SERVICE MANUAL

_PC70HS(-G) / PC70HR(-G) / PC70HP(-G)_

notebook

Notebook Computer

PC70HS(-G) / PC70HR(-G) / PC70HP(-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 ***PC70HS(-G) / PC70HR(-G) / PC70HP(-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

IMPORTANT SAFETY INSTRUCTIONS

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

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

- AC Input of 100 - 240V, 50 - 60Hz, DC Output of 19.5V, 9.23A (**180** Watts) minimum AC/DC Adapter.

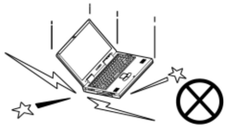
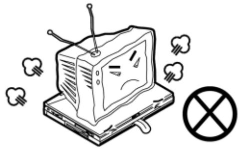
FCC Statement

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

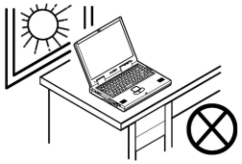
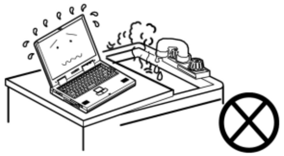
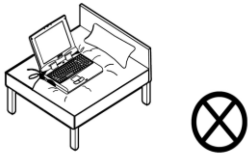
Instructions for Care and Operation

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

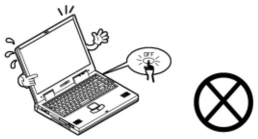
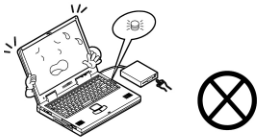
1. **Don't drop it, or expose it to shock.** If the computer falls, the case and the components could be damaged.

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

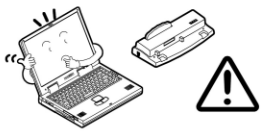
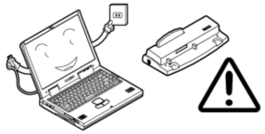
2. **Keep it dry, and don't overheat it.** Keep the computer and power supply away from any kind of heating element. This is an electrical appliance. If water or any other liquid gets into it, the computer could be badly damaged.

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

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

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

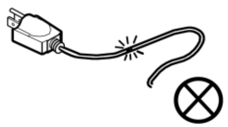
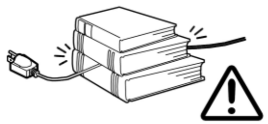
4. **Avoid interference.** Keep the computer away from high capacity transformers, electric motors, and other strong magnetic fields. These can hinder proper performance and damage your data.
5. **Take care when using peripheral devices**.

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

Power Safety

The computer has specific power requirements:

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

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.* 

Power Safety Warning

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

Battery Precautions

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

Battery Guidelines

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

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

Battery Disposal

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

Caution

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

Battery Level

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

Related Documents

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

User’s Manual on CD/DVD
This describes the notebook PC’s features and the procedures for operating the computer and its ROM-based setup program. It also describes the installation and operation of the utility programs provided with the notebook PC.

System Startup

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

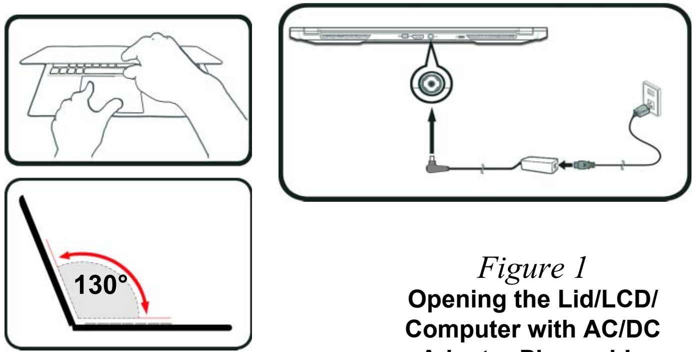
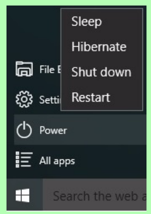


Figure 1
Opening the Lid/LCD/ Computer with AC/DC Adapter Plugged-In

Shut Down

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

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



Preface

Contents

Chapter 1: Introduction

Overview

This manual covers the information you need to service or upgrade the ***PC70HS(-G) / PC70HR(-G) / PC70HP(-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 ***PC70HS(-G) / PC70HR(-G) / PC70HP(-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 warn-ing and safety information indicated by the “” symbol.

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

Specifications

Latest Specification Information

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

CPU Speed & Computer in DC Mode

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

Surround Configuration

Note that the Thunderbolt port will need to be configured in the BIOS to support the NVIDIA control panel as the configuration utility for Discrete video, and NVIDIA Surround configuration is supported using the HDMI, MiniDisplay Port and Thunderbolt Ports if set to External Only.

Processor Options

i7-11800H (2.30GHz), TDP 45W

Core Logic

Intel® HM570 Express Chipset

LCD Options

LCD, 17.3" (43.94cm), 16:9, FHD (1920x1080)/ UHD(3840x2160)/*QHD (2560x1440)

***Note:** some QHD panels are available for systems with NVIDIA® G-SYNC™Technology only

BIOS

128Mb SPI Flash ROM

INSYDE BIOS

Memory

Dual Channel DDR4

Two 260 Pin SO-DIMM Sockets

Supporting up to **3200MHz DDR4** Memory

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

Compatible with 8GB, 16GB or 32GB Modules

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

Security

Security (Kensington® Type) Lock Slot

BIOS Password

Intel PTT for Systems Without TPM Hardware

Area Fingerprint Sensor

(**Factory Option**) TPM 2.0

Fingerprint Sensor

Video Adapter Options

Microsoft Hybrid Graphics Mode or Discrete Graphics Mode

Supports up to 4 Active Displays

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

Intel Integrated GPU

Intel® UHD Graphics

4K@120/5K@60 HDR Support

HW Video Decode/Encode support

OpenGL 4.5, DirectX12

OpenCL 2.2

NVIDIA® Discrete GPU

NVIDIA® GeForce RTX 3080 / GN20-E7 (PC70HS)

16GB GDDR6 Video RAM

Microsoft DirectX®12 Compatible

NVIDIA® GeForce RTX 3070 / GN20-E5 (PC70HR)

8GB GDDR6 Video RAM

Microsoft DirectX®12 Compatible

NVIDIA® GeForce RTX 3060 / GN20-E3 (PC70HP)

6GB GDDR6 Video RAM

Microsoft DirectX®12 Compatible

Pointing Device

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

Keyboard

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

Or

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

Storage

(Factory Option) Two M.2 SSDs:

One M.2 PCIe **Gen4 x4** Solid State Drive (SSD)*

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

*Supporting RAID Level 0/1 with two PCIe SSDs (**PCIe Gen3 x4**)

Audio

High Definition Audio Compliant Interface

S/PDIF Digital Output

Built-In Array Microphone

Two Speakers

Sound Blaster Atlas

Communication

1.0M HD Webcam

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

WLAN/ Bluetooth M.2 Modules:

(**Factory Option**) Intel® Dual Band Wi-Fi 6 AX200, 2x2 AX Wireless LAN + Bluetooth

(**Factory Option**) Intel® Dual Band Wi-Fi 6 AX201, 2x2 AX Wireless LAN + Bluetooth

(**Factory Option**) Intel® Dual Band Wireless-AC 9560, 2x2 AC Wireless LAN + Bluetooth

(**Factory Option**) Killer™ Dual Band Wi-Fi 6 AX1650i , 2x2 AX Wireless LAN + Bluetooth

M.2 Slots

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

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

Slot 3 for **PCIe Gen4 x4 SSD**

Interface

One Thunderbolt 4 Port

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

One Mini DisplayPort 1.4

One HDMI-Out Port

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

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

One RJ-45 LAN Jack

One DC-In Jack

Features

Intel® Optane™ Technology

Virtual Reality Ready

Windows® Mixed Reality Compatible

Pantone Certificate*

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

Environmental Spec

Temperature

Operating: 5°C - 35°C

Non-Operating: -20°C - 60°C

Relative Humidity

Operating: 20% - 80%

Non-Operating: 10% - 90%

Power

Embedded 3 Cell Polymer Battery Pack, 73WH

Full Range AC/DC Adapter

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

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

Dimensions & Weight

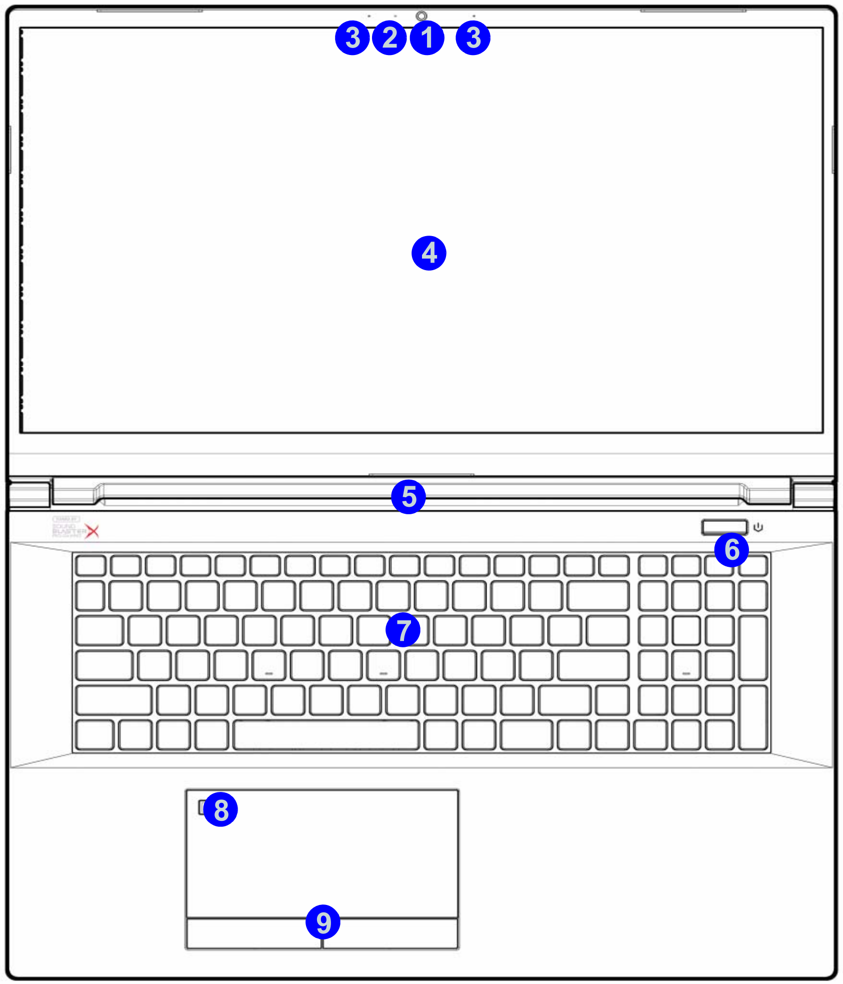
395.9mm (w) * 264.95mm (d) * 19.9mm (h)

2.3kg (Barebone with 73WH Battery)

External Locator - Top View with LCD Panel Open

Figure 1
Top View

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



External Locator - Front & Right Side Views

Figure 2
Front View

1. LED Indicators

FRONT VIEW

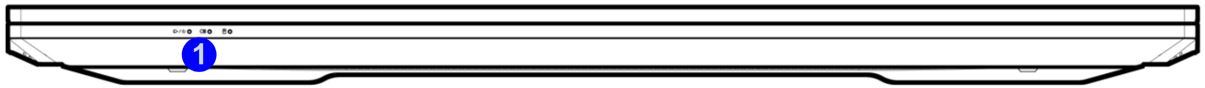
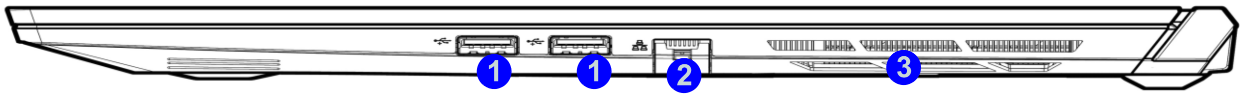


Figure 3
Right Side View

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

RIGHT SIDE VIEW



External Locator - Left Side & Rear View

Figure 4
Left Side View

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

LEFT SIDE VIEW

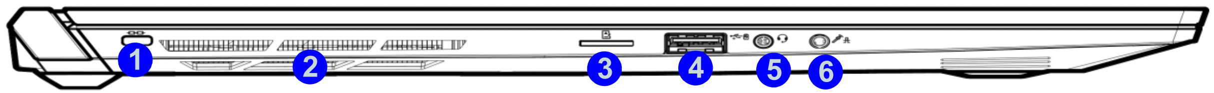
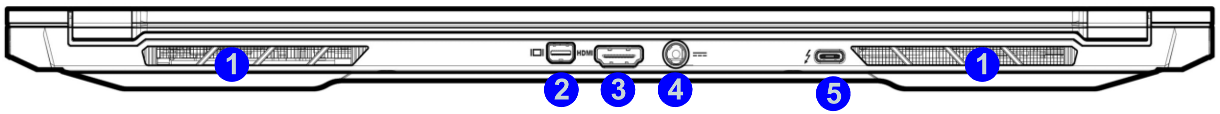


Figure 5
Rear View

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

REAR VIEW



External Locator - Bottom View

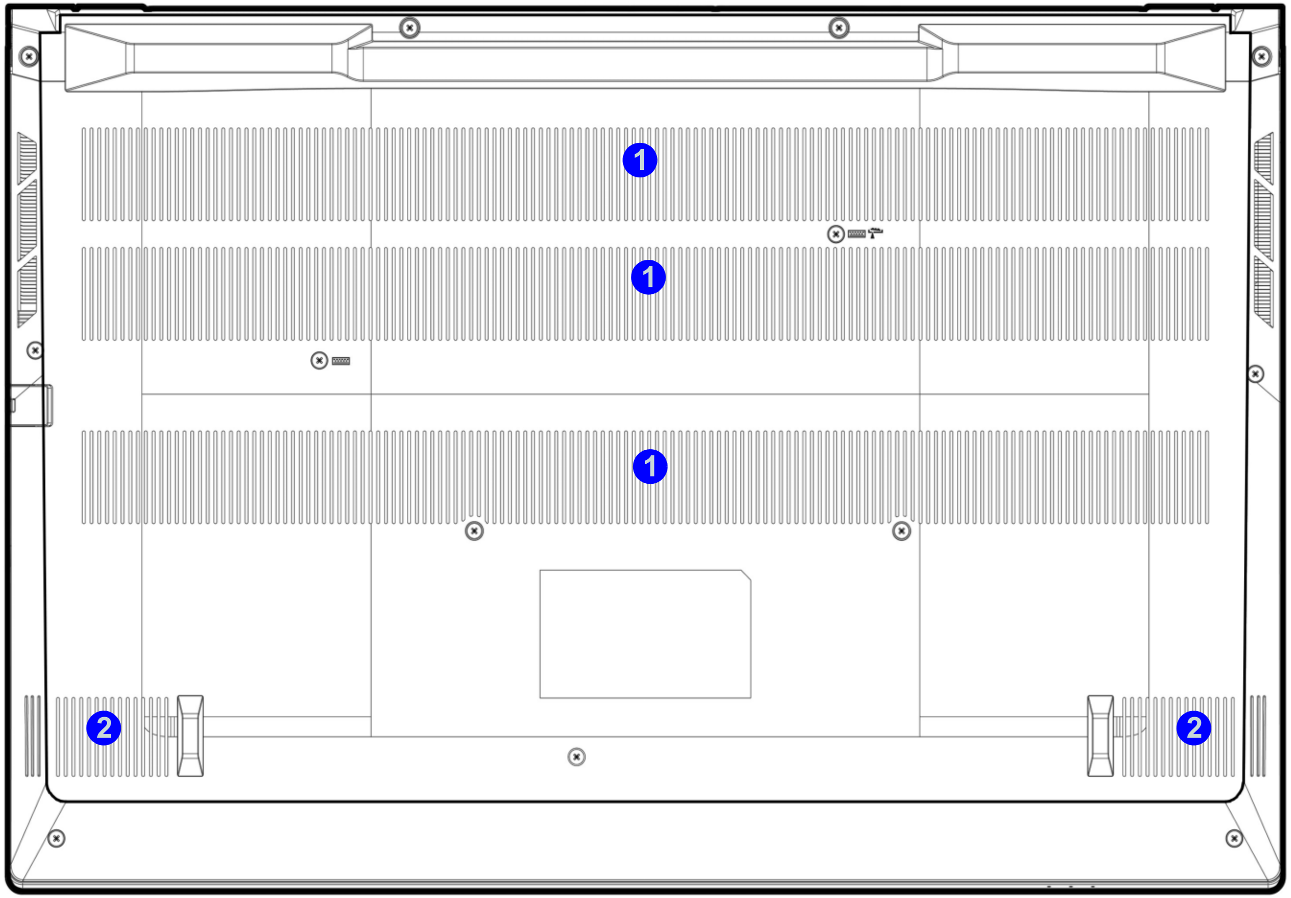


Figure 6
Bottom View

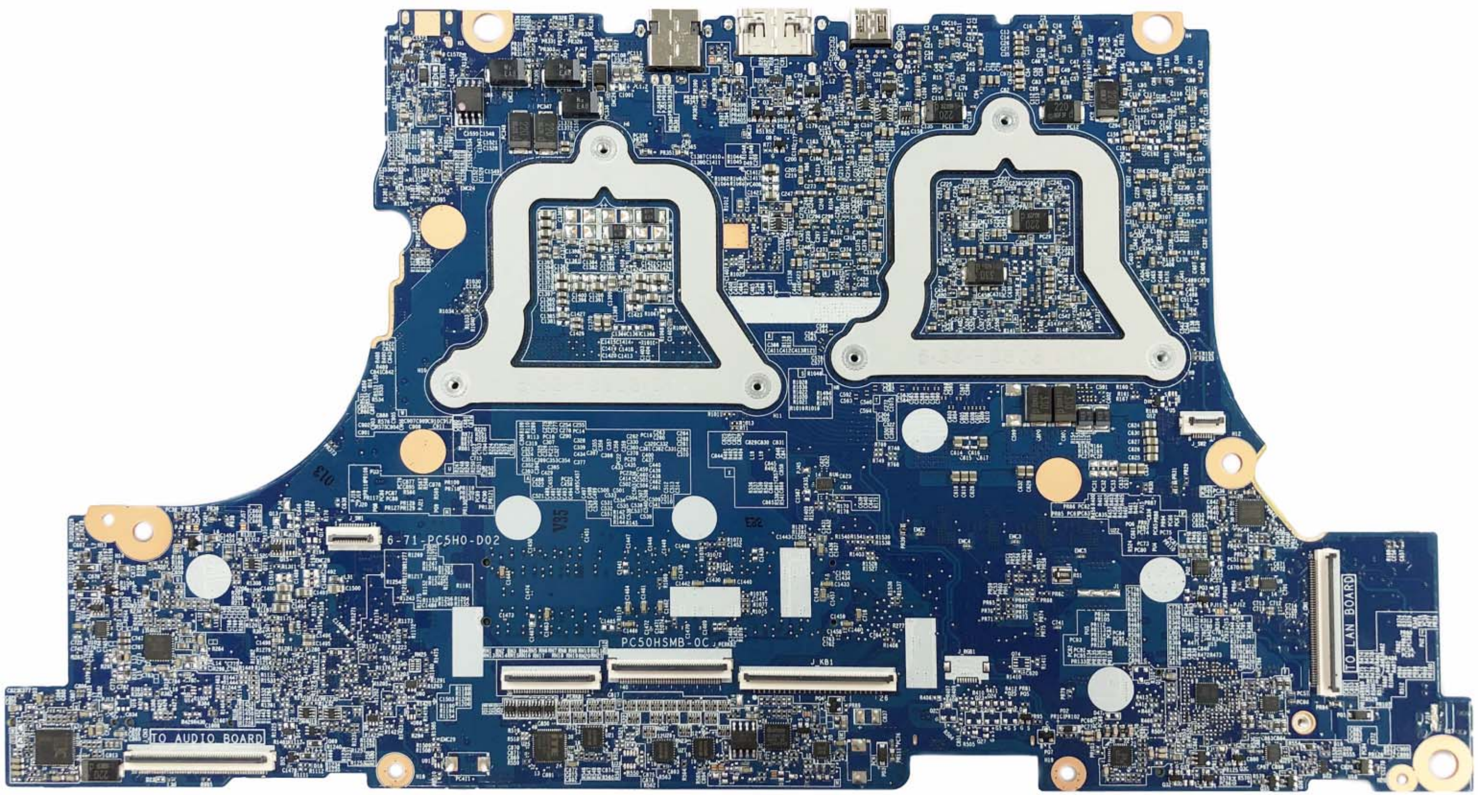
1. Vent
2. Speakers

Overheating

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

Figure 7
Mainboard Top Key Parts

Mainboard Overview - Top (Key Parts)



Mainboard Overview - Bottom (Key Parts)

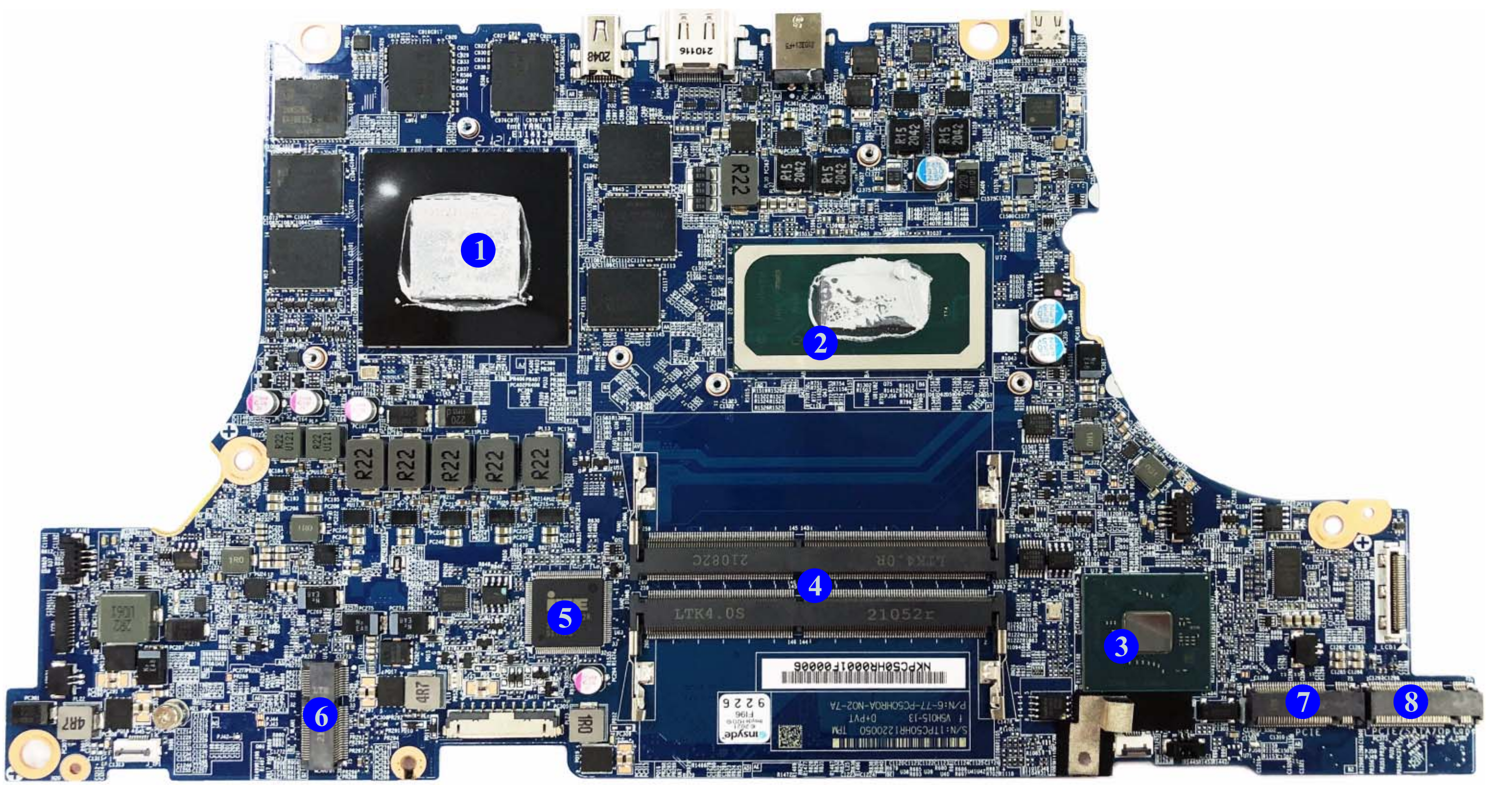


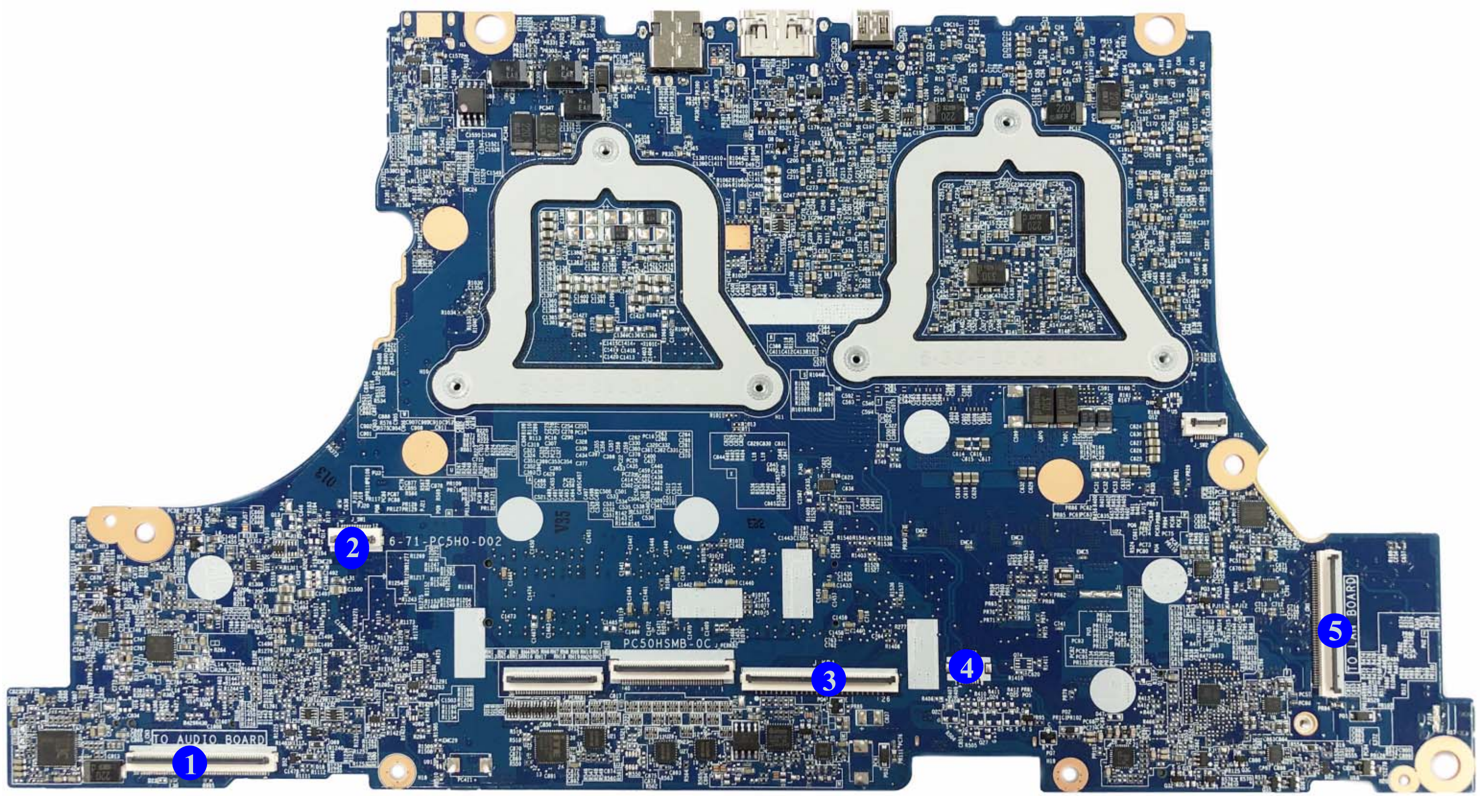
Figure 8
Mainboard Bottom Key Parts

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

Figure 9
Mainboard Top Connectors

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

Mainboard Overview - Top (Connectors)



Mainboard Overview - Bottom (Connectors)

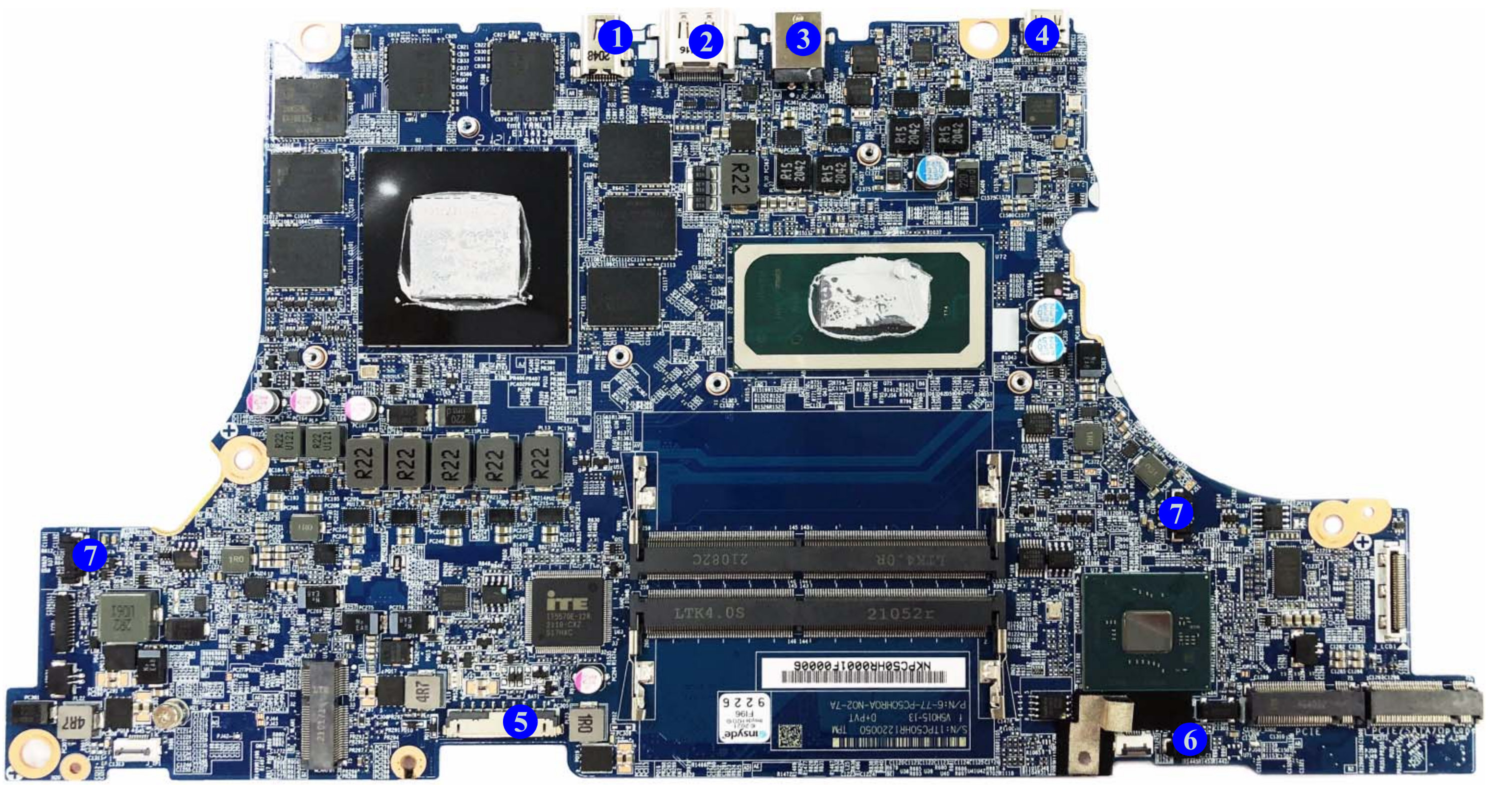


Figure 10
Mainboard Bottom Connectors

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

Chapter 2: Disassembly

Disassembly

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

Overview

This chapter provides step-by-step instructions for disassembling the ***PC70HS(-G) / PC70HR(-G) / PC70HP(-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.

Information

Warning

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

Maintenance Tools

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

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

Connections

Connections within the computer are one of four types:

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

Maintenance Precautions

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

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

Power Safety Warning

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

Cleaning

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

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

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

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

Disassembly Steps

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

To remove the Battery:

1. Remove the battery *page 2 - 5*

To remove and install the Keyboard:

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

To remove the System Memory:

1. Remove the battery *page 2 - 5*
2. Remove the keyboard *page 2 - 7*
3. Remove the system memory *page 2 - 10*

To remove and install the M.2 SSD:

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

To remove the Wireless LAN Module:

1. Remove the battery *page 2 - 5*
2. Remove the keyboard *page 2 - 7*
3. Remove the WLAN *page 2 - 13*

To remove the Hinge Cover:

1. Remove the battery *page 2 - 5*
2. Remove the hinge cover *page 2 - 15*

To remove the CCD Module:

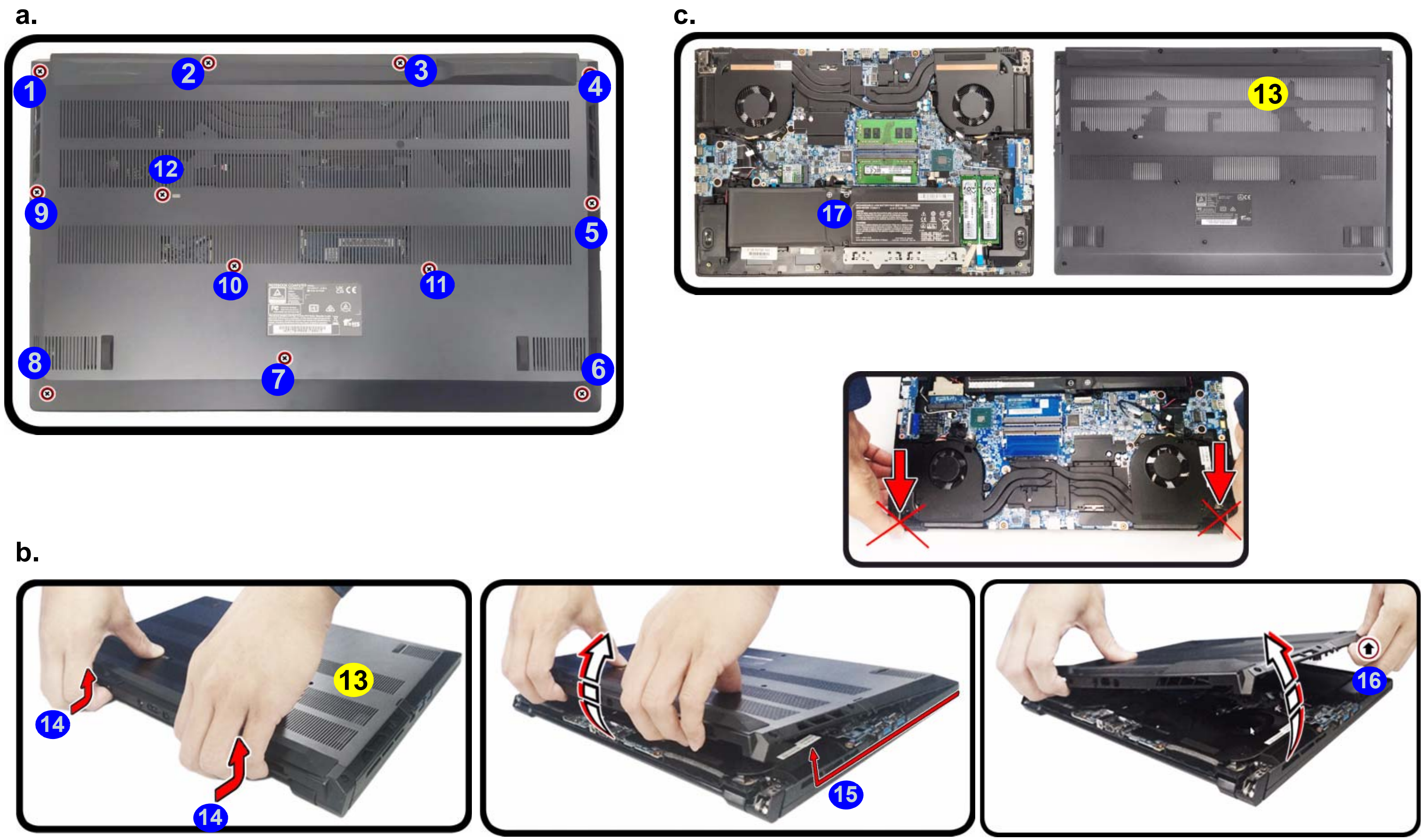
1. Remove the battery *page 2 - 5*
2. Remove the CCD module *page 2 - 16*

Removing the Battery

1. Turn **off** the computer, turn it over.
2. Remove screws 1 - 12 (*Figure 1a*).
3. Carefully lift the bottom case 13 up in the direction of the arrow at point 14 - 16 (*Figure 1b*). **Note: Do not press any of the hinge covers when or after removing the bottom case 13 .**
4. The battery will be visible at point 17 on the computer (*Figure 1c*).

Figure 1
Battery Removal

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



13. Bottom Case

- 12 Screws

Figure 2
Battery Removal

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

5. Carefully disconnect the cable 18, then remove screws 19 - 20 (***Figure 2d***). Note: make sure that SSD-2 (***page 2 - 12***) is not installed before removing screw 20.
6. Lift the battery 21 off the computer (***Figure 2e***).
7. Reverse the process to install a new battery (do not forget to replace all the screws and bottom cover).

d.

e.

21. Battery

- 2 Screws

Removing the Keyboard

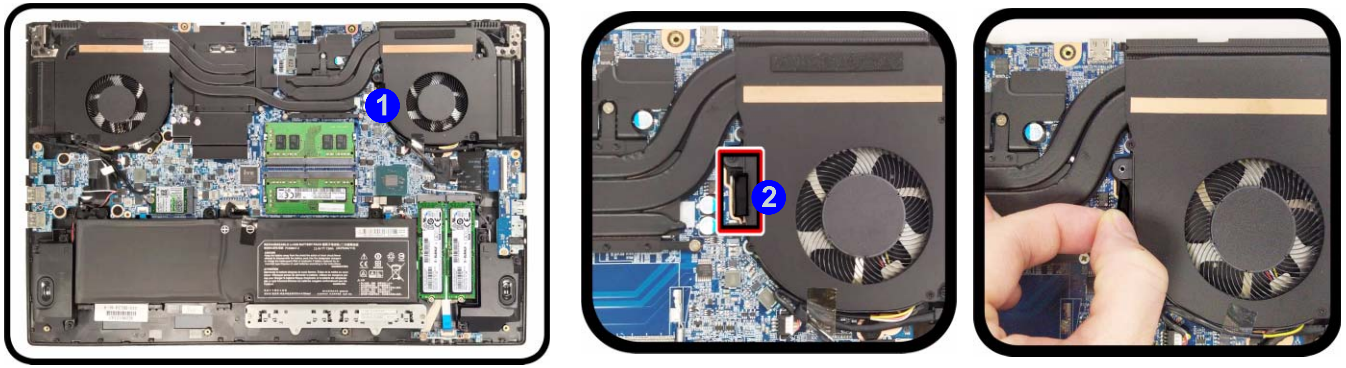
Keyboard Removal Procedure

1. Turn **off** the computer, remove the battery (*page 2 - 5*).
2. The keyboard adhesive mylar will be visible at point 1 on the computer. Pull the adhesive mylar 2 out to release the keyboard (*Figure 3a*).
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 3b*).

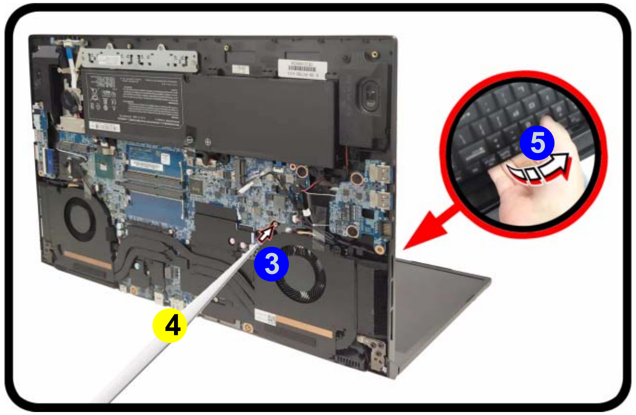
Figure 3
Keyboard Removal

a. Remove the adhesive mylar from the keyboard.
b. Use a special eject stick to push the keyboard out while releasing the keyboard as shown.

a.



b.



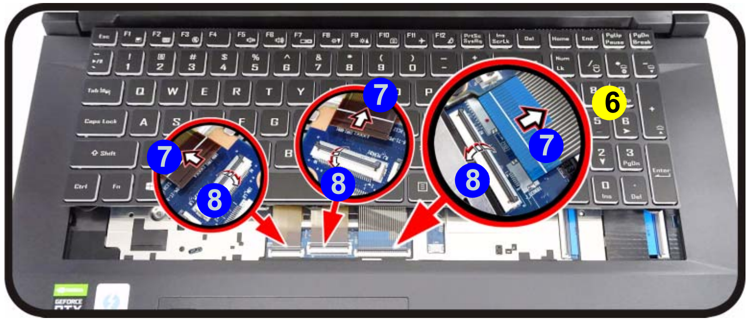
4. Eject Stick

Figure 4
Keyboard Removal (cont'd.)

c. Lift the keyboard up and disconnect the keyboard ribbon cable from the locking collar socket.
d. Remove the keyboard.

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 4c*).
5. Carefully lift the keyboard 6 off the computer (*Figure 4d*).

c.



d.

Re-inserting the Keyboard

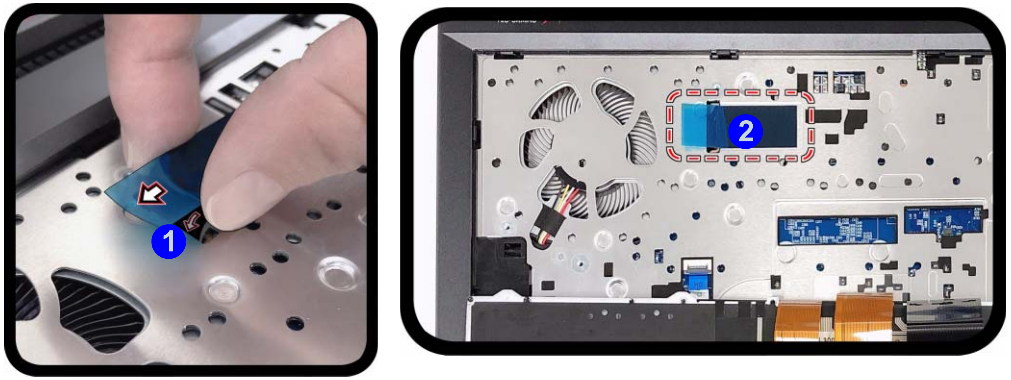
When re-inserting the keyboard firstly, align the keyboard tabs at the bottom of the keyboard with the slots in the case.

6. Keyboard

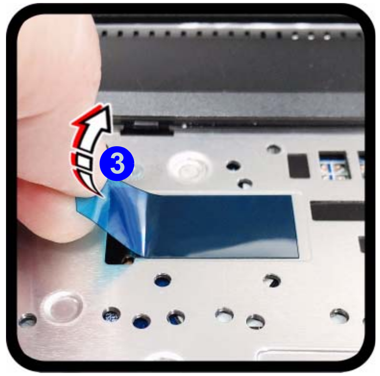
Keyboard Installation Procedure

1. Make sure to insert 1 a part of the adhesive mylar 2 and then install it properly in the location as shown (***Figure 5a***).
2. Pull the mylar cover 3 to reveal the adhesive side of the mylar (***Figure 5b***).
3. Carefully connect the keyboard ribbon cable 4 to the locking collar socket 5 and then insert the keyboard 6 in place (***Figure 5c***).
4. Make sure to press the keyboard downward in the indicated area as shown 7 to ensure that it sticks to the adhesive mylar (***Figure 5d***). Apply pressure atleast 2kg for 10 seconds.

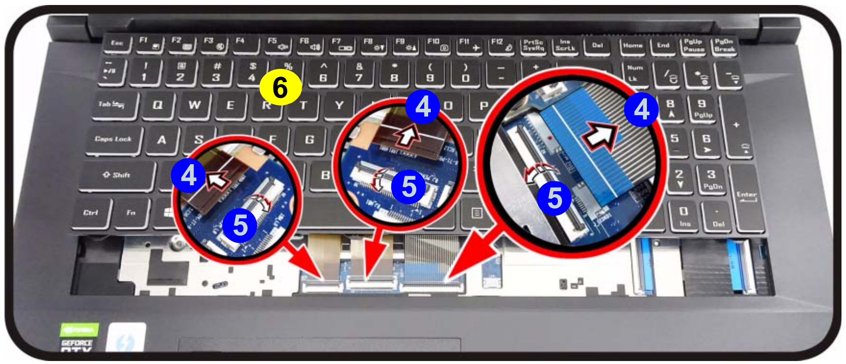
a.



b.



c.



d.

Figure 5
Keyboard Installation

a. Install the adhesive mylar.
b. Remove the mylar cover.
c. Connect the keyboard ribbon cable to the locking collar socket and insert the keyboard in place.
d. Make sure to press the keyboard toward the computer.

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.

6. Keyboard

Figure 6
RAM Module Removal

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

Contact Warning

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

4. RAM Module

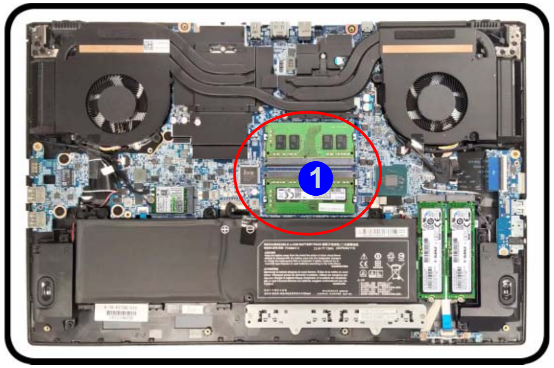
Removing the System Memory (RAM)

The computer has four memory sockets for 260 pin Small Outline Dual In-line Memory Modules (SO-DIMM) supporting DDR4 Up to 3200 MHz. The main memory can be expanded up to 64GB. The total memory size is automatically detected by the POST routine once you turn on your computer.

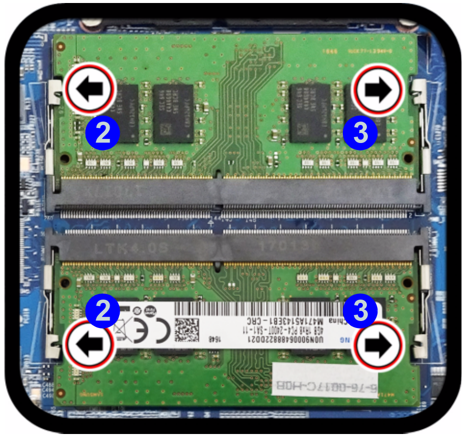
Memory Upgrade Process

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

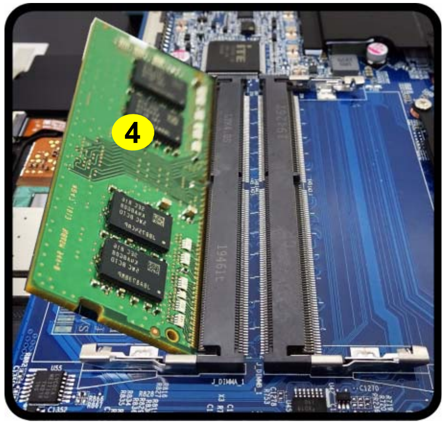
a.



b.



c.



