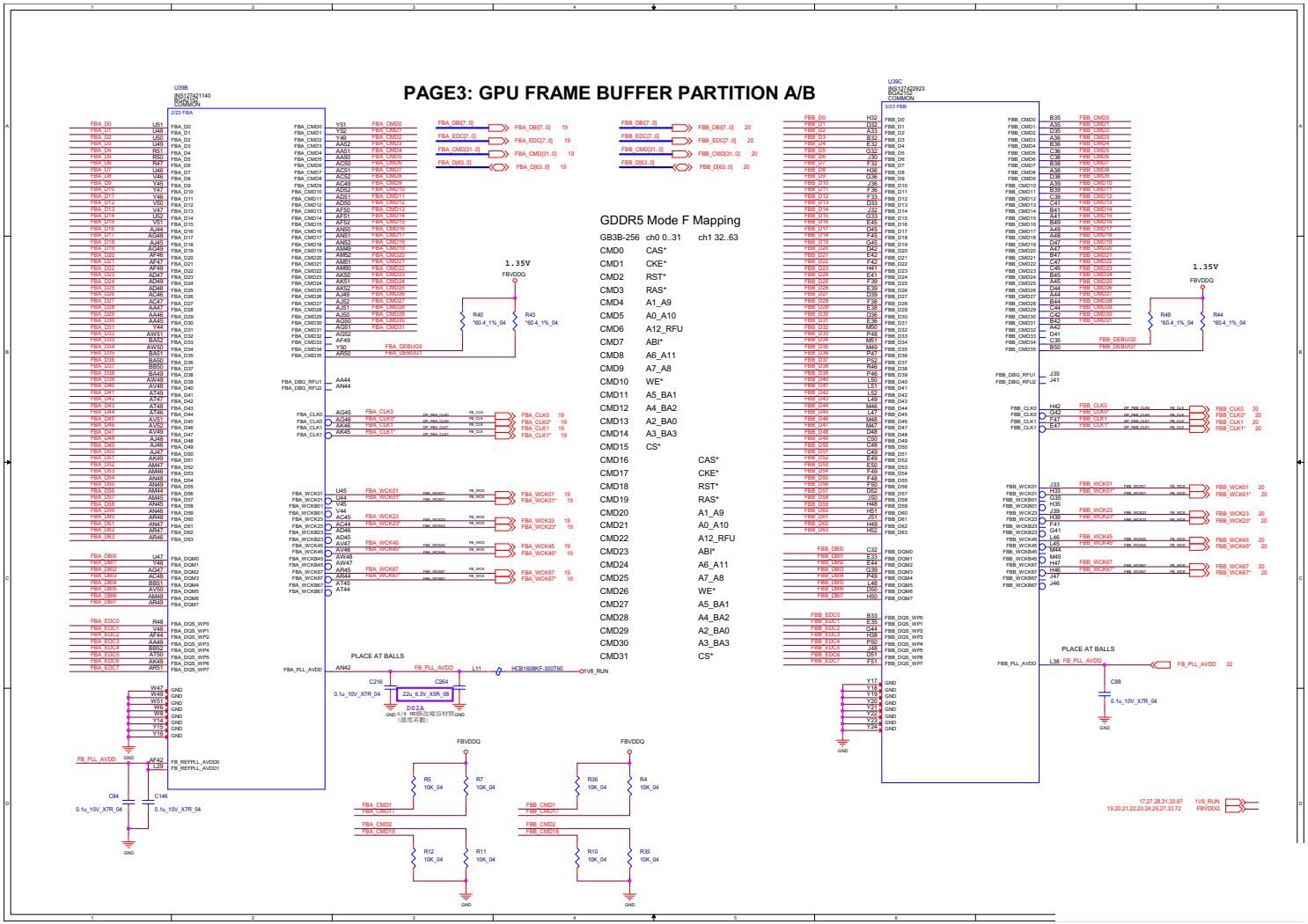
HDMI

VGA PCI Express

Sheet 17 of 91
VGA PCI Express



VGA Frame Buffer Partition



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VGA Frame Buffer Partition

Frame Buffer Partition A

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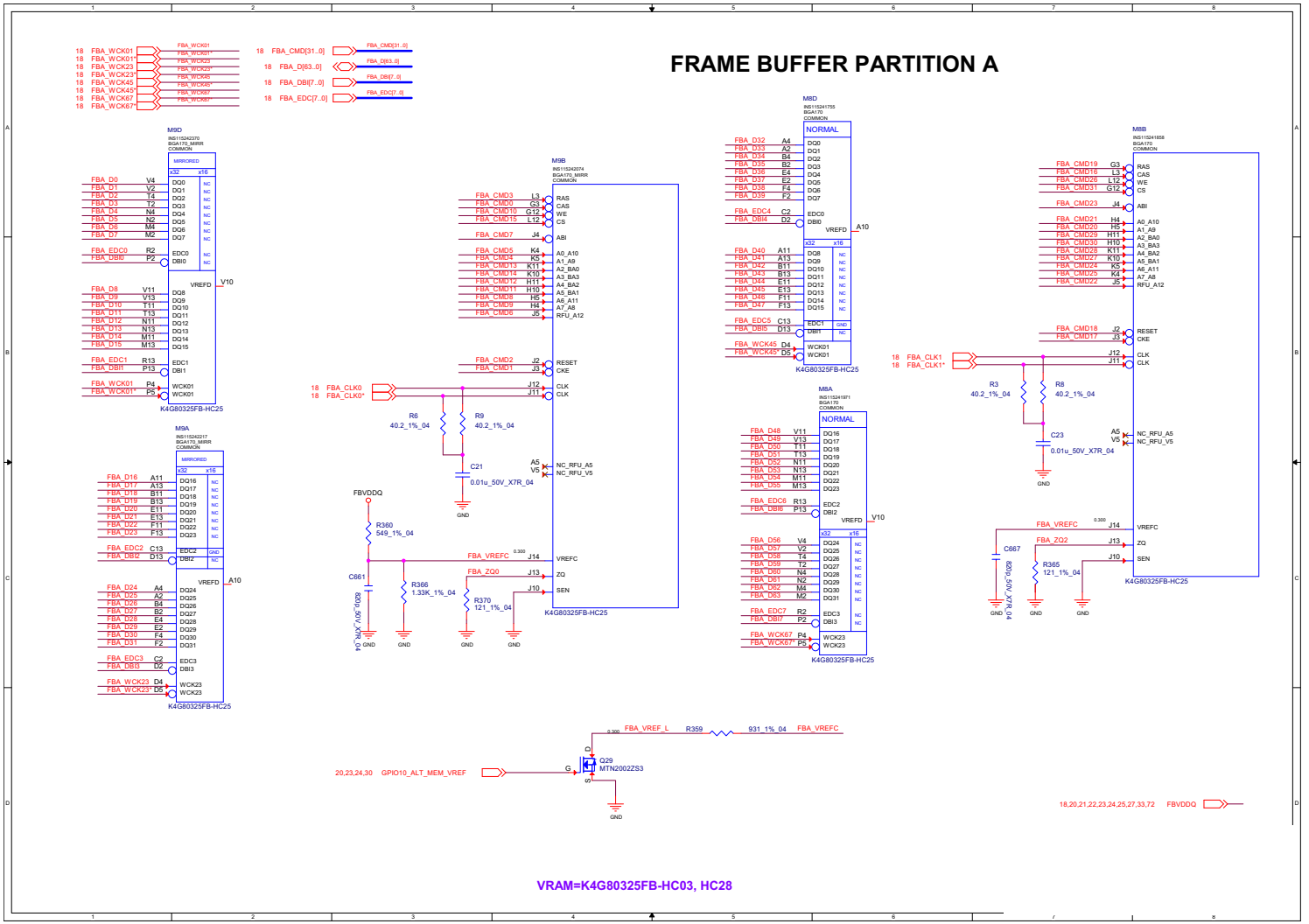
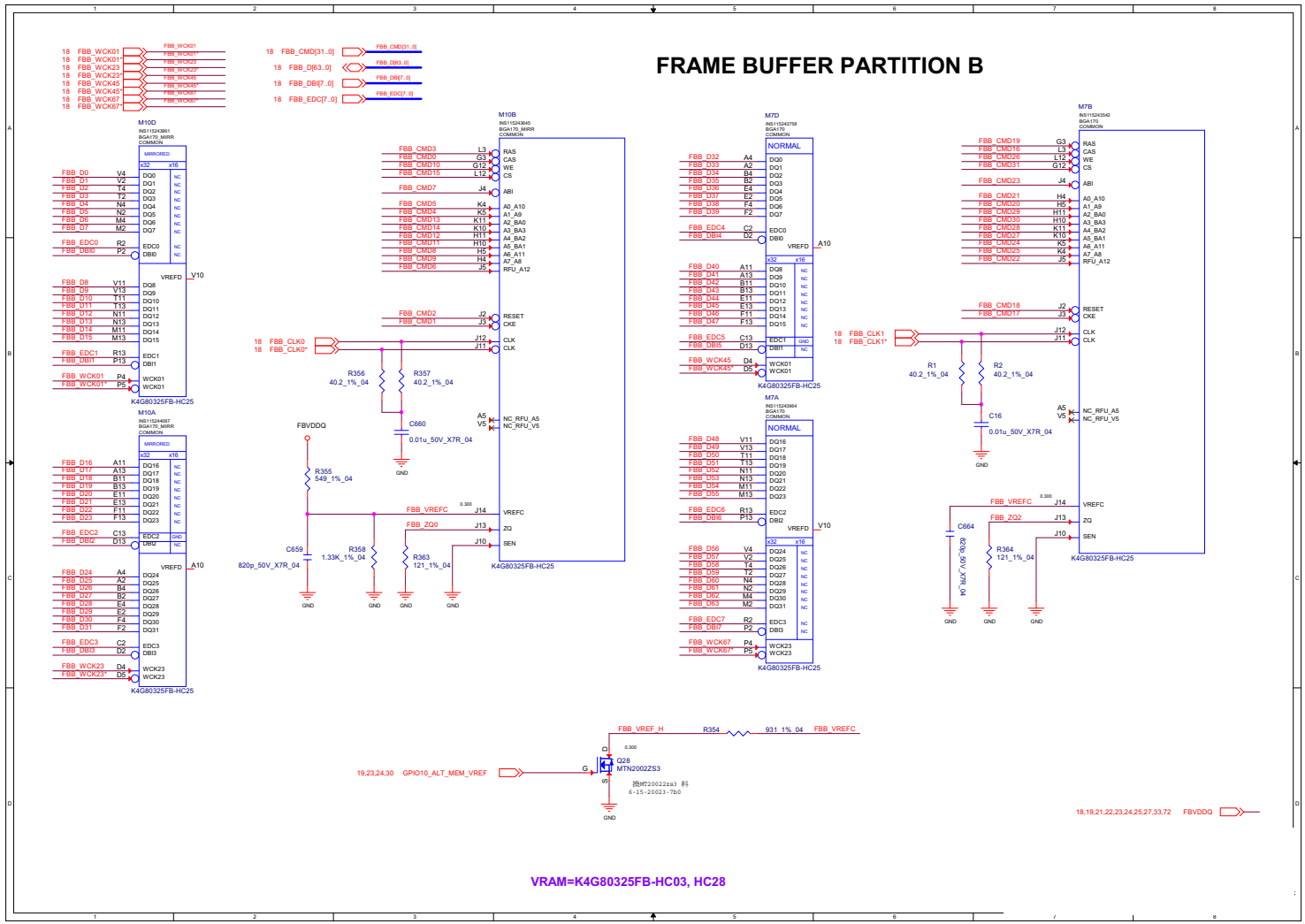
Frame Buffer Partition A



Frame Buffer Partition B



Sheet 20 of 91
Frame Buffer
Partition B

B.Schematic Diagrams

Frame Buffer Partition A_B

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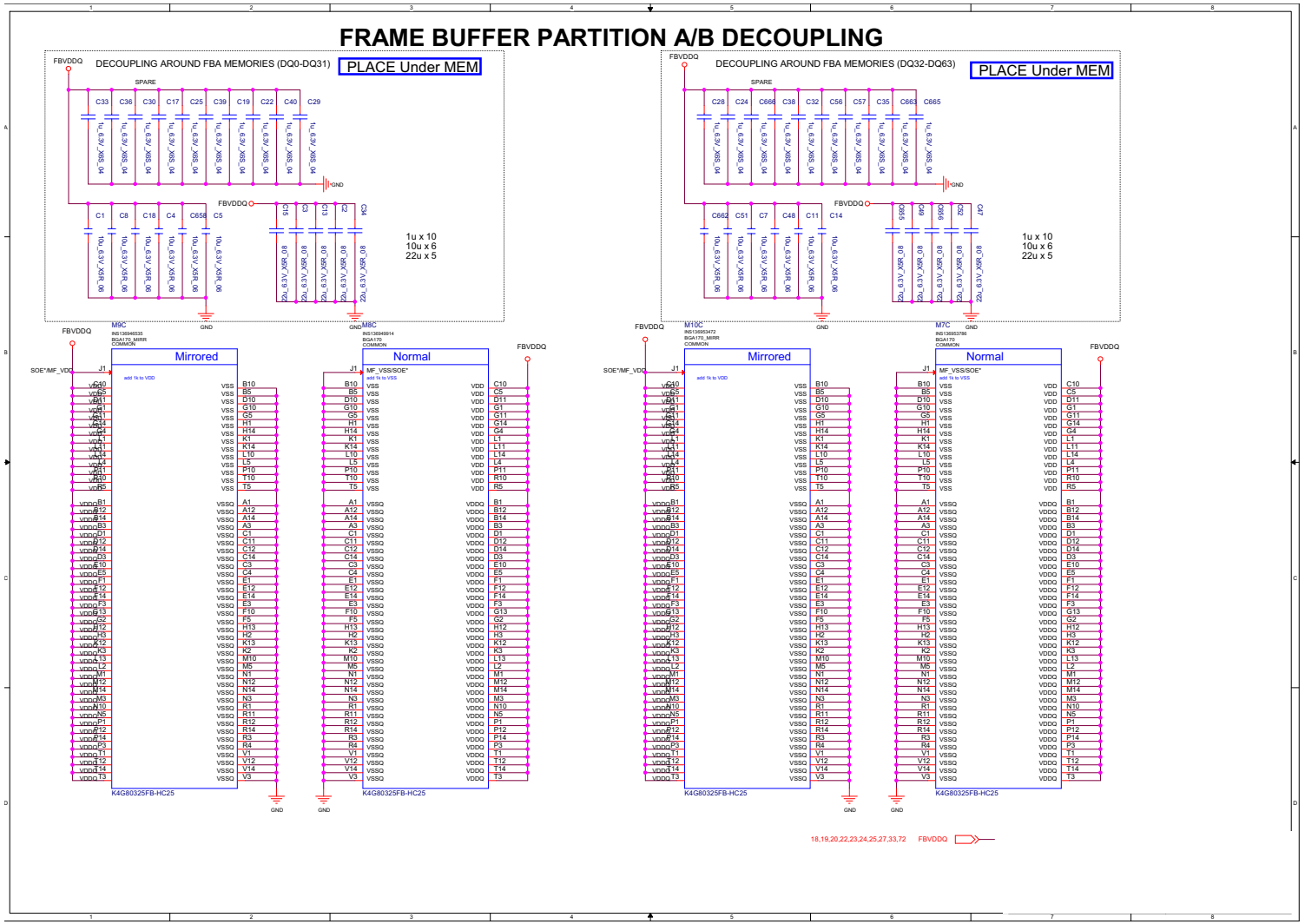
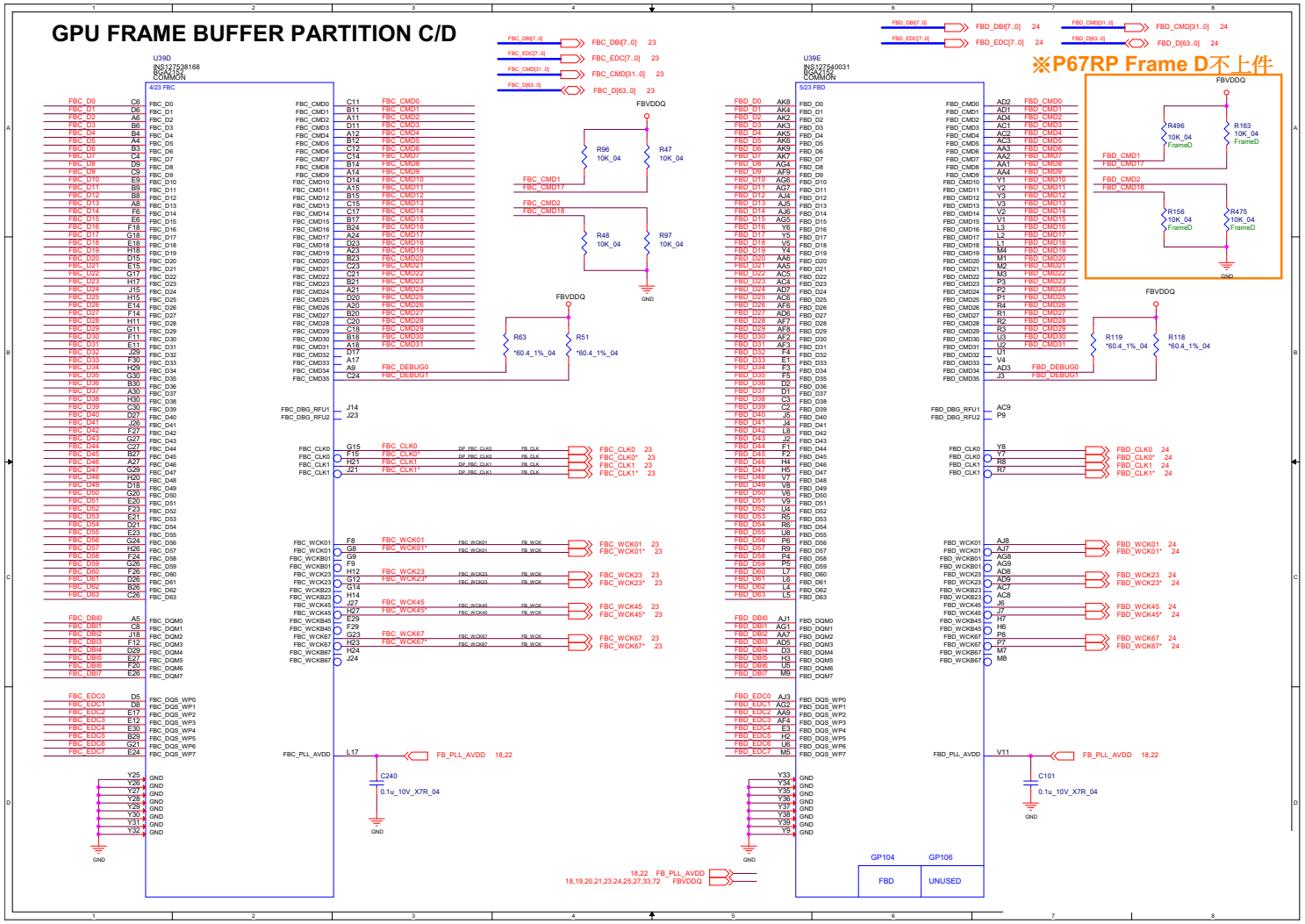
Frame Buffer
Partition A_B



GPU Frame Buffer Partition



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GPU Frame Buffer Partition

B.Schematic Diagrams

Frame Buffer Partition C

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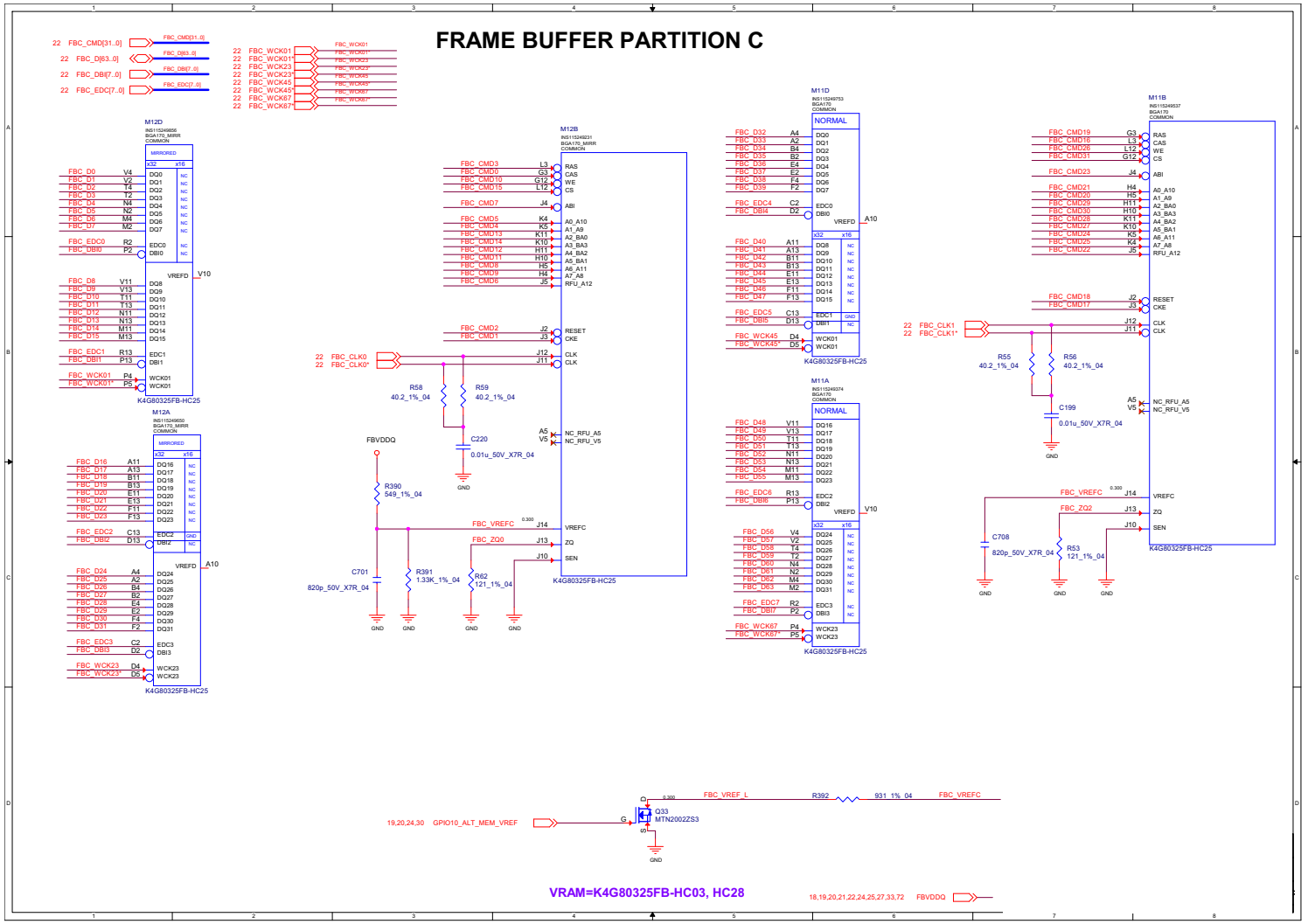
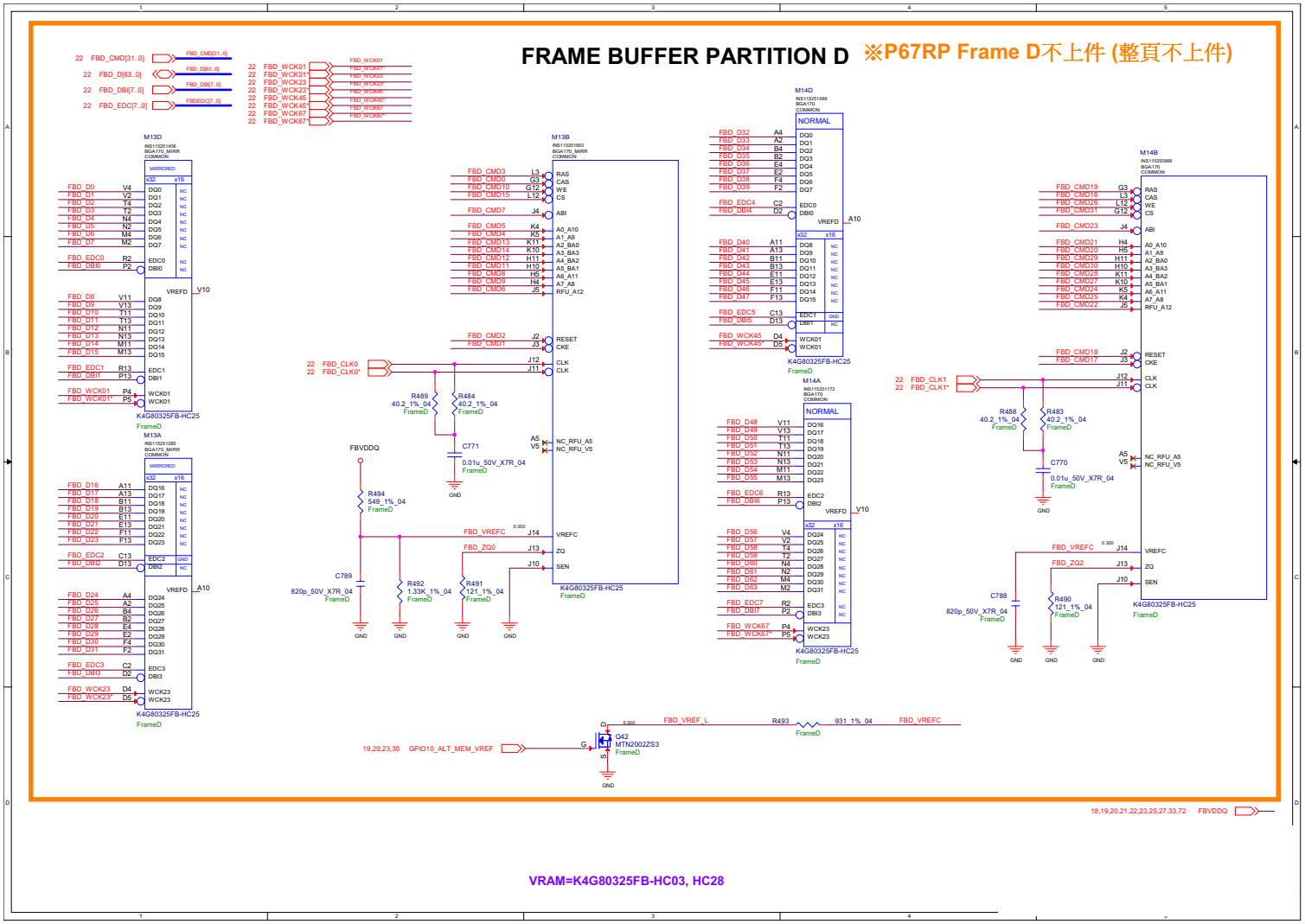
Frame Buffer Partition C



