

SERVICE MANUAL

NK70SB / NK70SE

notebook



Notebook Computer

NK70SB / NK70SE

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 **NK70SB** / **NK70SE** 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

Preface

IMPORTANT SAFETY INSTRUCTIONS

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

1. Do not use this product near water, for example near a bath tub, wash bowl, kitchen sink or laundry tub, in a wet basement or near a swimming pool.
2. Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electrical shock from lightning.
3. Do not use the telephone to report a gas leak in the vicinity of the leak.
4. Use only the power cord and batteries indicated in this manual. Do not dispose of batteries in a fire. They may explode. Check with local codes for possible special disposal instructions.
5. This product is intended to be supplied by a Listed Power Unit as follows:
 - AC Input of 100 - 240V, 50 - 60Hz, DC Output of 19.5V, 7.7A (**150** Watts) minimum AC/DC Adapter.

FCC Statement

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

This device may not cause harmful interference.

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

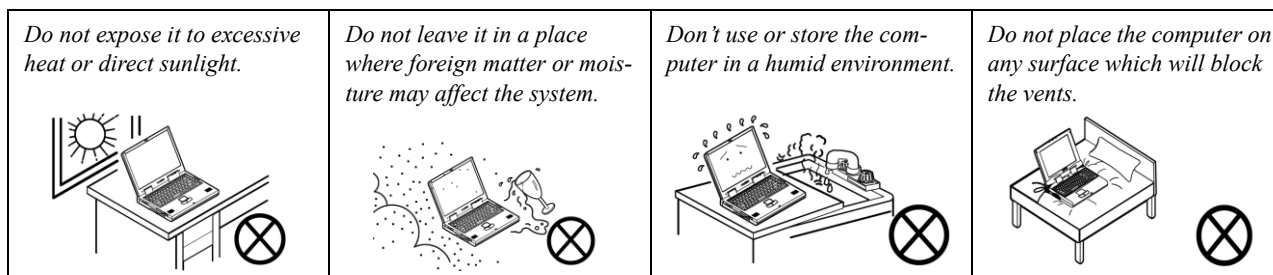
Instructions for Care and Operation

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

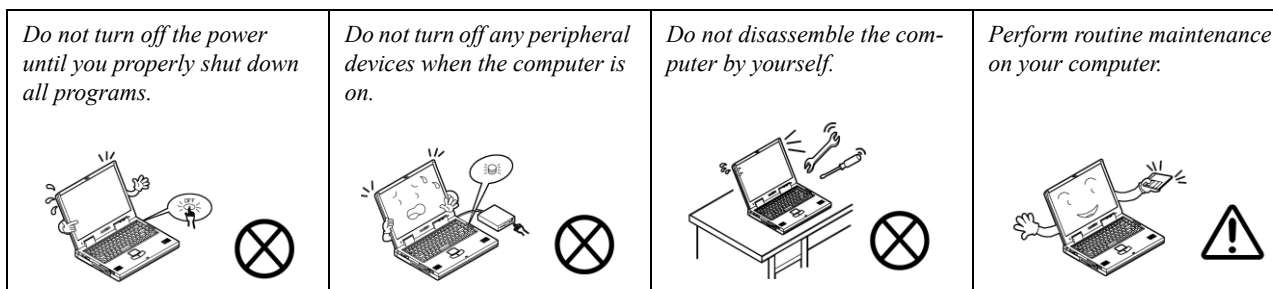
1. **Don't drop it, or expose it to shock.** If the computer falls, the case and the components could be damaged.



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

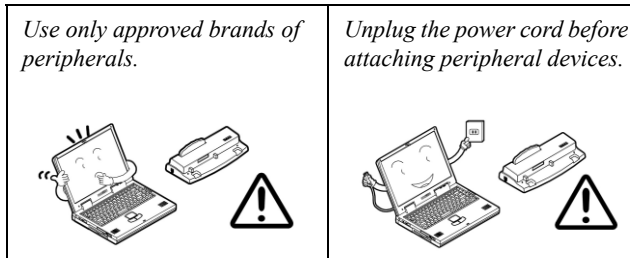


3. **Follow the proper working procedures for the computer.** Shut the computer down properly and don't forget to save your work. Remember to periodically save your data as data may be lost if the battery is depleted.



Preface

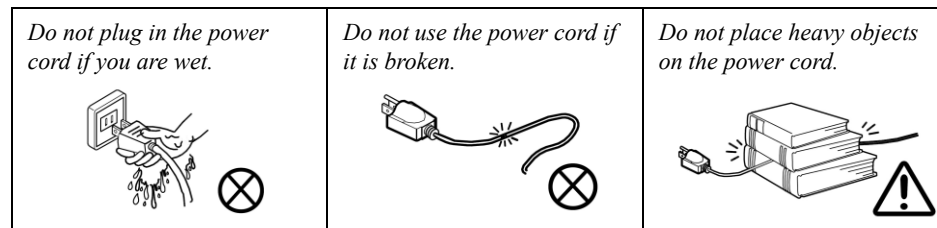
4. **Avoid interference.** Keep the computer away from high capacity transformers, electric motors, and other strong magnetic fields. These can hinder proper performance and damage your data.
5. **Take care when using peripheral devices.**



Power Safety

The computer has specific power requirements:

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



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. Attach the AC/DC adapter to the DC-In jack on the left of the computer, then plug the AC power cord into an outlet, and connect the AC power cord to the AC/DC adapter.
6. Use one hand to raise the lid/LCD to a comfortable viewing angle (do not exceed 130 degrees); use the other hand (as illustrated in Figure 1) to support the base of the computer (**Note: Never** lift the computer by the lid/LCD).
7. Press the power button to turn the computer "on".

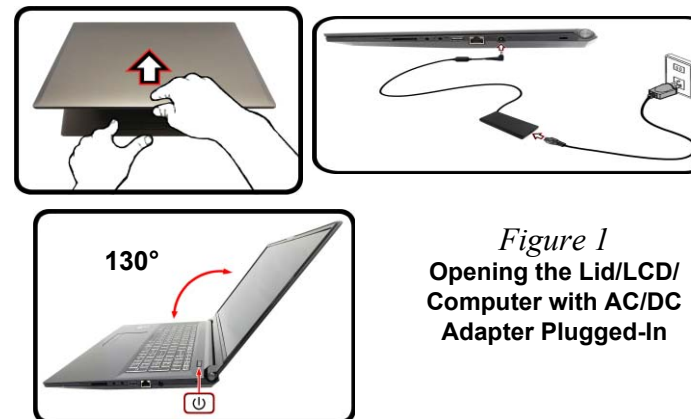



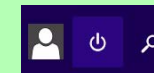
Figure 1
**Opening the Lid/LCD/
Computer with AC/DC
Adapter Plugged-In**




Shut Down

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

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



Or

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

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Chapter 1: Introduction

Overview

This manual covers the information you need to service or upgrade the **NK70SB / NK70SE** series notebook computer. Information about operating the computer (e.g. getting started, and the *Setup* utility) is in the *User's Manual*. Information about drivers (e.g. VGA & audio) is also found in the *User's Manual*. The manual is shipped with the computer.

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

The **NK70SB / NK70SE** series notebook is designed to be upgradeable. See [Disassembly on page 2 - 1](#) for a detailed description of the upgrade procedures for each specific component. Please take note of the warning and safety information indicated by the “” symbol.

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

Introduction

Specifications



Latest Specification Information

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



CPU

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

Processor Options

Intel® Core™ i7 Processor

i7-10700 (2.90GHz)

16MB Smart Cache, 14nm, DDR4-2933MHz, TDP 65W

Intel® Core™ i5 Processor

i5-10600 (3.30GHz)

12MB Smart Cache, 14nm, DDR4-2666MHz, TDP 65W

i5-10500 (3.10GHz)

12MB Smart Cache, 14nm, DDR4-2666MHz, TDP 65W

i5-10400 (2.90GHz)

12MB Smart Cache, 14nm, DDR4-2666MHz, TDP 65W

Intel® Core™ i3 Processor

i3-10320 (3.80GHz)

8MB Smart Cache, 14nm, DDR4-2666MHz, TDP 65W

i3-10310 (3.70GHz)

8MB Smart Cache, 14nm, DDR4-2666MHz, TDP 65W

i3-10100 (3.60GHz)

6MB Smart Cache, 14nm, DDR4-2666MHz, TDP 65W

Intel® Pentium® Processor

Gold G6600 (4.20GHz)

4MB Smart Cache, 14nm, DDR4-2666MHz, TDP 58W

Intel® Celeron Processor

Celeron G5920 (3.50GHz)

2MB Smart Cache, 14nm, DDR4-2666MHz, TDP 58W

Core Logic

Intel® H470 Chipset

BIOS

128Mb SPI Flash ROM

INSYDE BIOS

LCD Options

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

Memory

Dual Channel DDR4

Two 260 Pin SO-DIMM Sockets

Supporting up to **3200MHz DDR4** Memory

Memory Expandable up to **32GB**

Compatible with 4GB, 8GB or 16GB Modules

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

Video Adapter

Intel® Integrated GPU and NVIDIA® Discrete GPU

Supports Microsoft Hybrid Graphics

Intel Integrated GPU

Intel® UHD Graphics 630

Dynamic Frequency

Intel Dynamic Video Memory Technology

Microsoft DirectX®12 Compatible

Intel® UHD Graphics 610 (G5920 only)

Dynamic Frequency

Intel Dynamic Video Memory Technology

Microsoft DirectX®12 Compatible

NVIDIA® Discrete GPU

NVIDIA® GeForce GTX 1650Ti (NK70SE)

4GB GDDR5 Video RAM on board

Microsoft DirectX® 12 Compatible

NVIDIA® GeForce GTX 1650 (NK70SB)

4GB GDDR5 Video RAM on board

Microsoft DirectX® 12 Compatible

Storage

One Changeable 2.5" 7mm (h) SATA HDD/SSD

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

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

Audio

High Definition Audio Compliant Interface

2 * Built-In Speakers

Built-In Array Microphone

Sound Blaster™ Cinema 6

Security

Security (Kensington® Type) Lock Slot

BIOS Password

Intel PTT for systems without hardware TPM

Keyboard

Full-size Keyboard (with Numeric Keypad)

Or

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

Pointing Device

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

Interface

One USB 3.2 Gen 2 Type-C Port*

**The maximum amount of current supplied by USB Type-C ports is 500mA (USB 2.0)/900mA (USB 3.2).*

Two USB 3.2 Gen 2 Type-A Ports

One USB 2.0 Port

One Mini DisplayPort 1.4

One HDMI-Out Port

One Microphone-In Jack

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

One RJ-45 LAN Jack

One DC-In Jack

Card Reader

Embedded Multi-In-1 Card Reader

MMC (MultiMedia Card) / RS MMC

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

M.2 Slots

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

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

Slot 3 for **PCIe Gen3 x4 SSD**

Communication

1.0M HD PC Camera Module

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

WLAN/ Bluetooth M.2 Modules:

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

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

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

Environmental Spec**Temperature**

Operating: 5°C - 35°C

Non-Operating: -20°C - 60°C

Relative Humidity

Operating: 20% - 80%

Non-Operating: 10% - 90%

Power

Full Range AC/DC Adapter

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

DC Output: 19.5V, 7.7A (**150W**)

Removable 6 Cell Smart Lithium-Ion Battery Pack, 47WH

Dimensions & Weight

398.6mm (w) * 275mm (d) * 31.5mm (h)

2.7kg (Barebone with 47WH Battery)

Introduction

Figure 1
Top View

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

External Locator - Top View with LCD Panel Open



External Locator - Front & Right Side Views

Figure 2
Front View

1. LED Indicator

FRONT VIEW



RIGHT SIDE VIEW



Figure 3
Right Side View

1. Multi-in-1 Card Reader
2. Audio Jack
3. Microphone-In Jack
4. USB 2.0 Port
5. RJ-45 LAN Jack
6. DC-In Jack
7. Security Lock Slot

Introduction

External Locator - Left Side & Rear View

Figure 4

Left Side View

1. Vent
2. Mini Display Port
3. HDMI-Out Port
4. USB 3.2 Gen 2 Type-C Port
5. USB 3.2 Gen 2 Type-A Ports

LEFT SIDE VIEW



REAR VIEW



Figure 5

Rear View

1. Battery
2. Vent

External Locator - Bottom View

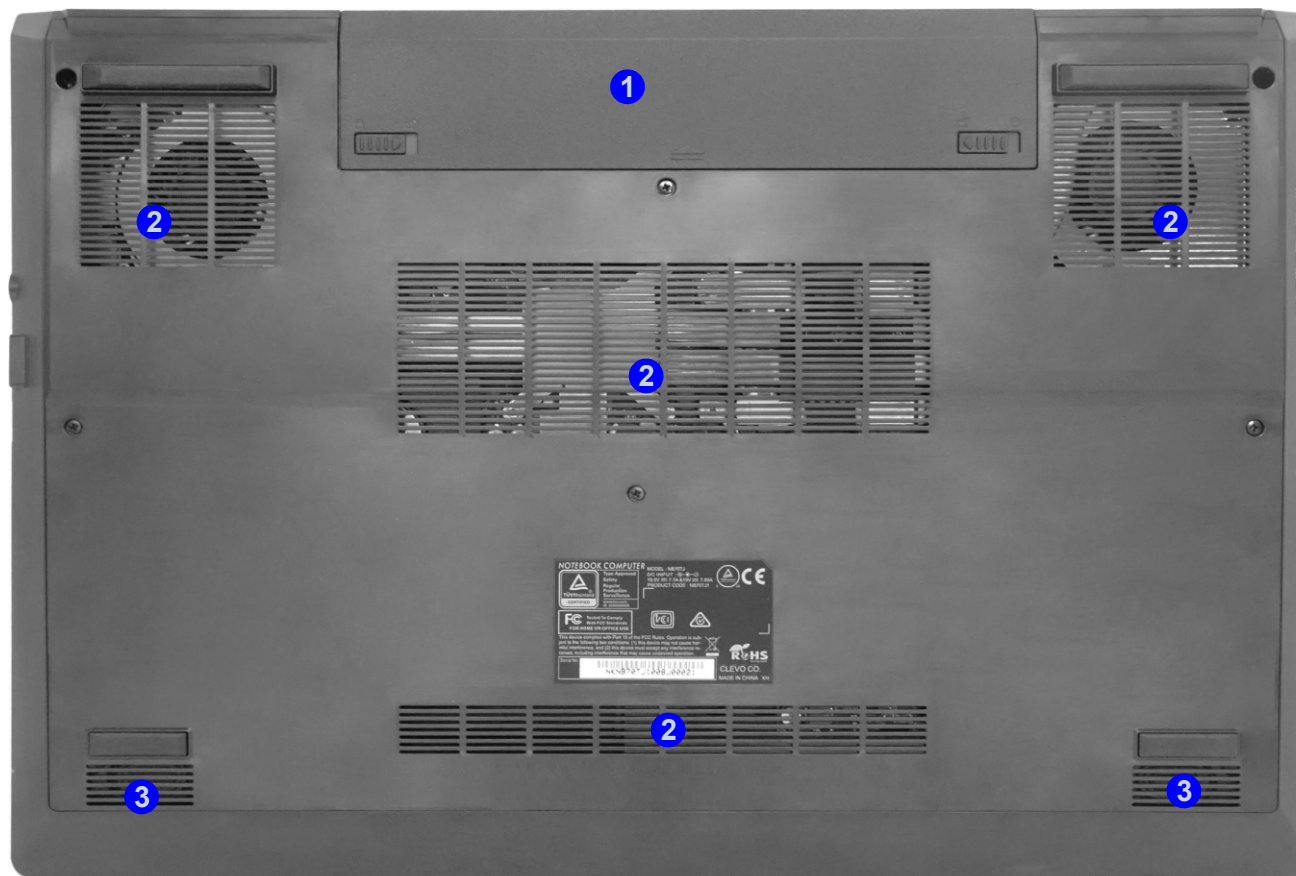


Figure 6
Bottom View

1. Battery
2. Vent
3. Speakers



Overheating

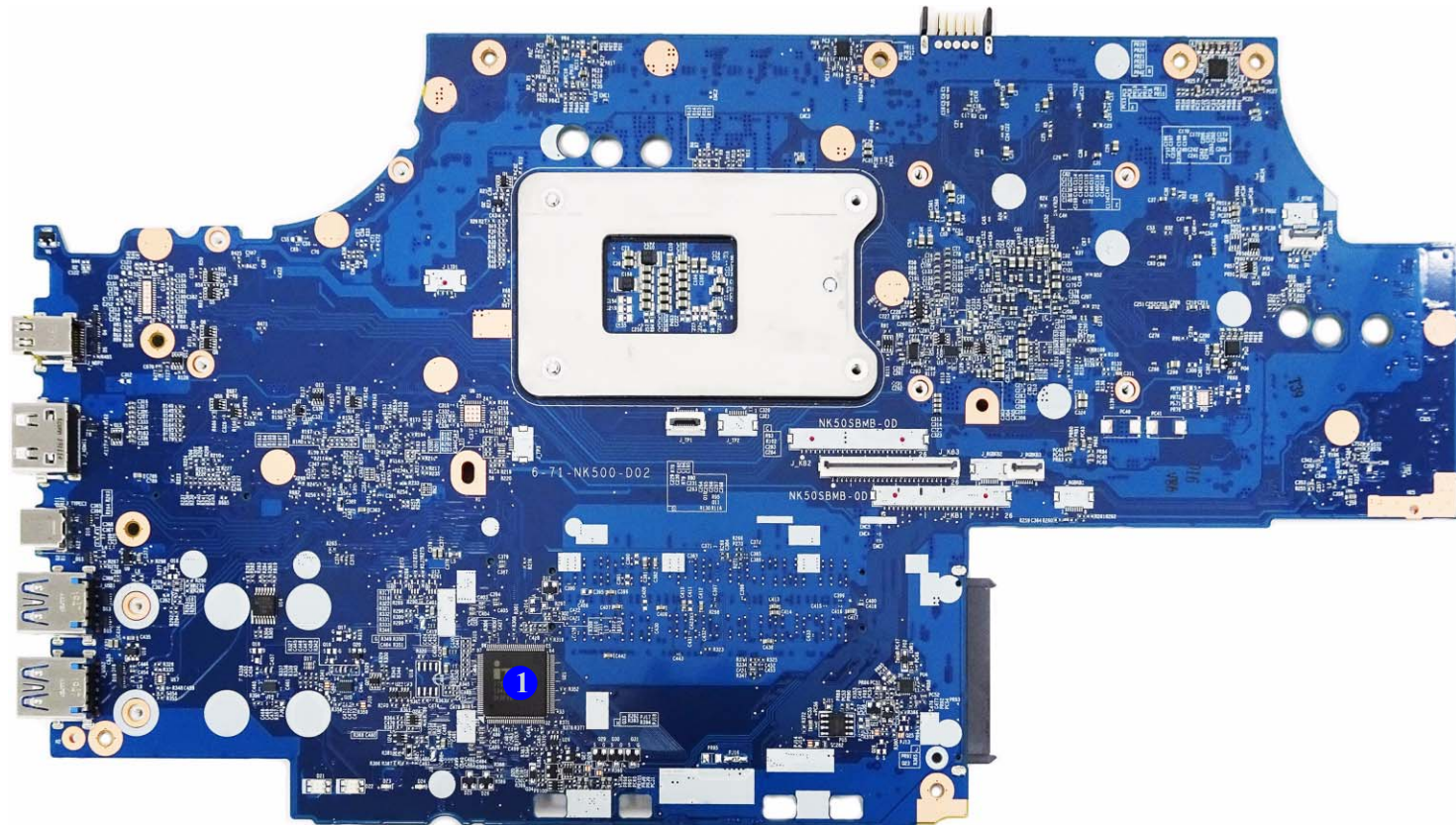
To prevent your computer from overheating, make sure nothing blocks any vent while the computer is in use.

Introduction

Figure 7
**Mainboard Top
Key Parts**

1. KBC-ITE IT5570

Mainboard Overview - Top (Key Parts)



Mainboard Overview - Bottom (Key Parts)

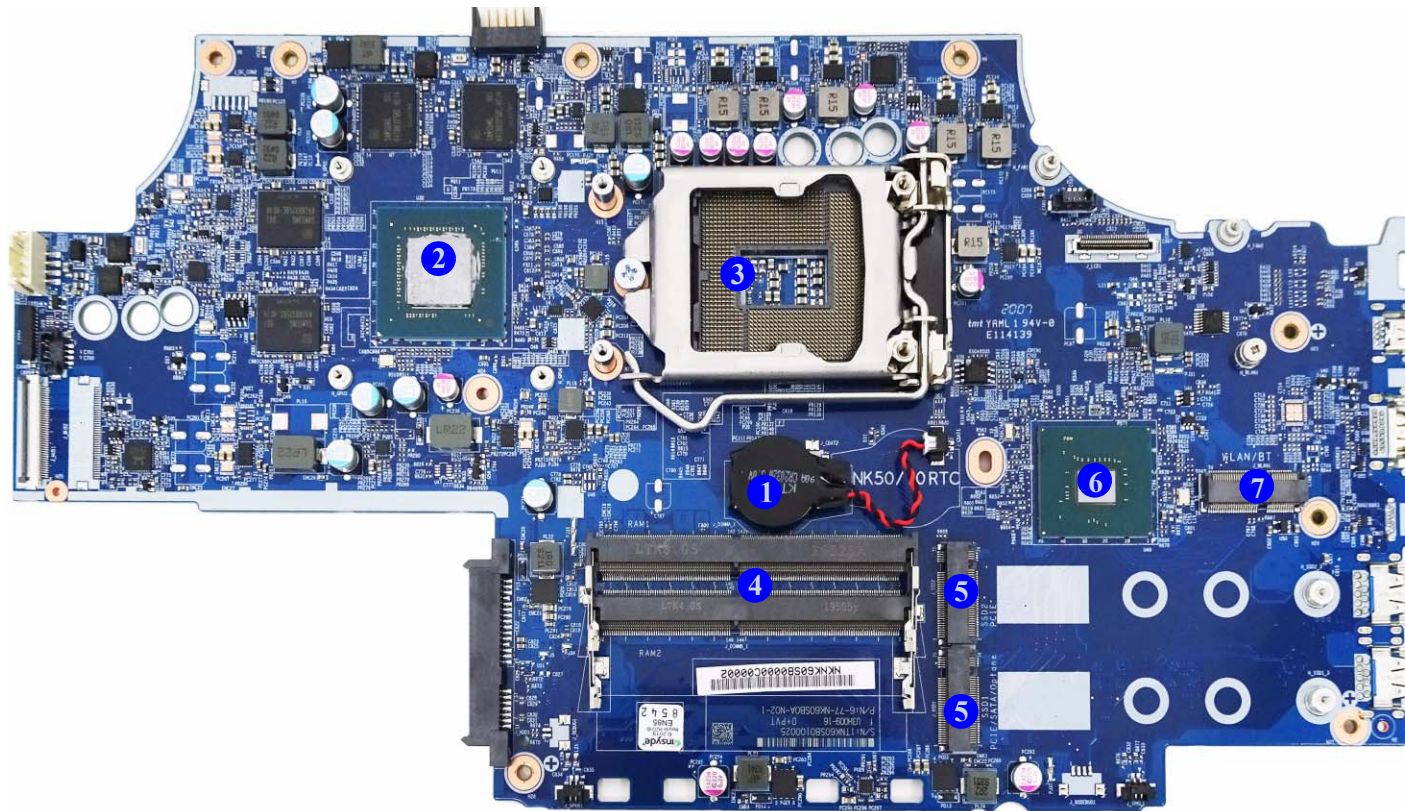


Figure 8
**Mainboard Bottom
Key Parts**

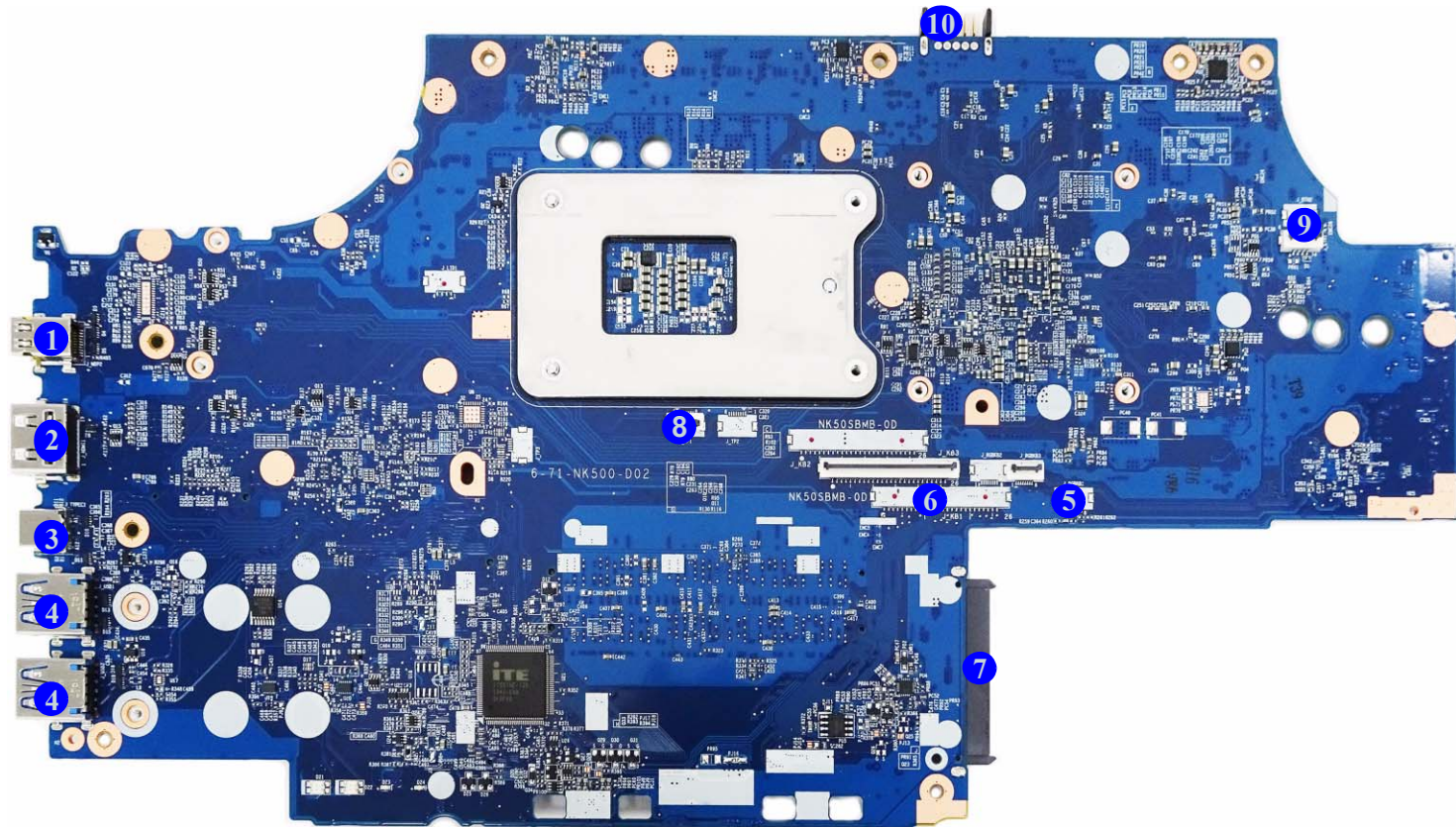
1. CMOS Battery
2. GPU
3. CPU (not installed)
4. Memory Slots
DDR4 SO-DIMM
5. M.2-Card
Connector (SSD
Module)
6. PCH
7. M.2-Card
Connector (WLAN
Module)

Introduction

Figure 9
**Mainboard Top
Connectors**

1. Mini Display Port
2. HDMI-Out Port
3. USB Port 3.2
(Type C)
Connector
4. USB Port 3.2
(Type A)
Connector
5. KB LED (White)
Connector
6. Keyboard Cable
Connector
7. HDD Connector
8. Touchpad
Connector
9. Power Button
Connector
10. Battery
Connector

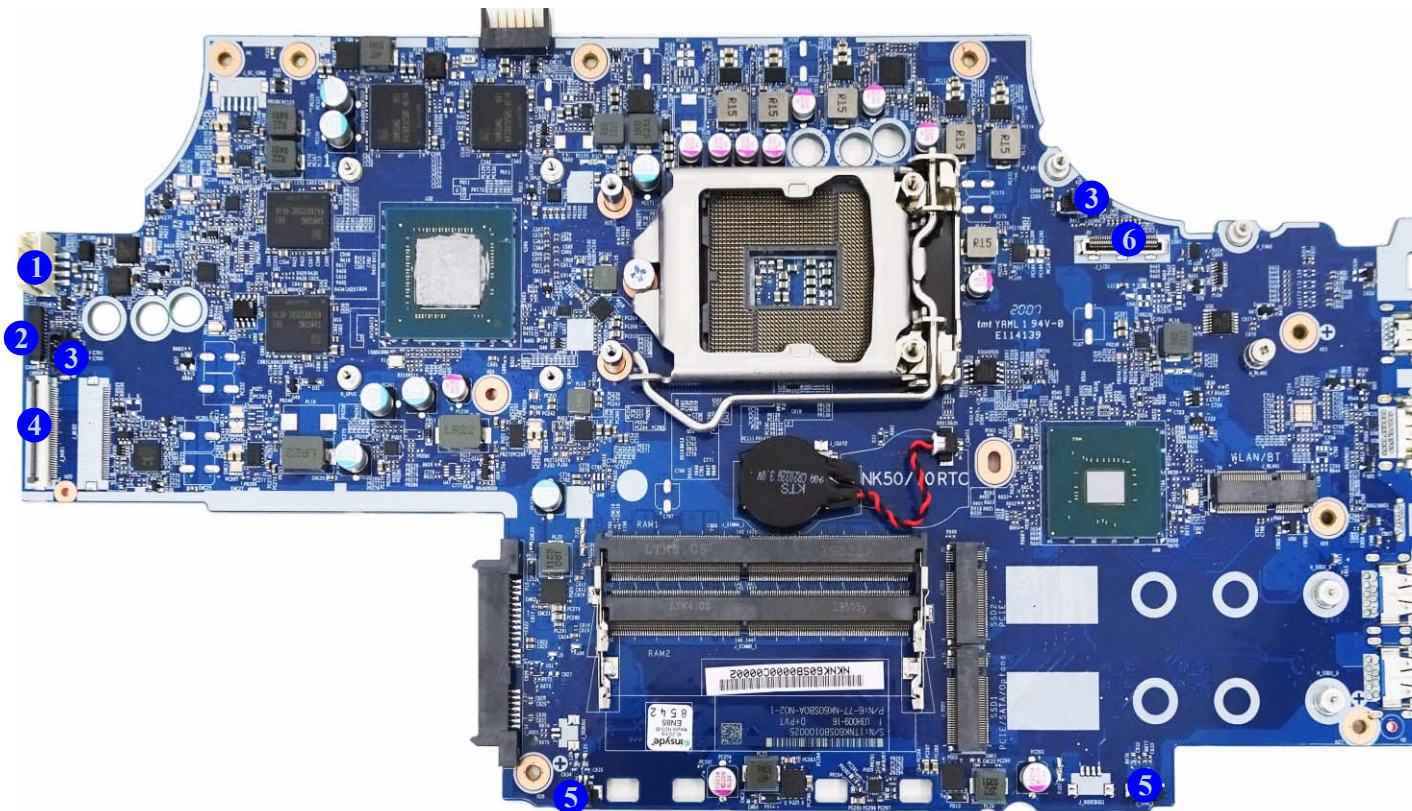
Mainboard Overview - Top (Connectors)



Mainboard Overview - Bottom (Connectors)

Figure 10
**Mainboard Bottom
Connectors**

1. DC-In Connector
2. CCD Connector
3. Fan Connector
4. J_MUX Connector
5. Speaker Connector
6. LCD Connector




Chapter 2: Disassembly



Overview

This chapter provides step-by-step instructions for disassembling the *NK70SB / NK70SE* series notebook's parts and subsystems. When it comes to reassembly, reverse the procedures (unless otherwise indicated).

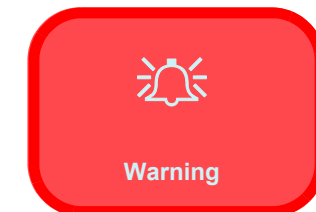
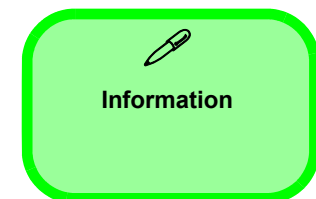
We suggest you completely review any procedure before you take the computer apart.

Procedures such as upgrading/replacing the RAM, optical device and hard disk are included in the User's Manual but are repeated here for your convenience.

To make the disassembly process easier each section may have a box in the page margin. Information contained under the figure # will give a synopsis of the sequence of procedures involved in the disassembly procedure. A box with a  lists the relevant parts you will have after the disassembly process is complete. **Note:** The parts listed will be for the disassembly procedure listed ONLY, and not any previous disassembly step(s) required. Refer to the part list for the previous disassembly procedure. The amount of screws you should be left with will be listed here also.

A box with a  will also provide any possible helpful information. A box with a  contains warnings.

An example of these types of boxes are shown in the sidebar.



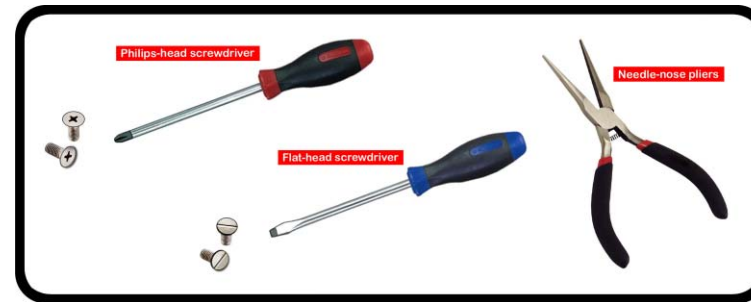
Disassembly

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

Maintenance Tools

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

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



Connections

Connections within the computer are one of four types:

Locking collar sockets for ribbon connectors

To release these connectors, use a small flat-head screwdriver to gently pry the locking collar away from its base. When replacing the connection, make sure the connector is oriented in the same way. The pin1 side is usually not indicated.

Pressure sockets for multi-wire connectors

To release this connector type, grasp it at its head and gently rock it from side to side as you pull it out. Do not pull on the wires themselves. When replacing the connection, do not try to force it. The socket only fits one way.

Pressure sockets for ribbon connectors

To release these connectors, use a small pair of needle-nose pliers to gently lift the connector away from its socket. When replacing the connection, make sure the connector is oriented in the same way. The pin1 side is usually not indicated.

Board-to-board or multi-pin sockets

To separate the boards, gently rock them from side to side as you pull them apart. If the connection is very tight, use a small flat-head screwdriver - use just enough force to start.

Maintenance Precautions

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

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

Cleaning

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

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

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

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



Power Safety Warning

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

Disassembly Steps

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

To remove the Battery:

1. Remove the battery *page 2 - 5*

To remove the HDD:

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

To remove the Keyboard:

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

To remove and install the Processor:

1. Remove the battery *page 2 - 5*
2. Remove the HDD *page 2 - 6*
3. Remove the processor *page 2 - 9*
4. Install the processor *page 2 - 11*

To remove the System Memory:

1. Remove the battery *page 2 - 5*
2. Remove the HDD *page 2 - 6*
3. Remove the system memory *page 2 - 12*

To remove the M.2 SSD:

1. Remove the battery *page 2 - 5*
2. Remove the HDD *page 2 - 6*
3. Remove the SSD *page 2 - 13*

To remove the Wireless LAN Module:

1. Remove the battery *page 2 - 5*
2. Remove the HDD *page 2 - 6*
3. Remove the WLAN *page 2 - 14*

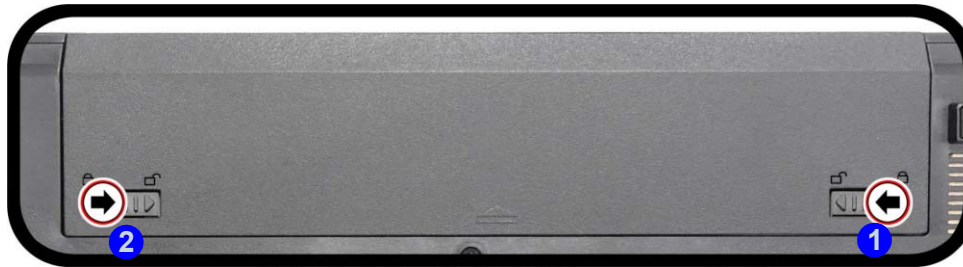
To remove the CCD Module:

1. Remove the battery *page 2 - 5*
2. Remove the HDD *page 2 - 6*
3. Remove the CCD module *page 2 - 16*

Removing the Battery

1. Turn the computer **off**, and turn it over.
2. Slide the latch **1** in the direction of the arrow (*Figure 1a*).
3. Slide the latch **2** in the direction of the arrow.
4. While holding the latch **2**, slide the battery **3** out of the compartment (*Figure 1b*).
5. Reverse the process to install a new battery.

a.



b.