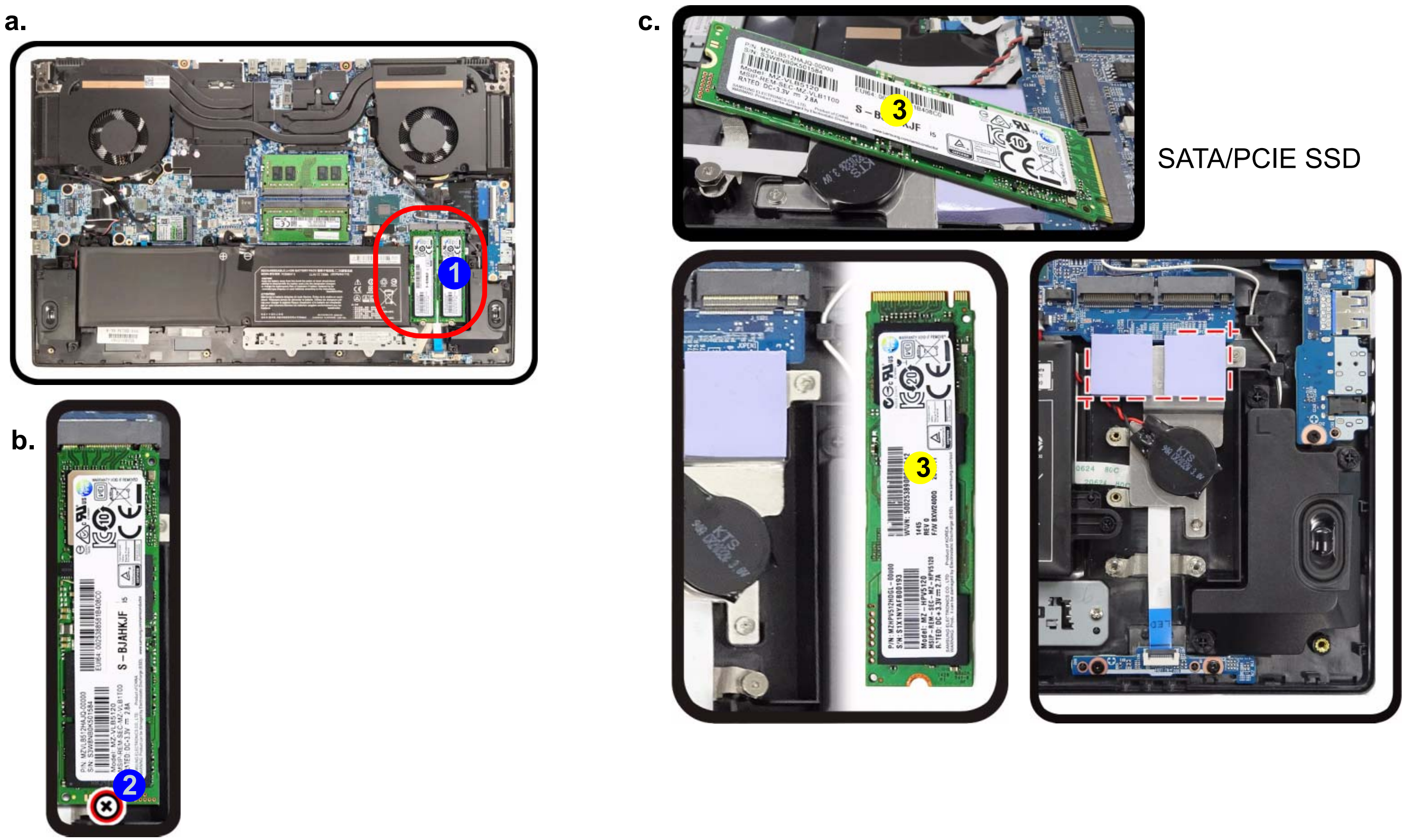
Removing the M.2 SSD Module

M.2 SSD-1 Removal Procedure

1. Turn **off** the computer, remove the battery (***page 2 - 5***), and keyboard (***page 2 - 7***).
2. The M.2 SSD module will be visible at point 1 on the mainboard (***Figure 7a***).
3. Remove the screw 2 (***Figure 7b***).
4. The M.2 SSD module 3 (***Figure 7c***) 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 7
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.



3.M2 SSD Module

- 1 Screw

2.Disassembly

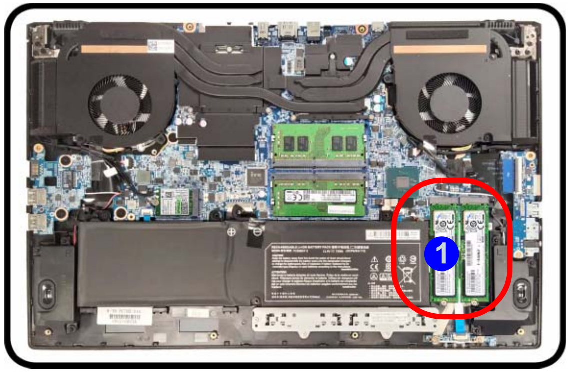
Figure 8
M.2 SSD-2 Module Removal

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

M.2 SSD-2 Removal Procedure

1. Turn **off** the computer, remove the battery (***page 2 - 5***), and keyboard (***page 2 - 7***).
2. The M.2 SSD module will be visible at point 1 on the mainboard (***Figure 8a***).
3. Remove the screw 2 (***Figure 8b***).
4. The M.2 SSD module 3 (***Figure 8c***) will pop-up, and you can remove it from the computer.
5. Reverse the process to install a new module (do not forget to replace the screws and thermal pad).

a.



b.

c.

PCIE SSD

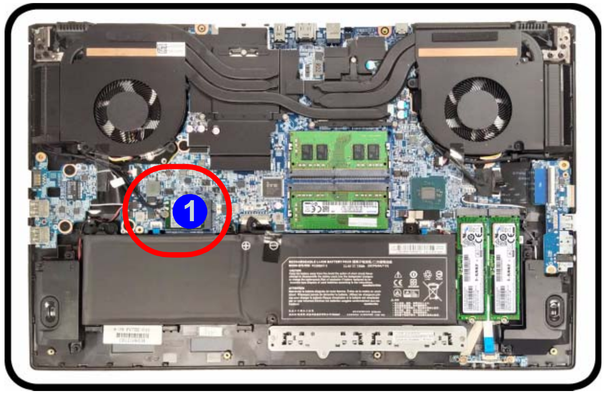
3.M2 SSD Module

- 1 Screw

Removing the Wireless LAN Module

1. Turn **off** the computer, remove the battery (***page 2 - 5***), and keyboard (***page 2 - 7***).
2. The Wireless LAN module will be visible at point 1 on the mainboard (***Figure 9a***).
3. Carefully disconnect the cables 2 & 3, and then remove the screw 4 (***Figure 9b***)
4. The Wireless LAN module 5 (***Figure 9c***) will pop-up, and you can remove it from the computer.

a.



b.

c.

Figure 9
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 9b***).

5.Wireless LAN Module

- 1 Screw

Wireless LAN, Combo Module Cables

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

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

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

Removing the Hinge Cover

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

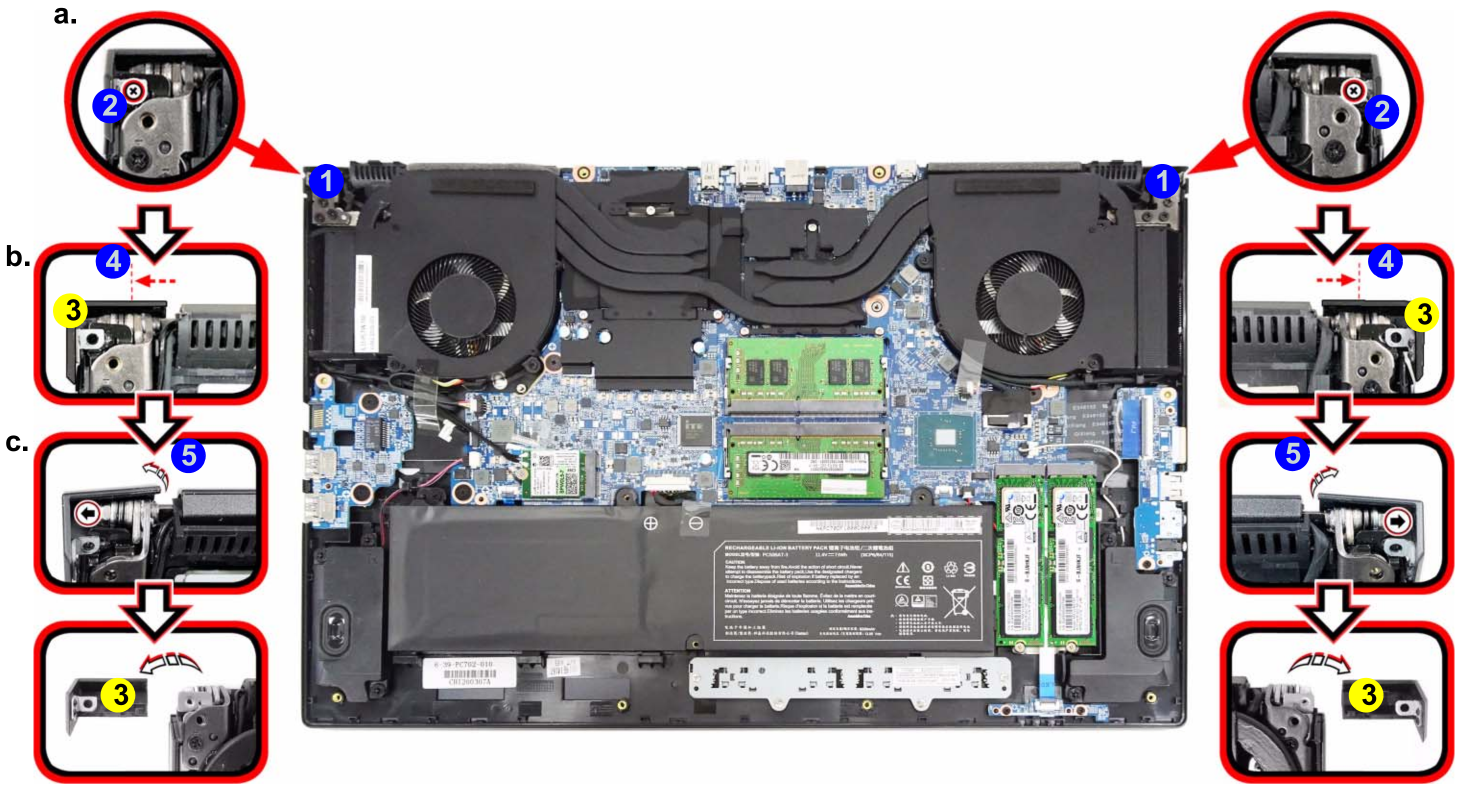


Figure 10
Hinge Cover Removal

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

3.Hinge Cover

- 1 Screw

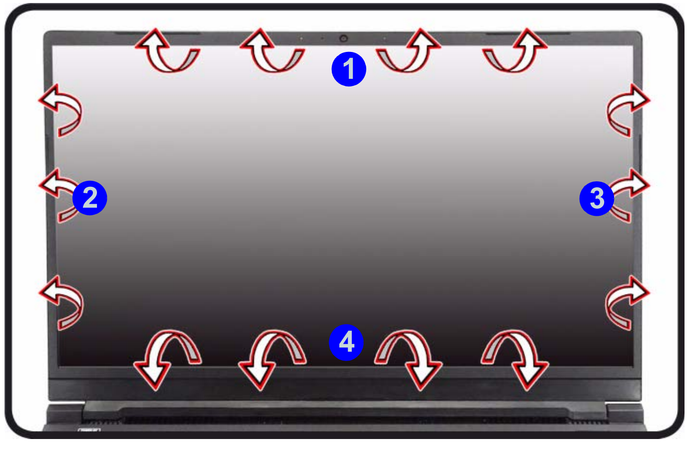
Figure 11
CCD Removal

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

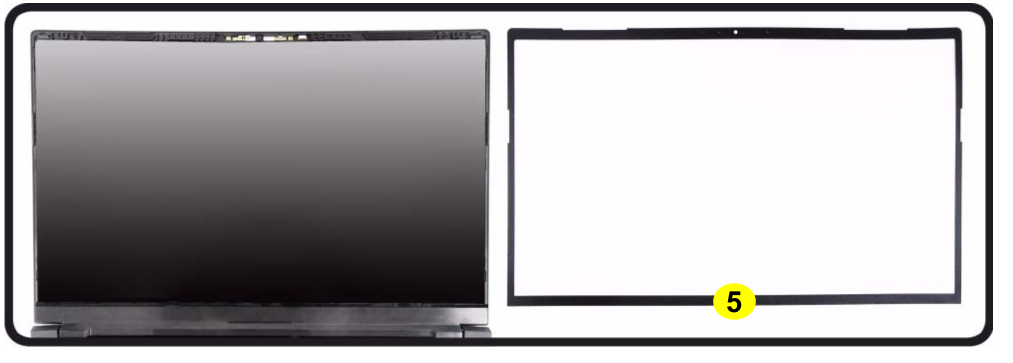
Removing the CCD

1. Turn **off** the computer, turn it over to remove the battery (***page 2 - 5***).
2. Lay the computer down on a flat surface with the top case up forming a 130 degree angle.
3. Carefully run your fingers around the inner frame of the LCD mylar to lift at points 1 - 4 as indicated by the arrows (***Figure 11a***).
4. Remove the LCD front cover 5 (***Figure 11b***).

a.



b.



5. LCD Mylar Cover

5. Disconnect the cable 6 from the locking collar socket by using a flat-head screwdriver to pry the locking collar pins 7 away from the base (***Figure 12c***).
6. Remove the CCD module 8 (***Figure 12d***).
7. Reverse the process to install a new CCD module.

c.

d.

Figure 12
CCD Removal (cont'd)

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

8. CCD Module

Appendix A: Part Lists

This appendix breaks down the ***PC70HS(-G) / PC70HR(-G) / PC70HP(-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.

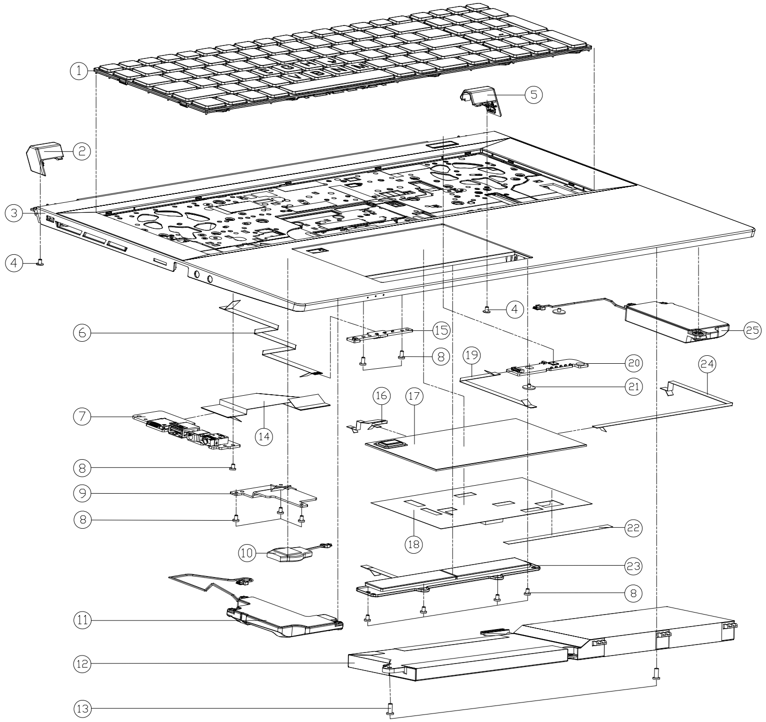
Part List Illustration Location

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

Table A - 1
Part List Illustration Location

Part	PC70HS/PC70HP/PC70HR	PC70HS-D/PC70HP-D/PC70HR-D	PC70HS-G/PC70HP-G/PC70HR-G
Top	*page A - 3*		
Bottom	*page A - 4*		
Main Board	*page A - 5*		
LCD	*page A - 6*	*page A - 7*	*page A - 8*

Top

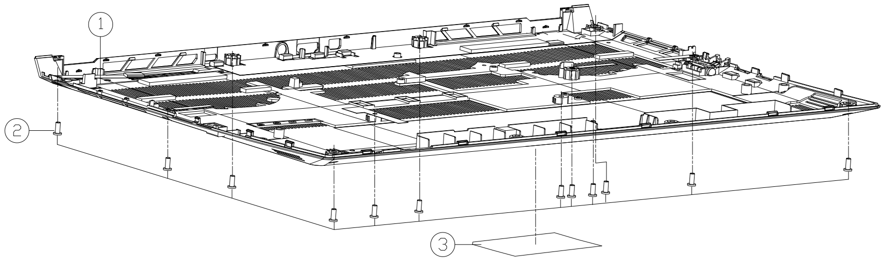


ITEM	PART NAME	PART NO	REMARK
1	KB FOR LED PER KEY KB US SERIES PC50HS	6-PC50HS-KB-LPK-US	
1	KB FOR MULTI 15C BL KB US SERIES PC50HS	6-PC50HS-KB-MCL-US	
1	MCJ (OPTION) BOM PC70HS	6-PC70HS-CUSTOM-MCJ	
2	TOP CASE HINGE CAP L MODULE PC70DN2 (MP)	6-42-PC702-206	
3	TOP CASE MODULE(WO SD)(BLASTERX) (KAPOK) PC70HS	6-39-PC7H2-020-B	
3	TOP CASE MODULE(BLASTERX)(KAPOK)(W/CARD READER)PC70HS	6-39-PC7H2-011-B	
4	.SCREW M2*2.5L KI NI ICT NY (ø4 T=0.5 1#)	6-35-B1120-2R6	
5	TOP CASE HINGE CAP R MODULE PC70DN2 (MP)	6-42-PC702-106	
6	FFC CABLE LED TO MB L=192MM 50V 12PIN (QX) PC70DN2	6-43-PC700-052-1	
7	AUDIO BOARD V2.0 PC50HS	6-77-PC5D8-D02-A	
7	AUDIO BOARD V2.0 (W/CARD READER) PC50DS	6-77-PC5D8-D02-1	
8	SCREW M2*3L KI NI ICT NY (DD=ø4.0,DT=0.8)	6-35-B1120-3RD	
9	M2 THERMAL BKT AL5052 PC70DN2	6-33-PC702-052	
10	BAT. 20MM 3V 220MAH W/CABLE 55MM BCR2032H5.5VM1UB (SHIHNO)	6-23-22015-TE0	
11	SPEAKER+CABLE L 95MM 2W 4? 2P 640301 (FOSTER) (ADD NUMBER LABE) PC70DN2	6-23-5PC70-0L2	
12	BAT.P S LI 11.4V/6.405AH/73WH PSE 3S1P GETAC/HIGH POWER (POLYMER)541391410001(6220MAH)	6-87-PC50S-72A03	
13	.SCREW M2.5*6L K BZ ICT NY	6-35-82125-6RA	
14	FFC CABLE AUDIO TO MB L=92MM 50V 50PIN (QX) PC70DN2	6-43-PC700-043-1	
15	LED BOARD V1.0 PC70DS	6-77-PC7D4-D01	
16	FFC CABLE FINGER TO MB L=58MM 50V 6PIN (QX) PC70DN2	6-43-PC700-032-1	
17	SECURE PAD SYNAPTICS TM-P3621-001 I2C+PS2 (130*67MM) (FW:3174198)	6-49-X17S3-011-G	
18	TP MYLAR PET FOR PC70DN2	6-40-PC702-022	
19	FFC CABLE POWER TO MB L=102MM 50V 8PIN (QX) PC70DN2	6-43-PC700-062-1	
20	POWER BOARD V1.0 PC70DS	6-77-PC7DC-D01	
21	SCREW M2*2L KI BK/Z ICT NY(ø8,T=0.6)	6-35-B6120-2RE	
22	CONDUCTIVE CLOTH 90*5*0.1 PC70DN2	6-47-PC702-030	
23	FUNCTION KEY FOR CLICK BUTTON MODULE W/O FINGER ADD PAINT PC70DN2	6-23-KPC70-010	
24	FFC CABLE CLICK TO MB L=190MM 50V 8PIN (QX) PC70DN2	6-43-PC700-012-1	
25	SPEAKER+CABLE R 67MM 2W 4? 2P 640509 (FOSTER)(ADD NUMBER LABE) PC70DN2	6-23-5PC70-0R2	

Figure A - 1
Top

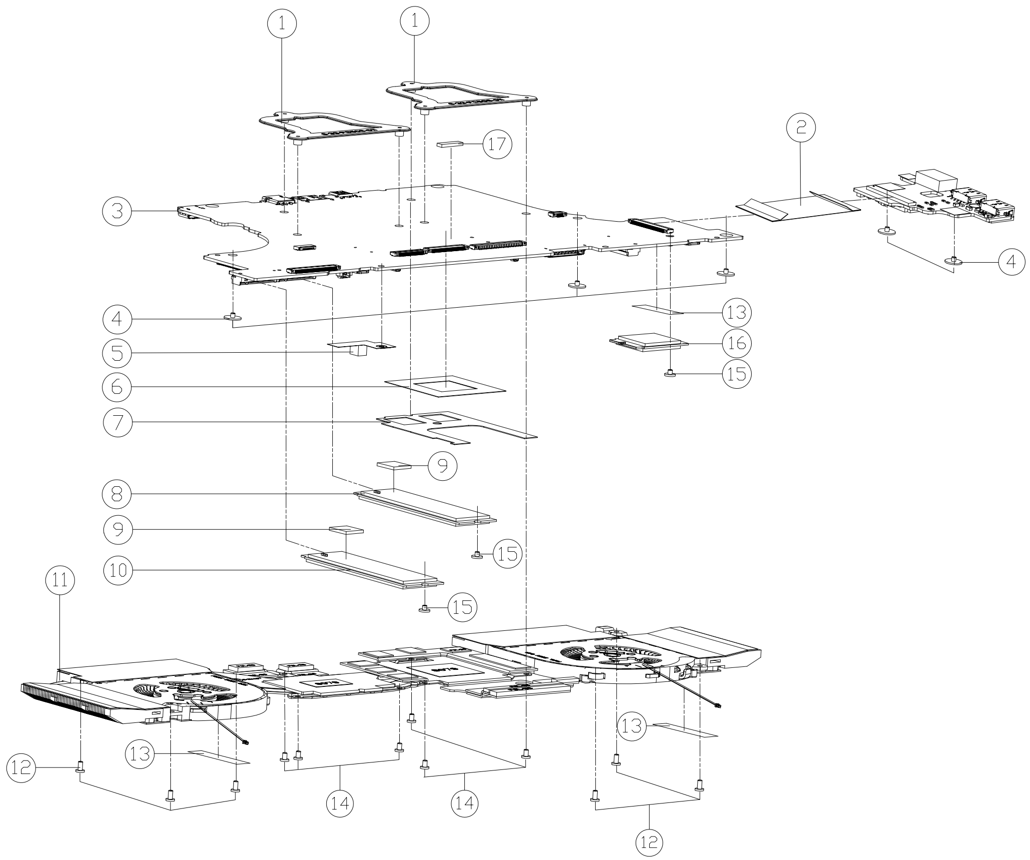
Bottom

Figure A - 2
Bottom



ITEM	PART NAME	PART NO	REMARK
1	BOTTOM CASE MODULE PC70HS	6-39-PC7H3-011	
2	SCREW M2.5*6L K BZ ICT NY	6-35-82125-6RA	
3	PRODUCT LABEL FOR PC70HS	6-45-PC70HS03-010	
3	PRODUCT LABEL FOR PC70HR	6-45-PC70HR03-010	
3	PRODUCT LABEL FOR PC70HP	6-45-PC70HP03-010	
3	PRODUCT LABEL FOR PC70HR-D	6-45-PC70HRD3-010	
3	PRODUCT LABEL FOR PC70HS-D	6-45-PC70HSD3-010	
3	PRODUCT LABEL FOR PC70HP-D	6-45-PC70HPD3-010	
3	PRODUCT LABEL FOR PC70HS-G	6-45-PC70HSG3-010	
3	PRODUCT LABEL FOR PC70HR-G	6-45-PC70HRG3-010	
3	PRODUCT LABEL FOR PC70HP-G	6-45-PC70HPG3-010	

Main Board

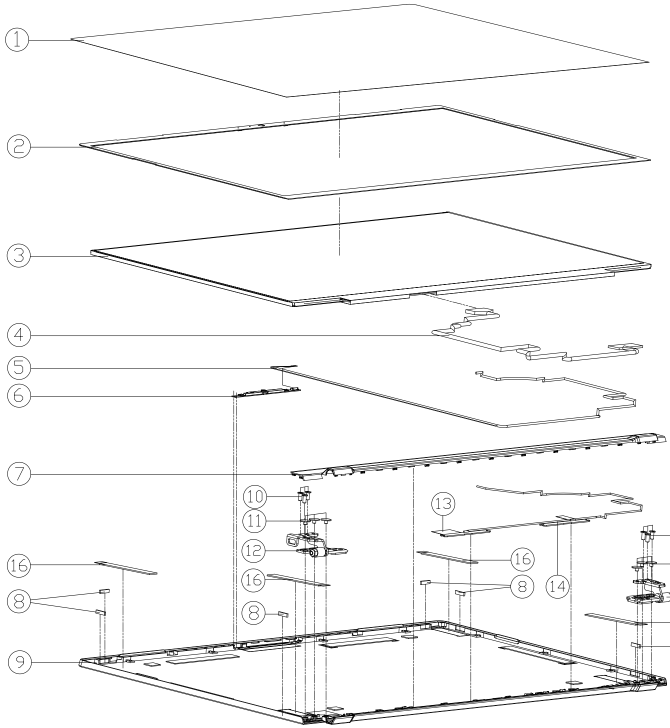


ITEM	PART NAME	PART NO	REMARK
1	CPU SUPPORT PC50DN2	6-33-PC50S-011	
2	FFC CABLE USB TO MB L=55MM 50V 50PIN (QX) PC70DN2	6-43-PC700-022-1	
3	MAIN BOARD(CPU/I7-11800H/2.3G) V2.0 (EDP)(LED PER KEY KB)(W/O TPM) +LAN BOARD V1.0 PC70HS	6-77-PC70HS0A-N02-2A	
3	MAIN BOARD(CPU/I7-11800H/2.3G) V2.0 (EDP)(LED PER KEY KB)(W/TPM) (C)+LAN BOARD V1.0 PC70HS	6-77-PC70HS0A-N02-7A	
3	MAIN BOARD(CPU/I7-11800H/2.3G) V2.0 (EDP)(LED PER KEY KB)(W/O TPM) +LAN BOARD V1.0 PC70HS-G	6-77-PC70HSGA-N02-2A	
3	MAIN BOARD(CPU/I7-11600H/2.9G) V2.0 (EDP)(LED PER KEY KB)(W/O TPM) +LAN BOARD V1.0 PC70HS-G	6-77-PC70HSGA-N02-2B	
3	MAIN BOARD(CPU/I7-11800H/2.3G) V2.0 (EDP)(RGB)(MULTI 15C BL KB ? LED PER KEY KB)(W/O TPM) +LAN BOARD V1.0 PC70HR	6-77-PC70HR0A-N02-6A	
3	MAIN BOARD(CPU/I7-11800H/2.3G) V2.0 (EDP)(LED PER KEY KB)(W/TPM) (C)+LAN BOARD V1.0 PC70HR	6-77-PC70HR0A-N02-7A	
3	MAIN BOARD(CPU/I7-11800H/2.3G) V2.0 (EDP)(MULTI 15C BL KB)(W/O TPM) +LAN BOARD V1.0 PC70HR-G	6-77-PC70HRGA-N02-3A	
3	MAIN BOARD(CPU/I7-11600H/2.9G) V2.0 (EDP)(MULTI 15C BL KB)(W/O TPM) +LAN BOARD V1.0 PC70HR-G	6-77-PC70HRGA-N02-3B	
3	MAIN BOARD(CPU/I7-11600H/2.9G) V2.0 (EDP)(MULTI 15C BL KB)(W/O TPM) (C)+LAN BOARD V1.0 PC70HP	6-77-PC70HP0A-N02-10B	
3	MAIN BOARD(CPU/I7-11800H/2.3G) V2.0 (EDP)(LED PER KEY KB)(W/TPM) (C)+LAN BOARD V1.0 PC70HP	6-77-PC70HP0A-N02-7A	
3	MAIN BOARD(CPU/I7-11800H/2.3G) V2.0 (EDP)(LED PER KEY KB)(W/TPM) +LAN BOARD V1.0 PC70HP	6-77-PC70HP0A-N02-A	
3	MAIN BOARD(CPU/I7-11600H/2.9G) V2.0 (EDP)(MULTI 15C BL KB)(W/O TPM) +LAN BOARD V1.0 PC70HP	6-77-PC70HP0A-N02-3B	
3	MAIN BOARD(CPU/I7-11800H/2.3G) V2.0 (EDP)(MULTI 15C BL KB)(W/ TPM) +LAN BOARD V1.0 PC70HP-G	6-77-PC70HPGA-N02-1A	
3	MAIN BOARD(CPU/I7-11600H/2.9G) V2.0 (EDP)(MULTI 15C BL KB)(W/ TPM) +LAN BOARD V1.0 PC70HP-G	6-77-PC70HPGA-N02-1B	
4	SCREW M2*2L KI BK/Z ICT NY(ø8,T=0.6)	6-35-B6120-2RE	
5	MB CONDUCTIVE CLOTH+MYLAR+GASKET (26.5*17.5*5.15T) PC50HS	6-47-PC50S-H20	
6	GN20 MYLAR E5-E7 PC50DS	6-40-X17K0-010	FOR PC70HS(-D)(-G) PC70HR(-D)(-G)
6	GN20 MYLAR E3 PC50DS	6-40-X17K0-020	FOR PC70HP/HP-D PC70HP-G
7	VGA EMI ABSORBER 3 PC50HS	6-47-PC50S-H10	
8	SSD M2 2280 512GB SAMSUNG MZVL2512HCJQ-XXXXX (PM9A1) PCIE G4*4 3D TLC 128 LAYERS	6-85-D515B-S0C	OPTION
8	SSD M2 2280 1TB SAMSUNG MZVLB1T0HBLR-00000 (PM981A) PCIE G3*4 3D TLC 96 LAYERS	6-85-D511T-S04	OPTION
8	SSD M2 2280 1TB WD SDBPNTY-1T00 (SN730) PCIE G3*4 3D TLC 96 LAYERS	6-85-D511T-W01	OPTION
8	SSD M2 2280 512GB SAMSUNG MZVLB512HBJQ-00000 (PM981A) PCIE G3*4 3D TLC 96 LAYERS	6-85-D515B-S0A	OPTION
8	SSD M2 2280 512GB WD SDBPNTY-512G (SN730) PCIE G3*4 3D TLC 96 LAYERS	6-85-D515B-W02	OPTION
8	SSD M2 2280 512GB PHISON ESMP512GKB4C2-E13T (E13T) PCIE G3*4 DRAMLESS 3D TLC 96 LAYERS	6-85-D515B-H05	OPTION
8	SSD M2 2280 256GB WD SDBPNTY-256G (SN730) PCIE G3*4 3D TLC 96 LAYERS	6-85-D51R6-W02	OPTION
8	SSD M2 2280 1TB PHISON ESMP001TKB4C2-E16S (E16) PCIE G4*4 3D TLC 96 LAYERS	6-85-D511T-H01	OPTION
8	SSD M2 2280 16GB(256GB INTEL HBRPEKNX0101A (TETON GLACIER) PCIE G3*4 3DXPOINT QLC 64 LAYERS	6-85-D51R6-Z04	OPTION
8	SSD M2 2280 512GB BIWIN CNF82NS1B02-512 (NI201) PCIE G3*4 DRAMLESS 3D TLC 96 LAYERS	6-85-D515B-B01	OPTION
8	SSD M2 2280 512GB PHISON MGEACSDM4-512G (E12S) PCIE G3*4 3D TLC 96 LAYERS	6-85-D515B-H07	OPTION
9	THERMAL PAD MA500 (17.3*17.3*2.75T)MM N750BU	6-48-N7503-010	
10	SSD M2 2280 512GB KINGSTON RBU-SNS8180S3/512GJ (RBU-SNS8180S3) SATA3 3D TLC 64 LAYERS	6-85-D515B-K00	OPTION
10	SSD M2 2280 512GB TEAMGROUP TE512GS510SM80 (S510) SATA3 3D TLC 96 LAYERS	6-85-D515B-T00	OPTION
10	SSD M2 2280 512GB MICRON MTFDDAV512TDL(1300) SATA3 3D TLC 96 LAYERS	6-85-D515B-102	OPTION
10	SSD M2 2280 512GB KINGSTON DM8P0S3512B-A0 (DM8P0S3) SATA3 3D TLC 96 LAYERS	6-85-D515B-K01	OPTION
10	SSD M2 2280 512GB SAMSUNG MZVL2512HCJQ-XXXXX (PM9A1) PCIE G4*4 3D TLC 128 LAYERS	6-85-D515B-S0C	OPTION
10	SSD M2 2280 1TB SAMSUNG MZVLB1T0HBLR-00000 (PM981A) PCIE G3*4 3D TLC 96 LAYERS	6-85-D511T-S04	OPTION
10	SSD M2 2280 1TB WD SDBPNTY-1T00 (SN730) PCIE G3*4 3D TLC 96 LAYERS	6-85-D511T-W01	OPTION
10	SSD M2 2280 512GB SAMSUNG MZVLB512HBJQ-00000 (PM981A) PCIE G3*4 3D TLC 96 LAYERS	6-85-D515B-S0A	OPTION
10	SSD M2 2280 512GB WD SDBPNTY-512G (SN730) PCIE G3*4 3D TLC 96 LAYERS	6-85-D515B-W02	OPTION
10	SSD M2 2280 512GB PHISON ESMP512GKB4C2-E13T (E13T) PCIE G3*4 DRAMLESS 3D TLC 96 LAYERS	6-85-D515B-H05	OPTION
10	SSD M2 2280 256GB WD SDBPNTY-256G (SN730) PCIE G3*4 3D TLC 96 LAYERS	6-85-D51R6-W02	OPTION
10	SSD M2 2280 1TB PHISON ESMP001TKB4C2-E16S (E16) PCIE G4*4 3D TLC 96 LAYERS	6-85-D511T-H01	OPTION
10	SSD M2 2280 16GB(256GB INTEL HBRPEKNX0101A (TETON GLACIER) PCIE G3*4 3DXPOINT QLC 64 LAYERS	6-85-D51R6-Z04	OPTION
10	SSD M2 2280 512GB BIWIN CNF82NS1B02-512 (NI201) PCIE G3*4 DRAMLESS 3D TLC 96 LAYERS	6-85-D515B-B01	OPTION
10	SSD M2 2280 512GB PHISON MGEACSDM4-512G (E12S) PCIE G3*4 3D TLC 96 LAYERS	6-85-D515B-H07	OPTION
11	THERMAL MODULE PC70HP	6-31-PC70N-P11	
12	.SCREW M2*4L KI BZ ICT NY	6-35-B6120-4RA	
13	TAPE MYLAR (C),MYLAR M550J	6-40-M55J2-030	
14	.SCREW M2*3L KI NI ICT NY (DD=ø4.0,DT=0.8)	6-35-B1120-3RD	
15	SCREW M2*2L KI NI ICT NY (DD=ø5 ,T=0.8)	6-35-B1120-2RA	
16	WLAN+BT COMBO DUAL BAND INTEL HARRISON PEAK 2 NEV OTP AX201NGW(GNV) NON-VPRO 2*2 AX+BT BT5.0 CNVI M2 2230	6-88-NV40F-4210	
16	WLAN+BT COMBO DUAL BAND INTEL JEFFERSON PEAK 1 9462NGW(MWW9950S9) NON-VPRO 1X1 DIVERSITY ANTENNA AC+BT BT5.0 CNVI M2 2230	6-88-N24GF-4200	
16	WLAN+BT COMBO DUAL BAND INTEL CYCLONE PEAK 2 AX200NGW(GNV) NON-VPRO 2*2 AX+BT BT5.0 M2 2230	6-88-N15CF-4210	
16	WLAN+BT COMBO DUAL BAND RIVET KILLER 1650 NEV OTP (INTEL AX201NGW(NEV OTP) 2*2 AC+BT BT5.0 CNVI M2 2230	6-88-NV40F-4220	
16	WLAN+BT COMBO DUAL BAND INTEL KILLER 1675X(AX210NGW(GNV)) (MM99999M86) 2*2 AX+BT BT5.2 M2 2230	6-88-X17KF-4220	
16	WLAN+BT COMBO DUAL BAND INTEL WIFI 6E TYPHOON PEAK 2 AX210NGW(GNV) (MM99999M85) NON-VPRO 2*2 AX+BT BT5.2 M2 2230	6-88-X17KF-4210	
17	RUBBER L10*W3.2*0.9T NB60TK1	6-47-NB601-030	

Figure A - 3
Main Board

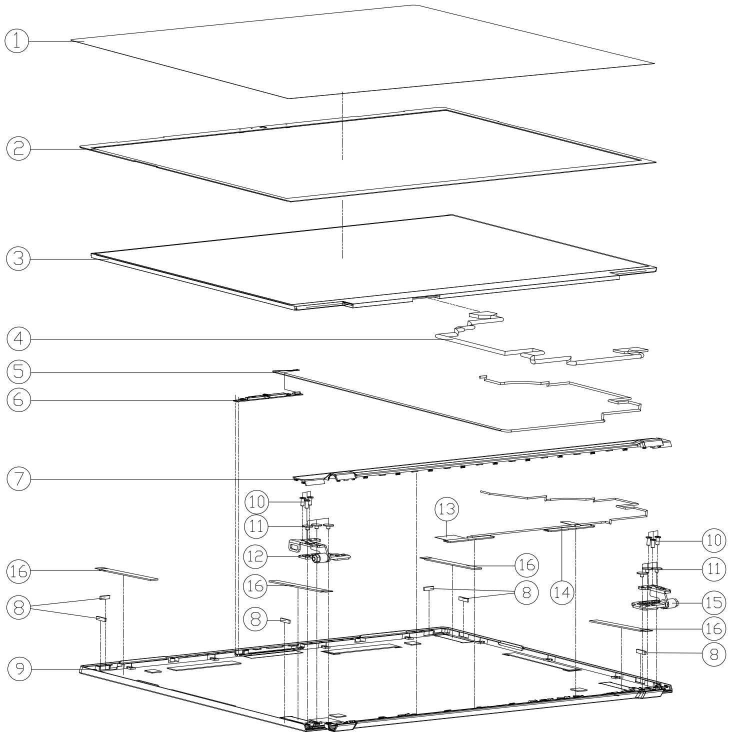
LCD (PC70HS/PC70HP/PC70HR)

Figure A - 4
LCD (PC70HS/ PC70HP/PC70HR)



ITEM	PART NAME	PART NO	REMARK
1	LCD PROTECT MYLAR BOPP NB70TJ1	6-40-NB708-010	
2	LCD FRONT COVER MYLAR PC70DS	6-40-PC7D1-010	
3	LCD N17.3" FHD/WVA/300HZ/SW G-SYNC/N7/NON GT/EDP AU B173HAN05.1 3.5MM	6-50-NBB35-G190	
3	LCD N17.3" FHD/WVA/144HZ/SW G-SYNC/N7/NON GT/EDP LG LP173WFG-SPB3 3.5MM	6-50-NBB35-L124	
3	LCD N17.3" UHD/WVA/SW G-SYNC/ADOBE 100%/NON GT/EDP AU B173ZAN03.0 (H/W:2A) 3.5MM	6-50-N1B35-G100	
3	LCD N17.3" QHD/WVA/165HZ/DDS G SYNC/DCI P3 100%/NON GT/EDP BOE NE173QHM-NY3 3.5MM	6-50-N6B35-Z220	
4	WIRE EDP CABLE FHD 400MM 19V 40PIN (HT/LW CON:LV03140-212-HF) PC70DN2	6-43-PC701-011-1N	
4	COAXIAL CABLE EDP 400MM 30V 40PIN (240HZ) (HT/LW CON: LV06130-224) PC70DN2	6-43-PC701-021-1N	
4	WIRE EDP CABLE DDS FHD 400MM 19V 40PIN (CMI/LW CON:LV03140-212) PC70DS	6-43-PC7D1-010-1N	
5	WIRE+FFC CABLE FOR CCD D-MIC 650MM 3.3V 8P TO 12P(HT) PC70DN2	6-43-PC70T-012-1	
6	UVC CAMERA BISON FIX(RGB) BNH419VXB-000 1M HD OV9734 N150ZU FWXXXX W/WHITE-LED W/2D-MIC(NARROW BORDER WITH FFC)	6-88-N15ZC-4900	OPTION
6	UVC CAMERA CHICONY FIX(RGB) C7FKH722100392OLH 1M HD W/2D-MIC 4.0*71.2 OV9734 N150ZU FW2739 W/WHITE-LED	6-88-N15ZC-5102	OPTION
7	LCD FRONT COVER MODULE PC70DS	6-39-PC7D1-012	
8	LCD RUBBER (9.5*2.5*1.2T) GARY P970EN	6-47-P97N1-030	
9	LCD BACK COVER MODULE PC70DN2	6-39-PC701-024	
10	.SCREW M2.5*6L K BZ ICT NY	6-35-82125-6RA	
11	SCREW M2.5*2.5L KI BK/Z ICT NY(Ø8,T=0.6)	6-35-B6125-2R5	
12	LCD HINGE L (MP1) (SK7+1144) PC70DN2	6-33-PC701-0L2	
13	ANTENNA IPEX4 WLAN WGT WL1 PCB DL 2.4G/5G/6GHZ WL1=450MM PC70DN2	6-23-7PC70-011	
14	ANTENNA IPEX4 WLAN WGT WL2 PCB DL 2.4G/5G/6GHZ WL2=300MM PC70DN2	6-23-7PC70-021	
15	LCD HINGE R (MP1) (SK7+1144) PC70DN2	6-33-PC701-0R2	
16	LALATAPE (75*10*0.3T)	6-47-0019A-K04	

LCD (PC70HS-D/PC70HP-D/PC70HR-D)



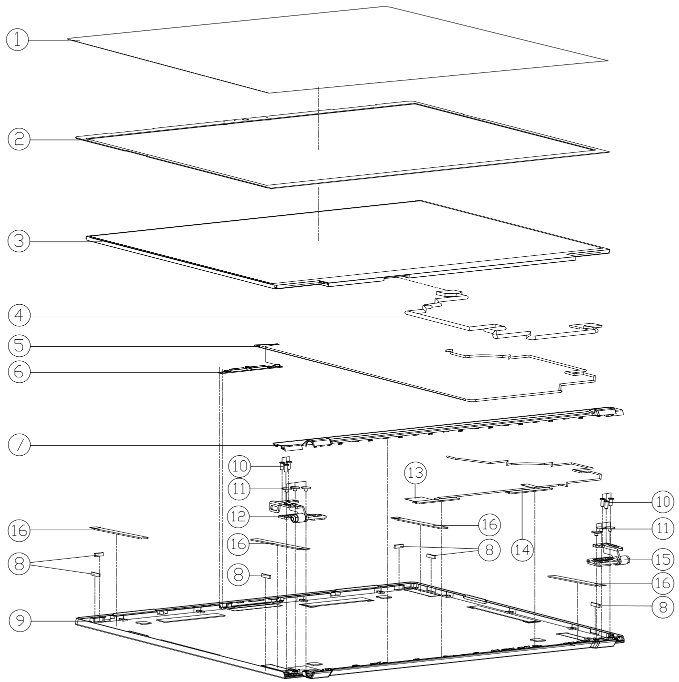
ITEM	PART NAME	PART NO	REMARK
1	LCD PROTECT MYLAR BOPP NB70TJ1	6-40-NB708-010	
2	LCD FRONT COVER MYLAR PC70DS	6-40-PC7D1-010	
3	LCD N17.3" FHD/WVA/144HZ/SW G-SYNC/N7/NON GT/EDP LG LP173WFG-SPB3 3.5MM	6-50-NBB35-L124	
3	LCD N17.3" UHD/WVA/SW G-SYNC/ADOBE 100%/NON GT/EDP AU B173ZAN03.0 (H/W:2A) 3.5MM	6-50-N1B35-G100	
4	WIRE EDP CABLE FHD 400MM 19V 40PIN (HT/LW CON:LV03140-212-HF) PC70DN2	6-43-PC701-011-1N	
5	WIRE+FFC CABLE FOR CCD D-MIC 650MM 3.3V 8P TO 12P(HT) PC70DN2	6-43-PC70T-012-1	
6	UVC CAMERA BISON FIX(RGB) BNH419VXB-000 1M HD OV9734 N150ZU FWXXXX W/WHITE-LED W/2D-MIC(NARROW BORDER WITH FFC)	6-88-N15ZC-4900	OPTION
6	UVC CAMERA CHICONY FIX(RGB) C7FKH7221003920LH 1M HD W/2D-MIC 4.0*71.2 OV9734 N150ZU FW2739 W/WHITE-LED	6-88-N15ZC-5102	OPTION
7	LCD FRONT COVER MODULE PC70DS	6-39-PC7D1-012	
8	LCD RUBBER (9.5*2.5*1.2T) GARY P970EN	6-47-P97N1-030	
9	LCD BACK COVER MODULE PC70DN2	6-39-PC701-024	
10	.SCREW M2.5*6L K BZ ICT NY	6-35-82125-6RA	
11	SCREW M2.5*2.5L KI BK/Z ICT NY(Ø8,T=0.6)	6-35-B6125-2R5	
12	LCD HINGE L (MP1) (SK7+1144) PC70DN2	6-33-PC701-0L2	
13	ANTENNA IPEX4 WLAN WGT WL1 PCB DL 2.4G/5G/6GHZ WL1=450MM PC70DN2	6-23-7PC70-011	
14	ANTENNA IPEX4 WLAN WGT WL2 PCB DL 2.4G/5G/6GHZ WL2=300MM PC70DN2	6-23-7PC70-021	
15	LCD HINGE R (MP1) (SK7+1144) PC70DN2	6-33-PC701-0R2	
16	LALATAPE (75*10*0.3T)	6-47-0019A-K04	

Figure A - 5
LCD (PC70HS-D/ PC70HP-D/ PC70HR-D)

A.Part Lists

LCD (PC70HS-G/PC70HP-G/PC70HR-G)

Figure A - 6
LCD (PC70HS-G/ PC70HP-G/ PC70HR-G)



ITEM	PART NAME	PART NO	REMARK
1	LCD PROTECT MYLAR BOPP NB70TJ1	6-40-NB708-010	
2	LCD FRONT COVER MYLAR PC70DS	6-40-PC7D1-010	
3	LCD N17.3" QHD/WVA/165HZ/DDS G SYNC/DCI P3 100%/NON GT/EDP BOE NE173QHM-NY3 3.5MM	6-50-N6B35-Z220	
4	WIRE EDP CABLE DDS FHD 400MM 19V 40PIN (CMI/LW CON:LV03140-212) PC70DS	6-43-PC7D1-010-1N	
5	WIRE+FFC CABLE FOR CCD D-MIC 650MM 3.3V 8P TO 12P(HT) PC70DN2	6-43-PC70T-012-1	
6	UVC CAMERA BISON FIX(RGB) BNH419VXB-000 1M HD OV9734 N150ZU FWXXXX W/WHITE-LED W/2D-MIC(NARROW BORDER WITH FFC)	6-88-N15ZC-4900	OPTION
6	UVC CAMERA CHICONY FIX(RGB) C7FKH7221003920LH 1M HD W/2D-MIC 4.0*71.2 OV9734 N150ZU FW2739 W/WHITE-LED	6-88-N15ZC-5102	OPTION
7	LCD FRONT COVER MODULE PC70DS	6-39-PC7D1-012	
8	LCD RUBBER (9.5*2.5*1.2T) GARY P970EN	6-47-P97N1-030	
9	LCD BACK COVER MODULE PC70DN2	6-39-PC701-024	
10	.SCREW M2.5*6L K BZ ICT NY	6-35-82125-6RA	
11	SCREW M2.5*2.5L KI BK/Z ICT NY(Ø8,T=0.6)	6-35-B6125-2R5	
12	LCD HINGE L (MP1) (SK7+1144) PC70DN2	6-33-PC701-0L2	
13	ANTENNA IPEX4 WLAN WGT WL1 PCB DL 2.4G/5G/6GHZ WL1=450MM PC70DN2	6-23-7PC70-011	
14	ANTENNA IPEX4 WLAN WGT WL2 PCB DL 2.4G/5G/6GHZ WL2=300MM PC70DN2	6-23-7PC70-021	
15	LCD HINGE R (MP1) (SK7+1144) PC70DN2	6-33-PC701-0R2	
16	LALATAPE (75*10*0.3T)	6-47-0019A-K04	

Appendix B: Schematic Diagrams

This appendix has circuit diagrams of the ***PC70HS(-G) / PC70HR(-G) / PC70HP(-G)*** notebook's PCB's. The following table indicates where to find the appropriate schematic diagram.