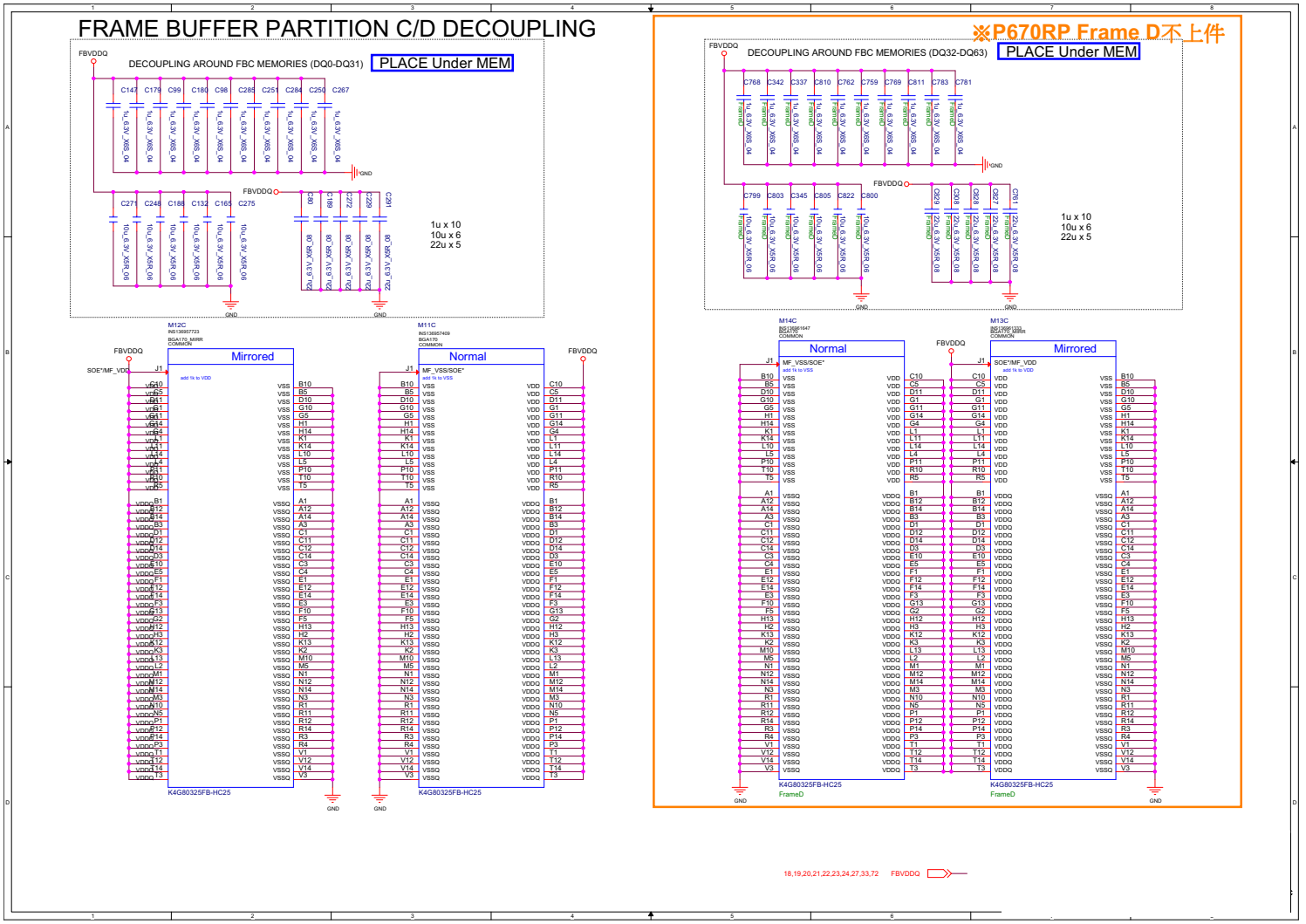
Frame Buffer Partition D



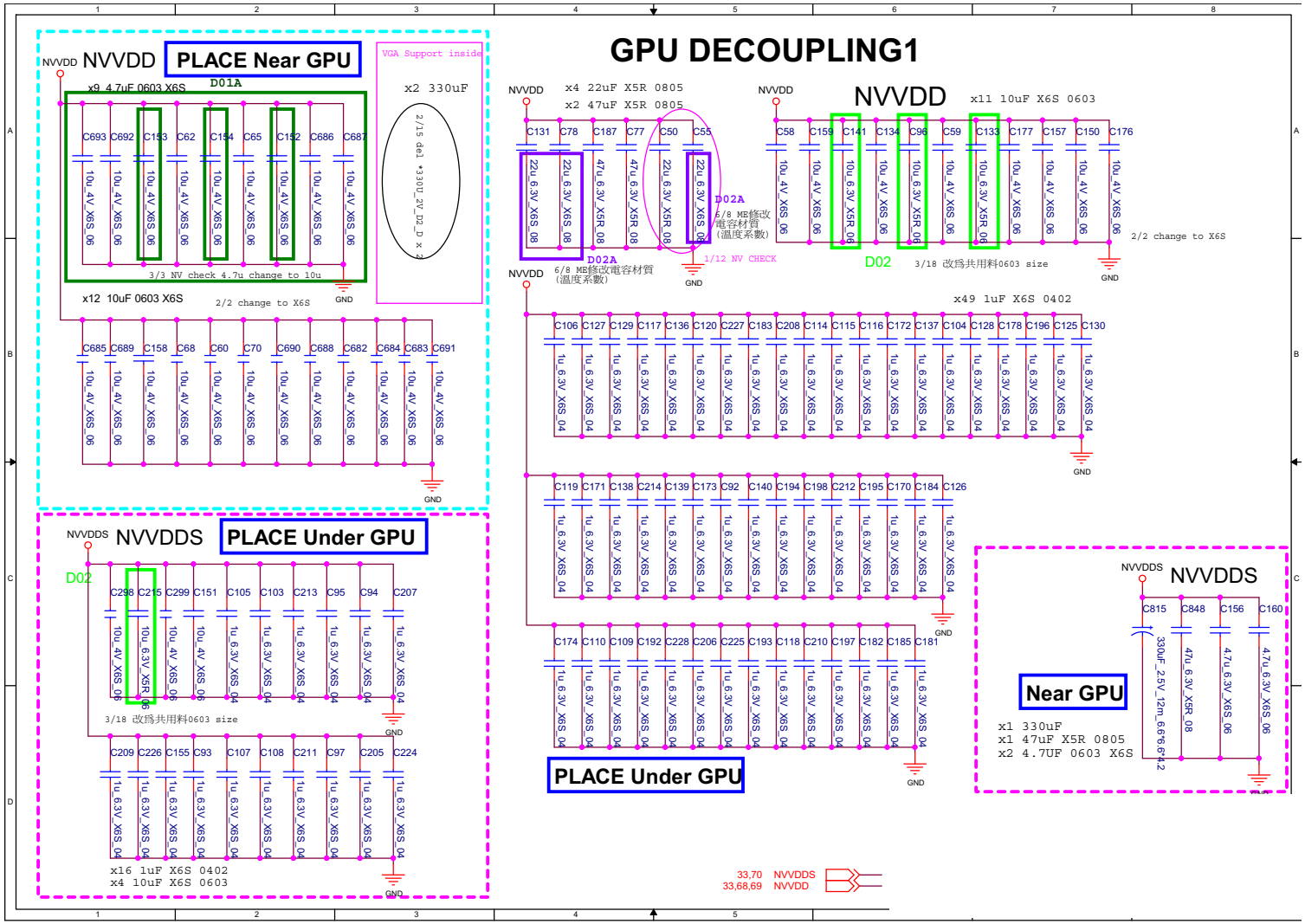
Sheet 24 of 91
Frame Buffer
Partition D

Frame Buffer Partition C_D

Sheet 25 of 91
Frame Buffer Partition C_D



GPU Decoupling 1



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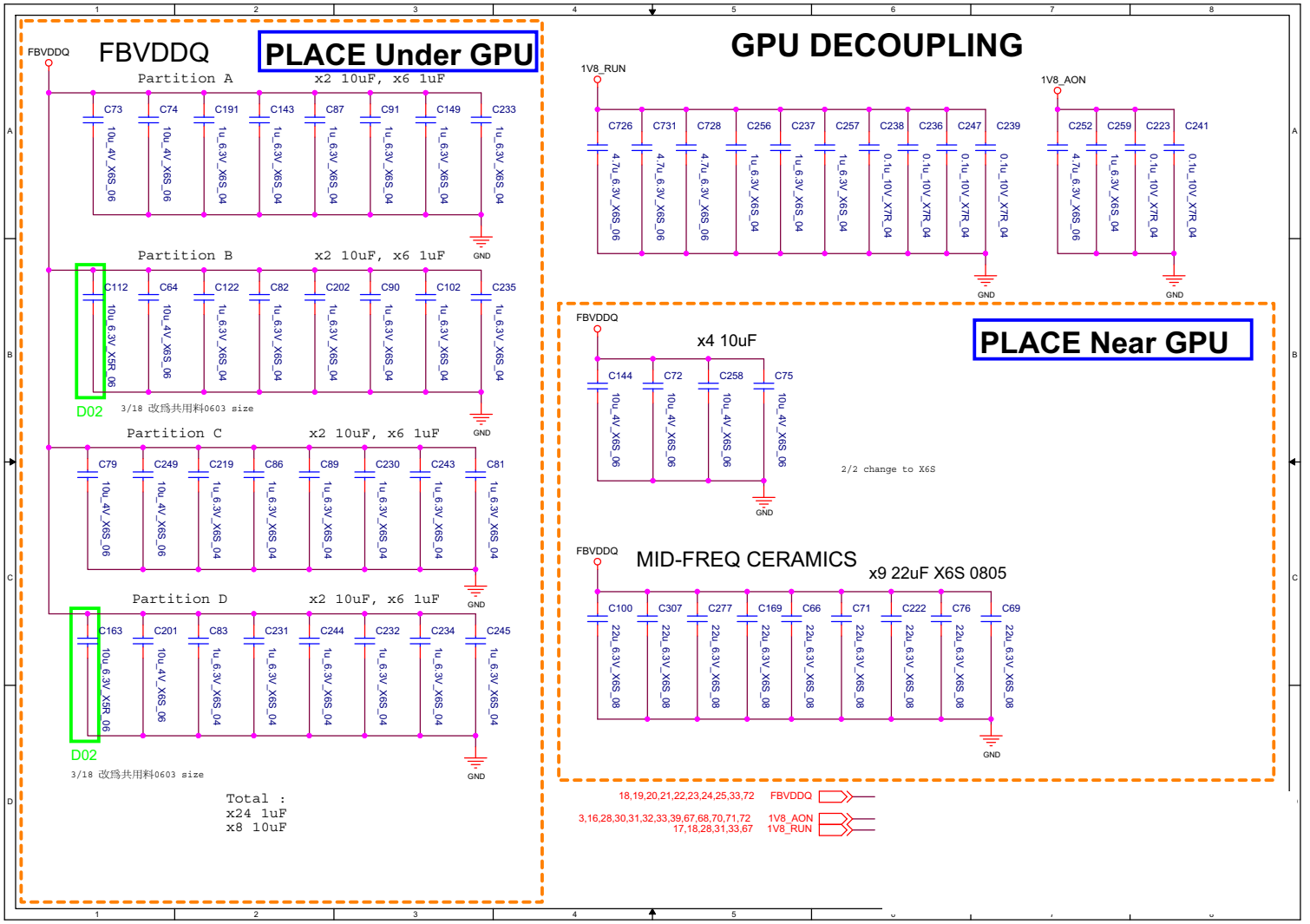
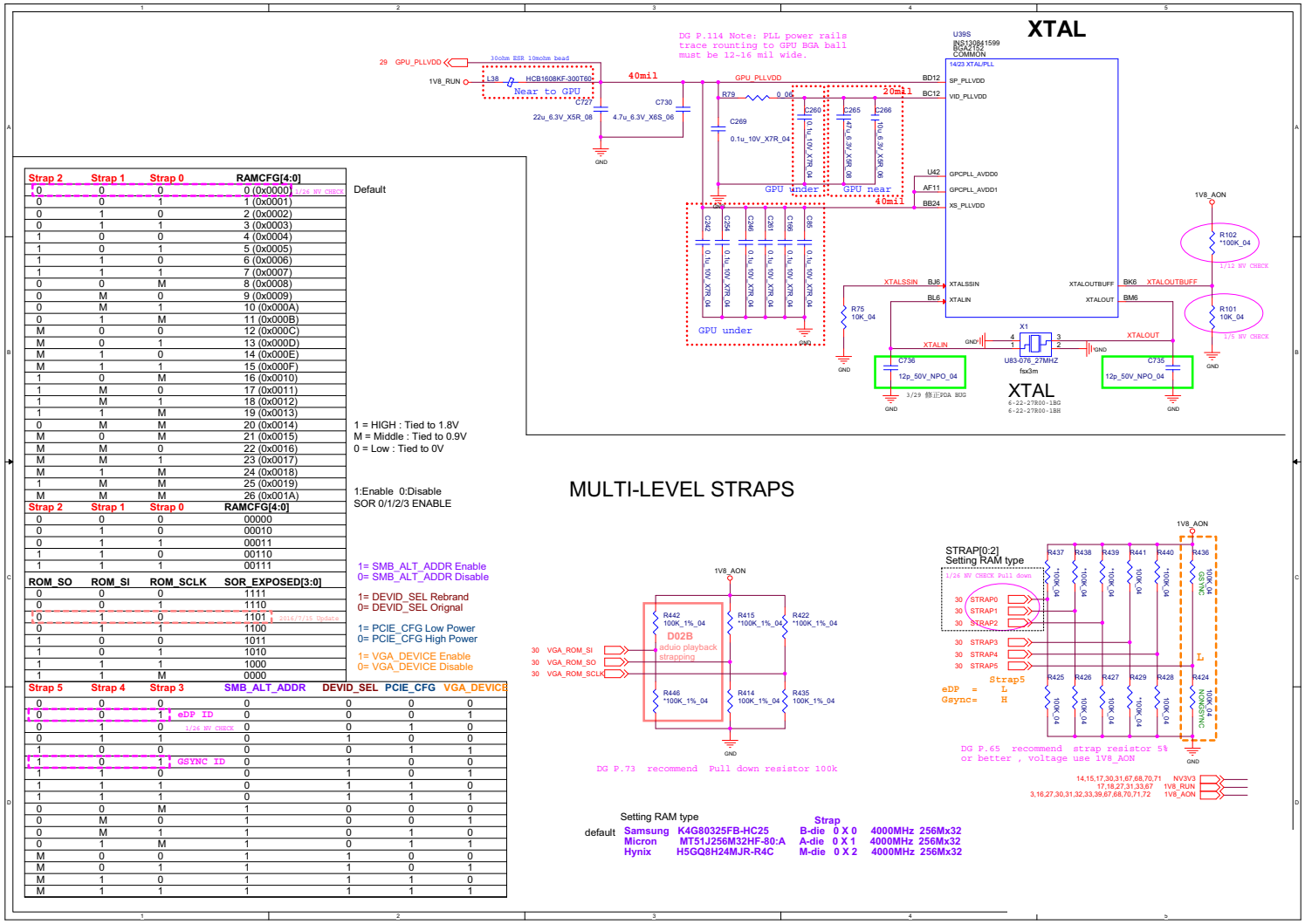
GPU Decoupling 1

GPU Decoupling 2

Sheet 27 of 91
GPU Decoupling 2



Straps & XTAL



Strap 2	Strap 1	Strap 0	RAMCFG[4:0]
0	0	0	0 (0x0000)
0	0	1	1 (0x0001)
0	1	0	2 (0x0002)
0	1	1	3 (0x0003)
1	0	0	4 (0x0004)
1	0	1	5 (0x0005)
1	1	0	6 (0x0006)
1	1	1	7 (0x0007)
0	0	M	8 (0x0008)
0	M	0	9 (0x0009)
0	M	1	10 (0x000A)
0	1	M	11 (0x000B)
M	0	0	12 (0x000C)
M	0	1	13 (0x000D)
M	1	0	14 (0x000E)
M	1	1	15 (0x000F)
1	0	M	16 (0x0010)
1	M	0	17 (0x0011)
1	M	1	18 (0x0012)
1	1	M	19 (0x0013)
0	M	M	20 (0x0014)
M	0	M	21 (0x0015)
M	M	0	22 (0x0016)
M	M	1	23 (0x0017)
M	1	M	24 (0x0018)
1	M	M	25 (0x0019)
M	M	M	26 (0x001A)

Strap 2	Strap 1	Strap 0	RAMCFG[4:0]
0	0	0	00000
0	1	0	00010
0	1	1	00011
1	1	0	00110
1	1	1	00111

ROM_SO	ROM_SI	ROM_SCLK	SOR_EXPOSED[3:0]
0	0	0	1111
0	0	1	1110
0	1	0	1101
0	1	1	1100
1	0	0	1011
1	0	1	1010
1	1	1	1000
1	1	M	0000

Strap 5	Strap 4	Strap 3	SMB_ALT_ADDR	DEVID_SEL	PCIE_CFG	VGA_DEVICE
0	0	0	0	0	0	0
0	0	1	0	0	0	1
0	1	0	0	0	1	0
0	1	1	0	1	0	0
1	0	0	0	0	1	1
1	0	1	0	1	0	0
1	1	0	0	1	0	1
1	1	1	0	1	1	0
1	1	1	0	1	1	1
0	0	M	1	0	0	0
0	M	0	1	0	0	1
0	M	1	1	0	1	0
0	1	M	1	0	1	1
M	0	0	1	1	0	0
M	0	1	1	1	0	1
M	1	0	1	1	1	0
M	1	1	1	1	1	1

Sheet 28 of 91
Straps and XTAL

IFP I/O Interface

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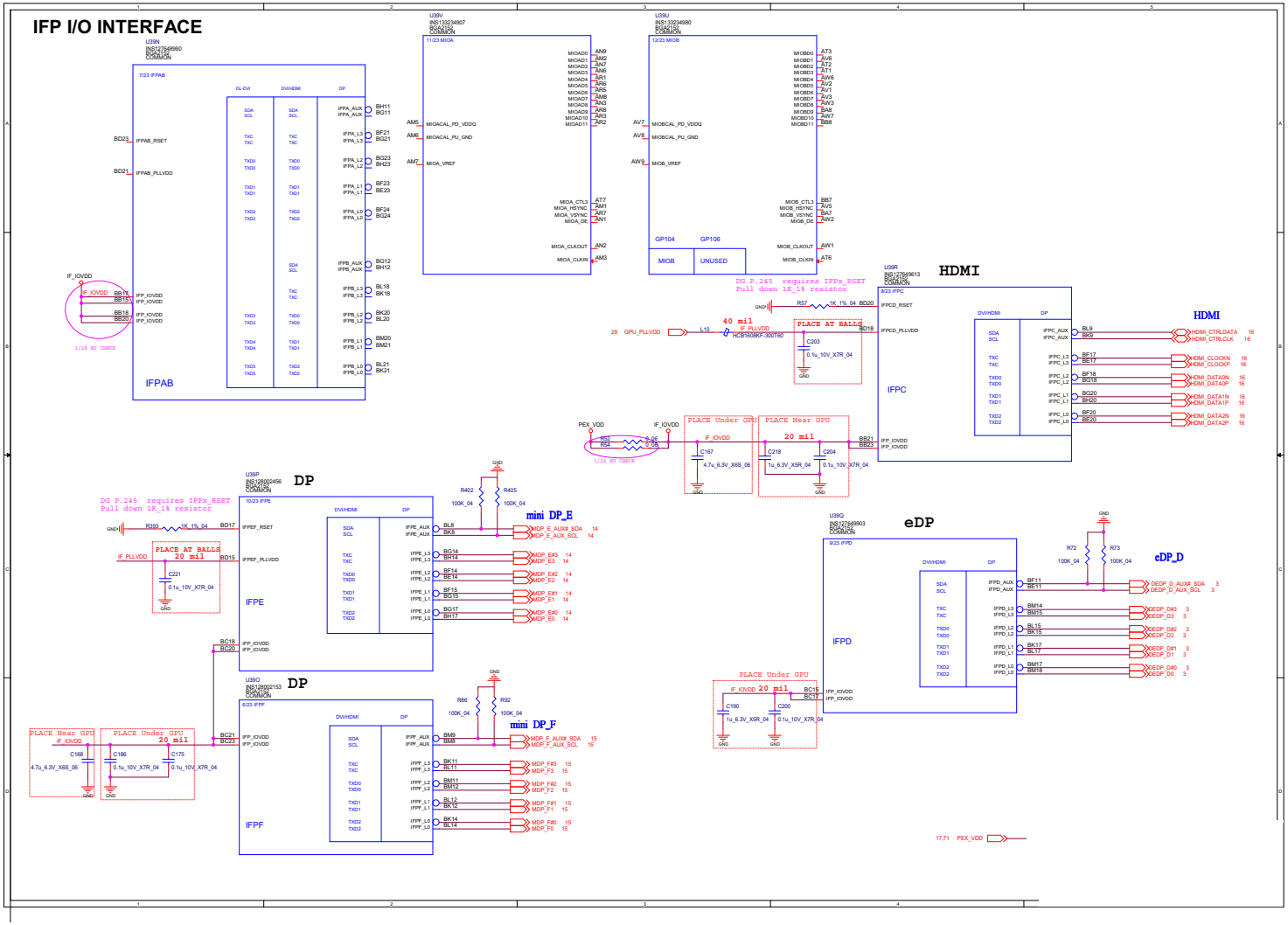
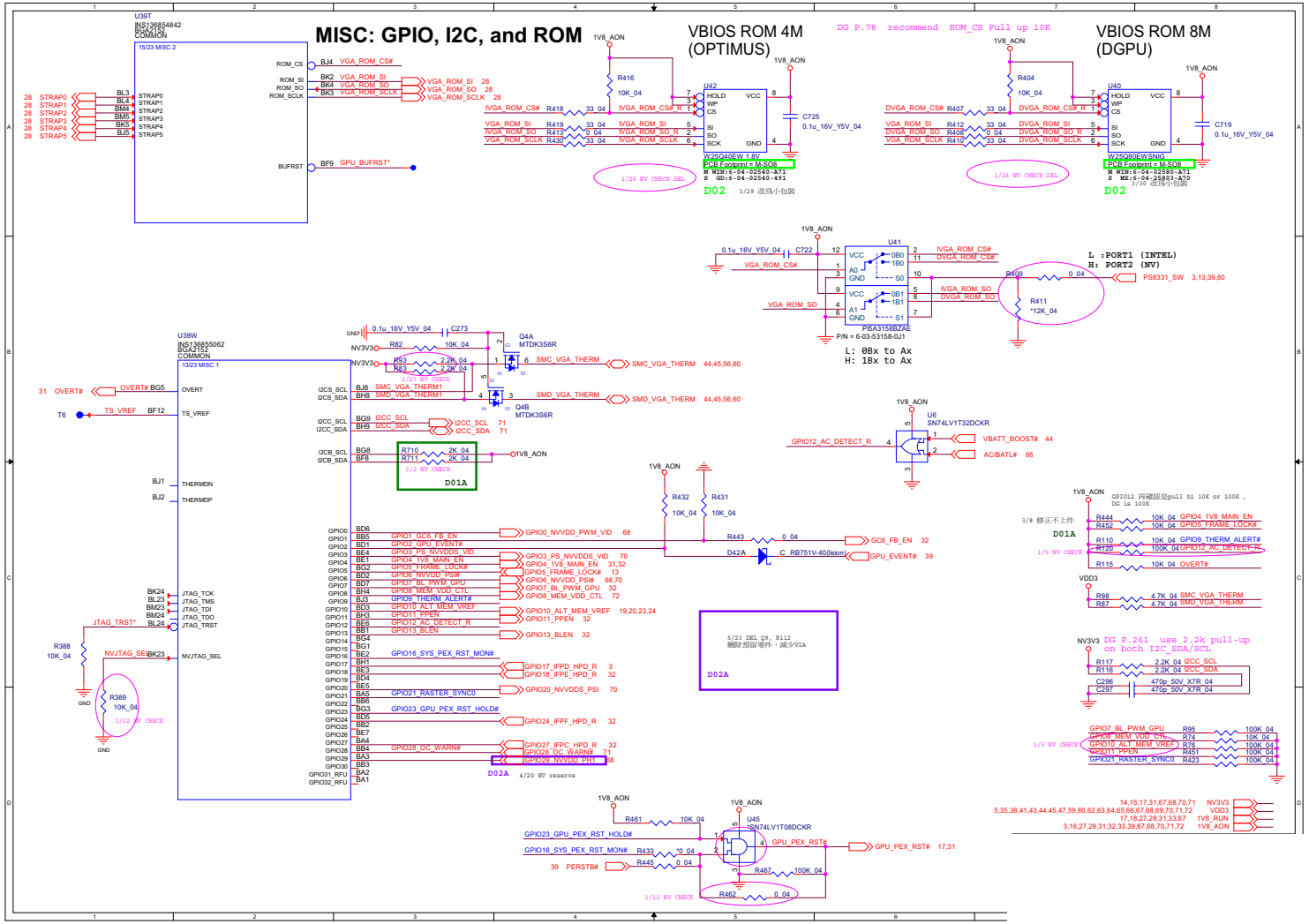
IFP I/O Interface



Misc - GPIO, I2C and ROM



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Misc - GPIO, I2C and ROM

B.Schematic Diagrams

NVIDIA Power Sequence

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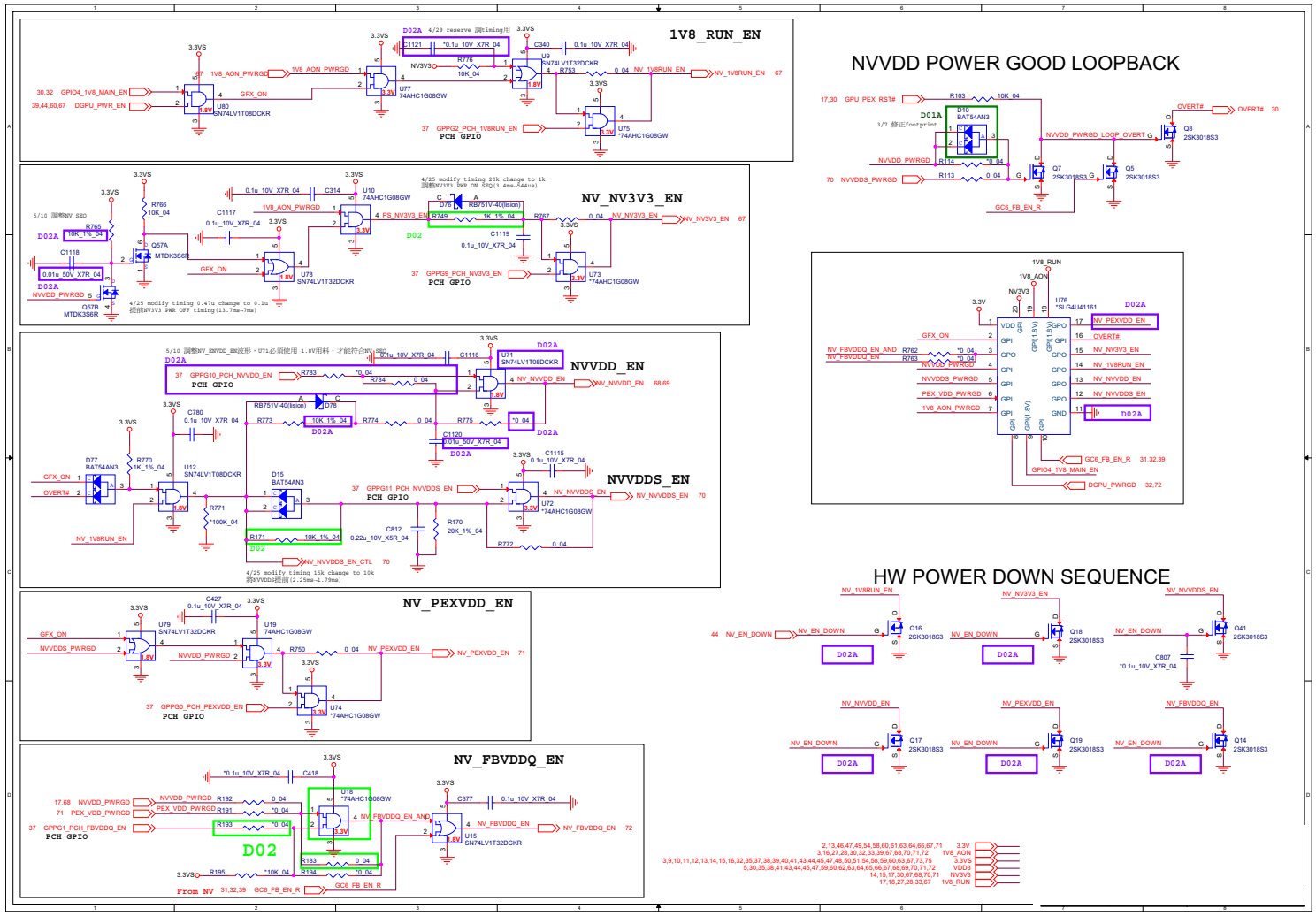
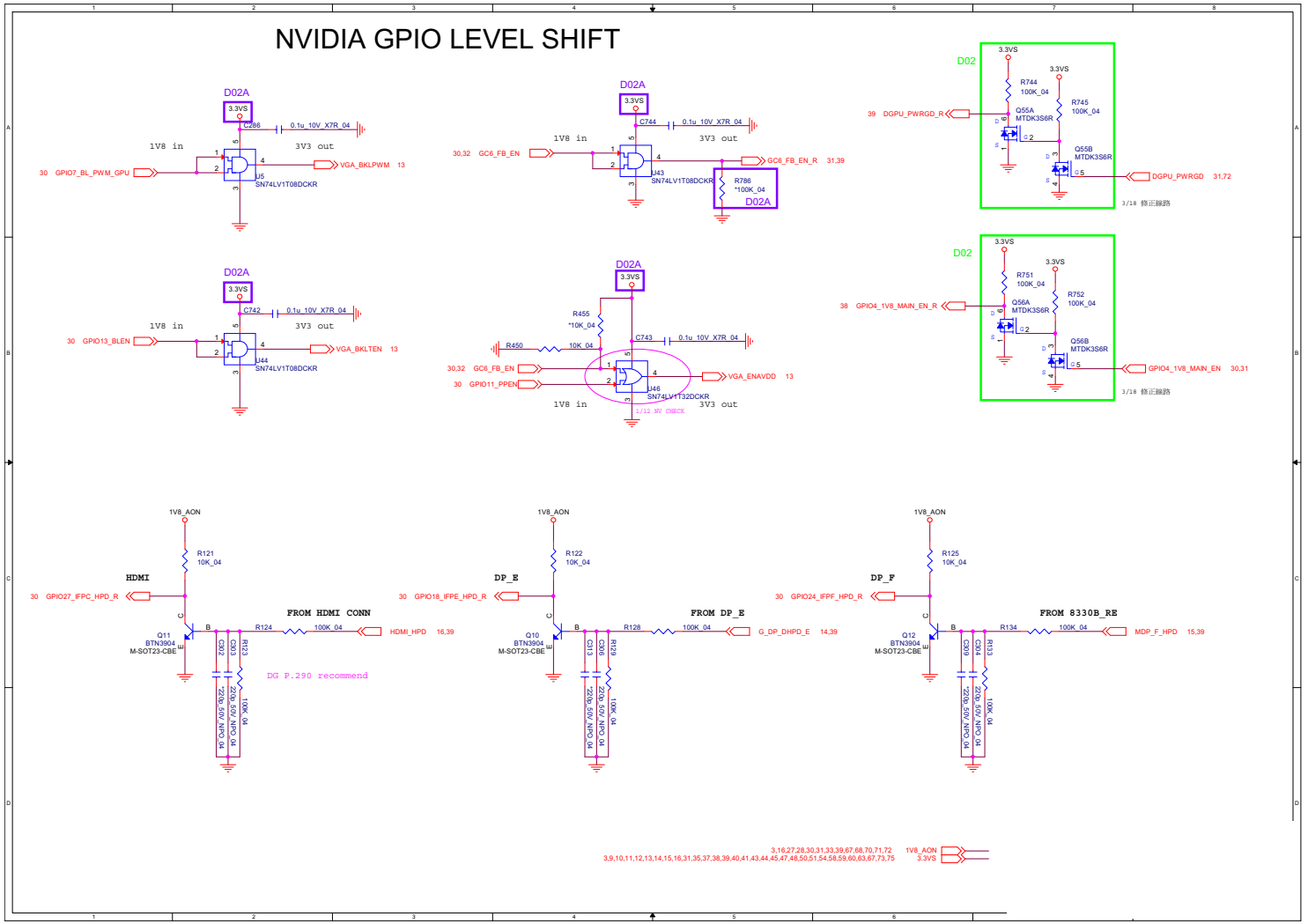
NVIDIA Power Sequence