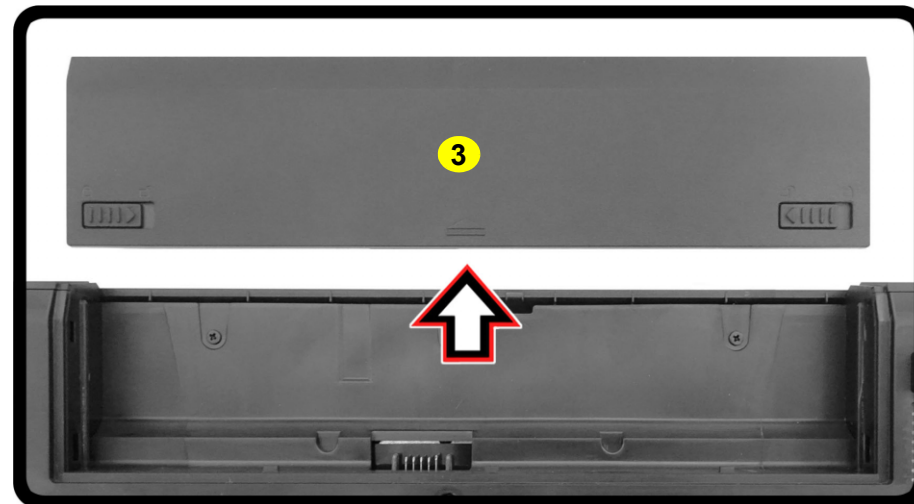


Figure 1
Battery Removal

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



3. Battery

Disassembly

Figure 2
**HDD Assembly
Removal**

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

Powering the Computer On

After every disassembly, make sure that the bottom case's screws are all inserted and tightened before opening the Lid/LCD and turning the computer on.

7. Bottom Case

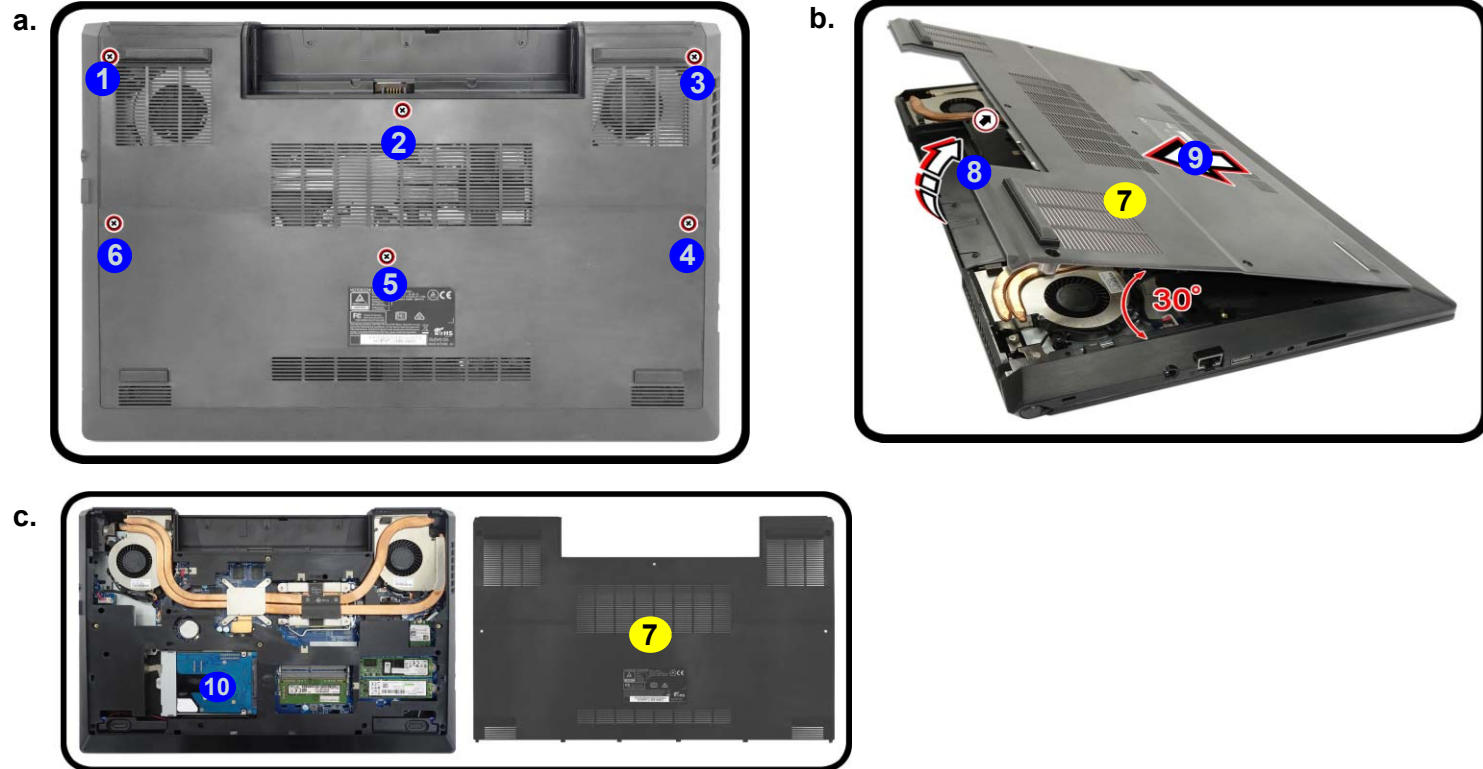
- 6 Screws

Removing the Hard Disk Drive

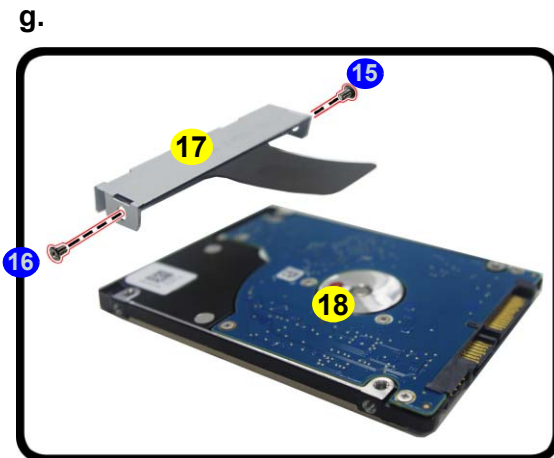
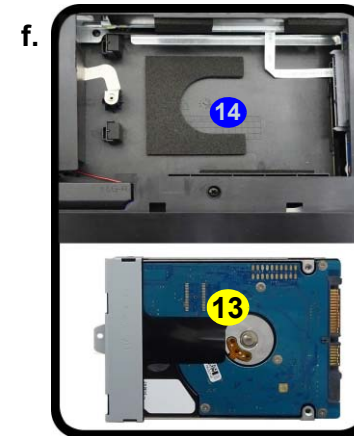
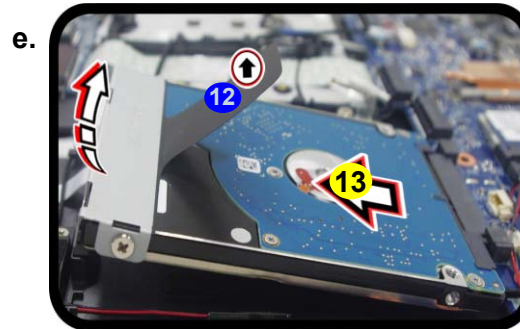
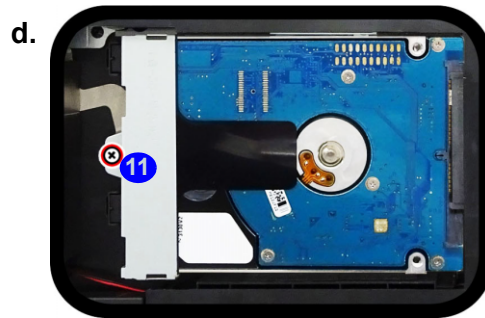
The hard disk drive can be taken out to accommodate other 2.5" serial (SATA) hard disk drives with a height of 7mm (h). Follow your operating system's installation instructions, and install all necessary drivers and utilities (as outlined in **Chapter 4 of the User's Manual**) when setting up a new hard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

Hard Disk Disassembly Process

- Turn **off** the computer, and remove the battery ([page 2 - 5](#)).
- Remove screws ① - ⑥ ([Figure 2a](#)).
- Carefully lift the bottom case ⑦ up from point ⑧ first and then lift it up ⑨ to remove it ([Figure 2b](#)).
- The HDD will be visible at point ⑩ on the mainboard ([Figure 2c](#)).



5. Remove screws **11** from the HDD assembly (**Figure 3d**).
6. Slightly lift and pull the hard disk assembly in the direction of arrow **12** (**Figure 3e**).
7. Lift the hard disk assembly **13** out of the bay **14** (**Figure 3f**).
8. Remove screws **15** - **16** and bracket **17** from the hard disk **18** (**Figure 3g**).
9. Reverse the process to install a new hard disk (do not forget to replace the 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.



13. HDD Assembly
17. Bracket
18. HDD

- 3 Screws

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

Figure 3
**HDD Assembly
Removal (cont'd.)**

Disassembly

Figure 4
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.

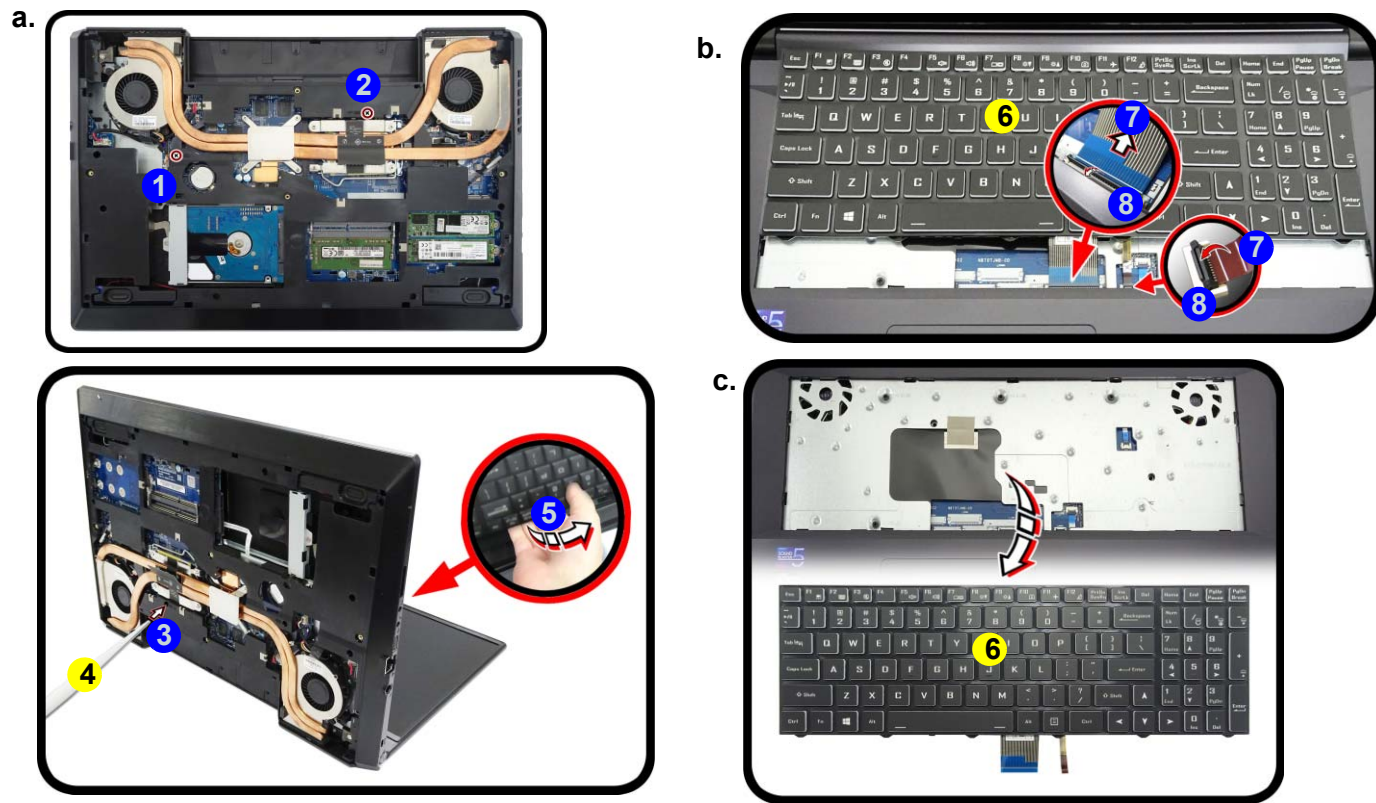


4. Eject Stick
6. Keyboard

- 2 Screws

Removing the Keyboard

1. Turn **off** the computer, remove the battery ([page 2 - 5](#)) and bottom cover ([page 2 - 6](#)).
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 4a](#)).
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 4b](#)).
5. Carefully lift the keyboard ⑥ off the computer ([Figure 4c](#)).
6. Reverse the process to install a new keyboard (do not forget to replace all the screws).

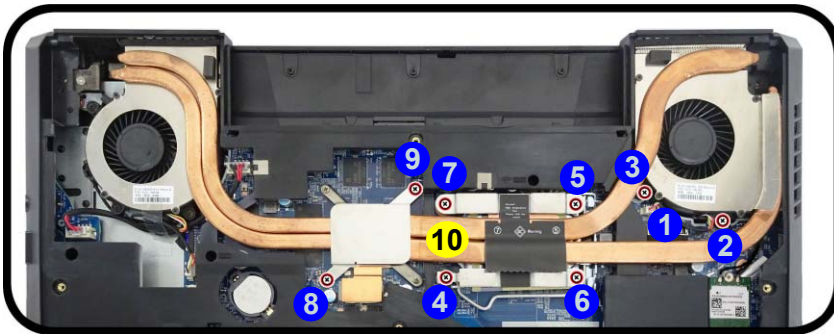


Removing and Installing the Processor

Processor Removal Procedure

1. Turn **off** the computer, remove the battery ([page 2 - 5](#)) and bottom cover ([page 2 - 6](#)).
2. Disconnect the cable **1** and remove screws **2** - **9** from the CPU fan & heat sink unit **10** in the order indicated on the label (i.e screw **9** first through to screw **2** last [Figure 5a](#)).
3. Carefully (it may be hot) remove the heat sink unit **10** and bracket **11** as shown by the arrow ([Figure 5b](#)).

a.



b.

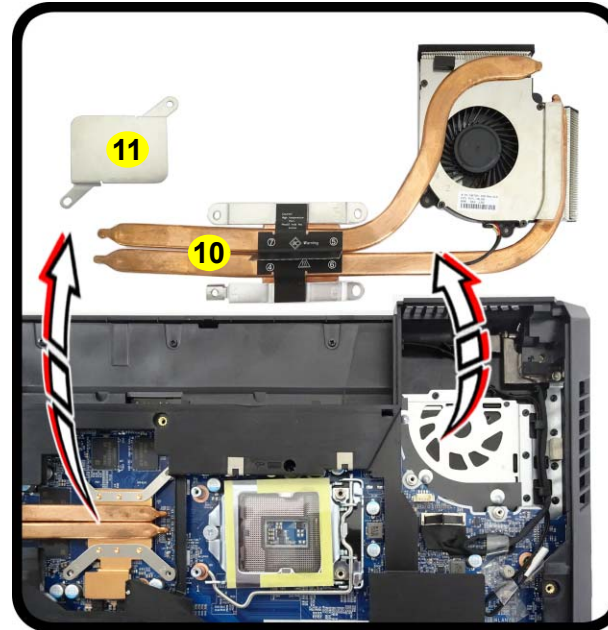


Figure 5
**Processor
Removal
Procedure**

- a. Disconnect the fan cable and remove the screws in the correct order.
- b. Carefully remove the heat sink unit and bracket as shown.



10. Heat Sink Unit
11. Heat Sink Bracket

- 8 Screws

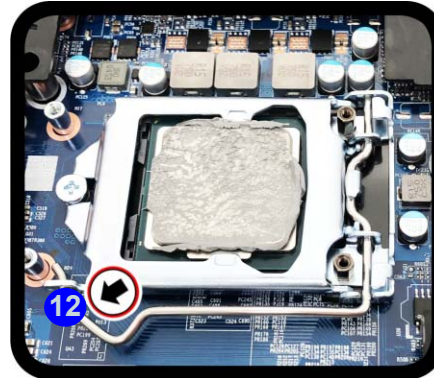
Disassembly

Figure 6
Processor Removal
(cont'd)

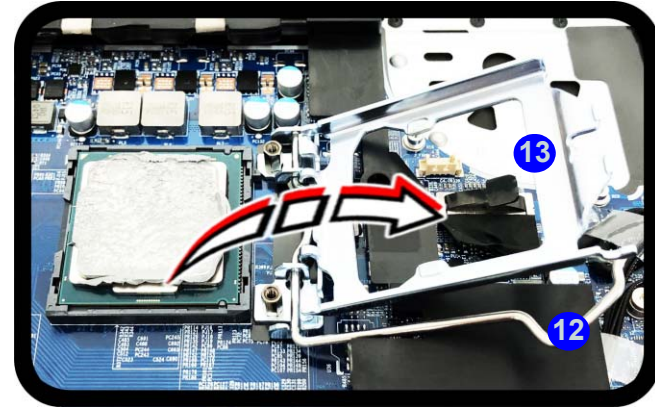
- c. Move the latch and bracket fully in the direction indicated to unlock the CPU.
- d. Lift the CPU out of the socket.

- 4. Press down and hold the latch 12 (with the latch held down you will be able to release it).
- 5. Move the latch 12 and bracket 13 fully in the direction indicated to unlock the CPU (Figure 6d).
- 6. Carefully (it may be hot) lift the CPU A up out of the socket (Figure 6e).
- 7. See [page 2 - 11](#) for information on inserting a new CPU.
- 8. When re-inserting the CPU, pay careful attention to the pin alignment, it will fit only one way (DO NOT FORCE IT!).

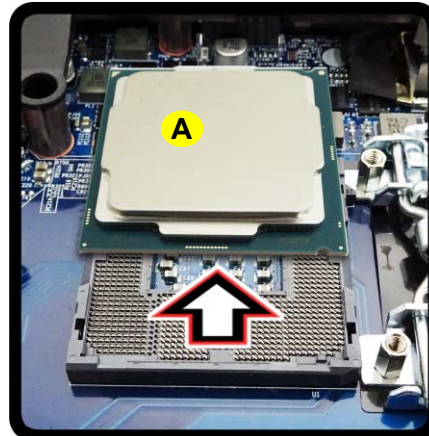
c.



Unlock



d.



Caution

The heat sink, and CPU area in general, contains parts which are subject to high temperatures. Allow the area time to cool before removing these parts.



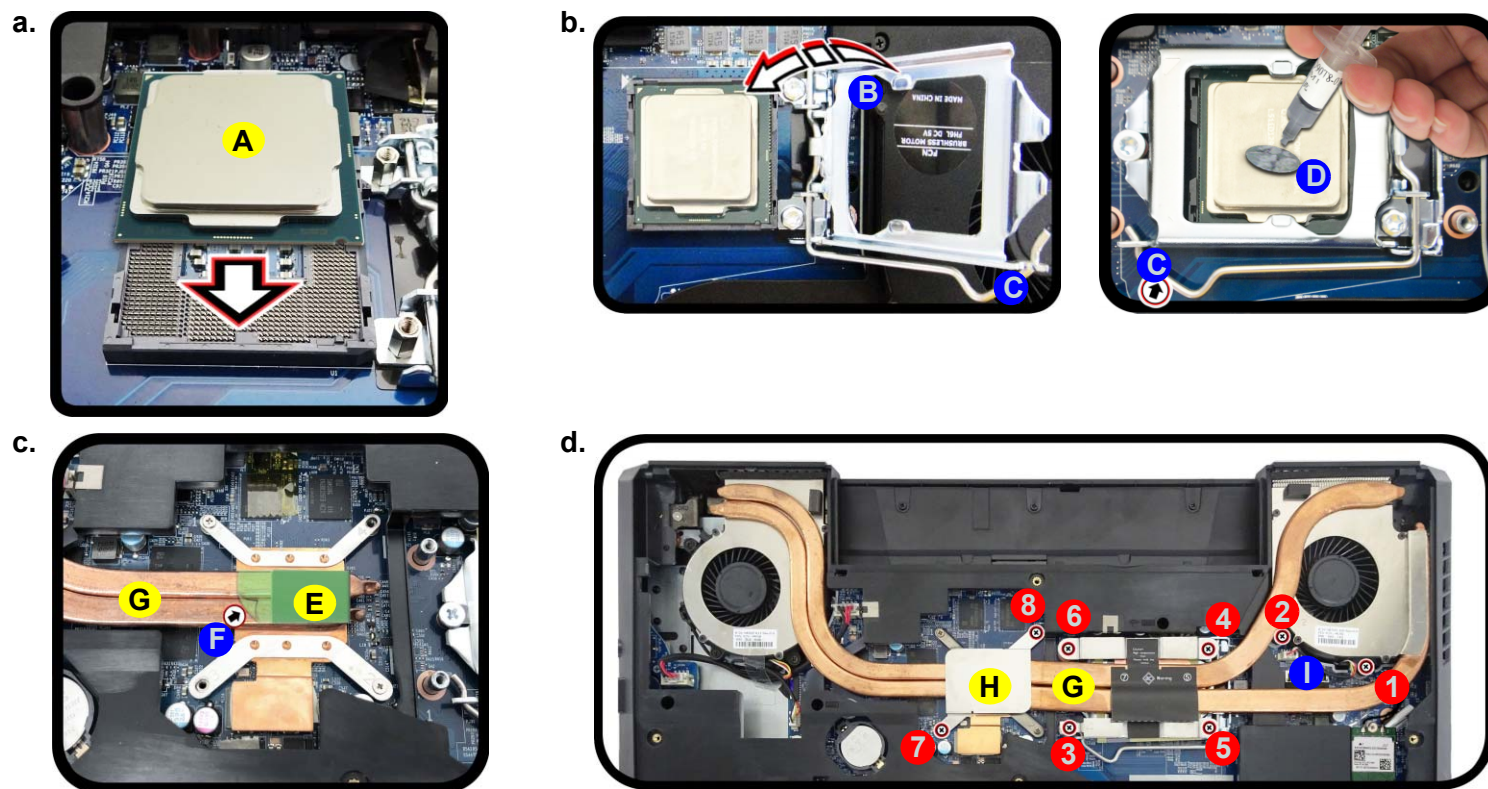
A. CPU

Processor Installation Procedure

1. Insert the CPU **A**; pay careful attention to the pin alignment (**Figure 7a**), it will fit only one way (DO NOT FORCE IT!).
2. Move the bracket **B** and latch **C** fully in the direction indicated to lock the CPU.
3. Apply the thermal grease **D** to the top of the CPU as shown (**Figure 7b**).
4. Place the thermal pad **E** and remove the protective strip **F** as indicated in **Figure 7c**.
5. Insert the heat sink unit **G** and bracket **H** and tighten the CPU heat sink screws in the order **1** - **7** (the order as indicated on the label and **Figure 7d**).
6. Connect the CPU fan cable **I**, replace the component bay cover and tighten the screws (**page 2 - 6**).

Figure 7
**Processor
Installation**

- a. Insert the CPU.
- b. Move the latch and bracket fully in the direction indicated to lock the CPU. Apply thermal grease.
- c. Place the thermal pad.
- d. Insert the heat sink and bracket. Tighten the screws.



- A. CPU
- G. Heat Sink Unit
- H. Heat Sink Bracket
- 8 Screws

Disassembly

Figure 8
RAM Module Removal

- The RAM modules will be visible at point **1** on the main-board.
- Pull the release latches.
- 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.



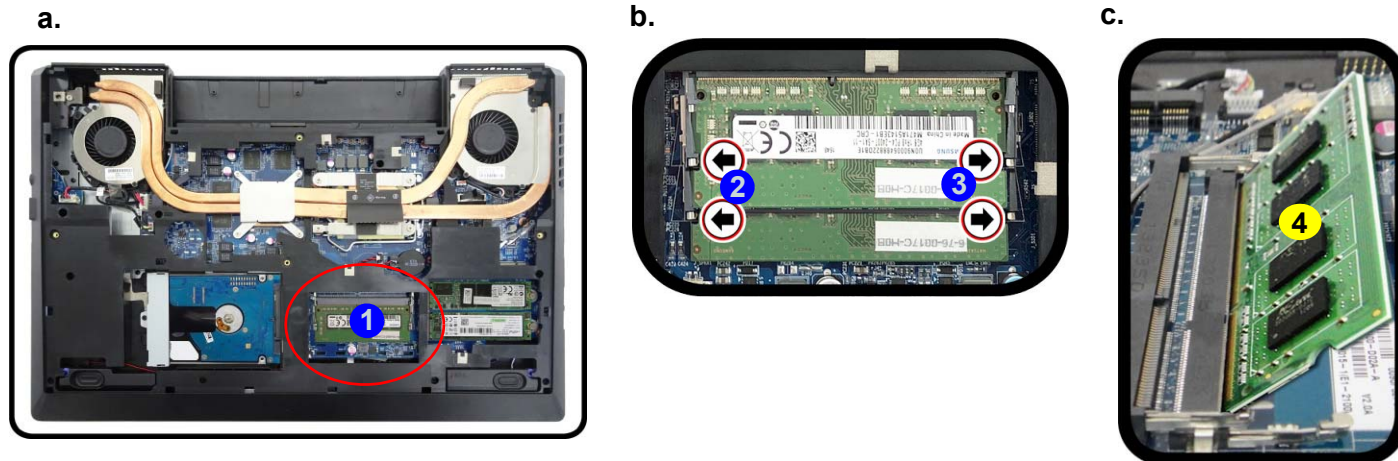
4. RAM Module

Removing the System Memory (RAM)

The computer has two memory sockets for 260 pin Small Outline Dual In-line Memory Modules (SO-DIMM) supporting DDR4 3200 MHz. The main memory can be expanded up to 16GB. The total memory size is automatically detected by the POST routine once you turn on your computer.

Memory Upgrade Process

- Turn **off** the computer, turn it over, remove the battery ([page 2 - 5](#)).
- The RAM-2 modules will be visible at point **1** on the mainboard ([Figure 8a](#)).
- 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.
- Pull the latches to release the second module if necessary.
- Insert a new module holding it at about a 30° angle and fit the connectors firmly into the memory slot.
- 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.
- Press the module in and down towards the mainboard until the slot levers click into place to secure the module.
- Replace the bottom cover and the screws (see [page 2 - 6](#)).
- Restart the computer to allow the BIOS to register the new memory configuration as it starts up.



Removing the M.2 SSD Module

1. Turn **off** the computer, turn it over, remove the battery ([page 2 - 5](#)).
2. The M.2 SSD module will be visible at point **1** on the mainboard ([Figure 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 thermal pad and all the screws).

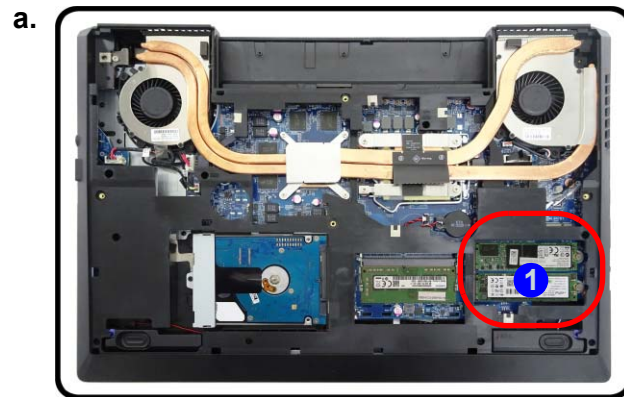


Figure 9
M.2 SSD Module Removal

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



3.M2 SSD Module

- 2 Screws

Disassembly

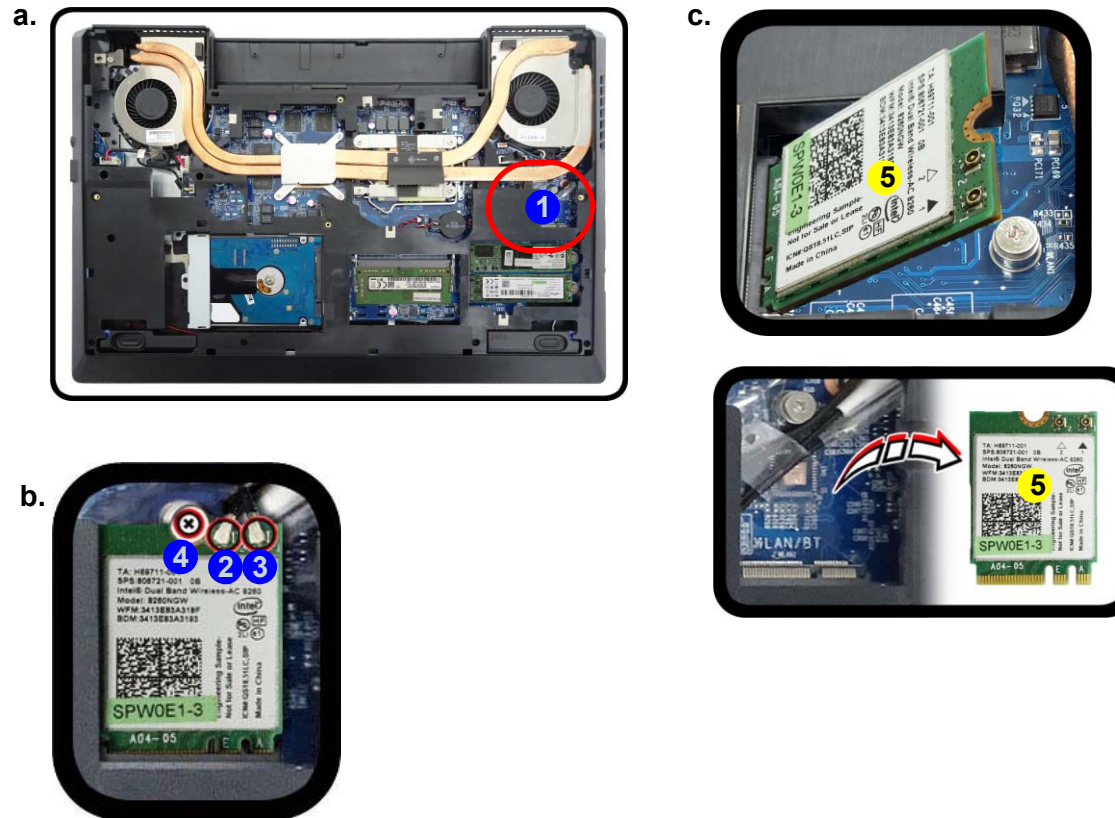
Figure 10
**Wireless LAN
Module Removal**

- a. Locate the WLAN.
- b. Disconnect the cables **2** & **3**, and remove the screw **4**.
- c. The WLAN module will pop up.

Note: Make sure you reconnect the antenna cable to the “1 + 2” socket (*Figure 10b*).

Removing the Wireless LAN Module

1. Turn **off** the computer, turn it over, remove the battery (*page 2 - 5*).
2. The Wireless LAN module will be visible at point **1** on the mainboard (*Figure 10a*).
3. Carefully disconnect the cables **2** & **3**, and then remove the screw **4** (*Figure 10b*).
4. The Wireless LAN module **5** (*Figure 10c*) 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 all the screws).




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	WL 1	Black	Transparent
	WL 2	Black	White

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

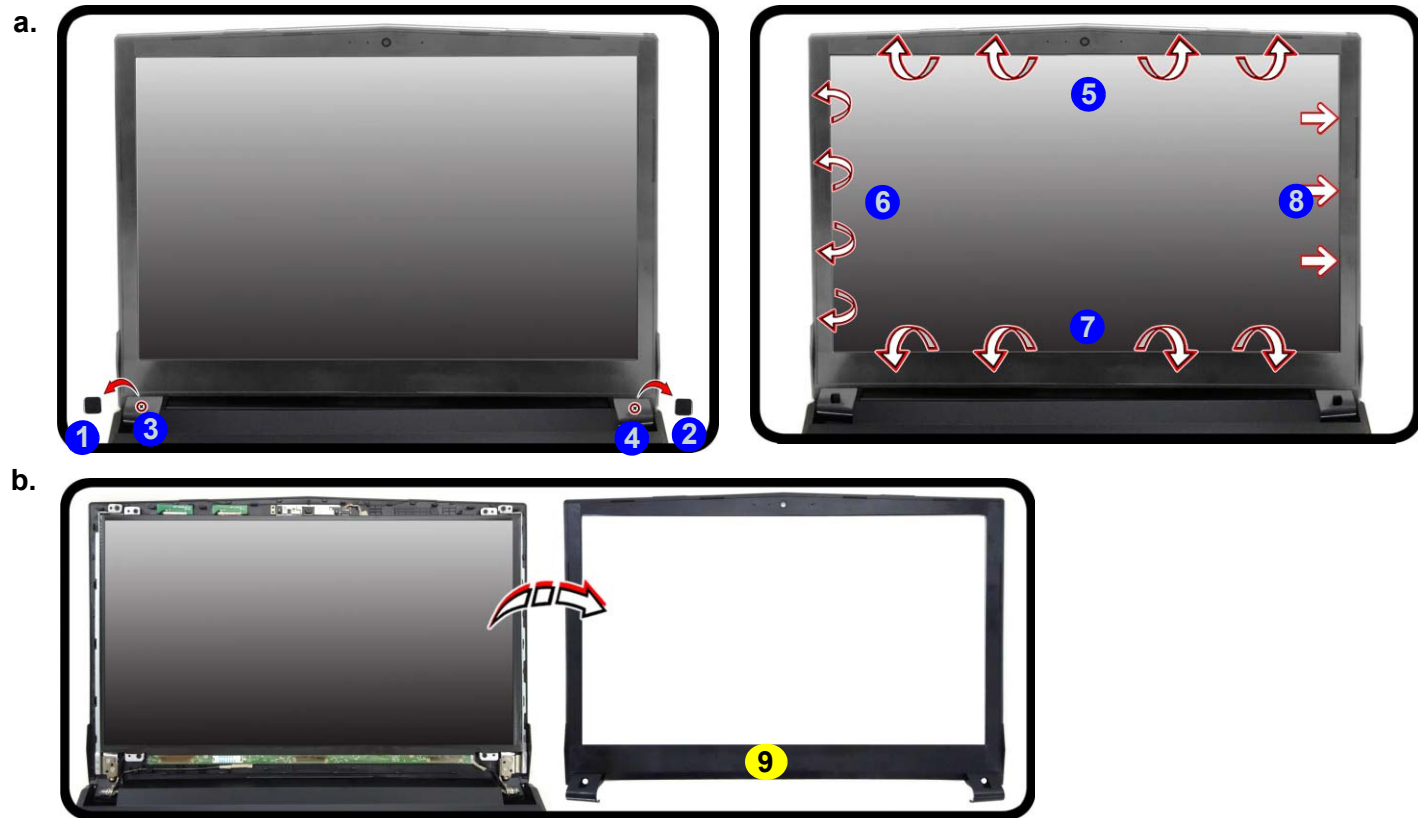
Disassembly

Figure 11
CCD Removal

- a. Remove rubber and screws and then carefully release the inner frame of the LCD panel 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 90 degree angle. Carefully remove the rubber covers **1** - **2** and screws **3** - **4**.
3. Run your fingers around the inner frame of the LCD panel to lift at the upper point **5** as indicated by the arrows, continue to lift up the inner frame at points **6** - **7** as indicated by the arrows, and then remove the inner frame at point **8** as indicated by the arrows ([Figure 11a](#)).
4. Remove the LCD front cover **5** ([Figure 11b](#)).