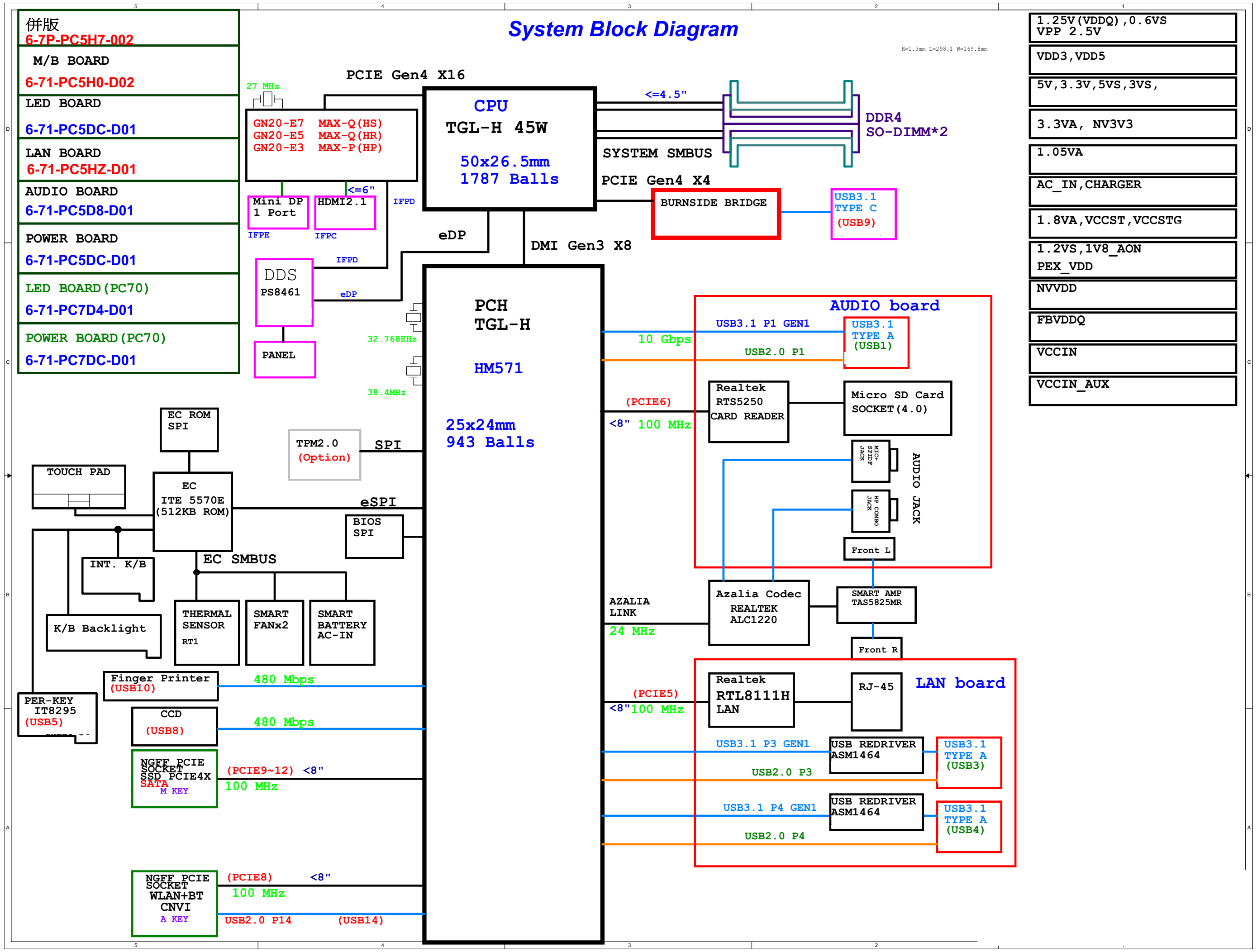
Table B - 1
SCHEMATIC DIAGRAMS

Version Note

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

System Block Diagram

Sheet 1 of 79
System Block
Diagram



Processor 1/6

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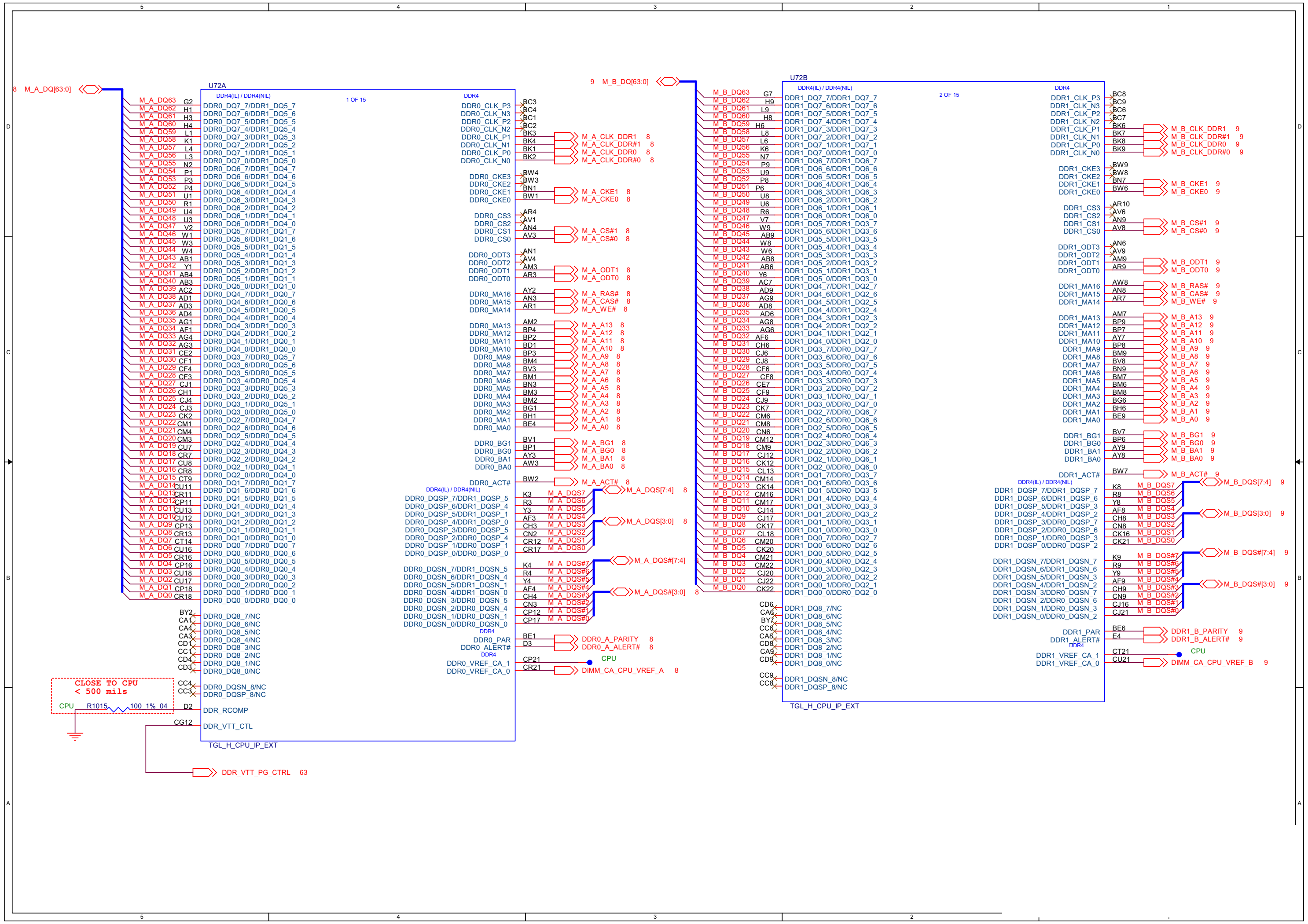
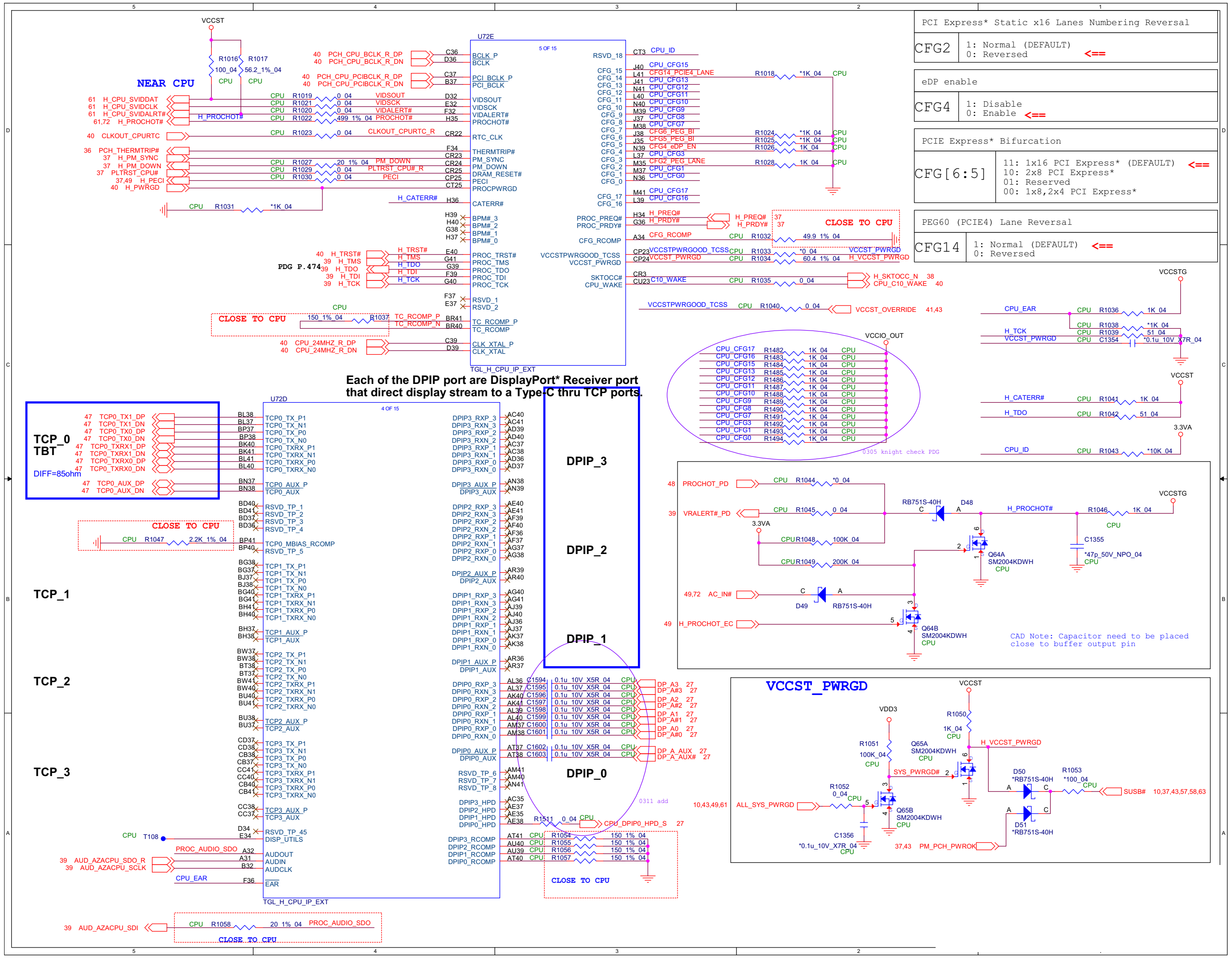
Processor 1/6

Processor 2/6

Sheet 3 of 79
Processor 2/6



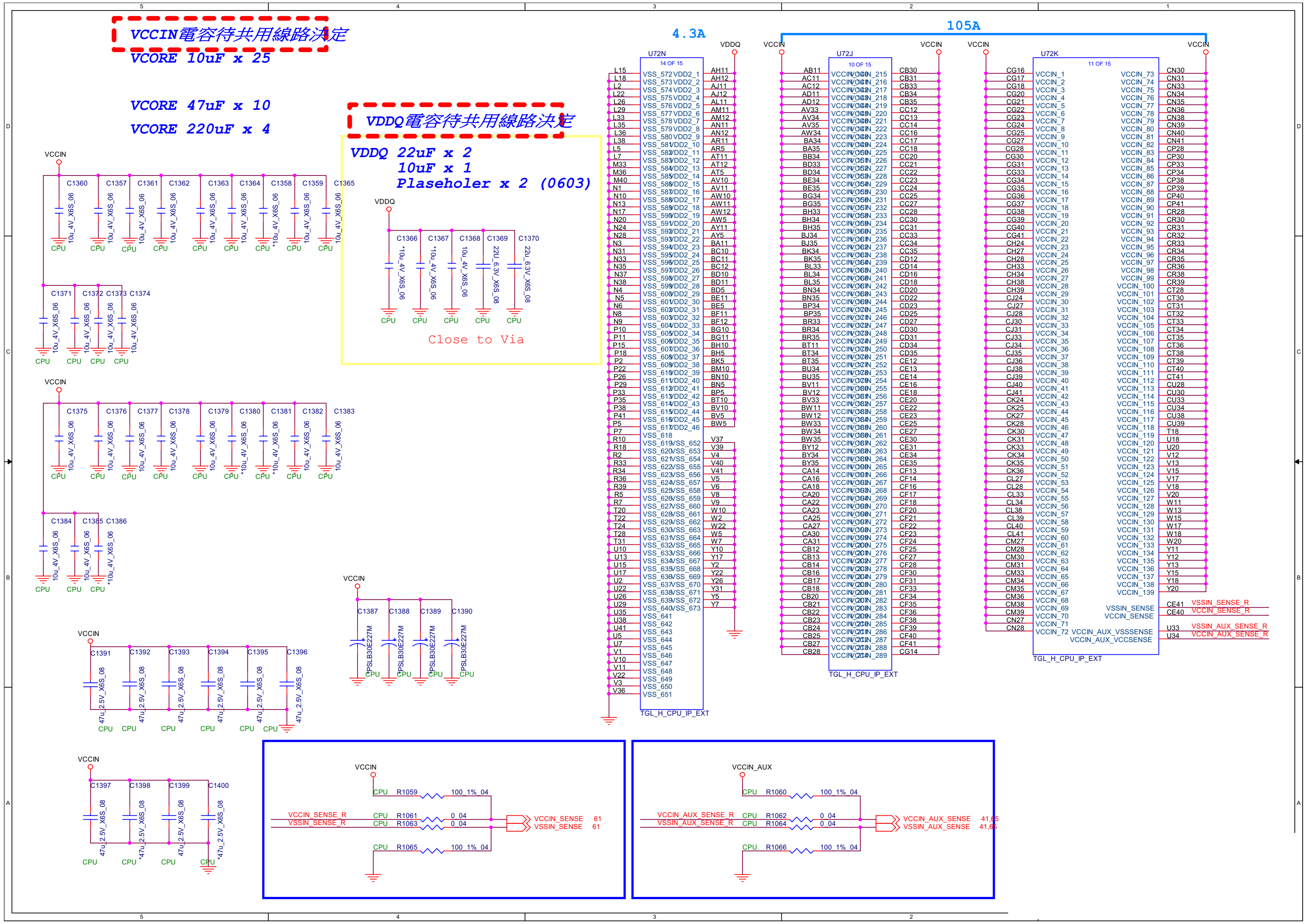
Processor 3/6



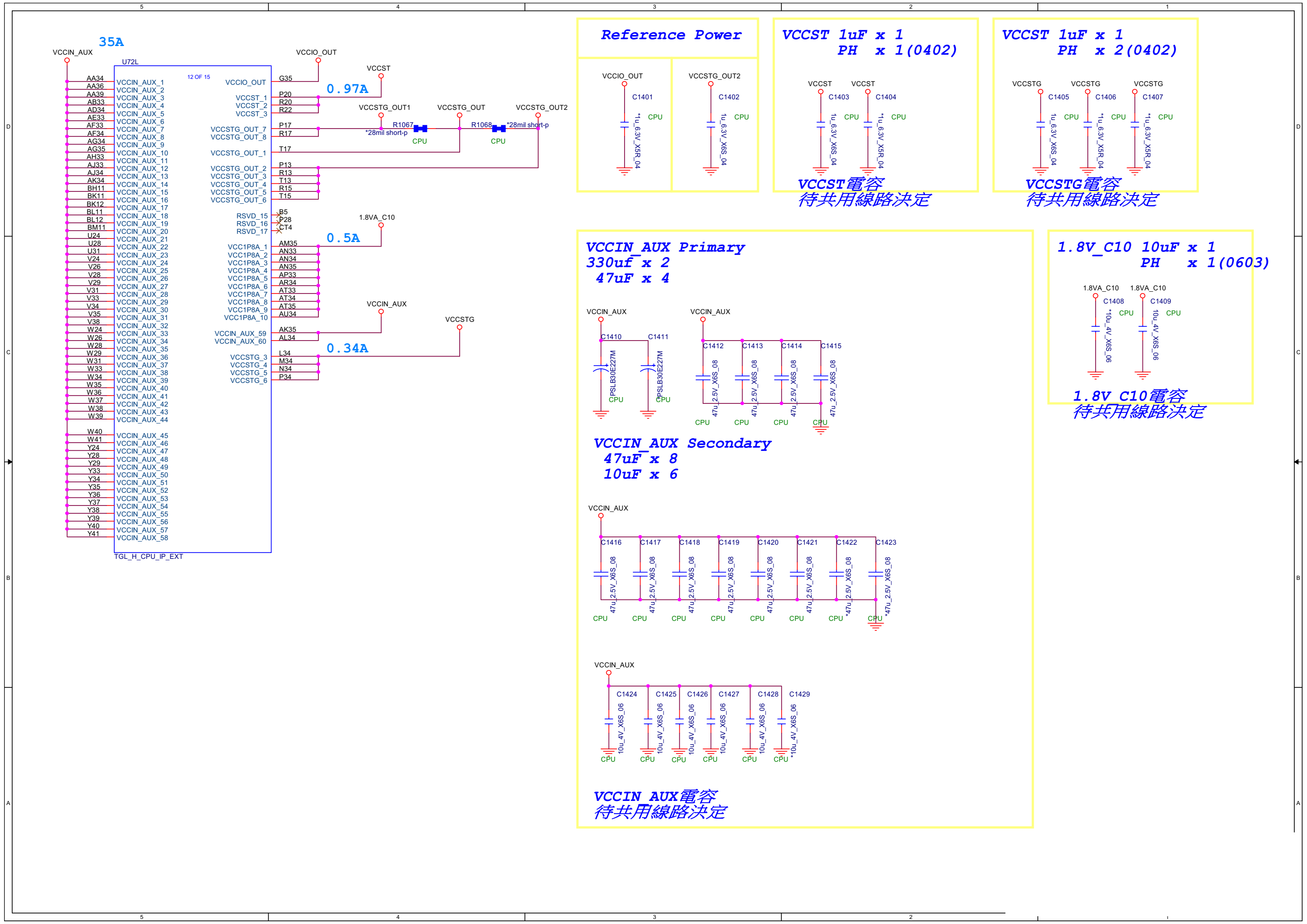
Sheet 4 of 79
Processor 3/6

Processor 4/6

Sheet 5 of 79
Processor 4/6



Processor 5/6



Sheet 6 of 79
Processor 5/6

B.Schematic Diagrams

Processor 6/6

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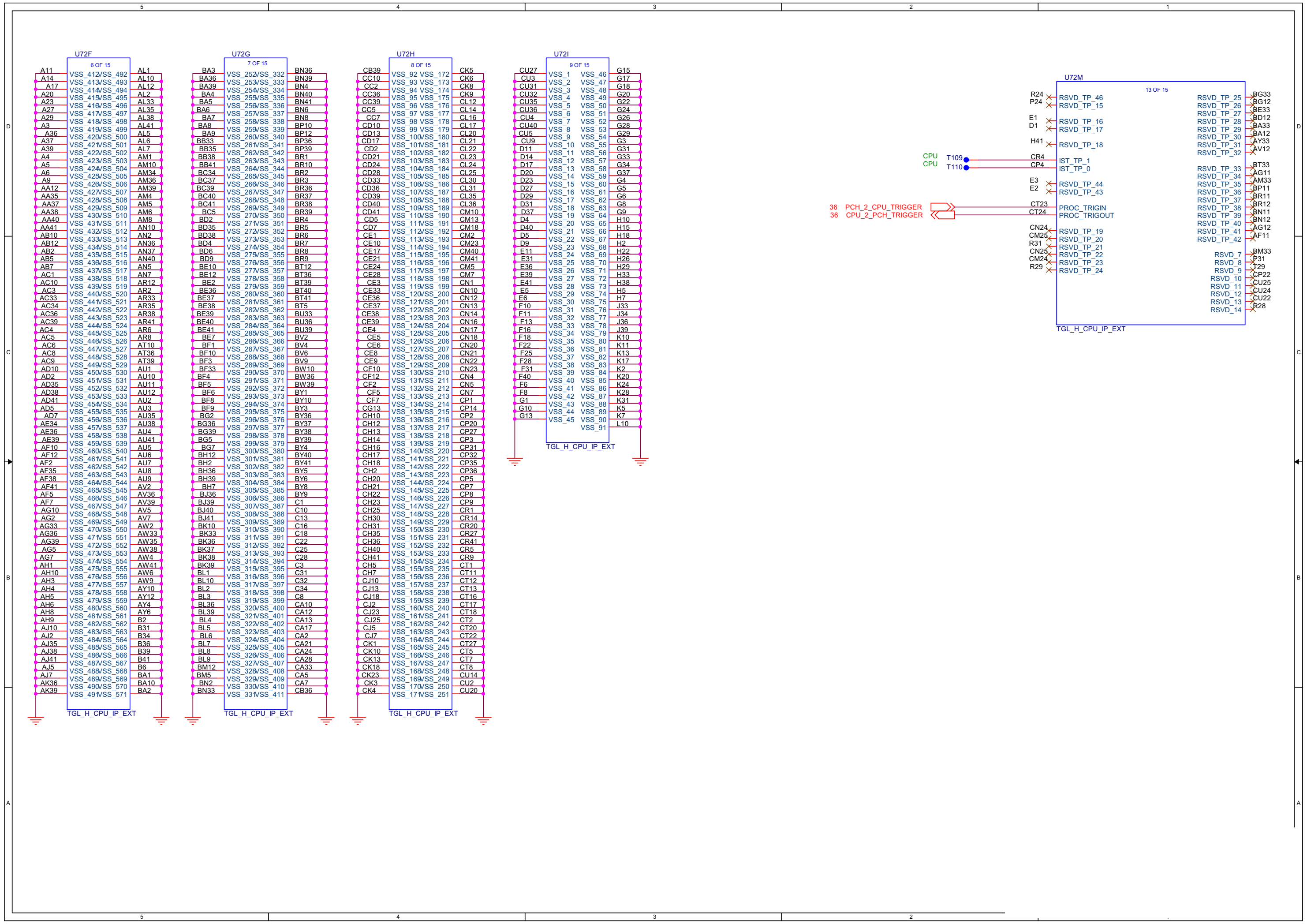
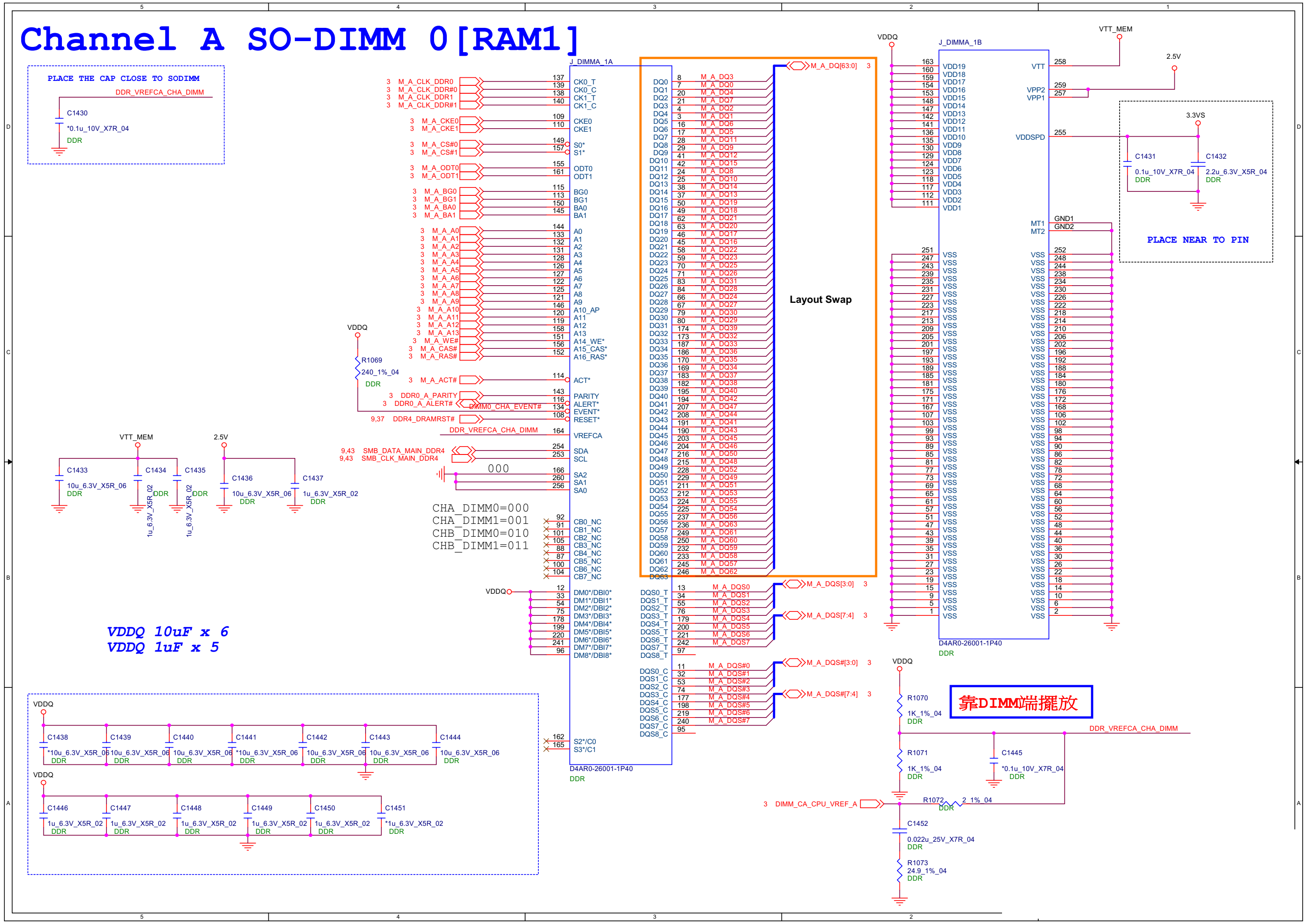
Processor 6/6