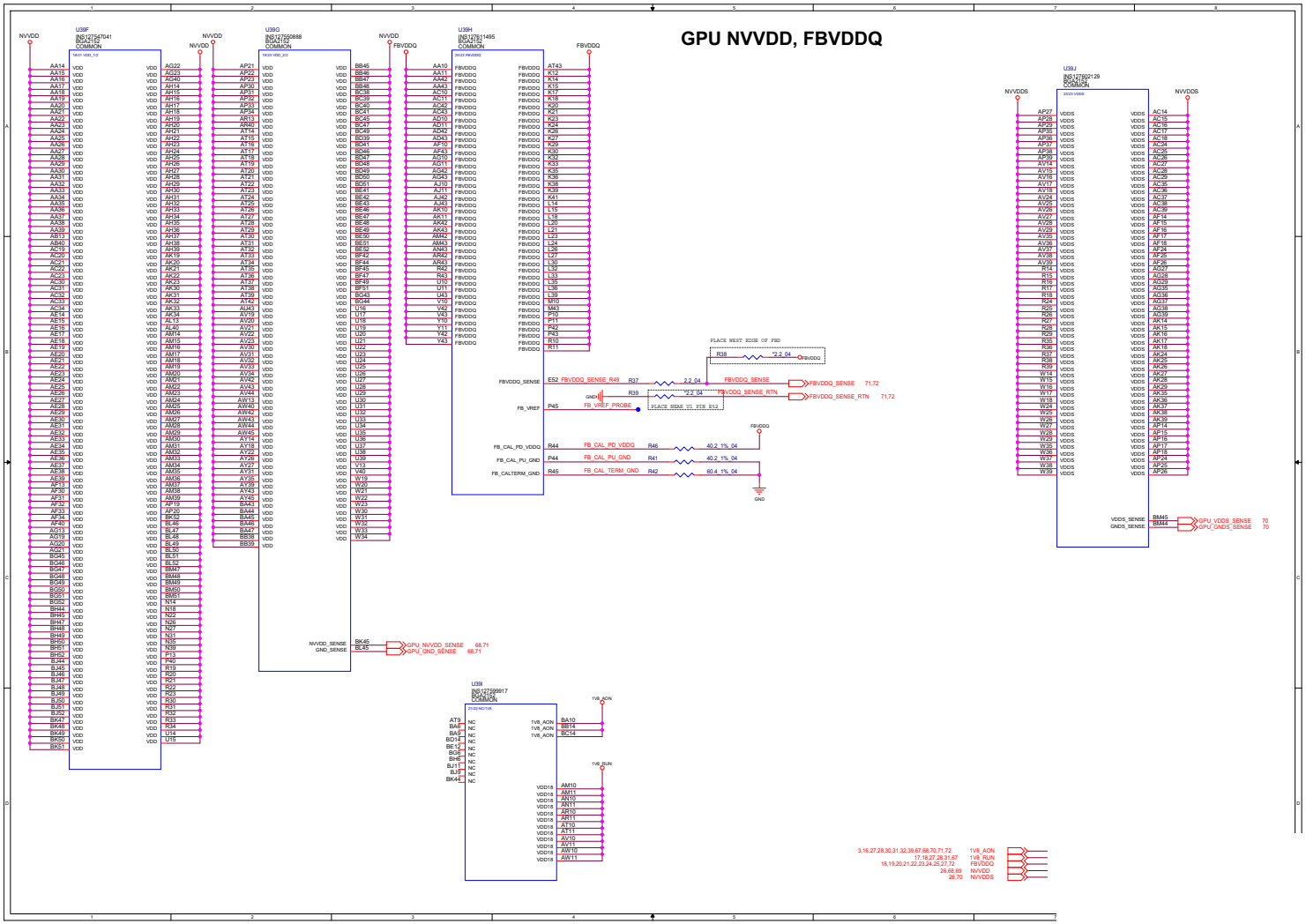
GPIO Level Shift



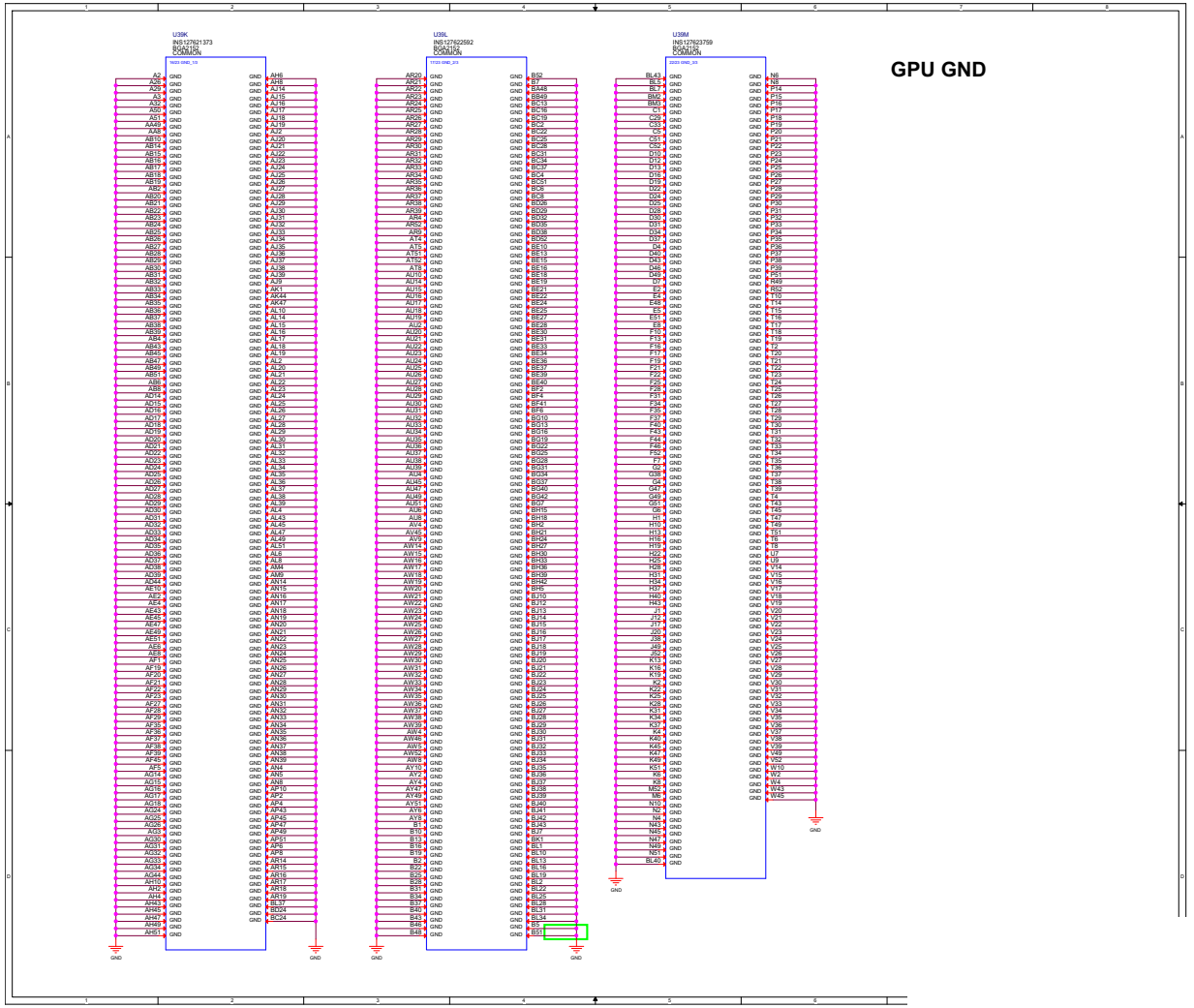
Sheet 32 of 91
GPIO Level Shift

GPU NVVDD, FBVDDQ

Sheet 33 of 91
GPU NVVDD,
FBVDDQ



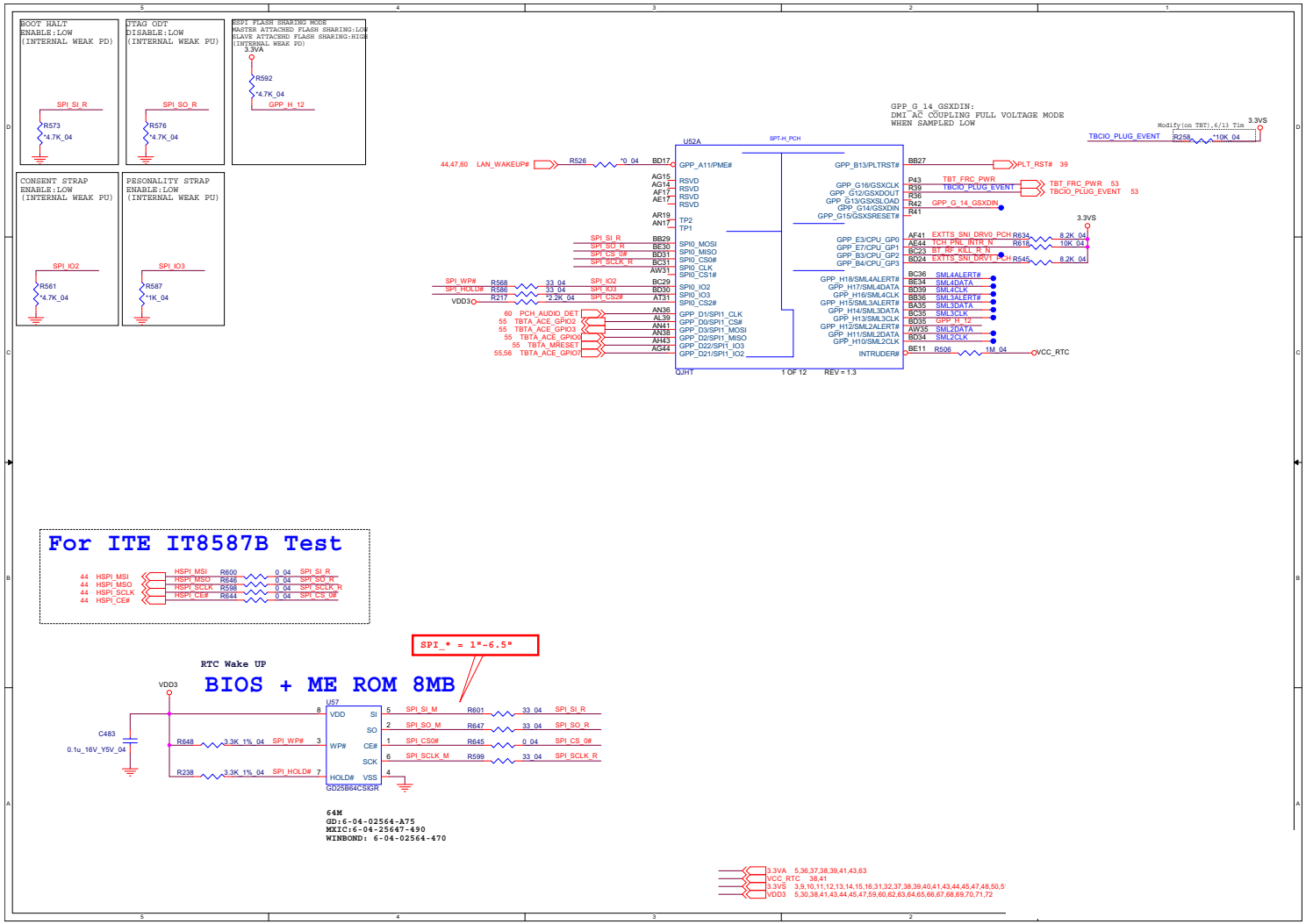
GPU GND



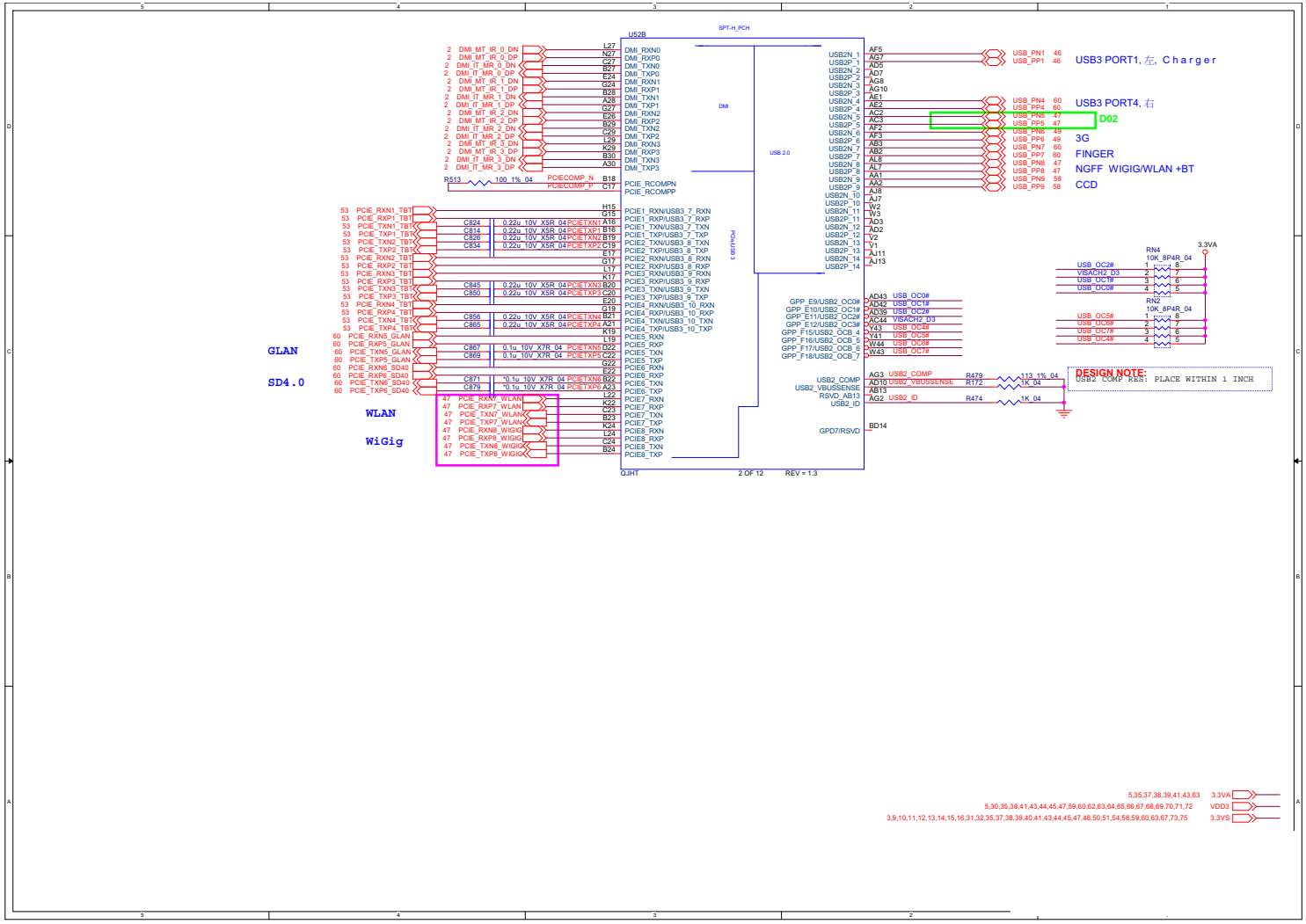
Sheet 34 of 91
GPU GND

PCH 1/9

Sheet 35 of 91
PCH 1/9



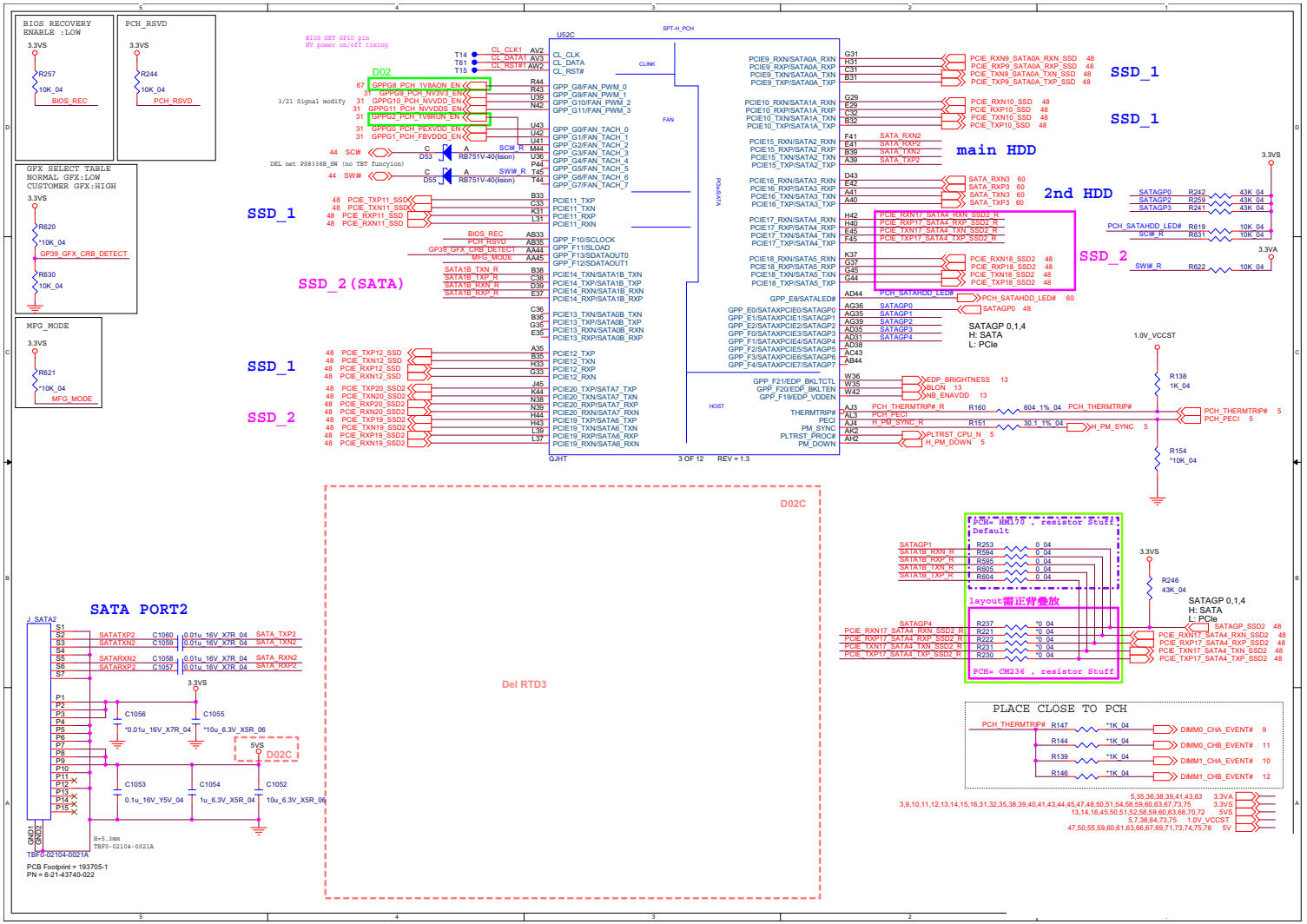
PCH 2/9



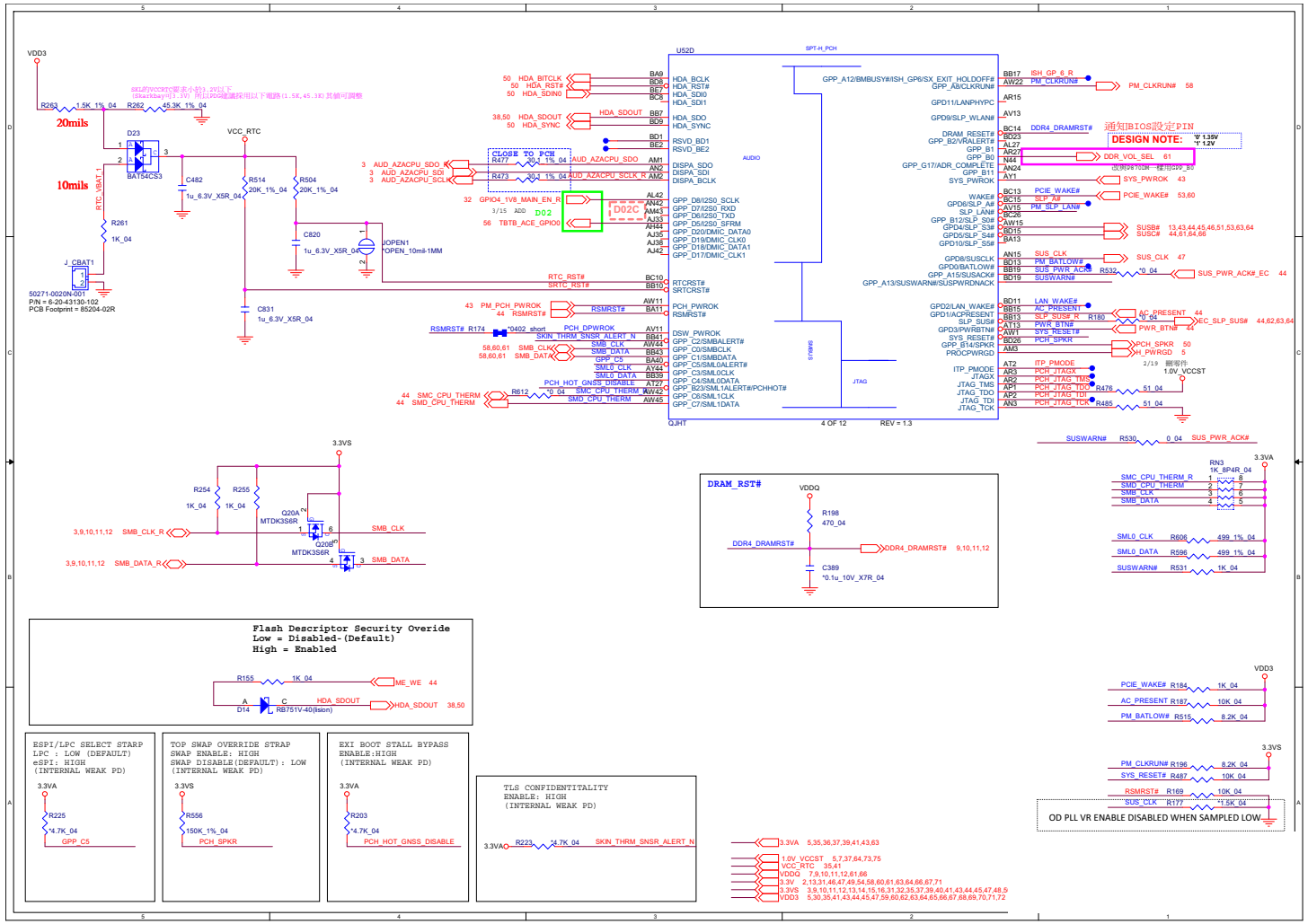
Sheet 36 of 91
PCH 2/9

PCH 3/9

Sheet 37 of 91
PCH 3/9



PCH 4/9



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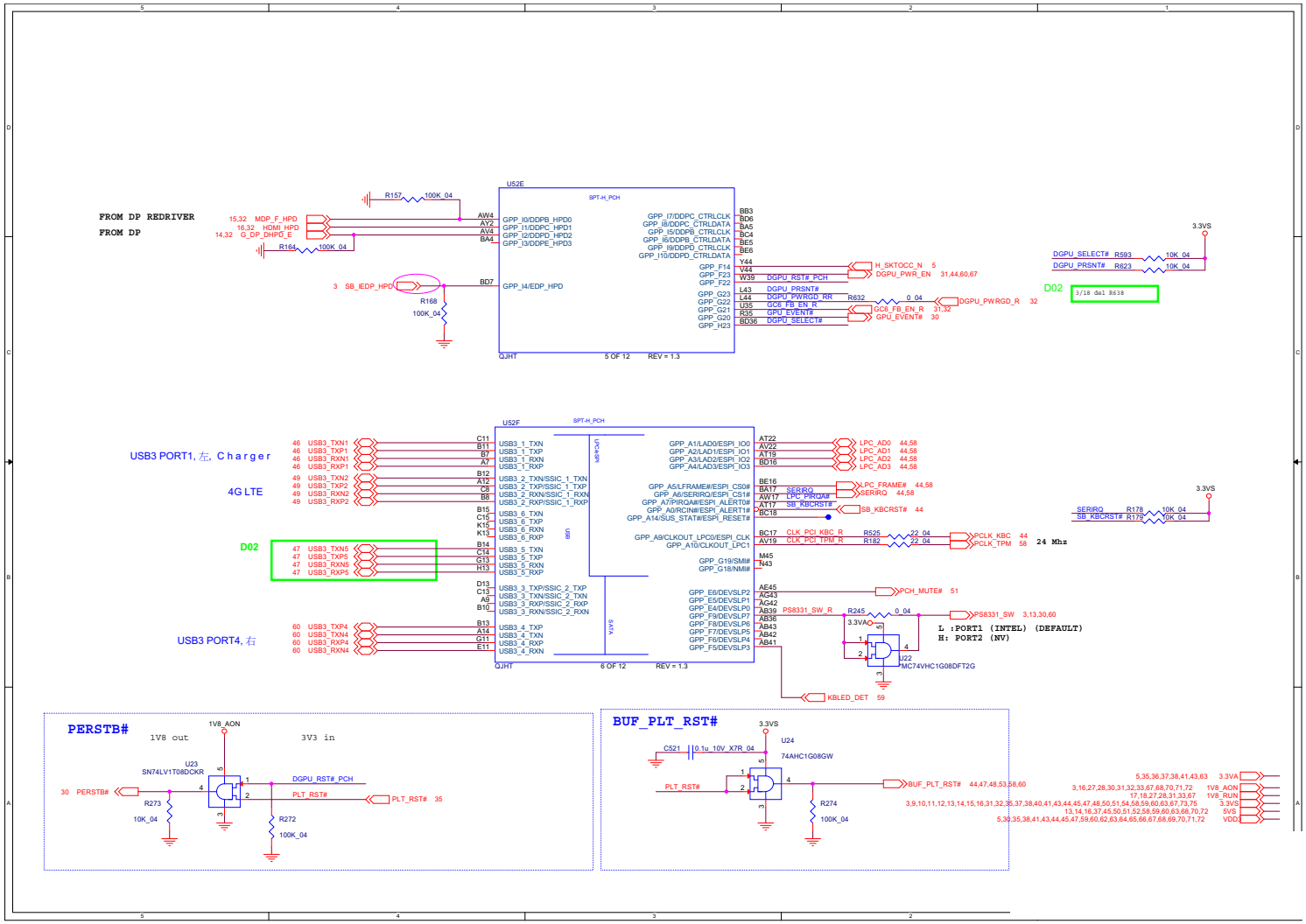
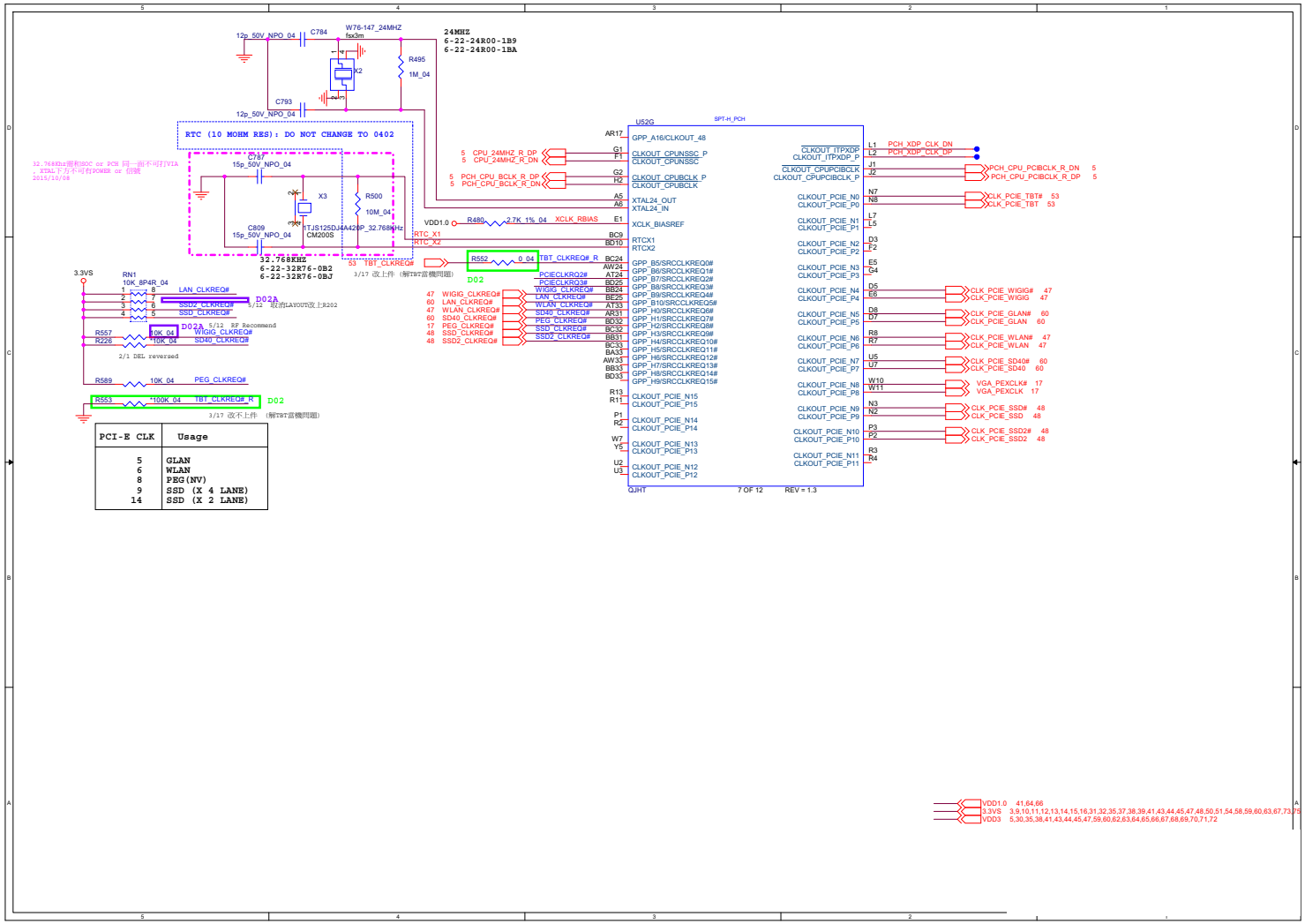
PCH 4/9

PCH 5/9

Sheet 39 of 91
PCH 5/9



PCH 6/9


24MHZ
6-22-24R00-1B9
6-22-24R00-1BA
RTC (10 MOHM RES): DO NOT CHANGE TO 0402
32.768KHZ
6-22-32R76-0B2
6-22-32R76-0BJ
U52G
SPT-H_PCH
7 OF 12
REV = 1.3
PCI-E CLK
Usage
5 GLAN
6 WLAN
8 PEG(NV)
9 SSD (X 4 LANE)
14 SSD (X 2 LANE)

PCH 7/9

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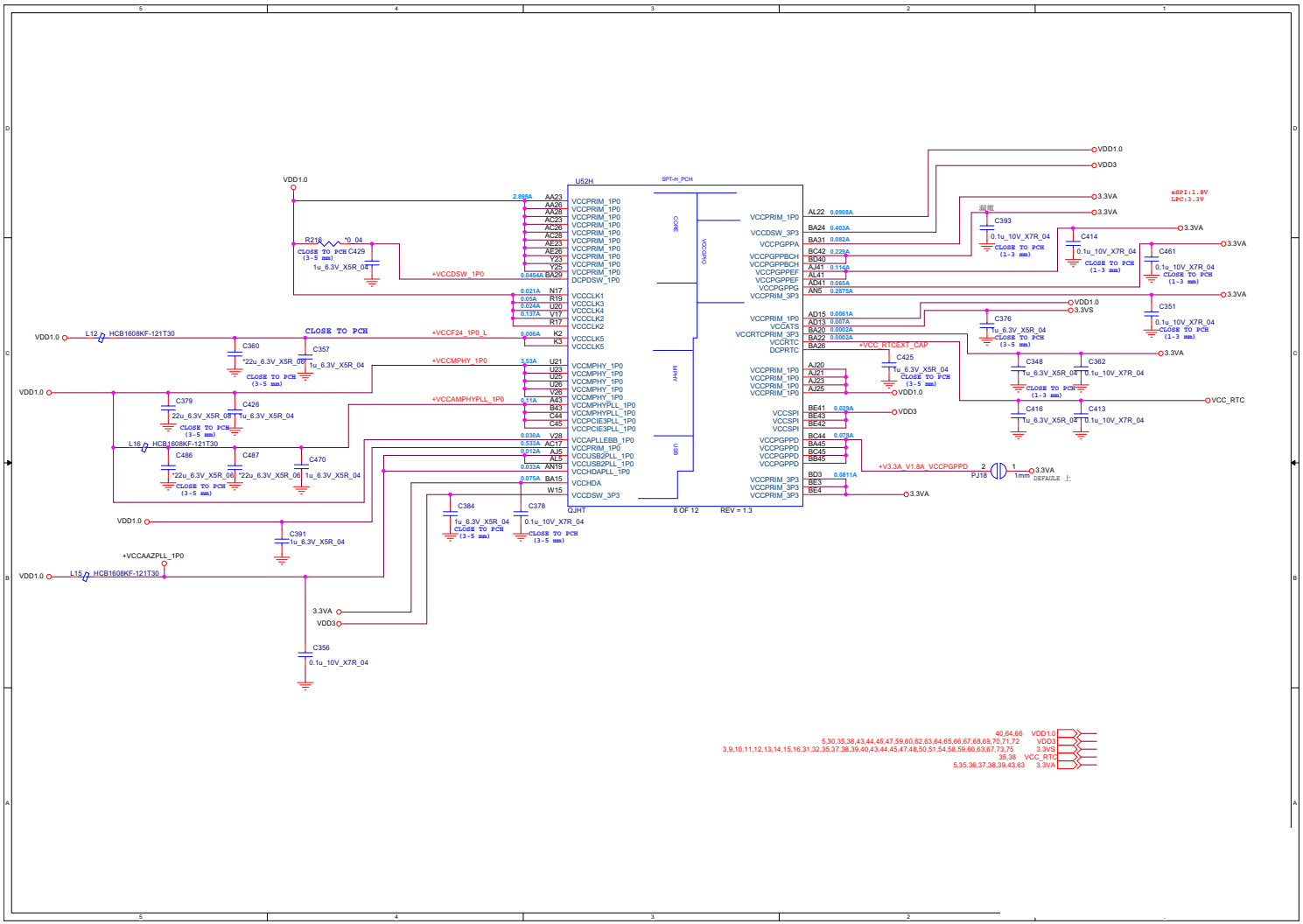
PCH 7/9



PCH 8/9

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PCH 8/9

PCH 9/9

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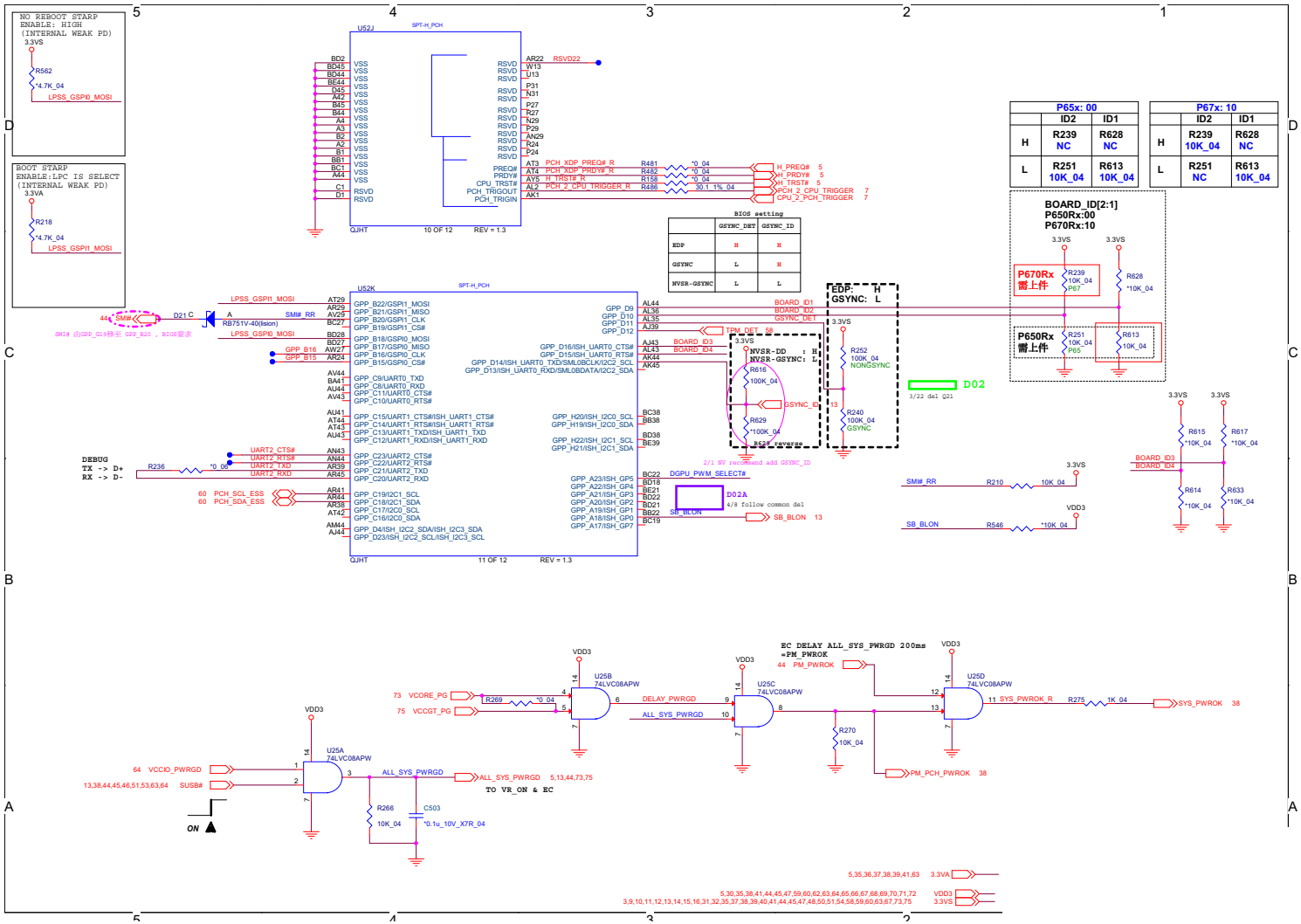
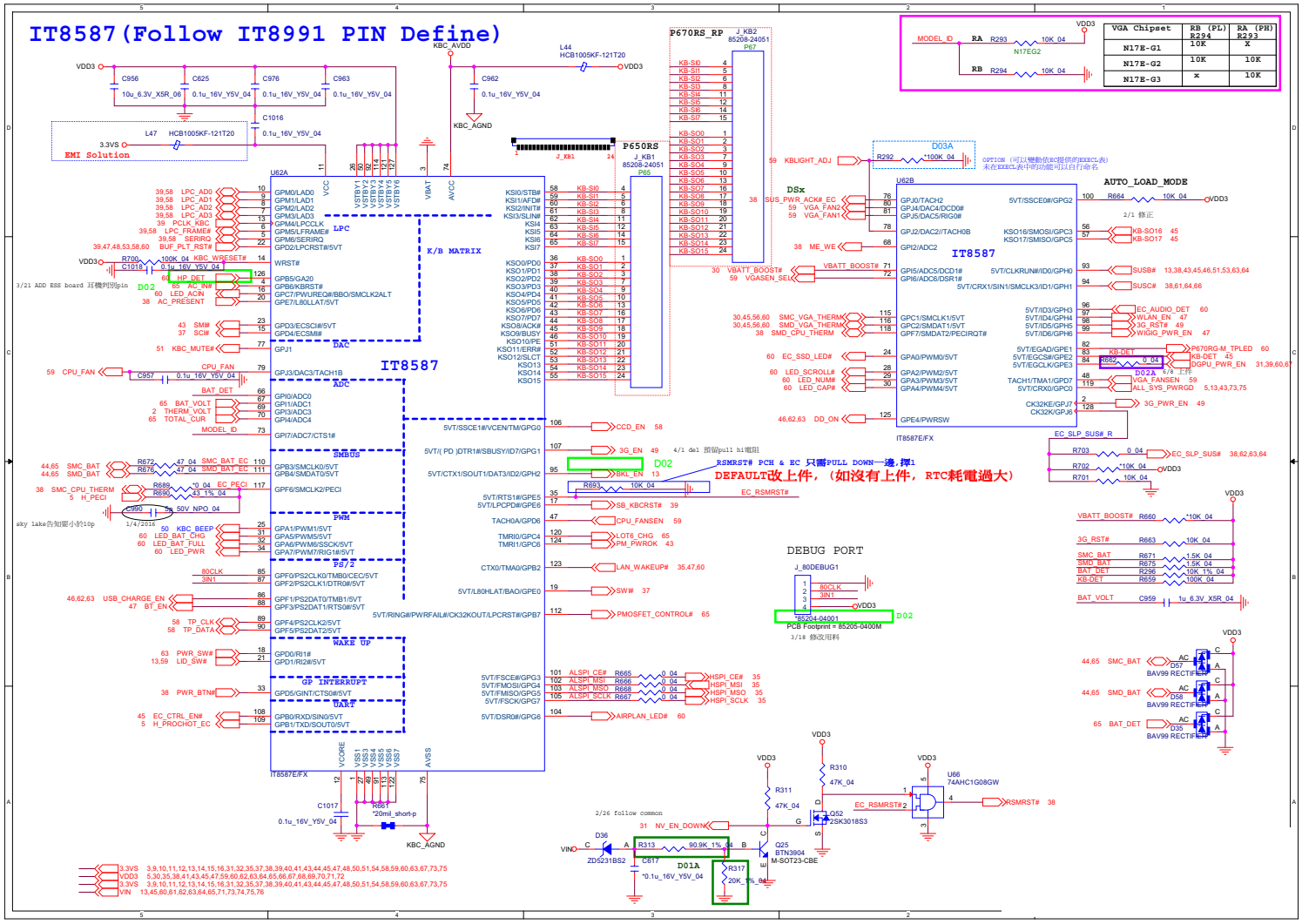
PCH 9/9



KBC IT8587



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KBC IT8587

RGB KB Only

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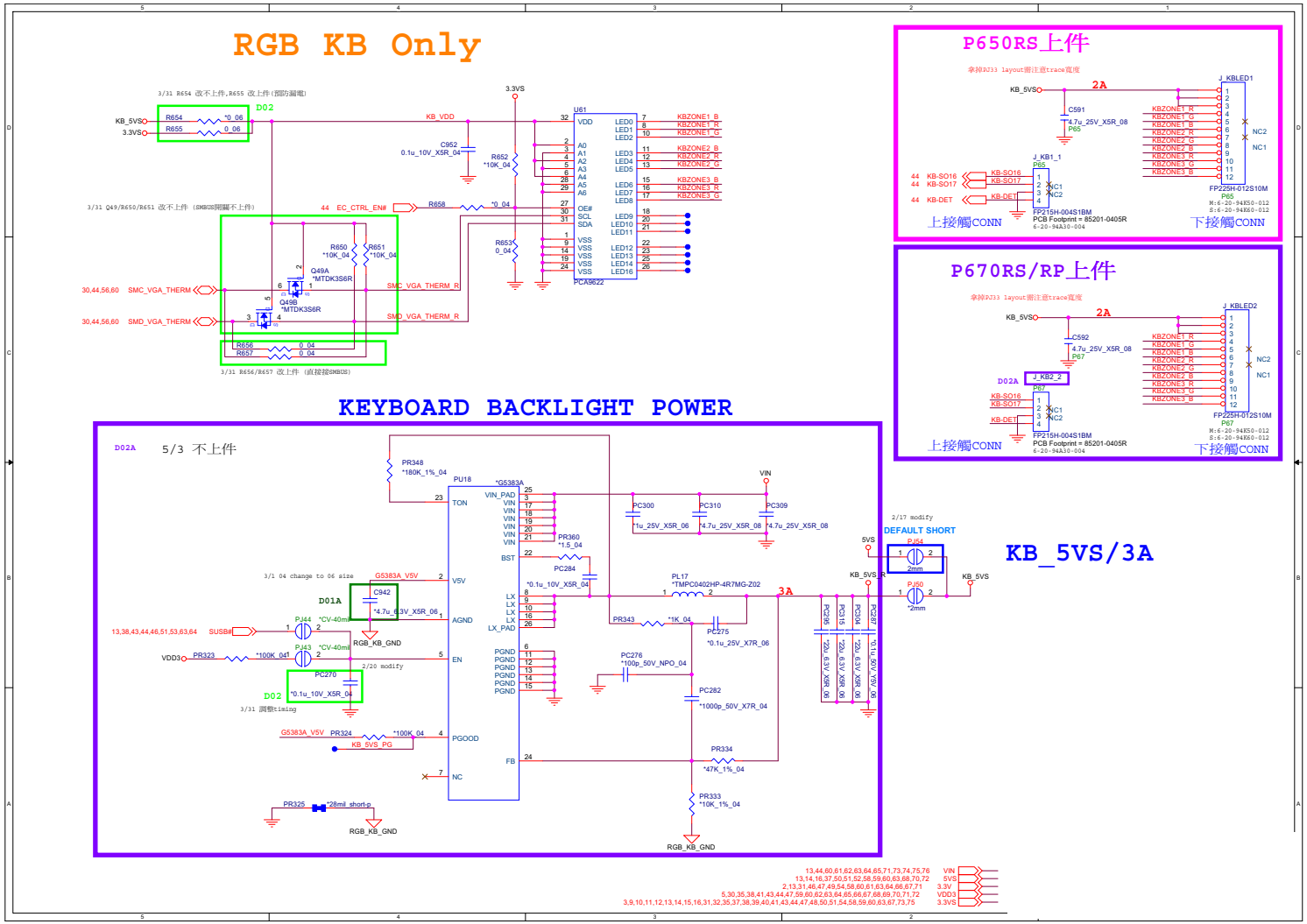
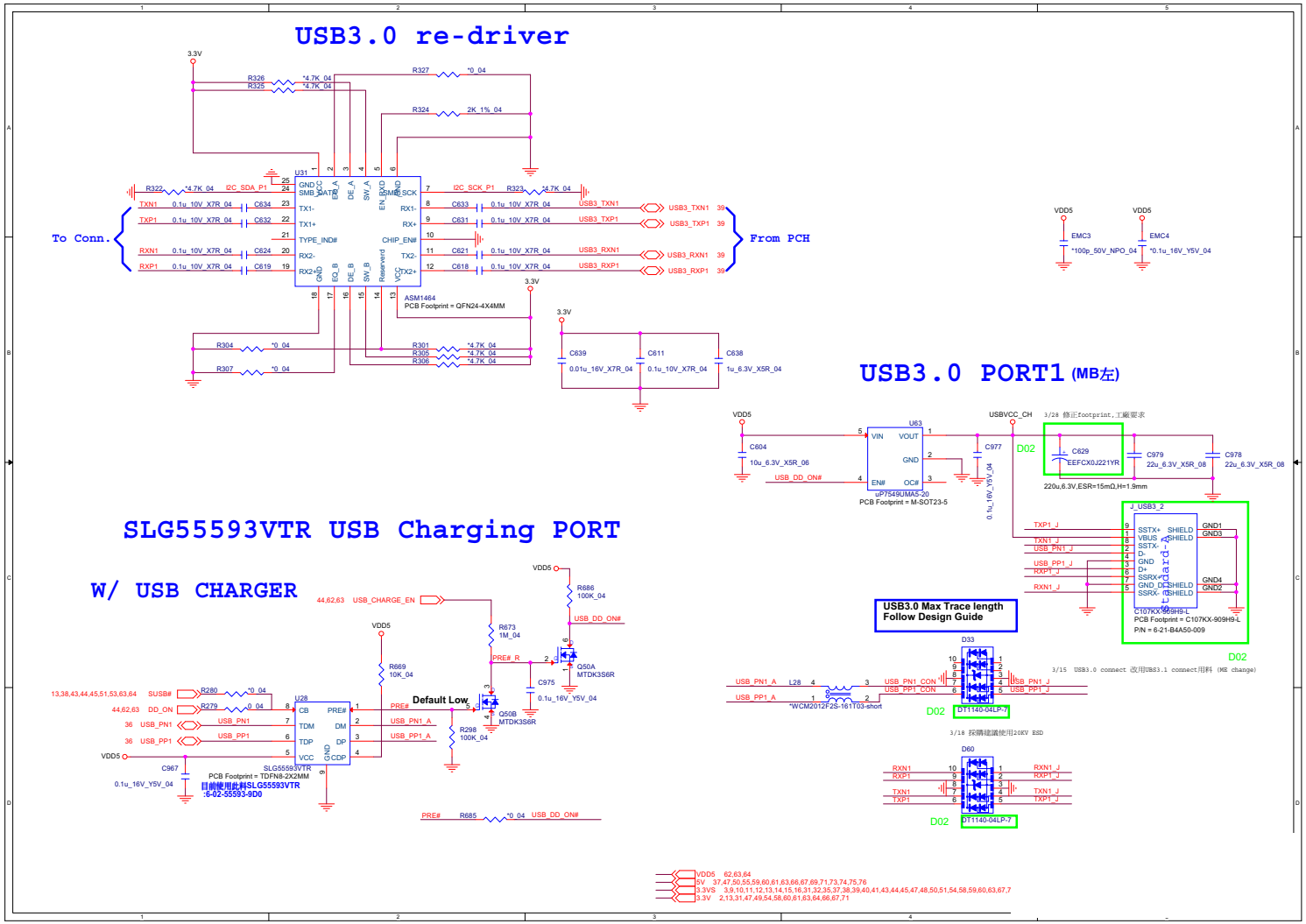
RGB KB only