9. LCD Front Cover

- 2 Screws

5. Disconnect the cable **10** (*Figure 12c*).
6. Remove the CCD module **11** (*Figure 12d*).
7. Reverse the process to install a new CCD module.



Figure 12
CCD Removal
(cont'd)

- c. Disconnect the cable.
- d. Remove the CCD module.



11. CCD Module

Appendix A:Part Lists

This appendix breaks down the *NK70SB/NK70SE* 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.

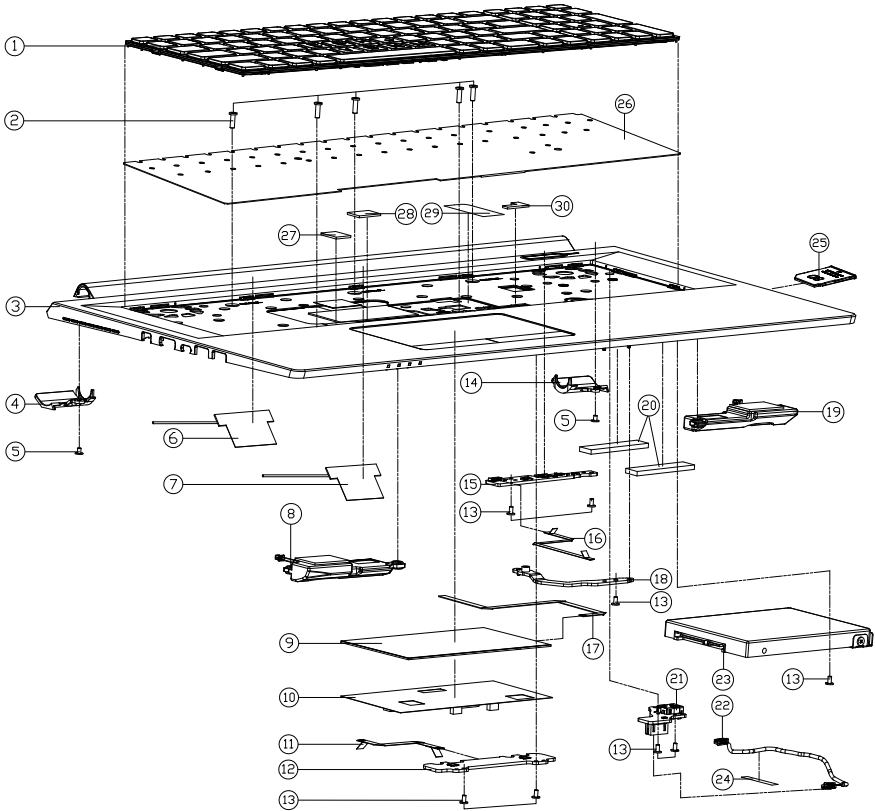
Part List Illustration Location

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

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

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

Top

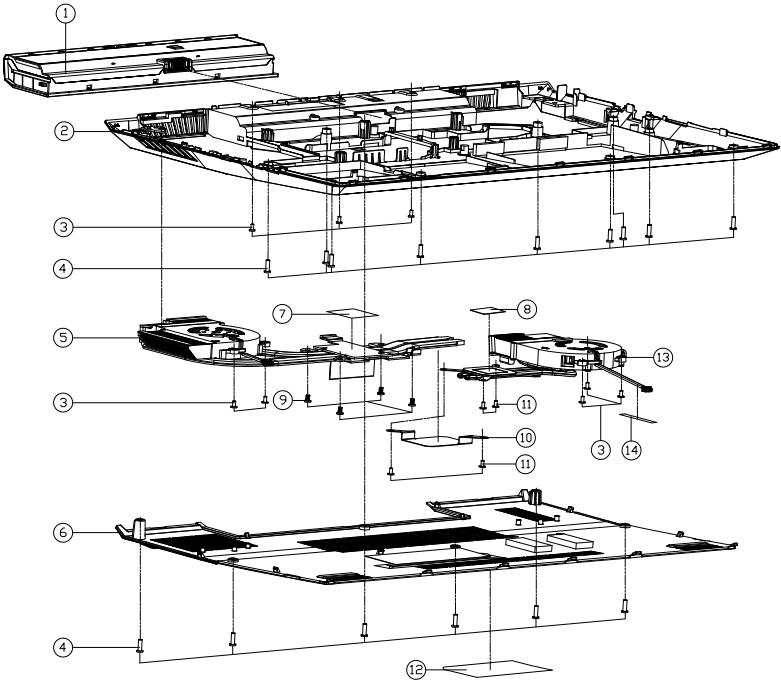


ITEM	PART NAME	PART NO	REMARK
1	KB FOR MULTI ISC BL KB US SERIES NB70TH	6-NB70TH-KB-MCL-US	
1	KB FOR NON BL KB SERIES NK70SB	6-NK70SB-KB-NBL	
1	KB JAPANESE CAMERA-CONV-3000 BLACK COATING WITH VIBO KEY CO250MM FOR MCL	6-80-N1520-212-1M	
1	KB JAPANESE CAMERA-CONV-3000 BLACK COATING WITH VIBO KEY CO250MM FOR MCL	6-80-N1520-21D-1M	
2	.SCREW M2.5*8L KI BK/Z NY ICT	6-35-B6125-8R0	
3	TOP CASE MODULE NB70TJ1	6-39-NB702-016	
4	TOP HINGE COVER L (PC+ABS COVESTRO FR3008+) NB70TJ1	6-42-NB702-070	
5	.SCREW M2*3L KI NI ICT NY (DD=Ø4.0,DT=0.8)	6-35-B1120-3RD	
6	ANTENNA PEBA VIAN VET M1 PCB FOR 500MM 2.6/5G M2-20MM NB70TJ1	6-23-7NB70-030	
7	ANTENNA PEBA VIAN VET M2 PCB FOR 500MM 2.6/5G M2-20MM NB70TJ1	6-23-7NB70-040	
8	SPK L-CABLE L25H4 2W 4T L 200MM DS-25H-ML-32-HF NB70TJ1	6-23-5NB70-0L1	
9	TOUCH PAD FLIN S9M5H-5700 COB6450400MM 508610-670T M500C	6-49-NH5D3-011	
10	TP INSIDE MYLAR NB70TA	6-40-NB7A2-010	
11	FFC CABLE TP TO CLICK L=70MM SV 4PIN PITCH=1.0MM (CNUS) NB70TJ1	6-43-NB700-031	
12	CLICK BOARD V2.0 NK70SB	6-77-NK502-D02-A	
13	.SCREW M2*4L KI BZ ICT NY	6-35-B6120-4RA	
14	TOP HINGE COVER R (PC+ABS COVESTRO FR3008+) NB70TJ1	6-42-NB702-061	
15	POWER SW BOARD V2.0 NK70SB	6-77-NK70S-D02	
16	FFC POWER TO MB L=100.4MM 6PIN (PITCH=0.5) NB70TA	6-43-NB7A0-020	
17	FFC CABLE FOR TP TO MB L=160MM 60V 6PIN (CNUS) NB70TA	6-43-NB7A0-011	
18	MB BRACKET (SECC) NB70TA	6-33-NB7A2-010	
19	SPK R-CABLE L25H4 2W 4T L 200MM DS-25H-ML-32-HF NB70TJ1	6-23-5NB70-0R1	
20	SPONGE (45*10*2.65T) CR4382 NBS0TL	6-47-0019A-45J	
21	DC JACK BOARD V2.0 NK70SB	6-77-NK70C-D02	
22	WIRE CABLE FOR DC-IN TO MB 120MM 30V 4PIN NBS0TJ1	6-43-NB500-030	
23	W/HDD ASS'Y NB70TJ1	6-79-NB70TJ1J-010	
23	W/O HDD ASS'Y NB70TJ1	6-79-NB70TJ1J-020	
24	TAPE MYLAR (C)MYLAR M550J	6-40-M55J2-030	
25	DUMMY 3IN NON PUSH TYPE PC+ABS (C7238P-700EXCHANGED) M5705W	6-42-W9708-011	
26	KB MYLAR FOR WD BACKLIGHT NB70TJ1	6-40-NB702-030	KB FOR NON BL KB SERIES
27	WD-BL KB-SPONGE-MCRA382-18.2*18.2*25T+J055NK70SB	6-47-0019A-18N	KB FOR NON BL KB SERIES
28	WD-BL KB-SPONGE-MCRA382-22.3*18.2*25T+J055NK70SB	6-47-0019A-2AH	KB FOR NON BL KB SERIES
29	WD-KB-MYLAR(50.8*17.7*0.4T+DS-5)NK70SB	6-40-NK702-010	KB FOR NON BL KB SERIES
30	WD-BL KB-SPONGE-CICRA382-20.5*19.5*25T+J055NK70SB	6-47-0019A-2AJ	KB FOR NON BL KB SERIES

Figure A - 1
Top

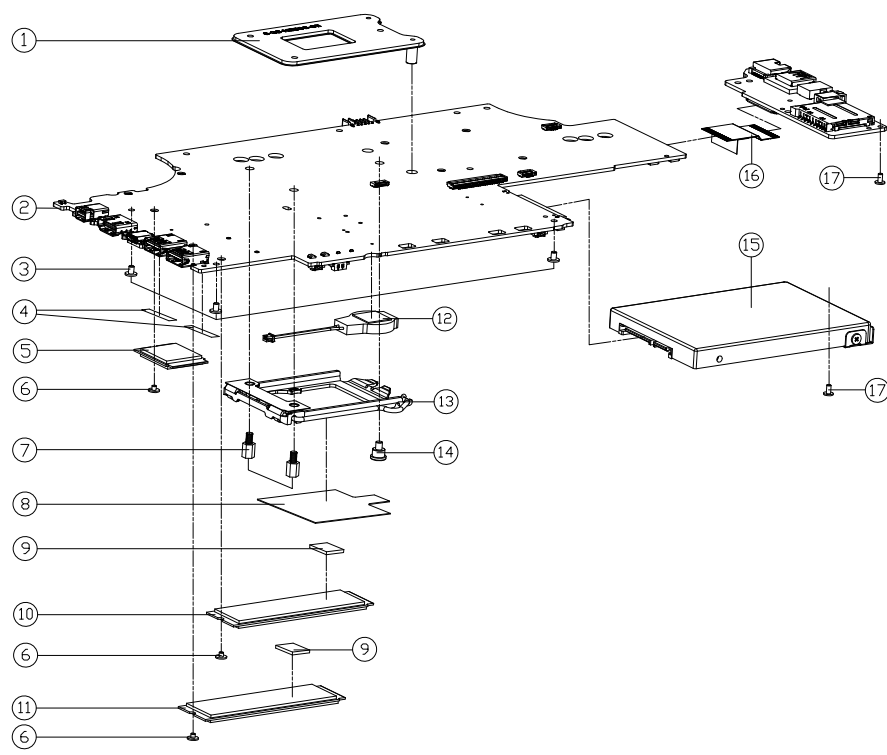
Bottom

Figure A - 2
Bottom



ITEM	PART NAME	PART NO	REMARK
1	TAPE S LI 100V/4MM/47MM 352P SMP/STB CAC (ORANGE) 980222P/78 (TEXTURE) NIS07J1	6-87-NB50S-41C02	
1	TAPE S LI 100V/4MM/47MM 352P SMP/LIC CAC (ORANGE) 980222P/78 (TEXTURE) NIS07J1	6-87-NB50S-41D02	
2	BOTTOM CASE MODULE FOR NB70TJ1	6-39-NB703-014	
3	.SCREW M2*4L KI BZ ICT NY	6-35-B6120-4RA	
4	.SCREW M2.5*8L KI BK/Z NY ICT	6-35-B6125-8R0	
5	CPU HEATSINK MODULE NK60SB	6-31-NK60N-100	
6	CPU COVER MODULE FOR NB70TJ1	6-42-NB708-103	
7	GREASE GA-690<0.6G> P157SM	6-47-P1578-020	
8	THERMAL PAD PSX 20*15*0.20T M860TU	6-47-M8608-010	
9	SCREW M2.5*4L <D=4.6,T=0.8> KI NI ICT NY	6-35-B1125-4RA	
10	PIPE SUPPORT PLATE <SUS301> NB70TJ1	6-33-NB702-021	
11	.SCREW M2*3L KI NI ICT NY <DD=Ø4.0,DT=0.8>	6-35-B1120-3RD	
12	PRODUCT LABEL FOR NK70SB	6-45-NK70SB03-010	
12	PRODUCT LABEL FOR NK70SE	6-45-NK70SE03-010	
13	VGA HEATSINK MODULE NK60SB	6-31-NK60N-200	
14	TAPE MYLAR <A>,MYLAR M550J	6-40-M55J2-010	

Main Board

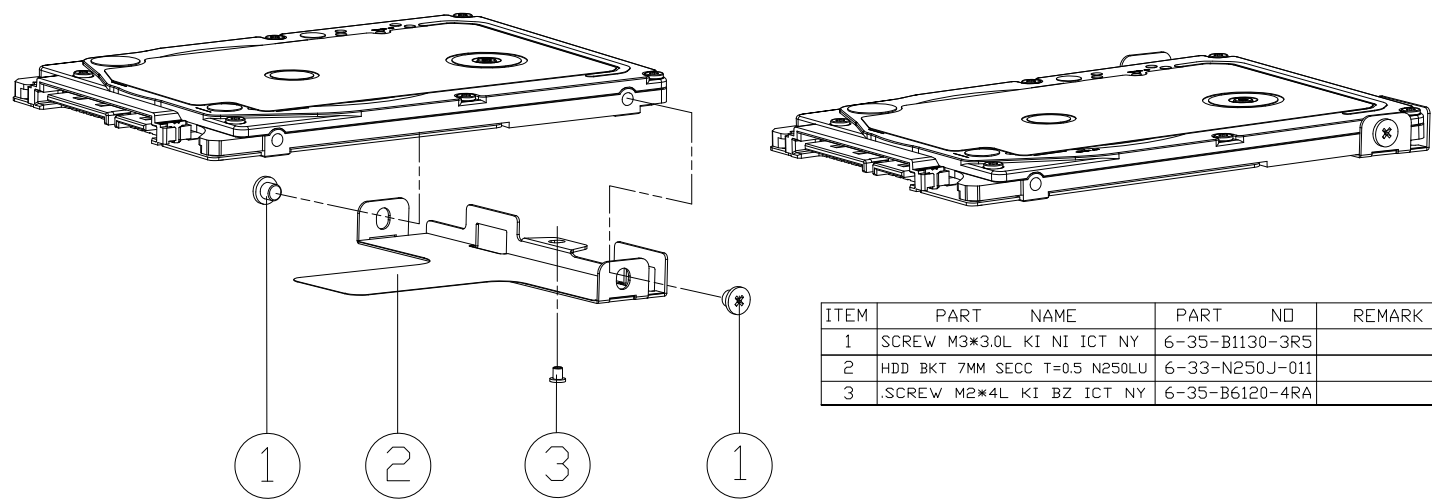


ITEM	PART NAME	PART NO	REMARK
1	CPU SOCKET SOCKET 34MTFSMT MYLART-40-RESMT-40 CHINESE MYLART	6-33-NB50S-011	
2	MAIN BOARD V2.0 (CEIP)+MULTI BOARD V2.0 NK70SD	6-77-NK70SD0A-N02-1	
2	MAIN BOARD V2.0 (CEIP)+MULTI BOARD V2.0 NK70SE	6-77-NK70SE0A-N02	
2	MAIN BOARD V2.0 (CEIP)+MULTI BOARD V2.0 NK70SE	6-77-NK70SE0A-N02-1	
3	SCREW M2.5*4L (D=4.6,T=0.8) KI NI ICT NY	6-35-B112S-4RA	
4	TAPE MYLAR (C),MYLAR M550J	6-40-M55J2-030	
5	MYLART CPU SOCKET 34MTFSMT MYLART-40-RESMT-40 CHINESE MYLART	6-88-N15CF-4210	
5	MYLART CPU SOCKET 34MTFSMT MYLART-40-RESMT-40 CHINESE MYLART	6-88-L140F-4210	
5	MYLART CPU SOCKET 34MTFSMT MYLART-40-RESMT-40 CHINESE MYLART	6-88-NV40F-4210	
5	MYLART CPU SOCKET 34MTFSMT MYLART-40-RESMT-40 CHINESE MYLART	6-88-N24GF-4200	
6	SCREW M2*2L KI NI ICT NY (DD=0.5 ,T=0.8)	6-35-B1120-2RA	
7	SCREW M3.0*5.0L NI ICT NY FOR CPU SOCKET	6-35-Z1130-5R0-1	
8	CPU SOCKET MYLAR FOR D900F	6-40-D90FS-070	
9	THERMAL PAD M4500 (17.3*17.3*2.75)MM N750BU	6-48-N7503-010	
10	SSD M2 2280 32GB Kingston NV5000 NV5000 32GB 3D TLC 64 LAYERS	6-85-D515B-K00	OPTION
10	SSD M2 2280 32GB Kingston NV5000 NV5000 32GB 3D TLC 64 LAYERS	6-85-D51C8-H03	OPTION
10	OPTICAL MEMORY M2 2280 4GB INTEL HEMPHILL-4GB 4GB 3D TLC 64 LAYERS	6-85-D5164-Z00	OPTION
10	SSD M2 2280 32GB Kingston NV5000 NV5000 32GB 3D TLC 64 LAYERS	6-85-D51C8-K00	OPTION
10	SSD M2 2280 32GB Kingston NV5000 NV5000 32GB 3D TLC 64 LAYERS	6-85-D51R6-Z04	OPTION
11	OPTICAL MEMORY M2 2280 4GB INTEL HEMPHILL-4GB 4GB 3D TLC 64 LAYERS	6-85-D5164-Z00	ONLY FOR PCIE
11	SSD M2 2280 32GB Kingston NV5000 NV5000 32GB 3D TLC 64 LAYERS	6-85-D51C8-K00	ONLY FOR PCIE
11	SSD M2 2280 32GB Kingston NV5000 NV5000 32GB 3D TLC 64 LAYERS	6-85-D51R6-Z04	ONLY FOR PCIE
12	BAT. 20MM 3V 220MAH W/CABLE 35MM B002020205VMMU (SHIMMED)	6-23-22015-TE0	
13	ILM FOR CPU SOCKET G LGA1200P (WMM6L61-11N80-4H)	6-86-25C00-003	
14	SCREW M3*3.5L BZ/Z ICT NY	6-35-Z2130-3R5	
15	W/HDD ASS'Y NB70TJ1	6-79-NB70TJ1J-010	
15	W/D HDD ASS'Y NB70TJ1	6-79-NB70TJ1J-020	
16	FTC CABLE ADDIO TO M2 L-4230M 5V 40PIN PITCH-4.5MM (KUS) NB071A	6-43-NB700-011	
17	SCREW M2*4L KI NI ICT NY (DD=0.45,DT=0.4)	6-35-B1120-4RE	

Figure A - 3
Main Board

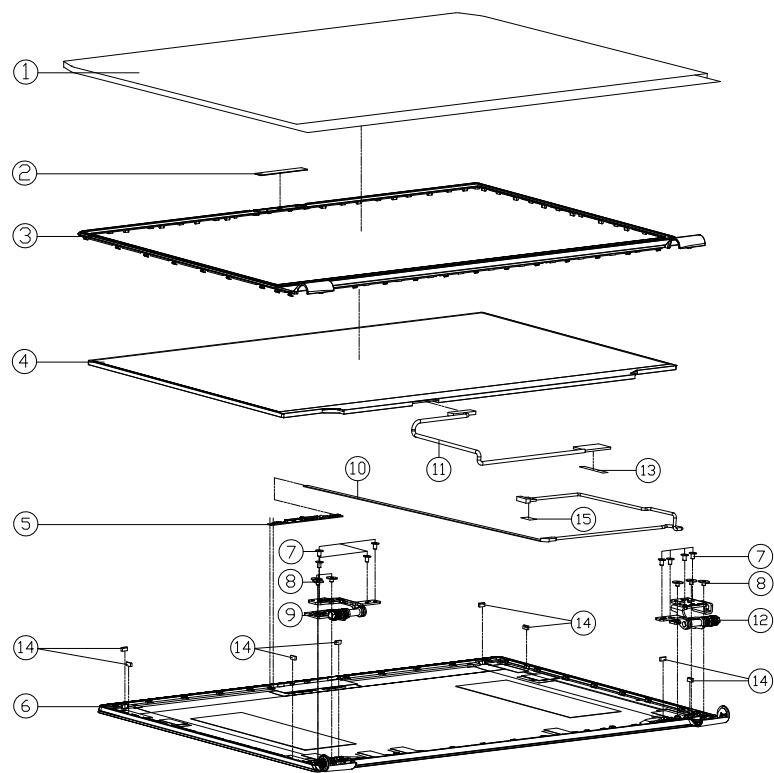
HDD

Figure A - 4
HDD



ITEM	PART	NAME	PART	NO	REMARK
1	SCREW	M3*3.0L KI NI ICT NY	6-35-B1130-3R5		
2	HDD BKT	7MM SECC T=0.5 N250LU	6-33-N250J-011		
3	SCREW	M2*4L KI BZ ICT NY	6-35-B6120-4RA		

LCD



ITEM	PART NAME	PART NO	REMARK
1	LCD PROTECT MYLAR BOPP NB70TJ1	6-40-NB708-010	
2	CCD LENS PMMA(46.3*7.215) N150ZU	6-42-N15Z1-020-1	
3	FRONT COVER MODULE NB70TJ1	6-39-NB701-013	
4	LCD N17.3" FHD/VVA/N7/NDN GT/EDP AU B173HND04.2 (H/V00) LED 35MM	6-50-NBB35-G020	
4	LCD N17.3" FHD/VVA/120HZ/N4/NDN GT/EDP AU B173HND04.7 35MM	6-50-NBB35-G150	
4	LCD N17.3" FHD/VVA/144HZ/SV G-SINC/N7/NDN GT/EDP BOE NV173FM-M44 LED 35MM	6-50-NBB35-Z120	
4	LCD N17.3" FHD/VVA/N4/NDN GT/EDP BOE NV173FM-M49 LED 35MM	6-50-NBB35-Z010	
5	ONV CAMERA LENS (F1.8) 1/4" 1.8mm F1.8mm WHITE-LED W/IR-LED W/IR-LED W/IR-LED W/IR-LED	6-88-N15ZC-5100	
5	ONV CAMERA LENS (F1.8) 1/4" 1.8mm F1.8mm WHITE-LED W/IR-LED W/IR-LED W/IR-LED W/IR-LED	6-88-N15ZC-4900	
6	BACK COVER MODULE NB70TJ1	6-39-NB701-023	
7	SCREW M2.5*4L (D=4.6,T=0.8) KI NI ICT NY	6-35-B1125-4RA	
8	SCREW M2.5*2.5L KI BK/Z ICT NY(Ø8,T=0.6)	6-35-B6125-2R5	
9	HINGE L (SK7) NB70TJ1	6-33-NB701-0L1	
10	WIRE+FFC CABLE FOR CCD D-MIC 600MM 3.3V 8P TO 12P(H/L) NB70TJ1	6-43-NB70T-012-1	
11	WIRE CABLE FOR EDP FHD 35MM (D 19V 30PM 0L/L/V COM.V0330-222-HF) N170TJ0	6-43-NH701-011-N	
11	WIRE CABLE FOR EDP FHD 144HZ 35MM (D 19V 40PM 0L/L/V COM.V0330-222-HF) N170TJ0	6-43-NH701-021-N	
12	HINGE R (SK7) NB70TJ1	6-33-NB701-0R1	
13	TAPE MYLAR (C),MYLAR M550J	6-40-M55J2-030	
14	RUBBER 5*2.65*1.5 (PANTONE GLAY 4C)NB70TJ1	6-47-NB701-041	
15	TAPE MYLAR TRANSPARENT (20*10*0.05) P180HM	6-40-P1803-020	

Figure A - 5
LCD)

Appendix B: Schematic Diagrams

This appendix has circuit diagrams of the *NK70SB / NK70SE* notebook's PCB's. The following table indicates where to find the appropriate schematic diagram.

Diagram - Page	Diagram - Page	Diagram - Page
<i>System Block Diagram - Page B - 2</i>	<i>HDMI Repeater - Page B - 23</i>	<i>VDDQ, VTT_MEM, 2.5V - Page B - 44</i>
<i>Processor 1/5 - Page B - 3</i>	<i>Panel Conn - Page B - 24</i>	<i>MP2979 - Page B - 45</i>
<i>Processor 2/5 - Page B - 4</i>	<i>PCH 1/9 - Page B - 25</i>	<i>VCore Output Stage - Page B - 46</i>
<i>Processor 3/5 - Page B - 5</i>	<i>PCH 2/9 - Page B - 26</i>	<i>VCCGT, VCCSA - Page B - 47</i>
<i>Processor 4/5 - Page B - 6</i>	<i>PCH 3/9 - Page B - 27</i>	<i>VCCIO - Page B - 48</i>
<i>Processor 5/5 - Page B - 7</i>	<i>PCH 4/9 - Page B - 28</i>	<i>1.8VA - Page B - 49</i>
<i>DDR4 CHA SO-DIMM_0 - Page B - 8</i>	<i>PCH 5/9 - Page B - 29</i>	<i>AC_In, Charger - Page B - 50</i>
<i>DDR4 CHB SO-DIMM_0 - Page B - 9</i>	<i>PCH 6/9 - Page B - 30</i>	<i>NVVDD1 - Page B - 51</i>
<i>VGA PCI-E Interface - Page B - 10</i>	<i>PCH 7/9 - Page B - 31</i>	<i>NVVDD2 - Page B - 52</i>
<i>VGA Frame Buffer Interface - Page B - 11</i>	<i>PCH 8/9 - Page B - 32</i>	<i>FBVDDQ - Page B - 53</i>
<i>VGA Frame Buffer A - Page B - 12</i>	<i>PCH 9/9 - Page B - 33</i>	<i>IV8_AON, PEX_VDD - Page B - 54</i>
<i>VGA Frame Buffer A - Page B - 13</i>	<i>KBC-ITE IT5570 - Page B - 34</i>	<i>DC Jack Board - Page B - 55</i>
<i>VGA Frame Buffer B - Page B - 14</i>	<i>Audio Codec - Page B - 35</i>	<i>Power SW Board - Page B - 56</i>
<i>VGA Frame Buffer B - Page B - 15</i>	<i>M.2 PCIE4X SSD - Page B - 36</i>	<i>Click Board - Page B - 57</i>
<i>VGA I/O - Page B - 16</i>	<i>USB Type-C, M.2 WLAN+BT - Page B - 37</i>	<i>Multi Board - Page B - 58</i>
<i>VGA I/O - Page B - 17</i>	<i>USB Type-A, TPM - Page B - 38</i>	<i>LAN RTL8411B - Page B - 59</i>
<i>VGA Sequence / GPIO - Page B - 18</i>	<i>RGB KB, Fan, LED - Page B - 39</i>	<i>DC Jack Board - Page B - 60</i>
<i>VGA Decoupling - Page B - 19</i>	<i>HDD, CCD, TP, LID, PWR SW - Page B - 40</i>	<i>Power SW Board - Page B - 61</i>
<i>mDP Conn - Page B - 20</i>	<i>5V, 5VS, 3.3V, 3.3VS, NV3V3 - Page B - 41</i>	<i>LID Board - Page B - 62</i>
<i>DP Redriver - Page B - 21</i>	<i>VDD3, VDD5 - Page B - 42</i>	
<i>HDMI - Page B - 22</i>	<i>1.05A, VCCST/STG/SFR - Page B - 43</i>	

Table B - 1
**SCHEMATIC
DIAGRAMS**

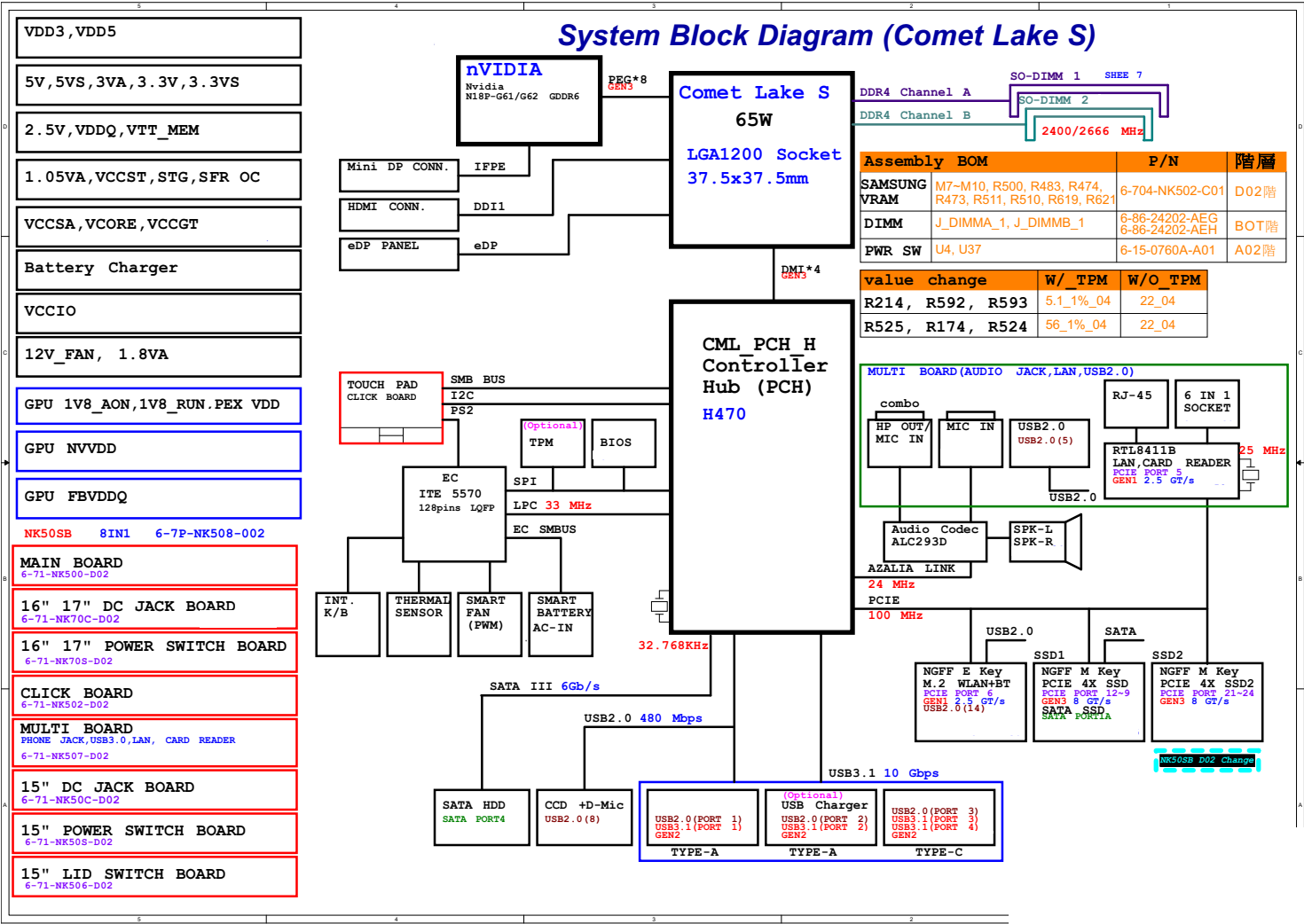


Version Note

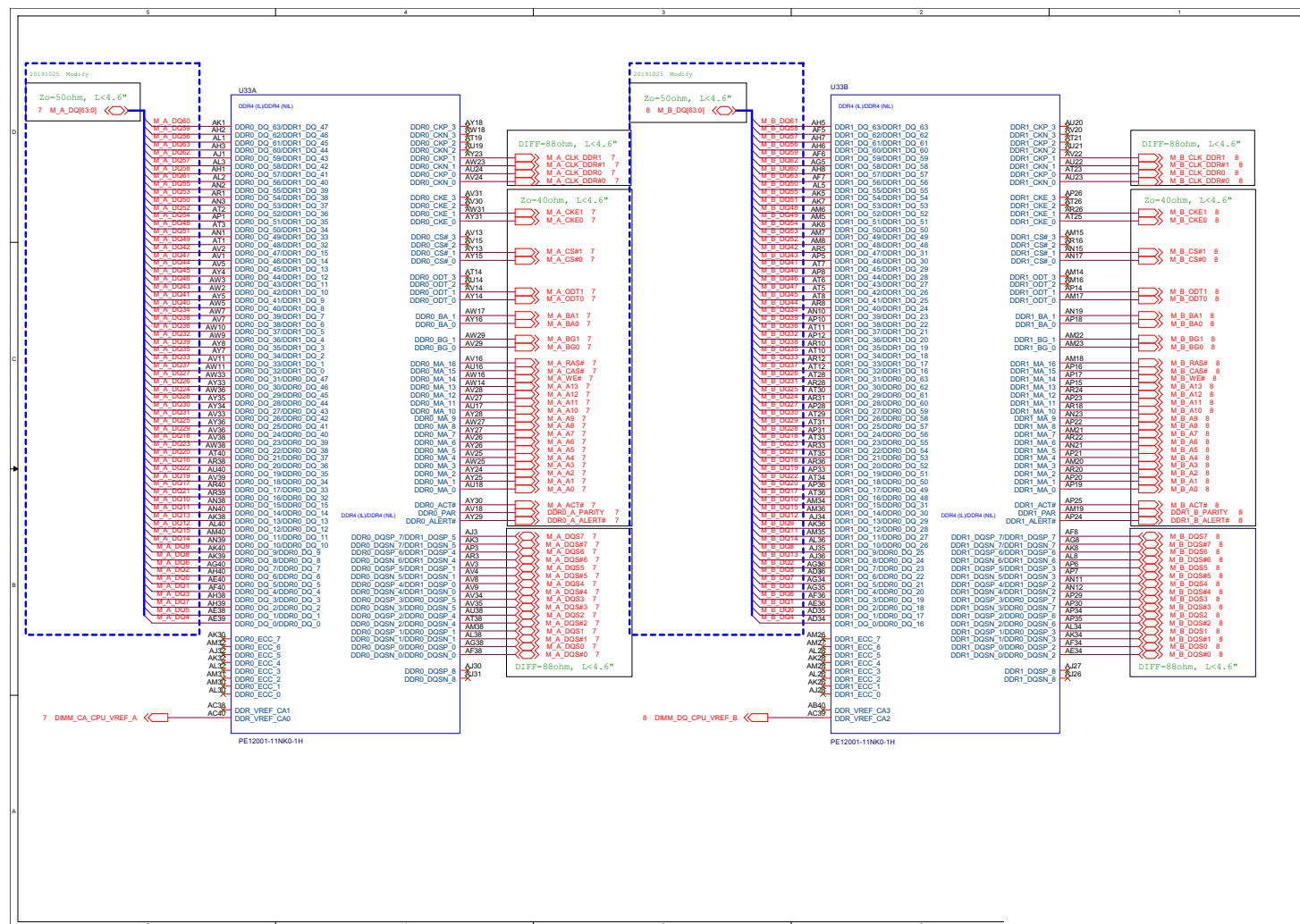
The schematic diagrams in this chapter are based upon version 6-7P-NK508-002. If your mainboard (or other boards) are a later version, please check with the Service Center for updated diagrams (if required).