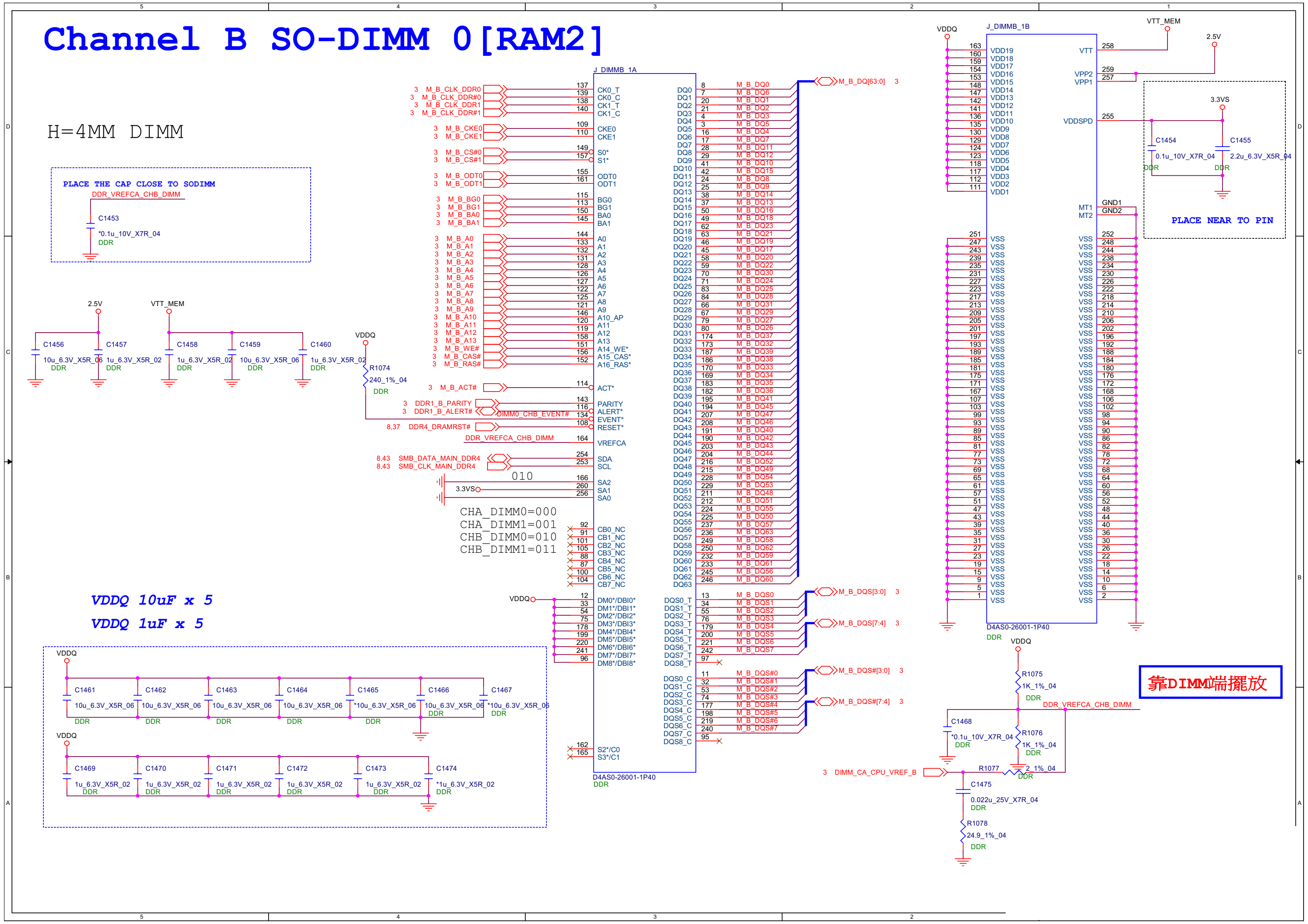
DDR4 CHA SO-DIMM_0



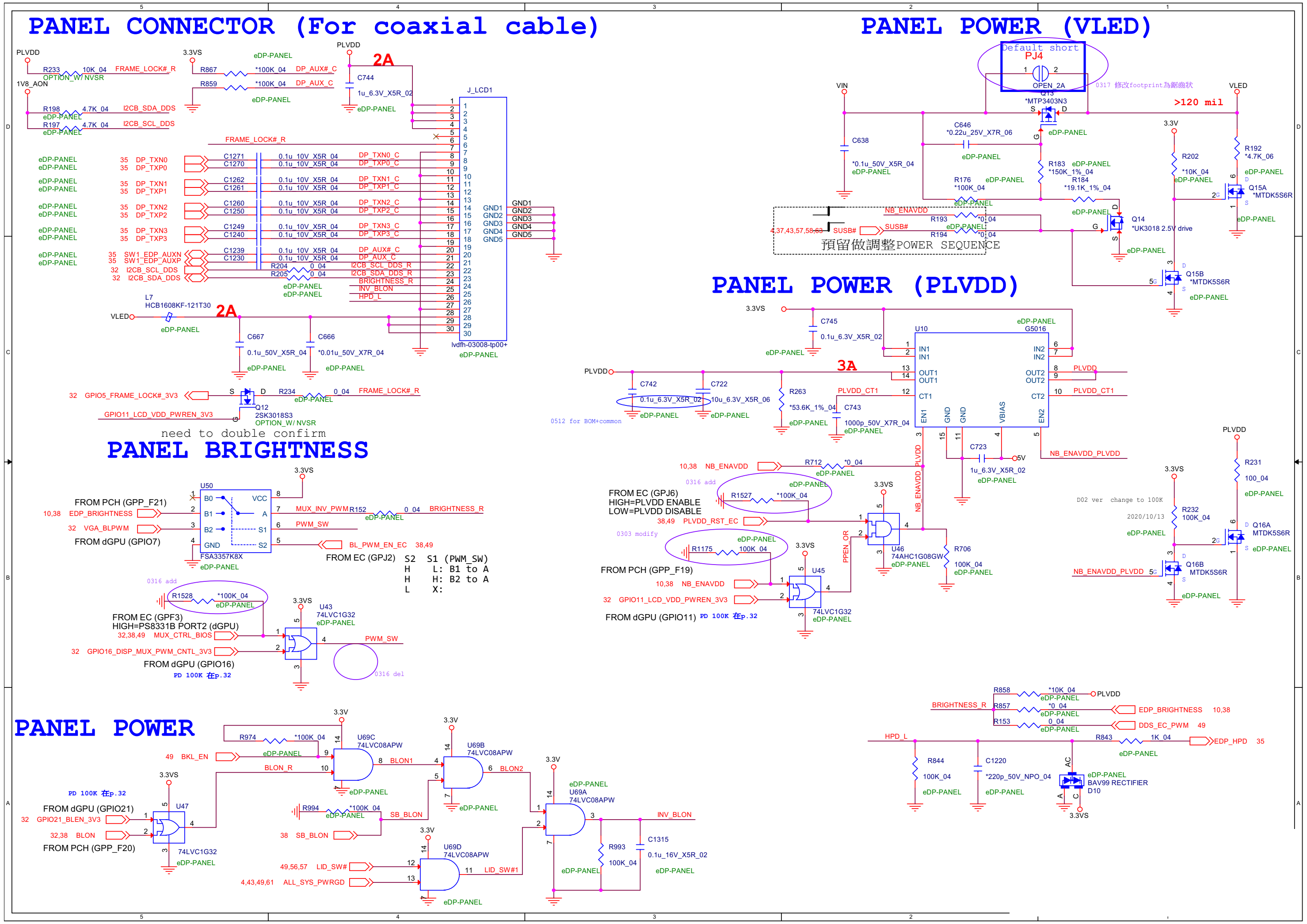
Sheet 8 of 79
DDR4 CHA SO-DIMM_0

DDR4 CHB SO-DIMM_0

Sheet 9 of 79
DDR4 CHB SO-DIMM_0



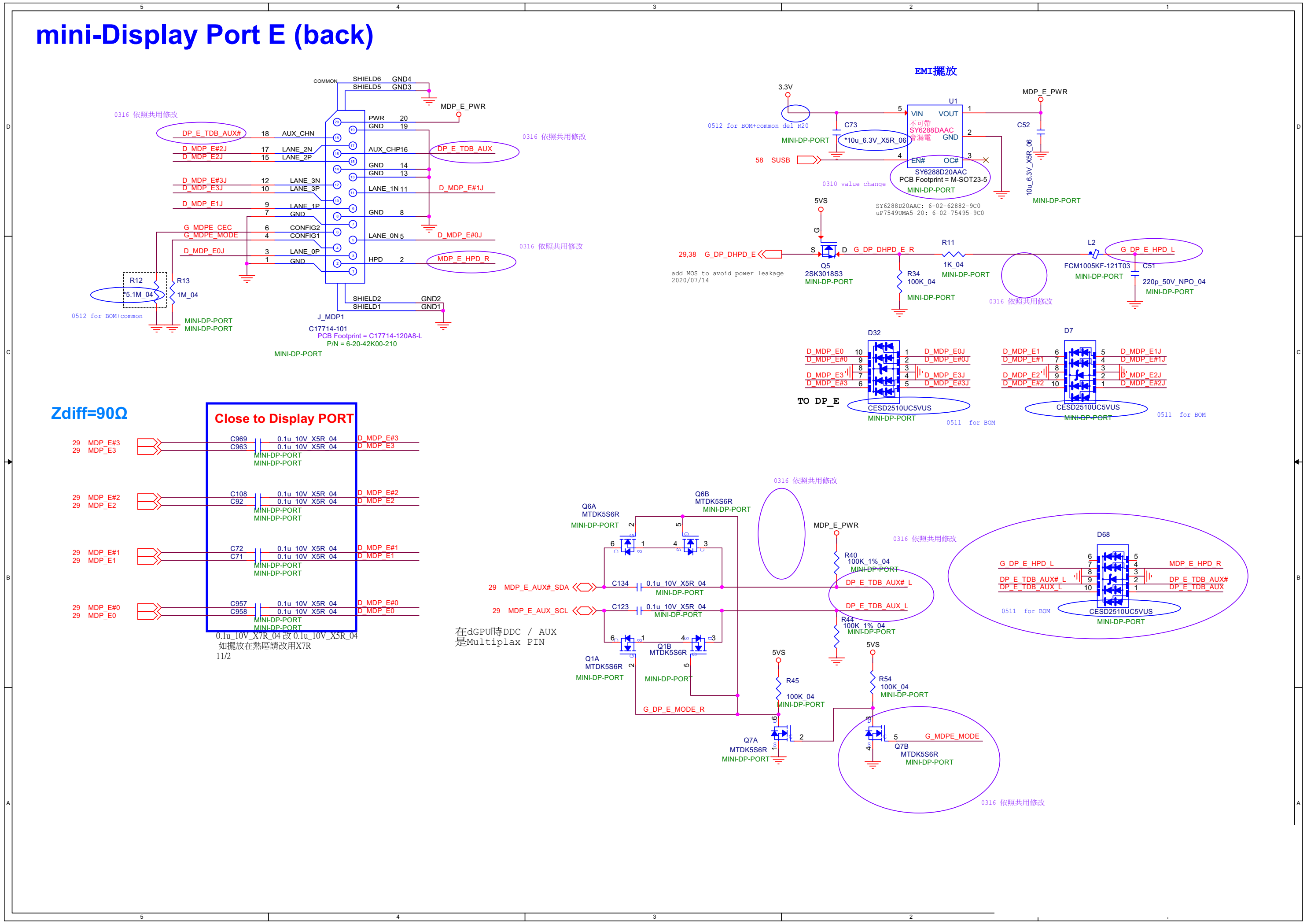
Panel, Inverter



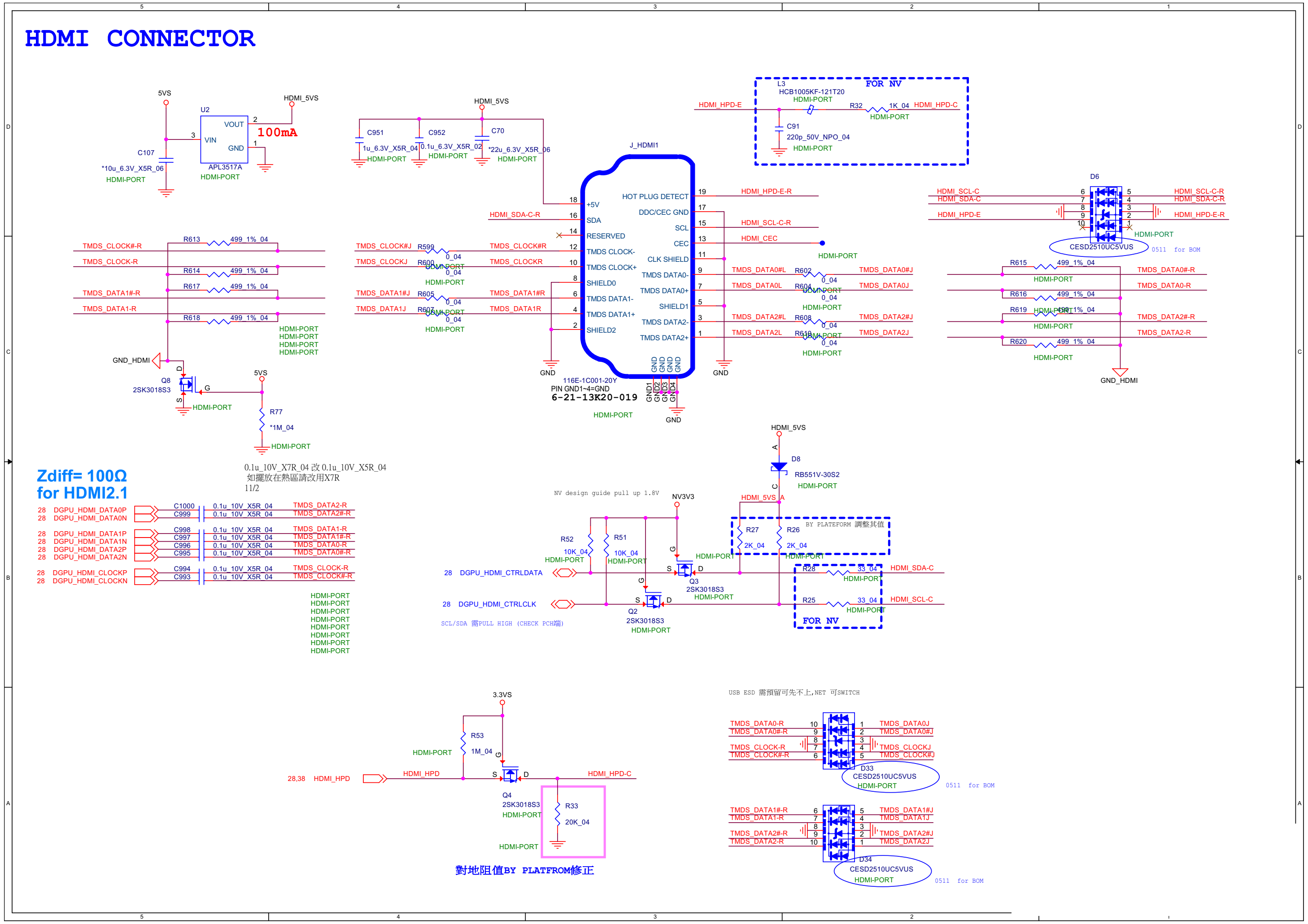
Sheet 10 of 79
Panel, Inverter

Mini DP Port

Sheet 11 of 79
Mini DP Port



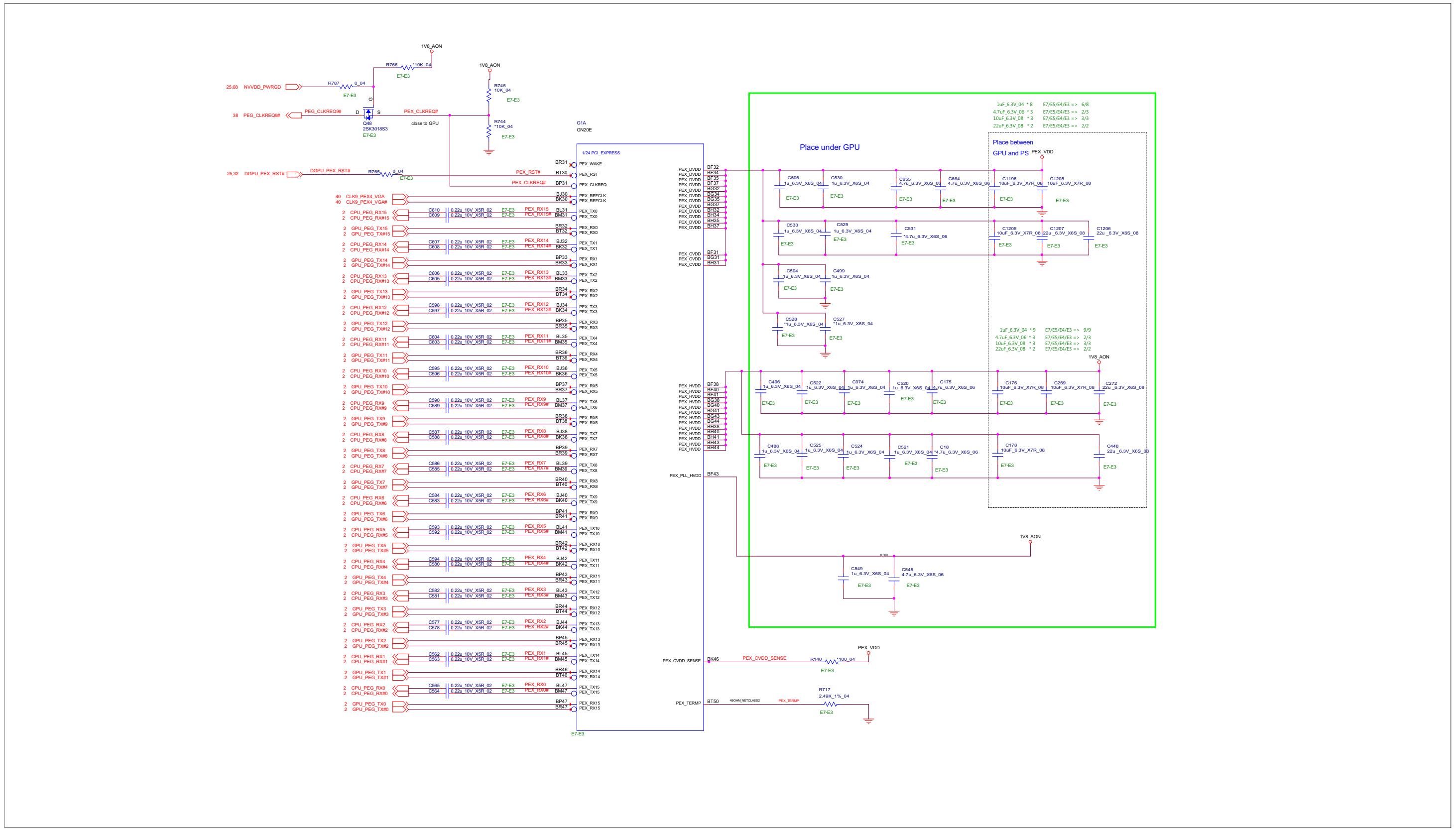
HDMI



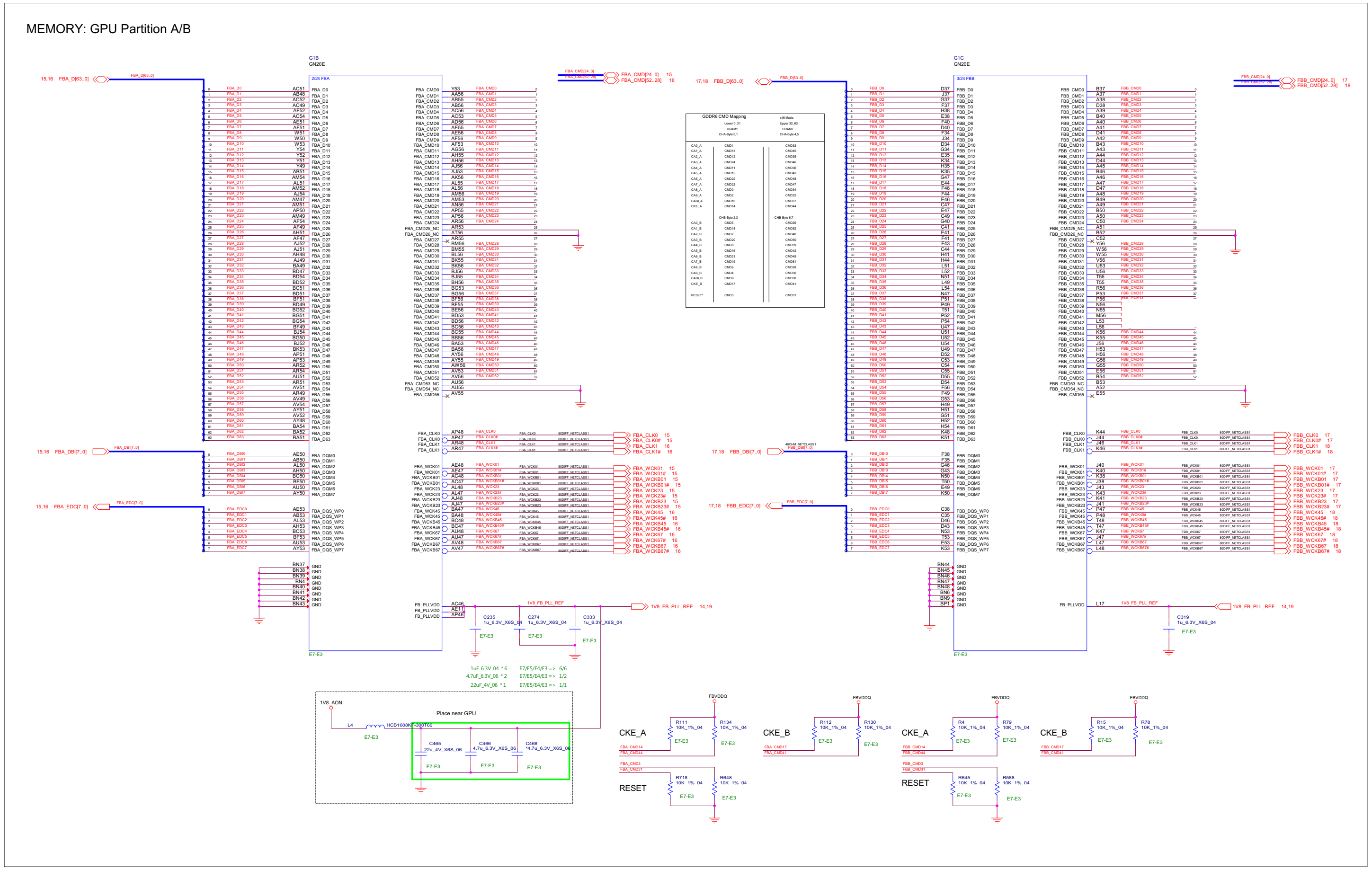
Sheet 12 of 79
HDMI

PCI Express

Sheet 13 of 79
PCI Express



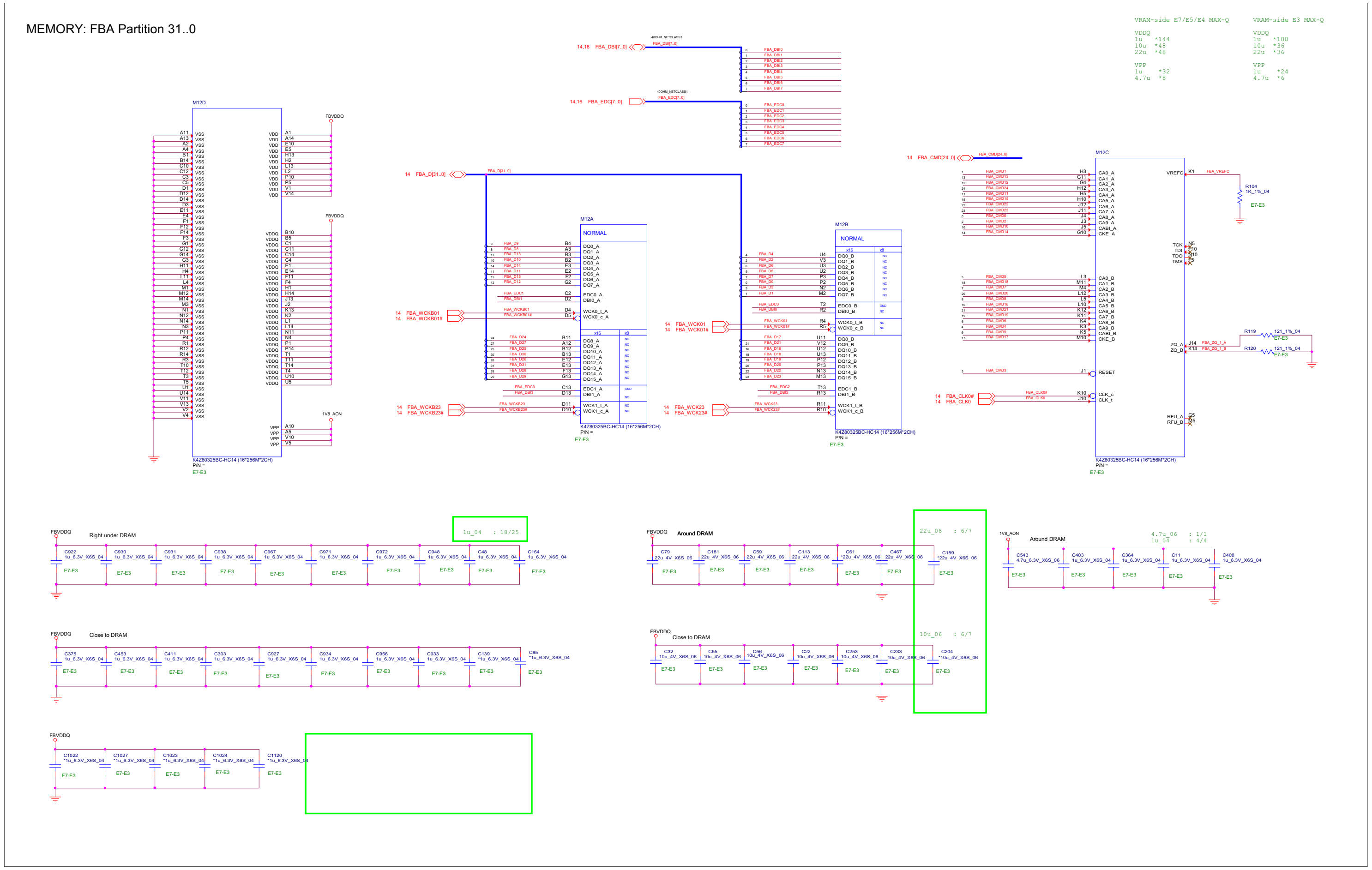
GPU Frame Buffer Partition A_B



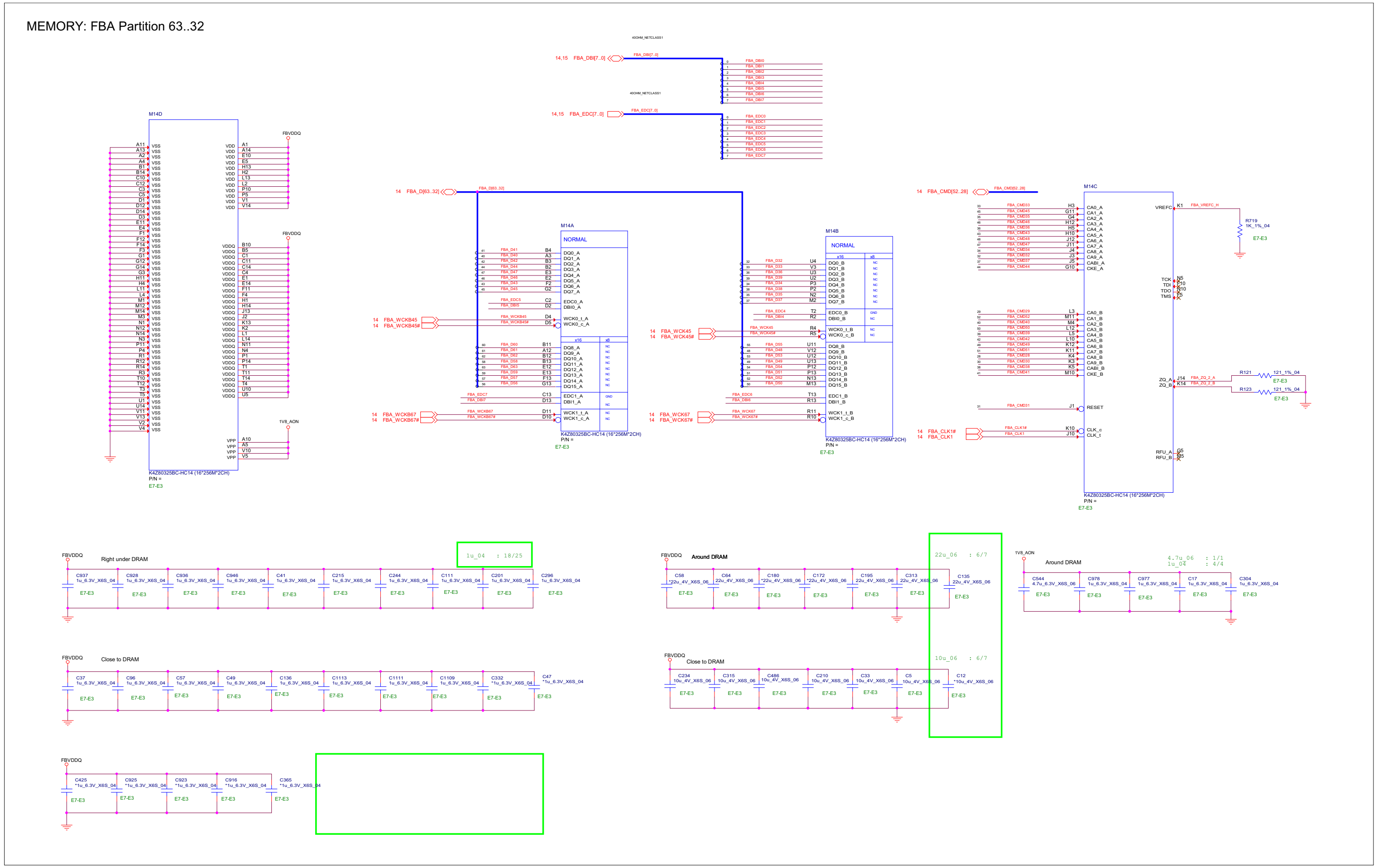
Sheet 14 of 79
GPU Frame Buffer
Partition A_B

Frame Buffer Partition A

Sheet 15 of 79
Frame Buffer
Partition A



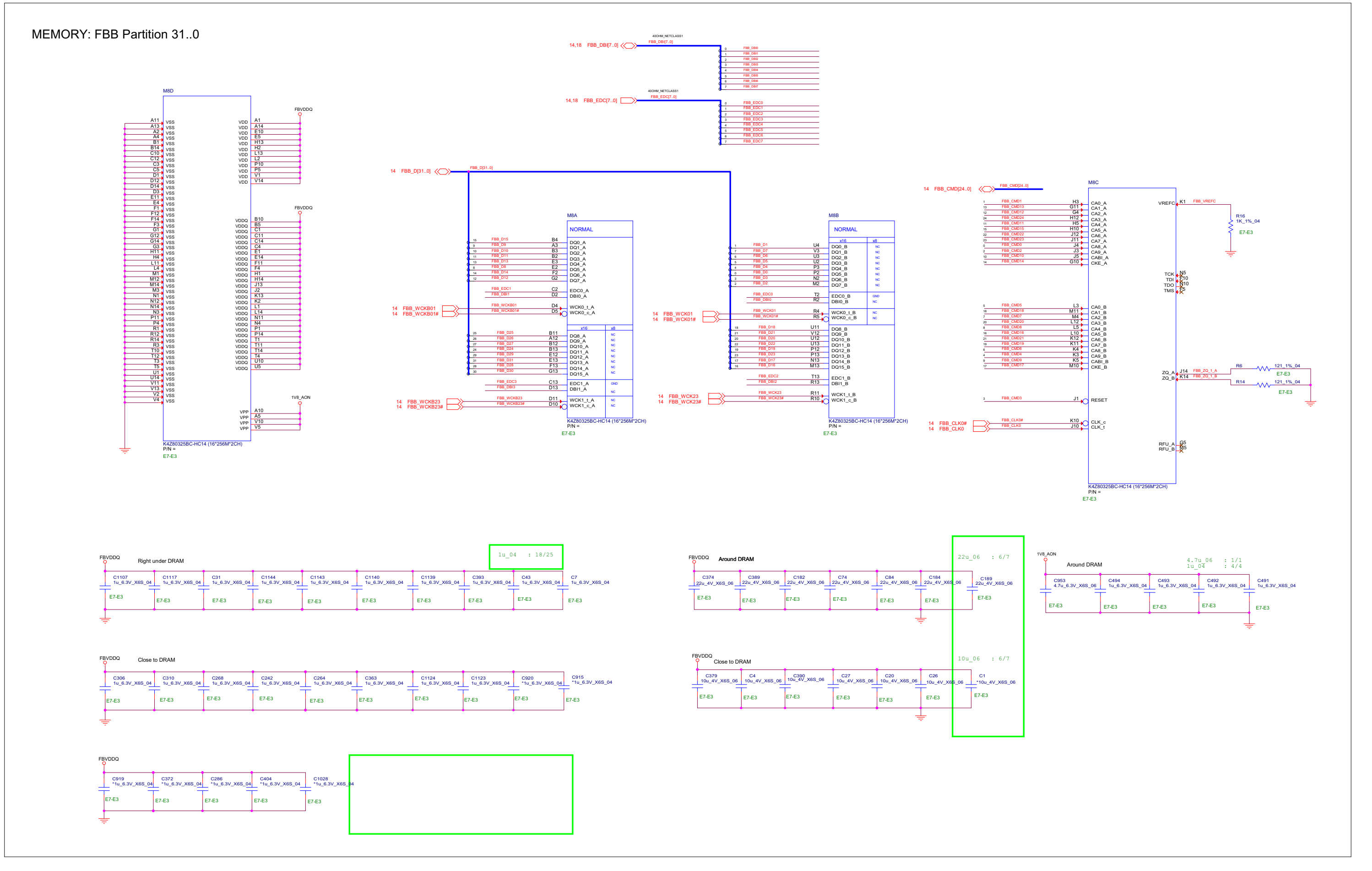
Frame Buffer Partition A



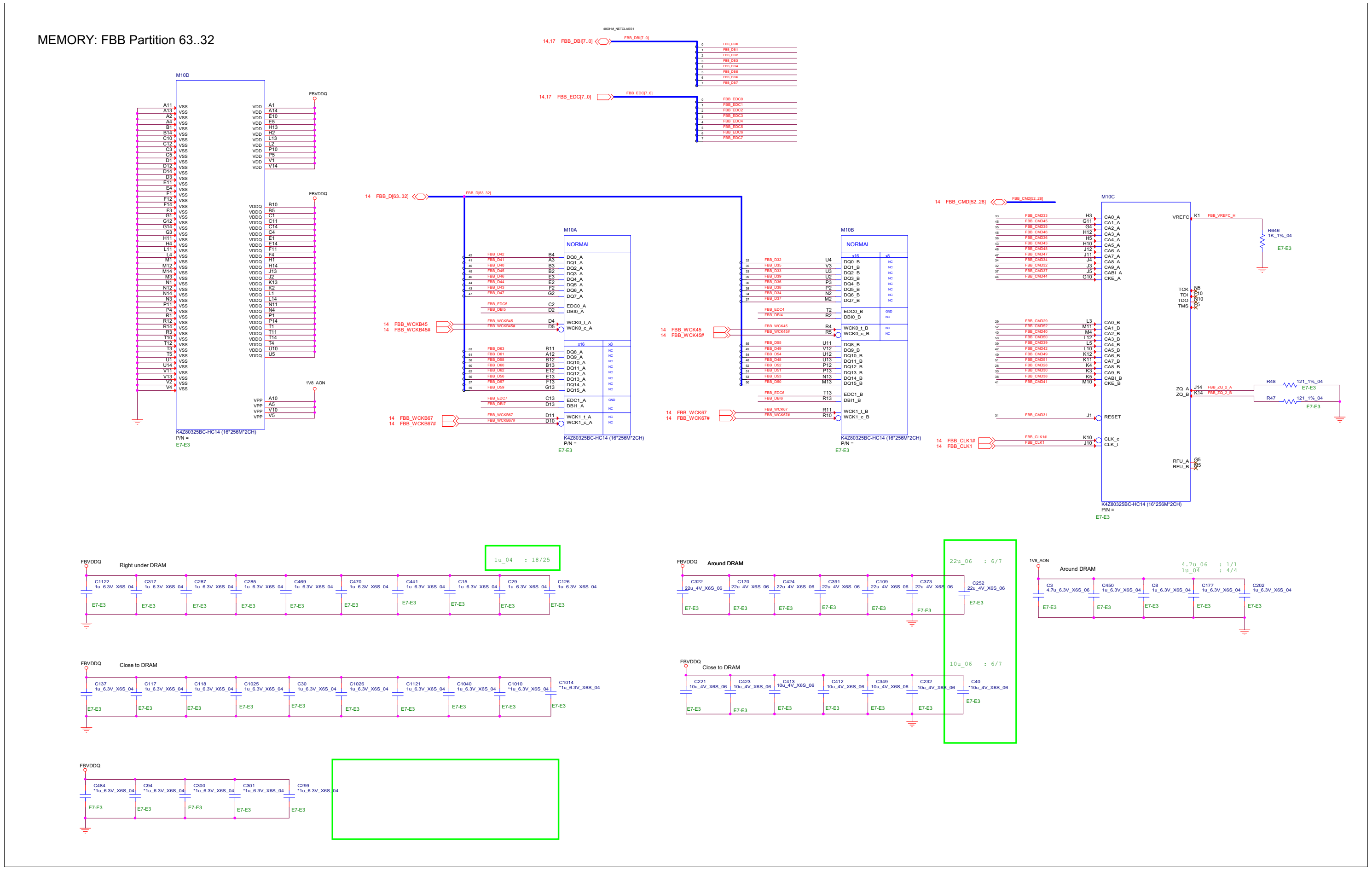
Sheet 16 of 79
Frame Buffer
Partition A

Frame Buffer Partition B

Sheet 17 of 79
Frame Buffer
Partition B



Frame Buffer Partition B



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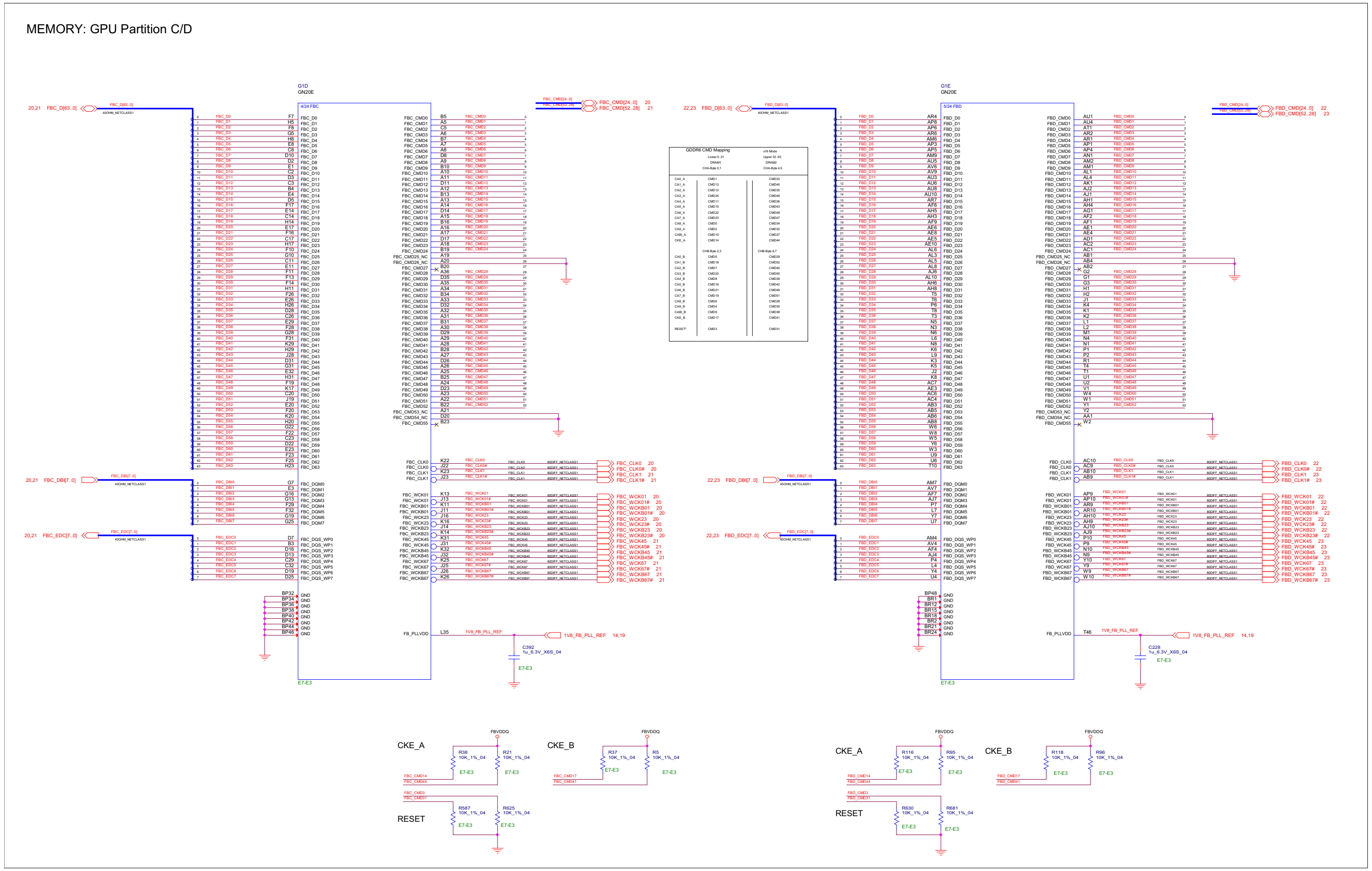
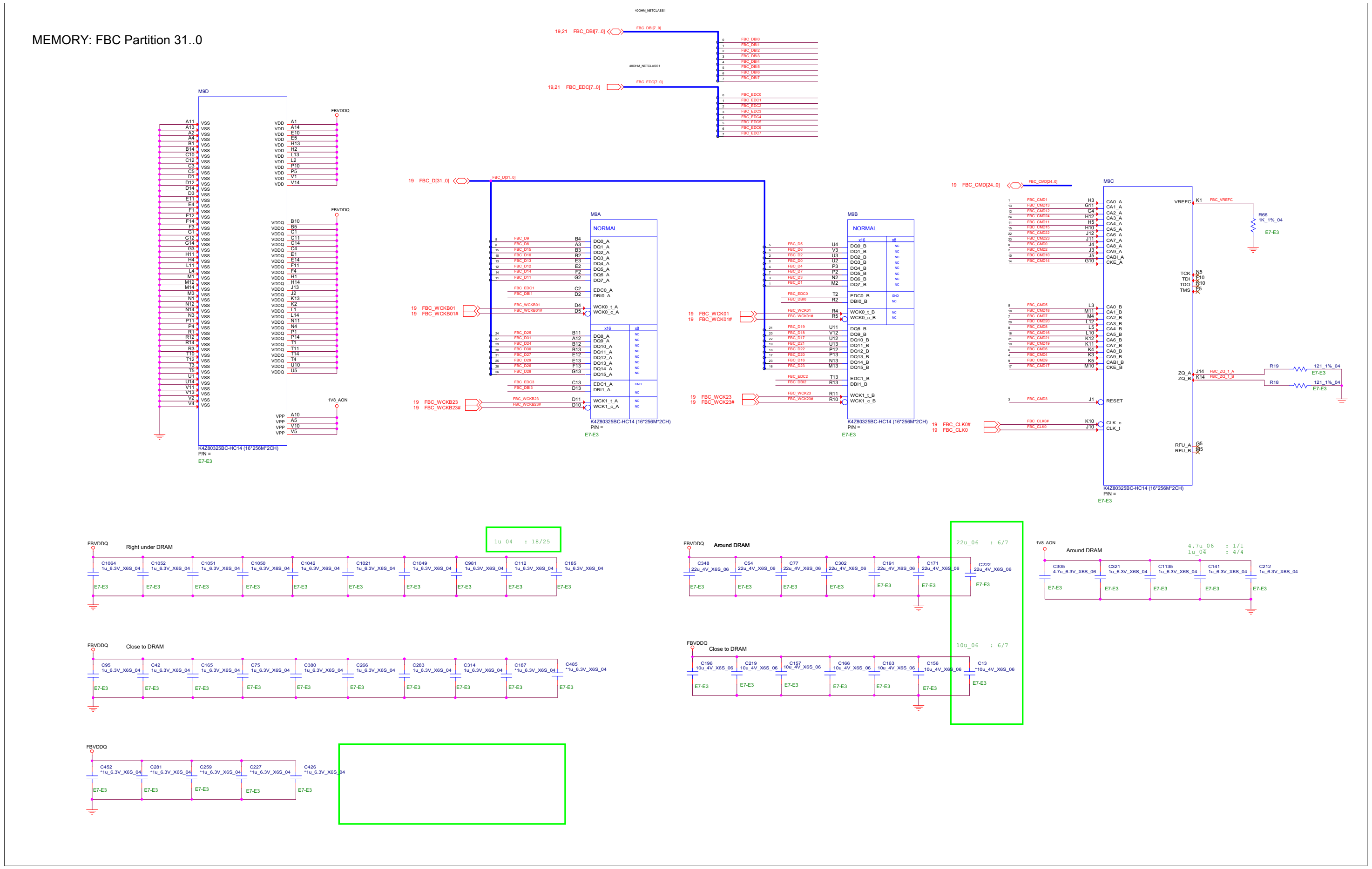
Frame Buffer
Partition B

GPU Frame Buffer Partition C_D



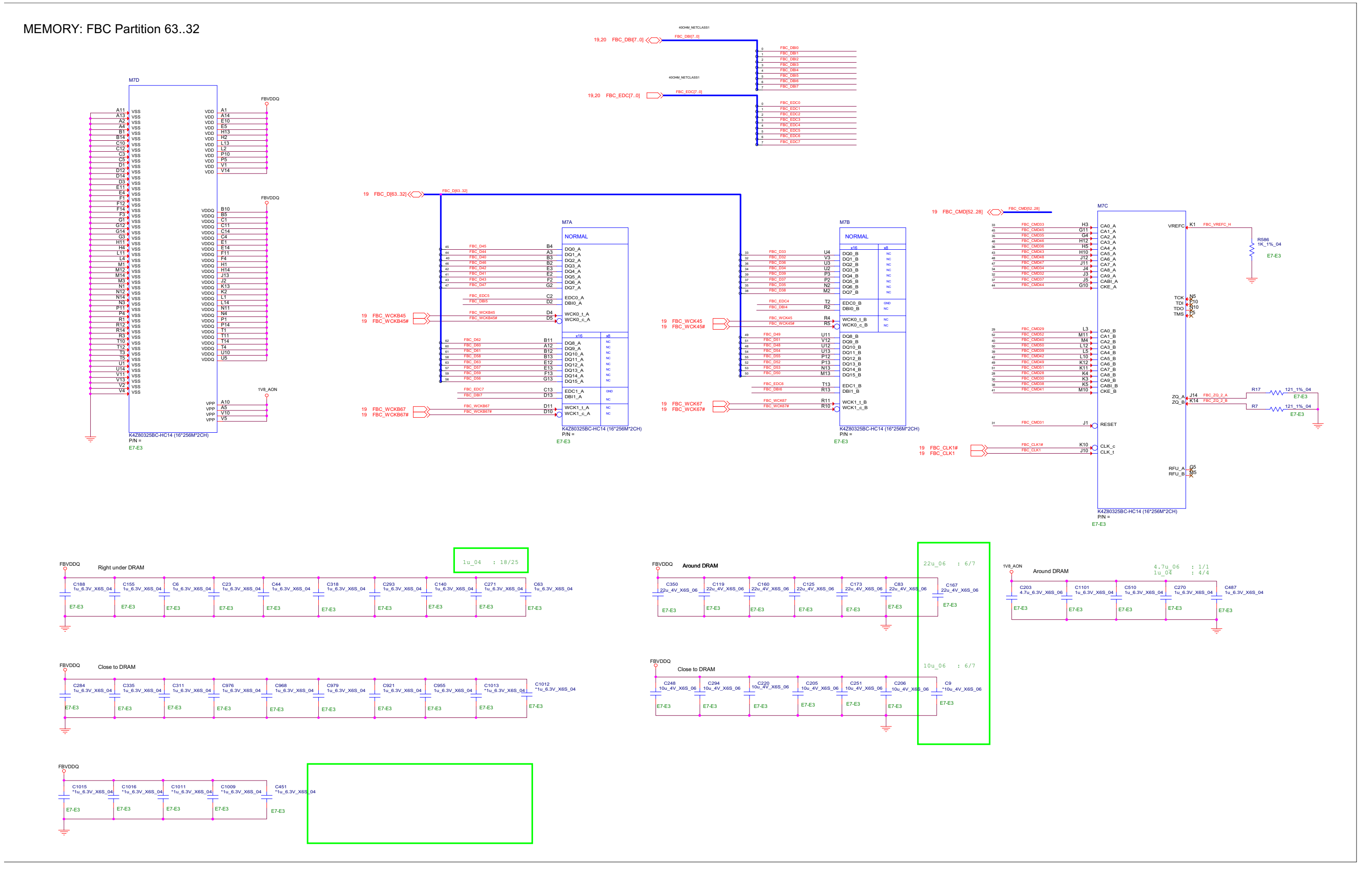
Sheet 19 of 79
GPU Frame Buffer
Partition C_D

Frame Buffer Partition C



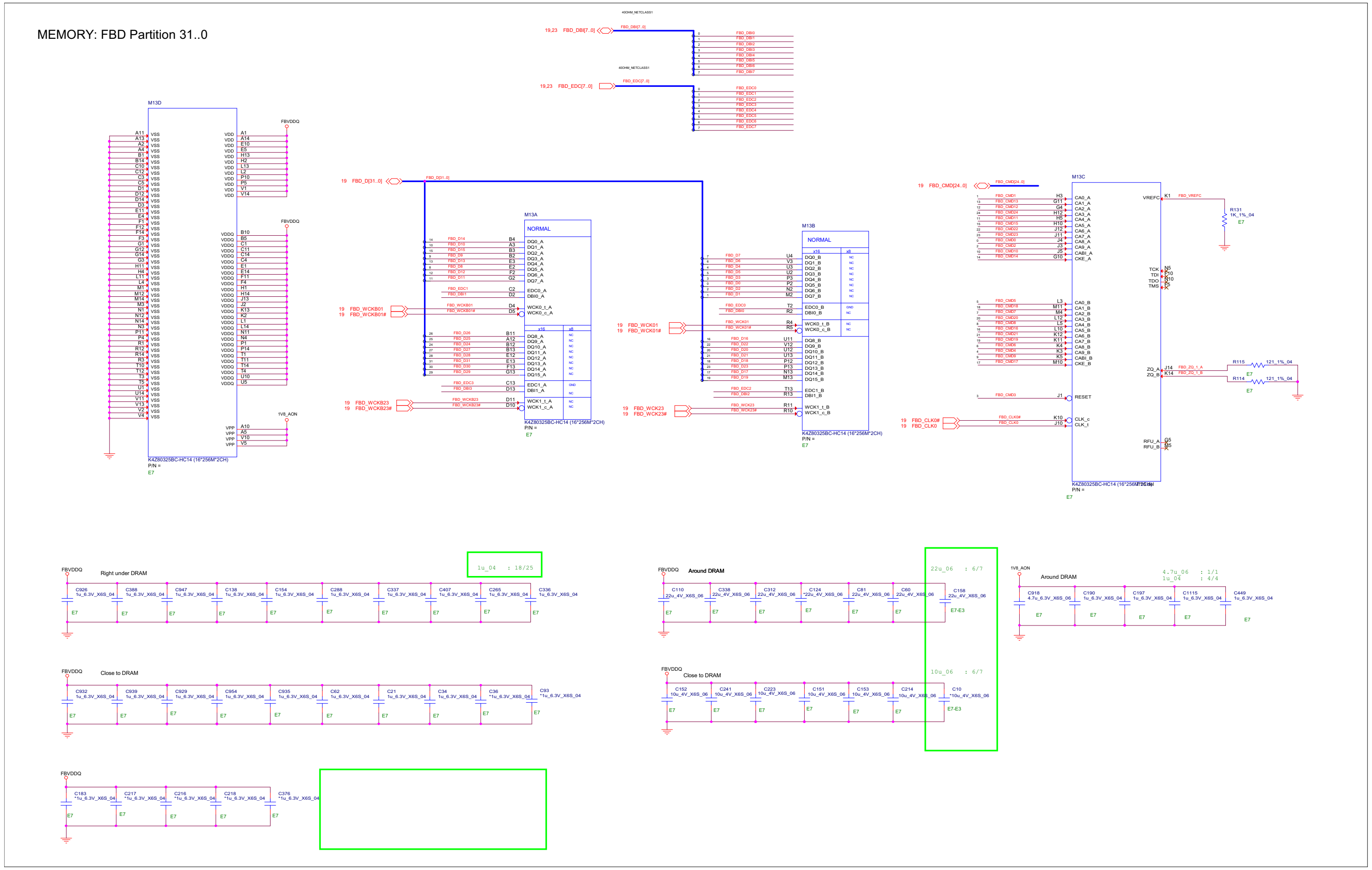
Sheet 20 of 79
Frame Buffer
Partition C

Frame Buffer Partition C



Sheet 21 of 79
Frame Buffer
Partition C

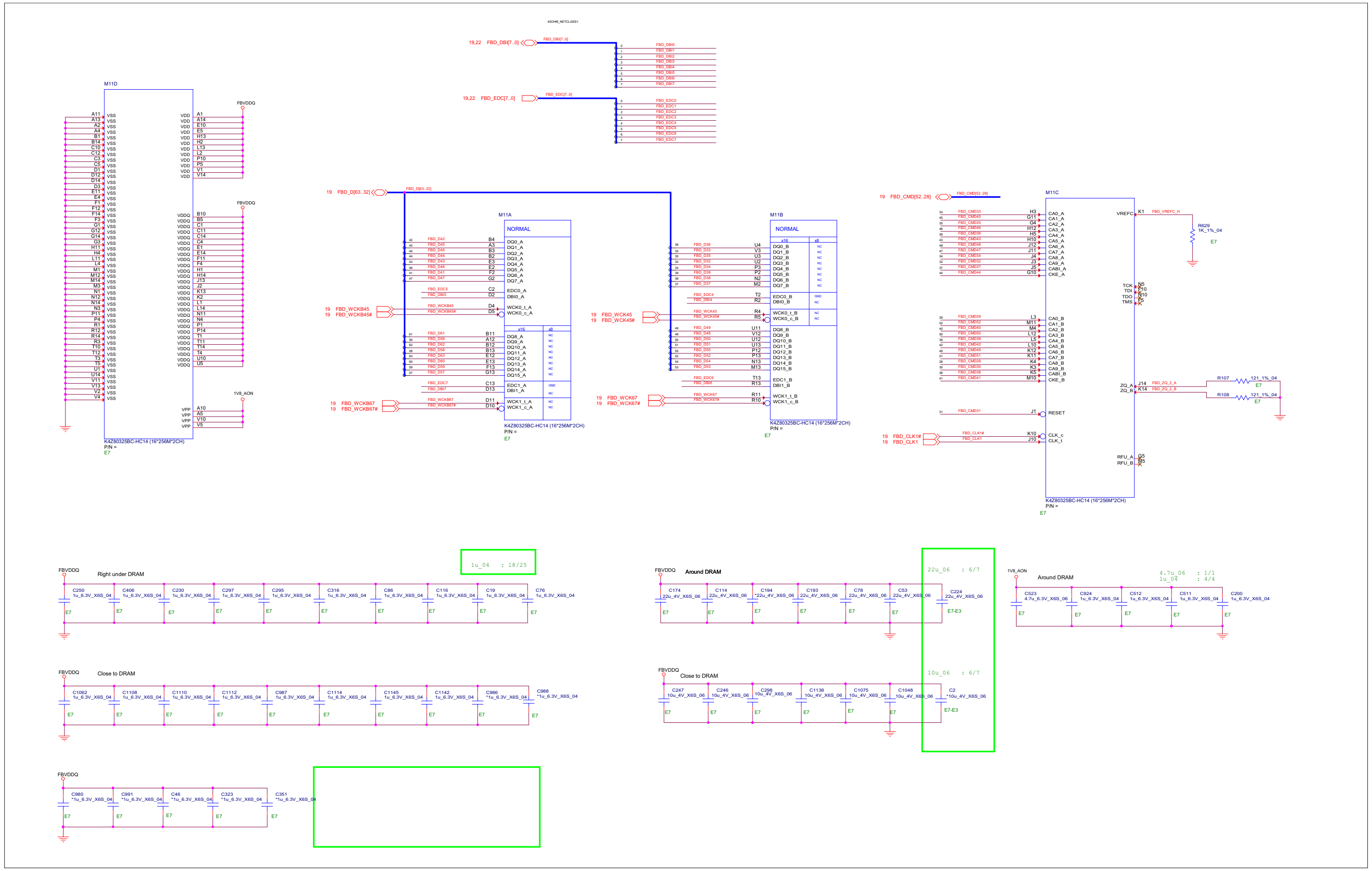
Frame Buffer Partition D



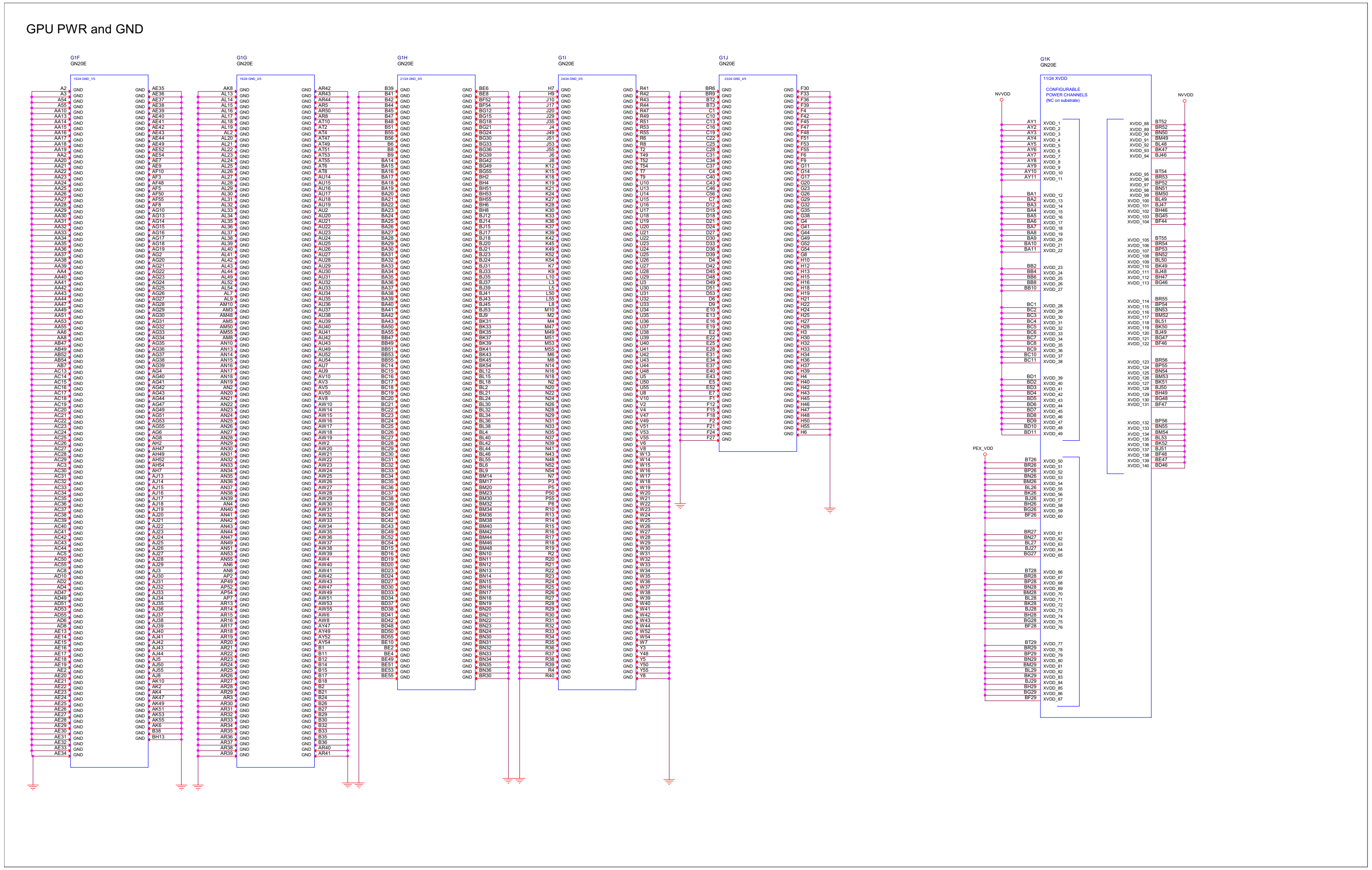
Sheet 22 of 79
Frame Buffer
Partition D

Frame Buffer Partition D

Sheet 23 of 79
Frame Buffer
Partition D



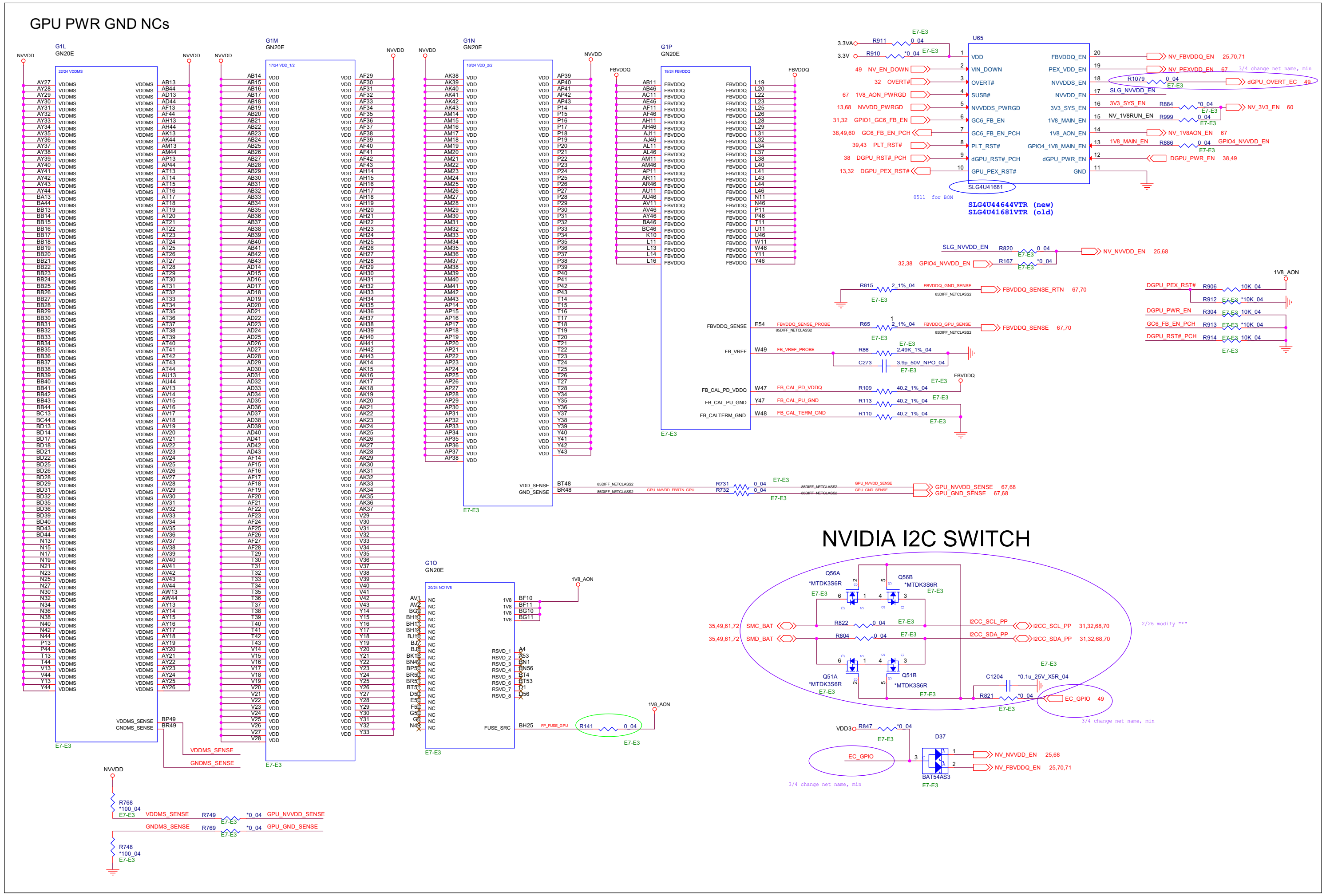
GPU PWR & GND



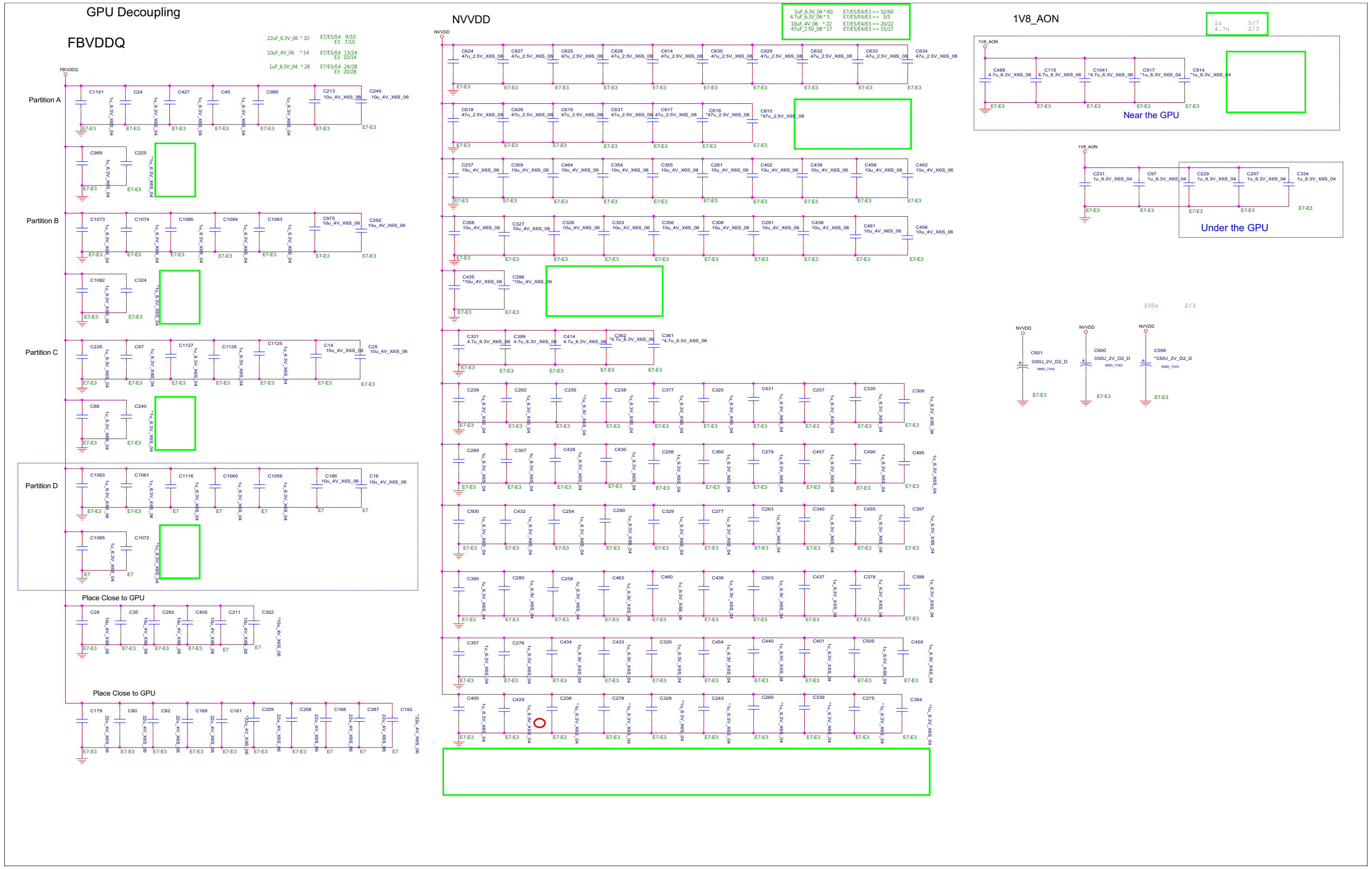
Sheet 24 of 79
GPU PWR & GND

GPU PWR & GND

Sheet 25 of 79
GPU PWR & GND



GPU Decoupling



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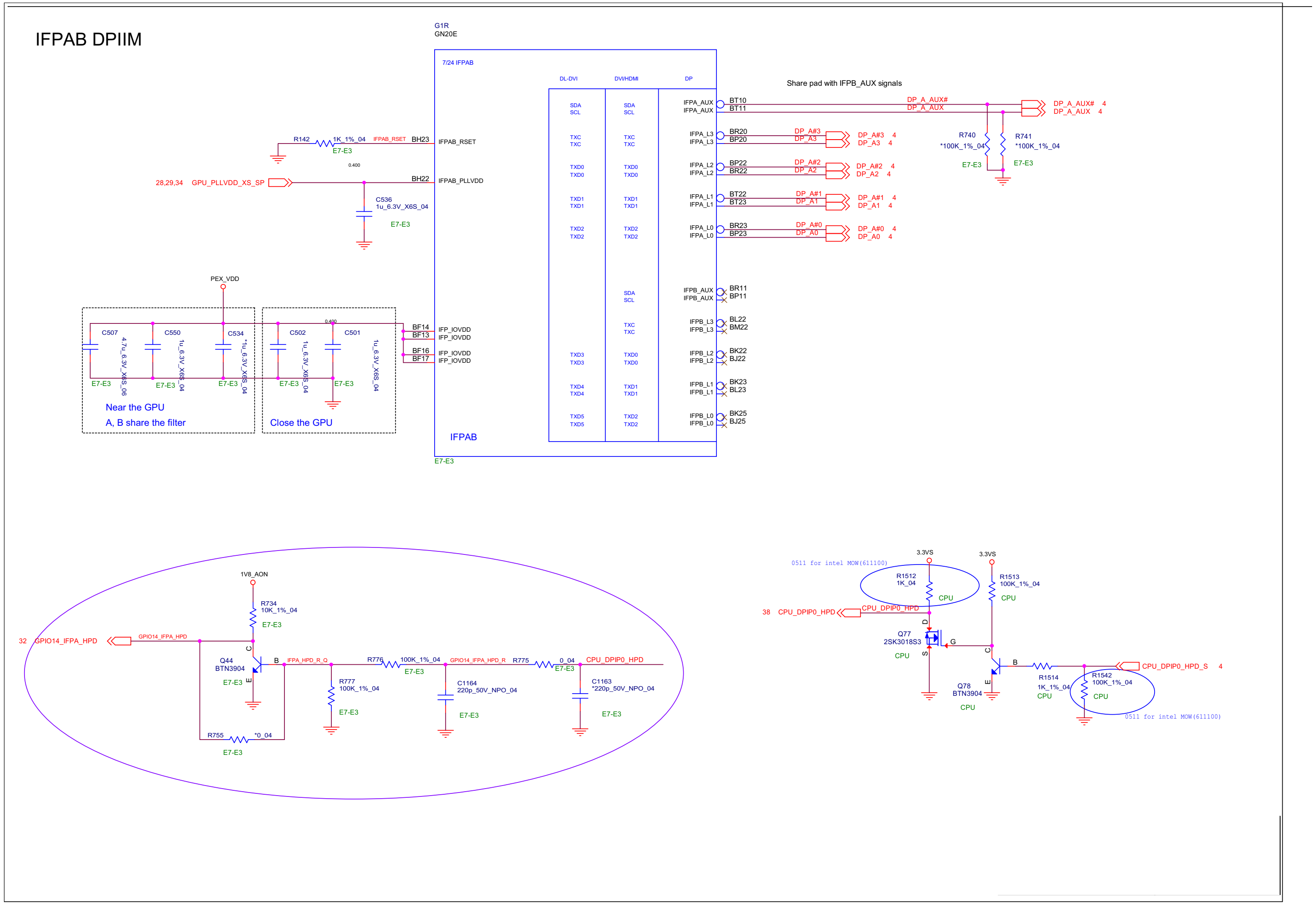
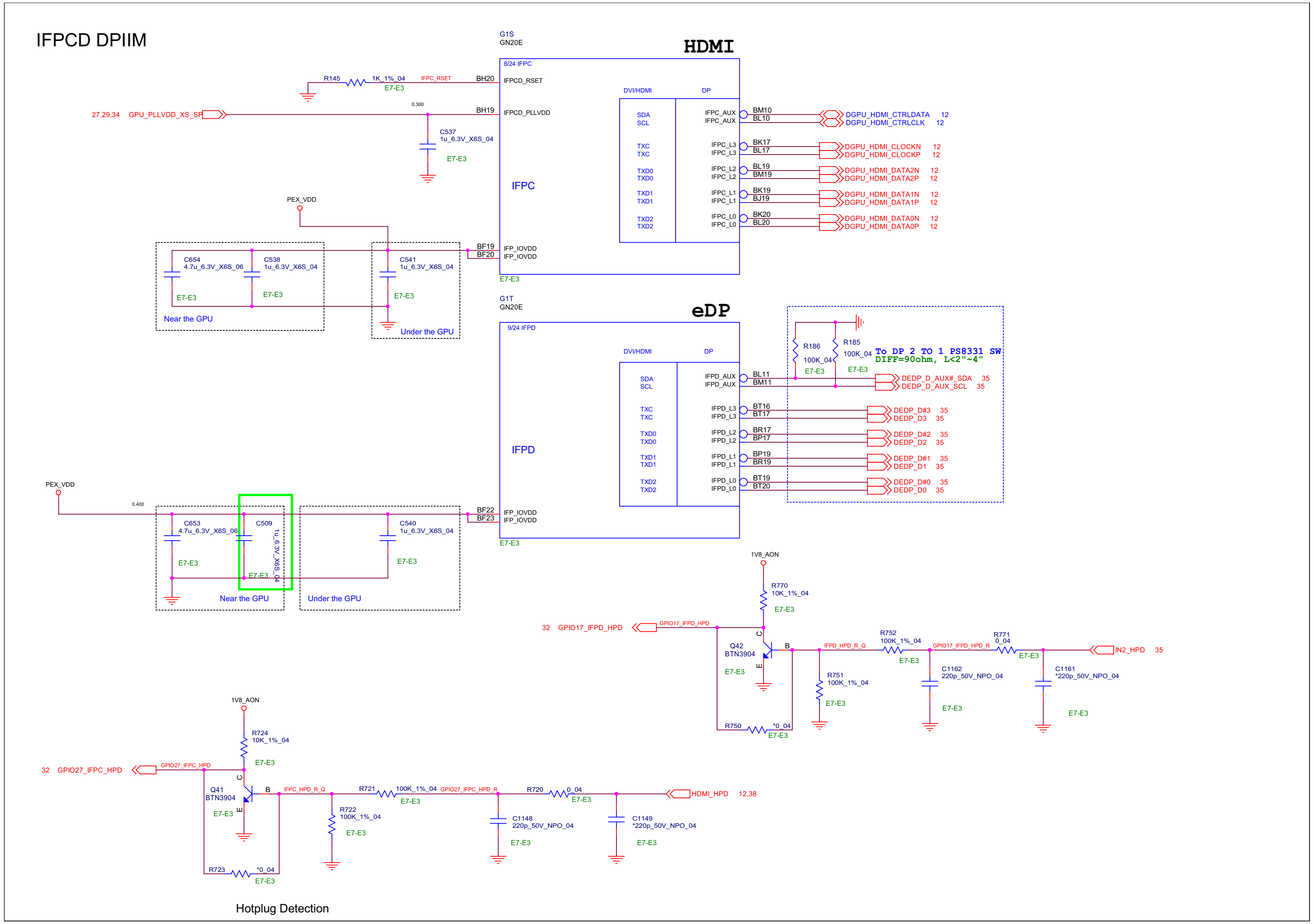
GPU Decoupling