USB Charger



Sheet 46 of 91
USB Charger

M.2 WiGig/WLAN + BT

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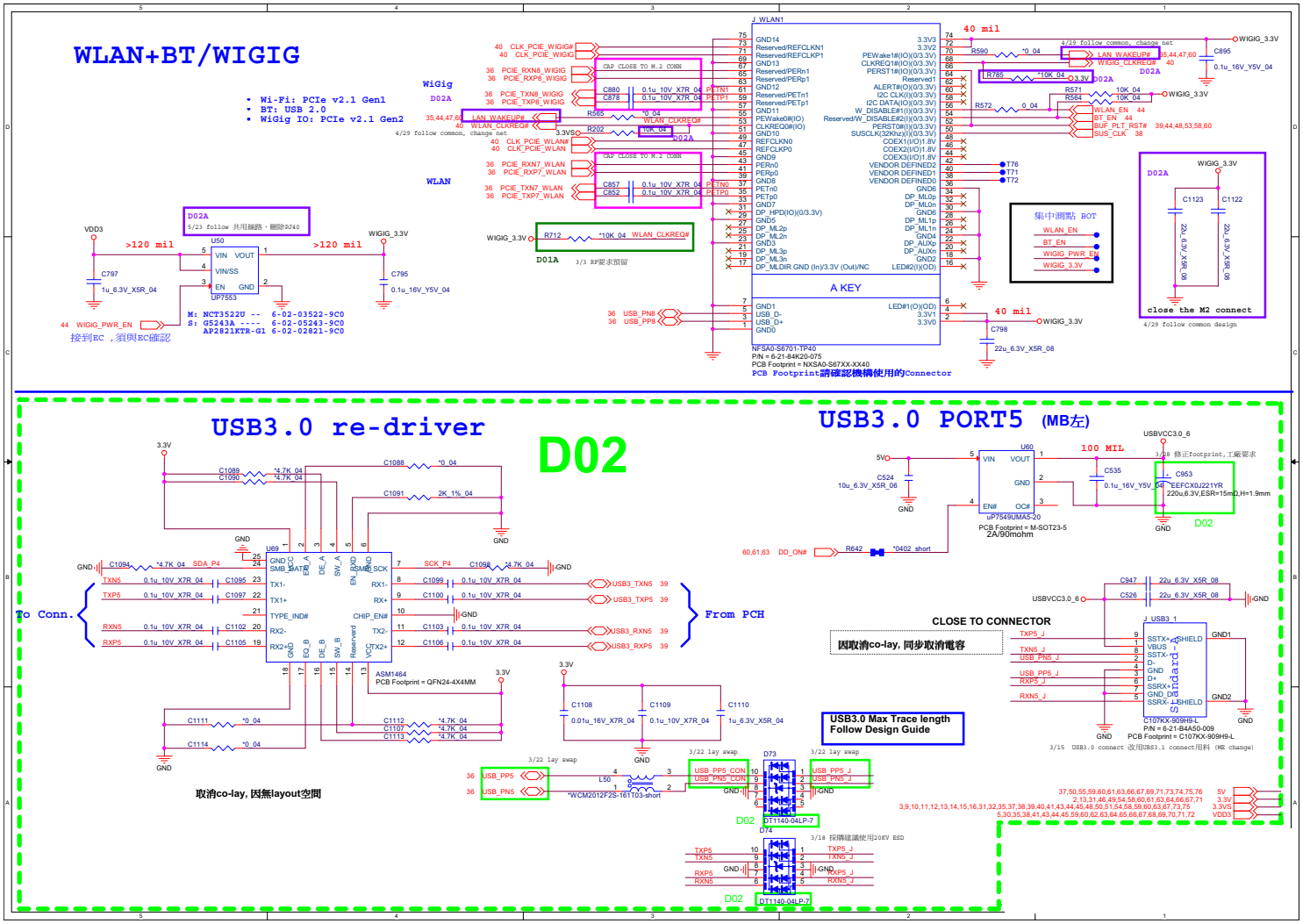
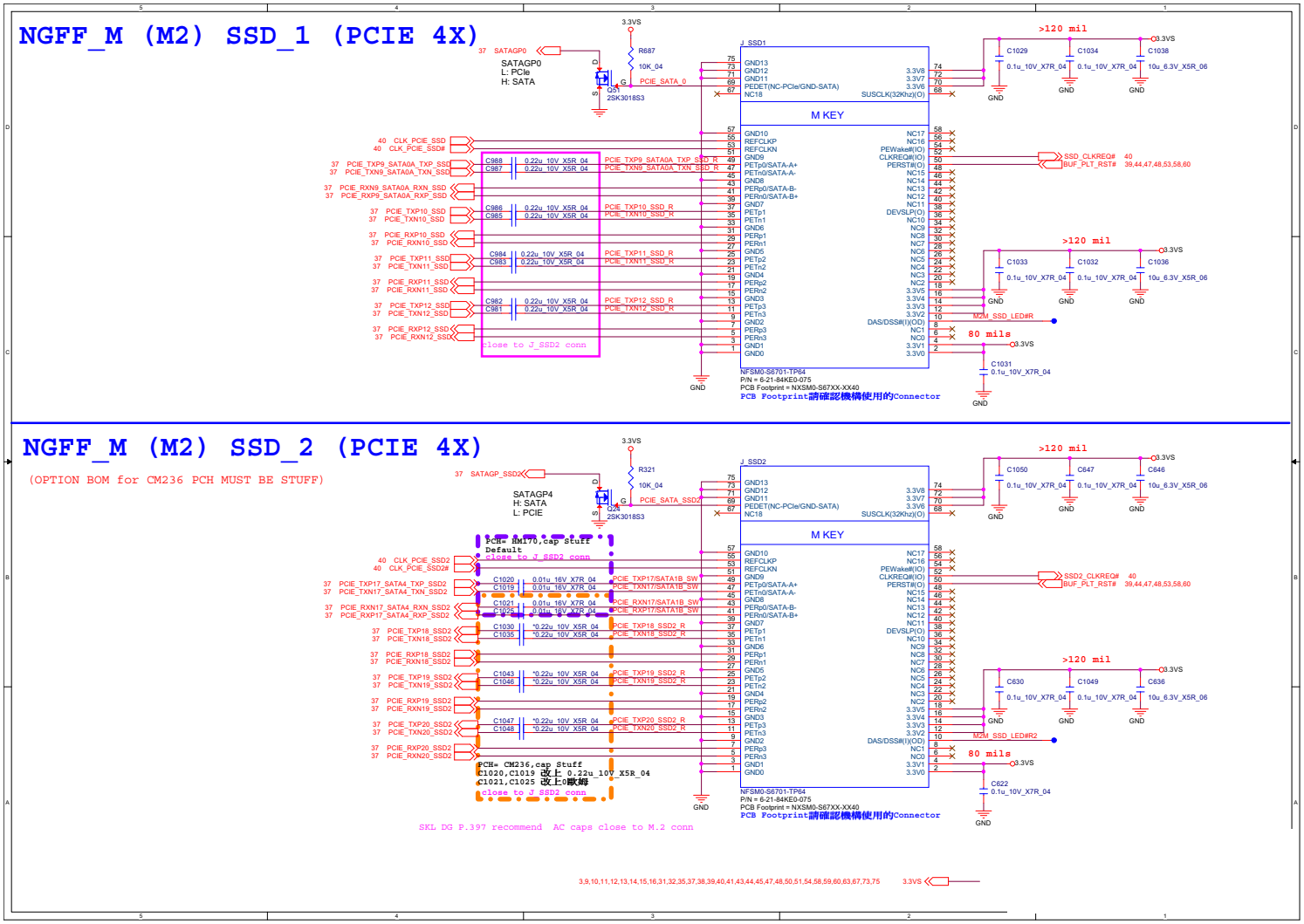
M.2 WiGig/WLAN + BT



M.2 PCIE4X SSD



Sheet 48 of 91
M.2 PCIE4X SSD

M.2 3G/LTE

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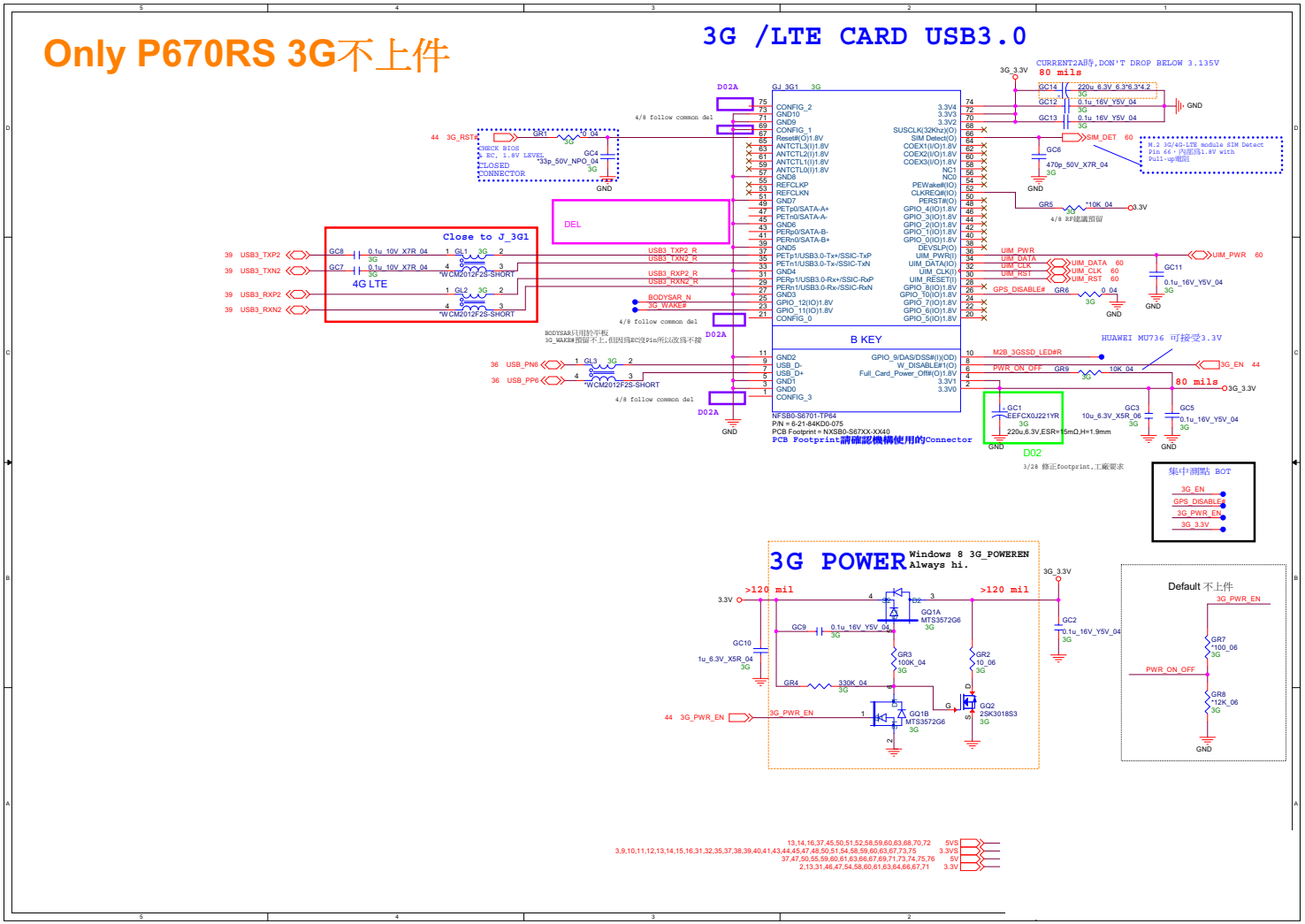
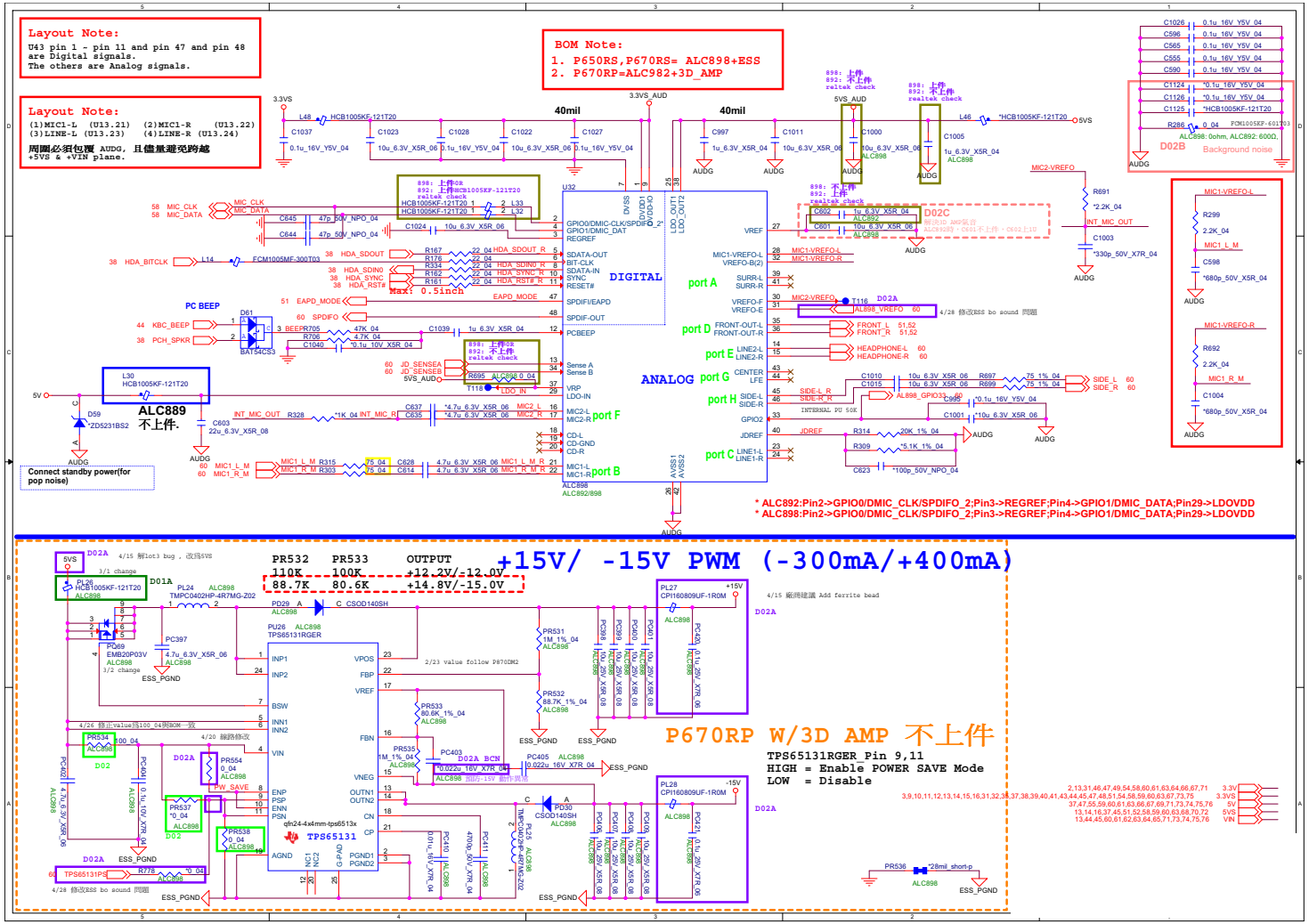
M.2 3G/LTE



Realtek ALC898



Sheet 50 of 91
Realtek ALC898

TPA2008D2

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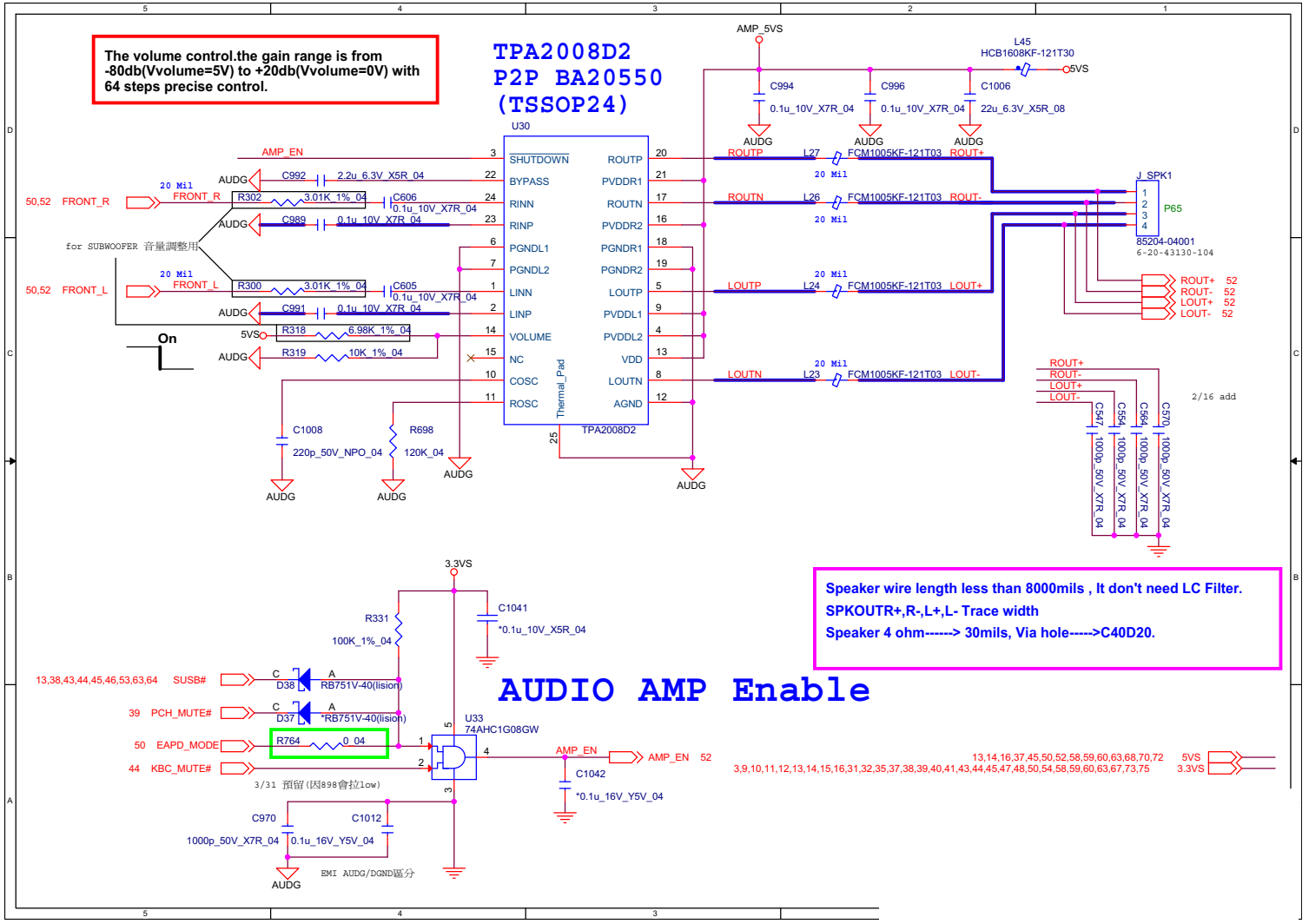
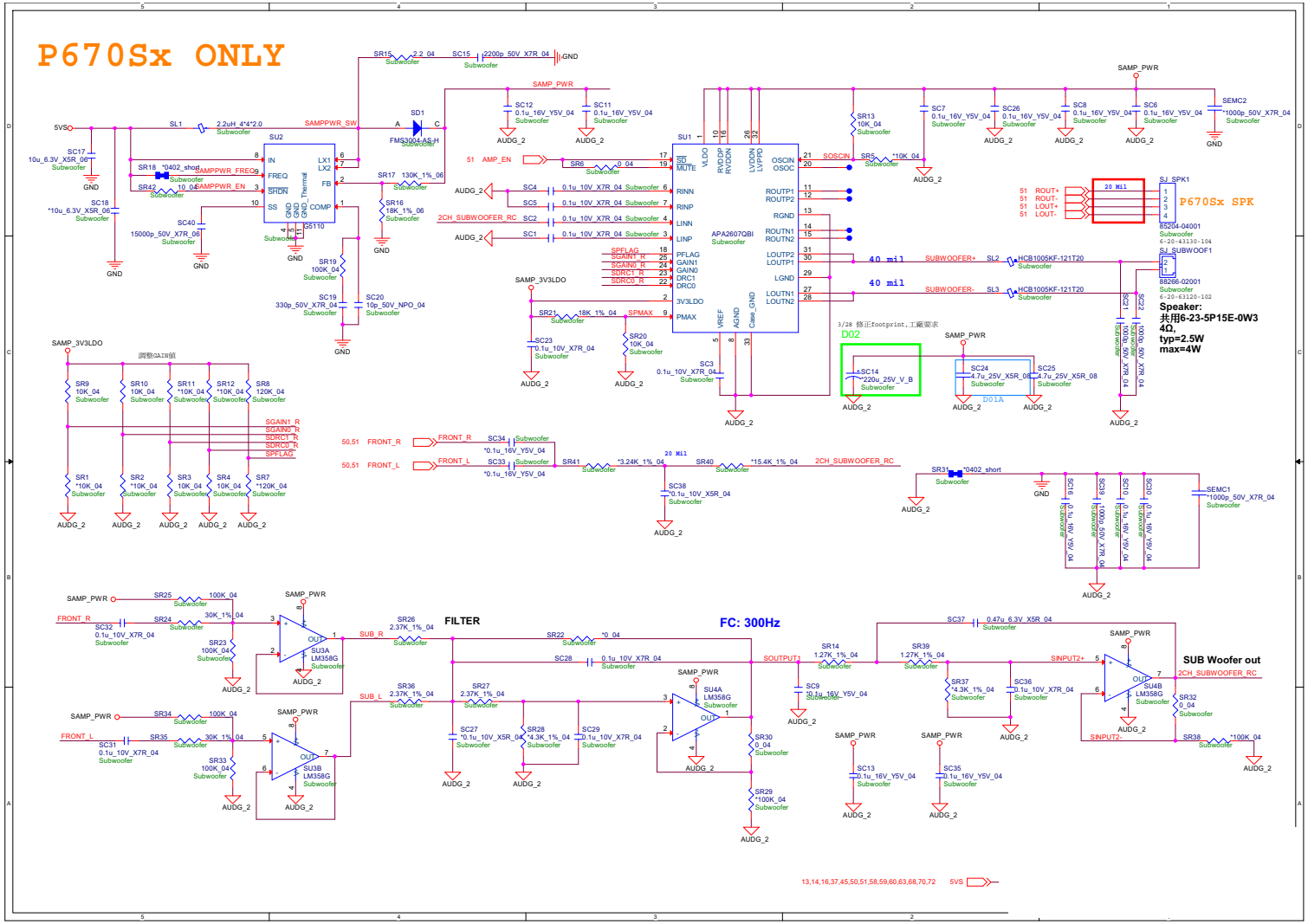
TPA2008D2



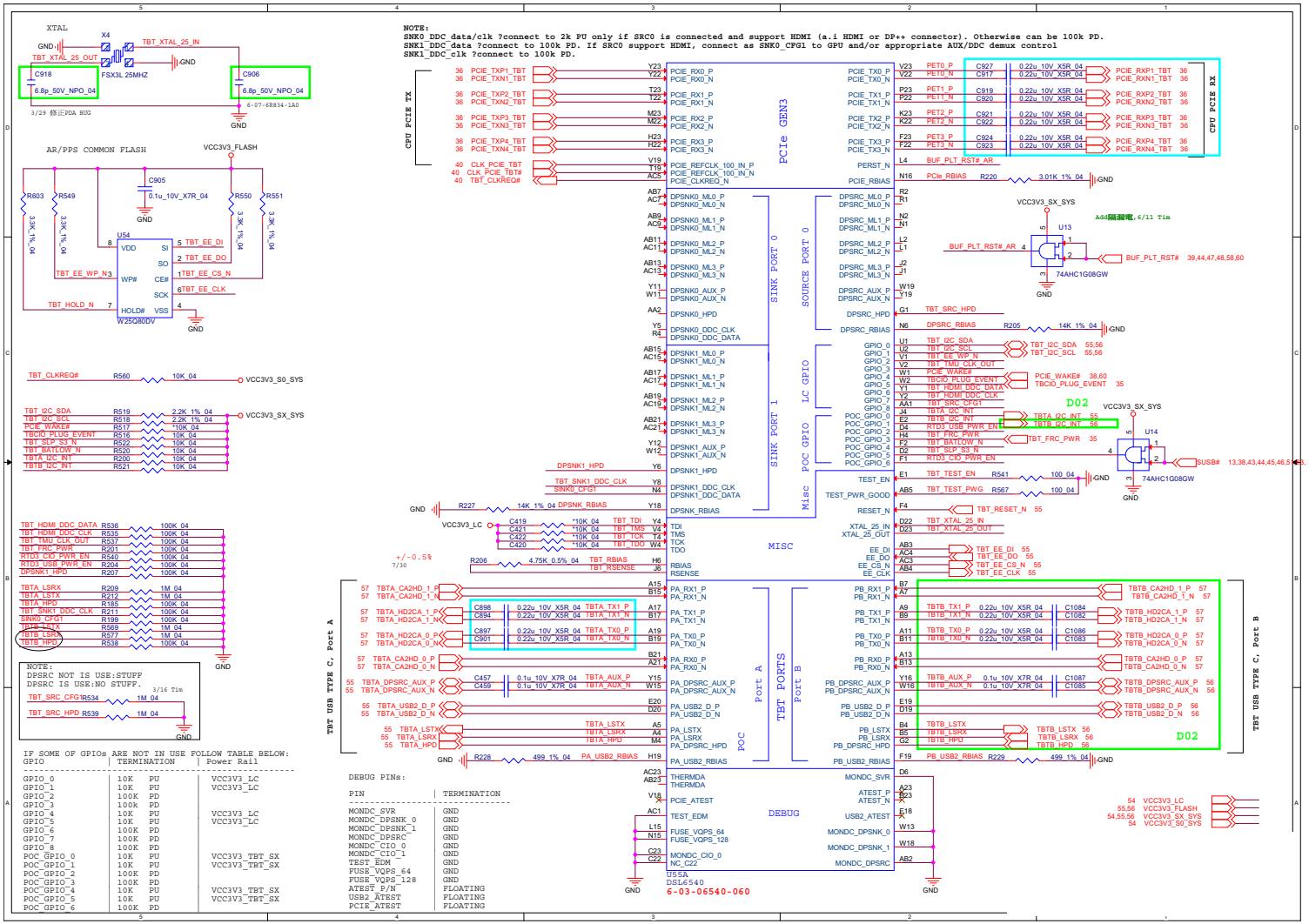
Subwoofer



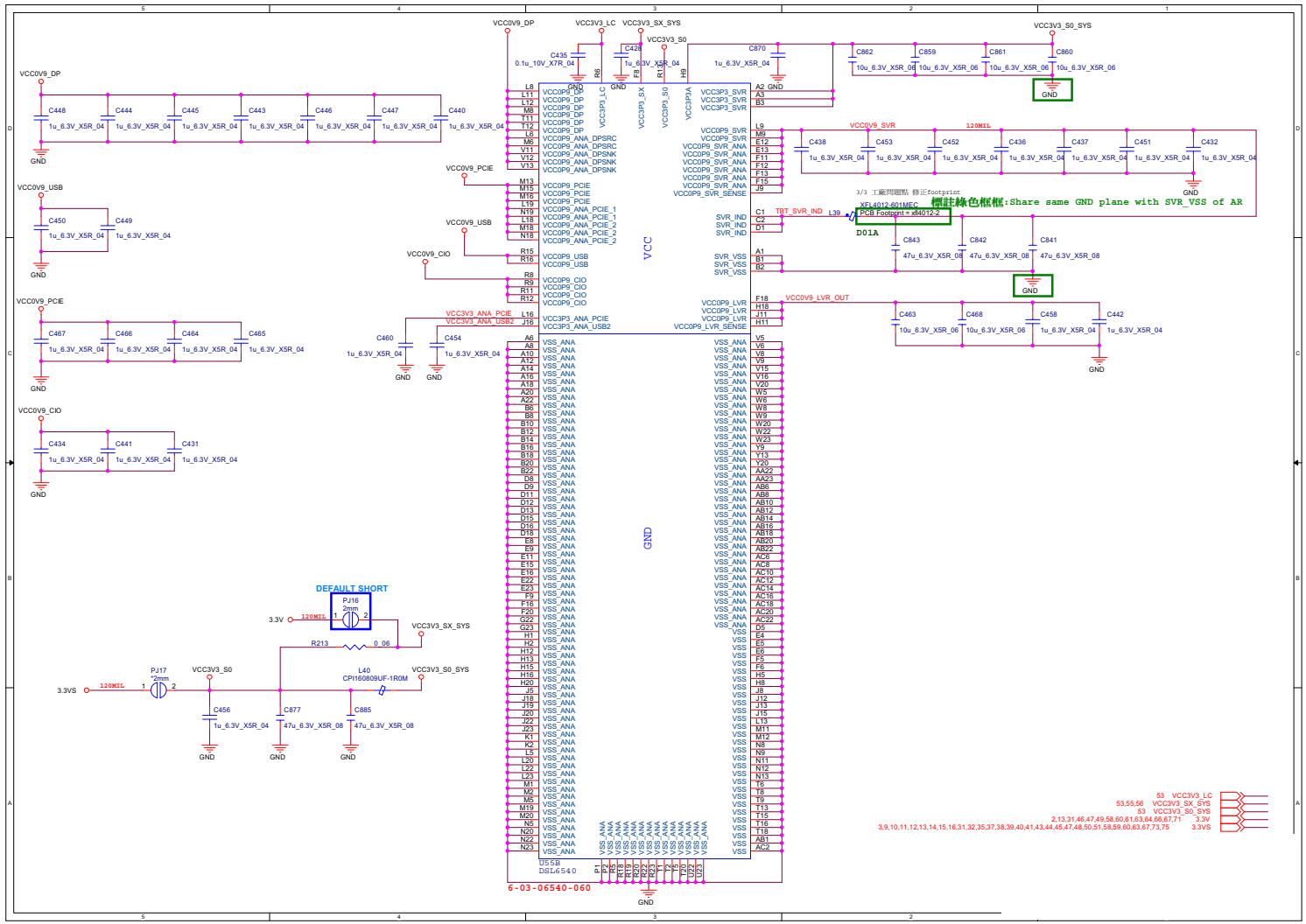
Sheet 52 of 91
Subwoofer

AR_TBT

Sheet 53 of 91
AR_TBT



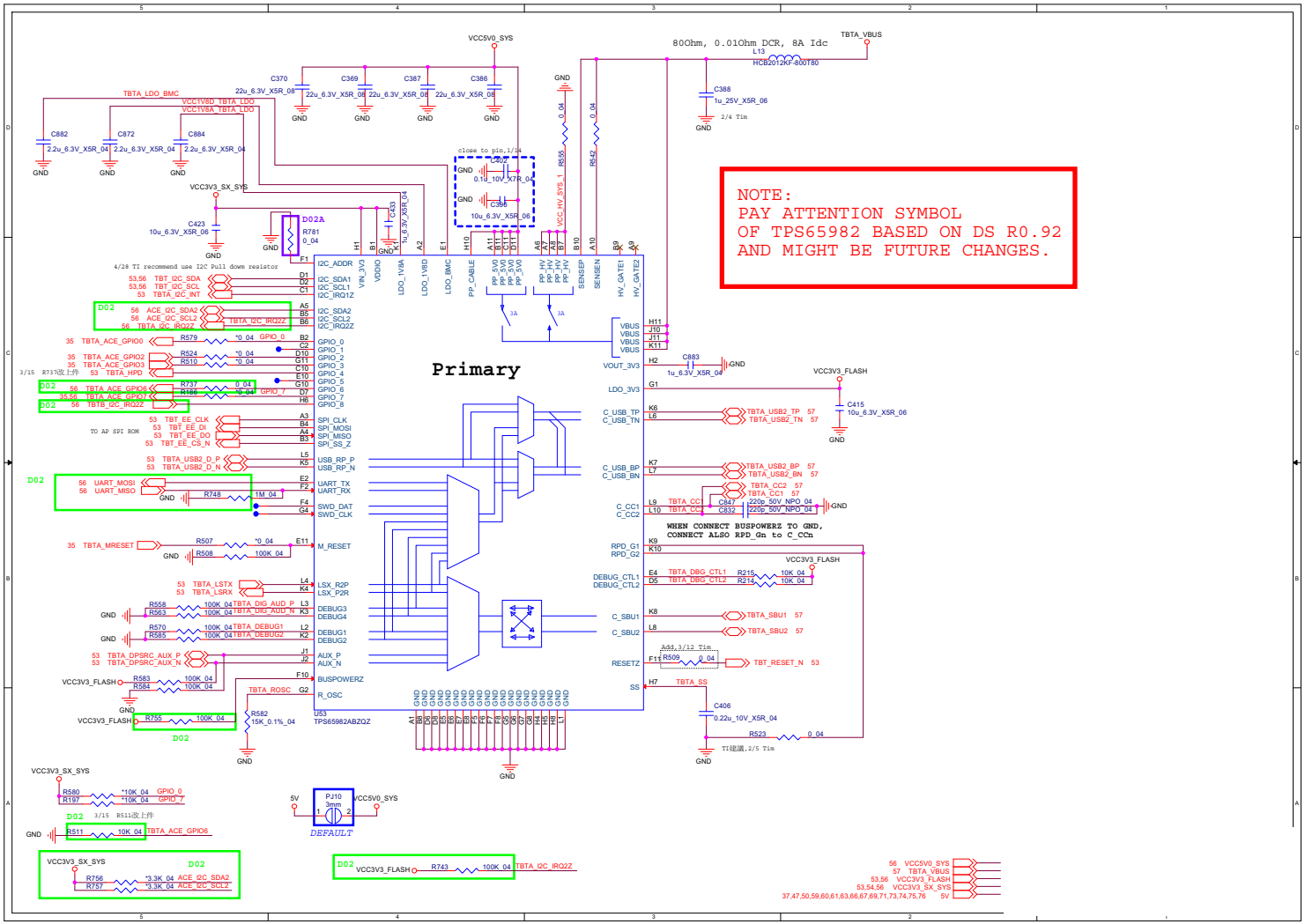
AR_Power



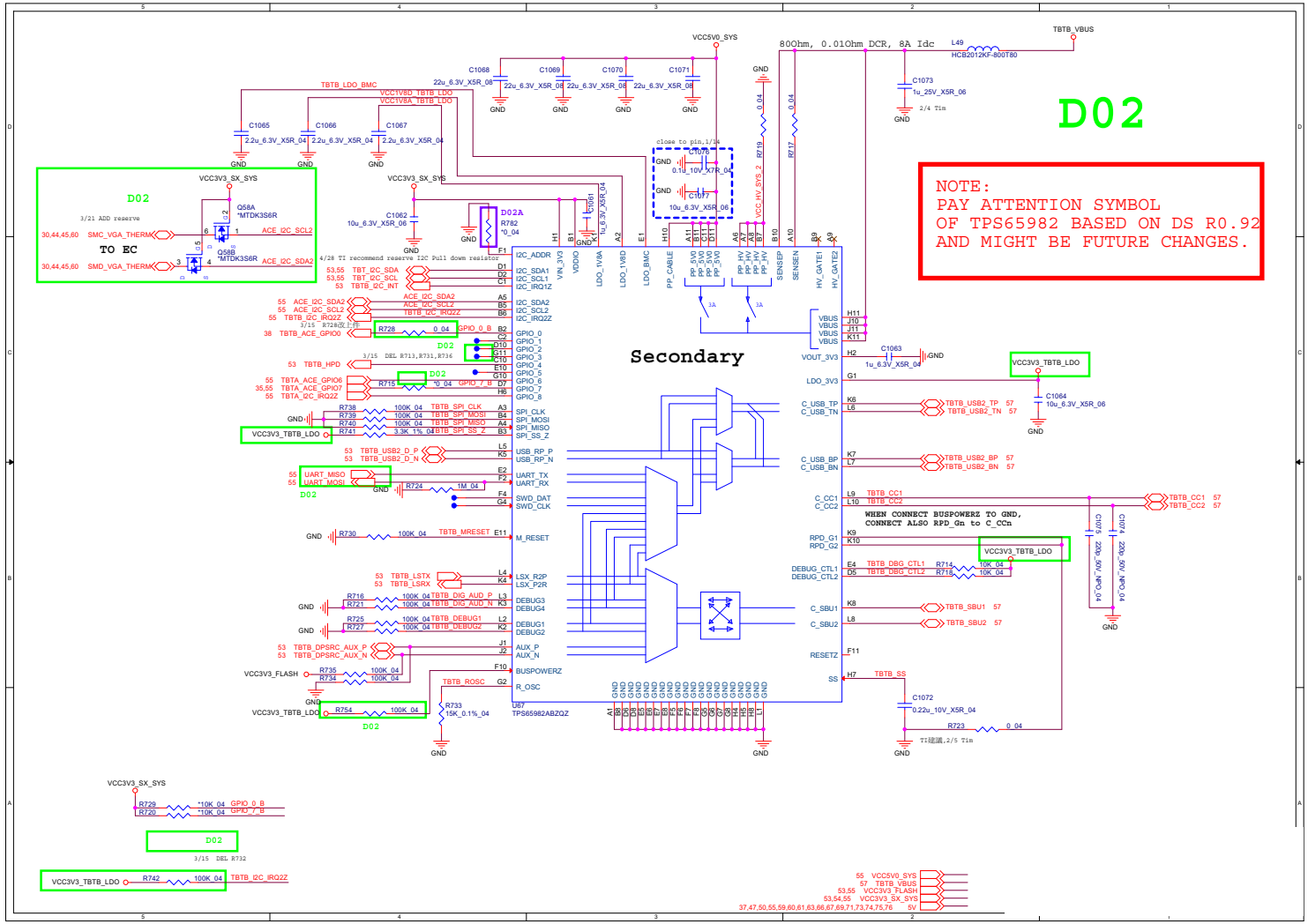
Sheet 54 of 91
AR_Power

TPS65982

Sheet 55 of 91
TPS65982



TPS65982-1


D02
NOTE:
PAY ATTENTION SYMBOL
OF TPS65982 BASED ON DS R0.92
AND MIGHT BE FUTURE CHANGES.
Secondary
TO EC
TBTB_VBUS
VCC5V0_SYS
VCC3V3_SX_SYS
VCC3V3_TBTB_LDO
VCC3V3_FLASH
WHEN CONNECT BUSPOWERZ TO GND,
CONNECT ALSO RPD_Gn to C_CCn
TPS65982ABZQZ