System Block Diagram

Sheet 1 of 61
System Block
Diagram



Processor 1/5

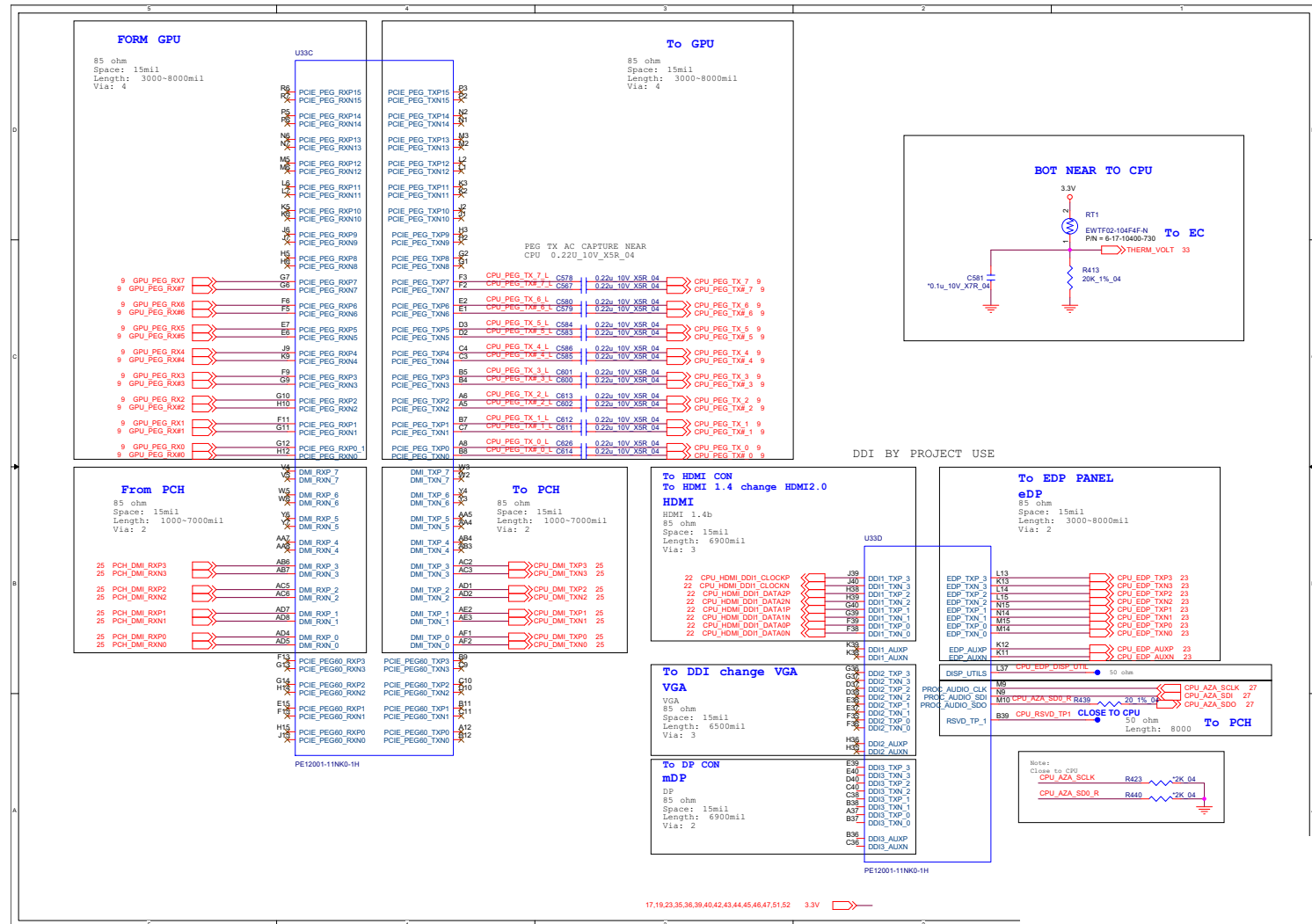


Sheet 2 of 61
Processor 1/5

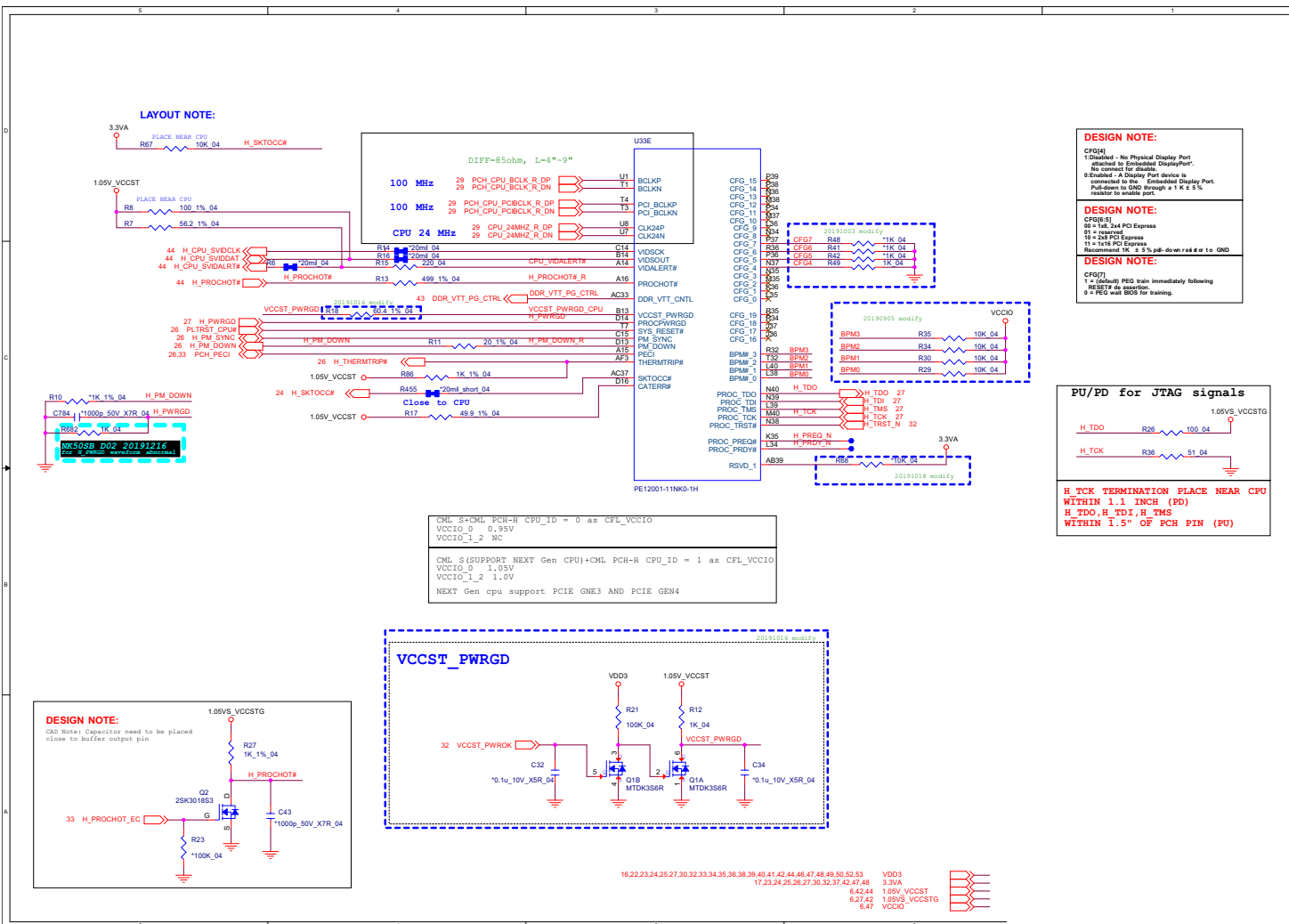
B.Schematic Diagrams

Schematic Diagrams

Processor 2/5

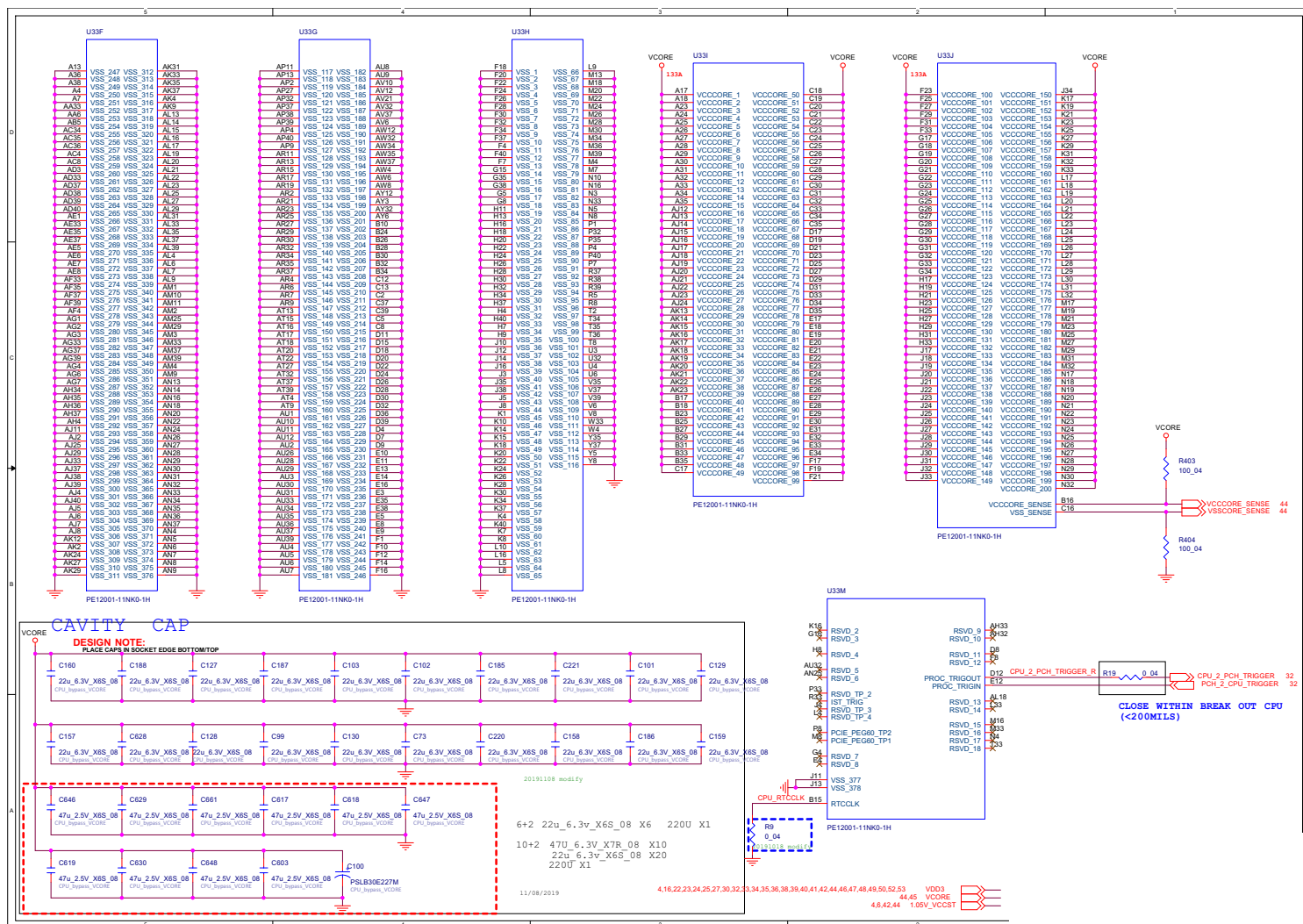
Sheet 3 of 61
Processor 2/5

Processor 3/5

Sheet 4 of 61
Processor 3/5

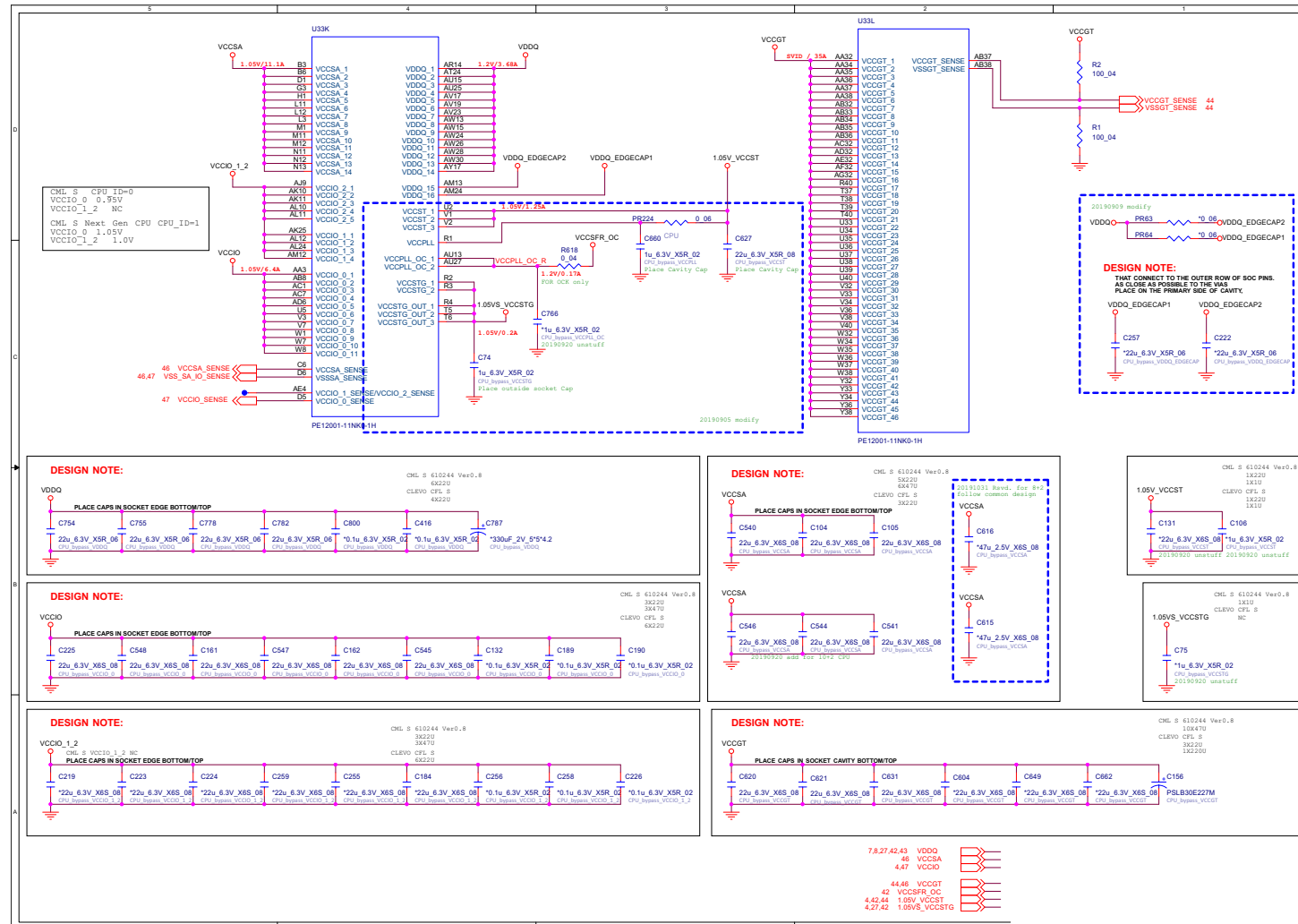
Processor 4/5

Sheet 5 of 61
Processor 4/5



Processor 5/5 B - 7

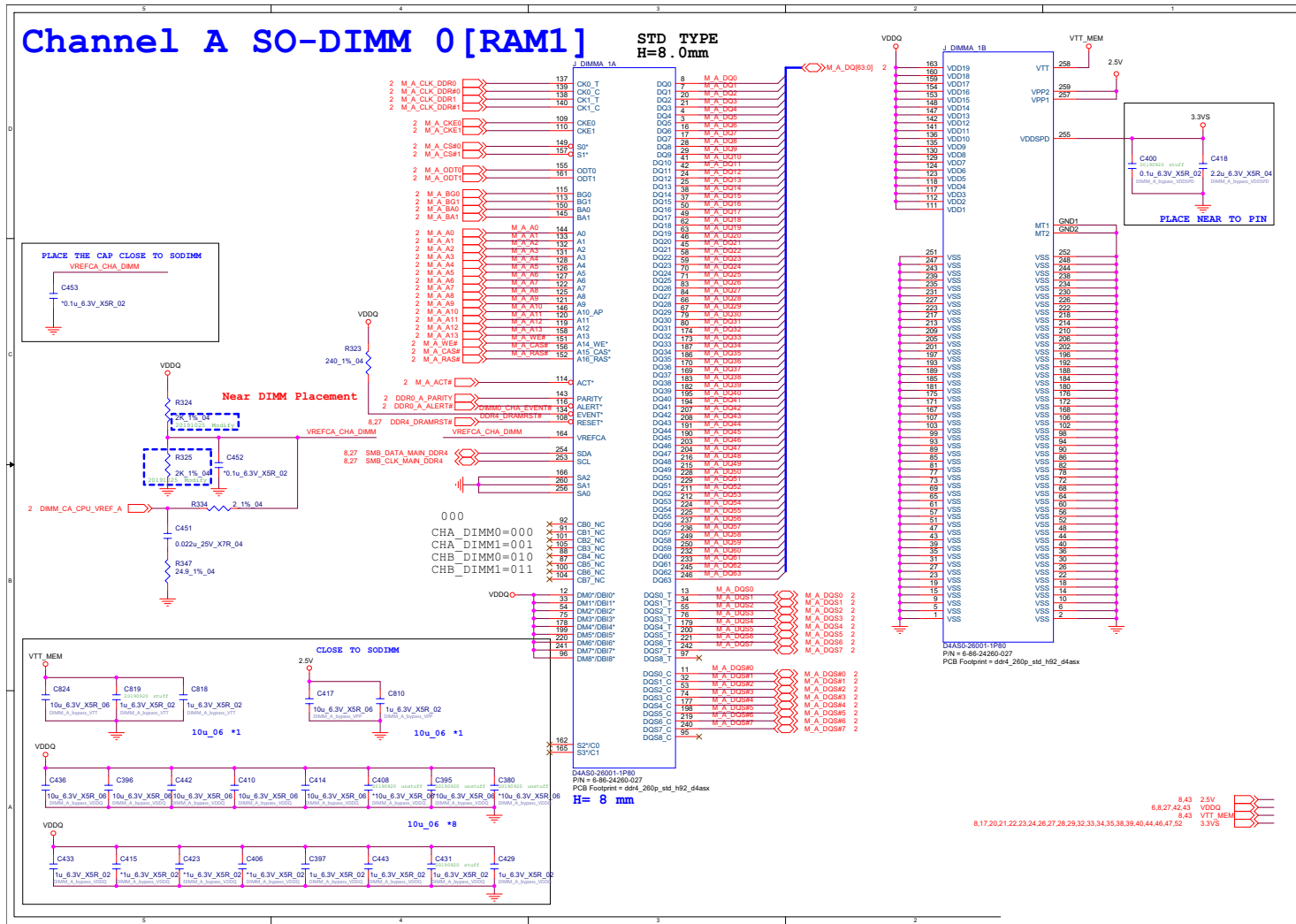
B.Schematic Diagrams



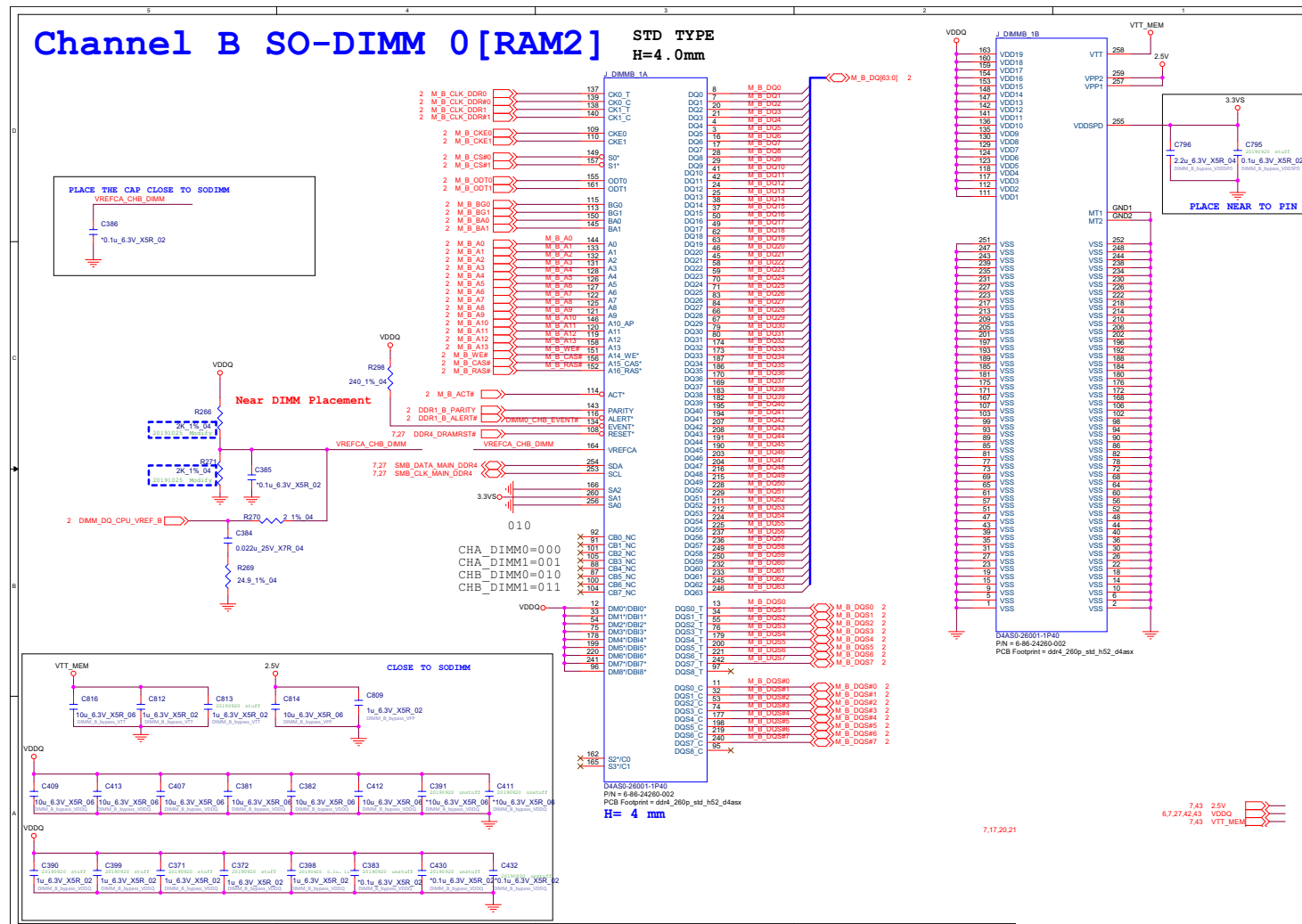
DDR4 CHA SO-DIMM_0

B. Schematic Diagrams

Sheet 7 of 61
DDR4 CHA SO-
DIMM_0



DDR4 CHB SO-DIMM_0



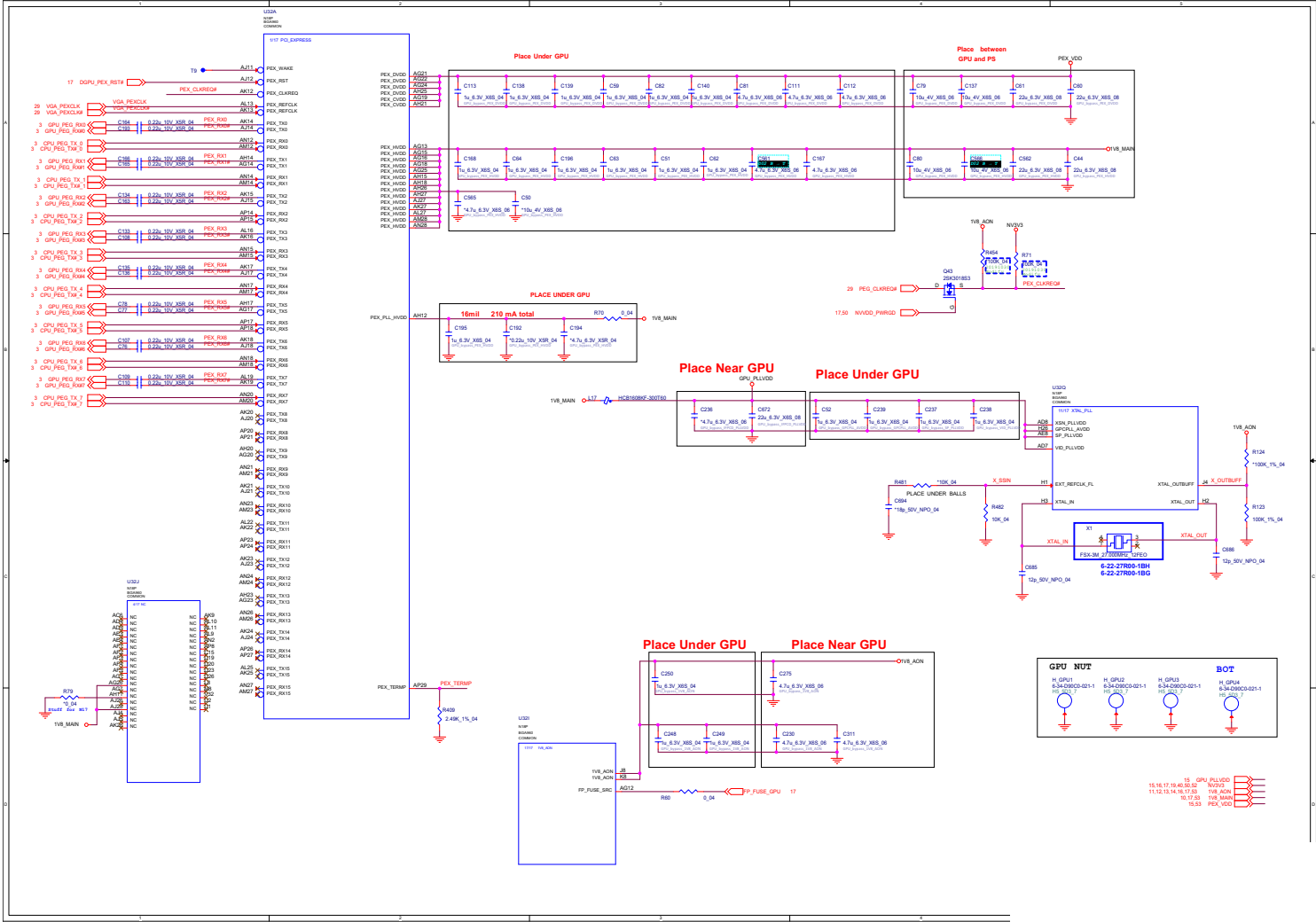
Sheet 8 of 61
DDR4 CHB SO-
DIMM_0

B.Schematic Diagrams

Schematic Diagrams

VGA PCI-E Interface

Sheet 9 of 61
VGA PCI-E
Interface



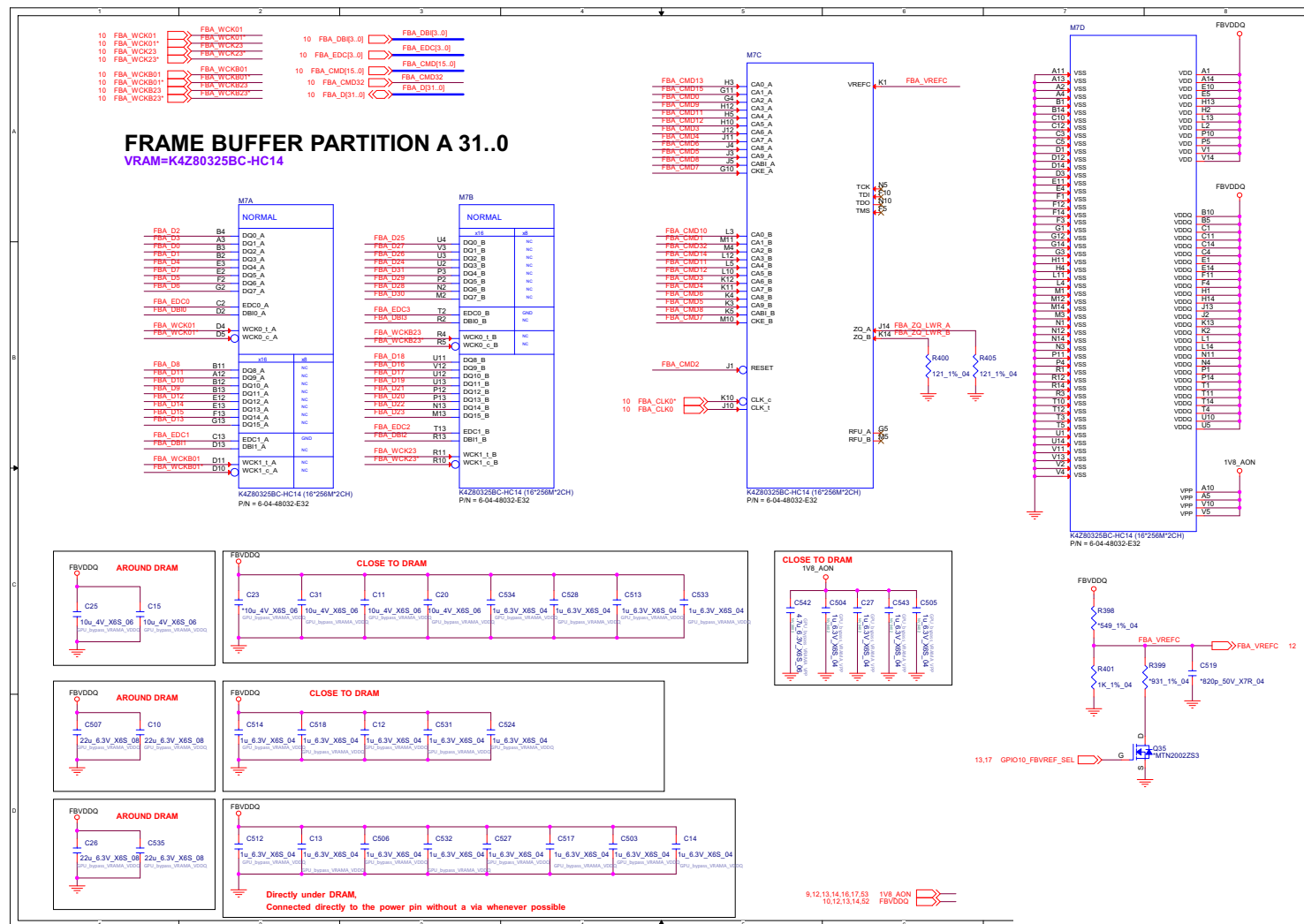
Sheet 10 of 61
VGA Frame Buffer
Interface



VGA Frame Buffer A

B.Schematic Diagrams

Sheet 11 of 61
VGA Frame Buffer
A

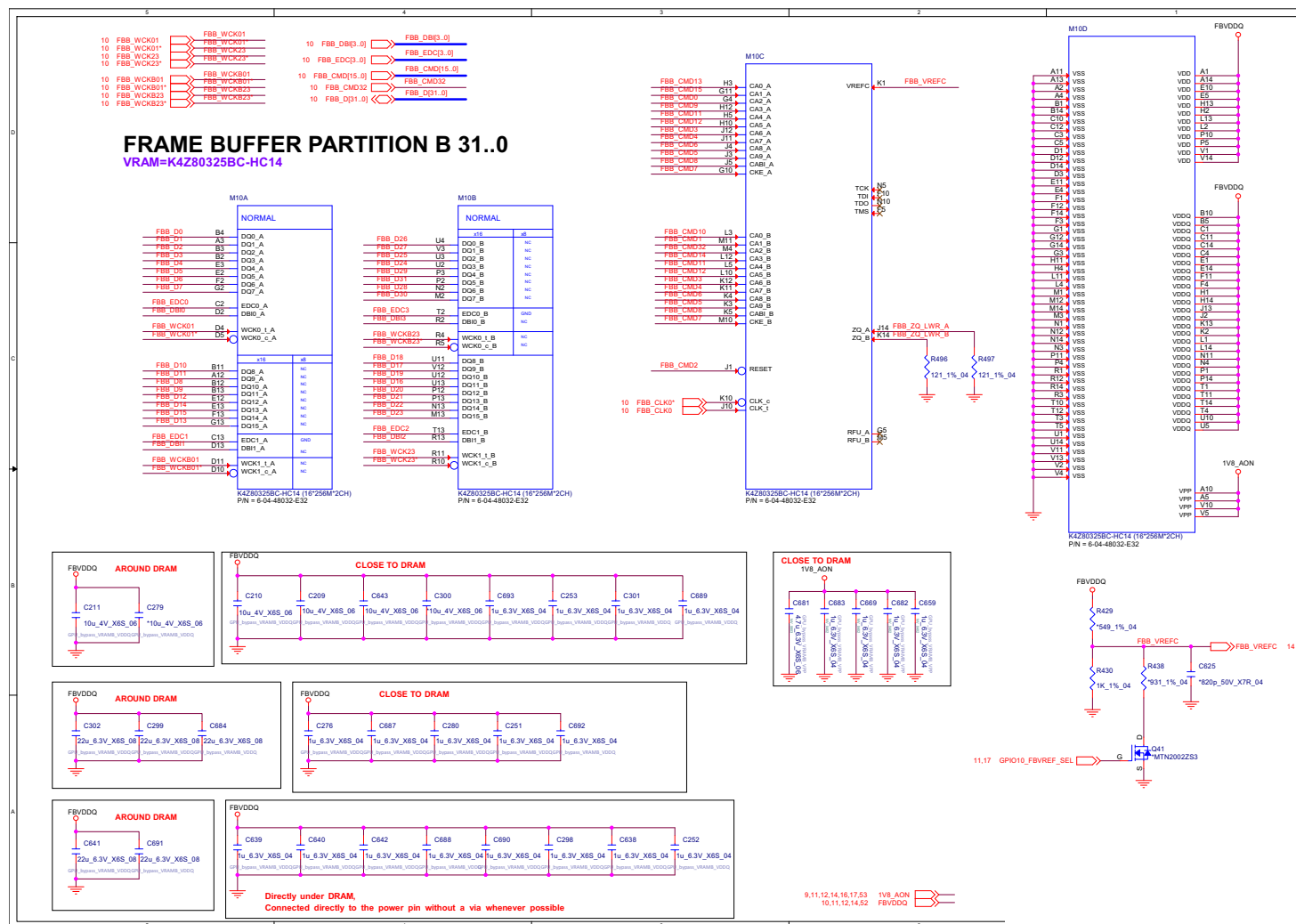


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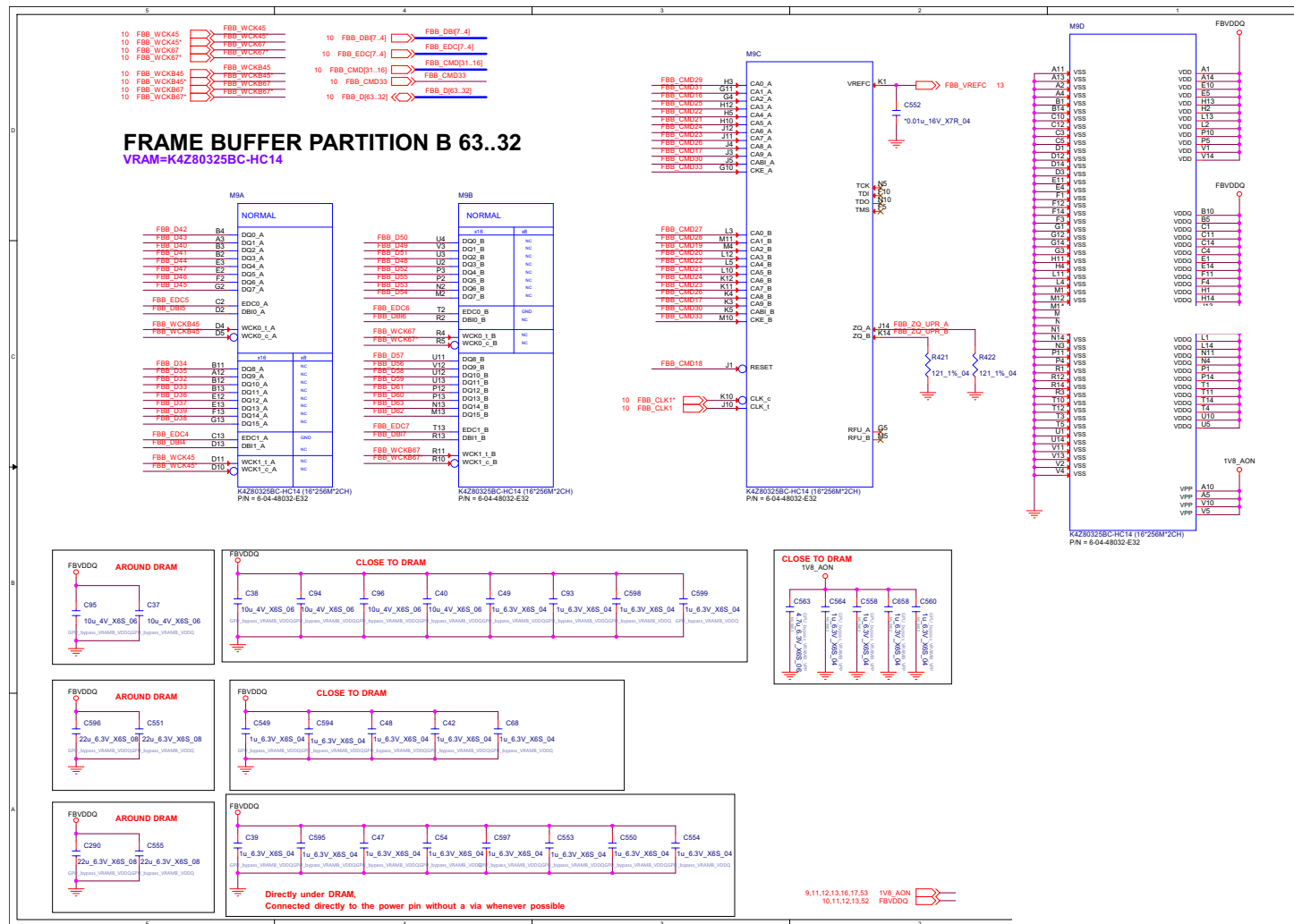
VGA Frame Buffer B