GPU IFPAB DPIIM

Sheet 27 of 79
GPU IFPAB DPIIM



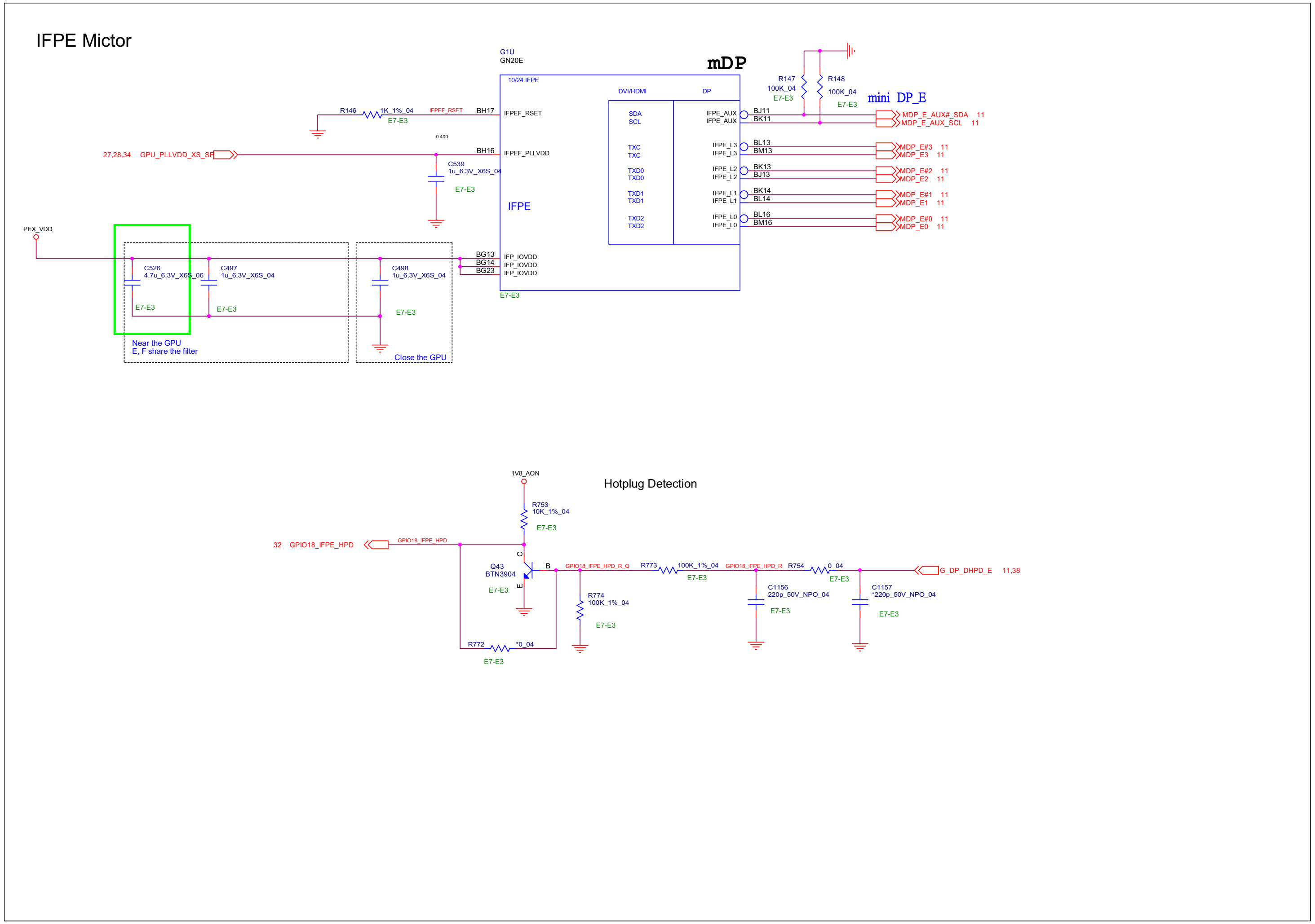
GPU IFPCD DPIIM



Sheet 28 of 79
GPU IFPCD DPIIM

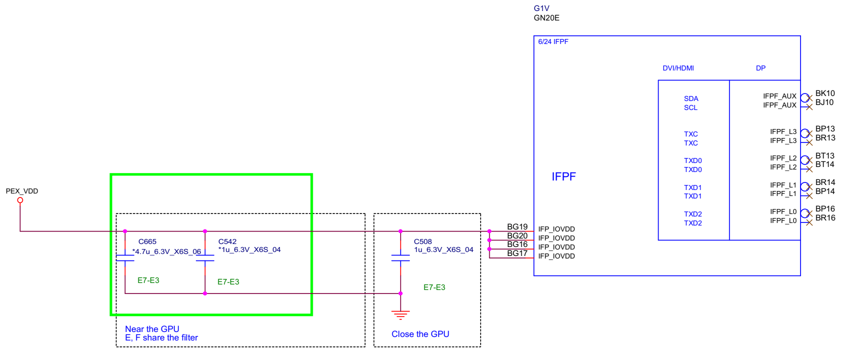
GPU IFPE Mictor

Sheet 29 of 79
GPU IFPE Mictor



GPU IFPF USB-C DP

IFPF DP



Sheet 30 of 79
GPU IFPF USB-C DP

Output Power Measurement

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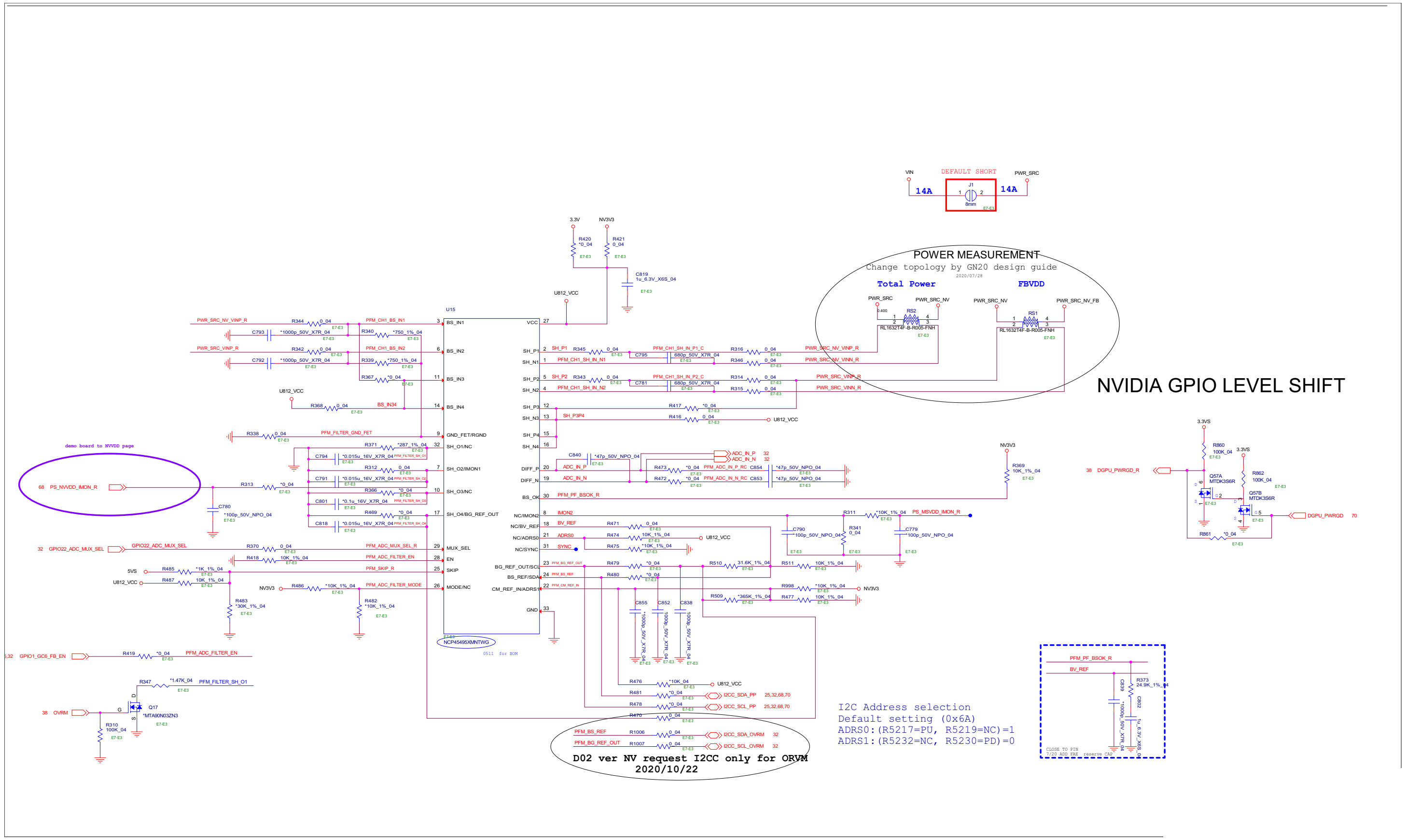
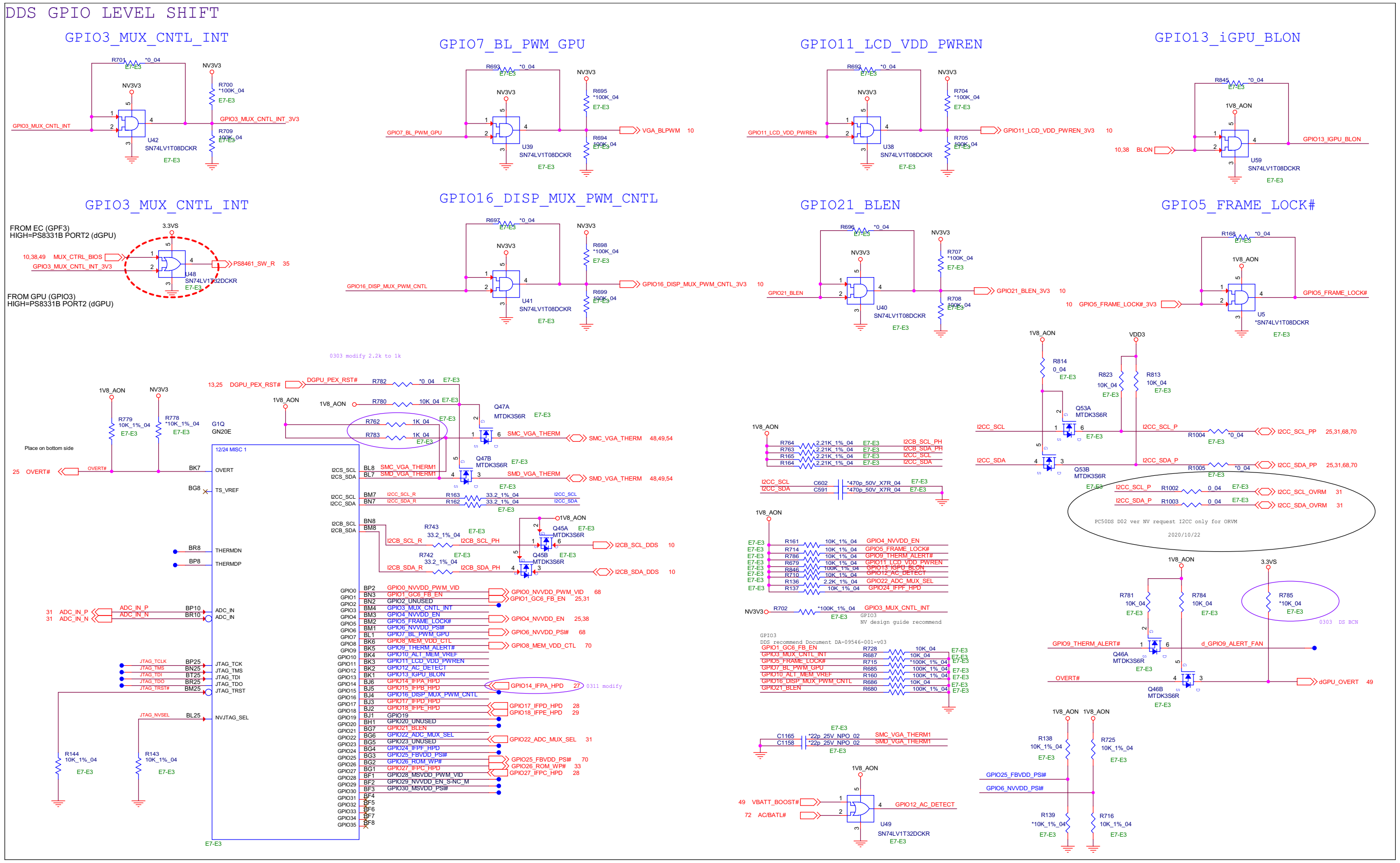
Output Power
Measurement



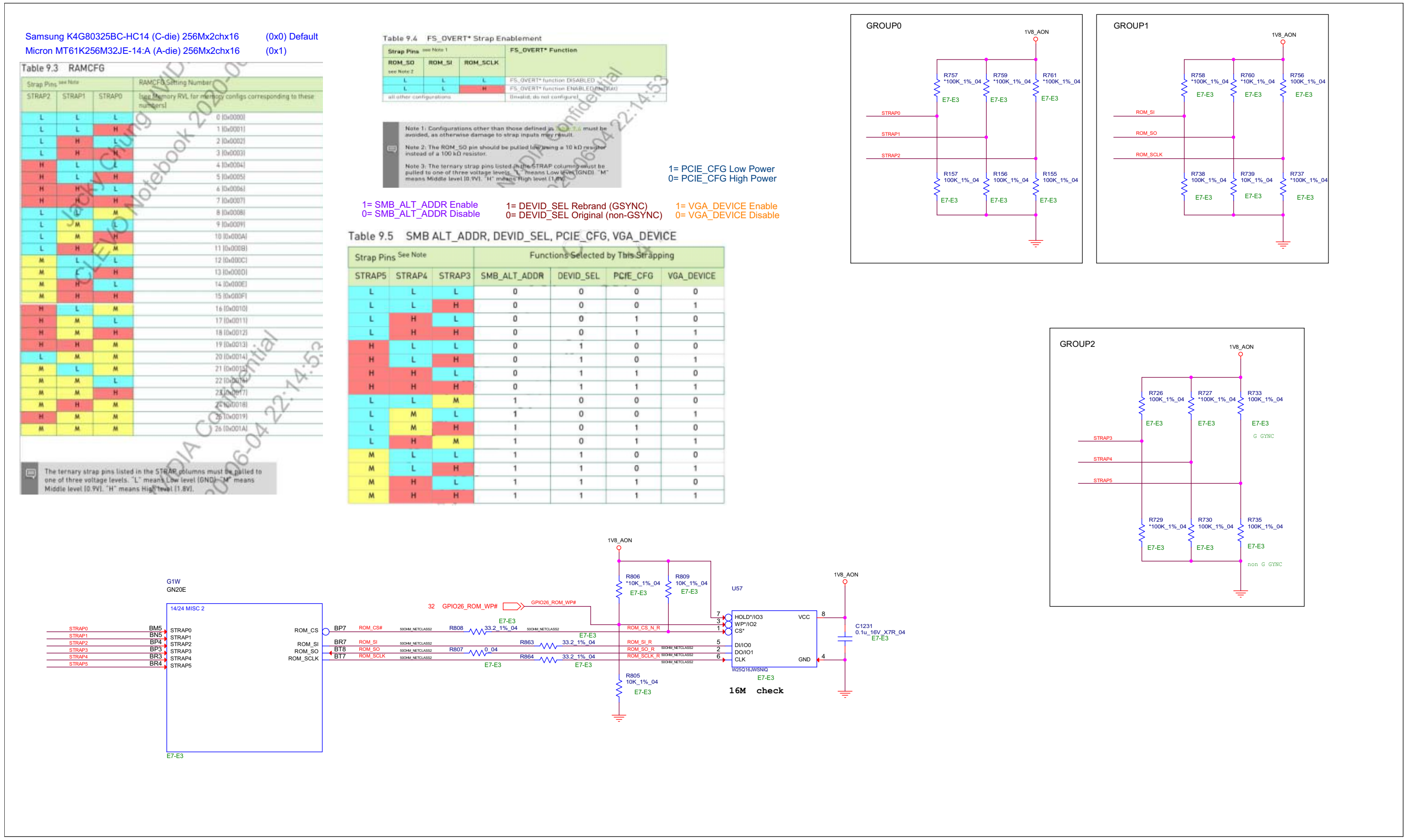
GPU GPIO, Fan, JTAG



Sheet 32 of 79
GPU GPIO, Fan, JTAG

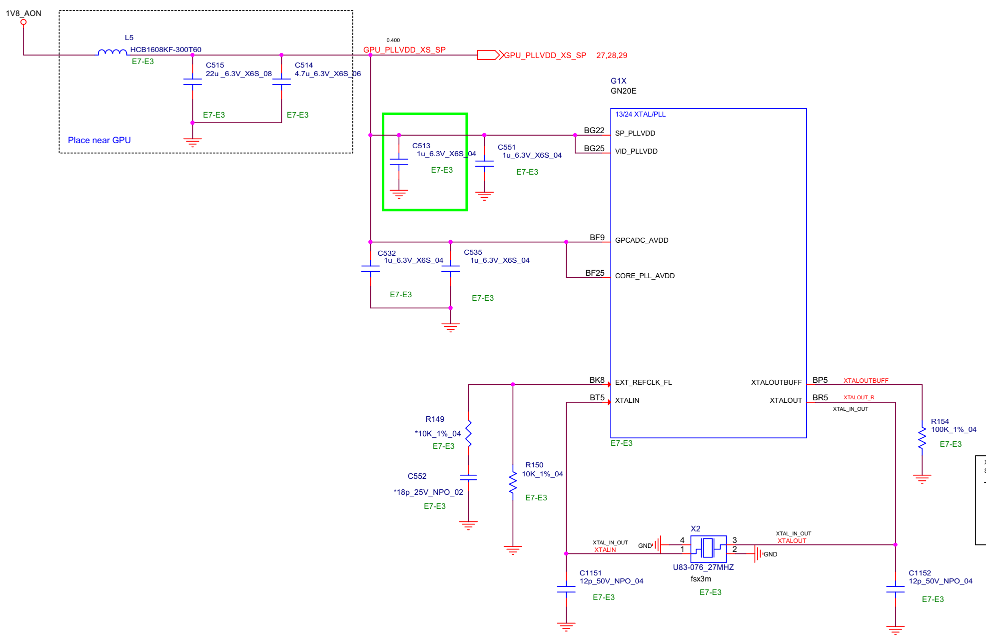
GPU ROM, Straps

Sheet 33 of 79
GPU ROM, Straps



GPU XTAL

MISC2: XTAL. PLL



SmartFan Strap Table

XTALOUTBUFF STRAP VALUE	Voltage	Inverted SmartFan PWM %
0	0V	GPIO DISABLED
1	0.9V	33% PWM
3	1.8V	66% PWM

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GPU XTAL

eDP 2-to-1 PS8461 SW

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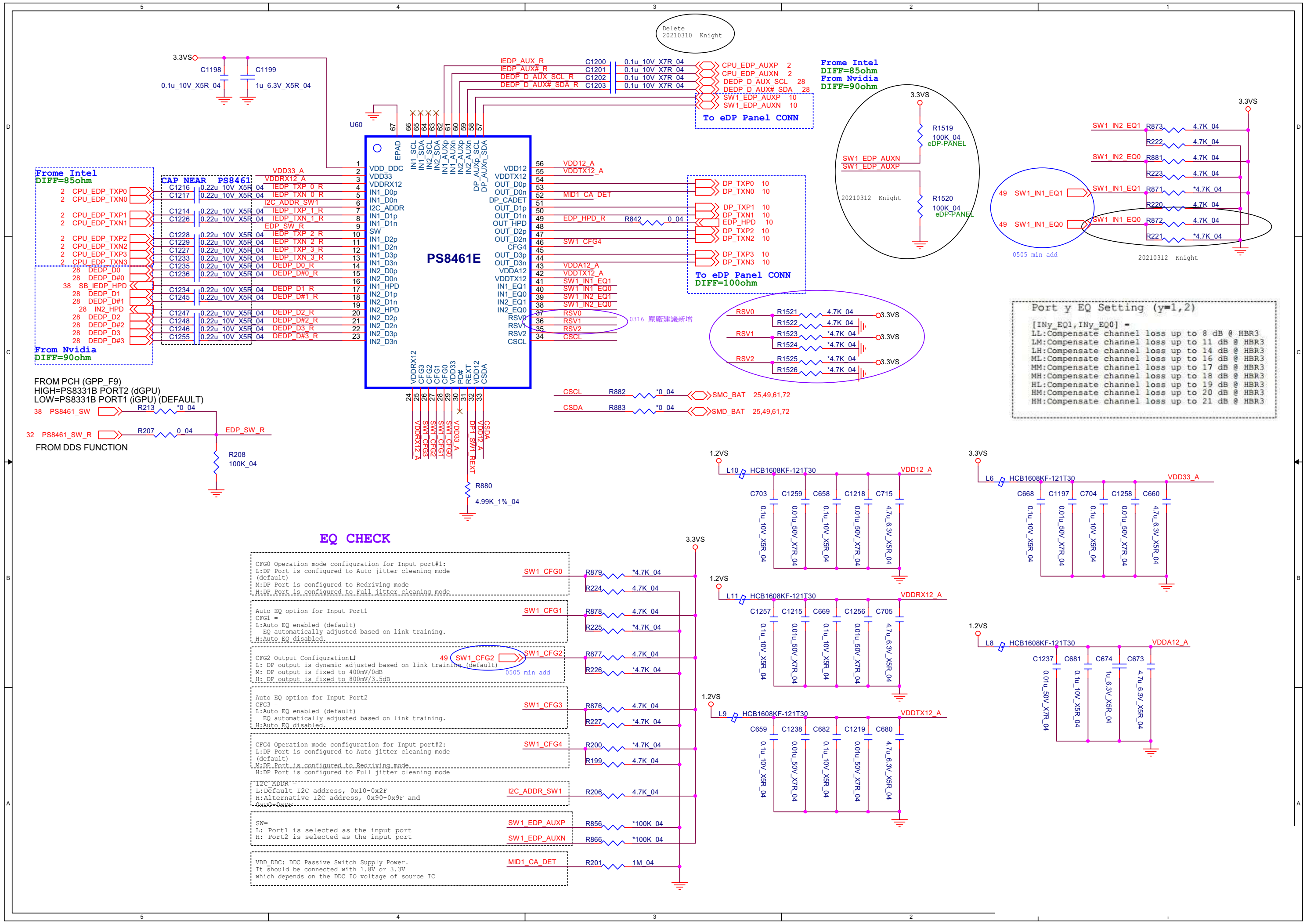
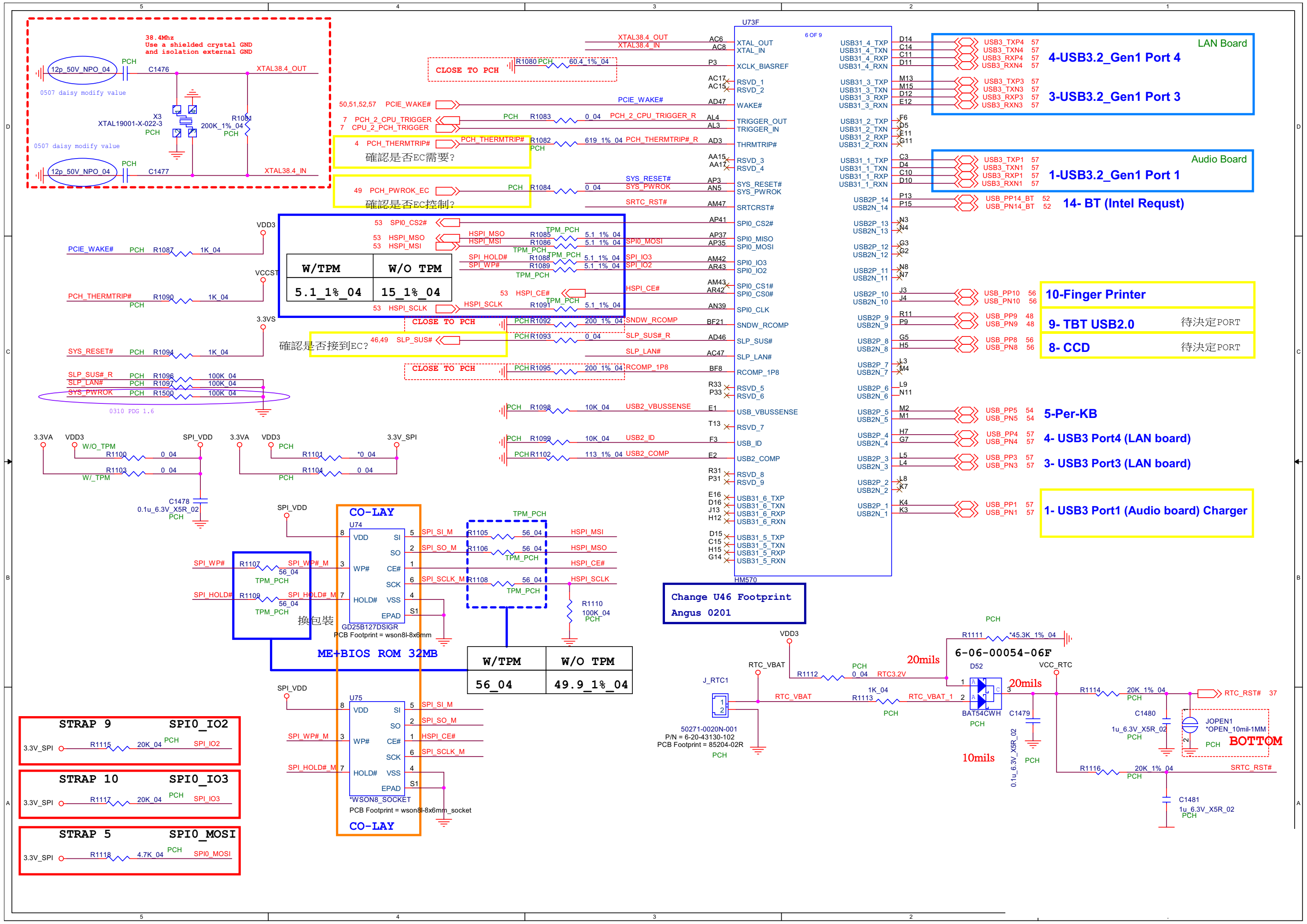
eDP 2-to-1 PS8461
SW



PCH 1/8



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PCH 1/8

B.Schematic Diagrams

PCH 2/8

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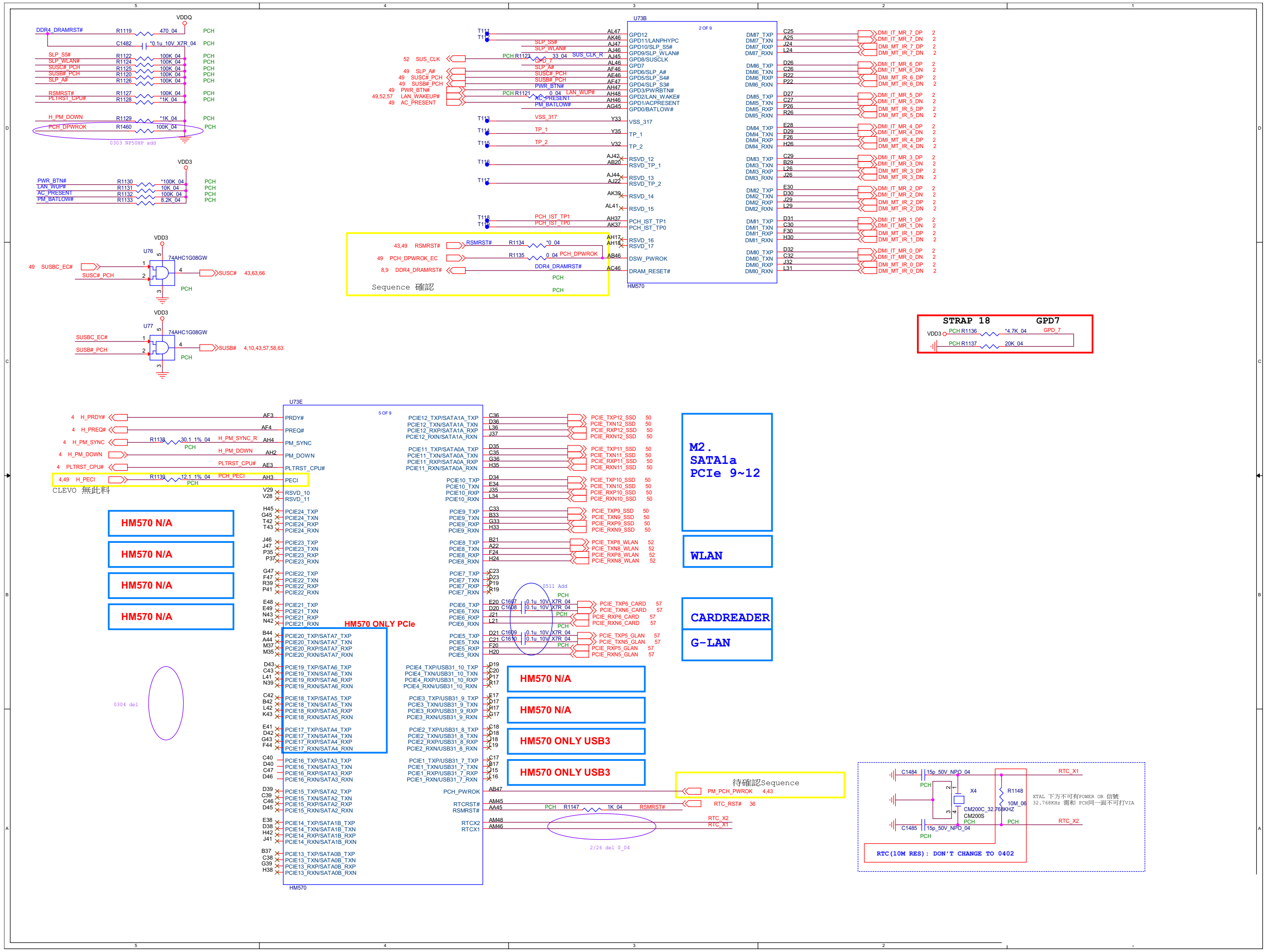
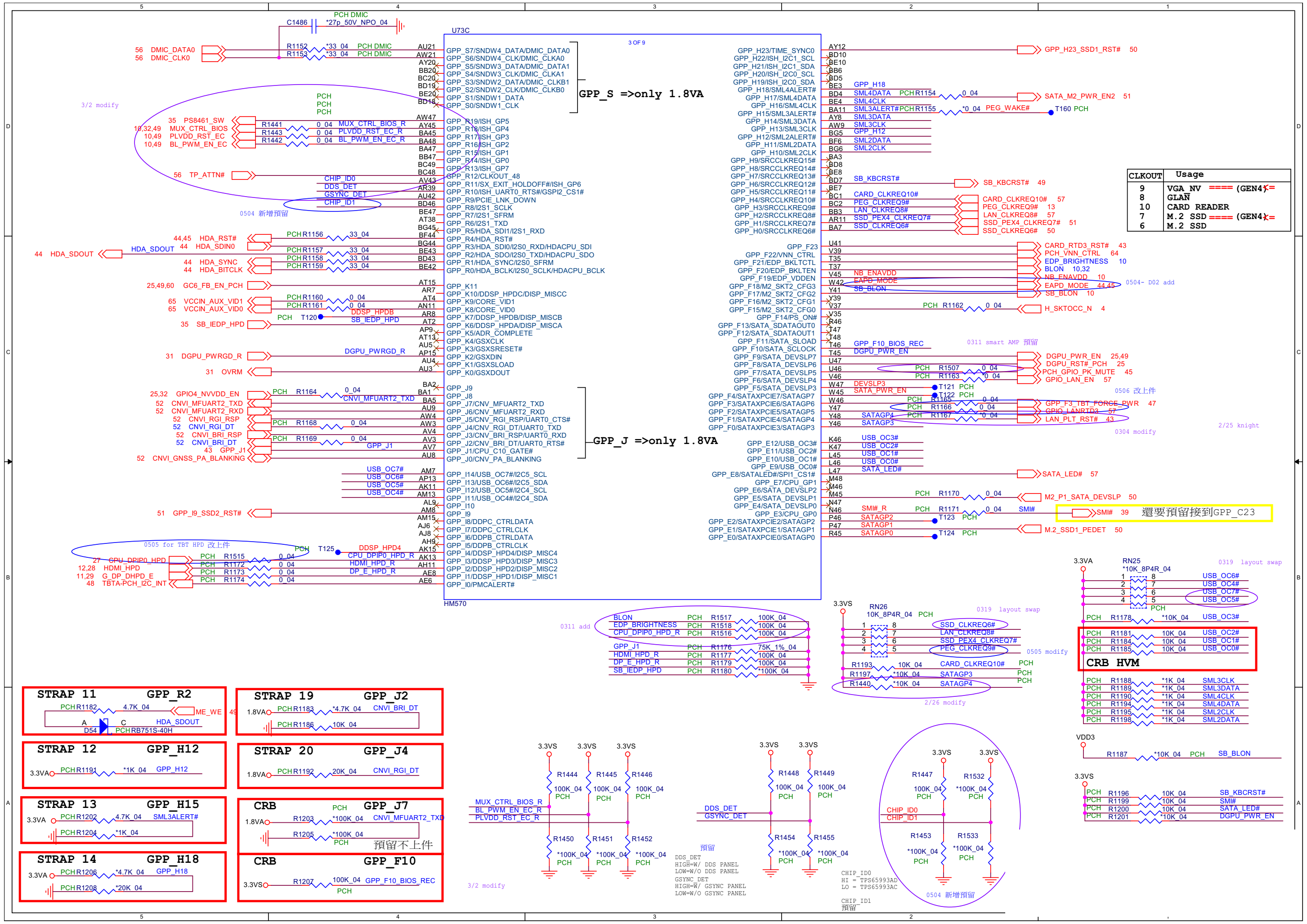
PCH 2/8



PCH 3/8



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PCH 3/8

PCH 4/8

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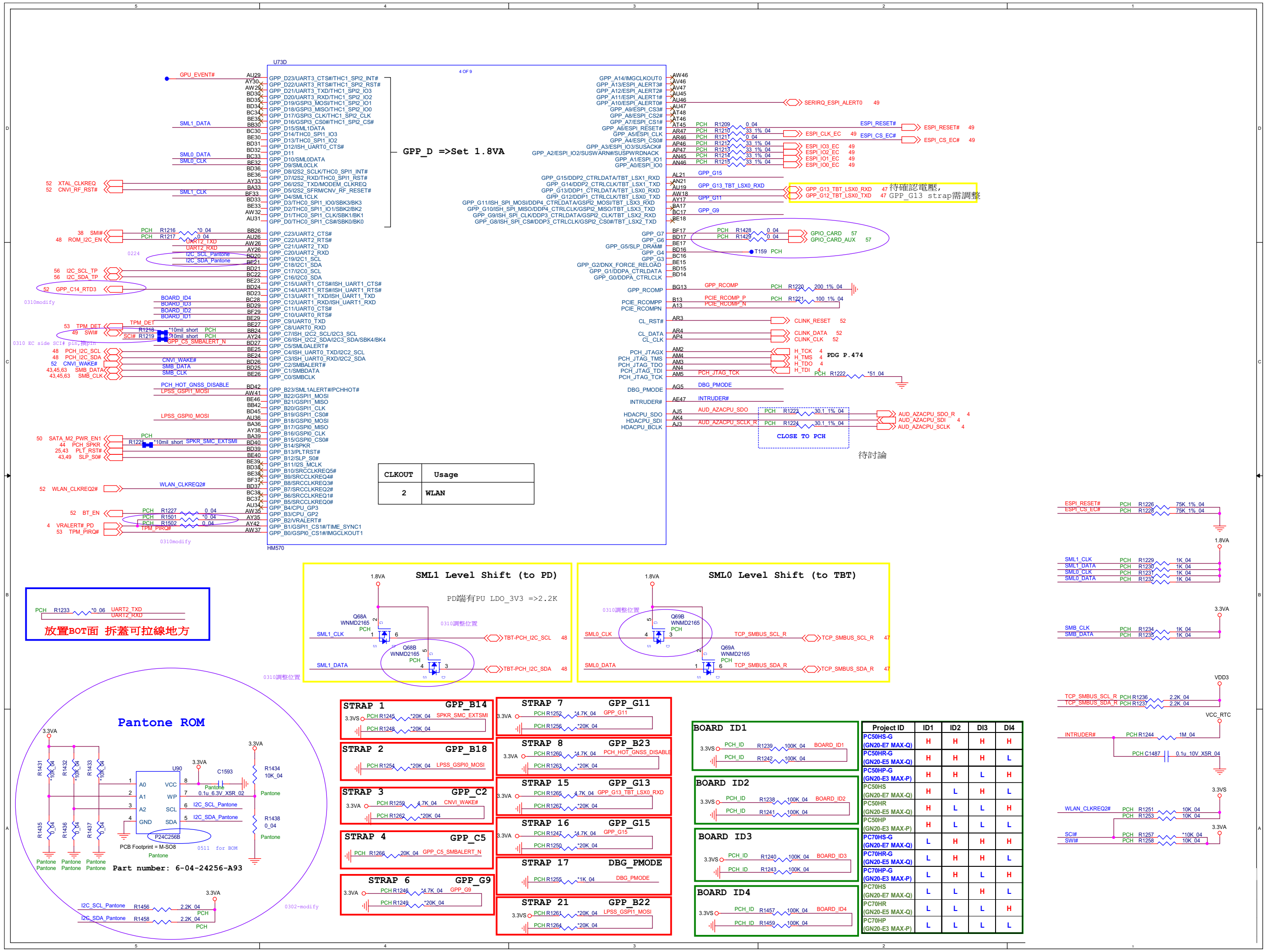
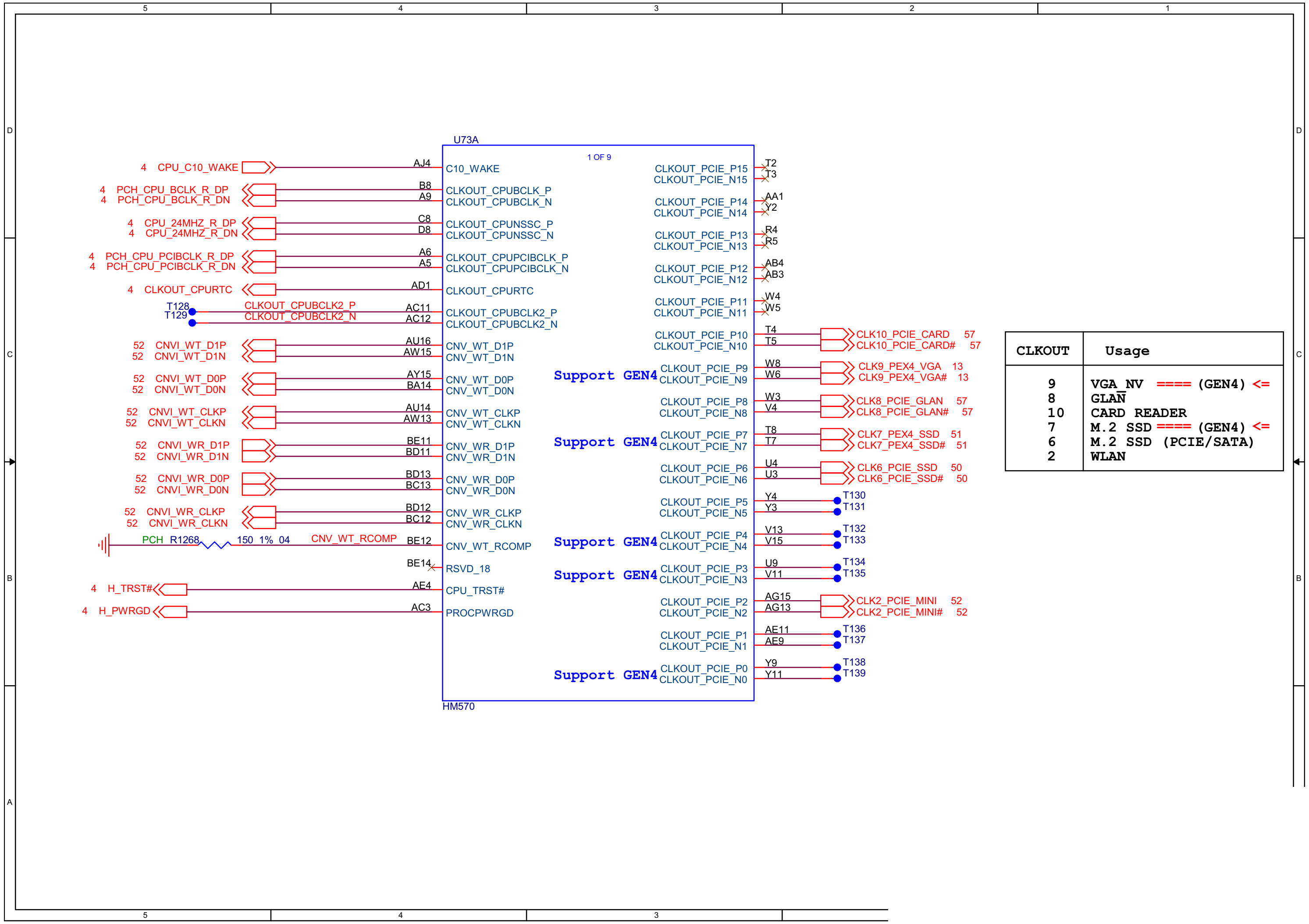
PCH 4/8