AR_Conn Type A/C

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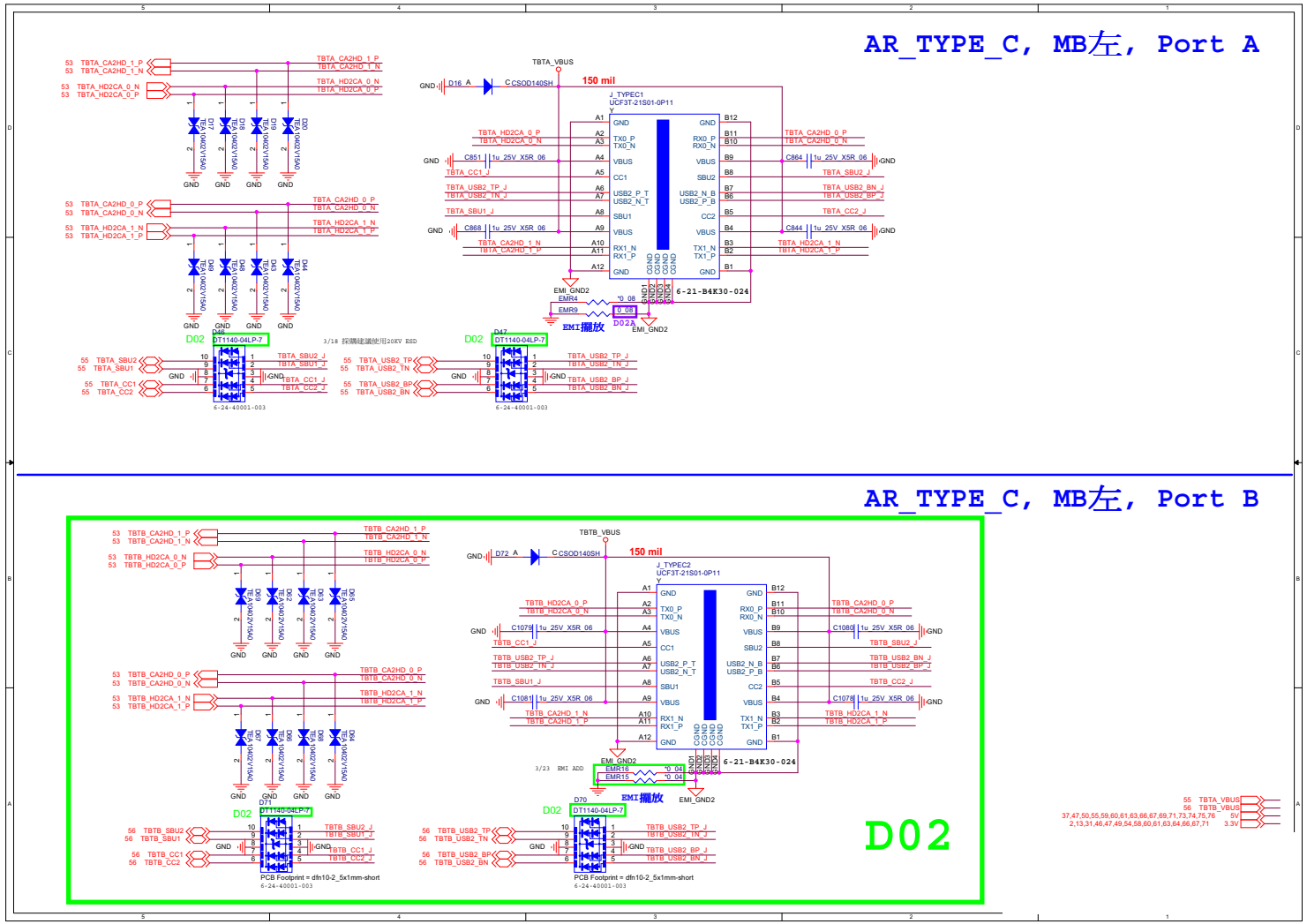
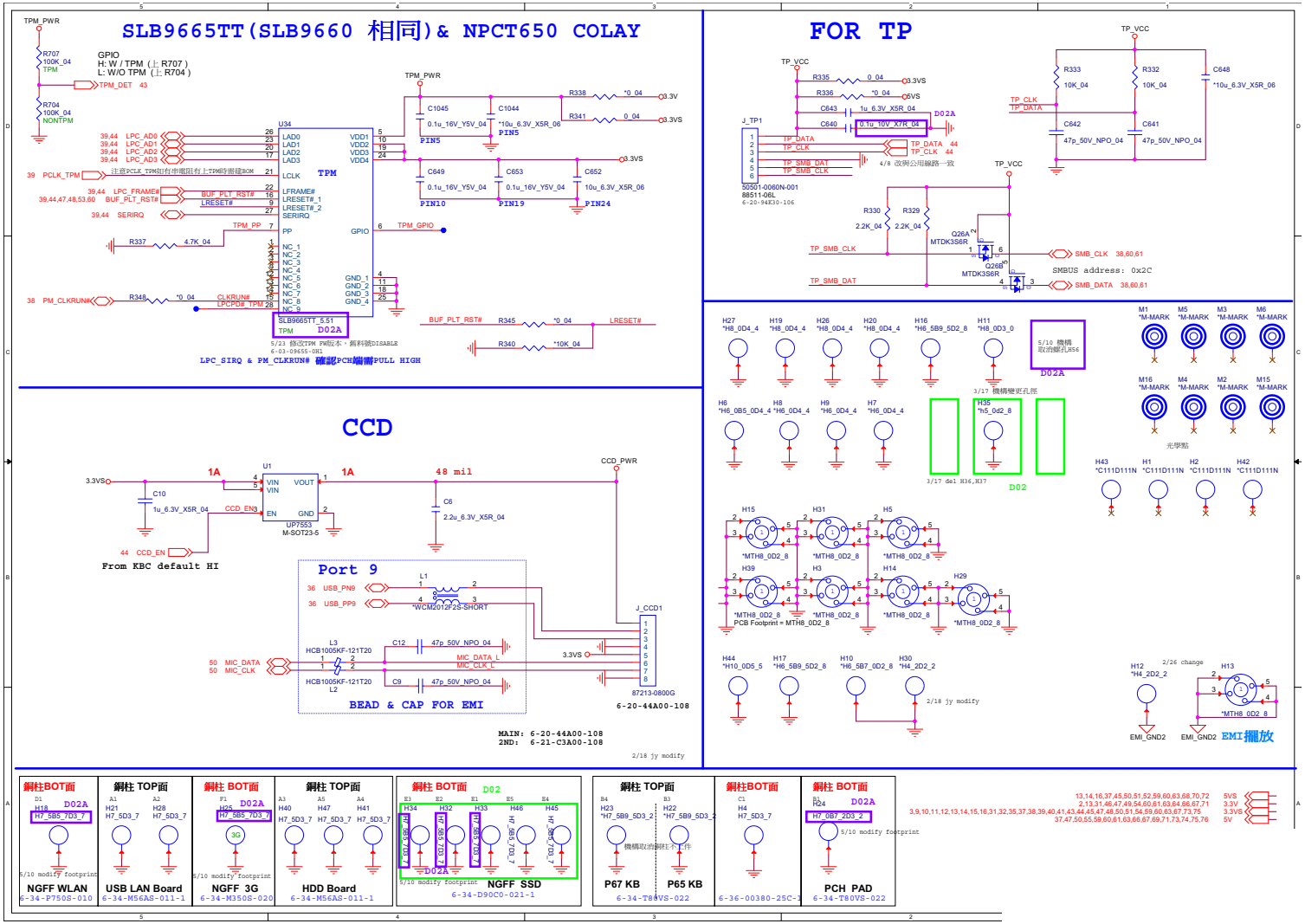
AR_Conn Type A/C



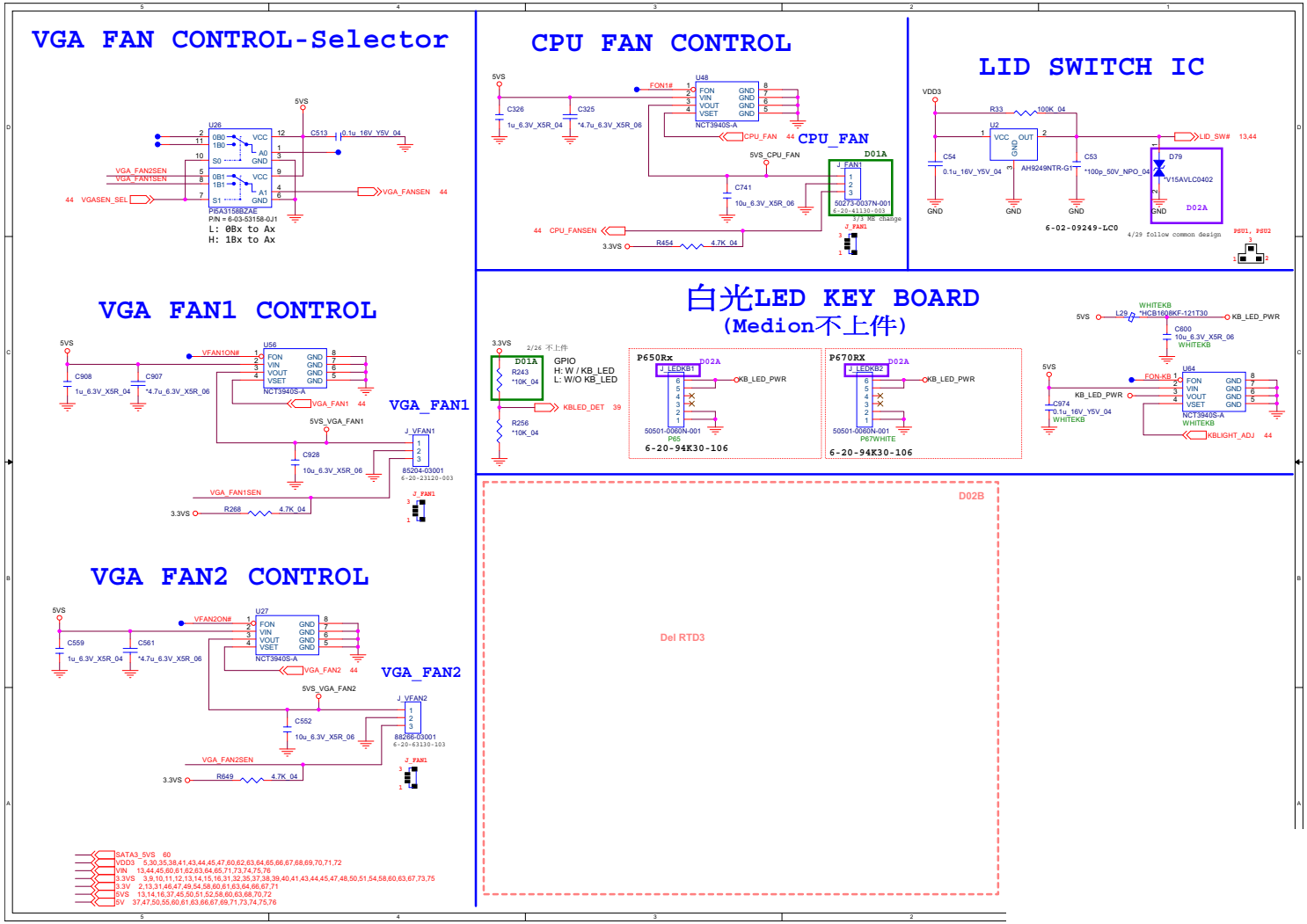
TPM, CCD, TP



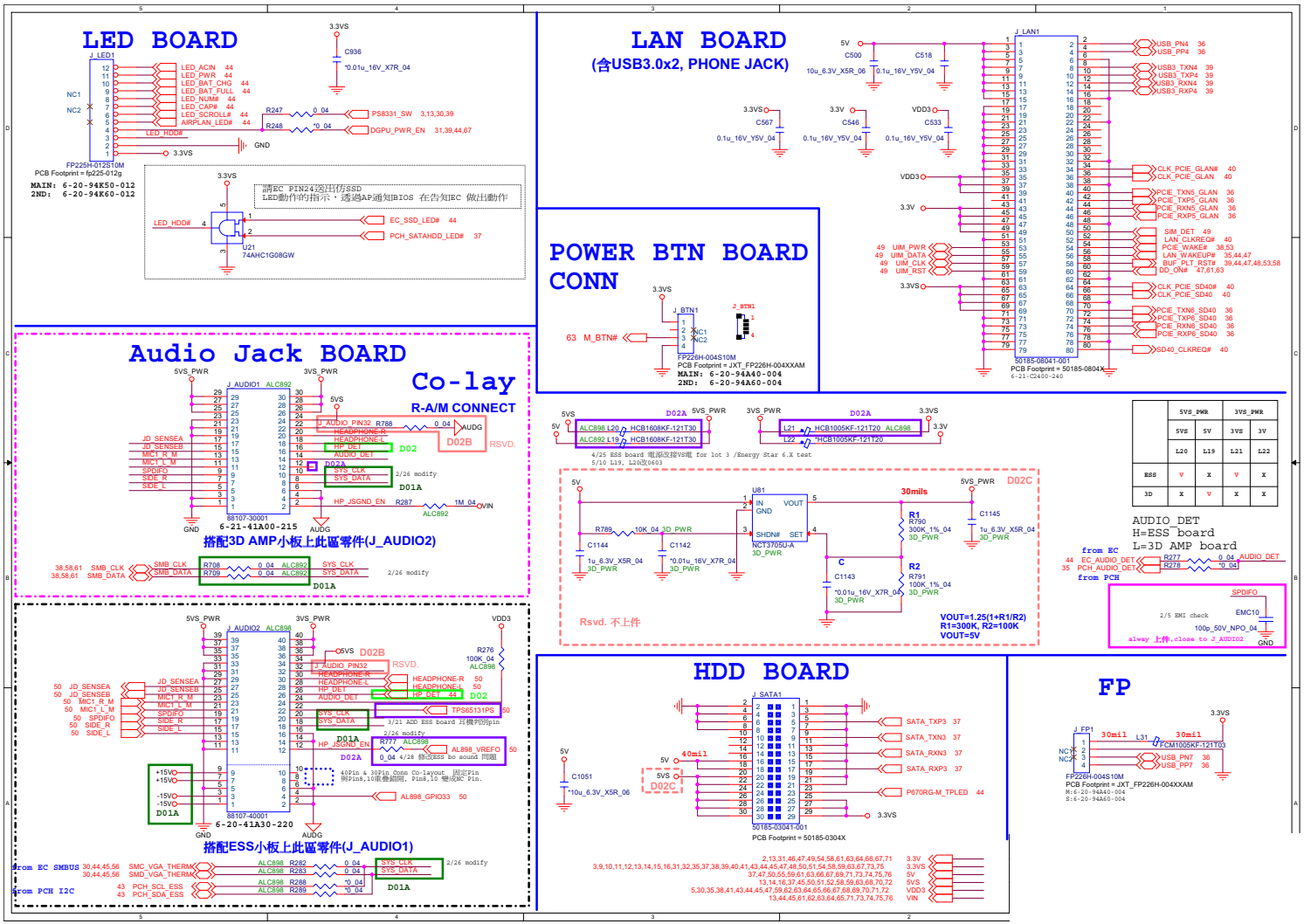
Sheet 58 of 91
TPM, CCD, TP

Fan, LID, KB LED

Sheet 59 of 91
Fan, LID, KB LED



Connector



Sheet 60 of 91
Connector

DDR 1.2V / 0.6VS

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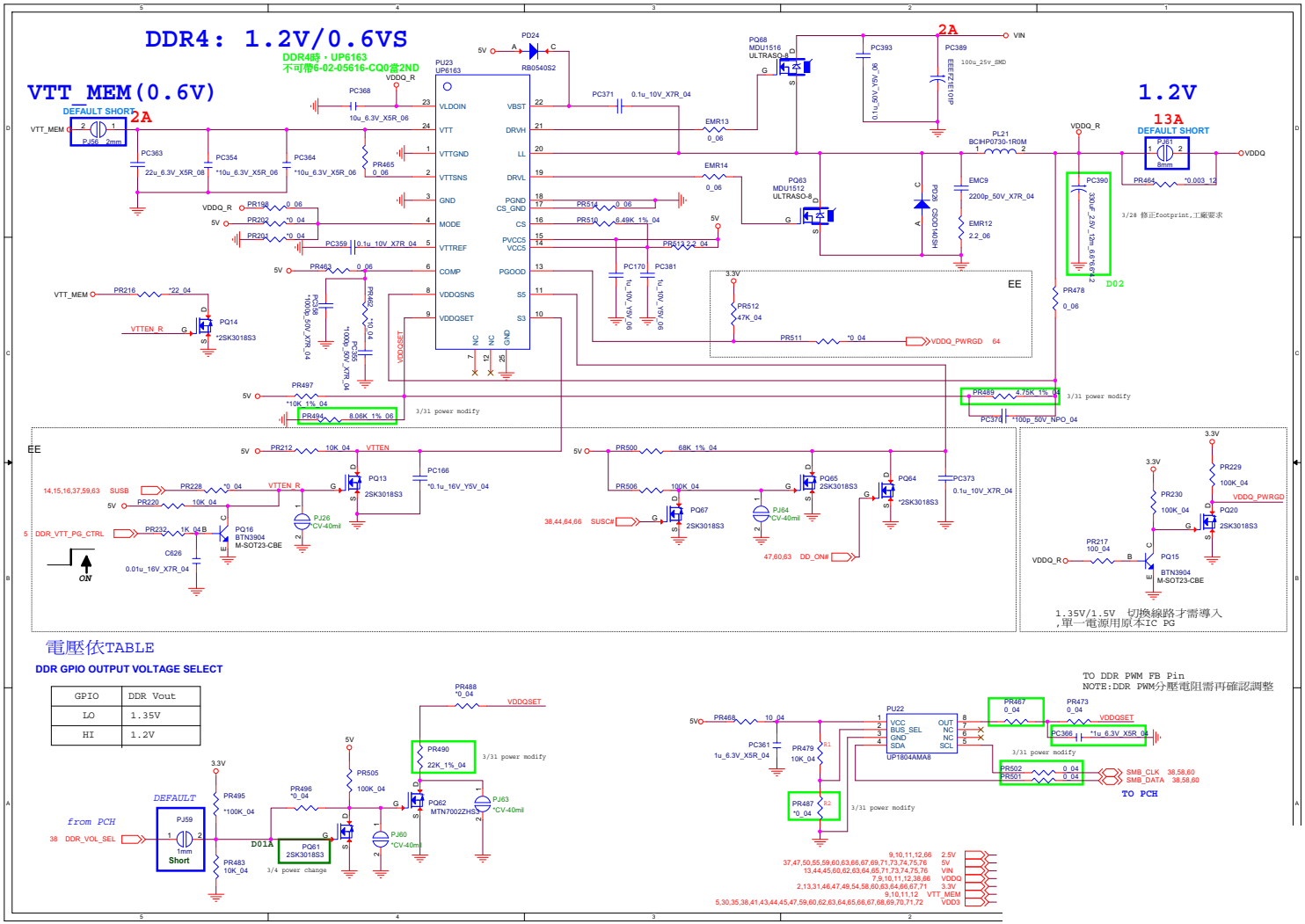
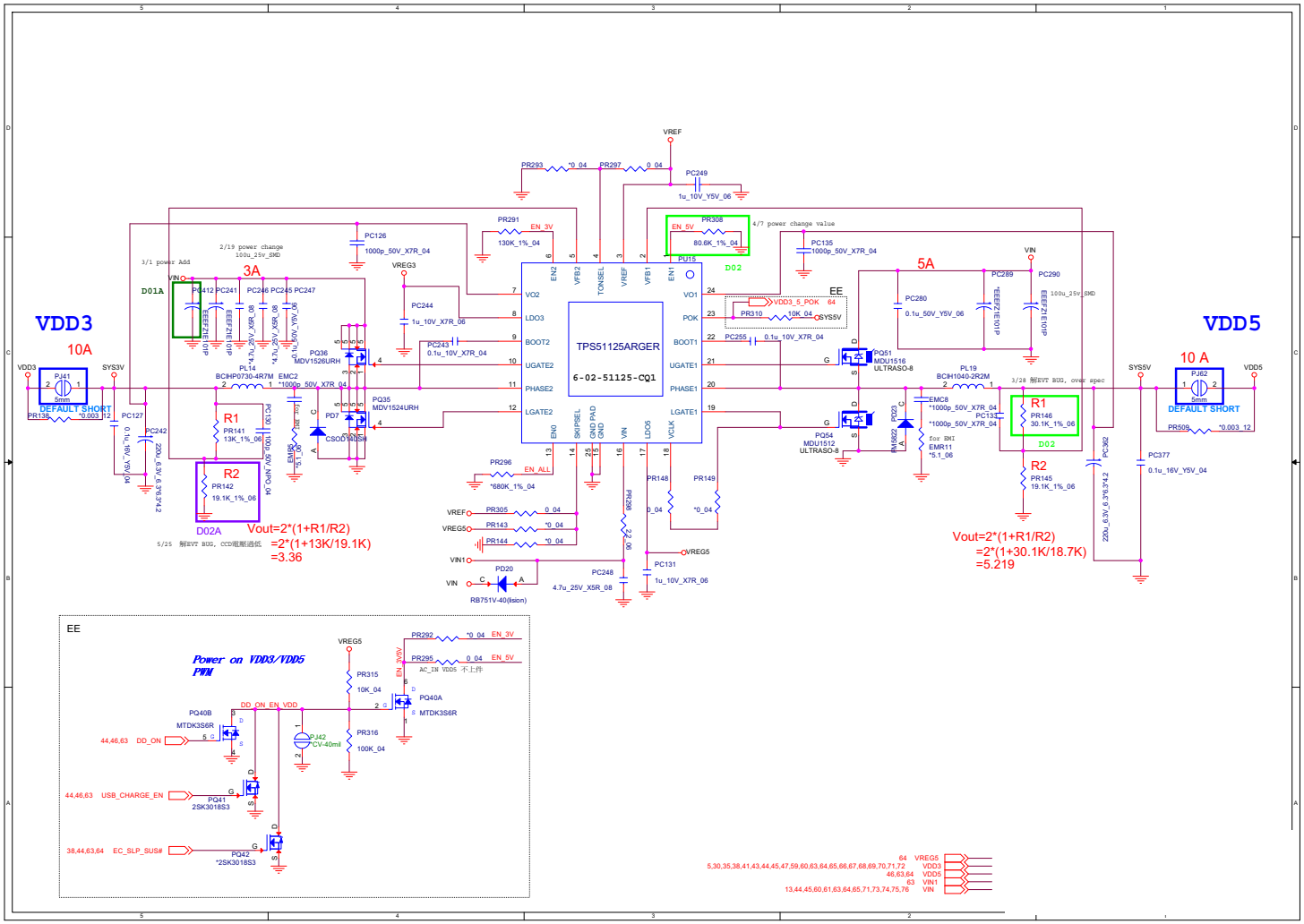
DDR 1.2V / 0.6VS