B. Schematic Diagrams

Sheet 13 of 61
VGA Frame Buffer
B



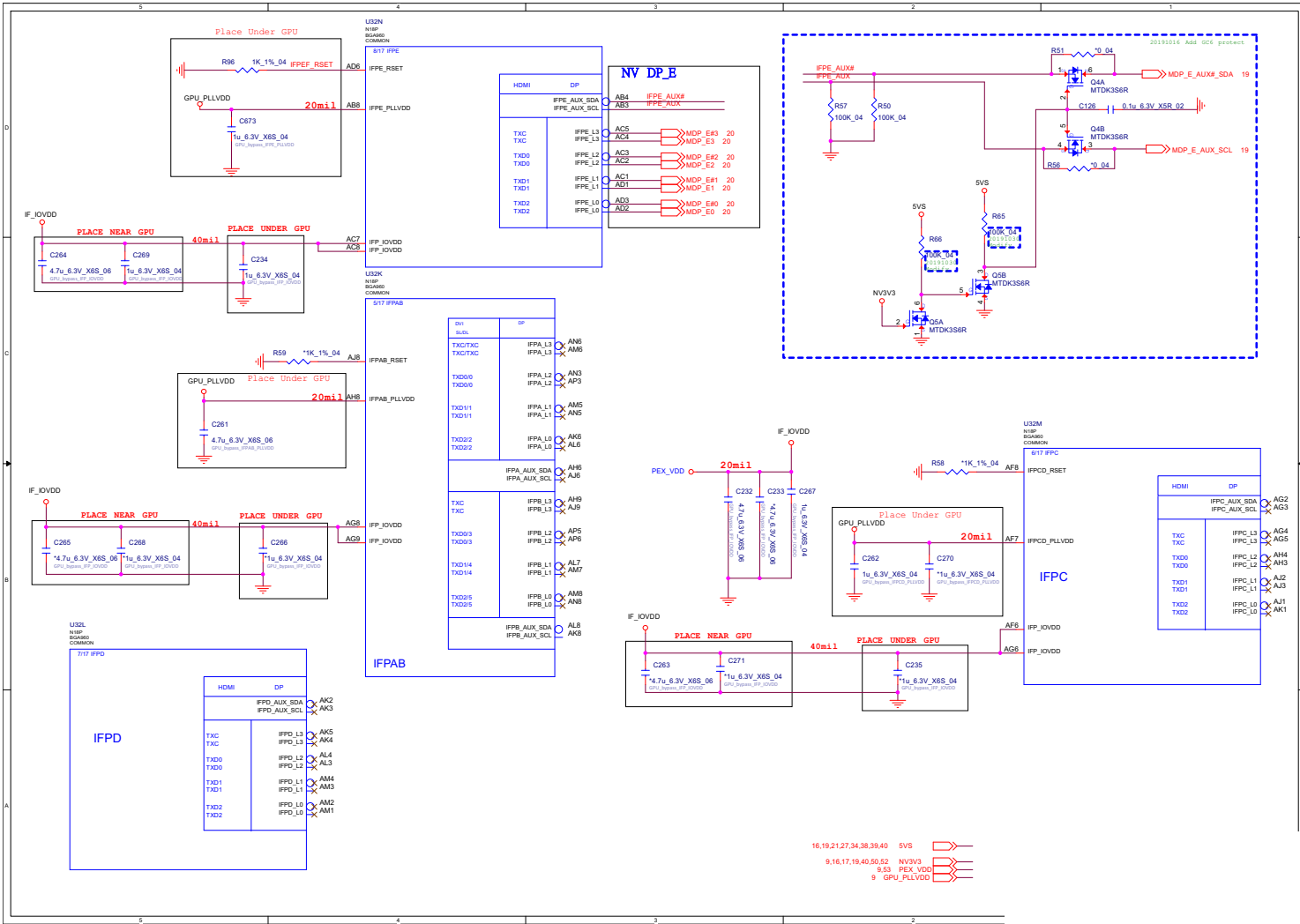
VGA Frame Buffer B



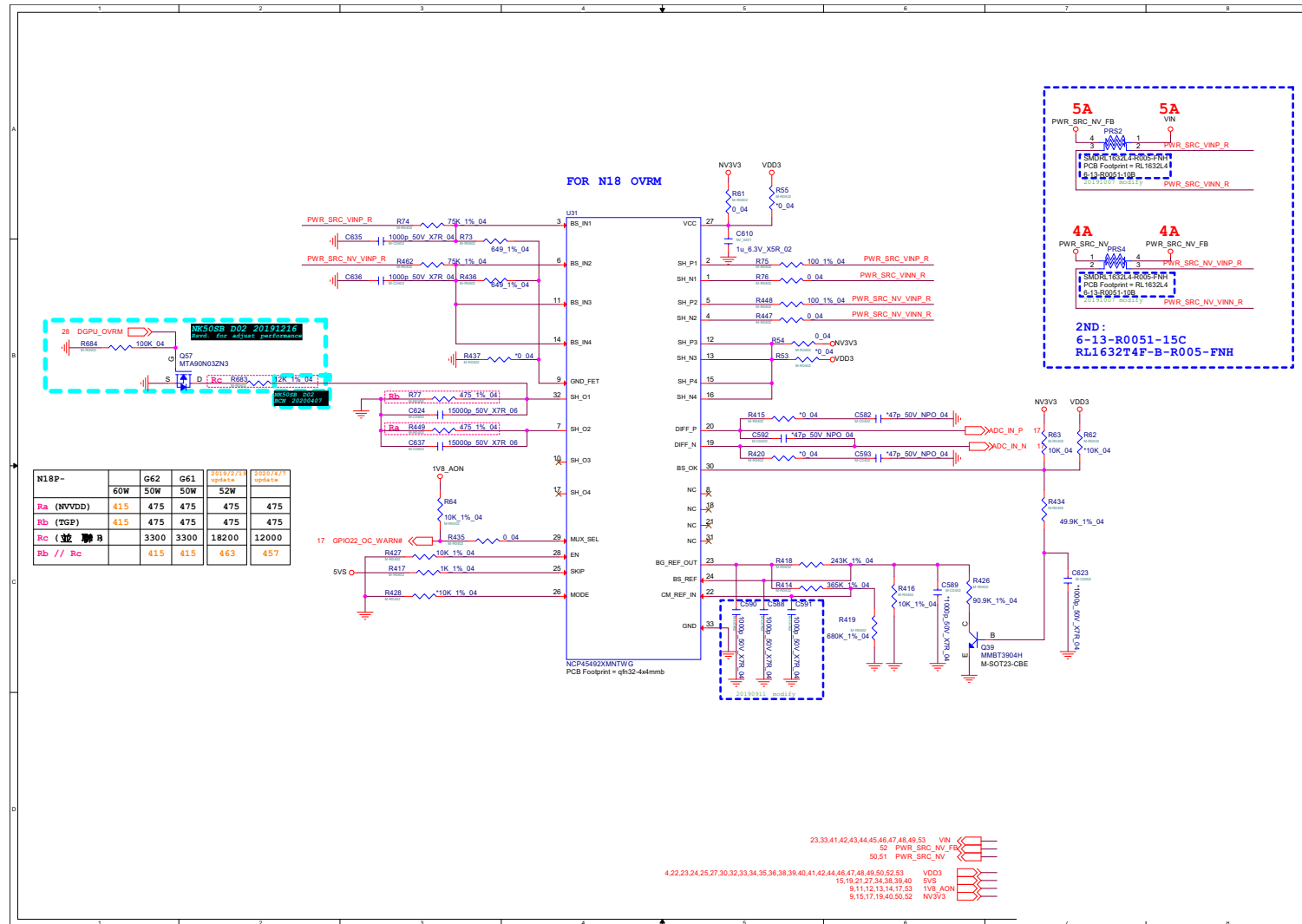
VGA I/O

B.Schematic Diagrams

Sheet 15 of 61
VGA I/O



VGA I/O

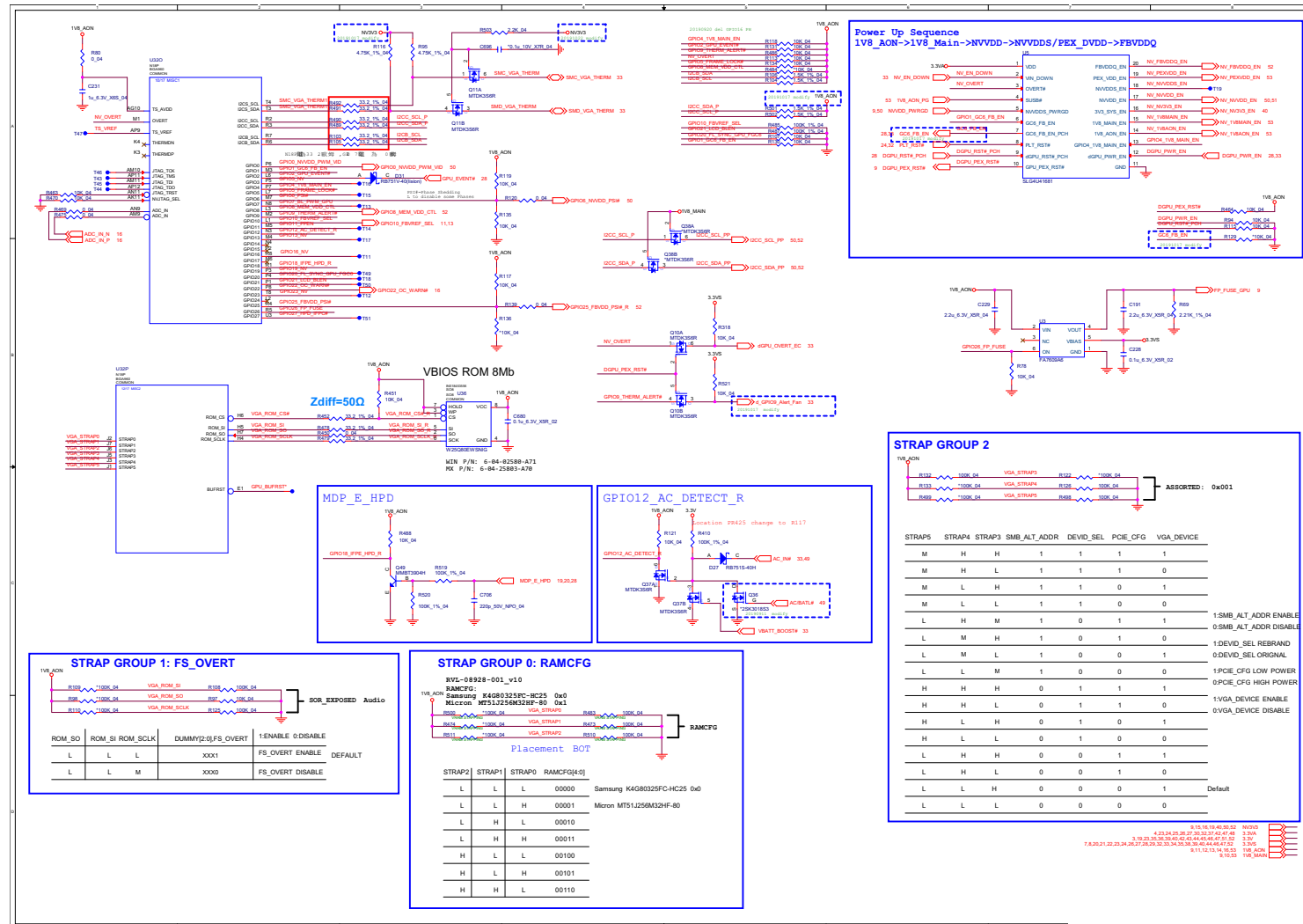


Sheet 16 of 61
VGA I/O

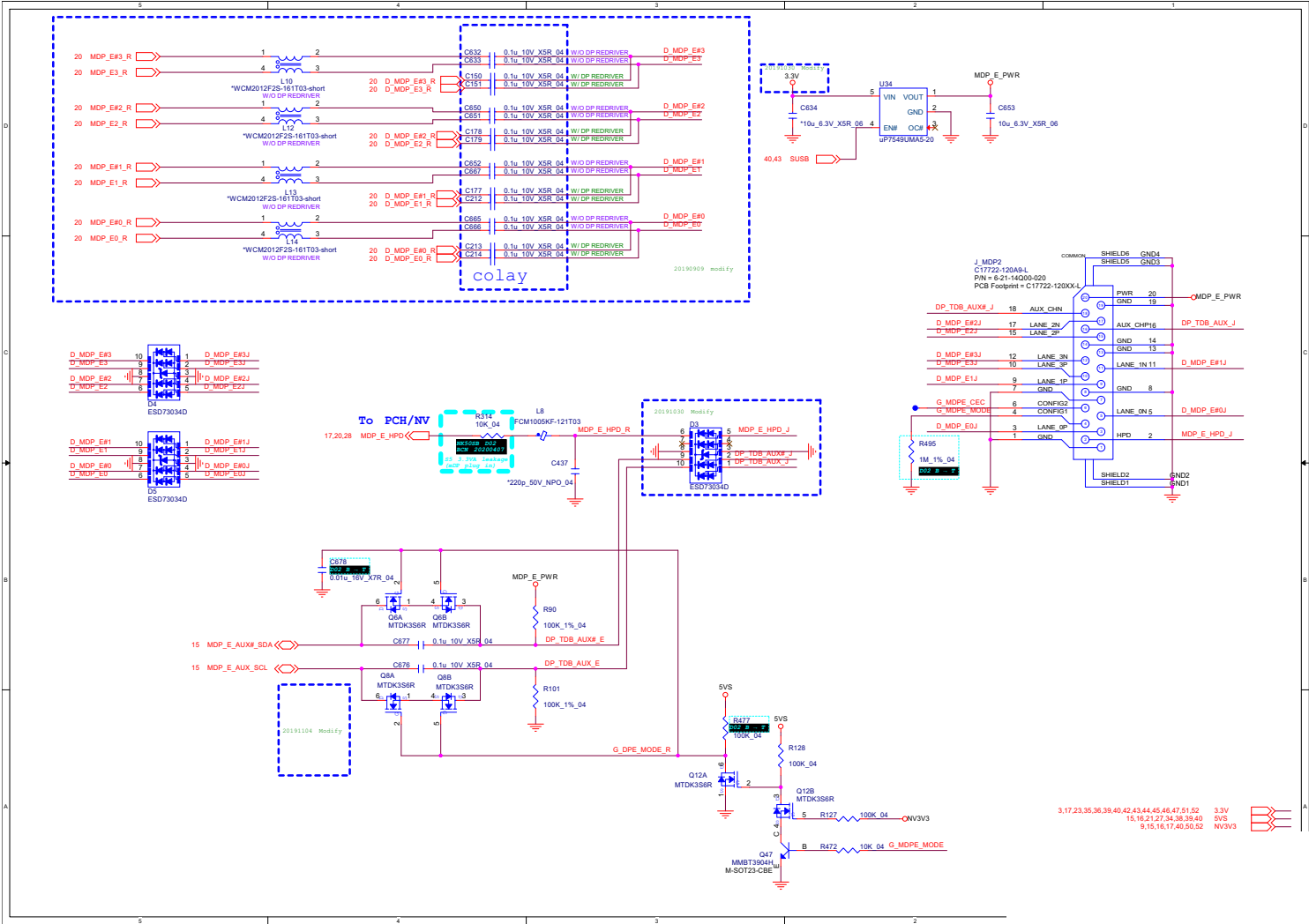
Schematic Diagrams

VGA Sequence / GPIO

Sheet 17 of 61
VGA Sequence /
GPIO



mDP Conn



Sheet 19 of 61
mDP Conn

B.Schematic Diagrams

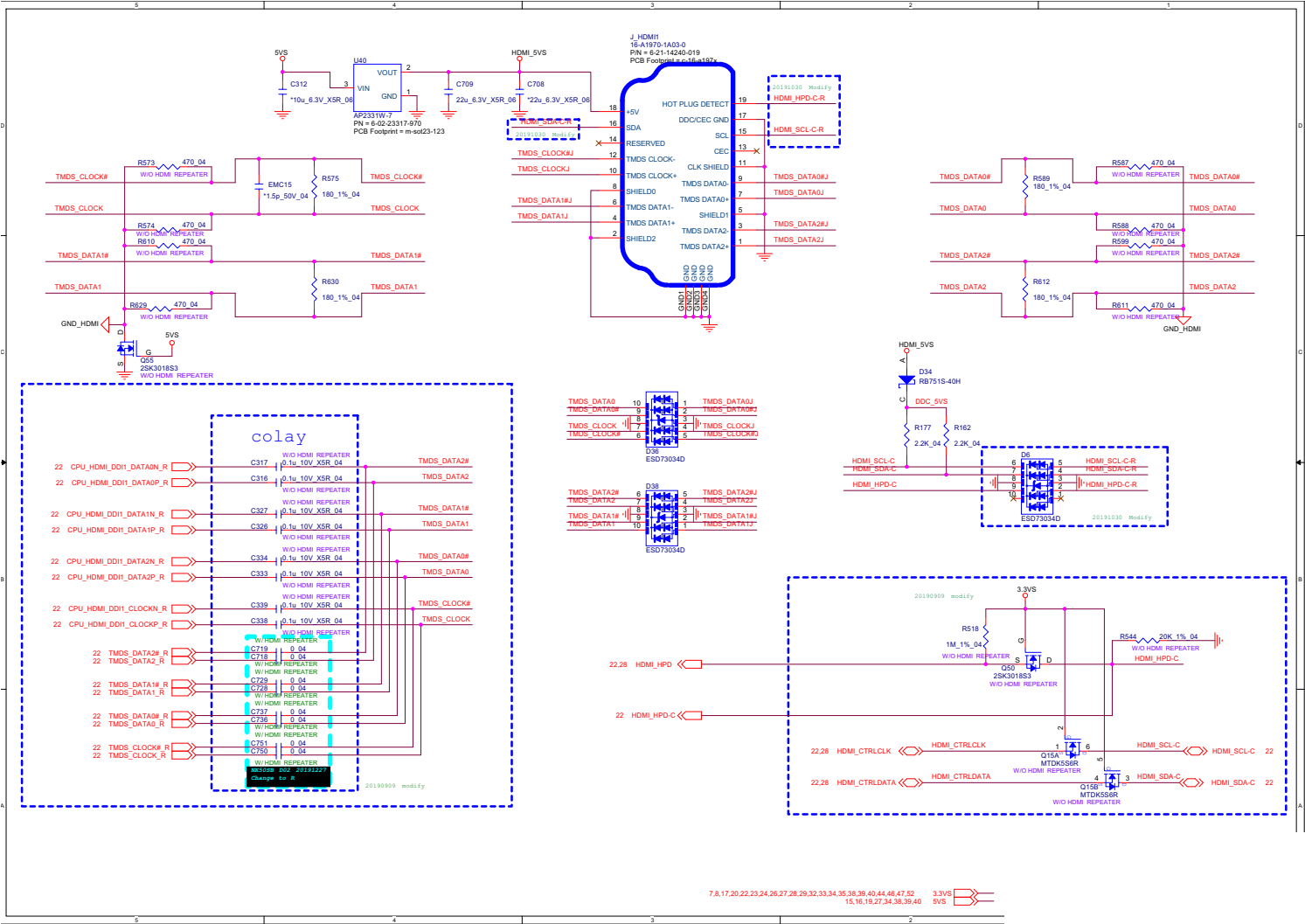
B.Schematic Diagrams



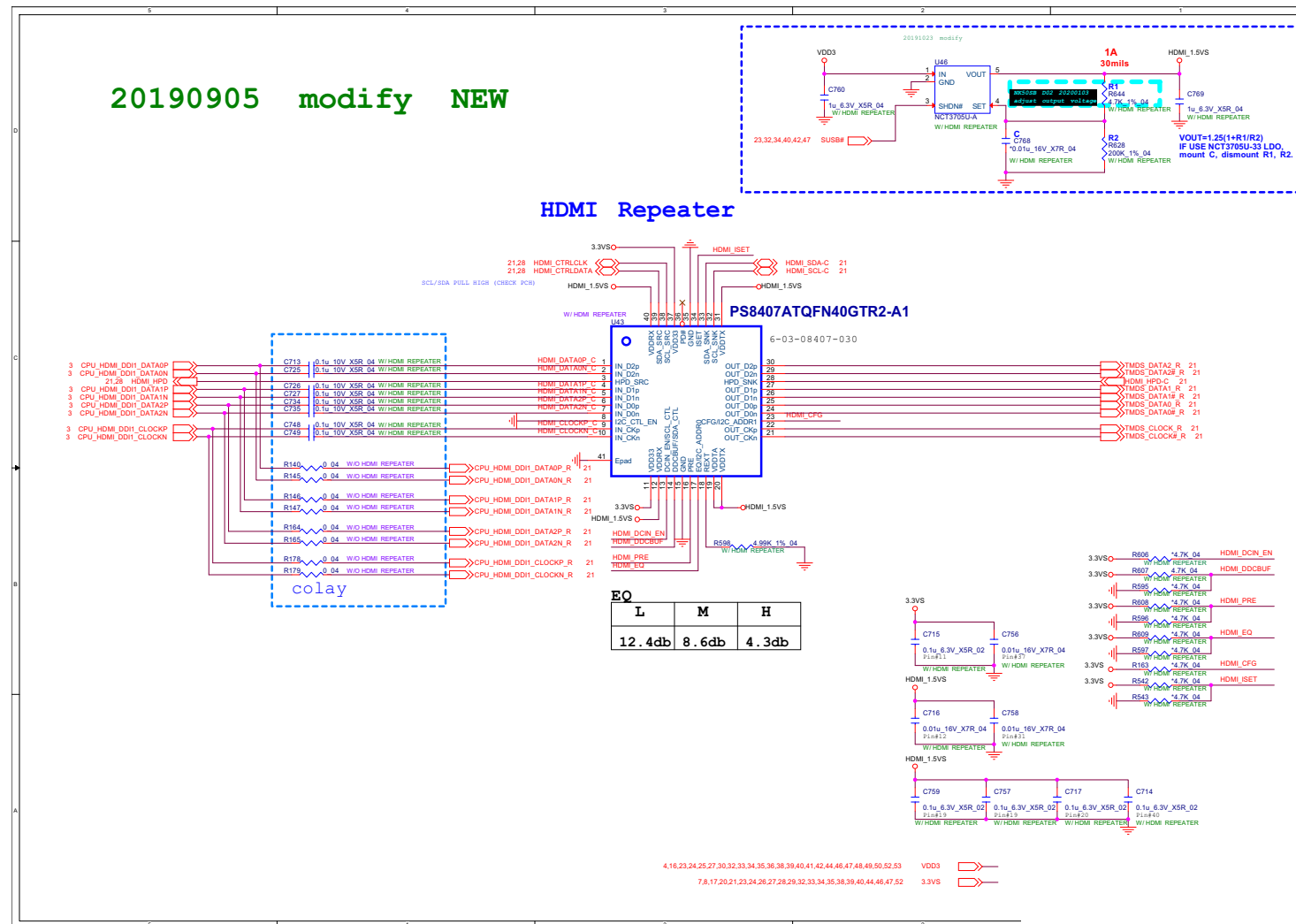
Schematic Diagrams

HDMI

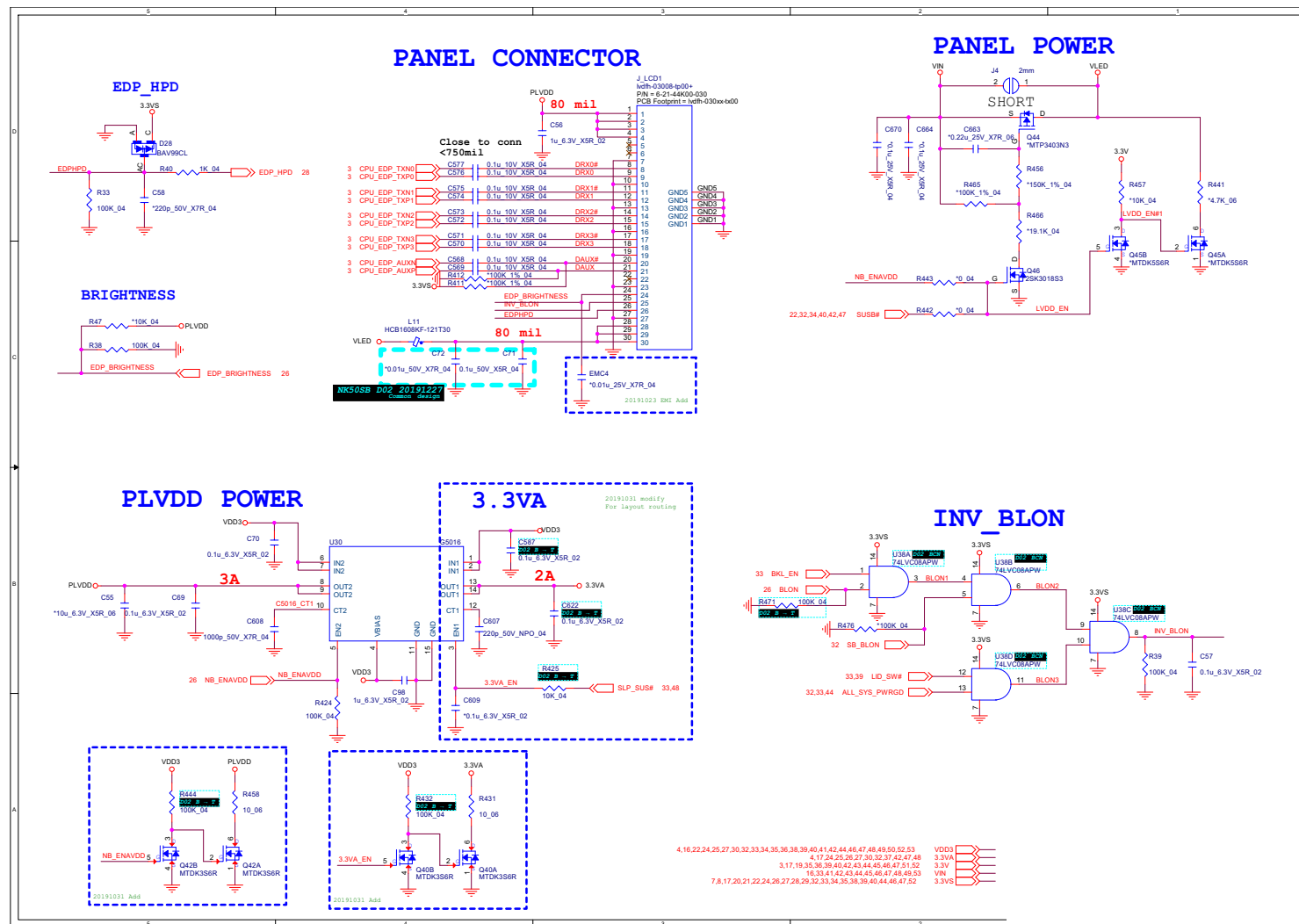
Sheet 21 of 61
HDMI



HDMI Repeater

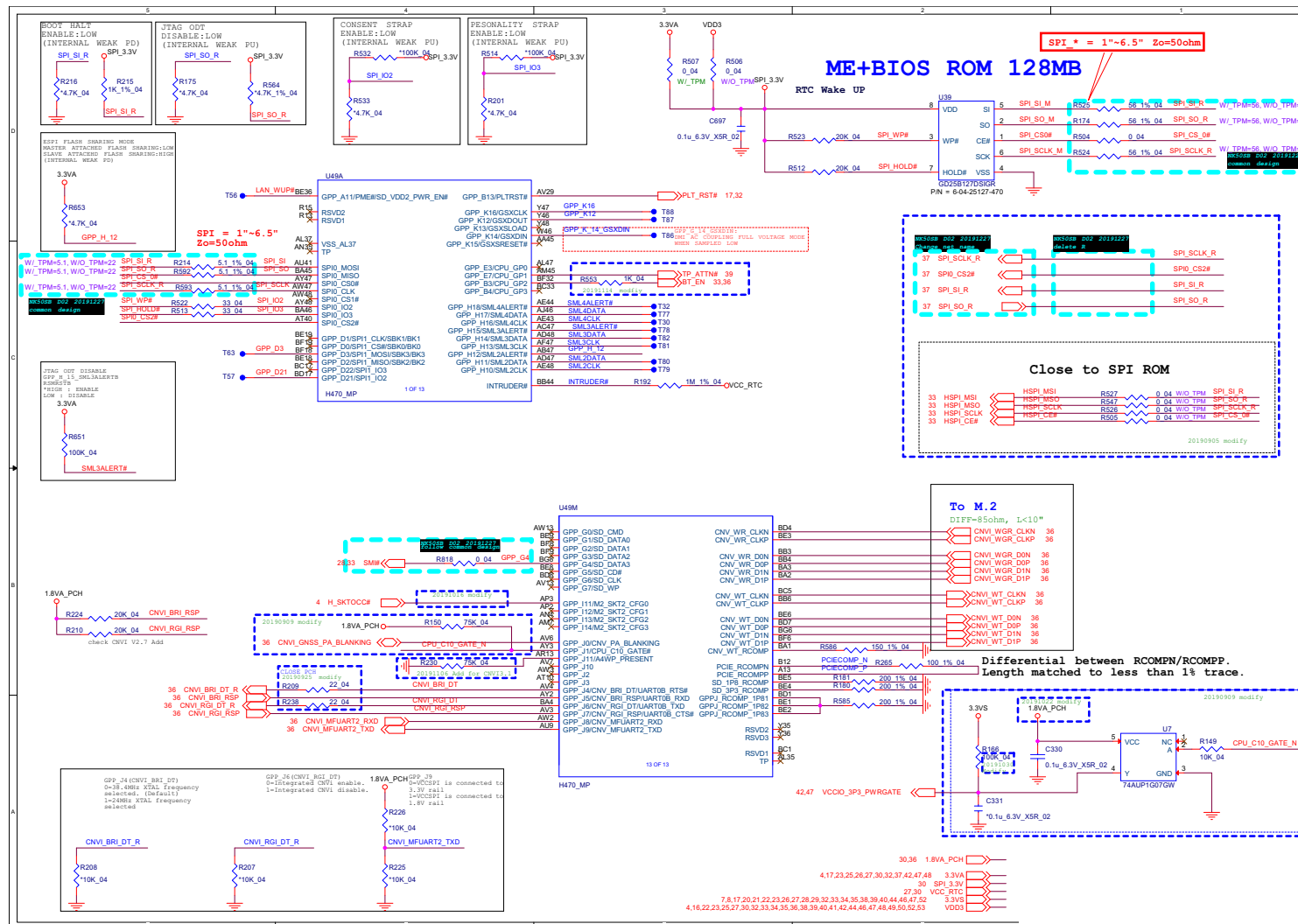
Sheet 22 of 61
HDMI Repeater

Sheet 23 of 61
Panel Conn



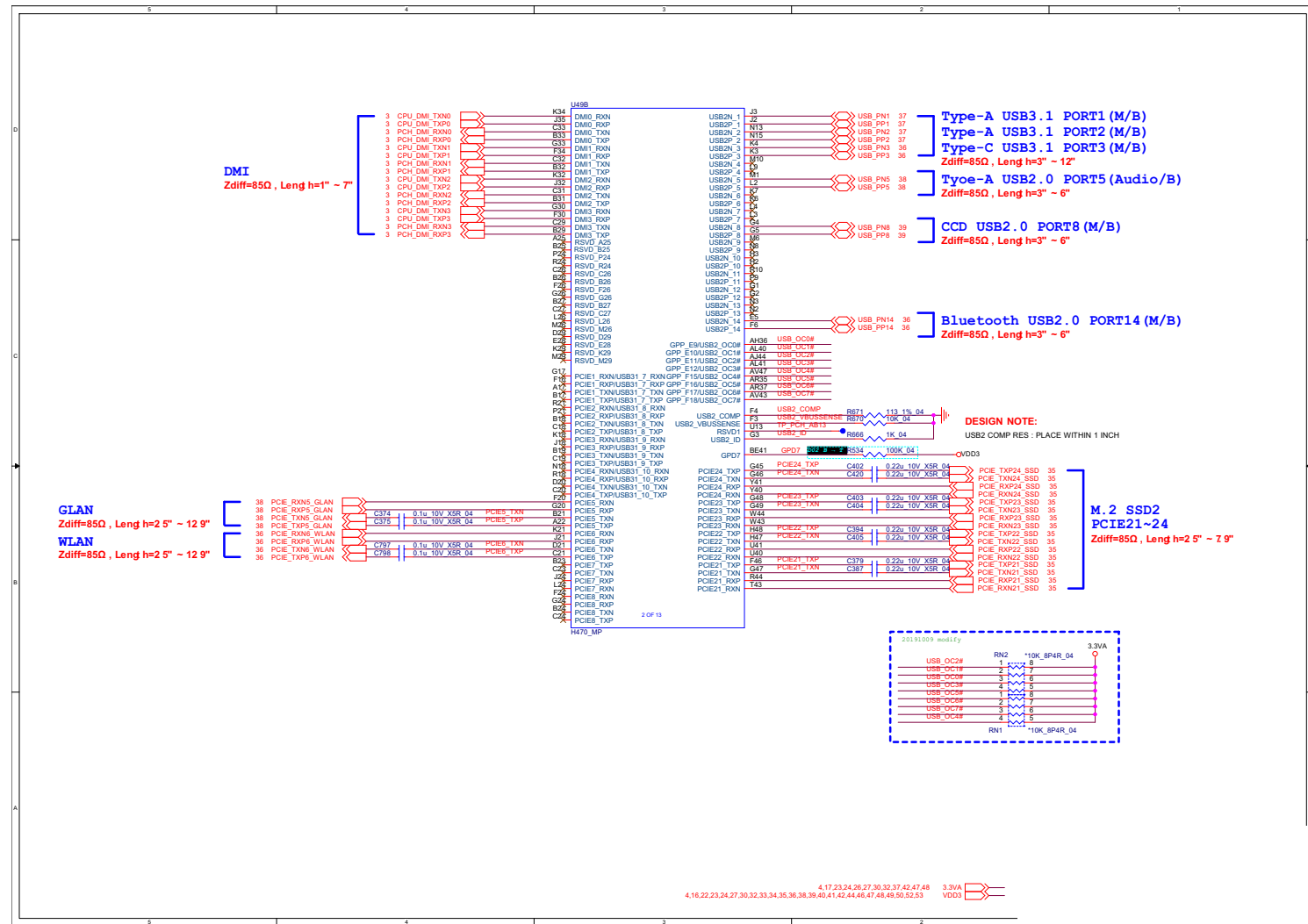
Schematic Diagrams

PCH 1/9

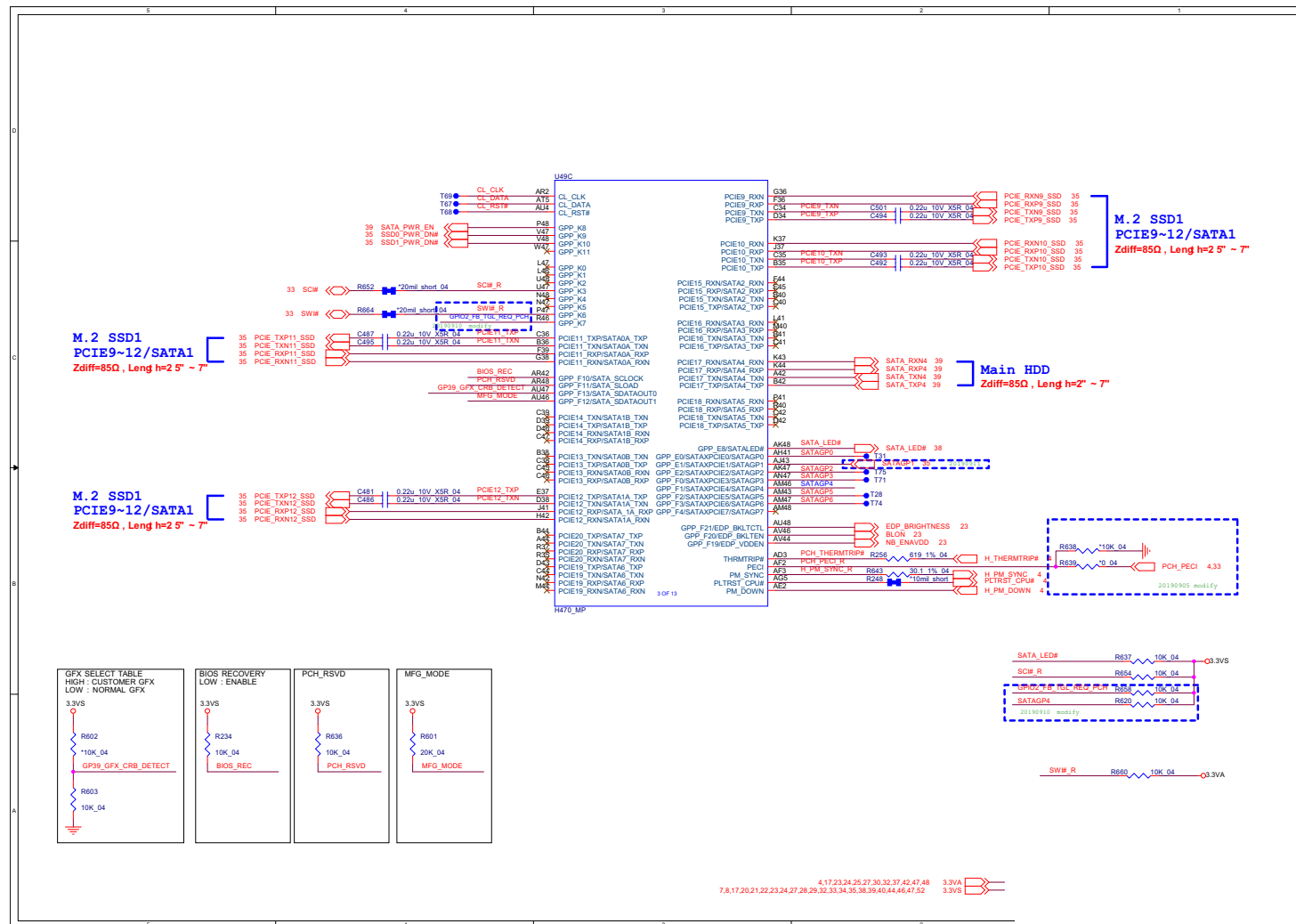


PCH 2/9

Sheet 25 of 61
PCH 2/9

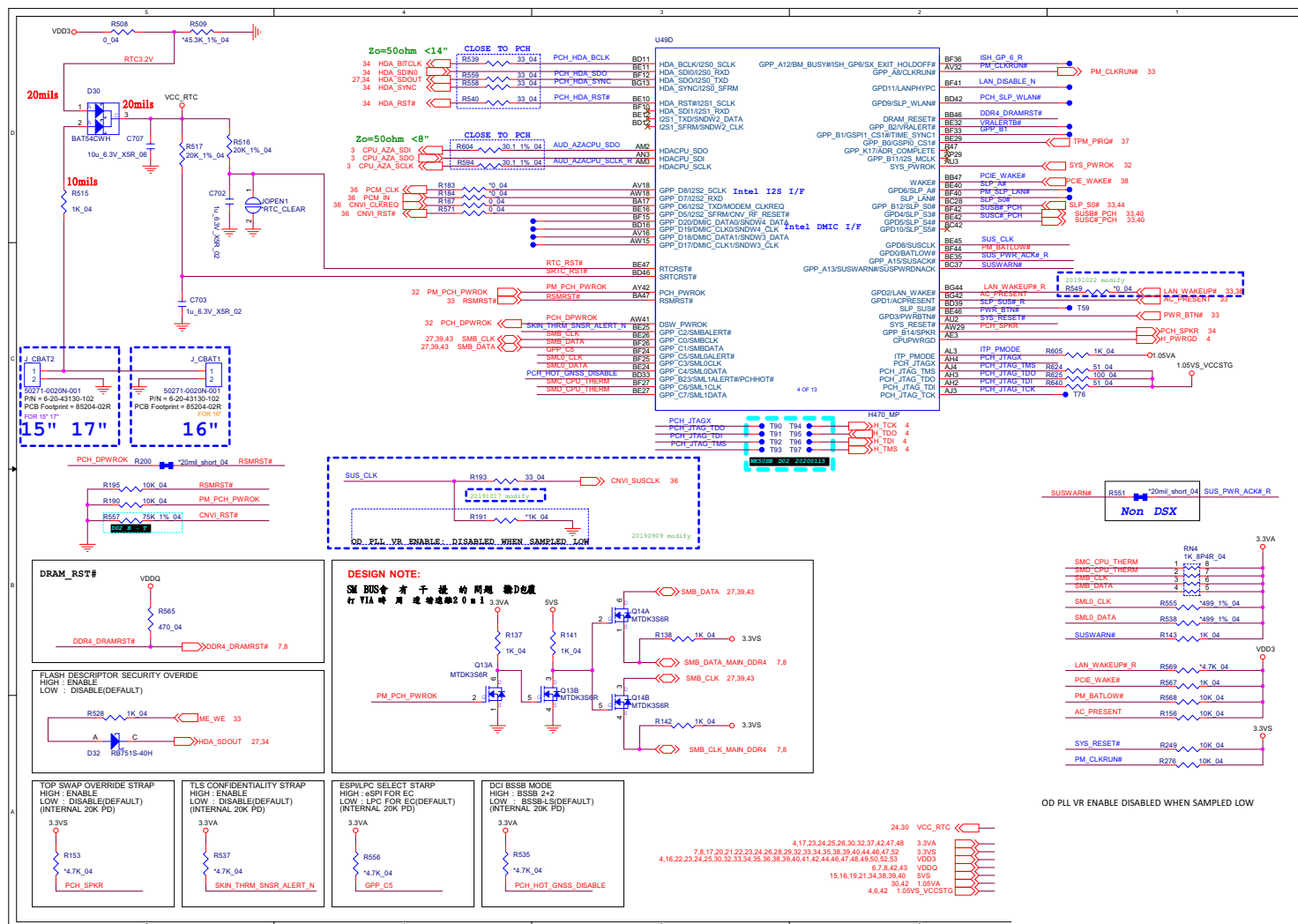


PCH 3/9 B - 27