PCH 5/8



CLKOUT	Usage
9	VGA_NV ==== (GEN4) <=
8	GLAN
10	CARD READER
7	M.2 SSD ==== (GEN4) <=
6	M.2 SSD (PCIE/SATA)
2	WLAN

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PCH 5/8

PCH 6/8

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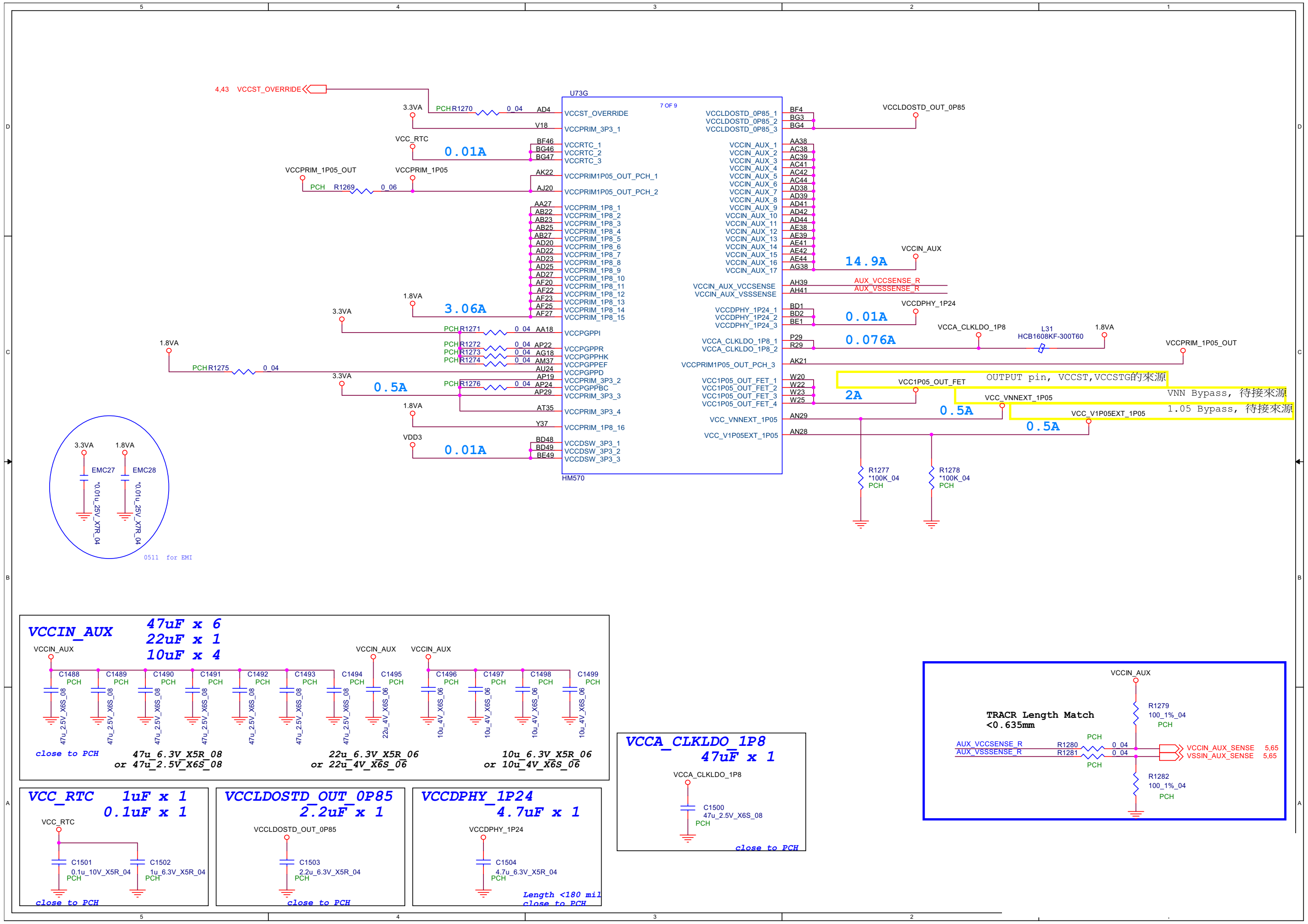
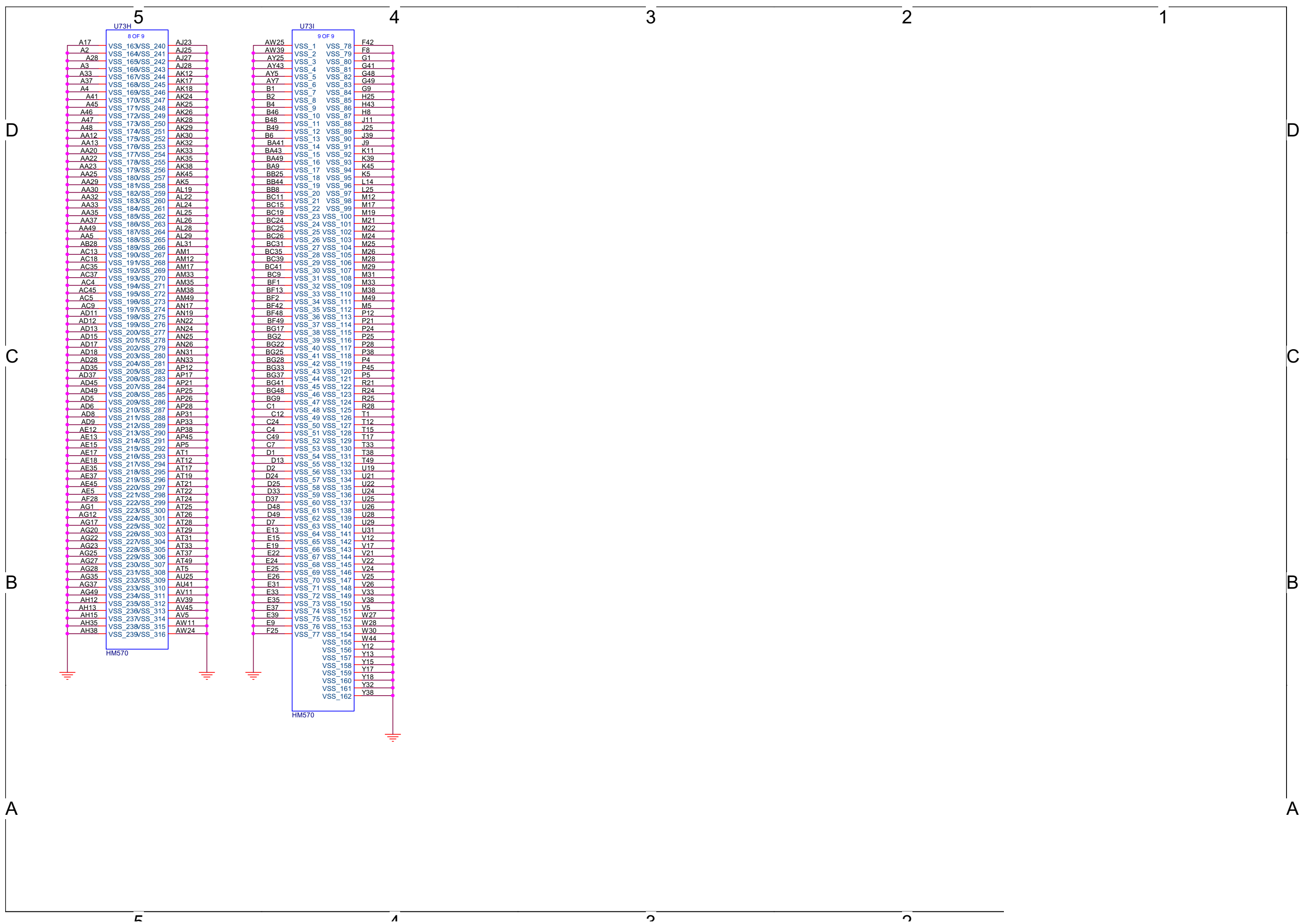
PCH 6/8



PCH 7/8



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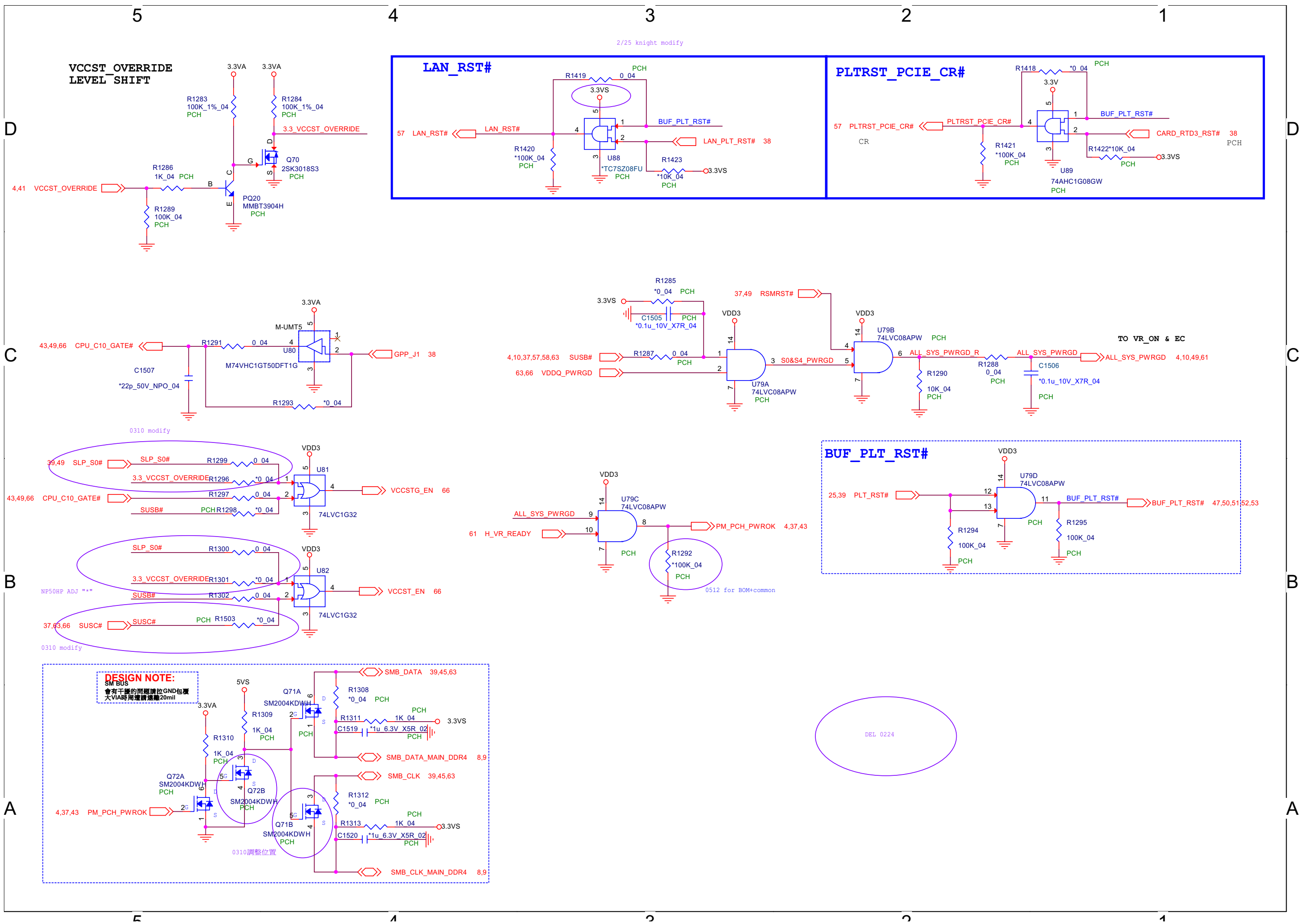
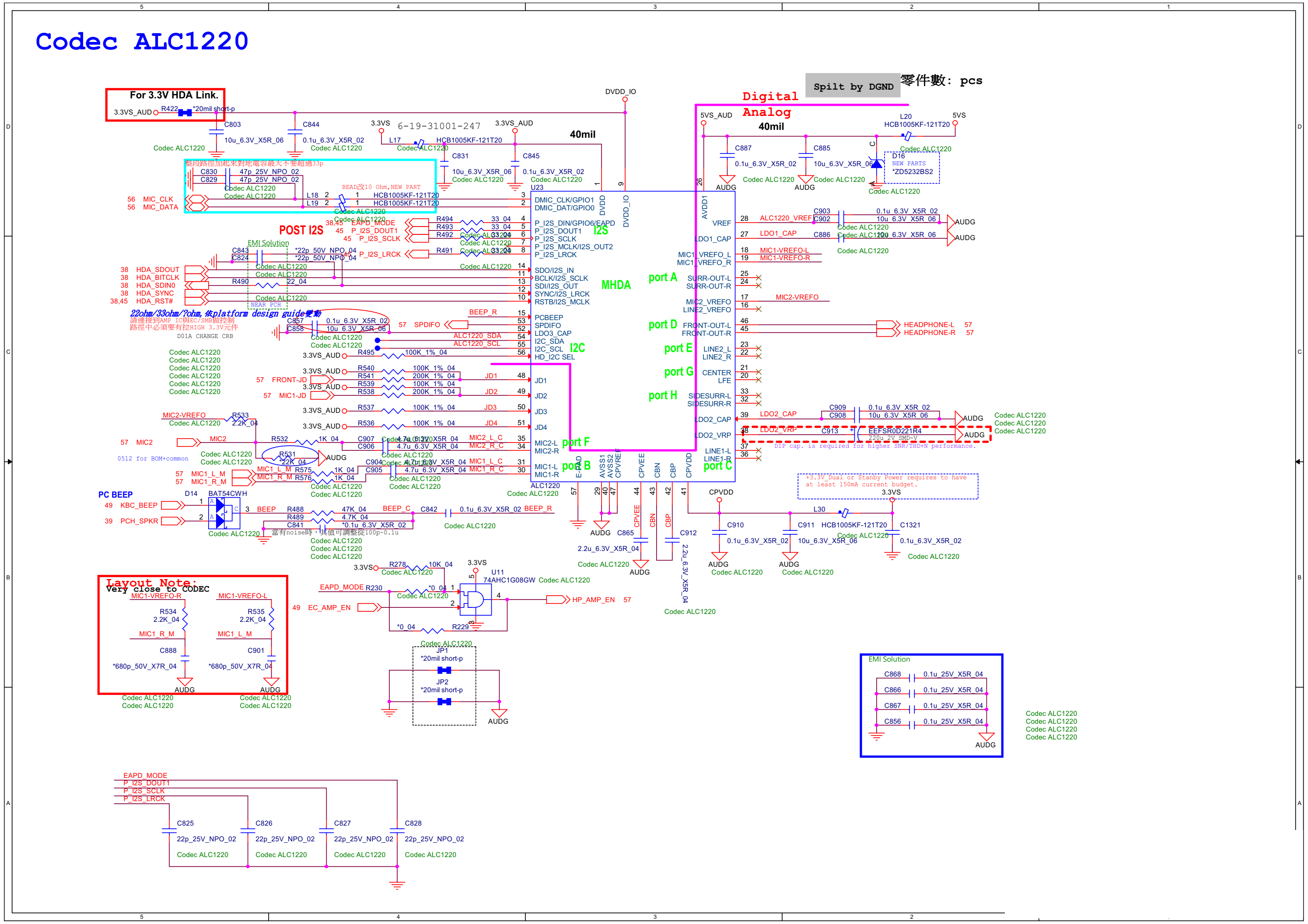
PCH 7/8

PCH 8/8

Sheet 43 of 79
PCH 8/8



Audio Codec



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Audio Codec

Smart AMP

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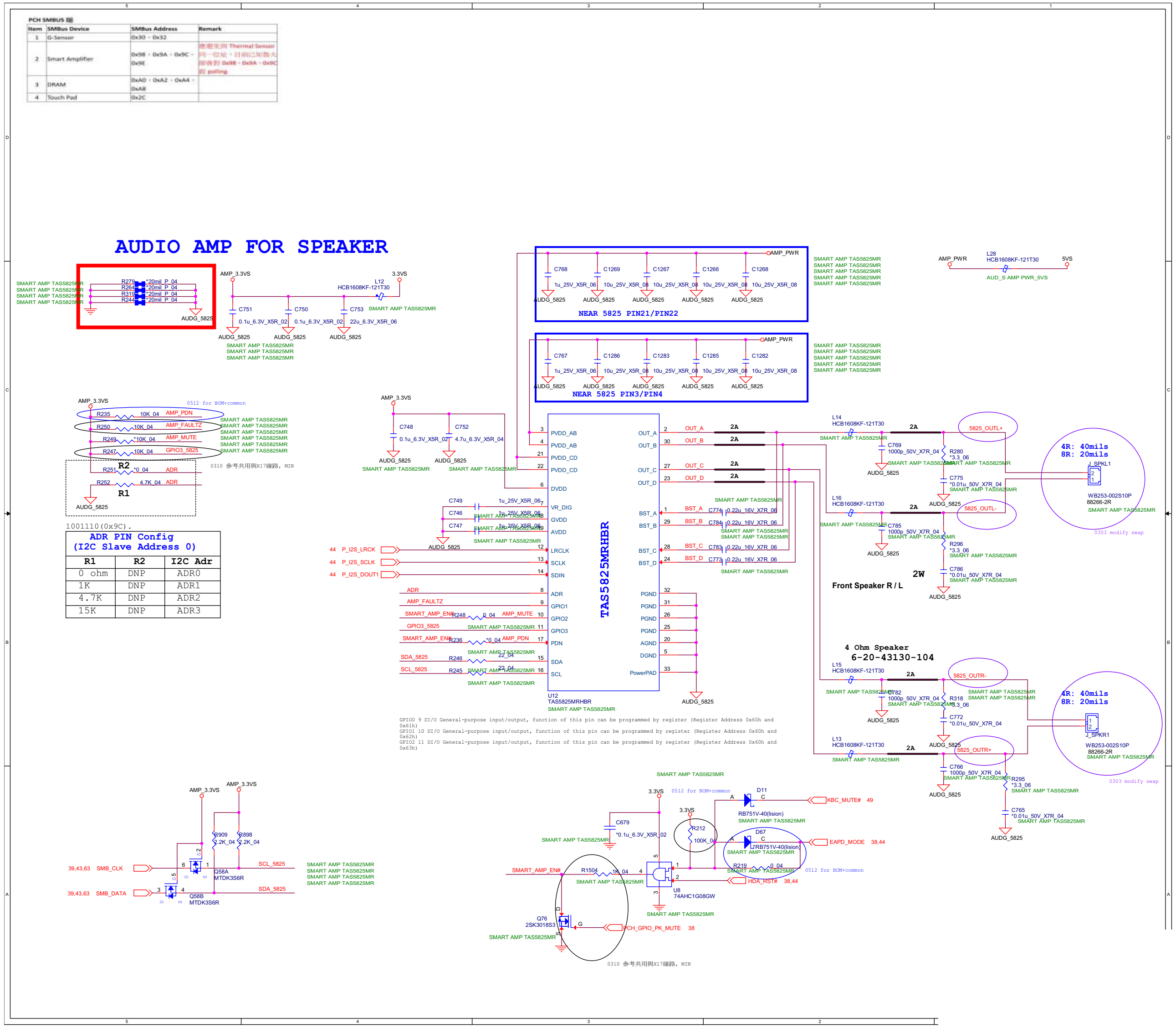
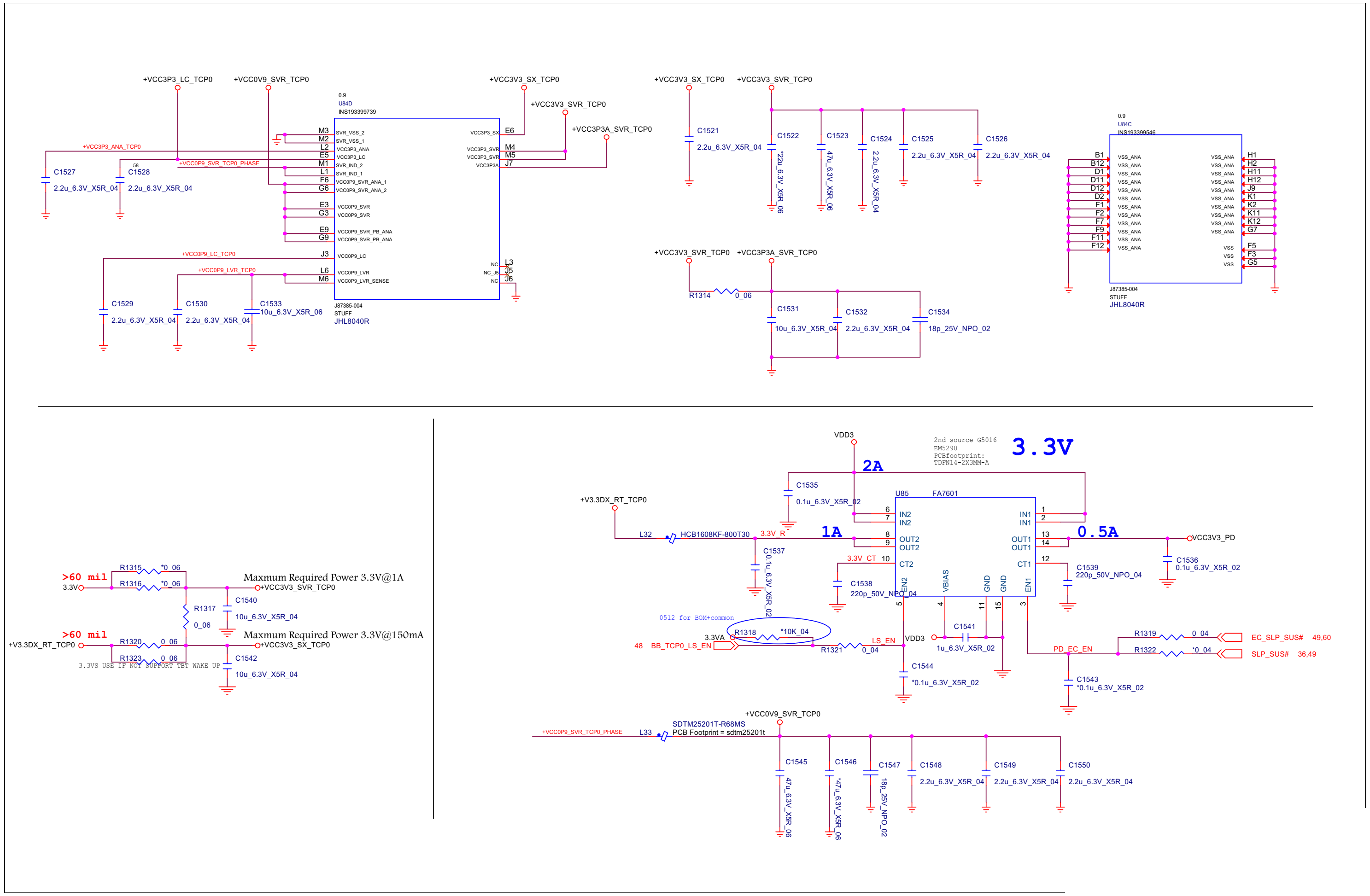
Smart AMP



TBT Retimer



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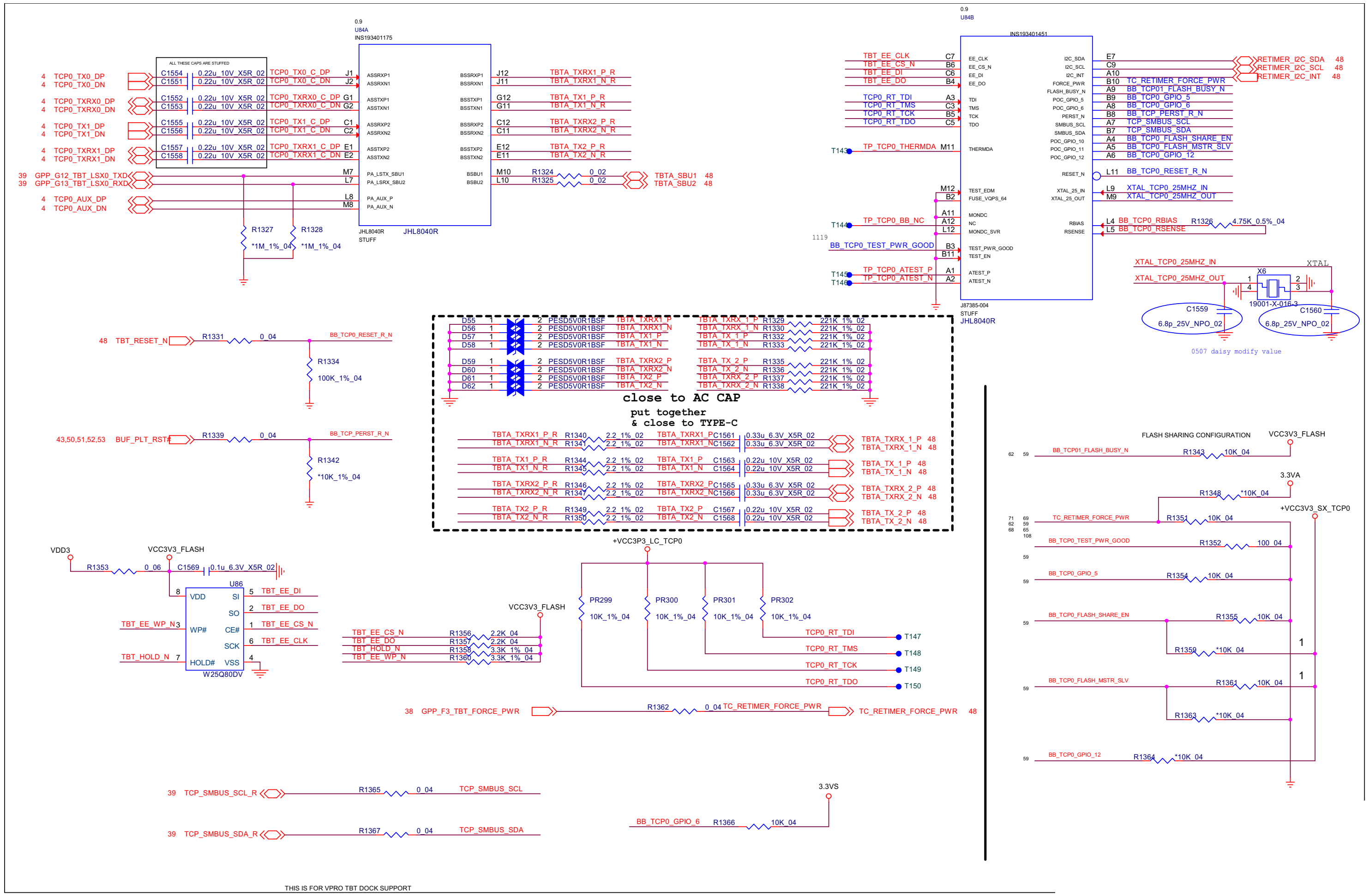
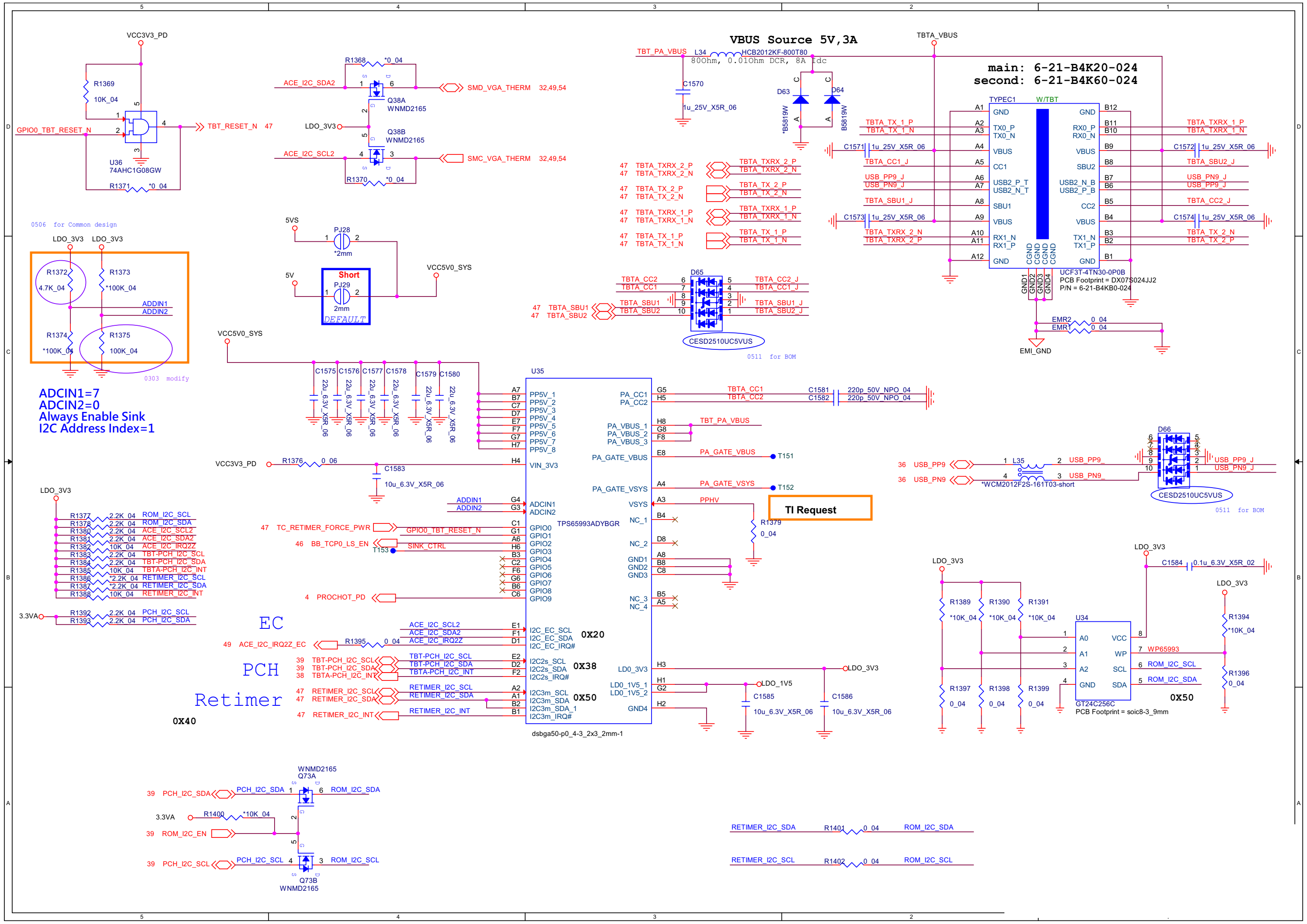
TBT Retimer

TBT Retimer

Sheet 47 of 79
TBT Retimer



TPS65987D



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TPS65987D

EC ITE5570

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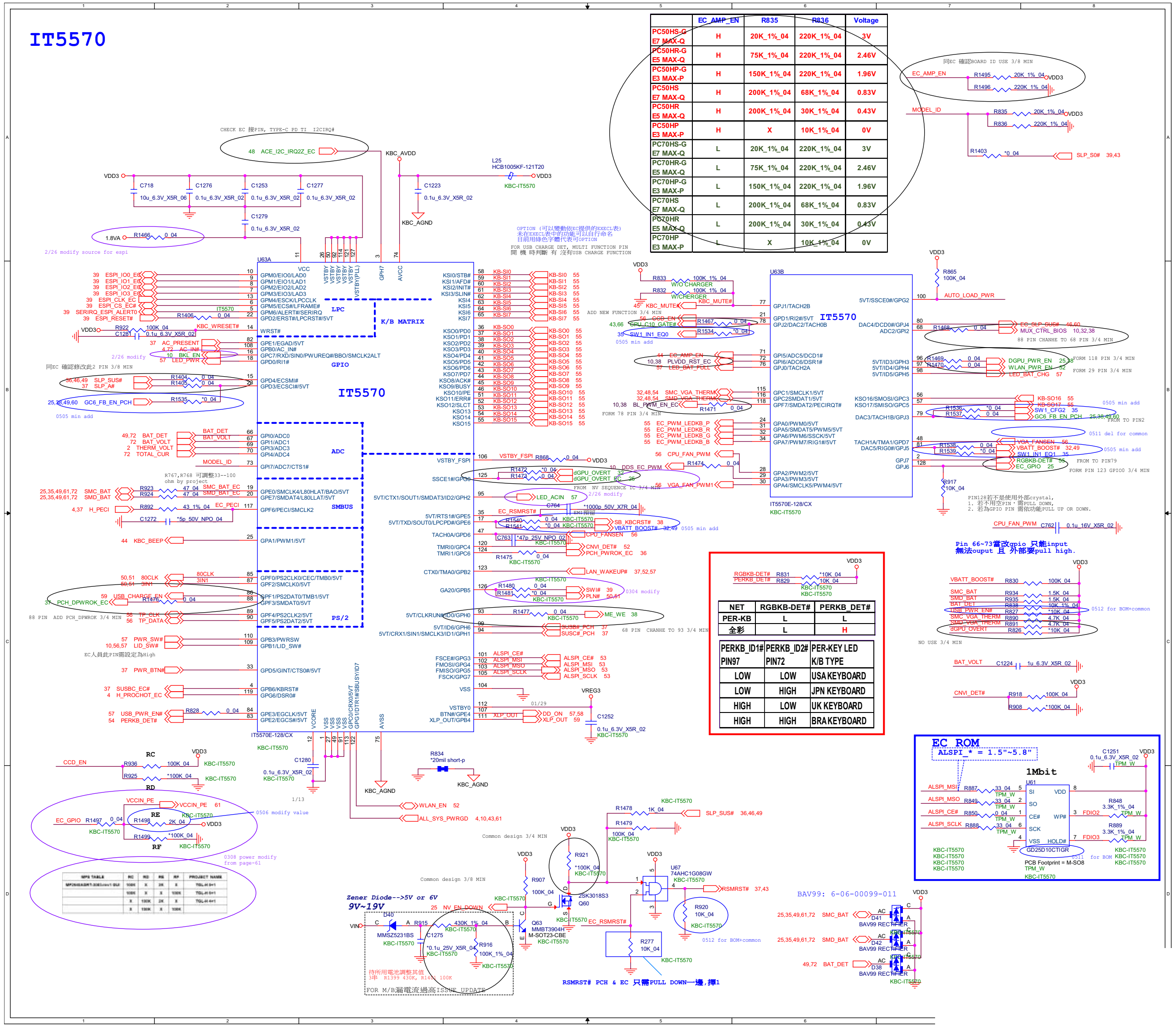
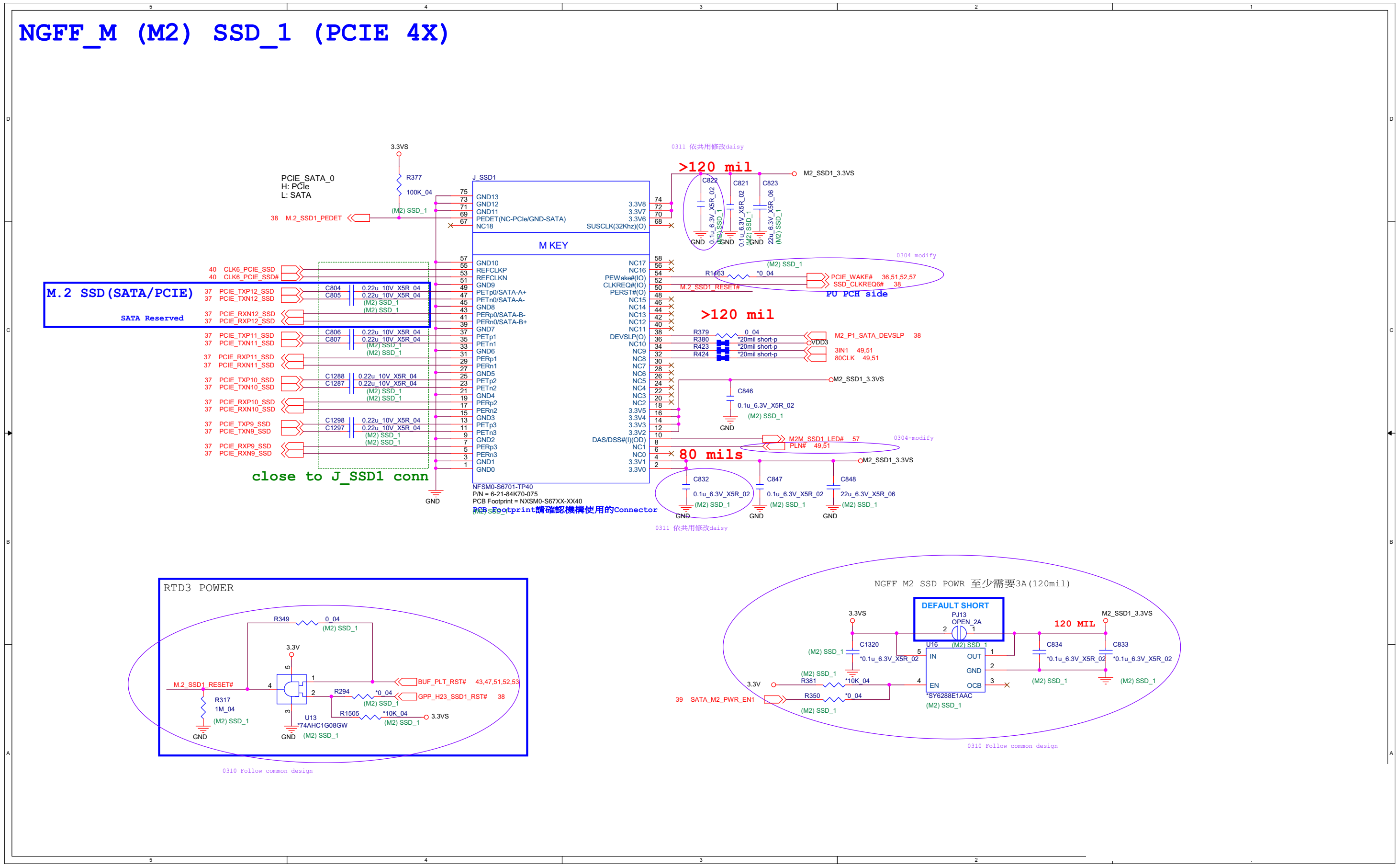
EC ITE5570



M.2 PCIE4X SSD1



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M.2 PCIE4X SSD1

M.2 PCIE4X SSD2

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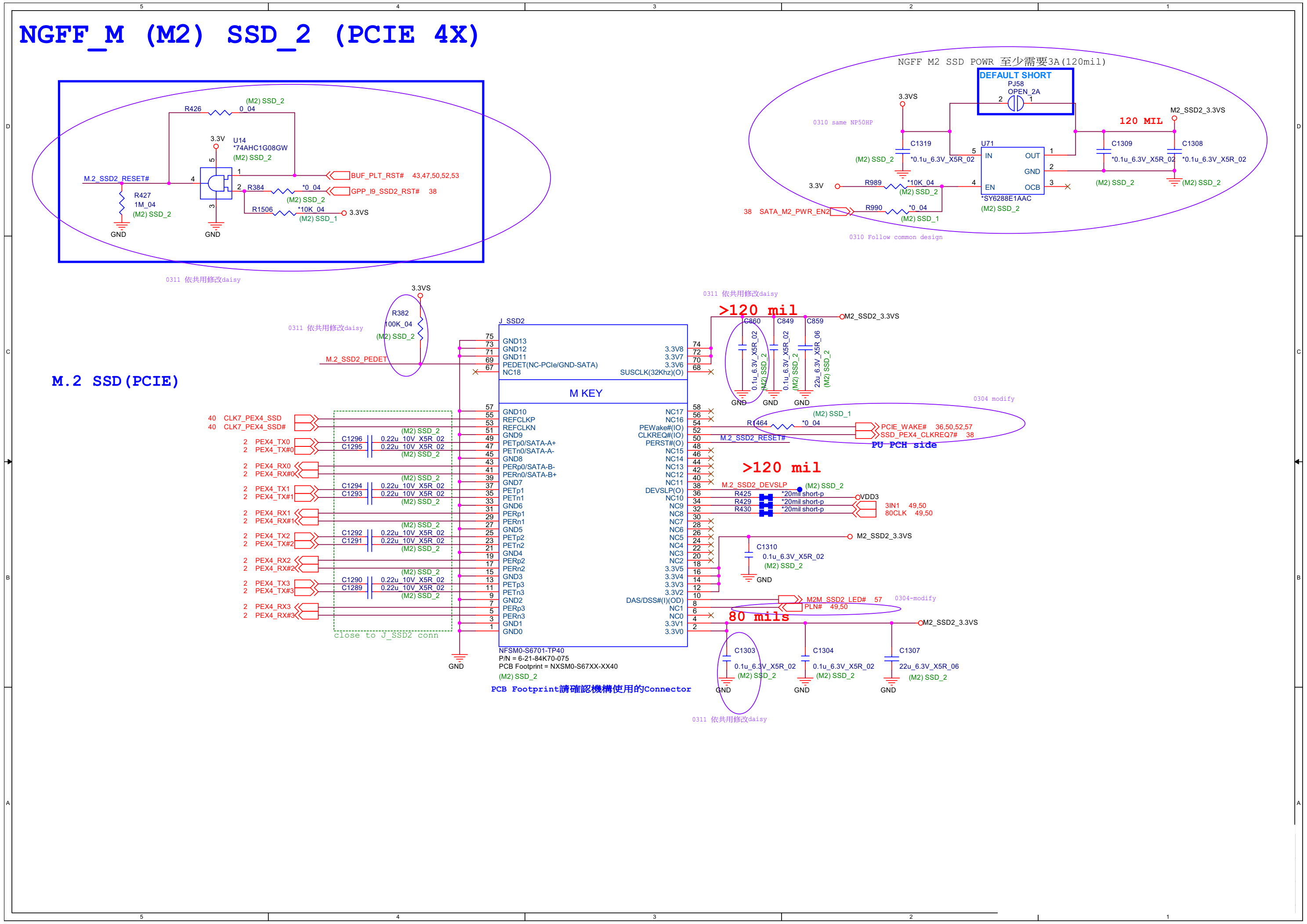
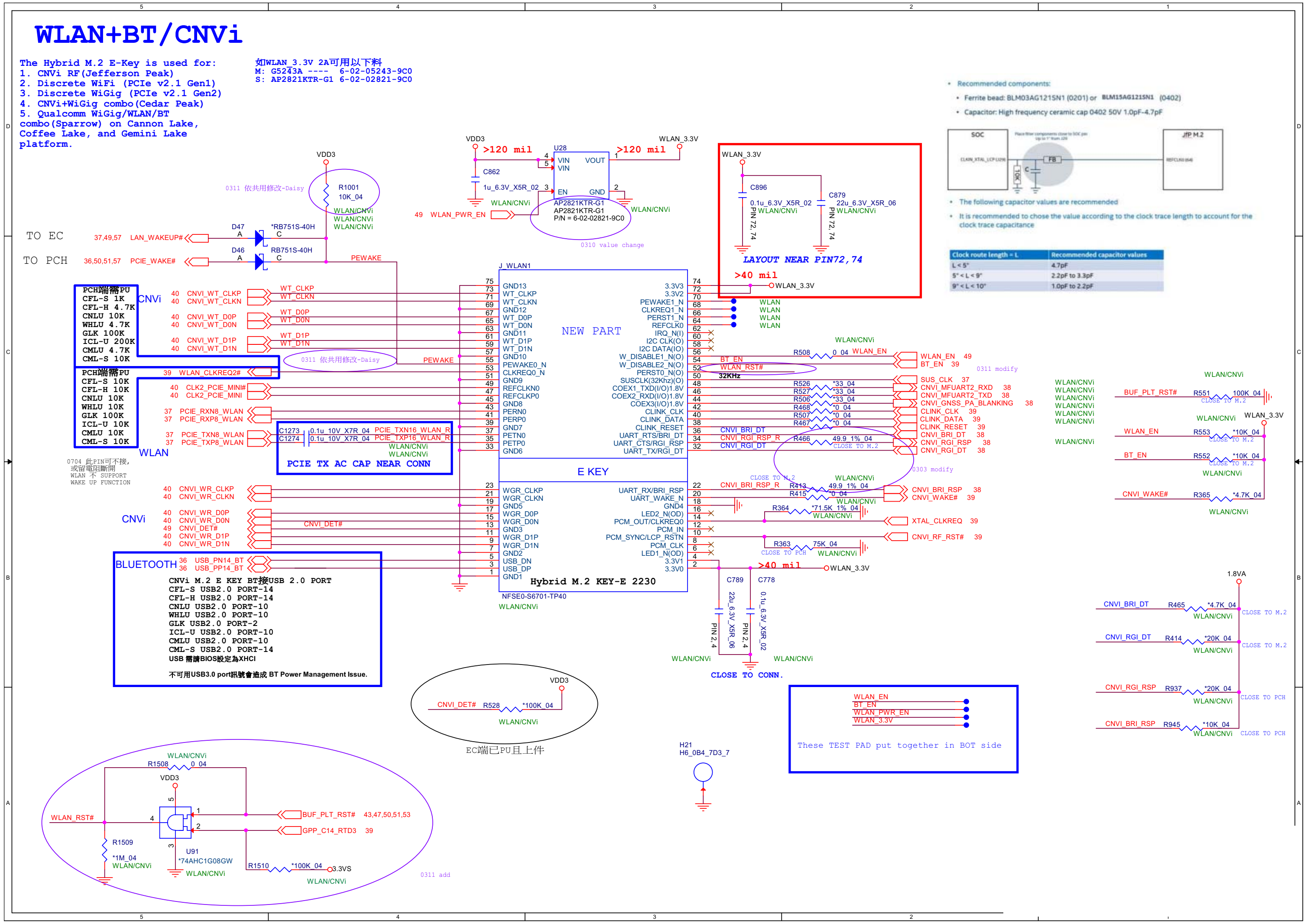
M.2 PCIE4X SSD2