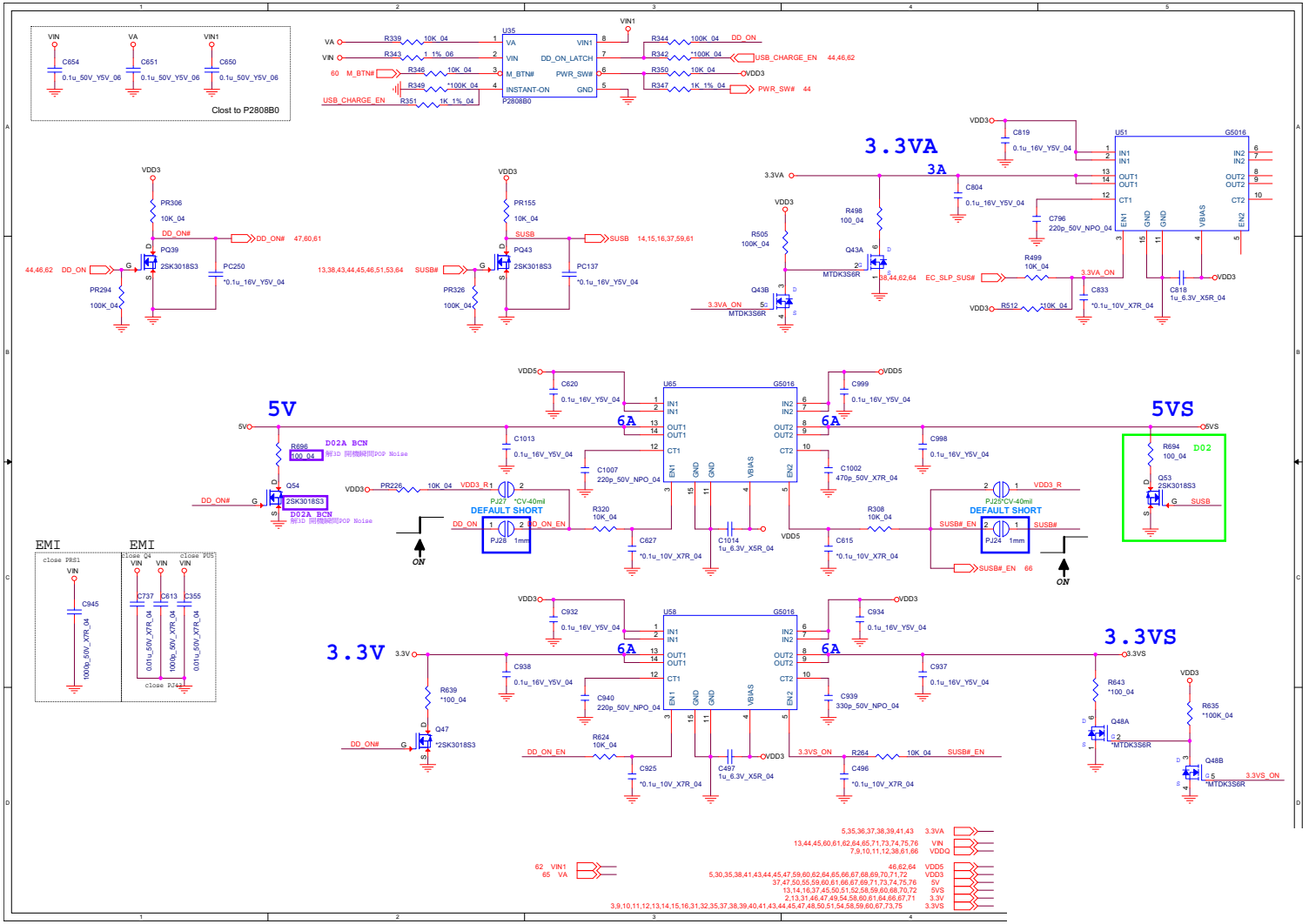
VDD3, VDD5



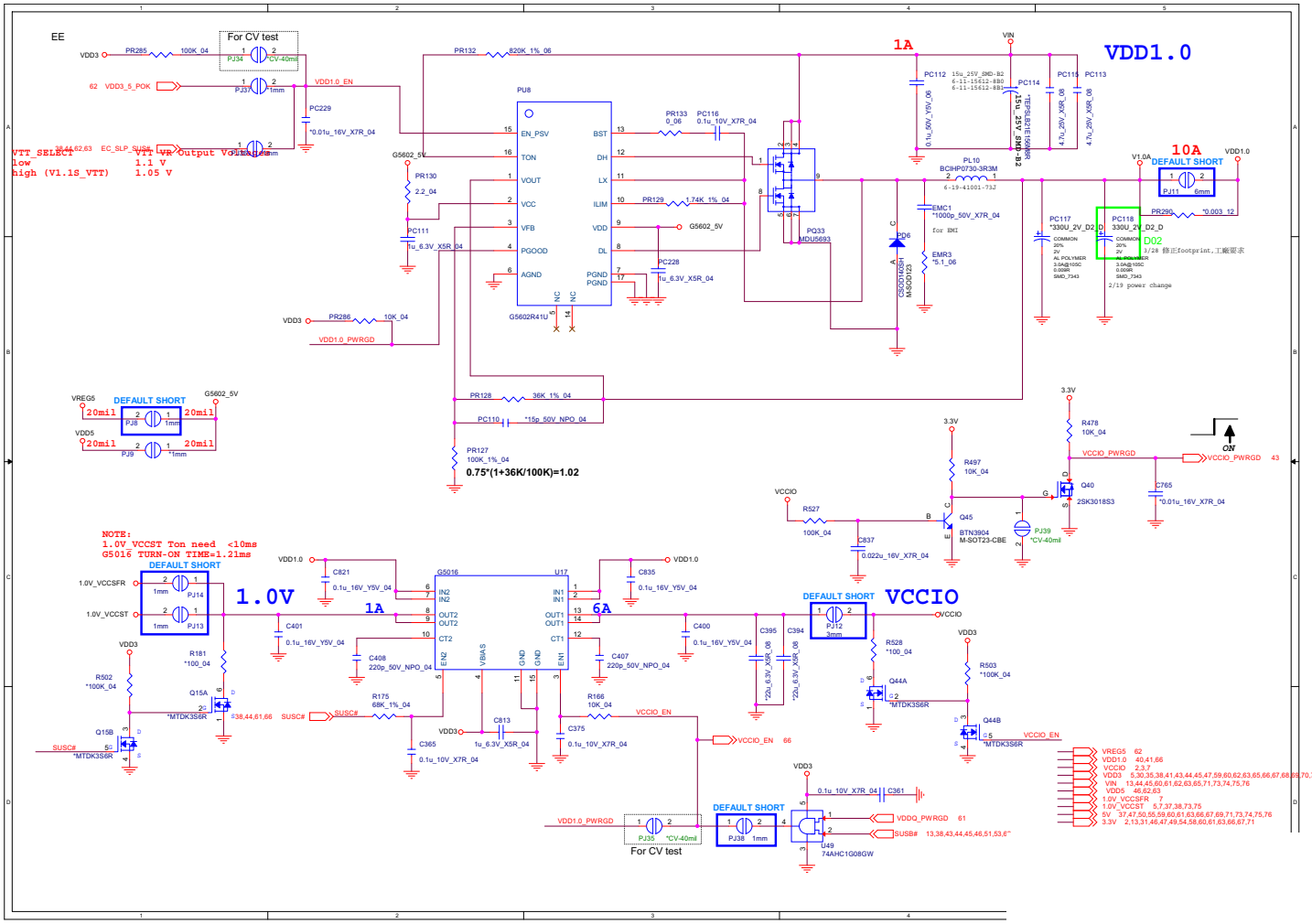
Sheet 62 of 91
VDD3, VDD5

5V, 5VS, 3.3V, 3.3VS, 3.3VA

Sheet 63 of 91
5V, 5VS, 3.3V,
3.3VS, 3.3VA



Power 1.0V, VCCIO



Sheet 64 of 91
Power 1.0V, VCCIO

AC_In, Charger

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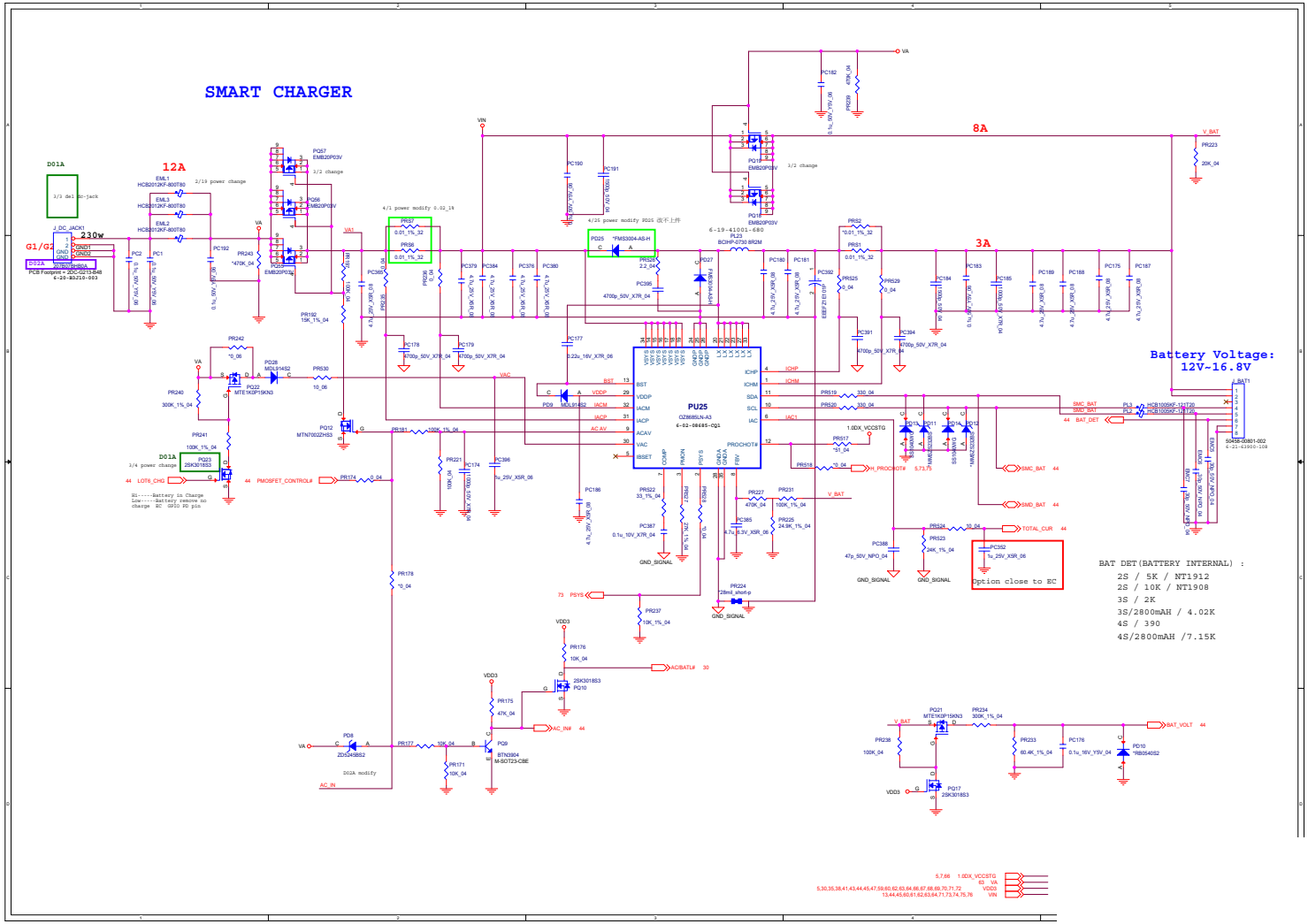
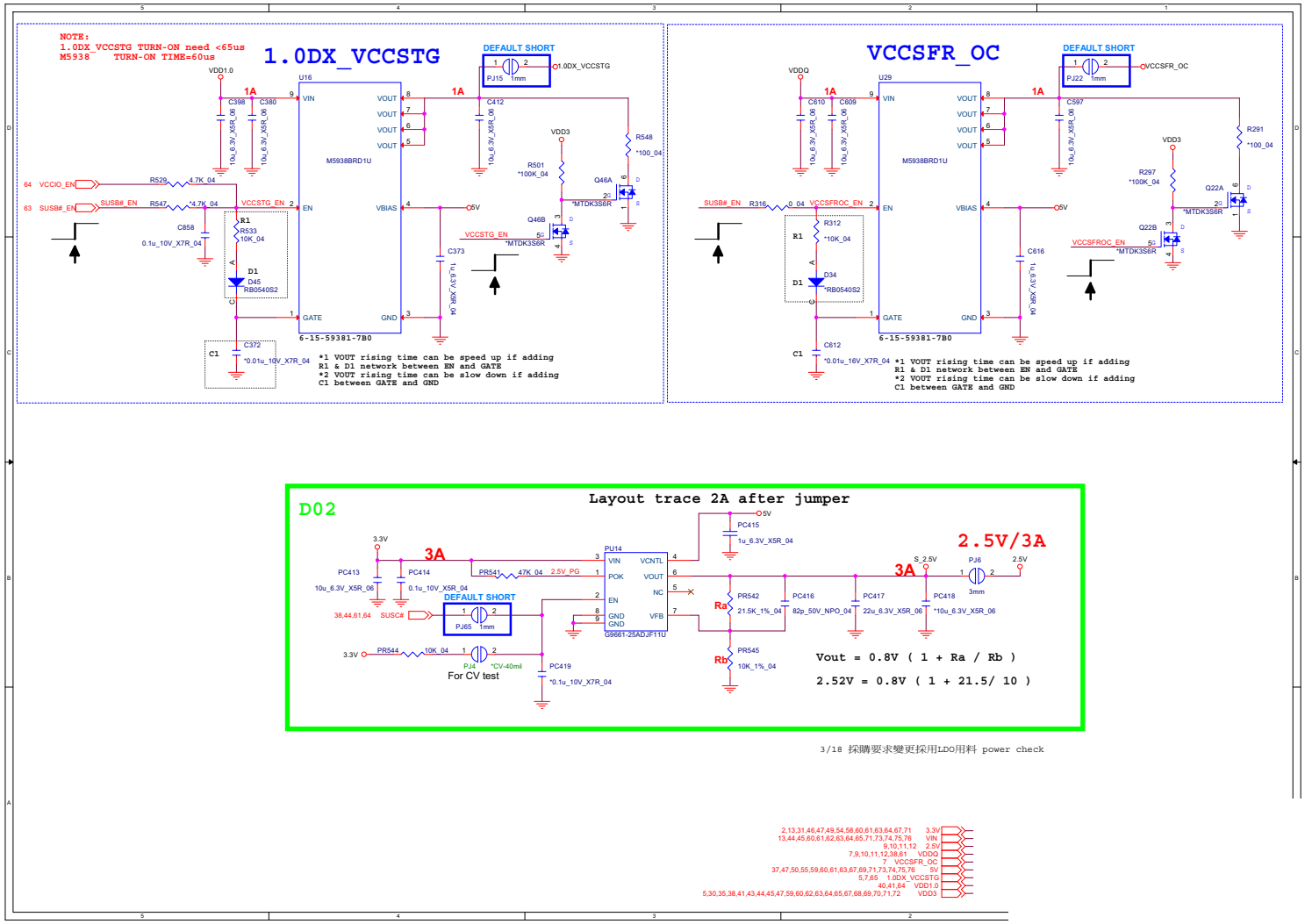
AC_In, Charger



1.0DX_VCCSTG/VCCSFR_OC/2.5V



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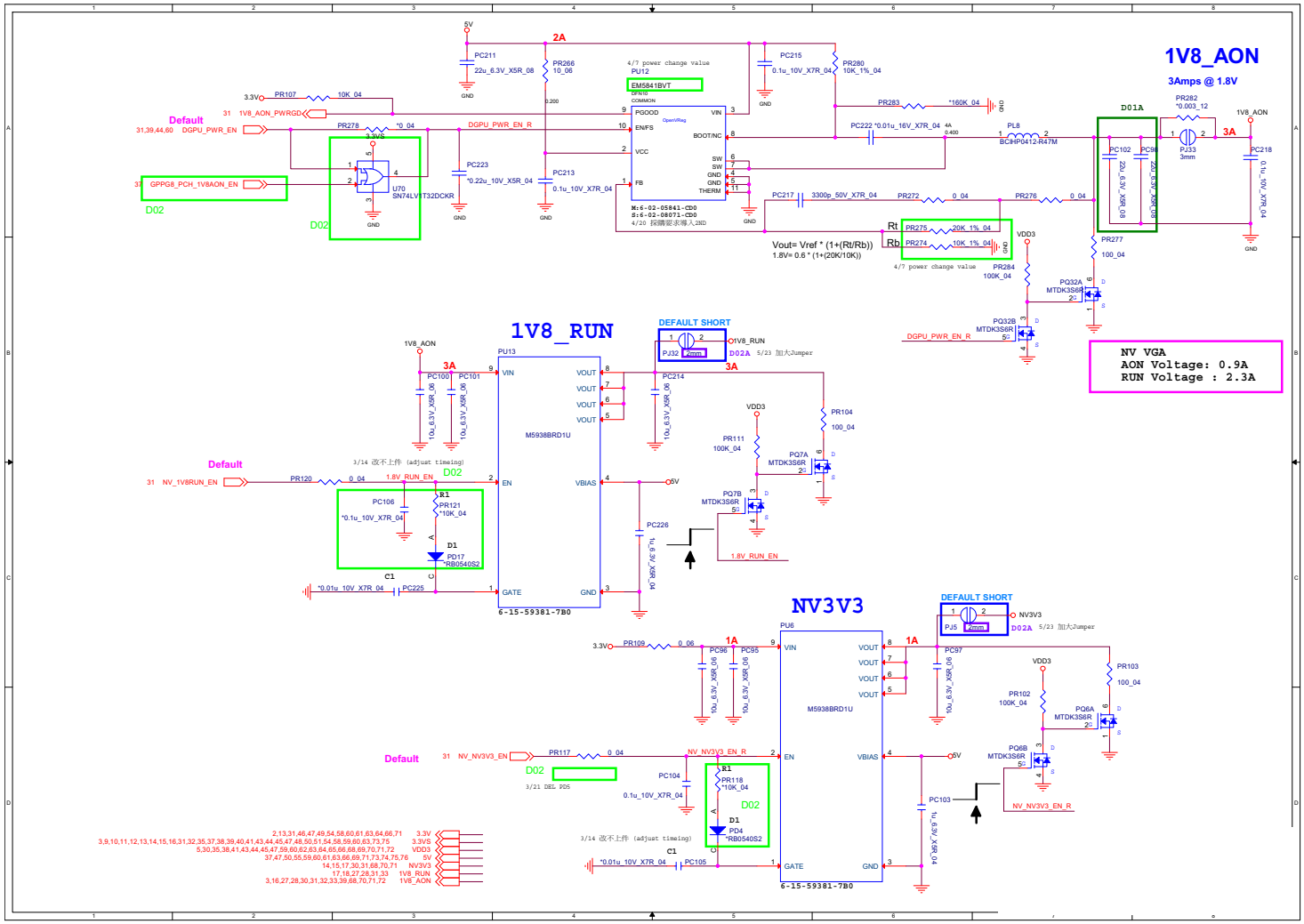
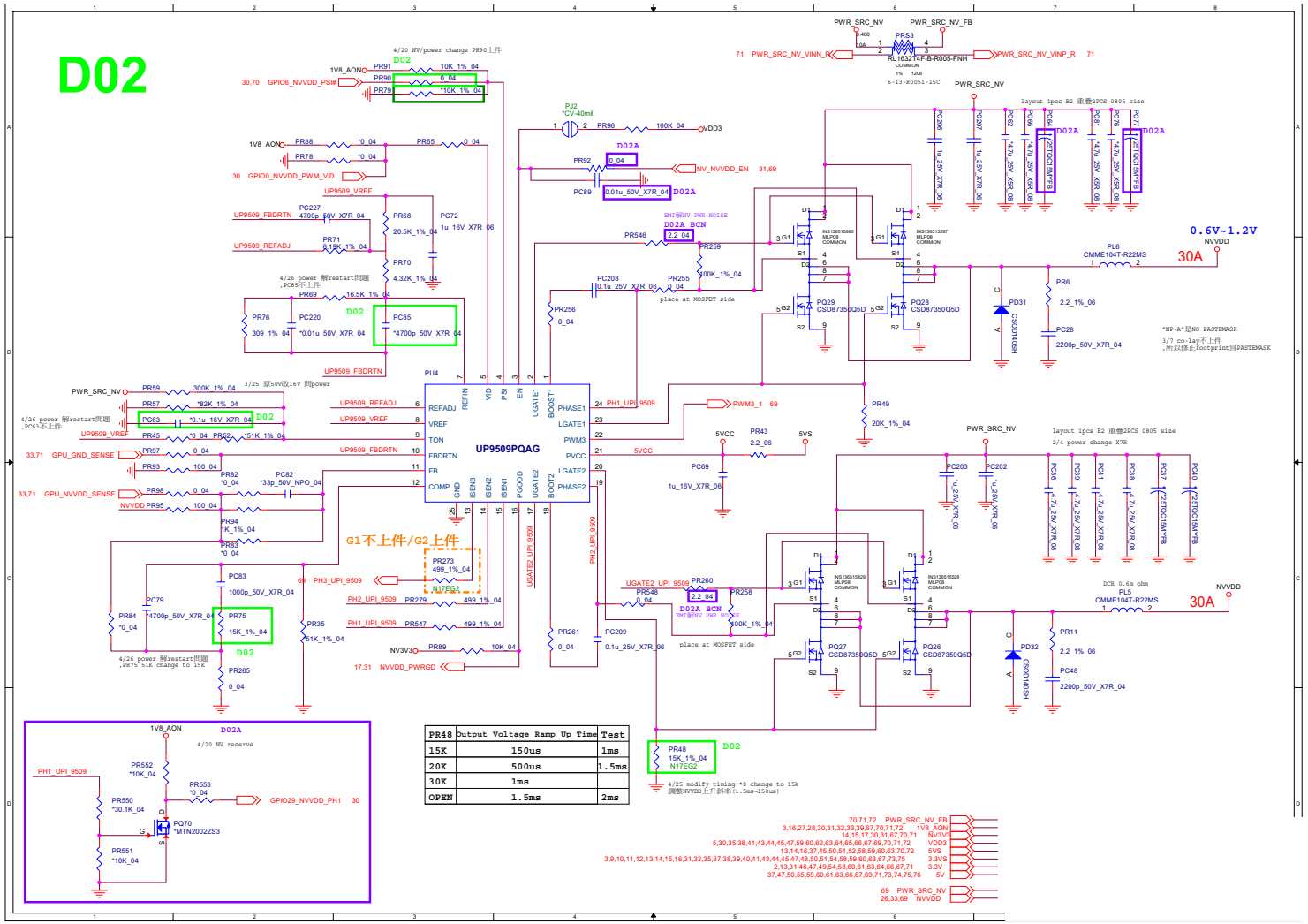
1.0DX_VCCSTG/
VCCSFR_OC/2.5V

1V8_RUN/AON, NV3V3

Sheet 67 of 91_Run
1V8_RUN/AON,
NV3V3



NVVDD Phase 1 & 2



Sheet 68 of 91
NVVDD Phase 1 & 2

NVVDD Phase 3~4

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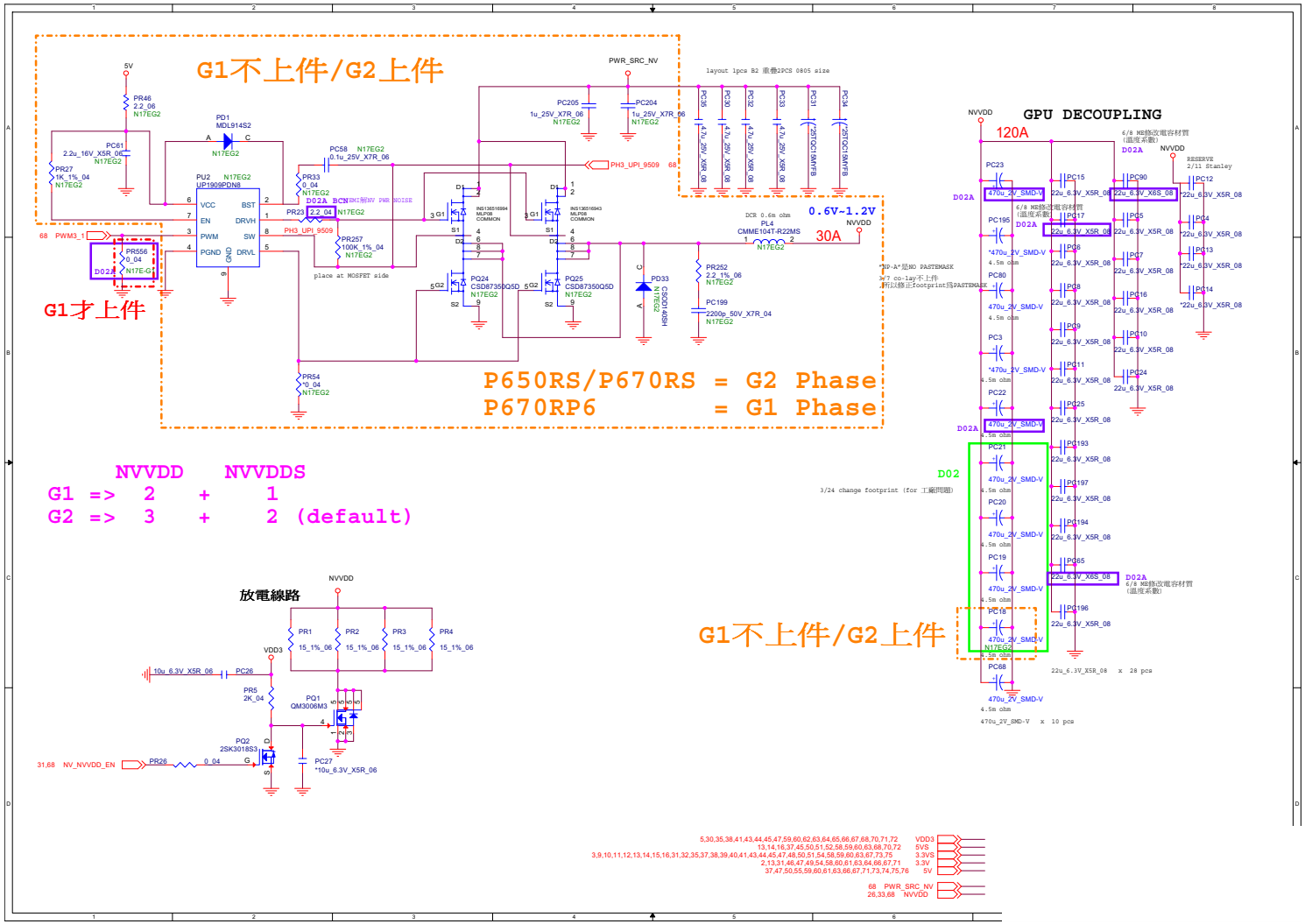
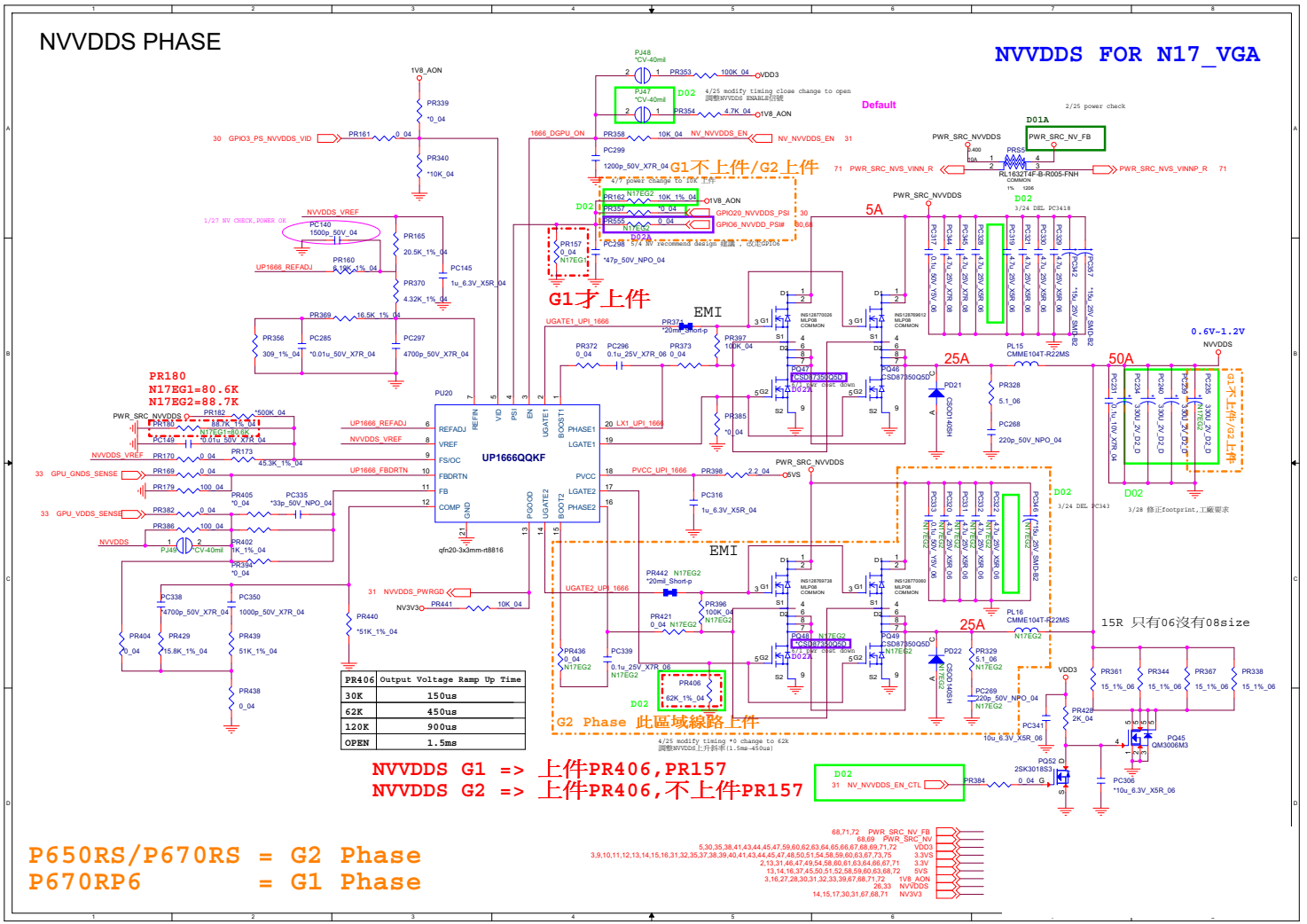
NVVDD Phase 3~4



NVVDDS



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NVVDDS

PEX_VDD

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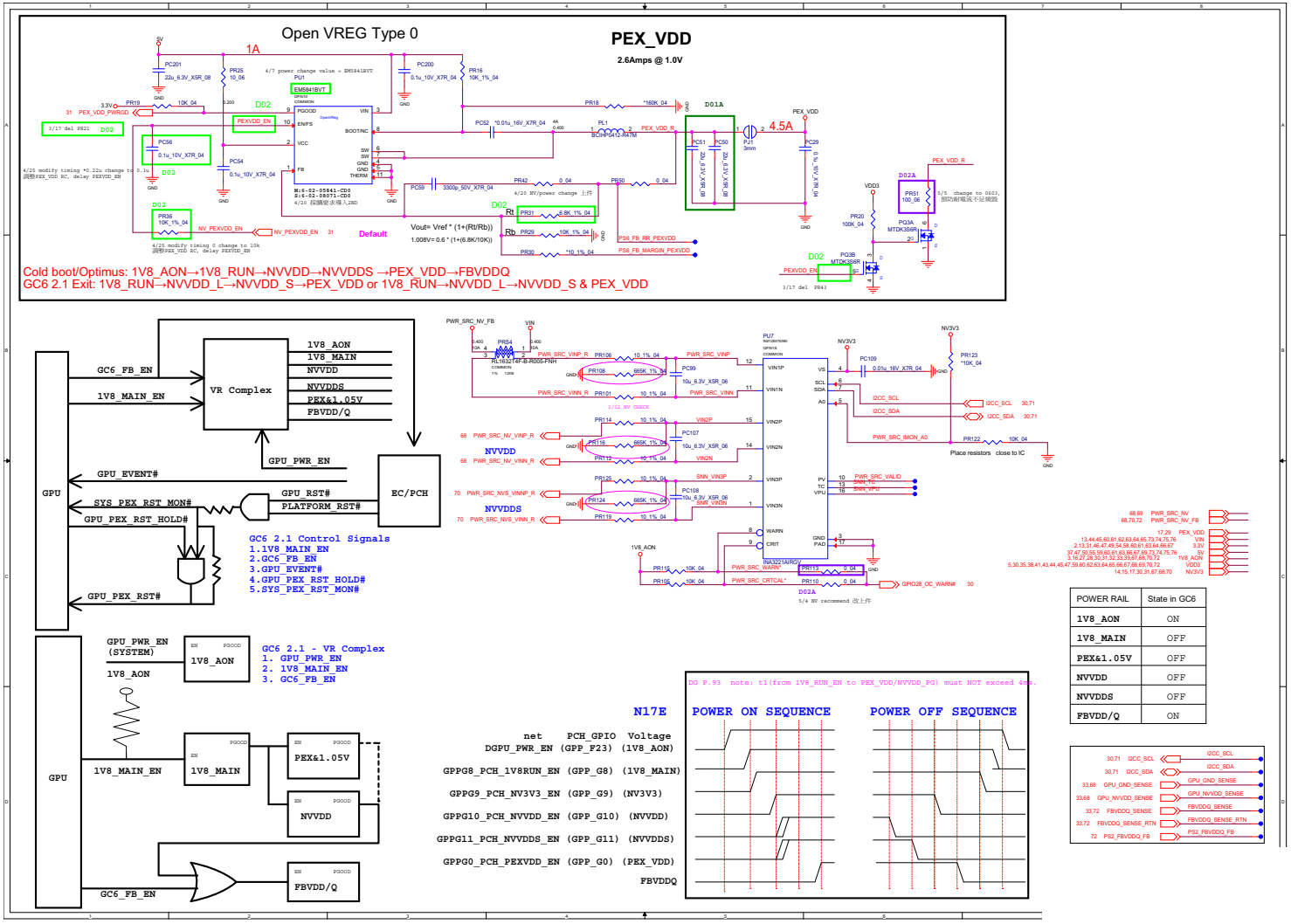
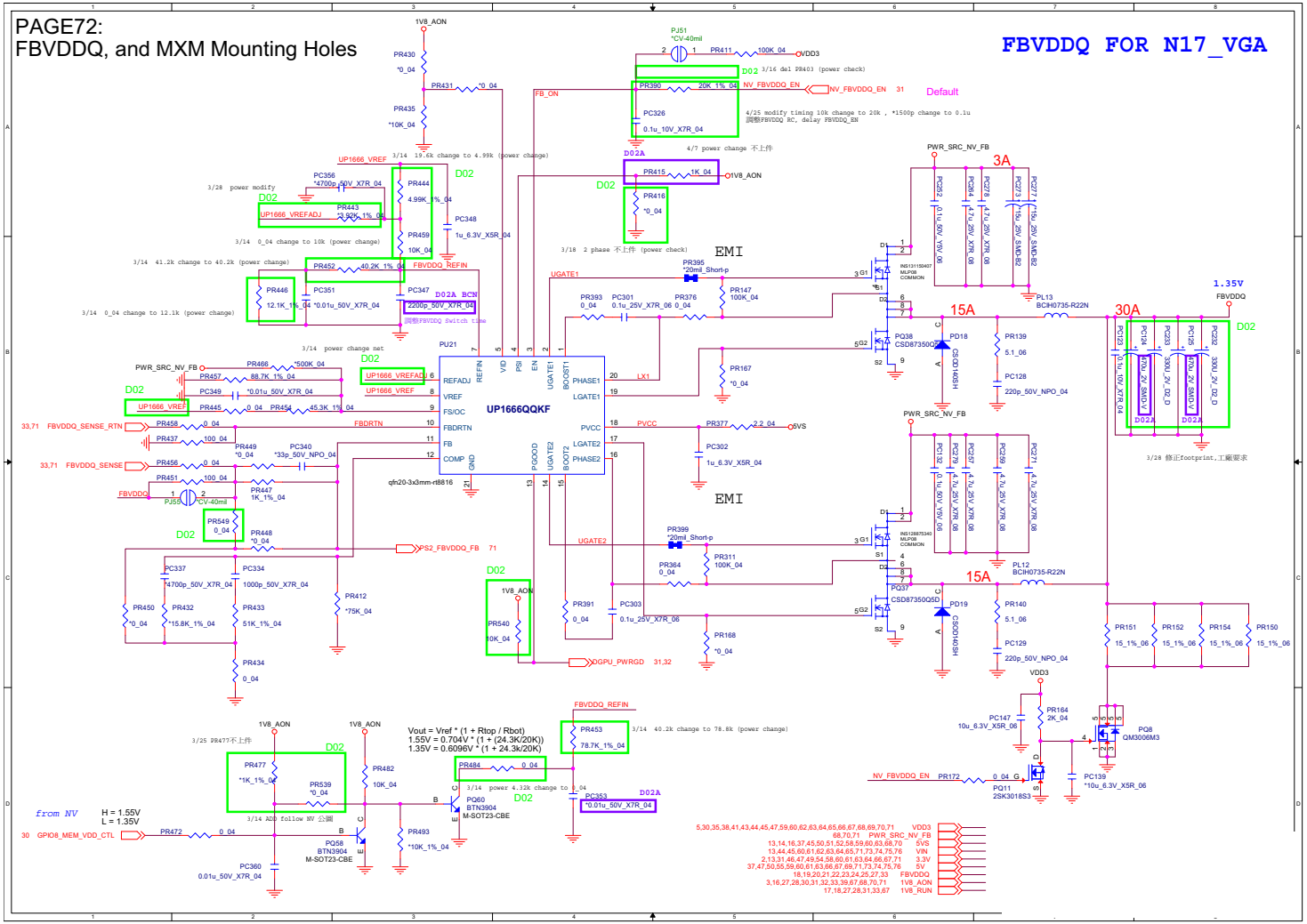
PEX_VDD



POWER RAIL	State in GC6
1V8_AON	ON
1V8_MAIN	OFF
PEX&1.05V	OFF
NVVDD	OFF
NVVDDS	OFF
FBVDD/Q	ON

FBVDDQ



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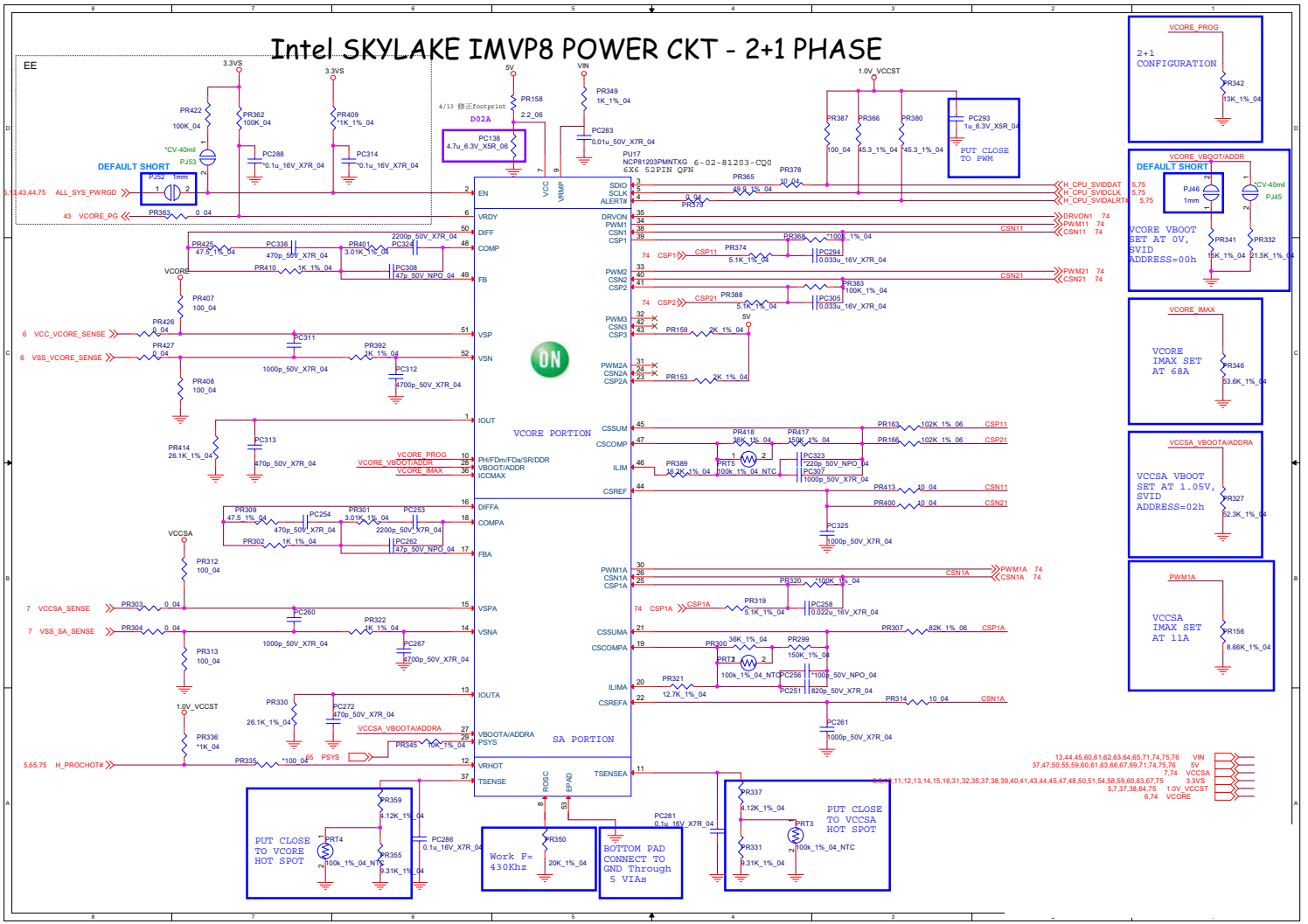
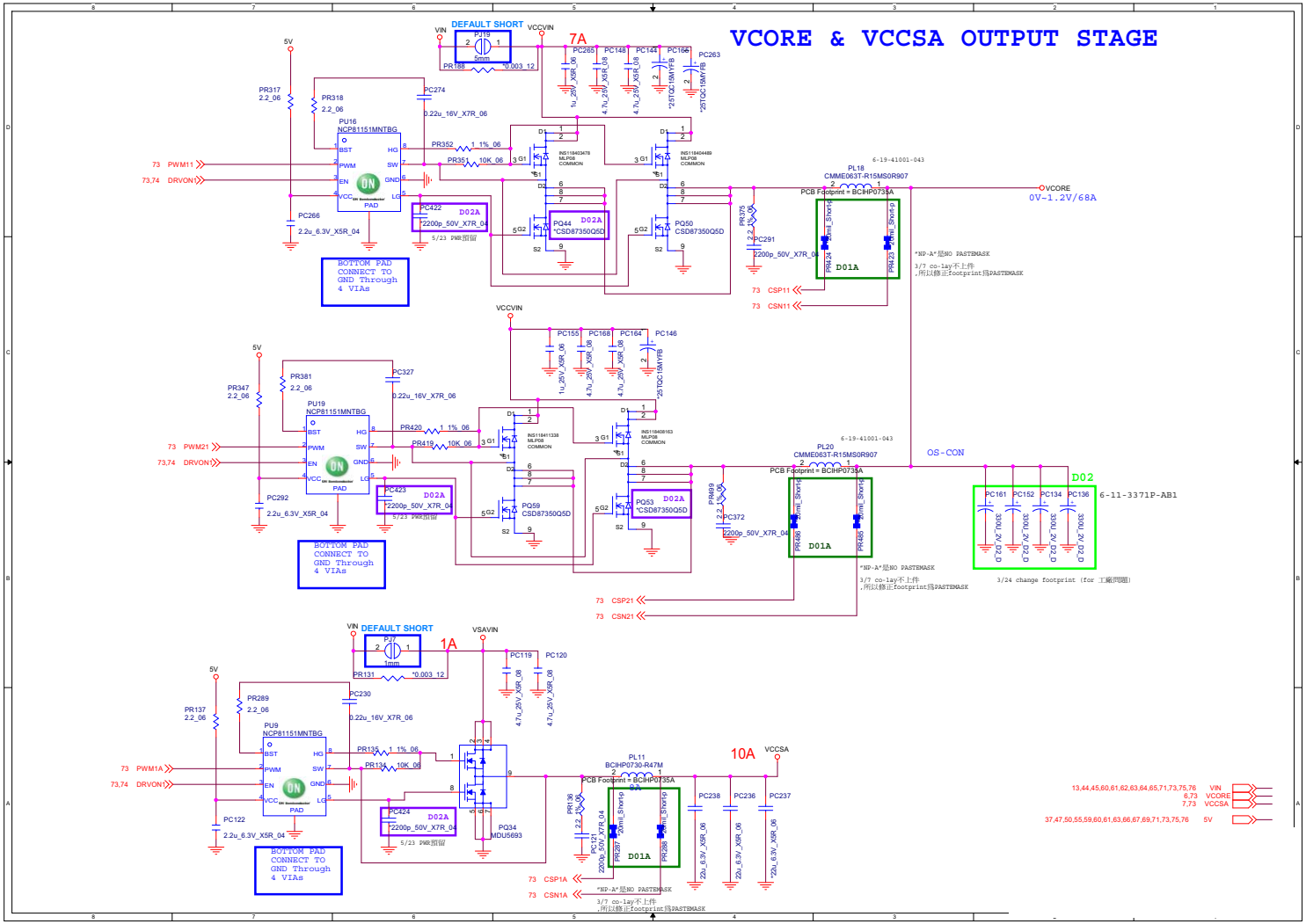
FBVDDQ