PCH 4/9

Sheet 27 of 61
PCH 4/9



TEST SETUP MENU TABLE

TEST SETUP MENU TABLE	
BOARD STYLE	
1	DISABLED (DEFAULT)
0	TEST SETUP MENU ENABLED

DESIGN NOTE:
TEST SETUP MENU JUMPER

3.3VS
R258
R257
10K 04
20190910 modify

21,22 HDMI_HPD
17,19,20 MDP_E_HPD
23 EDP_HPD

H470_M0

AT6
AN0
AN5
AN6

GPP_I0DDPB_HPD0/ISP_MISC0
GPP_I1DDPC_HPD0/ISP_MISC1
GPP_I2DDPD_HPD0/ISP_MISC2
GPP_I3DDPF_HPD0/ISP_MISC3
GPP_I4EDP_HPD0/ISP_MISC4
GPP_F14IPS_ON0
GPP_K23MGLCKOUT1
GPP_K23MGLCKOUT10
GPP_K20
GPP_K20
GPP_H23TIME_SYNC0

8 OF 13

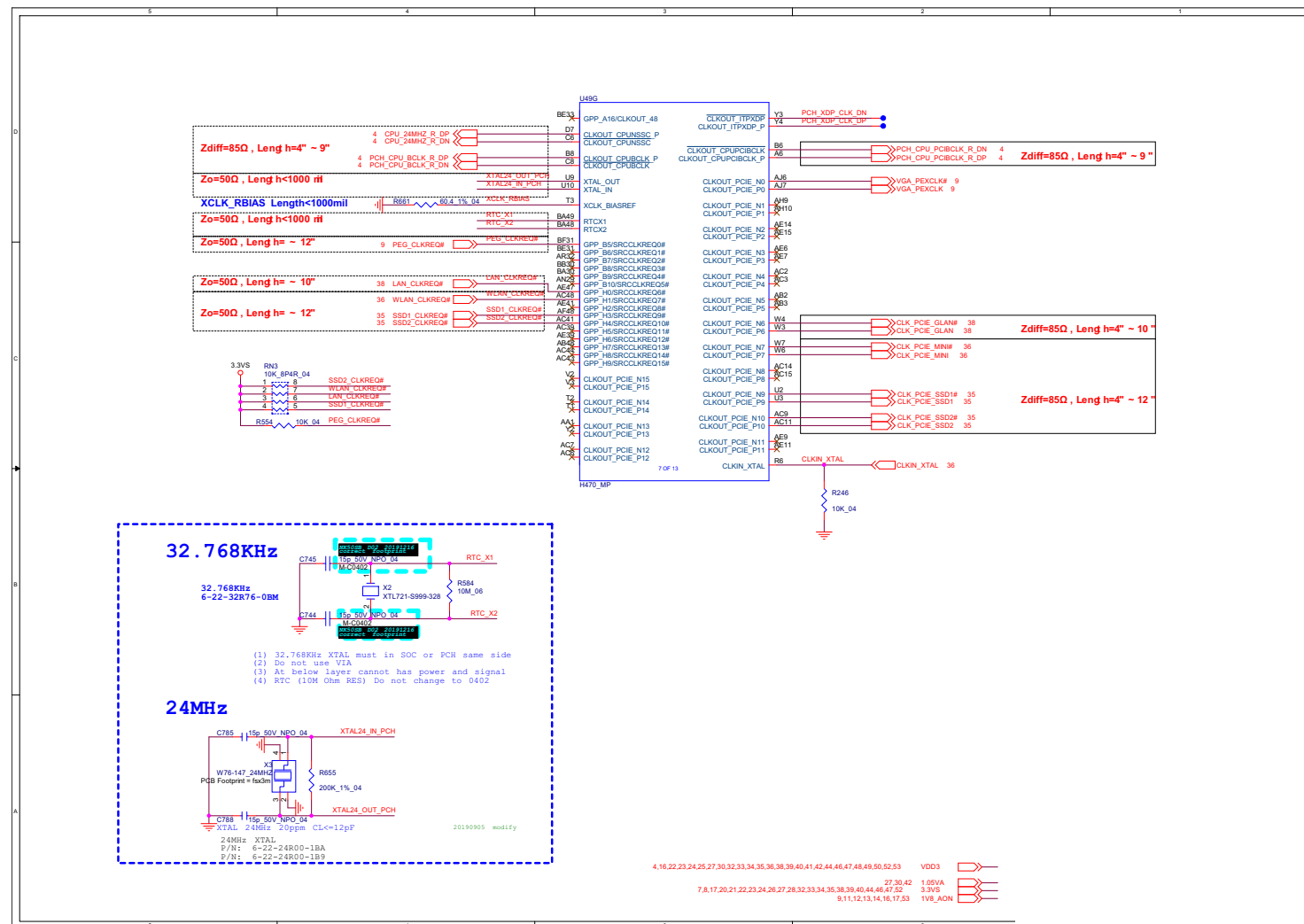
H470_M0

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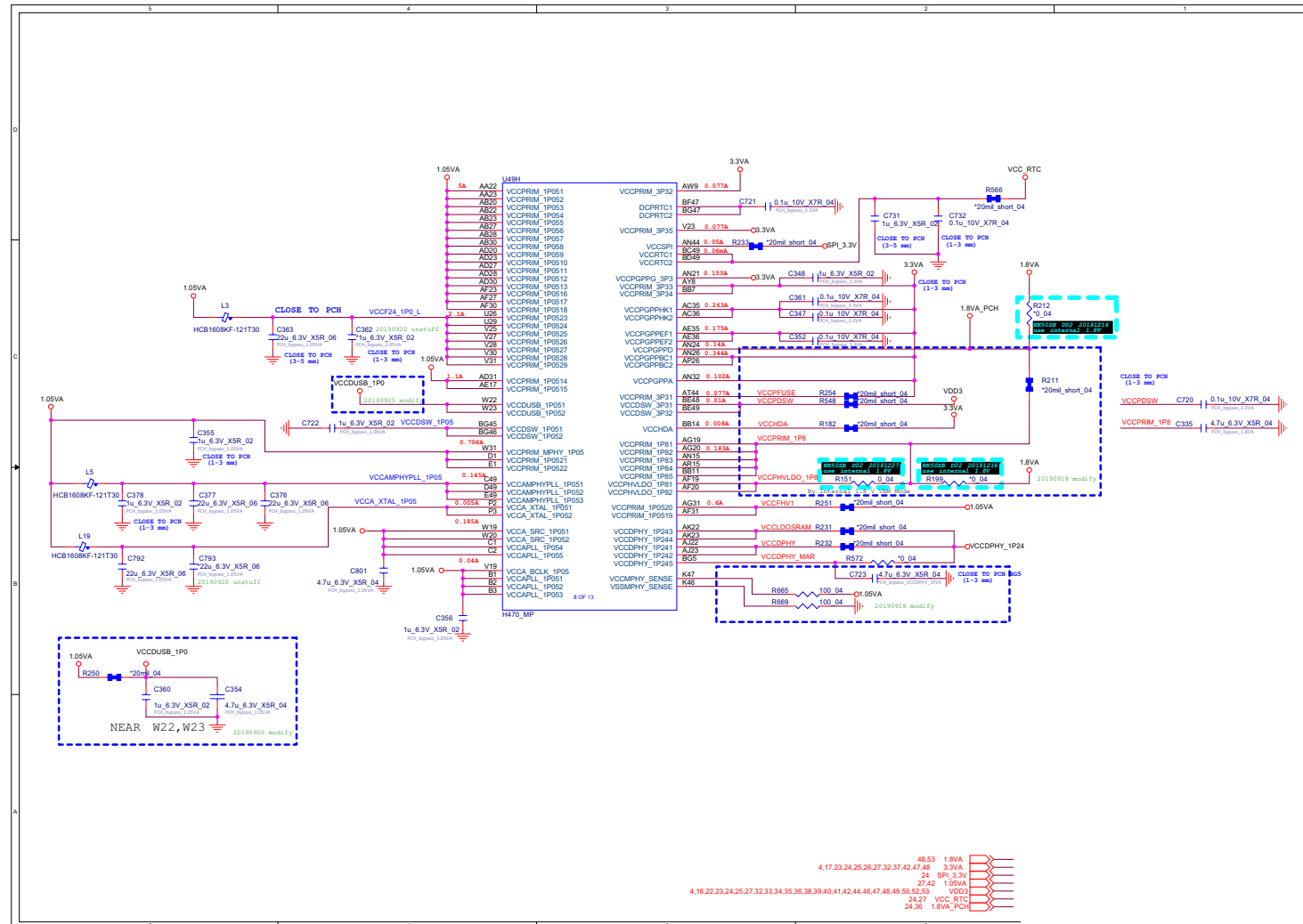
PCH 6/9

B.Schematic Diagrams

Sheet 29 of 61
PCH 6/9

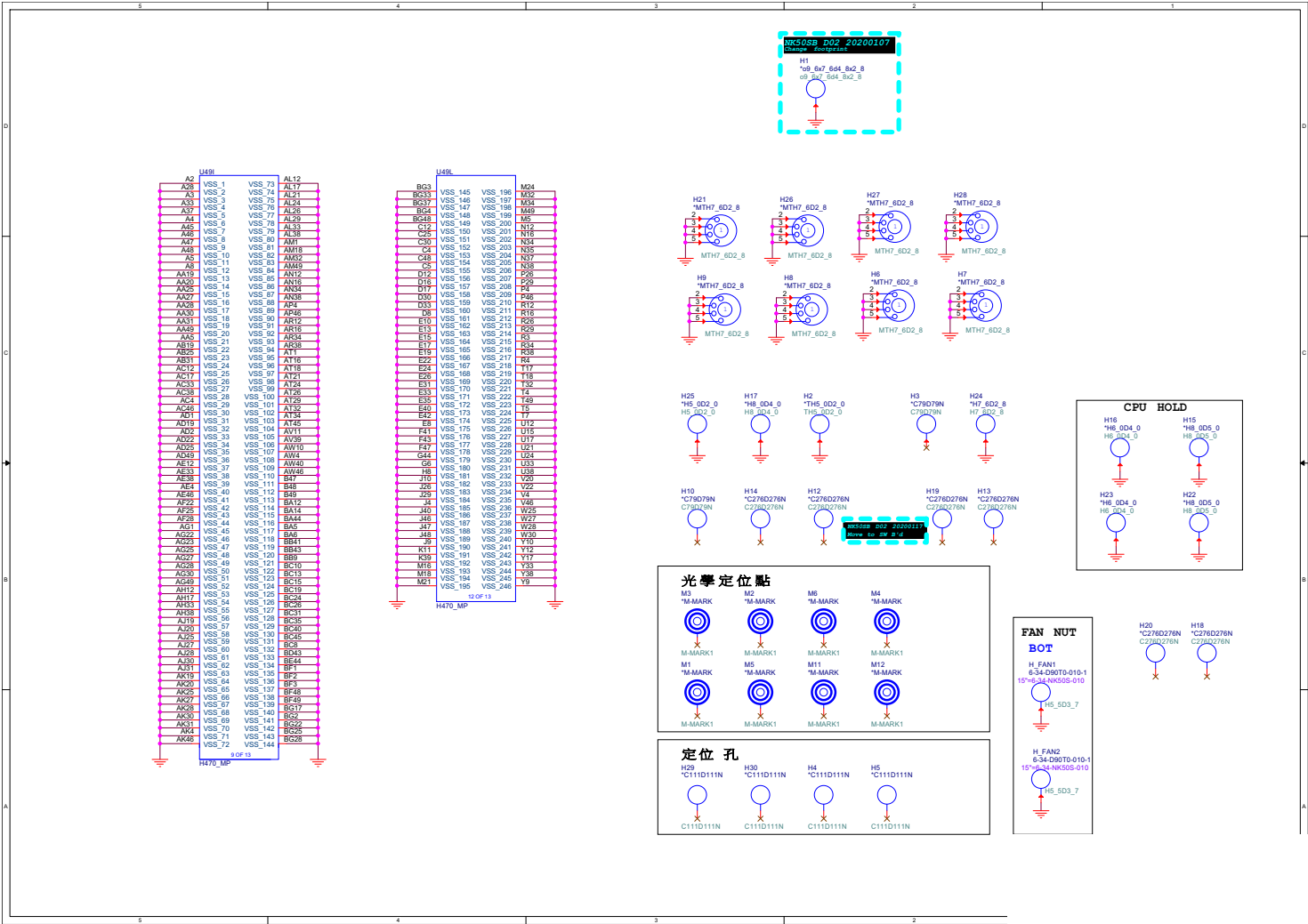


PCH 7/9 B - 31



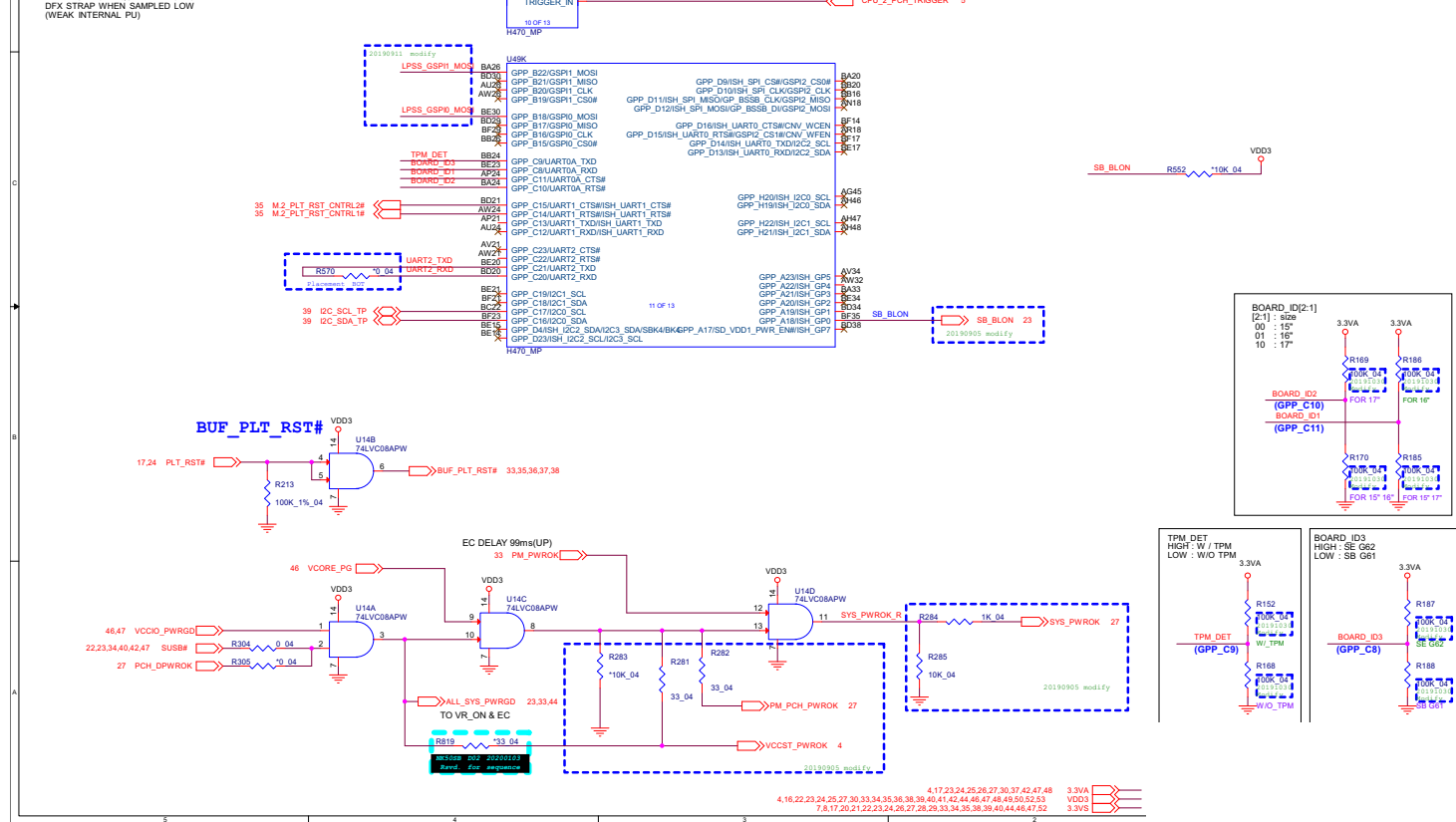
PCH 8/9

Sheet 31 of 61
PCH 8/9

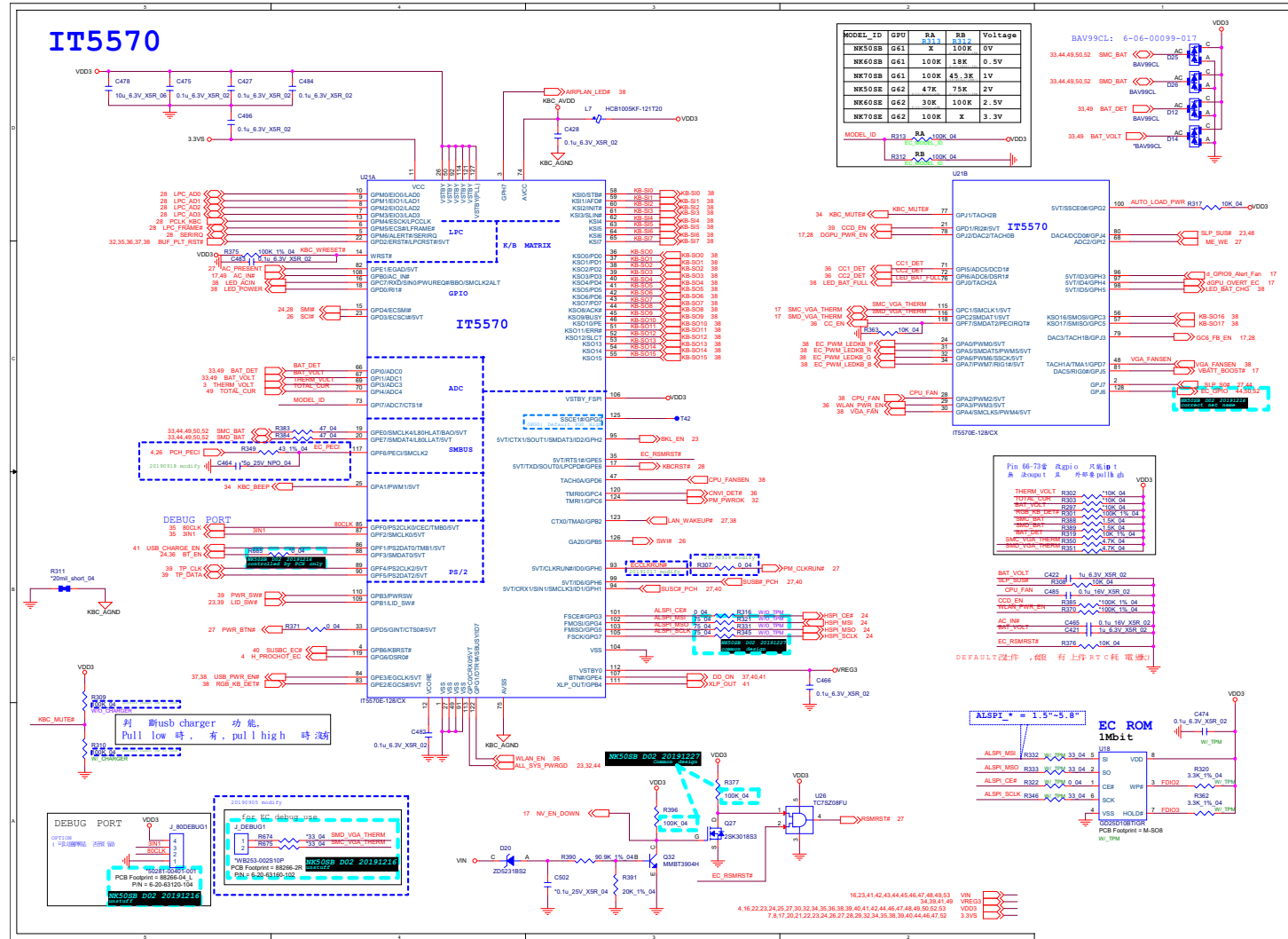


Sheet 32 of 61
PCH 9/9

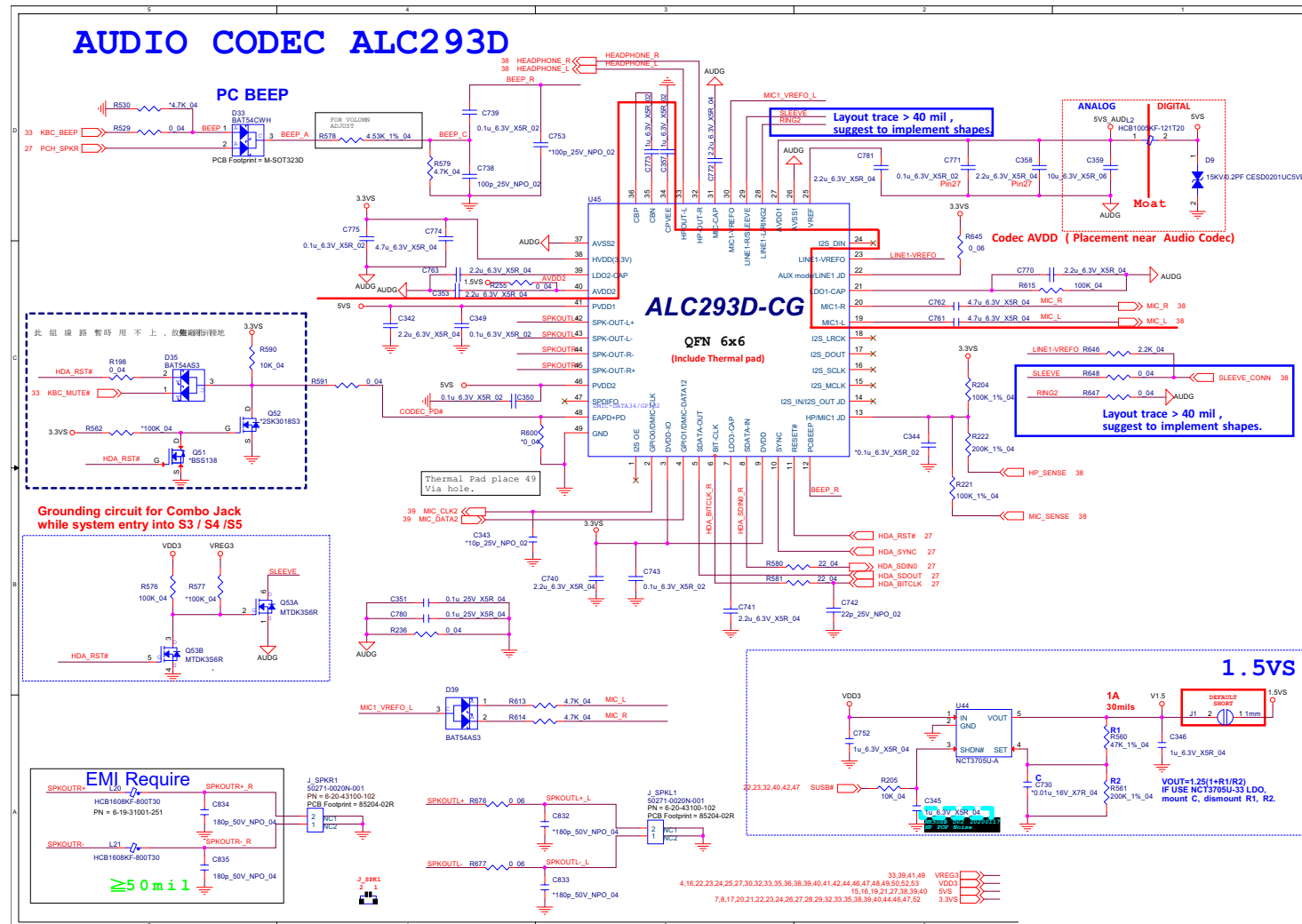
DFX STRAP WHEN SAMPLED
(WEAK INTERNAL FU)