M.2 WLAN+BT



Sheet 52 of 79
M.2 WLAN+BT

TPM, Screw

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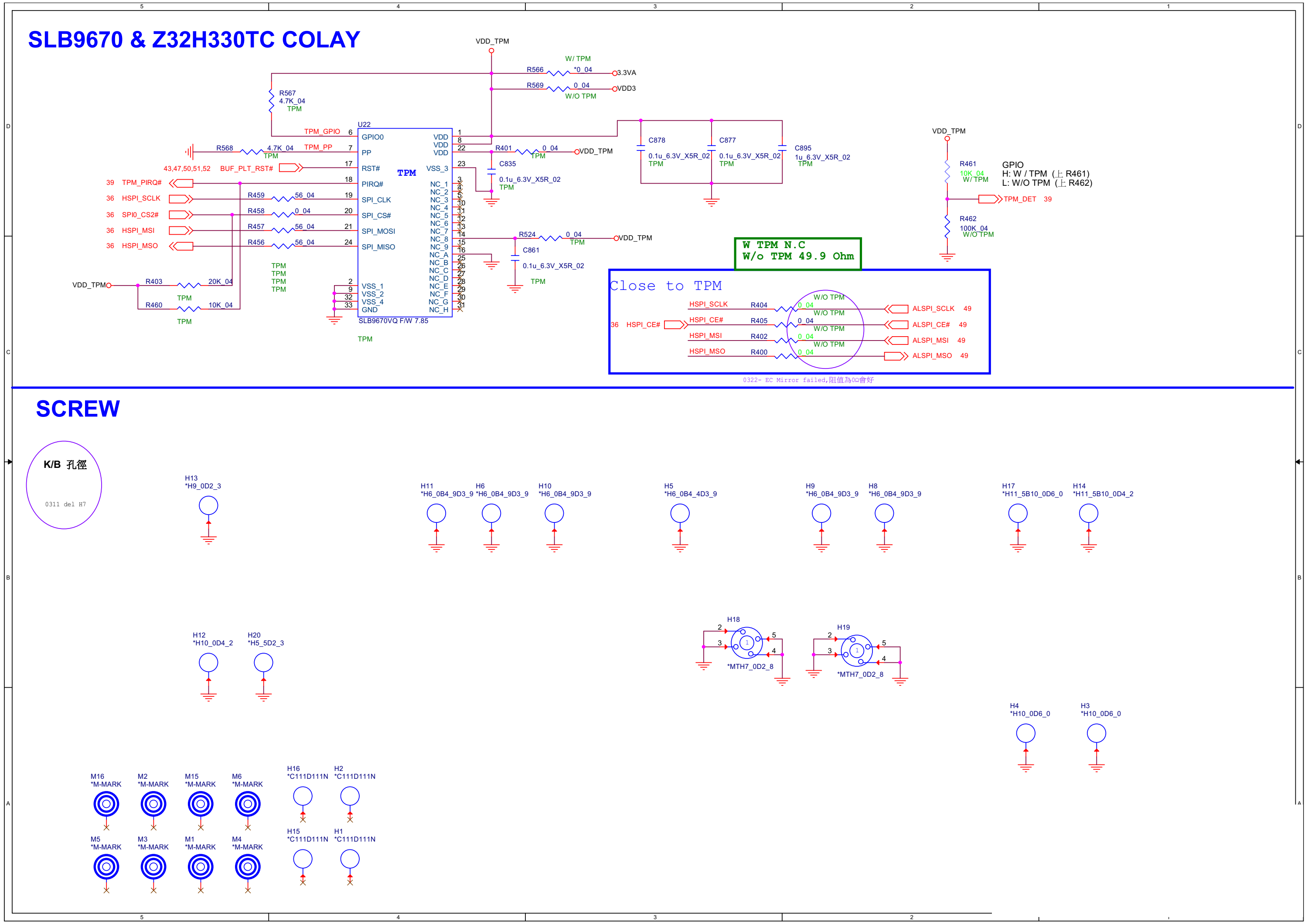
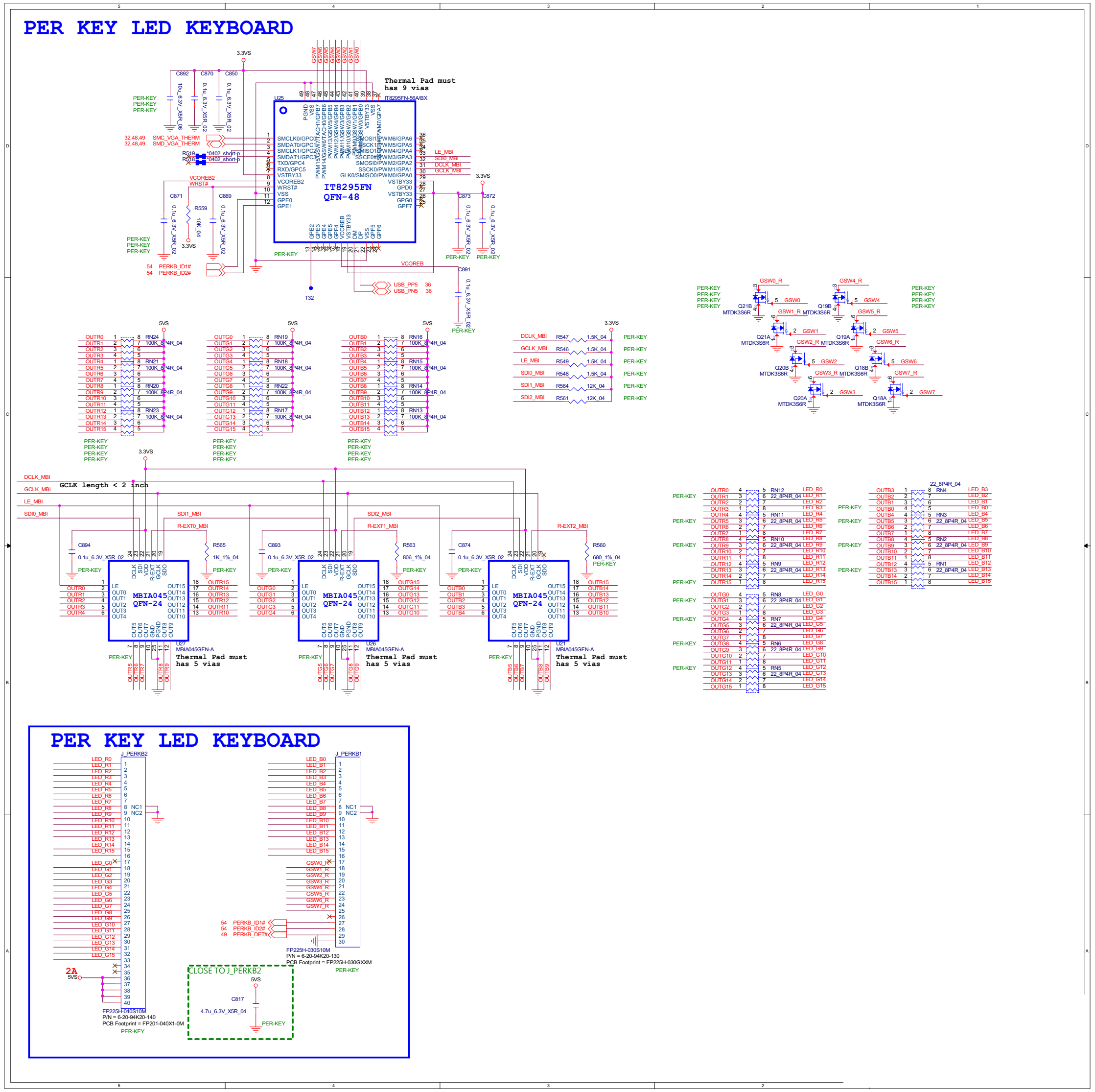
TPM, Screw



Per Key LED KB



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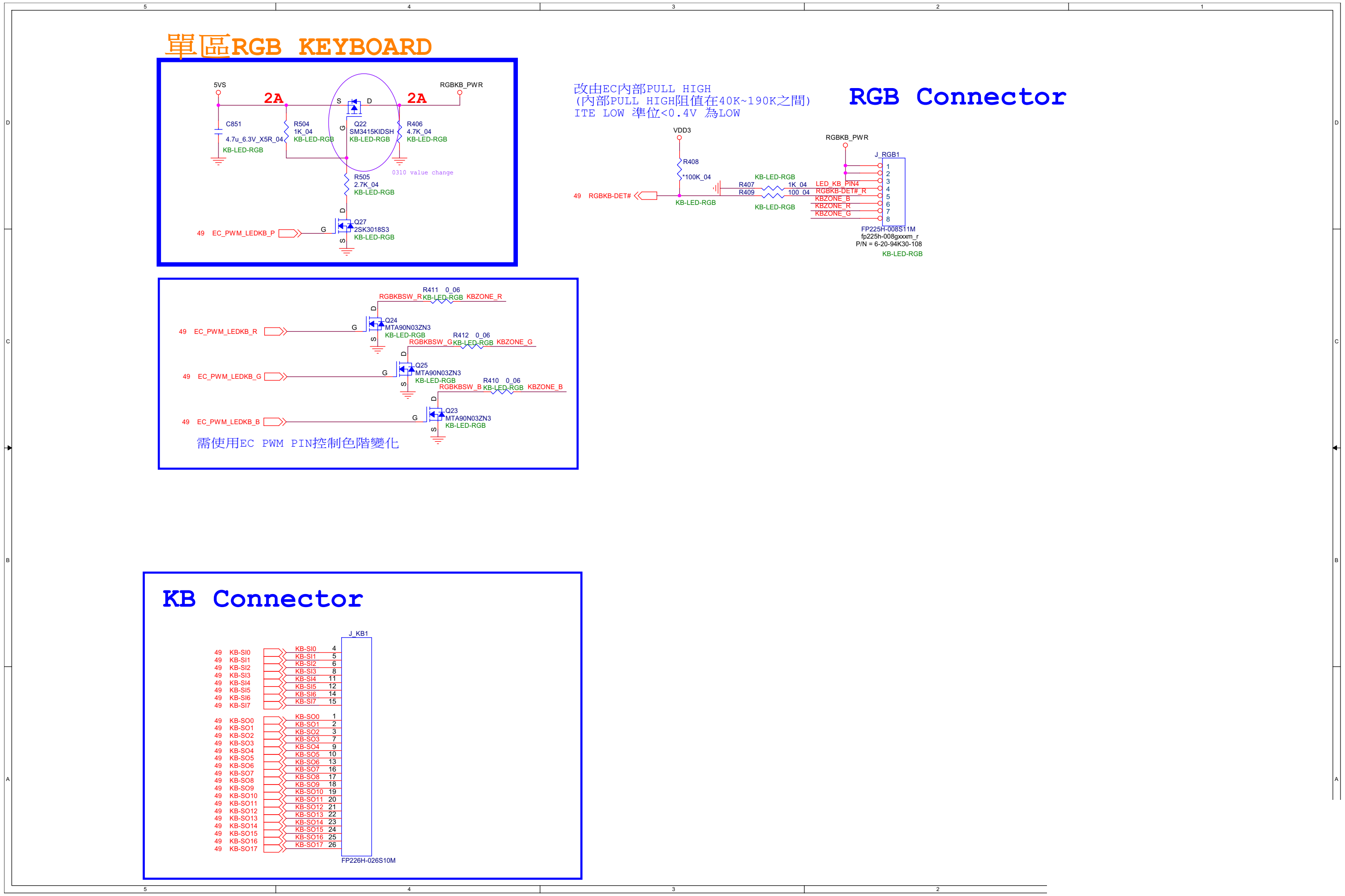
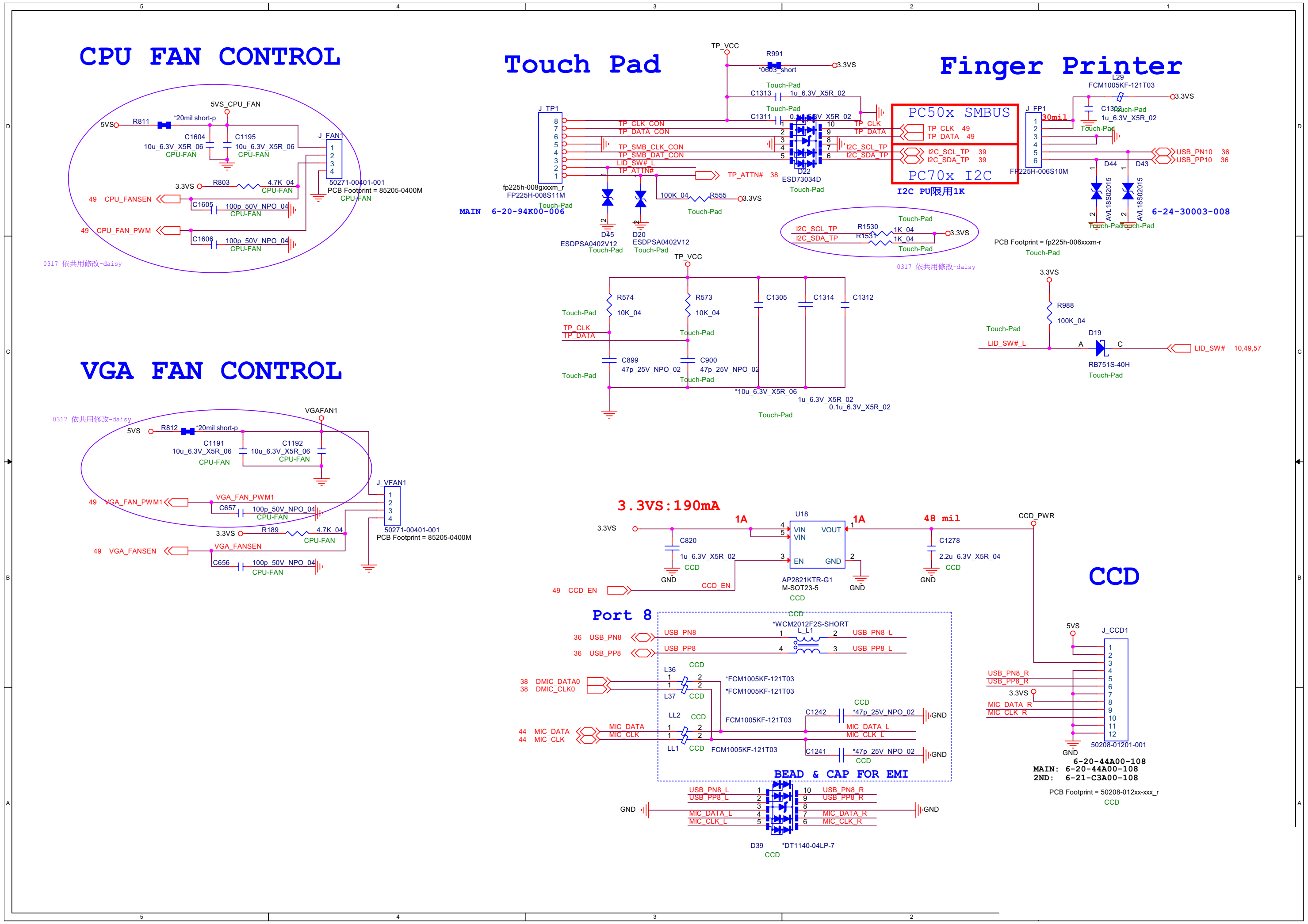
Per Key LED KB

Backlight KB



Sheet 55 of 79
Backlight KB

NB Connector



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NB Connector

Card Connector

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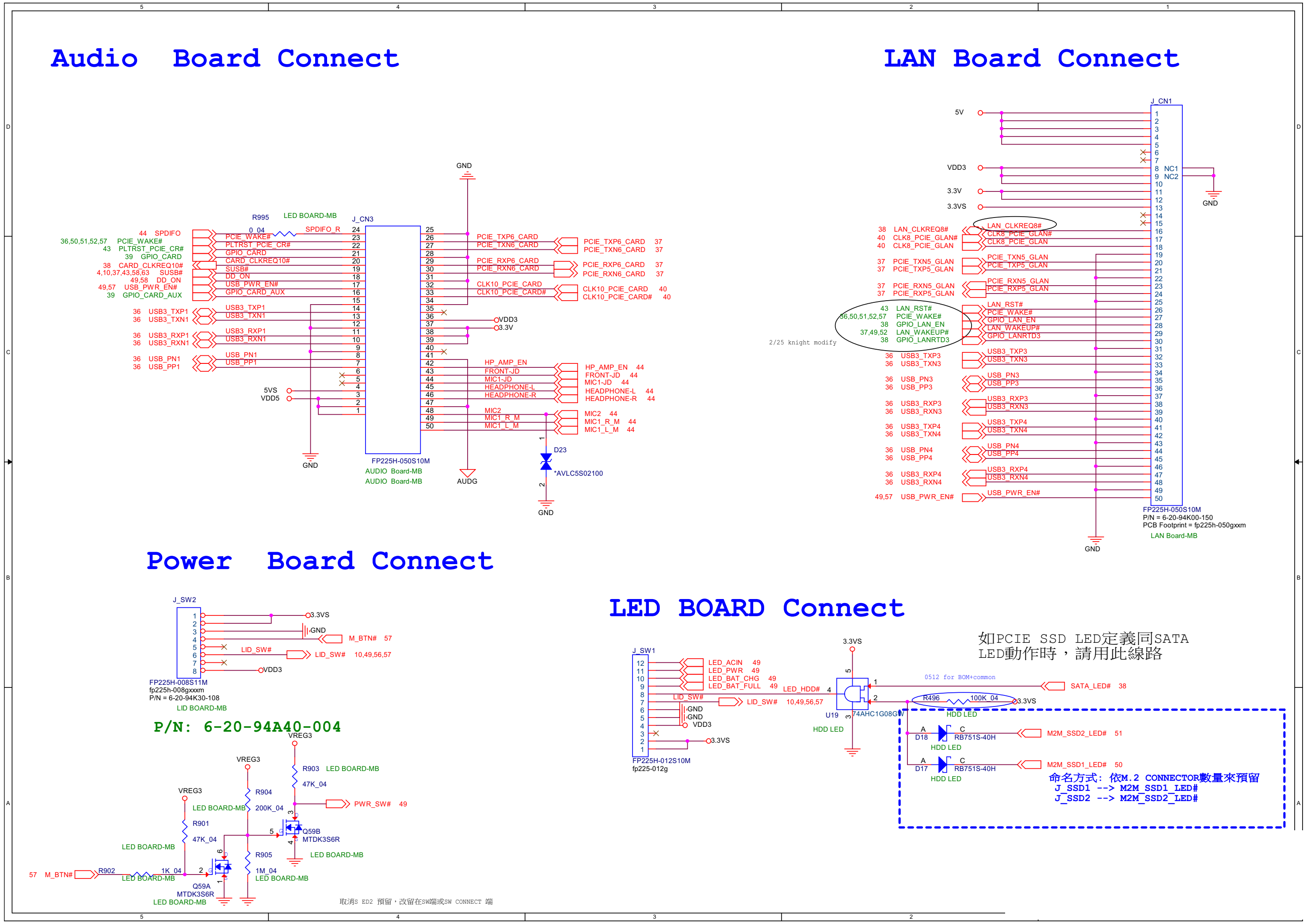
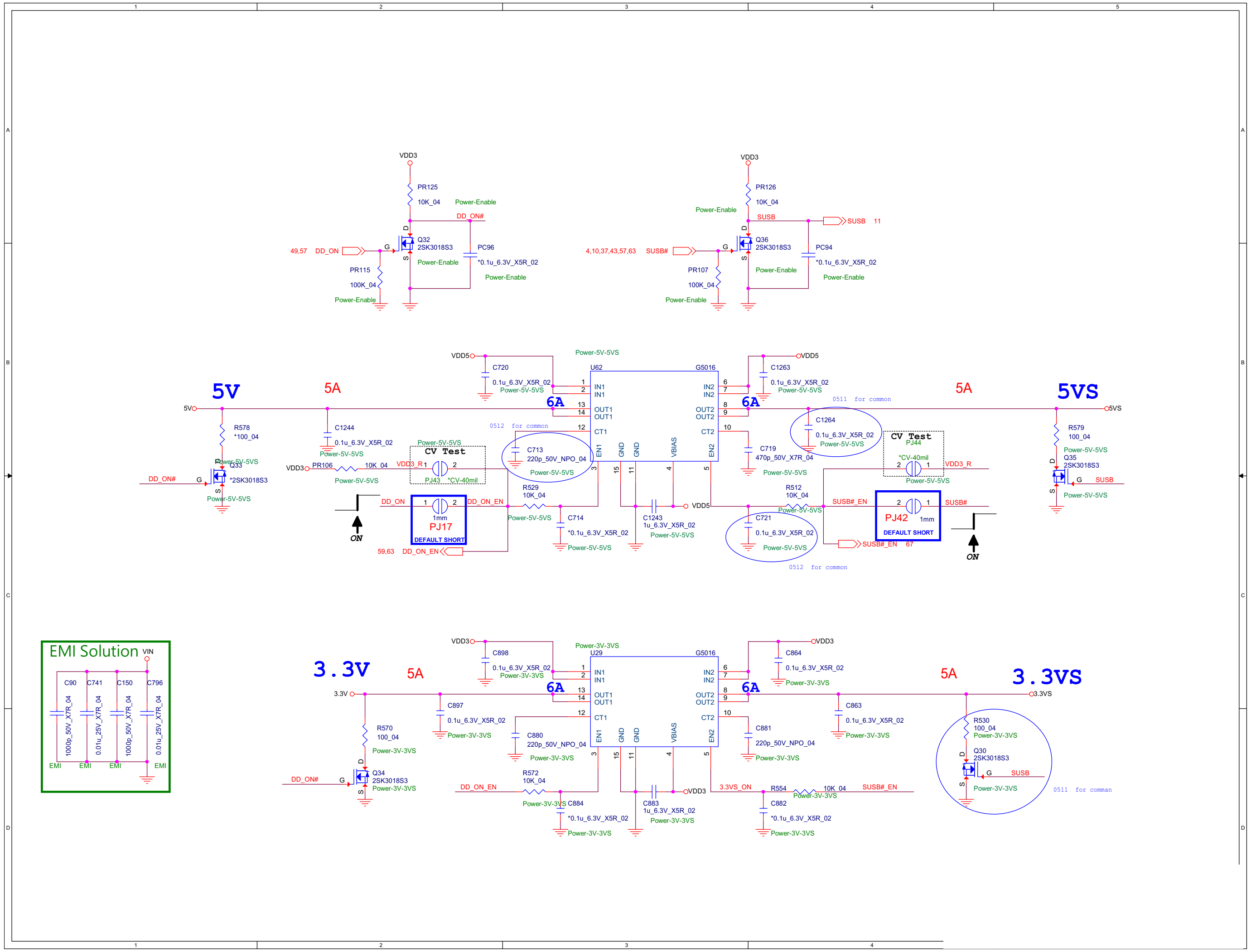
Card Connector



5V, 5VS, 3.3V, 3.3VS



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5V, 5VS, 3.3V,
3.3VS

VDD3, VDD5

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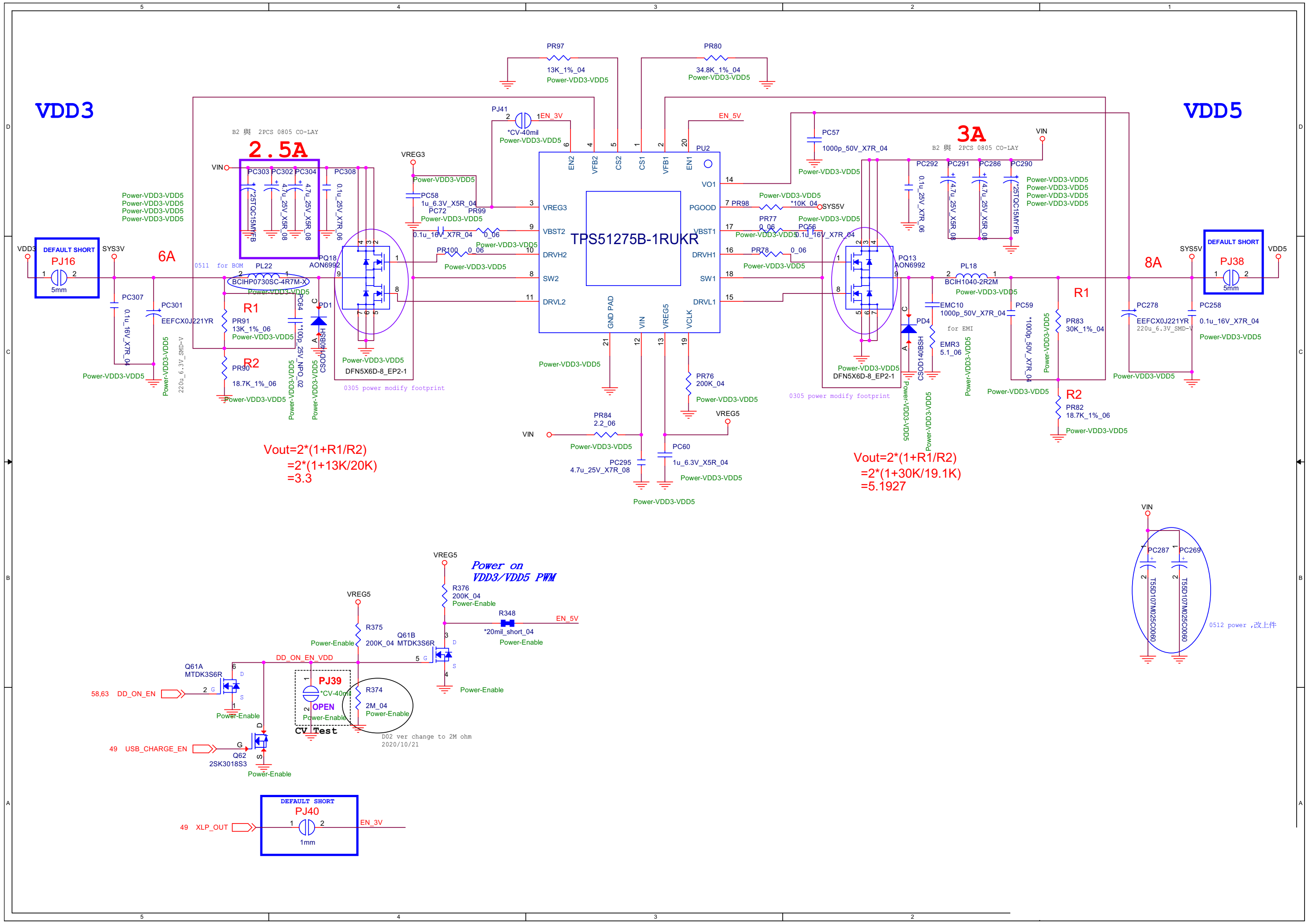
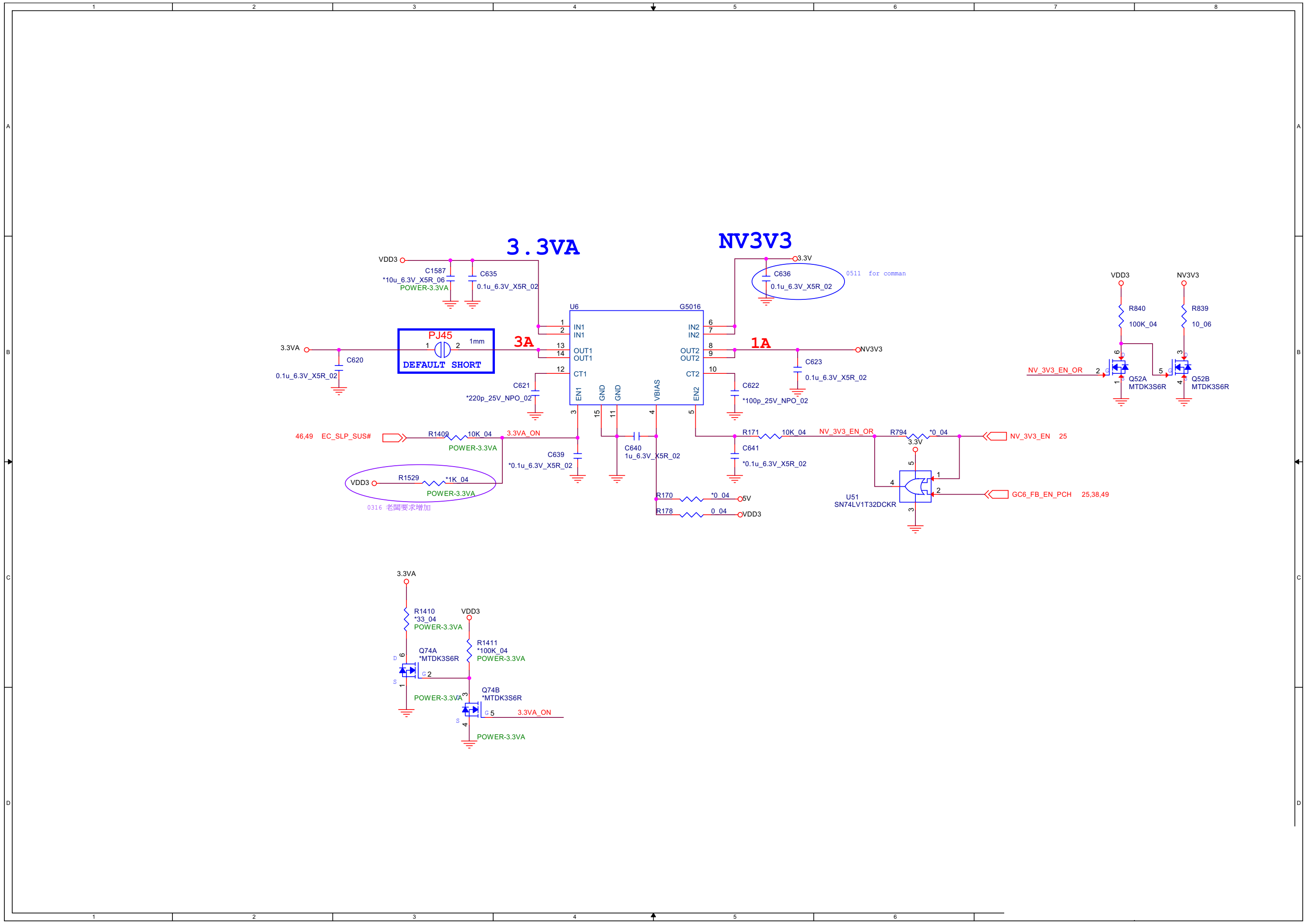
VDD3, VDD5



3.3VA



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3.3VA

VCCIN

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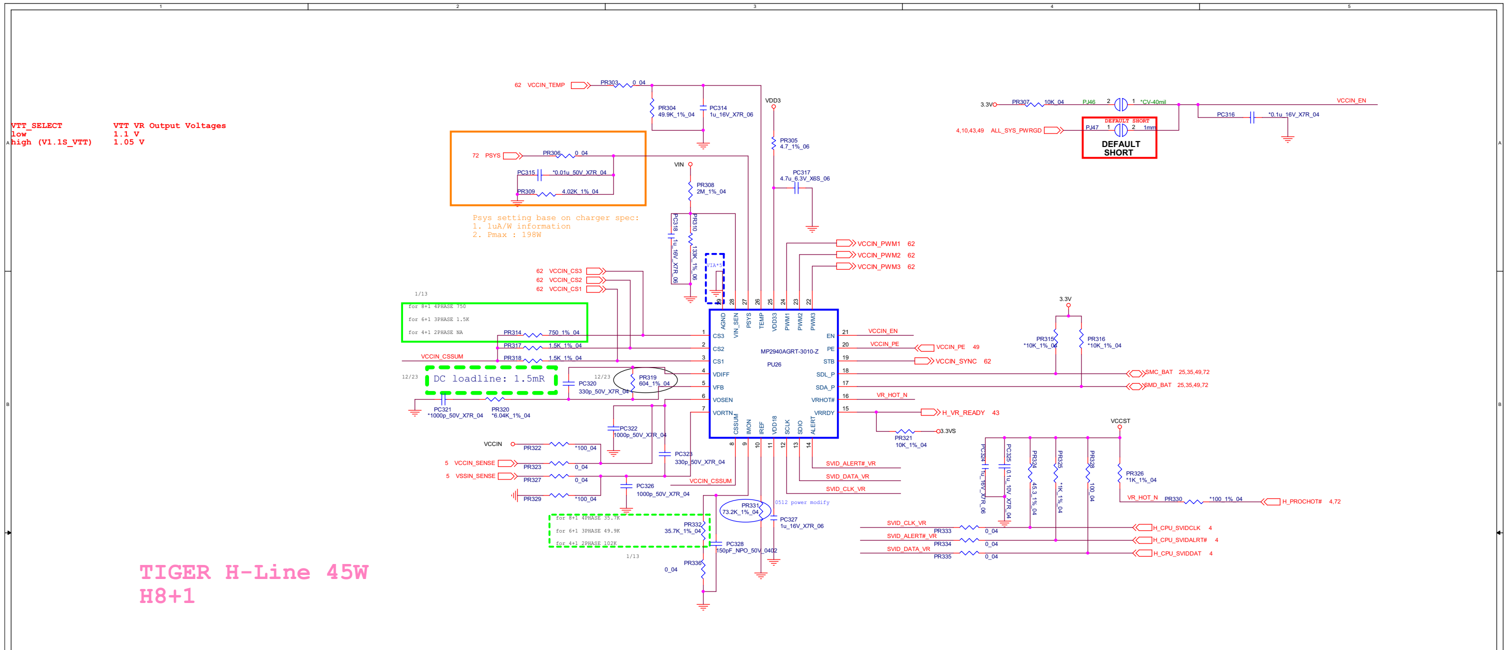
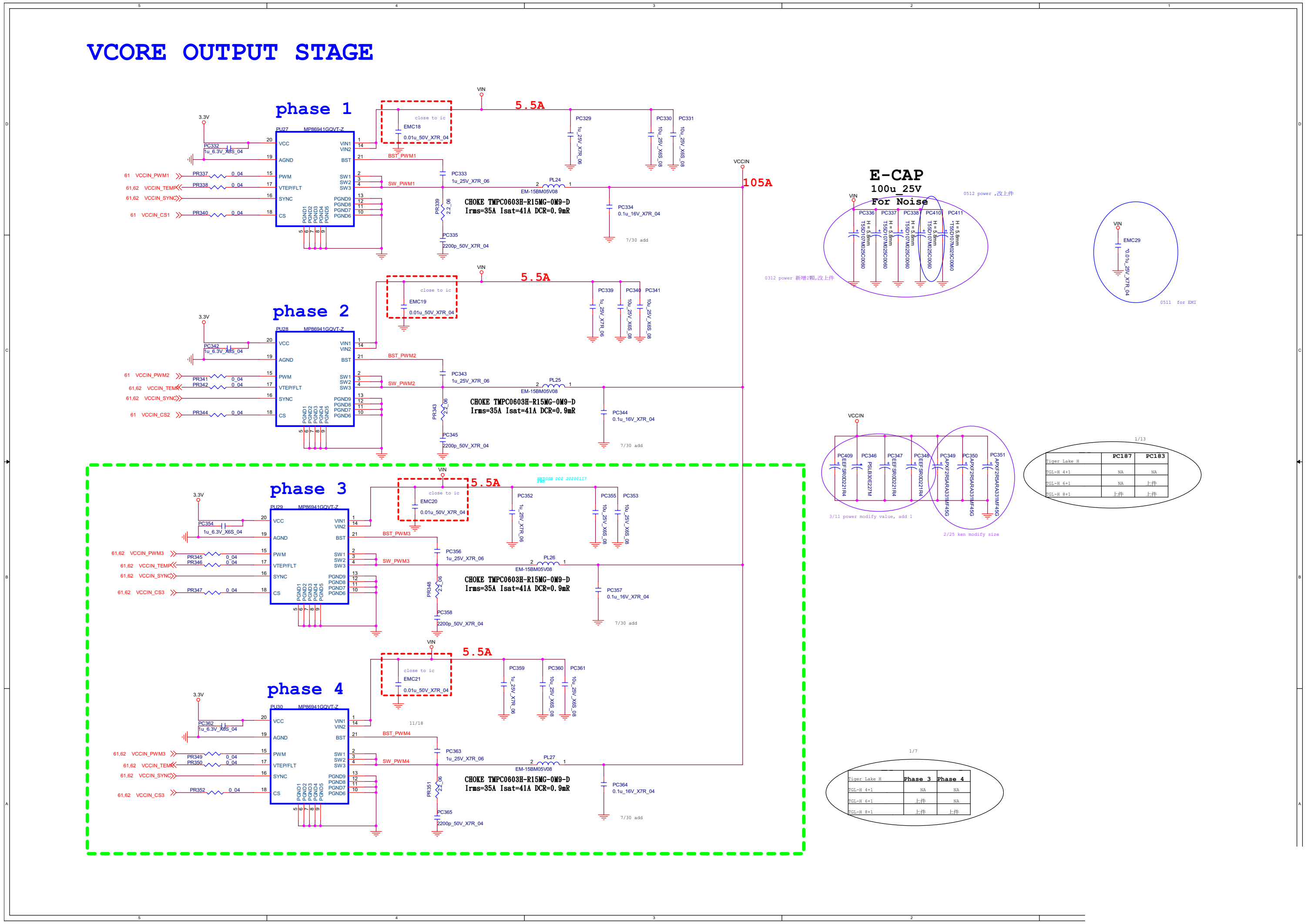
VCCIN



	TGL H 4+1 45W 3PHASE (1+1+0)	TGL H 6+1 45W 3PHASE (1+1+1)	TGL H 8+1 45W 4PHASE (1+1+2)
PMBUS Address (2B)	20h	20h	20h
4 DIGI Code			
IAICCMAX	36(Performance)	74(Performance)	105(Performance)
PL2	65(Performance)	83(Performance)	109(Performance)
IAIPL2(A)	28(Performance)	45(Performance)	61(Performance)
LL(mΩ)	1.5	1.5	1.5
Imon setting	102K_1%_04	49.9K_1%_04	35.7K_1%_04
VDIFFA Rdroop setting	604_1%_04	604_1%_04	604_1%_04
CS1	1.5K_1%_04	1.5K_1%_04	1.5K_1%_04
CS2	1.5K_1%_04	1.5K_1%_04	1.5K_1%_04
CS3	NA	1.5K_1%_04	750_1%_04
PSYS (198W)	4.02K_1%_04	4.02K_1%_04	4.02K_1%_04

VCore Output Stage



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VCore Output Stage

DDR 1.2V, 0.6VS

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DDR 1.2V, 0.6VS

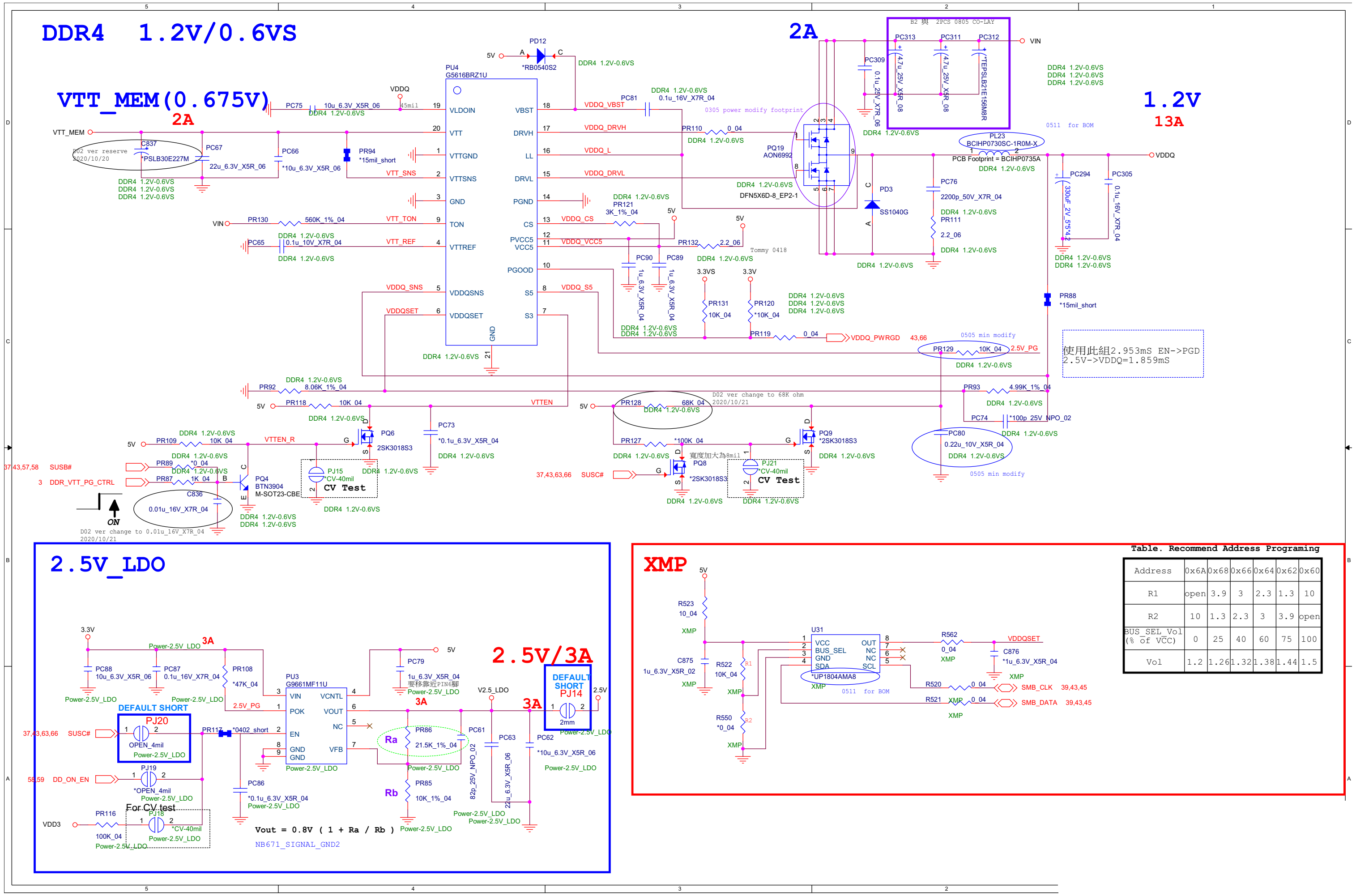
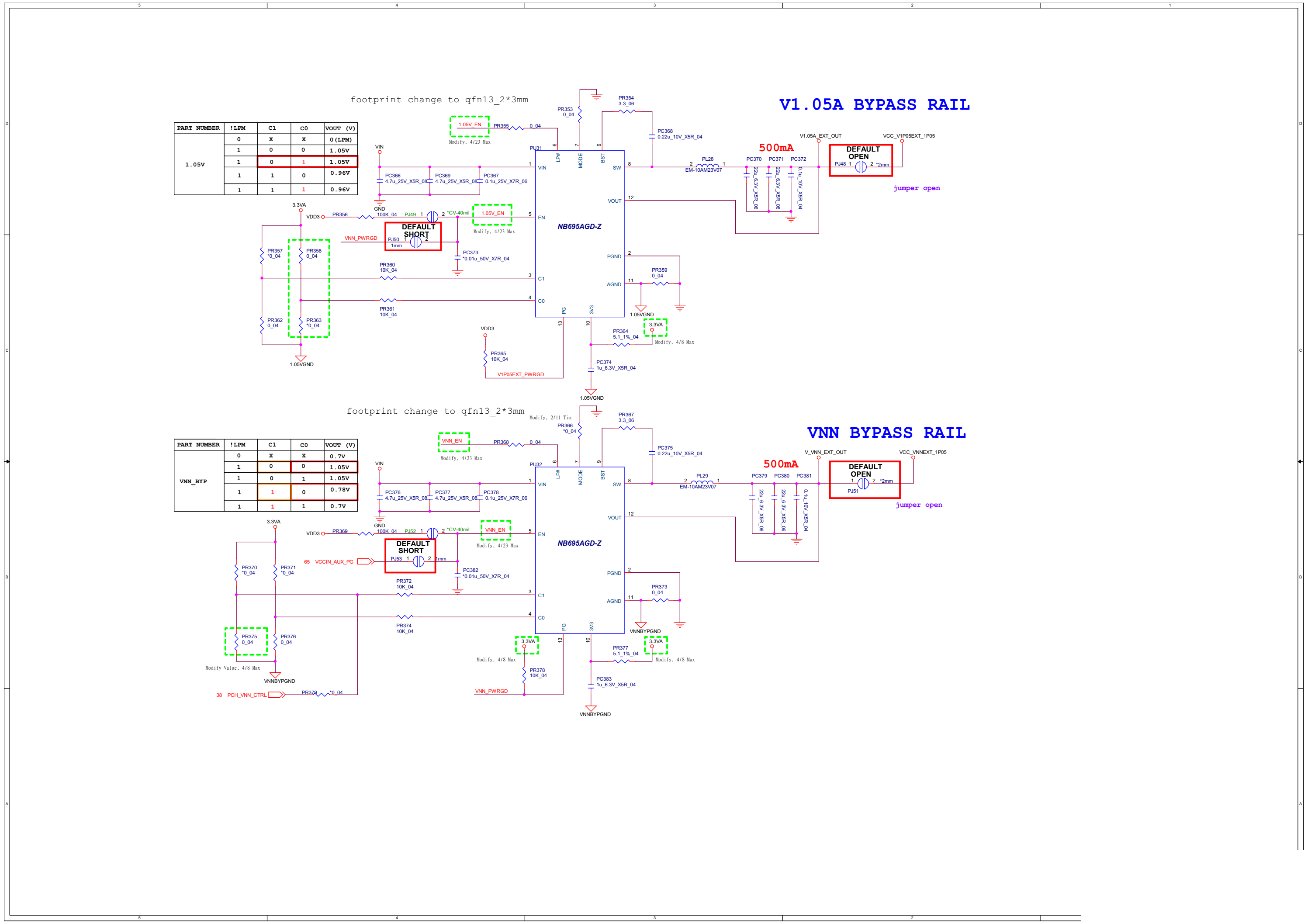