VCC_Core & VCCSA

Sheet 73 of 91
VCC_Core & VCCSA



VCore Output Stage



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VCore Output Stage

VCCGT

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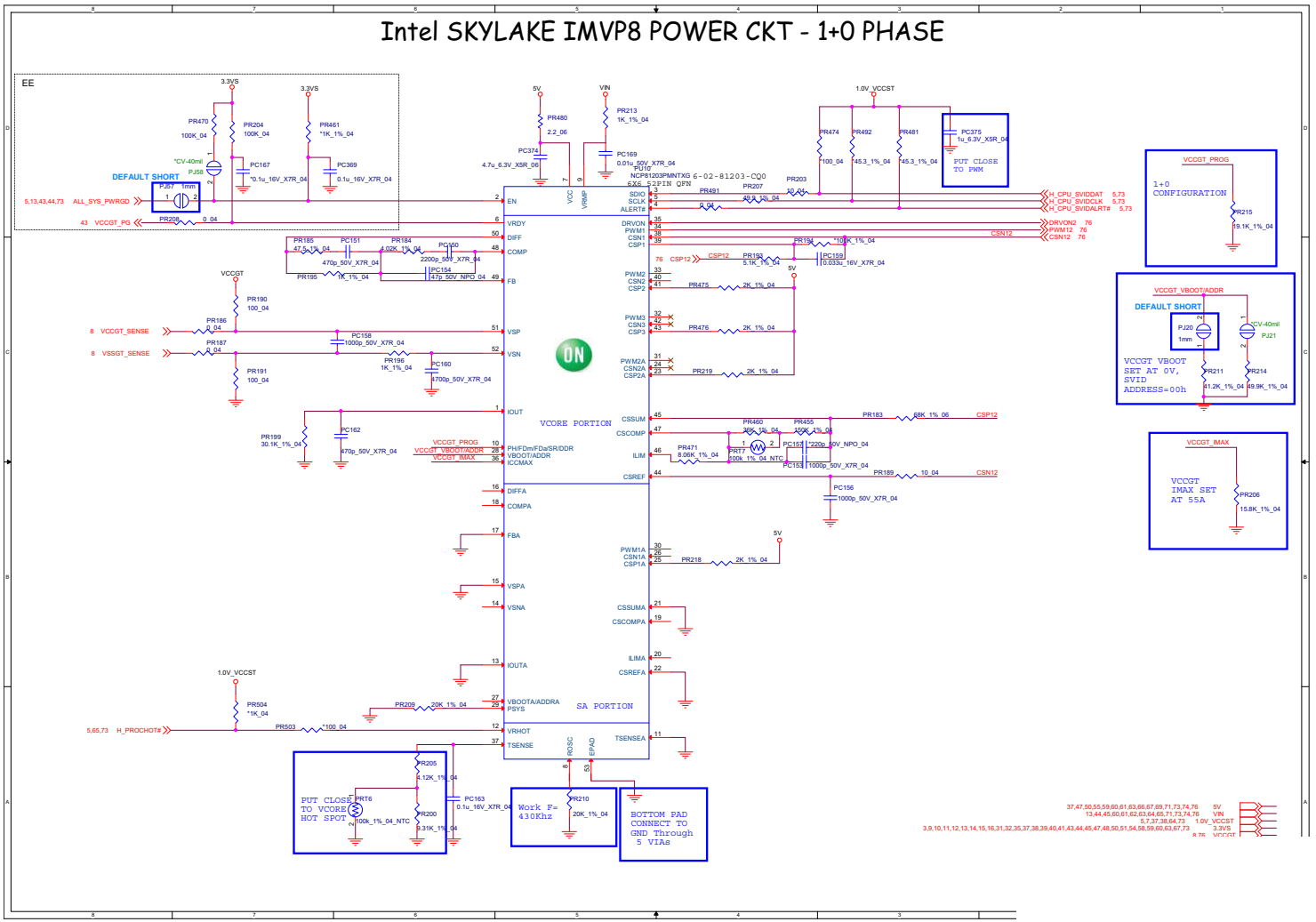
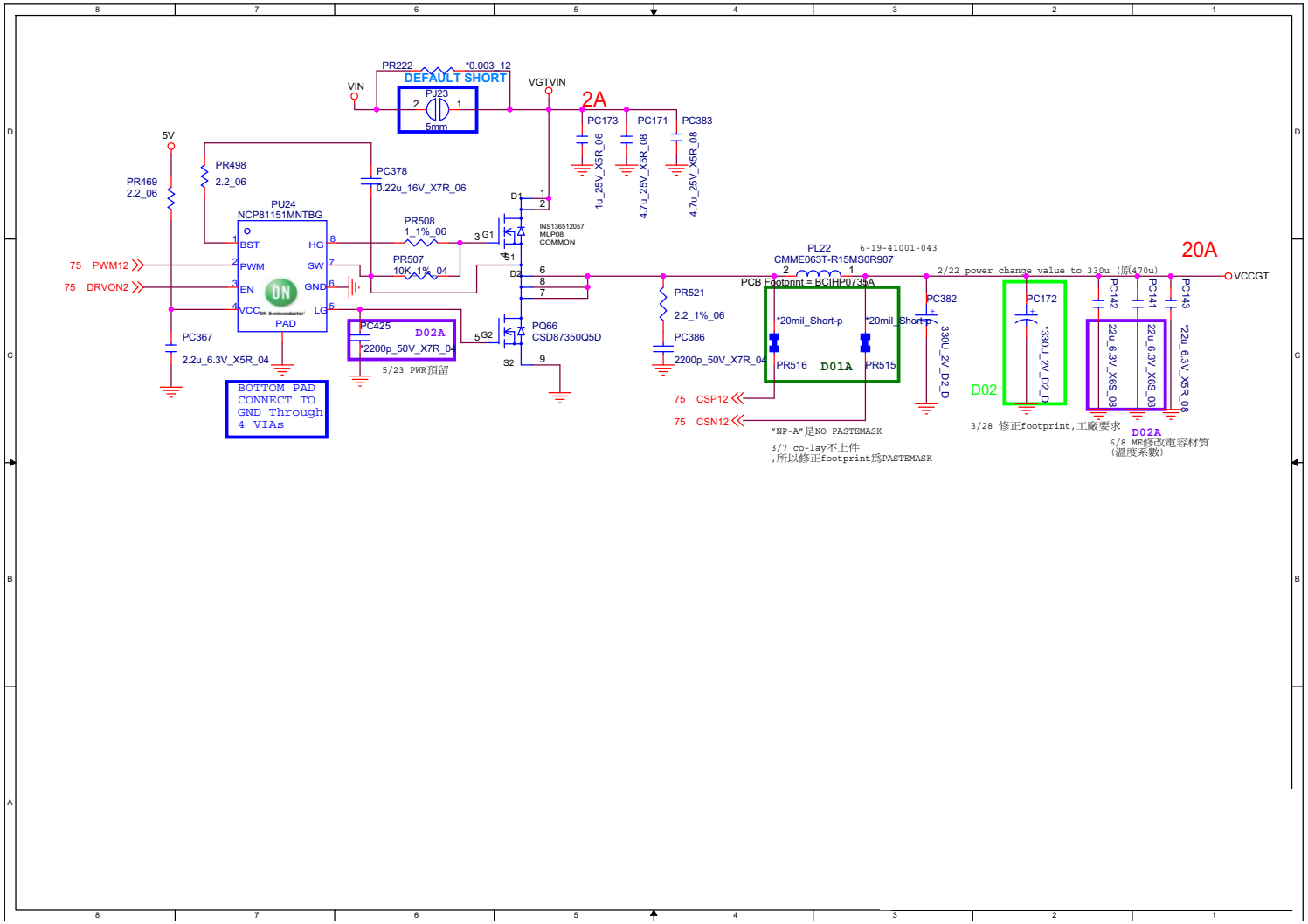
VCCGT



VCCGT Output Stage



Sheet 76 of 91
VCCGT Output Stage

Audio Board P65_ESS_A 1/3

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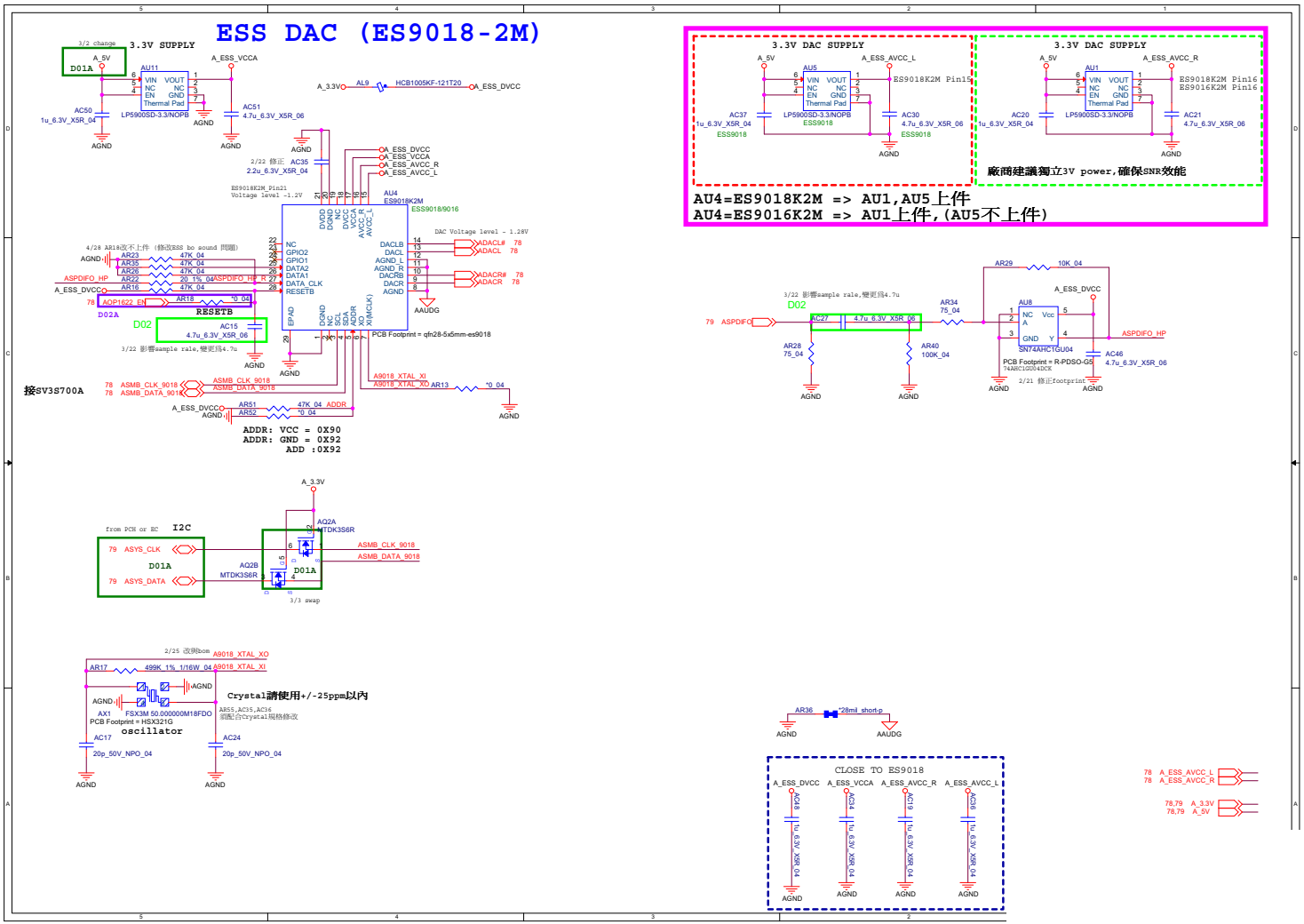
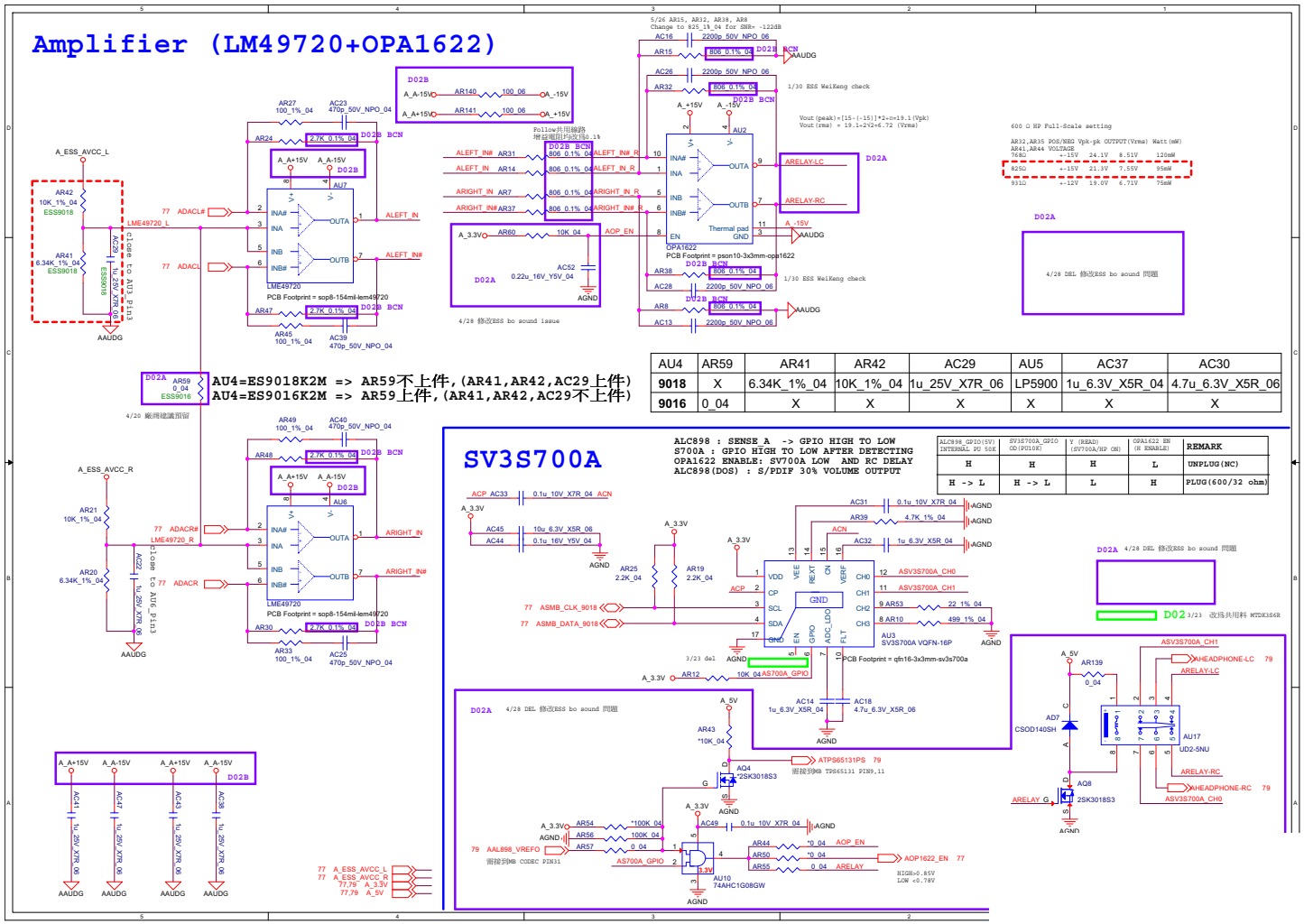
Audio Board
P65_ESS_A 1/3



Audio Board P65_ESS_A 2/3



AU4	AR59	AR41	AR42	AC29	AU5	AC37	AC30
9018	X	6.34K_1%_04	10K_1%_04	1u_25V_X7R_06	LP5900	1u_6.3V_X5R_04	4.7u_6.3V_X5R_06
9016	0_04	X	X	X	X	X	X

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Audio Board
P65_ESS_A 2/3

Audio Board P65_ESS_A 3/3

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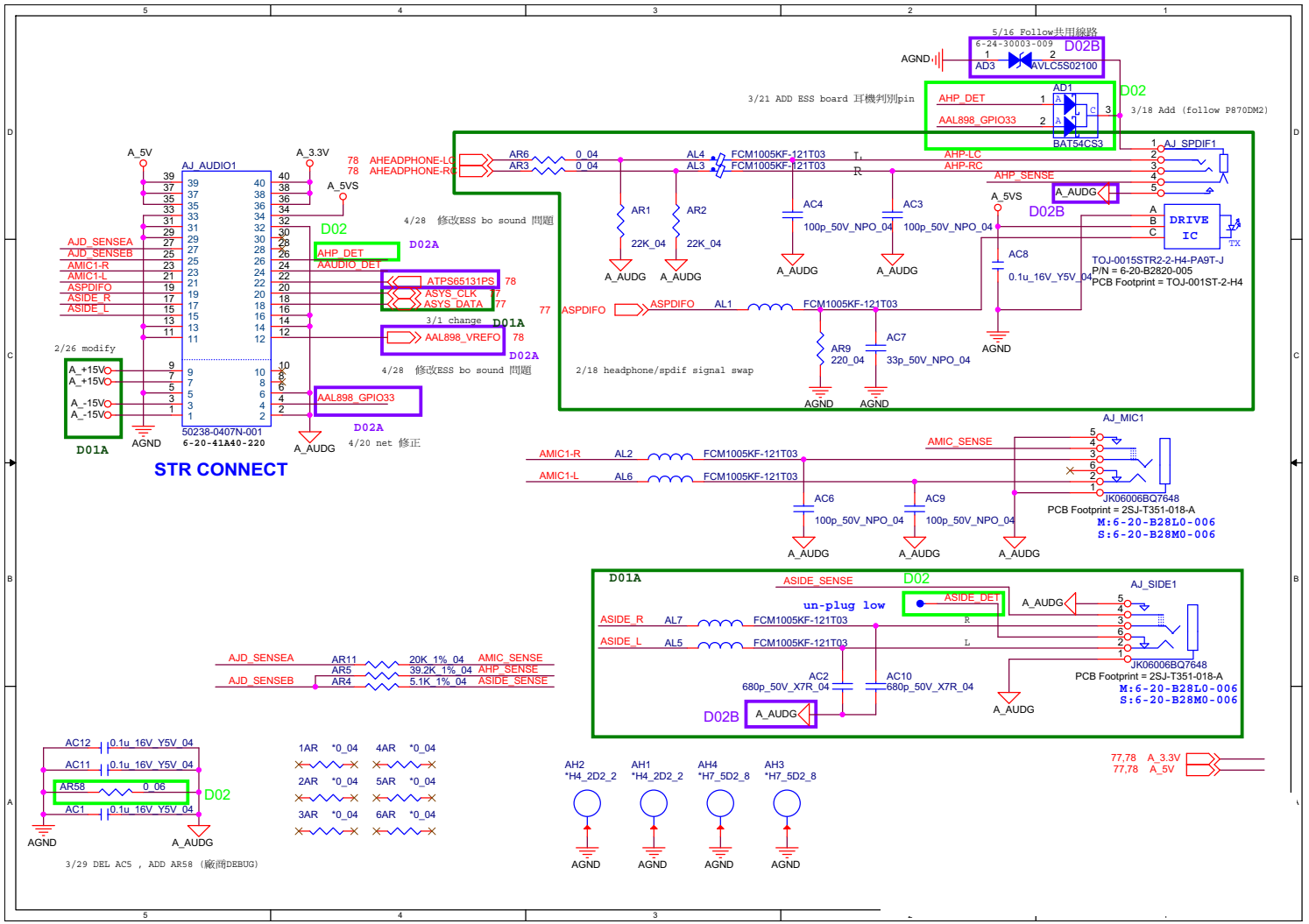
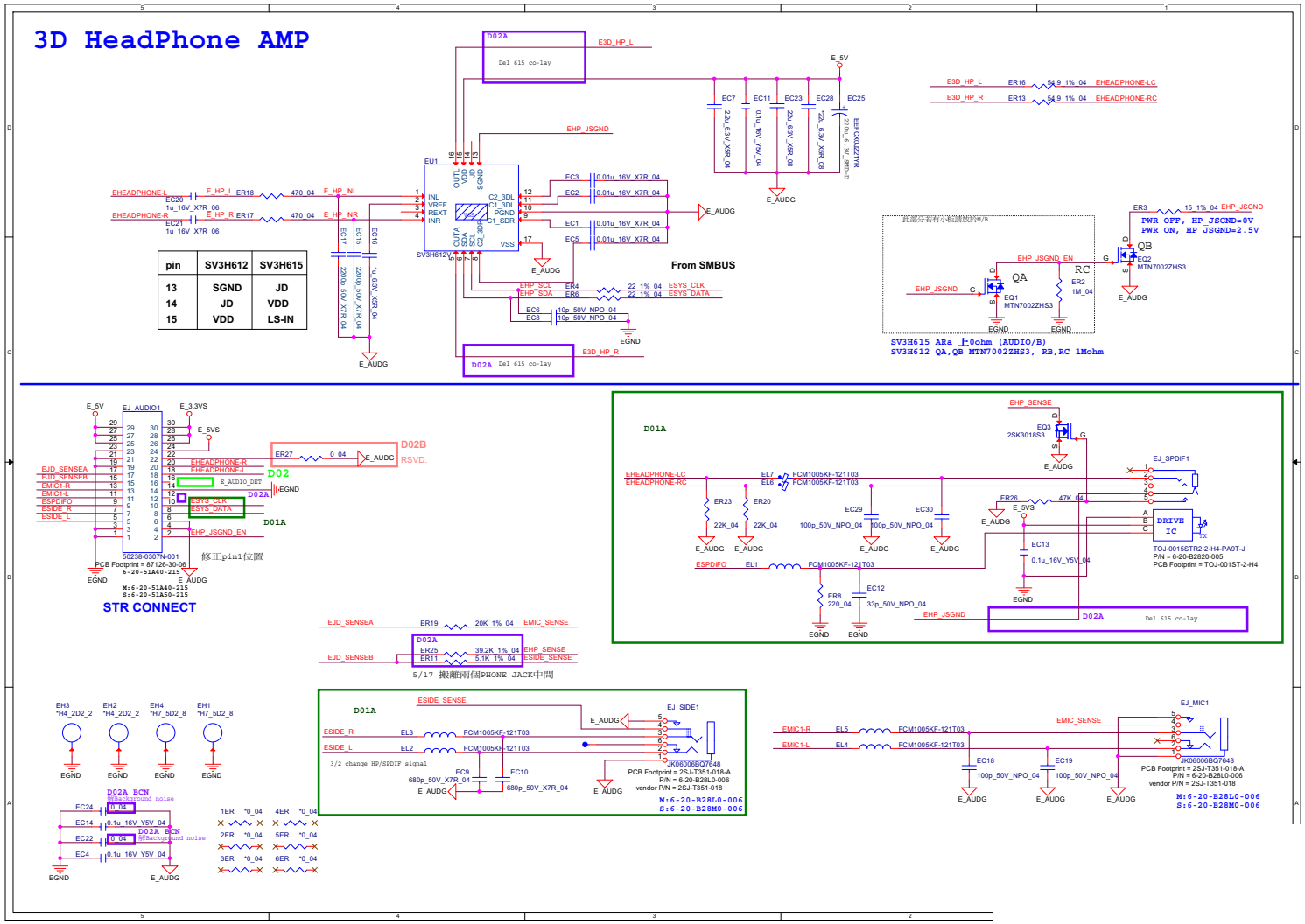
Audio Board
P65_ESS_A 3/3



Audio Board P67_3DAMP_E



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Audio Board
P67_3DAMP_E

P650RS Power Board

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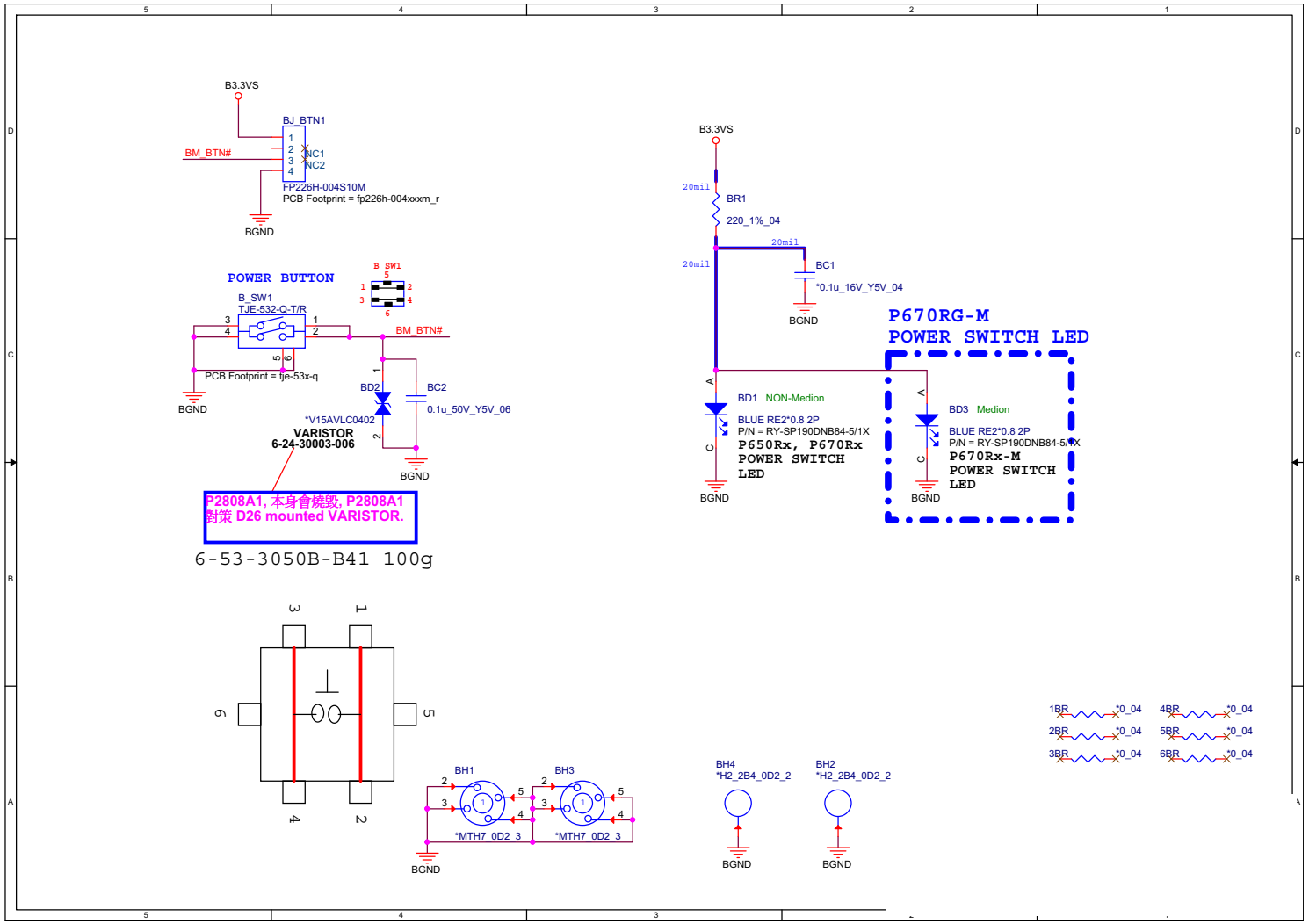
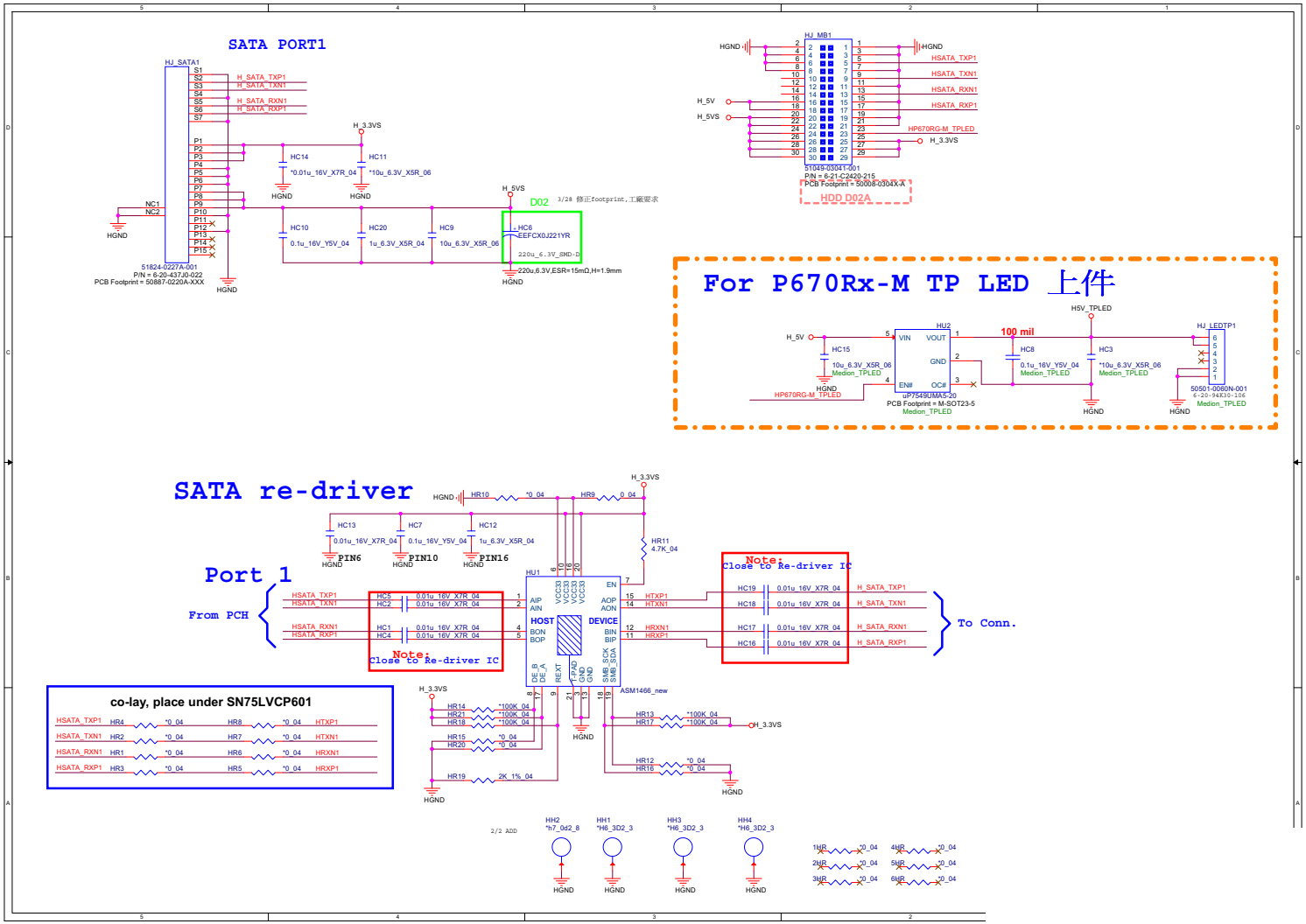
P650RS Power Board