KBC-ITE IT5570

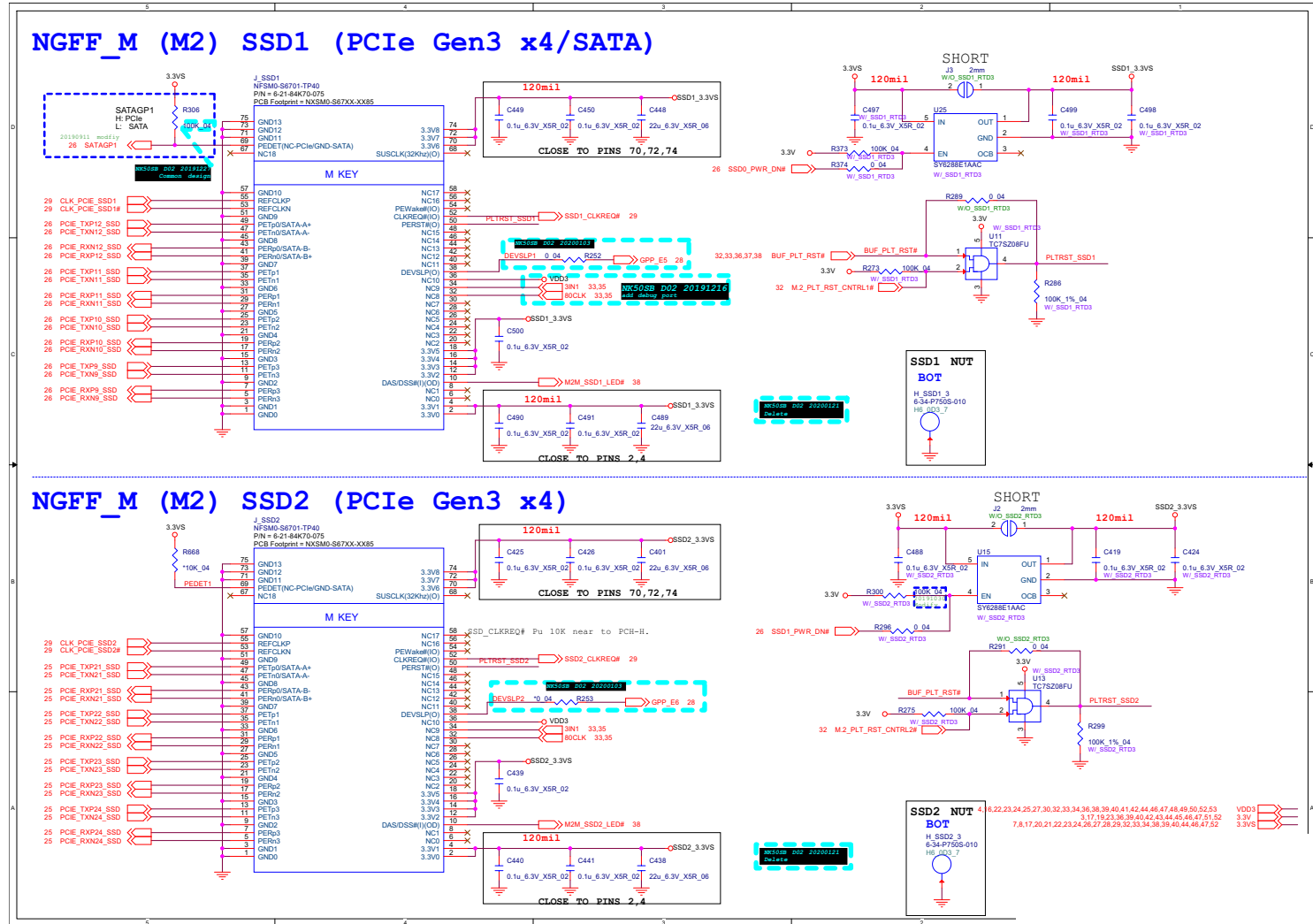
Sheet 33 of 61
KBC-ITE IT5570

Audio Codec

Sheet 34 of 61
Audio Codec

M.2 PCIE4X SSD

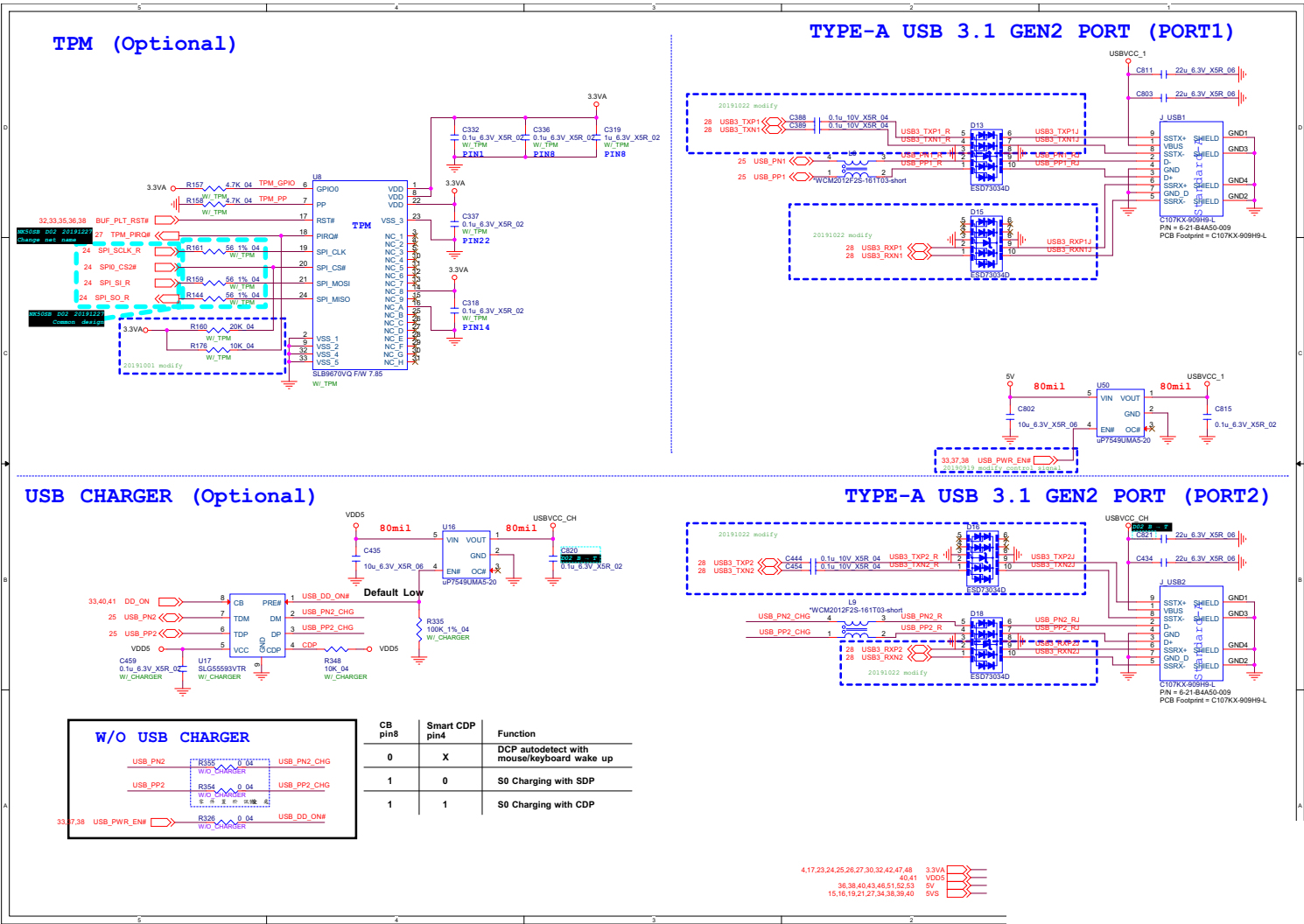
Sheet 35 of 61
M.2 PCIE4X SSD



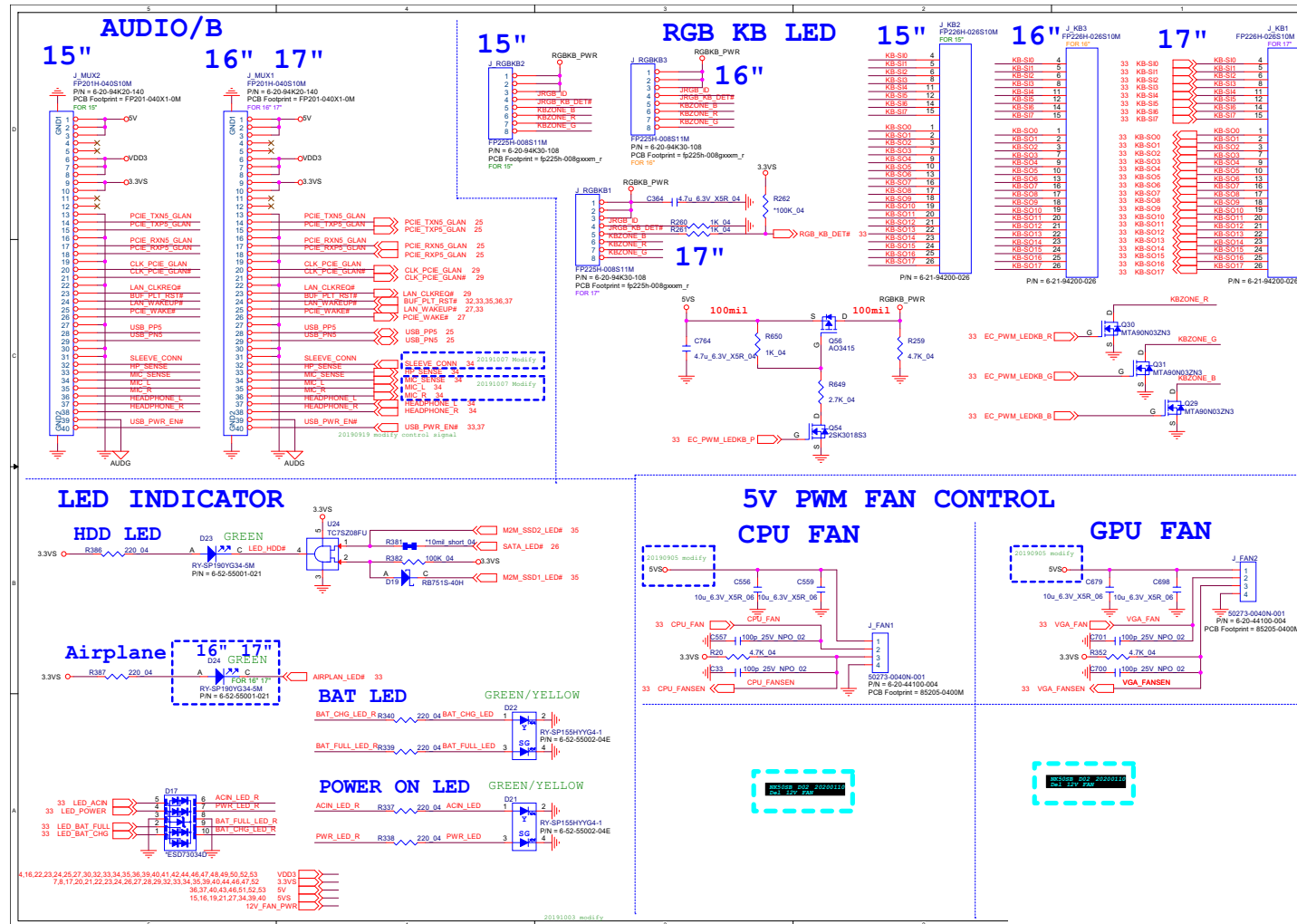
B.Schematic Diagrams

USB Type-A, TPM

Sheet 37 of 61
USB Type-A, TPM



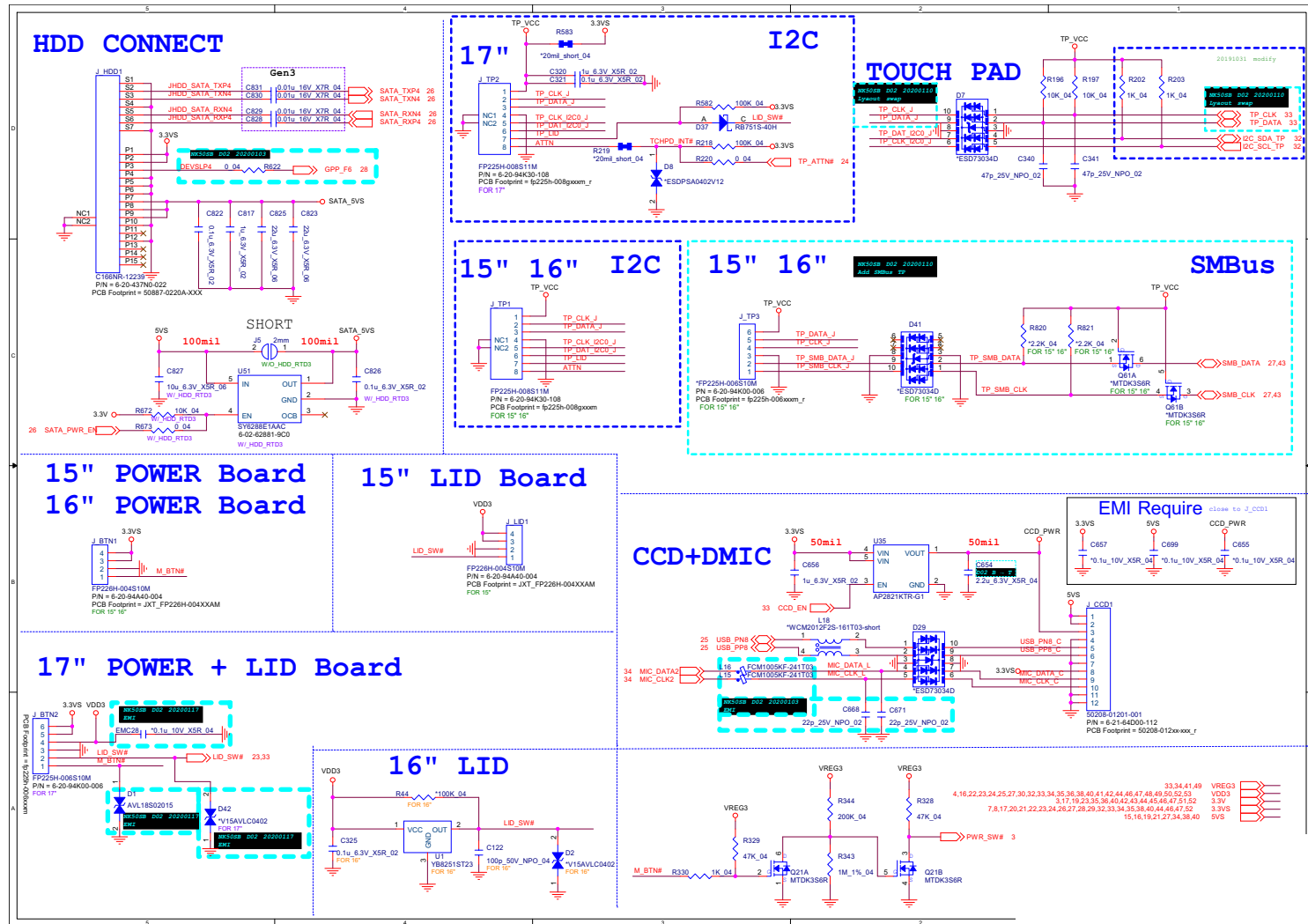
RGB KB, Fan, LED

Sheet 38 of 61
RGB KB, Fan, LED

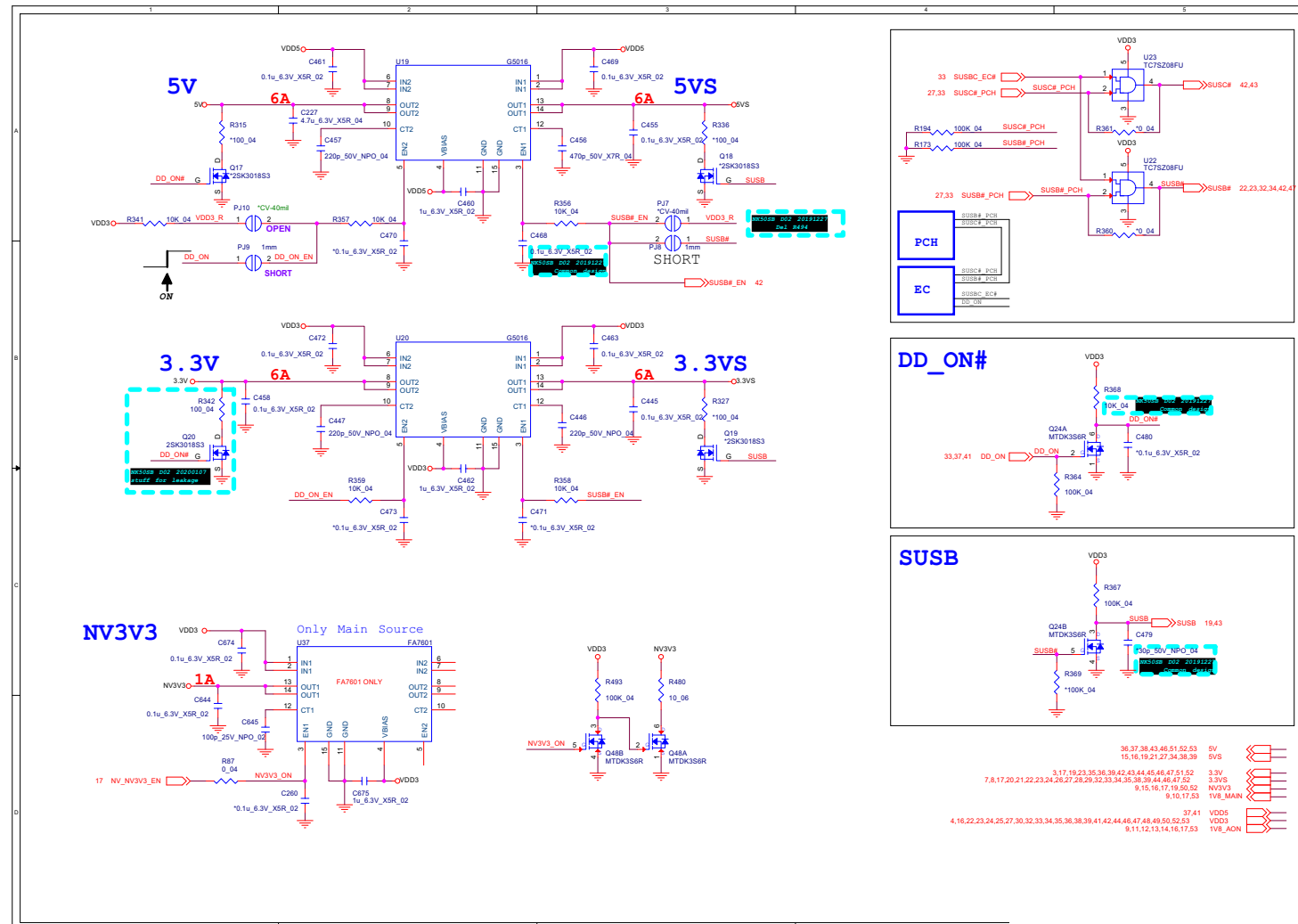
Schematic Diagrams

HDD, CCD, TP, LID, PWR SW

Sheet 39 of 61
HDD, CCD, TP, LID,
PWR SW



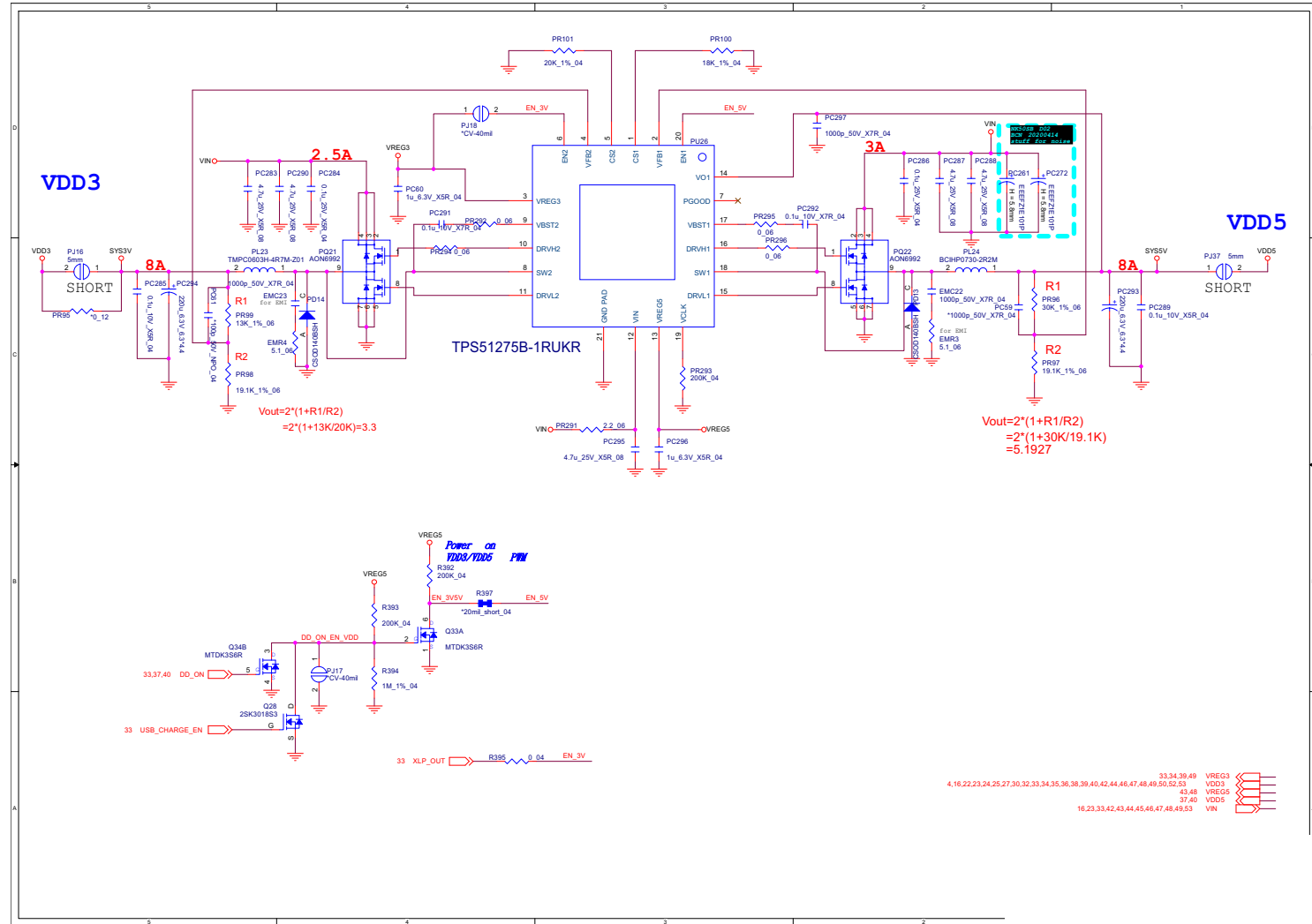
5V, 5VS, 3.3V, 3.3VS, NV3V3



Sheet 40 of 61
5V, 5VS, 3.3V,
3.3VS, NV3V3

VDD3, VDD5

Sheet 41 of 61
VDD3, VDD5



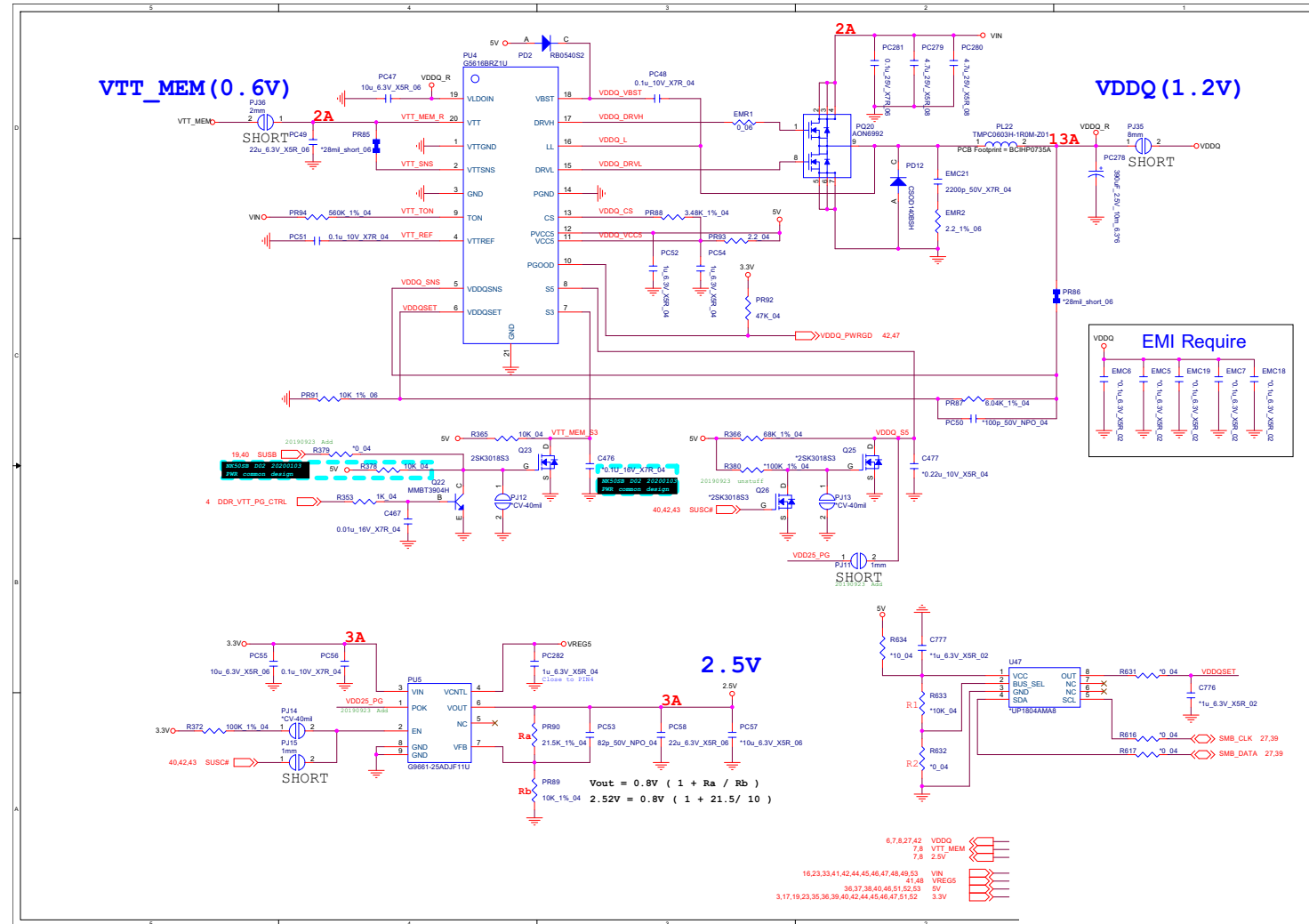
Sheet 42 of 61
1.05A, VCCST/STG/
SFR



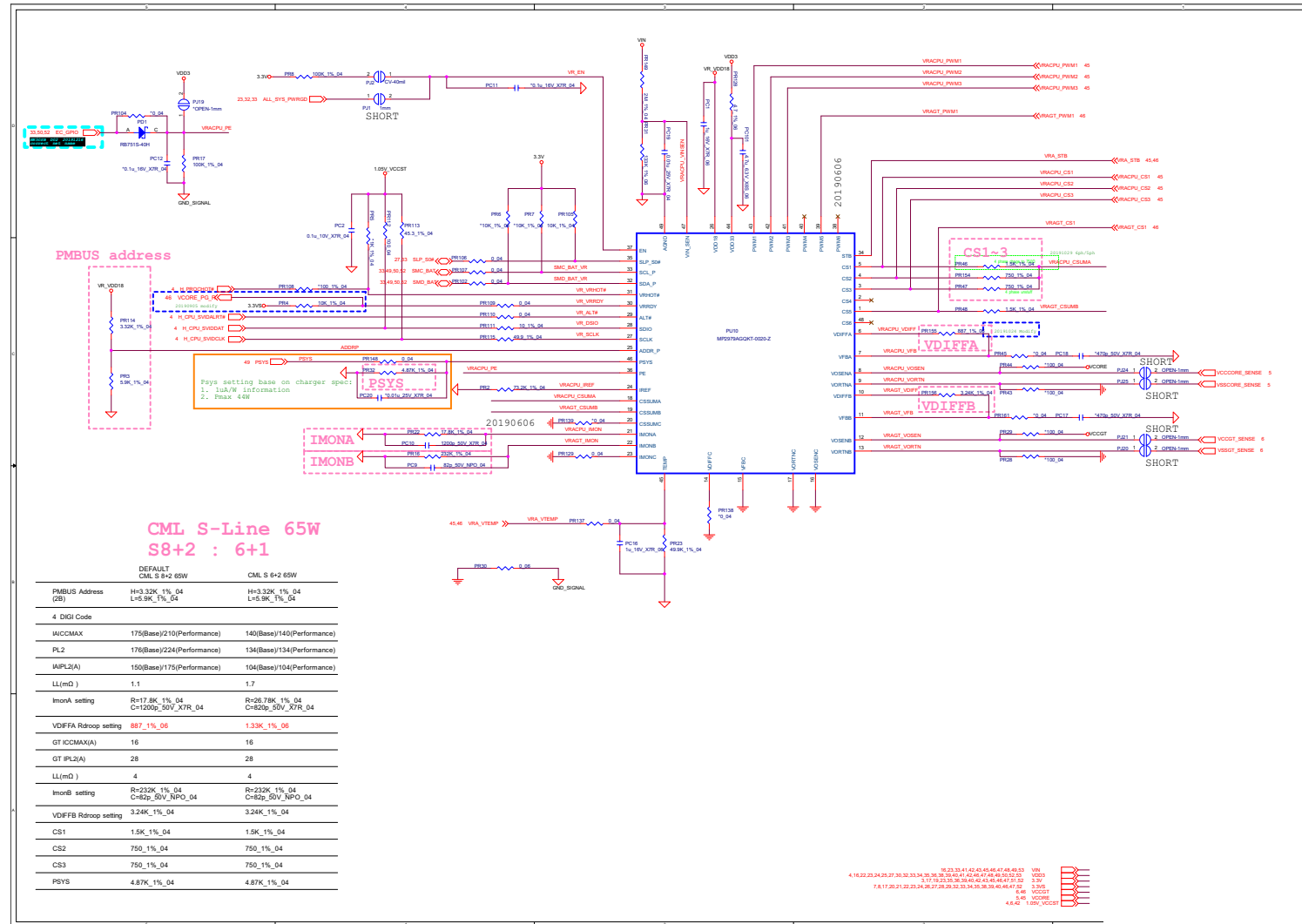
Schematic Diagrams

VDDQ, VTT_MEM, 2.5V

Sheet 43 of 61
VDDQ, VTT_MEM,
2.5V



MP2979

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MP2979

VCore Output Stage

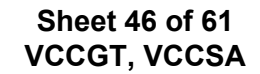
4 phase = phase 1+2+3+4
5 phase = phase 2+3+4+5+6