Table. Recommend Address Programing

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

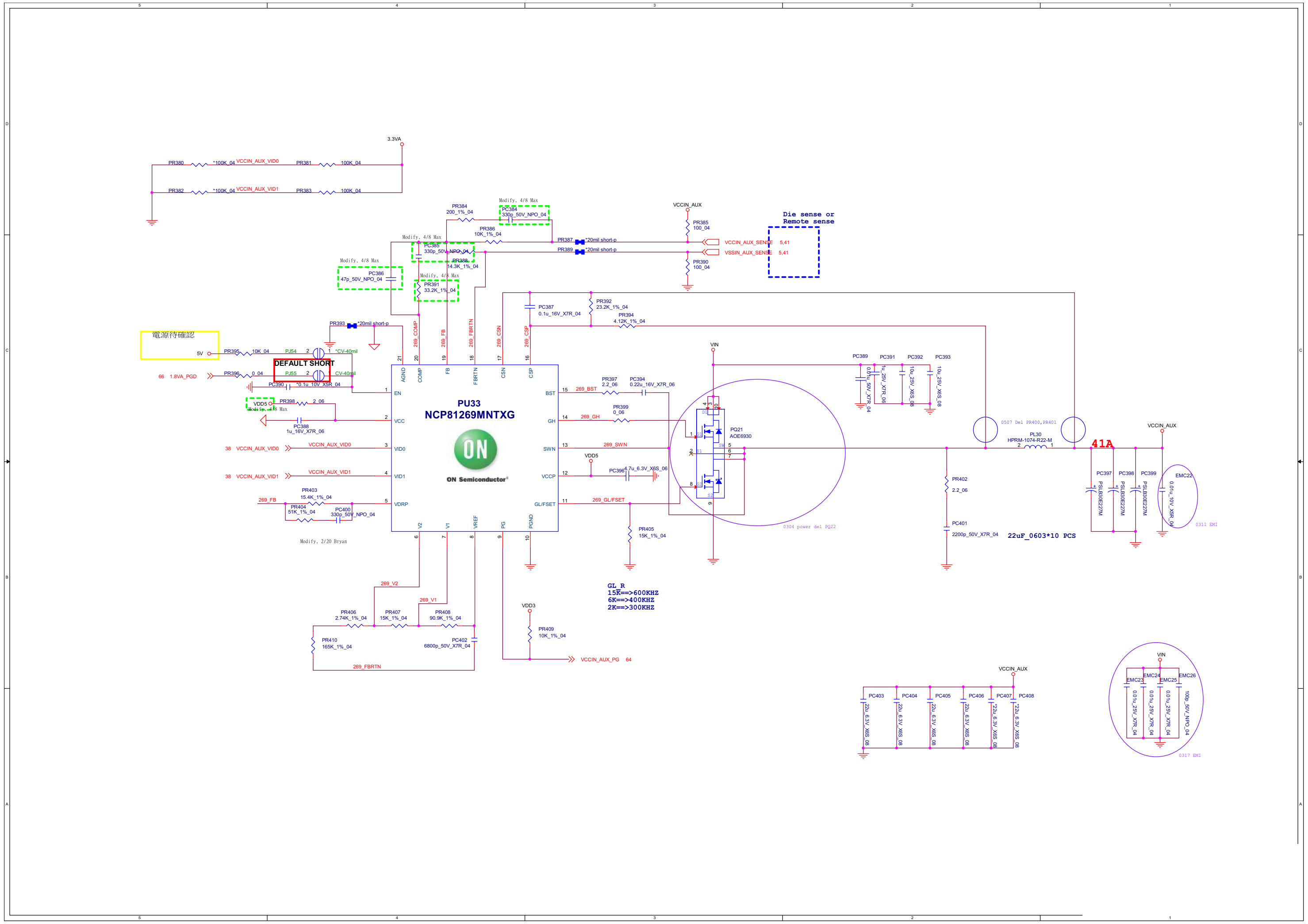
VCore Output



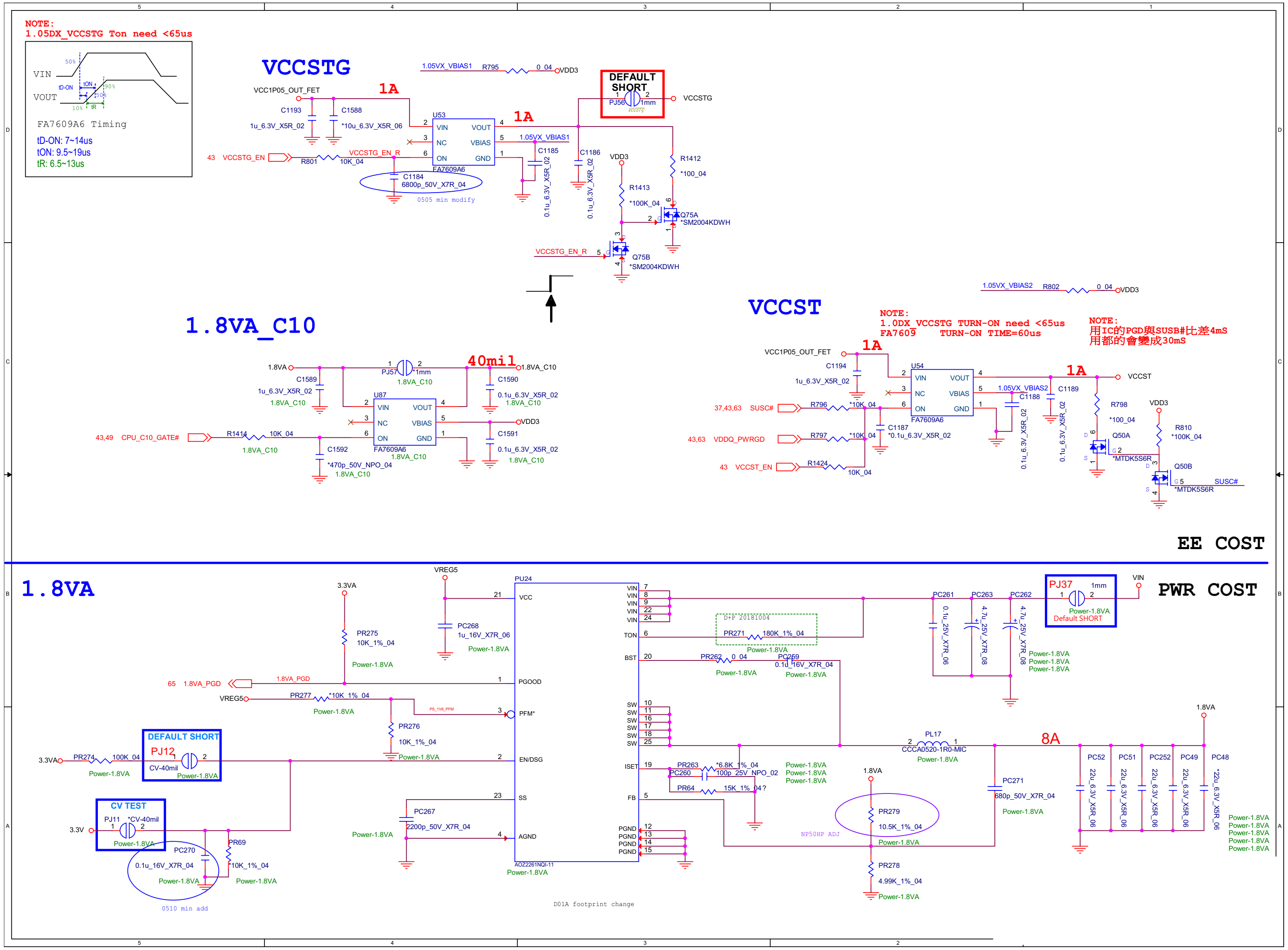
Sheet 64 of 79
VCore Output

VCCIN AUX NCP81269

Sheet 65 of 79
VCCIN AUX
NCP81269



1.8VA, 1.05V_XX/NV3V3



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1.8VA, 1.05V_XX/
NV3V3

PEX_VDD, 1.2VS, 1V8_AON

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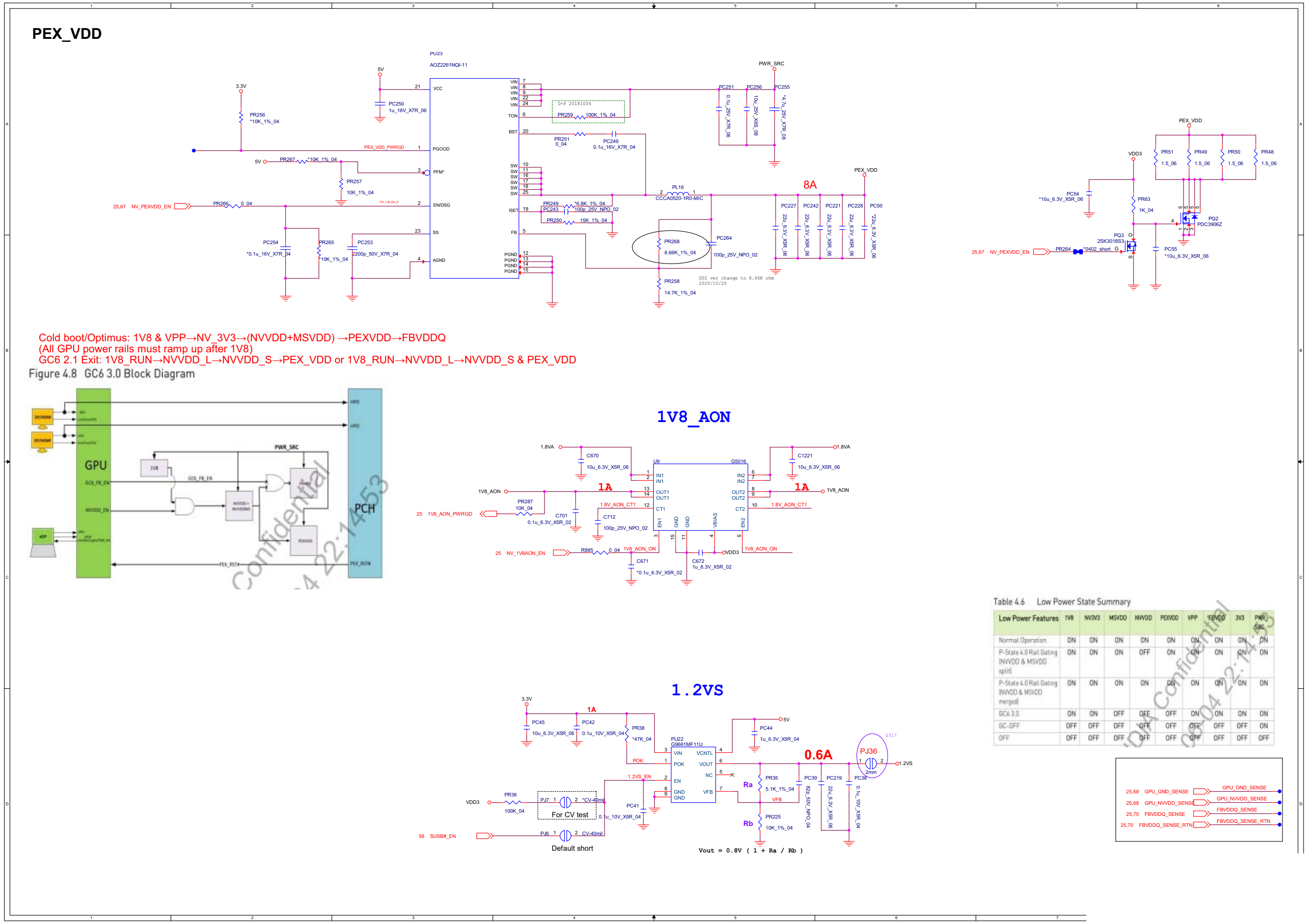
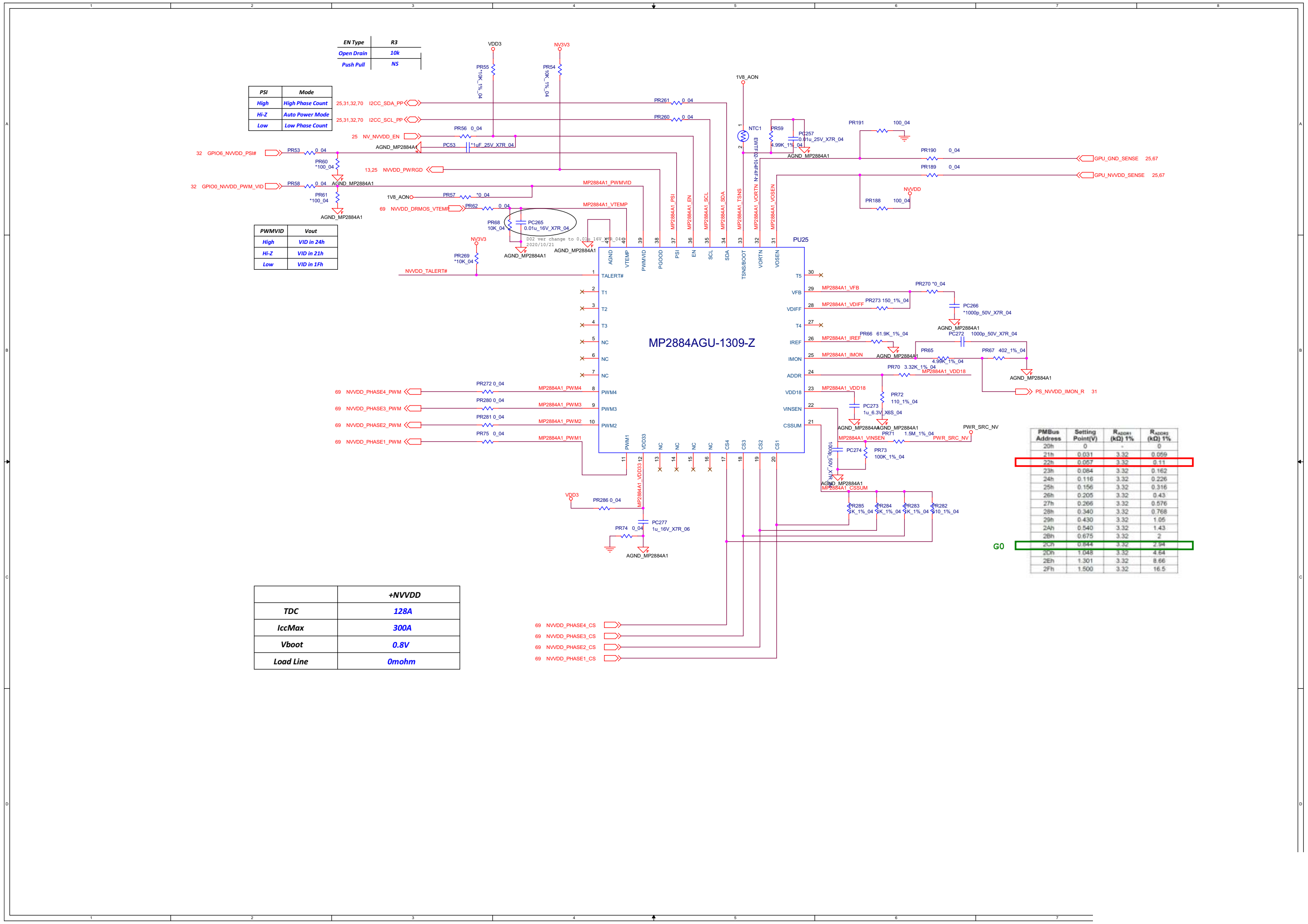
PEX_VDD,1.2VS,
1V8_AON



NVVDD 1



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NVVDD 1

NVVDD 2

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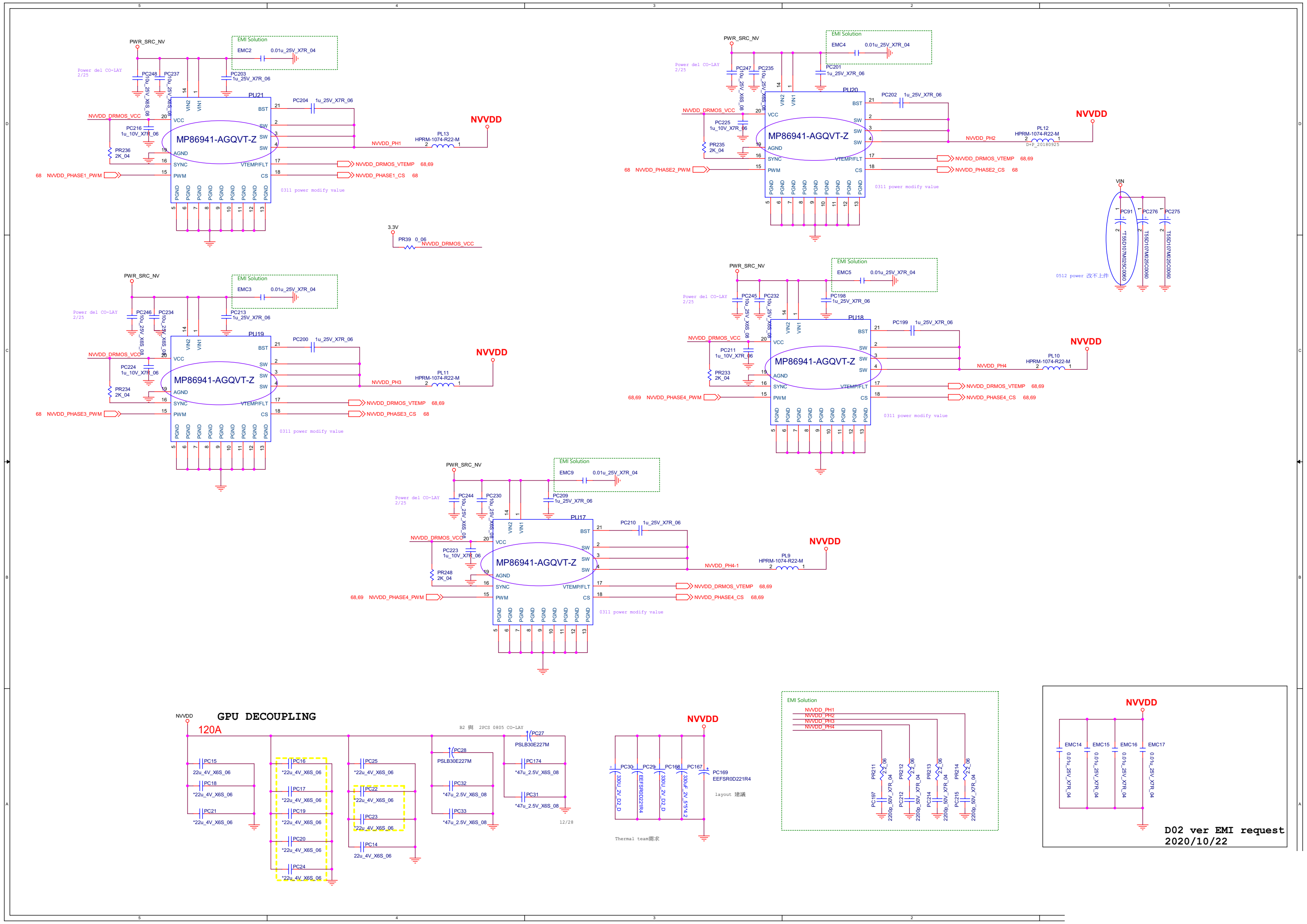
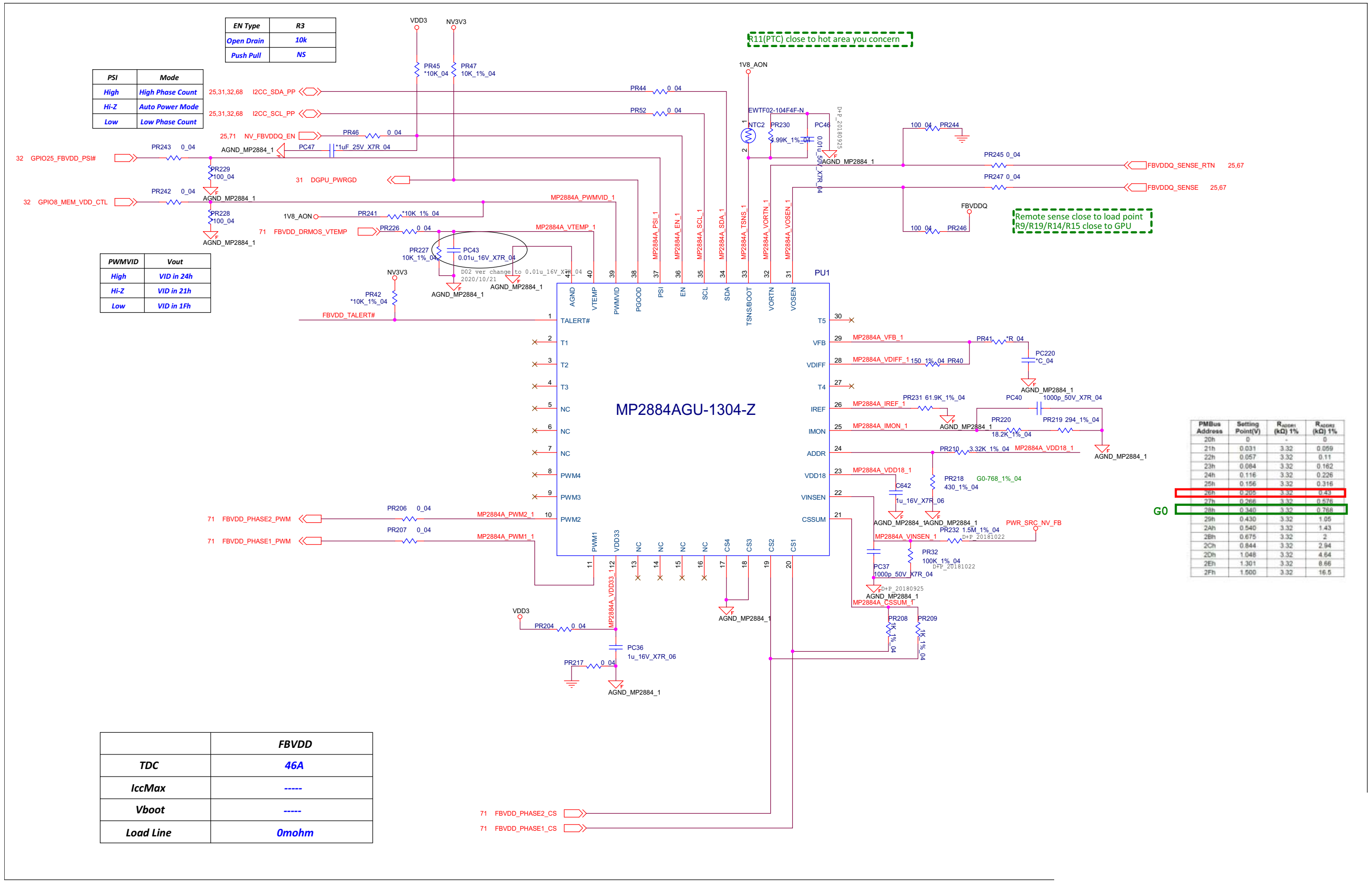
NVVDD 2



FBVDD



EN Type	R3
Open Drain	10k
Push Pull	NS

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

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

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

PMBus Address	Setting Point(V)	R_{ADDR1} (kΩ) 1%	R_{ADDR2} (kΩ) 1%
20h	0	-	0
21h	0.031	3.32	0.059
22h	0.057	3.32	0.11
23h	0.084	3.32	0.162
24h	0.116	3.32	0.226
25h	0.156	3.32	0.316
26h	0.205	3.32	0.43
27h	0.266	3.32	0.576
28h	0.340	3.32	0.768
29h	0.430	3.32	1.05
2Ah	0.540	3.32	1.43
2Bh	0.675	3.32	2
2Ch	0.844	3.32	2.94
2Dh	1.048	3.32	4.64
2Eh	1.301	3.32	8.66
2Fh	1.500	3.32	16.5

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FBVDD

FBVDD

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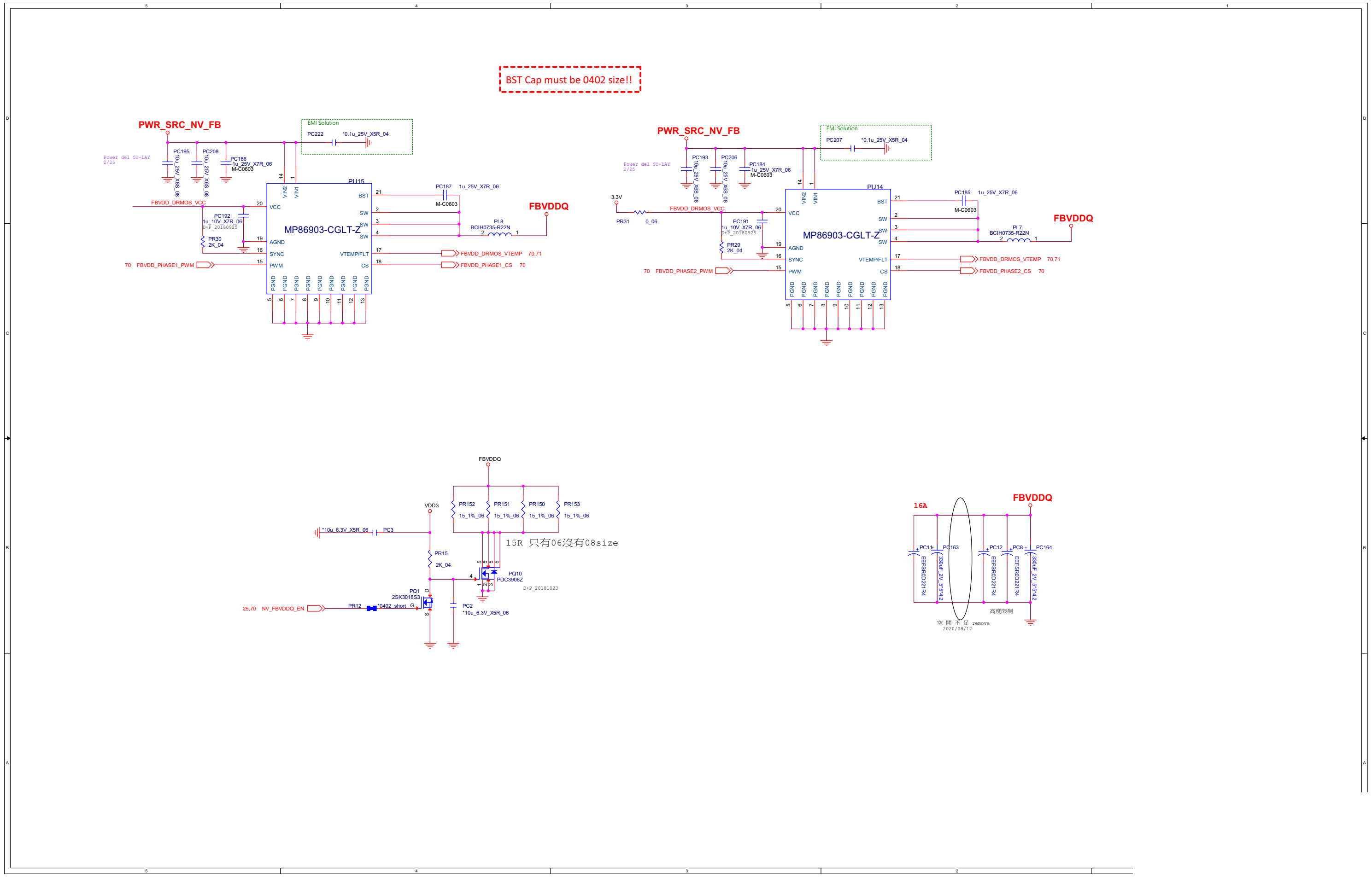
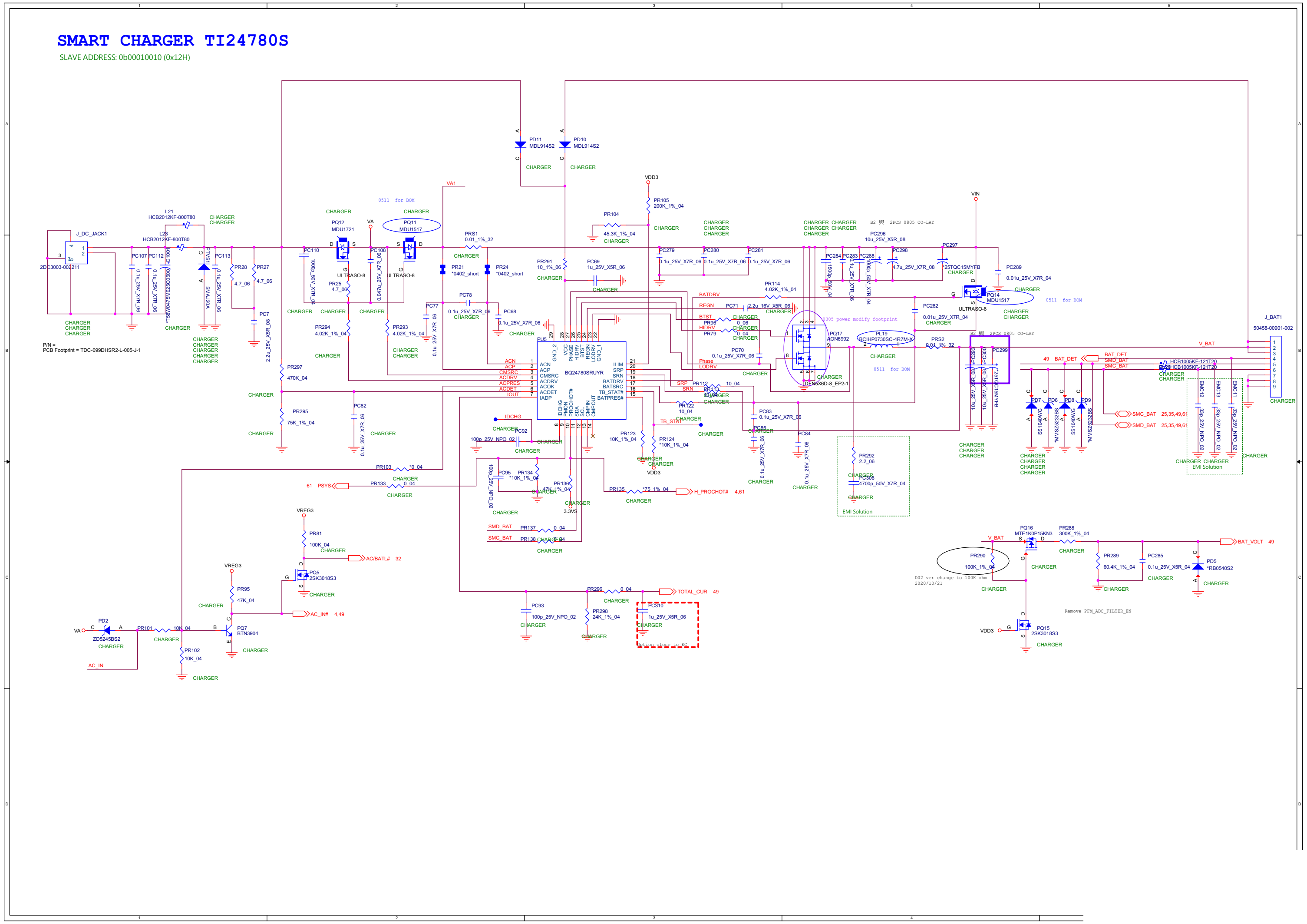
FBVDD



AC_In, Charger



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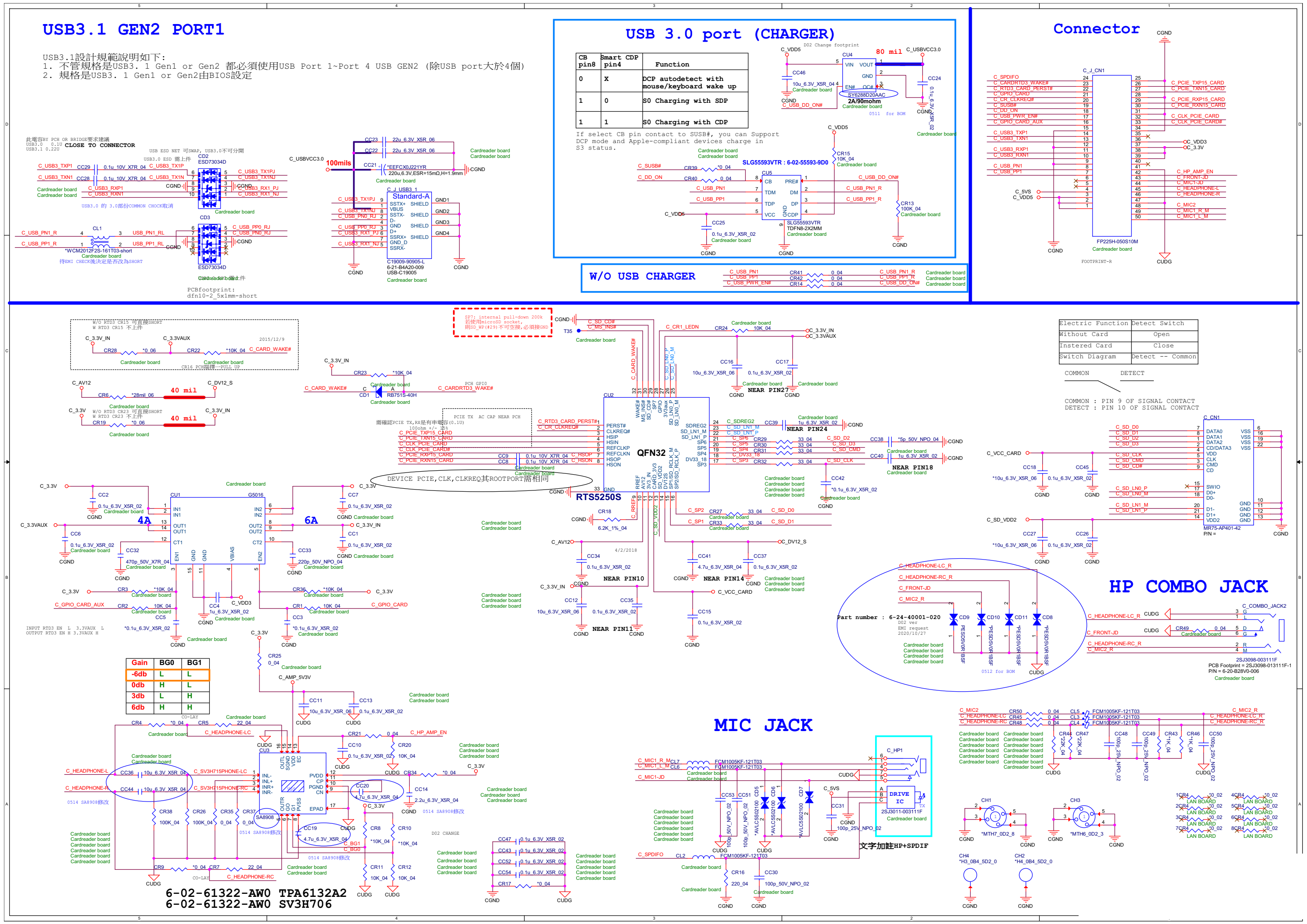
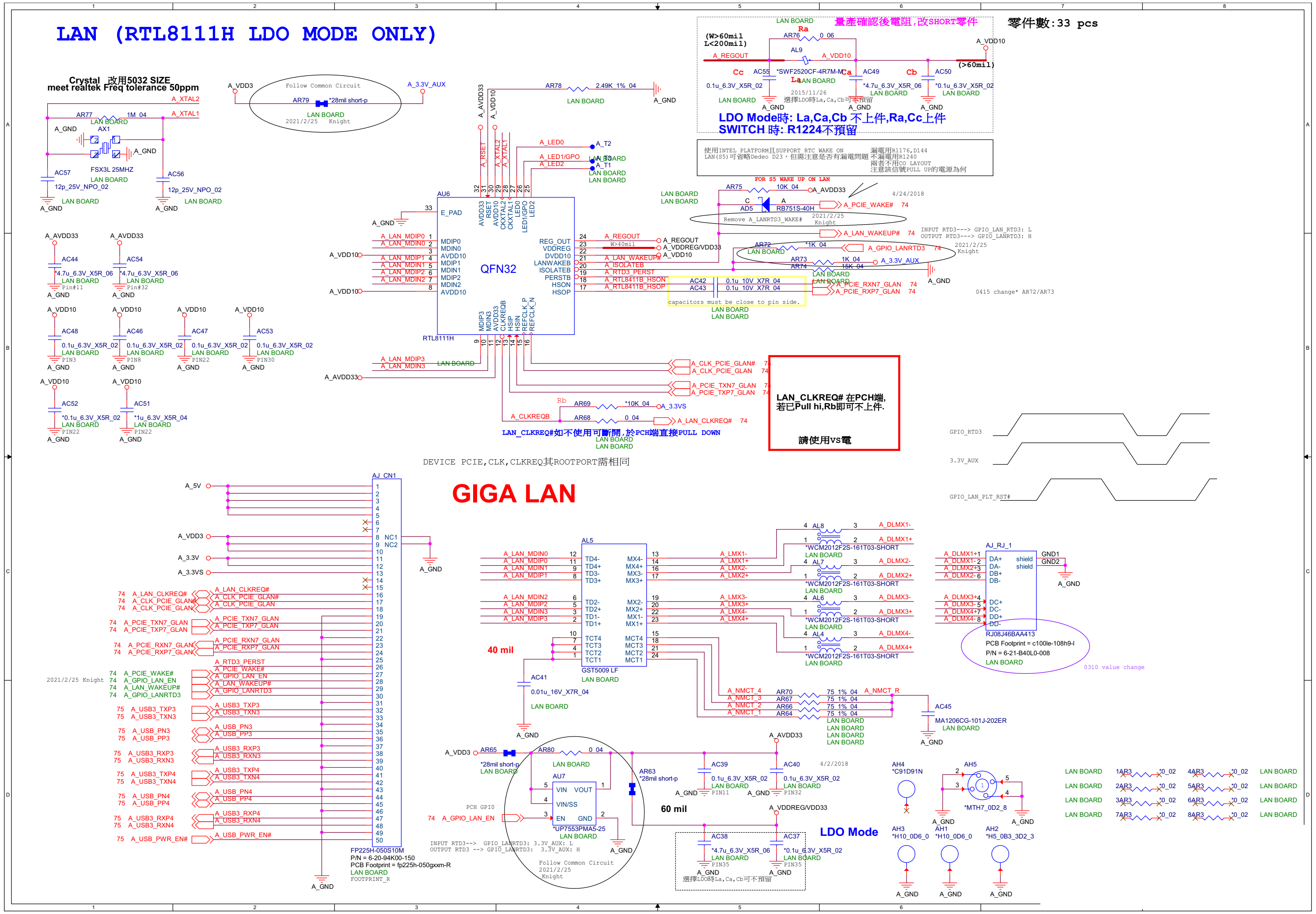
AC_In, Charger

Audio Board

Sheet 73 of 79
Audio Board



LAN Board



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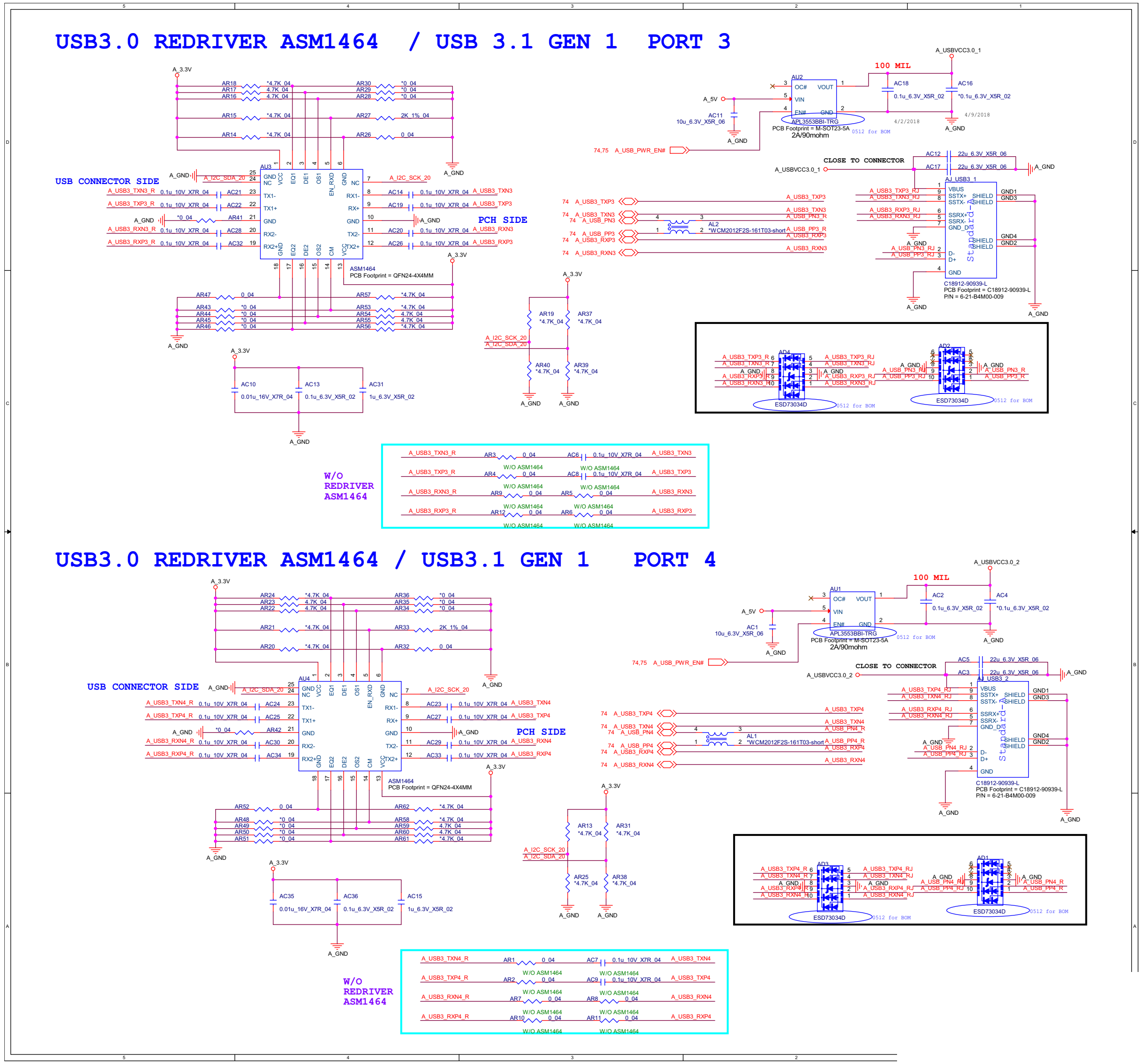
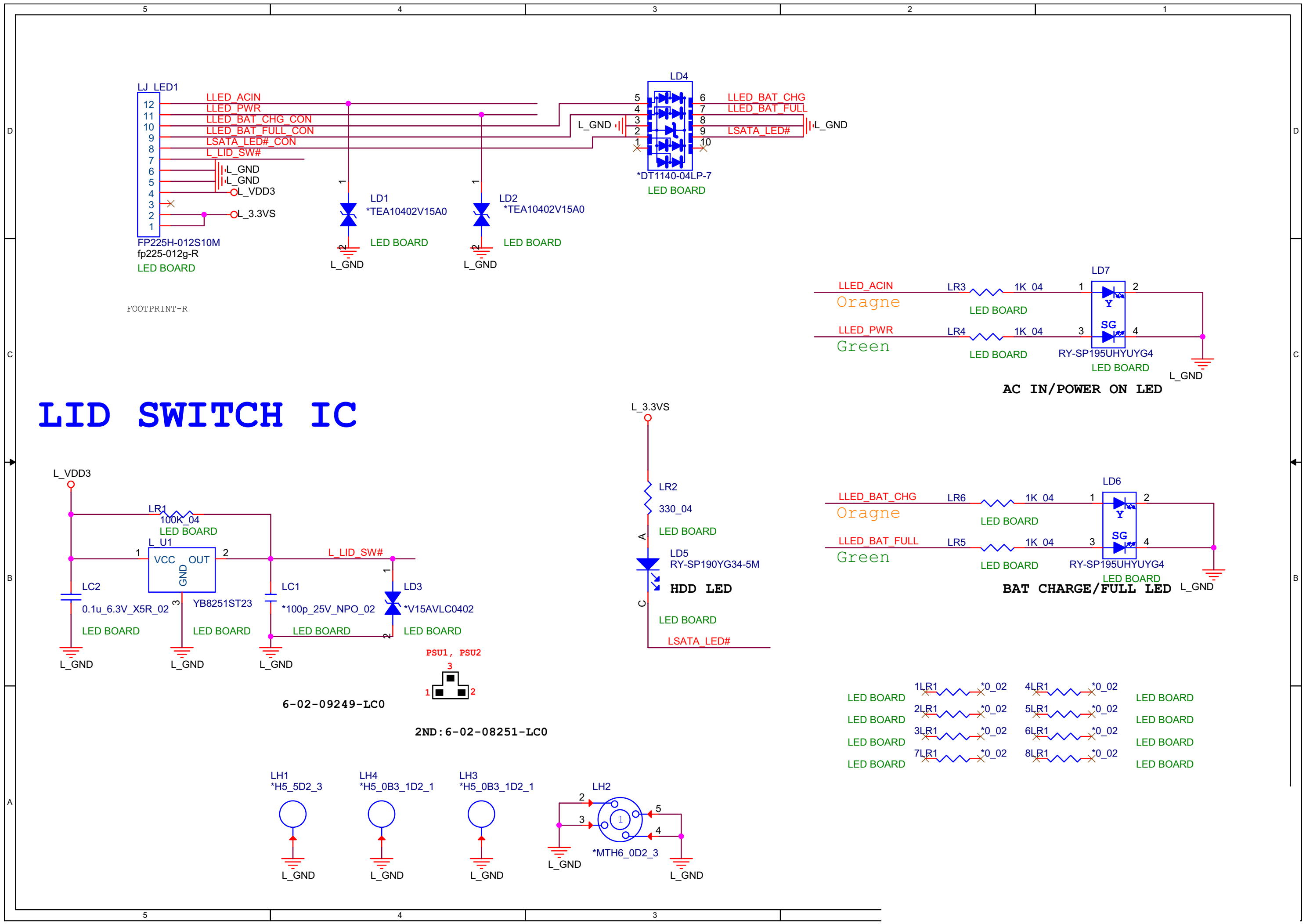
LAN Board

LAN Board

Sheet 75 of 79
LAN Board



LED Board



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LED Board

Power Board PC50

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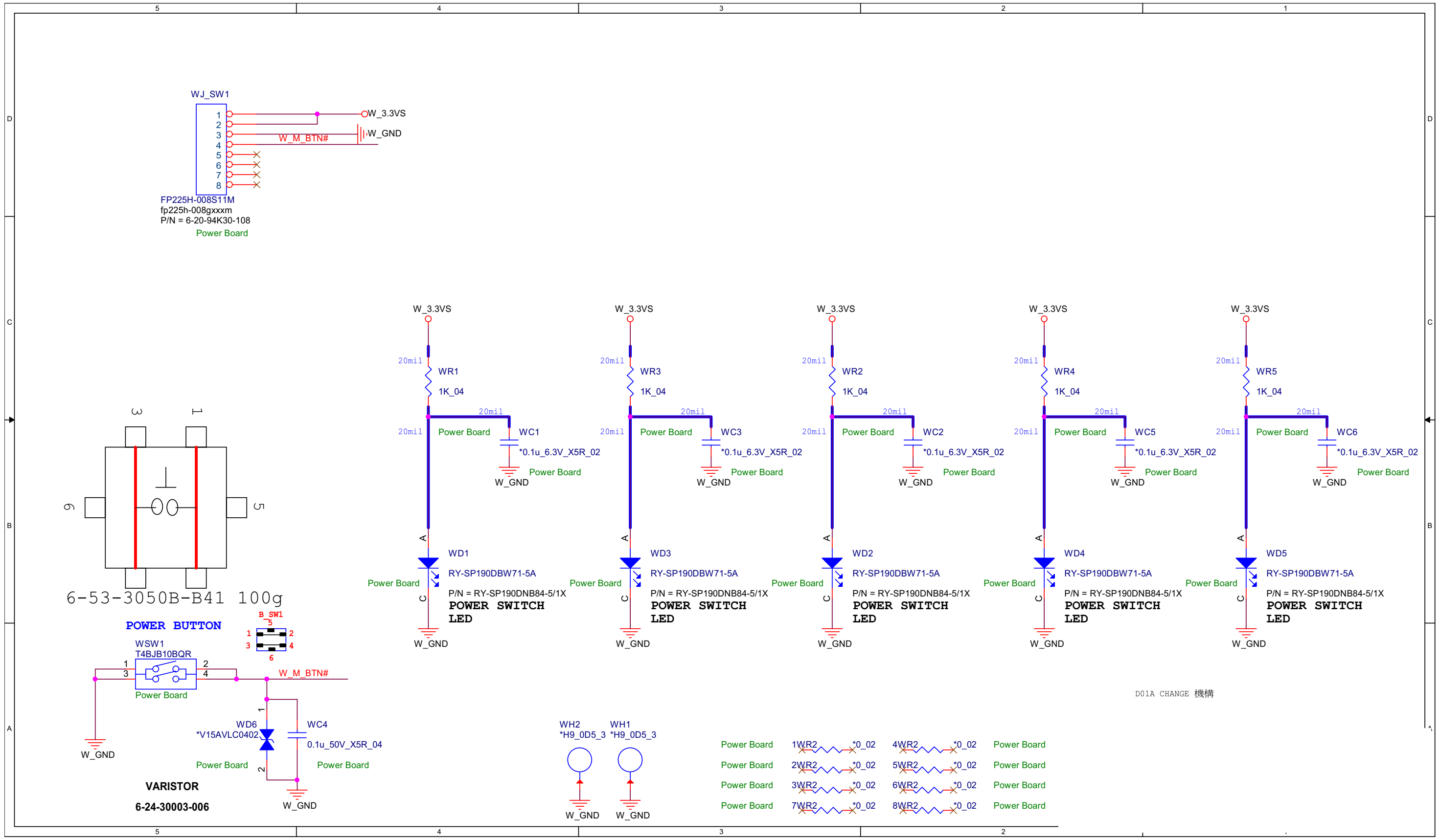
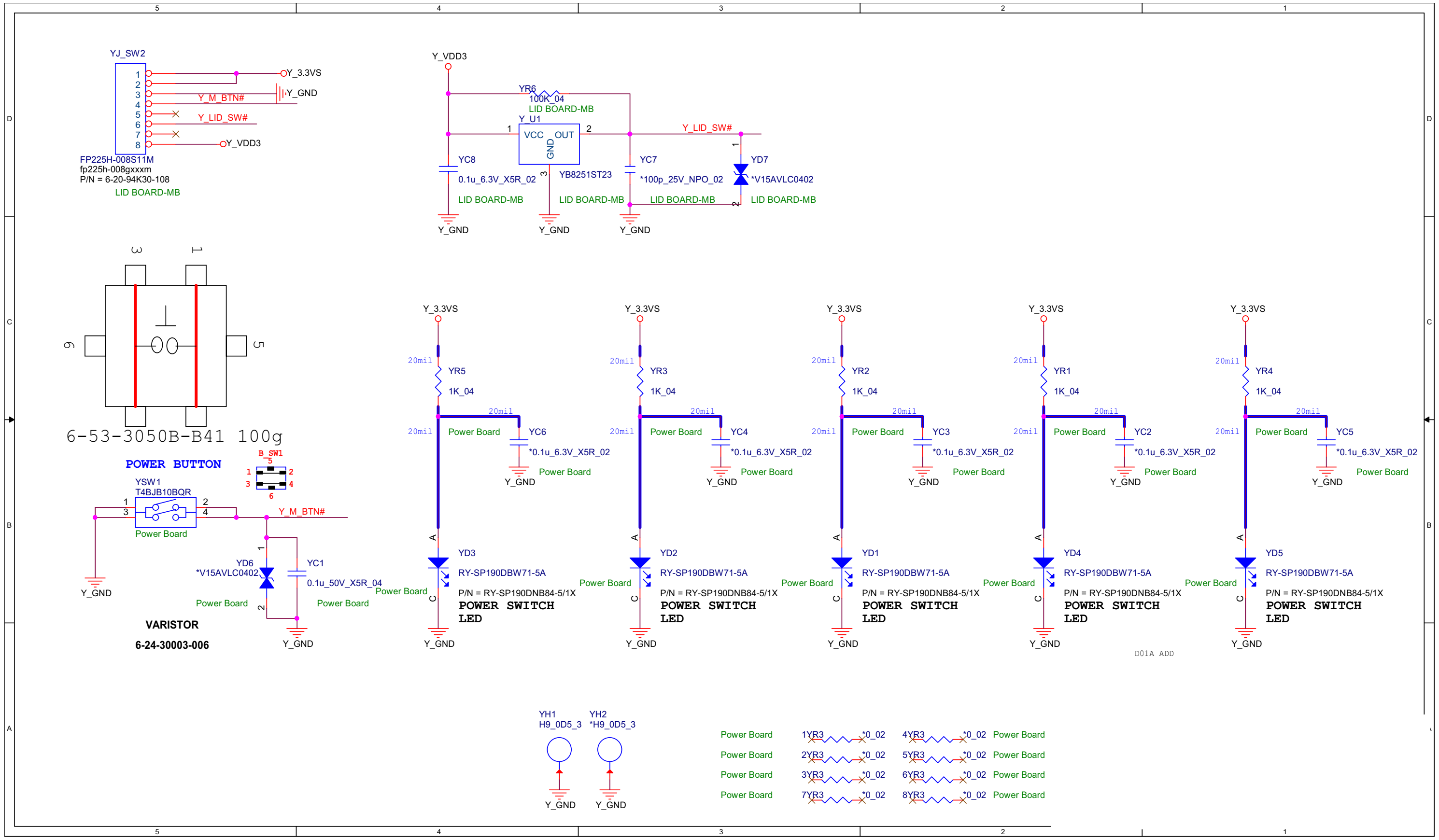
Power Board PC50



Power Board PC70



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Power Board PC70

LED Board PC70

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LED Board PC70