P650RS HDD Board



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P650RS HDD Board

B.Schematic Diagrams

P650RS LED Board

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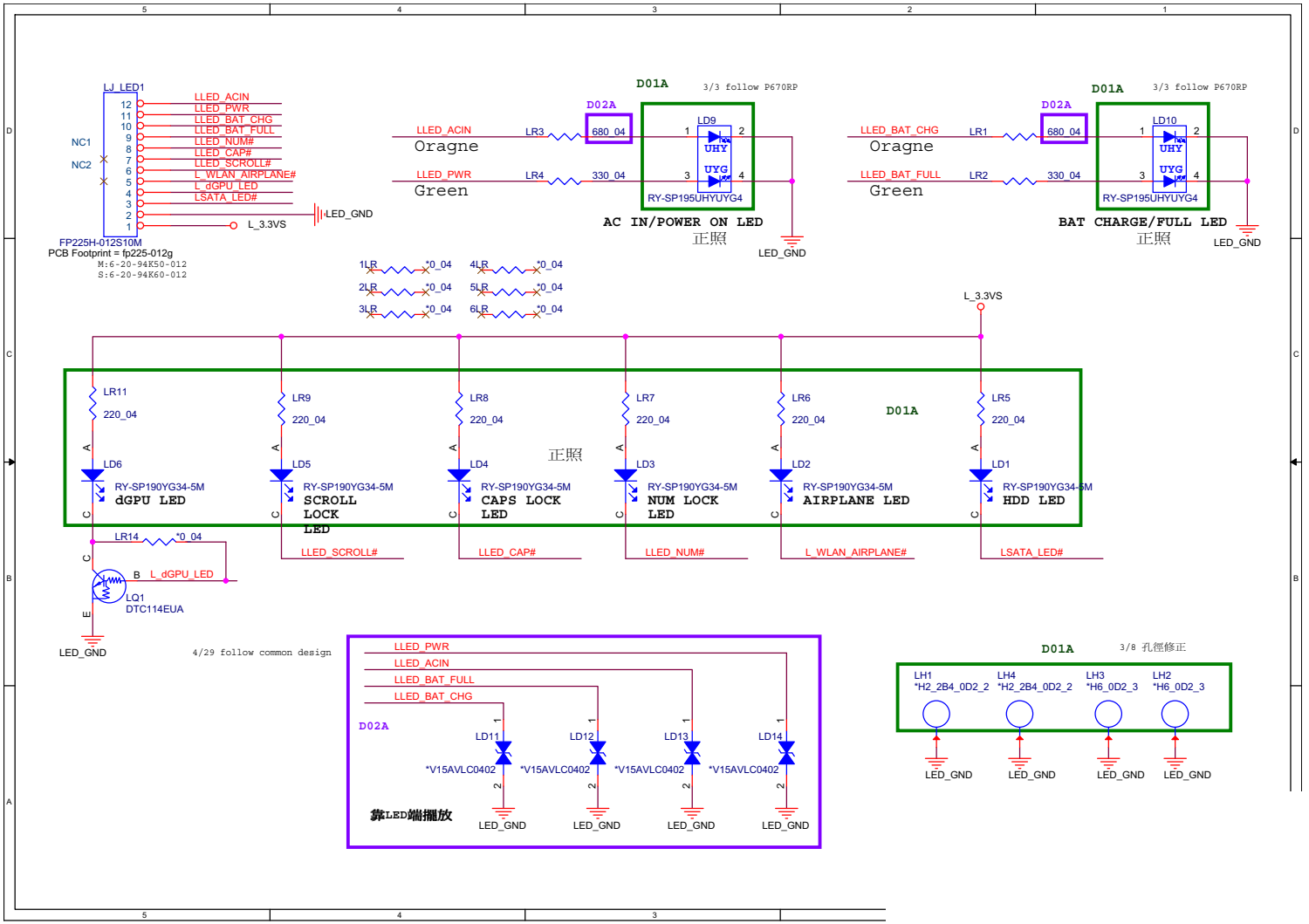
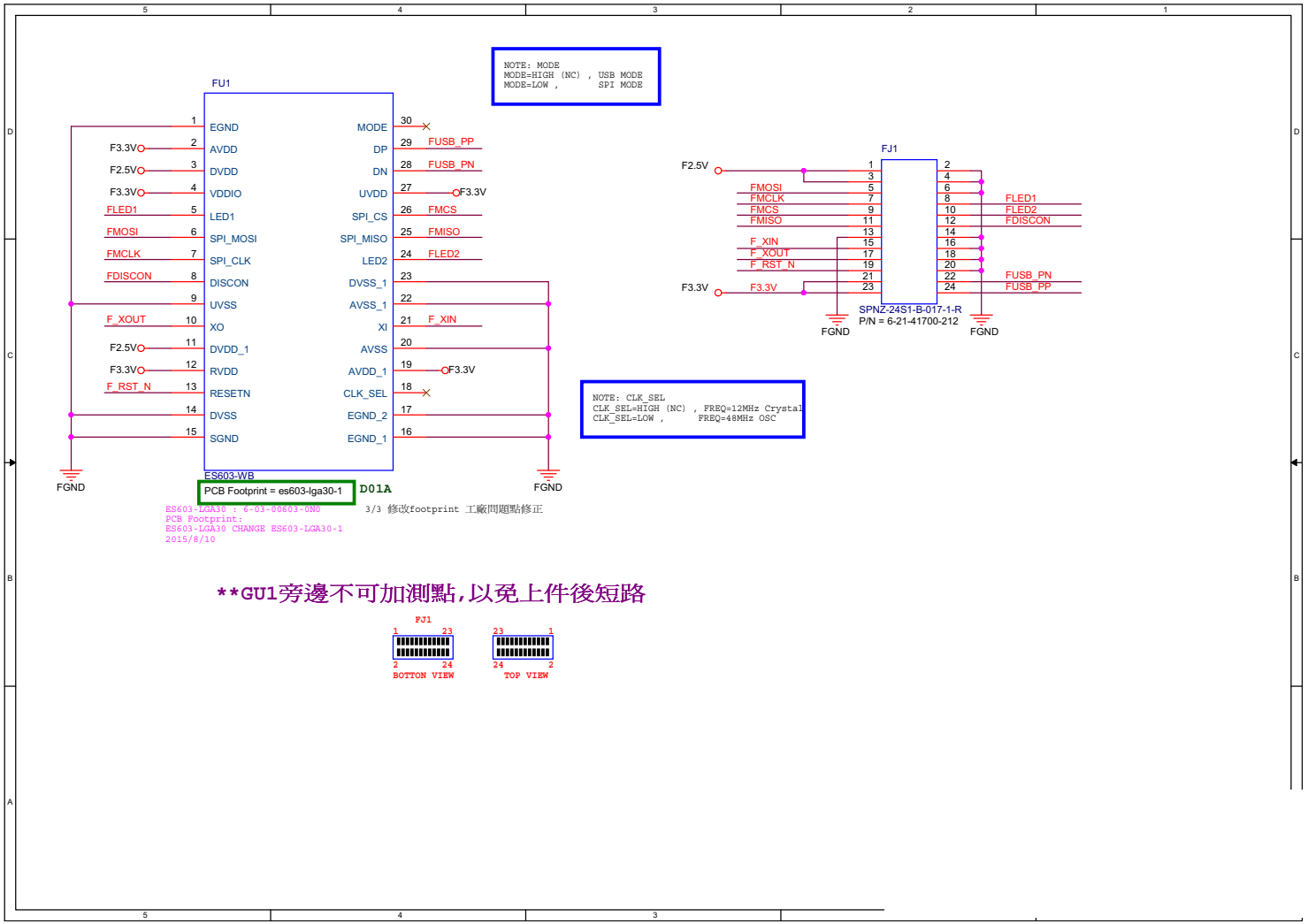
P650RS LED Board



P650RS FP Board



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P650RS FP Board

P650RS Click Board

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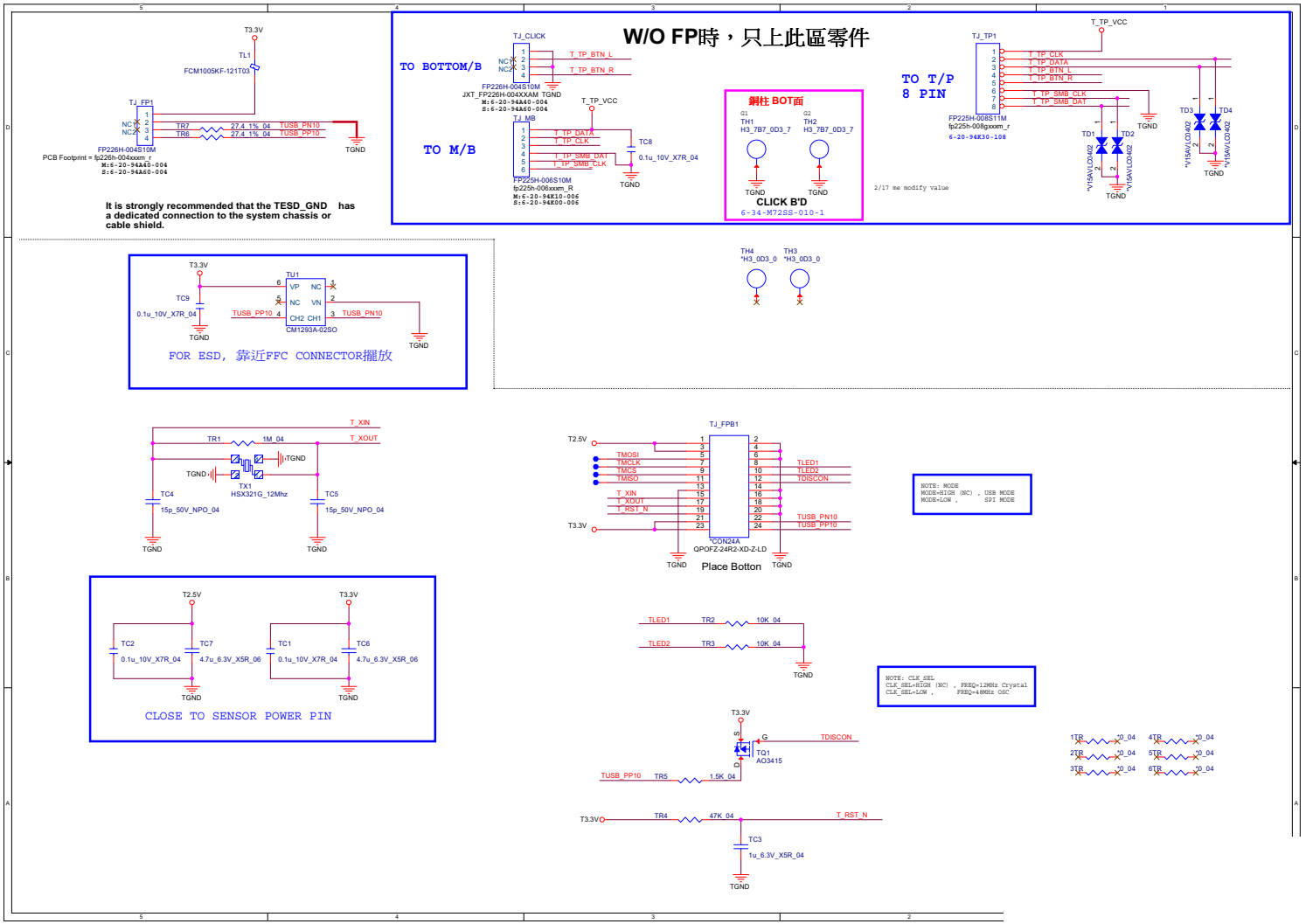
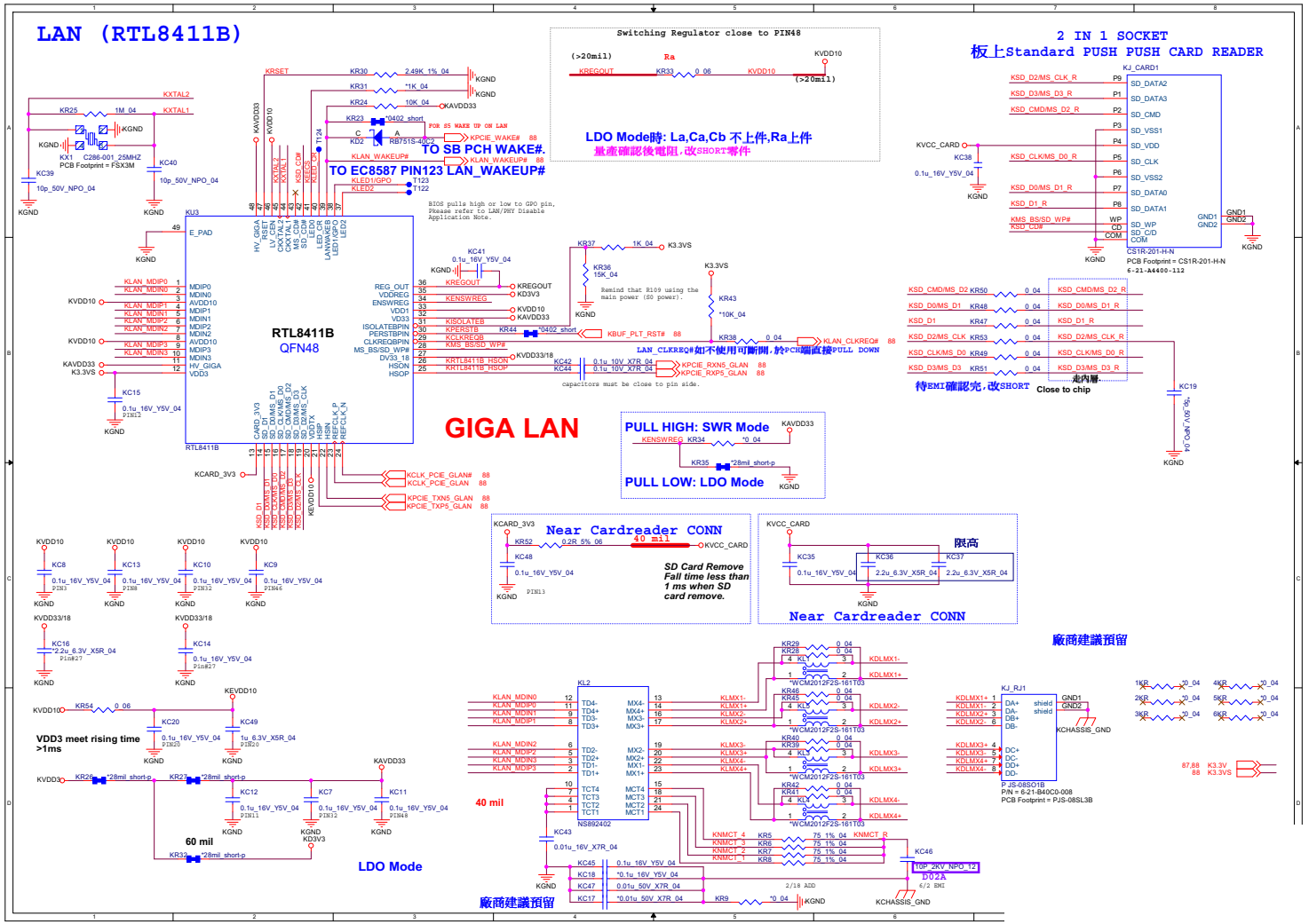
P650RS Click Board



P650RS USB Board 1/3



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P650RS USB Board
1/3

P650RS USB Board 2/3

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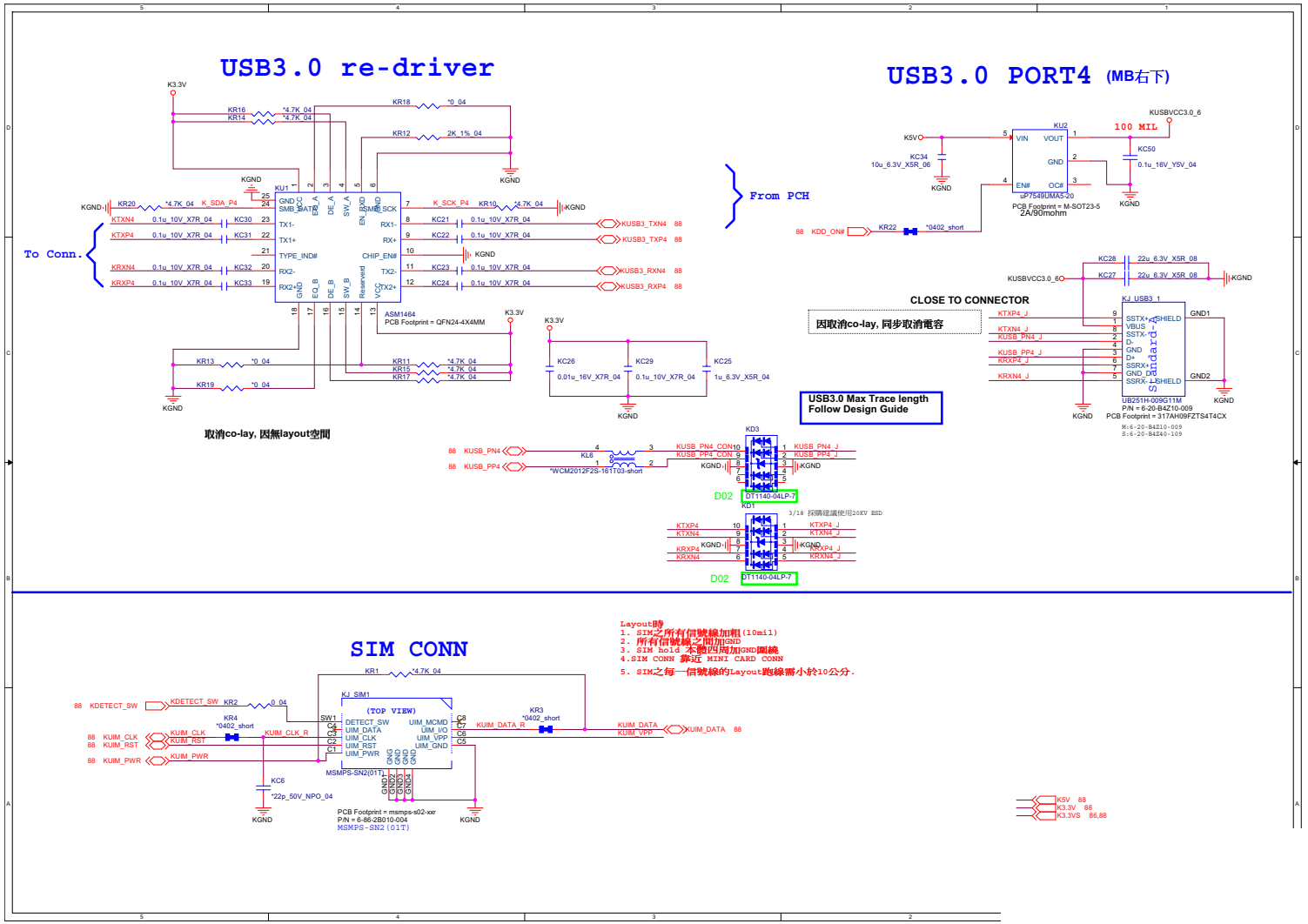
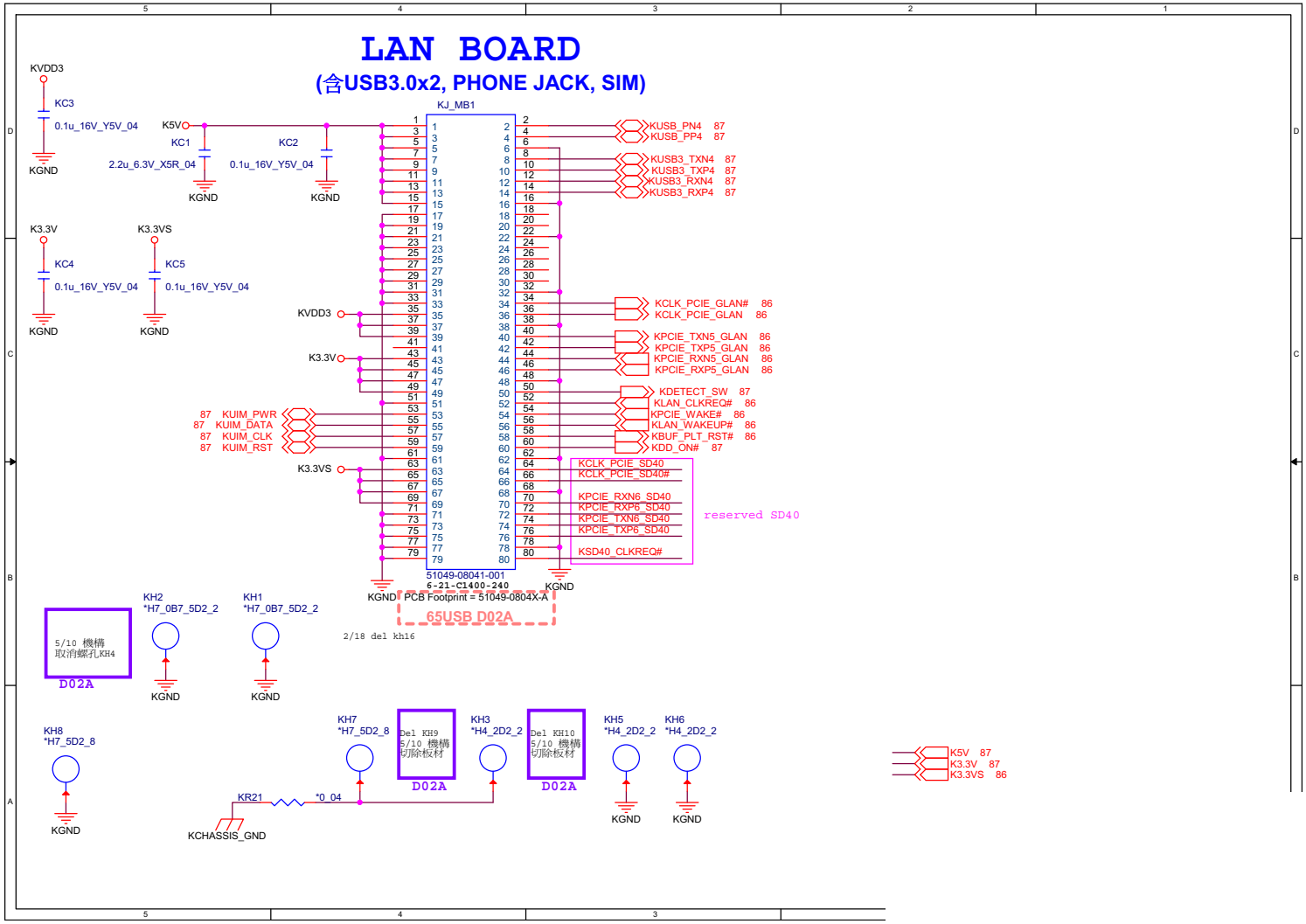
P650RS USB Board 2/3



P650RS USB Board 3/3



Sheet 88 of 91
P650RS USB Board
3/3

P670RS LED Board

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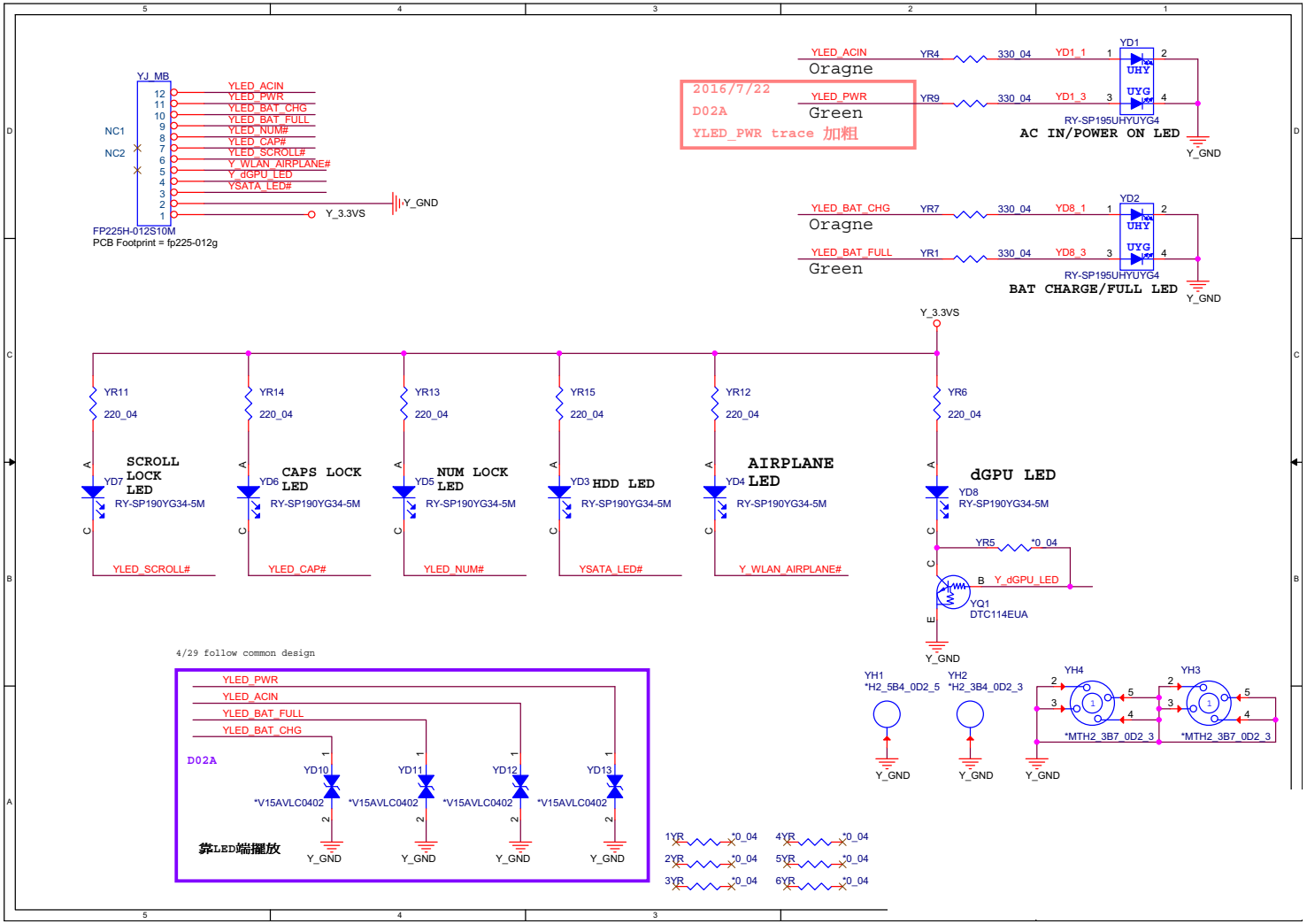
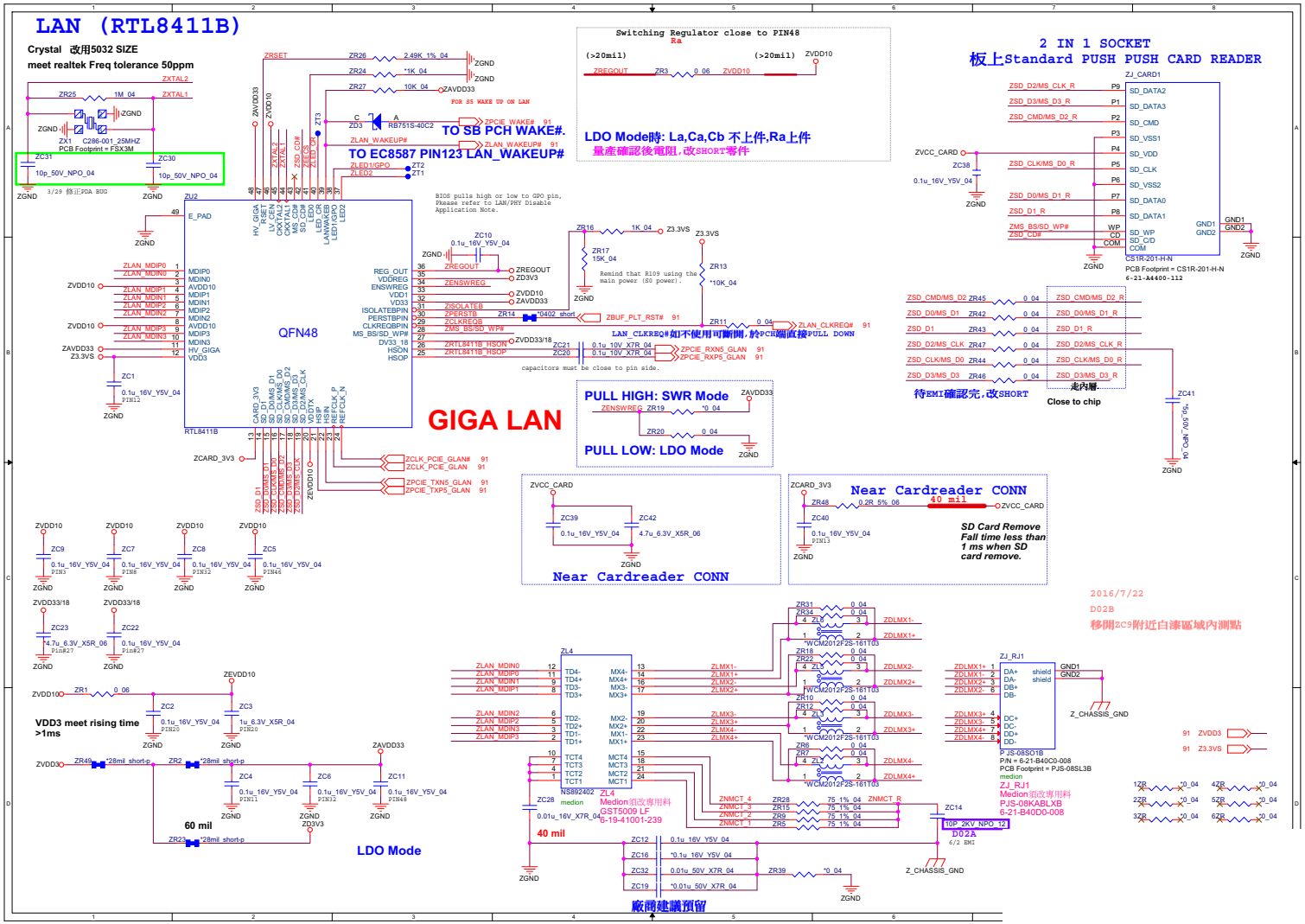
P670RS LED Board



P670RS USB Board 1/2



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P670RS USB Board
1/2

P670RS USB Board 2/2

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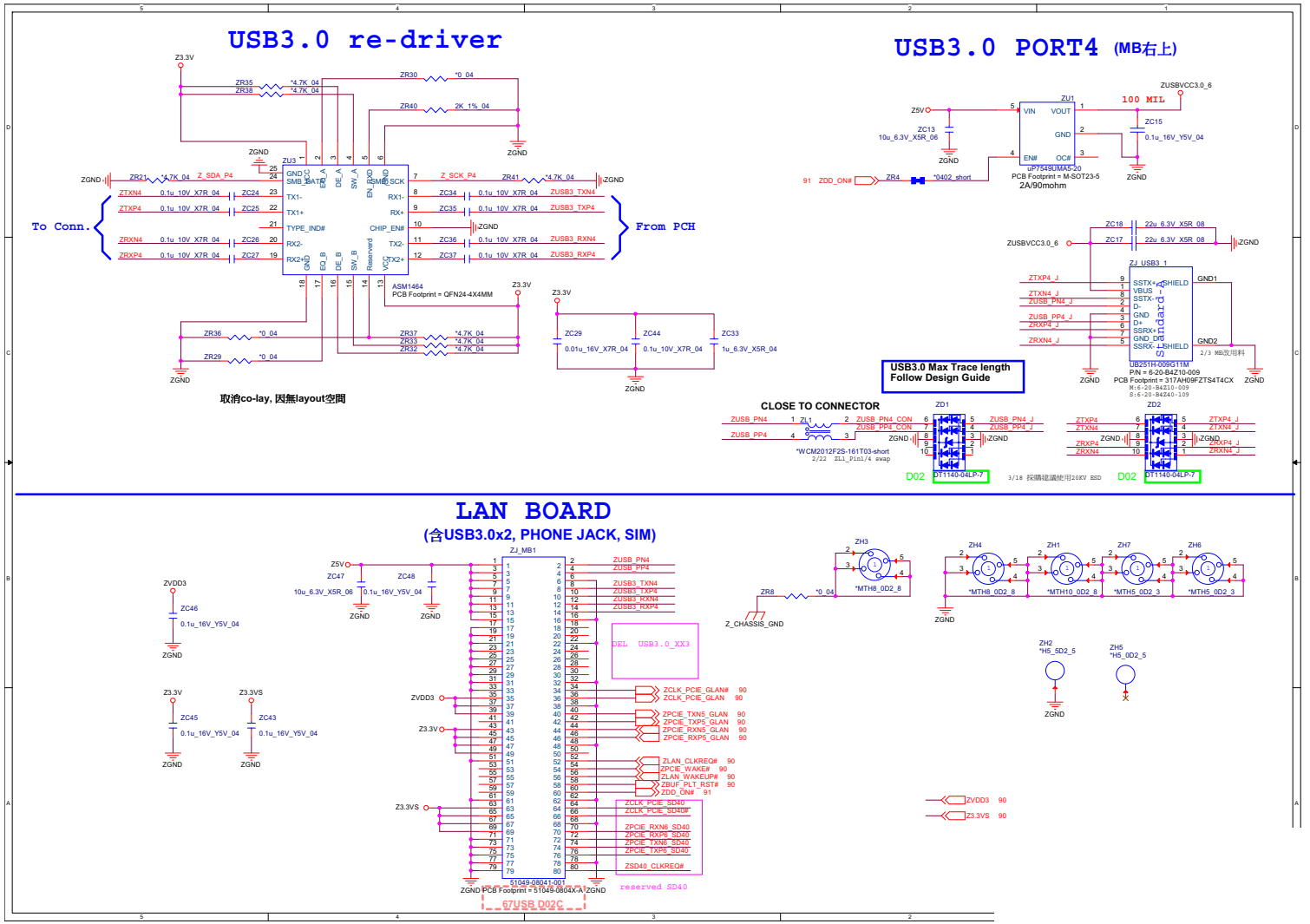
P670RS USB Board 2/2



Appendix C:Updating the FLASH ROM BIOS

To update the FLASH ROM BIOS, you must:

- Download the BIOS update from the web site.
- Unzip the files onto a bootable CD/DVD/USB Flash Drive.
- Reboot your computer from an external CD/DVD/USB Flash Drive.
- Use the flash tools to update the flash BIOS using the commands indicated below.
- Restart the computer booting from the HDD and press **F2** at startup enter the BIOS.
- Load setup defaults from the BIOS and save the default settings and exit the BIOS to restart the computer.
- After rebooting the computer you may restart the computer again and make any required changes to the default BIOS settings.

Download the BIOS

1. Go to **www.clevo.com.tw** and point to **E-Services** and click **E-Channel**.
2. Use your user ID and password to access the appropriate download area (BIOS), and download the latest BIOS files (the BIOS file will be contained in a batch file that may be run directly once unzipped) for your computer model (**see sidebar for important information on BIOS versions**).

Unzip the downloaded files to a bootable CD/DVD/ or USB Flash drive

1. Insert a bootable CD/DVD/USB flash drive into the CD/DVD drive/USB port of the computer containing the downloaded files.
2. Use a tool such as Winzip or Winrar to unzip all the BIOS files and refresh tools to your bootable CD/DVD/USB flash drive (you may need to create a bootable CD/DVD with the files using a 3rd party software).

Set the computer to boot from the external drive

1. With the bootable CD/DVD/USB flash drive containing the BIOS files in your CD/DVD drive/USB port, restart the computer and press **F2** (in most cases) to enter the BIOS.
2. Use the arrow keys to highlight the **Boot** menu.
3. Use the "+" and "-" keys to move boot devices up and down the priority order.
4. Make sure that the CD/DVD drive/USB flash drive is set first in the boot priority of the BIOS.
5. Press **F4** to save any changes you have made and exit the BIOS to restart the computer.

BIOS Version

Make sure you download the latest correct version of the BIOS appropriate for the computer model you are working on.

You should only download BIOS versions that are V1.0X.XX or higher as appropriate for your computer model.

Note that BIOS versions are not backward compatible and therefore **you may not downgrade your BIOS to an older version** after upgrading to a later version (e.g if you upgrade a BIOS to ver 1.0X.05, you **MAY NOT** then go back and flash the BIOS to ver 1.0X.04).

Use the flash tools to update the BIOS

1. Make sure you are not loading any memory management programs such as HIMEM by holding the **F8** key as you see the message "**EFI Shell**". You will then be prompted to give "**Y**" or "**N**" responses to the programs being loaded by EFI Shell. Choose "N" for any memory management programs.
2. You should now see DISK **fsX**:\> (X is the designated drive number for the CD/DVD drive/USB flash drive).
3. **Type the following command**:

   fsX:\> Flash.nsh

4. The utility will then proceed to flash the BIOS.
5. You should then be prompted to press any key to restart the system or turn the power off, and then on again but make sure you remove the CD/DVD/USB flash drive from the CD/DVD drive/USB port before the computer restarts.

Restart the computer (booting from the HDD)

1. With the CD/DVD/USB flash drive removed from the CD/DVD drive/USB port the computer should restart from the HDD.
2. Press **F2** as the computer restarts to enter the BIOS.
3. Use the arrow keys to highlight the **Exit** menu.
4. Select **Load Setup Defaults** (or press **F3**) and select "**Yes**" to confirm the selection.
5. Press **F4** to save any changes you have made and exit the BIOS to restart the computer.

Your computer is now running normally with the updated BIOS

You may now enter the BIOS and make any changes you require to the default settings.