16,23,33,41,42,43,44,46,47,48,49,53 VIN
3,17,19,23,35,36,39,40,42,43,44,46,47,51,52 3.3V

B. Schematic Diagrams

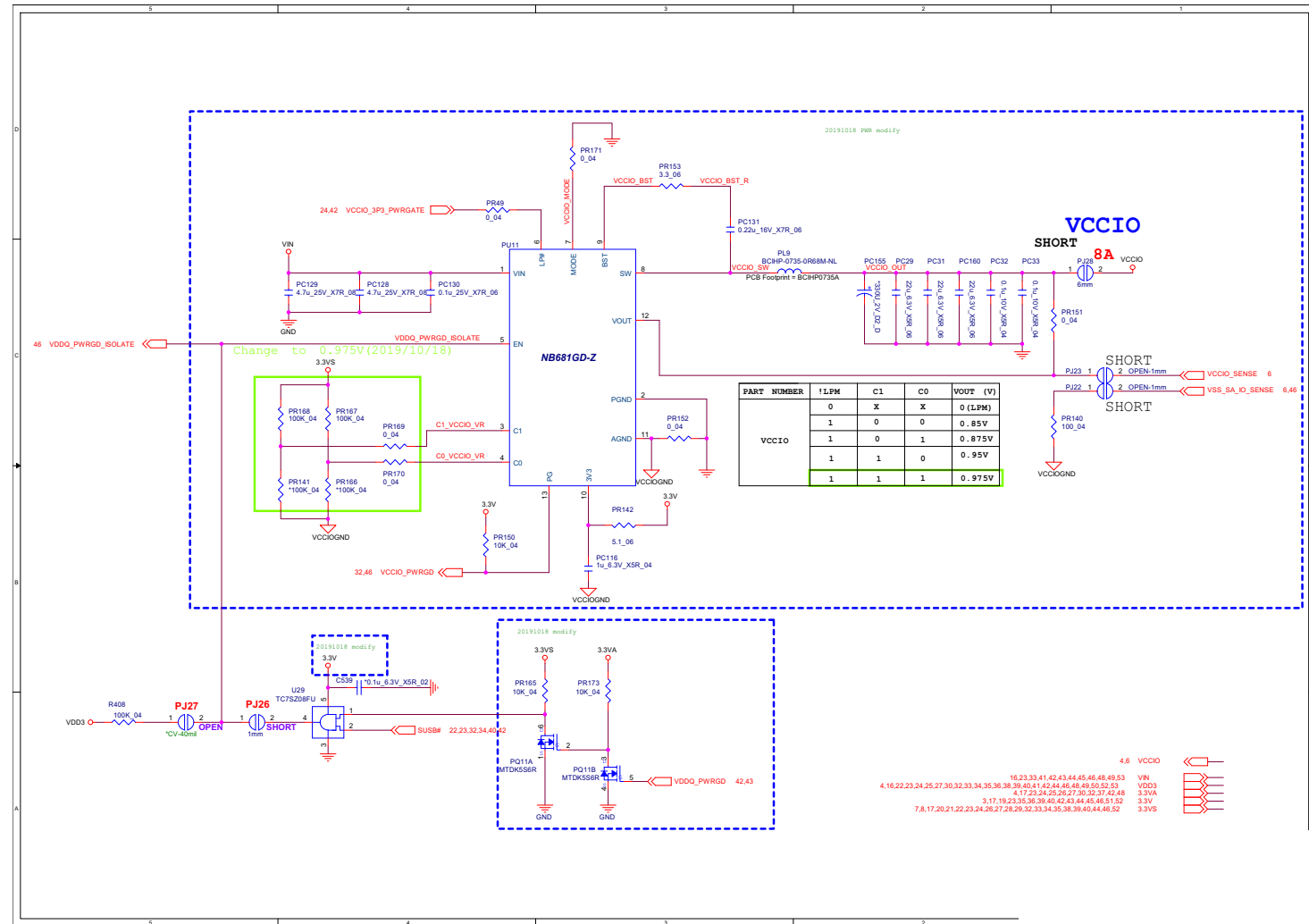
Sheet 45 of 61
VCore Output
Stage

VCCGT, VCCSA B - 47



VCCIO

Sheet 47 of 61
VCCIO

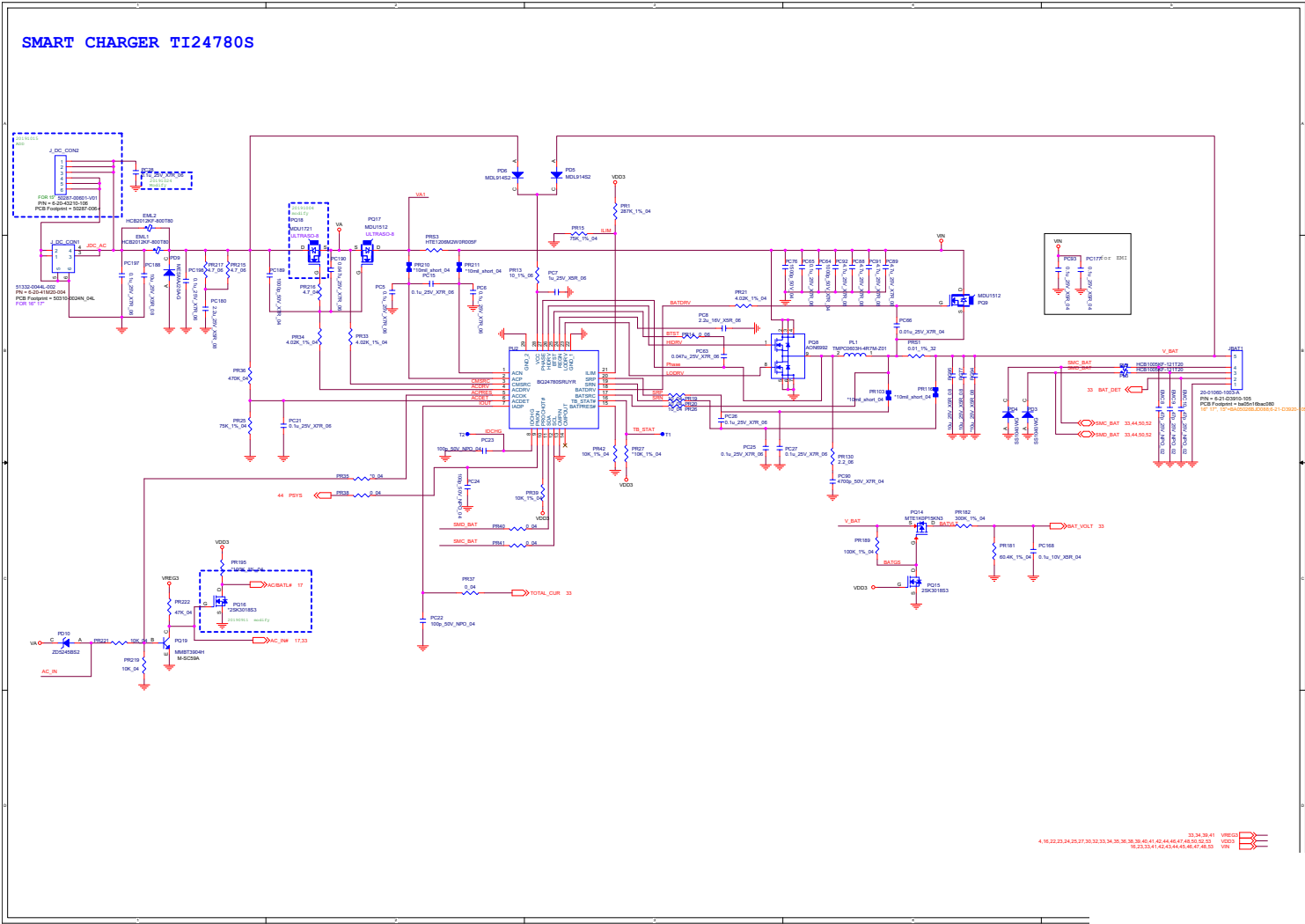


1.8VA B - 49

Schematic Diagrams

AC_In, Charger

Sheet 49 of 61
AC_In, Charger

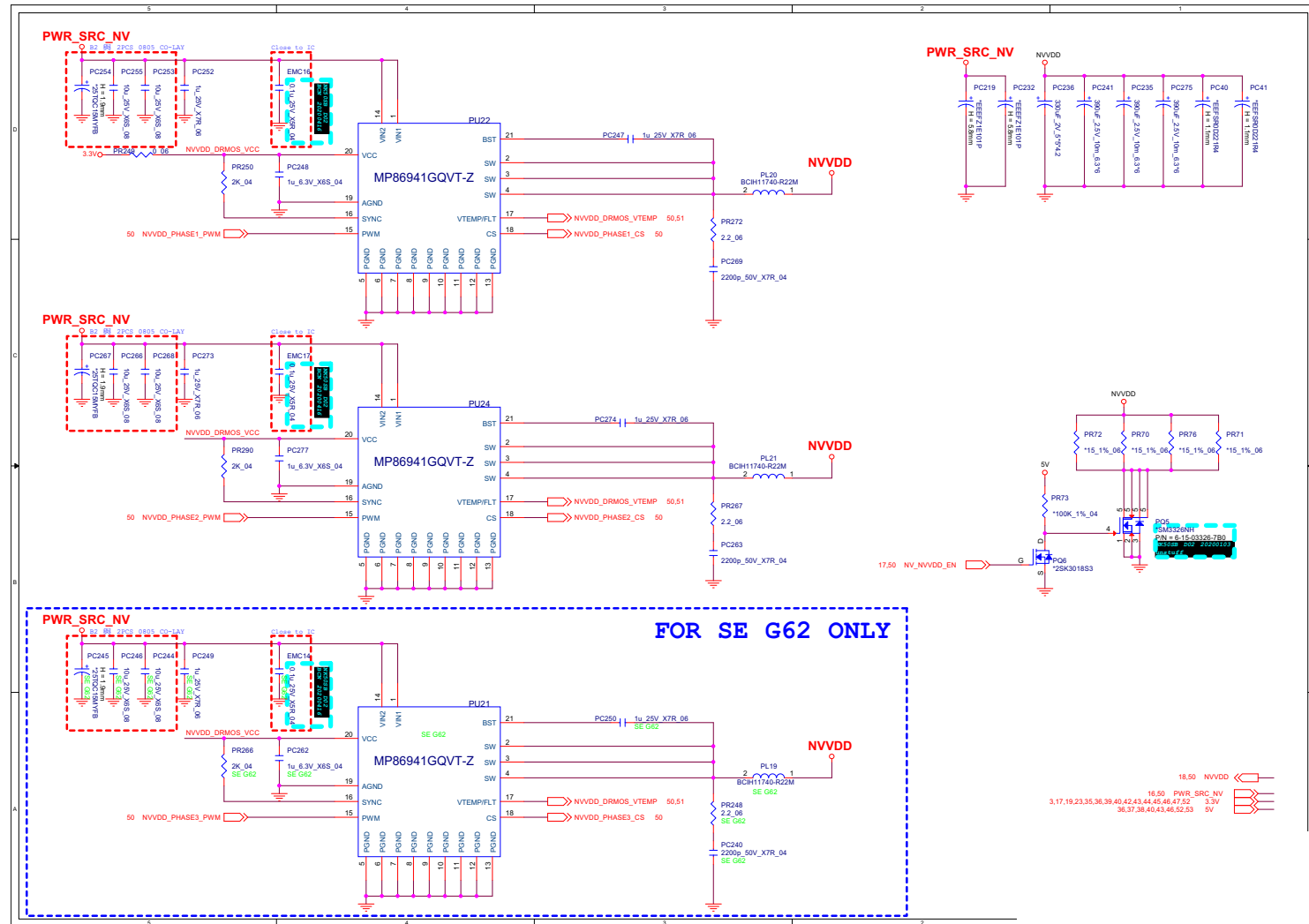


NVVDD1 B - 51

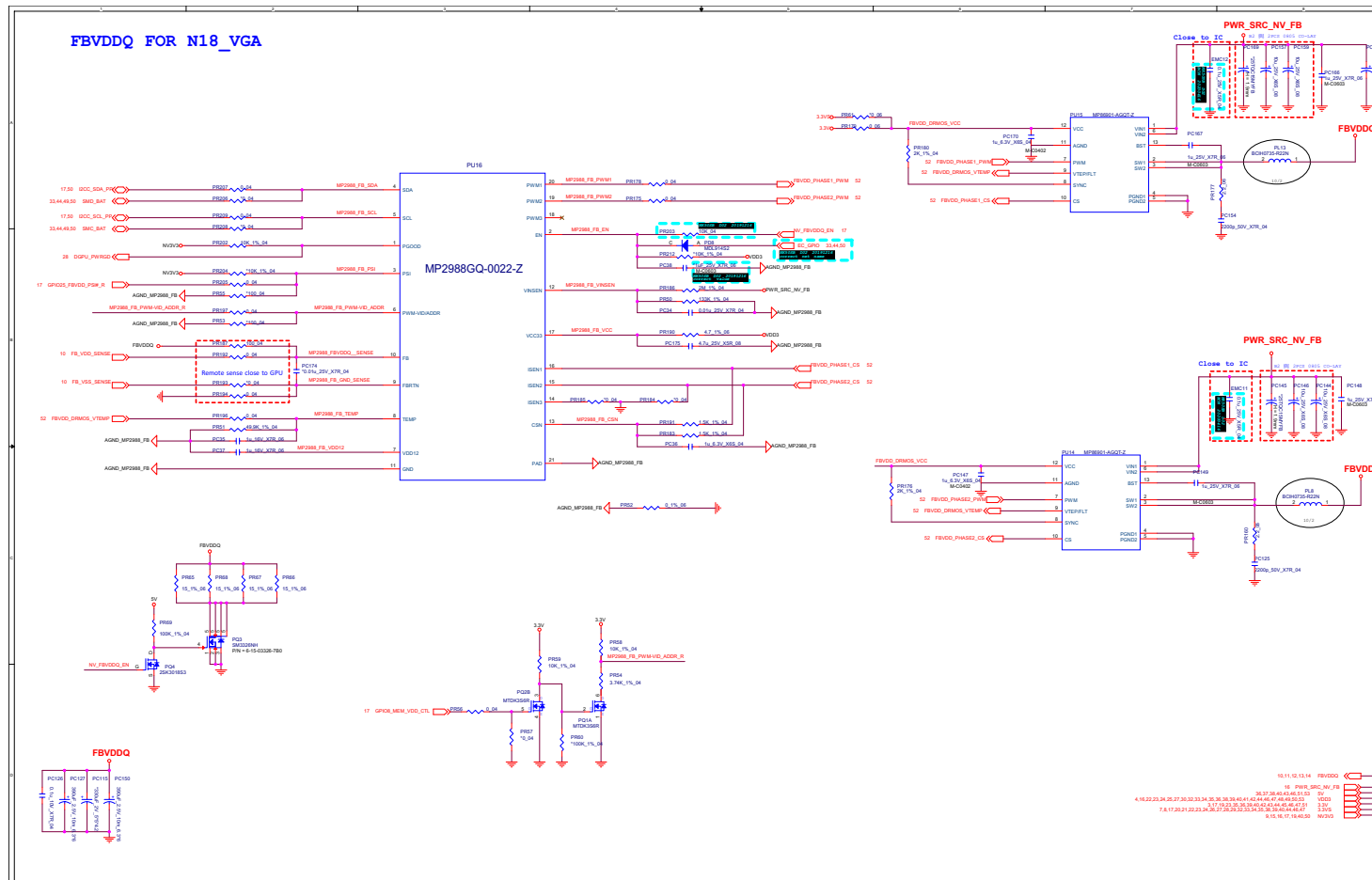


Schematic Diagrams

NVVDD2

Sheet 51 of 61
NVVDD2

Schematic Diagrams

FBVDDQ

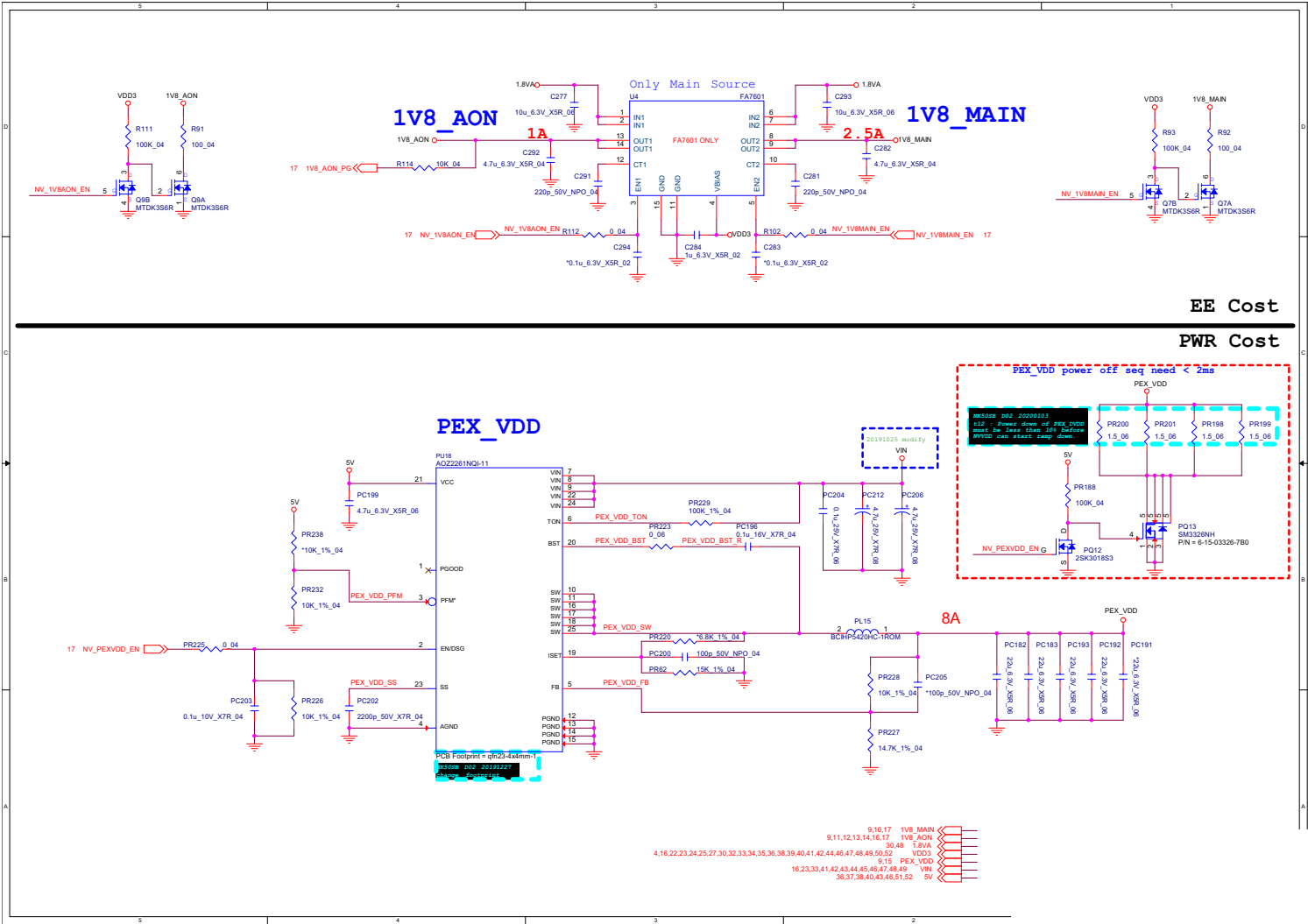
Sheet 52 of 61
FBVDDQ

B.Schematic Diagrams

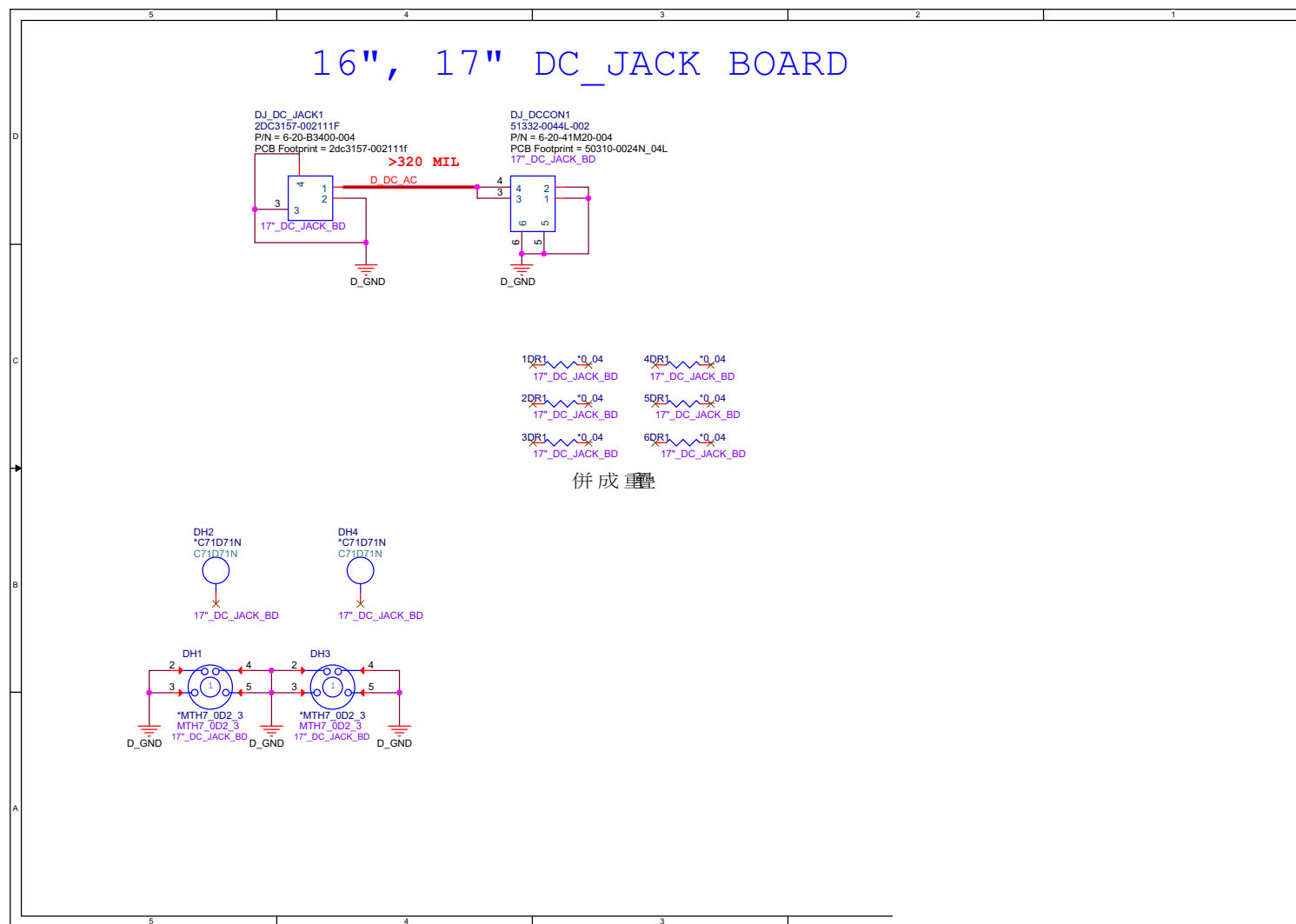
Schematic Diagrams

1V8_AON, PEX_VDD

Sheet 53 of 61
1V8_AON,
PEX_VDD

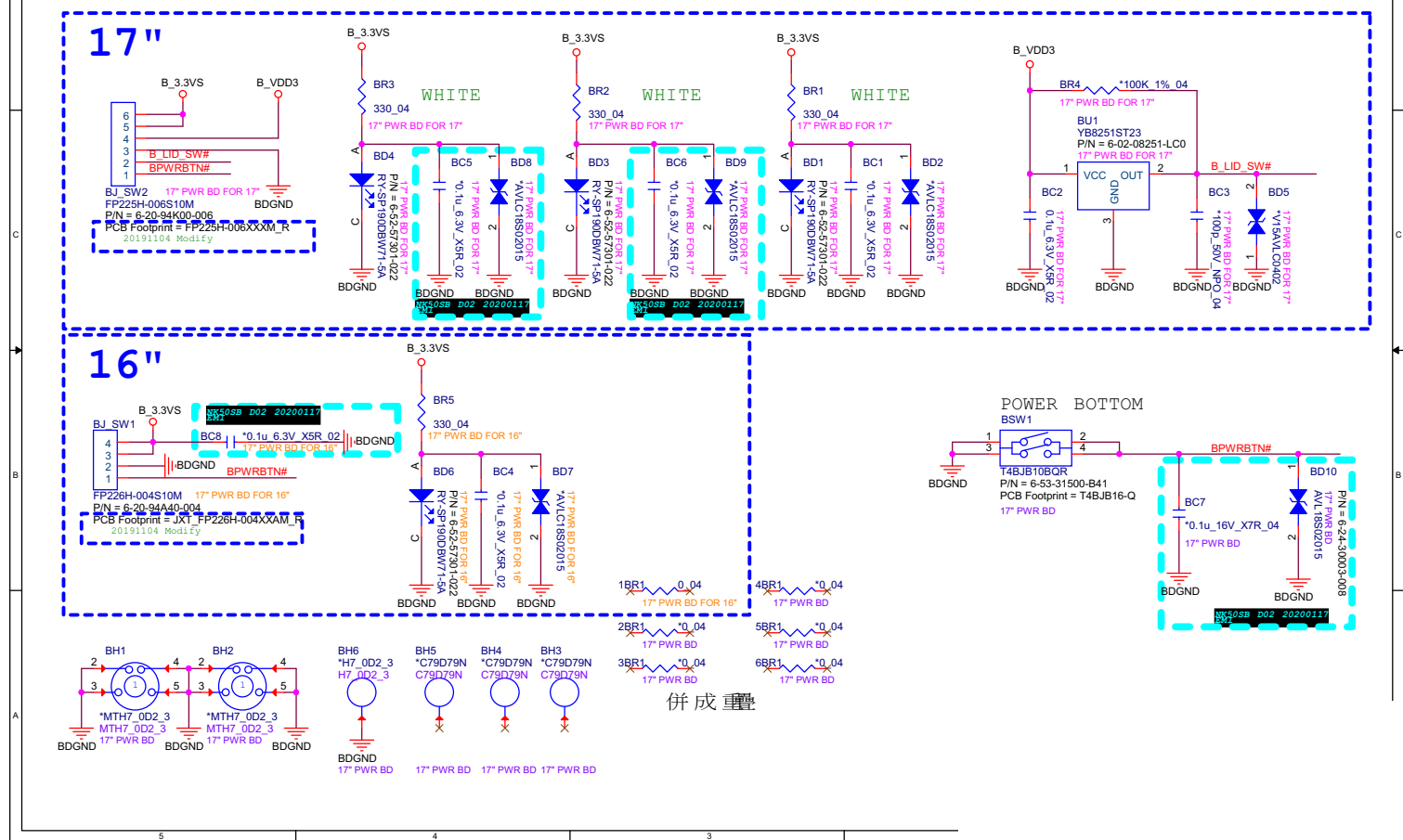


DC Jack Board

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DC Jack Board

Power SW Board

17" POWER SW BOARD: W/LID: 6-77-NK70S-D01
16" POWER SW BOARD: W/O LID: 6-77-NK70S-D01-A

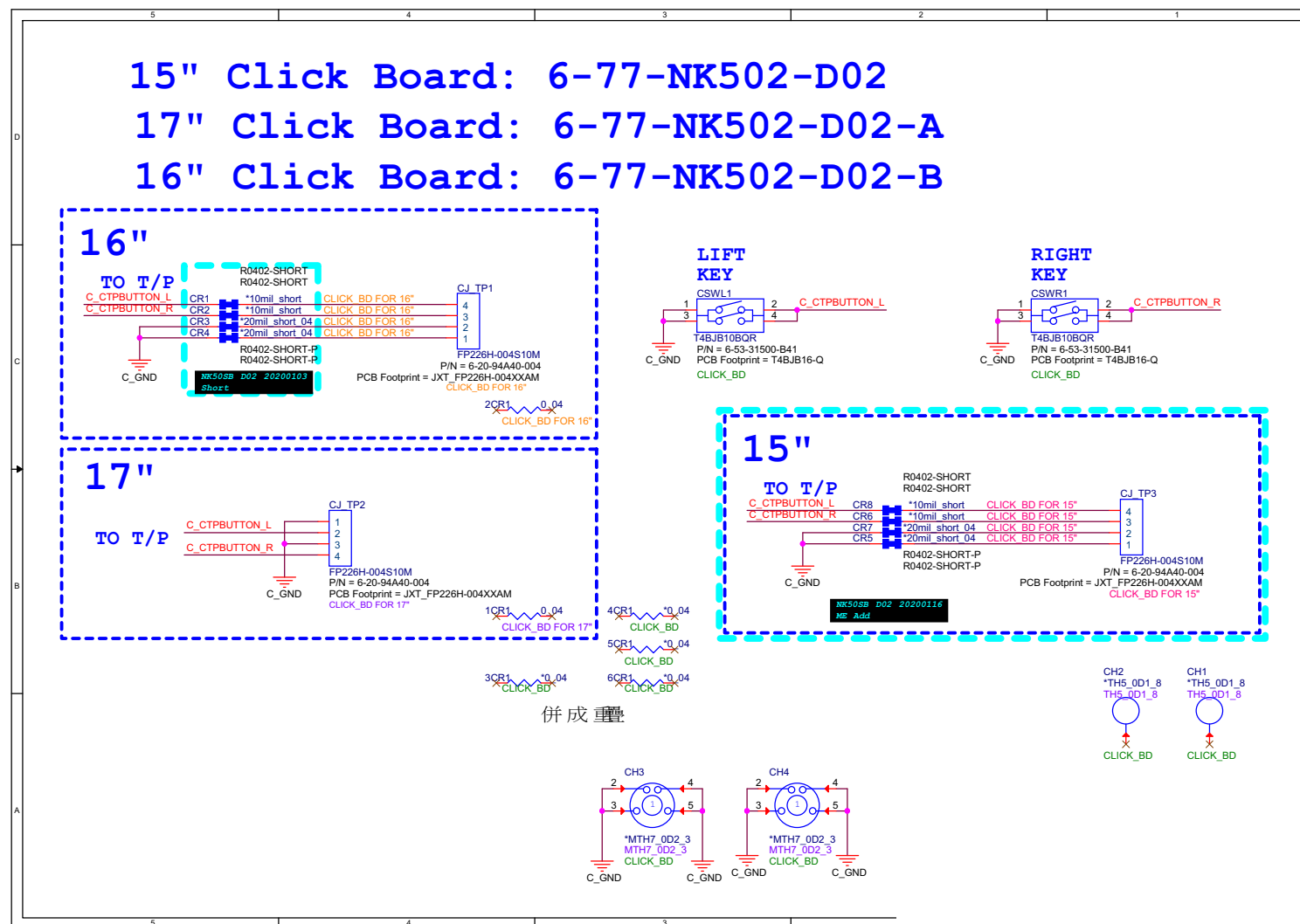


Click Board

15" Click Board: 6-77-NK502-D02

17" Click Board: 6-77-NK502-D02-A

16" Click Board: 6-77-NK502-D02-B

Sheet 56 of 61
Click Board

B.Schematic Diagrams

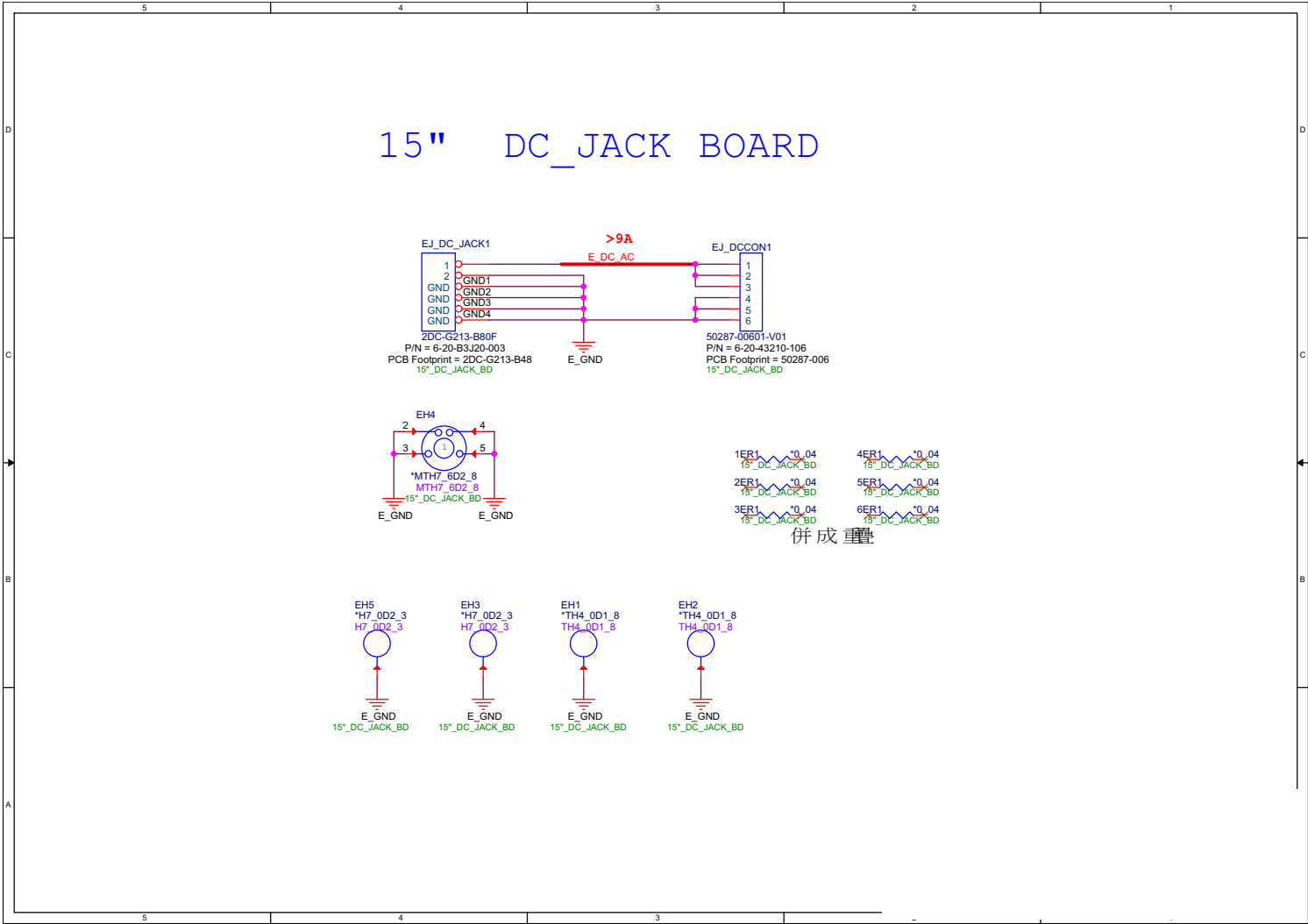
Sheet 57 of 61
Multi Board



The image displays a complex PCB layout for a Raspberry Pi 4B, featuring several key sections:

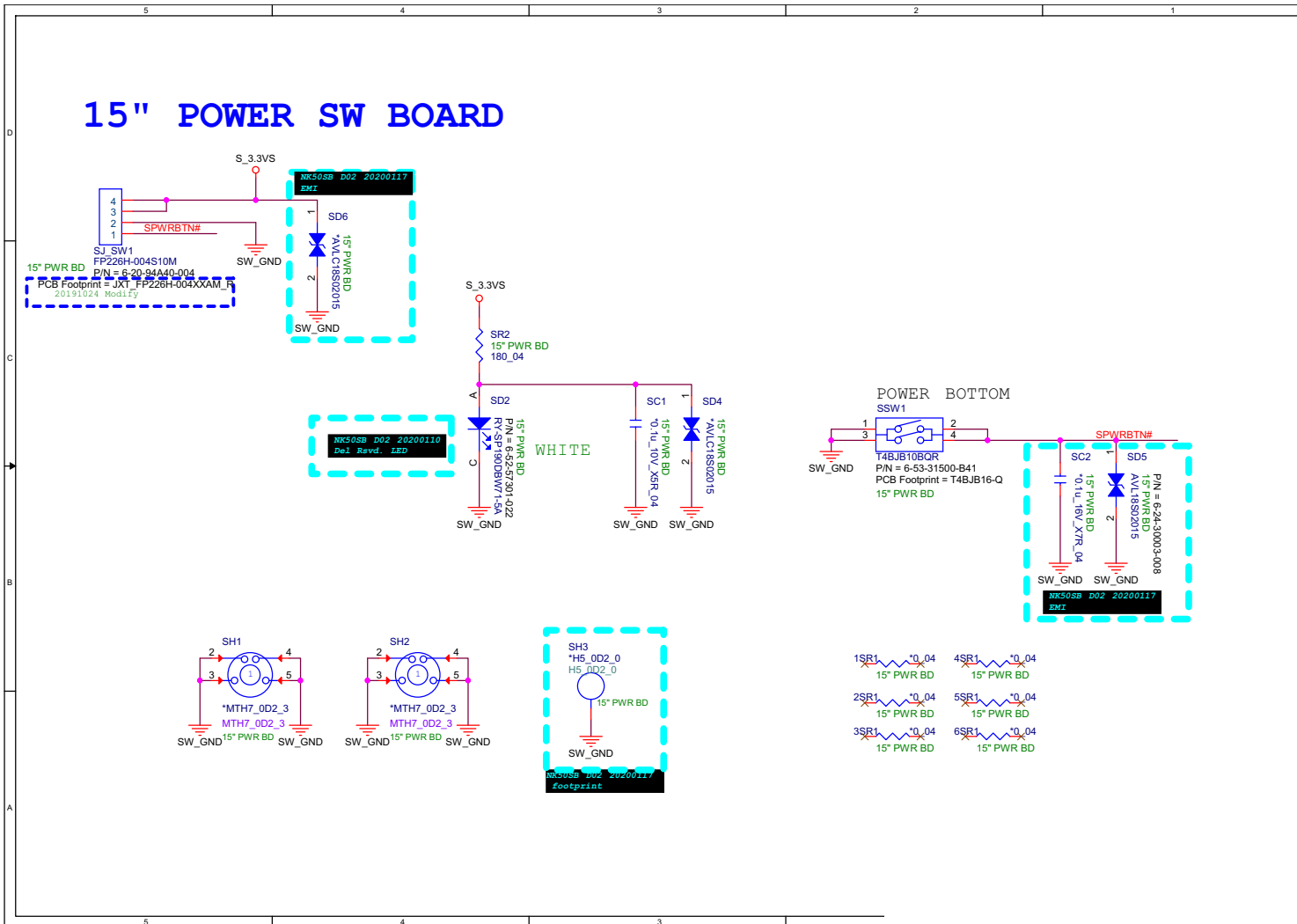
- GIGA LAN (RTL8411):** Located at the top left, this section shows the connection of the GIGA LAN module to the board's pins. It includes labels for various pins and components like MC15, MC20, MC19, MC27, MC1, MC3, MC4, MC24, MC25, MC26, MC27, MC28, MC29, MC30, MC31, MC32, MC33, MC34, MC35, MC36, MC37, MC38, MC39, MC40, MC41, MC42, MC43, MC44, MC45, MC46, MC47, MC48, MC49, MC50, MC51, MC52, MC53, MC54, MC55, MC56, MC57, MC58, MC59, MC60, MC61, MC62, MC63, MC64, MC65, MC66, MC67, MC68, MC69, MC70, MC71, MC72, MC73, MC74, MC75, MC76, MC77, MC78, MC79, MC80, MC81, MC82, MC83, MC84, MC85, MC86, MC87, MC88, MC89, MC90, MC91, MC92, MC93, MC94, MC95, MC96, MC97, MC98, MC99, MC100.
- RJ45 CONN:** Located at the top center, this section shows the connection of the RJ45 module to the board's pins. It includes labels for various pins and components like MC15, MC20, MC19, MC27, MC1, MC3, MC4, MC24, MC25, MC26, MC27, MC28, MC29, MC30, MC31, MC32, MC33, MC34, MC35, MC36, MC37, MC38, MC39, MC40, MC41, MC42, MC43, MC44, MC45, MC46, MC47, MC48, MC49, MC50, MC51, MC52, MC53, MC54, MC55, MC56, MC57, MC58, MC59, MC60, MC61, MC62, MC63, MC64, MC65, MC66, MC67, MC68, MC69, MC70, MC71, MC72, MC73, MC74, MC75, MC76, MC77, MC78, MC79, MC80, MC81, MC82, MC83, MC84, MC85, MC86, MC87, MC88, MC89, MC90, MC91, MC92, MC93, MC94, MC95, MC96, MC97, MC98, MC99, MC100.
- LAN (RTL8411B):** Located at the top right, this section shows the connection of the LAN module to the board's pins. It includes labels for various pins and components like MC15, MC20, MC19, MC27, MC1, MC3, MC4, MC24, MC25, MC26, MC27, MC28, MC29, MC30, MC31, MC32, MC33, MC34, MC35, MC36, MC37, MC38, MC39, MC40, MC41, MC42, MC43, MC44, MC45, MC46, MC47, MC48, MC49, MC50, MC51, MC52, MC53, MC54, MC55, MC56, MC57, MC58, MC59, MC60, MC61, MC62, MC63, MC64, MC65, MC66, MC67, MC68, MC69, MC70, MC71, MC72, MC73, MC74, MC75, MC76, MC77, MC78, MC79, MC80, MC81, MC82, MC83, MC84, MC85, MC86, MC87, MC88, MC89, MC90, MC91, MC92, MC93, MC94, MC95, MC96, MC97, MC98, MC99, MC100.
- Switching Regulator close to PM48:** Located at the bottom left, this section shows the connection of the switching regulator to the board's pins. It includes labels for various pins and components like MC15, MC20, MC19, MC27, MC1, MC3, MC4, MC24, MC25, MC26, MC27, MC28, MC29, MC30, MC31, MC32, MC33, MC34, MC35, MC36, MC37, MC38, MC39, MC40, MC41, MC42, MC43, MC44, MC45, MC46, MC47, MC48, MC49, MC50, MC51, MC52, MC53, MC54, MC55, MC56, MC57, MC58, MC59, MC60, MC61, MC62, MC63, MC64, MC65, MC66, MC67, MC68, MC69, MC70, MC71, MC72, MC73, MC74, MC75, MC76, MC77, MC78, MC79, MC80, MC81, MC82, MC83, MC84, MC85, MC86, MC87, MC88, MC89, MC90, MC91, MC92, MC93, MC94, MC95, MC96, MC97, MC98, MC99, MC100.
- 6 IN 1 SOCKET - MMC / RMCC - SD / mini SD / SDHC / SDXC:** Located at the bottom center, this section shows the connection of the 6 IN 1 socket to the board's pins. It includes labels for various pins and components like MC15, MC20, MC19, MC27, MC1, MC3, MC4, MC24, MC25, MC26, MC27, MC28, MC29, MC30, MC31, MC32, MC33, MC34, MC35, MC36, MC37, MC38, MC39, MC40, MC41, MC42, MC43, MC44, MC45, MC46, MC47, MC48, MC49, MC50, MC51, MC52, MC53, MC54, MC55, MC56, MC57, MC58, MC59, MC60, MC61, MC62, MC63, MC64, MC65, MC66, MC67, MC68, MC69, MC70, MC71, MC72, MC73, MC74, MC75, MC76, MC77, MC78, MC79, MC80, MC81, MC82, MC83, MC84, MC85, MC86, MC87, MC88, MC89, MC90, MC91, MC92, MC93, MC94, MC95, MC96, MC97, MC98, MC99, MC100.
- LDO Mode:** Located at the bottom right, this section shows the connection of the LDO mode to the board's pins. It includes labels for various pins and components like MC15, MC20, MC19, MC27, MC1, MC3, MC4, MC24, MC25, MC26, MC27, MC28, MC29, MC30, MC31, MC32, MC33, MC34, MC35, MC36, MC37, MC38, MC39, MC40, MC41, MC42, MC43, MC44, MC45, MC46, MC47, MC48, MC49, MC50, MC51, MC52, MC53, MC54, MC55, MC56, MC57, MC58, MC59, MC60, MC61, MC62, MC63, MC64, MC65, MC66, MC67, MC68, MC69, MC70, MC71, MC72, MC73, MC74, MC75, MC76, MC77, MC78, MC79, MC80, MC81, MC82, MC83, MC84, MC85, MC86, MC87, MC88, MC89, MC90, MC91, MC92, MC93, MC94, MC95, MC96, MC97, MC98, MC99, MC100.

DC Jack Board



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DC Jack Board

Power SW Board



Sheet 60 of 61
Power SW Board

LID Board

Sheet 61 of 61
LID Board

